

## DirectX, Ĺ–Ú“İ

Microsoft DirectX™ Software Development Kit (SDK), Ĺ AfnfCfpftfH [f}f“fX, ĀfŠfAf<f^fCf€  
, ĒfAfvfŠfP [fVf‡f“đ ŸŒv, ·, é, ½, ß, Ē•K—v, ĒfŠf\ [fX, đ’ñ<Ÿ, ·, ×, A , I, Ēf`f...  
[fj}f“fO, đ s, Ā, ½fAfvfŠfP [fVf‡f“fvf fOf%of~f“fO EfCf“f^ [ftfFfCfX(API)fZfbfg, Ā, , é BDirectXfefNfmf  
fW [, Ĺ AŽŸ ċ’ā, ĹfRf“fsf... [f^fQ [f€, āf}f<f`f ftfBfAfAfvfŠfP [fVf‡f“ŠJ”, Ē–đ—§, Ā, ¾, ě, □ B

Microsoft, Ĺ AMicrosoft WindowsfIfyfŒ [fefBf“fOfVfXfef€, Ā“® ĩ, ·, éfAfvfŠfP [fVf‡f“, ĹfpftfH [f}  
f“fX, đ AMS-DOS, āfA [fP [fhfQ [f€<@, Ā“® ĩ, ·, éfAfvfŠfP [fVf‡f“, ĹfpftfH [f}f“fX`Ē ā, Ĺ, à, Ĺ, Ē, μ, æ, □  
, ĀDirectX, đŠJ”, μ, ½ BŠæ<, Ā A•W €%o», ³, ě A“K Ø, Ē•¶ “%o», ³, ě, ½ AfQ [f€, đ ‘, -  
, ½, ß, ĹfIfyfŒ [fefBf“fOŠĀ««, đ’ñ<Ÿ, ·, é, ±, Ą, Ē, æ, ě AWindows, Ā, ĹfQ [f€ŠJ”, đ’£ ĩ, ·, é, ½, ß, Ē A, ±, ĹSDK, ĹŠJ”-  
, ³, ě, ½, Ĺ, Ā, , é B

, ±, Ĺ Ĺ, Ā, Ĺ ADirectX, đŽg—p, ·, é, Ó, ½, Ā, Ĺ d—v, Ē—~“\_đ à–¾, ·, é Bf\ftfgfEfFfAŠJ”-  
ŽŒ, Ĺ, ½, ß, Ĺfn [fhfEfFfA”ñĒĒ“¶ «, Ĺ’ñ<Ÿ, Ą Afñ [fhfEfFfAŠJ”ŽŒ, Ĺ, ½, ß, ĹfKfCfhf%ofCf“, Ĺ Ÿ’è, Ā, , é B

DirectX WindowsfAfvfŠfP [fVf‡f“ŠJ”, Ĺ—~“

fn [fhfEfFfAŠJ”, Ĺ, ½, ß, ĹfKfCfhf%ofCf“, Ĺ’ñ<Ÿ

## DirectX WindowsAfvfŠfP [fVf‡f“ŠJ”,l~“\_

DirectX,l'æ^ê,l-Ú“l,l A i“úMS-DOS,ÅŽg—p,<sup>3</sup>,ê,Ä,¢,é<@”\,Ö,ÌEÝŠ· «,l, ,éAfNfZfX,ð'ñ<Ÿ,µ AMS-DOSfRf“f\ [f<fx [fX,lfAfvfŠfP [fVf‡f“•Ä,Ý, ,é,¢,l,»,ê^È ã,lfpftfH [f} f“fX,ð o,<sup>3</sup>,<sup>1</sup> A,»,µ,Äfp [f\if<fRf“fsf... [f^,É,“,~,éfn [fhfEfFfA<Z pŠv V,l áŠQ,ðŽæ,è æ,,±,Æ,Ä, ,é B

Microsoft,l AWindowsfx [fX,lfAfvfŠfP [fVf‡f“É AÆ» Ý,»,µ,Ä «—^,lfRf“fsf... [f^fVfXfef€ ã,Ä—~ p%oÄ”\,Èfn [fhfEfFfA,Ö,lfnfCfpftfH [f}f“fX,ÄfŠfAf<f^fCf€,ÈfAfNfZfX,ð'ñ<Ÿ,·,é,½,ßDirectX,ðŠJ”- ,µ,½ BDirectX,l AfCf“fXfg [f<,âfRf“ftfBfMf... f€ [fVf‡f“,l”lŽG,<sup>3</sup>,ðE,,ç,µ Afn [fhfEfFfA,l' Š,ð Ä'âEÀŠ^,©,µ,È,<sup>a</sup>,ç Afn [fhfEfFfA,ÆfAfvfŠfP [fVf‡f“,Æ,lŠÖ,É~êŠŇ,µ,½fCf“f^ [ftfFfCfX,ð'ñ<Ÿ,µ,Ä,¢,é B

fnfCfpftfH [f}f“fX,ÈWindowsfx [fX,lfQ [f€,l A^È%°,lfeNfmf fW [,ð—~p,µ,Ä,¢,é B

fpftfH [f}f“fXÆü ã,l,½,ß“Á•Ê ÝEv,<sup>3</sup>,ê,½fAfNfZf%of€ [f^fJ [fh  
vf%ofOfAf“fhfvf€fC,Æ A'¼,lWindowsfn [fhfEfFfA,âf\ftfgfEfFfA  
DirectPlay,ðŠÜ,ð AWindowsfrf<fgfCf“,l'Ê MfT [frfX

fn [fhfEfFfAŠJ” ,ì,½,B,ìfKfCfhf%oCf“ ,ì”ñ·Ÿ

Microsoft,“DirectX,ðŠJ” ,μ,½,Æ,« ,ì’æˆê,ì—Ú“ I,ì,Đ,Æ,Â,Í AWindowsfIfyfŒ [fefBf“fOŠÂ« ,Â,ìfQ [f€ŠJ”- ,ì’£ i,¾,Â,½ BDirectXˆO,Í Afp [f\fi fRf“fsf... [f^—p,ÉŠJ” ,³,ê,½fQ [f€,İŽâ— ,ÍMS-DOSfx [fX,¾,Â,½ B,» ,ê,ç,ìfQ [f€,ìŠJ”ŽÖ,Í A,³,Ü,‘,Ü,ÈfJ [fh,ì ”“½,Œfn [fhfEfFfAŽÂ“ ,É ] ,í,È,ˆ,ê,İ,È,ç,È,©,Â,½ B,μ,©,μDirectX,Â,Í AfQ [f€ŠJ”ŽÖ,Í Afn [fhfEfFfA,Ö,ìf\_CfŒfNfgfAfNfZfX,ì— “— ,ðŽ ,μ,±,Æ,È, AfffofCfX”ñˆÈ“¶ « ,Æ,ç,μ— “— ,“¾,ç,ê,é,İ,Â , ,é B

,à,μ,Đ,Æ,Â,ì d—v,È—Ú“ I,Í Afn [fhfEfFfA%öİŽĐ,É‘İ,μ AfnfCfpftfH [f}f“fX,ÈfAfvfŠfP [fVf‡f“ ,ìŠJ”- ŽÖ,âfn [fhfEfFfAfxf“f\_ [(IHV),©,ç,ìftfB [fhfofbfN,ÉŠİ,Â,ç,½fKfCfhf%oCf“ ,ð’ñ·Ÿ , ,é,±,Æ,Â , ,é BDirectX SDKfRf“f [fIf“fg,Í AŒ%oÈ,Æ,μ,Â,Ü,¾¶¶ Ý,μ,È,Œfn [fhfEfFfAfNfZf%oŒ [f^<@” ,ìŽd— I,ð’ñ·Ÿ , ,é,± ,Æ,È,È,é,©,à,μ,ê,È,Œ B’½, ,ì ê ‡,Â,Í Af\ftfgfEfFfA,» ,ê,ç,İ<@” \,ðfGf~f... fŒ [fg, , ,é B,» ,êˆŠO,Â,Í Af\ftfgfEfFfA,Ífn [fhfEfFfA,É‘İ,μ,» , ,İ” — I,É,Â,ç,Ä—â,ç ‡,í,¹ A ,à,μfTf [fg,³,ê,Â,Œ ,È,ˆ,ê,İ—Ž< , ,é,Æ,ç,μ,±,Æ,È,È,é B

«B XŽg—p%oÂ” \,É,È,é,Â , ,ë,ffBfXfvfŒfCfn [fhfEfFfA<@” ,Í AˆÈ%o ,ðŠÜ,ñ,Â,ç,é B

fi [fo [fŒfC Bfy [fW EftfŠfbfsf“fO,ðfOf%oftfBfbfNffofCfXfCf“f^ [ftfFfCfX(GDI)fEfBf“fhfE“à,Â%o Â” \,É, , ,é,½,ß,ÈfTf [fg,³,ê,é,¾,è,μ Bfy [fW EftfŠfbfsf“fO,Í AfXfNfŠ [f““S‘İ,É , ,éftfŒ [f€,ð·Žİ, , ,é,½,ßŽg —p,³,ê,é,fuf<fobftf@ EfXfL [f€,Â, , ,é B

fXfvf%oCfGfGf“fWf“ BfXfvf%oCfG,ðfI [fo [fŒfC,³,¹,é,±,Æ,ð—eˆÖ,É, , ,é B

•ăŠÖ,É,æ,é L’ B ¬,³,ŒtfŒ [f€,Â,àXfNfŠ [f““S‘İ,ÉftfBfbfg, , ,é,æ,μ ,ÉŠg‘ă, , ,é,½,ß AfffBfXfvfŒfCf f,fŠ,ðŒø—“ I,É ß—ñ, , ,é B

fAf<ftf@ EfufŒf“ffBf“fO Bfn [fhfEfFfAfsfNfZf< ,ìfŒfxf< ,Â F,ð ¬ ‡, , ,é B

fp [fX, , ³Šm,ÈfefNfXf`ff,ðŽ ,ÂŽŸŒ³(3D)fAfNfZf%oŒ [f^ B3D,Ì— È,ÈfefNfXf`ff,ð·Žİ,Â,« , ,é B,½,Æ, , ,ì A3Df\ftfgfEfFfA,Â ¶ ¬,μ,½ é,ìŒ°ŠÖ,É Afp [fX,ð ³Šm,É·Û,Â,½,Û, Ü—ùŠŒ·Çfrfbfgf}fbfv,ìfefNfXf`ff,ð· , ,é,±,Æ, , ,â,« , ,é B

Zfobftf@,ð l—¶,É“ü,ê,½3DfOf%oftfBfbfN,ìfuf fbfn“j— B

•W €2f fKfOfCfG(MB),ìffBfXfvfŒfCf f,fŠ Bˆ”Ê“ I,É A3DfQ [f€,É Â’áŒÀ·K—v,Æ,³,ê,é B

³ k<Z—@,Ì·W € BffBfXfvfŒfCf f,fŠ,É,æ,è‘½,,ìff [f^,ðŠİ” [ ,Â,« , ,é,æ,μ,É, , ,é B,±,Ì·W € ,Í Af\ftfgfEfFfA Afn [fhfEfFfA‘o·û,ÉŽÂ‘· ,³,ê,ê,İ,½,Œ,Ö,ñ ,‘¬,É,È,é,¾,è,μ BfefNfXf`ff,ÉŽg— p,³,ê A“§%oß³ k,ðŠÜ,b B

«B XŽg—p%oÂ” \,É,È,é,Â , ,ë,ffI [ffBfIfn [fhfEfFfA<@” ,Í AˆÈ%o ,ðŠÜ,ñ,Â,ç,é B

ˆÛ,È,é%o¹,ð3D<óŠÖ,É”z’u, , ,éfn [fhfEfFfA,ÆfGf“fnf“fT B

fi [ffBfIf { [fh,ìIf“f { [fhf f,fŠ B

fIf“f { [fhf f,fŠ,ð<—L, , ,é AfI [ffBfI Eftrffi EfRf“ftrf [fVf‡f“f { [fh B

%oÂ, , ,Ä A «—ˆ,ìDirectXŒŸŠ·fn [fhfEfFfAfAfNfZf%oŒ [f^,É,æ,è Afrfffi Ä ¶ ,à%o¶Œb,ðŽó,ˆ,é,¾,è,μ B «— ˆfŠŠ [fX,³,ê,éDirectX,ìˆ<@” \,Æ,μ,Ä AYUVftrfffi,Ì“WŠJfn [fhfEfFfAfAfNfZf%oŒ [fVf‡f“ , ,afTf [fg,³,ê,é,¾,è,μ B

DirectX SDK

,±,ìfZfNfVf±f“,Â,Í ADirectX SDK,Æ,¢,,Â,©,ìDirectXŽĀ‘•,ì Ú ×,ð«L q,·,é B`È%°,ìfgfsfbfN,É,Â,¢,Ä à–¾,·,é B

DirectX SDKfRf“f|\_ [flf“fg  
f}fNf ’èç` ,ìŽq—p



## DirectX SDKfRf“f| [flf“fg

DirectX SDK,Í AWindowsfx [fX,lfQ [f€,âfnfCfpftfH [f}f“fX,ÈfAfvfŠfP [fVf‡f“,lfpftfH [f}f“fX,ðµ,ϣ,¢,-  
,Â,©,lfRf“f| [flf“fg,ðŠÜ,ñ,Â,¢,é B,±,lfZfNfVf‡f“,Á,Í A,»,é,ç,lfRf“f| [flf“fg,ð—ñ“,µ A à¾,Ì, ,é Í,Ö,lfŠf“f  
N,ðŽ',· B

DirectDraw®,Í Afñ [fhfEfFfA,lfuf fbfN“]‘—,âfobftf@ftfŠfbfsf“fO<@”\  
,Ö,Ì’ ,‘¬AfNfZfX,Í,à,¿,è,ñ AfIfxfXfNfŠ [f“ffBfXfvfœfCf f,fŠ’†,lftrfbfgf}  
fbfv,Ö,lf\_fCfœfNfgfAfNfZfX,ð’ñ<Ÿ,·,é,±  
,Æ,É,æ,è Afñ [fhfEfFfA,Æf\ftfgfEfFfA,lfAfjf [fVf‡f“<Z p,ð ,‘¬%»,·,é B,±,lfRf“f| [flf“fg,É,Â,¢  
,Ä,Ì Ú × îñ,Í ADirectDraw,lfDirectDraw,É,Â,¢,Ä,ðŽQ Æ,·,é,±,Æ B

DirectSound®,É,æ,è Afñ [fhfEfFfA Af\ftfgfEfFfA,ÂfTfEf“fh,lf~fLfVf“fO,â Ä ¶,%oÂ”,É,È,é B,±,lfRf“f|  
[flf“fg,É,Â,¢,Ä,Ì Ú × îñ,Í ADirectSound,lfDirectSound,É,Â,¢,Ä,ðŽQ Æ,·,é,±,Æ B

DirectPlay®,Í Af,ffœfŠf“fN,âflfbfgf [fN,ð%oi,µ,½fQ [f€ŠÖ,Ì Ú‘±,ð—eÖ,É,·,é B,±,lfRf“f| [flf“fg,É,Â,¢  
,Ä,Ì Ú × îñ,Í ADirectPlay,lfDirectPlay,É,Â,¢,Ä,ðŽQ Æ,·,é,±,Æ B

Direct3D™,Í AfAfvfŠfP [fVf‡f“,“Š@‘S,È3DfOf%oftfBfbfNfVfXfœf€,ð—  
eÖ,ÉŽÀ‘,Â,«,é,æ,ϣ A ,fœfxf<,lfŠfefCf“fh Ef, [fhfCf“f^ [ftfFfCfX,ð’ñ<Ÿ,·,é B,Ü,½ AfAfvfŠfP [fVf‡  
f“,“fœf“f\_fŠf“fOfpfCfvf%ofCf“,ðŠ@‘S,ÉfRf“fgf [f<,Ä,«,é,æ,ϣ A’áfœfxf<,lfCf~ftfBfG [fg Ef, [fhfCf“f  
^ [ftfFfCfX,à’ñ<Ÿ,·,é B,±,lfRf“f| [flf“fg,É,Â,¢,Ä,Ì Ú × îñ,Í ADirect3D,lfDirect3D,É,Â,¢,Ä,ðŽQ Æ,·,é,±  
,Æ B

DirectInput™,Í A «—^,lWindowsfx [fX,lfñ [fhfEfFfA“ü—ÍAPI,Æfhf%ofCfo,ÖfXfP [f%ofuf<,È“ü—Í<@”\  
,ðfQ [f€,É’ñ<Ÿ,·,é Bœ» Ý AfWf‡fCfXfefBfbfN Af}fEfX AfL [f{ [fh,“fTf| [fg,³,è,Ä,¢,é B,±,lfRf“f|  
[flf“fg,É,Â,¢,Ä,Ì Ú × îñ,Í ADirectInput,É,æ,éfWf‡fCfXfefBfbfN,lfTf| [fg,ðŽQ Æ,·,é,±,Æ B

DirectSetup,Í A1%ñ,ÌœÄ,Ñ o,µ,ÂfCf“fXfg [f<,“Š@—1,·,éDirectXfvf fV [fWff,ð’ñ<Ÿ,·,é B,±,lfRf“f|  
[flf“fg,É,Â,¢,Ä,Ì Ú × îñ,Í ADirectSetup,lfDirectSetup,É,Â,¢,Ä,ðŽQ Æ,·,é,±,Æ B

AutoPlay,Í ACD-ROMfhf%ofCfu,ÉfRf“fpfNfgffBfXfN,ð’“ü,·,é,ÆŽ@“®“l,ÉfCf“fXfg [f<fvf fOf%of€  
,âfQ [f€,ðŠJŽn,·,éWindows 95,Ì<@”\,Ä, ,é B,±,lfRf“f| [flf“fg,É,Â,¢  
,Ä,Ì Ú × îñ,Í AAutoPlay,lfAutoPlay,É,Â,¢,Ä,ðŽQ Æ,·,é,±,Æ B

AutoPlay<@”\,Í AMicrosoft Win32® API,lfê•”,Ä, ,è ADirectX“Ä—L,Ì,à,Ì,Ä,Í,È,¢ B

DirectX SDKfhfLf...f f“fg,Ì Ä,à d—v,È•”•,ª AfTf“fvf<fR [fh,Ä, ,é B ¶,«,½fTf“fvf<,©,çfR [fh,ðŠw,Ô,±,Æ,±  
,» ADirectX,ð— %oð,·,é,½,ß,Ì Ä,à,æ,¢  
,â,è•û,Ì,Ð,Æ,Ä,È,Ì,¾ BfTf“fvf<fAfvfŠfP [fVf‡f“,Í ASdk,lfSdk\SamplesftfHf<f\_,lf†,É, ,é B

**f}fNf 'è` ,İŽg—p**

DirectXfCf“f^ [ftfFfCfX,İfwfbf\_ftf@fCf<,İ‘½,,Í AŠef f\fbfh,İf}fNf 'è` ,ðŠÜ,ñ,Å,¢,é B,±,ê,ç,İf}  
fNf ,É,æ,è Afvf fOf%of~f“fO,Åf f\fbfh,ðŽg—p,·,é,İ,ª—eˆÖ,É,È,é B

ˆÈ%°,İ—á,Å,Í A **IDirectDraw2::CreateSurface** f\fbfh,ðŒÄ,Ô,½,ß**IDirectDraw2\_CreateSurface**}fNf ,ðŽg—  
p,µ,Ä,¢,é B Ä %o,İfpf%of [f^,Í ADirectDrawIfufWfFfNfg,Ö,İŽQ Æ,Ä, ,é B

ret = IDirectDraw2\_CreateSurface (lpDD, &ddsd, &lpDDS,  
NULL);

f}fNf 'è` ,ªfTf| [fg,·,éf f\fbfh,İŒ» Ý,İfŠfXfg,ð“¾,é,É,Í AŽg—p,µ,½,¢DirectXfRf“f|  
[flf“fg,İ“K Ø,Èfwfbf\_ftf@fCf<,ðŽQ Æ,·,é,±,Æ B

DirectX,ÆfRf“f| [flf“fg EfIfufWfFfNfg Ef,fff<

,±,ìfZfNfVf‡f“,Å,Í AfRf“f| [flf“fg EfIfufWfFfNfg Ef,fff<(COM)  
,Æ ACOM,ìfIfufWfFfNfg,“,æ,ÑfCf“f^ [ftfFfCfX,İŽÀ‘•,É,Â,¢,ÄL q,.,é B à-¾,.,éfgfsfbfN,ÍÈ%º,Ì’Ê,è,Å, ,é  
B

fRf“f| [flf“fg EfIfufWfFfNfg Ef,fff<  
IUnknownfCf“f^ [ftfFfCfX  
DirectX COMfCf“f^ [ftfFfCfX  
C++,ÆCOM,ìfCf“f^ [ftfFfCfX  
C,Å,ìCOMfIfufWfFfNfg.Ö,ÌfAfNfZfX  
fCf“f^ [ftfFfCfXf f\fbfh-¼,ÆfVf“f^fbfNfX

**fRf“f| [flf“fg EfIfufWfFfNfg Ef,ff<**

DirectX SDK,ì'ä•”•ª,ìAPI,Í ACOM,ÉŠì,Ä,-  
flfufWfFfNfg,“,æ,ÑfCf“f^ [ftFfCfX,©,ç \ ¬,³,ê,é BCOM,Í AfCf“f^ [ftFfCfX,ì Ä—~—p,É Ä“\_,ð“—  
,Ä,½flfufWfFfNfgfx [fXfVfXfef€,ì,½,B,ì“y‘ä,Ä, è AOLEfvf fOf%of~f“fO,ìŠj S,É, ,éf,ff<,Ä, ,é B,Ü,½ AfC  
f“f^ [ftFfCfX,ð,c,,Ä,Ä,à \z,Ä,«,é,æ,ϱ,ÉfCf“f^ [ftFfCfXZd—l,Ä,à, ,é BCOM,Í AOSfœfxf<,Ä,ìflfufWfFfNf  
gf,ff<,È,ì,Ä, ,é B

‘½,,ìDirectX  
API,Í AOLEfIfufWfFfNfg,ì W ‡,Æ,μ,ÄfCf“fXf^f“fX%»,Ä,«,é BfIfufWfFfNfg,Í Afn [fhEfFfA,ð•\  
,μfCf“f^ [ftFfCfX,ð'Ê,μ,ÄfAfvfŠfP [fVf‡f“,Æ'Ê M,·,é•K—v,ì, ,éuf%ofbfNf{fbfNfX,Æ l,ì,é,±  
,Æ,ª,Ä,«,é BCOMfCf“f^ [ftFfCfX,ð'Ê,μ,ÄfIfufWfFfNfgŠÔ,ÄŽó,~“n,μ,³,ê,éRf}  
f“fh,Íf f\fbfh,Æœ¾,i,ê,é B,½,Æ,!,ì AfIfBfXfvfœfCfAf\_fvf^,ìœ» Ý,ìffBfXfvfœfCf, [fh,ðŽæ“¾,·,é,½,ß A  
DirectDrawfIfufWfFfNfg,©,ç**IDirectDraw2::GetDisplayMode**f\fbfh,ª**IDirectDraw2**fCf“f^ [ftFfCfX,ð'Ê,μ,Ä‘—  
,ç,ê,é B

flfufWfFfNfg,Í AŽÀ sŽž,É'¼,ìflfufWfFfNfg,ÆfOfCf“fh,Ä,« A'¼,ìflfufWfFfNfg,ª“ñ<Ÿ,·,éCf“f^ [ftFfCfX,ð  
ŽÀ‘•,μ,ÄŽg—p,Ä,«,é BfIfufWfFfNfg,ªOLEfIfufWfFfNfg,Ä, ,è A,»,μ,Ä,»,ìflfufWfFfNfg,ªfTf|  
[fg,·,éCf“f^ [ftFfCfX,ª,i,©,ê,î AfAfvfŠfP [fVf‡f“(Ü,½,Í'¼,ìflfufWfFfNfg),Í A Ä %  
,ìflfufWfFfNfg,ªŽÀ s,Ä,«,éfT [frfX,ðœ“è,·,é,±,Æ,ª%Ä”\,Ä, ,é B  
**QueryInterface** f\fbfh,Í AOLEfIfufWfFfNfg,·,×,Ä,ªœp ³,·,é f\fbfh,ì,ð,Æ,Ä,¾,ª A,±,ê,É,æ,è A, ,éIfufWfFf  
Nfg,ªfTf| [fg,·,éCf“f^ [ftFfCfX,ðœ“è,Ä,«,é B,»,ê,ç,ìfCf“f^ [ftFfCfX,Ö,ìf|fCf“f^,ì,±  
,ìf f\fbfh,Ä ì ¬,·,é B Ú × î•ñ,Í AIUnknownfCf“f^ [ftFfCfX,ðŽQ Ä,·,é,±,Æ B

## IUnknownfCf“f^ [ftfFfCfX

COMfCf“f^ [ftfFfCfX,Í,·,×,Ä AIUnknown,ÆĖÄ,Î,ê,éfCf“f^ [ftfFfCfX,©,ç“± o,³,ê,é B,±  
,İfCf“f^ [ftfFfCfX,Í AfIfufWfFfNfg,İŽō-½,İ §ĖÄ,â‘½ dfCf“f^ [ftfFfCfX,ð‘Ė İ,·,é<@”\  
,ðDirectX,Ė’ñ<Ÿ,·,é BIUnknown,Í A,R,Ä,İf f\fbfh,ðŽ ,Ä B

**AddRef**,Í AfCf“f^ [ftfFfCfX A,Ü,½,Í‘¼,İfAvfŠfP [fVf‡f“‘,³,»,êŽ© g,ðfIfufWfFfNfg,ÆfofCf“fh,μ,½,Æ,«  
AfIfufWfFfNfg,İŽQ ÆfJfEf“fg,ðfCf“fNfŠf f“fg,·,é B

**QueryInterface**,Í AŽw’è,μ,½fCf“f^ [ftfFfCfX,Ö,İf|fCf“f^,ð—v< ,·,é,±,Æ,É,æ,è AfIfufWfFfNfg,³fTf|  
[fg,·,é<@”\,É,Ä,¢,Ä Æ%öİ,·,é B

**Release**,Í AfIfufWfFfNfg,İŽQ ÆfJfEf“fg,ðffNfŠf f“fg,·,é BfJfEf“fg,³0,É,È,Ä,½,Æ,« AfIfufWfFfNfg,Í%  
ð•ü,³,ê,é B

**AddRef,ÆRelease**,İŽQ ÆfJfEf“fg,ðf f“fefif“fX,·,é B,½,Æ,İ,İDirectDrawSurfaceIfufWfFfNfg,ð İ ¬,·,é,Æ AfIf  
ufWfFfNfg,İŽQ ÆfJfEf“fg,Í1,É Ÿ’è,³,ê,é BŠÖ ”,³fIfufWfFfNfg,İfCf“f^ [ftfFfCfX,Éf|  
fCf“f^,ð•Ö,·,½,Ñ AŽQ ÆfJfEf“fg,ðfCf“fNfŠf f“fg,·,é B,»,İŠÖ ”,Í•Ö,μ,½f|  
fCf“f^,ð’Ê,μ,ÄAddRef,ðĖÄ,Ñ o,³,È,¬,ê,İ,È,ç,È,¢ B,Ü,½AddRef,İŠeĖÄ,Ñ o,μ,É,ÍRelease,İĖÄ,Ñ o,μ,ð’İ%ž,³,¹,È,-  
,Ä,Í,È,ç,È,¢ Bf|fCf“f^,ð”jŠü,³,ê,é‘O,É A,»,İf|fCf“f^,ð’Ê,μ,ÄRelease,ðĖÄ,İ,È,¬,ê,İ,È,ç,È,¢,İ,Ä, ,é BfIfufWfFfNfg  
,İŽQ ÆfJfEf“fg,³0,É,È,é,Æ AfIfufWfFfNfg,İ”jŠü,³,ê A,·,×,Ä,İfCf“f^ [ftfFfCfX,Í¬Ėø,Æ,È,é B

**QueryInterface**,Í AfIfufWfFfNfg,³Žw’è,³,ê,½fCf“f^ [ftfFfCfX,ðfTf| [fg,·,é,©,Ç,□  
,©Ė”è,·,é BfIfufWfFfNfg,³fCf“f^ [ftfFfCfX,ðfTf| [fg,μ,Ä,¢  
,é ê ‡ AQueryInterface,Í A,»,İfCf“f^ [ftfFfCfX,Ö,İf|  
fCf“f^,ð•Ö,· B,·,é,ÆfIfufWfFfNfg,Æ’Ê M,·,é,½,ß,ÉfCf“f^ [ftfFfCfX,ðŽ ,Äf f\fbfh,³Žg—  
p,Ä,«,é BfCf“f^ [ftfFfCfX,Ö,İf|  
fCf“f^,ð•Ö,·,İ,É ¬Ė÷,·,é,Æ AQueryInterface,Í AŽQ ÆfJfEf“fg,ðfCf“fNfŠf f“fg,·,é,×,-  
ˆÄ,ÉAddRef,ðĖÄ,Ö B,»,İ,½,ßfAvfŠfP [fVf‡f“‘,Í AfCf“f^ [ftfFfCfX,Ö,İf|  
fCf“f^”jŠü,·,é‘O,É AŽQ ÆfJfEf“fg,ðffNfŠf f“fg,·,é,×,Release,ðĖÄ,İ,È,¬,ê,İ,È,ç,È,¢ B

**IUnknown::AddRef**

ULONG AddRef();

fIfufWfFfNfg,İŽQ ÆfJfEf“fg,ðfCf“fNfŠf f“fg,·,é B

V,µ,¢ŽQ ÆfJfEf“fg,ð•Ô,· B

fIfufWfFfNfg,<sup>a</sup> ì ¬,<sup>3</sup>,ê,é,Æ AŽQ ÆfJfEf“fg,Í1,É Ý’è,<sup>3</sup>,ê,é BfAfvfŠfP [fVf‡f“,<sup>a</sup>fIfufWfFfNfg,Ö,İfCf“f^ [ft  
fFfCfX,ðŽæ“¾,·,é,© A**AddRef** f\fbfh,ðŒÄ,Ñ o,·,½,Ñ,É AfIfufWfFfNfg,İŽQ ÆfJfEf“fg,İfCf“fNfŠf f“fg,<sup>3</sup>,  
ê,é BfIfufWfFfNfg,İŽQ ÆfJfEf“fg,ðffNfŠf f“fg,·,é,É,İ**Release** f f\fbfh,ðŽg—p,·,é,±,Æ B  
,±,İf f\fbfh,Í AfIfufWfFfNfg,É,æ,Á,ÄEp <sup>3,3</sup>,ê,é**Unknown** fCf“f^ [ftfFfCfX,İ1•”,Å, ,é B

## IUnknown::QueryInterface

HRESULT QueryInterface(REFIID riid, LPVOID\* obp);

*fIfufWfFfNfg,“Á’è,ÌCOMfCf“f^ [ftFfCfX,ðfTf| [fg,μ,Ä,¢,é,©,Ç,¤,©Œ~è,·,é BfTf| [fg,μ,Ä,¢  
,é ê ± AfVfXfef€  
,ÍfIfufWfFfNfg,ÌŽQ ÆfJfEf“fg,ð’ ,â,μ AfAfvfŠfP [fVf±f“,Í,½,¾,¿,É,»,ÌfCf“f^ [ftFfCfX,ðŽg—p,Å,«,é B*

*ŒÄ,Ñ o,μ,<sup>a</sup> ¬Œ÷,μ,½ ê ± AS\_OK,ð•Ô,· BŒÄ,Ñ o,μ,<sup>a</sup>Ž,”s,μ,½ ê ± Af f\fbfh,Í AE\_NOINTERFACE,Ü,½  
,ÍÈ%°,ÌfCf“f^ [ftFfCfXŒÄ—L,ÌfGf% [‘l,Ì,Đ,Æ,Ä,ð•Ô,· BfCf“f^ [ftFfCfXŒÄ—L,ÌfGf% [‘l,Í AfRf“f|  
[flf“fg’PˆÊ,ÄfŠfXfg,<sup>3</sup>,é,é B*

DirectDraw

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

**DDERR\_OUTOFMEMORY** (IDirectDrawSurface2,Ì,Ý)

DirectSound

**DSERR\_GENERIC** (IDirectSound,ÆIDirectSoundBuffer,Ì,Ý)

**DSERR\_INVALIDPARAM**

DirectPlay

**DPERR\_INVALIDOBJECT**

**DPERR\_INVALIDPARAMS**

*Direct3D,ÌfŠfefCf“fh Ef, [fh,ÆfCf~ffBfG [fg Ef, [fh,ÌfCf“f^ [ftFfCfX,É,Ä,¢  
,Ä,Í AQueryInterface f\fbfh,Í ADirect3D•ŮŽ f, [fh,Ì•Ô‘l,ÆDirect3D’¼ Úf, [fh,Ì•Ô‘l,Ì,Ç,¿,Ç,©,Đ,Æ,Ä,ð•Ô,  
· B*

*riid*

*—v< ,<sup>3</sup>,é,½fCf“f^ [ftFfCfX,ÌŽQ ÆŽˆ•ÊŽq B*

*obp*

*Æ%öi,<sup>a</sup> ¬Œ÷,μ,½ ê ± AfCf“f^ [ftFfCfXf|fCf“f^,<sup>a</sup>Ô,<sup>3</sup>,é,é|fCf“f^,ÌfAfhfŒfX B*

*,±,Ìf f\fbfh,ðŒÄ,Ô,±,Æ,ÄŽæ“¾,μ,½fCf“f^ [ftFfCfX,<sup>a</sup>s—*

*v,É,È,Ä,½ ê ± AfAfvfŠfP [fVf±f“,Í AfCf“f^ [ftFfCfX,ð%ð•ú,·,é,½,B,É**Release** f\fbfh,ðŒÄ,Ñ o,••K—v,<sup>a</sup>,  
,é BQueryInterface f\fbfh,É,æ,è AMicrosoft,ÆfT [fhfp [fefB,Í AŒ»‘Œ, ,é,¢,Í «—^,Ì<@”\,ÆŠ± Ä,·,é,±,Æ,È,-  
fIfufWfFfNfg,ðŠg’£,Ä,«,é,æ,¤,É,È,é B*

*,±,Ìf f\fbfh,Í AfIfufWfFfNfg,É,æ,Ä,ÄEp <sup>3,3</sup>,é,é**Unknown**fCf“f^ [ftFfCfX,Ìˆê•”,Ä, ,é B*

**IUnknown::Release**

ULONG Release();

fIfuWfFfNfg,ìŽQ ÆfJfEf“fg,ðffNfŠf f“fg,·,é B

V,µ,¢ŽQ ÆfJfEf“fg,ð•Ô,· B

ŽQ ÆfJfEf“fg,°0,É,È,Á,½,Æ,« AfIfuWfFfNfg,íŽ©•°Ž© g,ð%ð•ú,·,é BfIfuWfFfNfg,ìŽQ ÆfJfEf“fg,ðfCf“fNfŠf f“fg,·,é,È,Í AAddRef f\fbfh,ðŽg—p,·,é,±,Æ B

,±,ìf f\fbfh,Í AfIfuWfFfNfg,É,æ,Á,ÄÆp ³,³,ê,éUnknownfCf“f^ [ftfFfCfX,ì`ê•”,Å, ,é B



## DirectX COMfCf“f^ [ftFfCfX

DirectX SDK,lfCf“f^ [ftFfCfX,Í ACOMfvf fOf%of~f“fOŠK‘w,l”ñ í,ÉŠi-{"I,ÈfCfxf<,Á ì ¬,³,ê,½ B  
**IDirectDraw2 AIDirectSound AIDirectPlay**,Æ,¢,Á,½ Afff ofCfX,ð•\  
,·fIfufWfFfNfg,Ö,ì,»,ê,¼,ê,lfCf“f^ [ftFfCfX,Í A Unknown OLEfCf“f^ [ftFfCfX,©,ç’¼ Ú“± o,³,ê,é B,±  
,ê,ç,lŠi-{"fIfufWfFfNfg,Ì ì ¬,Í ACOMfIfufWfFfNfg ì ¬,É^ê”Ê,É—p,¢  
,ç,ê,éWin32,Í**CoCreateInstance**ŠÖ ”,æ,è,Í,Ð,µ,è ASefIfufWfFfNfg,Ì,½,ßf\_fCfif~fbfNfŠf“fNf%ofCfuf%ofŠ(DLL)’†,  
Á“Á%»»,³,ê,½ŠÖ ”,É,æ,è ^— ,³,ê,é B

^ê”Ê,É,Í ADirectX SDK,lfIfufWfFfNfgf,ff<,Í ASefff ofCfX,É,Ð,Æ,Â,ÌŽă—v,ÈfIfufWfFfNfg,ð’ñ<Ÿ,·,é B‘¼,lfTf|  
[fgfT [frfXfIfufWfFfNfg,Í A,»,lfIfufWfFfNfg,©,ç“± o,³,ê,é,±  
,Æ,É,È,é B,½,Æ,,Í ADirectDrawfIfufWfFfNfg,Í AfffBfXfvfCfCfAf\_fvf^,ð•\,µ,Ä,¢,é B,±,lfIfufWfFfNfg,ð—  
p,¢ AfffBfXfvfCfCf f,fŠ,ð•\,·DirectDrawSurfacefIfufWfFfNfg,ð Afn [fhEfFfAfpfCfbfg,ð•\  
,·DirectDrawPalettefIfufWfFfNfg,ð ì ¬,·,é,±,Æ,ª,Ä,«é B“—  
l,É ADirectSoundfIfufWfFfNfg,Íl [ffBfIfJ [fh,ð•\,µ A,»,lfJ [fh ã,ì%¹CE¹,ð•\  
,·DirectSoundBufferfIfufWfFfNfg,ð ì ¬,·,é B

%o^ÊfIfufWfFfNfg ¶ ¬,l”\—Í,É%»Á,! AŽă—  
v,Èfff ofCfXfIfufWfFfNfg,Í AfXfNfŠ [f“,lfTfCfY,â F ” AfI [ffBfIfJ [fh,ªEfF [fufe [fuf<fVf“fZfTfCf  
U [,ðŽ ,Á,©,Ç,ª,©,Æ,¢,Á,½ AfIfufWfFfNfg,ª•\,·fn [fhEfFfAfff ofCfX,l”\—Í,ðCE^è,·,é B

C++,ÆCOM,İfCf“f^ [ftfFfCfX

C++fvf fOf%of},É,Æ,Ä,Ä ACOMfCf“f^ [ftfFfCfX,Í A'Š ŪŠî-{fNf%ofX,ÉŽ—,Ä,¢  
,é B,·,È,İ,ç AfVfOfIf`ff,ÆfZf}  
f“fefBfbfNfX,ð'èç',·,é,<sup>a</sup> AŽÄ'•,İ'èç',<sup>1</sup>, AfXfe [fg,İff [f^,ðfCf“f^ [ftfFfCfX,ÉŠÖ`A,Ä,¯,È,¢,İ,Ä, ,é BC++  
,İ'Š ŪŠî-{fNf%ofX,Ä,Í A, ,ç,ä,éf f\fbfh,Í AŠÖ`A,·,é fR [fh,ðŽ ,½,È,¢,Æ,¢,ϣÖ—  
i,Ä A f ~%¼'z,Æ,µ,Ä'èç',<sup>3</sup>,ê,é B

f ~%¼'zC++ŠÖ ”,ÆCOMfCf“f^ [ftfFfCfX,Í A,Æ,à,ÉVfe [fuf<,ÆÆÄ,İ,ê,éfffofCfX,ð—p,¢  
,é BVfe [fuf<,Í A—^,!,ç,ê,½fCf“f^ [ftfFfCfX,ðŽÄ'•,·,éŠÖ ”,·,×,Ä,İfAfhfÆfX,ðŽ ,Ä B,±,ê,ç,İŠÖ ”,ðŽg—  
p,·,éfvf fOf%of€,âfIfufWfFfNfg,<sup>a</sup>K—v,È ê ‡ A QueryInterface f\fbfh,ð—p,¢  
,Ä AfIfufWfFfNfg,É,»,İfCf“f^ [ftfFfCfX,<sup>a</sup>¶ Ý,·,é,©,Ç,ϣ,©Šm”F,µ A,»,İfCf“f^ [ftfFfCfX,Ö,İf|  
fCf“f^,ð“¾,ê,±,Æ,<sup>a</sup>Ä,«,é B

**QueryInterface**,ðÆÄ,×,é,İ,İfIfufWfFfNfg,<sup>a</sup>ŽÄ'•,·,éCf“f^ [ftfFfCfXf f\fbfh,¾,<sup>a</sup> AŽÄ Ū,É,İ,±,İf f\fbfh,İ'—  
MĖä AfAfvfŠfP [fVf‡f“,âfIfufWfFfNfg,Í AVfe [fuf<,Ö,İf|fCf“f^,ðfIfufWfFfNfg,©,çŽó,¯Žæ,é,±

,Æ,È,È,é B,±,İf fJjfYf€,Í AfIfufWfFfNfg,<sup>a</sup>Žg—

p,·,éfvf%ofCfX [fgf [f^,ÆÆÄ,Ŋ o,µ'ϣfNf%ofCfAf“fgfvf fZfX,Æ,ð Ø,è—£,· B

COM fIfufWfFfNfg,ÆC++fIfufWfFfNfg,Æ,İŠÖ,İ,à,ϣ,D,Æ,Ä,İ—bŽ—“\_,Í Af f\fbfh,İ Ä %  
,İ'ø ”,<sup>a</sup>,»,İfCf“f^ [ftfFfCfX,Ū,½,İfNf%ofX,İ-¼'O,Ä, ,é,±,Æ,Ä, ,é BC++,Ä,İthis~ø ”,ÆÆ¾,İ,ê,é,à,İ,Ä, ,é BCOMfI  
fufWfFfNfg,ÆC++fIfufWfFfNfg,İŠ®'S,ÉfofCfifŠÆÝŠ·,È,½,ß AfRf“fpfCf%,ÍCOMfCf“f^ [ftfFfCfX,ðC+  
+'Š ŪfNf%ofX,İ,æ,ϣ,É~µ,¢ A““,¶•¶—@,Ä, ,é,à,İ,Æ%¼'è',·,é B,±,İÆ%oÊ AfR [fh,İ•;ŽG,<sup>3</sup>,³EyÆ,<sup>3</sup>,ê,é,İ,Ä, ,é B,½,  
Æ,İ,İ AC++  
,Ä^ø ”,İthis,Í A,·,Ä,É%oðŽß,<sup>3</sup>,ê,½fpf%of [f^,Æ,µ,Ä^µ,İ,ê,ÄfR [fh%o»,<sup>3</sup>,ê, AVfe [fuf<,ð'Ê,µ,½\*s <sup>3</sup>,ÍC++  
,Ä^Ä,É ^— ,<sup>3</sup>,ê,é B

C,Ä,ÏCOMfIfufWfFfNfg,Ö,ÏfAfNfZfX

,Ç,ñ,ÈCOMfCf“f^ [ftfFfCfXf f\fbfh,àCCE¾CEê,©,çCEÄ,Ñ o,·,±  
,Æ,a,Ä,«,é BCE¾CEê,©,çfCf“f^ [ftfFfCfXf f\fbfh,ðCEÄ,Ô,Æ,«,É AŠo,|,Ä,“,×,«Ž-•,ª,Ó,½,Ä, ,é B

f f\fbfh,Ï Ä %  
,Ïfpf%of [f^,Í A,Ä,Ë,Éf f\fbfh,ðCEÄ,Ñ o,· B,·,Ä,É ¶ ¬,³,ê,½fIfufWfFfNfg,ðŽQ Æ,·,é(∅ ”,Ïthis) B  
fCf“f^ [ftfFfCfX,ÏŠef f\fbfh,Í AfIfufWfFfNfg,ÏVfe [fuf<,Ö,Ïf|fCf“f^,ð’Ê,µ,ÄŽQ Æ,³,ê,é B

^È%°,Ï—á,Ä,Í A CCE¾CEê,ÄIDirectDraw2::CreateSurface f\fbfh,ðCEÄ,Ñ o,·,±  
,Æ,ÄDirectDrawfIfufWfFfNfg,ÆŠÖ~A,Ä,¬,ç,ê,½fT [ftfFfX,ð ï ¬,·,é B

```
ret = lpDD->lpVtbl->CreateSurface (lpDD, &ddsd, &lpDDS,  
    NULL);
```

lpDDfpf%of [f^,Í A V,µ,çfT [ftfFfX,ÉŠÖ~A,Ä,¬,ç,ê,½DirectDrawfIfufWfFfNfg,ðŽQ Æ,·,é B,ç,È,Ý,É,±  
,Ïf f\fbfh,Í AfT [ftfFfX ã•ñ \‘ç‘Ï(&ddsd),ð Ý’è,µ A V,µ,çfT [ftfFfX,Ô,Ïf|fCf“f^(&lpDDS),ð•Ö,· B

IDirectDraw2::CreateSurface f\fbfh,ðCEÄ,Ñ o,·,É,Í A,Ü,,DirectDrawfIfufWfFfNfgVfe [fuf<,Ö,ÏŽQ Æ,ðŠO,µ  
A,»,µ,ÄVfe [fuf<,©,çf f\fbfh,Ö,ÏŽQ Æ,ðŠO,· Bf f\fbfh,Ä<Ÿ<<,³,ê,é Ä %  
,Ïfpf%of [f^,ª Af f\fbfh,ð<N“@,·,é,½,ß,É A,·,Ä,É ï ¬,³,ê,½DirectDrawfIfufWfFfNfg,Ö,ÏŽQ Æ,Ä, ,é B

COMfIfufWfFfNfgf f\fbfh,ðC,ÆC++,ÄCEÄ,Ñ o,·^á,ç,ð à-¾,·,é,½,ß AC++,Ï“¬,¶f f\fbfh,ðŽŸ,ÉŽ!,·(C++  
,Í AlpVtblfpf%of [f^,Ö,ÏŽQ Æ,ðŠO,µ Athis|fCf“f^,à”ò,Î,µ,Ä,µ,Ü,ª) B

```
ret = lpDD->CreateSurface(&ddsd, &lpDDS, NULL)
```

fCf“f^ [ftfFfCfXf f\fbfh-¼,ÆfVf“f^fbfNfX

-{fhfLf...f f“fg’†,Ä<L q,<sup>3</sup>,ê,Ä,¢,éCOMfCf“f^ [ftfFfCfXf f\fbfh,Í,·,×,Ä AC++fNf%ofX-¼,É,æ,Ä,Ä•\,<sup>3</sup>,ê,Ä,¢  
,é B,±,ì-½-¼<K-ñ,Í A“ ^ê «,ì,½,ß,É—p,¢,ç,ê A,Û,½ AQueryInterface AAddRef ARelease,Æ,¢,Ä,½ A“¬,¶-  
¼‘O,ðŽg—p,·,é,ªÛ,È,éDirectXfIfufWfFfNfg,Æ Af f\fbfh,Æ,ð<æ•Ê,·,é,½,ßŽg—p,<sup>3</sup>,ê,é B,±,ê,ÍC++,Ä,ì,Y A,±  
,ê,ç,ìf f\fbfh,ðŽg—p,Ä,«<sub>1</sub>,é,Æ,¢,¤,±,Æ,Ä,Í,È,¢ B

,±,ê,É%oÁ,<sub>1</sub> Af f\fbfh,ì,½,ß,É’ñ<Y,<sup>3</sup>,ê,é•¶-@,Í A“ ^ê «,ì,½,ßC++,ì-½-¼<K-ñ,ðŽg—p,·,é B,±  
,ê,ìfCf“f^ [ftfFfCfX,Ö,ìthisf|fCf“f^,ðŠÛ,Û,È,¢ BCE¾Æê,Ä,Í AfCf“f^ [ftfFfCfX,Ö,ìf|  
fCf“f^,ÍŠef f\fbfh,ÉŠÛ,Û,ê,Ä,¢,é•K—v,<sup>a</sup>, ,é B^È%o°,ì—á,Ä AIDirectDraw2::GetCapsf f\fbfh,ìC++,Ä,ì•¶-  
@,ðŽ<sub>1</sub>,· B

HRESULT GetCaps(LPDDCAPS lpDDDriverCaps,  
LPDDCAPS lpDDHELCaps);

“¬,¶—á,<sup>a</sup> AC,ì•¶-@,¾,Æ,±,ì,æ,¤,É,È,é B

HRESULT GetCaps(LPDIRECTDRAW lpDD,  
LPDDCAPS lpDDDriverCaps, LPDDCAPS lpDDHELCaps);

lpDDfpf%of [f^,Í ADirectDrawfIfufWfFfNfg,ð•\,·DirectDraw \‘¢‘ì,Ö,ìf|fCf“f^,Ä, ,é B

## DirectX 3 SDK,À,Ì V<@”\,Æ,Í?

DirectX 3 SDK,Í ADirectX 2 SDK,æ,è‘½,,ÌfT [frfX,â‘½,,Ì<Z pŠv V,Ö,Ìžžè‘i,ð’ñ<Ÿ,·,é B,±,ÌSDK,Í‘Ç%Á,³,è,½ŠÖ ”,âfT [frfX,ðšŮ,ñ,Á,¢,é,ª ADirectX 2 SDK,âfIfšfWfif<,ÌDirectX 1 SDK,Á ‘,©,ê,½fAfvfšfP [fVf‡f“,Í,·,×,Ä Af\ [fX,ð•Í X¹,,É ÄfRf“fpfCf<,μŽÄ s,Á,«,é,Á, ,ë,□ B,±,Ì Í,Á,Ì–Ú“Í,Í ADirectX 2 SDK,ð,æ,’m,é 1,Ö A,±,ÌSDK,Á‘â,«,˘Ù,È,Á,Á,¢,é,¢,,Á,©,Ì d—v,ÈŽ– €,ð,·,Î,â,—%ð,·,é,½,ß,Ìžè •,–,È,È,é,±,Æ,Á, ,é B,±,è,ç,Ì‘á,¢,ð AfRf“f| [flf“fg’P‘Ê,Áˆê——,É,·,é B

## DirectDraw

API,Ì•Í X,Í,È,¢ BfVf“fvf<,ÈDirectDrawfAfvfšfP [fVf‡f“,ðžÄ‘•,·,é à–¾,ð AfXfefbfv²,Æ,É’ñ<Ÿ,·,é`f... [fgfšfAf<,ð,¢,,Á,©“ü,è,½ Bf`f... [fgfšfAf<,È,Á,¢,Ä,Í ADirectDraw,ÌDirectDrawf`f... [fgfšfAf<,ðžQ Æ,·,é,±,Æ B

## DirectSound

DirectX 3,Í AfAfvfšfP [fVf‡f“,“%¹CE¹,Ì•,±,!,Ä,,éÊ‘u,ð•Í X,Á,«,é,æ,□,É,·,é DirectSound3D<@”\,ðšŮ,Ð BfAfvfšfP [fVf‡f“,Í AžwCEü «,Ì, ,é%¹CE¹,Ì%¹%~ A˘Ú“@,·,é%¹,Ìfhfbfvf% [CEø%Ê A,»,μ,Ä˘Ù,È,éCEø%Ê,ª”- ¶,·,é<—£,ðžw’è,Á,«,é BDirectSound,Ì V<@”\,É,Á,¢,Ì,Ì Ú × îñ,Í ADirectSound,Ì Í,Ì3DfTfEf“fh,ðžQ Æ,·,é,±,Æ B

## DirectPlay

DirectPlay,Í Ašî‘b,É, ,éfgf%of“fXf| [fg Afvf fgfRf< AfIf“f%ofCf“fT [frfX,É,æ,ç,,fAfvfšfP [fVf‡f“,ªCEÝ,¢,É,Ê M,Á,«,é,æ,□,É,·,é¾,–,Ä,È, Af} fbf`f [fLf“fOfT [fo,Ö,Ì”ñ˘Ê•¶ «,à’ñ<Ÿ,·,é<Z p,ÌèšÄ,Æ,È,Á,½ B,±,Ì V,μ,¢<Z p,ðžÄ‘•,·,é,½,ß AIDirectPlay2 A IDirectPlay2A AIDirectPlayLobby fCf“f^ [ftfFfCfX,ªÇ%Á,³,è,½ BDirectPlay,Ì V<@”\,É,Á,¢,Ä,Ì Ú × îñ,Í ADirectPlayfo [fWf‡f“3,Á%¹½,ª V,μ,,È,Á,½,©? ,ðžQ Æ,·,é,±,Æ B

## Direct3D

API,Ì•Í X,Í,È,¢ BfšfefCf“fh Ef, [fh,Ìf`f... [fgfšfAf<,Í A X V,³,èšÈ‘P,É,È,Á,Ä,¢,é B,±,Ìf`f... [fgfšfAf<,É,Á,¢,Ä,Í ADirect3D,Ì Direct3D,Ì•Ůž f, [fh,Ìf`f... [fgfšfAf<,ðžQ Æ,·,é,±,Æ B

## DirectInput

DirectInput,Í V,½,É AfWf‡fCfXfefBfbfN,Æ“—l Af} fEfX,ÆfL [f{ [fh“ü—Í,ðfTf| [fg,μ,½ B

## DirectSetup

DirectSetup,Í AfAfvfšfP [fVf‡f“,ðfCf“fXfg [f<‘†,ÉfCEfWfXfgfš,Ö ³,μ,-fGf“fgfš,ð“o^,Á,«,é,æ,□•â •,·,é V<@”\,ðž ,Á,½ B

## AutoPlay

AutoPlay,É,Á,¢,Ä,ÌfhfLf...f f“fg,Í A V,½,ÉWindows NT®,Ì îñ,àž ,Á,½ B

•\L

ˆÈ%°,É-{\,Å,İ•\L,ð à-¾,•,é B

•\L

ˆÓ-i

fCf^fŠfbfN'İ

fvfœ [fXfzf<f\_ [,Û,½,Í'İ ",ð\,• BŽÀ Û,İ'l,ð—  
^,!,È,—,ê,Î,È,ç,È,¢ B,½,Æ,!,Î AfXfe [fgf f“fg  
SetCursorPos(X, Y)  
,Å,Í AX AYfpf%of [f^,É'ã,í,éŽÀ Û,İ'l,ð—  
^,!,È,—,ê,Î,È,ç,È,¢ B

[]

fIfvfVf‡f“,İfpf%of [f^,ðŠ‡,é B

|

,Ç,ç,ç,©, ,é,¢,Í—¼•û,İ'I'ðŽ^,ðª,—,é B

...

'¼'O,İ €-Ú,İĲJ,è•Ô,µ,ðŽ',• B

.

fTf“fvf<fAfvfŠfP [fVf‡f“,İ È—ª”ª,ð\,• B

.

.

ŽŸ,İ “İ,Í,»,ê,¼,êˆÈ%°,İŒ-i,ð\,• B

•\L

ˆÓ-i

SMALL CAPITALS

fL [ AfL [fV [fPf“fX AfL [fRf“frfl [fVf‡f“  
,İ-¼'O,ð\,• B,½,Æ,!,Î AALT+SPACEBAR B

FULL CAPITALS

‘â”ª,İĲ^,â \‘¢'İ,İ-¼'O,ð\  
,• B,»,ê,ç,Íf{ [f<fh,Å,à•\L,³ê,é B'è ",à\,• B

monospace

fR [fhfTf“fvf<,ð<'²,µ AfVf“f^fbfNfX,İfXfy [fV  
f“fO,ðŽ',• B

## DirectDraw,É,Â,¢,Ã

DirectDraw®.Í AftfBfXfvfƎfC Ef f,fŠ Afn [fhEfFfA Efuf fbfN“]’—

AfI [fo [fƎfC AftfŠfbfsf“fO,È,Ç,Ì¼ Ú‘€ ì,ð‰Â”\,É,.,éDirectX™ SDKRf“f| [flf“fg,Â, ,é B,±,ê,ç,ì<@”\ ,ð A DirectDraw,ÍŠù‘Œ,ÌMicrosoft® Windows®

fx [fX,ÌfAfVfŠfP [fVf‡f“,âftfOfCfX Efhf‰OfCfo,Æ,ìƎÝŠ· «,ð•Û,¿,È,ª,çŽÂƎ»,.,é B

DirectDraw.Í A,.,Ü,ÂWindows fOf‰OfBfbfN EfffofCfX EfCf“f^ [ftfFfCfX (GDI)

,Æ,ìƎÝŠ· «,ð•Û,¿,È,ª,ç,à AftfBfXfvfƎfC EfffofCfX,Ö,Ì¼ ÚfAfNfZfX,ð’ñ<Ÿ,.,éf\ftfgEfFfA EfCf“f^ [ftfFfCfX,Â, ,è AfOf‰OfBfbfNfX,Ì,½,B,Ì ,fƎfxf<,ÈfAfVfŠfP [fVf‡f“ EfVf fOf‰Of~f“fO EfCf“f^ [ftfFfCfX (API),Â,Í,È,¢ B3DfOf‰OfBfbfNfX EfPfbfP [fW,âftfWf^f< Eftrffi EfR [ffbfNfX,ð—~p,µ,½fQ [fƎ ,âWindowsfTfufVfXfef€,É‘Í,µ AftfOfCfX,É‘È‘Œ,µ,È,¢“Á“èftfBfXfvfƎfC EfffofCfX<@”\ ,Ö,ÌfAfNfZfX,ð’ñ<Ÿ,.,é,à,Ì,Â, ,é B

DirectDraw.Í A,³,Ü,‘,Ü,ÈftfBfXfvfƎfC Efn [fhEfFfA,Â“® ì,.,é B,»\”Í‘Í,Í AfVf“fvf<,ÈSVGaf,fj^ [.,©,ç A fNfŠfbfsf“fO,â L’ A”ñRGBfJf‰ [ftfH [f}fbfg,ðfTf| [fg,.,é Â V,Ìfn [fhEfFfA,É,Ü,ÂŽŠ,é B

DirectDraw,ÌfCf“f^ [ftfFfCfX,Í AŠt‘b,É, ,éfn [fhEfFfA,Ì”—Í,ð”FŽ~ ,µ AfTf|

[fg,³,è,½,.,×,Â,Ìfn [fhEfFfA EfAfNfZf‰OfƎ [fVf‡f“,ðŽg,±,±,Æ,ª,«„é,æ,±,é,Â,¢ ,é Bfn [fhEfFfA,ªŽÀ‘•,µ,Â,¢,È,¢<@”\,Í ADirectX,ªfGf~f...fƎ [fg,.,é,æ,±,é,È,Á,Â,¢,é B

DirectDraw.Í A ]—^,È,ç“Á’è,ÌftfBfXfvfƎfC EfffofCfX,É‘È‘Œ,µ,½fR [fh,ð•K—

v,Æ,.,éfAfVfŠfP [fVf‡f“,Â,µ,©,Â,«„È,©,Â,½È‰°,Ì,æ,±,È—~„ð AftfOfCfX,É‘È‘Œ,µ,È,¢,©,½,¿,Â’ñ<Ÿ,.,é B

f\_fuf<fobftf@,ÆftfŠfbfsf“fO EfOf‰OfBfbfNfX,ÌfTf| [fg

ffBfXfvfƎfC EfJ [fh,Ìfn [fhEfFfA Efuf fbfN“]’—,Ö,ÌfAfNfZfX,Æ §Ǝä

3D Zfobftf@,ÌfTf| [fg

ZfI [f\_Šf“fO,Ìfn [fhEfFfA EfI [fo [fƎfC,ÌfTf| [fg

fCf [fW L’·fn [fhEfFfA,Ö,ÌfAfNfZfX

fXf^f“f\_ [fh,“,æ,ÑfGf“fnf“fXfh‘o•û,ÌftfBfXfvfƎfC Ef f,fŠ—Ìæ,Ö,Ì“~ŽžfAfNfZfX

DirectDraw,Ì—Ú“Í,Í A—{—

^ AftfBfXfvfƎfC Ef f,fŠ,Ö,ÌftfOfCfX,É‘È‘Œ,.,éfAfNfZfX,ð AftfOfCfX,É‘È‘Œ,µ,È,¢•û—@,Â’ñ<Ÿ,.,é,±,Æ,Â, ,é BŽ—ŽÂ ä ADirectDraw,ÌftfBfXfvfƎfC Ef f,fŠ,ðŠÇ—

,.,é BfAfVfŠfP [fVf‡f“,Í ARGB,ÆYUVfJf‰ [ EftfH [f}

fbfg,âf‰OfXf^ŠÔfsfbf^,È,Ç Afn [fhEfFfAZŽÀ‘•,ÉŠÖ,.,éW €“Í,ÈŠt—

{“ÍftfOfCfX^È‘Œ «„ð”FŽ~ ,.,é,¾,^,Â,æ,¢ Bfuf fbfN“]’—,âpfƎfbfg EfƎfWfXf^,Ì—~p,É•K—

v,È“Á’è,Ìfvf fV [fWffƎÄ,Ñ o,µ,É,Â,¢,Ä l—Œ,.,é•K—v,ª,È,¢,Ì,Â, ,é B

DirectDraw,ðŽg,!,Í A~Ü,È,éf^fCfv,Ìfn [fhEfFfA,ªŽ ,Âfuf fbfN“]’—,â F L’·,ì<@”\

,ðftf<,É‘ø,« o,µ,È,ª,ç A,µ,©,âfn [fhEfFfA,Ì“Á’è”~È,É‘È‘Œ,.,é,±,Æ,È, A

ffBfXfvfƎfC Ef f,fŠ,ðŠÈ‘P,É‘€ ì,.,é,±,Æ,ª,Â,«„é B

Windows 95,Æ Windows NT® version 4.0^È ~,ª“® ì,.,éRf“fsf... [f^ ä,Â L,Žg,,éfq [fƎ EfOf‰OfBfbfNfX,ð A

DirectDraw,Ì’ñ<Ÿ,.,é,Ì,Â, ,é B

## DirectDrawA [fLfefNf`ff

DirectDraw,Í AfBfXfvfC Ef f,fŠ,ÆffBfXfvfC Efn [fhEfFfAŠÇ— fT [frfX,ð'ñ<Ÿ,µ Af f,fŠŠÇ—  
,ÉŠÖ`A,µ,½f f,fŠ,İŠ,,è“—,Ä A`Ú“® A“]‘— A%øð•ú,È,Ç,İ`ê”Ê“I<@”\,à'ñ<Ÿ,·,é BDirectDraw,“ŠÇ—  
,·,éf f,fŠ,Í%øæ‘æfCf [fW,ð•\,µ AfT [ftfFfX,ÆÆÄ,Î,ê,é B  
fAfvfŠfP [fVf‡f“,ÍDirectDraw,İfn [fhEfFfA EfAfufXfgf%ofNfVf‡f“ EfCfCf,, (HAL)  
,ð'Ê,¶ A L'·,âfI [fo [fCfC AfefNfXf`ff Ef}  
fbfsf“fO A%øñ“] Af~f%o [fŠf“fO,ðŠÜ,b“Æ“Á,ÈffBfXfvfC Efn [fhEfFfA<@”\,ð—~—p,Å,«,é B



## DirectDrawŠT—v

,±,ì ß,Å,Í ADirectDrawfRf“f| [flf“fg,Îê”Ê“l,È,±,Æ,É,Â,¢,Ä à–¾,·,é B

DirectDraw

,»,'¼,ì DirectDraw,Ì“Á'Ÿ

DirectDraw HAL

DirectDraw HEL

DirectDrawfIfufWfFfNfq,Ìf^fCfv

• ,Æfsfbf`

3D fT [ftfFfX,ÌfTf] [fg

DirectDraw,ÆDirect3D,Ì“ ±

f, [fhXfffBfXfvfÆfC Ef, [fh

fsNfZf< EftfH [f}fbfq

## DirectDraw

DirectDraw,Í Afñ [fhfEfFfA,Æf\ftfgfEfFfA'o•û,ÄŽÄ'•,³,ê,é B  
DirectDraw,ðŽg,²fAfvfŠfP [fVf±f“,Í Afñ [fhfEfFfA,“,æ,Ñf\ftfgfEfFfA EfGf~f...fœ [fVf±f“,ì,Q,Ä,ì”~Í,ð~  
—p,.,é,±,Æ,ª,Ä,«é BfAfvfŠfP [fVf±f“,Í A DirectDraw,ª½,ðfGf~f...fœ [fVf±f“,µ,Ä,¢,é,© A,»,µ,Ä,Ç,ì<@”\  
,ªfn [fhfEfFfA,Ä'ñ<Ÿ,³,ê,Ä,¢,é,© AŠÈ'P,É²² „Ä,«é BDirectDraw,Í A DirectDraw  
fn [fhfEfFfA EfAfufXfgf%oNfVf±f“ EfœfCf„(HAL),ì—B^ê,ìfNf%oCfAf“fg,Ä,è AfAfvfŠfP [fVf±f“,Í  
•K, DirectDraw,É'í,µ,ÄfAfNfZfX,ð s,ì,È,^,ê,ì,È,Ç, A,»,è,æ,è'áfœfxf<,ÈHAL,É'¼ ÚfAfNfZfX,.,é,±  
,Æ,ì,Ä,«,È,¢ B

DirectDraw,Í A Ddrawf\_fCfif~fbfN EfŠf“fN Ef%oCfuf%oŠ (DLL),É,æ,Ä,ÄŽÄ'•,³,ê,Ä,¢,é B,±  
,ì32f\fbfGDLL,Í A DirectDraw,ì—v< ,.,é,¢'È<@”\,.,×,Ä,ðŽÄ'•,µ,Ä,¢,é B,±,ìDLL,Í Afpf%o [f^,ðŠ@'S,É—  
Lœø%»,.,é,ì,à,ç,ë,ñ A Win32@,ÆHAL,ì16f\fbfG”ª,Æ,ìŠÖ,É•K—  
v,ÈfTf“fN,ð,.,×,Ä s,¢ AfIfxfNfŠ [f“ EfffBfXfvfœfC Ef f,fŠ,ðŠÇ— ,µ A DirectDraw,ª—v< ,.,é,.,×,Ä,ìŠÇ  
— <L^,âfZf}f“fefBfbfN Ef fWfbfN,ð'S—,.,é B,Û,½NfŠfbfv EfŠfXfg,Æ,»,ì¼,.,×,Ä,ìfffofCfX“Æ—§<@”\  
,ð'ñ<Ÿ,.,éEfBf“fhfE Efñf“fhf<,ðftfbfN,.,é,±,Æ,Ä AfAfvfŠfP [fVf±f“,Ö,ìRf“f|  
[flf“fg EfIfufWfFfNfg Ef,fff< iCOM jfCf“f^ [ftfFfCfX,ð'ñ<Ÿ,.,é B

DirectDraw,Í AIDirectDraw2 AIDirectDrawSurface2 AIDirectDrawPalette AIDirectDrawClipper,Æ,¢  
,ª4,Ä,ìCOMfCf“f^ [ftfFfCfX,ì'g,Ÿ ±,ì,¹,Ä, ,é BCOM,ìŠT”O,É,Ä,¢,Ä,Í A ufRF“f|  
[flf“fg EfIfufWfFfNfg Ef,fff< v,ðŽQ Æ,.,é,±,Æ B

DirectDrawfAfvfŠfP [fVf±f“,ª Ä %o,ÉŽg,²,Ó,½,Ä,ìIfufWfFfNfg,ÍDirectDraw,ÆDirectDrawSurface,Ä, ,é B  
DirectDrawfIfufWfFfNfg,Í A**DirectDrawCreate**ŠÖ ”,ð—p,¢,Ä ì ¬,³,è A ffbfXfvfœfC EfAf\_fvf^ EfJ [fh,ð<  
,. BfAfvfŠfP [fVf±f“,Í AfIfufWfFfNfg,Ö,ì**IDirectDraw2**fCf“f^ [ftfFfCfX,ðŽæ“¾,µ,½Eä Afvf%oCf}  
fŠDirectDrawSurfacefIfufWfFfNfg,ð ì ¬,.,é,½,ß Af,fjf^•%oæ—p,ìffBfXfvfœfC Ef f,fŠ,ð<  
,**IDirectDraw2::CreateSurface** ffbfh,ðEÄ,Ñ o,¹,é,æ,²,É,È,é B,Û,½ Afvf%oCf}  
fŠ EfT [ftfFfX,©,ç“Æ<fŠfXfg•ûŽ®,ÄfIfxfNfŠ [f“ EfT [ftfFfX,ð ì ¬,.,é,±,Æ,à,Ä,«é B

•È í Afvf%oCf}  
fŠ EfT [ftfFfX,Æ•Ž'fCf [fW,ðftfŠfbfsf“fO,.,é,½,ß Afofbfn Efobftf@,ð,D,Æ,Ä ì ¬,.,é Bfvf%oCf}  
fŠ EfT [ftfFfX,ì•Ž'fCf [fW,ð— ,.,é,ì,ÉfXfNfŠ [f“,ªf\W [É,È,Ä,Ä,¢  
,éŠÖ Afobfn Efobftf@ EfT [ftfFfX EfTœ [fœ,Ö•%oæ,.,é B,±  
,è,ìffBfXfvfœfC Ef f,fŠ,ÍDirectDrawSurfacefIfufWfFfNfg,ÉŠ”[³,è,Ä,¢,é~A,ìfIfxfNfŠ [f“ Ef\fbfgf}  
fbfv,ðfobfn Efobftf@,É“—,.,é,±,Æ,É,æ,éŽÄE»,.,é BfAfvfŠfP [fVf±f“,Í A'¼'O,É•%oæ,µ,½ftœ [fœ  
,ð•Ž',.,é,½,ß,É A**IDirectDrawSurface2::Flip** f\fbfh,ðEÄ,Ñ o, B,±  
,ìf ffbfh,Í AfXfNfŠ [f“ if,fjf^ j,ª ,¼•ûEü,ì Ä— ,ð s,²,Æ,«É%oæ—È,ð•,«Š,.,é,æ,²  
,ÉfœfWfXf^,ðfZfbg,.,é B,±,ì'€ ì,ì”ñ~Šü,È,½,ß Af ffbfh,ðEÄ,ñ,Ä,©,ç,àfAfvfŠfP [fVf±f“,Í ~— ,ð'±  
,^,ç,è,é i,±,ìf ffbfh,ªEÄ,ì,è,é,Æ A•,«Š,.,ç,è,é,Ü,ÄŽ@“L,Éfobfn Efobftf@,Í ‘,«,±  
,Ÿ•ÖŽ~Æ,È,é j Bfvf%oCf}  
fŠ EfT [ftfFfX,ª•,«Š,.,ç,è,½Eä AfAfvfŠfP [fVf±f“,Ífobfn Efobftf@,ÉŽŸ,ìftœ [fœ  
,ð \ ¬,µ**IDirectDrawSurface2::Flip**,ðEÄ,Ñ o,.,È,Ç,ì ~— ,ð'±,~é B

Windows 3.1 GDIf,fff<,Ä,ìffBfXfvfœfC Ef f,fŠ,ìf\fbfgf}fbfv,Ö,ì¼ ÚfAfNfZfX,ð,.,é,ì,~Ä,ì,È,¢,ª A  
DirectDraw,É,æ,è,»,ìfpftfH [f]f“fX,ìEü ã,.,é BŽÄ,Í AGDI,ìfpftfH [f]f“fX'á%°,ì ~—{“L,È—  
vö,Í Afuf fbnN”]—,ð,Û, fVfXfefœ Ef f,fŠ ã,ÄŽÄ s,µ A,»,ìE%oE,ðffBfXfvfœfC Ef f,fŠ,Ö”]—  
,.,é A,Æ,¢,ª“ñ d,ìfI [fo [fwfbfh,É, ,é B,µ,©,µ A DirectDraw,ð~—p,.,é è ± A%oÄ”\  
,È,©,¬,èffBfXfvfœfC EfAf\_fvf^ EfJ [fh ã,Ä ^— ,ð s,²,½,ß A,»,ìfI [fo [fwfbfh,ð³ k,Ä,«é,ì,Ä, ,é B,Û  
,½Windows 95,àWindows NT GDIf,fff<,Ä,Í**CreateDIBSection**ŠÖ ”,ªfn [fhfEfFfA ~— ,ð%oÄ”\  
,É,.,é,ª A DirectDraw,ì,»,ìfpftfH [f]f“fX,àEü ã,³,¹,é B

‘æŽO,ì DirectDrawfIfufWfFfNfg,Í DirectDrawPalette,Ä, ,é B•—  
ffBfXfvfœfC Efpfœfbg,ì'È iffbfXfvfœfC Efn [fhfEfFfA“à,ÉŽ ,½,è,é,½,ß A,D,Æ,Ä,ìfIfufWfFfNfg,É,  
æ,è,»,è,ð•,µ'€ ì,.,é,±,Æ,É,È,é B  
**IDirectDrawPalette**fCf“f^ [ftfFfCfX,Í Afpfœfbg,ðfn [fhfEfFfA ã,ÄŽÄ'•,.,é B,±  
,è,ç,É,æ,èWindowsfpfœfbg,ÍofCfpfX,³,è AfQ [fœ  
,ªffBfXfvfœfC Efn [fhfEfFfA,ð'r¼“L,ÉfAfNfZfX,.,é,Æ,«¾,~Žg,ì,è,é B  
DirectDrawPalettefIfufWfFfNfg,à,Û,½ A DirectDrawfIfufWfFfNfg,©,ç ì ¬,³,è,é B

ÄEä,ì DirectDrawfIfufWfFfNfg,ÍDirectDrawClipper,Ä, ,é B DirectDraw,ì,±  
,ìfIfufWfFfNfg,ðŽg,Ä,Ä AfBfXfvfœfC Ef f,fŠ,ìfNfŠfbfsf“fO,³,è,½—ìæ,ðŠÇ— ,.,é B

„»,İ¼,İDirectDraw,İ“Á’Ÿ

DirectDraw B,ÄŽ!,µ,½“Á’Ÿ,É%Á,¹ ADirectDraw,İ“\$%ßCE^fuf fbfN“]‘—,ÆfI [fo [fCEfC,àTf] [fg,µ,Ä,¢,é B

“\$%ßCE^fuf fbfN“]‘—’†,İ Afrfbfgrf}fbfv,İfT [ftfFX,É“]‘—,³ê Afrfbfgrf}fbfv’†,İ, é F,Ü,½,İ F—  
İæ,İ“\$%ß,Æ,µ,Ä’èç,³ê,é B“\$%ßCE^fuf fbfN“]‘—,İ AfJf% [ EfL [,ðŽg,Á,ÄŽÀÆ»,³ê,é B“]‘—  
Æ³fJf% [ EfL [,İ A“]‘— ^— ’† Afrfbfgrf}fbfv,İ,Ç,İ F A,Ç,İ F—İæ,ð“\$%ß,É,·,é,© A,Ä,Ü,èRfs [,µ,È,¢  
,İ,©,ð’èç,·,é,±,Æ,É,æ,è s,İ,ê,é B“]‘— æfJf% [ EfL [,İ A“]‘—Æ³fRfbfgrf}fbfv,İ,»,İ F A F—  
İæ,ðŽ ,ÄfsfNfZfç,É,æ,Ä,Ä AfT [ftfFX,İ,Ç,İ F A,Ç,İ Fæ,ª ä ‘,«³,ê,é,©,ð’èç,·,é,±  
,Æ,É,æ,è s,İ,ê,é B Ú ×,İ ufJf% [ EfL [fCf“fQ v,ðŽQ Æ,·,é,±,Æ B

ÄÆä,É A DirectDraw,İfn [fhfEfFFA,İfI [fo [fCEfC,Æf\ftfgfEfFFA EfGf~f...

fCE [fVf‡f“,É,æ,éfi [fo [fCEfC,İ—¼•û,ðfTf]

[fg,·,é Bfi [fo [fCEfC,İ AfXfvf%fcfg,İŽÄ‘•,âfAjjf [fVf‡f“,İ•i ”fCEfCf,,ŠÇ— ,İ A,æ,èŠÈ’P,ÈŽè’i,Ä, ,é  
Bfi [fo [fCEfC,¾,¯,ÉŠÖ~A,µ,½’Ç%Á”—İ,É%Á,¹ A,»,İ¼,Ç,ñ,ÈfT [ftfFX,İ”—  
İ,à,·,×,ÄŽ ,Äfi [fo [fCEfC,Æ,µ,Ä A, ,ç,ä,éDirectDrawSurfacefiufWfFFNfg,ð ì ¬,Ä,«é B,±,ê,ç,İç@”\  
,İ’Ç%Á,İffBfXfvfCEfC Ef f,fŠ,ð•K—v,Æ,µ AffBfXfvfCEfC Ef f,fŠ,Éfi [fo [fCEfCç@”\  
,ª,È,¯,ê,İ AfVfXfef€ Ef f,fŠ ä,Éfi [fo [fCEfC Ef f,fŠ,ð’u,±,Æ,à,Ä,«é B

fJf% [ EfL [,İ A fi [fo [fCEfC,ÉÎ,µ,Ä,à“\$%ßCE^fuf fbfN“]‘—,ÉÎ,µ,Ä,Æ“—l,É“, B  
fi [fo [fCEfCZfi [f [,İ AfI [fo [fCEfCŠÖ,İ d,È, ,í,¹ ^— ,Æ“\$%ß ^— ,ðŽç“@“l,Éµ,□ B

DirectDraw HAL

DirectDraw fn [fhfEfFfA EfAfufXfgf%NfVf‡f“ EfŒfCf,, (HAL)  
,Í Afn [fhfEfFfA,É`Ě‘¶,µ Afn [fhfEfFfAŒĀ—L,lfR [fh,¾,¯,©,ç,È,é B  
HAL,Í A16frfbfg,Ā,à32frfbfg,Ā,à A,Ü,½ Windows 95 ä,Ā,Í‘o•û,ì‘g,Y ‡,í,¹,ĀŽĀ‘•,³,ê“¾,é BWindows  
NT ã,Ā,Í,Ā,È,É32 frfbfg,ĀŽĀ‘•,³,ê,é B  
HAL,Í AfBfBfXfvfŒfC EfBf%ŒfCfo,É“ ‡,³,ê,½ˆê”,É,à A,Ü,½fhf%ŒfCfo ì ¬ŽÒ,ª’èç,µ,½fvf%ŒfCfx [fg EfC  
f“f^ [ftfFfCfX,ð’È,µ,ĀffBfXfvfŒfC EfBf%ŒfCfo,Æ’Ê M,·,é“Æ—§,µ,½DLL,É,à,È,è“¾,é B  
  
DirectDraw HAL,Í Af`fbfvf [fJ [ Af{ [fhf [fJ [ A,n,d,l,É,æ,èŽĀ‘•,³,ê,é B HAL,ÍfffofCfXŒĀ—  
L,lfR [fh,¾,¯,©,çŽĀ‘•,³,ê AfGf~f...fŒ [fVf‡f“,Í s,í,, Afn [fhfEfFfA,É,È,Œ@”\,Í’Ê’m,µ,È,Œ B  
HAL,Í Afpf%Œ [f^,lŠm”F,ð s,í,È,, Afpf%Œ [f^ Ef`FfbfN,Í AHAL,ªŒĀ,Ñ o,³,ê,é‘O,ÉDirectDraw,É,æ,è s  
,í,ê,é B

**DirectDraw HEL**

DirectDrawfn [fhfEfFfA EfGf~f...fŒ [fVf‡f“ EfŒfCf„(HEL) ,Í AHAL,ª s,ƒ,Ì,Æ“—l,É A  
DirectDraw,É‘Î,µ,»,Ì”—Í,ð’Ê’m,·,é B,±,ƒ,µ,½”—Í,ðfAfvfŠfP [fVf‡f“ %Šú%»’iŠK,Â’² ,·,é,±  
,Æ,É,æ,Â,Ä AfpftfH [f}f“fX,ð Â“K%»»,µ Afvf%ofbfghtfH [f€  
,²,Æ,ÉfAfvfŠfP [fVf‡f“,Ìpf%of [f^,ð’² ®,Â,«,é B,à,µDirectDraw HAL,ªŒ©,Â,©,ç,È,¢ ê ‡ A,Û,½,Í—  
v< ,³,ê,½<@”\,ðfn [fhfEfFfA,ªñ<Ÿ,µ,Ä,¢,È,¢ ê ‡ A DirectDraw,Í,»,Ì<@”\,ðfGf~f...fŒ [fg,·,é,±,Æ,É,È,é B

## DirectDrawIfufWfFfNfg,İf^fCfv

DirectDrawIfufWfFfNfg,İffBfXfvfƎfC Efft ofCfX,ðŽ!,· BŠe~\_— fffBfXfvfƎfC Efft ofCfX,É‘İ,μ•i ”,İ  
DirectDrawIfufWfFfNfg,ð ì ¬,·,é,±,Æ,<sup>a</sup>Ä,«<sub>1</sub>é B  
,»,ê,¼,ê“ÆŽ©,İDirectDrawIfufWfFfNfg,İ A,»,İ‘¼,·,×,Ä,İDirectDrawIfufWfFfNfg,©,ç“Æ—  
§,μ,½fT [ftfFfX AfpfƎfbfg AfNfŠfbfp [,È,Ç,İfIfufWfFfNfg,ð ì ¬,·,é B

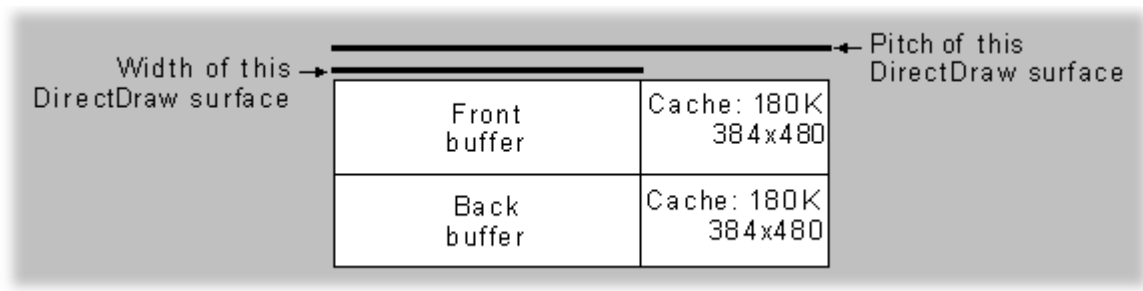
DirectDrawSurfaceIfufWfFfNfg,İ A’¼ ÚfAfNfZfX,μ,½,è‘€ ì,μ,½,è,Ä,«<sub>1</sub>éffBfXfvfƎfC Ef f,fŠ,İ‘A‘±•”<sup>a</sup>,ð\,  
·,· B,±,ê,ç,İffBfXfvfƎfC Ef f,fŠ,İfAfhfƎfX,İ A%oÄŽ<ftfƎ [f€ Efofbftf@ Ef f,fŠ ifvf%ofCf}  
fŠ EfT [ftfFfX j, ,é,ç,İ•s%oÄŽ<fofbftf@ ifIftfXfNfŠ [f“ EfT [ftfFfX,Ü,½,İfI [fo [fƎfC EfT [ftfFfX)  
,ðŽw,· B•s%oÄŽ<fofbftf@,İ‘Ê í AfBfXfvfƎfC Ef f,fŠ,É í“<sub>1</sub>,·,é B,μ,©,μ Afn [fh ÝƎv ã,İ— —  
R,©,ç A,Ü,½,İ DirectDraw,<sup>a</sup>f\ftfgfEfFfA EfGf~f...fƎ [fVf‡f“,ðŽÀ s,μ,Ä,ç  
,é ê ± AfVfXfef€ Ef f,fŠ ã,É ì ¬,·,é,±,Æ,à,Ä,«<sub>1</sub>é B

DirectDrawPaletteIfufWfFfNfg,İ A16 F,Æ256 F‘o•û,İfCf“fffbfNfX EfpfƎfbfg,ð\,· B fpfƎfbfg,İ A  
fefNfXf`ff AfIftfXfNfŠ [f“ EfT [ftfFfX AfI [fo [fƎfC EfT [ftfFfX,É‘İ,μ’ñ<Ÿ,<sup>3</sup>ê,é B,±  
,ê,ç,İ,Ç,ê,à Afvf%ofCf}fŠ EfT [ftfFfX,Æ“¬,İfpfƎfbfg,ðŽ ,½,È,,Æ,à,æ,ç B

DirectDrawIfufWfFfNfg,İDirectDrawSurface ADirectDrawPalette ADirectDrawClipper,İŠefIfufWfFfNfg,ð ì ¬,·,é  
B DirectDrawPalette fIfufWfFfNfg,Æ DirectDrawClipperfIfufWfFfNfg,İ A,»,ê,<sup>a</sup> ì—  
p,·,éDirectDrawSurface,ÉfAf^fbf\_,μ,È,¬,ê,İ,È,ç,È,ç BDirectDrawSurfaceIfufWfFfNfg,İ A  
DirectDrawPaletteIfufWfFfNfg,ðfAf^fbf`,·,é—v< ,ð<“”Ü,·,é%oÄ”\ «,<sup>a</sup>,é B‘â•”<sup>a</sup>,İfn [fhEfFfA,İ•i ”fpfƎfbfg,ðf  
Tf| [fg,μ,Ä,ç,È,ç,½,ß,Ä A,μ,İ,μ,İ<N,«<sub>1</sub>é,±,Æ,Æ,μ,Ä’ ^Ó,μ,È,,Ä,İ,ç,¬,È,ç B

• ,Æfsfbf`

fffBfXfvfƎfC Ef f,fŠ,É ‘,«±,p,æ,µ,ÈfAfvfŠfP [fVf‡f“,ì ê ‡ Af f,fŠ,ÉŠi”[<sup>3</sup>,ê,½frfbfgf}fbfv,Í‘A‘±  
 ,µ,½f f,fŠ ã,É,È,,Æ,à—Ç, A,±,ì ê ‡ Afrfbfgf}fbfv ã,ìf%ofCf“,ì• ,Æfsfbf`,“Û,È,Ä,Ä,¢  
 ,Ä,à,æ,¢ B• ,Í AŠi”[<sup>3</sup>,ê,½frfbfgf}fbfv,ìf%ofCf“,ìŽn“\_,Æ I“\_,Æ,ð•\,·f f,fŠ ã,ì“ñfAfhfƎfXŠÔ,ì—£,Ä, ,é B  
 ,±,ì—£,Í Af f,fŠ ã,ìfrfbfgf}fbfv,ì• ,¾,—,ð•\,µ Afrfbfgf}fbfv,ìŽY,ìf%ofCf“,ìŽn“\_,É‘B,·,é,½,ß,É•K—  
 v,È‘Ç%oÁf f,fŠ ifJfEf“fg j,ðŠÛ,Û,È,¢ Bfsfbf`,Í AŠi”[<sup>3</sup>,ê,½frfbfgf}  
 fbfv,ìƎ» Ý,ìf%ofCf“,ìŽn“\_,ÆŽY,ìf%ofCf“,ìŽn“\_,Æ,ð•\,·f f,fŠ ã,ì“ñfAfhfƎfXŠÔ,ì—£,Ä, ,é B  
 ,½,Æ,ì,ìéƎ`f f,fŠ,Ä,Í AftfBfXfvfƎfC Ef f,fŠ,ìfsfbf`,Í Afrfbfgf}fbfv,ì• fvf%ofX AfLfffbfVf...  
 •”•,ðŠÛ,p BŽY,ì },Í AéƎ`f f,fŠ,É,“,·,é• ,Æfsfbf`,ì‘á,¢,ðŽì,µ,Ä,¢,é B



,±,ì },Ä,Í Aftf f“fg Efobftf@,ÆfobfN Efobftf@,Í640‘480‘8 AfLfffbfVf...,Í384‘480‘8,Ä, ,é B  
 ŽYf%ofCf“,ìfAfhfƎfX,ð• ,ß,é,É,Í A 640,Æ384,ð•«µ,Ä1024,Æ,µ A,±,ê,“ŽYf%ofCf“,ìŽn“\_,Æ,È,é B  
 ,µ,½,“Ä,Ä AfT [ftfFX Ef f,fŠ,É‘¼ ÚfƎf“f\_Šf“fO,·,é,Æ,«Í A,Ä,È,ÉIDirectDrawSurface2::Lock f f\fbfh  
 (,Û,½,Í A IDirectDrawSurface2::GetDCf f\fbfh),“Ô,·‘l,ðŽg—p,·,é B‘P f,ÉftfBfXfvfƎfC Ef, [fh,ÉŠi,Ä,-  
 fsfbf`,ð‘O‘ñ,Æ,µ,Ä,Í,È,Ç,È,¢ B‘P,ÉftfBfXfvfƎfC Ef, [fh,ÉŠi,Ä,-  
 fsfbf`,ð‘O‘ñ,Æ,·,é,Æ AfAfvfŠfP [fVf‡f“,“ffBfXfvfƎfC EfAf\_fvf^,É,æ,Ä,Ä“®,¢,½,è,µ,Û,-  
 “®,©,È,©,Ä,½,è,·,é ê ‡,“ ,é B

3DfT [ftfFfX,lfTf| [fg

,±,ì ß,Å,ÍDirectDraw,ì3DfT [ftfFfX<@”\,É,Â,¢,Ä à–¾,·,é B

feNfXf`ff\_Ef}fbfv

f~fbfvf}fbfv

Zfofbftf@



**fefNfXf`ff Ef}fbfv**

fefNfXf`ff Ef}fbfv,Í AHEL,ðŽg,Á,ÄVfXfef€ Ef f,fŠ ã,ÉŠ,,è“–,Ä,é,±,Æ,“%oÂ”\,Â, ,é BfefNfXf`ff Ef}  
fbfv EfT [ftfFfX,ðŠ,,è“–,Ä,é,½,ß,É A

**IDirectDraw2::CreateSurface** f\fbfh,É“n,·**DDSURFACEDESC** \‘¢‘ì,ìddsCapsf f“fo,É**DDSCAPS\_TEXTURE**ftf%of  
O,ðŽw’è,·,é B

HEL,Í L”Í,ÈfefNfXf`ff EfsfNfZf< EftfH [f}fbfg,ðfTf| [fg,·,é B,±,ê,ç,ìftfH [f}  
fbfg,ì Ú ×,Í A u**fefNfXf`ff Ef}fbfv,ìftfH [f}fbfg** v,ðŽQ Æ,·,é,±,Æ B

**f~fbfvf}fbfv**

DirectDraw,Í Af~fbfvf}fbfv EfefNfXf`ff EfT [ftFfX,ðfTf] [fg,·,é B f~fbfvf}  
fbfv,ÍfefNfXf`ff,ÌfV [fPf`fX,Ä, ,è A,»,è,¼,è,ÌfefNfXf`ff,Í%ðð`æ`x,`QŽŸ`á,È,é`¬,¶fCf [fW,Ä, ,é B  
f~fbfvf}fbfv`†,ÌftfBf<f^,ð,©,¬,ç,è,½%æ`æfCf [fW,ðfæfxf<,æCEÄ,Ñ A,»,Ì`ä,«,<sup>3</sup>Ífæfxf<ŠÖ,Ä`ñ æ,ÌŠÖEW,É, ,  
é B ,%ðð`æ`xfæfxf<,Í AŠİ`aŽÖ,Éð,çfIfufWfFfNfg,Ä—p,ç A  
`á%ðð`æ`xfæfxf<,Í AŠİ`aŽÖ,©,ç,æ,è%`çfIfufWfFfNfg,Ä—p,ç,é Bf~fbfvf}  
fbfv,Í Afæf`f\_Šf`fO,<sup>3</sup>è,½fefNfXf`ff,ÌiŽç,ðCEü ä,µ AÆvŽZ—Ê,ð ß-ñ,·,é,½,ß,ÉŽg—p,·,é B

DirectDraw,Ä,Ìf~fbfvf}fbfv,Í AfAf^fbf`<sup>3</sup>,è,½fT [ftFfX,Ìf`fF [f“,Æ,µ,Ä·\,· B  
Ä ,%ðð`æ`x,ÌfefNfXf`ff,Íf`fF [f“,Ì æ“a,É`u,©,è AfAf^fbf`f f`fg,·,È,í,žŽŸfæfxf<,Ìf~fbfvf}  
fbfv,ðŽ ,Ä B,»,Ìfæfxf<,à,Ü,½,<sup>3</sup>ç,ÉŽŸfæfxf<,ðfAf^fbf`f f`fg,Æ,µ,ÄŽ ,ç A,»,<sup>□</sup>  
µ,Ä ‡,É Ä`á%ðð`æ`xfæfxf<,Ü,Ä`±,ç,Ä,ç, B

f~fbfvf}fbfv,Ì,Pfæfxf<,ð·\  
·,fT [ftFfX,ð Ì ¬,·,é,É,Í AIDirectDraw2::CreateSurface f\fbfh,É`n,·DDSURFACEDESC \`ç`ì,ÌDDSCAPS\_MIPMAPftf%oO,ðŽw`è,·,é Bf~fbfvf}fbfv,Í,·,×,ÄfefNfXf`ff,Ä,à, ,é,½,ß A DDSCAPS\_TEXTURE  
ftf%oO,àŽw`è,<sup>3</sup>è,Ä,ç,È,¬,è,Ì,È,ç,È,ç B IDirectDrawSurface2::AddAttachedSurface f\fbfh  
·,ðŽg,ç AŠefæfxf<,ðŽÖ`a,Ä Ì ¬,µ,Äf`fF [f“,ð \ ¬,·,é,±  
·,Æ,<sup>a</sup>,Ä,«,é B,µ,©,µIDirectDraw2::CreateSurface f\fbfh,ðŽg,Ì,Í A`Sf`fF [f“,ð`è`€ Ì,Ä \ ¬,Ä,«,é B

ŽŸ,Ì—á,Ä,Í A fTfCY,`256`256 A128`128 A64`64 A32`32 A16`16,Ì,T,Ä,Ìf~fbfvf}  
fbfv Efefxf<,©,çf`fF [f“,ð \ ¬,·,é è ‡,ðŽ,· B

```
DDSURFACEDESC          ddsd;  
LPDIRECTDRAW2 lpDDMipMap;  
ZeroMemory(&ddsd, sizeof(ddsd));  
ddsd.dwSize = sizeof(ddsd);  
ddsd.dwFlags = DDS_DCAPS | DDS_DMIPMAPCOUNT;  
ddsd.dwMipMapCount = 5;  
ddsd.ddsCaps.dwCaps = DDSCAPS_TEXTURE |  
                    DDSCAPS_MIPMAP | DDSCAPS_COMPLEX;  
ddsd.dwWidth = 256UL;  
ddsd.dwHeight = 256UL;
```

```
ddres = lpDD->CreateSurface(&ddsd, &lpDDMipMap);  
if (FAILED(ddres))  
{  
    .  
    .  
    .  
}
```

f~fbfvf}fbfv Efefxf<,Ì ”,ð È—<sup>a</sup>,·,é,±  
·,Æ,à,Ä,«,é<sup>a</sup> A,»,Ì è ‡IDirectDraw2::CreateSurface f\fbfh,<sup>a</sup>fT [ftFfX,Ìf`fF [f“,ð Ì ¬,·,é B,»,Ì,»,è,¼,è,ÌfT  
[ftFfX,Í`OfT [ftFfX,Ì·½·Ü`a,Ì`ä,«,<sup>3</sup>Ä Ìç,è A%Ä”\,È,©,¬,è,Ì ¬,<sup>3</sup>,Ü,Ä`±, B· ,Æ ,,<sup>3</sup>,ð È—<sup>a</sup>,·,é,±  
·,Æ,à,Ä,« A,»,Ì è ‡IDirectDraw2::CreateSurface,<sup>a</sup> A Ä ¬fæfxf<,ÌfTfCY,ð1  
`1,Æ,·,éŽw`è,µ,½ ”,Ìfæfxf<,ð Ì ¬,·,é B

f~fbfvf}fbfv EfT [ftFfX,Ìf`fF [f“,Í AIDirectDrawSurface2::GetAttachedSurface f\fbfh,ð—  
p,ç DDSCAPS \`ç`ì,ÌDDSCAPS\_MIPMAP,Æ DDSCAPS\_TEXTUREftf%oO,ðŽw`è,·,é,±,Æ,É,æ,Ä,Ä s,<sup>□</sup> B ŽŸ,Ì  
—á,Í A Ä ,%ðð`æ`x,©,ç Ä`á%ðð`æ`x,Ü,Äf~fbfvf}fbfv Ef`fF [f“,ðfge [fX,µ,½,à,Ì,Ä, ,é B

```
LPDIRECTDRAW2 lpDDLevel, lpDDNextLevel;  
DDSCAPS ddsCaps;
```

```
lpDDLevel = lpDDMipMap;  
lpDDLevel->AddRef();  
ddsCaps.dwCaps = DDSCAPS_TEXTURE | DDSCAPS_MIPMAP;  
ddres = DD_OK;  
while (ddres == DD_OK)  
{  
    // ,±,Ìfæfxf<,Ì ^—  
    .  
    .  
    .  
}
```

```

ddres = lpDDLevel->GetAttachedSurface(
    &ddsCaps, &lpDDNextLevel);
lpDDLevel->Release();
lpDDLevel = lpDDNextLevel;
}
if ((ddres != DD_OK) && (ddres != DDERR_NOTFOUND))
{
    .
    .
    .

f~fbfvf}fbfv,łftfŠfbfsf“fO Ef`fF [f“,đ \ ¬,·,é,±,Æ,à,Ä,«é B,±,İ ê ± AŠef~fbfvf}
fbfv EfƎfxf<,ª AŠÖ`A,·,éfofbfN Efofbftf@ EfefNfXf`fffT [ftfFfX,đŽ ,Ä BŠefofbfN Efofbftf@ EfefNf
Xf`fffT [ftfFfX,İ Af~fbfvf}fbfv,İ`êƎfxf<,ÉfAf^fbf`,³,ê,Ä,¢,é B
f`fF [f“,łftf f“fg Efofbftf@,¾,¬,İDDSCAPS_MIPMAP ftf%oO,İfZfbfg,đŽ ,¿ A,»,İ¼,İP,È,éfefNfXf`ff Ef}
fbfv,Ä,é İDDSCAPS_TEXTURE ftf%oO,đŽg,¢ İ ¬,³,ê,éfefNfXf`ff Ef}fbfv) B,Đ,Æ,Ä,İf~fbfvf}
fbfv EfƎfxf<,İ AfAf^fbf`,³,ê,½fefNfXf`ff Ef}fbfv,đ,Ó,½,ÄŽ ,Ä,±,Æ,ª,Ä,«é B,Đ,Æ,Ä,İf~fbfvf}
fbfv Ef`fF [f“,İŽŸfƎfxf<,Ä, éDDSCAPS_MIPMAPfZfbfg A,à,□
,Đ,Æ,Ä,İftfŠfbfsf“fO Ef`fF [f“,İfofbfN Efofbftf@,Ä, éDDSCAPS_BACKBUFFER ftf%oO,İfZfbfg,Ä, é BŠef
tfŠfbfsf“fO Ef`fF [f“,łft [ftfFfX,İ A,·,×,Ä¬,¶fTfCfY,Ä,È,¬,ê,İ,È,ç,È,¢ B

,±,İ,æ,□,ÈfT [ftfFfX,İ ®—ñ,İ A
IDirectDraw2::CreateSurface f\fbfh,İĖÄ,Ñ o,µ`ê%ñ,Ä,İ \ ¬,Ä,«È,¢ BftfŠfbfsf“fO Ef~fbfvf}fbfv,đ`g,Ÿ—
§,Ä,é,É,İ A•İ ±f~fbfvf}fbfv Ef`fF [f“,đ \ ¬,µ IDirectDrawSurface2::AddAttachedSurface
f f\fbfh,È,æ,éfofbfN Efofbftf@,đŽê“®,ÄfAf^fbf`,·,é,© A, é,¢
,İftfŠfbfsf“fO Ef`fF [f“,İfV [fPf“fX,đ İ ¬,µ,Ä IDirectDrawSurface2::AddAttachedSurface,É,æ,èf~fbfvf}
fbfv,đ \ ¬,·,é,±,Æ,È,È,é B

```

---

#### Note

fuf fbfN“]‘—‘€ İ,İ Af~fbfvf}fbfv Ef`fF [f“,İ`êƎfxf<,É,İ,Ÿ“K—p,³,ê,é Bf~fbfvf}
fbfv,İ`Sf`fF [f“,đfuf fbfN“]‘—,·,é,½,B,É,İ AŠefƎfxf<,đ•Ê X,Éfuf fbfN“]‘—,µ,È,¬,ê,İ,È,ç,È,¢ B

---

**IDirectDrawSurface2::Flip** f\fbfh,İ A—^,İ,ç,ê,½fƎfxf<,©,çf~fbfvf}
fbfv`t,İ Ä`áfƎfxf<,Ü,Ä A,·,×,Ä,İfƎfxf<,đftfŠfbfsf“fO,·,é BftfŠfbfsf“fO æ,İfT [ftfFfX,à`ñ,Ÿ,³,ê,ª A,»,İ ê
±f~fbfvf}fbfv,İ`SfƎfxf<,ª,»,İftfŠfbfsf“fO Ef`fF [f“,İfofbfN Efofbftf@,ÉftfŠfbfsf“fO,³,ê,é B,±
,İfofbfN Efofbftf@,İ A—^,İ,ç,ê,½fI [fof%oCfh,Æ`ê`v,·,é B,½,Æ,İ,İftfŠfbfsf“fOf`fF [f“,İfgfbfvfƎfxf<,É, é,
R”Ö—Ü,İfofbfN Efofbftf@,ªfI [fof%oCfh,Æ,µ,Ä—^,İ,ç,ê,½ ê ± Af~fbfvf}fbfv,İ`SfƎfxf<,İ,»,İ,R”Ö—
Ü,İfofbfN Efofbftf@,ÉftfŠfbfsf“fO,·,é B

f~fbfvf}fbfv Ef`fF [f“,İfƎfxf< ”,İ A—¾Ž,“İ,ÉŠi”[³,ê,é B
fAfvfŠfP [fVf±f“,ª İIDirectDrawSurface2::Lock,Ü,½,İIDirectDrawSurface2::GetSurfaceDesc f\fbfh,đĖÄ,Ñ o,µ,
Ä)f~fbfvf}fbfv,İfT [ftfFfX EftfXfNfŠfvf^,đŽæ“¾,·,é,Æ,« AfgfbfvfƎfxf<,đŠÜ,bf~fbfvf}fbfv,İfƎfxf< ”,İ
DDSURFACEDESC \`¢İ,İ dwMipMapCountf f“fo,ªŽ ,Ä,Ä,¢,é Bf~fbfvf}
fbfv,İfgfbfvfƎfxf<ÈŠÖ,İfƎfxf<,É,Ä,¢,Ä,İ A dwMipMapCountf f“fo,İ A,»,İf~fbfvf}
fbfv,©,çf`fF [f“,İ Ä ¬f~fbfvf}fbfv,Ü,Ä,İfƎfxf< ”,đŽw`è,·,é B

## Zfobftf@

DirectDraw HEL,Í A Direct3D™

,â,»,ì¼3DfŒf“f\_Šf“fO Ef\ftfgfEfFfA,Žg,²Zfobftf@,ð ì ¬,Å,«,é BHEL,Í16frfbfg,Æ32frfbfg‘o•û,ìZfobftf@,ðfTf| [fg,·,é B3DfAfNfZf%Œ [fVf‡f“,ðŽ ,ÂffBfXfvfŒfC EfJ [fh—

p,ìDirectDrawffofCfX Efhf%ŒCfo,Í A **DDSCAPS\_ZBUFFER**ftf%ŒO,ðfGfNfXf| [fg,·,é,±,Æ,É,æ,è AfBfXfvfŒfC Ef f,fŠ,ÉZfobftf@,ð ì,é,±,Æ,ª,Å,«,é B,»,ì è ‡ffofCfX Efhf%ŒCfo,Í A **DDCAPS** \‘c‘ì,ìdwZBufferBitDepthsf f“fo,ðŽg,Å,Ä AfTf| [fg,·,é Zfobftf@,ì [,³,ðŽw‘è,µ,È,,Ä,Í,È,ç,È,¢ B

fAfvfŠfP [fVf‡f“,Í A **IDirectDrawSurface2::Bltf** f\fbfh,ðŽg,²,±,Æ,É,æ,Å,Ä AZfobftf@,ðfNfŠfA,·,é,±,Æ,ª,Å,«,é **BDDBLT\_DEPTHFILL**ftf%ŒO,Í A fuf fbfN“]‘—,²Zfobftf@,ðfNfŠfA,·,é,±,Æ,ðŽ,µ,Ä,¢,é B,±,ìftf%ŒO,²Žw‘è,³,è,Ä,¢,é,Æ A **IDirectDrawSurface2::Bltf** f\fbfh,É“n,³,è,½**DDBLTFX** \‘c‘ì,Í A—v<,³,è,½Zfobftf@‘l,ðdwFillDepthf f“fo,ÉfZfbfg,·,é B3DfAfNfZf%Œ [fVf‡f“,ðŽ ,ÂffBfXfvfŒfC EfJ [fh,ì,½,ß,ì DirectDrawffofCfX Efhf%ŒCfo,ª AZfobftf@,ìfNfŠfA,ðfn [fhfEfFfA,ÄfTf| [fg,·,é,æ,²,É ÝŒv,³,è,Ä,¢,é è ‡ A **DDCAPS\_BLTDEPTHFILL**ftf%ŒO,ðfGfNfXf| [fg,µ A **DDBLT\_DEPTHFILL**fuf fbfN“]‘—,ðµ,²,Í,,Ä, ,é B%œ s,«,ð—,,ß,éfuf fbfN“]‘—,ì“]‘— æfT [ftfFX,Í A Zfobftf@,Å,È,¬,è,Î,È,ç,È,¢ B

---

## Note

%œ s,«,‘l,ìŽÄ Û,ì%ðŽß,Í A3DfŒf“f\_Šf“fO EfVfXfef€,É‘Ë‘¶,·,é B

---

**DirectDraw,ÆDirect3D,ì“   ‡**

,±,ì   ß,Å,Í   ADirectDraw,Æ Direct3D,ìŠÖEW,É,Â,¢,Ä   q,×,é   B

Direct3Dfhf%o fCfo   EfCf“f^   [ftfEfCfX

Direct3DfffofCfX   EfCf“f^   [ftfEfCfX

Direct3DfefNfXf`ff   EfCf“f^   [ftfEfCfX

DirectDraw HEL,ÆDirect3D

**Direct3Dfhf%o fCfo EfCf“f^ [ftfFfCfX**

DirectDraw,Ífvf fOf%of},É“ ±,³,ê,½’P^ê,ÌIfufWfFfNfg,ð’ñ<Ÿ,·,é B,±,ÌIfufWfFfNfg,Í A DirectDraw,Æ  
Direct3D’o•û,Ì ó‘Ô,ðfJfvfZf,«»,·,é B  
DirectDrawfhf%o fCfo,ÌCOMfCf“f^ [ftfFfCfX,ÆDirect3Dfhf%o fCfo,ÌCOMfCf“f^ [ftfFfCfX,Í A,Æ,à,É AŠî‘b,É, ,  
é“~êIfufWfFfNfg,Æ,ÌÊ M,“%oÂ”\,Â, ,é BfAfvfŠfP [fVf±f“,ª Direct3D,ðŽg,²,Æ,« A  
Direct3DfIfufWfFfNfg,Í Ì ¬,³,ê,È,¢ BfAfvfŠfP [fVf±f“,ªDirectDrawfIfufWfFfNfg,Ö,ÌDirect3D  
fCf“f^ [ftfFfCfX,ð“¾,é,É,Í A•W €,ÌCOM **QueryInterface** f\fbfh,ð—p,¢,é B

ŽŸ,Ì—

á,Í ADirectDrawfIfufWfFfNfg,ð Ì ¬,µ A,»,ÌIfufWfFfNfg,Æ’Ê M,·,é,½,ß,ÌDirect3DfCf“f^ [ftfFfCfX,ð“¾,é•û-  
@,ðŽ,µ,Â,¢,é B

```
LPDIRECTDRAW lpDD;  
LPDIRECT3D lpD3D;  
ddres = DirectDrawCreate(NULL, &lpDD, NULL);  
if (FAILED(ddres))
```

```
·  
·  
·  
ddres = lpDD->QueryInterface(IID_IDirect3D,  
    &lpD3D);  
if (FAILED(ddres))  
·  
·  
·
```

,±,Ì—á,ÂŽ,³,ê,Ä,¢  
,éR [fh,Â,Í A,D,Æ,Â,ÌIfufWfFfNfg,ð Ì ¬,µ A,»,ÌIfufWfFfNfg,É‘Î,·,é,Ó,½,Â,ÌfCf“f^ [ftfFfCfX,ð“¾,Ä,¢  
,é B,µ,½,ª,Â,Ä AfIfufWfFfNfg,ÌŽQ ÆfJfEf“fg,Í A **IDirectDraw2::QueryInterface**  
f f\fbfh,ÌÆÄ,Ñ o,µÆä,Í2,Æ,È,é B,±,±,Â d—v,È,Ì,Í ADirect3Dfhf%o fCfo EfXfe [f^fX,ÌŽð-½,Í A  
DirectDrawfIfufWfFfNfg,ÌŽð-½,Æ““,Â, ,é,Æ,¢,²,±,Æ,Â, ,é B Direct3D fCf“f^ [ftfFfCfX,ðŠJ•ú,µ,Ä,à A  
Direct3Dfhf%o fCfo EfXfe [f^fX,ªŽg,Ì,È,,È,é,Í,Ä,Í,È,¢ B  
,»,ÌfXfe [f^fX,Í A,»,ÌIfufWfFfNfg,Ö,ÌŽQ Æ,ª i,»,ÌŽQ Æ,ªDirectDraw,Ü,½,Í Direct3D,Ì,¢  
,,ê,Â, ,é,©,È,©,í,ç,, j,·,×,ÄŠJ•ú,³,ê,é,Ü,Â,È,,È,é,±,Æ,Í,È,¢ B,µ,½,ª,Â,Ä ADirectDrawfhf%o fCfo  
EfCf“f^ [ftfFfCfX,ðŽQ Æ,µ,½,Ü,ÜDirect3DfCf“f^ [ftfFfCfX,ðŠJ•ú,µ A Ä,ÑDirect3D  
fCf“f^ [ftfFfCfX,ð Æ%ï,µ,½ ê ±,Â,à ADirect3DfXfe [f^fX,Í^ÜŽ ,³,ê,Ä,¢,é B

## Direct3DfffofCfX EfCf“f^ [ftfFfCfX

Direct3DIfufWfFfNfg,Ì ê ‡,Æ“—l A“Æ—§,μ,½ Direct3DfffofCfX EfIfufWfFfNfg,Í,È,¢ B  
Direct3DfffofCfX,Í A 3DfÆf“f\_fŠf“fO,Ì'Î Û,Æ,μ,ÄŽg,í,ê,é  
DirectDrawSurfaceIfufWfFfNfg,Æ'Ê M,·,é,½,ß,Ì'P,È,éfCf“f^ [ftfFfCfX,È,Ì,Ä, ,é BŽŸ,Ì—á,Ä,Í A  
DirectDrawSurfaceIfufWfFfNfg,Ö,ÌDirect3D fffofCfX EfCf“f^ [ftfFfCfX,ð ì ¬,μ,Ä,¢,é B

```
LPDIRECTDRAWSURFACE lpDDSurface;  
LPDIRECT3DDEVICE      lpD3DDevice;
```

```
ddres = lpDD->CreateSurface(&ddsd, &lpDDSurface,  
    NULL);  
if (FAILED(ddres))  
.  
.  
.  
ddres = lpDDSurface->QueryInterface(lpGuid,  
    &lpD3DDevice);  
if (FAILED(ddres))  
.  
.  
.
```

ŽQ ÆfJfEf“fg,ÆfXfe [f^fX,ÌŽð-½,É,Ä,¢,Ä A“¬,¶f< [f<,ªDirectDrawSurfaceIfufWfFfNfg,Æ  
Direct3DfffofCfX,É“K—p,³,ê,é(,±,ê,ç,Ìf< [f<,Ä,¢  
,Ä,Í A uDirect3Dfhf%ofCfo EfCf“f^ [ftfFfCfX v,ðŽQ Æ,·,é,±,Æ) B,³,ç,É A“^ê,Ì  
DirectDrawSurfaceIfufWfFfNfg,É'Î,μ A•j ”,Ì“ÆŽ©,È Direct3D fffofCfX EfCf“f^ [ftfFfCfX,ð“¾,é,±  
,Æ,ª,Ä,«,é B,μ,½,ª,Ä,Ä A'P^ê,Ì  
DirectDrawSurfaceIfufWfFfNfg,ð Af%of“fvfx [fX EfffofCfX,ÆRGBfx [fX EfffofCfX'o•û,Ìf^ [fQfbfg,Æ,·,é,  
±,Æ,à,Ä,«,é B

## Direct3DfefNfXf`ff EfCf“f^ [ftfEfCfX

Direct3D fefNfXf`ff,Í“ÆŽ©,ìlufWfFfNfgf^fCfv,Â,Í,È, A DirectDrawSurfaceIfufWfFfNfg,ì,à,□  
,Đ,Æ,Â,ìfCf“f^ [ftfEfCfX,Â, ,é BŽŸ,ì—  
á,Â,Í A DirectDrawSurfaceIfufWfFfNfg,©,çDirect3DfefNfXf`ff EfCf“f^ [ftfEfCfX,đ“¾,Ä,¢,é B

```
LPDIRECTDRAWSURFACE lpDDSurface;  
LPDIRECT3DTEXTURE lpD3DTexture;
```

```
ddres = lpDD->CreateSurface(&ddsd, &lpDDSurface,  
    NULL);  
if (FAILED(ddres))  
    .  
    .  
    .  
ddres = lpDDSurface->QueryInterface(  
    IID_IDirect3DTexture, &lpD3DTexture);  
if (FAILED(ddres))  
    .  
    .  
    .
```

ŽQ ÆfJfEf“fg,ÆfXfe [f^fXŽð-½,É,Â,¢,Ä A“¬,¶f< [f<,ªDirect3DfefNfXf`ff,É“K—p,³,ê,é(±,ê,ç,ìf< [f<,Â,¢  
,Â,Í A uDirect3Dfhf%ofCfo EfCf“f^ [ftfEfCfX v,đŽQ Æ,·,é,±,Æ) B  
,Đ,Æ,Â,ìDirectDrawSurfaceIfufWfFfNfg,ðfEf“f\_Šf“fO,ìf^ [fQfbfg,ÆfefNfXf`ff,ì'o•û,É•l—p,·,é,±,Æ,ª%oÂ”,Â,  
,é B



## DirectDraw HEL,ÆDirect3D

DirectDraw HEL,Í A fefNfXf`ff Af~fbfvf}fbfv AZfofbftf@ EfT [ftfFfX,ì ì ¬,ðfTf| [fg,·,é B  
,<sup>3</sup>,ç,É ADirectDraw,Æ Direct3D,Æ,ì-§,È“ þ,É,æ,è ADirectDraw,<sup>a</sup>“® ì%oÂ”,ÈfVfXfef€,Í,Â,È,ÉDirect3D,ðfTf|  
[fg,·,é i ,È,,Æ,àf\ftfgfEfFfAfGf~f...fœ [fVfþf“,É,æ,Á,ÄfTf| [fg,<sup>3</sup>,ê,é j B,µ,½,<sup>a</sup>,Á,ÄDirectDraw  
HEL,Í AfT [ftfFfX,ð3Dfœf“f\_Šf“fO,ÉŽg,!,é,±,Æ,ðŽ!,·,½,ß A DDSCAPS 3DDEVICE ftf%oO,ðfGfNfXf|  
[fg,·,é Bfn [fhfEfFfA,ÄfAfNfZf%oœ [fg,<sup>3</sup>,ê,½3DftfBfXfvfœfC EfJ [fh,ÌDirectDrawfhf%oCfo,Í A3Dfn [  
fhfEfFfA EfAfNfZf%oœ [fVfþf“,Ì‘¶ Ý,ðŽ!,·,½,ß,±,Ì”—Í,ðfGfNfXf| [fg,·,é B

**f, [fhXffBfXfvfCfC Ef, [fh**

f, [fhX,Í A•W €VGAf, [fh13,©,ç”h ¶,µ,½fñfCfuſŠfbfh EffBfXfvfCfC Ef, [fh,Å, ,é B,±,lf, [fh,Å,Í A  
VGAffBfXfvfCfC EfAf\_fvf^,ÏEGA•; ”frffI EfvfC [f“ EfVfXfef€  
,É,æ,è256KfofCfG,Ü,Å,lfBfXfvfCfC Ef f,fŠ,ðŽg,□,±,Æ,<sup>a</sup>Å,«,é(f, [fh13,Å,Í64KfofCfG,Ü,Å) BWindows  
95 ã,Å,Í A DirectDraw,Í, ,ç,ã,éffBfXfvfCfC EfJ [fh,É,Ó,½,Å,lf, [fhXf, [fh (320´200´8,Æ320´240´8)  
,ð’ñ,Ÿ,.,é B,Ü,½ AfŠjJfA,È’á%ð’æ“xf, [fh,ðfTf| [fg,.,éJ [fh,à, ,è AfŠjJfA,È’á%ð’æ“xf, [fh,Å,Ífvf%oCf}  
fŠ EfT [ftfFfX,ðf fbfN,µ,Ä’¼ ÚfAfNfZfX,Í,Å,«,é Bf, [fhXf, [fh,Å,Ífvf%oCf}  
fŠ EfT [ftfFfX,Ö,ì’¼ ÚfAfNfZfX,Í,Å,«,é,È,¢ B.

f, [fhXf, [fh,ÍC» ÝWindows NT,Å,ÍfTf| [fg,<sup>3</sup>,ê,Ä,“,ç,, AfŠjJfA’á%ð’æ“xf, [fh,à L,fTf| [fg,Í,<sup>3</sup>,ê,Ä,¢,È,¢ B

**fsfNfZf< EftfH [f}fbfg**

,±,ì ß,í A fn [fhfEfFfA EfGf~f...fÇ [fVf‡f“ EfÇfCf,,(HEL),É,æ,Á,ÄfTf| [fg,<sup>3</sup>,ê,éfsfNfZf< EftfH [f}  
fbfg,ì î•ñ,É,Â,ç,Ä q,×,é B`È%º,ìfgfsfbfN,É,Â,ç,Ä à-¾,·,é B

fefNfXf`ff Ef}fbfv,ìftfH [f}fbfq  
fIftfXfNfŠ [f“ EfT [ftfEfX,ìftfH [f}fbfq

fefNfXf`ff Ef}fbfv,ìftfH {f}fbfg

HEL,Í L”Í,ÈfefNfXf`ff EfsfNfZf< EftfH {f}fbfg,ðfTf| [fg,·,é BŽŸ•\,ª,»»,ê,ç,ÌftfH {f}fbfg,ðŽ',μ,Ä,¢,é Bf}  
fXfN,Ì—“,Í A Ô ired j A—Î igreen j A Â iblue j A ¬ F ialpha jf}  
fXfN,©,ç \ ¬,³,ê A,»,ê,¼,ê,ÌfsfNfZf< EftfH {f}fbfg Eftf%oO,Æfrfbfg [“x,Æ,ì‘g,Ý ‡,í,¹,É‘Î%ž,·,é B

fsfNfZf< EftfH {f} fbfg Eftf%oO	frfbfg l“x	f}fXfN
DDPF_RGB	1	R: 0x00000000
DDPF_PALETTEINDEXED1		G: 0x00000000
		B: 0x00000000
		A: 0x00000000
DDPF_RGB	1	R: 0x00000000
DDPF_PALETTEINDEXED1		G: 0x00000000
DDPF_PALETTEINDEXEDTO8		B: 0x00000000
		A: 0x00000000
DDPF_RGB	2	R: 0x00000000
DDPF_PALETTEINDEXED2		G: 0x00000000
		B: 0x00000000
		A: 0x00000000
DDPF_RGB	2	R: 0x00000000
DDPF_PALETTEINDEXED2		G: 0x00000000
DDPF_PALETTEINDEXEDTO8		B: 0x00000000
		A: 0x00000000
DDPF_RGB	4	R: 0x00000000
DDPF_PALETTEINDEXED4		G: 0x00000000
		B: 0x00000000
		A: 0x00000000
DDPF_RGB	4	R: 0x00000000
DDPF_PALETTEINDEXED4		G: 0x00000000
DDPF_PALETTEINDEXEDTO8		B: 0x00000000
		A: 0x00000000
DDPF_RGB	8	R: 0x00000000
DDPF_PALETTEINDEXED8		G: 0x00000000
		B: 0x00000000
		A: 0x00000000
DDPF_RGB	8	R: 0x000000E0
		G: 0x0000001C
		B: 0x00000003
		A: 0x00000000

DDPF_RGB   DDPF_ALPHAPIXELS	16	R: 0x00000F00 G: 0x000000F0 B: 0x0000000F A: 0x0000F000
DDPF_RGB	16	R: 0x0000F800 G: 0x000007E0 B: 0x0000001F A: 0x00000000
DDPF_RGB	16	R: 0x0000001F G: 0x000007E0 B: 0x0000F800 A: 0x00000000
DDPF_RGB	16	R: 0x00007C00 G: 0x000003E0 B: 0x0000001F A: 0x00000000
DDPF_RGB   DDPF_ALPHAPIXELS	16	R: 0x00007C00 G: 0x000003E0 B: 0x0000001F A: 0x00008000
DDPF_RGB	24	R: 0x00FF0000 G: 0x0000FF00 B: 0x000000FF A: 0x00000000
DDPF_RGB	24	R: 0x000000FF G: 0x0000FF00 B: 0x00FF0000 A: 0x00000000
DDPF_RGB	32	R: 0x00FF0000 G: 0x0000FF00 B: 0x000000FF A: 0x00000000
DDPF_RGB	32	R: 0x000000FF G: 0x0000FF00 B: 0x00FF0000 A: 0x00000000
DDPF_RGB	32	R: 0x00FF0000

DDPF\_ALPHAPIXELS

G: 0x0000FF00

B: 0x000000FF

A: 0xFF000000

DDPF\_RGB |

32

R: 0x000000FF

DDPF\_ALPHAPIXELS

G: 0x0000FF00

B: 0x00FF0000

A: 0xFF000000

HEL,Í,±,ê,ç,ÏftfH [f}fbfg,ðfVfXfef€ Ef f,fŠ ã,É ì ¬,·,é,±  
,Æ,<sup>a</sup>,Å,«,é B3DfAfNfZf%of€ [fVf‡f“ EftfBfXfvf€fC EfJ [fh,Ï,½,ß,ìDirectDrawffofCfX Efhf%ofCfo,Í Aff  
fBfXfvf€fC Ef f,fŠ,É¼,ÏftfH [f}fbfg,ð ì ¬,·,é ê ‡,<sup>a</sup>,é B,»,<sup>□</sup>  
,μ,½fhf%ofCfo,Í AfefNfXf`ff,ð ì ¬,Å,«,é,±,Æ,ðŽ',·,½,ß DDSCAPS\_TEXTURE ftf%ofO,ðfGfNfXf| [fg,·,é B

**fIfXfNfŠ [f“ EfT [ftFfX,İftfH [f}fbfg**

ŽŸ,İ•,Í A DirectX 3 HEL,³fTf| [fg,·,éIfXfNfŠ [f“ EfVfCE [f“fT [ftFfX,İfsfNfZf< EftfH [f}  
fbfg,đŽ',µ,Ä,¢,é Bf}fXfN,İ—“,Í Ō ired j A—Î igreen j  
A Â iblue j AfAf<ftf@ ialpha j,Å \ ¬,³,ê A,»,ê,¼,ê,İfsfNfZf< EftfH [f}  
fbfg Eftf%ofO,Æfrfbfg [“x,Æ,İ'g,Ÿ ‡,í,¹,É'İ%ž,·,é B

<b>fsfNfZf&lt; EftfH [f} fbfg Eftf%ofO</b>	<b>frfbfg [“x</b>	<b>f}fXfN</b>
DDPF_RGB   DDPF_PALETTEINDEXED1	1	R: 0x00000000 G: 0x00000000 B: 0x00000000 A: 0x00000000
DDPF_RGB   DDPF_PALETTEINDEXED2	2	R: 0x00000000 G: 0x00000000 B: 0x00000000 A: 0x00000000
DDPF_RGB   DDPF_PALETTEINDEXED4	4	R: 0x00000000 G: 0x00000000 B: 0x00000000 A: 0x00000000
DDPF_RGB   DDPF_PALETTEINDEXED8	8	R: 0x00000000 G: 0x00000000 B: 0x00000000 A: 0x00000000
DDPF_RGB	16	R: 0x0000F800 G: 0x000007E0 B: 0x0000001F A: 0x00000000
DDPF_RGB	16	R: 0x00007C00 G: 0x000003E0 B: 0x0000001F A: 0x00000000
DDPF_RGB	24	R: 0x00FF0000 G: 0x0000FF00 B: 0x000000FF A: 0x00000000
DDPF_RGB	24	R: 0x000000FF G: 0x0000FF00 B: 0x00FF0000 A: 0x00000000

DDPF\_RGB32R: 0x00FF0000G: 0x0000FF00B: 0x000000FFA: 0x00000000

DDPF\_RGB32R: 0x000000FFG: 0x0000FF00B: 0x00FF0000A: 0x00000000

HEL,Í,Ü,½ A L”Í,ÈfIfXfNfŠ [f“ EfT [ftfEfX,lfTf| [fg,É%Á,‘ A  
Direct3D,Æ,»,ì¼3DfEf“f\_Šf“fO EfVfXfef€,ĂŽg,í,ê,é,æ,▯ ÝEv,³,ê,½fT [ftfFfX,àfTf| [fg,·,é B



**DirectDraw***fCf“f^ [ftfFfCfXŠT—v*

,±,Ì ß,ÍDirectDraw COM *fCf“f^ [ftfFfCfX,É,Â,¢,Ä,Ì^ê”Ê“l,ÈŠT—v,ð à–¾,. ,é B*

*IDirectDraw2 fCf“f^ [ftfFfCfX*

*IDirectDrawClipper fCf“f^ [ftfFfCfX*

*IDirectDrawPalette fCf“f^ [ftfFfCfX*

*IDirectDrawSurface2 fCf“f^ [ftfFfCfX*

**IDirectDraw2fCf“f^ [ftfFfCfX**

,±,ì ß,Å,ÍIDirectDraw2fCf“f^ [ftfFfCfX,ÉŠÖ,·,é’Ç%Á î•ñ,ð à–¾,·,é B

DirectDrawfIfufWfFfNfg

IDirectDraw2,Å%½,ª V,µ,,È,Á,½,©?

^— ,²,Æ,ì•j ”DirectDrawfIfufWfFfNfg

\_,%øð“x,ÆfgfDf< [fJf% [,ìfrfbfg [“xfTf\ [fg

fvf%fcf}fŠ EfT [ftfFfX EfŠf\ [fX<□—Lf,fff<

f, [fh•İ X,Æ”r‘¼“IfAfNfZfX

CoCreateInstance,ð—p,¢,½DirectDrawfIfufWfFfNfg,ì ì ¬

## DirectDrawIfufWfFfNfg

DirectDrawIfufWfFfNfg,Í AfffBfXfvfƎfC Efn [fhEfFfA,ð•\,· B  
fCf“fXf^f“fX%»»,³,ê,½ftfBfXfvfƎfC EfftofCfX,³fn [fhEfFfA EfAfNfZf%Ǝ [fVf‡f“,ðŽ ,Â ê ‡ AfIfuf  
WfFfNfg,Ífn [fhEfFfA EfAfNfZf%Ǝ [fVf‡f“,ª s,í,ê,é B DirectDrawIfufWfFfNfg,ÍŽŒŽi—  
p,ÌIfufWfFfNfg,ð ì ¬,·,é BDirectDrawSurface ADirectDrawPalette ADirectDrawClipper,Â, ,é B

DirectDrawIfufWfFfNfg,Í Aˆê“x,É,Ó,½,ÂˆÈ ãfCf“fXf^f“fX%»»,Â,«,é B Â,à’P f,È—á,Æ,µ,Ä,Í AWindows 95  
fVfXfef€ â,Â,Ó,½,Â,Ìf,fjf^ [ ,ðŽg,□ ê ‡,ª , ,é B Windows 95Ž©‘Ì,Í Afff...fAf< Ef,fjff^,ðfTf| [fg,µ,È,¢  
,ª AfffBfXfvfƎfC EfftofCfX,»,ê,¼,ê,ÉDirectDraw HAL,ð ‘,±,Æ,ª,Â,«,é B Windows  
95,ÆGDI,ª”FŽˆˆ,·,éftfBfXfvfƎfC EfftofCfX,Í AffftfHf<fg,ÌDirectDrawIfufWfFfNfg,ªfCf“fXf^f“fX%»»,³,ê,é,Æ,  
«—p,¢,ç,ê,é,à,Ì,Â, ,è A,»,²,Â,È,¢fftofCfX,Í A‘æ“ñ,ÌftfBfXfvfƎfC EfftofCfX,ÌfOf [fof< Ef†fj [fNŽˆ•ÈŽq  
(GUID) ,ðŽg,Â,Ä ì ¬,³,ê,½“Æ—§,µ,½,à,²,D,Æ,Â,ÌDirectDrawIfufWfFfNfg,É,æ,èfAfhfƎfX,·,é B,±,Ì  
GUID,Í **ADirectDrawEnumerate** ŠŒ ”,ðŽg,Â,ÄŽæ“¼,Â,«,é B

DirectDrawIfufWfFfNfg,Í ì ¬,µ,½fIfufWfFfNfg,·,×,Ä,ðŠÇ— ,µ AffftfHf<fg,ÌfpfƎfbfg ifvf%ƎfC}  
fŠ EfT [ftfFfX,ª8frfbfg/  
fsfNfZf< Ef, [fh,Ì ê ‡ j AffftfHf<fg,ÌfJf%»» [ EfL ] Afn [fhEfFfA EfffBfXfvfƎfC Ef, [fh,ð §Ǝä,·,  
é B,»,µ,Ä,Ç,ÌfŠf\ [fX,ªŠ,,è“—,Ä Ĭ,Ý,Â,Ç,ÌfŠf\ [fX,ªŽg—p%»Â”,©,ð² ,·,·,é B

**IDirectDraw2**,**Á%½,ª V,µ,È,Á,½,©?**

DirectX,ªŽg—p,·,éCOMf,fffç,Í A V,µ,çfCf“f^ [ftFfCfX,Ì’ñ<Ÿ,É,æ,è V,µ,ç<@”\,ð’Ç%Á,Á,«,é,Æ,ç,□“Á’Ÿ  
,ð,à,Á,Á,,è A

IDirectDraw2fCf“f^ [ftFfCfX,Í AIDirectDrawfCf“f^ [ftFfCfX,ð’ä‘Ö,·,é,à,Ì,Á, ,é BIDirectDraw2fCf“f^ [ftFfCfX,Í AIDirectDraw::QueryInterface f f\fbfh,ðŽg,Á,Á“%,é,±,Æ,ª,Á,«,é BŽŸ,É—á,ðŽ!,· B

// IDirectDraw2fCf“f^ [ftFfCfX,Ì ì ¬

LPDIRECTDRAW lpDD;

LPDIRECTDRAW2 lpDD2;

ddrval = DirectDrawCreate(NULL, &lpDD, NULL);

if(ddrval != DD\_OK)

return;

ddrval = lpDD->SetCooperativeLevel(hwnd,

DDSCD\_NORMAL);

if(ddrval != DD\_OK)

return;

ddrval = lpDD->QueryInterface(IID\_IDirectDraw2,

(LPVOID \*)&lpDD2);

if(ddrval != DD\_OK)

return;

ddscaps.dwCaps = DDSCAPS\_OFFSCREENPLAIN;

ddrval = lpDD2->GetAvailableVidMem(&ddscaps, &total,

&free);

if(ddrval != DD\_OK)

return;

—á,Í AC++•¶—@,Á<L q,³,è,Ä,ç,é B,±,Ì ê ± AIDirectDraw2

fCf“f^ [ftFfCfX,ð ì ¬,·,é,½,ß,ÉIDirectDraw::QueryInterface f f\fbfh,ð—p,ç,é,±,Æ,É,È,é B,±

,ÌfCf“f^ [ftFfCfX,ÍIDirectDraw2::GetAvailableVidMem f f\fbfh,ðŠÜ,ñ,Á,ç,é,ª A,±,Ìf f\fbfh,ðIDirectDraw

fCf“f^ [ftFfCfX,©,çŽg,·,□,Æ,·,é,ÆfRf“fpfCf‘†,ÉfGf% [,” ¶,·,é B

**IDirectDraw2::GetAvailableVidMem** f f\fbfh,Í AIDirectDraw2

fCf“f^ [ftFfCfX,ª ì ¬,³,è,½,Æ,«,ÉIDirectDrawtDrawfCf“f^ [ftFfCfX,É%Á,í,Á,½—B^è,Ìf f\fbfh,Á, ,é

iIDirectDraw2::SetDisplayMode,ÆIDirectDraw2::EnumDisplayModes,Ì,Ó,½,Á,Ìf f\fbfh,Í

AIDirectDraw2,ÉŠÜ,Ü,è,½,Æ,«,É•Í X EŠg’£,ª,È,³,è,½ j B

**IDirectDraw::SetCooperativeLevel** f f\fbfh,ÆCooperativeLevelIDirectDraw f f\fbfh,Æ,Ì’ŠŸÝ ì—p,Í A

IDirectDraw2::SetCooperativeLevel f f\fbfh,ÆIDirectDraw2::SetDisplayModef f f\fbfh,Æ,Ì’ŠŸÝ ì—

p,Æ,Í,í,,©,É~Ü,È,Á,Á,ç

,é BIDirectDrawfCf“f^ [ftFfCfX,ðŽg,ç AfAfvfŠfP [fVf‡f“,ª ADDSCL\_EXCLUSIVEftf%ofO,ðfZfbfg,µ,ÄIDir  
ectDraw2::SetCooperativeLevel,ðŒÄ,Ñ o,µ,Ä”r¼“I iftf<fXfNfŠ [f“ jf, [fh,ðŽæ“¾ A

**IDirectDraw2::SetDisplayMode**,ðŽg,Á,Äf, [fh,ð•Í, ADDSCL\_NORMALftf%ofO,ðfZfbfg,µIDirectDraw.Q::SetCoop  
erativeLevel,ðŒÄ,Ñ o,µ,Ä”r¼“If, [fh,ð%ð•ú,µ,½ ê ±,ÉfIfŠfWfif<,ÌffBfXfvfŒfC Ef, [fh,ªœŒ³,³,è,È,ç,Ì,Á, ,

é B,±,Ì ê ±,ÍfAfvfŠfP [fVf‡f“,ª IDirectDraw::RestoreDisplayModef f f\fbfh,ðŒÄ,Ñ o,·,© A

DirectDrawfIfufWfFfNfg,ª í œ,³,è,é,Ü,Á,Í A V,µ,çffBfXfvfŒfC Ef, [fh,Ì,Ü,Ü,Æ,È,é B

,µ,©,µ AIDirectDraw2fCf“f^ [ftFfCfX,ðŽg,Á,Á,ç,é ê ± AfAfvfŠfP [fVf‡f“,ª—Ì,ÌfXfefbfv,ð“Ÿ

,B,Æ A”r¼“If, [fh,ªŽ,í,è,è,ÌfIfŠfWfif<,ÌffBfXfvfŒfC Ef, [fh,ªŽ©“@“I,ÉfŠfXfgfA,³,è,é,æ,ª,É,È,é B

V,µ,çfCf“f^ [ftFfCfX,ÌŠfŠ [fX,Æ,Æ,à,É A ]—,Ìf f\fbfh,ª,ç,-

,Á,©•Í X,³,è,é B,»,Ì,½,ß AfCf“f^ [ftFfCfX Ef f\fbfh,Ì Vœfo [fWf‡f“ i,½,Æ,!,Í IDirectDraw,Æ

**IDirectDraw2** j,ð ¬—p,·,é,Æ A—\zŠO,ÌŒ%œÈ,ðø,«<N,±

,· B“Á’è,Ìfo [fWf‡f“,ÌfCf“f^ [ftFfCfX,©,ç,¾,¬ f f\fbfh,ðŽg,□,×,«,Á, ,é B

^— ,²,Æ,ì•; ”DirectDrawIfufWfFfNfg

DirectDraw,Ä,Í A•K—v,È%õñ ”,¾,¯,ì **DirectDrawCreate** ŠÖ ”ÆÄ,Ñ o,µ ^— ,%oÄ”\,Ä, ,é B  
ÆÄ,Ñ o,µ,²,Æ,É A“Æ—§,µ,½^Û,È,éfCf“f^ [ftfFfCfX,ª•Ô,³,ê,é B  
,»,ê,¼,ê,ìDirectDrawIfufWfFfNfg,Í AfIfufWfFfNfgŠÖ,Ä^Ě“¶ «,ª,È,¢ B,Û,³,É A“ÆŽ©fvf fZfX,©,ç ì ¬,³,ê,½,  
©,ì,æ,²,É U,é•‘,²,ì,Ä, ,é B

DirectDrawIfufWfFfNfg,“Æ—§,µ,Ä,¢,é,±,Æ,©,ç A“Á’è,ì DirectDrawIfufWfFfNfg,É,æ,Ä,Ä ì ¬,³,ê,½  
DirectDrawSurface ADirectDrawPalette ADirectDrawClipper,ìŠefIfufWfFfNfg,Í A ì ¬Æ¹ÈŠÖ,ìDirectDrawIfufWfF  
fNfg,Æ,Æ,à,ÉŽg,í,ê,Ä,Í,È,ç,È,¢ B,±  
,ê,ç,ìfIfufWfFfNfg,Í ì ¬Æ¹,ìDirectDrawIfufWfFfNfg,“”jŠü,³,ê,é,Æ,«,ÉŽ©“®“I,É%oð•ú,³,ê,é,©,ç,Ä, ,é B’¼,ì  
DirectDrawIfufWfFfNfg,Æ,Æ,à,ÉŽg,í,ê,½ ê ‡ A,à,Æ,ìfIfufWfFfNfg,“”jŠü,³,ê,é,Æ<@”\,ª’âŽ~,µ,Ä,µ,Û,²%oÄ”\ «,ª,  
,é B

,½,¾,µ **ADirectDrawCreateClipper** ŠÖ ”,É,æ,è ì ¬,³,ê,½DirectDrawClipperfIfufWfFfNfg,Í—áŠÖ,Ä, ,é B,±  
,ìfIfufWfFfNfg,Í A, ,ç,ä,éDirectDrawIfufWfFfNfg,©,ç“Æ—  
§,µ A,Ð,Æ,Ä,Û,½,Í,»,ê^È ã,ìDirectDrawIfufWfFfNfg,Æ,Æ,à,ÉŽg—p,·,é,±,Æ,ª,Ä,«,é B

,%øð‘œ“x,ÆfgfDf< [fJf% [lÏfrfbfg [“xfTf| [fg

DirectDraw,Í A fffBfXfvfŒfC EfffofCfX Efhf%øfCfo,ªfTf|  
[fg,·,é,·,×,Ä,ÏfXfNfŠ [f“%øð‘œ“x,Æfrfbfg [“x,ðfTf| [fg,·,é B

DirectDraw,Ê,æ,è AfAfvfŠfP [fVf‡f“,Í AfRf“fsf... [f^,ÏffBfXfvfŒfC Efhf%øfCfo,ªfTf|  
[fg,·,é,Ç,Ïf, [fh,Ê,à•Ï X,Ä,«,é,æ,ð,Ê,È,é B,±,ê,Ê,ÏfTf| [fg,³,ê,Ä,¢,é24-bpp,Æ32-bpp,Ïf, [fh,·,×,Ä,ªŠÜ,Ü,ê,é B

DirectDraw,Í,Ü,½ A HEL,ª24- bpp,Æ 32-bpp fT [ftfFfX,Ïfuf fbfN“]‘—,àfTf| [fg,µ,Ä,¢,é B  
fffBfXfvfŒfC EfffofCfX Efhf%øfCfo,ª,±,ê,ç,l%øð‘œ“x,Äfuf fbfN“]‘—,ðfTf| [fg,µ,Ä,¢  
,é ê ‡,Í AfffBfXfvfŒfC Ef f,fŠŠÔ,Ïfuf fbfN“]‘—,Éfn [fhEfFfA Efuf fbfN“]‘—,ªŽg,í,ê A,»,ð,Ä,È,¢  
,Æ,«,ÍHEL,ªŽg—p,³,ê,é B

Windows,Ä,Í A Žg,Ä,Ä,¢,éf,fjf^,Ïf^fCfv,ðf† [fU,ªŽw’è,·,é,±  
,Æ,ª,Ä,«,é BDirectDraw,Í AfCf“fXfg [f<,³,ê,½f,fjf^,ÏffBfXfvfŒfC §ŒÄ,ðf`fFfbfN,·,é B—  
v< ,³,ê,½f, [fh,ªf† [fU,Ïf,fjf^,Ä•Ž,Ä,«,É,¢,Æ A **IDirectDraw2::SetDisplayMode**  
f f\fbfh,ÏŒÄ,Ñ o,µ,ÍŽ,”s,·,é B,Ü,½ A**IDirectDraw2::EnumDisplayModes**f f\fbfh,ðŒÄ,Ñ o,µ,½,Æ,«,É—  
ñ< ,³,ê,é,Ï,Í AfCf“fXfg [f<,³,ê,Ä,¢,éf,fjf^,ªfTf| [fg,·,éf, [fh,¾,¯,Ä,·,é B

$f v f \% C f\} f \check{S} \text{ EfT } [f t f F f X \text{ Ef} \check{S} \setminus [f X \langle \alpha - L f, f f f \langle$

DirectDraw,Í'P f,ÈfŠf\ [fX<α—Lf,fff<,Å, ,é B fffBfXfvfœfC Ef f,fŠ,Í<α—LfŠf\ [fX,Å, ,è A•s'«μ,<sup>a</sup>,ç,Å, ,é B fffBfXfvfœfC Ef, [fh,<sup>a</sup>İ X,<sup>3</sup>,ê,é,Æ A fffBfXfvfœfC Ef f,fŠ,ÉŠi"[<sup>3</sup>,ê,½fT [ftfFfX,Í,·,×,ÄŽ,í,é,é i Ú,μ,- ,Í A ufT [ftfFfX,İ ÄŽ v,ðŽQ Æ,·,é,±,Æ j B

DirectDraw,Í A GDI,Æ<α—L,·,éffBfXfvfœfC EfffofCfX,İ,½,ß,ÉCf“fXf^f“fX%»,<sup>3</sup>,ê,é,Æ,« A^Ã–Û“I,É GDI fvf%ofCf}fŠ EfT [ftfFfX,ð ì ¬,·,é B GDI,Í A fvf%ofCf}fŠ EfT [ftfFfX,Ö,İ<α—LfAfNfZfX,ð— ^,!,ç,ê,é BDirectDraw,Í A GDI,<sup>a</sup> fvf%ofCf}fŠ EfT [ftfFfX,Æ,μ,Ä”FŽ~,·,éfT [ftfFfX Ef f,fŠ,ð<L%—,μ,Ä,ç,é B GDI,İfvf%ofCf}fŠ EfT [ftfFfX,ð Š— L,·,éDirectDrawSurfaceIfufWfFfNfg,Í A,Â,Ë,ÉIDirectDraw2::GetGDISurface f f\fbfh,ðŽg,□,± ,Æ,É,æ,Â,Ä“¾,ç,ê,é B

GDI,Í A DirectDraw,<sup>3</sup>Ç— ,·,éffBfXfvfœfC Ef f,fŠ ã,İftfHf“fg Afuf%ofV A fffofCfX^Ë“İftrfbfgf} fbfv(DDB),ðfLfffbfVf...,Â,«,Ë,ç B—~p,Â,«,é f,fŠ,ð DirectDraw,İfq [fvf}fl [fWff,Ë'Ë'm,·,é'O A, ,é,ç ,ÍDirectDraw,İfq [fvf}fl [fWff,©,çfLfffbfVf...,<sup>3</sup>,ê,½ff [f^,İ,½,ß,ÉffBfXfvfœfC Efhf%ofCfo,<sup>a</sup>f f,fŠ,ðŠ,,è“— ,Ä,Û,½,Í%ð•ú,Â,«,é,æ,□,É,Ë,é'O,É AHAL,Í A DIBfGf“fWf“ Efhf%ofCfo,<sup>a</sup>K—v,Æ,·,éffBfXfvfœfC Ef f,fŠ,ð —\~ñ,μ,Ë, \_ê,İ,Ë,ç,Ë,ç B

**f, [fh•İ X,Æ”r¼“IfAfNfZfX**

fAfvfŠfP [fVf‡f“,Í A **IDirectDraw2::SetDisplayMode** f f\fbfh,ðŽg,Á,ÄffBfXfvfŒfC Ef, [fh,ð•İ X,·,é,±,Æ,ª,Ä,«,«,é B ^ê-‡,İffBfXfvfŒfC EfJ [fh,ð<□—L,µ,Ä,¢,é,©,¬,è A,·,×,Ä,İfAfvfŠfP [fVf‡f“,ªf, [fh,ð•İ X,Ä,«,«,é B

ffBfXfvfŒfC Ef, [fh,İsfNfZf< [“x,Í A DirectDrawIfufWfFfNfg,Ö,İ”r¼“IfAfNfZfX,ªŽæ“¾,Ä,«,½ ê ±,É,¾,¯ AfAfvfŠfP [fVf‡f“,©,ç•İ X,Ä,«,«,é Bf, [fh,ª•İ X,³,è,é,Æ A,·,×,Ä,İ DirectDrawSurfaceIfufWfFfNfg,ÍfT [ftfFfX Ef f,fŠ,ðŽ,,¢‘€ `s”\,É,È,é B fT [ftfFfX,İf f,fŠ,Í A**IDirectDrawSurface2::Restore** f f\fbfh,ðŽg,□,±,Æ,Ä ÄŠ,,,è“-Ä,µ,È,,Ä,Í,È,ç,È,¢ B

DirectDraw,İ”r¼“I iftf<fXfNfŠ [f“ jf, [fh,É,¬,¢,Ä A’¼,İfAfvfŠfP [fVf‡f“,Ä,ÍDirectDrawSurfaceIfufWfFfNfg,ðŠ,,,è“-Ä,ç,ê ADirectDraw,İŽg—p,âGDI,İ<@”\,à~—p%oÄ”\,Ä, ,é B,µ,©,µ A”r¼“If, [fh^ÈŠÖ,İfAfvfŠfP [fVf‡f“,ªffBfXfvfŒfC Ef, [fh,âfpfŒfbfg,ð•İ X,·,é,±,Æ,Í<ÖŽ~,³,è,é B



```
fAfVfVŠfP [fVf‡f“„ð•Â„¶„ë“O„É A CoUnitialize ŠÖ ”,ðŽg,Á,ÄCOM,ðfVfffbfgrfEf“,μ,È,,Ä,Í,È,ç,¢ B
CoUnitialize();
```

**IDirectDrawClipper***fCf“f^ [ftfFfCfX*

*IDirectDrawClipper**fCf“f^ [ftfFfCfX,Í AfNfŠfbfv EfŠfXfg,ì ì ¬,Æf f“fefif“fX,ìf^fXfN,ð’P f%»,.·,é B ,± ,ìfCf“f^ [ftfFfCfX,Í A”r‘¼“I iftf<fXfNfŠ [f“ jf, [fh,æ,è,à AfEfBf“fhfE,Å“® ì,.·,éAfvfŠfP [fVf‡f“,Å—L —p,Å, ,é BfEfBf“fhfE,Å“® ì,.·,éAfvfŠfP [fVf‡f“,Í A•İ X,<sup>3</sup>,ê,½— İæ,¾,—fXfNfŠ [f“,ð X V,.·,é,½,ß,É AfNfŠfbfv EfŠfXfg,ðŽg,²,±,Æ,<sup>a</sup>,Å,« ,é B*

*ˆÈ%°,ìfgfsfbfN,Í A**IDirectDrawClipper** fCf“f^ [ftfFfCfX ,ÉŠÖ~A,.·,é’Ç%Á î•ñ,©,ç,È,é B*

*fNfŠfbfv EfŠfXfg*

*DirectDrawClipperIfufWfFfNfg,İ,□—L*

*fhf%oCfo”ñˆË‘¶,İDirectDrawClipperIfufWfFfNfg*

*CoCreateInstance,ð—p,¢,½DirectDrawClipperIfufWfFfNfg,İ ì ¬*

## ***fNfŠfbfv EfŠfXfg***

DirectDraw,Í ADirectDrawClipperIfufWfFfNfg,ðŽg,Á,ÄfNfŠfbfv EfŠfXfg,ðŠÇ— ,·,é B  
fNfŠfbfv EfŠfXfg,Í AfT [ftfFfX,ì%oÂŽ←Îæ,ðL q,·,ééÇ,ÌfŠfXfg,Ä, ,é B  
DirectDrawClipperIfufWfFfNfg,Í A,Ç,ÌfT [ftfFfX,É,àfAf^fbf`,Ä,«,é B,Û,½EfBf“fhfE Efnf“fhf<,ðDirectDraw  
ClipperIfufWfFfNfg,ÉfAf^fbf`,·,é,±  
,Æ,à,Ä,« A,»,Ì ê ±DirectDraw,Í AfEfBf“fhfE,Ìİ X,É”o,Á,ÄEfBf“fhfE,©,ç“¾,ç,ê,é fNfŠfbfv EfŠfXfg,É,æ,è  
ADirectDrawClipperfNfŠfbfv EfŠfXfg,ð X V,·,é B

fNfŠfbfv EfŠfXfg,Í DirectDraw HAL,É,æ,Á,Ä%oÂŽ<%o»,³,ê,é,<sup>a</sup> A DirectDraw,ÍfNfŠfbfv EfŠfXfg,Ì—  
v< ,ÉÇ© ±,²<éÇ,Ìfuf fbfN“]‘—  
,É,¾, HAL,ðÇÄ,Ñ o,· B,½,Æ,!,ÌfT [ftfFfX,ì%oE à,ÌŽlŠpÇ`,<sup>a</sup>fNfŠfbfsf“fO,³,ê A,»,ÌfT [ftfFfX,ðfvf%oCf}  
fŠ EfT [ftfFfX,Éfuf fbfN“]‘—,·,é,æ,²fAfvfŠfP [fVf±f“,<sup>a</sup> DirectDraw,ÉŽwŽ!,µ,½ ê ± A  
DirectDraw,ÍHAL,É,Ó,½,Ä,Ìfuf fbfN“]‘—,ð s,í,¹,é B,Ð,Æ,Ä,ÍfT [ftfFfX,Ì ¶ äŠp A,à,²  
,Ð,Æ,Ä,ÍfT [ftfFfX,ì%o”¼<sup>a</sup>,Ä, ,é B

fI [fo [fÇfC Efn [fhfEfFfA,<sup>a</sup>fNfŠfbfsf“fO,ðfTf] [fg,µ A,©,Ä“]‘—  
æJf%o [ EfL ],<sup>a</sup>fAfNfefBfu,Ä,È,Ç ê ±,É,Ì,Ý AHAL,ÍfI [fo [fÇfC,ÉfNfŠfbfv EfŠfXfg,ð—~p,·,é B  
Ç» Ý,Ìfn [fhfEfFfA,Ì‘â”<sup>a</sup>,Í A“]‘— æJf%o [ EfL [É ],í,È,Ç,©,¬,è A•Ä Ç,µ,½fI [fo [fÇfC,ÍfTf]  
[fg,µ,È,Ç B,±,ê,Ífn [fhfEfFfA”\—Í,Æ,µ,ÄDirectDraw,É•ñ ,³,ê,é,<sup>a</sup> A,±  
Ì,Æ,«,à,µ•Ä Ç,Æ,È,é,ÆfI [fo [fÇfC,Í—³Çø%o»,³,ê,é B,±,Ì ê ± AHAL,ÍfNfŠfbfv EfŠfXfg,ð—³Ž<,·,é B

## DirectDrawClipperIfufWfFfNfg,İ,œ—L

DirectDrawClipperIfufWfFfNfg,İ A•i ”fT [ftFfXŠÔ,Âœ—L,·,é,±,Æ,ª,Â,«é B,½,Æ,,İ““,¶  
DirectDrawClipperIfufWfFfNfg,İ AftfŠfbfsf“fO Ef`fF [f“,İftf f“fg Efofbftf@,ÆfofbfN Efofbftf@,İ‘o•û,Âf  
Zfbfg,·,é,±,Æ,ª,Â,«é BfAfvfŠfP [fVf‡f“,ª,İ,irectDrawSurface2::SetClipper f f\fbfh,ðŽg,Â,Â  
DirectDrawClipperIfufWfFfNfg,ðfT [ftFfX,ÉfAf^fbf`,·,é,Æ,« AfT [ftFfX,İ,»,İfIfufWfFfNfg,İŽQ ÆfJfEf“fg  
,ðfCf“fNfŠf f“fg,·,é BfT [ftFfX,İŽQ ÆfJfEf“fg,ª0,É,È,é,Æ A  
fAf^fbf`³,ê,½DirectDrawClipperIfufWfFfNfg,İŽQ ÆfJfEf“fg,İffNfŠf f“fg,³,ê,é B,³,ç,É A  
fNfŠfbfp [ EfCf“f^ [ftFfCfX Ef|fCf“f^,ðNULL,É,µ,ÂIDirectDrawSurface2::SetClipper,ðÆÄ,Ń o,·,±  
,Æ,É,æ,èDirectDrawClipperIfufWfFfNfg,ªfT [ftFfX,©,çff^fbf`³,ê,½ ê ‡ A  
fT [ftFfX,İDirectDrawClipperIfufWfFfNfg,İŽQ ÆfJfEf“fg,İftfNfŠf f“fg,³,ê,é B

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### Note

““,¶IDirectDrawClipperIfufWfFfNfg A““,¶fT [ftFfX,É·İ,µ AIDirectDrawSurface2::SetClipper,ð%½“x,©‘±  
,·,ÄÆÄ,Ń o,µ,½ ê ‡ AfIfufWfFfNfg,İŽQ ÆfJfEf“fg,İê“x,µ,©fCf“fNfŠf f“fg,³,ê,È,¢ B`A‘±  
,·,éÆÄ,Ń o,µ,İ AfIfufWfFfNfg,İŽQ ÆfJfEf“fg,É%œç,ð—^,,È,¢,İ,Â, ,é B

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**fhf%oCfo”ñ`Ě‘¶,İDirectDrawClipperIfufWfFfNfg**

, ,ç,ä,éDirectDrawIfufWfFfNfg,É,à'¼ Ú Š—L,<sup>3</sup>,ê,È,¢DirectDrawClipperIfufWfFfNfg,ð ì ¬,·,é,±,Æ,<sup>a</sup>,À,«<sub>1</sub>,é B,±  
,ê,ç,İDirectDrawClipperIfufWfFfNfg,Í A•j ”,İDirectDrawIfufWfFfNfg,<sup>a</sup>⊞—L,·,é,±,Æ,<sup>a</sup>%oÂ”\,À, ,é Bfhf%oCfo”ñ`  
Ě‘¶,İDirectDrawClipperIfufWfFfNfg,Í A V,μ,¢**DirectDrawCreateClipper**  
ŠÖ ”,ðŽg,Á,Ä ì ¬,·,é BfAfvfŠfP [fVf‡f“,Í ADirectDrawIfufWfFfNfg,ð ì ¬,·,é‘O,À,à ADirectDawClipperIf  
ufWfFfNfg,ð ì ¬,·,é,±,Æ,<sup>a</sup>,À,«<sub>1</sub>,é B

DirectDrawIfufWfFfNfg,Í,±,ê,ç,İDirectDrawClipperIfufWfFfNfg,ð Š—L,μ,È,¢  
,½,ß AfAfvfŠfP [fVf‡f“,İIfufWfFfNfg,<sup>a</sup>%oð•ú,<sup>3</sup>,ê,Ä,àŽ©“®“I,É,Í%oð•ú,<sup>3</sup>,ê,È,¢ B,Û,½ AfAfvfŠfP [fVf‡f“,<sup>a</sup>—  
¼Ž‘I,É%oð•ú,μ,È,¢ ê ‡,İDirectDraw,<sup>a</sup>fAfvfŠfP [fVf‡f“ I—<sup>1</sup>Žž,É%oð•ú,·,é B

**IDirectDraw2::CreateClipper** f f\fbfh,ðŽg,Á,Ä DirectDrawClipperIfufWfFfNfg,ð ì ¬,·,é,±,Æ,à,À,«<sub>1</sub>,é B,±  
,ê,ç,İDirectDrawClipperIfufWfFfNfg,Í A,à,Æ,İDirectDrawIfufWfFfNfg,<sup>a</sup>%oð•ú,<sup>3</sup>,ê,½,Æ,«Ž©“®“I,É%oð•ú,<sup>3</sup>,ê,é B

**CoCreateInstance**,ð—p,¢,½**DirectDrawClipperIfufWfFfNfg,İ** ì ¬

DirectDrawClipperIfufWfFfNfg,İ ACOM,Æ,İEÝŠ· «,İ,½,ß,ÉfNf%ofX Eftf@fNfgfŠ,ðŠ@‘SfTf|  
[fg,·,é B,³,ç,É A·W €“I,È **DirectDrawCreateClipper** ŠÖ ”,Æ **IDirectDraw2::CreateClipper** f f\fbfh,ðŽg,²,±  
,Æ,É%oÁ,| A**CoGetClassObject**  
ŠÖ ”,ðEÄ,ÑfNf%ofX Eftf@fNfgfŠ,ð“¾,Ä,©,ç**CoCreateInstance**ŠÖ ”,ðEÄ,Ñ o,·,© A, ,é,¢,Í¼ Ú  
**CoCreateInstance**,ðEÄ,Ñ o,·,±,Æ,É,æ,Á,Ä A**DirectDrawClipperIfufWfFfNfg**,ð ì ¬,·,é,±,Æ,ª,Ä,«,é B`È%o°,ì—p—  
á,Í A **CoCreateInstance**,Æ**IDirectDrawClipper::Initialize**  
f f\fbfh,ðŽg,ÄA**DirectDrawClipperIfufWfFfNfg**,ð ì ¬,·,é•û—@,ðŽ!,µ,Ä,¢,é B  
  
ddrval = CoCreateInstance(&CLSID\_DirectDrawClipper,  
NULL, CLSCTX\_ALL, &IID\_IDirectDrawClipper, &lpClipper);  
if (!FAILED(ddrval))  
ddrval = IDirectDrawClipper\_Initialize(lpClipper,  
lpDD, 0UL);

**CoCreateInstance**,İEÄ,Ñ o,µ,Ä,Í A Ä %  
,İfpf%of [f^CLSID\_DirectDrawClipper,İ A**DirectDrawClipperIfufWfFfNfg** EfNf%ofX,İfNf%ofXŽ·ÊŽq,Ä, ,é BII  
D\_IndirectDrawClipperpf%of [f^,İ AÆ» ÝfTf| [fg,³,ê,Ä,¢  
,éfCf“f^ [ftfFfCfX,ðŽ·Ê,µ AlpClipperpf%of [f^,İ AŽæ“¾,³,ê,½**DirectDrawClipperIfufWfFfNfg**,ðŽw,· B  
  
fNf%ofX Eftf@fNfgfŠ,İf fJfYf€,É,æ,Ä,Ä ì ¬,³,ê,é**DirectDrawClipperIfufWfFfNfg**,ðŽg—  
p‘O,É %oŠú%o»,·,é,½,ß,É AfAvfŠfP [fVf‡f“,Í **IDirectDrawClipper::Initialize**f f\fbfh,ðŽg,²•K—v,ª, ,é B  
0UL,İ‘l,İdwFlagpf%of [f^,Ä A,±,İ ê ‡,İftf%ofO,ªE» ÝfTf| [fg,³,ê,Ä,¢,È,¢,½,ß‘l,Í0,Æ,È,é B—p—á,Ä,Í A  
lpDD,İ**DirectDrawClipperIfufWfFfNfg**,ð Š—L,·,é**DirectDrawIfufWfFfNfg**,Ä, ,é B,µ,©,µ A‘ä,í,è,ÉNULL,İ‘l,ðŽw‘è  
,·,é,±,Æ,à,Ä,« A,»,²,·,é,Æ“Æ—§,µ,½ **DirectDrawClipperIfufWfFfNfg**,ª ì ¬,³,ê,é i,±,ê,İ**DirectDrawCreateClipper**  
ŠÖ ”,ðŽg,ÄA**DirectDrawClipper**,ð ì ¬,·,é,±,Æ,Æ““,Ä, ,é j B  
  
fAvfŠfP [fVf‡f“,ð I—1,·,é‘O,É**CoUninitialize** ŠÖ ”,ðŽg,Ä,ÄCOM,ðfVfffbfgf\_fEf“,·,é,±,Æ,ª•K—v,Ä, ,é B  
  
CoUninitialize();

**IDirectDrawPalette fCf“f^ [ftfFfCfX**

^È%°,Í AIDirectDrawPalette fCf“f^ [ftfFfCfX,ÉŠÖ,·,é’Ç%Á î•ñ,Å, ,é B

DirectDrawPaletteIfufWfFfNfg

”ñfvf%o fCf}fŠ EfT [ftfFfX,Å,ìfpfŒfbfg,ì Ý’è

fpfŒfbfg,ì<▯—L

fpfŒfbfg Ef^fCfv

## DirectDrawPalettefIfufWfFfNfg

DirectDrawPalettefIfufWfFfNfg,Í A16 F,Æ256 F,ÌpfƎfbfg,ð'¼ Ú'€ ì,Ä,«é,æ,²,É,·,é,½,ß'ñ<Ÿ,³,ê,Ä,¢,é i  
DirectDrawPalettefIfufWfFfNfg,Î^ê"Ê,É ADirectDrawSurfacefIfufWfFfNfg,ÉfAf^fbf`,³,ê,é j B  
DirectDrawPalettefIfufWfFfNfg,Í A256 FfpfƎfbfg,Ì,½,ß,Ë0,©,ç255,Û,Ä,ÌfGf"fgfŠ,ð—  
p^Ó,·,é B16 FfpfƎfbfg,Ì,½,ß,ÌfGf"fgfŠ,Í—p^Ó,³,ê,Ê,¢ B,±  
,ê,Ê,æ,èfJf% [ Efe [fuf<,ð^ê,Ä,Ìfe [fuf<,Æ,µ,Ä'¼ Ú'€ ì,Ä,«é BfJf% [ Efe [fuf<,ÍfJf% [l îê"Ê,É,ÍRGB  
ŽOĚ´ F j,Ì"z—ñ,Ä, ,è A,±,Ìfe [fuf<,Í A^ê"Ê,É  
ŠefCf"fffbfNfX,ÆŠÖ`A,µ,½ F,ð^Ě»,·,é16frfbfg,Æ24frfbfg,ÌRGBfGf"fgfŠ,ðŠÛ,Ð B,Û,½16 FfpfƎfbfg,Ì,½,ß,É  
Afe [fuf<,Í,à,²,Ð,Æ,Ä,Ì256 FfpfƎfbfg,Ö,ÌfCf"fffbfNfX,àŽ ,Ä,±,Æ,ª,Ä,«é B

fAfvfŠfP [fVf‡f“,Í A **DirectDrawPalette::GetEntries** f f\fbfh,ðŽg,Ä,Ä,±  
,ê,ç,Ìfe [fuf<^†,ÌfGf"fgfŠ,ðŽæ"¾,Ä,«é B,Û,½ A **DirectDrawPalette::SetEntries** f f\fbfh,ðŽg,Ä,Ä A,±  
,ê,ç,ÌfGf"fgfŠ,ð•Í X,·,é,±,Æ,à,Ä,«é B,±,Ìf f\fbfh,Í A ppfƎfbfg,Ö,Ì•Í X,ª,¢,Ä"Ěø,·,é,©Žw'è,·,édwFlags  
fpf%of [f^,ðŽ ,Ä B

DirectDrawPalettefIfufWfFfNfg,ðŽg,Ä,½ŠÈ'P,ÈfpfƎfbfgfAfjf [fVf‡f“,ð'ñ<Ÿ,·,é,É,Í A,»,ê,¼,ê,Ð,Æ,Ä,Ä,Ä,Ìf f\fbfh,ð—p,¢,½,Ó,½,Ä,Ì•û—@,ª, ,é B Ä %o,Ì•û—@,Í A"@%oæ,ÉŽg—  
p,³,ê,é F,É'Î%oŽ,·,éfpfƎfbfg EfGf"fgfŠ,ð'¼ Ú'Í X,·,é,±,Æ,Ä, ,é B,±,ê,É,Í**DirectDrawPalette::SetEntries**  
f f\fbfh,ð^ê%oñĚÄ,Ñ o,¹,Í,æ,¢ B,à,²,Ð,Æ,Ä,Ì•û—@,É,Í A ,Ó,½,Ä,ÌDirectDrawPalettefIfufWfFfNfg,ª•K—  
v,Ä, ,é BfAfvfŠfP [fVf‡f“,Í A  
,Ð,Æ,Ä,ÌDirectDrawSurfacefIfufWfFfNfg,É,Q,Ä,ÌDirectDrawPalettefIfufWfFfNfg,ðĚðĚÝ,ÉfAf^fbf`,·,é,±  
,Æ,ÄfAfjf [fVf‡f“,ðŽÄ s,·,é B,±,ê,Í **DirectDrawSurface2::SetPalette** f f\fbfh,ðŽg,Ä,Ä s,²,±,Æ,ª,Ä,«é B



”ñfvf%ofCf}fŠ EfT [ftfFfX,Ä,ìpfŒfbfg,ì Ý’è

fpfŒfbfg,Í AfpfŒfbfg%»,<sup>3</sup>,ê,½,Ç,ñ,ÈfT [ftfFfX ifvf%ofCf}  
fŠ AfofbfN Efofbftf@ AfIfXfNfŠ [f“ EfvfŒ [f“ AfefNfXf`ff Ef}fbfv j,É,àfAf^fbf`,·,é,±  
,Æ,<sup>a</sup>,Ä,«,é,<sup>a</sup> AfVfXfef€ EfpfŒfbfg,É%œç,ð—^,!,é,ì,Í Afvf%ofCf}  
fŠ EfT [ftfFfX,ÉfAf^fbf`<sup>3</sup>,ê,½fpfŒfbfg,¾,—,Ä, ,é B’ ^Ó,·,×,« d—v,È“\_,Í A DirectDraw fuf fbfN“]‘—  
,<sup>a</sup> F•İŠ,ðŽÄ s,μ,È,Œ,Æ,Œ,±,Æ,Ä, ,é Bfuf fbfN“]‘—,ì“]‘—Œ<sup>3</sup>, ,é,Œ,Í“]‘—  
æfT [ftfFfX,ÉfAf^fbf`<sup>3</sup>,ê,½,·,×,Ä,ìpfŒfbfg,<sup>a</sup>Ž<<sup>3</sup>,ê,é,ì,Ä, ,é B,<sup>3</sup>,Ç,ÉIDirectDrawSurface2::GetDC  
f f\fbfh,Í AfT [ftfFfX,É‘Î,μ,Ä‘Î,ê,½, ,Ç,ä,éDirectDrawPalettefIfufWfFfNfg,ð—<sup>3</sup>Ž<,·,é B  
fAfvfŠfP [fVf±f“,âDirect3D (Ü,½,Í‘¼,ì3DfŒf“f\_fŠf“fOfVfXfef€),Í A”ñfvf%ofCf}fŠ EfT [ftfFfX  
EfpfŒfbfg,İŽg—p,ð‘O’ñ,É,μ,Ä,Œ,é B

***f*p*f*Ɛ*f*b*f*g,İ<sub>α</sub>—L**

*f*p*f*Ɛ*f*b*f*g,İ<sub>α</sub> ”*f*T [f*t*f*F*f*X*ŠŎ,Â<sub>α</sub>—  
L,·,é B*f*t*f*Š*f*b*f*s*f*“*f*O E*f*`*f*F [f“<sub>“</sub>İ*f*t*f* f“*f*g E*f*o*f*b*f*t*f*@,Æ*f*o*f*b*f*N E*f*o*f*b*f*t*f*@,Â“<sub>“</sub>İ*f*p*f*Ɛ*f*b*f*g,<sup>3</sup>ê A•<sub>i</sub> ”*f*e  
f*N*f*X*f`*f*f E*f*T [f*t*f*F*f*X*ŠŎ,Â<sub>α</sub>—L,<sup>3</sup>ê,é B*f*A*f*v*f*Š*f*P [f*V*f‡*f*“,<sup>a</sup> **IDirectDrawSurface2::SetPalette**  
f f\i**b**f*h*,ðŽg,Â,Â*f*p*f*Ɛ*f*b*f*g,ð*f*T [f*t*f*F*f*X*,É*f*A*f*^*f*b*f*`,·,é,Æ A*f*T [f*t*f*F*f*X*,İ,»<sub>“</sub>İ*f*p*f*Ɛ*f*b*f*g,İŽQ Æ*f*J*f*E*f*“*f*g,ð*f*C*f*“*f*N*f*  
Š*f* f“*f*g,·,é B*f*T [f*t*f*F*f*X*,İŽQ Æ*f*J*f*E*f*“*f*g,<sup>3</sup>0,É,È,é,Æ A*f*T [f*t*f*F*f*X*,İ*f*A*f*^*f*b*f*`,<sup>3</sup>ê,<sup>1</sup>/<sub>2</sub>*f*p*f*Ɛ*f*b*f*g,İŽQ Æ*f*J*f*E*f*“*f*g,ð*f*  
f*f*N*f*Š*f* f“*f*g,·,é B,<sup>3</sup>,ç,É A*f*p*f*Ɛ*f*b*f*g E*f*C*f*“*f*^ [f*t*f*F*f*C*f*X* E*f*|*f*C*f*“*f*^,ðNULL,É,μ,Â  
**IDirectDrawSurface2::SetPalette**,É,æ,è*f*T [f*t*f*F*f*X*,©,ç*p**f*Ɛ*f*b*f*g,ð*f*f*f*^*f*b*f*`,μ,<sup>1</sup>/<sub>2</sub> ê ‡ A*f*T [f*t*f*F*f*X* E*f*p*f*Ɛ*f*b*f*g,İŽQ  
Æ*f*J*f*E*f*“*f*g,İf*f*f*N*fŠ*f* f“*f*g,<sup>3</sup>ê,é B

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**Note**

“<sub>“</sub>İ*f*p*f*Ɛ*f*b*f*g A“<sub>“</sub>İ*f*T [f*t*f*F*f*X*,É<sub>“</sub>İ,μ A **IDirectDrawSurface2::SetPalette**,<sup>a</sup>%<sub>0</sub><sup>1</sup>/<sub>2</sub>“*x*,©‘<sub>“</sub>±  
,<sub>“</sub>ÂĖÂ,Ń o,<sup>3</sup>ê,<sup>1</sup>/<sub>2</sub> ê ‡ A*f*p*f*Ɛ*f*b*f*g,İŽQ Æ*f*J*f*E*f*“*f*g,İ<sub>“</sub>ê“*x*,μ,©*f*C*f*“*f*N*f*Š*f* f“*f*g,<sup>3</sup>ê,È,ç B~A‘<sub>“</sub>±  
,·,éĖÂ,Ń o,μ,İ A*f*p*f*Ɛ*f*b*f*g,İŽQ Æ*f*J*f*E*f*“*f*g,É%œ<sub>“</sub>ĉ,ð—<sub>“</sub>!,È,ç,İ,Â, ,é B

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**f p f Ć f b f g E f ^ f C f v**

DirectDraw,Í A 1 f r f b f g ( 2 f G f “ f g f Š ) A 2 f r f b f g ( 4 f G f “ f g f Š ) A 4 f r f b f g ( 1 6 f G f “ f g f Š ) A 8 f r f b f g ( 2 5 6 f G f “ f g f Š )  
f p f Ć f b f g , đ f T f | [ f g , · , é B f p f Ć f b f g , Í A f s f N f Z f ĸ E f t f H [ f } f b f g , “ ê ‘ v , · , é f T [ f t f F f X , Ê , ¾ , ¯ f A f ^ f b f ` , ³ , ê , é , ±  
, Æ , ª , Å , « , é B , ½ , Æ , , , Í A **DDPCAPS\_1BIT** f t f % o f O , đ Ž w ‘ è , μ , Å ì ¬ , ³ , ê , ½ 2 f G f “ f g f Š f p f Ć f b f g , Í A  
**DDPF\_PALETTEINDEXED1** f t f % o f O , đ Ž w ‘ è , μ , Å ì ¬ , ³ , ê , ½ 1 f r f b f g f T [ f t f F f X , Ê , ¾ , ¯ f A f ^ f b f ` , ³ , ê , é , ± , Æ , ª , Å , « , é B .

, Ü , ½ A f C f “ f f f b f N f X E f p f Ć f b f g , đ ì ¬ , · , é , ±  
, Æ , à , Å , « , é B f C f “ f f f b f N f X E f p f Ć f b f g , ì f G f “ f g f Š , Í R G B f J f % [ , đ Ž , ½ , , A f ^ [ f Q f b f g , Æ , Ê , é ‘ ¼ , ì f p f Ć f b f g , ì P A L  
E T T E E N T R Y \ ‘ Ć ‘ ì , ì ” z —  
ñ , Ö , ì ® ” f C f “ f f f b f N f X , đ Ž , Â B f C f “ f f f b f N f X E f p f Ć f b f g , ì f J f % [ E f e [ f u f ĸ , Í A 2 A 4 A 1 6 A 2 5 6 f o f C f g , ì  
” z — ñ , Å , , è A , » , ê , ¼ , ê , ì f o f C f g , Í A f p f Ć f b f g , ì f C f “ f f f b f N f X , đ • \ , · B

f C f “ f f f b f N f X E f p f Ć f b f g , đ ì ¬ , · , é , Ê , Í A **IDirectDraw2::CreatePalette** f f \ b f h , , đ Ć Ä , Ñ o , · , Æ , « , Ê A  
**DDPCAPS\_8BITENTRIES** f t f % o f O , đ Ž w ‘ è , · , é B , ½ , Æ , , , Í A , S f r f b f g , ì f C f “ f f f b f N f X E f p f Ć f b f g , đ ì ¬ , · , é , Æ , « , Í  
**DDPCAPS\_4BIT** |

**DDPCAPS\_8BITENTRIES**, đ Ž w ‘ è , · , é B , Ü , ½ A f C f “ f f f b f N f X E f p f Ć f b f g , đ ì ¬ , · , é , Æ , « , Í A P A L E T T E E N T R Y  
\ ‘ Ć ‘ ì , ì ” z — ñ f | f C f “ f ^ , æ , è , à A f o f C f g ” z — ñ f | f C f “ f ^ , đ “ n , · , Û , □ , ª — ] , Û , μ , Ć B , » , ì , Æ , « **IDirectDraw2::CreatePalette**  
f f \ b f h , đ Ž g , □ ê ‡ , Í A L P P A L E T T E E N T R Y Ć ^ , Ö f o f C f g ” z — ñ f | f C f “ f ^ , đ f L f f f X f g , μ , È , ¯ , ê , î , È , Ç , È , Ć B

fEfBf“fhfE Ef, [fh,Ā,ĪDirectDrawfpfĈfbfgŽg—p

ĪDirectDrawPalette

fCf“f^ [ftfFfCfX Ef f\fbfh,Ī Af ffBfXfvfĈfC,“r¼“Ī iftf<fXfNfŠ [f“ jf, [fh,Ī ê ± Af n [fhfEfFfA,É¼  
Ú ‘,«,±  
,Ý,ð s,□ B,μ,©,μffBfXfvfĈfC Ef, [fh,ª A”ñ”r¼“Ī ifEfBf“fhfE jf, [fh,Ī ê ± A¼,ĪfEfBf“fhfEfAfvfŠfP  
[fVf±f“,Æç’²“@ ĩ,·,é,½,ß,É A **ĪDirectDrawPalette**  
fCf“f^ [ftfFfCfXf f\fbfh,ĪGDI,ĪfpfĈfbfg‘€ iŠÖ ”,ðĈĀ,Ī,Ē,̄,ê,Ī,Ē,ç,Ē,Ĉ B ,±,ê,É,æ,è A  
DirectDraw,ĪfEfBf“fhfE EfAfvfŠfP [fVf±f“,Ā,ĪfpfĈfbfg,ĪŽŸ,Ī,æ,□,Ē•û—@,ĀŽg,Ī,ê,é,±,Æ,É,Ē,é B

**(ĪDirectDraw2::CreatePalette,ÆĪDirectDrawPalette::SetEntries** f\fbfh,É“n,³,ê,é) **PALETTEENTRY**  
 \‘ĈĪ,Ī**peFlags** f“fo,ð“ĪSm,ÉfZfbfg,μ,Ē,̄,ê,Ī,Ē,ç,Ē,Ĉ B

Windows,Ī Ā“ĪfpfĈfbfg EfGf“fgfŠ i0,©,ç9 A246,©,ç255,ÉfCf“fffbfNfX,³,ê,Ā,Ĉ,é),ð•Ī X,μ,æ,□  
,Æ,μ,Ā,Ī,Ē,ç,Ē,Ĉ B

ŽŸ,ĪfgfsfbfN,Ī Afvf%oCf)fŠ EfT [ftfFfX,â”Ē“Ī,ĒWindows,ĪfEfBf“fhfE,ð ĩ ¬ĈoĈ±,ª, ,é,±  
,Æ AWindows,ĪffXfNfgfbfv,ª8rfbfg EfpfĈfbfg Ef, [fh,Ā, ,é,±,Æ,ðz’è,μ,Ā ‘,©,ê,Ā,Ĉ,é B

fEfBf“fhfE Ef, [fh,ĪfpfĈfbfg EfGf“fgfŠ Ef^fCfv

fEfBf“fhfE Ef, [fh,Ā,ĪDirectDraw::CreatePalette,ĪĈĀ,Ñ o,μ

fEfBf“fhfE Ef, [fh,ĪDirectDrawPalette::SetEntries,ĪĈĀ,Ñ o,μ

fEfBf“fhfE Ef, [fh,ĪfpfĈfbfg EfGf“fgfŠ Ef^fCfv

”ñ”r¼“Ī ifEfBf“fhfE jf, [fh,Ā,Ī Af pfĈfbfg EfGf“fgfŠ,ĪÈ%°,ĪŠef^fCfv,Ī A‘Ī%ž,·,é **PALETTEENTRY**  
 \‘ĈĪ,Ī**peFlags** f“fo,É,Ē,é,fZfbfg,ðŽ ,½,Ē,̄,ê,Ī,Ē,ç,Ē,Ĉ B \‘ĈĪ,Ī**ĪDirectDraw2::CreatePalette**,Ü,½,Ī

**ĪDirectDrawPalette::SetEntries** f f\fbfh,É“n,“z—ñ“Ī,É, ,é B”r¼“Ī iftf<fXfNfŠ [f“ jf, [fh,Ā,Ī**peFlags** f“fo,Ī—  
³Žç,³,ê,é,½,ß A Ī—Ī,μ,Ē,̄,ê,Ā,æ,Ĉ B

”ñ”r¼“Ī ifEfBf“fhfE jf, [fh,Ā,Ī Af pfĈfbfg,ÉĪ,·,é,fGf“fgfŠ,ĪŽŸ,Ī3,Ā,Īf^fCfv,Ā, ,é B

Windows Ā“ĪfGf“fgfŠ

ê”Ē“Ī,ĒAWindows,Ī A0,©,ç9 A246,©,ç255,Ü,Ā,ĪfGf“fgfŠ,ð—\—

ñ ifVfXfefĈfbfg j,μ,Ā,̄,è AfAfvfŠfP [fVf±f“,ª,»,é,ç,fGf“fgfŠ,Ī F’l,ð•Ī X,·,é,±,Æ,ðÖŽ~,μ,Ā,Ĉ

,é B,»,é,ç,Ī F,ðŠÜ,ð256 FfGf“fgfŠ EfpfĈfbfg,ð**GetSystemPaletteEntries** Win32

ŠÖ ”,ðĈĀ,Ñ o,μ,Ā \ ¬,·,é,±,Æ,Ī,Ā,«,é,ª AfAfvfŠfP [fVf±f“,ª¼ Ú,±,ê,ç,ĪfGf“fgfŠ,ðŽQ Æ,·,é,û,ªĈo—  
“Ī,Ā, ,é B,»,é,Ē,Ī,Ü, Af pfĈfbfg Efe [fufç,Ī—^,Ī,ç,ê,½fGf“fgfŠ,ª,ç,Ī—

“Ī,ĒfpfĈfbfg EfCf“fffbfNfX,ðf}fbfv,·,é,©Žw’è,·,é BPC\_EXPLICIT ftf%oF,ð**PALETTEENTRY**

\‘ĈĪ,Ī**peFlags** f“fo ,ÉŠi”Ī,μ AfGf“fgfŠ,ªf}fbfv,·,é—

fpfĈfbfg,ĪfCf“fffbfNfX,Æ,μ,Ā**peRed** f“fo,ðfZfbfg,·,é B,±,□,μ,ĀAfAfvfŠfP [fVf±f“,©,ç¼ ÚŽQ Æ,·,é,±

,Æ,ª,Ā,«,é BfAfvfŠfP [fVf±f“,Ī,Ü,½ Aç §“Ī,ĒWindows,É0,Æ255,ĪfGf“fgfŠ,¾,̄,ð—ñ,·,é,æ,□

,Ē,³,¹,é,½,ß A**SetSystemPaletteUse** Win32 ŠÖ ”,ðĈĀ,Ñ,¾,·,±,Æ,à,Ā,« A,±

,Ī ê ±,ĪPC\_EXPLICIT,ÉĪ,·,é**PALETTEENTRY** \‘ĈĪ,Ī0,Æ255,ĪfGf“fgfŠ,¾,̄,ðŽw’è,·,é,×,«,Ā, ,é B

fAfjf [fVf±f“ EfGf“fgfŠ

fAfvfŠfP [fVf±f“,ª Af pfĈfbfg EfAfjf [fVf±f“Ĉo%Ē,ð ĩ ¬,·,é,½,ß,É•Ī X,Ā,«,é B

fAfjf [fVf±f“ EfGf“fgfŠ,Ī,½,ß,ĪPC\_RESERVED ftf%oF,ðAfAfvfŠfP [fVf±f“,ªŽw’è,μ,½ ê ± A

Windows,Ī¼AfAfvfŠfP [fVf±f“,ª— fpfĈfbfg,ð•— fpfĈfbfg,Éf}fbfv,·,é,±,Æ,ðÖŽ~,·,é B,±

,é,Ē,æ,è AfAfvfŠfP [fVf±f“,ªfGf“fgfŠ,ÉÜ,Ē,é F,ð Y’è,μ,½,Æ,«É A¼,ĪfAfvfŠfP [fVf±f“,ª,»,Ī F,ð—

ß,μ,Ā,μ,Ü,□,±,Æ,ð”ð,̄,ç,ê,é B

”ñfAfjf [fVf±f“ EfGf“fgfŠ

fAfvfŠfP [fVf±f“,ª•Ī X,Ā,«,é,Ĉ,fGf“fgfŠ,Ā, ,é B”ñfAfjf [fVf±f“ EfGf“fgfŠ,Ī A’P,ÉPC\_NOCOLLAPSE

ftf%oF,Ā—,ß,ç,ê,Ā,̄,è A,±,Īftf%oF,Ī A¼,ĪŠ,,,è—,Ā Ī,Ÿ•— fpfĈfbfg EfGf“fgfŠ,ðWindows,ªu,«Š,Ī,Ē,Ĉ

,æ,□,É,μ,Ā,Ĉ,é B

,Ü,Æ,ß,é,Æ A **PALETTEENTRY** \‘ĈĪ,Ē,ĪÈ%°,Ī,æ,□,É3,Ā,Īf^fCfv,ð Y’è,·,é,±,Æ,É,Ē,é B

fGf“fgfŠ Ef^fCfv

peFlags’l

peRed, peGreen, peBlue’l

Windows Ā“ĪfGf“fgfŠ(0-9,Æ

PC\_EXPLICIT

peRed = index, peGreen = 0, peBlue = 0

246-

255 A,Ü,½,Ī0,Æ255,Ö,ĪfCf“ff

fbfNfX)

```
fAfjf [fVfzf" EfGf"fgfŠ PC_RESERVED| F'1
PC_NOCOLLAPSE
"ñfAfjf [fVfzf" EfGf"fgfŠ PC_NOCOLLAPSE F'1
```

```
fEfBf"fhfE Ef, [fh,Ä,ÄDirectDraw2::CreatePalette,ÄÄ,Ñ o,µ
ŽŸ,É A"ñ"r¼"I ifEfBf"fhfE jf, [fh,Ä DirectDrawpfÆfbfg,ð,Ç,Ä,æ,²,É ì ¬,·,é,©,ðŽ,· B
ÄDirectDraw2::CreatePalette f f\fbfh,É"n,µ,½ PALETTEENTRY \c'Ä,Ä256fGf"fgfŠ,Ä,·,×,Ä,ðfZfbfgfAfbfv,·,é,±
,Æ,a,«,í,ß,Ä d—v,Ä,·,é B
```

```
LPDIRECTDRAW lpDD; // ,ç,©,Ä,ß %Šú%»,³,é,Ä,Ç,é
PALETTEENTRY pPaletteEntry[256];
int index;
HRESULT ddrval;
LPDIRECTDRAWPALETTE lpDDPal;
```

```
// Windows Ä"IfGf"fgfŠ,ð Ý'è,·,é
for (index = 0; index < 10 ; index++)
{
```

```
    // Ä %»,Ä10,Ä Ä"IfGf"fgfŠ
    pPaletteEntry[index].peFlags = PC_EXPLICIT;
    pPaletteEntry[index].peRed = index;
    pPaletteEntry[index].peGreen = 0;
    pPaletteEntry[index].peBlue = 0;
```

```
    // ÄÄÄ,Ä10,Ä Ä"IfGf"fgfŠ
    pPaletteEntry[index+246].peFlags = PC_EXPLICIT;
    pPaletteEntry[index+246].peRed = index+246;
    pPaletteEntry[index+246].peGreen = 0;
    pPaletteEntry[index+246].peBlue = 0;
}
```

```
// fvf%Çfx [fgfGf"fgfŠ,ÄfZfbfgfAfbfv B,±,Ä—á,Ä,Í A—~—p,Ä,«,é
// Ä %»,Ä16fGf"fgfŠ,aAfjf [fVfzf",³,é,é
for (index = 10; index < 26; index ++)
{
    pPaletteEntry[index].peFlags = PC_NOCOLLAPSE|PC_RESERVED;
    pPaletteEntry[index].peRed = 255;
    pPaletteEntry[index].peGreen = 64;
    pPaletteEntry[index].peBlue = 32;
}
```

```
// Žç,è,ðfZfbfgfAfbfv B"ñfAfjf [fVfzf" EfGf"fgfŠ
for (; index < 246; index ++) // 'O,Äf< [fv,ÄfÇf"fffbfNfX,ðfZfbfg
{
    pPaletteEntry[index].peFlags = PC_NOCOLLAPSE;
    pPaletteEntry[index].peRed = 25;
    pPaletteEntry[index].peGreen = 6;
    pPaletteEntry[index].peBlue = 63;
}
```

```
// ,·,×,Ä,Ä256fGf"fgfŠ,a—,Ü,Ä,½ BfpfÆfbfg,Ä ì ¬
ddrval = lpDD->CreatePalette(DDPCAPS_8BIT, pPaletteEntry,
&lpDDPal,NULL);
```

```
fEfBf"fhfE Ef, [fh,Ä,ÄDirectDrawPalette::SetEntries,ÄÄÄ,Ñ o,µ
ÄDirectDrawPalette::SetEntries f f\fbfh,Ä—p,Ç,Ç,é,ÉPALETTEENTRY \c'Ä,É"K—
p,³,é,é< [f<,Ä ÄDirectDraw2::CreatePalette f f\fbfh,É,à"K—p,³,é,é B"è"È,ÉPALETTEENTRY \c'Ä,Ä"z—
ñ,ÄfAfvfŠfP [fVfzf"ŠJ"ŽÖŽ© g,a f"fefif"fX,·,é,½,ß A Ä \z,Ís—v,Æ Ä,Ç,é,é B•K—v,È,Ç,Ä"z—
ñ,ð•Ä X,µ AfpfÆfbfg X VŽž,É,Í ÄDirectDrawPalette::SetEntries,ðÄÄ,Ñ o,·,±,Æ,à,Ä,«,é B
'½,Ä ê ± A"ñ"r¼"I ifEfBf"fhfE jf, [fh,ÄWindows Ä"IfGf"fgfŠ,ð Ý'è,µ,æ,²,Æ,µ,½ ê ± ÄÄÄ%Ä,Ä—
```

\^a,Ä,«,È,¢ B ],Ä,Ä”ñ”r¼“I ifEfBf“fhfE jf, [fh,Ä,ìWindows Ä“IfGf“fgfŠ,Ö,ì Ý’è,Í,·,é,×,«,Ä,Í,È,¢ B —B^è,ì —áŠO,Í A256fGf“fgfŠ,ð,·,×,ÄfŠfZfbfg,·,é ê ±,Ä, ,é BfpfƎfbfgfAfjf [fVf±f“,Ä,Í^è”Ê,É A  
PALETTEENTRY”z—ñ,ì ¬,³,ÈfTfufZfbfg,¾,¬,ð•İ X,·,é B ,»,é,ç,İfGf“fgfŠ,¾,¬,ð  
IDirectDrawPalette::SetEntries,É“n,·,ì,Ä, ,é B,»,ì,æ,□,È ¬,³,ƎTfufZfbfg,ðfŠfZfbfg,·,é ê ±,Í A  
PC\_NOCOLLAPSE,Æ PC\_RESERVED ftf%oO,Äf} [fN,³,ê,½fGf“fgfŠ,¾,¬,ðfŠfZfbfg,µ,È,-  
,Ä,Í,È,ç,È,¢ B¼,İfGf“fgfŠ,ðfAfjf [fVf±f“,µ,æ,□,Æ,·,é,Æ—Šú,µ,È,¢Ǝ%È,ð µ,,±,Æ,É,È,è A D,Ü,µ,,È,¢ B

ŽŸ,ì—á,Í A”ñ”r¼“If, [fh,İfpfƎfbfgfAfjf [fVf±f“,ðŽ!,µ,Ä,¢,é B

```
LPDIRECTDRAW          lpDD;           // , ,ç,©,¶,ß %Šú%»,³,ê,Ä,¢,é
PALETTEENTRY pPaletteEntry[256]; // , ,ç,©,¶,ß %Šú%»,³,ê,Ä,¢,é
LPDIRECTDRAWPALETTE lpDDPal;         // , ,ç,©,¶,ß %Šú%»,³,ê,Ä,¢,é
int                index;
HRESULT            ddrval;
PALETTEENTRY      temp;
```

```
// ,¢,,Ä,©,İfGf“fgfŠ,ðfAfjf [fVf±f“,·,é B,Í,¶,ß,ì16,ì~—p,Ä,«,é
// fGf“fgfŠ,ð zŠÄ,³,¹,é B,±,ê,È,æ,Ä,ÄfAfjf [fVf±f“,ª s,í,ê,é
temp = pPaletteEntry[10];
for (index = 10; index < 25; index ++ )
{
    pPaletteEntry[index] = pPaletteEntry[index+1];
}
pPaletteEntry[25] = temp;
```

```
// ’l,ð Ý’è,·,é BfpfƎfbfg EfGf“fgfŠ \^c`ì’S`ì,Ö,İf|fCf“f^,Ä,Í,È, A
// •İ X,³,ê,½fGf“fgfŠ,¾,¬,Ö,İf|fCf“f^,ð“n,³,È,¬,ê,Í,È,ç,È,¢
ddrval = lpDDPal->SetEntries(
    0,                // ftf%oO,Íf[f ,Ä,È,¬,ê,Í,È,ç,È,¢
    10,               // Ä %»,İfGf“fgfŠ
    16,               // fGf“fgfŠ ”
    & (pPaletteEntry[10])); // ff [f^,ª¼,ç,ê,é,Æ,±,ë
```

**IDirectDrawSurface2**fCf“f^ [ftfFfCfX

^È%°,ìfgfsfbfN,Â,Í A IDirectDrawSurface2 fCf“f^ [ftfFfCfX,É,Â,¢,Ä à¬¼,.,é B

IDirectDrawSurface2

IDirectDrawSurface2,Â%½,ª V,µ,.,È,Á,½,©?

fT [ftfFfX,ì ì ¬

ftfœ [f€ Efobftf@,ìfAfNfZfX

ftfŠfbfsf“fO EfT [ftfFfX,ÆGDIftfœ [f€ Efœ [fg

fT [ftfFfX,ì ÁŽ.

F•İŠ,ÆftfH [f}fbfg•İŠ.

fJf% [ EfL [fCf“fO

fI [fo [fœfCZfI [f\_\_I

fIfXfNfŠ [f“ EfT [ftfFfX,ì,½,ß,İ•j ”fpfœfbfg

fuf fbfN“]‘—,ÆfVfXfef€ Ef f,fŠ EfT [ftfFfX

## DirectDrawSurfaceIfufWfFfNfg

DirectDrawSurfaceIfufWfFfNfg,Í2D•”<sup>a</sup>,ð•\,· B,±,Ìff [f^,ÍffBfXfvfƎfC Efn [fhfEfFfA,<sup>a</sup>—  
%øð,Å,«„éƎ`Ô,Æ,È,Á,Ä,“,è A,Ü,½,»,Ìfn [fhfEfFfA,ÍDirectDrawSurfaceIfufWfFfNfg,ð Ì ¬,·,é  
DirectDrawIfufWfFfNfg,É,æ,Á,Ä•\Ǝ»,<sup>3</sup>,è,Ä,Ǝ,é B DirectDrawSurfaceIfufWfFfNfg,Í A  
**DirectDraw2::CreateSurface** f f\fbfh,ðŽg,Á,Ä Ì ¬,·,é B DirectDrawSurfaceIfufWfFfNfg,ÍÊ í A•s—  
v,È è ±,Ä, ,Ä,Ä,àffBfXfvfƎfC EfJ [fh,ÌffBfXfvfƎfC Ef f,fŠ,É í“,µ,Ä,Ǝ,é B  
DirectDrawIfufWfFfNfg,Í ADirectDrawSurfaceIfufWfFfNfg,Ì Ì ¬† A“Á•Ê,ÉŽwŽ',<sup>3</sup>,è,È,Ǝ,©,¬,è A—  
v< ,<sup>3</sup>,è,½<@”\,Ä Ä „,ÌfpftfH [f]f“fX,<sup>a</sup>“¾,ç,è,é è Š,ÉDirectDrawSurfaceIfufWfFfNfg,ð'u, B

DirectDrawSurfaceIfufWfFfNfg,Í AffBfXfvfƎfC EfJ [fh,ÌŽ ,Ä“Á%ø»,<sup>3</sup>,è,½fvf fZfbfT,ð—LƎø,É—~—  
p,Ä,« Af^fXfN,ð,æ,è ,¬,É s,µ,Ì,©,è,Ä,È, A•Ä s,µ,ÄfVfXfef€,ÌCPU,Éf^fXfN,ðŽÄ s,<sup>3</sup>,<sup>1</sup>,é B

DirectDrawSurfaceIfufWfFfNfg,Í AWindows,ÌffBfXfvfƎfC EfVfXfef€,Ì¼,ÌfRf“f|  
[flf“fg,ð”FŽ~,µ A,Ü,½,»,è,ç,Æ“ ±,<sup>3</sup>,è,Ä,Ǝ,é B  
DirectDrawSurfaceIfufWfFfNfg,<sup>a</sup>•\Ǝ»,·,éfT [ftfFfX Ef f,fŠ,ÉGDI ŠÖ ”,<sup>a</sup> ‘,«„±,Ý,Ä,«„é,æ,µ,É,·,éWindows  
GDIffofCfX EfRf“fefLXfg,Ö,Ìfnf“fhf< (HDC),ð ADirectDrawSurfaceIfufWfFfNfg,Í Ì ¬,·,é,±,Æ,%øÄ”\  
,Ä, ,é B GDI,Í A,±  
,è,ç,ÌHDC,ðf f,fŠ EfffofCfX EfRf“fefLXfg,Æ,µ,Ä”FŽ~,·,é,<sup>a</sup> Afn [fhfEfFfA EfAfNfZf%Ǝ [f^,ÍÊ í Aff  
fBfXfvfƎfC Ef f,fŠ ä,É, ,é è ±HDC,ÉÍ,µ,Ä—LƎø,Æ,È,é B



**IDirectDrawSurface2**,<sup>3</sup> V,μ,È,Á,½,©?

DirectX,<sup>3</sup>g,COMf,ff,Í A V,μ,ƒCf“f^ [ftFfCfX,îñ<ÿ,É,æ,è V<@”\,“Ç%Á,<sup>3</sup>,ê,é B IDirectDrawSurface2  
fCf“f^ [ftFfCfX,Í A **IDirectDrawSurface** fCf“f^ [ftFfCfX,ð“ã“Ö,·,é,à,ì,Á, ,é B,±  
,ì V,μ,ƒCf“f^ [ftFfCfX,Í**IDirectDraw::QueryInterface** f\fbfh,ðŽg,Á,Ä“¾,é,±,Æ,<sup>a</sup>,Ä,«,é B Žÿ,É—á,ðŽ!,· B

LPDIRECTDRAW\_SURFACE lpSurf;  
LPDIRECTDRAW\_SURFACE2 lpSurf2;

```
// fT [ftFfX,ì ì ¬.
memset(&ddsd, 0, sizeof(ddsd));
ddsd.dwSize = sizeof(ddsd);
ddsd.dwFlags = DDS_DCAPS | DDS_WIDTH | DDS_HEIGHT;
ddsd.ddsCaps.dwCaps = DDSCAPS_OFFSCREENPLAIN |
    DDSCAPS_SYSTEMMEMORY;
ddsd.dwWidth = 10;
ddsd.dwHeight = 10;
```

```
ddrval = lpDD2->CreateSurface(&ddsd, &lpSurf,
    NULL);
if( ddrval != DD_OK)
    return;
```

```
ddrval = lpSurf->QueryInterface(
    IID_IDirectDrawSurface2, (LPVOID *)&lpSurf2);
if( ddrval != DD_OK)
    return;
```

```
ddrval = lpSurf2->PageLock(0);
if( ddrval != DD_OK)
    return;
```

```
ddrval = lpSurf2->PageUnlock(0);
if( ddrval != DD_OK)
    return;
```

**IDirectDrawSurface2** fCf“f^ [ftFfCfX,Í A,R,Ä,ì V,μ,ƒf f\fbfh i **IDirectDrawSurface2::GetDDInterface** A  
**IDirectDrawSurface2::PageLock** A**IDirectDrawSurface2::PageUnlock** j,ðŽn,ß A **IDirectDrawSurface**  
fCf“f^ [ftFfCfX,Ä’ñ<ÿ,<sup>3</sup>,ê,é,·,×,Ä,ìf f\fbfh,ðŠÜ,ñ,Ä,ƒ,é B

**fT** [ftfFfX,İ ì ¬

DirectDrawSurfaceIfufWfFfNfg,Í AfT [ftfFfX ifsfNfZf<f f,fŠ j,ð•\E»,·,é BfT [ftfFfX,ÍÊ iftfBfXfvfŒfC Ef f,fŠ,É i““,µ,Ä,Œ,é,ª AfBfXfvfŒfC Ef f,fŠ,ª Á”i,³,ê,½ ê ‡,â–¾Ž,“L,ÉfŠfNfGfXfg,³,ê,½ ê ‡ AfVfXfefŒ Ef f,fŠ,É,à‘¶ Ý,·,é,±,Æ,ª%Ä”\,Ä, ,é Bfn [fhfEfFfA,ª—v< ,³,ê,½”\—Í,ðfTf| [fg,Ä,«„È,Œ ê ‡,âfŠf\ [fX,ª¼,İDirectDrawSurfaceIfufWfFfNfg,É, ,ç,©,¶,ßŠ,,è“—,Ä,ç,ê,Ä,Œ,½ ê ‡,Í A **İDirectDraw2::CreateSurface**,İ ^— ,İŽ,”s,·,é B

**İDirectDraw2::CreateSurface** f f\fbfh,ÍÊ í A,Đ,Æ,Ä,İDirectDrawSurfaceIfufWfFfNfg,ð ì ¬,·,é B **DDSCAPS** \‘Œ‘İ,İdwCapsf f“fo,İDDSCAPS\_FLIP ftf%oF,ªfZfbfg,³,ê,Ä,Œ,é ê ‡ A **İDirectDraw2::CreateSurface** f f\fbfh,Í,Œ,Ä,©,İDirectDrawSurfaceIfufWfFfNfg,ð ì ¬,·,é B,»,ê,ç,Í,Ü,Æ,ß,Ä•j ‡fT [ftfFfX,ÆŒÄ,Í,ê A,Ü,½’Ç%Á,µ,Ä ì ¬,³,ê,½fT [ftfFfX,ÍÄŽ,“IfT [ftfFfX,ÆŒÄ,Í,ê,é BÄŽ,“IfT [ftfFfX,İff^fbf^,·,é,±,Æ,ª,Ä,«„È,Œ ê B Ü ×,Í A **İDirectDrawSurface2::DeleteAttachedSurface**,ðŽQ Æ,·,é,±,Æ B

,Ü,½ Afvf%oFcf}fŠ EfT [ftfFfX,æ,è L,ffBfXfvfŒfC Ef f,fŠ EfT [ftfFfX,ðŽæ,é,±,Æ,Í,Ä,«„È,Œ ê B Ñ%°,Í A—LŒø,ÈfT [ftfFfX ì ¬,İfVfifŠfI—á,Ä, ,é B

**fVfifŠfI1**

fvf%oFcf}fŠ EfT [ftfFfX,Í AŒ» Ýf† [fU,ÉŒŒ,İ,Ä,Œ,éfT [ftfFfX,Ä, ,é Bfvf%oFcf} fŠ EfT [ftfFfX,ð ì ¬,·,é,Æ,«„È,Í A GDI,ªŽ—p,µ,Ä,Œ ,éŠù‘¶,İfT [ftfFfX,ÉfAfNfZfX,·,é,½,ß ADirectDrawSurfaceIfufWfFfNfg,ð ì ¬,·,é B,µ,½,ª,Ä,Ä A **DDSURFACEDESC** \‘Œ‘İ,İdwHeightf f“fo,İdwWidthf f“fo,İl,ðfT [ftfFfX,İ¼,İf^fCfv,·,×,Ä,ª—v< ,µ,Ä,Œ ,éŠŒ,Í AŒ» Ý,İfT [ftfFfX,Æ—,¶ŽŸŒ³,Ä, ,é,Æ,İ,©,Ä,Ä,Œ,½,Æ,µ,Ä,à Afvf%oFcf} fŠ EfT [ftfFfX,Í,»,İl,ðŽw’è,µ,Ä,Í,È,ç,È,Œ ê B

,»,µ,µ,Äfvf%oFcf}fŠ EfT [ftfFfX ì ¬,ÉŠŒEW,·,é**DDSURFACEDESC** \‘Œ‘İ(Ñ%°,İddsd),İf f“fo,ª ‘,«„± ,Ü,ê,é B

```
DDSURFACEDESC ddsd;
ddsd.dwSize = sizeof(ddsd);
```

```
// ,Ç,İf f“fo,ª—LŒø,©DirectDraw,É’m,ç,¹,é
ddsd.dwFlags = DDSD_CAPS;
```

```
// fvf%oFcf}fŠ EfT [ftfFfX,ðfŠfNfGfXfg
ddsd.ddsCaps.dwCaps = DDSCAPS_PRIMARYSURFACE;
```

**fVfifŠfI2**

fuf fbfn“—fn [fhfEfFfA,ª \ ¬,·,éfrfbfgf}fbfv,İfLfffbfVf... ,ÉŽg,İ,ê,é’P f,ÉfİftfXfNfŠ [f“ EfT [ftfFfX,ð ì ¬,µ,Ä,Ý,é B fvf%oFcf} fŠ EfT [ftfFfXÈŠO,İ,·,×,Ä,İfT [ftfFfX,Ä,Í A ,³,Æ• ,ðŒ^,ß,é•K— v,ª, ,é B,·,é,ÆfİftfXfNfŠ [f“ EfT [ftfFfX ì ¬,ÉŠŒEW,·,é **DDSURFACEDESC** \‘Œ‘İ (ddsd below),İf f“fo,ª ‘,«„±,Ü,ê,é B

```
DDSURFACEDESC ddsd;
ddsd.dwSize = sizeof(ddsd);
```

```
// ,Ç,İf f“fo,ª—LŒø,©DirectDraw,É’m,ç,¹,é
ddsd.dwFlags = DDSD_CAPS | DDSD_HEIGHT | DDSD_WIDTH;
```

```
// ŠÈ’P,ÈfİftfXfNfŠ [f“ EfT [ftfFfX,ð—v< ,·,é B
// fTfCfY,Í100 ~100fsfNfZf<,Ä, ,é B
ddsd.ddsCaps.dwCaps = DDSCAPS_OFFSCREENPLAIN;
dwHeight = 100;
dwWidth = 100;
```

DirectDraw,Í A,±

,İfT [ftfFfX,ðfBfXfvfŒfC Ef f,fŠ,É ì ¬,·,é B,µ,©,µfffBfXfvfŒfC Ef f,fŠ,É“ü,è,«„ç,È,Œ ê ‡,É,Í AfT [ftfFfX,İfVfXfefŒ Ef f,fŠ,É ì ¬,³,ê,é B,±,İ,Æ,«**DDSCAPS** \‘Œ‘İ,İdwCapsf f“fo ,É,Í AfT [ftfFfX,ðfVfXfefŒ Ef f,fŠ,Ä ì ¬,µ,È,—,ê,İ,È,ç,È,Œ ê ‡,É,İDDSCAPS\_SYSTEMMEMORY ftf%oF,ð AfBfXfvfŒfC Ef f,fŠ,Ä ì ¬,µ,È,—,ê,İ,È,ç,È,Œ ê ‡,É,İDDSCAPS\_VIDEOMEMORY ftf%oF,ð A,»,ê,¼,êŽg—

p,·,é BŽw'è,μ,½ ê Š,ÉfT [ftfFfX,ð ì ¬,·,«„È,¢ ê ‡,Í AfGf%o [,ª•Ô,³,ê,é B

DirectDraw,à•î ‡fT [ftfFfX,ð ì ¬,·,é,±,Æ,ª,Ä,«„é B•î ‡fT [ftfFfX,Í AIDirectDraw2::CreateSurface  
f f\fbfh,ðˆê“xĈÄ,Ñ o,·,±,Æ,Ä ì ¬,³,ê,éfT [ftfFfX,İfZfbfg,Ä, ,é B  
**IDirectDraw2::CreateSurface**,İĈÄ,Ñ o,μ,ÄDDSCAPS\_COMPLEX ftf%oO,ªfZfbfg,³,ê,Ä,¢,é ê ‡ AŽw'è,μ,½–  
¾Ž,“İfT [ftfFfX,İ¼,É,Đ,Æ,ÄˆÈ ã,İˆÄŽ,“İfT [ftfFfX,ªDirectDraw,É,æ,Ä,Ä ì ¬,³,ê,é B,Ü,½ A•î ‡fT [ftfFfX,Í  
A,Đ,Æ,Ä,İfT [ftfFfX,Æ,μ,ÄŠÇ— ,³,ê,é B,Ä,Ü,è **IDirectDraw::Release**  
f f\fbfh,İˆê“x,İĈÄ,Ñ o,μ,Ä A \‘ĉ‘İ,İ,·,×,Ä,İfT [ftfFfX,ª%ð•ú,³,ê A  
**IDirectDrawSurface2::Restore**f f\fbfh,İˆê“x,İĈÄ,Ñ o,μ,Ä,»„ê,ç,ªfŠfXfgfA,³,ê,é,İ,Ä, ,é B

### fVfifŠfI3

Ä,à—L—p,È•î ‡fT [ftfFfX,İ,Đ,Æ,Ä,Í Afvf%oCf}  
fŠ EfT [ftfFfX,ÆfT [ftfFfX EfıfŠfbfsf“fOŠÄ«„ðĈE` ¬,·,é,Đ,Æ,ÄˆÈ ã,İfofbfN Efofbftf@,ðŽ ,Ä,à,İ,Ä, ,é B  
•î ‡fT [ftfFfX ì ¬,ÆŠÖĈEW,·,é**DDSURFACEDESC** \‘ĉ‘İ (È%°,İddsd)  
,İf f“fo,Í AfofbfN Efofbftf@,ð,Đ,Æ,ÄŽ ,ÄftfŠfbfsf“fo EfT [ftfFfX,ðL q,·,é,½,ß,É ‘,«„±,Ü,ê,é B

DDSURFACEDESC ddsd;  
ddsd.dwSize = sizeof(ddsd);

// ,Ç,İf f“fo,ª—LĈø,©DirectDraw,É’m,ç,¹,é  
ddsd.dwFlags = DDSD\_CAPS | DDSD\_BACKBUFFERCOUNT;

// ,Đ,Æ,Ä,İfofbfN Efofbftf@,Æ,Æ,à,Éfvf%oCf}fŠ EfT [ftfFfX,ð—v< ,·,é  
//  
ddsd.ddsCaps.dwCaps = DDSCAPS\_COMPLEX | DDSCAPS\_FLIP |  
DDSCAPS\_PRIMARYSURFACE;  
ddsd.dwBackBufferCount = 1;

,±,ê,ç,Í Af\_fuf<fofbftf@ EftfŠfbfsf“fOŠÄ«„ð \z,·,é B **IDirectDrawSurface2::Flip**f f\fbfh,ðˆê“xĈÄ,Ñ o,·,±  
,Æ,Ä Afvf%oCf}fŠ EfT [ftfFfX,İfT [ftfFfX Ef f,İfŠ,ÆfofbfN Efofbftf@,Æ,ðĈðŠ·,·,é,İ,Ä, ,é B  
**DDSURFACEDESC** \‘ĉ‘İ,İ**BackBufferCount**f f“fo,ð2,ÉŽw'è,·,ê,İ2ĈÄ,İfofbfN Efofbftf@,ª ì ¬,³,ê A  
**IDirectDrawSurface2::Flip**,ðĈÄ,Ñ o,·,²,Æ,ÉfgfŠfvf<fofbftf@ EftfŠfbfsf“fOŠÄ«„ªñ×Ÿ,³,ê,Ä3,Ä,İ%~ĈE`pf^ [f“,İ  
,æ,ª,É Ø,è'Ö,İ,ç,ê,é B

ftfœ [f€ Efobftf@,İfAfNfZfX

DirectDrawfA [fLfefNf`ff,Ä,Í ADirectDrawSurfaceIfufWfFfNfg,ªfT [ftfFfX Ef f,fŠ,ð•  
 ,• BfAfvfŠfP [fVf‡f“,Í **IDirectDrawSurface2::Lock**  
 f f\fbfh,ðŽg,Ä,ÄfT [ftfFfX Ef f,fŠ,ð¼ ÚfAfNfZfX,•,é,±,Æ,ª%Ä”,Ä, ,é BfAfvfŠfP [fVf‡f“,ÍfAfNfZfX,ð  
 —v,•,éfT [ftfFfX ä,İ,éœ,ðRECT \‘c‘İ,ÄŽw’è,µ A **IDirectDrawSurface2::Lock** f f\fbfh,ðœÄ,Ñ o,• B RECT  
 \‘c‘İ,ðNULL,É,µ,Ä**IDirectDrawSurface2::Lock**,ðœÄ,Ñ o,• ê ‡ AfT [ftfFfX Ef f,fŠ,İ,•,×,Ä,İ”ª,É”r¼“IfAfN  
 fZfX,ð—v• ,•,é,Æ,c,•Ó—i,É,È,é B,±  
 ,İf f\fbfh,Í AfT [ftfFfX Ef f,fŠ,Ö,İfAfNfZfX,ð,•,é,½,ß,ÉfAfvfŠfP [fVf‡f“,ª•K—  
 v,È îñ,ð**DDSURFACEDESC** \‘c‘İ,É ‘,«,±,Đ B,±,İ îñ,Í Afvf%oCf}fŠ EfT [ftfFfX,ÆfsfNfZf< EftfH [f}  
 fbf,ª“Ü,É,é ê ‡ AfT [ftfFfX,İfsfbf i,Ü,½,İfXfgf%oCfh j,ÆfsfNfZf< EftfH [f}fbfg,ðŠÜ,ñ,Ä,c  
 ,é BfAfvfŠfP [fVf‡f“,ª AfT [ftfFfX Ef f,fŠ,Æ,Æ,à,É I—,µ,½ ê ‡ AfT [ftfFfX Ef f,fŠ,Í A  
 **IDirectDrawSurface2::Unlock** f f\fbfh,ð—p,c,Ä %oð•ú,•,é,±,Æ,ª,Ä,«,é B

ŽŸ,İfŠfXfg,Í A DirectDrawSurfaceIfufWfFfNfg,ð¼ Úfœf“f\_Šf“fO,•,é,Æ,«,İ A,æ,, ,é—  
 â’è,ð%ñ”ð,•,é,½,ß,İfqf“fg,Ä, ,é B

ˆè’è,İffBfXfvfœC Ef sfbf`,ð‘O’ñ,Æ,µ,Ä,Í,È,c,È,c B,Ä,È,É**IDirectDrawSurface2::Lock**  
 f f\fbfh,ª•Ô,•fsfbf` îñ,ð²,×,é,±  
 ,Æ Bfsfbf`,Í AfT [ftfFfX Ef f,fŠ,İ ê Š AffBfXfvfœC EfJ [fh,İf^fCfv A  
 DirectDrawfhf%oCfo,İfo [fWf‡f“,Æ,c,Ä,½,³,Ü,´,Ü,È— —R,©,ç•İ%»,•,é B

**IDirectDrawSurface2::Lock**,İœÄ,Ñ o,µ,Æ**IDirectDrawSurface2::Unlock** f f\fbfh,İŠÖ,İ,â,èŽæ,è,ð §œÄ,•,é,±  
 ,Æ BfT [ftfFfX Ef f,fŠ,İfAfNfZfXŽæ“¾,ð^Ä‘S,É s,µ,½,ß A **IDirectDrawSurface2::Lock**  
 f f\fbfh,İWIN16,İf fbfN,ð•ÜŽ ,µ,Ä,“,è A**IDirectDrawSurface2::GetDC** f f\fbfh,ÍÄ—  
 Ü“I,É**IDirectDrawSurface2::Lock**,ðœÄ,Ñ o,• B WIN16f fbfN,Í A **IDirectDrawSurface2::Lock**,Æ  
 **IDirectDrawSurface2::Unlock**,İŠÖ,à GDI,ÆUSER,İfAfNfZfX,ð**IDirectDrawSurface2::GetDC**,Æ  
 **IDirectDrawSurface2::ReleaseDC**,İŠÖ,Æ““,¶,æ,µ,É §œÄ,•,é B

ffBfXfvfœC Ef f,fŠ,ð~A±,³,¹,ÄfRfs [,•,é,±,Æ B  
 fof“fN EfXfCfbf` Ef f,fŠ,ðŽg,Ä,½ffBfXfvfœC EfJ [fh,İ,½,ß,İ%¼‘zftf%obfg Eftfœ [f€ Efobftf@,  
 ðŽÄ‘,•,é,½,ß,É AWindows 95,İfy [fW EftfH [f<fg Efnf“fhf%o Vflatd.386,ðŽg,µ B ,±,İfnf“fhf%o  
 ,É,æ,Ä,Ä A,±,è,c,İffBfXfvfœC EfffofCfX,Í DirectDraw,É^A±,µ,½ftfœ [f€fobftf@,ð“n,•,±  
 ,Æ,ª,Ä,«,é B•“f,µ,½ffBfXfvfœC Ef f,fŠ,ÖfRfs [,•,é,Æ AfRfs [,ªf f,fŠfof“fN,É,İ,½,Ä,½ ê ‡,É AfV  
 fXfef€,ª“èŽŽ’âŽ~,ðN,±,•%Ä”\ «,ª, ,é B

ftfŠfbfsf“fO EfT [ftfFfX,ÆGDIftfÆ [f€ EfÆ [fg

DirectDraw,İ,·,×,Ä,İfT [ftfFfX,“ftfŠfbfsf“fO EfT [ftfFfX,Æ,μ,Ä—~p,Ä,«é B  
ftfŠfbfsf“fO EfT [ftfFfX,İ Aftf f“fg Efobftf@,ÆfobfN Efobftf@ŠÖ,ÄfXf fbfv,³,ê,éf f,fŠ,İ”CÖ,İ•“  
Ä,é B ftfŠfbfsf“fO EfT [ftfFfX,Æ,μ,ÄDirectDrawfT [ftfFfX,ð \z,·,é,±,Æ,İ A ]—  
^,İÆÄ,ç,ê,½fy [fWftfŠfbfsf“fO,İ 1,İ,Ê”ä,×½,İ—“\_,,é B

fAfvfŠfP [fVf±f“,“ftfŠfbfsf“fO“€ İ,İ—v, ÉIDirectDrawSurface2::Flip f\fbfh,ðŽg,μ  
Æ,« AftfŠfbfsf“fO,³,ê,éDirectDrawSurfacefİfufWfFfNfg,ÆŠÖ~A,Ä, ,ç,ê,½fT [ftfFfX Ef f,fŠ—  
İæ,İ Ø,è,Ö,İ,ç,ê,é BftfŠfbfsf“fO,³,ê,éDirectDrawSurfacefİfufWfFfNfg,ÉfAf^fbf“,³,ê,½fT [ftfFfX,É,İ%œç,μ,È,¢  
B,½,Æ,İ,İf\_fuf<fobftf@,İ óÖ,Ä,İ AfobfN Efobftf@,É•%œ,·,éfAfvfŠfP [fVf±f“,İ,Ä,È,É“~IDirectDrawSur  
facefİfufWfFfNfg,ðŽg—p,·,é B  
IDirectDrawSurface2::Flip,“fŠfNfGfXfg,³,ê,½,Æ,« AfİfufWfFfNfg%o,İfT [ftfFfX Ef f,fŠ,İ A’P,Éftf f“fg E  
fobftf@,Ö Ø,è,Ö,İ,ç,ê,é B

ftf f“fg Efobftf@,“%ÄŽ,Ä, ,ê,İ A,»,ê,İvf%oCf}fŠ EfT [ftfFfX,Ä, ,é,©, ,é,¢  
İÆ” Y%oÄŽ,İfİ [fo [f€fC,Ä, ,é,½,ß AfobfN Efobftf@,ðİ Ü,Æ,·,éIDirectDrawSurface2::Lock,Ü,½,İIDirect  
DrawSurface2::Bltf f\fbfh,ð~A±,μ,ÄÆÄ,Ñ o,·,Æ ÄŽY,İ ,½•üEü,İfŠftfÆfbfVf...,“N,±,é,Ü,Ä,İŠÖŽ,”s,μ A  
DDERR\_WASSTILLDRAWING,ðÖ,· B,±  
ê,İ Aftf f“fg Efobftf@,İÈÖ,İf f,fŠ,“ AfobfN Efobftf@,É,à,μAf^fbf“,³,ê,Ä,¢,È,¢  
É,à,©,©,İ,ç, A,È,“fn [fhfEfFA,É,æ,è— ffbfXfvfÆfC,É•%œ,³,ê,±,·,é,½,ß,ÉN,±,é B,±  
İ óÖ,İ ÄŽY,İ ,½•üEü,İfŠftfÆfbfVf...“t,É Ä—Ä,·,é B—  
fffbfXfvfÆfC,ð X V,·,éfn [fhfEfFA,“ AfŠftfÆfbfVf...  
²,Æ,ÉfffbfXfvfÆfC Ef f,fŠ,İ”z’u,ð“Ç,Y Ž,Ý¼,μ,Ä,¢,é,©,ç,Ä, ,é B

,±,İ,æ,μ,È— “İ,ÈÈ~ö,©,ç A%oÄŽ<fT [ftfFfX ä,İDirectDrawSurface2::Flip f f\fbfhÆÄ,Ñ o,μ,İ”n~ŠúRf}  
f“fh,Æ,È,é BfQ [f€,ð İ,é,Æ,«İ Af f\fbfh,“ÆÄ,İ,ê,½Æä,ÄfQ [f€,İ,·,×,Ä,İs%oÄŽ<—v’f,ðŽÄ s,·,×,«Ä, ,é B,½,  
Æ,İ,İ A“ü—İ,äfİ [ftfBfİ AfQ [f€,İfvfÆfC A,»,μ,ÄfVfXfef€ Ef f,fŠ•%œ“€ İ,Š@—  
¹,μ,Ä,©,ç A%oÄŽ<fobfN Efobftf@,Ö,İAfNfZfXŽæ“¼,ð—v,·,é•%œf^fXfN,ðİ,İ,ß,é,±,Æ,“Ä,«é B

fAfvfŠfP [fVf±f“,“EfBf“fhfE,Ä“®•K—v,“ ,è A,È,“ftfŠfbfsf“fOŠÄ<«,ð—  
v,·,é,È,ç AftfŠfbfsf“fOfl [fo [f€fC EfT [ftfFfX,İ İ ò,ðŽŽ,Y,é Bfn [fhfEfFA,“fİ [fo [f€fC,ðfTf]  
[fg,μ,Ä,¢,È,Ä,Ä Afy [fW,ðftfŠfbfsf“fO,·,éfvf%oCf}fŠ EfT [ftfFfX,ð İ ò,·,é,±,Æ,“Ä,«é B  
fT [ftfFfX,“fvf%oCf}fŠ,É,È,è,æ,μ,Ä,¢,é,Æ,«ÉGDI,“»,İfT [ftfFfX,É,Ä,¢,Ä İñ,ðŽ ,Ä,Ä,¢  
È,~è,İ AGDI,“ ‘,«±,ñ,Ä,¢,éfvf%oCf}fŠ EfT [ftfFfX,İ† g,ð%oÄŽ<É,È,è,μ,Æ,μ,Ä,¢  
é,éfobftf@,Öfuf fbfN“]—,·,é,±,Æ,“Ä,«é Bfuf fbfN“]—,İ”n~Šü,ÉŽÄ s,³,ê,é,½,ß A,±  
İf^fXfN,İŽŽŠÖ,“©,©,é,Æ,μ,Ä,à,Ü,ñ,İ,İ,·,©,Ä, ,é B,μ,©,μ A  
fy [fW,“ftfŠfbfsf“fO,³,ê,éEfBf“fhfE,İfTfCfY,ÆfXfNfŠ [f“%oð“œ“x,ÉÈ“İ,·,éfuf fbfN“]—  
İfof“fh• ,Æ,ð,©,È,è Ä”İ,·,é BftfÆ [f€f€ [fg,²0fps,ð%o%oñ,ç,È,¢,©,~è,İ AGDI,“ ³,μ,“® İ,μ,Ä,¢,é,æ,μ  
ÉÈ©,İ,é,Ä, ,è,μ B

DirectDrawfİfufWfFfNfg,ðfCf“fXf^f“fX%o»,·,éÖ,É AGDI,İ ÄŽ© g,İ•Ž’,ÉfffbfXfvfÆfC Ef f,fŠ,ð,·,Ä,ÉŽg,Ä,  
Ä,¢,é Bfvf%oCf}fŠ EfT [ftfFfX,ðfCf“fXf^f“fX%o»,·,é,½,ß,É  
DirectDraw,ðÆÄ,Ñ o,·,Æ,« A,»,İfT [ftfFfX,İf f,fŠfAfhfÆfX,İ AGDI,“Æ» ÝŽg,Ä,Ä,¢,é,à,İ,Æ“~İ,Ä, ,é B

fobfN Efobftf@,Ä•İ ‡fT [ftfFfX,ð İ ò,·,é è ‡,İ AGDI,İ A,Ü,·,fvf%oCf}  
fŠ EfT [ftfFfX,İ,½,ß,İfffbfXfvfÆfC Ef f,fŠ,ðŽv,· BGDI,İDirectDraw,æ,èÆÄ,¢  
½,ß ADirectDraw,İ“® İ,ð’m,é,±  
Æ,“Ä,«É,¢ B,μ,½,“Ä,ÄGDI,İ A,½,Æ,İftfŠfbfsf“fO,³,ès%oÄŽ<fobfN Efobftf@,É,È,Ä,½,Æ,μ,Ä,à A,±  
İfT [ftfFfX,ð€ İ,μ±,·,é B

½,İfAfvfŠfP [fVf±f“,İ A’SfXfNfŠ [f“,ð•¢,μ“ä,«ÈEfBf“fhfE,ð İ ò,·,é,±,Æ,©,ç ^—  
ðŽn,ß,é BfAfvfŠfP [fVf±f“,“fAfNfefBfu,Ä A,©,ÄftfH [fJfX,ðŽ ,Ä,©,~è A  
GDI,İfobftf@,İRfs [ð ,«±,Ü,È,¢ BGDI,“fRf“fgf [fç,·,é,à,İ,İ Ä•%œ,ð•K—v,Æ,μ,È,¢,©,ç,Ä, ,é B

¼,İfVfİfšfİ,Ä,İ AGDI,İfİfšfWfİfç,ÈfT [ftfFfX,İ İñ,μ,©Ž ,½,·, AÆ» Ýfvf%oCf}  
fŠ EfT [ftfFfX,È,İ,©fobfN Efobftf@,È,İ,©,Æ,¢,μ İñ,ðŽ ,½,È,¢,±,Æ,ðŽv,¢ o,μ,Ä,Ü,μ,¢ B  
GDIxXfNfŠ [f“,“s—v,È,ç A ä q,İfefNfjfbfN,“Žg,İ,é B GDI,“K—v,Ä, ,è,İ ÄŽY,É, °  
éfefNfjfbfN,ðŽŽ,μ,Ä,Y,é,±,Æ,“Ä,«é B

- 1 fobfN Efobftf@,ð,Ö,½,ÄŽ ,Äfvf%oCf}fŠ EfT [ftfFfX,ð İ ò,·,é B
- 2 %oŠúfvf%oCf}fŠ EfT [ftfFfX(GDIft [ftfFfX),ð†ŠÖfobfN Efobftf@,Éfuf fbfN“]—,·,é B
- 3 GDI,ðÖ,İ è Š,É’u,ç,Ä %oŠúRfs [ð%oÄŽ<%o»,·,é,½,ß AlpDDSurfaceTargetOverride  
fpf%oof [f^,ðNULL,ÉfZfbfg,μ,ÄfT [ftfFfX,ðftfŠfbfsf“fO,·,é B

,±,ê,ð s,¡ AGDIfofbftf@,©,ç†ŠÔfofbftf@,ÖfRfs [,ª,Å,« A,»,lfofbftf@ ã,Åf† [fU,ÉŒ©,¹,½,¢  
,à,ì,ð•%œ,Å,«,é BGDI,ð^À‘S,É%°•û,É’u,¢,Ä,“,« A,Ó,½,Â,lfofbftf@ŠÔ,ð% •œ,³,¹,é,±,Æ,à,Å,«,é B•û–  
@,íŽŸ,ìÊ,è,Å, ,é B

pPrimary->Flip(pMiddle);

**fT** [ftfFfX,ì ÁŽ,

fT [ftfFfX Ef f,fŠ,Ì”•ª,ð•\Œ»,·,·,é DirectDrawSurfaceIfufWfFfNfg,ª•K,,μ,à%øð•ú,·,é•K—v,ª,È,Œ  
,É,àŠÖ,í,ç,, A DirectDrawSurfaceIfufWfFfNfg,ÆŠÖ~A,Ä,¯,ç,ê,½fT [ftfFfX Ef f,fŠ,ª%øð•ú,³,ê,é,±  
,Æ,ª,·,é BDirectDrawSurfaceIfufWfFfNfg,ªfT [ftfFfX Ef f,fŠ,ðŽ,·,Á,½ ê ± A‘½,-  
,Ìf f\fbfh,Ì**DDERR SURFACELOST**,ð•Ö,μ A‘¼,ÌfAfNfVf‡f“,ðŽÄ s,μ,È,Œ B

ffBfXfvfŒfC EfJ [fh,Ìf, [fh,ª•Ì X,³,ê,½,è AfAfvfŠfP [fVf‡f“,ªffBfXfvfŒfC EfJ [fh,Ö,Ì”r‘¼“IfAfNfZfX  
,ðŽó,¯Žæ,èfJ [fh,ÉŠ,,è“-,Ä,ç,ê,½fT [ftfFfX Ef f,fŠ,ð,·,×,Ä%øð•ú,μ,½,è,μ,½ ê ± AfT [ftfFfX,ÍŽ,,í,ê,é B

**IDirectDrawSurface2::Restore**f f\fbfh

,Í ÁŽ,,í,ê,½fT [ftfFfX,ð Ä ì ¬,μDirectDrawSurfaceIfufWfFfNfg,Ö Ä Ú‘±,·,é B

,³,ç,É Ú,μ,,Í A uf, [fh•Ì X,Æ”r‘¼“IfAfNfZfX v,ðŽQ Æ,·,é,±,Æ B

F•İŠ•,ÆftfH [f}fbfg•İŠ•

”ñRGBfT [ftfFfX EftfH [f}fbfg,Í A4•¶ŽšfR [fh iFOURCCfR [fh)  
,É,æ,Á,ÄL q,³,ê,é BfAfvfŠfP [fVf‡f“,ªfsfNfZf< EftfH [f}fbfg,ðfŠfNfGfXfg,·,é,½,ß,É

**IDirectDrawSurface2::GetPixelFormat**

f f\fbfh,ðÆÄ,Ñ o,· ê ‡ A,~,æ,ÑfT [ftfFfX,ª”ñRGBfT [ftfFfX,Ä, ,é ê ‡ A DDPF\_FOURCC  
ftf%oO,ªfZfbfg,³,ê A **DDPIXELFORMAT** \‘c‘İ,İdwFourCCf f“fo,ª—LÆø,Æ,È,é B ,à,µ A FOURCCfR [fh,ª  
YUVftfH [f}fbfg,ð^\\,· ê ‡ A DDPF\_YUV ftf%oO,àfZfbfg,³,ê A dwYUVBitCount,ÆdwYBits A dwUBits A  
dwVBits AdwYUVAAlphaBitsf f“fo,ªfsfNfZf<,©,ç î•ñ,ð^ø,« o,·,½,ß,ÉŽg,í,ê,é—LÆø,Èf}fXfN,É,È,é B

RGB ftfH [f}fbfg,ª“¶ Ý,·,é,Æ DDPF\_RGB ftf%oO,ªfZfbfg,³,ê A dwRGBBitCount A dwRBits AdwGBits A  
dwBBits AdwRGBAlphaBitsf f“fo,ªfsfNfZf<,©,ç î•ñ,ð^ø,« o,·,½,ß,ÉŽg,í,ê,é—LÆø,Èf}  
fXfN,É,È,é B”ñ•W €RGB ftfH [f}fbfg,ªL q,³,ê,é ê ‡,Í A DDPF\_RGB ftf%oO,İDDPF\_FOURCC  
ftf%oO,Æ‘g,Ý ‡,í,¹,ÄfZfbfg,Ä,«,é B

F•İŠ•,ÆftfH [f}

fbfg•İŠ•’†,É AfAfvfŠfP [fVf‡f“,É•Î,µFOURCCfR [fh,ªQfZfbfgÆöŠJ,³,ê,é BFOURCCfR [fh,İfZfbfg,İ,Đ,Æ,Â,Í  
Afn [fhfEfFfA,İfuf fbfn“]‘—”\—İ,ð, ,ç,í,µ A,à,ª,Đ,Æ,Â,Í Afn [fhfEfFfA,İfI [fo [fÆfC”\—İ,ð, ,ç,í,· B



**fJf% [ EfL [fCf“fO**

DirectDraw,Ā,Í Afuf fbfn“‘—,ÆfI [fo [fƎfC,ĭ,½,ß,É“]‘—Ǝ³ E“‘— æ ufJf% [ EfL [fCf“fO v,³fTf|  
[fg,³,ê,Ā,Ǝ,é B “]‘—Ǝ³ E“‘— æ,ĭ,Ɔ,ç,É,à A,±,ĭfJf% [ EfL [ A,Û,½,Í Fˆæ,ðŽw’è,·,é,±,Æ,ª,Ā,«,é B

“]‘—Ǝ³fJf% [ EfL [fCf“fO,Í Afuf fbfn“]‘—ŽŽ,ÉfRfs [,³,ê,È,¢ F,Û,½,Í Fˆæ AfI [fo [fƎfCŽŽ,É“‘—  
æ,Ā\*s%oĀŽ<,ĭ F,Û,½,Í Fˆæ,ðŽw’è,·,é B “]‘— æfJf% [ EfL [fCf“fO,Í Afuf fbfn“]‘—  
ŽŽ,É’u,«Š·,!,ç,ê,é F,Û,½,Í Fˆæ AfI [fo [fƎfCŽŽ,É“]‘— æ,ð•¢,▯ F,Û,½,Í Fˆæ,ðŽw’è,·,é B “]‘—  
Ǝ³fJf% [ EfL [,ĭfT [ftfFX,©,ç%½,““Ç,Ý,Æ,è%½,““Ç,Ý,Æ,è,È,¢,©Žw’è,·,é B “]‘—  
æfJf% [ EfL [,ĭ A“]‘— æfT [ftfFX,Ā ‘,¢,½,è•¢,Ā,½,è,Ā,«,é,à,ĭ,Æ,Ā,«,È,¢,à,ĭ,Æ,ðŽw’è,·,é B “]‘—  
æfT [ftfFX,ªfJf% [ EfL [,ðŽ ,Ā,Æ AfJf% [ EfL [,Æf}fbf`,µ,½fsfNfZf<,¼,“]‘—  
æfT [ftfFX ā,Ā•ĭ X A ā ‘,«,³,ê,é B

,¢,,Ā,©,ĭfn [fhEfFA,Í AYUVsfNfZf< Eff [f^,ĭ,½,ß,ĭ Fˆæ,¾,¯,ðfTf| [fg,·,é B  
YUVff [f^,ÍÊ ĭ,ĭfrrffl,Ā, ,è A•ĭŠ·’†,ÉƎè ·,ªN,±,é,ĭ,Ā A“§%ßfofbfNfOf%ofEf“fh,ĭ’P F,Ā,Í,È,¢%oĀ”\ «,ª, ,é,ª  
A—{—,ĭfsfNfZf< EftfH [f}fbfg,É,æ,ç,%,oĀ”,È,©,¬,è’Pˆê,ĭ“§%ß F,Æ,·,é,×,«,Ā, ,é B

fJf% [ EfL [,ĭ AfT [ftfFX,ĭfsfNfZf< EftfH [f}fbfg,ĀŽw’è,³,ê,é BfT [ftfFX,ªpfƎfbfg%»»,³,ê,½ftfH [f}  
fbfg,Ā, ,é ê ± A

fJf% [ EfL [,ĭ AfCf“fffbfNX,Û,½,ĭfCf“fffbfNXˆæ,Æ,µ,ĀŽw’è,³,ê,é BfT [ftfFX,ĭfsfNfZf< EftfH [f}  
fbfg,ªYUV ftfH [f}fbfg,ðL q,·,éFOURCCfR [fh,É,æ,ðŽw’è,³,ê,Ā,¢,é ê ± AYUV fJf% [ EfL [,ĭ A  
**DDCOLORKEY** ‘¢‘ĭ.

,ĭdwColorSpaceLowValue f“fo,ÆdwColorSpaceHighValue f“fo‘o‘û,ĭ%oˆÊ3fofCfg,ĀŽw’è,³,ê,é B Ā%oˆÊfofCfg,  
ĭVff [f^ A,Q“Ō–Ū,ĭff [f^ A Ā ãÊfofCfg,ĭYff [f^,Ā, ,é B **IDirectDrawSurface2::SetColorKey** f f\fbfh,ĭ  
dwFlags fpf%of [f^,ĭ AfJf% [ EfL [,ªfI [fo [fƎfC,Û,½,ĭfuf fbfn“]‘—,ĭ,Ɔ,ç,ç,ĀŽg,ĭ,ê,é,© A“]‘—  
Ǝ³,È,ĭ,©“]‘— æ,È,ĭ,©,ðŽw’è,·,é BˆÈ%o,ĭ—LƎø,ÈfJf% [ EfL [,ĭ—á,Ā, ,é B

**8frfbfgpfƎfbfg%»f, [fh**

```
// fpfƎfbfg EfGf“fgfŠ26,ĭfJf% [ EfL [  
dwColorSpaceLowValue = 26;  
dwColorSpaceHighValue = 26;
```

**24frfbfgfgfDf< [fJf% [f, [fh**

```
// F255,128,128,ĭfJf% [ EfL [  
dwColorSpaceLowValue = RGBQUAD(255,128,128);  
dwColorSpaceHighValue = RGBQUAD(255,128,128);
```

**FourCC YUVf, [fh**

```
// YUVfJf% [ Y,ĭ100,Æ110,ĭŠŌ  
// U,Û,½,Í v,ĭ50,Æ55,ĭŠŌ,Ā“§%ß,Ā, ,é  
dwColorSpaceLowValue = YUVQUAD(100,50,50);  
dwColorSpaceHighValue = YUVQUAD(110,55,55);
```

**fI [fo [fœfCZfI [f\_ [**

fI [fo [fœfCZfI [f\_ [,Í AFI [fo [fœfC,“œÝ,¢,ÉfNfŠfbfsf“fO,µ ‡,□ ‡”Ô,ðœ”è,·,é B,±  
,ê,É,æ,èDirectDraw%°,lfn [fhfEfFFA EfXfvf%ofCfG EfVfXfef€ŽĀ“•,“%oĀ”\  
,É,È,é BfI [fo [fœfC,Í A‘¼,lfXfNfŠ [f“ EfRf“f| [flf“fg,·,×,Ă,ł ãÊ,ÉÊ’u,·,é,à,ì,Æ%¼’è,³,ê,é B“]‘—  
æfJf%o [ EfL [,Í Afvf%ofCf}  
fŠ EfT [ftfFfX,lfrrfbfg,É,¾,“%oe<ç,³,ê,é,×,«,Ă A‘¼,lfI [fo [fœfC,ÉŽŒ,ç,ê,½fI [fo [fœfC,É%oe<ç,³,ê,é,×,«,Ă,È  
,¢ B“]‘—œ³fJf%o [ EfL [,Í AZfI [f\_Žw’è,ì—L→³,É,æ,ç,,fI [fo [fœfC,É ì—  
p,·,é BŽw’è,³,ê,½ZfI [f\_,ðŽ ,½,È,¢fI [fo [fœfC,Í A fvf%ofCf}fŠ EfT [ftfFfX ã,ì“—,¶—  
Îæ,ÉfI [fo [fœfC,³,ê,é,Æ A—Šú,µ,È,¢ U,é•,¢,ð,·,é BZfI [f\_ [,ìŽw’è,³,ê,Ă,¢,È,¢fI [fo [fœfC,Í A  
ZfI [f\_ [0,Æ,Ý,È,³,ê,é BZfI [f\_,ì”ÍÍ,Í Afvf%ofCf}fŠ EfT [ftfFfX Ā ãÊ,Ă, ,é0,©,ç AŠĪ“ŽŒ,É Ā,à&,¢Ê’u,  
ì40%,Ü,Ā,Ā, ,é BZfI [f\_2,lfI [fo [fœfC,Í AZfI [f\_1,lfI [fo [fœfC,ð•¢,¢  
%oB,· B“—,¶ZfI [f\_,ðŽ ,ĀfI [fo [fœfC,Í“¶ Ý,µ,È,¢ B

**fIf\_tFfXfNfŠ [f“ EfT [ftFfX,ì,½,ß,î,î ”fpfŒfbfg**

DirectDraw,É,æ,è AfIIf\_tFfXfNfŠ [f“ EfT [ftFfX,ÉfAf^fbf`,Ä,«épfŒfbfg,ð•î ” ì ¬,·,é,±,Æ,ª,Ä,«é B,±,ì,Æ,«fIf\_tFfXfNfŠ [f“ EfT [ftFfX,Í Afvf%ŒfCf}fŠ EfT [ftFfX,ÆfpfŒfbfg,ð<□—L,µ,È,Œ Bfvf%ŒfCf}fŠ EfT [ftFfX,ì,à,ì,Æ,Û,È,Ä,½fsfNfZf< EftfH [f}fbfg,ðŽ ,ÄfIf\_tFfXfNfŠ [f“ EfT [ftFfX,ð ì ¬,·,é ê ±,Í Afn [fhfEfFfA,ª,»ê,ðŽg—p,Ä,«é,±,Æ,ª“O’ñ,Ä, ,é B,½,Æ,,Í Afvf%ŒfCf}fŠ EfT [ftFfX,ª16frfbfg EfJf% [f, [fh,ì,Æ,«fpfŒfbfg%»fIf\_tFfXfNfŠ [f“ EfT [ftFfX,ð ì ¬,·,é ê ± Afuf fbfn“]—fn [fhfEfFfA,Í€ ì†,ÉfpfŒfbfg%»fT [ftFfX,ðfgfDf< [fJf% [,Ö•İŠ,·,é,±,Æ,ª,Ä,«é,à,ì,Æ%¼è,·,é B

DirectDraw,Ä,Í A256 F,ð•Ž',Ä,«é•W €8frfbfg,ìfpfŒfbfg%»fT [ftFfX,Æ A,»,ê,¼,ê16 F,ð•Ž',Ä,«é,QŽí—p,ì4frfbfgfpfŒfbfg%»fT [ftFfX,Æ,ð ì ¬,·,é,±,Æ,ª,Ä,«é B4frfbfgfpfŒfbfg%»fT [ftFfX,Ìªê,ìf^fCfv,ÍfgfDf< [fJf% [,ìfJf% [ Efe [fuf<,ÄfCf“fffbfNfX,³,ê Aª“ñ,ìf^fCfv,Ífvf%ŒfCf}fŠ EfT [ftFfX,ìfCf“fffbfNfX EfJf% [ Efe [fuf<,ÉfCf“fffbfNfX,³,ê,é B,±,Ìª“ñ,ìf^fCfv,Í Aªê,ìf^fCfv,Ì”¼ª,ìff [f^—Ê,Ä İ,Y AfXfvf%ŒfCf,ðŠi”[,·,é,½,ß,ÉŠÖ Ú“İ,Ê—p,Œ,ç,ê,½,è,·,é B

,±,ê,ç,ìfT [ftFfX,ª ì ¬,³,ê,é,Æ,«É,Í Afuf fbfn“]—fn [fhfEfFfA,Í€ ì†,ÉfpfŒfbfg,ì’uŠ,ª%Ä”\,Ä,È,¬,ê,Ì,È,ç,È,Œ B,µ,½,ª,Ä,Ä AfpfŒfbfg%»fT [ftFfX,©,çfpfŒfbfg%»fT [ftFfX,Öfuf fbfn“]—‘€ ì,ª s,í,ê,é,Æ A,»,ìfpfŒfbfg,İ—³Ž<,³,ê,é BfpfŒfbfg,ìffR [fh,Í AfgfDf< [fJf% [ EfT [ftFfX,ì ê ±,Æ A4frfbfgfpfŒfbfg,ª8frfbfgfpfŒfbfg EfCf“fffbfNfX,Ö,ìfCf“fffbfNfX,Ä, ,é ê ±,Æ,Ä,¾,¬ s,í,ê,é B¼,ì ê ±,Ä,Í AfCf“fffbfNfX EfpfŒfbfg,Í“]—æ,ìfpfŒfbfg,É,È,é B

fpfŒfbfg%»fT [ftFfX,ì%ŒfXf^€ ì,İ—³Ž<,³,ê,é B,Û,½fAf^fbf`,³,ê,½fpfŒfbfg,ì•İ X^€ ì,İ,«í,ß,Ä ,¬,Ä, ,é B,±,ê,çfpfŒfbfg%»,³,ê,½fT [ftFfX,ì,R,Ä,·,×,Ä,Í A3DfAfNfZf%Œ [fVf±f“ Efn [fhfEfFfA,ìfefNfXf`ff,Æ,µ,Ä fTf] [fg,³,ê,È,,Ä,Í,È,ç,È,Œ B

fIf\_tFfXfNfŠ [f“ EfvfŒ [f“ EfT [ftFfX,ìfsfNfZf< EftfH [f}fbfg,É,Ä,Œ,Ä,ì,³,ç,É Ú,µ,Œ îñ,Í A uIfIf\_tFfXfNfŠ [f“ EfT [ftFfX,ìftfH [f}fbfg v,ðŽQ ,Æ,·,é,±,Æ B

fuf fbfN“]‘—,ÆfVfXfef€ Ef f,fŠ EfT [ftfFfX

fVfXfef€ Ef f,fŠ,©,ç A,Ü,½,ÍfVfXfef€ Ef f,fŠ,ÖŒø—“I,Èfuf fbfN“]‘—,ð%â”\  
,É,·,éDMAfn [fhfEfFfA,ð,à,ÂftfBfXfvfŒfC EfJ [fh,ª, ,é Bfhf%oCfo,Í A,±,ì,“@”,ðDDCAPS  
‘ç‘Ì,ð’Ê,µ,Ä’m,ç,¹,é B,±,Ì ‘ç‘Ì,ÍŽŸ,Ì12,Ì V,µ,çf f“fo,©,ç \ ¬,³,ê,é B

dwSVBCaps	dwVSBCaps	dwSSBCaps
dwSVBCKeyCaps	dwVSBCKeyCaps	dwSSBCKeyCaps
dwSVBFXCaps	dwVSBFXCaps	dwSSBFXCaps
dwSVBRops	dwVSBRops	dwSSBRops

—ªŒêSVB,Í AfVfXfef€ Ef f,fŠ,©,çffBfXfvfŒfC Ef f,fŠ,Ö,Ìfuf fbfN“]‘—,ÉŠÖŒW,·,é”\—Í’l,ðŽ’,· B  
VSB,Í AftfBfXfvfŒfC Ef f,fŠ,©,çfVfXfef€ Ef f,fŠ,Ö,Ìfuf fbfN“]‘—,ÉŠÖŒW,·,é”\—  
Í’l,ðŽ’,· BSSB,Í AfVfXfef€ Ef f,fŠ,©,çfVfXfef€ Ef f,fŠ,Ö,Ìfuf fbfN“]‘—,ÉŠÖŒW,·,é”\—Í’l,ðŽ’,· B

dwSVBCapsf f“fo,Í AdwCapsf f“fo,É‘Î%ž,·,é B,½,¾,µ AfVfXfef€ Ef f,fŠ,©,çffBfXfvfŒfCf f,fŠ,Ö,Ìfuf  
fbfN“]‘—,ÉŠÖŒW,·,éffBfXfvfŒfC Efhf%oCfo,Ì”\—Í,ð‘L q,·,é ê ‡,ð æ, B “—  
l,É AdwSVBCKeyCapsf f“fo,Í  
dwCKeyCapsf f“fo,É‘Î%ž,µ AdwSVBFXCapsf f“fo,ÍdwFXCapsf f“fo,É‘Î%ž,·,é B dwSVBRopsf f“fo”z—  
ñ,Í A,±,Ìf^fCfv,Ìfuf fbfN“]‘—,Äfhf%oCfo [ªfTf| [fg,·,éf%oXf^‘€ ì,ð‘L q,·,é B

,±,ê,ç,Ìf f“fo [l,Í A dwCaps,Ä DDCAPS\_CANBLTSYSMEM ftf%oO,ªfZfbfg,³,ê,Ä,ç,é ê ‡,É,Ì,Ÿ—  
LŒø,Ä, ,é B,±,Ìftf%oO,ªfZfbfg,³,ê,Ä,ç  
,é,Æ AfVfXfef€ Ef f,fŠ,©,ç A,Ü,½,ÍfVfXfef€ Ef f,fŠ,Ö Afuf fbfN“]‘—,Ä,«,é”\—Í,ªfhf%oCfo [l,É, ,é,±  
,Æ,ðŽ’,µ,Ä,ç,é B

fn [fhfEfFfA Efuf fbfN“]‘—,É,æ,Á,ÄŽg,í,ê,Ä,ç,éVfXfef€ Ef f,fŠ EfT [ftfFfX,ªf fbfN,³,ê,Ä,ç  
,È,ç ê ‡ A DirectDraw,ÍŽ©“®“I,É AfT [ftfFfX,É‘Î,µ IDirectDrawSurface2::PageLock f f\fbfh,ðŒÄ,Ñ o,· B

## DirectDraw f`f... [fgfŠfAf<

,±,ì ß,í A`ê`A,ìf`f... [fgfŠfAf<,©,ç \ ¬,³,ê,é B,»,ê,¼,êfXfefbfv,²,Æ,É A ŠÈ`P,ÈDirectDraw  
fAfvfŠfP [fVf±f“,ðŽÀÆ»,.,é,½,ß,ì•û-@,ð Ð%oi,.,é B,±,ê,ç,ìf`f... [fgfŠfAf<,í ASDK,É,æ,Á,Ä`ñ<Ÿ,³,ê,é  
DirectDrawfTf“fvf<ftf@fCf<,ì¼,ðŽg,Á,Ä,ç,é BfTf“fvf<,ì¼,,í DDEX,Æ,ç,¤•¶Žš,ð æ““,É-¼•t,¯,ç,ê,Ä,ç,é B,±  
,ê,ç,ìfTf“fvf<,Á,í A DirectDraw,ð,Ç,ì,æ,¤,É,µ,ÄfZfbfgfAfbfv,.,é,© A ŠÈ`P,Èf^fXfN,ðŽÀÆ»,.,é,½,ß,É DirectDraw  
f ffbfh,ð,Ç,ì,æ,¤,ÉŽg,¤,©,ð Ð%oi,.,é B

f`f... [fgfŠfAf<1: DirectDraw,ìŠi`b(DDEX1)

f`f... [fgfŠfAf<2: frfbfgf}fbfv,ðfofbfN Efofbftf@,É“]“(DDEX2)

f`f... [fgfŠfAf<3: fIfTfXfNfŠ [f“ EfT [ftfFfX,©,ç,ìfuf fbfN“]“(DDEX3)

f`f... [fgfŠfAf<4: fJf%o [ EfL [,Æfrfbfgf}fbfv EfAfjf [fVf±f“(DDEX4)

f`f... [fgfŠfAf<5: fpfÆfbfg,ì“®“I•ĩ X(DDEX5)

,±,ê,ç,ìf`f... [fgfŠfAf<,ìfTf“fvf<,í A IDirectDraw,Æ IDirectDrawSurface  
fCf“f^ [ftfFfCfX,ìÆÄ,çfo [fWf±f“,ðŽg,Á,Ä,ç,é B DirectX 3 fCf“f^ [ftfFfCfX—IDirectDraw2,Æ  
IDirectDrawSurface2—,ðŽg,¤,±,ê,ç,ì—á,ðfAfbfvff [fg,.,é ê ±,í A—¼•û,ìfCf“f^ [ftfFfCfX,É  
QueryInterface,ð%oÁ,!,é,±,Æ B,±,ê,É,Ä,ç,Ä,í A uIDirectDraw2,Ä%o½,ª V,µ,,É,Ä,½,©?  
v,Æ uIDirectDrawSurface2,Ä%o½,ª V,µ,,É,Ä,½,©? v,Ä à-¾,³,ê,Ä,ç,é B,³,ç,ÉIDirectDraw2,Ü,½,í  
IDirectDrawSurface2,É,æ,Á,Ä AfAfbfvff [fg,³,ê,½f ffbfh,ÉŠ,,è“-Ä,ç,ê,½fpf%of [f^,ð•ĩ X,.,é•K—v,ª, ,é B

---

## Note

,±,ê,ç,ìf`f... [fgfŠfAf<,ì DDEXfTf“fvf<ftf@fCf<C++,Ä ‘,©,ê,Ä,ç,é B CfRf“fpfCf%,ðŽg,Á,Ä,ç  
,é ê ± AfRf“fpfCf%,ð’Ê,.,½,ß,Éftf@fCf<,ð“K<X•ĩ X,µ,È,¯,ê,ĩ,È,ç,È,ç BCfRf“fpfCf%,É’Ê,.,½,ß,É,í A ,È,-  
,Æ,àvtablefCf“f^ [ftfFfCfX Ef ffbfh,É,Ä,ç,Ä,ìthisf|fCf“f^,ð%oÁ,!,é•K—v,ª, ,é B,³,ç,É Ú,µ,ç î•ñ,í A  
uC,Ä,ìCOMfIfufWfFfNfg,Ö,ìfAfNfZfX v,ðŽQ Æ,.,é,±,Æ B

---

***f`f... [fgfŠfAf< 1: DirectDraw,İŠi`b***

DirectDraw,đŽg,▯,É,Í A,Ü,,Žn,ß,É A fRf“fsf...

[f^,İffBfXfvfŒfC EfAf\_fvf^,đ•Œ»,·,éDirectDrawIfufWfFfNfg,İfCf“fXf^f“fX,đ ì ¬,μ,È,¯,ê,Î,È,ç,È,¢ B,»,μ,Ä A,»,İfIfufWfFfNfg,đ'€ ì,·,é,½,ß,İfCf“f^ [ftfFfCfXf ffbfh,đŽg—p,·,é B%oÄ,!,Ä AfQ [f€

,đfOf%oftfBfbfNfT [ftfFfX ä,É•Ž!,·,é,½,ß,É,Í A

DirectDrawSurfaceIfufWfFfNfg,İfCf“fXf^f“fX,đê,Â,©,»,êÈ ä ì ¬,·,é•K—v,<sup>a</sup>, ,é B ,±,ê,đ à-

¾,·,é,½,ß,É ASDK,ÉŠÜ,Ü,ê,éDDEX1,İfTf“fvf<,đŽŸ,İfXfefbfbv,Ä Đ%oi,·,é B

Step 1: DirectDrawIfufWfFfNfg,İ ì ¬

Step 2: fAfvfŠfP [fVf±f“,İ U,é•',¢,İŒE`è

Step 3: fffBfXfvfŒfC Ef, [fh,İ•İ X

Step 4: ftfŠfbfsf“fO EfT [ftfFfX,İ ì ¬

Step 5: fT [ftfFfX,Ö,İfŒf“f\_fŠf“fO

Step 6: fT [ftfFfX,Ö,İ ‘,«,±,Ý

Step 7: ftfŠfbfsf“fO EfT [ftfFfX

Step 8: DirectDrawIfufWfFfNfg,İŠ,,è“-Ä í ø

### Step 1: DirectDrawIfufWfFfNfg,İ ì ¬

DirectDrawIfufWfFfNfg,İfCf“fXf^f“fX,đ ì ¬,·,é,É,Í A DDEX1fvf fOf%of€,İdoInit ŠÖ ”“à,ÂŽ!,<sup>3</sup>,ê,é,æ,□  
,É A DirectDrawCreate ŠÖ ”,đŽg,□ BDirectDrawCreate,Í3,Â,İfpf%of [f^,đ•K—v,Æ,·,é B  
‘æ~ê,İfpf%of [f^,É,Í AfffBfXfvfƎfC EfffofCfX,đ•\Ǝ»,·,éfOf [f of< Ef†fj [fNŽ~•ÊŽq (GUID)  
,đ,Æ,é BGUID,Í,Û,Æ,ñ,Ç,İ ê ‡NULL,ÉfZfbfg,<sup>3</sup>,ê,é,<sup>a</sup> A,±,ê,İDirectDraw,<sup>a</sup>fVfXfef€  
,İffftfHf<fg,İfffbfXfvfƎfC EfffofCfX,đŽg,□,±,Æ,đ~Ó—i,μ,Ä,Ǝ,é B  
‘æ~ñ,İfpf%of [f^,Í A ì ¬,<sup>3</sup>,ê,½DirectDrawIfufWfFfNfg,İf fP [fVf‡f“,đŽ~•Ê,·,éf|  
fCf“f^,İfAfhfƎfX,đŽ ,Â B‘æŽO,İfpf%of [f^,Í,Â,Ê,ÉNULL,ÉfZfbfg,<sup>3</sup>,ê,Ä,Ǝ,é,<sup>a</sup> A,±,ê,Í «—^,İŠg’Ǝ  
,Ê”ö,!,é,½,ß,Ä, ,é B

ŽŸ,İ—á,Í A DirectDrawIfufWfFfNfg,İ ì ¬•û—@,Æ A,»,İ ^— ,<sup>a</sup> ¬Ǝ±,μ,½,©,Ç,□,©,đ”»’f,·,é•û—@,đŽ!,μ,Ä,Ǝ,é B

```
ddrval = DirectDrawCreate(NULL, &lpDD, NULL);  
if(ddrval == DD_OK)  
{  
    // lpDD,Í—LƎø,ÈDirectDrawIfufWfFfNfg,Â, ,é  
}  
else  
{  
    // DirectDrawIfufWfFfNfg,Í ì ¬,Â,«,È,©,Á,½  
}
```

Step 2: fAfvfŠfP [fVf‡f“,İ U,é•,¢,İŒ~è

ffBfXfvfŒfC,İ%øđ“æ“x,đİ X,·,é‘O,É,Í A Ä‘áŒÄIDirectDraw2::SetCooperativeLevel  
f f\fbfh,İfpf%of [f^dwFlags ,É, ,éDDSCL\_EXCLUSIVE,Æ DDSCL\_FULLSCREEN  
ftf%ofO,đŽw’è,µ,È,¯,ê,İ,È,ç,È,¢ B,±  
,ê,È,æ,è AfAfvfŠfP [fVf‡f“,“ffBfXfvfŒfC EfffofCfX,đŠ@‘S,ÉfRf“fgf [f<,Ä,«,é,æ,□  
,É,È,è A‘¼AfAfvfŠfP [fVf‡f“,İffBfXfvfŒfC EfffofCfX,đ□—L,Ä,«,È,.,É,é B%Ä,İ,Ä DDSCL\_FULLSCREEN  
ftf%ofO,Í AfAfvfŠfP [fVf‡f“,đ”r‘¼“İ iftf<fXfNfŠ [f“ jf, [fh,ÉfZfbfg,·,é B,·,é,ÆfAfvfŠfP [fVf‡f“,İffXf  
Nfgfbfv,¢,Ä,İ,¢,É L,·,é A,Ü,½,»,İfAfvfŠfP [fVf‡f“,¾,¯,“fXfNfŠ [f“,É ‘,«,±,Đ,±,Æ,·,é,Ä,«,é,æ,□  
,É,È,é B,»,İ ó‘Ö,Ä,à AfffXfNfgfbfv,İ,Ü,¾—~p%Ä”,Ä, ,é i,½,Æ,İ,İ A”r‘¼“If, [fh,Ä“@,-  
fAfvfŠfP [fVf‡f“,É,¯,¢,ÄffXfNfgfbfv,đŒ©,é,É,İ ADDEX1,đfXf^ [fg,³,¹ A ALT + TAB,đ%Ÿ,¹,İ,æ,¢ j B

ŽŸ,İ—á,Ä,Í IDirectDraw2::SetCooperativeLevel ,İŽg,¢•û,đ à~¾,µ,Ä,¢,é B

HRESULT ddrval;  
LPDIRECTDRAW lpDD; // DirectDrawCreate,É,æ,Ä,Ä,·,Ä,É İ ¬,³,ê,Ä,¢,é

ddrval = lpDD->SetCooperativeLevel(hwnd, DDSCL\_EXCLUSIVE |  
DDSCL\_FULLSCREEN);  
if(ddrval == DD\_OK)  
{  
    // ”r‘¼“If, [fh,İ ¬Œ÷,µ,½.  
}  
else  
{  
    // ”r‘¼“If, [fh,İŽ,”s,µ,½  
    // ,µ,©,µ AfAfvfŠfP [fVf‡f“,İ,Ü,¾“@,¢,Ä,¢,é  
}

IDirectDraw2::SetCooperativeLevel,<sup>a</sup>

DD\_OK,đ•Ö,³,È,¢ ê ‡,Ä,à AfAfvfŠfP [fVf‡f“,İ‘± s,Ä,«,é B,µ,©,µ AfAfvfŠfP [fVf‡f“,”r‘¼“If, [fh,É,È,¯,ê  
,İ A—v< ,³,ê,éfpftfH [f]f“fX,đŽÄŒ»,Ä,«,È,¢%Ä”\ «,·,é B,±,İ ê ‡ A‘± s,·,é,©,Ç,□  
,©ft [fU,ÉŒ~è,³,¹,éf fbfZ [fW,đ•Ž!,µ,½,Ü,□,“—Ç,¢,¾,ë,□ B

IDirectDraw2::SetCooperativeLevel,đŽg,□ ê ‡ AfAfvfŠfP [fVf‡f“,“Ÿ İ I—¹,µ,½,±  
,Æ,đWindows,É’m,ç,¹,é,æ,²fEfBf“fhfE Efnf“fhf<(HWND),đ“n,³,È,¯,ê,İ,È,ç,È,¢ B,½,Æ,İ,İ A^ê”Ê•ŮŒi  
(GP)^á”½,·,éN,±,èGDI,“fofbfN Efofbftf@,ÉftfŠbfsf“fO,³,ê,Ä,¢,é,Æ Af† [fU,İ Windows,İfXfNfŠ [f“,đŽæ,è—ß,·,±  
,Æ,·,Ä,«,È,¢ B,±,ê,đ—h,®,½,ß DirectDraw,İ A,»,İfEfBf“fhfE,É‘—  
,ç,ê,½f fbfZ [fW,đfgf%ofbfv,·,éofbfNfOf%ofEf“fh Efvf fZfX,đ’ñ<Ÿ,µ,Ä,¢  
,é Bfgf%ofbfv,µ,½f fbfZ [fW,đŽg,¢ A DirectDraw,İfAfvfŠfP [fVf‡f“,·,é,Ä I—¹,µ,½,©Œ~è,·,é B,±,İ<@”  
,É,İ §ŒÄ,·,é,Ä,©, ,é B,Ü,·,é AfAfvfŠfP [fVf‡f“,İ,½,ß,İf fbfZ [fW,đŽæ“¾,µ,Ä,¢  
,éEfBf“fhfE Efnf“fhf<,đŽw’è,µ,È,¯,ê,İ,È,ç,È,¢ B ,Ä,Ü,è AfEfBf“fhfE,đ,à,□  
,Đ,Æ,Ä İ ¬,·,é ê ‡ AŽw’è,·,éEfBf“fhfE,İSmŽÄ,ÉfAfNfefBfu,Ä,È,·,Ä,İ,È,ç,È,¢ B,³,à,è,¢,Æ AGDI,©,ç—  
\Šú,µ,È,¢ U,é•,¢,·,¢ ¶,¶,½,è A ALT+TAB,đ%Ÿ,µ,Ä,àfŒXf|f“fX,·,é,©,Ä,½,è,æ,¢,Ä,½—â‘è,É~ ,□,±,Æ,·,é B



### Step 3: ffbfXfvfC Ef, [fh,l·i X

fAfvfŠfP [fVfzf“l U,é•,cfZfbfg,μ,½Eã,Å A IDirectDraw2::SetDisplayMode

f f\fbfh,žg,cf AffbfXfvfC,l%đ‘œ“x,đ·i X,·,é,±,Æ,ª,Å,«,é BŽŸ,l—á,Å,Í AffbfXfvfC Ef, [fh,đ 640  
‘480’8 bpp,ÉfZfbfg,·,éû—@,ž‘,μ,Å,cf B

HRESULT ddrval;

LPDIRECTDRAW lpDD; // ,·,Å,É i ¬,³,ê,Å,cf,é

ddrval = lpDD->SetDisplayMode(640, 480, 8);

if(ddrval == DD\_OK)

{

// ffbfXfvfC Ef, [fh,l·i X,Í ¬E÷,μ,½

}

else

{

// ffbfXfvfC Ef, [fh,l·i X,Å,«,È,©,Á,½

// f, [fh,ªfTf| [fg,³,ê,Å,cf,È,cf,© A‘¼,lAfvfŠfP [fVfzf“,ª

// ”r‘¼“lf, [fh,É,È,Á,Å,cf,é

}

ffbfXfvfC Ef, [fh,đfZfbfg,·,é,É,½,è Af† [fU,lfn [fhEfFA,ª ,%đ‘œ“x,đfTf| [fg,μ,Å,cf,È,cf,È,cf

,Æ,«,É,ÍffbfXfvfC EfAf\_fvf^,l‘á‘½ ”,ªfTf| [fg,μ,Å,cf,é•W Ef, [fh,ÉfAfvfŠfP [fVfzf“,ªœA,Å,«,é,±

,Æ,đ•Ů Ø,μ,Å,·,©,È,¬,ê,l,È,ç,È,cf B,½,Æ,‘,l A640‘480’8,Æ,cf,•W Ef,lfofbfNfAfbfv%đ‘œ“x,đfTf| [fg,μ,Å,cf

,é,·,×,Å,lVfXfef€,Å“®,æ,cfAfvfŠfP [fVfzf“,đ ŸEv,·,é,×,«,Å, ,é (—

v< ,·,é%đ‘œ“x,ÉffbfXfvfC EfAf\_fvf^,đfZfbfg,Å,«,È,©,Á,½ ê ‡ AIDirectDraw::SetDisplayMode,ÍfGf% [

lDDERR\_INVALIDMODE,đ•Ů,· B,μ,½,ª,Å,Å AffbfXfvfC Ef, [fh,đfZfbfg,μ,æ,□

,Æ,·,é‘O,É Af† [fU,lffbfXfvfC EfAf\_fvf^,l“Á’è,Å,«,é IDirectDraw2::EnumDisplayModes f\fbfh,žg,□

,×,«,Å, ,é) B

#### Step 4: $\text{ftf}\tilde{\text{Sfbfsf}}\text{fO EfT [ftfFX,}\tilde{\text{I}}\text{ } \neg$

```
ffBfXfvfC Ef, [fh,dfZfbfg,μ,½,ç AfAvfŠfP [fVf±f“,ÄŽg—
p,·,éT [ftfFX,δ ì ¬,μ,È,¯,ê,Î,È,ç,È,Ç BDDEX1,Ì—
á,Ä,Í A”r¼“I ift<fXfNfŠ [f“ jf, [fh,ÉfZfbfg,·,é,½,ßIDirectDraw2::SetCooperativeLevel f f\fbfh,ðŽg,Ä,Ä,Ç
,é,Ì,Ä AfT [ftfFXŠÖ,ÄftfŠfbfsf“fO,·,éT [ftfFX,δ ì ¬,·,é,±
,Æ,ª,Ä,«,é Bf, [fh,δDDSC_L_NORMAL,ÉfZfbfg,·,é,½,ßIDirectDraw2::SetCooperativeLevel,ðŽg,Ä,½ ê ± A
fT [ftfFXŠÖ,Äfuf fbfN“]—
,·,éT [ftfFX,μ,© ì ¬,Ä,«,È,Ç BftfŠfbfsf“fO EfT [ftfFX,δ ì ¬,·,é,É,Í AŽŸ,Ì,æ,µ,ÈfXfefbfv,Ä s,µ B
fT [ftfFX—v< ,Ì’è<
fT [ftfFX ì ¬
```

#### $\text{fT [ftfFX—v< ,Ì’è<}$

```
ftfŠfbfsf“fO EfT [ftfFX,δ ì ¬,·,é Ä %,ÌfXfefbfv,Í A DDSURFACEDESC \‘c‘Ì,ÌfT [ftfFX—
v< ,ð’è<,·,é,±,Æ,Ä, ,é BŽŸ,Ì—á,Ä,Í AftfŠfbfsf“fO EfT [ftfFX,δ ì ¬,·,é,Ì,È•K—
v,È A \‘c‘Ì’è<,Æftf%oO,ðŽ,μ,Ä,Ç,é B
```

```
// fofbfN Efofbftf@,ð,Đ,Æ,ÄŽ ,Äfvf%oCf}fŠ EfT [ftfFX,δ ì ¬,·,é
ddsd.dwSize = sizeof(ddsd);
ddsd.dwFlags = DDSD_CAPS | DDSD_BACKBUFFERCOUNT;
ddsd.ddsCaps.dwCaps = DDSCAPS_PRIMARYSURFACE |
    DDSCAPS_FLIP | DDSCAPS_COMPLEX;

ddsd.dwBackBufferCount = 1;
```

```
,±,Ì—á,Ä,Í A dwSizef f“fo,É DDSURFACEDESC \‘c‘Ì,ÌfTfCY,ðfZfbfg,·,é B ,±,È,ÍDirectDraw
f f\fbfhÆÄ,Ñ o,μ,Ä—LÆø,Ä,È,Çf f“foGf%o [,ªÖ,Ä,Ä,±,È,Ç,æ,µ,É,·,é,½,ß,Ä, ,é i dwSizef f“fo,Í A
DDSURFACEDESC \‘c‘Ì,Ì «—,ÌŠg’£,Ì,½,ß,È—pÖ,ª,é,½,à,Ì,Ä, ,é j B
```

```
dwFlagsf f“fo,Í A DDSURFACEDESC \‘c‘Ì,Ì,Ç,Ìf f“fo,É—LÆø,È îñ,ªÖ,ª,é,é,©Æ”è,·,é BDDEX1,Ì—
á,Ä,Í AdwFlags,ðfZfbfg,·,é,±,Æ,Ä ADDSCAPS \‘c‘Ì,ðŽg,Ç(DDSD_CAPS)fofbfN Efofbftf@
,δ ì ¬,·,é(DDSD_BACKBUFFERCOUNT),±,Æ,ðŽw’è,μ,Ä,Ç,é B
```

```
dwCapsf f“fo,Í A DDSCAPS \‘c‘Ì,ÄŽg,í,è,éftf%oO,ðŽ,μ,Ä,Ç,é B,±,Ì ê ±,Í Afvf%oCf}
fŠ EfT [ftfFX(DDSCAPS_PRIMARYSURFACE),ÆftfŠfbfsf“fO EfT [ftfFX
(DDSCAPS_FLIP) A; j ±fT [ftfFX (DDSCAPS_COMPLEX),ðŽw’è,μ,Ä,Ç,é B
```

```
ÄÆä,É A,±,Ì—á,Ä,ÍfofbfN Efofbftf@,ð,Đ,Æ,ÄŽw’è,μ,Ä,Ç
,é BfofbfN Efofbftf@,Í A”wÆi,ÆfXfvf%oCf,ªÄ Û,É ‘,«,±,Û,È,é ê Š,Ä, ,é B,»,μ,ÄfofbfN Efofbftf@,Í
Afvf%oCf}fŠ EfT [ftfFX,ÉftfŠfbfsf“fO,ª,é B DDEX1,Ì—á,Ä,ÍfofbfN Efofbftf@,Ì ”,Í1,ÉfZfbfg,ª,é,Ä,Ç
,é,ª A fffBfXfvfC Ef f,fŠ,ª<,·,©,¬,è,Ç,,Ä,Ä,à ì ¬,·,é,±
,Æ,ª,Ä,«,é BfofbfN Efofbftf@,ÉŠÖ,·,é,ª,É Û,μ,Ç îñ,Í A ufqfŠfvf< Efofbftf@fŠf“fO v,ðŽQ Ä,·,é,±
,Æ B.
```

```
fT [ftfFX Ef f,fŠ,ÍffBfXfvfC Ef f,fŠ,É,àfVfXfef€ Ef f,fŠ,É,à’u,,±,Æ,ª,Ä,«,é B
DirectDraw,Í AfAvfŠfP [fVf±f“,ªffBfXfvfC Ef f,fŠŠÖ,Ä“@,,Æ,«,ÍfVfXfef€ Ef f,fŠ,ðŽg,µ
(½,Æ,,Í A1MB,ÌRAMf f,fŠ,μ,©,È,ÇffBfXfvfC EfAf_fvf^ ä,Ä A,Đ,Æ,Ä”È ä,ÌfofbfN Efofbftf@,ðŽw’è,
·,é,æ,µ,È ê ±,Ä, ,é) B DDSCAPS
\‘c‘Ì,ÌdwCapsf f“fo,ðDDSCAPS_SYSTEMMEMORY,Û,½,ÍDDSCAPS_VIDEOMEMORY,ÉŽw’è,·,é,±
,Æ,É,æ,Ä,Ä AfVfXfef€ Ef f,fŠ,¾,¬,ðŽg,µ,©ffBfXfvfC Ef f,fŠ,¾,¬,ðŽg,µ
,©,ðŽw’è,Ä,«,é iDDSCAPS_VIDEOMEMORY,ðŽw’è,μ,½,É,àŠÖ,í,ç,,fT [ftfFX ì ¬,É [ª,Èf f,fŠ,ð—
p,Ä,«,È,Ç ê ±,Í A IDirectDraw2::CreateSurface,ª DDERR_OUTOFVIDEOMEMORYfGf%o [,ªÖ,é j B
```

#### $\text{fT [ftfFX,}\tilde{\text{I}}\text{ } \neg$

```
DDSURFACEDESC \‘c‘Ì,Ìf f“fo,ð—,,ß,½,ç A DirectDrawCreate ,ª ì ¬,μ,½DirectDrawfIfufWfFfNfg,Ö,Ìf|Cf“f^
lpDD,ÄDDSURFACEDESC \‘c‘Ì,Æ,ðŽg,Ä,Ä A IDirectDraw2::CreateSurface f f\fbfh,ðÆÄ,Ñ o,·,±
,Æ,ª,Ä,«,é BŽŸ,È—á,ðŽ,· B
```

```
ddrval = lpDD->CreateSurface(&ddsd, &lpDDPrimary, NULL);
if(ddrval == DD_OK)
{
    // V,μ,ÇfT [ftfFX,ðŽw,lpDDPrimary
```

```

}
else
{
    // fT [ftFfX,ª ì ¬,³,ê,È,©,Á,½
    return FALSE;
}

lpDDSPPrimary fpf%of [f^,Í AÆÄ,Ñ o,µ,ª ¬Æ÷,µ,½ ê ‡ A IDirectDraw::CreateSurface,ªÔ,·fvf%ofCf}
fŠ EfT [ftFfX,Ö,ìf|fCf“f^,Æ,È,é B

fvf%ofCf}fŠ EfT [ftFfX,Ö,ìf|fCf“f^,ðŽæ“¾,µ,½,ç AŽŸ,ì—á,ÄŽ!,·Ê,è AfobfN Efofbftf@,ìf|
fCf“f^,ðŽæ“¾,·,é,½,ß,É IDirectDrawSurface2::GetAttachedSurface f f\bfh,ðŽg—p,Ä,«,é B

ddscaps.dwCaps = DDSCAPS_BACKBUFFER;
ddrval = lpDDSPPrimary->GetAttachedSurface(&ddcaps, &lpDDSBack);
if(ddrval == DD_OK)
{
    // lpDDSBack,Í AfobfN Efofbftf@,Ö,ìf|fCf“f^
}
else
{
    return FALSE;
}

fT [ftFfX,ìfvf%ofCf}fŠ EfT [ftFfX,ìfAfhfÆfX,ð’ñ<Ÿ,µ ADDSCAPS_BACKBUFFER ftf%ofO,Ä”\—
Í’l,ðfZfbfg,·,é,±,Æ,É,æ,Á,Ä A IDirectDrawSurface2::GetAttachedSurface,ìÆÄ,Ñ o,µ,ª ¬Æ÷,µ,½ ê ‡ A
lpDDSBack fpf%of [f^,Í fobfN Efofbftf@,Ö,ìf|fCf“f^,Æ,È,é B

```

## Step 5: `ft [ftFfX,Ö,İfÆf“f_Šf“fO`

`f\vf%oCf}fŠ Eft [ftFfX,ÆfobfN Efofbftf@,ª ì ¬,³,ê,½Æã A DDEX1fTf“f\vf<,Ä,Í A•W €,İ Windows GDI ŠÖ ”,ðŽg,¢f\vf%oCf}fŠ Eft [ftFfX,ÆfobfN Efofbftf@ Eft [ftFfX ä,Ä,¢,-,Ä,©,İfLlXfg,ðfÆf“f_Šf“fO,µ,Ä,¢,é BŽŸ,İ—á,ÄŽ,‘,‘Ê,è,Ä, ,é B`

```
if (lpDDSPPrimary->GetDC(&hdc) == DD_OK)
{
    SetBkColor(hdc, RGB(0, 0, 255));
    SetTextColor(hdc, RGB(255, 255, 0));
    TextOut(hdc, 0, 0, szFrontMsg, lstrlen(szFrontMsg));
    lpDDSPPrimary->ReleaseDC(hdc);
}
```

```
if (lpDDSBack->GetDC(&hdc) == DD_OK)
{
    SetBkColor(hdc, RGB(0, 0, 255));
    SetTextColor(hdc, RGB(255, 255, 0));
    TextOut(hdc, 0, 0, szBackMsg, lstrlen(szBackMsg));
    lpDDSBack->ReleaseDC(hdc);
}
```

—á,Ä,Í AfffoCfX EfRf“fefLlXfg,Ö,İfnf“fhf<,ðŽæ“¾,‘,é,½,ß,É **IDirectDrawSurface2::GetDC**  
`f f\fbfh,ðŽg,¢ A“à”,ÄfT [ftFfX,ðf fbfN,µ,Ä,¢,é BfffoCfX EfRf“fefLlXfg,Ö,İfnf“fhf<,ðK—  
v,Æ,‘,éWindowsŠÖ ”,ðŽg,İ,È,¢,İ,È,ç AfobfN Efofbftf@,ðf fbfN,Ü,½,İf fbfN%oð æ,‘,é,½,ß,É  
IDirectDrawSurface2::Lock and IDirectDrawSurface2::Unlock,Æf f\fbfh,ðŽg,µ,±,Æ,ª,Ä,«,é B`

`fT [ftFfX Ef f,fŠ ifT [ftFfX,İ‘S‘İ A,à,µ,İ‘ê” j,ðf fbfN,‘,é,±  
,Æ,Í AfAfvfŠfP [fVf±f“,ÆfVfXfef€ Efuf fbfN“‘—,Æ,“~Žž,ÉfT [ftFfX Ef f,fŠ,ÖfAfNfZfX,Ä,«,È,¢,±  
,Æ,ðÖ—İ,µ,Ä,¢,é B,±,è,Í AfAfvfŠfP [fVf±f“,ªfT [ftFfX Ef f,fŠ,Ö ‘,«,±,Ý‘†,ÉfGf%o [,” ¶,µ,È,¢,æ,µ  
,É,‘,é,½,ß,Ä, ,é B,³,ç,É AfAfvfŠfP [fVf±f“,Í AfT [ftFfX Ef f,fŠ,ªf fbfN%oð æ,³,è,é,Ü,Äfy [fW EftfŠfb  
fsf“fO,Ä,«,È,¢ B`

`fT [ftFfX,ªf fbfN,³,è,½Æã AfTf“f\vf<,Ä,Í A”wEi F,ðfZfbfg,‘,é,½,ß,É•W €,İWindows GDI ŠÖ ”  
SetBkColor,ðŽg,¢ A”wEi,É‘u,-  
fefLlXfg,İ F,ð‘İ,Ö,½,ß,ÉSetTextColor,ð AfT [ftFfX ä,ÉfefLlXfg,Æ”wEi F,ð ‘,½,ß,ÉTextOut,ðŽg,Ä,Ä,¢  
,é B`

`fTf“f\vf<,Ä,Í Afobfbftf@,ÉfefLlXfg,ð ‘,« ž,ñ,¾Æã AIDirectDrawSurface2::ReleaseDC  
f f\fbfh,ðŽg,¢fT [ftFfX,ðf fbfN%oð æ,µ,Ä,¢,é BfAfvfŠfP [fVf±f“,ªfobfN Efofbftf@,Ö,İ ‘,« ž,Ý,ð I—  
¹,µ,½,Æ,«,Í İ,É A IDirectDrawSurface2::ReleaseDC,Ü,½,İ  
IDirectDrawSurface2::Unlock,İ,Ç,¿,ç,©,ð ê ±,É%ož,¶,ÄÆÄ,Ň o,³,È,—,ê,İ,È,ç,È,¢ BfAfvfŠfP [fVf±f“,Í AfT [ftF  
FfX,ðf fbfN%oð æ,‘,é,Ü,ÄfTfŠfbfsf“fO,Ä,«,È,¢ B`

`ˆê”Ê,É A ‘,« ž,Ý,İ•Ž,³,è,éfvf%oCf}fŠ Eft [ftFfX,ÖftfŠfbfsf“fO,‘,éfobfN Efofbftf@,É‘İ,µ,Ä s,µ B  
DDEX1,İ ê ± A Ä %o,İftfŠfbfsf“fO,İ‘O,É—L‘Ö,È‘x%o,,ª ¶,¶,é,½,ß A  
DDEX1,Ä,İfT [ftFfX•Ž‘‘O,İ‘x,è,ð”ð,—,é,½,ß %oŠú%o”ŠÖ ”“à,Äfvf%oCf}fŠfobftf@,É ‘,«,±,Ý,ð,‘,é B,±,İfˆf...  
[fgfŠfAf<,İŽŸ,İXfefbfv,ðÆ©,ê,İ,İ,©,é,æ,µ,É A DDEX1fTf“f\vf<,Ä,Í  
WM_TIMER,İŠÖ AfobfN Efofbftf@,É,¾,— ‘,«,±,Ý,ð s,µ Bfvf%oCf}fŠ Eft [ftFfX,É ‘,«,±,Ý,ªK—  
v,È,İ,Í A %oŠú%o”ŠÖ ”,©f^Cf gfy [fW,,ç,¢,¾,ÆŽv,İ,è,é B`

---

### Note

**IDirectDrawSurface2::Unlock**,ÄfT [ftFfX,ðf fbfN%oð æ,µ,½Æã AfT [ftFfX Ef f,fŠ,Ö,İ|fCf“f^,Í—  
³Æø,Æ,È,é B fT [ftFfX Ef f,fŠ,Ö,İ—LÆø,Èf|  
fCf“f^,ð“¾,é,É,Í A**IDirectDrawSurface2::Lock**,ð Ä,ŇŽg,İ,È,—,ê,İ,È,ç,È,¢ B

---

# Step 6: fT [ftfFfX,Ö,İ ‘,«,±,Ý

DDEX1,İ WM\_TIMERf fbfZ [fW,İ'O"¼,Å,Í AŽŸ,İ—á,ÅŽ!,·'Ê,è ê,çfobfN Efofbftf@,Ö,İ ‘,«,±,Ý,ð s,□ B

case WM\_TIMER:

// fT [ftfFfX,ðftfŠfbfsf“fO

if (bActive)

{

if (lpDDSBack->GetDC(&hdc) == DD\_OK)

{

SetBkColor(hdc, RGB(0, 0, 255));

SetTextColor(hdc, RGB(255, 255, 0));

if (phase)

{

TextOut(hdc, 0, 0, szFrontMsg, lstrlen(szFrontMsg));

phase = 0;

}

else

{

TextOut(hdc, 0, 0, szBackMsg, lstrlen(szBackMsg));

phase = 1;

}

lpDDSBack->ReleaseDC(hdc);

}

**IDirectDrawSurface2::GetDC** f f\fbfh,ðŒÄ,Ŧ o,· s,Å,Í A ‘,«,±,Ý,İ €”ð,ÅfobfN Efofbftf@,ðf fbfN,·,é B  
**SetBkColor,Æ SetTextColor** ŠÖ ”,É,æ,Á,Ä A”wŒi,ÆfefLXfg,İ F,ðŽw’è,·,é B

‘±,Œ,Ä Aphase·İ ”,İ Afvf%oCf}

fŠ Efofbftf@ Ef fbfZ [fW,Ŭ,½,İfobfN Efofbftf@ Ef fbfZ [fW,İ,Ç,¿,Ş,a ‘,«,±

,Ŭ,è,é,×,«,,©,ðŒ”è,·,é B•İ ”phase,a1,Å,,ê,İ Afvf%oCf}fŠ EfT [ftfFfX Ef fbfZ [fW,a ‘,«,±,Ŭ,è A

•İ ”phase,İ0,ÉfZfbfg,3,è,é B•İ ”phase,a0,É“™,µ,¯,ê,İ AfobfN Efofbftf@ Ef fbfZ [fW,a ‘,«,±

,Ŭ,è A•İ ”phase,İ1,ÉfZfbfg,3,è,é B,µ,©,µ A,Ç,¿,Ş,İ ê ±,É,àf fbfZ [fW,İfobfN Efofbftf@,É ‘,«,±

,Ŭ,è,é,Æ,Œ,Œ,±,Æ,É’ ˆÖ,·,é,±,Æ B

f fbfZ [fW,afofbfN Efofbftf@,É ‘,©,è,½Œä AfobfN Efofbftf@,İ A **IDirectDrawSurface2::ReleaseDC**

f f\fbfh,É,æ,Á,Äf fbfN%ð æ,3,è,é B

## Step 7: `ftfŠfbfsf“fO EfT [ftfFX`

`fT [ftfFX Ef f,fŠ,³f fbfN%ð œ,³ê,½Ēă,Ā AfobfN Efobftf@,ðfvf% Cf}`  
`fŠ EfT [ftfFX,ÉftfŠfbfsf“fO,·,éIDirectDrawSurface2::Flip f f\fbfh,ðŽg—p,Ā,«,é,æ,²,É,È,é BŽŸ,İ—`  
`á,ĀŽ!,·Ê,è,Ā, ,é B`

```
while(1)
{
    HRESULT ddrval;
    ddrval = lpDDSPPrimary->Flip(NULL, 0);
    if(ddrval == DD_OK)
    {
        break;
    }
    if(ddrval == DDERR_SURFACELOST)
    {
        ddrval = lpDDSPPrimary->Restore();
        if(ddrval != DD_OK)
        {
            break;
        }
    }
    if(ddrval != DDERR_WASSTILLDRAWING)
    {
        break;
    }
}
```

—á,Ā,Í A `lpDDSPPrimary,Ífvf% Cf}` `fŠ EfT [ftfFX,Æ,» ,ê,ÉŠÖ~A,Ā,¯,ç,ê,½fobfN Efobftf@,Æ,ðŽ!,µ,Ā,Ĉ,é B`  
**IDirectDrawSurface2::Flip,ªĒĀ,İ,ê,é,Æ Aftf f“fg EfT [ftfFX,ÆfobfN EfT [ftfFX,ªĒŠ,³,ê,é ifT [ftfFX**  
**,Ö,İf|Cf“f^,ªİ X,³,ê,é,¾,¯,Ā AŽĀ Ū,Éff [f^,ªŪ“@,·,é,İ,¯,Ā,İ,È,Ĉ j BftfŠfbfsf“fO,ª ¬Ē÷,µ**  
**DD\_OK,ª•Ö,³,ê,é,Æ AfAfvfŠfP [fVf±f“,İwhilef< [fv,©,ç”²,¯,é B**

`ftfŠfbfsf“fO,ª•IDDERR_SURFACELOST,ð•Ö,· ê ± AIDirectDrawSurface2::Restore`  
`f f\fbfh,É,æ,Ā,ĀfT [ftfFX,İfŠfXfgfA,ªŽŽ,Ÿ,ç,ê,é BfŠfXfgfA,ª ¬Ē÷,·,é,Æ AfAfvfŠfP [fVf±f“,İf< [fv,É-`  
`ß,è`  
**IDirectDrawSurface2::Flip,İĒĀ,Ń o,µ,ð Ā,ŃŽŽ,Ÿ,é BfŠfXfgfA,ªŽ,²s,·,é,Æ AfAfvfŠfP [fVf±f“,İwhilef< [fv,ð”**  
**²,¯,Ā AfGf% [,ð•Ö,· B**

---

### Note

**IDirectDrawSurface2::Flip,ðĒĀ,Ń o,· ê ± AftfŠfbfsf“fO,İ,·,®,É,İŠ@—**  
**¹,¹,, AŽŸ,İ ,’¼A ũŠúŠÖ,É s,İ,ê,é B,½,Æ,!,İ‘O,İftfŠfbfsf“fO,ª İ,İ,Ā,Ā,Ĉ,È,Ĉ,Æ,« A IDirectDrawSurface2::Flip,İ**  
**DDERR\_WASSTILLDRAWING,ð•Ö,· B—á,Ā,Í A IDirectDrawSurface2::Flip,İDD\_OK,ð•Ö,·,Ū,Āf< [fv,µ‘±,¯,é B**

---

### Step 8: DirectDrawIfufWfFfNfg,İŠ,,è“–,Ä í œ

F12fL [,ð%Ÿ,.,Æ ADDEX1 fAfvfŠfP [fVf‡f“,Í I—‘O,É WM\_DESTROY f fbfZ [fW,ð ^—  
,.,é BŽŸ,ÉŽ!,,‘È,è A,±,İf fbfZ [fW,Í,.,×,Ä,İIUnknown::ReleaseŠÖ ”,ðŠÜ,İfiniObjects ŠÖ ”,ðCEÄ,Ń o,· B

static void finiObjects(void)

```
{
    if (lpDD != NULL)
    {
        if (lpDDSPPrimary != NULL)
        {
            lpDDSPPrimary->Release();
            lpDDSPPrimary = NULL;
        }
        lpDD->Release();
        lpDD = NULL;
    }
} // finiObjects
```

fAfvfŠfP [fVf‡f“,Í ADirectDrawIfufWfFfNfg,Ö,İf|fCf“f^(lpDD),ÆDirectDrawSurfaceIfufWfFfNfg,Ö,İf|  
fCf“f^(lpDDSPPrimary),“NULL,Ä,È,¢,©,Ç,¤,©f`fFfbfN,.,é B „,µ,ÄDEX1,Í A  
DirectDrawSurfaceIfufWfFfNfg,İŽQ ÆfJfEf“fg,ð1,,ÄCE,,Ç,.,½,B IDirectDrawSurface2::Release  
f f\fbfh,ðCEÄ,Ń o,· BŽQ ÆfJfEf“fg,“0,É,È,é,Æ A DirectDrawSurface,Í%ð•ú,³,è,é B DirectDrawSurface|  
fCf“f^,Í ANULL,ð'l,ÉfZfbfg,µ,Ä”jŠü,³,è,é BŽŸ,É A  
DirectDrawIfufWfFfNfg,İŽQ ÆfJfEf“fg,ð0,Ü,ÄCE,,Ç,.,½,B,É A IDirectDraw::Release,ðCEÄ,Ń o,· B  
DirectDrawIfufWfFfNfg,İŠ,,è“–,Ä,Í%ð œ,³,è,é B,±,İf|fCf“f^,à,Ü,½ A NULL,ð'l,ÉfZfbfg,µ,Ä”jŠü,³,è,é B

**f`f... [fgfŠfAf<2: frfbfgf}fbfv,đfofbfN Efofbftf@,É“]‘—**

,±,ìf`f... [fgfŠfAf<(DDEX2),Å%øđ à,·,éTf“fvf<,Í Af`f... [fgfŠfAf<1,Å%øđ à,μ,½ DDEX1,đŠg’E  
,μ,½,à,ì,Å, ,é B DDEX2,Í Afrfbfgf}fbfvftf@fCf<,đfofbfN Efofbftf@,Öf [fh,·,é<@”\,đŠÜ,ñ,Å,¢,é B,±  
,ì V,μ,¢<@”\,đ AŽŸ,ì,æ,□,ÈfXfefbfv,Å à~¾,·,é B

Step 1: fpfŒfbfg,ì ì ¬

Step 2: fpfŒfbfg,ì Ý`è

Step 3: fofbfN Efofbftf@,Ö,Ìfrfbfgf}fbfv,ìf [fh

Step 4: fT [ftfFfX EftfŠfbfsf“fQ

DDEX1,Æ“—l A doInit,Í DDEX2fAfvfŠfP [fVf‡f“,ì %Šú%»ŠÖ ”,Å, ,é B DirectDraw %Šú%»fR [fh,Í A  
DDEX1,ÆDDEX2,Æ,Å,Í,¢,³,³,©`Ü,E,Å,ÄŒ©,‘,é,ª A—{Žč“l,É,Í“¬,¶,Å, ,è AŽŸ,ìfZfNfVf‡f“,ªÜ,E,é,¾,¬,Å, ,é B

lpDDPal = DDLoadPalette(lpDD, szBackground);

if (lpDDPal == NULL)  
goto error;

ddrval = lpDDSPPrimary->SetPalette(lpDDPal);

if(ddrval != DD\_OK)  
goto error;

// frfbfgf}fbfv,đfofbfN Efofbftf@,Éf [fh  
ddrval = DDReLoadBitmap(lpDDBack, szBackground);

if(ddrval != DD\_OK)  
goto error;



DDEX2fTf“fvfç,Å,Í AŽŸ,ÌfR [fh,ðŽg,Á,Ä \‘ç‘İ,ÖfpfÆfbfg,ðf [fh,·,é B

```
lpDDPal = DDLoadPalette(lpDD, szBackground);
```

```
if (lpDDPal == NULL)
    goto error;
```

```

DDloadPalette,Í A,«'ÊDirectDraw ŠÖ ",Ä,è A\Sdk\Samples\Misc\Ddutil.cpp,É,é B
DirectDrawTfTf"fvf<tf@fCf<,Íâ"«ª,±,±,Ítf@fCf<,Đžg,Ä,Ä,¢,é B,±,é,Í Aftf@fCf<,Ü,½,ÍfŠf\{fX,©,çftrfbfgf}
fbfv,ÆfpfÆfbfg,đf [fh,É,½,B,İŠÖ "EQ,©,ç \ ³,é,é B,±,é,ç,İŠÖ "Í A Ä—
p,Ä,«é,Đ,Ä,Ä,Ítf@fCf<,Ä,Ä,B,šç,é,Ä,¢,é BžÇ,é,İ DDEX samples,Æ,Ä,ä,ÉfRf"fpfCf<.,éftf@fCf<EQ,İfŠfXfg,É
Ddutil.cpp,ªŠÜ,Ü,é,Ä,¢,é,±,Æ,đŠmF",é,±,Æ B

```

DDEX2,Å ADDLoadPalette ŠÖ ",Í  
Back.bmpftf@fCfç,©,ŠDirectDrawPalettefIfufWfFfNfng,ð ì ¬,é BDDLoadPalette  
ŠÖ ",Í AfpfÇfbfg,ð ì ¬,é,½,½,Íftf@fCfç,Ü,½,ÍŠf [fX,"¶ Ý,é,©,©,Ç,¤  
(,ð),"é,é B,à,µ,È,é,ÍftfHfç,f,ÍfpfÇfbfg,ð ì ¬,é B DDEX2,Å,Í Afrfbfgf}  
fbvfvpfÇfbfg,©,çfpfÇfbfg ì ñ,ðŠ Ö,f AfjCfç"^\ape,aZw,· \ç'í,ÉŠi"[,é B

» , μ , ÄDEX2, Í ŽÝ, Ì—á, ĚŽ, ·, æ, □, ÉDirectDrawPalettefIfufWfFfNfg, đ ì ¬, ·, é B

```
pdd->CreatePalette(DDPCAPS_8BIT, ape, &ddpal, NULL);
return ddpal;
```

IDirectDraw2::CreatePalette *f\fbfh*,<sup>a</sup>—

[illegible]

```
ape pfp%of [f^,Í \c'í,Ö,]f|fCf"f^,Â A^A±,µ,½2 A4 A16 A256fGf"fGfŠ,í,¢,,ê,©,ðŠÜ,ñ,Â,¢,é B
fGf"fGfŠ,í ",Í IDirectDraw2::CreatePalette f f\fbfh,ldwFlags pfp%of [f^,É'É'¶,,'é B ä,î ê ± A dwFlags
pfp%of [f^,IDDPCAPS_8BIT,ÉfZfbfG,³,ê A,±,í \c'í,É256,lfGf"fGfŠ,³,,'é,±,Æ,ðŽ,µ,Ä,¢
,'é BfGf"fGfŠ,í,,»,é¼,é4fofCfG if'fffflf< Ô Af'fffflf<—Í Af'fffflf< Â Aftf%ofO j,Ä \ ¬,³,ê,é B
```

Step 2: *f p f Ć f b f g, Ĭ* Ý'è

*f p f Ć f b f g, ð* ì ¬, μ, ½ Ć ã A **IDirectDrawSurface2::SetPalette** *f* f\fbfh, ð Ć ã, Ñ o, ·, ±  
, Æ, Å A DirectDrawPalette *f If u f W f F f N f g, Ö, Ĭ | f C f “ f ^ i d d p a l j, ð f v f % o f C f } f Š* E f T [ f t f F f X, É “ n, · B Ž Ÿ, Ĭ —  
á, Å Ž', · Ê, è, Å, , é B

`ddrval = lpDDSPPrimary->SetPalette(lpDDPal);`

`if(ddrval != DD_OK)  
 // SetPaletteŽ,”s`

**IDirectDrawSurface2::SetPalette**, ð Ć ã, Ñ o, ·, ±, Æ, É, æ, Å, Å A DirectDrawPalette *f If u f W f F f N f g, Ĭ*  
DirectDrawSurface *f If u f W f F f N f g, É Š Ö`A, ã, ¯, ç, ê, é* B *f p f Ć f b f g, Ĭ • Ĭ* X, ° K — v, È, Æ, «, Ĭ, Ć  
, Å, Å, à V, μ, Ć *f p f Ć f b f g, ð* ì ¬, μ *f p f Ć f b f g, ð* Å Ý'è, ·, é, ¾, ¯, Å, æ, Ć B i, ±, ê, Ĭ f T f “ f v f ¸, Å Ž g, í, ê, Å, Ć, é • û —  
@, ¾, ° A Ć ã, É à —¾, ·, é, Æ, ¨, è ‘¼, É, à • û — @, °, , é B j

### Step 3: fofbfN Efofbftf@,Ö,İfrfbfgf}fbfv,İf [fh

DirectDrawPalettelfIfufWfFfNfg,ª DirectDrawSurfaceIfufWfFfNfg,ÆŠÖ~A,Ä,¯,ç,ê,é,Æ ADDEX2,İŽŸ,İfR [fh,Ä Back.bmpfrfbfgf}fbfv,ðfofbfN Efofbftf@,Éf [fh,·,é B

```
// fofbfN Efofbftf@,Éfrfbfgf}fbfv,ðf [fh
ddrval = DDReLoadBitmap(lpDDSBack, szBackground);
```

```
if(ddrval != DD_OK)
    // f [fh,İŽ,~s,µ,½
```

**DDReLoadBitmap**,İ A Ddutil.cpp,É,·,é,à,µ,Đ,Æ,Ä,İŠÖ ~,Ä,·,é B,±,İŠÖ ~,İftf@fCf<,Ü,½,İfŠf\ [fX,©,çfrfbfgf}fbfv,ðŠù‘¶,İDirectDrawfT [ftfFfX,Öf [fh,·,é B(fT [ftfFfX,ð ì ¬,µ Afrfbfgf}fbfv,ð,»„İfT [ftfFfX,Öf [fh,·,é,½,ß,É **DDLloadBitmap**,ðŽg,µ,±,Æ,ª,Ä,«é B³,ç,É Ú,µ,ç î•ñ,İ A u f`f... [fgfŠfAf<5:fpfÆfbfg,İ“®“J•İ X v,ðŽQ Æ,·,é,±,Æ B) DDEX2,É,·,ç,Ä,İ AszBackground,ªŽw,· Back.bmpftf@fCf<,ð A lpDDSBack,ªŽw,·fofbfN Efofbftf@,Éf [fh,·,é B **DDReLoadBitmap** ŠÖ ~,İftf@fCf<,ðfofbfN Efofbftf@,ÉfRfs [µ“K Ø,ÈfTfCfY,É L’·,·,é,½,ß,É A **DDCopyBitmap** ŠÖ ~,ðÆÄ,Ñ o,· B

**DDCopyBitmap** ŠÖ ~,İ Afrfbfgf}fbfv,ðf f,fŠ,ÉfRfs [µ Afrfbfgf}fbfv,İfTfCfY,ð²,×,é,½,ß,ÉGetObject ŠÖ ~,ðŽg,µ B,»µ,Äfrfbfgf}fbfv,ªu,©,ê,éfofbfN Efofbftf@,İfTfCfY,ð²,×,é,½,ß,ÉŽŸ,İ,æ,µ,É,µ,Ä,ç,é B

```
// fT [ftfFfX,İfTfCfY,ð“¾,é
ddsd.dwSize = sizeof(ddsd);
ddsd.dwFlags = DDSD_HEIGHT | DDSD_WIDTH;
pdds->GetSurfaceDesc(&ddsd);
```

ddsd,İ A **DDSURFACEDESC** \‘ç‘İ,Ö,İf|fCf“f^,Ä,·,é B,±,İ \‘ç‘İ,İ A DirectDrawfT [ftfFfX,İÆ» Y,İkL q,ðŠi”[·,é B,±,İ ê ‡ A **DDSURFACEDESC**f f“fo,İ A DDSD\_HEIGHT,Æ DDSD\_WIDTH,ÄŽ‘,³,ê,éft [ftfFfX,İ ,³,Æ• ,Æ,ðkL q,·,é B **IDirectDrawSurface2::GetSurfaceDesc** f f\fbfh,Ö,İÆÄ,Ñ o,µ,İ A \‘ç‘İ,É“K Ø,È‘l,ðf [fh,·,é B DDEX2,Ä,İ A ,³480 A• 640,Æ,È,Ä,Ä,ç,é B

**DDCopyBitmap** ŠÖ ~,İ AfT [ftfFfX,ðf fbfn,µ AŽŸ,İ—á,ÄŽ‘,·,æ,µ ,ÉfofbfN Efofbftf@,É, ,Ä,İ,Ü,é,æ,µ L’·,Ü,½,İ³ k,µ,Äfrfbfgf}fbfv,ðfRfs [·,é B

```
if ((hr = pdds->GetDC(&hdc)) == DD_OK)
{
    StretchBlt(hdc, 0, 0, ddsd.dwWidth, ddsd.dwHeight, hdcImage, x, y,
        dx, dy, SRCCOPY);
    pdds->ReleaseDC(hdc);
}
```

**Step 4: fT [ftFfX EftŠfbfsf“fO**

DDEX2fTf“fvf<,Å,łfT [ftFfX,łftŠfbfsf“fO,Í A–{Ž;“I,É AfT [ftFfX,<sup>a</sup> ÁŽ,,μ,½ ê ‡ i  
DDERR\_SURFACELOST j,ð æ,¢,Ä DDEX1f`f... [fgfŠfAf<,Æ“<sup>–</sup>,¶,Å, ,é i uf`f... [fgfŠfAf<1:  
DirectDraw,İŠi`b v,ðŽQ Æ,·,é,±,Æ) B,»,İ ê ‡ AfT [ftFfX,<sup>a</sup>fŠXfgfA,<sup>3</sup>ê,½Ėă ADDReLoadBitmap  
ŠÖ ”,ðŽg,Å,Äfıbfgf}fbfv,ðfofbfN Efofbftf@,Êf [fh,μ’¼,<sup>3</sup>È,<sup>–</sup>,ê,İ,È,ç,È,¢ B

f`f... [fgfŠfAf<3: fIftfXfNfŠ [f“ EfT [ftfFfX,©,ç,İfuf fbfN“]‘—

f`f... [fgfŠfAf<2 (DDEX2),İfTf“fvf<,Í Afrfbfgrf}  
fbfv,ðŽæ“¾,µ,ÄfofbfN Efofbftf@,É’u,« AfobfN Efofbftf@,Æfvf%ofCf}  
fŠfofbftf@,Æ,İŠÖ,ðftfŠfbfsf“fO,µ,Ä,ç,é B,±,ê,Í Afrfbfgrf}fbfv,ðŽ,.,é,İ,É, ,Ü,èÆ»ŽÀ“L,È•û–  
@,Ä,Í,È,ç B,Ó,½,Ä,İfrfbfgrf}fbfv |,Đ,Æ,Ä,Í A<ô ”,İfXfNfŠ [f“ A,à,º,Đ,Æ,Ä,İŠi ”,İfXfNfŠ [f“ |  
,“Ši”[.,³,ê,½,Ó,½,Ä,İfIftfXfNfŠ [f“fofbftf@,ðŠÜ,Đ,±,Æ,É,æ,Ä,Ä A,±,İ f`f... [fgfŠfAf<3(DDEX3),İ—á,Ä,Í A  
DDEX2,İ”\—Í,ðŠg’£,µ,Ä,ç,é BfIftfXfNfŠ [f“ EfT [ftfFfX,İ“à—e,ðfofbfN Efofbftf@,ÉfRfs [,.,é,½,B,É A  
**IDirectDrawSurface2::BltFast**  
f f\fbfh,ðŽg,² B,»,µ,Ä Afobftf@,ðftfŠfbfsf“fO,µ AŽŸ,İfIftfXfNfŠ [f“ EfT [ftfFfX,ðfofbfN Efofbftf@,  
ÉfRfs [,.,é B

DDEX3,ÄŽ!,³,ê,é V,µ,ç<@”\,ðŽŸ,İfXfefbfv,Ä à–¾,.,é B

Step 1: fIftfXfNfŠ [f“ EfT [ftfFfX,İ ì ñ

Step 2: fIftfXfNfŠ [f“ EfT [ftfFfX,İfrfbfgrf}fbfv,İf [fh

Step 3: fofbfN Efofbftf@,Ö,İfIftfXfNfŠ [f“ EfT [ftfFfX,İfuf fbfN“]‘—

Step 1: *fIfTfXfNfŠ* [f“ EfT [ftFfX,ì ì ¬

ŽŸ,ìfR [fh,Ä,Í A,Ó,½,Ä,ìfIfTfXfNfŠ [f“fofbftf@,ð ì ¬,·,é,½,ß,É A DDEX3,ìdoInit ŠÖ ”,ð’Ç%Á,μ,Ä,¢,é B

```
// fIfTfXfNfŠ [f“frfbfgf}fbfv,ð ì ¬
ddsd.dwFlags = DDSD_CAPS | DDSD_HEIGHT | DDSD_WIDTH;
ddsd.ddsCaps.dwCaps = DDSCAPS_OFFSCREENPLAIN;
ddsd.dwHeight = 480;
ddsd.dwWidth = 640;
ddrval = lpDD->CreateSurface(&ddsd, &lpDDOne, NULL);
if(ddrval != DD_OK)
{
    return initFail(hwnd);
}
```

```
// ,à,²,D,Æ,Ä,ìfIfTfXfNfŠ [f“frfbfgf}fbfv,ð ì ¬
ddrval = lpDD->CreateSurface(&ddsd, &lpDDTwo, NULL);
if(ddrval != DD_OK)
{
    return initFail(hwnd);
}
```

**dwFlags**f f“fo,Ä AfAvfšfP [fVf‡f“,“**DDSCAPS** \‘¢‘ì,ðŽg,²,±,Æ,ðŽw’è,·,é B,»,μ,Ä e  
DDSCAPS\_OFFSCREENftf%fo,“**DDSCAPS** \‘¢‘ì,ÉfZfbfg,³,è,é,±,Æ,É,æ,Ä,ÄŽ!,³,è,é,æ,²,É Afobftf@,ì ,³,Æ%  
i• ,ðfZfbfg,·,é B  
fT [ftFfX,ìfIfTfXfNfŠ [f“ EfvfÆ [f“ Efobftf@,É,È,é B ,³,Æ• ,Í,»,è,¼,ê A480,Æ640,É  
**DDSURFACEDESC** \‘¢‘ì“à,ÄfZfbfg,³,è,é BfT [ftFfX,Í\_  
**IDirectDraw::CreateSurface**f f\fbfh,ðŽg,Ä,Ä ì ¬,·,é B

*fIfTfXfNfŠ* [f“ EfvfÆ [f“ Efobftf@,Í—¼•û,Æ,à“¬,¶fTfCY,Ä, ,é,½,ß AfZfJf“fh Efobftf@,ð ì ¬,·,é,½,ß,É  
,Í A Ä,Ñ A`Ü,È,éf|Cf“f^¬¼,Ä**IDirectDraw::CreateSurface**,ðÆÄ,Ñ o,<sup>1</sup>,Î,æ,¢ B

“Á,É **DDSCAPS** \‘¢‘ì,IDDSCAPS\_SYSTEMMEMORY,Ü,½,IDDSCAPS\_VIDEOMEMORY”—Í,ðfZfbfg,·,é,±  
,Æ,É,æ,Ä,Ä AfIfTfXfNfŠ [f“ Efobftf@,ðfVfXfef€ Ef f,fŠ,Ü,½,ÍfBfXfvfÆfCf f,fŠ,É’u,±,±,Æ,ðŽw’è,·,é,±  
,Æ,<sup>a</sup>,Ä,«,é B ftfBfXfvfÆfC Ef f,fŠ,Éfrfbfgf}fbfv,ð•Ü“¶,·,é,±  
,Æ,É,æ,Ä,Ä AfIfTfXfNfŠ [f“ EfT [ftFfX,ÆfobfN Efobftf@ŠÖ,ì“]—fXfs [fh,ð ä,°,é,±  
,Æ,<sup>a</sup>,Ä,«,é Bfrfbfgf}fbfv EfAfjf [fVf‡f“,ðŽg,²,Æ,«,É,±,è,Í,æ,è d—  
v,Æ,È,é B,μ,©,μfIfTfXfNfŠ [f“ Efobftf@,É DDSCAPS\_VIDEOMEMORY,ðŽw’è,μ,½ ê ‡ Aftrfbfgf}  
fbfv“S”,ð•ÜŽ ,·,é,ì,É [“<sup>a</sup>,Èf f,fŠ,<sup>a</sup>,È,¢ ê ‡ AfT [ftFfX,ð ì ¬,·,é Ü,ÉŽ,”s,μ ADDERR\_OUTOFVIDEOMEM  
ORYfGf%o [,“Ö,<sup>3</sup>,è,é B

**Step 2: fIfTfXfNfŠ [f“ EfT [ftfFfX,İfRfbfgf}fbfv,İf [fh**

,Ó,½,Â,İfIfTfXfNfŠ [f“ EfT [ftfFfX,ª İ ¬,³,ê,½Eã A DDEX3,İ  
Frntback.bmpftf@fCf<,©,çfT [ftfFfX,ÖfRfbfgf}fbfv,ðf [fh,·,é,½,ß,É A InitSurfaces ŠÖ ”,ðŽg—p,·,é B  
**InitSurfaces ŠÖ ”,İ A —¼•û,İfRfbfgf}fbfv,ðf [fh,·,é,½,ß,ÉDdutil.cpp,É, ,éDDCopyBitmap ŠÖ ”,ðŽg—  
p,·,é BŽŸ,İ—á,ðŽQ Æ,·,é,±,Æ B**

```
// fRfbfgf}fbfvfŠf\ [fX,İf [fh  
hbm = (HBITMAP)LoadImage(GetModuleHandle(NULL), szBitmap,  
    IMAGE_BITMAP, 0, 0, LR_CREATEDIBSECTION);
```

```
if (hbm == NULL)  
    return FALSE;
```

```
DDCopyBitmap(lpDDSOne, hbm, 0, 0, 640, 480);  
DDCopyBitmap(lpDDSTwo, hbm, 0, 480, 640, 480);  
DeleteObject(hbm);
```

```
return TRUE;
```

Microsoft Paint,â,Û,©,İfhf [fAfvfŠfP [fVf‡f“,Â  
Frntback.bmpftf@fCf<,İ'† g,ðE©,½ ê ‡ A^ê•û,ª,à,□ê•û,É d,È,é,Ó,½,Â,İfXfNfŠ [f“,©,çfRfbfgf}fbfv,ª ¬,è—  
§,Â,±,Æ,ª,İ,©,é,¾,ë,□ B **DDCopyBitmap ŠÖ ”,İ A,»,İfXfNfŠ [f“,ª ‡,İ,³,éf|**  
fCf“fg,ð,Ó,½,Â,É•ª,¬,é B,³,ç,É A1”Ô—Û,İfRfbfgf}fbfv,ð1”Ô—  
Û,İfIfTfXfNfŠ [f“ EfT [ftfFfX,Éf [fh,·,é B(lpDDSOne),Û,½ A2”Ô—Û,İfRfbfgf}fbfv,İ A2”Ô—  
Û,İfIfTfXfNfŠ [f“ EfT [ftfFfX,Éf [fh,·,é B(lpDDSTwo)

**Step 3: fofbfN Efofbftf@,Ö,İfIfxfNfŠ [f“ EfT [ftfFfX,İfuf fbfN“]‘—**

WM\_TIMER f fbfZ [fW ^— •”,İ AfT [ftfFfX,É ‘,«±,ĐfR [fh,Æ AftfŠfbfsf“fO,·,é fR [fh,đŠÜ,ñ,Å,¢,é B  
DDEX3,İ ê ‡ AŽŸ,İ,æ,ϱ,È A“K—,ÈfIfxfNfŠ [f“ EfT [ftfFfX,đ‘I,Ô,æ,ϱ  
,ÈfR [fh,Æ AfofbfN Efofbftf@,É“]‘—,·,é fR [fh,Æ,đŠÜ,ñ,Å,¢,é B

```
rcRect.left = 0;
rcRect.top = 0;
rcRect.right = 640;
rcRect.bottom = 480;
if(phase)
{
    pdds = lpDDSTwo;
    phase = 0;
}
else
{
    pdds = lpDDOne;
    phase = 1;
}
while(1)
{
    ddrval = lpDDSBack->BlitFast(0, 0, pdds, &rcRect, FALSE);
    if(ddrval == DD_OK)
    {
        break;
    }
}
```

phase,İ AfIfxfNfŠ [f“ EfT [ftfFfX,³fofbfN Efofbftf@,Éfuf fbfN“]‘—,³,ê,é,½,ß,İftf%fo,Å, ,é B  
**IDirectDrawSurface2::BlitFast**  
f f\fbfh,İ A‘I,İ,ê,½fIfxfNfŠ [f“ EfT [ftfFfX,đfofbfN Efofbftf@,É ¶ äŠp,İ Å•W(0,0),©,çfuf fbfN“]‘—  
,·,é,½,ß,ÉĖÄ,Ñ o,³,ê,é B rcRect fpf%of [f^,İ RECT \‘ċ‘İ,Ä, ,è AfAf“fpfTf“fh i • j,đ,Ä,\_,Ä,»,İf|  
fCf“f^,Æ,È,é B,±,İĖÄ,Ñ o,µ,É,æ,è AfIfxfNfŠ [f“ EfT [ftfFfX,İ ¶ äŠp,©,ç%oE%oŠp,Ü,Ä,İ—İæ,““]‘—  
,³,ê,é B ÄĖä,İfpf%of [f^,İ FALSE (Ü,½,İ O),É Ÿ’è,³,ê A“Á•Ė,È“]‘—ftf%fo,İŽg,í,È,¢,±,Æ,đŽ,µ,Ä,¢,é B

•K—v,È,ç,İ A **IDirectDrawSurface2::Blit** f f\fbfh,Æ**IDirectDrawSurface2::BlitFast**  
f f\fbfh,İ,Ç,ç,àfIfxfNfŠ [f“ Efofbftf@,©,ç“]‘—,·,é,½,ß,ÉŽg,ϱ,±,Æ,³,Ä,«é B  
,à,ç,è,ñ AfIfxfNfŠ [f“ EfvfĖ [f“ Efofbftf@,©,ç,İ“]‘—,İfpftfH [f}f“fX,đ, ,°é ê ‡ A  
**IDirectDrawSurface2::BlitFast**,đŽg,ϱ,×,«Ä, ,é B ftfBfXfvfĖfC EfAf\_fvf^ ä,İfn [fhfEfFfA Efuf fbfN“]‘—  
,đŽg,Ä,Ä,à AfVfXfefĖ,İfXfs [fh,““¾,ç,ê,È,ċ ê ‡ Afn [fhfEfFfA EfGf~f...fĖ [fVf±f“““]‘—  
,đŽÄ s,·,é,Æ10fp [fZf“fg’öfpftfH [f}f“fX,³—Ž,ç,é B,±  
,İ,½,ß AfIfBfXfvfĖfC Ef f,fŠ,©,çffBfXfvfĖfC Ef f,fŠ,Ö“]‘—,³,¹,é,·,×,Ä,İffBfXfvfĖfC‘Ė İ,İ,½,ß,É,İ A  
**IDirectDrawSurface2::BlitFast**,đŽg,ϱ,×,«Ä, ,é B,µ,©,µ AfVfXfefĖ Ef f,fŠ,©,ç“]‘—  
,µ,½,è A“Á•Ė,Èfn [fhfEfFfA Eftf%fo,đ—vċ ,·,é ê ‡,İ A **IDirectDrawSurface2::Blit**,đŽg,í,È,—,ê,İ,È,ç,È,ċ B

fIfxfNfŠ [f“ EfT [ftfFfX,đfofbfN Efofbftf@,Éf [fh,µ,½Ėä AfofbfN Efofbftf@,Æfvf%oCf}  
fŠ EfT [ftfFfX,İ‘O,İf f... [fgfŠfAfċ,ÄŽ],µ,½,İ,Æ,Ü,Æ,ñ,Ç“—,¶•û—@,ÄftfŠfbfsf“fO,³,ê,é B



f`f... [fgfŠfAf<4: fJf% [ EfL [,Æfrfbfgf}fbfvfAfjf [fVf‡f“

f`f... [fgfŠfAf<,R(DDEX3),İfTf“fvf<,Á,Í AfobfN Efofbtf@,É“]‘—,·,é‘O,Éfrfbfgf}  
fbfv,ðfİftfXfNfŠ [f“fofbtf@,Ö”z’u,·,é,İ,É AƐ’Žn“I,È•û–@,ðŽg,Á,Ä,¢,é Bf`f... [fgfŠfAf<(DDEX4)  
,İfTf“fvf<,Á,Í A‘O,İf`f... [fgfŠfAf<,Á à–  
¾,³,ê,½”wƐi,Æ~ê~A,İfXfvf%oCfɡ,ðfİftfXfNfŠ [f“ EfT [ftfFfX,Öf [fh,·,é,½,ß,İfefNfjfbfN,ðŽ!,· B,±,±  
,Á,İfİftfXfNfŠ [f“ EfT [ftfFfX,İ~ê•”,ðfofbN Efofbtf@,ÉfRfs [,·,é A,Á,Ü,è AŠÈ’P,Èfrfbfgf}  
fbfv EfAfjf [fVf‡f“,ð İ ¬,·,é,½,ß,É A **IDirectDrawSurface2::BltFast** f f\fbfh,ðŽg—p,·,é B

DDEX4,ÁŽg,Ɔfrfbfgf}fbfvftf@fCf<,Í A”wƐi,Æ •,İ”wƐi,É Ô,¢—  
Ö,ª,®,é,®,é%ñ,é,»,İƐJ,è•Ô,µ,©,ç \ ¬,³,ê,éAll.bmp,Á, ,é B DDEX4,İfTf“fvf<,Í A%ñ“,µ,Ä,¢,é—  
Ö,ð d,È, ,í,¹,é,½,ß,İfJf% [ EfL [,ðfZfbfg,·,é V,µ,¢ŠÖ ”,ðŠÜ,ñ,Á,¢,é B,»,µ,ÄfTf“fvf<,Í A “K“–  
,ÈfXfvf%oCfɡ,ðfİftfXfNfŠ [f“ EfT [ftfFfX,©,çfofbN Efofbtf@,ÖfRfs [,·,é B

DDEX4,İ V,µ,¢<@”\,ðŽŸ,İ,æ,µ,ÈfXfefbfv,Á à–¾,·,é B

Step 1: fJf% [ EfL [,İ Ý’è

Step 2: ŠÈ’P,ÈfAfjf [fVf‡f“,İ İ ¬

### Step 1: $fJf\% \ [ \ EfL \ ] \dot{\bar{I}} \ \acute{Y}'\grave{e}$

‘¼,ÌDirectDrawTf“fvf<,Á,Í A‘¼,ÌŠÖ ”,ðĖ©,Â,¯,é,±,Æ,ª,Â,«,é B,μ,©,μ A  
DDEX4,ÌfTf“fvf<,Í AfXfvf%ofCfɡ,Ì,½,ß,ÌfJf% [ EfL [ ,ðfZfbfg,·,éfR [fh,ðŠÜ,ñ,Ä,¢  
,é BfJf% [ EfL [ ,Í A“§-¾%»,ÄŽg,í,ê,é F’l,Ì Y’è,ð,·,é BfVfXfef€,ªfn [fhfEfFA“]‘—”\—  
Í,ðŽ ,Ä,Æ,« A«Ė,ÌfsfNfZf<,Í AfJf% [ EfL [ ,Æ,μ,ÄfZfbfg,³,ê,½’l,ð œ,¢  
,Ä AfT [ftfFfX ä,Ì”ñ«ĖfXfvf%ofCfɡ,ð ì ¬,μ,Ê,ª,ç“]—,³,ê,é B DDEX4,ÄfJf% [ EfL [ ,ð Y’è,μ,Ä,¢  
,é•ª,ÍŽY,Ì’Ê,ê,Ä, ,é B

```
// •,Ìfrfbfgf}fbfv,ðfJf% [ EfL [ ,É Y’è,·,é  
DDSetColorKey(lpDDSTone, RGB(0,0,0));
```

```
return TRUE;
```

**DDSetColorKey** ŠÖ ”,ðĖÄ,Ñ o,·,Æ,«,É AŽw’è,μ,½,¢ F,ÌRGB’l,ð Y’è,·,é,±  
,Æ,É,æ,Ä,ÄfJf% [ EfL [ ,ð’I’ð,·,é B i •,Ì RGB’l,Í(0,0,0),Ä, ,é j B **DDSetColorKey**ŠÖ ”,Í A **DDColorMatch**  
ŠÖ ”,ðĖÄ,Ñ,¾,· B i,Ç,·,ç,à ADdutil.cpp,É, ,é j **DDColorMatch**ŠÖ ”,Í A  
lpDDSToneT [ftfFfX,É”z’u,³,ê,½frfbfgf}fbfv ä,Ì(0,0),ÌfsfNfZf<,ÌĖ» Y,ÌfJf% [’l,ðŠi”[μ AŽw’è,μ,½  
RGB’l,ðŽæ,Ä,Ä(0,0),Ì’Ê’u,ÌfsfNfZf<,É,»,Ì F,ðfZfbfg,·,é B ÄĖä,É A—~p%Ä”,ÈfsfNfZf<~  
^,Ìfrfbfg ”,Ä,»,ÌfJf% [ ,’l,ðf}fXfN,·,é B,±,ê,ª I,í,é,Æ AŽn,ß,Ì F,Í(0,0)  
,Ì’Ê’u,ÌĖä,ë,É’u,©,ê AŽÄ Ü,ÌfJf% [ EfL [ ,’l,Ä«¼,É A **DDSetColorKey**,Ö–ß,é B  
**DDColorMatch**,ÌĖÄ,Ñ o,μ,ª I,í,Ä,½Ėä AfJf% [ EfL [’l,Í A **DDCOLORKEY**  
\“ĉ’l,ÌdwColorSpaceLowValuef f“fo,É,ù,©,ê,é B,Ü,½ A dwColorSpaceHighValuef f“fo,É,àfRfs [ ,³,ê,é B  
**IDirectDrawSurface2::SetColorKey**,Ö,ÌĖÄ,Ñ,¾,μ,É,æ,Ä,ÄfJf% [ EfL [ ,ð Y’è,·,é B

**DDSetColorKey**,Æ**DDColorMatch**,Ä A CLR\_INVALID,ðŽQ Æ,μ,Ä,¢,é,±,Æ,É<C,Ä,¢,½,©,à,μ,ê,È,¢ B iDDEX4,Ì  
**DDSetColorKey**,ðĖÄ,Ñ o,·,Æ,«,É AfJf% [ EfL [ ,Æ,μ,ÄCLR\_INVALID,ð“n,· ê ‡ Afrfbfgf}fbfv,Ì ¶ äŠp,Ì  
(0,0)fsfNfZf<,ª AfJf% [ EfL [ ,Æ,μ,ÄŽg,í,ê,é B DDEX4,Ìfrfbfgf}fbfv,“n,³,ê,½ ê ‡ A(0,0)  
,ÌfsfNfZf<,Ì F,ª AfOfĖ [ ,Ì%œ,Æ,Ê,é,±,Æ”Ö–j,·,é,í,¯,Ä,Í,È,¢ B DDEX4,ÌfTf“fvf<,Ä A(0,0)  
,ÌfsfNfZf<,ðfJf% [ EfL [ ,Æ,μ,ÄŽg,ª•û–@,ð— %ð,μ,½,¯,ê,Î Afrfbfgf}  
fbfvftf@fCf<All.bmp,ðfhf [fCf“fOfAfvfŠfP [fVf‡f“,ÄŠJ,« A(0,0),ÌfsfNfZf<,ð •,É•I X,μ,Ä,Y,é,±,Æ B  
j,»,ê,Í AŽY,ÌDDEX4 **DDSetColorKey**,ðĖÄ,Ñ o,· s,Ä s,í,ê,é **B**

```
DDSetColorKey(lpDDSTone, CLR_INVALID);
```

DDEX4,ÌfTf“fvf<,ð ÄfRf“fpfCf<,·,é,Æ,« A V,μ,¢frfbfgf}fbfvftf@fCf<,ªŠÜ,Ü,ê,Ä,¢  
,é,½,ß AfŠf\ [fX,ª”è<,³,ê,½ftf@fCf<,ð ÄfRf“fpfCf<,μ,½,±,Æ,ðŠm”F,·,é,±,Æ B i,±,ê,ð s,ª,½,ß,É,Í A  
Ddex4.rcftf@fCf<,É”è,Ä,ÌfXfy [fX,ð’Ç%Ä,μ,Ä Ä,¹,Î,¢,ç,¾,¯,Ä, ,é B j,·,é,Æ DDEX4,Ì—  
á,ÍfJf% [ EfL [ ,Æ,μ,Ä •,ÉfZfbfg,³,ê,½(0,0),ÌfsfNfZf<,ðŽg,ª,æ,ª,É,É,é B

Step 2: ŠÈ'P,ÈfAfjf [fVf‡f“,ì ì ¬

DDEX4,ìftf“fvf<,Ă,Í A All.bmpftf@fCf<,ÉŠÜ,Ü,ê,é Ô,¢—Ö,ðŽg,Ă,½ŠÈ'P,ÈfAfjf [fVf‡f“,ð ì ¬,·,é,½,ß,É  
updateFrameŠÖ ”,ðŽg,Ă,Ă,¢,é B »,ìfAfjf [fVf‡f“,Í A3,Ă,Ì Ô,¢—Ö,³ŠpĚ,ðĚ` ì,è A—  
l X,ÈfXfs [fh,Ă%ñ“],·,é B,±,ìftf“fvf<,Ă,Í A Win32

GetTickCountŠÖ ”,ð A ĀĚã,ÉGetTickCount,ðĚĂ,Ñ o,μ,Ă,©,çfXfvf%ofCfg,ð Ā•%œ,·,é,©,Ç,□  
,©,ðĚ~è,·,é,½,ß,É%½f~fŠ•b,©,©,Ă,½,©,Ă”ăŠr,μ,Ă,¢,é B,»,ìĚã A,Ü,, A\_IDirectDrawSurface2::BltFast  
f f\fbfh,ðŽg,Ă,Ă A”wĚi,ðfIfXfNfŠ [f“ EfT [ftfFfX(lpDDSOne),©,çfobfN Efofbftf@,Ö“]‘—,μ A, ,ç,©,¶,ß  
,Ç,ìfsfNfZf<,ð“\$%ß,É,·,é,©Ě~,ß,Ă,“,«fJf% [ EfL [,ðŽg,Ă,ĂfobfN Efofbftf@,ÖfXfvf%ofCfg,ð“]‘—  
,·,é BfobfN Efofbftf@,ÉfXfvf%ofCfg,““]‘—,³,ê,½Ěã ADDEX4,ÍfobfN Efofbftf@,Æfvf%ofCf}  
fŠ EfT [ftfFfX,ðftfŠfbfsf“fO,·,é,½,ß,É\_IDirectDrawSurface2::Flip,ðĚĂ,Ô B

fIfXfNfŠ [f“ EfT [ftfFfX,©,ç”wĚi,ð“]‘—,·,é,½,ß,É\_IDirectDrawSurface2::BltFast,ðĚĂ,Ñ o,·,Æ,«,Í A“]‘—  
,ìf^fCfv,ðŽw'è,·,édwTrans fpf%of [f^,ðDDBLTFast\_NOCOLORKEY,ÉŽw'è,·,é B,±,ê,Í A fm [f}f<,È“]‘—  
,Ă,Í“\$%ßfrfbfg,ª,È,Ç,±,Æ,ðŽ!,μ,Ă,¢,é B,»,ìĚã A Ô,¢—Ö,³fobfN Efofbftf@,É“]‘—,³,ê,½,Æ,« AdwTrans  
fpf%of [f^,ð A DDBLTFast\_SRCCOLORKEY,ÉfZfbfg,·,é B,±,ê,Í A'è<,³,ê,½“\$%ß,ì,½,ß,ìfJf% [ EfL [ i,±  
,Ì ê ±lpDDSOne,É“¶ Ý,·,é j,ª“¶ Ý,·,éfuf fbN“]‘—,ð,·,é,±,Æ,ðŽ!,μ,Ă,¢,é B

,±,ìftf“fvf<,Ă,Í A updateFrame,É,æ,Ă,Ă”wĚi‘S•”,^%ñ Ā•%œ,³,ê,é B,±,ìftf“fvf<,ð Ā“K%»,·,éê,Ă,ì•û—  
@,Í A Ô,¢—Ö,ª%ñ“],μ,Ă,¢,éŠÔ A•Ĭ X,³,ê,é•”ª,¾,~”wĚi,ð Ā•%œ,·,é,±,Æ,Ă, ,é B—  
Ö,ª d,Ě ‡,í,³,ê,éĚĚ,ìftfCfY,â”z’u,Í•Ĭ X,μ,Ě,Ç,æ,□,É ADDEX4,ìftf“fvf<,ð Ā“K%»,·,é,½,ß,ìŠÈ'P,È C ³,ð,·,é,±  
,Æ,ª,Ă,« ,é B

*f`f... [fgfŠfAf<5: fpfŒfbfg,ì“@“I•İ X*

,±,ìf`f... [fgfŠfAf<(DDEX5),Å,Í A f`f... [fgfŠfAf<4(DDEX4),Å%ø ò³,ê,½fTf“fvf<,ì C ³,É,Â,¢,Ä à-  
¾,·,é B ,±,±,Å,Í AfAfvfŠfP [fVf‡f“,““@,¢,Å,¢,éŠÔ AfpfŒfbfg,İfGf“fgfŠ,ð“@“I,É•İ X,·,é•û-@,ð%ø ò³,·,é B  
DDEX5,Å%ø ò³,ê,é V,µ,¢<@”\,ð AŽŸ,İfXfefbfv,Å à-¾,·,é B

*Step 1: fpfŒfbfg EfGf“fgfŠ,İf [fh*

*Step 2: fpfŒfbfg,İf [fe [fg*

DDEX5,İŽŸ,İfR [fh,İ AfpfƎfbfg EfGf“fgfŠ,É A All.bmpftf@fCfç,İƎă”¼••ª i Ô,Ǝ—  
Ö,İ,đŠŮ,Ɓ•ª j,İ'İ,đf [fh,µ,Ă,Ǝ,é B

```
// ,Í,Œ,É A,.,×,Ä,Ì F,ð-čŽg—p,ÉfZfbfg,.é
for(i=0; i<256; i++)
{
    torusColors[i] = 0;
}
```

```
// fT [ftfFfX,df fbfn,p AĖā¼•••,dfXfLff““,é ifg [f%ofX EfGfŠfA j
// ĖĖ,Ā,Ė,Ā,½fCf“ffbfNfX,İL^,đ•ŰŽ ,é
ddsd.dwSize = sizeof(ddsd);
while (lpDDSDone->Lock(NULL, &ddsd, 0, NULL) == DDERR_WASSTILLDRAWING)
;
```

```
// fg [f%ofX EftfCE [f€,ðCEŸ ò,µ AŽg—p F,ðf} [fN,·,é
for(y=480; y<480+384; y++)
{
    for(x=0; x<640; x++)
    {
        torusColors[ ((BYTE *)ddsd.lpSurface)[y*ddsd.lPitch+x]] = 1;
    }
}
```

```
lpDDSOne->Unlock(NULL);
```

**torusColors**"z—ñ,Í A  
All.bmpftf@fCfç,İEă"¼-••,ĂŽg,í,ê,é fJf% [ EfCf"fffbfNfX,İfCf"fWfP [f^,Æ,μ,ĂŽg,□ B Å %o,É A  
**torusColors**"z—  
ñ,İ¹,İ,·,×,Ă,ð,ÉfŠfZfbfç,·,é BfİftfXfNfŠ [f" Efofbftf@,İ AfJf% [ EfCf"fffbfNfX¹,¹Žg,í,ê,é ê ± A,»,ê,ç,  
İ F,¹Šm'è,³,è,é¹O,Éf fbfN,³,è,é B

**torusColors**"z—ñ,Í Afrfbfgfjfbfv,Ì480—ñ,Ì0E...,©,ç,Í,¶,ß,é,æ,æ,ÉfZfbfg,,:é B"z—  
ñ,ÍJf% [ EfCf"ffbfNfX'Í Afrfbfgfjfbfv EfT [ftFfX,"z'u,³,é,f,f,ſſ,"z'u ê Š,É,æ,éE~é,:é B,±  
,"z'u ê Š,Í A **DDSURFACEDESC** \^c'Í,¶p**Surfacef** f"fo,É,æ,Á,ÁE~é,³,é B,»,é,Ífrfbfgfjfbfv,Ì480—ñ0E...  
(y **IPitch** + x),É'Íºµ,½f f,ſſ,"z'u ê Š,Ö,Íf|  
fCf"/,Æ,É,é B"Á,É,ÍJf% [ EfCf"ffbfNfX'Í,"z'u ê Š,Í,ÉfZfbfg,:é B'ly( srow),Í A **IPitch** l i  
**DDSURFACEDESC** \^c'Í,Á,,:é jſſfjAf f,ſſ,ÍſfNfZf,ÌŽÀ Û,Í,"z'u,đ¾,é,±,Æ,Á,«,é B

**torusColors**,ÉfZfbfg,<sup>3</sup>,é,½fJf% [ EfCf“ffbfNfX”l,Í A,Æ,ÄfpfEfbfg“à,l,Ç,l F,ðf [fe [fg,<sup>3</sup>,é,©E“ß,é,Æ,«,ÉŽg,□ B”wEiA,Æ Ö,¢—Ö,É,Í,©“É,·,é F,<sup>3</sup>,ä,¢,½,ß A Ö,¢—Ö,ÆSÖ~A,Ä,·,ç,é,½ F,¾,~“f [fe [fg,<sup>3</sup>,é,é B,±,é,“true,©,Ç,□,©,ðf“FFfbfN,·,é,½,ß,É,Í A”z—ñ,©,¢“ddsd.lPitch”,žŽæ,è æ,« Afvf fOf%øf,ð ÄfRf“fpfCf,μ,½, ,Æ“®,©,·,Æ,«,É%ø½,“N,±,é,©,ð— %øð,·,é,±,Æ B (y lPitch,ÄŠl, žŽð,ð,μ,É,¢,Æ Ö,¢—Ö,žæ“¾,¾,é,É,¢,μ”wEiA,Æ©,ç,é,é F,¾,~“fCf“ffbfNfX,<sup>3</sup>,é A,Æ,Äf [fe [fg,<sup>3</sup>,é,é)  
¾,ç,É Ú,μ,¢ îñ,Í A u“Æfsbf” v,ðžQ Æ,·,é,±,Æ B

## Step 2: `fpfŒfbfg,İf lfe lfg`

```
DDEX5,İ updateFrameŠÖ ",İ A f`f... [fgfŠfAf, 4 (DDEX4),Æ,Û,Æ,ñ,Ç“¬,¶•û-@,Å“-
B,İ,¶,ß,É”wŒi,đfofbfN Efofbftf@,É“]‘—,µ AŽŸ,É A3,Å,İ—Ö,đ‘O—Ê,É“]‘—
,·,é BfT [ftfFfX,đftfŠfbfsf“fO,·,é‘O,É A updateFrame,İ Afvf%oCf}
fŠ EfT [ftfFfX,İfpfŒfbfg,đdoInitŠÖ ",Å İ ¬,³,ê,½fpfŒfbfg EfCf“ffbfNfX,©,Ç•İ X,·,é B•û-
@,İŽŸ,İfR [fh,İÊ,è B
```

```
// fpfŒfbfg,İ•İ X
if(lpDDPal->GetEntries(0, 0, 256, pe) != DD_OK)
{
    return;
}
```

```
for(i=1; i<256; i++)
{
    if(!torusColors[i])
    {
        continue;
    }
    pe[i].peRed = (pe[i].peRed+2) % 256;
    pe[i].peGreen = (pe[i].peGreen+1) % 256;
    pe[i].peBlue = (pe[i].peBlue+3) % 256;
}
```

```
if(lpDDPal->SetEntries(0, 0, 256, pe) != DD_OK)
{
    return;
}
```

**IDirectDrawPalette::GetEntries** f f\fbfh,İ A Å %o,İ s,Å

DirectDrawPalette,©,çfpfŒfbfg'l,đ“¾,é BfpfŒfbfg EfGf“fgfŠ'l,İ A pe,đf|fCf“f^,Æ,·,é•İ ”,É“ü,è Af f\fbfh,İ  
DD\_OK,đ•Ô,µ A ^— ,ª±,¬,ç,ê,é B,»,İŠÖ AfJf%o [ EfCf“ffbfNfX,ª1,ÊfZfbfg,³,ê,Ä,ç,é,©,Ç,ª  
,© A torusColors,đf`fFfbfN,µª±,¬,é BfZfbfg,³,ê,Ä,ç,é ê ‡ AfpfŒfbfg EfGf“fgfŠ,İ Ô A—  
İ A Å,İ'l,İ Af [fe [fg i zŠÄ j,³,ê,é B

f} [fN,³,ê,½,·,×,Ä,İfpfŒfbfg EfGf“fgfŠ,ªf [fe [fg,³,ê,½Œä A

DirectDrawPalettefİfufWfFfNfg,İfGf“fgfŠ,đ•İ X,·,é,½,ß,É**IDirectDrawPalette::SetEntries**f f\fbfh,đŒÄ,Ñ o,· B,±  
,İ•İ X,İ Afvf%oCf}fŠ EfT [ftfFfX,Ö,İfpfŒfbfgfZfbfg,ª—LŒø,É,Ê,é,Æ,·,®,É,·,ç,İ,ê,é B

,±,ê,ª İ,İ,é,Æ Aª±,ç,ÄfT [ftfFfX,İDDEX5,đftfŠfbfsf“fO,·,é

,»,"¼," DirectDrawTf“fvf<

fAfvfŠfP [fVf‡f“,ÅDirectDraw,ð,Ç,ì,æ,ϣ,ÉŽg,ϣ,©Šw,Ô,É,Í A DirectX SDK,ÉŠÜ,Ü,ê,éŽŸ,lfTf“fvf<,ì,¢,-  
,Â,©,ðf`fFfbfN,·,é,Æ,æ,¢ B

Stretch

”ñ”r“¼“I ifEfBf“fhfE jf, [fh EfAfjff [fVf‡f“,ð ifNfŠfbfsf“fO,<sup>3</sup>,ê,½“]‘—  
,Æ L’·,µfNfŠfbfsf“fO,<sup>3</sup>,ê,½“]‘—,l”\—Í,<sup>a</sup>, ,é jfEfBf“fhfE“à,É ì ¬,·,é•û—@,ðŽ!,· B

Donut

‘½,,l”r“¼“If, [fh EfAfvfŠfP [fVf‡f“,”ñ”r“¼“If, [fh EfAfvfŠfP [fVf‡f“,Æ‘ŠŒÝ ì—p,·,éŽŽ,Ý,ðŽ!,· B

Wormhole

fpfŒfbfg EfAfjff [fVf‡f“,ì•û—@,ðŽ!,· B

Dxview

fffBfXfvfŒfC Efn [fhfEfEfA,l”\—Í,ð’<sup>2</sup>,×,é•û—@,ðŽ!,· B

,Ü,©,É,àDirectDraw,ÉŠÖ,·,éfTf“fvf<,Í A Duel, Iklowns, Foxbear, Palette,Flip2d,È,Ç,°, ,é B

Å“K%»»,ÆfJfXf^f}fCfY

,±,ìSDK,Å'ñ<ÿ,³,ê,éDirectDraw,ìfTf“fvf<,Í”äŠr“IfVf“fvf<,È,à,ì,Å A“® ì,·,éfVfXfef€,É‘½,,ì'O'ñ ðŒ ,ð Ý,¯,Ä,¢  
,é B,±,ì ß,Å,Í AfR [fh,\*Œ»ŽÀ,É,æ,e—Ç,“® ì,·,é,æ,²,ÈfTf“fvf<,Ì Å“K%»» AfJfXf^f}fCfY,É,Â,¢,Ä à-¾,·,é B

ftfŠfbfsf“fO,Æfuf fbfN“]‘—,Ì ó‘ÔŽæ“¾  
fJf%₀ [ftfBf<,ð”º,²fuf fbfN“]‘—  
fffBfXfvfŒfC Efn [fhfEfFfA”\—Í,ìŒ~`è  
fffBfXfvfŒfC Ef f,fŠ,Ö,Ìfrfbfgf}fbfv,ÌŠi”[  
fqfŠfvf< Efofbftf@fŠf“fO



*ftfŠfbfsf“fO,Æfuf fbfN“]‘—,ì ó‘ÔŽæ“¾*

**IDirectDrawSurface2::Flip** *f\fbfh,ªCEÄ,Î,ê,½,Æ,« Afvf%ofCf}fŠ EFT [ftfFfX ,ÆfobfN Efofbftf@,ÍCEðŠ·,³,ê,é B,μ,©,μ A,»,Ì·İŠ·,Í,·,®É,Í s,í,ê,È,¢ B,½,Æ,,Î‘O,ÌftfŠfbfsf“fO,ª I—¹,μ,Ä,¢ ,È,¢ ê ± A,Ü,½,ÌftfŠfbfsf“fO,ÉŽ,”s,μ,È,©,Ä,½ ê ± A,± ,İf f\fbfh,İDDERR\_WASSTILLDRAWING,ð·Ô,· BSDK,İftf“fvf<,Ä,Í A **IDirectDrawSurface2::Flip**,ÌCEÄ,Ñ o,μ,Í DD\_OK,ª·Ô,³,ê,é,Ü,Äf< [fv,μ‘±,¯,é B,Ü,½ **IDirectDrawSurface2::Flip**,ÌCEÄ,Ñ o,μ,à,·,®,ÉŠ®— ¹,μ,È,¢ BftfŠfbfsf“fO,ÍfvfXfef€,İŽŸ,Ì ,’¼<A ü,ª,“,±,Ä,½,Æ,«É s,í,ê,é B*

*DDERR\_WASSTILLDRAWING,ª·Ô,³,ê,È,,È,é,Ü,Ä‘Ò,Ä,Ì,ÍCEø—¹,ª^,¢ B‘ã,í,è,É AftfŠfbfsf“fO,ª I—¹,μ,½,©,Ç,¤ ,©,ðCE¨è,·,é,½,ß AfofbfN Efofbftf@,Ä**IDirectDrawSurface2::GetFlipStatus**,ðCEÄ,Ñ o,·ŠÖ ”,ð ì ¬,·,×,«Ä, ,é B*

*,à,μ‘O,ÌftfŠfbfsf“fO,ª L,í,Ä,Ä,“,ç,, AÆÄ,Ñ o,μ,Ä DDERR\_WASSTILLDRAWING,ª·Ô,Ä,½ ê ± AfAfvfŠfP [fvf±f“,Í AfXfe [f^fX,ð Ä,Ñf`FFfbfN,·,é‘O,É‘¼,İŽdŽ —,ð s,¤,±,Æ,ª,Ä,«é B,»,¤,Ä,È,¯,ê,Î AŽŸ,ÌftfŠfbfsf“fO,ðŽÄ s,Ä,«é BŽŸ,Ì—á,Ä A,±,İŠT”O,ð à—¾,·,é B*

*while (lpDDSTBack->GetFlipStatus (DDGFS\_ISFLIPDONE) == DDERR\_WASSTILLDRAWING) ;*

*// ‘O,ÌftfŠfbfsf“fO,ª I—¹,μ,½,Ì,ð‘Ò,Ä ,  
// fAfvfŠfP [fvf±f“,Í,±,±,Ä A‘¼,İf^fXfN,ðŽÄ s,Ä,«é*

*ddrval = lpDDSPPrimary->Flip (NULL, 0) ;*

*fuf fbfN“]‘—,ª I—¹,μ,½,©,Ç,¤,©,ð”»’f,·,é,½,ß,É“¬,¶,æ,¤,È·û—  
@,Ä**IDirectDrawSurface2::GetBltStatus** f\fbfh,ðŽg,¤,±,Æ,ª,Ä,«é B**IDirectDrawSurface2::GetFlipStatus**,Æ **IDirectDrawSurface2::GetBltStatus**,Í,·,®,É·Ô,é,½,ß AŽüŠú“İ,É,± ,ê,ç,ðŽg,Ä,Ä,àfAfvfŠfP [fvf±f“,Í,Ü,Æ,ñ,ÇfXfs [fh,ðf fX,μ,È,¢ B*

**fJf% [ EftfBf<,đŽ”„fuf fbfN“]‘—**

•Ž|,³,¹,½,¢<◻’Ê F,İfJf% [ EftfBf<,đŽÀĈ»,·,é,½,ß,É**DirectDrawSurface2::Blt** f\fbfh,đŽg,◻,±  
,Æ,ª,Â,«,é B,½,Æ,,İ AfAfvfŠfP [fVf‡f“,ª\Ž|,·,é<◻’Ê F,ª Â,İ ê ‡ A Â F,Â Â %o,ÉfT [ftfFfX,đ-  
,,ß,é,½,ß,ÉDDBLT\_COLORFILL ftf%ofo,Æ<◻,É**DirectDrawSurface2::Blt**,đŽg,◻ B,·,é,Æ A,»,İ ã,É%½,Â,à ‘,«,±  
,p,±,Æ,ª,Â,«,é B<◻’Ê F,Â,·,İ,â,—,ß,é,±,Æ,ª,Â,«,é,İ,Â AfT [ftfFfX,Ö Â ¬,İ F ”,đ ‘,©,È,—,ê,İ,¢,—,È,¢  
,¾,—,Â, ,é B

ŽŸ,İ—á,İ AfJf% [ EftfBf<,đŽÀĈ»,·,é•û-@,İ,Đ,Æ,Â,Â, ,é B

DDBLTfX ddbltfx;

```
ddbltfx.dwSize = sizeof(ddbltfx);
ddbltfx.dwFillColor = 0;
ddrval = lpDDSPPrimary->Blt(
    NULL,          // “]— æ
    NULL, NULL,    // “]‘—Ĉ³«éĈ`
    DDBLT_COLORFILL, &ddbltfx);
```

```
switch(ddrval)
{
    case DDERR_WASSTILLDRAWING:
        .
        .
        .
    case DDERR_SURFACELOST:
        .
        .
        .
    case DD_OK:
        .
        .
        .
    default:
}
```

**ffBfXfvfƎfC Efn [fhfEfFfA”—Í,İƎ~è**

DirectDraw,Í Af† [fU,İfn [fhfEfFfA,<sup>a</sup>fTf] [fg,µ,Ä,Ǝ  
,È,ƎDirectDrawŠÖ ”,ðŽÀ s,·,é,½,ß,Éfn [fhfEfFfA EfGf~f...fƎ [fVf‡f“,ðŽg,□ B  
DirectDrawAfvfŠfP [fVf‡f“,İpfth [f}f“fX,ð ,‘¬%»»,·,é,½,ß,É A  
DirectDrawIfufWfFfNfg,ð ì ¬,µ,½ƎÄ,Ä Af† [fU,İffBfXfvfƎfC Efn [fhfEfFfA,İ”—Í,ðƎ~è,·,×,«,Ä, ,é B  
DirectDraw,Í Af† [fU,İfVfXfef€ ä,ÄŽg—p%Ä”\,È,Ç,İffBfXfvfƎfC ,‘¬%»»fn [fhfEfFfA,àŽg,□,±  
,Æ,<sup>a</sup>,Ä,«,é BfAfvfŠfP [fVf‡f“,<sup>a</sup>—  
v< ,·,éffBfXfvfƎfC ,‘¬%»»fn [fhfEfFfA,ðf† [fU,İfVfXfef€ ä,İffBfXfvfƎfC EfAf\_fvf^,É‘¶ Ý,µ,È,Ǝ ê ‡  
AfAfvfŠfP [fVf‡f“,Í•K—v,Æ,·,éfn [fhfEfFfAfGf~f...fƎ [fVf‡f“,İfŠfXfg,ðDirectDraw,É’ñ<Ý,µ,È,¬,ê,İ,È,ç,È,Ǝ  
,±,Æ,É’ ^Ó,·,é B

ffBfXfvfƎfC Efn [fhfEfFfA,İ”—Í,ðŽæ“¾,·,é,½,ß,É A **IDirectDraw2::GetCaps**,ðŽg,□,±  
,Æ,<sup>a</sup>,Ä,«,é Bfn [fhfEfFfA,İ,½,ß,İDirectDrawffofCfX Efhf%ofCfo,Í A **DDCAPS** \‘‘İ,İdwCapsf f“fo,İ’l,ð ‘,«\  
,· B ,±,ê,ç,İ’l,Í AfVfXfef€,İffBfXfvfƎfC ,‘¬%»»fn [fhfEfFfA,İ”—Í,ðŽ’,· B **DDCAPS**  
\‘‘İ,Í AfAfvfŠfP [fVf‡f“,İ—v< ,Äfn [fhfEfFfA EfGf~f...fƎ [fVf‡f“,ð’ñ<Ý,·,é**DDSCAPS**  
\‘‘İ,İfAfhfƎfX,ðŠÜ,ñ,Ä,Ǝ,é B DirectDraw,İfn [fhfEfFfA §Ǝä”—Í,<sup>a</sup>ffBfXfvfƎfC EfAf\_fvf^ ä,Ä—~—  
p,Ä,«,È,Ǝ ê ‡ Afn [fhfEfFfA EfGf~f...fƎ [fVf‡f“,<sup>a</sup>Žg—p,<sup>3</sup>,ê,é B,±,İ ê ‡ AfAfvfŠfP [fVf‡f“,<sup>a</sup>**DDSCAPS**  
\‘‘İ,Ä—v< ,<sup>3</sup>,ê,éfn [fhfEfFfA EfGf~f...fƎ [fVf‡f“’l,ð’ñ<Ý,µ,È,¬,ê,İ,È,ç,È,Ǝ B.

**ffBfXfvfƎfC Ef f,fŠ,Ö,ìfrfbfgf}fbfv,ìŠi”[**

ffBfXfvfƎfC Ef f,fŠ,©,çffBfXfvfƎfC Ef f,fŠ,Ö,ì“]’—

,Í AfVfXfef€ Ef f,fŠ,©,çffBfXfvfƎfC Ef f,fŠ,Ö,ì“]’—,æ,è,à,Í,é,©,ÉƎø—“I,Å, ,é B,Æ,¢,□,±  
,Æ,Í AfAfVfŠfP [fVf‡f“,Í‘½,,ìXfvf%oCf g,ðffBfXfvfƎfC Ef f,fŠ,ÉŠi”[,μ,½,Û,□,ª,¢,±,Æ,É,È,é B

,Û,Æ,ñ,Ç,ìffBfXfvfƎfC Efn [fhfEfFfA,Í Afvf%oCf}fŠ EfT [ftFfX,ÆfofbfN Efofbftf@,¾,¯,Å,È,-  
,à,Å,Æ‘½,,ì,à,ì,ðŠi”[,·,é,½,ß,É [ª,Èf f,fŠ,ðŽ ,Å,Å,¢,é BffBfXfvfƎfC EfAf\_fvf^f f,fŠ,Éfrfbfgf}  
fbfv,ðŠi”[,·,é,½,ß,É—~—p,Å,«éf f,fŠ,ì‘à,«³,ðƎ^è,·,é,½,ß,É **DDCAPS** \‘¢‘ì,ì dwVidMemTotalf f“fo,Æ  
dwVidMemFreef f“fo,ðŽg,□,±,Æ,ª,Å,«é B(,à,μ Af† [fU,ìffBfXfvfƎfC Efn [fhfEfFfA,ì”\—Í,ð“¾,é,½,ß,É\_  
**IDirectDraw2::GetCaps**f f\fbfh,ðŽg,Å,½ ê ‡) ,±,ê,ª,Ç,ì,æ,□,É“®,,©— %øð,μ,½,¯,ê,Î A DirectX SDK,ª”ñ<Ÿ,·,é  
DirectXfrf... [f EfAfVfŠfP [fVf‡f“,ðŽg,□ B DirectDrawfffoCfX,ì,à,Æ,Å,Í A fvf%oCf}  
fŠ EftfBfXfvfƎfC Efhf%oCfo EftfHf<f\_,ðŠJ,« A,»,ìƎä ^è”ÊftfHf<f\_,ðŠJ,,±  
,Æ BffBfXfvfƎfC Ef f,fŠ,ì ‡Ǝv,Æ ifvf%oCf}fŠ EfT [ftFfX,ð æ, j-¢Žg—  
pf f,fŠ,ì ‡Ǝv,ª•Ž‘,³,ê,é BfT [ftFfX,ª A DirectDrawfIfufWfFfNfg,É‘Ç%oÁ,³,ê,é“x,É A-¢Žg—  
pf f,fŠ,ì ‡Ǝv,Í A‘Ç%oÁ,³,ê,½fT [ftFfX,ªŽg,Å,½ª,ìf f,fŠªƎ,Å,Å,¢, B

**fgfŠfvf< Efofbftf@fŠf“fO**

fgfŠfvf< Efofbftf@fŠf“fO,đŽg,Á,Ä AfAfvfŠfP [fVf‡f“,ì•Ž! ^— ,đ ,‘-‰»„Ä,«é ê ‡,ª,é AfgfŠfvf< Efofbftf@fŠf“fO,Í A^ê,Ä,lfvf‰fCf}fŠ EfT [ftfFfX,Æ,Ó,½,Ä,lfobfN Efofbftf@,đŽg,□ BŽŸ,ì— á,Á,Í AfgfŠfvf< Efofbftf@fŠf“fO EfXfL [f€,đ %Šú‰»,·,é•û-@,đŽ!,µ,Ä,¢,é B

```
// ,Ó,½,Ä,lfobfN Efofbftf@,Æfvf‰fCf}fŠ EfT [ftfFfX,đ ì ¬
ddsd.dwSize = sizeof(ddsd);
ddsd.dwFlags = DDSD_CAPS | DDSD_BACKBUFFERCOUNT;
ddsd.ddsCaps.dwCaps = DDSCAPS_PRIMARYSURFACE |
    DDSCAPS_FLIP | DDSCAPS_COMPLEX;
ddsd.dwBackBufferCount = 2;
ddrval = lpDD->CreateSurface(&ddsd, &lpDDSPimary, NULL);
if(ddrval == DD_OK)
{
    // ‘æ^ê,lfobfN Efofbftf@,Ö,lf|fCf“f^,đŽæ“¾
    ddscaps.dwCaps = DDSCAPS_BACKBUFFER;
    ddrval = lpDDSPimary->GetAttachedSurface(&ddscaps,
        &lpDDSBackOne);
    if(ddrval != DD_OK)
        // ,±,±,ÄfGf‰ [f fbfZ [fW,đ•Ž!
        // ‘æ“ñ,lfobfN Efofbftf@,Ö,lf|fCf“f^,đŽæ“¾
    ddscaps.dwCaps = DDSCAPS_BACKBUFFER;
    ddrval = lpDDSPimary->GetAttachedSurface(&ddscaps,
        &lpDDSBackTwo);
```

ftfŠfbfsf“fO,ªŠ@—¹,µ,È,,Ä,à A,Ü,½‘æ^ê,lfobfN Efofbftf@,““]‘—,đ I—¹,µ,È,-  
,Ä,à AfgfŠfvf< Efofbftf@fŠf“fO,É,æ,Á,ÄAfvfŠfP [fVf‡f“,lfobfN Efofbftf@,É“]‘—,µ‘±,¯,é,±  
,Æ,ª,Ä,«é BftfŠfbfsf“fO,ÌŽÄ s,Í,·,®,É,Í<N,±  
,ç,È,¢ B,µ,½,ª,Ä,Ä AfAfvfŠfP [fVf‡f“,ª,Đ,Æ,Ä,lfobfN Efofbftf@,¾,~Žg,□ ê ‡ A  
**IDirectDrawSurface2::Flip** f\fbfh,ª DD\_OK,đ•Ö,·,ì,đ•Ö,ÁŠÖ AfAfCfhfŠf“fOŽžŠÖ,ª,©,©,é‰Ä”\ «,ª,é B

DirectDrawŠftf@fŒf“fX

šö ”

## DirectDrawCreate

```
HRESULT DirectDrawCreate(GUID FAR * lpGUID,  
    LPDIRECTDRAW FAR * lplpDD, IUnknown FAR * pUnkOuter);
```

DirectDrawIfufWfFfNfg,lfCf“fXf^f“fX,ð ì ¬,·,é B

¬Ç÷,·,ê,ÎDD\_OK AŽ,”s,·,ê,ÎŽŸ,lfGf%o [,ð•Ô,· B

**DDERR\_DIRECTDRAWALREADYCREATED**

**DDERR\_GENERIC**

**DDERR\_INVALIDDIRECTDRAWGUID**

**DDERR\_INVALIDPARAMS**

**DDERR\_NODIRECTDRAWHW**

**DDERR\_OUTOFMEMORY**

lpGUID

ì ¬,³,ê,éfhf%oCfo,ð•\,·fOf [fof<f†fj [fNŽ¬•ÊŽq (GUID),Ö,lfAfhfÇfX B  
NULL,Í,Â,Ë,É AfAfNfefBfu,ÈffBfXfvfÇfC Efhf%oCfo,ðŽ!,· B

lplpDD

ÇÄ,Ñ o,µ,<sup>a</sup> ¬Ç÷,µ,½ ê ‡ A—LÇø,ÈDirectDrawIfufWfFfNfg,lf|fCf“f^,Â %oŠú%o»,³,ê,éf|  
fCf“f^,Ö,lfAfhfÇfX B

pUnkOuter

COM W ¬%o»<@”\,Æ «—^,lÇŸŠ· «,l,½,ß,É, ,é BCE» Ý,Í NULL,ð Ý’è,µ,È,Ç,ÆfGf%o [,Æ,È,é B  
,±,lŠÖ ”,ÍDirectDrawIfufWfFfNfg,l %oŠú%o»,ðŽŽ,Ý,é BCEÄ,Ñ o,µ,<sup>a</sup> ¬Ç÷,µ,½ ê ‡ AfIfufWfFfNfg,Ö,lf|  
fCf“f^,<sup>a</sup>lplpDD,ÉfZfbfg,³,ê,é B %oŠú%o»’¼Çä,É**DirectDraw2::GetCaps** f f\fbfh,ðÇÄ,Ô,±,Æ,Â A,±  
,lfIfufWfFfNfg,<sup>a</sup>fn [fhEfFfA,Â,Ç,ì’ö“xfAfNfZf%oÇE [fg,³,ê,é,©,ðÇŸ o,µ’m,ç,<sup>1</sup>,é B



## DirectDrawCreateClipper

```
HRESULT DirectDrawCreateClipper(DWORD dwFlags,  
    LPDIRECTDRAWCLIPPER FAR *lplpDDClipper,  
    IUnknown FAR *pUnkOuter);
```

DirectDrawIfufWfFfNfg,ÉŠÖ~A,Ä,¯,ç,ê,È,¢DirectDrawClipperIfufWfFfNfg,ÌfCf“fXf^f“fX,ð ì ¬,·,é B

–œ÷,·,ê,Î DD\_OK AŽ,”s,·,ê,îŽŸ,ÌfGf‰ [,ð•Ô,· B

**DDERR\_INVALIDPARAMS**

**DDERR\_OUTOFMEMORY**

*dwFlags*

,±,Ìfpf‰f [f^,Íœ» Ý–œŽg—p,Ä A0,ÉfZfbfg,µ,Ä,“,©,È,¯,ê,Î,È,ç,È,¢ B

*lplpDDClipper*

V,µ,¢DirectDrawClipperIfufWfFfNfg,Ö,ÌfAfhfœfX,ª•Ô,³,ê,éf|fCf“f^,Ö,ÌfAfhfœfX B

*pUnkOuter*

COM W ¬‰»«@”\,Æ «—^,ÌœÝŠ· «,Ì,½,ß,É, ,é BCE» Ý,Í A NULL,ð Ý’è,µ,È,¢,ÆfGf‰ [,Æ,È,é B

,±,ÌŠÖ ”,Í A ,Ç,ÌDirectDrawIfufWfFfNfg,ª ì ¬,³,ê,é‘O,É,àœÄ,Ñ o,·,±

,Æ,ª,Ä,«,é BDirectDrawClipperIfufWfFfNfg,Í,Ç,ÌDirectDrawIfufWfFfNfg,É,à Š—L,³,ê,È,¢

,½,ß AfAvfŠfP [fVf‡f“,ÌfIfufWfFfNfg,ª‰ð•ú,³,ê,Ä,àŽ©“®“I,É‰ðð•ú,³,é,±,Æ,Í,È,¢ BfAvfŠfP [fVf‡f“,ª–  
¾Ž,“I,ÉDirectDrawClipperIfufWfFfNfg,ð‰ðð•ú,µ,È,¢ ê ‡ A fAvfŠfP [fVf‡f“ I—¹ŽŽ,ÉDirectDraw,ª‰ðð•ú,·,é B

“Á’è,ÌDirectDrawIfufWfFfNfg,É,æ,Á,Ä Š—L,³,ê,½DirectDrawClipperIfufWfFfNfg,ð ì ¬,·,é,½,ß,É,Í A

**IDirectDraw2::CreateClipper** f f\fbfh,ðŽg,µ,±,Æ B

ŽQ Æ @**IDirectDraw2::CreateClipper**

## DirectDrawEnumerate

```
HRESULT DirectDrawEnumerate(LPDDENUMCALLBACK lpCallback,  
    LPVOID lpContext);
```

*fVfXfef€*,ÉfCf“fXfg [f<,<sup>3</sup>,ê,½DirectDrawfIfufWfFfNfg,ð—ñ<“,;é B NULL,ìGUIDfGf“fgfŠ,Í AGDI,Æ<□—  
L,<sup>3</sup>,ê,éfvf%ofCf}fŠ EftfBfXfvfÆfC EftfofCfX,ðŽ!,· B

¬Æ÷,μ,½,çDD\_OK AŽ,”s,·,é,ÆDDERR\_INVALIDPARAMS,ð•Ô,· B

*lpCallback*

*fVfXfef€*,ÌHALffXfNfŠfvf^,ðfpf%of [f^,É,μ,ÄÆÄ,Ñ o,<sup>3</sup>,ê,é CallbackŠÖ ”,ÌfAfhfÆfX B

*lpContext*

—ñ<“fR [f<fobfNŠÖ ”,ªÆÄ,Ñ o,<sup>3</sup>,ê,é,<sup>2</sup>,Æ,É“n,<sup>3</sup>,ê,éfAfvfŠfP [fVf‡f“,Á’è<`,μ,½fRf“fefLfXfg,Ö,Ìf|fCf“f^ B

**fR [f<fofbfNŠÖ ”**

## Callback

```
BOOL WINAPI lpCallback(GUID FAR * lpGUID,  
    LPSTR lpDriverDescription, LPSTR lpDriverName,  
    LPVOID lpContext);
```

**DirectDrawEnumerate** ŠÖ ”,İ,½,ß,İfAfvfŠfP [fVf‡f“,Å’èç,·,éfR [f<fofbfNŠÖ ” B

—ñ<“,ð‘±,¯,é ê ‡,ÍDDENUMRET\_OK,ð•Ô,µ AŽ~,ß,é ê ‡,ÍDDENUMRET\_CANCEL,ð•Ô,· B

*lpGUID*

DirectDrawIfufWfFfNfg“à,İfOf [fof<f†fj [fNŽ¯•ÊŽq i,f,t,h,c j,İfAfhfŒfX B

*lpDriverDescription*

fhf%oCfo,ÉŠÖ,·,éçL q,ðŽ!,••¶Žš—ñ,İfAfhfŒfX B

*lpDriverName*

fhf%oCfo—¼,ðŽ!,••¶Žš—ñ,İfAfhfŒfX B

*lpContext*

ŠÖ ”,ªŒÄ,Ñ o,³,ê,é,²,Æ,ÉfR [f<fofbfNŠÖ ”,É“n,³,ê,éfAfvfŠfP [fVf‡f“,Å’èç,µ,½ \‘Œ‘İ,Ö,İf|fCf“f^ B

EnumModesCallback

```
HRESULT WINAPI lpEnumModesCallback(LPDDSURFACEDESC lpDDSurfaceDesc,
    LPVOID lpContext);
```

IDirectDraw2::EnumDisplayModes f f\fbfh,ì,½,ß,ìfAfvfŠfP [fVf‡f“,Å’è<`,·,éfR [f<fofbfNŠÖ ” B

—ñ<“,ð‘±,¯,é ê ‡,ÍDDENUMRET\_OK,ð•Ô,· BŽ~,ß,é ê ‡,ÍDDENUMRET\_CANCEL,ð•Ô,· B

lpDDSurfaceDesc

f,fj f^ [ ,ìŽü”g ”,Æ ì ¬,³,ê“¾,éf, [fh,ð’ñ<Ÿ,·,éDDSURFACEDESC \‘¢‘ì,ìfAfhfÆfX B,±  
,ìff [f^,Í“Ç,Ÿ o,µ ê—p,Å, ,é B

lpContext

ŠÖ ”,ªÆÄ,Ñ o,³,ê,é,²,Æ,ÉfR [f<fofbfNŠÖ ”,É“n,³,ê,éfAfvfŠfP [fVf‡f“,Å’è<`,µ,½ \‘¢‘ì,Ö,Ìf|fCf“f^ B

## EnumSurfacesCallback

```
HRESULT WINAPI lpEnumSurfacesCallback(  
    LPDIRECTDRAW_SURFACE2 lpDDSurface,  
    LPDDSURFACEDESC lpDDSurfaceDesc, LPVOID lpContext);
```

**IDirectDrawSurface2::EnumAttachedSurfaces** *f f\fbfh, Ì, ½, B, ÌfAfvfŠfP [fVf‡f“, Å’è`, ·, éfR [f<fofbfNŠÖ ” B*

*—ñ<“, ð‘±, ¯, é ê ‡, ÍDDENUMRET\_OK, ð•Ô, µ AŽ~, B, é ê ‡, ÍDDENUMRET\_CANCEL, ð•Ô, · B*

*lpDDSurface*  
*, ±, ÌfT [ftfFfX, ÉfAf^fbf`, ³, ê, ½fT [ftfFfX, ÌfAfhfŒfX B*

*lpDDSurfaceDesc*  
*fAf^fbf`, ³, ê, ½fT [ftfFfX, ð<L q, ·, éDDSURFACEDESC \‘Œ‘Ì, ÌfAfhfŒfX B*

*lpContext*  
*ŠÖ ”, ¢Ä, Ñ o, ³, ê, é, ², Æ, ÉfR [f<fofbfNŠÖ ”, É“n, ³, ê, éfAfvfŠfP [fVf‡f“, Å’è`, µ, ½ \‘Œ‘Ì, Ö, Ìf|fCf“f^ B*

**fnCallback**

```
HRESULT WINAPI lpfnCallback(LPDIRECTDRAWSURFACE lpDDSurface,
    LPVOID lpContext);
```

**IDirectDrawSurface2::EnumOverlayZOrders** *f f\bfh,l,½,ß,İfAvfŠfP [fVf‡f“,Å’è¸,.,éfR [f<fofbfNŠÖ ” B*

—ñ<“,ð‘±,¯,é ê ‡,Í DDENUMRET\_OK,ð•Ô,µ AŽ~,ß,é ê ‡,Í DDENUMRET\_CANCEL,ð•Ô,· B

*lpDDSurface*

*fT [ftfFX,ÉfI [fo [fÆfC,³,ê,Ä,¢,éfT [ftfFX,İfAfhfÆfX B*

*lpContext*

ŠÖ ”,ªÆÄ,Ñ o,³,ê,é,²,Æ,ÉfR [f<fofbfNŠÖ ”,É“n,³,ê,éfAvfŠfP [fVf‡f“,Å’è¸,µ,½ \‘¢‘İ,Ö,İf|fCf“f^ B

## IDirectDraw2

DirectDrawIfufWfFfNfg,đ ì ¬,µfVfXfef€ EfƎfxf,•İ ”,Å“® ì,•,é,½,ß,É AfAfvfŠfP [fVf‡f“,ÍIDirectDraw2 fCf“f^ [ftfFfCfX,İf f\fbfh,đŽg,□ B,±,İ ß,Â,Í AIDirectDraw2 fCf“f^ [ftfFfCfX,İf f\fbfh,É,Â,¢,Ä à– ¼,•,é BŠT”O,İŠT—v,Í A uDirectDrawIfufWfFfNfg v,đŽQ Æ,•,é,±,Æ B

IDirectDraw2 fCf“f^ [ftfFfCfX,İf f\fbfh,Í AŽŸ,İ,æ,□,ÈfOf< [fv,É•ª,¬,ç,ê,é B

f f,fŠ,İŠ,,è“–,Ä Compact  
Initialize

fIfufWfFfNfg,İ ì ¬ CreateClipper  
CreatePalette  
CreateSurface

fffofCfX,İ”\—Í GetCaps

ffBfXfvfƎfC Ef, [f h EnumDisplayModes  
GetDisplayMode  
GetMonitorFrequency  
RestoreDisplayMode  
SetDisplayMode

ffBfXfvfƎfC EfXfe [f^fX GetScanLine  
GetVerticalBlankStatus

,»,İ¼ GetAvailableVidMem  
GetFourCCCodes  
WaitForVerticalBlank

“® ìŠÂ«„,İ Ý’è SetCooperativeLevel

fT [ftfFfX DuplicateSurface  
EnumSurfaces  
FlipToGDISurface  
GetGDISurface

IDirectDraw2fCf“f^ [ftfFfCfX,Í A,•,×,Ä,İCOMfCf“f^ [ftfFfCfX,Æ“— l AIUnknownfCf“f^ [ftfFfCfXf f\fbfh,đƎp ³,•,é B IUnknownfCf“f^ [ftfFfCfX,Í AŽŸ,İß,Â,İf f\fbfh,đfTf| [fg,µ,Ä,¢,é B

AddRef  
QueryInterface  
Release



**IDirectDraw2::Compact**

HRESULT Compact ( ) ;

Ⓔ» Ÿ A,±,łf f\fbfh,Í'è`³,ê,Ä,¢,é,¼,¯,Ä, ,è AŽÀ‘•,Í,Û,¼³,ê,Ä,¢,È,¢ B  
-Ⓔ÷,·,ê,Î DD\_OK AŽ, ”s,·,ê,ÎŽŸ,łfGf%o [,ð•Ô,· B

- DDERR\_INVALIDOBJECT
- DDERR\_INVALIDPARAMS
- DDERR\_NOEXCLUSIVEMODE
- DDERR\_SURFACEBUSY

,±,łf f\fbfh,Í AfffBfXfvfⒺfC EfJ [fh,łfT [ftfFfX Ef f,fŠ,ł'f•D,ð˘Ú“@,³¹,Ä`A‘±,μ,½^êfu ffbfN,ð,Æ,è A—  
~—p,Ä,«,é-ⒺŽg—pf f,fŠ,ð Ä‘â,É,·,é B,È,ñ,ç,©,Î ^— ,ª s,í,ê,Ä,¢,é,Æ,«,ÉⒺÄ,Ń o,·,ÆŽ, ”s,·,é B  
,±,łf f\fbfh,ðⒺÄ,Ń,¼,·fAfvfŠfP [fVf‡f“,Í A◁—LfⒺfxf◁,ð”r¼“IfⒺfxf◁,ÉfZfbfg,μ,Ä,¨,©,È,¯,ê,Î,È,ç,È,¢ B

## IDirectDraw2::CreateClipper

```
HRESULT CreateClipper(DWORD dwFlags,  
    LPDIRECTDRAWCLIPPER FAR * lplpDDClipper,  
    IUnknown FAR * pUnkOuter);
```

DirectDrawClipperIfufWfFfNfg,đ ì ¬,·,é B

¬Ė÷,·,ê,Î DD\_OK AŽ,”s,·,ê,îŽŸ,ìfGf%o [,đ•Ô,· B

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

DDERR\_NOCOOPERATIVELEVELSET

DDERR\_OUTOFMEMORY

*dwFlags*

,±,ìfpf%of [f^,íĖ» Ý¬ĖŽg—p,Â A0,ÉfZfbfg,μ,Ä,“,©,È,¬,ê,Î,È,ç,È,ĉ B

*lplpDDClipper*

,±,ìf f\fbfh,<sup>a</sup> ¬Ė÷,μ,½ ê ‡•Ô,<sup>3</sup>,ê,é V,μ,ĉDirectDrawClipperIfufWfFfNfg,đŽ|,·f|fCf“f^,ìfAfhfĖfX B

*pUnkOuter*

COM W ¬%o»«@”\,Æ «—^,ìĖÝŠ· «,ì,½,ß,É, ,é BCE» Ý,Í A NULL,đ Ý’è,μ,È,ĉ,ÆfGf%o [,Æ,È,é B

DirectDrawClipperIfufWfFfNfg,ÍDirectDrawSurfaceIfufWfFfNfg,ÉfA^fbf`,·,é,±

,Æ,<sup>a</sup>,Â,« AIDirectDrawSurface2::Blt AIDirectDrawSurface2::BltBatch AIDirectDrawSurface2::UpdateOverlay,ì ^  
— ’†,É Žg—p,Â,«,é B

“Á’è,ìDirectDraw,É Š—L,<sup>3</sup>,ê,È,ĉDirectDrawClipperIfufWfFfNfg,đ ì ¬,·,é,É,Í A

DirectDrawCreateClipperŠŎ ”,đŽg—p,·,é,±,Æ B

ŽQ Æ @IDirectDrawSurface2::GetClipper AIDirectDrawSurface2::SetClipper

## IDirectDraw2::CreatePalette

```
HRESULT CreatePalette(DWORD dwFlags,  
    LPPALETTEENTRY lpColorTable,  
    LPDIRECTDRAWPALETTE FAR * lpDDPalette,  
    IUnknown FAR * pUnkOuter);
```

DirectDrawPaletteIfufWfFfNfg,đ ì ¬,·,é B

¬Ė÷,·,ê,Î DD\_OK AŽ,”s,·,ê,ÎŽŸ,İfGf% [ ,đ•Ô,· B

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

DDERR\_NOCOOPERATIVELEVELSET

DDERR\_NOEXCLUSIVEMODE

DDERR\_OUTOFCAPS

DDERR\_OUTOFMEMORY

DDERR\_UNSUPPORTED

dwFlags

ŽŸ,İftf%ofO,İ,□,Ĵ A,Đ,Æ,ÂÈ ã,İ'l,đŽæ,é B

DDPCAPS\_1BIT

fCf“fffbfNfX,İlfrfbfg BfJf% [ Efe [fuf<,Ö,İfGf“fgfŠ,İ,Ó,½,Â,Â  
, ,é B

DDPCAPS\_2BIT

fCf“fffbfNfX,İ,Qfrfbfg BfJf% [ Efe [fuf<,Ö,İfGf“fgfŠ,İ,S,Â,Â, ,  
é B

DDPCAPS\_4BIT

fCf“fffbfNfX,İ,Sfrfbfg BfJf% [ Efe [fuf<,Ö,İfGf“fgfŠ,İ,P,UEÂ,  
Â, ,é B

DDPCAPS\_8BITENTRIES

8frfbfgfJf% [ EfCf“fffbfNfX,đŽQ Æ,·,éCf“fffbfNfX,đŽİ,· B,±  
,İftf%ofO,İ A  
DDPCAPS\_1BIT ADDPCAPS\_2BIT ADDPCAPS\_4BIT,đŽg,□ ê ±,Æf  
^ [fQfbfg EfT [ftFfX,\*8bpp,İ ê ±,¾,—  
LĖø,Æ,È,é BŠefJf% [fGf“fgfŠ,İ A,PfofCfg’,Â A8bpppfĖfbfg,İ  
fT [ftFfX,İfCf“fffbfNfX,đŽw,· B

DDPCAPS\_8BIT

fCf“fffbfNfX,İ8frfbfg BfJf% [ Efe [fuf<,Ö,İfGf“fgfŠ,İ256ĖÂ,Â,  
,é B

DDPCAPS\_ALLOW256

,±,İfpfĖfbfg,İ256ĖÂ,İfGf“fgfŠ,·,×,Ä,đ’è`,Â,«é B

lpColorTable

,±,İDirectDrawPaletteIfufWfFfNfg,đ %šú%»,·,é,½,ß,İ2 A4 A16 A256 F,Ô,ñ,İPALETTEENTRYĖ^”z—  
ñ,İfAfhfĖfX B

lpDDPalette

,±,İf f\fbfh,<sup>a</sup> ¬Ė÷,μ,½ ê ±•Ô,<sup>3</sup>,ê,é V,μ,ĖDirectDrawPaletteIfufWfFfNfg,Ö,İf|fCf“f^,İfAfhfĖfX B

pUnkOuter

COM W ¬%»<@”\,Æ «—^,İĖÝŠ· «,İ,½,ß,É, ,é BCE» Ý,İ NULL,đ Ý’è,μ,È,ĉ,ÆfGf% [ ,Æ,È,é B

## IDirectDraw2::CreateSurface

```
HRESULT CreateSurface(LPDDSURFACEDESC lpDDSurfaceDesc,  
    LPDIRECTDRAWSURFACE FAR * lplpDDSurface,  
    IUnknown FAR * pUnkOuter);
```

DirectDrawSurfaceIfufWfFfNfg,đ ì ¬,·,é B

¬Ė÷,·,ê,Î DD\_OK AŽ,”s,·,ê,ÎŽŸ,ÌfGf% [,đ•Ô,· B

DDERR\_INCOMPATIBLEPRIMARY

DDERR\_INVALIDCAPS

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

DDERR\_INVALIDPIXELFORMAT

DDERR\_NOALPHAHW

DDERR\_NOCOOPERATIVELEVELSET

DDERR\_NODIRECTDRAWHW

DDERR\_NOEMULATION

DDERR\_NOEXCLUSIVEMODE

DDERR\_NOFLIPHW

DDERR\_NOMIPMAPHW

DDERR\_NOZBUFFERHW

DDERR\_OUTOFMEMORY

DDERR\_OUTOFVIDEOMEMORY

DDERR\_PRIMARYSURFACEALREADYEXISTS

DDERR\_UNSUPPORTEDMODE

lpDDSurfaceDesc

ì ¬,μ,½,¢fT [ftfFfX,Ö,Ì—v< ,đ<L q,μ,½DDSURFACEDESC \‘¢‘Ì,Ö,Ìf|fCf“f^ B

lplpDDSurface

ĖÄ,Ñ o,μ,<sup>a</sup> ¬Ė÷,μ,½ ê ‡ A—LĖø,ÈDirectDrawSurface|fCf“f^,É,æ,Á,Ä %oŠú%o»,<sup>3</sup>,ê,éfT [ftfFfX,Ö,Ìf|fCf“f^,ÌfAfhfĖfX B

pUnkOuter

COM W ¬%o»<@”\,Æ «—^,ÌĖŸŠ· «,Ì,½,ß,É, ,é BĖ» Ý,Í NULL,đ Ý’è,μ,È,¢,ÆfGf% [,Æ,È,é B

## IDirectDraw2::DuplicateSurface

```
HRESULT DuplicateSurface(LPDIRECTDRAWSURFACE lpDDSurface,  
    LPLPDIRECTDRAWSURFACE FAR * lpDupDDSurface);
```

DirectDrawSurfaceIfufWfFfNfg,İ•ı » ,đ s,□ B

¬Ė÷,•,ê,Î DD\_OK AŽ,”s,•,ê,îŽŸ,İfGf%o [,đ•Ô,• B

**DDERR\_CANTDUPLICATE**

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

**DDERR\_OUTOFMEMORY**

**DDERR\_SURFACELOST**

lpDDSurface

•ı » ,•,éDirectDrawSurface \‘ċ‘İ,İfAfhfĖfX B

lpDupDDSurface

V,μ, İ ¬,³,ê,é•ı » ,İDirectDrawSurface \‘ċ‘İ,đŽw,•DirectDrawSurfacef|fCf“f^ ,İfAfhfĖfX B

,±,İf f\fbfh,Í A,•,Ä,É‘¶ Ý,•,éDirectDrawSurfaceIfufWfFfNfg,İfT [ftfFfX Ef f,fŠ,đ«—

p,•,é V,μ,ċDirectDrawSurfaceIfufWfFfNfg,đ İ ¬,•,é B ,±,İ•ı » ,İ AfIfŠfWfifċ,İfIfufWfFfNfg,Æ,Ü,Á,½,-  
“¬,¶,æ,□,ÉŽg—

p,Ä,«,é B ÄĖä,ÉŽQ Æ,³,ê,½fIfufWfFfNfg,ª%ođ•ú,³,ê,é,ÆfT [ftfFfX Ef f,f,fŠ,Í%ođ•ú,³,ê,é Bfvf%oCf}  
fŠ EfT [ftfFfX A3DfT [ftfFfX A,Ü,½,İ A^Ä–Ü“İ,É İ ¬,³,ê,½fT [ftfFfX,Í•ı » ,Ä,«,È,ċ B

## IDirectDraw2::EnumDisplayModes

```
HRESULT EnumDisplayModes(DWORD dwFlags,  
    LPDDSURFACEDESC lpDDSurfaceDesc, LPVOID lpContext,  
    LPDDENUMMODESCALLBACK lpEnumModesCallback);
```

DirectDrawIfuWfFfNfg,É,æ,Á,Ä'ñ<Ÿ,³,ê,½fT [ftfFfX,ÆEÝŠ· «,<sup>a</sup>,,é,Æfn [fhEfFfA,ª”FŽ<sup>−</sup>,μ,½ffBfXfvfÆfC  
Ef, [fh,ð—ñ<“,·,é BfT [ftfFfX,ÉNULL,ª“n,³,ê,½ ê ‡ A,·,×,Ä,İf, [fh,ð—ñ<“,·,é B

¬Æ÷,·,ê,Î DD\_OK AŽ,“s,·,ê,ÎŽŸ,İfGf% [,ð•Ö,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

*dwFlags*

**DDEDM\_REFRESHRATES**

ˆÜ,È,éfŠftfÆfbfVf...fÆ [fg,ð—ñ<“,·,é B  
**IDirectDraw2::EnumDisplayModes**,İ Šef, [fh,ªê“x,¾,¯,μ,©—  
ñ<“,³,ê,È,¢,±,Æ,ð•Û Ø,·,é B,±  
,İftf%ofO,İ Af, [fh,ªf†fj [fN,©,Ç,¤  
,©,ðÆˆè,·,éŽŽ,È AfŠftfÆfbfVf...fÆ [fg,ª l—  
¶,É“ü,ê,ç,ê,é,©,Ç,¤,©,ðŽw'è,·,é B

*lpDDSurfaceDesc*

—˜—p,Á,«,éf, [fh,ðf`fFfbfN,·,é**DDSURFACEDESC** \‘¢‘İ,Ö,İf|  
fCf“f^,İfAfhfÆfX BNULL,ðŽw'è,μ,½ ê ‡ A,·,×,Ä,İf, [fh,ª—ñ<“,³,ê,é B

*lpContext*

—ñ<“,³,ê,éf f“fo,»,ê,¼,ê,È“n,³,ê,éfAfvfŠfP [fVf‡f“,Á'è<,μ,½ \‘¢‘İ,Ö,İf|fCf“f^ B

*lpEnumModesCallback*

ðÆ ,É ‡v,μ,½,à,İ,ªÆ©,Á,©,é“x,ÉÆÄ,Î,ê,é**EnumModesCallback** ŠÖ ”,Ö,İf|fCf“f^  
,±,İf f\fbfh,İDDSURFACEDESC \‘¢‘İ,İdwRefreshRatef f“fo,ð—ñ<“,·,é,±,Æ,ª,Á,«,é,æ,¤,É,È,Á,Ä,¢,é BÉÄ,¢  
**IDirectDraw2::EnumDisplayModes** f f\fbfh,É,İ A,»,İ<@“\,ª,È,¢ B V<@“\,İfŠftfÆfbfVf...  
f, [fh,ðfZfbfg,·,é,½,ß,É**IDirectDraw2::SetDisplayMode** f f\fbfh,ðŽg,¤ Û,É,İ A dwRefreshRatef f“fo,ð—  
ñ<“,·,é,½,ß,É **IDirectDraw2::EnumDisplayModes**,ðŽg,í,È,,Ä,İ,È,ç,È,¢ B

ŽQ Æ @**IDirectDraw2::GetDisplayMode** A **IDirectDraw2::SetDisplayMode** A **IDirectDraw2::RestoreDisplayMode**

## IDirectDraw2::EnumSurfaces

HRESULT EnumSurfaces(DWORD dwFlags, LPDDSURFACEDESC lpDDSD,  
LPVOID lpContext, LPDDENUMSURFACESCALLBACK lpEnumSurfacesCallback);

Žw'è,³,ê,½Šî €É þ'v,·,éfT [ftFfX,ð,·,×,Ä—ñ<“,·,é B

¬€÷,·,ê,Î DD\_OK AŽ,”s,·,ê,ÎŽŸ,ÌfGf%o [,ð•Ô,· B

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

dwFlags

ŽŸ,Ìftf%fo,Ì,□,¿,Ì,D,Æ,Â B

DDENUMSURFACES\_ALL

Šî €É þ'v,·,éfT [ftFfX,·,×,Ä,ð—ñ<“,·,é B

DDENUMSURFACES\_CANBECREATED

Šî €É þ'v,μ,Ä A,©,Â A %o,É ì ¬,³,ê,½fT [ftFfX,ð—ñ<“,·,é B

DDENUMSURFACES\_DOEXIST

Šî €É þ'v,μ,Ä A,·,Ä,É‘¶ Ý,μ,Ä,¢,éfT [ftFfX,ð—ñ<“,·,é B

DDENUMSURFACES\_MATCH

fT [ftFfX EftfXfNfŠfvf^,ÉŠY“—,·,éfT [ftFfX,ð'T,· B

DDENUMSURFACES\_NOMATCH

fT [ftFfX EftfXfNfŠfvf^,ÉŠY“—,μ,È,©,Â,½fT [ftFfX,ð'T,· B

lpDDSD

Š—L,μ,Ä,¢,éfT [ftFfX,ð'è<“,·,éDDSURFACEDESC \‘¢‘Ì,Ö,Ìf|fCf“f^ B

lpContext

—ñ<“,³,ê,½f f“fo,É“n,³,ê,éfAfvfŠfP [fVfþf“,“è<“,μ,½ \‘¢‘Ì,Ö,Ìf|fCf“f^ B

lpEnumSurfacesCallback

ˆê'v,É þ'v,·,é,à,Ì,“€©,Â,©,é“x,É€Ä,Î,ê,éEnumSurfacesCallbackŠÖ ”,Ö,Ìf|fCf“f^ B

DDENUMSURFACES\_CANBECREATEDftf%fo,“fZfbfg,³,ê,é ê þ A,±,Ìf f\fbfh,ÍŠî €  
,É þ,□fT [ftFfX,ð'èŽŽ“Í,É ì ¬,μ,æ,□,Æ,·,é B fT [ftFfX,“—ñ<“,³,ê,é,ÆŽQ ÆfJfEf“fg,à‘ ,!„é,±  
,Æ,É<C,ð,Ä,¯,é,±,Æ B,à,μ,»,ÌfT [ftFfX,ðŽg,í,È,¢ ê þ A—ñ<“,³,ê,½€ã A

IDirectDraw::Release,ðŽg,Ä,Ä,»,ÌfT [ftFfX,ð%ð•ú,·,é B

IDirectDraw fCf“f^ [ftFfCfX,Ì'ê•”,Æ,μ,Ä A,±,Ìf f\fbfh,Í dwFlags,“f[f ˆÈŠO,Ì'l,ÍfTf| [fg,μ,È,¢ B

## IDirectDraw2::FlipToGDISurface

HRESULT FlipToGDISurface();

GDI, <sup>a</sup> Afvf%oCf}fŠ EfT [ftFfX,Æ,μ,Ä^μ,□fT [ftFfX,ð ì,é B

¬Œ÷,μ,½,çDD\_OK,ð•Ô,μ AŽ, ”s, ·,é,ÆŽŸ, ìfGf%o [ EfR [fh,ð•Ô, · B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

**DDERR\_NOTFOUND**

,±, ìf f\fbfh, Í AGDI, <sup>a</sup> ‘,«,±,ñ,Ä,¢,éffBfXfvfŒfC Ef f,fŠ, <sup>a</sup> Af† [fU,É%oÂŽ<,Æ,È,é,±  
,Æ,ð•Ô Ø, ·,é,½,ß,É Afy [fW EftfŠfbfsf“fO EfAfvfŠfP [fVf±f“, Ì ÅŒä,ÉŒÄ,Î,ê,é B

ŽQ Æ @**IDirectDraw2::GetGDISurface**



## IDirectDraw2::GetAvailableVidMem

```
HRESULT GetAvailableVidMem(LPDDSCAPS lpDDSCaps,  
    LPDWORD lpdwTotal, LPDWORD lpdwFree);
```

—~—p,Å,«éffBfXfvfEfC Ef f,fŠ,ì' —e—Ê,ÆffBfXfvfEfC Ef, [fh,ìE» Ý,ìó,«—e—Ê,ðŽæ“¾,·,é B  
¬E÷,·,ê,î DD\_OK AŽ,”s,·,ê,îŽŸ,ìfGf%o [,ð•Ô,· B

DDERR\_INVALIDCAPS

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

DDERR\_NODIRECTDRAWHW

lpDDSCaps

fT [ftFfX,ì Afñ [fhEfFfA”—í,ðŠŮ,ðDDSCAPS \‘¢‘ì,Ö,ìf|fCf“f^ B

lpdwTotal

—~—p,Å,«éffBfXfvfEfC Ef f,fŠ,ì' —e—Ê,ðŽæ“¾,·,é•İ ”,Ö,ìf|fCf“f^ B

lpdwFree

E» Ý,ìfVfXfvfEfCf f,fŠ,ìó,«—e—Ê,ðŽæ“¾,·,é•İ ”,Ö,ìf|fCf“f^ B

lpdwTotal,Ů,½,ìlpdwFree ,ÉNULL,““n,¾,ê,½ ê ‡ Afpf%of [f^,É‘İ,·,é‘l,İ•Ô,¾,ê,È,¢ B

ŽŸ,ìC++,ì—á,Å,İ AfefNfXf`ff Ef}fbfv EfT [ftFfX,Å—~—p,Å,«éffBfXfvfEfC Ef f,fŠ,ì' —e—  
Ê,Æó,«—e—Ê,ðE~`è,·,é IDirectDraw2::GetAvailableVidMem,ðŽg,Å,Å,¢,é B

LPDIRECTDRAW2 lpDD2;

DDSCAPS ddsCaps;

DWORD dwTotal;

DWORD dwFree;

ddres = lpDD->QueryInterface(IID\_IDirectDraw2, &lpDD2);

if (FAILED(ddres))

·  
·  
·

ddsCaps.dwCaps = DDSCAPS\_TEXTURE;

ddres = lpDD2->GetAvailableVidMem(&ddsCaps, &dwTotal, &dwFree);

if (FAILED(ddres))

·  
·  
·

,±

,ìf f\fbfh,Í AE» Ý,ìffBfXfvfEfC Ef f,fŠ,ì ó•Ô,ìXfifbfbfvfVf‡fbfg,ð`ñŸ,·,é BffBfXfvfEfC Ef f,fŠ,ìó,«—e—Ê,İ AfT [ftFfX,ì ì ¬,Æ%ð•ú,ì ‡”Ô,Ê,Ç,æ,Å,Å•İ,i,é B,µ,½,¾,Å,Å Aó,«f f,fŠ,ì—Ê,İ,·,·,Ü,©,È”»’f ð—ç,Æ,µ,ÄŽg,²,×,«Å, ,é B,¾,Ç,É A“Á’è,ìffBfXfvfEfC EfAf\_fvf^ EfJ [fh,İ A,Ó,½,Å,İŮ,È,éf f,fŠf^fCfv,ð¢æ•Ê,Å,«È,¢ B,½,Æ,İ,İ A Zfofbftf@,ÆfefNfXf`ff,ðŠi”[,·,é,İ,É AfBfXfvfEfC Ef f,fŠ,ì“¬,¶”•¾,ðfAf\_fvf^,Žg—p,·,é%oÅ”\ «,¾, ,é B,æ,Å,Å AfT [ftFfX,İê,Å,İf^fCfv i,½,Æ,,İ AZfofbftf@ j,İ A,à,σ^ê•û,İfT [ftFfX i,½,Æ,,İ AfefNfXf`ff j,¾—~—p,Å,«éffBfXfvfEfC Ef f,fŠ,ì—e—Ê,É%œç,ð—^,İ,é B,µ,½,¾,Å,Å A“@“İŽg—p ifefNfXf`ff Ef}fbfsf“fO,ì,æ,²,È j,Ê—~—p,Å,«éf f,fŠ,ì—e—Ê,ðE~`è,·,é•O,Ê AfAfVfŠfP [fVf‡f“,”EÄ`è,µ,½fŠf\ [fX iftf f“fg Efofbftf@,ÆfofbfN Efofbftf@ AZfofbftf@,ì,æ,²,È j,ð %o,ß,È”z’u,·,é,İ,¾ Å—Ç,ì•û—@,Å, ,é B

,±,ìf f\fbfh,Í A IDirectDraw2fCf“f^ [ftFfCfX,ì V<@”\,Å, ,è A IDirectDrawfCf“f^ [ftFfCfX,É,İŽÀ‘•,¾,ê,Å,¢,È,¢ B

## IDirectDraw2::GetCaps

```
HRESULT GetCaps(LPDDCAPS lpDDDriverCaps, LPDDCAPS lpDDHELCaps);
```

*fn* [fhEfFfA,ÆHEL ifn [fhEfFfA EfGf~f...fŒ [fVf‡f“ EfŒfCf,, j‘o•û,ìffofCfX Efhf%ofCfo,Ì”\—  
Í,ðŽæ“¾,·,é B

¬Œ÷,·,ê,Î DD\_OK AŽ,”s,·,ê,ÎŽŸ,ìfGf%o [,ð•Ô,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

*lpDDDriverCaps*

ffofCfX Efhf%ofCfo,É•ñ ,³,ê,éfn [fhEfFfA,Ì”\—Í,ðŽæ“¾,·,é**DDCAPS** \‘Œ‘Ì,Ö,ìf|fCf“f^ B

*lpDDHELCaps*

HEL,Ì”\—Í,ðŽæ“¾,·,é**DDCAPS** \‘Œ‘Ì,Ö,ìf|fCf“f^ B

ŽQ Æ @**DDCAPS**

## IDirectDraw2::GetDisplayMode

HRESULT GetDisplayMode(LPDDSURFACEDESC lpDDSurfaceDesc);

«» Ý, ðffBfXfvfCfC Ef, [fh, ðŽæ“¾, ·, é B

¬C÷, µ, ½, çDD\_OK, ð•Ô, µ AŽ, ”s, ·, ê, ÎŽÝ, ð, æ, ¢, ÈfGf%o [ , ð•Ô, · B

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

DDERR\_UNSUPPORTEDMODE

lpDDSurfaceDesc

fT [ftfFfX, ðŽl, DDSURFACEDESC \‘c‘ì, Ö, ðf|fCf“f^ B

fAfvfŠfP [fVf‡f“, ¢, ±, ðf f\fbfh, Å•Ô, ¸, ê, ½ î•ñ, ð—\

, ß•Ô‘¶, µ, Ä AfNfŠ [f“fAfbfv, ð Ô, ðffBfXfvfCfC Ef, [fh•æC³, ð, ½, ß, É—~p, ·, é, ±, Æ, Í–], Ü, µ, -

, È, ¢ B, µ, ½, ¢, Å, Ä Af}f`fvf fZXŠÂ««‚Ä¸N, ±

, éf, [fh Ý’è, ð£ ‡, ð”ð, ¯, é, ½, ß, É AfAfvfŠfP [fVf‡f“, Í AfNfŠ [f“fAfbfv, ð, ½, ß, ðf, [fh•æC³, É, Í A\_

IDirectDraw2::RestoreDisplayMode, ðŽg, ¢, ×, «, Å, , é B

ŽQ Æ @IDirectDraw2::SetDisplayMode A

IDirectDraw2::RestoreDisplayMode A IDirectDraw2::EnumDisplayModes

## IDirectDraw2::GetFourCCCodes

```
HRESULT GetFourCCCodes(LPDWORD lpNumCodes, LPDWORD lpCodes);
```

DirectDrawIfufWfFfNfg,ÄfTf| [fg,<sup>3</sup>,ê,Ä,¢,éFourCCfR [fh,ðŽæ“¾,·,é B,±,Ìf f\bfbh,Í AfTf| [fg,<sup>3</sup>,ê,Ä,¢,éfR [fh,Ì ”Žš,ð•Ô,·,½,ß,É,àŽg—p,<sup>3</sup>,ê,é B

¬Œ÷,·,ê,Î DD\_OK AŽ,”s,·,ê,ÎŽŸ,ÌfGf% [,ð•Ô,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

lpNumCodes

lpCodes,ÄŽ!,<sup>3</sup>,ê,é”z—ñ,ÌfGf“fgfŠ ” BfGf“fgfŠ ”,<sup>a</sup> ¬,<sup>3</sup>,·,¬,Ä,·,×,Ä,ÌfR [fh,<sup>a</sup>Žû”[,Ä,«,È,¢ ê ‡,É,Í A lpNumCodes,É,Í—v< ,<sup>3</sup>,ê,½'l,<sup>a</sup>fZfbfg,<sup>3</sup>,ê A »,Ì ”,Ô,ñ,<sup>a</sup>lpCodes,É“ü,é B

lpCodes

FourCCfR [fh,<sup>a</sup>“ü,é”z—ñ,Ö,Ìf|fCf“f^ B NULL,<sup>a</sup>“n,<sup>3</sup>,ê,é,Æ A lpNumCodes,É,Í FourCCfR [fh,ðfTf| [fg,·,é'l,ðfZfbfg,µ,Ä AfŠf^ [f“,·,é B

## IDirectDraw2::GetGDISurface

HRESULT GetGDISurface(LPDIRECTDRAWSURFACE FAR \* lplpGDIDDSurface);

GDI, a f v f % o f C f } f Š E f T [ f t f F f X, A, μ, Ä ^ μ, □ f T [ f t f F f X E f f, f Š, ø ^ \ , · DirectDrawSurfaceIfufWfFfNfg, ø Ž æ “ ¾, ·, é B

¬ € ÷, ·, ê, î DD\_OK A Ž, ” s, ·, ê, î Ž Ÿ, ì f G f % o [ , ø • Ô, · B

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

DDERR\_NOTFOUND

lplpGDIDDSurface

GDI, ì f v f % o f C f } f Š E f T [ f t f F f X, ø f R f “ f g f [ f <, μ, Ä, ¢, é DirectDrawSurfaceIfufWfFfNfg, Ö, ì f | f C f “ f ^ B Ž Q Æ @ IDirectDraw2::FlipToGDISurface

## IDirectDraw2::GetMonitorFrequency

HRESULT GetMonitorFrequency(LPDWORD lpdwFrequency);

DirectDrawIfufWfFfNfg,““® ì,·,éf,fjf^Žü”g ”,ðŽæ“¾,·,é BŽü”g ”,İ'l,Í100,ðŠ|,¬ŽZ,µ,½'l,Å, ,é B,½,Æ,!,Î A60Hz ,Å, ,ê,Î A6000,ª•Ô,é B

¬Œ÷,·,ê,Î DD\_OK AŽ,”s,·,ê,ÎŽŸ,İfGf% [ ,ð•Ô,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

**DDERR\_UNSUPPORTED**

lpdwFrequency

f,fjf^ [Žü”g ”,ðŽ|,·İ ”,İfAfhfŒfX B

## IDirectDraw2::GetScanLine

HRESULT GetScanLine(LPDWORD lpdwScanLine);

f,fj f^,^E» Ý•%æ,µ,Ä,¢,éXfLfff“f%ofCf“,ðŽæ“¾,·,é B

¬E÷,·,ê,Î DD\_OK AŽ,”s,·,ê,ÎŽŸ,lfGf% [,ð•Ô,· B

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

DDERR\_UNSUPPORTED

DDERR\_VERTICALBLANKINPROGRESS

lpdwScanLine

ffBfXfvfEfC,^E» Ý•%æ,µ,Ä,¢,éXfLfff“f%ofCf“,ðŽæ“¾,·,é•İ ”,lf|fCf“f^ B

ŽQ Æ @IDirectDraw2::GetVerticalBlankStatus A IDirectDraw2::WaitForVerticalBlank

## IDirectDraw2::GetVerticalBlankStatus

HRESULT GetVerticalBlankStatus(LPBOOL lpbIsInVB);

,¼A ü,Ì ó‘Ô,ðŽæ“¾,·,é B

¬œ÷,·,ê,Î DD\_OK AŽ,”s,·,ê,ÎŽŸ,ÌfGf% [,ð•Ô,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

*lpbIsInVB*

,¼A ü,Ì ó‘Ô,ðŽæ“¾,·,é•Î ”,Ìf|fCf“f^ B,±,Ìfpf% f [f^,Í A ,¼A üŠúŠÔ,É, ,é ê þ,Í TRUE A,»,□  
,Ä,È,¢ ê þ,Í FALSE,É,È,é B

,¼A ü,Æ“Šú,ðŽæ,é ê þ,Í A **IDirectDraw2::WaitForVerticalBlank** f f\bfh,ðŽg,□,±,Æ B

ŽQ Æ @**IDirectDraw2::GetScanLine** A **IDirectDraw2::WaitForVerticalBlank**



## IDirectDraw2::Initialize

HRESULT Initialize(GUID FAR \* lpGUID);

**CoCreateInstance** OLE ŠÖ ”,đŽg,Á,Ä A ì ¬,³,ê,éDirectDrawIfufWfFfNfg,đ %Šú%»,·,é B

¬Œ÷,·,ê,Î DD\_OK AŽ,”s,·,ê,ÎŽŸ,İfGf% [ ,đ•Ö,· B

**DDERR\_ALREADYINITIALIZED**

**DDERR\_DIRECTDRAWALREADYCREATED**

**DDERR\_GENERIC**

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

**DDERR\_NODIRECTDRAWHW**

**DDERR\_NODIRECTDRAWSUPPORT**

**DDERR\_OUTOFMEMORY**

lpGUID

fCf“f^ [ftfFfCfXŽ¬•ÊŽq,Æ,µ,ÄŽg—p,³,ê,éGUID ifOf [fof<f†fj [fNŽ¬•ÊŽq j,İfAfhfŒfX B  
,±,İf f\fbfh,İ A COM ifRf“f| [flf“fg EfIfufWfFfNfg Ef,ff< jfvf fgfRf<,É,æ,Á,Ä’ñ<Ÿ,³,ê,é B  
DirectDrawIfufWfFfNfg,đ ì ¬,·,é,½,ß,É**DirectDrawCreate**ŠÖ ”,ªŽg,í,ê,½ ê ‡ A,±,İf f\fbfh,İ  
DDERR\_ALREADYINITIALIZED,đ•Ö,· B **IDirectDraw2::Initialize**,ª  
DirectDrawIfufWfFfNfg,đ ì ¬,·,é,½,ß,É**CoCreateInstance**,ª,·,Ä,ÉŒÄ,Î,ê,Ä,Œ  
,Ê,Œ ê ‡,İ AfGf% [ ,Æ,È,è ADDERR\_NOTINITIALIZED,đ•Ö,· B

**CoCreateInstance**,Æ,ª,É**IDirectDraw2::Initialize**,đŽg,ª ê ‡ A u**CoCreateInstance**,đ—p,Œ  
,½DirectDrawIfufWfFfNfg,İ ì ¬ v,đŽQ Æ,·,é,±,Æ B

ŽQ Æ @**IUnknown::AddRef** A **IUnknown::QueryInterface** A

**IUnknown::Release**

## IDirectDraw2::RestoreDisplayMode

HRESULT RestoreDisplayMode();

*ff%ofCf}fŠ E fT [ftFfX,ìffBfXfvfEfC EfffofCfX Efn [fhEfFfA,ð A*

**IDirectDraw2::SetDisplayMode**,<sup>a</sup>ĖĖ,Ĥ,ê,éĖ‘O,Ė•æĖ<sup>3</sup>,·,é B”r¼“IfĖfxfç,Ė,ĤfAfNfZfX,μ,½Ėã,Ė,Ĥ•K—v,Ė Ĥ— ,Ė, ,  
é B

¬Ė÷,·,ê,Ĥ DD\_OK AŽ,”s,·,ê,ĤŽŸ,ĤGf% [,ð•Ô,· B

**DDERR\_GENERIC**

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

**DDERR\_LOCKEDSURFACES**

**DDERR\_NOEXCLUSIVEMODE**

ŽQ Æ @**IDirectDraw2::SetDisplayMode** A

**IDirectDraw2::EnumDisplayModes** A **IDirectDraw2::SetCooperativeLevel**

## IDirectDraw2::SetCooperativeLevel

HRESULT SetCooperativeLevel(HWND hWnd, DWORD dwFlags);

fAfvfŠfP [fVf‡f“,É“® iŠÂ«„İ„’²fŒfxf<„đ Ý’è„,é B

–Œ÷„,ê,İ DD\_OK AŽ„s„,ê,İŽŸ„İfGf% [„đ•Ö„. B

**DDERR\_EXCLUSIVEMODEALREADYSET**

**DDERR\_HWNDALREADYSET**

**DDERR\_HWNDSUBCLASSED**

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

**DDERR\_OUTOFMEMORY**

hWnd

fAfvfŠfP [fVf‡f“,ĂŽg„í„ê„éEfBf“fhfE Efnf“fhf< B

dwFlags

ŽŸ„İftf%ofO„İ’l„İ„ı„ı A„Đ„Æ„Â^È ã„đŽæ„é B

DDSCL\_ALLOWMODEX

f„ [fhXf‡fBfXf‡fŒfCf„ [fh„İŽg—p„İ<—%Â B

DDSCL\_ALLOWREBOOT

”r“¼“İ iftf<fXfNfŠ [f“ jf„ [fhŽŽ„É A CTRL+ALT+DEL„İ<@”\„İ<—%Â B

DDSCL\_EXCLUSIVE

”r“¼“İfŒfxf<„İ—v< B

DDSCL\_FULLSCREEN

”r“¼“İf„ [fh„İ Š—LŽÖ„“Sf‡f%ofCf}  
fŠ EfT [ftfFfX„É’İ„,é%Ž“š„đ s„ı„±„Æ„đŽ’„. B GDI„İ—  
³Ž<„ı„Ă„à„æ„Œ B

DDSCL\_NORMAL

fAfvfŠfP [fVf‡f“,“È í„İWindowsfAfvfŠfP [fVf‡f“,Æ„ı„Ă<@”\  
„,é„±„Æ„đŽ’„. B

DDSCL\_NOWINDOWCHANGES

fAfNfefBfx [fgŽŽ A  
DirectDraw„ªfAfvfŠfP [fVf‡f“fEfBf“fhfE„đ Â –%»„ı„½„èfŠfXfgfA  
„ı„½„è„³„¹„È„Œ B

“¼„İfAfvfŠfP [fVf‡f“,æ„è„à„Í„é„©„É—D æ“İ„È<@”\„đ—L„,é„½„ß„É„Í ADDSCL\_EXCLUSIVEftf%ofO„đfZfbfg„,é•K  
—v„ª„,é B **IDirectDraw2::Compact** f f\fbfh„đŒĂ„Ň AfffBfXf‡fŒfC Ef„ [fh„đ•İ X„ı Afvf%ofCf}  
fŠ EfT [ftfFfX„İ“® İ i„½„Æ„ı„İftfŠfbfsf“fo j„đ•Œ İ„,é„É„Í AfAfvfŠfP [fVf‡f“,İ”r“¼“İfŒfxf<„ÉfZfbfg„ı„Ă„,“-  
BfAfvfŠfP [fVf‡f“,ªDDSCL\_EXCLUSIVEftf%ofO„ÆDDSCL\_FULLSCREENftf%ofO„đfZfbfg„ı„Ă**IDirectDraw2::SetCooperativeLevel**„đŒĂ„Ö ê ‡EfBf“fhfE„İftf<fXfNfŠ [f“Ö„İfŠfTfCfY„đ s„,ı„  
„Æ„,é BDDSCL\_EXCLUSIVEftf%ofO„Ü„½„İDDSCL\_NORMALftf%ofO„Í„Ç„ı„ç„©„Đ„Æ„Ă„ªfZfbfg„³„è„È„,è„İ„È„Ç„È„Œ  
B„Ü„½ A DDSCL\_EXCLUSIVE„Í A DDSCL\_FULLSCREEN„İfZfbfg„à“ŽŽ„É•K—v„Æ„,é B

f„ [fhXf„ [fh„İ AfAfvfŠfP [fVf‡f“,ª DDSCL\_ALLOWMODEX„ÆDDSCL\_FULLSCREEN„Æ  
DDSCL\_EXCLUSIVE„đfZfbfg„ı„½ ê ‡„É„İ„Ÿ—~p„Ă„«„é B DDSCL\_ALLOWMODEX„Í A  
DDSCL\_NORMAL„Æ^ê „ÉŽg„ı„±„Æ„İ„Ă„«„È„Œ B DDSCL\_ALLOWMODEX„ªŽw’è„³„è„Ă„Œ„È„Œ ê ‡ A  
**IDirectDraw2::EnumDisplayModes** f f\fbfh„İf„ [fhXf„ [fh„đ—ñ<„ı„È„Œ B Mode X„ª—v< „³„è„½ ê ‡ A  
**IDirectDraw2::SetDisplayMode**„İŽ„s„,é Bftf [fg„³„è„èffBfXf‡fŒfC Ef„ [fh„İ A  
**IDirectDraw2::SetCooperativeLevel**„đŽg„ı„Æ„İ X„Ă„«„é B

Windows„Ă„İf„ [fhXf„ [fh„İ—ŒfTf [fg„Ă„,é B„ı„½„ª„Ă„Ăf„ [fhXf„ [fh„Ă„İf‡f%ofCf}  
fŠ EfT [ftfFfX„đf fbfn„Ü„½„İ“—  
„,é B**IDirectDrawSurface2::Lock** f f\fbfh„Æ**IDirectDrawSurface2::Blt** f f\fbfh„İŽg—p„Ă„«„È„Œ Bf‡f%ofCf}  
fŠ EfT [ftfFfX„**IDirectDrawSurface2::GetDC** f f\fbfh„đŽg„ı„±„Æ„à„Ă„«„È„Œ B„Ü„½ AfXfNfŠ [f“DC„Æ<ı  
„ÉGDI„đŽg„ı„±„Æ„à„Ă„«„È„Œ B f„ [fhXf„ [fh„İ A **IDirectDrawSurface2::GetCaps** f f\fbfh„Æ

**IDirectDraw2::EnumDisplayModes** *f\fbfh,É,æ,Á,Ä•Ö<sup>3</sup>,ê,é,±*  
*,Æ,Ê,È,é BDDSURFACEDESC \‘ç‘İ,İˆê•ˆ•ˆ,Á, ,éDDSCAPS \‘ç‘İ,İDDSCAPS\_MODEXftf%fo,ÄŽ<sup>3</sup>,ê,é B*

**IDirectDraw2::SetCooperativeLevel** ,Í AfAfvfŠfP [fVf‡f“,<sup>a</sup> DirectDraw,ðf}fç`fvfç EfeBf“fhfE,ÄŽg,±  
*,Æ,<sup>a</sup>,Ä,«,é,æ,±,É ADDSCL\_NORMALf, [fh,ðŽw’è,µ,½ Ū,Ê,àEfeBf“fhfE Efnf“fhfç,ð—*  
*vç ,µ,Ê,ç BfeBf“fhfE Efnf“fhfç,ÉNULL,ð“n,<sup>1</sup>,Í A,·,×,Ä,İfeBf“fhfE,Í Afm [f}*  
*fç,ÈWindowsf, [fh,Ä“Žž,ÉDirectDraw,ÄŽg,<sup>1</sup>,é,æ,±,Ê,È,é B*

**IDirectDraw::SetDisplayMode** *f\fbfh,Æ IDirectDraw::SetCooperativeLevelf f\fbfh,Æ,İ‘ŠŒÝ ì—p,Í A*  
*IDirectDraw2,É,“,—,é,»,ê,Æ,İˆŪ,Ê,Á,Ä,ç,é B,Ä,Ū,èAfvfŠfP [fVf‡f“,<sup>a</sup> §ŒăfŒfxç,ðfZfbfg,·,é,½,ß,É A,±*  
*,ê,ç,İfCf“f^ [ftfFfCfX,İ IDirectDrawfo [fWf‡f“,ðŽg,± ê ‡,Í AŒ<sup>3</sup>,İffBfXfvfŒfCf, [fh,Í A*  
**IDirectDraw::RestoreDisplayMode** *f\fbfh,ðŽg,±,Æ,Ê,æ,Á,ÄfŠfXfgfA,<sup>3</sup>,ê,é B*

- 1 ”r¼¼If, [fh,Ê,·,é,½,ß,É ADDSCL\_EXCLUSIVEftf%fo,ðfZfbfg,µ,Ä  
**IDirectDraw::SetCooperativeLevel**,ðŒÄ,Ñ o,· B
- 2 ffbfXfvfŒfCf, [fh,ð•İ X,·,é,½,ß,É **IDirectDraw::SetDisplayMode**,ðŒÄ,Ñ o,· B
- 3 ”r¼¼If, [fh,ð%ð æ,·,é,½,ß,ÉDDSCL\_NORMALftf%fo,Æç±,É**IDirectDraw::SetCooperativeLevel**,ðŒÄ,Ñ o,· B

*,µ,©,µ A IDirectDraw2fCf“f^ [ftfFfCfX,ðŽg,Á,Ä“ˆ,¶,æ,±*  
*,ÈŽè ‡,ð,Æ,é ê ‡ AŒ<sup>3</sup>,İffBfXfvfŒfC Efe, [fh,Í”r¼¼If, [fh,%ð æ,<sup>3</sup>,ê,½,Æ,«,ÉŽ©“@“I,É•æŒ<sup>3</sup>,<sup>3</sup>,ê,é B*

ŽQ Æ @**IDirectDraw2::SetDisplayMode** A**IDirectDraw2::Compact** A **IDirectDraw2::EnumDisplayModes**

## IDirectDraw2::SetDisplayMode

HRESULT SetDisplayMode(DWORD dwWidth, DWORD dwHeight,  
DWORD dwBPP, DWORD dwRefreshRate, DWORD dwFlags);

ffBfXfvfCfC EftfCfX Efn [fhEfFfA,lf, [fh,ð Ý'è,·,é B

–CE÷,·,ê,Î DD\_OK AŽ,”s,·,ê,ÎŽŸ,lfGf%o [,ð•Ô,· B

DDERR\_GENERIC

DDERR\_INVALIDMODE

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

DDERR\_LOCKEDSURFACES

DDERR\_NOEXCLUSIVEMODE

DDERR\_SURFACEBUSY

DDERR\_UNSUPPORTED

DDERR\_UNSUPPORTEDMODE

DDERR\_WASSTILLDRAWING

dwWidth and dwHeight

V,μ,¢f, [fh,Î• ,Æ ,·,³ B

dwBPP

V,μ,¢f, [fh,lfrrfbfg ^fsfNfZf<(bpp) B

dwRefreshRate

V,μ,¢f, [fh,lfŠftfCfbbfVf...fCE [fg B,±,lfpf%of [f^,ª,O,ÉfZfbfg,³,ê,é,Æ A,±,lf ffbfh,lfIDirectDraw  
fC“f^ [ftfFfCfX Efo [fWf±f“,ªŽg—p,³,ê,é B

dwFlags

,±,lfpf%of [f^,ÍCE» Ý–¢Žg—p B0,ÉfZfbfg,μ,Ä,“,·,±,Æ B

IDirectDraw2::SetCooperativeLevel ffbfh,Í Af, [fh,ª•İ X,ª%oÄ”\

,É,É,é“O,É”r¼“IfCEfxfAfNfZfX,ðfZfbfg,·,é,½,ß,ÉŽg—p,·,é B¼,lfAfvfŠfP [fVf±f“,ª Afvf%ofCf}

fŠ EfT [ftfFfX ä,lfDirectDrawSurface,ð ì ¬,μ,Ä Af, [fh,ð•İ X,·,é ê ±,É,Í AfAfvfŠfP [fVf±f“,lfvf%ofCf}

fŠ EfT [ftfFfX EfIfufWfFfNfg,Í AfŠfXfgfA,³,ê,é,Ü,Ä DDERR\_SURFACELOST,ð•Ô,· B

IDirectDraw fCf“f^ [ftfFfCfX,Ä,Í A,±,lf ffbfh,lfpf%of [f^dwRefreshRate,ÆdwFlags,ðŠÜ,ñ,Ä,¢,È,¢ B

IDirectDraw::SetDisplayMode,ÆIDirectDraw::SetCooperativeLevel,İŠÔ,İ ‘ŠCEÝ ì—

p,ÍIDirectDraw2,Ä,İ,»,ê,ÆˆÜ,È,é B,Ä,Ü,èfAfvfŠfP [fVf±f“,ª A ŽŸ,İ,æ,□

,ÉŽè ±,ÄffBfXfvfCfC Ef, [fh,Æ §CEäfCEfxf<,ðfZfbfg,·,é,½,ß,É,±

,ê,ç,lfCf“f^ [ftfFfCfX,lfIDirectDrawfo [fWf±f“,ðŽg,□ ê ± ACE³,lfBfXfvfCfC Ef, [fh,Í

IDirectDraw::RestoreDisplayMode ffbfh,ðŽg,Ä,Ä•æCE³,μ,È,¯,ê,Î,È,ç,È,¢ B

1 ”r¼“If, [fh,É,·,é,½,ß,É ADDSCL\_EXCLUSIVEftf%ofO,ðfZfbfg,μ,Ä

IDirectDraw::SetCooperativeLevel,ðCEÄ,Ñ o,· B

2 ffBfXfvfCfC Ef, [fh,Î•İ X,İ,½,ß,É IDirectDraw::SetDisplayMode,ðCEÄ,Ñ o,· B

3 ”r¼“If, [fh,ð%ð æ,·,é,½,ß,ÉDDSCL\_NORMALftf%ofO,ðfZfbfg,μ,ÄIDirectDraw::SetCooperativeLevel

,ðCEÄ,Ñ o,· B

,μ,©,μ IDirectDraw2,ðŽg,Ä,Ä“¬,¶,æ,□,ÉŽè ±,ð“Ÿ

,b ê ±,É,Í ACE³,lfBfXfvfCfC Ef, [fh,Î•æCE³,Í A”r¼“If, [fh,ª%ð æ,³,ê,½ŽŽ,É s,î,ê,é B

ŽQ Æ @IDirectDraw2::RestoreDisplayMode A

IDirectDraw2::GetDisplayMode A IDirectDraw2::EnumDisplayModes A IDirectDraw2::SetCooperativeLevel

## IDirectDraw2::WaitForVerticalBlank

HRESULT WaitForVerticalBlank(DWORD dwFlags, HANDLE hEvent);

*fAfvfŠfP [fVf‡f“<sup>a</sup>,¼A üŠúŠÔ,ðŽg,Á,Ä“Šú,ðŽæ,é•û–@,ð’ñ<Ÿ,·,é B*

*–œ÷,·,ê,Î DD\_OK AŽ,”s,·,ê,ÎŽŸ,İfGf%o [,ð•Ô,· B*

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

**DDERR\_UNSUPPORTED**

**DDERR\_WASSTILLDRAWING**

dwFlags

*,¼A üŠúŠÔ,É‘Î,µ A,Ç,İ,æ,²,É‘Ò,Â,İ,©œ“è,·,é B*

**DDWAITVB\_BLOCKBEGIN**

*,¼A üŠúŠÔ,İŠJŽnŽŽ,©,ç•Ô,· B*

**DDWAITVB\_BLOCKBEGINEVENT**

*,¼A ü,<sup>a</sup>Žn,Ü,é,Æ,«,İfCfxf“fg EfgfŠfK B,±,ê,Íœ» ŸfTf|  
[fg,<sup>3</sup>,ê,Ä,¢,È,¢ B*

**DDWAITVB\_BLOCKEND**

*,¼A üŠúŠÔ,<sup>a</sup> I,í,è A•Ž‘,ðŠJŽn,µ,½,Æ,«,É•Ô,<sup>3</sup>,ê,é B*

*hEvent*

*,¼A ü,<sup>a</sup>Žn,Ü,Á,½,Æ,«,ÉfgfŠfK,Æ,È,éfCfxf“fg Efnf“fhf<*

ŽQ Æ @**IDirectDraw2::GetVerticalBlankStatus** A **IDirectDraw2::GetScanLine**

## **IDirectDrawClipper**

*fAfvfŠfP [fVf±f“,ÍfNfŠfbfv EfŠfXfg,ðŠÇ—  
.,é,½,ß,ÉIDirectDrawClipperfCf“f^ [ftfFfCfX,lf f\fbfh,ðŽg,□ B,±,lfZfNfVf±f“,Å,Í A,±  
,lfCf“f^ [ftfFfCfX,lf f\fbfh,É,Â,ç,Ä%øð à,.,é BŠT—v,É,Â,ç,Ä,Í A uIDirectDrawClipper.  
fCf“f^ [ftfFfCfX v,ðŽQ Æ,.,é,±,Æ B*

**IDirectDrawClipper***fCf“f^ [ftfFfCfX,lf f\fbfh,Í AŽŸ,Ì,æ,□,ÈfOf< [fv,É•ª,¯,ç,ê,é B*

*f f,fŠ”z’u* **Initialize**

*fNfŠfbfv EfŠfXfg* **GetClipList**  
**IsClipListChanged**  
**SetClipList**  
**SetHWND**

*fnf“fhf<* **GetHWND**

**IDirectDrawClipper***fCf“f^ [ftfFfCfX,Í A,·,×,Ä,ÌCOMfCf“f^ [ftfFfCfX,Ì,æ,□,É=  
IUnknownfCf“f^ [ftfFfCfX Ef f\fbfh,ðÇp ³,.,é BIunknownfCf“f^ [ftfFfCfX,ÍŽŸ,Ì,R,Â,lf f\fbfh,ðfTf|  
[fg,.,é B*

**AddRef**

**QueryInterface**

**Release**

## IDirectDrawClipper::GetClipList

```
HRESULT GetClipList(LPRECT lpRect, LPRGNDATA lpClipList,  
    LPDWORD lpdwSize);
```

DirectDrawClipperIfUfWfFfNfg,ÉŠÖ`A,Ã,¯,ç,ê,½fNfŠfbfv EfŠfXfg,lfRfs [,ðŽæ“¾,·,é BfNfŠfbfv EfŠfXfg,ðf  
NfŠfbfsf“fO,·,ééE`,ð“n,·,±,Æ,ê,æ,Á,Ä AfNfŠfbfv EfŠfXfg,lfTfuZfbfg,ð'I'ð,·,é,±,Æ,ª,Ä,«,é B

¬E÷,·,ê,Î DD\_OK AŽ,”s,·,ê,ÎŽŸ,lfGf%o [,ð•Ô,· B

DDERR\_GENERIC

DDERR\_INVALIDCLIPLIST

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

DDERR\_NOCLIPLIST

DDERR\_REGIONTOOSMALL

lpRect

fNfŠfbfv EfŠfXfg,ðfNfŠfbfsf“fO,·,é,½,B,ÉŽg—p,·,ééE`,l \‘‘İ,Ö,lf|fCf“f^ B

lpClipList

fNfŠfbfv EfŠfXfg,lfRfs [E:‰Ê,ðŠÜ,bRGNDATA \‘‘İ,Ö,lf|fCf“f^ B

lpdwSize

fNfŠfbfv EfŠfXfg,lfTfCfY,ð Ý’è,·,éİ ”,Ö,lf|fCf“f^ B

,±,lf f\fbfh,ÄŽg,í,ê,éRGNDATA \‘‘İ,Í AŽŸ,İ,æ,²,È•¶—@,ÄŽg,í,ê,é B

```
typedef struct _RGNDATA {  
    RGNDATAHEADER rdh;  
    char            Buffer[1];  
} RGNDATA;
```

**RGNDATA** \‘‘İ,İ rdhf f“fo,Í AŽŸ,İ,æ,²,È•¶—@,ÄŽg,í,ê,éRGNDATAHEADER \‘‘İ,Ä, ,é B

```
typedef struct _RGNDATAHEADER {  
    DWORD dwSize;  
    DWORD iType;  
    DWORD nCount;  
    DWORD nRgnSize;  
    RECT rcBound;  
} RGNDATAHEADER;
```

,±,ê,ç,İ \‘‘İ,É,Ä,¢,Ä,İ,³,É Ú,µ,¢ îñ,Í A Win32SDK,lfhfLf...f f“fg,ðŽQ Æ,·,é,±,Æ B

ŽQ Æ @IDirectDrawClipper::SetClipList



## IDirectDrawClipper::GetHWnd

HRESULT GetHWnd(HWND FAR \* lphWnd);

## ^È‘O,ÉIDirectDrawClipper::SetHWnd

f f\fbfh,ðŽg,Á,Ä ADirectDrawClipperIfufWfFfNfg,ÆŠÖ~A,Ä,¯,ç,ê,½fEfBf“fhfE Efnf“fhf<,ðŽæ“¾,·,é B

¬Œ÷,·,ê,Î DD\_OK AŽ,”s,·,ê,ÎŽŸ,ÌfGf%o [,ð•Ô,· B

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

lphWnd

,·,Ä,ÉIDirectDrawClipper::SetHWndf f\fbfh,É,æ,Á,Ä A

DirectDrawClipperIfufWfFfNfg,ÆŠÖ~A,Ä,¯,ç,ê,½fEfBf“fhfE Efnf“fhf<,Ìf|fCf“f^ B

ŽQ Æ @IDirectDrawClipper::SetHWnd

## IDirectDrawClipper::Initialize

HRESULT Initialize(LPDIRECTDRAW lpDD, DWORD dwFlags);

DirectDrawClipperIfufWfFfNfg, aCoCreateInstance OLE ŠÖ ”, ðŽg, Á, Ä ì ¬,³,ê,½ ê ±, ì %Šú%» , ð s, □ B

¬Œ÷, ·, ê, Î DD\_OK AŽ, ”s, ·, ê, Î ŽŸ, ì fGf% [ , ð•Ö, · B

**DDERR\_ALREADYINITIALIZED**

**DDERR\_INVALIDPARAMS**

lpDD

DirectDrawIfufWfFfNfg, ì DirectDraw \“Œ‘Ì, ì f|fCf“f^ B, ±, ì pf% f [f^, aNULL, ÉfZfbfg,³,ê,é,Æ A“Æ—  
š, μ, ½ DirectDrawClipperIfufWfFfNfg, a ì ¬,³,ê,é B(**DirectDrawCreateClipper**ŠÖ ”, ð Žg, □, ì, Æ“™, μ, Œ)

dwFlags

, ±, ì pf% f [f^, ÍŒ» Ý–ŒŽg—p, È, Ì, Ä A0, ÉfZfbfg, μ, Ä, ”, ±, Æ B

, ±, ì f ffbfh, Í AfRf“f| [f|f“fg EfIfufWfFfNfg Ef, ftf<(COM)

, É, μ, ½, a, Ä, Ä’ñ<Ÿ,³,ê,é B, ·, Ä, ÉDirectDrawCreateClipper, Ü, ½, Í**IDirectDraw2::CreateClipper**f ffbfh, aDirectDrawClip  
per, ð ì ¬, ·, é, ½, ß, ÉŽg, í, ê, ½ ê ±, É, Í A, ±, ì f ffbfh, ì fGf% [ , Æ, È, è A DDERR\_ALREADYINITIALIZED, ð•Ö, · B

**IDirectDrawClipper::Initialize, ÆCoCreateInstance, ìŽg—p, É, Ä, Œ, Ä, ì Ú ×, Í A u**CoCreateInstance, ð—p, Œ****

**½DirectDrawClipperIfufWfFfNfg, Ì ì ¬ v, ðŽQ Æ, ·, é, ±, Æ B**

ŽQ Æ @**IUnknown::AddRef** A **IUnknown::QueryInterface** A **IUnknown::Release** A **IDirectDraw2::CreateClipper**

**IDirectDrawClipper::IsClipListChanged**

HRESULT IsClipListChanged(BOOL FAR \* lpbChanged);

fEfBf“fhfE Efnf“fhf<,³DirectDrawClipperfIfufWfFfNfg,ÉŠÖ~A,Ä,¯,ç,ê,Ä,¢  
,é ê ‡ AfNfŠfbfv EfŠfXfg,Ì ó‘Ô,ðf,fjf^,·,é B

¬Œ÷,·,ê,Î DD\_OK AŽ,”s,·,ê,ÎŽŸ,ÌfGf% [,ð•Ô,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

lpbChanged

Œ<%Œ,ðŠi”[,·,é•İ ”,Ö,Ìf|fCf“f^ BfNfŠfbfv EfŠfXfg,•İ X,³,ê,½ ê ‡ A TRUE,³fZfbfg,³,ê,é B

## IDirectDrawClipper::SetClipList

```
HRESULT SetClipList(LPRGNDATA lpClipList, DWORD dwFlags);
```

DirectDrawClipper, Ĩ efIfufWfFfNfg,ªfAf^fbf`³,ê,éfT [ftfFfX ã,Ĩ f f\fbfhIDirectDrawSurface2::Blt A IDirectDrawSurface2::BltBatch A IDirectDrawSurface2::UpdateOverlay,É,æ,Ä,ÄŽg— p,³,ê,éfNfŠfbfv EfŠfXfg,ðfZfbfg,·,é,© A í œ,·,é B

¬E÷,·,ê,Ĩ DD\_OK ÄŽ,”s,·,ê,ĨŽŸ,ĨfGf%o [,ð•Ö,· B

DDERR\_CLIPPERISUSINGHWND

DDERR\_INVALIDCLIPLIST

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

DDERR\_OUTOFMEMORY

*lpClipList*

—L(Eø,ÈRGNDATA \‘ċ‘İ,Ö,Ĩf|fCf“f^ A,à,µ,,ÍNULL B ,·,Ä,ÉDirectDrawClipper ,ÉŠÖ~A,Ä,¬,ç,ê,½fNfŠfbfv EfŠfXfg,ª“Ÿ Y,µ A,È,¬,©,Ä,±,Ĩ¹,ªNULL,Ä, ,ê,Ĩ AfNfŠfbfv EfŠfXfg,Í í œ,³,ê,é B

*dwFlags*

,±,Ĩfpf%of [f^,ÍE» Ý¬Źg—p,Ä A0,ÉfZfbfg,µ,Ä,¬,©,È,¬,ê,Ĩ,È,ç,È,Ź B

,·,Ä,ÉEfBf“fhfE Efnf“fhf,ªDirectDrawClipperfIfufWfFfNfg,ÆŠÖ~A,Ä,¬,ç,ê,Ä,Ź ,é ê ‡,Ĩ AfNfŠfbfv EfŠfXfg,ðfZfbfg,·,é,±,Æ,Ĩ,Ä,«,È,Ź B

IDirectDrawSurface2::BltFast f\fbfh,É,æ,é•%œ,Ĩ AfNfŠfbfsf“fO,³,ê,È,Ź,±,Æ,É’ ^Ó,·,é B

,±,Ĩf f\fbfh,ÄŽg,í,ê,éRGNDATA \‘ċ‘İ,Ĩ ÄŽŸ,Ĩ,æ,µ,È•Ÿ—@,ÄŽg,µ B

```
typedef struct _RGNDATA {  
    RGNDATAHEADER rdh;  
    char            Buffer[1];  
} RGNDATA;
```

RGNDATA \‘ċ‘İ,Ĩrdhf f“fo,Ĩ ÄŽŸ,Ĩ,æ,µ,È•Ÿ—@,ÄŽg,í,ê,éRGNDATAHEADER \‘ċ‘İ,Ä, ,é B

```
typedef struct _RGNDATAHEADER {  
    DWORD dwSize;  
    DWORD iType;  
    DWORD nCount;  
    DWORD nRgnSize;  
    RECT rcBound;  
} RGNDATAHEADER;
```

,±,ê,ç,Ĩ \‘ċ‘İ,É,Ä,Ź,Ź,Ĩ Ú ×,Ĩ A Win32 SDK,ĨfhfLf...f f“fg,ðŽQ Æ,·,é,±,Æ B

ŽQ Æ @IDirectDrawClipper::GetClipList A IDirectDrawSurface2::Blt A IDirectDrawSurface2::BltFast A IDirectDrawSurface2::BltBatch A IDirectDrawSurface2::UpdateOverlay

## IDirectDrawClipper::SetHWnd

HRESULT SetHWnd(DWORD dwFlags, HWND hWnd);

fNfŠfbfsf“fO î•ñ,ðŠŮ,þfEfBf“fhfE Efnf“fhf<,ð Ý’è,·,é B

¬Œ÷,·,ê,Î DD\_OK AŽ,”s,·,ê,ÎŽŸ,İfGf% [,ð•Ô,· B

DDERR\_INVALIDCLIPLIST

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

DDERR\_OUTOFMEMORY

dwFlags

,±,İfpf%of [f^,ÍŒ» Ý¬ŒŽg—p,Å A0,ÉfZfbfg,µ,Ä,¨,©,È,¬,ê,Î,È,ç,È,Œ B  
hWnd

fNfŠfbfsf“fO î•ñ,ðŠŮ,þfEfBf“fhfE Efnf“fhf<

ŽQ Æ @IDirectDrawClipper::GetHWnd

## IDirectDrawPalette

DirectDrawPaletteIfufWfFfNfg,ð ì ¬,µfVfXfef€ EfƎfxf◁İ ”,Å“® ì,³,¹,é,É,Í AIDirectDrawPalettefCf“f^ [ftfFfCfX,İf f\fbfh,ðŽg,² B,±,İ B,Í A,±,İfCf“f^ [ftfFfCfX,İf f\fbfh,É,Â,¢,Ä,İfŠftf@fƎf“fX,Å, ,é BŠT—v,É,Â,¢ ,Ä,Í A uDirectDrawPaletteIfufWfFfNfg v,ðŽQ Æ,·,é,±,Æ B

IDirectDrawPalette fCf“f^ [ftfFfCfX,İf f\fbfh,Í AŽŸ,İ,æ,²,ÈfOf◁ [fv,É•ª,¬,ç,ê,é B

f f,fŠ”z’u Initialize

fpfƎfbfg,İ”—Í GetCaps

fpfƎfbfg EfGf“fgfŠ GetEntries  
SetEntries

IDirectDrawPalette fCf“f^ [ftfFfCfX,Í A,·,×,Ä,İ COMfCf“f^ [ftfFfCfX,İ,æ,²,ÉIUnknownf f\fbfh,ðƎp ³,·,é B  
IunknownfCf“f^ [ftfFfCfX,ÍŽŸ,İ3,Ä,İf f\fbfh,ðfTf| [fg,µ,Ä,¢,é B

AddRef

QueryInterface

Release

## IDirectDrawPalette::GetCaps

HRESULT GetCaps(LPDWORD lpdwCaps);

HRESULT GetCaps(LPDWORD lpdwCaps);

DD\_OK

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

lpdwCaps

DDCAPS

**DDPCAPS\_4BIT**

**DDPCAPS\_8BIT**

**DDPCAPS\_8BITENTRIES**

**DDPCAPS\_ALLOW256**

**DDPCAPS\_PRIMARYSURFACE**

**DDPCAPS\_PRIMARYSURFACELEFT**

**DDPCAPS\_VSYNC**

## IDirectDrawPalette::GetEntries

```
HRESULT GetEntries(DWORD dwFlags, DWORD dwBase,  
    DWORD dwNumEntries, LPPALETTEENTRY lpEntries);
```

DirectDrawPalette fIfufWfFfNfg,©,ç,İfpfŒfbfg'l,ð“¾,é B

–Œ÷,·,ê,Î DD\_OK AŽ,”s,·,ê,ÎŽŸ,İfGf% [,ð•Ô,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

**DDERR\_NOTPALETTIZED**

dwFlags

,±,İfpf%of [f^,ÍŒ» Ý–ŒŽg—p B0,ÉfZfbfg,µ,Ä,“,·,±,Œ B

dwBase

fGf“fgfŠ,İŠJŽnfCf“fffbfNfX B

dwNumEntries

lpEntries,ÉŽw’è,³,ê,½fAfhfŒfX,É“K%ž,µ,½fpfŒfbfg EfGf“fgfŠ,İ ” B,»,ê,¼,ê,İfpfŒfbfg EfGf“fgfŠ,İ F,Í  
‡,É•Ô,³,ê,é B dwStartingEntry,İ'l,©,çfpf%of [f^ dwCount,ðf}fCfifX,P,µ,½'l,Û,Ä i,±  
,ê,ç,İfpf%of [f^,Í A**IDirectDrawPalette::SetEntries**,É,æ,Ä,Ä%oÄŽ<,Œ,È,é j B

lpEntries

fpfŒfbfg EfGf“fgfŠ,İfAfhfŒfX B

DDPCAPS\_8BITENTRIESftf%ofO,³fZfbfg,³,ê,½ ê ‡ AfpfŒfbfg EfGf“fgfŠ,Í,PfofCfg–^,Ä, ,é B,»,ê~ÈŠO,Í4fo  
fCfg–^,Œ,È,é BŠeftfB [f<fh,Í FŽw’è,Ä, ,é B

ŽQ Œ @**IDirectDrawPalette::SetEntries**



## IDirectDrawPalette::Initialize

```
HRESULT Initialize(LPDDIRECTDRAW lpDD, DWORD dwFlags,  
    LPPALETTEENTRY lpDDColorTable);
```

DirectDrawPaletteIfufWfFfNfg,đ %Šú%»,·,é B

DDERR\_ALREADYINITIALIZED,đ•Ô,· B

lpDD

DirectDrawIfufWfFfNfg,đ^Ó–i,·,éDirectDraw \‘¢‘ì,ìfAfhf¢fX B

dwFlags and lpDDColorTable

,±,ê,ç,Ìfpf%of [f^,Í¢» Ý–¢Žg—p B0,ÉfZfbfg,μ,Ä,“,±,Æ B

COM W ¬%»«@”\,Æ «—^,Ì¢ÝŠ· «,ì,½,ß,É, ,é B¢» Ý,Í NULL,đ Ý’è,μ,È,¢  
,ÆDirectDrawPalette,ªfGf%o [DDERR\_ALREADYINITIALIZED,đ•Ô,· B

ŽQ Æ @IUnknown::AddRef A IUnknown::QueryInterface A

IUnknown::Release

## **IDirectDrawPalette::SetEntries**

HRESULT SetEntries(DWORD dwFlags, DWORD dwStartingEntry,  
DWORD dwCount, LPPALETTEENTRY lpEntries);

DirectDrawPaletteIfufWfFfNfg,lfGf“fgfŠ,ìĪ X,đ‘Ī À,É s,▯ B

–Œ÷,·,ê,Ī DD\_OK AŽ,”s,·,ê,ĪŽŸ,lfGf‰ [,đ•Ô,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

**DDERR\_NOPALETTEATTACHED**

**DDERR\_NOTPALETTIZED**

**DDERR\_UNSUPPORTED**

dwFlags

,±,Īpf‰f [f^,ÍŒ» Ý–ŒŽg—p B0,ÉfZfbfg,μ,Ä,“,·,±,Æ B

dwStartingEntry

fZfbfg,<sup>3</sup>,ê,é ‰,ß,Ä,lfGf“fgfŠ B

dwCount

•Ī X,<sup>3</sup>,ê,½pfŒfbfg EfGf“fgfŠ ” B

lpEntries

fpfŒfbfg EfGf“fgfŠ,ĪAfhfŒfX B,±,ĪpfŒfbfg EfGf“fgfŠ,Ī A DDPCAPS\_8BITENTRIES

ftf‰fO,<sup>a</sup>fZfbfg,<sup>3</sup>,ê,é,Æ AfpfŒfbfg EfGf“fgfŠ,Ī,PfofCfg,Ä A,»,▯,Ä,È,Œ ê ‡,Ī4fofCfg,Ä, ,é BŠeftfB [f<f  
h,Ī FŽw’è,ĪL q,<sup>a</sup>,<sup>3</sup>,ê,é B

**IDirectDrawPalette::SetEntries,đŽg—p,·,·,é‘O,ÉIDirectDrawSurface2::SetPalette**

f f\fbfh,đŽg,Ä,Ä AfpfŒfbfg,đfAf^fbf`,μ,Ä,“,©,È,,Ä,Ī,È,ç,È,Œ B

ŽQ Æ @**IDirectDrawPalette::GetEntries** A**IDirectDrawSurface2::SetPalette**

## IDirectDrawSurface2

*fAfvfŠfP [fVf‡f“*,Í A **IDirectDrawSurface2** *fCf“f^ [ftfFfCfX,lf f\fbfh,ðŽg—p,µ A*DirectDrawSurface  
*fIfufWfFfNfg,ð ì ¬,µ,ÄfVfXfef€ EfƎfxf<,Ä“® ì,·,é B ,±,ì B,Í,±,lfCf“f^ [ftfFfCfX Ef f\fbfh,É,Â,¢*  
*,Ä,lfŠftf@fƎf“fX,Ä, ,é B ŠT”O,lfŠT—v,Í A u*[\*DirectDrawSurface fIfufWfFfNfg\*](#) *v,ðŽQ Æ,·,é,±,Æ B*

**IDirectDrawSurface2** *fCf“f^ [ftfFfCfX,lf f\fbfh,ÍÈ%°,lfOf< [fv,É•ª,¬,ç,ê,é B*

*f f,fŠ,lfŠ,,è“¬,Ä*

[Initialize](#)

[IsLost](#)

[Restore](#)

*fT [ftfFfX,lfAf^fbf`*

[AddAttachedSurface](#)

[DeleteAttachedSurface](#)

[EnumAttachedSurfaces](#)

[GetAttachedSurface](#)

*fuf fbfN“]‘—*

[Blt](#)

[BltBatch](#)

[BltFast](#)

*fJf%° [ EfL [*

[GetColorKey](#)

[SetColorKey](#)

*ffofCfX EfRf“fefLfXfg*

[GetDC](#)

[ReleaseDC](#)

*fT [ftfFfX EftfŠfbfsf“fO*

[Flip](#)

*fT [ftfFfX Ef fbfN*

[Lock](#)

[PageLock](#)

[PageUnlock](#)

[Unlock](#)

*,»,lf¼*

[GetDDInterface](#)

*fI [fo [fƎfC*

[AddOverlayDirtyRect](#)

[EnumOverlayZOrders](#)

[GetOverlayPosition](#)

[SetOverlayPosition](#)

[UpdateOverlay](#)

[UpdateOverlayDisplay](#)

[UpdateOverlayZOrder](#)

*ó‘Ô*

[GetBltStatus](#)

[GetFlipStatus](#)

*fT [ftfFfX”\—Í*

[GetCaps](#)

***fT [ftfFfX EfNfŠfbfp*** **GetClipper**  
**SetClipper**

***fT [ftfFfXđL q*** **GetPixelFormat**  
**GetSurfaceDesc**

***fT [ftfFfX EfpfŒfbfg*** **GetPalette**  
**SetPalette**

**IDirectDrawSurface2** *fCf“f^ [ftfFfCfX,Í A,·,×,Ä,Ì COM fCf“f^ [ftfFfCfX,Æ“—l A***IUnknown**  
*fCf“f^ [ftfFfCfX Ef f\fbfh,ðŒp ³,·,é B* **IUnknown** *fCf“f^ [ftfFfCfX,íŽŸ,ì,R,Â,ìf f\fbfh,ðfTf| [fg,·,é B*

**AddRef**

**QueryInterface**

**Release**

## IDirectDrawSurface2::AddAttachedSurface

```
HRESULT AddAttachedSurface(  
    LPDIRECTDRAWSURFACE2 lpDDSAttachedSurface);
```

fT [ftFfX,ð,à,ð,Ð,Æ,Â,ÌfT [ftFfX,ÉfAf^fbf^,·,é B  
-Æ÷,·,ê,Î DD\_OK AŽ,”s,·,ê,ÎŽÿ,ÌfGf%o [,ð•Ô,· B

DDERR\_CANNOTATTACHSURFACE

DDERR\_GENERIC

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

DDERR\_SURFACEALREADYATTACHED

DDERR\_SURFACELOST

DDERR\_WASSTILLDRAWING

lpDDSAttachedSurface

fAf^fbf^,·,é DirectDraw fT [ftFfX,Ö,Ìf|fCf“f^ B

Zfobfbtf@ AfAf<ftf@ Ef`ffflf<,”æ,ÑfobfbfN Efofbtf@,Ö,ÌfAf^fbf^,”%oÂ”\,Â, ,é B  
Ž©“@“I,É“¼,ÌfAf^fbf^,ð Ø“f(fff^fbf^),·,é fAf^fbf^,à, ,é B ,½,Æ,Ì,Ì3D  
Zfobfbtf@,”fAf^fbf^,Â,«„é,Ì,Ìê“x,É,Ð,Æ,Â,ÌfobfbfN Efofbtf@,Ö,Ì,Ý,Æ,È,Â,Ä,¢,é B fAf^fbf^,Í“o•ûEü“I,Â,Í,È,-  
AfT [ftFfX,»„êŽ© g,Ö,ÌfAf^fbf^,Í“s%oÂ”\,Â, ,é B ,Û,½ A(fVfXfef€ Ef f,fŠ,Â)fGf~f...  
fE [fg,³,ê,½fT [ftFfX,Í AfGf~f...fE [fVf±f“,Â,È,¢fT [ftFfX,É,ÍfAf^fbf^,Â,«„È,¢ B  
,Ð,Æ,Â,ÌfT [ftFfX,”fefNfXf`ff Ef}  
fbfv,Â,È,¢ ê ±,Í AfAf^fbf^,Ì“Û,Æ,È,é,Ó,½,Â,ÌfT [ftFfX,Í“¬,¶fTfCY,Ì•K—v,” ,é B  
ftfŠfbfsf“fO,·,éT [ftFfX,Í A“¬f^fCfv,ÌftfŠfbfsf“fO EfT [ftFfX,É,ÍfAf^fbf^,Â,«„È,¢  
,“ A“Û,È,é f^fCfv,Ì,Ö,½,Â,ÌfT [ftFfX,ðfAf^fbf^,·,é,±,Æ,Í,Â,«„é B  
,½,Æ,Ì,Í AftfŠfbfsf“fO,·,éZfobfbtf@,ðftfŠfbfsf“fO,·,é’Ê i,ÌfT [ftFfX,ÉfAf^fbf^,·,é,±,Æ,Í,Â,«„é B  
ftfŠfbfsf“fO,µ,È,¢fT [ftFfX,“¬f^fCfv,Ì,â,Ì,èftfŠfbfsf“fO,µ,È,¢fT [ftFfX,ÉfAf^fbf^,³,ê,é,Æ A,Ó,½,Â,ÌfT [f  
tFfX,ÍftfŠfbfsf“fO Ef`fF [f“,É,È,é B,Û,½ AftfŠfbfsf“fO,µ,È,¢fT [ftFfX,”ftfŠfbfsf“fO,·,éT [ftFfX,ÉfAf  
^fbf^,³,ê,é,Æ AŠù“¶,ÌftfŠfbfsf“fO Ef`fF [f“,Ìê•”,É,È,é B ,±  
,Ìf`fF [f“,É,ÍfT [ftFfX,Ì“Ç%oÂ,”Â,« AIDirectDrawSurface2::Flip f f\fbfh,ÌšeEÄ,Ñ o,µ,Í AfT [ftFfX,Ì ^—  
,ð I,Ì,é,ÆêfXfefbfv i,Ð,±,Æ,”Â,«„é B

ŽQ Æ @IDirectDrawSurface2::DeleteAttachedSurface A IDirectDrawSurface2::EnumAttachedSurfaces A  
IDirectDrawSurface2::Flip

## IDirectDrawSurface2::AddOverlayDirtyRect

HRESULT AddOverlayDirtyRect (LPRECT lpRect);

ŽŸ,É**IDirectDrawSurface2::UpdateOverlayDisplay***f\fbfh,ªŒÄ,Ń o,³,ê,é,Æ,«,É X V,·,é•K—v,ª, ,é«éŒ`,ìfŠfXfg,ð*  
ì ¬,·,é B

¬Œ÷,·,ê,Î DD\_OK AŽ,”s,·,ê,ÎŽŸ,ìfGf‰o [,ð•Ô,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

**DDERR\_INVALIDSURFACETYPE**

**DDERR\_UNSUPPORTED**

*lpRect*

X V,·,é•K—v,ª, ,é **RECT** \‘Œ‘Î,Ö,ìf|fCf“f^ B

,±,ìf f\fbfh,ÍfI [fo [fŒfC,ðf\ftfgfEfFfA,ÅŽÀ‘·,·,é,Æ,«,ì,½,ß,ÉŽg—p,³,ê,é B  
fn [fhfEfFfA,ªfI [fo [fŒfC,ðfTf| [fg,·,é ê ±,É,Í•K—v,È,Œ B

ŽQ Æ @**IDirectDrawSurface2::UpdateOverlayDisplay**

```
HRESULT Blt(LPRECT lpDestRect, LPDIRECTDRAW_SURFACE2 lpDDSrcSurface,
            LPRECT lpSrcRect, DWORD dwFlags, LPDDBLT_FX lpDDBlTfx);
```

$$\neg \mathbb{E} \div, \cdot, \hat{e}, \hat{I} \text{ DD\_OK} \quad \mathbb{A} \check{Z}, "s, \cdot, \hat{e}, \hat{I} \check{Z} \check{Y}, \grave{I} f G f \% \quad [, \check{d} \cdot \hat{O}, \cdot \quad \mathbb{B}$$

DDERR\_UNSUPPORTED

fsfNfZf< EftfH [f]fbfg,Å,İfAf<ftf@ îñ,© A,±,İfuf fbN“]—  
İfAf<ftf@ Ef`ffflf<,Æ,µ,Ä“]—

Ǝ³fT [ftFfX,ÉfAf^fbf`³,ê,½fAf<ftf@ Ef`ffflf< EfT [ftFfX,Ì,¢  
,,ê,©,ðŽg—p,·,é B

#### DDBLT\_ALPHASRCCONSTOVERRIDE

“]—Ǝ³fT [ftFfX,ÌfAf<ftf@ Ef`ffflf<,Æ,μ,Ä DDBLTFX \‘¢‘Ì,Ì  
dwAlphaSrcConst f f“fo,ðŽg—p,·,é B

#### DDBLT\_ALPHASRCNEG

fAf<ftf@’l,Ì’ %oÁ,É,Â,ê“]—Ǝ³fT [ftFfX,“§¾%o»,·,é,±,Æ,ð•\  
,· i0,Ís“§¾ j B

#### DDBLT\_ALPHASRCSURFACEOVERRIDE

“]—Ǝ³,ÌfAf<ftf@ Ef`ffflf<,Æ,μ,Ä DDBLTFX \‘¢‘Ì,ÌlpDDSAlphaSrc  
f f“fo,ðŽg—p,·,é B

#### DDBLT\_ASYNC

Žó,¬Žæ,è ±,ÌFIFO,ð’Ê,μ,Ä,±,Ìfuf fbfN“]—,ð”ñ¬ŠúŽÀ s,·,é B  
FIFO fn [fhfEfFfA,Ìó—Ìæ,ª—p%oÄ”\,Ä,Ê,¢  
,È,ç AƎÄ,Ñ o,μ,ÍŽ,”s,·,é B

#### DDBLT\_COLORFILL

“]— æfT [ftFfX ä,Ì“]— æéƎ`,ð—,ß,é RGB F,Æ,μ,Ä DDBLTFX  
\‘¢‘Ì,ÌdwFillColor f f“fo,ðŽg—p,·,é B

#### DDBLT\_DDFX

,±,Ìfuf fbfN“]—,ÉŽg—p,·,éƎ%oÊ,ðŽw’è,·,é,½,ß,É DDBLTFX  
\‘¢‘Ì,ÌdwDDFX f f“fo,ðŽg—p,·,é B

#### DDBLT\_DDROPS

Win32 API,ÉŠÜ,Ü,ê,È,¢f%oXf^ ^— i ROPS  
j,ðŽw’è,·,é,½,ß,ÉDDBLTFX \‘¢‘Ì,ÌdwDDROPS f f“fo,ðŽg—p,·,é B

#### DDBLT\_DEPTHFILL

“]— æZfobftf@ EfT [ftFfX ä,Ì“]— æéƎ`,ð—  
,,ß,é [“x’l,Æ,μ,ÄDDBLTFX \‘¢‘Ì,ÌdwFillDepth f f“fo,ðŽg—p,·,é B

#### DDBLT\_KEYDEST

“]— æfT [ftFfX,ÆŠÖ`A,Ä,¬,ç,ê,½fJf%o [ EfL [,ðŽg—p,·,é B

#### DDBLT\_KEYDESTOVERRIDE

“]— æfT [ftFfX,ÌfJf%o [ EfL [,Æ,μ,Ä DDBLTFX  
\‘¢‘Ì,ÌdckDestColorkey f f“fo,ðŽg—p,·,é B

#### DDBLT\_KEYSRC

“]—Ǝ³fT [ftFfX,ÆŠÖ`A,Ä,¬,ç,ê,½fJf%o [ EfL [,ðŽg—p,·,é B

#### DDBLT\_KEYSRCOVERRIDE

“]—Ǝ³fT [ftFfX,ÌfJf%o [ EfL [,Æ,μ,Ä DDBLTFX  
\‘¢‘Ì,ÌdckSrcColorkey f f“fo,ðŽg—p,·,é B

#### DDBLT\_ROP

,±,Ìfuf fbfN“]—,É,¬,¬,éROP,É DDBLTFX \‘¢‘Ì,Ì dwROP  
f f“fo,ðŽg—p,·,é B,±,ê,ç,Ì ROP ,Í Win32 API ,Ä’è`³,ê,Ä,¢  
,é,à,Ì,Æ“¬,¶,Ä,é B

#### DDBLT\_ROTATIONANGLE

fT [ftFfX,Ì%oñ“]Šp i1/100“x’P^Ê,ÄŽw’è³,ê,é j,Æ,μ,ÄDDBLTFX  
\‘¢‘Ì,Ì dwRotationAngle f f“fo,ðŽg—p,·,é B

#### DDBLT\_WAIT

fuf fbfN“]—,ªfrfW [,Ì ê ± A  
DDERR\_WASSTILLDRAWING•Ô’l,ð,·,®,É•Ô³,,É•Ô,Ä B»,μ,Äfuf fb  
fN“]—,Ì €”ð,ª,Ä,«é,©, ,é,¢,Í¼,ÌfGf%o [,“” ¶ŽŸæ A,½,¾,¿,É—  
ß,é B

#### DDBLT\_ZBUFFER

fT [ftFfX,Ì“]—Ǝ³,Æ“]— æ,Æ,ÉfAf^fbf`³,ê,½  
Zfobftf@ A»,μ,ÄZfobftf@,ÌfIfyfR [fh,Æ,μ,Ä,ÌDDBLTFX \‘¢‘Ì,Ì



**dwZBufferOpCode** f f“fo,ðŽg—p,μ A Zfofbftf@ Efuf fbfN“]‘—  
,ðŽÀ s,·,é B

#### DDBLT\_ZBUFFERDESTCONSTOVERRIDE

“]‘— æ,É,Â,¢,Ä A DDBLTFX \‘¢‘ì,ì dwZDestConst,“,æ,Ñ  
**dwZBufferOpCode** f f“fo,ð,»,ê,¼,ê  
Zfofbftf@,“,æ,ÑZfofbftf@ EfIfyfR [fh,Æ,μ,ÄŽg—p,μ A  
Zfofbftf@ Efuf fbfN“]‘—,ðŽÀ s,·,é B

#### DDBLT\_ZBUFFERDESTOVERRIDE

“]‘— æ,É,Â,¢,Ä A DDBLTFX \‘¢‘ì,ì lpDDSZBufferDest,“,æ,Ñ  
**dwZBufferOpCode** f f“fo,ð,»,ê,¼,ê Zfofbftf@,“,æ,ÑZfofbftf@  
EfIfyfR [fh,Æ,μ,ÄŽg—p,μ A Zfofbftf@ Efuf fbfN“]‘—  
,ðŽÀ s,·,é B

#### DDBLT\_ZBUFFERSRCCONSTOVERRIDE

“]‘—Æ³,É,Â,¢,Ä A DDBLTFX \‘¢‘ì,ì dwZSrcConst  
,“,æ,ÑdwZBufferOpCode  
f f“fo,ð,»,ê,¼,êZfofbftf@,“,æ,ÑZfofbftf@ EfIfyfR [fh,Æ,μ,ÄŽg—  
p,μ A Zfofbftf@ Efuf fbfN“]‘—,ðŽÀ s,·,é B

#### DDBLT\_ZBUFFERSRCOVERRIDE

“]‘—Æ³,É,Â,¢,Ä A DDBLTFX \‘¢‘ì,ì lpDDSZBufferSrc,“,æ,Ñ  
**dwZBufferOpCode** f f“fo,ð,»,ê,¼,ê  
Zfofbftf@,“,æ,ÑZfofbftf@ EfIfyfR [fh,Æ,μ,ÄŽg—p,μ A  
Zfofbftf@ Efuf fbfN“]‘—,ðŽÀ s,·,é B

lpDDBltFx

DDBLTFX \‘¢‘ì,ìfAfhfÆfX B

,±,ìf f\fbfh,í“Šú, ,é,¢,Í”ñ“Šú,ìfuf fbfN“]‘—  
,ð AfBfXfvfÆfC Ef f,fŠ,©,çffBfXfvfÆfC Ef f,fŠ,Ö AfBfXfvfÆfC Ef f,fŠ,©,çfVfXfef€ Ef f,fŠ,  
Ö AfVfXfef€ Ef f,fŠ,©,çffBfXfvfÆfC Ef f,fŠ,Ö AfVfXfef€ Ef f,fŠ,©,çfVfXfef€ Ef f,fŠ,Ö A,ì,¢  
,,ê,©,Ä s,“—Í,ðŽ ,ç AZ î•ñ,âfAf<ftf@ î•ñ A“]‘—Æ³Jf% [ EfL [ A“]‘— æfJf% [ EfL [ ,ðŽg—  
p,μ,Äfuf fbfN“]‘—,ðŽÀ s,·,é,±,Æ,ª,Ä,« ,é B“]‘—Æ³,Æ“]‘—  
æ,Æ,ìéÆ,ì‘â,«³,ªÜ,È,é ê ‡ A”C”Ö,ìŠg‘â,Ü,½,Í k ¬,ªŽÀ s,³,ê,é B

’Ê í AIDirectDrawSurface2::Blt,Ífuf fbfN“]‘—ŽÀ s’†,ì ê ‡ A,à,μ,,Ífuf fbfN“]‘—  
,ðfZfbfgfAfbfv,Ä,«,È,©,Á,½ ê ‡ AfGf% [ ,ð•Ö,μ,Ä,½,¾,ç,É—ß,é B,μ,©,μ ADDBLT\_WAIT  
ftf%fo,ðŽw’è,·,ê,Î Afuf fbfN“]‘—,ð €”ðŠ@—¹,·,é,©•Ê,ìfGf% [ ,ª” ¶,·,éŽž,Ü,Ä Af f\fbfh,ð‘Ò<@,³,¹,é B

## IDirectDrawSurface2::BltBatch

```
HRESULT BltBatch(LPDDBLTBATCH lpDDBlBatch,  
    DWORD dwCount, DWORD dwFlags);
```

,¢,,Â,©,ì“—Ē³,©,Đ,Æ,Â,ì“— æ,Ö A,Ü,Æ,ß,Ä **IDirectDrawSurface2::Bl** ^— ,đŽÀ s,,:é B,±  
,ìf f\fbfh,ÍĒ» Ý’è`³,ê,Ä,Í,¢,é,à,ì,ì AŽÀ‘•,Í,Ü,¼,È,³,ê,Ä,¢,È,¢ B

—Ē÷,·,ê,Î DD\_OK AŽ,”s,·,ê,îŽŸ,ìfGf‰ [,đ•Ô,· B

**DDERR\_GENERIC**

**DDERR\_INVALIDCLIPLIST**

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

**DDERR\_INVALIDRECT**

**DDERR\_NOALPHAHW**

**DDERR\_NOBLTHW**

**DDERR\_NOCCLIPLIST**

**DDERR\_NODDROPSHW**

**DDERR\_NOMIRRORHW**

**DDERR\_NORASTEROPHW**

**DDERR\_NOROTATIONHW**

**DDERR\_NOSTRETCHHW**

**DDERR\_NOZBUFFERHW**

**DDERR\_SURFACEBUSY**

**DDERR\_SURFACELOST**

**DDERR\_UNSUPPORTED**

*lpDDBlBatch*

fuf fbfN“]‘—,ì,½,ß,ìfpf‰f [f^,đ’è`·,é Ä ‰,ì **DDBLTBATCH** \‘¢‘ì,ìf|fCf“f^ B

*dwCount*

ŽÀ s,·,éfuf fbfN“]‘—‘€ ì,ì ” B

*dwFlags*

,±,ìfpf‰f [f^,ÍĒ» Ý—¢Žg—p B0,ÉfZfbfg,µ,Ä,“,·,±,Æ B

## IDirectDrawSurface2::BltFast

```
HRESULT BltFast(DWORD dwX, DWORD dwY,  
    LPDIRECTDRAWSURFACE2 lpDDSrcSurface, LPRECT lpSrcRect,  
    DWORD dwTrans);
```

“]—Ė³fJf% [ EfL [, ,é,ċ,Í“— æfJf% [ EfL [,đŽg—p,µ A“]—Ė³fRfs [ Efuf fbfN“]—, ,é,ċ  
Í“§%ßĖ^fuf fbfN“]—,đŽÀ s, ,é B,±,lf f\fbfh,Ífn [fhfEfFfA,“ñ“Šúfuf fbfN“]—,đfTf|  
[fg, ,é ê ‡ A í,É”ñ“Šúfuf fbfN“]—,đŽŽ,Ý,é B

¬Ė÷, ,é,Î DD\_OK AŽ,”s, ,é,ÎŽÝ,lfGf% [,đ•Ô,· B

DDERR\_EXCEPTION

DDERR\_GENERIC

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

DDERR\_INVALIDRECT

DDERR\_NOBLTHW

DDERR\_SURFACEBUSY

DDERR\_SURFACELOST

DDERR\_UNSUPPORTED

dwX and dwY

“]— æfT [ftfFfX ã,Éfuf fbfN“]—, ,é,~ À•W,“,æ,Ñ,™ À•W B

lpDDSrcSurface

fuf fbfN“]—€ ì,Í“—Ė³ DirectDraw fT [ftfFfX,lf|fCf“f^ B

lpSrcRect

fuf fbfN“]—,³,ê,é“]—Ė³fT [ftfFfX ã,Ì,éĖ,Ì ¶ ã,“,æ,Ñ%Ė%°,Ì À•W,đ’è<, ,é **RECT** \’ċ‘Ì,lf|fCf“f^ B

dwTrans

“]—f^fCfv B

DDBLTFAST\_DESTCOLOR

KEY

“]—  
æ,lfJf% [ EfL [,đŽg—  
p, ,é“§%ßĖ^fuf fbfN“]—  
,đŽw’è, ,é B

DDBLTFAST\_NOCOLORKE

Y

“§%ß,À,È,ċ’Ê ì,lfRfs [ Efuf fbfN“]—,đŽw’è, ,é B

**DDBLTFAST\_SRCCOLORKEY**

“]—Ė³,lfJf% [ EfL [,đŽg—p, ,é“§%ßĖ^fuf fbfN“]—  
,đŽw’è, ,é B

**DDBLTFAST\_WAIT**

fuf fbfN“]—,ªfrrfW [,Ì ê ‡ A  
DDERR\_WASSTILLDRAWING•Ô’l,đ, ,®,É,Í•Ô,³, ,É’Ò,À B,»,µ,Äfuf  
fbfN“]—,Ì €”ö,ª,À,«,é,©, ,é,ċ,Í¼,lfGf% [,“” ¶ŽÝ‘æ A,½,¾,¿,Ê—  
ß,é B

,±

,lf f\fbfh,lfBfBfXfvfĖfC Ef f,fŠ EfT [ftfFfX ã,Ì,Ý,À“® ì,µ Afuf fbfN“]—’†,ÍftfŠfbfsf“fO,À,«,È,ċ B

**IDirectDrawSurface2::BltFast**,lf\ftfgfEfFfAŽÀ‘•,Í **IDirectDrawSurface2::Bltf** f\fbfh,æ,è,à10fp [fZf“fg‘¬,ċ B

,µ,©,µ AfBfBfXfvfĖfC Efn [fhfEfFfA,ªŽg—p,³,ê,À,ċ,é ê ‡,É,Í A—¼ŽÔ,ÌŠÔ,ÄfXfs [fh,Ì ·Û,Í,È,ċ B

’Ê í **AIDirectDrawSurface2::BltFast**,Ífuf fbfN“]—ŽÀ s’†,Ì ê ‡ A,à,µ, ,Ífuf fbfN“]—

,đfZfbfgfAfbfv,À,«,È,©,Á,½ ê ‡ AfGf% [,đ•Ô,µ,À,½,¾,¿,Ê—ß,é BDDBLT\_WAIT ftf%fo,Í,±

,Ì“® ì,đ•Í X,µ Afuf fbfN“]—,đ €”öŠ®—¹, ,é,©•Ê,lfGf% [,“” ¶, ,é,Û,À Af f\fbfh,đ’Ò<@,³,¹,é B

## IDirectDrawSurface2::DeleteAttachedSurface

HRESULT DeleteAttachedSurface(DWORD dwFlags,  
LPDIRECTDRAWSURFACE2 lpDDSAttachedSurface);

,Ó,½,Â,İfAf^fbf`,³,ê,Ä,¢,éT [ftFfX,ð Ø,è—£,·(ff^fbf`,·,é) Bff^fbf`,³,ê,½fT [ftFfX,İ%ð•ú,³,ê,È,¢ B  
-Œ÷,·,ê,Î DD\_OK AŽ,”s,·,ê,İŽŸ,İfGf% [,ð•Ô,· B

DDERR\_CANNOTDETACHSURFACE

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

DDERR\_SURFACELOST

DDERR\_SURFACENOTATTACHED

dwFlags

,±,İfpf%of [f^,ÍŒ» Ý-ŒŽg—p,İ,½,ß A0,ÉfZfbfg,µ,Ä,”,©,È,¯,ê,Î,È,ç,È,¢ B

lpDDSAttachedSurface

ff^fbf`,³,ê,é DirectDraw fT [ftFfX,İfAhfŒfX B ,±,İfpf%of [f^,ªNULL,İ ê ‡ AfAf^fbf`,³,ê,Ä,¢  
,é,·,×,Ä,İfT [ftFfX,ªff^fbf`,³,ê,é B

**IDirectDrawSurface2::AddAttachedSurface** f\fbfh,É,æ,è—¾Ž“İ,ÉfAf^fbf`,µ,½fT [ftFfX,ðff^fbf`,·,é B,½,¾,µ  
DirectDraw,ªÄ—Ü“İ,É s,Ä,½fAf^fbf` EfT [ftFfX,İff^fbf`,³,ê,È,¢ B  
ftfŠfbfsf“fO Ef`fF [f“,©,çfT [ftFfX,ðff^fbf`,·,é,Æ Af`fF [f““†,İ¼fT [ftFfX,Í• X,³,ê,é%Â”\ «,ª, ,é Bft  
f f“fg Efofbftf@,ðftfŠfbfsf“fO Ef`fF [f“,©,çff^fbf`,·,é,Æ Af`fF [f““†,İŽŸfT [ftFfX,İftf f“fg Efofbftf  
@,É,È,è A,»,İŽŸ,İfT [ftFfX,İfofbfN Efofbftf@,É,È,é B  
fofbfN Efofbftf@,ðf`fF [f“,©,çff^fbf`,·,é,Æ AŽŸfT [ftFfX,İfofbfN Efofbftf@,É,È,é B,Ó,Â,□  
,İfT [ftFfX,ðf`fF [f“,©,çff^fbf`,·,é,Æ Af`fF [f“,Í’Z,È,é,¾,¯,Ä, ,é B  
fT [ftFfX,ª,Ó,½,Â,µ,©,È,¢ftfŠfbfsf“fO`fF [f“,ðff^fbf`,·,é,Æ Af`fF [f“,Í”jŠü,³,ê,Ä‘o•û,İfT [ftFfX,ÍÈ‘O,İ  
ó‘Ô,É-ß,é B

ŽQ Æ @IDirectDrawSurface2::Flip

## IDirectDrawSurface2::EnumAttachedSurfaces

```
HRESULT EnumAttachedSurfaces(LPVOID lpContext,  
    LPDDENUMSURFACESCALLBACK lpEnumSurfacesCallback);
```

Žw'è,<sup>3</sup>,ê,½fT [ftfFfX,ÉfAf^fbf`<sup>3</sup>,ê,Ä,č,é,·,×,Ä,lfT [ftfFfX,ð—ñ“,·,é B

¬Œ÷,·,ê,Î DD\_OK AŽ,”s,·,ê,ÎŽŸ,lfGf%o [,ð•Ô,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

**DDERR\_SURFACELOST**

*lpContext*

fR [f<fofbfNŠÖ ”,É“n,<sup>3</sup>,ê,é AfAfvfŠfP [fVf‡f“,”è<,μ,½ \‘Œ‘İ,Ö,lf|fCf“f^ B

*lpEnumSurfacesCallback*

fAf^fbf`<sup>3</sup>,ê,Ä,č,éfT [ftfFfX-^,ÉŒÄ,Ñ o,<sup>3</sup>,ê,é **EnumSurfacesCallback** ŠÖ ”,lf|fCf“f^ B

## IDirectDrawSurface2::EnumOverlayZOrders

```
HRESULT EnumOverlayZOrders(DWORD dwFlags, LPVOID lpContext,  
    LPDDENUMSURFACESCALLBACK lpfnCallback);
```

Žw'è,³,ê,½“]‘— æ â,łfI [fo [fŒfC EfT [ftfFfX,đ—ñ<“,·,é B ftf f“fg,©,çfofbfN,Ö A, ,é,¢  
,ÍfofbfN,©,çftf f“fg,Ö A,È,Ç—ñ<“,·,é ‡ ~,đŽw'è,Ä,«„é B

–Œ÷,·,ê,Î DD\_OK AŽ,”s,·,ê,ÎŽŸ,łfGf‰ [„đ•Ô,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

dwFlags

ˆÊ‰°,łftf‰foO,ł,▯,¿,Ç,¿,ç,©,Đ,Æ,Â,ł'l,đŽæ„é B

DDENUMOVERLAYZ\_BACKTOFRONT

fofbfN,©,çftf f“fg,ÖŒü,©,¢fI [fo [fŒfC,đ—ñ<“,·,é B

**DDENUMOVERLAYZ\_FRONTTOBACK**

ftf f“fg,©,çfofbfN,ÖŒü,©,¢fI [fo [fŒfC,đ—ñ<“,·,é B

lpContext

ŠefI [fo [fŒfC EfT [ftfFfX,łfR [f<fofbfNŠÖ ”,É“n,³,ê,éft† [fU'è`fRf“fefLfXfg,Ö,łf|fCf“f^ B

lpfnCallback

,±,łfT [ftfFfX ä,ÉfI [fo [fŒfC,³,ê,½fT [ftfFfX–ˆ,ÉŒÄ,Ň o,³,ê,é,ł **fnCallback** ŠÖ ”,łf|fCf“f^ B

## IDirectDrawSurface2::Flip

```
HRESULT Flip(  
    LPDIRECTDRAW_SURFACE2 lpDDSurfaceTargetOverride,  
    DWORD dwFlags);
```

## DDSCAPS\_BACKBUFFER

fT [ftFfX,ÆŠÖ~A,Ä,¯,ç,ê,½fT [ftFfX Ef f,fŠ,ð Aftf f“fg Efofbftf@ EfT [ftFfX,ÆŠÖ~A,Ä,¯,é B  
-Æ÷,·,ê,Î DD\_OK AŽ,”s,·,ê,ÎŽŸ,ÏGf%o [,ð•Ô,· B

## DDERR\_GENERIC

## DDERR\_INVALIDOBJECT

## DDERR\_INVALIDPARAMS

## DDERR\_NOFLIPHW

## DDERR\_NOTFLIPPABLE

## DDERR\_SURFACEBUSY

## DDERR\_SURFACELOST

## DDERR\_UNSUPPORTED

## DDERR\_WASSTILLDRAWING

## lpDDSurfaceTargetOverride

ftfŠfbfsf“fO,³,ê,é DirectDraw fT [ftFfX,Ï|fCf“f^ B ,±,Ïpf%of [f^,ÏfftfHf<fg,ÍNULL,Ä, ,è A,±  
,Ï,Æ,«IDirectDrawSurface2::Flip,Ïfofbftf@’†,ÄÆŸ,¢,ÉfAf^fbf`,³,ê,Ä,¢,é ‡,ÉfTfCfNf<,·,é B,±  
,Ïpf%of [f^,ÏfI [fo [f%ofCfh,Æ,µ,Ä,¾,¯Žg—p,³,ê,é B

## dwFlags

## DDFLIP\_WAIT

ˆê”Ê,É AftfBfXfvfÇfC Efn [fhfEfFfA,Ï ó•Ô,“K Ø,Ä,È,-  
ftfŠfbfsf“fO,Ï €”ö,ª,Ä,«,È,¢ ê ‡ ADDERR\_WASSTILLDRAWING  
fGf%o [,ª,½,¾,ç,É•Ô,è AftfŠfbfsf“fO,Í<N,±,ç,È,¢ B,µ,©,µ A,±  
,Ïtf%ofO,ðfZfbfg,·,é,Æ A HAL,©,çDDERR\_WASSTILLDRAWING  
fGf%o [,ðŽó, ¯Žæ,Ä,Ä,àIDirectDrawSurface2::Flip,ÏftfŠfbfsf“fO,µ,æ,□  
,Æ,µ’±,¯,é B,»,Ï ê ‡IDirectDrawSurface2::Flip,ÏftfŠfbfsf“fO ^—  
,ª -Æ÷,·,é,© A DDERR\_SURFACEBUSY,Ï,æ,□  
,È•Ê,ÏGf%o [,ª•Ô,³,ê,é,Ü,Ä–ß,ç,È,¢ B

,±,Ïf f\fbfh,ðÇÄ,Ñ o,·,±,Æ,ª,Ä,«,é,Ï,Í A DDSCAPS\_FLIP,¯,æ,Ñ  
DDSCAPS\_FRONTBUFFER,ªfZfbfg,³,ê,½fT [ftFfX,¾,¯,Ä, ,é B,±  
,Ïf f\fbfh,ðÇÄ,Ñ o,·ˆÈ•O,Éftf f“fg Efofbftf@,ÆŠÖ~A,Ä,¯,ç,ê,Ä,¢  
,½ffBfXfvfÇfC Ef f,fŠ,Í AfobfN Efofbftf@,ÆŠÖ~A,Ä,¯,ç,ê,é B  
•j ”,ÏfofbfN Efofbftf@,ª, ,é ê ‡,ÏfŠf“fO,ªÇ` ¬,³,ê Aft [ftFfX Ef f,fŠ Efofbftf@,Í  
IDirectDrawSurface2::Flip,ªÇÄ,Ñ o,³,ê,é,½,Ñ,Ê,»,ÏfŠf“fO,ð,PfTfCfNf<,·,é B

lpDDSurfaceTargetOverride fpf%of [f^,Í AfobfN Efofbftf@,ªftf f“fg Efofbftf@,É,È,é,×,«fobftf@,Ä,Í,È,¢  
,Æ,¢,□ A,Ü,ê,ÊfP [fX,ÄŽg,í,ê,é B ˆê”Ê,É,Í,±,Ïpf%of [f^,ÍNULL,Ä, ,é B

IDirectDrawSurface2::Flipf f\fbfh,Í,Ä,È,É ,’¼<A ü,Æ“Šú,·,é B

ŽQ Æ @IDirectDrawSurface2::GetFlipStatus

## IDirectDrawSurface2::GetAttachedSurface

```
HRESULT GetAttachedSurface(LPDDSCAPS lpDDSCaps,  
    LPDIRECTDRAWSURFACE2 FAR * lpplDDAttachedSurface);
```

Žw'è,<sup>3</sup>,ê,½" — Í,ǎŽ ,Â AfAf^fbf`<sup>3</sup>,ê,½fT [ftFfX,ǎŽæ"¼,·,é B

¬Œ÷,·,ê,Î DD\_OK AŽ,"s,·,ê,ÎŽŸ,İfGf% [,ð•Ô,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

**DDERR\_NOTFOUND**

**DDERR\_SURFACELOST**

lpDDSCaps

fT [ftFfX,İfn [fhfEfFfA" — Í,ǎŽ ,Â **DDSCAPS** \‘Œ'İ,İfAfhfŒfX B

lpplDDAttachedSurface

**EnumSurfacesCallback** fR [f<fofbfNŠÖ ",İ lpDDSurface fpf%of [f^,Žw'è,·,éŒ» Ý,İ DirectDraw  
fT [ftFfX,ÉfAf^fbf`<sup>3</sup>,ê A,©,ÂlpDDSCaps fpf%of [f^,İŽw'è,ÉŒ© ‡,²" — Í,ǎŽ ,Á,½ DirectDraw  
fT [ftFfX,Ö,İf|fCf" f^,İfAfhfŒfX B

fAf^fbf`<sup>İ</sup> A•İ ",İDirectDrawSurface fİfufWfFfNfg,ð•İ ‡ \‘Œ'İ,É Ú'±,·,é,½,ß,ÉŽg—  
p,<sup>3</sup>,ê,é B•İ ‡ \‘Œ'İ,İ AZfofbftf@,É,æ,é,R,cfy [fW EftfŠfbfsf"fo,İfTf| [fg,É•K—v,È,à,İ,È,Ç,Á, ,é B —  
v< ,<sup>3</sup>,ê,½" — Í,ÉŒ© ‡,²fT [ftFfX,<sup>3</sup>,Ð,Æ,Â^É âfAf^fbf`<sup>3</sup>,ê,Ä,Œ,é,Æ A,±,İf f\fbfh,İŽ,"s,·,é B ,±  
,İ ê ‡ AfAvfŠfP [fVf‡f",ÍfAf^fbf`<sup>3</sup>,ê,Ä,Œ  
,éfT [ftFfX,ð"¼,é,½,ß,É**IDirectDrawSurface2::EnumAttachedSurfaces**f f\fbfh,ðŽg—p,µ,È,¬,ê,Î,È,ç,È,Œ B



## IDirectDrawSurface2::GetBltStatus

HRESULT GetBltStatus(DWORD dwFlags);

*fuf fbfN“]‘—fn [fhfEfFfA, Ì ó‘Ô, ðŽæ“¾, ·, é B*

*fuf fbfN“]‘—fn [fhfEfFfA, “¶ Ý, ·, é, È, Ç DD\_OK, ð•Ô, · Afuf fbfN“]‘—fn [fhfEfFfA, “frfW [, È, Ç  
DDERR\_WASSTILLDRAWING Afuf fbfN“]‘—fn [fhfEfFfA, “¶ Ý, µ, È, Ç, È, Ç  
DDERR\_NOBLTHW AŽ,”s, ·, ê, îŽÝ, ìfGf% [, ð•Ô, · B*

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

**DDERR\_NOBLTHW**

**DDERR\_SURFACEBUSY**

**DDERR\_SURFACELOST**

**DDERR\_UNSUPPORTED**

**DDERR\_WASSTILLDRAWING**

dwFlags

*ˆÈ%°, ìftf%ofO, Ì, º, ç, Ç, ç, ©, Ð, Æ, Â, ðŽæ, é B*

DDGBS\_CANBLT

*, ±, ìfT [ftfFfX, ÉŠÖ, í, éfuf fbfN“]‘—, ð, ½, ¾, ç, ÉŽÀ s, Å, «, é, ©, Ç, º  
, ©, ð-â, Ç ‡, í, ¹ Afuf fbfN“]‘—, ðŠ®—¹, Å, «, é ê ‡DD\_OK, ð•Ô, · B*

DDGBS\_ISBLTDONE

*fuf fbfN“]‘—, “ s, í, ê, ½, ©, Ç, º, ©, ð-â, Ç ‡, í, ¹ A, ±  
, ìfT [ftfFfX, Ì ÅĖã, ìfuf fbfN“]‘—, “Š®—¹, µ, Å, Ç, é, È, ÇDD\_OK  
, ð•Ô, · B*

## IDirectDrawSurface2::GetCaps

HRESULT GetCaps(LPDDSCAPS lpDDSCaps);

HRESULT GetCaps(LPDDSCAPS lpDDSCaps);

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

lpDDSCaps

HRESULT GetCaps(LPDDSCAPS lpDDSCaps);

## **IDirectDrawSurface2::GetClipper**

HRESULT GetClipper(LPDIRECTDRAWCLIPPER FAR \* lplpDDClipper);

,±,̀fT [ftfFfX,ÆŠÖ~A,Ã,¯,ç,ê,½ DirectDrawClipper fIfufWfFfNfg,ðŽæ“¾,·,é B

¬Æ÷,·,ê,Î DD\_OK AŽ,”s,·,ê,ÎŽŸ,̀fGf%o [,ð•Ô,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

**DDERR\_NOCLIPPERATTACHED**

*lplpDDClipper*

fT [ftfFfX,ÆŠÖ~A,Ã,¯,ç,ê,½ DirectDrawClipper fIfufWfFfNfg,Ö,̀f|fCf“f^,̀fAfhfÆfX B

ŽQ Æ @**IDirectDrawSurface2::SetClipper**

## IDirectDrawSurface2::GetColorKey

HRESULT GetColorKey(DWORD dwFlags, LPDDCOLORKEY lpDDColorKey);

DirectDrawSurface fIfufWfFfNfg,İfJf% [ EfL [ 'l,ðŽæ“¾,·,é B

¬Œ÷,·,ê,Î DD\_OK AŽ,”s,·,ê,ÎŽŸ,İfGf% [,ð•Ô,· B

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

DDERR\_NOCOLORKEY

DDERR\_NOCOLORKEYHW

DDERR\_SURFACELOST

DDERR\_UNSUPPORTED

dwFlags

,Ç,İfJf% [ EfL [,ª—vª ,¾,ê,é,©Žw'è,·,é B

DDCKEY\_DESTBLT

\‘Ç‘İ,İfJf% [ EfL [, ,é,Ç,İfuf fbfN“]‘—,É,“,Ç,Ä“]‘—  
æfJf% [ EfL [,Æ,µ,ÄŽg,í,ê,é F«óŠÔ,ðŽw'è,·,é B

DDCKEY\_DESTOVERLAY

\‘Ç‘İ,İfJf% [ EfL [, ,é,Ç,İfI [fo [ EfŒfC ^— ,É,“,Ç,Ä“]‘—  
æfJf% [ EfL [,Æ,µ,ÄŽg,í,ê,é F«óŠÔ,ðŽw'è,·,é B

DDCKEY\_SRCBLT

\‘Ç‘İ,İfJf% [ EfL [, ,é,Ç,İfuf fbfN“]‘—,É,“,Ç,Ä“]‘—  
Œ³fJf% [ EfL [,Æ,µ,ÄŽg,í,ê,é F«óŠÔ,ðŽw'è,·,é B

DDCKEY\_SRCOVERLAY

\‘Ç‘İ,İfJf% [ EfL [, ,é,Ç,İfI [fo [fŒfC ^— ,É,“,Ç,Ä“]‘—  
Œ³fJf% [ EfL [,Æ,µ,ÄŽg,í,ê,é F«óŠÔ,ðŽw'è,·,é B

lpDDColorKey

DirectDrawSurface fIfufWfFfNfg,İŽw'è,¾,ê,½fJf% [ EfL [,İŒ» Ÿ,İ'l,ðŠi”[,·,éDDCOLORKEY \‘Ç‘İ,İf|  
fCf“f^ B

ŽQ Æ @IDirectDrawSurface2::SetColorKey

## **IDirectDrawSurface2::GetDC**

HRESULT GetDC(HDC FAR \* lphDC);

fT [ftFfX,ĭffofCfX EfRf“fefLfxfg,ĭGDIEŸŠ·fnf“fhf<,đ ĭ ¬,·,é B  
¬Œ÷,·,ê,ĭDD\_OK AŽ,”s,·,ê,ĭŽŸ,ĭfGf%o [,đ•Ô,· B

**DDERR\_DCALREADYCREATED**

**DDERR\_GENERIC**

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

**DDERR\_INVALIDSURFACETYPE**

**DDERR\_SURFACELOST**

**DDERR\_UNSUPPORTED**

**DDERR\_WASSTILLDRAWING**

lphDC

ffofCfX EfRf“fefLfxfg,ª•Ô,ª,ê,éfnf“fhf<,Ö,ĭf|fCf“f^ B

,±,ĭf f\fbfh,ĭ AfT [ftFfX,ĭf fbfN,É**IDirectDrawSurface2::Lock**f f\fbfh,ĭ“à”fo [fWf±f“,đŽg—p,·,é B  
fT [ftFfX,ĭ A**IDirectDrawSurface2::ReleaseDC**f f\fbfh,ªŒÄ,Ŧ o,ª,ê,È,ŒŒÄ,è Af fbfN,ª^ŮŽ ,ª,ê,é B

ŽQ Æ @**IDirectDrawSurface2::Lock**

**IDirectDrawSurface2::GetDDInterface**

HRESULT GetDDInterface(LPVOID FAR \*lplpDD);

fT [ftfFfX,ð ì ¬,·,é,½,ß,ÉŽg—p,<sup>3</sup>,ê,½ DirectDraw fIfufWfFfNfg,Ö,lfCf“f^ [ftfFfCfX,ðŽæ“¾,·,é B  
¬Œ÷,·,ê,Î DD\_OK AŽ,”s,·,ê,ÎŽŸ,lfGf%o [,ð•Ô,· B

**DDERR\_INVALIDOBJECT**  
**DDERR\_INVALIDPARAMS**

lpDD  
DirectDraw f|fCf“f^,ª•Ô,<sup>3</sup>,ê,éf|fCf“f^,lfAfhfŒfX BŒÄ,Ñ o,μ,ªŽ,”s,μ,½ ê ‡ A,±,Ì'l,Í–Œø,Æ,È,é B

,±,lf f\fbfh,Í**IDirectDraw2**fCf“f^ [ftfFfCfX,©,ç'Ç%oÁ,<sup>3</sup>,ê,½,à,Ì,Å A **IDirectDraw**  
fCf“f^ [ftfFfCfX,É,ÍŽÀ‘•,<sup>3</sup>,ê,Ä,¢,È,¢ B

## IDirectDrawSurface2::GetFlipStatus

HRESULT GetFlipStatus(DWORD dwFlags);

ft [ftFfX,^ftfŠfbfsf“fO ^— ,đ I,!,½,©,Ç,²,©,đŽæ“¾,·,é B

¬Æ÷,·,ê,Î DD\_OK AfT [ftFfX,^ftfŠfbfsf“fO ^— ,đ I,!,Ä,¢,È,¬,ê,Î DDERR\_WASSTILLDRAWING  
A,»,Î‘¼,Î— —R,ÄŽ,”s,µ,½,çŽŸ,İfGf% [,đ•Ô,· B

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

DDERR\_INVALIDSURFACETYPE

DDERR\_SURFACEBUSY

DDERR\_SURFACELOST

DDERR\_UNSUPPORTED

dwFlags

ˆÈ%°,İftf%ofO,İ,²,¿,Đ,Æ,Ä,đŽw’è,·,é B

DDGFS\_CANFLIP

,±,İfT [ftFfX,đ,½,¾,¿,ÉftfŠfbfsf“fO,Ä,«,é,©,Ç,²,©,đ-  
â,¢ ‡,í,¹ AfTfŠfbfsf“fO,đŠ®—¹,Ä,«,é ê ‡ DD\_OK,ª•Ô,é B

DDGFS\_ISFLIPDONE

ftfŠfbfsf“fO,ª s,í,ê,½,©,Ç,²,©-â,¢ ‡,í,¹ A,±  
,İfT [ftFfX,İ ÄÆâ,İftfŠfbfsf“fO,ªŠ®—¹,µ,Ä,¢,½ ê ‡,É,ÍDD\_OK  
,đ•Ô,· B

ŽQ Æ @IDirectDrawSurface2::Flip

## **IDirectDrawSurface2::GetOverlayPosition**

HRESULT GetOverlayPosition(LPLONG lplX, LPLONG lplY);

%0AŽ<,İfAfNfefBfu EfI [fo [fŒfC EfT [ftfFX i DDSCAPS\_OVERLAY ftf%ofo,³fZfbfg,³,ê,Ä,¢  
,é,à,İ j,İffBfXfvfŒfC À•W,ð•Ô,· B

-Œ÷,·,ê,Î DD\_OK AŽ,”s,·,ê,ÎŽŸ,İfGf%o [,ð•Ô,· B

**DDERR\_GENERIC**

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

**DDERR\_INVALIDPOSITION**

**DDERR\_NOOVERLAYDEST**

**DDERR\_NOTAOVERLAYSURFACE**

**DDERR\_OVERLAYNOTVISIBLE**

**DDERR\_SURFACELOST**

*lplX* and *lplY*

xffBfXfvfŒfC À•W,“,æ,ŸyffBfXfvfŒfC À•W,İf|fCf“f^ B

ŽQ Æ @**IDirectDrawSurface2::SetOverlayPosition** A **IDirectDrawSurface2::UpdateOverlay**



## IDirectDrawSurface2::GetPalette

```
HRESULT GetPalette(LPDIRECTDRAWPALETTE FAR * lpDDPalette);
```

*ft* [ftFfX,ÉŠÖ~A,Ã,¯,ç,ê,½ DirectDrawPalette \‘Ç‘İ,ðŽæ“¾,·,é B  
¬Ç÷,·,ê,Î DD\_OK AŽ,”s,·,ê,ÎŽŸ,İfGf%o [,ð•Ô,· B

DDERR\_GENERIC

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

DDERR\_NOEXCLUSIVEMODE

DDERR\_NOPALETTEATTACHED

DDERR\_SURFACELOST

DDERR\_UNSUPPORTED

*lpDDPalette*

Žæ“¾,·,éft [ftFfX,ÆŠÖ~A,Ã,¯,ç,ê,½ DirectDrawPalette \‘Ç‘İ,İf|fCf“f^,Ö,İfAfhfÇfX B,±  
,İft [ftFfX,ÆŠÖ~A,Ã,¯,ç,ê,½ DirectDrawPalette \‘Ç‘İ,ª,È,Ç ê ÷ A NULL ,ÉfZfbfg,³,ê,é B,±  
,İfpf%of [f^,Î AfT [ftFfX,ªfvf%ofCf}fŠ EfT [ftFfX,İ ê ÷ A,à,µ,,İfvf%ofCf}  
fŠ EfT [ftFfX,İfofbfN Efofbftf@,Ã A,©,Âfvf%ofCf}fŠ EfT [ftFfX,ª8  
bppf, [fh,Ã, ,é ê ÷ AfVfXfef€ EfpfÇfbfg,Ö,İf|fCf“f^,ðŽ ,Ã B

ŽQ Æ @IDirectDrawSurface2::SetPalette

## IDirectDrawSurface2::GetPixelFormat

HRESULT GetPixelFormat(LPDDPIXELFORMAT lpDDPixelFormat);

*fT* [ftfFfX,lfJf%o [,ÆfsfNfZf< EftfH [f}fbfg,ðŽæ“¾,·,é B  
¬Æ÷,·,ê,Î DD\_OK AŽ,”s,·,ê,îŽŸ,lfGf%o [,ð•Ô,· B

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

DDERR\_INVALIDSURFACETYPE

*lpDDPixelFormat*

Æ» ÝfsfNfZf<,ì Ú × î•ñ,ÆfT [ftfFfX,î\_F<óŠÔ EftfH [f}fbfg,ì Ú ×,È<L q,ðŽæ“¾,·,é  
DDPIXELFORMAT \‘¢î,Ö,lf|fCf“f^ B

## IDirectDrawSurface2::GetSurfaceDesc

HRESULT GetSurfaceDesc(LPDDSURFACEDESC lpDDSurfaceDesc);

fT [ftFfX,ìĖ» Ý,ì ó'Ô,ð Žw'è,μ,½DDSURFACEDESC \‘ċ'ì,ÉŽæ“¾,·,é B  
¬Ė÷,·,ê,Î DD\_OK AŽ,”s,·,ê,îŽŸ,ìfGf%o [,ð•Ô,· B

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

lpDDSurfaceDesc

fT [ftFfX,ì ó'Ô,ðŽæ“¾,·,éDDSURFACEDESC \‘ċ'ì,Ö,Ìf|fCf“f^ B

ŽQ Æ @DDSURFACEDESC

## IDirectDrawSurface2::Initialize

```
HRESULT Initialize(LPDIRECTDRAW lpDD,  
    LPDDSURFACEDESC lpDDSurfaceDesc);
```

DirectDrawSurface fIfufWfFfNfg,ð %Šú%»,·,é B

**DDERR\_ALREADYINITIALIZED**,ð•Ô,· B

lpDD

DirectDraw fIfufWfFfNfg,ð•\,· DirectDraw \‘ċ‘İ,İf|fCf“f^ B

lpDDSurfaceDesc

fT [ftfFfX,É,Â,ċ,Ä,İ Ú × î•ñ,<sup>a</sup> Ý’è,<sup>3</sup>ê,½ DDSURFACEDESC \‘ċ‘İ,Ö,İf|fCf“f^ B

,±,İf f\fbfh,ÍfRf“f| [flf“fg EfIfufWfFfNfg Ef,fƒfċ i COM jfvf fgfRfċ,ÉŠİ,Ä,«’ñċŸ,<sup>3</sup>ê,é B  
DirectDrawSurface fIfufWfFfNfg,İ ì ¬,<sup>3</sup>ê,½,Æ,«É %Šú%»,<sup>3</sup>ê,é,İ,Å A,±,İf f\fbfh,İ í,É  
DDERR\_ALREADYINITIALIZED,ð•Ô,· B

ŽQ Æ @IUnknown::AddRef A IUnknown::QueryInterface A IUnknown::Release

## IDirectDrawSurface2::IsLost

HRESULT IsLost();

DirectDrawSurface fIfufWfFfNfg,ŠÇ— ,·,éfT [ftfFfX Ef f,fŠ,ª,È,ñ,ç,©,ìŒ´ö,É,æ,Á,ĂŽ,,í,ê,½,©,Ç,▯,©,ð”»’f,·,é B

Ž,,í,ê,Ă,¢,È,¬,ê,î DD\_OK A,»,▯,Ă,È,¬,ê,îŽŸ,ìfGf%▯ [,ð•Ô,· B

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

DDERR\_SURFACELOST

fT [ftfFfX Ef f,fŠ,ì ĂŠ,,,è“–,Ă,ì,½,ß,É A,±,ìf f\fbfh,ðŽg—p,·,é,±,Æ,ª,Ă,«,é B DirectDrawSurface fIfufWfFfNfg,ªfT [ftfFfX Ef f,fŠ,ðŽ,▯,Æ A‘â•”ª,ìf f\fbfh,í DDERR\_SURFACELOST ,ð•Ô,μ,Ă‘¼,ì ^—,ðŽÀ s,μ,È,¢ B

ffBfXfvfŒfC EfJ [fh,ìf, [fh,ð•î X,·,éŽž A, ,é,¢ ,ÍfAfvfŠfP [fvf‡f“,ªffBfXfvfŒfC EfJ [fh,Ö,ì”r¼“I,ÈfAfNfZfX,ðŽó,¬Žæ,Á,ĂŒ» ÝffBfXfvfŒfC EfJ [fh ã,ÉŠ,,,è“–,Ă,ç,ê,Ă,¢,éfT [ftfFfX Ef f,fŠ,ì,·,×,Ă,ð%ð•ú,·,éŽž,É,Í AfT [ftfFfX,Íf f,fŠ,ðŽ,▯%Ô”\ «,ª, ,é B

ŽQ Æ @IDirectDrawSurface2::Restore

## IDirectDrawSurface2::Lock

HRESULT Lock(LPRECT lpDestRect, LPDDSURFACEDESC lpDDSurfaceDesc,  
DWORD dwFlags, HANDLE hEvent);

fT [ftfFfX Ef f,fŠ,Ö,lf|fCf“f^,ðŽæ“¾,·,é B  
¬æ÷,·,ê,Î DD\_OK AŽ,”s,·,ê,ÎŽŸ,lfGf%o [,ð•Ö,· B

## DDERR\_INVALIDOBJECT

## DDERR\_INVALIDPARAMS

## DDERR\_OUTOFMEMORY

## DDERR\_SURFACEBUSY

## DDERR\_SURFACELOST

## DDERR\_WASSTILLDRAWING

lpDestRect

f fbfN,·,éfT [ftfFfX—Îæ,ðŽ!,· RECT \‘ç‘İ,lf|fCf“f^ B

lpDDSurfaceDesc

fT [ftfFfX,É,Â,ç,Ä,İ îñ,ðŽw’è,·,é DDSURFACEDESC \‘ç‘İ,Ö,lf|fCf“f^ B

dwFlags

DDLOCK\_EVENT

**IDirectDrawSurface2::Lock**,<sup>a</sup>—v< ,<sup>3</sup>,ê,½fT [ftfFfX Ef f,fŠ,lf|fCf“f^,ð•Ö,·,±,Æ,“%oÂ”\  
,È,Æ,«,ÉfCfxf“fg,ðì“@,·,éftf%ofo BfCfxf“fg Efnf“fhf<,<sup>a</sup>**IDirectDrawSurface2::Lock**  
,É“n,<sup>3</sup>,ê,Ä,ç,é ê ‡ AfZfbfg,<sup>3</sup>,ê,é B,±  
,lf^fCfv,lf fbfN,<sup>a</sup>fT [ftfFfX ä,É•i ”, ,é,Æ,« AfCfxf“fg,ÍFIFO ‡,Â^ø,«N,±,<sup>3</sup>,ê,é B

## DDLOCK\_READONLY

f fbfN,·,éfT [ftfFfX,Í“Ç,Ý o,µ ê—p,Â, ,é,±,Æ,ðŽ!,·ftf%ofo B

## DDLOCK\_SURFACEMEMORYPTR

Žw’è,µ,½<éÇ,İ æ“a,Ö,İ—LÆø,Èf f,fŠ Ef|fCf“f^,ð•Ö,<sup>3</sup>,È,¯,ê,İ,È,ç,È,ç,±,Æ,ð•\,·ftf%ofo B  
<éÇ,<sup>a</sup>Žw’è,<sup>3</sup>,ê,È,ç ê ‡ A^ê”Ö ä,lfT [ftfFfX,Ö,lf|fCf“f^,•Ö,<sup>3</sup>,ê,é B ffftHf<fg,Â,İ,±  
,lf%ofo,ðŽw’è,·,é B

## DDLOCK\_WAIT

’Ê í Afuf fbfN“]‘— ^—  
,<sup>a</sup>frfW [ óÖ,İ,½,ßf fbfN,ð“¾,ç,ê,È,ç ê ‡ Af f\fbfh,Í¼,ç,É I—1,µ A  
DDERR\_WASSTILLDRAWING fGf%o [,ð•Ö,· B,µ,©,µ,±  
,lf%ofo,ðZfbfg,µ,½ ê ‡ Af fbfN,<sup>a</sup>¾,ç,ê,é,©  
DDERR\_SURFACEBUSY,È,Ç A•Ê,lfGf%o [,“”-  
¶,·,é,Ü,Â**IDirectDrawSurface2::Lock**,ð ÄŽŽ s,·,é B

## DDLOCK\_WRITEONLY

f fbfN,·,éfT [ftfFfX,Í ‘,«,±,Ý ê—p,Â, ,é,±,Æ,ðŽ!,· B

hEvent

fT [ftfFfX,lf fbfN,İ €”ö,<sup>a</sup>,Â,«,½ uŠÖ,ðfgfŠfK,Æ,·,éfVfXfef€ EfCfxf“fg,Ö,lfnf“fhf< B

f|fCf“f^,ðŽæ“¾,µ,½Çä A‘Î%öž,·,é

**IDirectDrawSurface2::Unlock**f f\fbfh,ðÇÄ,Ñ o,·,Ü,Â AfAvfŠfP [fVf‡f“,ÍfT [ftfFfX Ef f,fŠ,ÉfAfNfZfX,·,  
é,±,Æ,<sup>a</sup>,Â,«,é B **IDirectDrawSurface2::Unlock**f f\fbfhÇÄ,Ñ o,µÇä,Í AfT [ftfFfX Ef f,fŠ,Ö,lf|fCf“f^,İ-  
³Çø,É,È,é B

fAvfŠfP [fVf‡f“,Í Af fbfN,<sup>3</sup>,ê,½fT [ftfFfX,İ—Îæ,Äuf fbfN“]‘—,·,é,±,Æ,Í,Â,«,È,ç B  
f fbfN,<sup>3</sup>,ê,½fT [ftfFfX ä,Äuf fbfN“]‘—,“ŽŽ,Ý,ç,ê,½ ê ‡ Afuf fbfN“]‘—,Í DDERR\_SURFACEBUSY , ,é,ç,Í  
DDERR\_LOCKEDSURFACES fGf%o [,ð•Ö,· B

^ê”Ê,É Afuf fbfN“]‘— ^— ’†,Â, ,é,Æ,ç,«— —R,Äf fbfN,ðŽæ“¾,Â,«,È,ç ê ‡ A

**IDirectDrawSurface2::Lock**,ÍfGf%o [,ð•Ö,µ,Ä-ß,é B f fbfN,<sup>a</sup>Žæ“¾,Â,«,é,Ü,Â‘Ö,Á,Ä,à—Ç,ç ê ‡ A

DDLOCK\_WAIT ftf%ofo,ðŽg—p,·,é B

fT [ftFfX,Ö,İfAfNfZfX't,ÉffBfXfvfƎfC Ef f,fŠ,ªŽ,í,ê,é,İ,ð-h,®,½,ß A DirectDraw ,Í  
**IDirectDrawSurface2::Lock**,,æ,Ñ **IDirectDrawSurface2::Unlock**‘€ ì,İŠÔ,É A Win16 f fbfn,ð•ŮŽ ,μ,Ä,¢,é B  
Win16f fbfn,Í GDI ,ÆUSER,İfAfNfZfXŽÄ s,É,©,©,í,é d‘â,È•”ª,Ä, ,è A,±  
,İfefNfjfbfn,É,æ,èffBfXfvfƎfC Ef f,fŠ,Ö,İ'¼ ÚfAfNfZfX,ª%Â”\,É,È,Ä,Ä,¢  
,é B,»,İfAfNfZfX't,É,İ'¼,İfAvfŠfP [fVf‡f“,Íf, [fh•İ X,ª,Ä,«È,¢  
,ª AWindows,İ“® ì,ªŽ~,Ü,Ä,Ä,μ,Ü,□ B,»,İ,½,ß A **IDirectDrawSurface2::Lock**/**IDirectDrawSurface2::Unlock**,©,ς  
**IDirectDrawSurface2::GetDC**/**IDirectDrawSurface2::ReleaseDC**,İŠúŠÔ,Í,Ä,«,éƎÄ,è'Z,,·,é,×,«Ä, ,é B,±  
,İŠúŠÔ AWindows,ªŽ~,Ü,Ä,Ä,μ,Ü,□,½,ß AGUIfffofbfK,İŽg—p,ª,Ä,«È,,È,é B  
ŽQ Æ @**IDirectDrawSurface2::Unlock** A **IDirectDrawSurface2::GetDC** A **IDirectDrawSurface2::ReleaseDC**

## IDirectDrawSurface2::PageLock

HRESULT PageLock(DWORD dwFlags);

*f\_CfCfNfg Ef f,fŠ EfAfNfZfX (DMA) “J—,ð—p,¢,½fVfXfef€ Ef f,fŠ“à,ì“— A, ,é,¢  
ÍfVfXfef€ Ef f,fŠ,ðŠÛ,þfu fbfN“]‘—,Ì ^—*

*† AfVfXfef€ Ef f,fŠ EfT [ftFfX,³fy [fW EfAfEfeg,³,ê,é,±,Æ,ð—h,® B*

*—Æ÷,·,ê,î DD\_OK AŽ,”s,·,ê,îŽŸ,ìfGf‰ [,ð•Ô,· B*

**DDERR\_CANTPAGELOCK**

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

**DDERR\_SURFACELOST**

*dwFlags*

*,±,Ífp‰of [f^,íE» Ý—¢Žg—p B0,ÉfZfbfg,µ,Ä,“,±,Æ B*

*f fbfN,ÍIfyfE [fefBf“fO EfVfXfef€,ÌpftfH [f}f“fX,É^«‰e¢,ð—^,!,é B*

*f fbfN EfJfEf“fg,Í,»,ê,¼,ê,ìT [ftFfX,ì,½,ß,É•ÛŽ ,³,ê AIDirectDrawSurface2::PageLockEÄ,Ñ o,µ,ð,·,é,½,Ñ,  
ÉfCf“fNfŠf f“fg,³,ê AIDirectDrawSurface2::PageUnlock,³EÄ,Ñ o,³,ê,½,Æ,«ffNfŠf f“fg,³,ê,é B  
fJfEf“fg,³0,É’B,µ,½ŽŽ Af f,fŠ,³f fbfN,ð‰ð œ,µ AfVfXfef€ Ef f,fŠ EfT [ftFfX,ðflfyfE [fefBf“fO E  
fVfXfef€,³fy [fWf“fO’î Û,Æ,Ä,«,é,æ,µ,É,È,é B*

*,±,ìf f\fbfh,ÍfVfXfef€ Ef f,fŠ EfT [ftFfX ã,Ä,ì,Ý“® ì,·,é BffBfXfvfEfc Ef f,fŠ EfT [ftFfX, ,é,¢  
,ÍfGf~f...fE [fg,³,ê,½fvf‰fCf}fŠ EfT [ftFfX,ðfy [fW Ef fbfN,·,é,±  
,Æ,Í,Ä,«,È,¢ B,à,µffBfXfvfEfc Ef f,fŠ EfT [ftFfX ã,Ä,±,ìf f\fbfh,ðEÄ,Ñ o,µ,½ ê ± Af f\fbfh,Í  
DD\_OK,ð•Ô,^ÈŠO,Í‰½,à,µ,É,¢ B*

*,±,ìf f\fbfh,ÍIDirectDraw2fCf“f^ [ftFfCfX,©,ç’Ç‰Á,³,ê,½,à,Ì,Ä A IDirectDraw  
fCf“f^ [ftFfCfX,É,ÍŽÀ‘•,³,ê,Ä,¢,È,¢ B*

*ŽQ Æ @IDirectDrawSurface2::PageUnlock*



## IDirectDrawSurface2::PageUnlock

HRESULT PageUnlock(DWORD dwFlags);

*fVfXfef€ Ef f,fŠ EfT [ftFfX,lf fbfN,ð%ð æ,µ Afy [fW EfAfEfG,Å,«é,æ,µ,É,·,é B*

*¬€÷,·,ê,Î DD\_OK AŽ,”s,·,ê,ÎŽŸ,lfGf% [,ð•Ô,· B*

**DDERR\_CANTPAGEUNLOCK**

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

**DDERR\_NOTPAGELOCKED**

**DDERR\_SURFACELOST**

*dwFlags*

*,±,lfpf%of [f^,Í€» Ý¬Žg—p B0,ÉfZfbfg,µ,Ä,”,,±,Æ B*

*f fbfN EfJfEf“fg,Í,»,ê,¼,ê,lfT [ftFfX,É,Ä,¢*

*,Ä•ŰŽ ,³,ê A**IDirectDrawSurface2::PageLock**(EÄ,Ŧ o,µ,É,æ,Ä,ÄfCf“fNfŠf f“fg,³,ê A*

**IDirectDrawSurface2::PageUnlock**,l€Ä,Ŧ o,µ,l Ű,ÉffNfŠf f“fg,³,ê,é B

*fJfEf“fg,º0,É’B,µ,½ŽŽ Af f,fŠ,Íf fbfN,ð%ð æ,³,ê AfIfyf€ [fefBf“fO EfVfXfef€*

*,Í,»,lfVfXfef€ Ef f,fŠ EfT [ftFfX,ðfy [fWf“fO‘Í Ű,Æ,Ä,«é,æ,µ,É,È,é B*

*,±*

*,lf f\fbfh,ÍfVfXfef€ Ef f,fŠ EfT [ftFfX ã,Ä,l,Ÿ“® ì,·,é BffBfXfvf€fC Ef f,fŠ EfT [ftFfX,âfGf~f ...f€ [fg,³,ê,½fvf%ofCf}*

*fŠ EfT [ftFfX,lfy [fW Ef fbfN,Í,Ä,«,È,¢ BffBfXfvf€fC Ef f,fŠ EfT [ftFfX ã,Ä,±*

*,lf f\fbfh,ð€Ä,Ŧ o,µ,Ä,à Af f\fbfh,Î DD\_OK,ð•Ô,·,¼,¬,Ä, ,é B*

*,±,lf f\fbfh,Í**IDirectDraw2**fCf“f^ [ftFfCfX,©,ç’Ç%Á,³,ê,½,à,l,Ä A**IDirectDraw***

*fCf“f^ [ftFfCfX,É,ÍŽÀ‘•,³,ê,Ä,¢,È,¢ B*

*ŽQ Æ @**IDirectDrawSurface2::PageLock***

## **IDirectDrawSurface2::ReleaseDC**

HRESULT ReleaseDC(HDC hDC) ;

**IDirectDrawSurface2::GetDC** method.

**HRESULT ReleaseDC(**

*f f\fbfh,ðŽg—p,μ,ÄŽæ“¾,μ,½ffofCfX EfRf“fefLfXfg,lfnf“fhf<,ð%ð•ú,·,é B*

*–œ÷,·,ê,Î DD\_OK AŽ,”s,·,ê,ÎŽŸ,lfGf%o [,ð•Ô,· B*

**DDERR\_GENERIC**

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

**DDERR\_SURFACELOST**

**DDERR\_UNSUPPORTED**

*hDC*

**IDirectDrawSurface2::GetDC***f f\fbfh,ðŽg—p,μ,ÄŽæ“¾,μ,½ffofCfX EfRf“fefLfXfg,lfnf“fhf< B*

*,±,lf f\fbfh,É,æ,Á,Ä A‘O%ñ*

**IDirectDrawSurface2::GetDC***f f\fbfh,ðœÄ,Ñ o,μ,½ŽŽ,lfT [ftFfX,lf fbfN,%ð œ,³,ê,é B*

*ŽQ Æ @***IDirectDrawSurface2::GetDC**

## IDirectDrawSurface2::Restore

HRESULT Restore();

Ž,Á,½fT [ftFfX,đfŠfXfgfA,·,é B ,±,ê,Í DirectDrawSurface  
fIfufWfFfNfg,ÆŠÖ~A,Ä,¯,ç,ê,½fT [ftFfX Ef f,fŠ,ª%đ•ú,³,ê,½,Æ,«” ¶,·,é B  
¬Æ÷,·,ê,Î DD\_OK AŽ,”s,·,ê,ÎŽŸ,İfGf% [,đ•Ö,· B

DDERR\_GENERIC

DDERR\_IMPLICITLYCREATED

DDERR\_INCOMPATIBLEPRIMARY

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

DDERR\_NOEXCLUSIVEMODE

DDERR\_OUTOFMEMORY

DDERR\_UNSUPPORTED

DDERR\_WRONGMODE

ffBfXfvfÆfC EfJ [fh,İf, [fh•İ XŽž,â AfAfvfŠfP [fVf‡f“,ªffBfXfvfÆfC EfJ [fh,Ö,İ”r¼AfNfZfX,đŽó,¯  
Žæ,Ä,ÄÆ» ÝfJ [fh ã,ÉŠ,,,è“¬,Ä,ç,ê,Ä,¢  
,éfT [ftFfX Ef f,fŠ,İ,·,×,Ä,đ%đ•ú,·,éŽž,É,Í AfT [ftFfX,ªŽ,ı,ê,é%Ä”\ «,ª, ,é B DirectDrawSurface  
fIfufWfFfNfg,ª,»,İfT [ftFfX Ef f,fŠ,đŽ,,Á,½,Æ,« A‘½,,İf f\fbfh,Í DDERR\_SURFACELOST  
,đ•Ö,µ A¼,İ, ,ç,ä,é<@”\,İŽÄ s,ªs%Ä”\,É,È,é B  
**IDirectDrawSurface2::Restore**f f\fbfh,İfT [ftFfX Ef f,fŠ,đ ÄŠ,,,è“¬,Ä,µ A DirectDrawSurface  
fIfufWfFfNfg,É,»,ê,đ ÄfAf^fbf`,·,·,é B

,±,İf f\fbfh,İÆÄ,Ň o,µ,đ s,□,Æ A DirectDrawSurface fIfufWfFfNfg,ÉŠÖ~A,Ä,¯,ç,ê,½^Ä–  
Ü,İfT [ftFfX ifofbfN Efofbftf@,È,Ç j,ªfŠfXfgfA,³,ê,é B ^Ä–  
Ü~I,É İ,ç,ê,½fT [ftFfX,đfŠfXfgfA,·,éŽž,Ÿ,İfGf% [,Æ,È,é B  
**IDirectDrawSurface2::Restore,İDirectDrawSurface2::AddAttachedSurface**f f\fbfh,đŽg—p,µ,Ä İ ¬,³,ê,½–  
¾Ž,“I,ÈfAf^fbf`,Ü,Ä,İŽ©“®~I,ÉfŠfXfgfA,µ,È,¢ İ ,±,ê,ç,İfT [ftFfX,İ,»,ê,¼,ê,ªÆÄ X,ÉfŠfXfgfA,³,¹,ç,ê,È,-  
,Ä,İ,È,ç,È,¢ j B

ŽQ Æ @**IDirectDrawSurface2::IsLost** A **IDirectDrawSurface2::AddAttachedSurface**

## IDirectDrawSurface2::SetClipper

HRESULT SetClipper(LPDIRECTDRAWCLIPPER lpDDClipper);

DirectDrawClipper *fIfufWfFfNfg*,*đ* DirectDrawSurface *fIfufWfFfNfg*,*ÉfAf^fbf`*,*·*,*é* B

*-Œ÷*,*·*,*ê*,*Î* DD\_OK *AŽ*,*”s*,*·*,*ê*,*ÎŽŸ*,*ÌfGf%o* [*đ*•*Ô*],*·* B

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

DDERR\_INVALIDSURFACETYPE

DDERR\_NOCLIPPERATTACHED

*lpDDClipper*

DirectDrawSurface *fIfufWfFfNfg*,*ÉfAf^fbf`*,*·*,*é* DirectDrawClipper *fIfufWfFfNfg*,*đ*•*\*,*μ*,*Ä*,*¢*,*é* DirectDrawClipper  
`*¢*•*Ì*,*Ìf|fCf“f^* B *à*,*μ*,*±*,*Ìfpf%of* [*f^*,*^f[f* ,*È*,*ç*,*Î* AŒ» *Ÿ*,*Ì* DirectDrawClipper *fIfufWfFfNfg*,*đff^fbf`*,*·*,*é*,*±*  
*,Æ*,*đ*•*Ô*—*i*,*·*,*é* B

*,±*,*Ìf* *f\fbfh*,*ÍŽâ*,*ÉfT* [*ftfFfX*,*^* *Ä* %*o*,*ÌfT* [*ftfFfX*,*Ì* *ã*,*ÉfI* [*fo* [*fŒfC*,*³*,*ê*,*é*,*©* A, *é*,*¢*,*Ífuf* *fbfN*“]—  
*,³*,*ê*,*é*,*½*,*ß*,*ÉŽg*—*p*,*³*,*ê* A, *,ç*,*ã*,*é**fT* [*ftfFfX* *ã*,*ÄŽg*—*p*,*Ä*,*«*,*é* B DirectDrawClipper  
*fIfufWfFfNfg*,*^fAf^fbf`*,*³*,*ê* A,*»*,*μ*,*ÄfNfŠfbfv* *EfŠfXfg*,*^*,*»*,*ê*,*ÆŒ*•*Ÿ*,*ç*,*ê*,*½Œ*ã A DirectDrawClipper  
*fIfufWfFfNfg*,*ÌIDirectDrawSurface2::Blt* A *IDirectDrawSurface2::BltBatch* A,*”*,*æ*,*Ÿ*  
*IDirectDrawSurface2::UpdateOverlay* *^*— *,Ì*,*½*,*ß*,*ÉŽg*—*p*,*³*,*ê*,*é* B,*±*,*Ìf* *f\fbfh*,*Í* DirectDrawSurface  
*fIfufWfFfNfg*,*ÌŒ»* *Ÿ*,*Ì* DirectDrawClipper *fIfufWfFfNfg*,*đff^fbf`*,*·*,*é*,*±*,*Æ*,*^*,*Ä*,*«*,*é* B

*,±*,*Ìf* *f\fbfh*,*^“*,*¶* DirectDrawClipper *fIfufWfFfNfg*,*É*•*Î*,*μ*,*Ä*“*^êfT* [*ftfFfX* *ã*,*Ä*•*A*•*±*  
*,μ*,*Ä* ”%*ñŒ*Œ*Ä*,*Ÿ* *o*,*³*,*½* *ê* *‡*,*Ä*,*à* A*fIfufWfFfNfg*,*ÌŽQ* *ÆfJfEf“fg*,*Í*,*P*,*μ*,*©*• %*o*Ä,*μ*,*È*,*¢* B  
*d*•*i*,*·*,*éŒ*Œ*Ä*,*Ÿ* *o*,*μ*,*Í* A*fIfufWfFfNfg*,*ÌŽQ* *ÆfJfEf“fg*,*É*%*oe*•*¿*,*đ*—*^*,*„*,*È*,*¢* B

*ŽQ* *Æ* @*IDirectDrawSurface2::GetClipper*

## IDirectDrawSurface2::SetColorKey

HRESULT SetColorKey(DWORD dwFlags, LPDDCOLORKEY lpDDColorKey);

*f*n [fhfEfFfA,ªT [ftfFfX EfX [fX-^,ÉfJf% [ EfL [,ðfTf] [fg,·,é ê ‡ A DirectDrawSurface  
fIfufWfFfNfg,İfJf% [ EfL [,l,ðfZfbfg,·,é B

¬Œ÷,·,ê,Î DD\_OK AŽ,»s,·,ê,ÎŽŸ,İfGf% [,ð•Ô,· B

DDERR\_GENERIC

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

DDERR\_INVALIDSURFACETYPE

DDERR\_NOOVERLAYHW

DDERR\_NOTAOVERLAYSURFACE

DDERR\_SURFACELOST

DDERR\_UNSUPPORTED

DDERR\_WASSTILLDRAWING

dwFlags

,Œ,,ê,İfJf% [ EfL [,ª—vª ,ª,ê,é,©Žw'è,·,é B

DDCKEY\_COLORSPACE

\‘Œ‘İ,ª F«óŠŌ,ðŠŪ,ñ,Ä,Œ,é ê ‡fZfbfg,·,é B

\‘Œ‘İ,ªPê,İfJf% [ EfL [,ðŠŪ,ñ,Ä,Œ,é,Æ,«,İfZfbfg,µ,Ä,İ,Œ,¬,È,Œ B

DDCKEY\_DESTBLT

fuf fbfN“]‘—,İ“]‘— æfJf% [ EfL [,Æ,µ,ÄŽg—

p,ª,ê,éfJf% [ EfL [, ,é,Œ,İ“]‘— æ F«óŠŌ,ð \‘Œ‘İ,ªŽw'è,µ,Ä,Œ

,é ê ‡fZfbfg,·,é B

DDCKEY\_DESTOVERLAY

fI [fo [fŒfC ^— ,İ“]‘— æfJf% [ EfL [,Æ,µ,ÄŽg—

p,ª,ê,éfJf% [ EfL [, ,é,Œ,İ“]‘— æ F«óŠŌ,ð \‘Œ‘İ,ªŽw'è,µ,Ä,Œ

,é ê ‡fZfbfg,·,é B

DDCKEY\_SRCBLT

fuf fbfN“]‘—,İ“]‘—Œ³fJf% [ EfL [,Æ,µ,ÄŽg—

p,ª,ê,éfJf% [ EfL [, ,é,Œ,İ“]‘— æ F«óŠŌ,ð \‘Œ‘İ,ªŽw'è,µ,Ä,Œ

,é ê ‡fZfbfg,·,é B

DDCKEY\_SRCOVERLAY

fI [fo [fŒfC ^— ,İ“]‘—Œ³fJf% [ EfL [,Æ,µ,ÄŽg—

p,ª,ê,éfJf% [ EfL [, ,é,Œ,İ“]‘— æ F«óŠŌ,ð \‘Œ‘İ,ªŽw'è,µ,Ä,Œ

,é ê ‡fZfbfg,·,é B

lpDDColorKey

DirectDrawSurface fIfufWfFfNfg,İ V,µ,ŒfJf% [ EfL [,l,ðŠŪ,ñ,Ä,Œ,é DDCOLORKEY \‘Œ‘İ,İf|fCf“f^ B

ŽQ Æ @IDirectDrawSurface2::GetColorKey

## **IDirectDrawSurface2::SetOverlayPosition**

HRESULT SetOverlayPosition(LONG lX, LONG lY);

*fI [fo [fCfC EfT [ftFfX,ÏffBfXfvfCfC À•W,ð•İ,|,é B*

¬C÷,·,ê,Î DD\_OK AŽ,„s,·,ê,ÎŽŸ,ÏfGf%o [,ð•Ô,· B

**DDERR\_GENERIC**

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

**DDERR\_SURFACELOST**

**DDERR\_UNSUPPORTED**

*lX and lY*

V,µ,¢,~ffBfXfvfCfC À•W,„,æ,Ń,™ffBfXfvfCfC À•W B

ŽQ Æ @**IDirectDrawSurface2::GetOverlayPosition** A**IDirectDrawSurface2::UpdateOverlay**

## IDirectDrawSurface2::SetPalette

HRESULT SetPalette(LPDIRECTDRAWPALETTE lpDDPalette);

Žw'è,<sup>3</sup>,ê,½ DirectDrawPalette fIfuFWfFfNfg,đfT [ftfFfX,ÉfAf^fbf`,·,é B fT [ftfFfX,ÍÈ ~,ì ^— ,Å,Í,± ,İfpfŒfbfg,đŽg—p,·,é B fpfŒfbfg•İ X,İfŠftfŒfbfVf... Ef^fCf~f“fO,ÉŠÖŒW,È,‘ Å,É s,í,ê,é B

–Œ÷,·,ê,Î DD\_OK AŽ,”s,·,ê,ÎŽŸ,İfGf‰ [,đ•Ô,· B

DDERR\_GENERIC

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

DDERR\_INVALIDSURFACETYPE

DDERR\_NOEXCLUSIVEMODE

DDERR\_NOPALETTEATTACHED

DDERR\_NOPALETTEHW

DDERR\_NOT8BITCOLOR

DDERR\_SURFACELOST

DDERR\_UNSUPPORTED

lpDDPalette

DirectDrawPalette \‘Œ‘İ,İf|fCf“f^ B

,±,İf f\fbfh,““^êfT [ftfFfX ã,Å~A‘±

,μ,Ä ”‰ñŒÄ,Ň o,<sup>3</sup>,ê,½ ê ‡,Å,à AfpfŒfbfg,İŽQ ÆfJfEf“fg,Í,P,Â‘ ‰‰Ä,·,é,¾,–,Å ,é B d•i,·,éŒÄ,Ň o,μ,İfp fŒfbfg,İŽQ ÆfJfEf“fg,É‰œç,đ—^,‘,È,Œ B

ŽQ Æ @IDirectDrawSurface2::GetPalette AIDirectDraw2::CreatePalette

## **IDirectDrawSurface2::Unlock**

HRESULT Unlock(LPVOID lpSurfaceData);

DirectDraw,É'¼ ÚfT [ftfFfX'€ ì,ª I—¹,µ,½,±,Æ,ð'm,ç,¹,é B  
¬€÷,·,ê,Î DD\_OK AŽ,„s,·,ê,ÎŽŸ,ÌfGf%o [,ð•Ô,· B

**DDERR\_GENERIC**

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

**DDERR\_INVALIDRECT**

**DDERR\_NOTLOCKED**

**DDERR\_SURFACELOST**

*lpSurfaceData*

**IDirectDrawSurface2::Lock***f f\fbfh,É,æ,Á,Ä•Ô,³,ê,½f|fCf“f^,ÌfAfhf€fX B“¬,¶fT [ftfFfX,Â^Ù,È,é“]‘—  
æ<é€`,Ì,½,ß,É•j ”,Ì***IDirectDrawSurface2::Lock***€Ä,Ñ o,µ,ª%Â”,Ä, ,è A,±,Ìf|fCf“f^,Í*  
**IDirectDrawSurface2::Lock**,„æ,Ñ **IDirectDrawSurface2::Unlock***€Ä,Ñ o,µ,Æ,ð€<,Ñ•t,¬,é B*

ŽQ Æ @**IDirectDrawSurface2::Lock**



## IDirectDrawSurface2::UpdateOverlay

```
HRESULT UpdateOverlay(LPRECT lpSrcRect,  
    LPDIRECTDRAWSURFACE2 lpDDDestSurface,  
    LPRECT lpDestRect, DWORD dwFlags,  
    LPDDOVERLAYFX lpDDOverlayFx);
```

*lI* [*f*<sub>o</sub> [*f*Ɛ*f*C *E**f*T [*f**t**f**F**f*X, ĹŽŠo‘@ «,đ’uŠ·,Ü,½,Í C <sup>3</sup>,·,é B ,±,ê,ç,Ĺ*f*T [*f**t**f**F**f*X, Í DDSCAPS\_OVERLAY  
'Ĺ*f*Z*f*b*f*g,đŽ ,Ă,Ă,ç,È,.,Ă,Í,È,ç,È,ç B

–Ɛ÷,·,ê,Ĺ DD\_OK AŽ,”s,·,ê,ĹŽŸ,Ĺ*f*G*f*% [,đ•Ô,· B

DDERR\_GENERIC

DDERR\_HEIGHTALIGN

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

DDERR\_INVALIDRECT

DDERR\_INVALIDSURFACETYPE

DDERR\_NOSTRETCHHW

DDERR\_NOTAOVERLAYSURFACE

DDERR\_SURFACELOST

DDERR\_UNSUPPORTED

DDERR\_XALIGN

*lpSrcRect*

“]’—Ɛ<sup>3</sup>*f*T [*f**t**f**F**f*X,<sup>a</sup>*f*I [*f*<sub>o</sub> [*f*Ɛ*f*C, ĹŽg,□ ,~ A,™• ,·,æ,Ñ—Ĺˆæ,Ĺ ,,<sup>3</sup>,đ’èç,·,é **RECT** \‘ç’Ĺ,Ĺ*f*C*f*“*f*^ B

*lpDDDestSurface*

*f*I [*f*<sub>o</sub> [*f*Ɛ*f*C,<sup>3</sup>,ê,Ă,ç,é DirectDraw *f*T [*f**t**f**F**f*X,Ĺ*f*|*f*C*f*“*f*^ B

*lpDestRect*

*f*I [*f*<sub>o</sub> [*f*Ɛ*f*C,<sup>a</sup> s,í,ê,é“]’— æ*f*T [*f**t**f**F**f*X,Ĺ ä,É,~ A,™• ,·,æ,Ñ—Ĺˆæ,Ĺ ,,<sup>3</sup>,đ’èç,·,é **RECT** \‘ç’Ĺ,Ĺ*f*  
*f*C*f*“*f*^ B

*dwFlags*

DDOVER\_ADDDIRTYRECT

*f*G*f*~*f*...*f*Ɛ [*f*V*f*‡*f*“,Ă*f*I [*f*<sub>o</sub> [*f*Ɛ*f*C,<sup>3</sup>,ê,½*f*T [*f**t**f**F**f*X,É A X V,μ,È,¯,ê,Ĺ,È,ç,È,ç—  
Ĺˆæ,đ%Ă,.,é B

DDOVER\_ALPHADEST

*f*s*f*N*f*Z*f*ç *E**f**t**f*H [*f*]b*f*g,Ă,Ĺ*f*A*f*ç*f**t**f*@ î•ñ, ,é,ç,Ĺ*f*A*f*ç*f**t**f*@ *E**f*ˆ*f**f**f**f**f**f*ç *E**f*T [*f**t**f**F**f*X,đ A,±  
,Ĺ*f*I [*f*<sub>o</sub> [*f*Ɛ*f*C,Ĺ“]’— æ*f*A*f*ç*f**t**f*@ *E**f*ˆ*f**f**f**f**f*ç,Æ,μ,Ă*f*T [*f**t**f**F**f*X,É*f*A*f*^b*f*ç,·,é,½,ß,ÉŽg—  
p,·,é B

DDOVER\_ALPHADESTCONSTOVERRIDE

,±,Ĺ*f*I [*f*<sub>o</sub> [*f*Ɛ*f*C,Ĺ“]’— æ*f*A*f*ç*f**t**f*@ *E**f*ˆ*f**f**f**f**f*ç,Æ,μ,Ă**DDOVERLAYFX** \‘ç’Ĺ,Ĺ  
**dwAlphaDestConst** *f* *f*“*f*<sub>o</sub>,đŽg—p,·,é B

DDOVER\_ALPHADESTNEG

*f*A*f*ç*f**t**f*@’Ĺ,Ĺ‘ %Ă,É,Ă,ê“]’— æ*f*T [*f**t**f**F**f*X,“§–¾%»,·,é,±,Æ,đ•\,· i0,Í•s“§–¾ j B

DDOVER\_ALPHADESTSURFACEOVERRIDE

,±,Ĺ*f*I [*f*<sub>o</sub> [*f*Ɛ*f*C,Ĺ“]’— æ*f*A*f*ç*f**t**f*@ *E**f*ˆ*f**f**f**f**f*ç,Æ,μ,Ă**DDOVERLAYFX** \‘ç’Ĺ,Ĺ  
**lpDDAlphaDest** *f* *f*“*f*<sub>o</sub>,đŽg—p,·,é B

DDOVER\_ALPHAEDGEBLEND

*f*J*f*% [ *E**f*L [ *F*,Æ«,đ Ú,·,é%æ‘æ,Ĺ*f*G*f*b*f*W,Ĺ*f*A*f*ç*f**t**f*@ *E**f*ˆ*f**f**f**f**f*ç,Æ,μ,Ă**DDOVERLAYFX**  
\‘ç’Ĺ,Ĺ **dwAlphaEdgeBlend** *f* *f*“*f*<sub>o</sub>,đŽg—p,·,é B

DDOVER\_ALPHASRC

*f*s*f*N*f*Z*f*ç *E**f**t**f*H [*f*]b*f*g,Ă,Ĺ*f*A*f*ç*f**t**f*@ î•ñ, ,é,ç,Ĺ*f*A*f*ç*f**t**f*@ *E**f*ˆ*f**f**f**f**f*ç *E**f*T [*f**t**f**F**f*X,đ A,±  
,Ĺ*f*I [*f*<sub>o</sub> [*f*Ɛ*f*C,Ĺ“]’— Ɛ<sup>3</sup>*f*A*f*ç*f**t**f*@ *E**f*ˆ*f**f**f**f**f*ç,Æ,μ,Ă*f*T [*f**t**f**F**f*X,É*f*A*f*^b*f*ç,·,é,½,ß,ÉŽg—  
p,·,é B

DDOVER\_ALPHASRCCONSTOVERRIDE

,±,ìfI [fo [fCfC,ì“]—E³fAf<ftf@ Ef`ffflf<,Æ,μ,Ä **DDOVERLAYFX**  
 \‘c‘ì,ìdwAlphaSrcConst f f“fo,ðŽg—p,·,é B

**DDOVER\_ALPHASRCNEG**

fAf<ftf@‘l,ì‘ %oÁ,É,Â,ê“]—E³fT [ftfFfX,“§–¾%o»,·,é,±,Æ,ð•\,· i0,Í•s“§–¾ j B

**DDOVER\_ALPHASRCSURFACEOVERRIDE**

,±,ìfI [fo [fCfC,ìfAf<ftf@ Ef`ffflf<E¹,Æ,μ,Ä **DDOVERLAYFX** \‘c‘ì,ìlpDDSAlphaSrc  
f f“fo,ðŽg—p,·,é B

**DDOVER\_DDFX**

“ÁŽê,ÈfI [fo [fCfCCEø%oÊ,ð’è`,·,é,½,ß,É AfI [fo [fCfCFXftf%ofo,ðŽg—p,·,é B

**DDOVER\_HIDE**

,±,ìfI [fo [fCfC,ðfIfI,É,·,é B

**DDOVER\_KEYDEST**

]“— æfT [ftfFfX,ÆC<,Ñ•t,¯,ç,ê,½fJf%o [ EfL [,ðŽg—p,·,é B

**DDOVER\_KEYDESTOVERRIDE**

]“— æfT [ftfFfX,ìfJf%o [ EfL [,Æ,μ,Ä **DDOVERLAYFX** \‘c‘ì,ìdckDestColorkey  
f f“fo,ðŽg—p,·,é B

**DDOVER\_KEYSRC**

]“—E³fT [ftfFfX,ÆC<,Ñ•t,¯,ç,ê,½fJf%o [ EfL [,ðŽg—p,·,é B

**DDOVER\_KEYSRCOVERRIDE**

]“—E³fT [ftfFfX,ìfJf%o [ EfL [,Æ,μ,Ä **DDOVERLAYFX** \‘c‘ì,ìdckSrcColorkey  
f f“fo,ðŽg—p,·,é B

**DDOVER\_SHOW**

,±,ìfI [fo [fCfC,ðfIf“,É,·,é B

**DDOVER\_ZORDER**

,±,ìfI [fo [fCfC,ìZfI [f\_ [,Æ,μ,Ä **DDOVERLAYFX** \‘c‘ì,ìdwZOrderFlags f f“fo,ðŽg—  
p,·,é B lpDDSRelative f f“fo,Í AdwZOrderFlags f f“fo,³DDOVERZ\_INSERTINBACKOF  
,,é,¢,ÍDDOVERZ\_INSERTINFRONTOF ,ÉfZfbfg,³,ê,é,Æ,«Žg—p,·,é B

lpDDOverlayFx

**DDOVERLAYFX** \‘c‘ì,ðŽQ Æ,·,é,±,Æ B

## IDirectDrawSurface2::UpdateOverlayDisplay

HRESULT UpdateOverlayDisplay(DWORD dwFlags);

—LÆø,È,·,×,Ä,ÌfI [fo [fÆfC,Ì,ϰ,ç A X V,μ,È,—,ê,Î,È,ς,È,ϥ«éÆ`,ÌfŠfXfg,Ä«éÆ`,ð Ä•`%øæ,·,é B,Û,½ A ^—  
,ª I,í,é,Æ,»,Ì«éÆ`fŠfXfg,ðfNfŠfA,·,é B,±,Ìf f\fbfh,Íf\ftgfeFFfA EfGf~f...fÆ [fVf‡f“Žž,Ì,Y—  
LÆø,Ä Afñ [fhfEfFfA,ÄfI [fo [fÆfC,ªfTf| [fg,³,ê,Ä,ϥ,é ê ‡ A%½,à,μ,È,ϥ B

–Æ÷,·,ê,Î DD\_OK AŽ,”s,·,ê,ÎŽŸ,ÌfGf%ø [,ð•Ô,· B

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

DDERR\_INVALIDSURFACETYPE

DDERR\_UNSUPPORTED

dwFlags

^— ,·,×,« X Vf^fCfv B ^È%ø°,Ìftf%øfO,Ì,ϰ,ç,Ð,Æ,Ä,Î'l,ðŽæ,é B

DDOVER\_REFRESHDIRTYRECTS

,±,Ì“]‘— æ,Ì,½,ß,É‘O,à,Ä,Ä—p^Ó,μ,½ X V,·,×,««éÆ`,ÌfŠfXfg,ðŽg—  
p,μ,Ä AftfBfXfvfÆfC,ð X V,·,é B,Û,½ A,»,Ì«éÆ`fŠfXfg,ðfNfŠfA,·,é B

DDOVER\_REFRESHALL

X V,·,×,««éÆ`,ÌfŠfXfg,ð–³Žç,μ,Ä AfI [fo [fÆfC EfftBfXfvfÆfC,ðŠ@‘S,É X V,·,é B  
,Û,½ A,»,Ì«éÆ`fŠfXfg,ðfNfŠfA,·,é B

ŽQ Æ @IDirectDrawSurface2::AddOverlayDirtyRect

## IDirectDrawSurface2::UpdateOverlayZOrder

```
HRESULT UpdateOverlayZOrder(DWORD dwFlags,  
    LPDIRECTDRAWSURFACE2 lpDDSReference);
```

*fI* [*fO* [*fC*,*lZ**fI* [*f*\_,*ð* Ý'è,·,é B  
    ¬C÷,·,ê,Î DD\_OK AŽ,"s,·,ê,ÎŽŸ,İfGf%\_ [,ð•Ô,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

**DDERR\_NOTAOVERLAYSURFACE**

*dwFlags*

ˆÈ%°,İftf%OfO,İ,ϣ,ı,Đ,Æ,Â,İ'l,ðŽæ,é B

**DDOVERZ\_INSERTINBACKOF**

,±,İfI [*fO* [*fC*,*ðfI* [*fO* [*fC* Ef`fF [*f*“,İŽQ ÆfI [*fO* [*fC*,İCã,ë,É‘}“ü,·,é B

**DDOVERZ\_INSERTINFRONTOF**

,±,İfI [*fO* [*fC*,*ðfI* [*fO* [*fC* Ef`fF [*f*“,İŽQ ÆfI [*fO* [*fC*,İ‘O,É‘}“ü,·,é B

**DDOVERZ\_MOVEBACKWARD**

,±,İfI [*fO* [*fC*,*ðfI* [*fO* [*fC* Ef`fF [*f*“,İ,Đ,Æ,ÂCã•û,ÉˆÚ“®,·,é B

**DDOVERZ\_MOVEFORWARD**

,±,İfI [*fO* [*fC*,*ðfI* [*fO* [*fC* Ef`fF [*f*“,İ,Đ,Æ,Â‘O•û,ÉˆÚ“®,·,é B

**DDOVERZ\_SENDBACK**

,±,İfI [*fO* [*fC*,*ðfI* [*fO* [*fC* Ef`fF [*f*“,İCã•û,ÉˆÚ“®,·,é B

**DDOVERZ\_SENDFRONT**

,±,İfI [*fO* [*fC*,*ðfI* [*fO* [*fC* Ef`fF [*f*“,İ‘O•û,ÉˆÚ“®,·,é B

*lpDDSReference*

*fI* [*fO* [*fC* Ef`fF [*f*“,É,“,¬,é‘Š‘İ“I,ÈˆÊ‘u,Æ,μ,ĂŽg—p,<sup>3</sup>,ê,éDirectDraw fT [*f*tFfX,İf|fCf“f^ B,±  
,İfpf%of [*f*^,Í DDOVERZ\_INSERTINBACKOF,“,æ,Ń DDOVERZ\_INSERTINFRONTOF ,¼,¬,İ,½,ß,É•K—  
v,Æ,<sup>3</sup>,ê,é B

ŽQ Æ @**IDirectDrawSurface2::EnumOverlayZOrders**

٧٤١

## DDBLTBATCH

```
typedef struct _DDBLTBATCH{
    LPRECT          lprDest;
    LPDIRECTDRAWSURFACE lpDDSSrc;
    LPRECT          lprSrc;
    DWORD           dwFlags;
    LPDDBLTFX       lpDDBltFx;
} DDBLTBATCH, FAR *LPDDBLTBATCH;
```

**IDirectDrawSurface2::BltBatch** *f* \fbfh,É“n,·fuf fbfN“]‘—‘€ ì B

### lprDest

*fuf fbfN“]‘— æ,ð’è`·,·é RECT \‘€’ì,ìf|fCf“f^ B*

### lpDDSSrc

*fuf fbfN“]‘—€³,ð’è`·,·é DirectDrawSurfaceIfufWfFfNfg,ìfAfhfÆfX B*

### lprSrc

*fuf fbfN“]‘—€³,ìé€`ð’è`·,·é RECT \‘€’ì,ìfAfhfÆfX B*

### dwFlags

*fIfvfVf‡f“ §€ätf%oO B*

DDBLT\_ALPHADEST

*,±,ìfuf fbfN“]‘—,É,“,·,·éfuf fbfN“]‘—  
æfT [ftfFfX,ìfAf<ftf@ Ef`ffflf<,Æ,μ,Ä AfSfNfZf< EftfH [f}fbfg,Ä,ìfAf<ftf@ î•ñ, ,é,€  
ìfAf<ftf@ Ef`ffflf< Eft [ftfFfX,ì,€,·,ê,©,ðŽg—p,·,·é B*

### DDBLT\_ALPHADESTCONSTOVERRIDE

*,±,ìfuf fbfN“]‘—,É,“,·,·éfuf fbfN“]‘—  
æfT [ftfFfX,ìfAf<ftf@ Ef`ffflf<,Æ,μ,Ä ADDBLTFX \‘€’ì,ì dwAlphaDestConst  
f f“fo,ðŽg—p,·,·é B*

### DDBLT\_ALPHADESTNEG

*fAf<ftf@’l,ì‘ %oÁ,É,Ä,ê“]‘— æfT [ftfFfX,““§—¾%o»,·,·é,±,Æ,ð\,· i0,Ís“§—¾ j B*

### DDBLT\_ALPHADESTSURFACEOVERRIDE

*,±,ìfuf fbfN“]‘—,É,“,·,·éfuf fbfN“]‘—  
æfT [ftfFfX,ìfAf<ftf@ Ef`ffflf<,Æ,μ,Ä ADDBLTFX \‘€’ì,ì lpDDSAAlphaDest f f“fo,ðŽg  
—p,·,·é B*

### DDBLT\_ALPHAEDGEBLEND

*fJf%o [ EfL [ F,Æ«„ð Ú,·,·é%æ‘æ,ìfGfbfW,ìfAf<ftf@ Ef`ffflf<,Æ,μ,ÄADDBLTFX \‘€’ì,ì  
dwAlphaEdgeBlend f f“fo,ðŽg—p,·,·é B*

### DDBLT\_ALPHASRC

*,±,ìfuf fbfN“]‘—,É,“,·,·éfuf fbfN“]‘—  
æfT [ftfFfX,ìfAf<ftf@ Ef`ffflf<,Æ,μ,Ä AfSfNfZf< EftfH [f}fbfg,Ä,ìfAf<ftf@ î•ñ, ,é,€  
ìfAf<ftf@ Ef`ffflf< Eft [ftfFfX,ì,€,·,ê,©,ðŽg—p,·,·é B*

### DDBLT\_ALPHASRCCONSTOVERRIDE

*,±,ìfuf fbfN“]‘—,É,“,·,·éfuf fbfN“]‘—  
€³fT [ftfFfX,ìfAf<ftf@ Ef`ffflf<,Æ,μ,Ä ADDBLTFX \‘€’ì,ì dwAlphaSrcConst f f“fo,ðŽg  
—p,·,·é B*

### DDBLT\_ALPHASRCNEG

*fAf<ftf@’l,ì‘ %oÁ,É,Ä,ê“]‘—€³fT [ftfFfX,““§—¾%o»,·,·é,±,Æ,ð\,· i0,Ís“§—¾ j B*

### DDBLT\_ALPHASRCSURFACEOVERRIDE

*,±,ìfuf fbfN“]‘—,É,“,·,·éfuf fbfN“]‘—  
€³fT [ftfFfX,ìfAf<ftf@ Ef`ffflf<,Æ,μ,Ä ADDBLTFX \‘€’ì,ì lpDDSAAlphaSrc f f“fo,ðŽg—  
p,·,·é B*

### DDBLT\_ASYNC

*FIFO fn [fhfEfFfA,ð’Ê,μ,ÄŽó M,μ,½ ‡ ~,Ä A,±,ìfuf fbfN“]‘—,ð”ñ“Šú,ÉŽÀ s,·,·é B ,à,μ  
FIFO fn [fhfEfFfA,Éó—ìæ,ª,È,€,È,Ç A€Ä,Ñ o,μ,ÍŽ,”s,·,·é B*

### DDBLT\_COLORFILL

'Ç%oÁ,³,ê,½fuf fbfN“]‘—Eø%Ê,ðŽw’è,·,é **DDBLTFX** \‘¢‘Ì,Ìf/fCf“f^ B

## DDBLTFX

```
typedef struct _DDBLTFX{
    DWORD dwSize;
    DWORD dwDDFX;
    DWORD dwROP;
    DWORD dwDDROP;
    DWORD dwRotationAngle;
    DWORD dwZBufferOpCode;
    DWORD dwZBufferLow;
    DWORD dwZBufferHigh;
    DWORD dwZBufferBaseDest;
    DWORD dwZDestConstBitDepth;
union
{
    DWORD dwZDestConst;
    LPDIRECTDRAWSURFACE lpDDSZBufferDest;
};
    DWORD dwZSrcConstBitDepth;
union
{
    DWORD dwZSrcConst;
    LPDIRECTDRAWSURFACE lpDDSZBufferSrc;
};
    DWORD dwAlphaEdgeBlendBitDepth;
    DWORD dwAlphaEdgeBlend;
    DWORD dwReserved;
    DWORD dwAlphaDestConstBitDepth;
union
{
    DWORD dwAlphaDestConst;
    LPDIRECTDRAWSURFACE lpDDSAAlphaDest;
};
    DWORD dwAlphaSrcConstBitDepth;
union
{
    DWORD dwAlphaSrcConst;
    LPDIRECTDRAWSURFACE lpDDSAAlphaSrc;
};
union
{
    DWORD dwFillColor;
    DWORD dwFillDepth;
    LPDIRECTDRAWSURFACE lpDDSPattern;
};
DDCOLORKEY ddckDestColorkey;
DDCOLORKEY ddckSrcColorkey;
} DDBLTFX, FAR* LPDDBLTFX;
```

**IDirectDrawSurface2::Blt** É“n,· B,±,ì \‘‘ì,í,Û,½  
**IDirectDrawSurface2::BltBatch** f f\bfh,ÄŽg—p,³,ê,é**DDBLTBATCH** \‘‘ì,îê•”,Ä, ,é B

**dwSize**  
 \‘‘ì,ìâ,«,³ B,±,ìf f“fo,í \‘‘ì,ªŽg,í,ê,é‘O,É Ý’è,³,ê,Ä,¢,È,,Ä,í,È,ç,È,¢ B

**dwDDFX**  
 ¢ø%øÊ ^— ,ìf^fCfv,ðŽw’è,·,éftf%ofO B  
DDBLTFX\_ARITHSTRETCHY  
 ,±,ìfuf fbfN“]‘—,É,“,¢,Ä,™Ž²,É%ø^,Ä,Ä%ø%ŽZ L’·,ðŽg—p,·,é B

**DDBLTFX\_MIRRORLEFTRIGHT**  
 ,™Ž² ä,ÂfT [ftfFX,ð%øñ“],·,é B,±,ìfuf fbfN“]‘—,ífT [ftfFX,ð ¶,©,ç%øE,É“]ŽÊ,·,é B



#### DDBLTFX\_MIRRORUPDOWN

,Ž<sup>2</sup> ã,ÅfT [ftFfX,ð%õñ“],·,é B ,±,ìfuf fbfN“]‘—,ÍfT [ftFfX,ð ã,©,ç%°,É“]ŽÊ,·,é B

#### DDBLTFX\_NOTEARING

,±,ìfuf fbfN“]‘—,É,“,ĀfefBfAfŠf“fO,ð”ð,—,é,æ,ϣ,É l—¶,·,é B

#### DDBLTFX\_ROTATE180

,±,ìfuf fbfN“]‘—,ìŠÔ,ÉfT [ftFfX,ðŽžĈv%õñ,è,Å180“x%õñ“],<sup>3,1</sup>,é B

#### DDBLTFX\_ROTATE270

,±,ìfuf fbfN“]‘—,ìŠÔ,ÉfT [ftFfX,ðŽžĈv%õñ,è,Å270“x%õñ“],<sup>3,1</sup>,é B

#### DDBLTFX\_ROTATE90

,±,ìfuf fbfN“]‘—,ìŠÔ,ÉfT [ftFfX,ðŽžĈv%õñ,è,Å90“x%õñ“],<sup>3,1</sup>,é B

#### DDBLTFX\_ZBUFFERBASEDEST

,±,ìfuf fbfN“]‘—,ìŠÔ,É A”äŠr,·,é‘O,ìfuf fbfN“]‘—Ĉ<sup>3</sup>,š‘l,“,æ,Ñ,šfuf fbfN“]‘—  
,·,éfuf fbfN“]‘— æ,š‘l,ì,»,½,ê,ÉdwZBufferBaseDest f f“fo,ð%Å,!,é B

#### DDBLTFX\_ZBUFFERRANGE

,±,ìfuf fbfN“]‘—,ìŠÔ,Éfuf fbfN“]‘—  
Ĉ<sup>3</sup>fT [ftFfX,©,ç·i » ,μ,½f**r**fbfg,ìĈÀŠE,ðŽw’è,·,é”ÍÍ‘l,Æ,μ,ÄdwZBufferLow,“,æ,Ñ  
dwZBufferHigh f f“fo,ðŽg—p,·,é B

#### dwROP

Win32 f%oXf^ ^— B

#### dwDDROP

DirectDraw f%oXf^ ^— B

#### dwRotationAngle

fuf fbfN“]‘—,ì%õñ“]Šp“x B

#### dwZBufferOpCode

Zfofbftf@”äŠr B

#### dwZBufferLow

Zfofbftf@,ì Å’áĈÀŠE B

#### dwZBufferHigh

Zfofbftf@,ì Å ,ĈÀŠE B

#### dwZBufferBaseDest

Zfofbftf@,ìfuf fbfN“]‘— æŠî’è‘l B

#### dwZDestConstBitDepth

fuf fbfN“]‘— æ,š’è ”,ìf**r**fbfg [“x B

#### dwZDestConst

fuf fbfN“]‘— æZfofbftf@,Æ,μ,ÄŽg—p,<sup>3</sup>,ê,é’è ” B

#### lpDDSZBufferDest

fuf fbfN“]‘— æZfofbftf@,Æ,μ,ÄŽg—p,<sup>3</sup>,ê,éfT [ftFfX B

#### dwZSrcConstBitDepth

fuf fbfN“]‘—Ĉ<sup>3</sup>,š’è ”,ìf**r**fbfg [“x B

#### dwZSrcConst

fuf fbfN“]‘—Ĉ<sup>3</sup>Zfofbftf@,Æ,μ,ÄŽg—p,<sup>3</sup>,ê,é’è ” B

#### DDSZBufferSrc

fuf fbfN“]‘—Ĉ<sup>3</sup>Zfofbftf@,Æ,μ,ÄŽg—p,<sup>3</sup>,ê,éfT [ftFfX B

#### dwAlphaEdgeBlendBitDepth

fAf<ftf@ EfGfbfW EfufĈf“fh,ì,½,ß,ìf**r**fbfg [“x’è ” B

#### dwAlphaEdgeBlend

fGfbfW ¬ ‡,ì,½,ß,ÉŽg,í,ê,½fAf<ftf@’è ” B

#### dwReserved

«—,ì,½,ß,É—\—ñ,<sup>3</sup>,ê,Ä,ç,é B

#### dwAlphaDestConstBitDepth

fuf fbfN“]‘— æfAf<ftf@’è ”,ìf**r**fbfg [“x B

**dwAlphaDestConst**

fuf fbfN“]‘— æfAf<ftf@ Ef`ffflf<,Ì,½,ß,ÉŽg,í,ê,é’è ” B

**lpDDSAAlphaDest**

fuf fbfN“]‘— æfAf<ftf@ Ef`ffflf<,Æ,μ,ÄŽg—p,<sup>3</sup>,ê,éT [ftfFfX B

**dwAlphaSrcConstBitDepth**

fuf fbfN“]‘—Æ<sup>3</sup>fAf<ftf@’è ”,ìfrfbfg [“x B

**dwAlphaSrcConst**

fuf fbfN“]‘—Æ<sup>3</sup>fAf<ftf@ Ef`ffflf<,Ì,½,ß,ÉŽg,í,ê,é’è ” B

**lpDDSAAlphaSrc**

fuf fbfN“]‘—Æ<sup>3</sup>fAf<ftf@ Ef`ffflf<,Æ,μ,ÄŽg—p,<sup>3</sup>,ê,éT [ftfFfX B

**dwFillColor**

DDBLT\_COLORFILL,“Žw’è,<sup>3</sup>,ê,éŽŽ AfT [ftfFfX,ð•â [,·,é,½,ß,ÉŽg—p,<sup>3</sup>,ê,é F,ìŽw’è B,±,ì'l,Í  
fT [ftfFfX Ef^fCfv,É~Ë‘¶,μ,ÄRGB,R d'l, ,é,¢,ÍfpfÆfbfg\_EfCf“fffbfNfX,Ä, ,é B

**dwFillDepth**

Zfofbftf@,Ì [“x'l B

**lpDDSPattern**

fpf^ [f“,Æ,μ,ÄŽg—p,·,éT [ftfFfX B fpf^ [f“,Ífuf fbfN“]‘—Æ<sup>3</sup>,Æfuf fbfN“]‘—  
æ,ðfAf^fbf`,·,é“Á’è,Ìfuf fbfN“]‘—‘€ ì,ÉŽg—p,<sup>3</sup>,ê,é B

**ddckDestColorkey**

—D æ,·,éfuf fbfN“]‘— æfJf‰ [ EfL [ B

**ddckSrcColorkey**

—D æ,·,éfuf fbfN“]‘—Æ<sup>3</sup>fJf‰ [ EfL [ B

## DDCAPS

```
typedef struct _DDCAPS{
    DWORD    dwSize;
    DWORD    dwCaps;
    DWORD    dwCaps2;
    DWORD    dwCKeyCaps;
    DWORD    dwFXCaps;
    DWORD    dwFXAlphaCaps;
    DWORD    dwPalCaps;
    DWORD    dwSVCaps;
    DWORD    dwAlphaBltConstBitDepths;
    DWORD    dwAlphaBltPixelBitDepths;
    DWORD    dwAlphaBltSurfaceBitDepths;
    DWORD    dwAlphaOverlayConstBitDepths;
    DWORD    dwAlphaOverlayPixelBitDepths;
    DWORD    dwAlphaOverlaySurfaceBitDepths;
    DWORD    dwZBufferBitDepths;

    DWORD    dwVidMemTotal;
    DWORD    dwVidMemFree;
    DWORD    dwMaxVisibleOverlays;
    DWORD    dwCurrVisibleOverlays;
    DWORD    dwNumFourCCCodes;
    DWORD    dwAlignBoundarySrc;
    DWORD    dwAlignSizeSrc;
    DWORD    dwAlignBoundaryDest;
    DWORD    dwAlignSizeDest;
    DWORD    dwAlignStrideAlign;
    DWORD    dwRops[DD_ROP_SPACE];
    DDSCAPS ddsCaps;
    DWORD    dwMinOverlayStretch;
    DWORD    dwMaxOverlayStretch;
    DWORD    dwMinLiveVideoStretch;

    DWORD    dwMaxLiveVideoStretch;
    DWORD    dwMinHwCodecStretch;
    DWORD    dwMaxHwCodecStretch;
    DWORD    dwReserved1;
    DWORD    dwReserved2;
    DWORD    dwReserved3;
    DWORD    dwSVBCaps;
    DWORD    dwSVBCKeyCaps;
    DWORD    dwSVBFXCaps;
    DWORD    dwSVBRops[DD_ROP_SPACE];
    DWORD    dwVSBCaps;
    DWORD    dwVSBCKeyCaps;
    DWORD    dwVSBFXCaps;
    DWORD    dwVSBRops[DD_ROP_SPACE];
    DWORD    dwSSBCaps;
    DWORD    dwSSBCKeyCaps;

    DWORD    dwSSBCFXCaps;
    DWORD    dwSSBRops[DD_ROP_SPACE];
    DWORD    dwReserved4;
    DWORD    dwReserved5;
    DWORD    dwReserved6;
} DDCAPS, FAR* LPDDCAPS;
```

DirectDrawIfufWfFfNfg,©,ç“¾,ç,ê,½fn [fhfEfFfA”—Í,ð•\,· B ,±,Ì \‘ç‘İ,İ,±,İfRf“fefLfXfg,Ä,Ç,ñ,È  
DirectDrawSurface fIfufWfFfNfg,ð ì ¬,;é,±,Æ,ª,Ä,«,é,©◁L q,·,é **DDSCAPS** \‘ç‘İ,ðŠÜ,ñ,Ä,ç,é B ,µ,©,µ“~Žž,É,±  
,ê,ç,İ”—Í,É,æ,Ä,Ä◁L q,³,ê,½fT [ftfFfX,İ,·,×,Ä,ð ì,é,±,Æ,Í•s%Ä”\,È%Ä”\ «,à, ,é B ,±,Ì \‘ç‘İ,İ

**IDirectDraw2::GetCaps**, , æ, Ñ **IDirectDrawPalette::GetCaps** f\fbfh, ÅŽg—p, 3, ê, é B

**dwSize**

\`Ç`İ, İ`â, «, 3 B , ±, ìf f“fo, Í \`Ç`İ, aŽg, í, ê, é‘O, É Ý’è, 3, ê, È, , Å, Í, È, ç, È, Ç B

**dwCaps**

fhf%oCfo“Á’è”—Í, ð, , ç, í, ·ftf%oO B

**DDCAPS\_3D**

ffBfXfvfÇfC Efn [fhEfFfA, a, R, cAfNfZf%oÇ [fVf±f“, ðŽ , Á, Ä, Ç, é, ±, Æ, ð•\, · B

**DDCAPS\_ALIGNBOUNDARYDEST**

DirectDraw, ìfuf fbfN“]‘—Ç³<éÇ`, Ì À•W, Í A **dwAlignBoundaryDest**  
, Ì”{ ”, Å, , é ê ±, Ì, Ý, ðfTf| [fg, ·, é, ±, Æ, ð•\, · B

**DDCAPS\_ALIGNBOUNDARYSRC**

DirectDraw, ìfuf fbfN“]‘—Ç³<éÇ`, Ì À•W, Í A **dwAlignBoundarySrc**, Ì”{ ”, Å, , é ê ±, Ì, Ý, ðfTf|  
[fg, ·, é, ±, Æ, ð•\, · B

**DDCAPS\_ALIGNSIZEDEST**

DirectDraw , afoCfPg’P`Ê, Å, Ì, ~Ž²•ûÇü, Ì`â, «, 3, a**dwAlignSizeDest**, Ì”{ ”, Å, , é ê ±, ìfuf fbfN“]‘—  
Ç³<éÇ`, ¾, , ðfTf| [fg, ·, é, ±, Æ, ð•\, · B

**DDCAPS\_ALIGNSIZESRC**

DirectDraw , afoCfPg’P`Ê, Å, Ì, ~•ûÇü, Ì`â, «, 3, a**dwAlignSizeSrc**, Ì”{ ”, Å, , é ê ±, ìfuf fbfN“]‘—  
Ç³<éÇ`, ¾, , ðfTf| [fg, ·, é, ±, Æ, ð•\, · B

**DDCAPS\_ALIGNSTRIDE**

DirectDraw , a**dwAlignStrideAlign** `l, Æ“™, µ, ÇfXfgf%oCfh EfAf%oCf“f f“fg, ðŽ , Á, Ä, Ç  
, éffBfXfvfÇfC Ef f, fŠ EfT [ftFfX, ð ì ¬, ·, é, ±, Æ, ð•\, · B

**DDCAPS\_ALPHA**

fuf fbfN“]‘—‘€ ì, ÌŠÔ AffBfXfvfÇfC Efn [fhEfFfA, aAf<ftf@ Ef`ffffl<, ðfTf|  
[fg, ·, é, ±, Æ, ð•\, · B

**DDCAPS\_BANKSWITCHED**

ffBfXfvfÇfC Efn [fhEfFfA, afof“fN Ø, è‘Ö, , Å, , è AffBfXfvfÇfC Ef f, fŠ, Ìf%of“f\_fÇ  
EfAfNfZfX, ”ñ í, É’x, Ç%oÂ”\ «, a, , é, ±, Æ, ð•\, · B

**DDCAPS\_BLT**

ffBfXfvfÇfC Efn [fhEfFfA, Ìfuf fbfN“]‘—‘€ ì, a, Å, «, é, ±, Æ, ð•\, · B

**DDCAPS\_BLTCOLORFILL**

ffBfXfvfÇfC Efn [fhEfFfA, afuf fbfN“]‘—, ÅJf%o [ EftfBf<, a, Å, «, é, ±, Æ, ð•\, · B

**DDCAPS\_BLTDEPTHFILL**

ffBfXfvfÇfC Efn [fhEfFfA, afuf fbfN“]‘—, ÅZofbftf@ [“x•â [, a, Å, «, é, ±, Æ, ð•\, · B

**DDCAPS\_BLTFOURCC**

ffBfXfvfÇfC Efn [fhEfFfA, afuf fbfN“]‘—, Å\_FóŠÔ•İŠ, a, Å, «, é, ±, Æ, ð•\, · B

**DDCAPS\_BLTQUEUE**

ffBfXfvfÇfC Efn [fhEfFfA, ”ñ“Šúfuf fbfN“]‘—, a, Å, «, é, ±, Æ, ð•\, · B

**DDCAPS\_BLTSTRETCH**

fuf fbfN“]‘—‘€ ì, Å AffBfXfvfÇfC Efn [fhEfFfA, a L’·, Å, «, é, ±, Æ, ð•\, · B

**DDCAPS\_CANBLTSYSMEM**

ffBfXfvfÇfC Efn [fhEfFfA, afVfXfefÇ Ef f, fŠ, É, , é, Ç  
, ÌfVfXfefÇ Ef f, fŠ, ©, çfuf fbfN“]‘—, Å, «, é, ±, Æ, ð•\, · B

**DDCAPS\_CANCLIP**

ffBfXfvfÇfC Efn [fhEfFfA, afuf fbfN“]‘—, ÅNfŠfbfsf“fO, Å, «, é, ±, Æ, ð•\, · B

**DDCAPS\_CANCLIPSTRETCHED**

ffBfXfvfÇfC Efn [fhEfFfA, a A L’·fuf fbfN“]‘—’†, ÉfNfŠfbfsf“fO, Å, «, é, ±, Æ, ð•\, · B

**DDCAPS\_COLORKEY**

fI [fo [fÇfC, Ü, ½, Ìfuf fbfN“]‘—‘€ ì, Ì, Ç, , , è, ©, ÅfJf%o [ EfL [Ì, Ç, , Å, ©, ÌÇ`Ž®, ðfTf|  
[fg, ·, é B`Á`è, ÌfJf%o [ EfL [¬—Í îñ, Í **dwCKeyCaps** f f“fo, É, , é B

## DDCAPS\_COLORKEYHWASSIST

fJf% [ Efl [,^fn [fhEfFfA,É,æ,èfTf| [fg,^,ê,Ä,¢,é,±,Æ,ð\,· B

## DDCAPS\_GDI

ffBfXfvfÆfC Efn [fhEfFfA,^GDI,Æ<□—L,^,ê,é,±,Æ,ð\,· B

## DDCAPS\_NOHARDWARE

fn [fhEfFfA Eftf| [fg,^,È,¢,±,Æ,ð\,· B

## DDCAPS\_OVERLAY

ffBfXfvfÆfC Efn [fhEfFfA,^fI [fo [fÆfC,ðfTf| [fg,·,é,±,Æ,ð\,· B

## DDCAPS\_OVERLAYCANTCLIP

ffBfXfvfÆfC Efn [fhEfFfA,^fI [fo [fÆfC,ðfTf| [fg,·,é,^ AfNfŠfbfsf“fO,Í,Ä,«,É,¢,±,Æ,ð\,· B

## DDCAPS\_OVERLAYFOURCC

fI [fo [fÆfC Efn [fhEfFfA,^fI [fo [fÆfC ^—,İŠÔ A F<óŠÔ•İŠ·,^,Ä,«,é,±,Æ,ð\,· B

## DDCAPS\_OVERLAYSTRETCH

fI [fo [fÆfC Efn [fhEfFfA,É L'·,İ”—Í,^,·,é,±,Æ,ð\,· B

## DDCAPS\_PALETTE

DirectDraw,^fvf%ofCf}fŠ Eft [ftFfX,¾,^,Ä,È, A'^¼,İft [ftFfX,É,à DirectDrawPalette  
fIfufWfFfNfg,ð İ ¬,µ,Ä AfTf| [fg,Ä,«,é,±,Æ,ðŽ',· B

## DDCAPS\_PALETTEVSYNC

DirectDraw,^VSYNC,É“Šú,µ,ÄfpfÆfbfg,ð X V,Ä,«,é,±,Æ,ð\,· B

## DDCAPS\_READSCANLINE

ffBfXfvfÆfC Efn [fhEfFfA,^fXfLfff“f%ofCf““Ç,ÝŽæ,è,^%Ä”,Ä,·,é,±,Æ,ð\,· B

## DDCAPS\_STEREOVIEW

ffBfXfvfÆfC Efn [fhEfFfA,^fXfefÆfI EfrfWf±f““—Í,ðŽ ,Ä,Ä,¢,é,±,Æ,ð\,· B

## DDCAPS\_VBI

ffBfXfvfÆfC Efn [fhEfFfA,^Vfuf%of“fNŠ,,,è Ž,Ý,ð ¶ ¬,Ä,«,é,±,Æ,ð\,· B

## DDCAPS\_ZBLTS

fuf fbfN“]‘—‘€ İ,É,“,¢,ÄZfofbftf@,İŽg—p,ðfTf| [fg,·,é B

## DDCAPS\_ZOVERLAYS

d,È,è,ð §Æä,·,éfI [fo [fÆfC,š'l,Æ,µ,ÄIDirectDrawSurface2::UpdateOverlayZOrderf f\fbf  
h,İŽg—p,ðfTf| [fg,·,é B

## dwCaps2

,»,İfhf%ofCfo“Ä'è”—Í,İ Ú ×,ð\,·ftf%ofO B

## DDCAPS2\_CERTIFIED

ffBfXfvfÆfC Efn [fhEfFfA,^•Û Ø,^,ê,Ä,¢,é,±,Æ,ð\,· B

## DDCAPS2\_NO2DDURING3DSCENE

IDirect3DDevice::BeginScene f\fbfhÆÄ,Ń o,µ,Æ  
IDirect3DDevice::EndScene f\fbfhÆÄ,Ń o,µ,Æ,İŠÔ,É Direct3D,^Žg—p,µ,Ä,¢  
,é,·,×,Ä,İft [ftFfX ä,Ä AIDirectDrawSurface2::Blt,“,æ,ŃIDirectDrawSurface2::Lock,İ,æ,µ,È  
2D ^—,ðŽÄ s,Ä,«,È,¢,±,Æ,ð\,· B

## dwCKeyCaps

fJf% [ Efl [”—Í,ð\,·ftf%ofO B

## DDKEYCAPS\_DESTBLT

fJf% [ Efl [,É,æ,é“§%ßÆ^fuf fbfN“]‘—,ðfTf| [fg,·,é B fJf% [ Efl [,ÍRGB  
F,İfuf fbfN“]‘— æfT [ftFfX,Ä'uŠ·%Ä”,Èfrfbfg,ðŽ',· B

## DDKEYCAPS\_DESTBLTCLRSRSPACE

F<óŠÔ,É,æ,é“§%ßÆ^fuf fbfN“]‘—,ðfTf| [fg,·,é B F<óŠÔ,ÍRGB F,İfuf fbfN“]‘—  
æfT [ftFfX,Ä'uŠ·%Ä”,Èfrfbfg,ðŽ',· B

## DDKEYCAPS\_DESTBLTCLRSRSPACEYUV

F<óŠÔ,É,æ,é“\$%ßŒ^fuf fbfN“]‘—,ðfTf| [fg,.,é B F<óŠÔ,ÍYUV F,lfuf fbfN“]‘—  
æfT [ftfFfX,Ä’uŠ·%oÄ”\,Èfrfbfg,ðŽ|,· B

#### DDCKEYCAPS\_DESTBLTYUV

fJf%o [ EfL [,É,æ,é“\$%ßŒ^fuf fbfN“]‘—,ðfTf| [fg,.,é BfJf%o [ EfL [,ÍYUV  
F,lfuf fbfN“]‘— æfT [ftfFfX,Ä’uŠ·%oÄ”\,Èfrfbfg,ðŽ|,· B

#### DDCKEYCAPS\_DESTOVERLAY

fJf%o [ EfL [fCf“fO,É,æ,éfi [fo [fŒfC,ðfTf| [fg,.,é BfJf%o [ EfL [,ÍRGB  
F,Äfi [fo [fŒfC,³,è,éfuf fbfN“]‘— æfT [ftfFfX,Ä’uŠ·%oÄ”\,Èfrfbfg B

#### DDCKEYCAPS\_DESTOVERLAYCLRSPACE

RGB F,lfuf fbfN“]‘— æfJf%o [ EfL [,Æ,µ,Ä F<óŠÔ,ðfTf| [fg,.,é B

#### DDCKEYCAPS\_DESTOVERLAYCLRSPACEYUV

YUV F,lfuf fbfN“]‘— æfJf%o [ EfL [,Æ,µ,Ä F<óŠÔ,ðfTf| [fg,.,é B

#### DDCKEYCAPS\_DESTOVERLAYONEACTIVE

%oÄŽ< ó‘Ô,lfI [fo [fŒfC EfT [ftfFfX,É A,Đ,Æ,Ä,¾,¯,l—LŒø,Èfuf fbfN“]‘—  
æfJf%o [ EfL [’l,ðfTf| [fg,.,é B

#### DDCKEYCAPS\_DESTOVERLAYYYUV

fJf%o [ EfL [fCf“fO,É,æ,éfi [fo [fŒfC,ðfTf| [fg,.,é BfJf%o [ EfL [,Í  
YUV F,Äfi [fo [fŒfC,³,è,éfuf fbfN“]‘— æfT [ftfFfX,Ä’uŠ·%oÄ”\,Èfrfbfg B

#### DDCKEYCAPS\_NOCSTOVERLAY

fi [fo [fŒfC,ÄJf%o [ EfL [,ðŽg—p,.,é,±,Æ,É‘î,µ,Ä ^— ‘¬“x,É%œ<ç,ª,È,ç,±,Æ,ð•\,· B

#### DDCKEYCAPS\_SRCBLT

RGB FfT [ftfFfX,lfuf fbfN“]‘—Œ³fJf%o [ EfL [,É,æ,é“\$%ßŒ^fuf fbfN“]‘—,ðfTf|  
[fg,.,é B

#### DDCKEYCAPS\_SRCBLTCLRSPACE

RGB FfT [ftfFfX,lfuf fbfN“]‘—Œ³ F<óŠÔ,É,æ,é“\$%ßŒ^fuf fbfN“]‘—,ðfTf| [fg,.,é B

#### DDCKEYCAPS\_SRCBLTCLRSPACEYUV

YUV FfT [ftfFfX,lfuf fbfN“]‘—Œ³ F<óŠÔ,É,æ,é“\$%ßŒ^fuf fbfN“]‘—,ðfTf| [fg,.,é B

#### DDCKEYCAPS\_SRCBLTYUV

YUV FfT [ftfFfX,lfJf%o [ EfL [,É,æ,é“\$%ßŒ^fuf fbfN“]‘—,ðfTf| [fg,.,é B

#### DDCKEYCAPS\_SRCOVERLAY

RGB F,lfuf fbfN“]‘—Œ³fJf%o [ EfL [,É,æ,éfi [fo [fŒfC,ðfTf| [fg,.,é B

#### DDCKEYCAPS\_SRCOVERLAYCLRSPACE

RGB Ffi [fo [fŒfC EfT [ftfFfX,Äfuf fbfN“]‘—  
Œ³fJf%o [ EfL [,Æ,µ,Ä F<óŠÔ,ðŽg,Ä,½fi [fo [fŒfC,ðfTf| [fg,.,é B

#### DDCKEYCAPS\_SRCOVERLAYCLRSPACEYUV

YUV Ffi [fo [fŒfC EfT [ftfFfX,Äfuf fbfN“]‘—Œ³fJf%o [ EfL [,Æ,µ,Ä F<óŠÔ,ðfTf|  
[fg,.,é B

#### DDCKEYCAPS\_SRCOVERLAYONEACTIVE

%oÄŽ< ó‘Ô,lfI [fo [fŒfC EfT [ftfFfX,É A,Đ,Æ,Ä,¾,¯,l—LŒø,Èfuf fbfN“]‘—  
Œ³fJf%o [ EfL [’l,ðfTf| [fg,.,é B

#### DDCKEYCAPS\_SRCOVERLAYYYUV

YUV Ffi [fo [fŒfC EfT [ftfFfX,Äfuf fbfN“]‘—  
Œ³fJf%o [ EfL [,É,æ,éfi [fo [fŒfC,ðfTf| [fg,.,é B

### dwFXCaps

fhf%oCfo“Á’è,ì L’.,,æ,ÑFX”\—Í B

#### DDFXCAPS\_BLTARITHSTRETCHY

fsfNfZf<,ð,Q æ,É,µ,ÄŠg‘â,.,éfefNfjfbfN,Ä,Í,È,-  
Afuf fbfN“]‘—‘€ ì,ìŠÔ,ÉŠg‘â,µ AfT [ftfFfX,ð k ¬,.,é%o%ŽZ ^— ,ðŽg—p,.,é B,±  
,ê,Í A,™Z² i ,¼,É j,É%o^,Ä,Ä s,í,ê,é B

#### DDFXCAPS\_BLTARITHSTRETCHYN

fsfNfZf<,ð,Q æ,É,µ,ÄŠg‘â,·,éfefNfjfbfN,Ä,Í,È,-  
 Afuf fbfN“]‘—‘€ ì,İŠÖ,ÉŠg‘â,µ,Ä AfT [ftfFfX,ð k ¬,·,é%ŽZ ^— ,ðŽg—p,·,é B,±  
 ,é,İ,™Ž<sup>2</sup> i ,¼,É j,É%ˆ,Ä,Ä s,í,ê A ® ””{ i’1, ’2, İ,æ,µ,É j,ÄŠg‘â,·,é,½,ß,É“® ì,·,é B

#### DDFXCAPS\_BLMIRRORLEFTRIGHT

fuf fbfN“]‘—‘€ ì†,É ¶%E”½“],·,é,±,Æ,ðfTf| [fg,·,é B

#### DDFXCAPS\_BLMIRRORUPDOWN

fuf fbfN“]‘—‘€ ì†,É ã%”½“],·,é,±,Æ,ðfTf| [fg,·,é B

#### DDFXCAPS\_BLTROTATION

fuf fbfN“]‘—‘€ ì†,É”CˆÓ,İ%ñ“],ðfTf| [fg,·,é B

#### DDFXCAPS\_BLTROTATION90

fuf fbfN“]‘—‘€ ì†,É,X,O“x,İ%ñ“],ðfTf| [fg,·,é B

#### DDFXCAPS\_BLTSHRINKX

,Ž<sup>2</sup> i ...½ j,É%ˆ,Ä,ÄfT [ftfFfX,ð”CˆÓ,É k ¬,·,é,±,Æ,ðfTf| [fg,·,é B,±  
 ,İftf%oÍfuf fbfN“]‘—‘€ ì,İ,Ý,É—LÆø,Ä, ,é B

#### DDFXCAPS\_BLTSHRINKXN

,Ž<sup>2</sup> i ...½ j,É%ˆ,Ä,ÄfT [ftfFfX,ð ® ”ª,İˆ i’1/2 A’1/3,İ,æ,µ,É j,Ä k ¬,·,é,±,Æ,ðfTf|  
 [fg,·,é B,±,İftf%oÍfuf fbfN“]‘—‘€ ì,İ,Ý,É—LÆø,Ä, ,é B

#### DDFXCAPS\_BLTSHRINKY

,™Ž<sup>2</sup> i ,¼ j,É%ˆ,Ä,ÄfT [ftfFfX,ð”CˆÓ,É k ¬,·,é,±,Æ,ðfTf| [fg,·,é B,±  
 ,İftf%oÍfuf fbfN“]‘—‘€ ì,İ,Ý,É—LÆø,Ä, ,é B

#### DDFXCAPS\_BLTSHRINKYN

,™Ž<sup>2</sup> i ,¼ j,É%ˆ,Ä,ÄfT [ftfFfX,ð ® ”ª,İˆ i’1/2 A’1/3,İ,æ,µ,É j,Ä k ¬,·,é,±,Æ,ðfTf|  
 [fg,·,é B,±,İftf%oÍfuf fbfN“]‘—‘€ ì,İ,Ý,É—LÆø,Ä, ,é B

#### DDFXCAPS\_BLTSTRETCHX

,Ž<sup>2</sup> i ...½ j,É%ˆ,Ä,ÄfT [ftfFfX,ð”CˆÓ,ÉŠg‘â,·,é,±,Æ,ðfTf| [fg,·,é B,±  
 ,İftf%oÍfuf fbfN“]‘—‘€ ì,İ,Ý,É—LÆø,Ä, ,é B

#### DDFXCAPS\_BLTSTRETCHXN

,Ž<sup>2</sup> i ...½ j,É%ˆ,Ä,ÄfT [ftfFfX,ð ® ””{ i’1, ’2, İ,æ,µ,É j,ÄŠg‘â,·,é,±,Æ,ðfTf|  
 [fg,·,é B,±,İftf%oÍfuf fbfN“]‘—‘€ ì,İ,Ý,É—LÆø,Ä, ,é B

#### DDFXCAPS\_BLTSTRETCHY

,™Ž<sup>2</sup> i ,¼ j,É%ˆ,Ä,ÄfT [ftfFfX,ð”CˆÓ,ÉŠg‘â,·,é,±,Æ,ðfTf| [fg,·,é B,±  
 ,İftf%oÍfuf fbfN“]‘—‘€ ì,İ,Ý,É—LÆø,Ä, ,é B

#### DDFXCAPS\_BLTSTRETCHYN

,™Ž<sup>2</sup> i ,¼ j,É%ˆ,Ä,ÄfT [ftfFfX,İ ® ””{ i’1, ’2, İ,æ,µ,É j,ÄŠg‘â,·,é,±,Æ,ðfTf|  
 [fg,·,é B,±,İftf%oÍfuf fbfN“]‘—‘€ ì,İ,Ý,É—LÆø,Ä, ,é B

#### DDFXCAPS\_OVERLAYARITHSTRETCHY

fsfNfZf<,ð,Q æ,É,µ,ÄŠg‘â,·,éfefNfjfbfN,Ä,Í,È,-  
 Afuf fbfN“]‘—‘€ ì,İŠÖ,ÉŠg‘â,µ AfT [ftfFfX,ð k ¬,·,é%ŽZ ^— ,ðŽg—  
 p,·,é B,™Ž<sup>2</sup> i ,¼ j,É%ˆ,Ä,Ä s,í,ê,é B

#### DDFXCAPS\_OVERLAYARITHSTRETCHYN

fsfNfZf<,ð,Q æ,É,µ,ÄŠg‘â,·,éfefNfjfbfN,Ä,Í,È,-  
 Afuf fbfN“]‘—‘€ ì,İŠÖ,ÉŠg‘â,µ AfT [ftfFfX,ð k ¬,·,é%ŽZ ^— ,ðŽg—  
 p,·,é B,™Ž<sup>2</sup> i ,¼ j,É%ˆ,Ä,Ä s,í,ê A ® ””{ i’1, ’2, İ,æ,µ,É j,İŠg‘â,ª s,í,ê,é B

#### DDFXCAPS\_OVERLAYMIRRORLEFTRIGHT

¶%E”½“]fI [fo [fÆfC,ðfTf| [fg,·,é B

#### DDFXCAPS\_OVERLAYMIRRORUPDOWN

ã%”½“]fI [fo [fÆfC,ðfTf| [fg,·,é B

#### DDFXCAPS\_OVERLAYSHRINKX

,Ž<sup>2</sup> i ...½ j,É%ˆ,Ä,ÄfT [ftfFfX,ð”CˆÓ,É k ¬,·,é,±,Æ,ðfTf| [fg,·,é B,±,İftf%oÍ  
 DDSCAPS\_OVERLAY fT [ftfFfX,İ,Ý,É—LÆø,Ä, ,é B,±,İftf%oÍfT [ftfFfX,İ”—  
 Í,¾,¯,ðŽ,µ A k ¬,ª%Ä”\,Ä, ,é,±,Æ,ðª,³,È,¢ B

#### DDFXCAPS\_OVERLAYSHRINKXN

,<sup>TM</sup>Z<sup>2</sup> i ...•½ j,É%<sup>^</sup>,Á,ÄfT [ftFfX,ð ® ""{ i'1, '2, Ì,æ,ð,É j,Ä k ¬,·,é,±,Æ,ðfTf|  
[fg,·,é B,±,Ìftf%oO,Í DDSCAPS\_OVERLAY fT [ftFfX,Ì,Ý,É—LÆø,Ä, ,é B,±  
Ìftf%oO,ÍfT [ftFfX,Ì"—Í,¾,¬,ðŽ',µ A k ¬,°%Ä",Ä, ,é,±,Æ,ð•\,³,È,¢ B

#### DDFXCAPS\_OVERLAYSHRINKY

,<sup>TM</sup>Z<sup>2</sup> i , '¼ j,É%<sup>^</sup>,Á,ÄfT [ftFfX,ð"Ó,É k ¬,·,é,±,Æ,ðfTf| [fg,·,é B,±,Ìftf%oO,Í  
DDSCAPS\_OVERLAY fT [ftFfX,Ì,Ý,É—LÆø,Ä, ,é B,±,Ìftf%oO,ÍfT [ftFfX,Ì"—  
Í,¾,¬,ðŽ',µ A k ¬,°%Ä",Ä, ,é,±,Æ,ð•\,³,È,¢ B

#### DDFXCAPS\_OVERLAYSHRINKYN

,<sup>TM</sup>Z<sup>2</sup> i , '¼ j,É%<sup>^</sup>,Á,ÄfT [ftFfX,Ì ® "•ª,Ìê i'1/2 A'1/3,Ì,æ,ð,É j,Ä k ¬,·,é,±,Æ,ðfTf|  
[fg,·,é B,±,Ìftf%oO,Í DDSCAPS\_OVERLAY fT [ftFfX,Ì,Ý,É—LÆø,Ä, ,é B,±  
Ìftf%oO,ÍfT [ftFfX,Ì"—Í,¾,¬,ðŽ',µ A k ¬,°%Ä",Ä, ,é,±,Æ,ð•\,³,È,¢ B

#### DDFXCAPS\_OVERLAYSTRETCHX

,<sup>TM</sup>Z<sup>2</sup> i ...•½ j,É%<sup>^</sup>,Á,ÄfT [ftFfX,ð"Ó,ÉŠg'ä,·,é,±,Æ,ðfTf| [fg,·,é B,±,Ìftf%oO,Í  
DDSCAPS\_OVERLAY fT [ftFfX,Ì,Ý,É—LÆø,Ä, ,é B,±,Ìftf%oO,ÍfT [ftFfX,Ì"—  
Í,¾,¬,ðŽ',µ A k ¬,°%Ä",Ä, ,é,±,Æ,ð•\,³,È,¢ B

#### DDFXCAPS\_OVERLAYSTRETCHXN

,<sup>TM</sup>Z<sup>2</sup> i ...•½ j,É%<sup>^</sup>,Á,ÄfT [ftFfX,ð ® ""{ i'1, '2, Ì,æ,ð,É j,ÄŠg'ä,·,é,±,Æ,ðfTf|  
[fg,·,é B,±,Ìftf%oO,Í DDSCAPS\_OVERLAY fT [ftFfX,Ì,Ý,É—LÆø,Ä, ,é B,±  
Ìftf%oO,ÍfT [ftFfX,Ì"—Í,¾,¬,ðŽ',µ A k ¬,°%Ä",Ä, ,é,±,Æ,ð•\,³,È,¢ B

#### DDFXCAPS\_OVERLAYSTRETCHY

,<sup>TM</sup>Z<sup>2</sup> i , '¼ j,É%<sup>^</sup>,Á,ÄfT [ftFfX,ð"Ó,ÉŠg'ä,·,é,±,Æ,ðfTf| [fg,·,é B,±  
Ìftf%oO,Í DDSCAPS\_OVERLAY fT [ftFfX,Ì,Ý,É—LÆø,Ä, ,é B,±,Ìftf%oO,ÍfT [ftFfX,Ì"—  
Í,¾,¬,ðŽ',µ A k ¬,°%Ä",Ä, ,é,±,Æ,ð•\,³,È,¢ B

#### DDFXCAPS\_OVERLAYSTRETCHYN

,<sup>TM</sup>Z<sup>2</sup> i , '¼ j,É%<sup>^</sup>,Á,ÄfT [ftFfX,Ì ® ""{ i'1, '2, Ì,æ,ð,É j,ÄŠg'ä,ðfTf| [fg,·,é B,±  
Ìftf%oO,Í DDSCAPS\_OVERLAY fT [ftFfX,Ì,Ý,É—LÆø,Ä, ,é B,±,Ìftf%oO,ÍfT [ftFfX,Ì"—  
Í,¾,¬,ðŽ',µ A k ¬,°%Ä",Ä, ,é,±,Æ,ð•\,³,È,¢ B

#### dwFXAlphaCaps

f<sub>h</sub>f%oCfo“Á'è,ÌfAf<ftf@"—Í B

#### DDFXALPHACAPS\_BTALPHAEDGEBLEND

fuf fbfN“]‘—  
Æ³fJf% [ EfL [ÌfT [ftFfX,ÌfGfbfWŽü,è,ÌfAf<ftf@ EfufÆf“ffBf“fO,ðfTf|  
[fg,·,é Bfuf fbfN“]‘—‘€ Ì,½,ß,ÉŽg—p,³,è,é B

#### DDFXALPHACAPS\_BTALPHAPIXELS

fsfNfZf< EftfH [f]fbfg,ÄfAf<ftf@ î•ñ,ðfTf| [fg,·,é B fsfNfZf< EftfH [f]  
fbfg,Ä,ÌfAf<ftf@ î•ñ,Ìf<sub>r</sub>fbfg [“x,Í,P A,Q A,S A, ,é,¢,Í,W,Ä, ,é B  
fAf<ftf@'l,Í' %oÄ,·,é,É,Ä,è,Ä•s“§—¾,É,È,é B  
fAf<ftf@ î•ñ,Ì [“x,É,©,©,í,ç,, A,O,ª,Ä,È,ÉŠ@‘S,É“§—¾,È'l,Ä, ,é B  
fuf fbfN“]‘—‘€ Ì,½,ß,ÉŽg—p,³,è,é B

#### DDFXALPHACAPS\_BTALPHAPIXELSNEG

fsfNfZf< EftfH [f]fbfg,ÄfAf<ftf@ î•ñ,ðfTf| [fg,·,é B fsfNfZf< EftfH [f]  
fbfg,Ä,ÌfAf<ftf@ î•ñ,Ìf<sub>r</sub>fbfg [“x,Í,P A,Q A,S A, ,é,¢,Í,W,Ä, ,é B  
fAf<ftf@'l,Í' %oÄ,·,é,É,Ä,è,Ä“§—¾,É,È,é B  
fAf<ftf@ î•ñ,Ì [“x,É,©,©,í,ç,, A,O,ª,Ä,È,ÉŠ@‘S,É•s“§—¾,È'l,Ä, ,é B,±,Ìftf%oO,Í  
DDCAPS\_ALPHA,ªfZfbfg,³,è,½ è ‡,ÉÆÄ,èŽg,µ,±,Æ,ª,Ä,«é Bfuf fbfN“]‘—‘€ Ì,½,ß,ÉŽg  
—p,³,è,é B

#### DDFXALPHACAPS\_BTALPHASURFACES

fAf<ftf@ ê—pfT [ftFfX,ðfTf| [fg,·,é BfAf<ftf@ ê—  
pfT [ftFfX,Ìf<sub>r</sub>fbfg [“x,Í,P A,Q A,S A, ,é,¢,Í,W,Ä, ,è“¾,é B  
fAf<ftf@'l,Í' %oÄ,·,é,É,Ä,è,Ä•s“§—¾,É,È,é B  
fAf<ftf@ î•ñ,Ì [“x,É,©,©,í,ç,, A,O,ª,Ä,È,ÉŠ@‘S,É“§—¾,È'l,Ä, ,é B  
fuf fbfN“]‘—‘€ Ì,½,ß,ÉŽg—p,³,è,é B

#### DDFXALPHACAPS\_BTALPHASURFACESNEG



fAf<ftf@ Ef`ffflf<,<sup>a</sup> AfAf<ftf@'l,ì' %oÁ,É,Â,ê,Ä“§-¾,É,È,é,±,Æ,ð\,· B  
fAf<ftf@ Ef`ffflf< Eff [f^,Ì [“x,Í,P A,Q A,S A, ,é,¢,Í,W,Â, ,é B  
fAf<ftf@ î•ñ,Ì [“x,É,©,©,í,ç,, A,O,<sup>a</sup>,Â,Ë,ËŠ@‘S,É•s“§-¾,È'l,Â, ,é B,±,Ìftf%ofo,ÍDDCAPS\_  
ALPHASURFACES,<sup>a</sup>fZfbfg,<sup>3</sup>,ê,½ ê ±,É,ÉÄ,èfZfbfg,·,é,±,Æ,<sup>a</sup>,Â,«,é B  
fuf fbfN“]‘—€ ì,Ì,½,ß,ÉŽg—p,<sup>3</sup>,ê,é B

#### DDFXALPHACAPS\_OVERLAYALPHAEDGEBLEND

fuf fbfN“]‘—  
€³fJf%o [ EfL [,ÌfT [ftfFfX,ÌfGfbfWŽü,è,ÌfAf<ftf@ Efuf€f“ffBf“fo,ðfTf|  
[fg,·,é BfI [fo [f€fC,Ì,½,ß,ÉŽg—p,<sup>3</sup>,ê,é B

#### DDFXALPHACAPS\_OVERLAYALPHAIXELS

fsfNfZf< EftfH [f}fbfg,ÂfAf<ftf@ î•ñ,ðfTf| [fg,·,é B fsfNfZf< EftfH [f}  
fbfg,Â,ÌfAf<ftf@ î•ñ,ÌfRfbfg [“x,Í,P A,Q A,S A, ,é,¢,Í,W,Â, ,é B  
fAf<ftf@'l,ì' %oÁ,·,é,É,Â,ê,Ä•s“§-¾,É,È,é B  
fAf<ftf@ î•ñ,Ì [“x,É,©,©,í,ç,, A,O,<sup>a</sup>,Â,Ë,ËŠ@‘S,É“§-¾,È'l,Â, ,é B fI [fo [f€fC,Ì,½,ß,ÉŽg—  
—p,<sup>3</sup>,ê,é B

#### DDFXALPHACAPS\_OVERLAYALPHAIXELSNEG

fsfNfZf< EftfH [f}fbfg,ÂfAf<ftf@ î•ñ,ðfTf| [fg,·,é B fsfNfZf< EftfH [f}  
fbfg,Â,ÌfAf<ftf@ î•ñ,ÌfRfbfg [“x,Í,P A,Q A,S A, ,é,¢,Í,W,Â, ,é B  
fAf<ftf@'l,ì' %oÁ,·,é,É,Â,ê,Ä“§-¾,É,È,é B  
fAf<ftf@ î•ñ,Ì [“x,É,©,©,í,ç,, A,O,<sup>a</sup>,Â,Ë,ËŠ@‘S,É•s“§-¾,È'l,Â, ,é B,±,Ìftf%ofo,ÍDDCAPS\_  
ALPHAIXELS,<sup>a</sup>fZfbfg,<sup>3</sup>,ê,½ ê ±,É,ÉÄ,èŽg,±,±,Æ,<sup>a</sup>,Â,«,é B fI [fo [f€fC,Ì,½,ß,ÉŽg—  
p,<sup>3</sup>,ê,é B

#### DDFXALPHACAPS\_OVERLAYALPHASURFACES

fAf<ftf@ ê—pfT [ftfFfX,ðfTf| [fg,·,é BfAf<ftf@ ê—  
pfT [ftfFfX,ÌfRfbfg [“x,Í,P A,Q A,S A, ,é,¢,Í,W,Â, ,é B  
fAf<ftf@'l,ì' %oÁ,·,é,É,Â,ê,Ä•s“§-¾,É,È,é B  
fAf<ftf@ î•ñ,Ì [“x,É,©,©,í,ç,, A,O,<sup>a</sup>,Â,Ë,ËŠ@‘S,É“§-¾,È'l,Â, ,é B fI [fo [f€fC,Ì,½,ß,ÉŽg—  
—p,<sup>3</sup>,ê,é B

#### DDFXALPHACAPS\_OVERLAYALPHASURFACESNEG

fAf<ftf@ Ef`ffflf<,<sup>a</sup> AfAf<ftf@'l,ì' %oÁ,É,Â,ê,Ä“§-¾,É,È,é,±,Æ,ð\,· B  
fAf<ftf@ Ef`ffflf< Eff [f^,Ì [“x,Í,P A,Q A,S A, ,é,¢,Í,W,Â, ,é B  
fAf<ftf@ î•ñ,Ì [“x,É,©,©,í,ç,, A,O,<sup>a</sup>,Â,Ë,ËŠ@‘S,É•s“§-¾,È'l,Â, ,é B,±,Ìftf%ofo,ÍDDCAPS\_  
ALPHASURFACES,<sup>a</sup>fZfbfg,<sup>3</sup>,ê,½ ê ±,É,ÉÄ,èfZfbfg,·,é,±,Æ,<sup>a</sup>,Â,«,é B  
fI [fo [f€fC,Ì,½,ß,ÉŽg—p,<sup>3</sup>,ê,é B

#### dwPalCaps

fpf€fbfg”—Í,ð\,·ftf%ofo B

##### DDPCAPS\_1BIT

fCf“fffbfNfX,<sup>a</sup>PfRfbfg,Â, ,é,±,Æ,ð\,· B fJf%o [ Efe [fuf<,É2,Â,Ì €—Ú,<sup>a</sup>, ,é B

##### DDPCAPS\_2BIT

fCf“fffbfNfX,<sup>a</sup>QfRfbfg,Â, ,é,±,Æ,ð\,· B fJf%o [ Efe [fuf<,É4,Â,Ì €—Ú,<sup>a</sup>, ,é B

##### DDPCAPS\_4BIT

fCf“fffbfNfX,<sup>a</sup>SfRfbfg,Â, ,é,±,Æ,ð\,· B fJf%o [ Efe [fuf<,É16,Ì €—Ú,<sup>a</sup>, ,é B

##### DDPCAPS\_8BIT

fCf“fffbfNfX,<sup>a</sup>WfRfbfg,Â, ,é,±,Æ,ð\,· B fJf%o [ Efe [fuf<,É256,Ì €—Ú,<sup>a</sup>, ,é B

##### DDPCAPS\_8BITENTRIES

fCf“fffbfNfX,ð,WfRfbfg,ÌfJf%o [ EfCf“fffbfNfX,ÉŽw'è,·,é B,±  
,ÌftfB [f<fh,Í A,½,¾DDPCAPS\_1BIT A DDPCAPS\_2BIT A, ,é,¢,Í DDPCAPS\_4BIT”——  
Í,³Žg,í,è,éŽŽ,Ì,Y A,“,æ,Ñ—Ú•WfT [ftfFfX,<sup>a</sup>fsfNfZf< i bpp j—,É,WfRfbfg,Â, ,é ê ±,É—  
L€ø,Â, ,é B,»,è,¼,è,Ì F €—Ú,“,³,PfofCfG,Â, ,è Afuf fbfN“]‘— æfT [ftfFfX ã,Ì,W bpp  
fpf€fbfg,ÌfCf“fffbfNfX,Â, ,é B

##### DDPCAPS\_ALLOW256

,±,Ìfpf€fbfg,<sup>a</sup>256,Ì €—Ú,·,×,Ä,ð'è<,Â,«,é,±,Æ,ðŽ!,· B

##### DDPCAPS\_PRIMARYSURFACE

fpf€fbfg,<sup>a</sup>fvf%oCf}fŠ EfT [ftfFfX,ÉfAf^fbf`<sup>3</sup>,è,Ä,¢,é,±,Æ,ð\,· B fpf€fbfg,Ì X,Í A

DDPCAPS\_VSYNC ”—Í,İŽw’è AfTf| [fg,ª,È,¢,©,¬,è AffBfXfvfƎfC,É‘| À,É”½%of,³,ê,é B

**DDPCAPS\_PRIMARYSURFACELEFT**

fpfƎfbfg,ª ¶‘²fvf%oCf}fŠ Eft [ftFfX,ÉfAf^fbf`,³,ê,é,±,Æ,ð•\,· B fpfƎfbfg,İ•İ X,İ A  
DDPCAPS\_VSYNC ”—Í,İŽw’è AfTf| [fg,ª,È,¢,©,¬,è AffBfXfvfƎfC,É‘| À,É”½%of,³,ê,é B

**DDPCAPS\_VSYNC**

fpfƎfbfg,ªf,fjf^ [,İfŠftfƎfbfVf...,É“Šú,µ,Ä X V,Ä,«é,±,Æ,ð•\,· B

**dwSVCaps**

fXfefƎfI EfrfWf‡f“”—Í,ð•\,·ftf%oO B

**DDSVCAPS\_ENIGMA**

fGfjfOf} Efr [ffBf“fO,É,æ,èfXfefƎfI Efrf... [,ðŽÀƎ»,µ,Ä,¢,é,±,Æ,ð•\,· B

**DDSVCAPS\_FLICKER**

,Žü”gftfŠfbfJfŠf“fO,É,æ,èfXfefƎfI Efrf... [,ðŽÀƎ»,µ,Ä,¢,é,±,Æ,ð•\,· B

**DDSVCAPS\_REDBLUE**

Ö,Æ Ä,İftfBf<f^,ð ¶,Æ%oE,İŠá,É”z,µ,½3DŠá«¾,ÄfXfefƎfI Efrf... [,ðŽÀƎ»,µ,Ä,¢,é,±,Æ,ð•\,· B ,×,Ä,İ%œ‘œ(,İ F<óŠÖ),ð,±,İŽd’g,Y,É“K ‡,³,¹,È,,Ä,İ,È,ç,È,¢ B

**DDSVCAPS\_SPLIT**

•Š,,fXfNfŠ [f“,É,æ,èfXfefƎfI Efrf... [,ðŽÀƎ»,µ,Ä,¢,é,±,Æ,ð•\,· B

**dwAlphaBlitConstBitDepths**

DDBD\_2 ADDBD\_4,Ü,½,İ DDBD\_8 ifsfNfZf<^,É2frfbfg A4frfbfg , ,é,¢,İ8frfbfg,ðŽ‘,· j B

**dwAlphaBlitPixelBitDepths**

DDBD\_1 ADDBD\_2 ADDBD\_4,Ü,½,İ DDBD\_8 ifsfNfZf<^,É1frfbfg A2frfbfg A4frfbfg , ,é,¢,İ8frfbfg,ðŽ‘,· j B

**dwAlphaBlitSurfaceBitDepths**

DDBD\_1 ADDBD\_2 ADDBD\_4,Ü,½,İ DDBD\_8 ifsfNfZf<^,É1frfbfg A2frfbfg A4frfbfg , ,é,¢,İ8frfbfg,ðŽ‘,· j B

**dwAlphaOverlayConstBitDepths**

DDBD\_2 ADDBD\_4,Ü,½,İ DDBD\_8 ifsfNfZf<^,É2frfbfg A4frfbfg , ,é,¢,İ8frfbfg,ðŽ‘,· j B

**dwAlphaOverlayPixelBitDepths**

DDBD\_1 ADDBD\_2 ADDBD\_4,Ü,½,İ DDBD\_8 ifsfNfZf<^,É1frfbfg A2frfbfg A4frfbfg , ,é,¢,İ8frfbfg,ðŽ‘,· j B

**dwAlphaOverlaySurfaceBitDepths**

DDBD\_1 ADDBD\_2 ADDBD\_4,Ü,½,İ DDBD\_8 ifsfNfZf<^,É1frfbfg A2frfbfg A4frfbfg , ,é,¢,İ8frfbfg,ðŽ‘,· j B

**dwZBufferBitDepths**

DDBD\_8 ADDBD\_16 ADDBD\_24,Ü,½,İ DDBD\_32 ifsfNfZf<^,É1frfbfg A16frfbfg A24frfbfg , ,é,¢,İ32frfbfg,ðŽ‘,· j B

**dwVidMemTotal**

ffBfXfvfƎfC Ef f,fŠ,İ‘S‘İ,İ—Ê B

**dwVidMemFree**

<ó,«ffBfXfvfƎfC Ef f,fŠ,İ—Ê B

**dwMaxVisibleOverlays**

%oÄŽ< ó‘Ö,İfI [fo [fƎfC,İ Ä‘ä,İ ” B

**dwCurrVisibleOverlays**

%oÄŽ< ó‘Ö,İfI [fo [fƎfC,İƎ» Ý,İ ” B

**dwNumFourCCCodes**

FourCC fR [fh,İ ” B

**dwAlignBoundarySrc**

fuf fbfN“]‘—Ǝ³<éƎ’,İ Ä•W,İ’P’Ê B

**dwAlignSizeSrc**

fuf fbfN“]‘—Ė³«ėĖ`,ì‘â,«³ B  
**dwAlignBoundaryDest**  
 fuf fbfN“]‘— æ«ėĖ`,ì Ā•W,ì’P^Ê B  
**dwAlignSizeDest**  
 fuf fbfN“]‘— æ«ėĖ`,ì‘â,«³,ì’P^Ê B  
**dwAlignStrideAlign**  
 fXfgf%oCfh ®—ñ B  
**dwRops[DD\_ROP\_SPACE]**  
 f%oXf^ ^— ,ìfTf| [fg B  
**ddsCaps**  
 ^ê”Ê“I,Ê”\—Í,ðŽ,ì,· **DDSCAPS** \‘ċ‘ì B  
**dwMinOverlayStretch** and **dwMaxOverlayStretch**  
 1000”{³,ê,é Ā ¬ E Ā‘âĖÀ,ìfI [fo [fĖfCŠg‘âĖW ” B,½,Æ,,î Ā1.3=1300 B  
**dwMinLiveVideoStretch** and **dwMaxLiveVideoStretch**  
 1000”{³,ê,é Ā ¬ E Ā‘âĖÀ,ìf%oCfu EfrffIŠg‘âĖW ” B,½,Æ,,î Ā1.3=1300 B  
**dwMinHwCodecStretch** and **dwMaxHwCodecStretch**  
 1000”{³,ê,é Ā ¬ E Ā‘âĖÀ,ìfn [fhfEfFA EfR [ffbfNŠg‘âĖW ” B,½,Æ,,î Ā1.3=1300 B  
**dwReserved1, dwReserved2, dwReserved3**  
 «—^,ì,½,ß,Ê—\—ñ,³,ê,Ā,ċ,é B  
**dwSVBCaps**  
 fVfXfefĖ Ef f,šš |ffBfXfvfĖfC Ef f,ššfuf fbfN“]‘—,ìfhf%oCfo”\—Í B  
**dwSVBCKeyCaps**  
 fVfXfefĖ Ef f,šš |ffBfXfvfĖfC Ef f,ššfuf fbfN“]‘—,ìfhf%oCfofJf%o [ EfL [ĖÝŠ· « B  
**dwSVBFXCaps**  
 fVfXfefĖ Ef f,šš |ffBfXfvfĖfC Ef f,ššfuf fbfN“]‘—,ìfhf%oCfoFXĖÝŠ· « B  
**dwSVBRops[DD\_ROP\_SPACE]**  
 fVfXfefĖ Ef f,šš |ffBfXfvfĖfC Ef f,ššfuf fbfN“]‘—,ìf%oXf^ ^— fTf| [fg B  
**dwVSBCaps**  
 fffBfXfvfĖfC Ef f,šš |fVfXfefĖ Ef f,ššfuf fbfN“]‘—,ìfhf%oCfo”\—Í B  
**dwVSBCKeyCaps**  
 fffBfXfvfĖfC Ef f,šš |fVfXfefĖ Ef f,ššfuf fbfN“]‘—,ìfhf%oCfofJf%o [ EfL [ĖÝŠ· « B  
**dwSVBFXCaps**  
 fffBfXfvfĖfC Ef f,šš |fVfXfefĖ Ef f,ššfuf fbfN“]‘—,ìfhf%oCfoFXĖÝŠ· « B  
**dwSVBRops[DD\_ROP\_SPACE]**  
 fffBfXfvfĖfC Ef f,šš |fVfXfefĖ Ef f,ššfuf fbfN“]‘—,ìf%oXf^ ^— fTf| [fg B  
**dwSSBCaps**  
 fVfXfefĖ Ef f,šš |fVfXfefĖ Ef f,ššfuf fbfN“]‘—,ìfhf%oCfo”\—Í B  
**dwSSBCKeyCaps**  
 fVfXfefĖ Ef f,šš |fVfXfefĖ Ef f,ššfuf fbfN“]‘—,ìfhf%oCfofJf%o [ EfL [ĖÝŠ· « B  
**wSSBCFXCaps**  
 fVfXfefĖ Ef f,šš |fVfXfefĖ Ef f,ššfuf fbfN“]‘—,ìfhf%oCfoFXĖÝŠ· « B  
**dwSSBRops[DD\_ROP\_SPACE]**  
 fVfXfefĖ Ef f,šš |fVfXfefĖ Ef f,ššfuf fbfN“]‘—,ìf%oXf^ ^— fTf| [fg B  
**dwReserved4, dwReserved5, dwReserved6**  
 «—^,ì,½,ß,Ê—\—ñ,³,ê,Ā,ċ,é B

## DDCOLORKEY

```
typedef struct _DDCOLORKEY{
    DWORD dwColorSpaceLowValue;
    DWORD dwColorSpaceHighValue;
} DDCOLORKEY, FAR* LPDDCOLORKEY;
```

*fuf fbfN“]‘—Ē³fJf% [ EfL [,à,μ,,Ífuf fbfN“]‘— æfJf% [ EfL [,Æ,È,é F<óŠŌ,ðŽw’è,.,é B  
,à,μ ãĒĀ,Æ%°ĒĀ,Ì”ÍÍl,“““,¶,Ā, ,é,È,ç AfJf% [ EfL [,Æ,μ,ĀŽw’è,³,ê,é B,±,Ì \“ċ‘Ĭ,Ĭ  
IDirectDrawSurface2::GetColorKey,“,æ,Ń IDirectDrawSurface2::SetColorKey f\fbfh,ĀŽg,í,ê,é B*

### dwColorSpaceLowValue

*fJf% [ EfL [,Æ,μ,Ā—p,ç,ç,ê,é F”ÍÍ,Ì%°ĒĀ’l B*

### dwColorSpaceHighValue

*fJf% [ EfL [,Æ,μ,Ā—p,ç,ç,ê,é F”ÍÍ,Ì ãĒĀ’l B*

## DDOVERLAYFX

```
typedef struct _DDOVERLAYFX{
    DWORD dwSize;
    DWORD dwAlphaEdgeBlendBitDepth;
    DWORD dwAlphaEdgeBlend;
    DWORD dwReserved;
    DWORD dwAlphaDestConstBitDepth;
union
{
    DWORD dwAlphaDestConst;
    LPDIRECTDRAWSURFACE lpDDSAAlphaDest;
};
    DWORD dwAlphaSrcConstBitDepth;
union
{
    DWORD dwAlphaSrcConst;
    LPDIRECTDRAWSURFACE lpDDSAAlphaSrc;
};
    DDCOLORKEY dckDestColorkey;
    DDCOLORKEY dckSrcColorkey;

    DWORD dwDDFX;
    DWORD dwFlags;
} DDOVERLAYFX, FAR *LPDDOVERLAYFX;
```

**IDirectDrawSurface2::UpdateOverlay** *f\bfh,É“n,³,ê,éI [fofCfC îñ B*

**dwSize**

*‘ç‘ì,ì‘â,«,³ B,±,ìf f“fo,í ‘ç‘ì,ªŽg,í,ê,é‘O,É‘l,ª Ý’è,³,ê,È,¯,ê,î,È,ç,È,ç B*

**dwAlphaEdgeBlendBitDepth**

*fAf<ftf@ EfGfbfW EfufEf“fhEW ”,ðŽw’è,·,é,½,ß,ÉŽg—p,³,ê,érfbfg [“x B*

**dwAlphaEdgeBlend**

*fAf<ftf@ EfGfbfW EfufEf“fh,ìfAf<ftf@,Æ,µ,ÄŽg,í,ê,é’è ” B*

**dwReserved**

*«—,ìŽg—p,ì,½,ß,É—\ñ,³,ê,Ä,ç,é B*

**dwAlphaDestConstBitDepth**

*fuf fbfN“]‘— æ,ìfAf<ftf@’è ”,ðŽw’è,·,é,½,ß,ÉŽg—p,³,ê,érfbfg [“x B*

**dwAlphaDestConst**

*fuf fbfN“]‘— æ,ìfAf<ftf@ Ef`ffflf<,Æ,µ,ÄŽg,í,ê,é’è ” B*

**lpDDSAAlphaDest**

*fuf fbfN“]‘— æ,ìfAf<ftf@ Ef`ffflf<,Æ,µ,ÄŽg,í,ê,éT [ftfFfX,ìfAfhfEfX B*

**dwAlphaSrcConstBitDepth**

*fuf fbfN“]‘—Æ³,ìfAf<ftf@’è ”,ðŽw’è,·,é,ì,ÉŽg—p,³,ê,érfbfg [“x B*

**dwAlphaSrcConst**

*fuf fbfN“]‘—Æ³,ìfAf<ftf@ Ef`ffflf<,Æ,µ,ÄŽg,í,ê,é’è ” B*

**lpDDSAAlphaSrc**

*fuf fbfN“]‘—Æ³,ìfAf<ftf@ Ef`ffflf<,Æ,µ,ÄŽg,í,ê,éT [ftfFfX,ìf|fCf“f^ B*

**dckDestColorkey**

*—D æ,·,éfuf fbfN“]‘— æfJf%o [ EfL [ B*

**dckSrcColorkey**

*—D æ,·,éfuf fbfN“]‘—Æ³fJf%o [ EfL [ B*

**dwDDFX**

*fI [fo [fCfC FXftf%ofo B*

**DDOVERFX\_ARITHSTRETCHY**

*,à,µŠg‘â,·,é,È,ç A,™Ž²,É%o^,Á,Ä%o%ŽZŠg‘â,ðŽg—p,·,é B*

**DDOVERFX\_MIRRORLEFTRIGHT**

¶%oE”½“],đ s,□ B

DDOVERFX\_MIRRORUPDOWN

ã%o°”½“],đ s,□ B

dwFlags

,±,İf f“fo,ÍE» ÝŽg,í,ê,Ä,¢,È,¢ B,O,ªfZfbfg,³,ê,È,,Ä,Í,È,ç,È,¢ B

## DDPIXELFORMAT

```
typedef struct _DDPIXELFORMAT{
    DWORD dwSize;
    DWORD dwFlags;
    DWORD dwFourCC;
union
{
    DWORD dwRGBBitCount;
    DWORD dwYUVBitCount;
    DWORD dwZBufferBitDepth;
    DWORD dwAlphaBitDepth;
};
union
{
    DWORD dwRBitMask;
    DWORD dwYBitMask;
};
union
{
    DWORD dwGBitMask;
    DWORD dwUBitMask;
};
union
{
    DWORD dwBBitMask;
    DWORD dwVBitMask;
};
union
{
    DWORD dwRGBAlphaBitMask;

    DWORD dwYUVAAlphaBitMask;
};
} DDPIXELFORMAT, FAR* LPDDPIXELFORMAT;
```

,±  
,İ \‘İ,İ**IDirectDrawSurface2::GetPixelFormat** f\fbfh,İ,½,ß,É ADirectDrawSurfaceIfufWfFfNfg,İfsfNfZf< Eftf  
H [f}fbfg,ðL q,.,é,à,İ,Ä, ,é B

**dwSize**  
 \‘İ,İ,à,«,³ B ,±,İf f“fo,İ \‘İ,ªŽg,í,ê,é‘O,É‘l,ª Ý’è,³,ê,È,¯,ê,İ,È,ç,È,¢ B

**dwFlags**  
 fIfvfVf‡f“ §Eäft%oO B  
DDPF\_ALPHA  
 fsfNfZf< EftfH [f}fbfg,İfAf<ftf@ ê—pfT [ftfFfX,ðL q,µ,Ä,¢,é B

**DDPF\_ALPHAPIXELS**  
 fT [ftfFfX,İfAf<ftf@\_Ef`ffflf< îñ,ðŽ ,Ä,½fsfNfZf< EftfH [f}fbfg,Ä, ,é B

**DDPF\_COMPRESSED**  
 fT [ftfFfX,İŽw’è,³,ê,½ftfH [f}fbfg,ÄfsfNfZf< Eftf [f^,ðŽó,¯“ü,ê A ‘,«,±,Ý ^—  
’†,Éff [f^³ k,.,é B

**DDPF\_FOURCC**  
 FourCC fR [fh,ª—LÆø,Ä, ,é B

**DDPF\_PALETTEINDEXED1**

**DDPF\_PALETTEINDEXED2**

**DDPF\_PALETTEINDEXED4**

**DDPF\_PALETTEINDEXED8**

fT [ftfFfX,İ,Pfrrfbfg A,Qfrrfbfg A,Sfrrfbfg, ,é,¢,İ,Wfrrfbfg,ÄfCf“fffbfNfX,³,ê,Ä,¢,é B

**DDPF\_PALETTEINDEXEDTO8**

$fT \left[ ftfFX, \hat{I}, Pf rfbfg \ A, Qf rfbfg, , \acute{e}, \text{¢}, \hat{I} \right. \\ \left. , Sf rfbfg, \hat{I} \ F, \delta, Wf rfbfg \ Efpf \text{¢}fbfg, \acute{E}fCf \text{“}ffbfNfX, \mu, \hat{A}, \text{¢}, \acute{e} \ B \right.$

**DDPF\_RGB**

$fsfNfZf< \ EftfH \ [f]fbfg \ \text{‘}\text{¢}\hat{I}, \hat{A}, \hat{I}RGB \ ff \ [f^{\wedge}, \hat{I} \text{—}L\text{¢}\emptyset, \hat{A}, , \acute{e} \ B$

**DDPF\_RGBTOYUV**

$fT \left[ ftfFX, \hat{I}RGB \ ff \ [f^{\wedge}, \delta \acute{Z} \acute{o}, \text{“}\ddot{u}, \hat{e}, \hat{A} \ A, \rangle, \mu, \hat{A} \ \text{‘}, \langle, \pm, \acute{Y} \ \hat{\text{—}} \ , \hat{I}\acute{S}\hat{O}, \acute{E}YUV \right. \\ ff \ [f^{\wedge}, \hat{E} \cdot \hat{I}\acute{S} \cdot, \cdot, \acute{e} \ B \ \text{‘}, \langle, \pm, \acute{Y}, \hat{I}ff \ [f^{\wedge}, \hat{I}ftfH \ [f]fbfg, \hat{I}fsfNfZf< \ EftfH \ [f] \\ fbf g \ \text{‘}\text{¢}\hat{I}, \hat{E}\acute{S}\ddot{U}, \ddot{U}, \hat{e}, \acute{e} \ B \ DDPF\_RGB \ ftf\%fO, \text{¢}, \grave{a}, \acute{E}fZfbfg, ^3, \hat{e}, \grave{E}, \text{“}, \hat{e}, \hat{I}, \grave{E}, \text{¢}, \grave{E}, \text{¢} \ B$

**DDPF\_YUV**

$fsfNfZf< \ EftfH \ [f]fbfg \ \text{‘}\text{¢}\hat{I}, \hat{A}, \hat{I}YUV \ ff \ [f^{\wedge}, \hat{I} \text{—}L\text{¢}\emptyset, \hat{A}, , \acute{e} \ B$

**DDPF\_ZBUFFER**

$Zfofbftf@ \ \hat{e} \text{—}pfT \left[ ftfFX, \hat{I}fsfNfZf< \ EftfH \ [f]fbfg, \hat{A} \text{<}L \ q, ^3, \hat{e}, \acute{e} \ B \right.$

**dwFourCC**

$FourCC \ fR \ [fh \ B$

**wRGBBitCount**

$fsfNfZf<\text{“}, \hat{I}RGB \ frfbfg \ i4, 8, 16, 24, , \acute{e}, \text{¢}, \hat{I}32 \ j \ B$

**dwYUVBitCount**

$fsfNfZf<\text{“}, \hat{I}YUV \ frfbfg \ iDDBD\_4 \ A \ DDBD\_8 \ A \ DDBD\_16 \ A \ DDBD\_24 \ A, , \acute{e}, \text{¢}, \hat{I}DDBD\_32 \ j \ B$

**dwZBufferBitDepth**

$Zfofbftf@ \ Efrfbfg \ [ \text{“}x \ i8, 16, 24, , , \acute{e}, \text{¢}, \hat{I}32 \ j \ B$

**dwAlphaBitDepth**

$fAf<ftf@ \ Ef^fffflf< \ Efrfbfg \ [ \text{“}x \ iDDBD\_1 \ A \ DDBD\_2 \ A \ DDBD\_4 \ A, , \acute{e}, \text{¢}, \hat{I}DDBD\_8 \ j \ B$

**dwRBitMask**

$\hat{O}frfbfg, \hat{I}f\}fXfN \ B$

**dwYBitMask**

$,xf rfbfg, \hat{I}f\}fXfN \ B$

**dwGBitMask**

$\text{—}\hat{I}frfbfg, \hat{I}f\}fXfN \ B$

**dwUBitMask**

$,tf rfbfg, \hat{I}f\}fXfN \ B$

**dwBBitMask**

$\hat{A}frfbfg, \hat{I}f\}fXfN \ B$

**dwVBitMask**

$,uf rfbfg, \hat{I}f\}fXfN \ B$

**dwRGBAlphaBitMask**

$fAf<ftf@ \ Ef^fffflf<, \hat{I}f\}fXfN \ B$

**dwYUVAAlphaBitMask**

$fAf<ftf@ \ Ef^fffflf<, \hat{I}f\}fXfN \ B$



## DDSCAPS

```
typedef struct _DDSCAPS{
    DWORD dwCaps;
} DDSCAPS, FAR* LPDDSCAPS;
```

DirectDrawSurface fIfufWfFfNfg, l" — Í, ð'è<, ·, é B , ±, l \ 'ç' l, l DirectDraw fIfufWfFfNfg, l" — Í, ð<L q, ·, é, ½, ß, ÉŽg, í, è, é DDCAPS \ 'ç' l, l ê•", Å, , é B

## dwCaps

fT [ftfFfX, l" — Í, ð<, · B `È%° , lftf%oO, l, ð, ç, Ð, Æ, Å, Ü, ½, l, , é, ç, l•i " , l'® «, ðŽ , Å B  
DDSCAPS\_3D  
 , ±, è, l%° °ÊEÝŠ· «, l, ½, ß, ÉfTf| [fg, ³, è, Å, ç, é, ª AfAfvfŠfP [fVf±f“, Í'ã, í, è, É A  
DDSCAPS\_3DDEVICE ftf%oO, ðŽg, ð, ×, «, Å, , é B

## DDSCAPS\_3DDEVICE

, ±, l fT [ftfFfX, ª, R, c\«» — p, É — ~ — p%Å" , È, ±, Æ, ð<, · B  
fAfvfŠfP [fVf±f“, lftfofCfX, ª“K Ø, Èfq [fv, ©, çŠ„, è“—  
 , Å, ç, è, ½, flftfXfNfŠ [f“ E fT [ftfFfX, ðŽ , Å, Å, ç, é A“Å'è, lfq [fv, l, Ý, ð\«», ·, é, ±  
 , Æ, ª, Å, «, é, ±, Æ, ð•Ü Ø, ·, é, ½, ß, È A, ±, lftf%oO, ðŽg — p, ·, é, ±, Æ, ª, Å, «, é B , à, µ, ±  
 , lftf%oO, ªfq [fv, l, ½, ß, ÉfZfbfg, ³, è, Å, ç, é, È, ç AfT [ftfFfX, l, » , lfq [fv, ©, çŠ„, è“— , Å, ç, è, È, ç B

## DDSCAPS\_ALLOCONLOAD

fT [ftfFfX, ª IDirect3DTexture::Load f f\fbfh, È, æ, Å, Äf [fh, ³, è, é, Ü, Å AfT [ftfFfX, Éf f, f  
Š, ðŠ„, è“— , Å, È, ç, Æ, ç, ðŽw'è B

## DDSCAPS\_ALPHA

, ±, l fT [ftfFfX, ª fAf<ftf@ îñ, ðŠÜ, ñ, Å, ç, é, ±, Æ, ð<, · B fsfNfZf< EftfH [f]fbfg, l, ±  
 , l fT [ftfFfX, ª, ½, ¾ fAf<ftf@ îñ, , é, ç, lfsfNfZf< Fff [f^ i RGBA, , é, ç, l YUVA, l, æ, ð  
 , È j, Æ ¬ ±, ³, è, ½ fAf<ftf@ îñ, ¾, ¯, ðŠÜ, ñ, Å, ç, é, ©, Ç, ð, ©«”è, ·, é, ½, ß, ÉŽæ“¾, ³, è, È, -  
 , Å, l, È, ç, È, ç B

## DDSCAPS\_BACKBUFFER

, ±, l fT [ftfFfX, ª fT [ftfFfX EftfŠfbfsf“fo \ 'ç' l, l fofbfN Efofbftf@, Å, , é, ±, Æ, ð<, · B  
 ^è”È, È, ±, lftf%oO, l DDSCAPS\_FLIP ftf%oO, ªŽg—  
 p, ³, è, ½ IDirectDraw2::CreateSurface f f\fbfh, È, æ, Å, Ä Ý'è, ³, è, é BDDSCAPS\_FRONTBUFFERf  
 T [ftfFfX, æ, è'¼ Ü æ s, ·, é fT [ftfFfX, ¾, ¯, ª, ±, lftf%oO, ðŽ , Å, Å, ç, é B '¼, l fT [ftfFfX, l  
 DDSCAPS\_FLIP ADDSCAPS\_BACKBUFFER ftf%oO, l'¶ Ý A, ·, æ, Ñ  
 DDSCAPS\_FRONTBUFFER, lÊ±”@, È, æ, è fofbfN Efofbftf@, Æ, µ, Å”F'm, ³, è, é B , ±, l" — Í, ª  
 IDirectDraw2::CreateSurface f f\fbfh, È'— , ç, è, é, Æ A“Æ—  
 §Æ^, l fofbfN Efofbftf@, ª î ¬, ³, è, é B , ±, l f f\fbfh, ªÆÄ, Ñ o, ³, è, ½Æã A, ±  
 , l fT [ftfFfX, l AfT [ftfFfX EftfŠfbfsf“fo \ 'ç' l, ð«` ¬, ·, é, ½, ß, Éftf f“fg Efofbftf@ A, à  
 , ð, Ð, Æ, Å, l fofbfN Efofbftf@ A, , é, ç, l — ¼•û, Æ, à, È fAf^fbf` , ·, é, ±, Æ, ª, Å, «, é B Ü ×, l  
 IDirectDrawSurface2::AddAttachedSurface, ðŽQ Æ, ·, é, ±, Æ B DirectDraw  
 , lftfŠfbfsf“fo \ 'ç' l, Å”C^Ö, l " , l fT [ftfFfX, ðfTf| [fg, ·, é B

## DDSCAPS\_COMPLEX

·i ±fT [ftfFfX, ª<L q, ³, è, Å, ç, é, ±, Æ, ð<, · B  
 ·i ±fT [ftfFfX, l, P`È ã, l fT [ftfFfX, l î ¬, ð, à, ½, ç, · B  
 'Ç%ÅfT [ftfFfX, l f< [fg E fT [ftfFfX, É fAf^fbf` , ³, è, é B ·i ± \ 'ç' l, l, ½, ¾ f< [fg, ð”jŠü, ·, é, ±  
 , Æ, È, æ, Å, Ä”jŠü, ·, é, ±, Æ, ª, Å, «, é B

## DDSCAPS\_FLIP

, ±, l fT [ftfFfX, ª fT [ftfFfX ftfŠfbfsf“fo \ 'ç' l, l ê•", Å, , é, ±, Æ, ð<, · B , ±, l" — Í, ª  
 IDirectDraw2::CreateSurface f f\fbfh, È“n, ³, è, é, Æ, « A, Ð, Æ, Å, lftf f“fg Efofbftf@, ·, æ, Ñ, Ð,  
 Æ, Å`È ã, l fofbfN Efofbftf@, ª î ¬, ³, è, é B DirectDraw  
 , lftf f“fg Efofbftf@, l DDSCAPS\_FRONTBUFFER ffbfg, ·, æ, Ñ ftf f“fg Efofbftf@, È—  
 × Ü, µ, Å, ç, é fT [ftfFfX, l DDSCAPS\_BACKBUFFER ffbfg, ðfZfbfg, ·, é B , ±  
 , lftf%oO, ðŽw'è, ·, é è ± ADDSURFACEDESC \ 'ç' l, l dwBackBufferCount f f“fo, l , È, -  
 , Æ, à, P, ÉfZfbfg, µ, È, ¯, è, l, ç, ¯, È, ç B IDirectDraw2::CreateSurface f f\fbfh, ðŽg — p, µ, Å  
 '½ " , l fT [ftfFfX, ð î, èŽŽ A í, È DDSCAPS\_COMPLEX ftf%oO, ðfZfbfg, µ, È, , Å, l, È, ç, È, ç B

## DDSCAPS\_FRONTBUFFER

, ±, l fT [ftfFfX, ª fT [ftfFfX EftfŠfbfsf“fo \ 'ç' l, lftf f“fg Efofbftf@, Å, , é, ±, Æ, ð<, · B , ±  
 , lftf%oO, l`è”È, È DDSCAPS\_FLIP" — Í, ª fZfbfg, ³, è, ½, Æ, «

IDirectDraw2::CreateSurface f\fbfh,É,æ,Á,ÄfZfbfg,<sup>3</sup>,é,é B  
IDirectDraw2::CreateSurface f\fbfh,ðŽg—p,μ,½ ê ‡,Í“Æ—  
§E^ftf f“fg Efofbftf@,<sup>a</sup> i,ç,ê,é B ,±,ìfT [ftfFfX,Í  
DDSCAPS\_FLIPftf%o,ðŽ ,½,È,¢ BftfŠfbfsf“fO \“¢Ì,ðE` ¬,·,é,½,ß,É AIDirectDrawSurfa  
ce2::AddAttachedSurface ,ðŽg—p,·,é,±,Æ,É,æ,Á,Ä“¼,ìfofbfN Efofbftf@,ÉfAf^fbf` ,Ä,« ,é B

#### DDSCAPS\_HWCODEC

,±,ìfT [ftfFfX,<sup>a</sup>fn [fhEfFfA,É,æ,Á,Ä<sup>3</sup> k%ð æ,<sup>3</sup>,é,½fXfgfŠ [f€,ðŽ ,Ä,±,Æ,<sup>a</sup>,Ä,« ,é,±  
,Æ,ð·,· B

#### DDSCAPS\_LIVEVIDEO

,±,ìfT [ftfFfX,<sup>a</sup>f%oCfu Efrfffi,ÌŽó,¬Žæ,è,%oÄ”\,Ä ,é,±,Æ,ð·,· B

#### DDSCAPS\_MIPMAP

,±,ìfT [ftfFfX,<sup>a</sup>PfCefxf<,ìf~fbfvf}fbfv,Ä ,é,±,Æ,ð·,· B ,±,ìfT [ftfFfX,ìf~fbfvf}  
fbfv,ðE` ¬,·,é,½,ß,É“¼,ÌDDSCAPS\_MIPMAP fT [ftfFfX,ÉfAf^fbf`<sup>3</sup>,é,é B,±  
,é,Í A“½ ”,ìfT [ftfFfX,ð i,èIDirectDrawSurface2::AddAttachedSurface f\fbfh,ðŽg—p,·,é,±  
,Æ,Ä–¾Ž“Í,É s,í,ê,é,© A ,é,¢,Í IDirectDraw2::CreateSurface f\fbfh,ðŽg—p,·,é,±,Æ,Ä^Ä–  
Ü“Í,É s,í,ê,é B ,à,μ,±,ìftf%o,ðfZfbfg,·,é,È,¢ A DDSCAPS\_TEXTURE,àfZfbfg,μ,È,-  
,Ä,Í,È,¢,È,¢ B

#### DDSCAPS\_MODEX

,±,ìfT [ftfFfX,<sup>a</sup>320’200 ,é,¢,Í 320’240,ìf, [fhX10 (f, [fhX) fT [ftfFfX,Ä ,é,±,Æ,ð·,· B

#### DDSCAPS\_OFFSCREENPLAIN

,±  
,ìfT [ftfFfX,<sup>a</sup>fi [fo [fCfC AfefNfXf`ff AZfofbftf@ Aftf f“fg Efofbftf@ AfofbfN  
Efofbftf@ A ,é,¢,ÍfAf<ftf@ Eft [ftfFfX,ì,Ç,é,Ä,à,È,¢ AfXfNfŠ [f“ŠO,ìfT [ftfFfX,Ä ,  
é,±,Æ,ð·,· BfvfC [f“ Eft [ftfFfX,ðŽ–È,·,é,½,ß,ÉŽg,í,ê,é B

#### DDSCAPS\_OVERLAY

,±,ìfT [ftfFfX,<sup>a</sup>fi [fo [fCfC,Ä ,é,±,Æ,ð·,· B E» Ý Ä %  
,ìfT [ftfFfX,Éfi [fo [fCfC,<sup>3</sup>,é,Ä,¢,é,©,Ç,□,©,É,æ,Ä,Ä A%oÄŽ<,Ä ,é,© A,»,□,Ä,È,¢  
,©,^E^Ü,é B DDSCAPS\_VISIBLE ,Í Aft [ftfFfX,^E» Ýfi [fo [fCfC,<sup>3</sup>,é,Ä,¢,é,©,Ç,□  
,©”»f,·,é,½,ß,ÉŽg,□,±,Æ,<sup>a</sup>,Ä,« ,é B

#### DDSCAPS\_OWNDC

,±,ìfT [ftfFfX,<sup>a</sup>·ŽžŠÖ,É,í,½,èfffoCfX Efrf“fefLfXfg i,c,b j,Æ,ìŠÖ~A,ðŽ ,Ä,Ä ,è,□,±  
,Æ,ð·,· B

#### DDSCAPS\_PALETTE

,±,ìfffoCfX Efhf%oCfo,É,æ,è~ó“Í,ÈDirectDrawPalette flufWfFfNfg,ð ì ¬,μ,Ä,±  
,ìfT [ftfFfX,ÉfAf^fbf` ,Ä,« ,é,±,Æ,ð·,· B

#### DDSCAPS\_PRIMARYSURFACE

,±,ìfT [ftfFfX,<sup>a</sup>fv%oCf}fŠ Eft [ftfFfX,Ä ,é,±,Æ,ð·,· B ,±,ìfT [ftfFfX,%oÄŽ<,Ä ,é,±  
,Æ,ðÖ–i,·,é B

#### DDSCAPS\_PRIMARYSURFACELEFT

,±,ìfT [ftfFfX,<sup>a</sup> ¶–Ú—p,ìfv%oCf}fŠ Eft [ftfFfX,Ä ,é,±,Æ,ð·,· B ,±  
,ìfT [ftfFfX,Í† [fU,ì ¶–Ú,ÉE©,·,é,à,ì,ì“à—e,ð·,· B ,±,ìfT [ftfFfX,<sup>a</sup> i,ç,ê,éŽž A  
DDSCAPS\_PRIMARYSURFACEftf%o,ðŽ ,Ä,Ä,¢,éft [ftfFfX,Í A^Ä–Ü,ì,□,¿,É%oE–Ú—  
p,ìfv%oCf}fŠ Eft [ftfFfX,Æ%oðŽß,<sup>3</sup>,é,é B

#### DDSCAPS\_SYSTEMMEMORY

,±,ìfT [ftfFfX Ef f, fŠ,<sup>a</sup>fvfXfef€ Ef f, fŠ,ÉŠ,,,è“–,Ä,ç,é,é,±,Æ,ð·,· B

#### DDSCAPS\_TEXTURE

,±,ìfT [ftfFfX,ð,R,cfefNfXf`ff,Æ,μ,Ä—p,é,±,Æ,<sup>a</sup>,Ä,« ,é,±,Æ,ð·,· B  
,½,¾,μ A^K,,μ,à,R,cfefNfXf`ff,Æ,μ,ÄŽg,í,È,,Ä,Í,¢,¬,È,¢,Æ,¢,□,±,Æ,Ä,Í,È,¢ B

#### DDSCAPS\_VIDEOMEMORY

,±,ìfT [ftfFfX,<sup>a</sup>ffBfXfvfCfC Ef f, fŠ,É“¶ Ý,·,é,±,Æ,ð·,· B

#### DDSCAPS\_VISIBLE

,±,ìfT [ftfFfX,É‘Í,μ,Ä s,í,ê,é·Í X,<sup>a</sup>“ Ä,É%oæ–È,É”½%o,<sup>3</sup>,é,é,±,Æ,ð·,· B,Ä,È,Éfvf%oCf}  
fŠ Eft [ftfFfX,ÉfZfbfg,<sup>3</sup>,é,é B

#### DDSCAPS\_WRITEONLY

*f*T [ftfFfX,<sup>a</sup> ‘,«,<sup>±</sup>,Ý ê—p,Æ,È,é,<sup>±</sup>,Æ,ð•\,· B  
*f*T [ftfFfX,©,ç,Ì“Ç,Ý o,μfAfNfZfX,<sup>a</sup>~ê”Ê•ÛŒì i,f,o j—áŠO,ð ¶ ¬,·,é%oÂ”\ «,à, ,é B,<sup>±</sup>  
,ÌfT [ftfFfX,©,ç,Ì“Ç,Ý o,μŒç%oÊ,Ì“à—e,Í•Û Ø,<sup>3</sup>,ê,È,¢ B

#### DDSCAPS\_ZBUFFER

,<sup>±</sup>,ÌfT [ftfFfX,<sup>a</sup>Zfofbftf@,Â, ,é,<sup>±</sup>,Æ,ð•\,· B Zfofbftf@,Í•Ž',Â,«È,¢ î•ñ,ðŠÛ,ñ,Â,¢  
,é BfsfNfZfç,Ì%oA—Ê ÁçŽ“™,É—~—p,<sup>3</sup>,ê,éfrfbfg [“x î•ñ,ðŠÛ,ñ,Â,¢,é B

## DDSURFACEDESC

```
typedef struct _DDSURFACEDESC{
    DWORD dwSize;
    DWORD dwFlags;
    DWORD dwHeight;
    DWORD dwWidth;
    LONG lPitch;
    DWORD dwBackBufferCount;
    union
    {
        DWORD dwMipMapCount;
        DWORD dwZBufferBitDepth;
        DWORD dwRefreshRate;
    };

    DWORD dwAlphaBitDepth;
    DWORD dwReserved;
    LPVOID lpSurface;
    DDCOLORKEY ddckCKDestOverlay;
    DDCOLORKEY ddckCKDestBlt;

    DDCOLORKEY ddckCKSrcOverlay;
    DDCOLORKEY ddckCKSrcBlt;
    DDPIXELFORMAT ddpfPixelFormat;
    DDSCAPS ddsCaps;
} DDSURFACEDESC, FAR* LPDDSURFACEDESC;
```

*fT [ftFfX,ð ì ¬,;éffXfNfŠfvf^,ð•\,· B ,±,Ì \‘‘İ,İDirectDraw2::CreateSurfacef f\fbfh,É“n,³,ê,é B  
“K Ø,Èf f“fo,İ,»,ê,¼,ê,İf^fCfv,İfT [ftFfX,É,æ,è“Ü,È,é B*

### dwSize

*\‘‘İ,İ,â,«,³ B ,±,İf f“fo,İ \‘‘İ,ªŽg,í,ê,é‘O,É‘l,ª Ý’è,³,ê,È,,Ä,İ,È,Ç,È,Ç B*

### dwFlags

*fİfvfVf±f“ §Çäftf%o B ^È%°,İftf%ofo,İ,□,¿,Đ,Æ,Â,Ü,½,İ•i ”,İ‘® «,ðŽ ,Â B \‘‘İ,İ,Ç,İf f“fo,ª—  
LÇø,È,İ,©Žw’è,·,é B*

### DDSD\_ALL

*“ü—İ,³,ê,½,·,×,Ä,İf f“fo,ª—LÇø,Ä, ,é,±,Æ,ð•\,· B*

### DDSD\_ALPHABITDEPTH

*dwAlphaBitDepth f f“fo,ª—LÇø,Ä, ,é,±,Æ,ð•\,· B*

### DDSD\_BACKBUFFERCOUNT

*dwBackBufferCount f f“fo,ª—LÇø,Ä, ,é,±,Æ,ð•\,· B*

### DDSD\_CAPS

*ddsCaps f f“fo,ª—LÇø,Ä, ,é,±,Æ,ð•\,· B*

### DDSD\_CKDESTBLT

*ddckCKDestBlt f f“fo,ª—LÇø,Ä, ,é,±,Æ,ð•\,· B*

### DDSD\_CKDESTOVERLAY

*ddckCKDestOverlay f f“fo,ª—LÇø,Ä, ,é,±,Æ,ð•\,· B*

### DDSD\_CKSRCLBLT

*ddckCKSrcBlt f f“fo,ª—LÇø,Ä, ,é,±,Æ,ð•\,· B*

### DDSD\_CKSRCOVERLAY

*ddckCKSrcOverlay f f“fo,ª—LÇø,Ä, ,é,±,Æ,ð•\,· B*

### DDSD\_HEIGHT

*dwHeight f f“fo,ª—LÇø,Ä, ,é,±,Æ,ð•\,· B*

### DDSD\_MIPMAPCOUNT

*dwMipMapCount f f“fo,ª—LÇø,Ä, ,é,±,Æ,ð•\,· B*

**IPitch**  $f$   $f^{\circ} f_0, ^a\text{—L}\mathbb{E}\emptyset, \mathring{\text{A}}, ,\acute{e}, \pm, \mathbb{E}, \mathring{\text{d}}\bullet\backslash, \cdot$  B

**ddpfPixelFormat** *f* *f*“f0,<sup>a</sup>—LÆø,Å, ,é,±,Æ,ð\.,· B

**dwRefreshRate**  $f$   $f_0, a, L, \epsilon, \pm, \Delta, \delta, \lambda, \cdot, B$

**dwWidth** *f* *f*“*f*0,<sup>a</sup>—LŒø,Å, ,é,±,Æ,đ•\,· B

**dwZBufferBitDepth** f f“f0,a—LÆø,Å, ,é,±,Æ,đ•\,· B

$fT \quad [ftfFfX, \dot{t} \quad , ,^3 \quad B$

“ü—ÍfT [ftfFfX,ì• B

ŽŸ, Ìf%ofCf“ŠJŽn,Ü,Å,Ì«—£ i•Ô'l,Ì,Ý j ifsfbf` j B

f of b f N E f of b f t f @ , i " B

$$\underline{f \sim f b f v f} \} f b f v f \in f x f \langle, \dot{\iota} \quad " \quad B$$

Zfobftf@,ì ["x B

$$f\check{S}t f\mathbb{E}f b f V f \ldots \neg^{\circ} x \text{ iff } f B f X f v f \mathbb{E} f C \ E f, \ [f h,^a L \ q,^3,\hat{e},\acute{e}\check{Z}\check{Z}\check{Z}g - p,^3,\hat{e},\acute{e} \ j \ B$$

$fAf\langle ftf@ \quad Efofbftf@, \dot{\imath} \quad [“x \quad B$

—\-ñ,³,ê,Ä,¢,é B

ŠÖ~A,Ã,-,ç,ê,½fT [ftfFfX Ef f,fŠ,ìfAfhfÆfX B

$$fI \ [fo \ [f\mathbb{C}fC \ \mathfrak{x},\acute{E}\check{Z}g\text{---}p,\cdot,\acute{e}fJf\%_{\circ} \ [ \ EfL \ [ \ B$$

fuf fbfN“]— æ,ÉŽg—p,·,éfJf%o [ EfL [ B

$$fI \ [f_o \ [f\mathbb{C}f\mathbb{C}\mathbb{C}^3,\acute{E}\check{Z}g\text{---}p,\cdot,\acute{e}fJf\%_o \ [ \ EfL \ [ \ B$$
$$fuf \quad fbfN^{\prime\prime}]^{\prime}-\mathbb{E}^3,\acute{E}\check{Z}g-p,\cdot,\acute{e}fJf\%_0 \quad [ \quad EfL \quad [ \quad B$$
$$fT \quad [ftfFfX, \grave{I}fsfNfZf\langle \quad EftfH \quad [f\}fbfg\langle L \quad q \quad B$$

DirectDraw fT [ftfFfX"\"—Í B

•Ô¹

fGf% [ ,Í•% ,Ì¹,É,æ,Á,Ä·\,³,ê A‘g,Ý ‡,í,³,ê,é,±,Æ,Í,È,¢ B ,±,Ìfe [fuf<,Í,·,×,Ä,Ì  
IDirectDraw2 A IDirectDrawSurface2 IDirectDrawPalette,“,æ,Ñ  
IDirectDrawClipperfCf“f^ [ftfFfCfX,Ìf f\fbfh,É,æ,Á,Ä•Ô,³,ê,é%Â”\ «,Ì, ,é¹,ðfŠfXfgfAfbfv,µ,Ä,¢  
,é B,»,ê,¼,ê,Ìf f\fbfh,ª•Ô,·%Â”\ «,Ì, ,éfGf% [fR [fh,ÌfŠfXfg,Í Af f\fbfh,Ì·L q,ðŽQ Æ,·,·,é,±,Æ B

DD\_OK

—v< ,Í ¬Œ÷,µŠ®—¹,µ,½ B

DDERR\_ALREADYINITIALIZED

fIfufWfFfNfg,Í,·,Ä,É %Šú%»,³,ê,Ä,¢,é B

DDERR\_BLTFASTCANTCLIP

DirectDrawClipper  
fIfufWfFfNfg,ªIDirectDrawSurface2::BltFastf f\fbfh,ÌŒÄ,Ñ o,µ,É“n,³,ê,é“]‘—  
Œ³fT [ftfFfX,ÉfAf^fbf` ,³,ê,Ä,¢,é B

DDERR\_CANNOTATTACHSURFACE

—v< ,³,ê,½fT [ftfFfX,É,ÍfT [ftfFfX,ðfAf^fbf` ,Ä,«,È,¢ B

DDERR\_CANNOTDETACHSURFACE

—v< ,³,ê,½fT [ftfFfX,©,çfT [ftfFfX,ðff^fbf` ,Ä,«,È,¢ B

DDERR\_CANTCREATEDC

Windows,Í,»,êÈ ä,Ì,¢,©,È,éffofCfX EfRf“fefLfXfg iDC j,ð ì,é,±,Æ,ª,Ä,«,È,¢ B

DDERR\_CANTDUPLICATE

fvf%oCf}fŠ EfT [ftfFfX A3DfT [ftfFfX A~Ä-Ü“I,É ì,ç,ê,éfT [ftfFfX,Í·i » ,Ä,«,È,¢ B

DDERR\_CANTLOCKSURFACE

DCI fTf| [fg,È,µ,Äfvf%oCf}fŠ EfT [ftfFfX,Ìf fbfn,ð,µ,æ,²,Æ,µ,½,½,ß A,±  
,ÌfT [ftfFfX,Ö,ÌfAfNfZfX,ª,‘”Ü,³,ê,½ B

DDERR\_CANTPAGELOCK

fT [ftfFfX,Ìfy [fW Ef fbfn,ªŽ,”s,µ,½ B  
fy [fW Ef fbfn,ÍffBfXfvfŒfC Ef f,fŠ EfT [ftfFfX, ,é,¢,ÍfGf~f...  
fŒ [fg,³,ê,½fvf%oCf}fŠ EfT [ftfFfX,Ì ä,Ä,Í“® ì,µ,È,¢ B

DDERR\_CANTPAGEUNLOCK

fT [ftfFfX,Ìfy [fW Ef fbfn%ð æ,ªŽ,”s,µ,½ B  
fy [fW Ef fbfn%ð æ,ÍffBfXfvfŒfC Ef f,fŠ EfT [ftfFfX, ,é,¢,ÍfGf~f...  
fŒ [fg,³,ê,½fvf%oCf}fŠ EfT [ftfFfX,Ì ä,Ä,Í“® ì,µ,È,¢ B

DDERR\_CLIPPERISUSINGHWND

fEfBf“fhfE Efnf“fhf<,ð,·,Ä,Éf,fjf^ [ ,µ,Ä,¢,éDirectDrawClipper  
fIfufWfFfNfg,ÉfNfŠfbfv EfŠfXfg,ðfZfbfg,µ,æ,²,Æ,µ,½ B

DDERR\_COLORKEYNOTSET

“]‘—Œ³fJf% [ EfL [ ,ªŽw`è,³,ê,Ä,¢,È,¢ B

DDERR\_CURRENTLYNOTAVAIL

Œ» ÝfTf| [fg,³,ê,Ä,¢,È,¢ B

DDERR\_DCALREADYCREATED

fffofCfX EfRf“fefLfXfg(DC),Í,·,Ä,É,±,ÌfT [ftfFfX,É·Î,µ•Ô,³,ê,Ä,¢,é B  
^éfT [ftfFfX,É,Ä,«,Ð,Æ,Ä,Ì,c,b,µ,©Žæ“¾,·,é,±,Æ,Í,Ä,«,È,¢ B

DDERR\_DIRECTDRAWALREADYCREATED

DirectDrawfIfufWfFfNfg,Í,·,Ä,É ì ¬,³,ê,Ä,¢,é B

DDERR\_EXCEPTION

—v< ,³,ê,½ ^— ,ð s,²ŠÖ,É—áŠO,ª” ¶,µ,½ B

DDERR\_EXCLUSIVEMODEALREADYSET

,·,Ä,É”r“¼“If, [fh,ªfZfbfg,³,ê,Ä,¢,é,È,à,©,©,í,ç,, A<¹²fŒfxf<,ðfZfbfg,µ,æ,²,Æ,µ,½ B

DDERR\_GENERIC

—Œ`è`,ÌfGf% [ ó•Ô,Ä, ,é B

#### DDERR\_HEIGHTALIGN

—^,!,ç,ê,½<éÇ`l̇ ,³,Í•K—v,Æ,³,ê,é ®—ñ,l̇”{ ”,Ä,Í,È,Ç B

#### DDERR\_HWNDALREADYSET

DirectDraw<“²fÇEfxf< EfEfBf“fhfE Efnf“fhf<,Í,·,Ä,É Ý’è,³,ê,Ä,Ç  
,é BfEfBf“fhfE Efnf“fhf<,Ífvf fZX,ªfT [ftfFfX, ,é,Ç,Í ¶ ¬,µ,½pfÇfbfg,ð•ÛŽ ,µ,Ä,Ç  
,éŠÖ,ÍfŠfZXfbfg,Ä,«,È,Ç B

#### DDERR\_HWNDSUBCLASSED

DirectDraw<“²fÇEfxf< EfEfBf“fhfE Efnf“fhf<,ª fTfufNf%oX%o»,³,ê,Ä,Ç,é,½,ß A  
DirectDraw,l̇ ó‘Ô,l̇fŠfXfgfA,ªjŽ~,³,ê,½ B

#### DDERR\_IMPLICITLYCREATED

^Ä–Û–“I,É ì,ç,ê,½fT [ftfFfX,ðfŠfXfgfA,µ,æ,²,Æ,µ,½ B

#### DDERR\_INCOMPATIBLEPRIMARY

fvf%oCf}fŠ EfT [ftfFfX ì ¬—v< ,ªŠù“¶,lfvf%oCf}fŠ EfT [ftfFfX,Æ^êˆv,µ,Ä,Ç,È,Ç B

#### DDERR\_INVALIDCAPS

fR [f<fofbfNŠÖ ”,É“n,³,ê,½,Ð,Æ,Ä^È ã,l̇”\—Írfbfg,ªs ³,Ä, ,é B

#### DDERR\_INVALIDCLIPLIST

DirectDraw ,Í—^,!,ç,ê,½fNfŠfbfv EfŠfXfg,ðfTf| [fg,µ,È,Ç B

#### DDERR\_INVALIDDIRECTDRAWGUID

DirectDrawCreate ŠÖ ”,É“n,³,ê,éfof [fof< Ef†fj [fNŽ~•ÊŽq iGUID j,Í—LÆø,È  
DirectDraw fhf%oCfoŽ~•ÊŽq,Ä,Í,È,Ç B

#### DDERR\_INVALIDMODE

DirectDraw ,Í—v< ,³,ê,½f, [fh,ðfTf| [fg,µ,È,Ç B

#### DDERR\_INVALIDOBJECT

DirectDraw ,Í–³Æø,ÈDirectDraw fIfufWfFfNfg,l̇f|fCf“f^,ðŽÓ,~Žæ,Ä,½ B

#### DDERR\_INVALIDPARAMS

f f\fbfh,É“n,³,ê,½,Ð,Æ,Ä^È ã,l̇pf%o [f^,ª ³,µ,,È,Ç B

#### DDERR\_INVALIDPIXELFORMAT

Žw’è,³,ê,½fsfNfZf< EftfH [f}fbfg,Í–³Æø,Ä, ,é B

#### DDERR\_INVALIDPOSITION

“]— æ ã,l̇fI [fo [fÇfC,l̇Êˆu,ªs ³,Ä, ,é B

#### DDERR\_INVALIDRECT

—^,!,ç,ê,½<éÇ`,ª–³Æø,Ä, ,é B

#### DDERR\_INVALIDSURFACETYPE

fT [ftfFfX,ªŠÖˆá,Ä,½f^fCfv,Ä, ,Ä,½,½,ß A—v< ,³,ê,½ ^— ,ðŽÄ s,Ä,«,È,©,Ä,½ B

#### DDERR\_LOCKEDSURFACES

,Ð,Æ,Ä^È ã,l̇fT [ftfFfX,ªf fbfN,³,ê,Ä,¨,è A—v< ,³,ê,½ ^— ,ÉŽ,”s,µ,½ B

#### DDERR\_NO3D

,R,cfn [fhfEfFfA, ,é,Ç,ÍfGf~f...fÇ [fVf‡f“,ª¶ Ý,µ,È,Ç B

#### DDERR\_NOALPHAHW

fAf<ftf@ EfAfNfZf%oÇ [fVf‡f“ Efn [fhfEfFfA,ª¶ Ý,µ,È,Ç,©, ,é,Ç,Í—~—  
p,Ä,«,È,©,Ä,½,½,ß A—v< ,³,ê,½ ^— ,ÉŽ,”s,µ,½ B

#### DDERR\_NOBLTHW

fuf fbfN“]—fn [fhfEfFfA,ª¶ Ý,µ,È,Ç B

#### DDERR\_NOCLIPLIST

fNfŠfbfv EfŠfXfg,ª~—p,Ä,«,È,Ç B

#### DDERR\_NOCLIPPERATTACHED

,±,lfT [ftfFfX EfIfufWfFfNfg,É,ÍDirectDrawClipper fIfufWfFfNfg,ðfAf^fbf`,Ä,«,È,Ç B

#### DDERR\_NOCOLORCONVHW

F•İŠ~fn [fhfEfFfA,ª¶ Ý,µ,È,Ç A, ,é,Ç,Í—~—p,Ä,«,È,Ç,½,ß A ^— ,ªŽÄ s,Ä,«,È,Ç B

## DDERR\_NOCOLORKEY

fT [ftfFfX,ÍĖ» ÝfJf% [ E fL [,ðŽ ,Á,Ä,ċ,È,ċ B

## DDERR\_NOCOLORKEYHW

“]’— æfJf% [ E fL [,É‘Î,·,éfn [fhfEfFfAfTf| [fg,<sup>a</sup>,È,ċ,½,ß A ^— ,<sup>a</sup>ŽÀ s,Á,«,È,ċ B

## DDERR\_NOCOOPERATIVELEVELSET

IDirectDraw2::SetCooperativeLevel f f\fbfh,ðĖÄ,Ñ o,·,±,Æ,È, ì -ŠÖ ”,<sup>a</sup>ĖÄ,Ñ o,<sup>3</sup>,ê,½ B

## DDERR\_NODC

,c,b,Í A,±,ê,Û,Ä,É,±,ÌfT [ftfFfX—p,É ì,ç,ê,Ä,ċ,È,©,Á,½ B

## DDERR\_NODDROPSHW

DirectDraw f%oXf^ ^— ì ROP jfn [fhfEfFfA,<sup>a</sup>—p,Á,«,È,ċ B

## DDERR\_NODIRECTDRAWHW

fn [fhfEfFfA ê—p DirectDraw  
fIfuWfFfNfg ì ¬,Á,«,È,ċ Bfhf%oCfo,Ífn [fhfEfFfA,ðfTf| [fg,μ,È,ċ B

## DDERR\_NODIRECTDRAWSSUPPORT

Ė» Ý,ÌftfBfXfvfĖfC Efhf%oCfo,ÍDirectDraw,ðfTf| [fg,μ,Á,ċ,È,ċ B

## DDERR\_NOEMULATION

f\ftfgEfFfA EfGf~f...fĖ [fVf‡f“,<sup>a</sup>—p,Á,«,È,ċ B

## DDERR\_NOEXCLUSIVEMODE

fAfvfŠfP [fVf‡f“,É‘Î,μ”r‘¼“If, [fh,<sup>a</sup>—  
v< ,<sup>3</sup>,ê,½,<sup>a</sup> AfAfvfŠfP [fVf‡f“,Í”r‘¼“If, [fh,ðŽ ,Á,Ä,ċ,È,ċ B

## DDERR\_NOFLIPHW

%oÄŽ<fT [ftfFfX,ÍftfŠfbfsf“fO,Á,«,È,ċ B

## DDERR\_NOGDI

GDI,<sup>a</sup>“Œ Ý,μ,È,ċ B

## DDERR\_NOHWN

fNfŠfbfsf“fO’Ê’m,<sup>a</sup>fEfBf“fhfE Efnf“fhf<,ð•K—v,Æ,·,é A, ,é,ċ  
,ÍfEfBf“fhfE Efnf“fhf<,<sup>a</sup>‘’<sup>2</sup>fĖfxf< EfEfBf“fhfE Efnf“fhf<,Æ,μ,Ä, ,ç,©,Œ,ßfZfbfg,<sup>3</sup>,ê,Ä,ċ  
,È,ċ B

## DDERR\_NOMIPMAPHW

f~fbfvf}fbfv EfefNfXf`ff Ef}fbfsf“fO,Ìfn [fhfEfFfA,<sup>a</sup>“Œ Ý,μ,Á,ċ,È,ċ,©, ,é,ċ,Í—~  
p,Á,«,È,ċ,½,ß A ^— ,ðŽÀ s,Á,«,È,ċ B

## DDERR\_NOMIRRORHW

f~f% [fŠf“fO Efn [fhfEfFfA,<sup>a</sup>“Œ Ý,μ,È,ċ,©, ,é,ċ,Í—~p,Á,«,È,ċ,½,ß A ^—  
,<sup>a</sup>ŽÀ s,Á,«,È,ċ B

## DDERR\_NOOVERLAYDEST

“]’— æŠm—š,Ì,½,ß,ÌIDirectDrawSurface2::UpdateOverlayf f\fbfhĖÄ,Ñ o,μ,ð,μ,Ä,ċ  
,È,ċfI [fo [fĖfC,É‘Î,μ AIDirectDrawSurface2::GetOverlayPositionf f\fbfh,<sup>a</sup>ĖÄ,Ñ o,<sup>3</sup>,ê,½  
B

## DDERR\_NOOVERLAYHW

fI [fo [fĖfC Efn [fhfEfFfA,<sup>a</sup>“Œ Ý,μ,Á,ċ,È,ċ,©, ,é,ċ,Í—~p,Á,«,È,ċ,½,ß A ^—  
,<sup>a</sup>ŽÀ s,Á,«,È,ċ B

## DDERR\_NOPALETTEATTACHED

fpfĖfbfg EfIfuWfFfNfg,<sup>a</sup>,±,ÌfT [ftfFfX,ÉfAf^fbf<sup>3</sup>,ê,Ä,ċ,È,ċ B

## DDERR\_NOPALETTEHW

16 F, ,é,ċ,Í256 F,ÌpfĖfbfg,É‘Î,·,éfn [fhfEfFfA EfTf| [fg,<sup>a</sup>,È,ċ B

## DDERR\_NORASTEROPHW

“K Ø,Èf%oXf^ ^— fn [fhfEfFfA,<sup>a</sup>“Œ Ý,μ,È,ċ,©, ,é,ċ,Í—~p,Á,«,È,ċ,½,ß A ^—  
,<sup>a</sup>ŽÀ s,Á,«,È,ċ B

## DDERR\_NOROTATIONHW

%oñ“]fn [fhfEfFfA,<sup>a</sup>“Œ Ý,μ,Á,ċ,È,ċ,© A, ,é,ċ,Í—~p,Á,«,È,ċ,½,ß ^— ,<sup>a</sup>ŽÀ s,Á,«,È,ċ B



#### DDERR\_NOSTRETCHHW

Šg‘âfn [fhfEfFfA,“Ŧ Ÿ,µ,Ä,¢,È,¢,©, ,é,¢,Í—~p,Ä,«,È,¢,½,ß A ^— ,ŽÄ s,Ä,«,È,¢ B

#### DDERR\_NOT4BITCOLOR

DirectDrawSurface fIfufWfFfNfg,Í A—v< ,³,ê,½,Sfrfbfg FfpfƎfbfg,ðŽg,Ä,Ä,¢,È,¢ B

#### DDERR\_NOT4BITCOLORINDEX

DirectDrawSurface fIfufWfFfNfg,Í A—  
v< ,³,ê,½,Sfrfbfg,İfJf%o [ EfCf“fffbfNfX EfpfƎfbfg,ðŽg,Ä,Ä,¢,È,¢ B

#### DDERR\_NOT8BITCOLOR

DirectDrawSurface fIfufWfFfNfg,Í A—v< ,³,ê,½,Wfrfbfg FfpfƎfbfg,ðŽg,Ä,Ä,¢,È,¢ B

#### DDERR\_NOTAOVERLAYSURFACE

”ñfI [fo [fƎfC EfT [ftFfX,É‘Î,µ AfI [fo [fƎfC EfRf“f| [flf“fg,“ƎÄ,Ñ o,³,ê,½ B

#### DDERR\_NOTTEXTUREHW

fefNfXf`ff Ef}fbfsf“fO Efn [fhfEfFfA,“Ŧ Ÿ,µ,Ä,¢,È,¢,©, ,é,¢,Í—~p,Ä,«,È,¢,½,ß A ^  
— ,ŽÄ s,Ä,«,È,¢ B

#### DDERR\_NOTFLIPPABLE

ftfŠfbfsf“fO,Ä,«,È,¢fT [ftFfX,ðftfŠfbfsf“fO,µ,æ,²,Æ,µ,½ B

#### DDERR\_NOTFOUND

—v< ,³,ê,½ €–Ú,ÍƎ©,Ä,©,ç,È,©,Ä,½ B

#### DDERR\_NOTINITIALIZED

fIfufWfFfNfg,“ %Šú%»,³,ê,é‘O,É A CoCreateInstance,Ä ì ¬,³,ê,½ DirectDraw  
fIfufWfFfNfg,İfCf“f^ [ftFfCfX Ef f\fbfh,ðƎÄ,Ñ o,»,²,Æ,µ,½ B

#### DDERR\_NOTLOCKED

f fbfN,³,ê,Ä,¢,È,¢fT [ftFfX,İf fbfN%ð œ,“ s,í,ê,½ B

#### DDERR\_NOTPAGELOCKED

–¢ ^— ,İfy [fW Ef fbfN,“È,¢fT [ftFfX,İfy [fW Ef fbfN%ð œ,“ s,í,ê,½ B

#### DDERR\_NOTPALETTIZED

Žg—p,µ,Ä,¢,éft [ftFfX,ÍfpfƎfbfg Efx [fX,İfT [ftFfX,Ä,Í,È,¢ B

#### DDERR\_NOVSYNCHW

,¼‘A ü“Šú ^— ,É‘Î,·,éfn [fhfEfFfAfTf| [fg,“È,¢,½,ß A ^— ,ðŽÄ s,Ä,«,È,¢ B

#### DDERR\_NOZBUFFERHW

Zfofbftf@,É‘Î,·,éfn [fhfEfFfA EfTf| [fg,“È,¢  
,½,ß AfFfBfXfvfƎfC Ef f,fŠ,Ä,İZfofbftf@ ì ¬, ,é,¢,ÍZfofbftf@,ðŽg—  
p,µ,½fuf fbfN“]‘—,ŽÄ s,Ä,«,È,¢ B

#### DDERR\_NOZOVERLAYHW

fI [fo [fƎfC EfT [ftFfX,Í AfN [fhfEfFfA,“fI [fo [fƎfC EZfI [f\_ [,ðfTf| [fg,µ,È,¢  
,½,ß AZfI [f\_ [,“Ž<,³,ê,½ B

#### DDERR\_OUTOFCAPS

—v< ,³,ê,½ ^— ,É•K—v,Èfn [fhfEfFfA,“,·,Ä,ÉŠ,,,è“—,Ä,ç,ê,Ä,¢,é B

#### DDERR\_OUTOFMEMORY

DirectDraw,“ ^— ,ð s,²,İ,É \“,Èf f,fŠ,“È,¢ B

#### DDERR\_OUTOFVIDEOMEMORY

DirectDraw,“ ^— ,ð s,²,İ,É \“,ÈffBfXfvfƎfC Ef f,fŠ,“È,¢ B

#### DDERR\_OVERLAYCANTCLIP

fn [fhfEfFfA,ÍfNfŠfbfsf“fO EfI [fo [fƎfC,ðfTf| [fg,µ,È,¢ B

#### DDERR\_OVERLAYCOLORKEYONLYONEACTIVE

fI [fo [fƎfC ä,É,D,Æ,Ä~È ä,İ—LƎø,ÈfJf%o [ EfL [,ðŽ ,Æ,²,Æ,µ,½ B

#### DDERR\_OVERLAYNOTVISIBLE

IDirectDrawSurface2::GetOverlayPosition  
f f\fbfh,“s%oÄŽ<fI [fo [fƎfC ä,ÄƎÄ,Ñ o,³,ê,½ B

#### DDERR\_PALETTEBUSY

$f p f \mathbb{C} f b f g,^a, \grave{\alpha}, \varpi, \mathbb{D}, \mathbb{A}, \hat{\mathbb{I}} f X f \mathbb{C} f b f h, \acute{E}, \mathfrak{a}, \acute{A}, \check{A} f \quad f b f N,^3, \hat{e}, \check{A}, \mathbb{C}, \acute{e}, \grave{\alpha}, \beta \quad A f A f N f Z f X,^a, \text{''}\hat{U},^3, \hat{e}, \frac{1}{2} \quad B$

#### DDERR\_PRIMARYSURFACEALREADYEXISTS

$, \pm, \hat{\mathbb{I}} \quad \text{---} \quad , \hat{\mathbb{I}}, \cdot, \check{A}, \acute{E} f v f \% o f \check{S} f \} f \check{S} \quad E f T \quad [f t f F f X, \delta \quad \grave{\mathbb{I}} \quad \neg, \mu, \check{A}, \mathbb{C}, \acute{e} \quad B$

#### DDERR\_REGIONTOOSMALL

IDirectDrawClipper::GetClipList  $f \quad f \backslash f b f h, \acute{E} \text{''} n,^3, \hat{e}, \frac{1}{2} \text{---} \hat{\mathbb{I}}^{\mathfrak{a}},^a \quad \neg,^3, \cdot, \neg, \acute{e} \quad B$

#### DDERR\_SURFACEALREADYATTACHED

$, \cdot, \check{A}, \acute{E} f A f^{\wedge} f b f^{\neg}, \mu, \check{A}, \mathbb{C}, \acute{e}, \grave{\alpha}, \varpi, \mathbb{D}, \mathbb{A}, \hat{\mathbb{I}} f T \quad [f t f F f X, \acute{E} f T \quad [f t f F f X, \delta f A f^{\wedge} f b f^{\neg}, \mu, \mathfrak{a}, \varpi, \mathbb{A}, \mu, \frac{1}{2} \quad B$

#### DDERR\_SURFACEALREADYDEPENDENT

$, \cdot, \check{A}, \acute{E} \text{''}\frac{1}{4}, \grave{\mathbb{I}} f T \quad [f t f F f X, \acute{E}^{\neg} \mathbb{C}, \mu, \check{A}, \mathbb{C}, \acute{e} f T \quad [f t f F f X, \delta^{\neg} \mathbb{C},^3,^1, \mathfrak{a}, \varpi, \mathbb{A}, \mu, \frac{1}{2} \quad B$

#### DDERR\_SURFACEBUSY

$f T \quad [f t f F f X,^a, \grave{\alpha}, \varpi, \mathbb{D}, \mathbb{A}, \hat{\mathbb{I}} f X f \mathbb{C} f b f h, \acute{E}, \mathfrak{a}, \acute{A}, \check{A} f \quad f b f N,^3, \hat{e}, \check{A}, \mathbb{C}$   
 $, \acute{e}, \frac{1}{2}, \beta \quad A f T \quad [f t f F f X, \check{O}, \hat{\mathbb{I}} f A f N f Z f X,^a, \text{''}\hat{U},^3, \hat{e}, \frac{1}{2} \quad B$

#### DERR\_SURFACEISOBSCURED

$f T \quad [f t f F f X, \check{O}, \hat{\mathbb{I}} f A f N f Z f X,^a \quad A f T \quad [f t f F f X,^a, \mathbb{C}, \mathbb{C} \% B,^3, \hat{e}, \check{A}, \mathbb{C}, \acute{e}, \grave{\alpha}, \beta, \text{''}\hat{U},^3, \hat{e}, \frac{1}{2} \quad B$

#### DDERR\_SURFACELOST

$f T \quad [f t f F f X \quad E f \quad f, f \check{S}, \hat{\mathbb{I}}^{\neg} s^{\neg} \ll, \hat{\mathbb{I}}, \frac{1}{2}, \beta \quad A f T \quad [f t f F f X, \check{O}, \hat{\mathbb{I}} f A f N f Z f X,^a, \text{''}\hat{U},^3, \hat{e}, \frac{1}{2} \quad B, \pm$   
 $, \hat{\mathbb{I}} f T \quad [f t f F f X, \delta^{\neg} \backslash, \cdot \text{DirectDrawSurface}$   
 $f l f u f W f F f N f g, \acute{E}, \hat{\mathbb{I}} \text{DirectDrawSurface2::Restore} f \quad f \backslash f b f h,^a \mathbb{C} \check{A}, \tilde{N} \quad o,^3, \hat{e}, \grave{E}, \neg, \hat{e}, \hat{\mathbb{I}}, \grave{E}, \zeta, \grave{E}, \mathbb{C} \quad B$

#### DDERR\_SURFACENOTATTACHED

$\text{---} v \ll \quad ,^3, \hat{e}, \frac{1}{2} f T \quad [f t f F f X, \hat{\mathbb{I}} f A f^{\wedge} f b f^{\neg}, \check{A}, \ll, \grave{E}, \mathbb{C} \quad B$

#### DDERR\_TOOBIGHEIGHT

$\text{DirectDraw} \quad , \acute{E}, \mathfrak{a}, \acute{A}, \check{A} \text{---} v \ll \quad ,^3, \hat{e}, \frac{1}{2} \quad , ,^3,^a, \grave{\alpha}, \ll, \cdot, \neg, \acute{e} \quad B$

#### DDERR\_TOOBIGSIZE

$\text{DirectDraw} \quad , \acute{E}, \mathfrak{a}, \acute{A}, \check{A} \text{---} v \ll \quad ,^3, \hat{e}, \frac{1}{2} \text{''}\grave{\alpha}, \ll,^3,^a, \grave{\alpha}, \ll, \cdot, \neg, \acute{e} \quad B, \mu, \odot, \mu \quad A \mathbb{C} \hat{A} \cdot \hat{E}, \hat{\mathbb{I}} \quad , ,^3, \mathbb{A} \cdot \quad , \hat{\mathbb{I}} \text{---} \hat{a}^{\neg} \grave{e},^a, \grave{E}, \mathbb{C} \quad B$

#### DDERR\_TOOBIGWIDTH

$\text{DirectDraw} \quad , \acute{E}, \mathfrak{a}, \acute{A}, \check{A} \text{---} v \ll \quad ,^3, \hat{e}, \frac{1}{2} \cdot \quad ,^a, \grave{\alpha}, \ll, \cdot, \neg, \acute{e} \quad B$

#### DDERR\_UNSUPPORTED

$f T f | \quad [f g,^3, \hat{e}, \check{A}, \mathbb{C}, \grave{E}, \mathbb{C} \quad \text{---} \quad , \check{A}, \quad , \check{A}, \frac{1}{2} \quad B$

#### DDERR\_UNSUPPORTEDFORMAT

$\text{---} v \ll \quad ,^3, \hat{e}, \frac{1}{2} \quad \text{FourCC} \quad f t f H \quad [f] f b f g, \hat{\mathbb{I}} \text{DirectDraw} \quad , \acute{E}, \mathfrak{a}, \acute{A}, \check{A} f T f | \quad [f g,^3, \hat{e}, \check{A}, \mathbb{C}, \grave{E}, \mathbb{C} \quad B$

#### DDERR\_UNSUPPORTEDMASK

$\text{---} v \ll \quad ,^3, \hat{e}, \frac{1}{2} f s f N f Z f \ll \quad E f t f H \quad [f] f b f g, \check{A}, \hat{\mathbb{I}} \quad f r f b f g f \} f X f N, \hat{\mathbb{I}} \text{DirectDraw} \quad , \acute{E}, \mathfrak{a}, \acute{A}, \check{A} f T f | \quad [f g,^3, \hat{e}, \check{A}, \mathbb{C}$   
 $, \grave{E}, \mathbb{C} \quad B$

#### DDERR\_UNSUPPORTEDMODE

$f f B f X f v f \mathbb{C} f C, \hat{\mathbb{I}} \mathbb{C} \gg \quad \acute{Y} f T f | \quad [f g,^3, \hat{e}, \check{A}, \mathbb{C}, \grave{E}, \mathbb{C} f, \quad [f h, \check{A}, \quad , \acute{e} \quad B$

#### DDERR\_VERTICALBLANKINPROGRESS

$, \frac{1}{4} \ll A \quad \ddot{u} \check{S} \acute{u} \check{S} \hat{O}, \check{A}, \quad , \acute{e} \quad B$

#### DDERR\_WASSTILLDRAWING

$, \pm, \hat{\mathbb{I}} f T \quad [f t f F f X, \odot, \zeta \quad A, \ddot{U}, \frac{1}{2}, \hat{\mathbb{I}} f T \quad [f t f F f X, \check{O}, \hat{\mathbb{I}}^{\neg} O \% \grave{o} \grave{n}, \hat{\mathbb{I}} f u f \quad f b f N \text{''}]^{\neg} \text{---} \text{''}\mathbb{C} \quad \hat{\mathbb{I}},^a \check{S} \text{---} \text{---}^1, \mu, \check{A}, \mathbb{C}, \grave{E}, \mathbb{C} \quad B$

#### DDERR\_WRONGMODE

$\text{---} \hat{U}, \grave{E}, \check{A}, \frac{1}{2} f, \quad [f h, \check{A} \quad \hat{\mathbb{I}}, \zeta, \hat{e}, \frac{1}{2}, \frac{1}{2}, \beta \quad A, \pm, \hat{\mathbb{I}} f T \quad [f t f F f X, \hat{\mathbb{I}} f \check{S} f X f g f A, \cdot, \acute{e}, \pm, \mathbb{A},^a, \check{A}, \ll, \grave{E}, \mathbb{C} \quad B$

#### DDERR\_XALIGN

$\text{---} \text{---}^{\neg},^1, \zeta, \hat{e}, \frac{1}{2} \ll \acute{e} \mathbb{C}^{\neg}, \delta^{\neg} K \text{---} v, \mathbb{A},^3, \hat{e}, \acute{e} \text{''}\acute{\mathbb{I}} \acute{\mathbb{I}}, \acute{E} \quad \dots \cdot \frac{1}{2} \hat{\text{---}} \text{---} \bar{n}, \acute{E} \cdot \check{A}, \times, \acute{e}, \pm, \mathbb{A},^a, \check{A}, \ll, \grave{E}, \odot, \check{A}, \frac{1}{2} \quad B$

## DirectSound,É,Â,Ç,Ä

The Microsoft® DirectSound® fAfvfŠfP [fVf‡f“ Efvf fOf%of~f“fO EfCf“f^ [ftfFfCfX(API),Í ADirectX™ 3 Software Development Kit (SDK),İfI [ffBfI EfRf“f [flf“fg,Â, ,é BDirectSound,İ‘Ö,¿ŽžŠÔ ifŒfCfef“fV j,İ - ,È,Çf~fLfVf“fO Afñ [fhfEfFfA,İfAfNfZf%ofŒ [fVf‡f“ A,»,µ,ÄfTfEf“fh EfffofCfX,Ö,İf\_CfŒfNfg,ÈfAfN fZfX,ðŽÄŒ»,·,é B,±,ê,ç,İ<@”\ ,İŽÄŒ»,İ,½,ß,É,Í AŒ»“¶,İWindows ä,İfAfvfŠfP [fVf‡f“,ÆffofCfX Efhf%ofCfo,Æ,İŠÔ,İŒÝŠ· «,ª•K— v ðŒ ,Æ,È,é B

## DirectX

3,É,æ,Á,Ä Afñ [fhfEfFfA,ÉŠÖ,·,é Ú ×,È’mŽ̄,È,µ,ÄffBfXfvfŒfC,âfI [ffBfI EfffofCfX,ÖfAfNfZfX,·,é,± ,Æ,%oÄ”\,É,È,é BDirectX ÝŒvŽž,İ Ä—D æ—Ú“İŽ— €,İfXfs [fh,Â, ,é B ,fŒfxf<ŠÔ ”ŒQ,É,æ,è A DirectSound,İfffofCfX”ñˆË“¶fCf“f^ [ftfFfCfX,ð’ñ<Ÿ,µ A,»,ê,É,æ,Á,ÄfAfvfŠfP [fVf‡f“,ÍfI [ffBfI<@Ši,İ”— Í,ð Ä‘âŒÄ,Éˆø,« o,·,±,Æ,ª,Ä,«,é B

**DirectSoundfA [fLfefNf`ff**

,±,ì ß,Å,Í ADirectSoundfRf“f| [flf“fg,Æ,»,ì‘¼,ì  
DirectX AfIfyfŒ [fefBf“fO EfVfXfef€ AfVfXfef€ Efn [fhfEfFfA,ìŠÖŒW,É,Â,¢,Ä,Ì^ê”Ê“l,È î•ñ,ð à–  
¾,·,é B

fA [fLfefNf`ffŠT—v  
fIfufWfFfNfg Ef^fCfv  
f\ftfqfEfFfA EfGf~f...fŒ [fVf#f“  
fffofCfX Efhf%ofCfo  
ç'²fŒfxfç  
fVfXfef€,ì“ ±

fA [fLfefNf`ffŠT—v

fnfCfpfth {f}f“fX,lfAfvfŠfP [fVf‡f“,âfQ [f€,lfvf fOf%of~f“fO,É,Í AÆø%œ“l,Ä—Í<-  
,çfTfEf“fh ì,è,³,ß,ç,è,é BMicrosoft,³,½,½,ß,Èñ<Ÿ,µ,Ä,ç,é,ì,“MIDIfXfgfŠ [f€  
,ÆDirectSound,ì,Ó,½,Ä,lf f\fbfh,Ä, ,é B MIDIfXfgfŠ [f€,Í AWindows 95f}f<f f ffBfAAPI,ìè•”,Ä, ,é B  
MIDIfXfgfŠ [f€,ÍMIDIf fbfZ [fW,Éf^fCf€fXf^f“fv,ðt, A,»,lf fbfZ [fW,lfobftf@,ðfVfXfef€,Ö—  
M,·,é BMIDIfXfgfŠ [f€,É,Ä,ç,Ä,ì Ú × îñ,Í A Microsoft Win32® Software Development Kit (SDK)  
,ÉŠÜ,Ü,è,éfhfLf...f f“fg,ðŽQ Æ,·,é,±,Æ B

ˆê•û ADirectSound,Í AfffWf^f<^%¹,³,è,½fTf“fvfŠf“fO EfTfEf“fh,ì Ä ¶,ÆfTf“fvfŠf“fO%¹œ¹,lf~fLfVf“fO,ì  
V,µ,çf,ff<,ðŽÄ•,µ,Ä,ç,é B ¼,ìDirectX 3 SDK,lfIfufWfFfNfg EfNf%ofX,Æ—l A  
DirectSound,Ífn [fhfEfFA,ì<@”\,ð Ä‘âœÄ,Éˆø,« o,µ AfN [fhfEfFA,Äœ» Ý—çfTf [fg,ì”——Í,ª, ,è,Î A,»,è,ðf\  
tfgEfFA,ÄGf~f...fœ [fg,·,é BŽÄ sŽž,Éfn [fhfEfFA,ì”——Í,ì Æ%œ¹,ª,Ä,« Afpf\Rf“ŠÄ<«,É,©,©,í,è,È,-  
Ä ,,ì «”\,ðˆø,« o,·,±,Æ,ª,Ä,«é B

DirectSound,ÍIDirectSound,ÆIDirectSoundBuffer,Æ,ç  
,ðCOMfx [fX,lfCf“f^ [ftfFfCfX ã,É \z,³,è A¼,lfCf“f^ [ftfFfCfX,ÖŠg’£,à,Ä,«é BDirectX 3  
SDK,ÄAfvfŠfP [fVf‡f“,ì ì ¬,É,ÍCOM,ÌŠT”O,Ö,ì— %ð,ð—v,·,é,ª A,±,è,È,Ä,ç,Ä,ÍRf“f [f  
— [flf“fg EfIfufWfFfNfg Ef,fff<,ðŽQ Æ,·,é,±,Æ B

DirectSoundIfufWfFfNfg,Í AfTfEf“fh EfJ [fh,Æ,»,ì—l X,Èˆ® «,ð•\  
,· BfAfvfŠfP [fVf‡f“,ÍDirectSoundIfufWfFfNfg,ìIDirectSound::CreateSoundBuffer f\fbfh,ðŽg—  
p,µ,ÄDirectSoundBufferIfufWfFfNfg,ð ì ¬,·,é BDirectSoundBufferIfufWfFfNfg,Æ,Í Afobftf@,ðŠÜ,bfTfEf“fh  
Eff [f^,ì,±,Æ,Ä, ,é Bfvf%ofCf}  
fŠDirectSoundBufferIfufWfFfNfg,É,Í; ”,ìDirectSoundBufferIfufWfFfNfg,ª¶ Ý,µ A‘ŠœÝ,Éf~fLfVf“fO,ªœÄ”\  
,Ä, ,é BDirectSoundfobftf@,ÍŽü”g ” EftfH [f}  
fbfG,È,Ç,ìˆ® «,ð Ýè,·,é,Æ,Æ,à,È AfTfEf“fh,ì Ä ¶ E’âŽ~ EˆèŽž’âŽ~,ÉŽg—p,³,è,é B

DirectSoundfobftf@,Í AfIf“f{ [fhRAM A  
fEfF [fufe [fuf< Ef f,š Af\_fCfœfNfg Ef f,š EfAfNfZfX(DMA)f’ffflf< A%¼‘zfobftf@(I/Of [f  
[fg,ª,ð,Æ,Ä,lfI [ffBfI EfJ [fh,ì è ‡),ì,ç,»,è,©,lfN [fhfEfFA—  
p,É ì ¬,³,è,é Bfobftf@ ì ¬,Í AfJ [fh,lf^fCfv,Éˆ“¶,·,é BDirectSoundfobftf@,ì,½,ß,lfN [fhfEfFA,ª,È,ç è  
‡,Í AfVfXfef€ Ef f,š,ÄGf~f...fœ [fg,³,è,é B

fvf%ofCf}fŠ EfTfEf“fh Efofbftf@,ÍÊ ífZfJf“f fŠ EfTfEf“fh Efofbftf@,©,ç—  
,ç,è,éTfEf“fh,lf~fLfVf“fO,ì,½,ß,ÉŽg—  
p,³,è,é,ª AfJfXf^f€ Ef~fLfVf“fO,â,»,ì¼,ìÄ•È,èˆ® ì,Ä¼ ÚfAfNfZfX,·,é,±,Æ,à,Ä,«é(fvf%ofCf}  
fŠ Efofbftf@,ðf fbfN,·,é,Æ AfTfEf“fh<@Ši,Ö,ì¼,lf [fX,©,ç,lfAfNfZfX,àuf fbfN,³,è,Ä,µ,Ü,² Bf fbfN,·,  
é Ê,Íœx ,ð o,·,±,Æ) B

fZfJf“f\_fŠ Efofbftf@,É,Í AfQ [f€ EfAfvfŠfP [fVf‡f“,ìŽÄ s’t A,-  
,è•Ö,µ Ä ¶,³,è,éçˆÊTfEf“fh,ð<L%—,µ,Ä,“,±  
,Æ,ª,Ä,«é BfZfJf“f\_fŠ Efofbftf@,É<L%—,³,è,½fTfEf“fh,Í AfAfvfŠfP [fVf‡f“,ì†,Ä A1%ñœÄ,è,lfCxf“fg,Æ  
,µ,Ä Ä ¶,·,é,±,Æ,à A^A±,µ,Ä,è•Ö,µ Ä ¶,³,è,éç< [fsf“fO EfTfEf“fh,Æ,µ,Ä Ä ¶,·,é,±,Æ,à%œÄ”\,Ä, ,é B

,³,ç,É AfZfJf“f\_fŠ Efofbftf@,Í A—  
Lœø,ÈTfEf“fh Efofbftf@ Ef f,š,æ,è,à‘â,«çfTfCfY,lfTfEf“fh,ð Ä ¶,·,é,±  
,Æ,ª,Ä,«é BfTfEf“fh Efofbftf@ Ef f,š,æ,è,à‘â,«çfTfEf“fh,ì Ä ¶,ÉfZfJf“f\_fŠ Efofbftf@,ðŽg—  
p,·,é,Æ AfZfJf“f\_fŠ Efofbftf@,Í Ä ¶,·,éTfEf“fh,ìè•”ª,ð<L%—,·,éLf... [ð—pˆÓ,·,é,æ,²,É,È,é B

## flufWfFfNfg Ef^fCfv

,Ü,, A'æê,îŠî—[“I,ÈflufWfFfNfg Ef^fCfv,ÍDirectSoundflufWfFfNfg,Å A,±,ê,ÍfTfEf“fh EfJ [fh,ì,±,Æ,Å, ,é BÍDirectSoundflufWfFfNfg,ð §Eä,µ,Ä,¢,é,ì,Í AIDirectSoundRf“f]

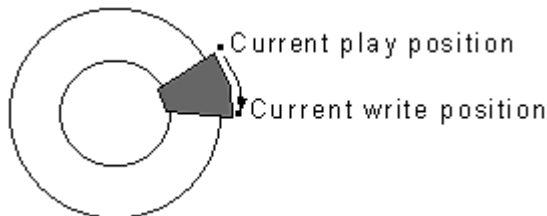
[flf“fg EfIfufWfFfNfg Ef,ff“(COM)fCf“f^ [ftfFfCfX,Å, ,é B,± ,ÍfCf“f^ [ftfFfCfX,Íf f\fbfh,É,æ,è AfAvfŠfP [fVf‡f“,©,çJ [fh,ì“Å «,ð•I X,.,é,±,Æ,ª,«,é B

‘æ“ñ,ÍflufWfFfNfg Ef^fCfv,ÍfTfEf“fh Efobftf@,Å, ,é BDirectSound,Ífvf%ofCf} fŠ EfTfEf“fh Efobftf@ A,.,æ,ÑfZfJf“f\_fŠ EfTfEf“fh Efobftf@,ðŽg—p,.,é Bfvf%ofCf} fŠ EfTfEf“fh Efobftf@,Æ,ÍŽÀ Û,É† [fU,ª,.,Žæ,ê,éfi [ffBfI Eff [f^,ì,±,Æ,Å, ,è AfZfJf“f\_fŠ EfTfEf“fh Efobftf@,Æ,Í,»,é,¼,ê,ì%¹E¹,ì,±,Æ,Å, ,é BDirectSound,Í Afvf%ofCf} fŠ EfTfEf“fh Efobftf@ A,.,æ,ÑfZfJf“f\_fŠ EfTfEf“fh Efobftf@,É¹,µ,Ä §Eä,ð s,¢ A,»,é,ç,Í IDirectSoundBufferfCf“f^ [ftfFfCfX“à,É, ,é B

fvf%ofCf}fŠ Efobftf@,Í A o—ÍEŽ® Afg [f^f Ef{fŠf... [fE ,È,Ç AfTfEf“fh,ì“Å «,ð §Eä,.,é B,Ü,½ A ì ¬,µ,½AfAvfŠfP [fVf‡f“,©,ç¼ Úfvf%ofCf} fŠ Efobftf@,Ö,ì ‘,«,± ,Ý,ð s,ì,é B,½,¾,µ,»,ì ê ±,Í ADirectSoundf~fLfVf“fO,Æfn [fhEfFfA EfAfNfZf%ofE [fVf‡f“,ì<@“\,Í—³Eø,É,È,é B,³,ç,É Afvf%ofCf}fŠ Efobftf@,Ö,ì¼ Ú“I,È ‘,«,± ,Ý,Í A¼,ÍDirectSoundfAvfŠfP [fVf‡f“,ì“® ì,ð—W,°,é,±,Æ,É,à,È,é B,µ,½,ª,ÄAfAvfŠfP [fVf‡f“,©,ç,ì ‘,«,± ,Ý,Í Afvf%ofCf}fŠ Efobftf@,É,Å,Í,È,fZfJf“f\_fŠ Efobftf@,Ö s,µ,ü,ª,æ,¢ BfZfJf“f\_fŠ Efobftf@,Å, ,è,Í A [fhEfFfA,³E ŽŽ ,Å,Å,¢,È,¢<@“”,ðfGf~f...fE [fg,.,é,± ,Æ,ª,Å,« A,³,ç,ÉfTfEf“fh EfJ [fh,ðfVfXfefE“à,ì¼,ÍfAvfŠfP [fVf‡f“,Æ,«—L,.,é,±,Æ,à,Å,«,é,©,ç,Å, ,é B

fZfJf“f\_fŠ Efobftf@,Æ,ÍfAvfŠfP [fVf‡f“,Žg—p,.,éEÄ X,ì%¹E¹,ì,±,Æ,Å, ,é B,Ð,Æ,Å,ÍfAvfŠfP [fVf‡f“,©,ç A,»,é,¼,ê,Ífobftf@,ðEÄ X,É Å ¶ E¹ž~.,,é,± ,Æ,ª,Å,«é BDirectSound,Í Å ¶†,Ífobftf@,ð,.,×,Äfvf%ofCf}fŠ Efobftf@ ã,Äf~fLfVf“fO,µ A,»,Ífvf%ofCf} fŠ Efobftf@,ðfTfEf“fh EfffofCfX,Ö o—Í,Å,«,é BfZfJf“f\_fŠ Efobftf@,Ífn [fhEfFfA A,à,µ,-,ÍfVfXfefE Efobftf@,Ö i“³,¹,é,± ,Æ,ª,Å,«,é Bfn [fhEfFfA Efobftf@,ÍfTfEf“fh EfffofCfX ã,Äf~fLfVf“fO,³,è,é,ì,Å AfVfXfefE ã,ì ^— ,È,º%¹S,ð,©, -,é,±,Æ,ª,È,¢ B

fZfJf“f\_fŠ EfTfEf“fh Efobftf@,É,Í AfXf^fefBfbfN EfTfEf“fh Efobftf@ A,.,æ,ÑfXfgfŠ [fE EfTfEf“fh Efobftf@,ì,QŽî—p,ª, ,é BfXf^fefBfbfN EfTfEf“fh Efobftf@,Æ,Í AfTfEf“fh Eff [f^S¹,ðŽû—e,.,éofobftf@,Å, ,é BfXfgfŠ [fE EfTfEf“fh Efobftf@,Æ,ÍfTfEf“fh,ìê•,¾, -,ðŽû—e,.,éofobftf@,Å, ,è A,»,ì, ½,B,É Å ¶†,ÍfAvfŠfP [fVf‡f“,©,ç â,ì, V,µ,¢ff [f^,ðfobftf@,Ö ‘,«,±,B•K—v,ª, ,é BfTfEf“fh<@Ší ã,ÍfTfE f“fh Ef f, fŠ,ª—L Eø,Å, ,è,Í A DirectSound,Í,»,é,ð—~p,µ,ÄfXf^fefBfbfN Efobftf@,ðŠm•Ü,µ,æ,µ ,Æ,.,é BfTfEf“fh<@Ší ã,ÉŠm•Ü,³,è,½fobftf@,Í Afn [fhEfFfA ã,Äf~fLfVf“fO,³Š®—¹,µ,Ä,¢ ,é,½,ß A Å ¶†,ÉfVfXfefE ^— ŽŽŠÖ,ð Å¹,.,é,±,Æ,ª,È,¢ B e %¹,È,Ç,ì,- ,èÖ,µŽg,ì,è,éTfEf“fh,É,Í AfXf^fefBfbfN Efobftf@,ìŽg—p,ª Å“K,Å, ,é B fAvfŠfP [fVf‡f“,Í AfTfEf“fh Efobftf@“à,É, ,éJfEef“fg EfvfEfc Ef| fWfVf‡f“,ÆJfEef“fg Ef%ofCfE Ef|fWfVf‡f“,Æ,¢,µ,Ó,½,Å,ì d—v,Èf| fWfVf‡f“,Å“® ì,.,é BfJfEef“fg EfvfEfc Ef| fWfVf‡f“,Í Afobftf@,ì†,ÍfTfEf“fh,ì Å ¶,³JŽn,³,è,éÊ¹u,ðŽ!,µ,Ä,¢,é BfJfEef“fg Ef%ofCfE Ef| fWfVf‡f“,Í Afobftf@,ì†,Å¹S,Éff [f^,ð•I X,Å,«,éÊ¹u,ðŽ!,µ,Ä,¢,é BŽŽ,ì },ì,±,ì,Ó,½,Å,ìf| fWfVf‡f“,ìŠÖEW,ðŽ!,µ,Ä,¢,é B



DirectSoundfobftf@,ÍŠT”O“I,É,ÍfŠf“fO ó,É,È,Å,Å,¢,é,ª AŽÀ Û,É,Í¹A¹,µ,½fŠfjA,Èf f,fŠ,Å ì ¬,³,è,Å,¢ ,é ifŠf“fO Efobftf@ j BfJfEef“fg EfvfEfc Ef|fWfVf‡f“,Ífobftf@,ì ÅEä,Ü,Å,.,é,ÆŠJŽnÊ¹u,Ü,Å—B,é B ,±,ì Í,Å,Í ADirectSound A,.,æ,Ñ DirectSoundBufferflufWfFfNfg,É,Å,¢,Ä,Æ AfAvfŠfP [fVf‡f“,É,.,-,é,± ,é,çIfufWfFfNfg,ì—~p•û—@,ð%ð à,.,é B

DirectSoundflufWfFfNfg

DirectSoundBuffer flufWfFfNfg



## DirectSoundIfufWfFfNfg

$fVfXfef\epsilon, \acute{E}fCf^{\text{“}fXfg\ [f\langle,^3,\acute{e},\ddot{A},\text{¢},\acute{e},\rangle,\acute{e},\frac{1}{4},\acute{e},\grave{I}fTfEf^{\text{“}fh\ EfffofCfX,\acute{I}DirectSoundIfufWfFfNfg,\acute{A},\text{,}\acute{e}\ A$   
IDirectSoundCf^  $[ftfFfCfX,\acute{\partial}'\acute{E},\mu,\ddot{A}fAfNfZfX,\text{^} s,\acute{I},\acute{e},\acute{e}\ BDirectSoundIfufWfFfNfg,\grave{I}\ \grave{I}\ \neg,\acute{I}$   
DirectSoundCreateŠÖ ”,ðŒÄ,Ñ o,μ,Ä s,± B,±  
,İÖ ”,İ•Ö'l,Æ,μ,Ä A,Đ,Æ,Ä,İIDirectSoundCf^  $[ftfFfCfX,\acute{\partial}\cdot\acute{O},\cdot\ B$   
DirectSoundEnumerateŠÖ ”,ðŒÄ,Ñ o,.,Æ AfVfXfefϵ,ÉfCf^fXfg  $[f\langle,^3,\acute{e},\ddot{A},\text{¢},\acute{e}DirectSoundIfufWfFfNfg,\acute{\partial}$ —  
ñ<“,.,é B

Windows,İf}f<f^fXfN EfIfyfŒ [fefBf^fo EfVfXfefϵ,Ä, ,é Bf† [fU,^è“x,É•ı ”,İfvf fOf%ofϵ,ð‘—  
,ç,^1 A,»,ê,ç,.,×,Ä,ÉfŠf\ [fX,ð<□—L,^3,^1,½,¢,Æ l,ı,é,İ,İ“—R,Ä, ,é BDirectSoundIfufWfFfNfg,İ“ü—  
İftfH [fJfX,İ'Ç Ö,ð s,Ä,ÄfTfEf^fh EfffofCfX,ð<□—L,.,é BDirectSoundIfufWfFfNfg,İ A,»,ê,¼,ê,^aS“—  
,.,éAfvfŠfP [fVf‡f“,^“ü—İftfH [fJfX,ð“¾,½ŽŽ,É,¾,^%o^1,ð—Ä,ç,· B, ,éAfvfŠfP [fVf‡f“,^“ü—  
İftfH [fJfX,ðŽ,±,Æ A,»,İfIfufWfFfNfg,©,ç,İfI [ftfBfI EfXfgfŠ [fϵ,İf~f...  
[fg,^3,ê,é B•ı ”,İfAfvfŠfP [fVf‡f“,^“^,¶fTfEf^fhffofCfX,É'İ,.,é,»,ê,¼,ê,İDirectSoundIfufWfFfNfg,ð İ ¬,.,é,  
±,Æ,à%oÄ”,Ä, ,é BfAfvfŠfP [fVf‡f“ŠÖ,Ä“ü—İftfH [fJfX,^•İ,ı,é,Æ AfI [ftfBfI o—  
İ,İŽ©“@“L,É,»,İfAfvfŠfP [fVf‡f“,İfXfgfŠ [fϵ,©,çŽŸ,İfAfvfŠfP [fVf‡f“,İfXfgfŠ [fϵ  
,Ö Ø,è'Ö,ı,é BŒ%oÊ“L,É AfAfvfŠfP [fVf‡f“,İ“ü—  
İftfH [fJfX,^•İ,ı,é,½,Ñ,Éfobftf@,İ Ä ¶ E'âŽ~,ðŒJ,è•Ö,·K—v,^,È,,È,é B

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## Note

DirectSound,İfwfbf\_ftf@fCf<,İIDirectSound,İf f\fbfh,ÆIDirectSoundBufferCf^  $[ftfFfCfX,\acute{A}'\acute{e}\langle,^3,\acute{e},\frac{1}{2}\ AC\acute{E}\frac{3}{4}\acute{E}\hat{e}$   
İf}fNf 'è<,ðŠÜ,ñ,Ä,¢,é B

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## DirectSoundBufferIfufWfFfNfg

,D,Æ,Â,D,Æ,Â,lfTfEf“fh,“,æ,ÑfI [ffBfI EfXfgfŠ [f€,ÍDirectSoundBuffer,Â, ,è AfAfvfŠfP [fVf±f“,  
ÍIDirectSoundBufferCf“f^ [ftFfCfX,ð'Ê,µ,Ä,±  
,è,ç,Ö,lfAfNfZfX,ð s,□ BIDirectSound::CreateSoundBuffer f\fbfh,ðEÄ,Ñ o,.,Æ ADirectSoundBufferIfufWfFfNfg,ð ì ¬,.,é,±,Æ,ª,Ä,«,é B,±,ì•Ö'l,ÍIDirectSoundBufferCf“f^ [ftFfCfX,Â, ,é B

,Ü,½ AfAfvfŠfP [fVf±f“,ÍfVf%ofCf}  
fŠ EfTfEf“fh Efofbftf@,ÆfZfJf“f fŠ EfTfEf“fh Efofbftf@,ð ì ¬,.,é,±,Æ,ª,Ä,«,é B» Ý,ì,Æ,±  
,è,Í A,D,Æ,Â,ÍDirectSoundIfufWfFfNfg,Ê,Â,« A,D,Æ,Â,lfvf%ofCf}fŠ Efofbftf@,µ,©Ž ,Â,±,Æ,ª,Ä,«,É,¢ B

fAfvfŠfP [fVf±f“,É,æ,éTfEf“fh Efofbftf@,Ö,iff [f^,ì ‘,«,±,Ý,Í A,Ü,,fofbftf@,ðf fbfN,µ,Ä,©,ç ‘,«,±  
,Ý,ð s,¢ A,»,lEä,Éfofbftf@,lf fbfN,ð%ð æ,.,é Bfofbftf@,ðf fbfN,.,é,É,ÍIDirectSoundBuffer::Lockf f\fbfh,  
ðEÄ,Ñ o,· B,±,lf f\fbfh,lf fbfN,³,è,½fofbftf@,lf  
fCf“f^,ð•Ö,· Bfofbftf@,ªf fbfN,³,è,é,Æ AfAfvfŠfP [fVf±f“,É,æ,éI [ffBfI Eff [f^,lfobftf@,Ö,lfRfs [,ª  
%oÄ”,É,É,é Bfofbftf@,Ö,iff [f^ ‘,«,±,Ý I—Eä Afobftf@,lf fbfN,ð%ð æ,µ,Ä ‘,«,±,Ý‘€ ì,ðŠ®—  
¹,.,é Bfofbftf@,lf fbfN,ð%ð æ,.,é,É,ÍIDirectSoundBuffer::Unlockf f\fbfh,ðEÄ,Ñ o,· B

fVf%ofCf}fŠ EfTfEf“fh Efofbftf@,É,ÍŽÀ Ü,É•,«Žæ,è%Ä”,Èff [f^,ªSi”[,³,é B\_  
IDirectSoundBuffer::Playf f\fbfh,ðŽg—p,.,é,±  
,Æ,É,æ,è AfZfJf“f\_fŠ EfTfEf“fh Efofbftf@,©,ç,ìfI [ffBfI Ä ¶,à%Ä”,Ä, ,é B,±,lf f\fbfh,ðŽg—  
p,.,é,Æ ADirectSound,ÍZfJf“f\_fŠ Efofbftf@,ðfVf%ofCf}  
fŠ Efofbftf@,Öf~fLfVf“fO,.,é Bf~fLfVf“fO,.,é,É,¢ è ± A  
IDirectSoundBuffer::Play,Í,P%ñ,¾,~fofbftf@,ð Ä ¶,µ,Ä ÅEä,Ä'âŽ~,.,é B,±,lf f\fbfh“à,É  
DSBPLAY\_LOOPINGftf%ofO,ðŽw'è,.,é,Æ A'A'±f< [fv,ì't,ÅEJ,è•Ö,µfTfEf“fh,ð Ä ¶,Ä,«,é B Ä ¶'†,lfobftf@  
,ð'âŽ~,.,é,É,ÍIDirectSoundBuffer::Stopf f\fbfh,ðŽg—p,.,é B

fTfEf“fh Efofbftf@,²,Æ,lfAfvfŠfP [fVf±f“,É,æ,éŽg,¢ª,¬,Í AfTfEf“fh,ì Ä ¶ŽžŠÖ,ÅE~è,.,é BfTfEf“fh,ì',³,ª  
”•b'ö“x,Ä, ,è,Í AfXf^fefBfbfN EfTfEf“fh Efofbftf@,ÖfTfEf“fh,ðŠi”[,.,é,±  
,Æ,ª,Ä,«,é B,»,è,æ,è,à',¢fTfEf“fh,Ä, ,è,Í AfXfgfŠ [f€ EfTfEf“fh Efofbftf@,ðŽg—p,.,é,Æ,æ,¢ B

fXf^fefBfbfN Efofbftf@,ðŽ ,ÂDirectSoundBufferIfufWfFfNfg,ð ì ¬,.,é,É,Í A  
IDirectSound::CreateSoundBuffer f\fbfh,ðŽg—p,µ,Ä A DSBCAPS\_STATICftf%ofO,ð~¾L,.,é (,±  
,lfTf%ofO,ðŽw'è,µ,É,¬,è,Í AfXfgfŠ [f€ Efofbftf@,ª ì ¬,³,è,é) B DirectSound,Í AfTfEf“fh<@Ši,ª—  
LÆø,Ä, ,è,Í A,»,ì<@Ši ä,É, ,éTfEf“fh Ef f,fŠ,ðŽg—  
p,µ,ÄXf^fefBfbfN Efofbftf@,Ö,ìŠi”[,ðŽŽ,Ý,é BfTfEf“fh<@Ši ä,É<L%~³,è,½fofbftf@,Íf~fLfVf“fO,ªfn [fhfE  
FFfA ä,Ä s,í,è,é,½,ß A Ä ¶'†,ÉCPUfPf [,ð Ä”i,µ,È,¢ BfGf“fWf“%o¹ AŠ½ ° A,â,¶,È,Ç,ì,-  
,è•Ö,µŽg,í,è,éTfEf“fh,Í AfXf^fefBfbfN Efofbftf@—p,Æ,µ,Ä Ä“K,Ä, ,é B

fn [fhfEfFfA Ef~fLfVf“fO,ðfTf] [fg,µ,½ ,‘~fofX iPCI,ì,æ,µ,È j ä,lfTfEf“fh EfffofCfX,Ä, ,è,Í AfXfgfŠ  
[f€ Efofbftf@,ð~—p,.,é,±,Æ,à%Ä”,Ä, ,é B,µ,©,µfRf“fsf... [f^,ª ,‘~fofX,ðŽ ,Ä,Ä,¢  
,È,¢ è ±,Í Afn [fhfEfFfA Ef~fLfVf“fO,ì—~\_,æ,èff [f^“]—,ìfI [fo [fwfbfh,ì,Ü,µ,ª,ª,«,.,È,Ä,Ä,µ,Ü,□ B  
DirectSound,Í AfTfEf“fh EfffofCfX,ª ,‘~fofX ä,É, ,é è ±,É,¾,~fXfgfŠ [f€ Efofbftf@,ðfn [fhfEfFfA ä,É  
ì ¬,.,é B

**f\ftfgfEfFfA EfGf~f...fŒ [fVf‡f“**

DirectSound,Í A, ,éTfEf“fh EfJ [fh,ªŽÀ Û,É,ÍfTf| [fg,µ,Ä,¢,È,¢‹@”\,ð Af\ftfgfEfFfA,ÂfGf~f...  
fŒ [fg,Â,«,é B **IDirectSound::GetCapsf** f\fbfh,ðŽg—  
p,·,ê,Î AfAfvfŠfP [fVf‡f“,©,çDirectSound,É‘Î,µ,ÄfI [ffBfI‹@Ší,İ‹@”\,ð•ñ ,·,é,æ,▯—v‹ ,Â,«,é B,±  
,ê,É,æ,Á,Ä AfnfCfpftfH [f}f“fX,İfQ [f€,Á,»,İfI [ffBfI,İ“Á «,ð²,×,é,Æ,¢,Á,½,±,Æ,%oÂ”\,Á, ,é B

## ffofCfX Efhf%oCfo

DirectSound,Í AfI [ffBfI EfffofCfX Efhf%oCfo,ªŽÀ‘•,·,éCf“f^ [ftFfCfX A DirectSound HAL,ð—p,¢  
,ÄfTfEf“fh<@Ší,ÖfAfNfZfX,·,é B,±,ê,ÍWindows,ÌfI [ffBfI EfffofCfX Efhf%oCfo ,Ä, ,è AHAL,ðfTf|  
[fg,·,é,½,ß,É•Ĭ X,ð%Á,!,ç,ê,Ä,¢,é B ,±  
,Ìfhf%oCfo EfA [fLfefNf`ff,Í AÆ»“¶,·,éWindowsfx [fX,ÌfAfvfŠfP [fVf‡f“,É%°ÊÆÝŠ· «,ð’ñ<Ÿ,·,é BDirectS  
ound HAL,ª’ñ<Ÿ,·,é<@”\,Í AŽŸ,ÌÊ,è,Ä, ,é B

fI [ffBfI<@Ší,É‘Ĭ,·,éRf“fgf [f<,ÌŽæ“¾,Æ%ð•ú

fI [ffBfI<@Ší,Ì «”•]‰

fn [fhfEfFfA,ª—LÆø,È ê ‡,Ì“Á’è,Ì‘€ ì,ÌŽÀ s

fn [fhfEfFfA,ª³Æø,È ê ‡,Ì‘€ ì—v< ,Ì<”Ũ

ffofCfX Efhf%oCfo,Íf\ftfgfEfFfA EfGf~f...fÆ [fVf‡f“,ð^ê Ø s,í,È,¢ Bfn [fhfEfFfA,Ì «”\  
,ðDirectSound,Ö’Ê’m,µ ADirectSound,©,ç,Ì—v< ,ðfn [fhfEfFfA,É“^,!,é,¾,¯,Ä, ,é B,à,µ—  
v< ,³,ê,½‘€ ì,ðfn [fhfEfFfA,ªŽÀ s,Ä,«„È,¢ ê ‡ ADirectSound,ª,»„ê,ðfGf~f...fÆ [fg,·,é B

DirectSound,ªfn [fhfEfFfA,Æ,ÌÆð M,ð s,ªŽŽ,ÉDirectSoundfhf%oCfo,ª—LÆø,Ä,È,¢ ê ‡,É,Í A•W € ,ÌWindows  
95 AWindows NT® AWindows 3.1,ÌfI [ffBfI EfffofCfX Efhf%oCfo,ðŽg—p,·,é B,±,Ì ê ‡ ADirectSound,Ì<@”\  
,Íf\ftfgfEfFfA EfGf~f...fÆ [fVf‡f“,É,æ,è,·,×,Ä—  
LÆø,Æ,È,é,ª Afn [fhfEfFfA,ÌfAfNfZf%oCfÆ [fVf‡f“,Í•s‰Â”\,Æ,È,é B

‘<sup>1</sup>’<sup>2</sup>fƎfxf<

DirectSound,Í AfTfEf“fh EfffofCfX,É‘Í,µ,Ä•W € A—D æ A”r¼ A ‘,«±,Ý—  
D æ,l4,Ä,Ì‘<sup>2</sup>fƎfxf<,ð‘è‘,·,é BfAfvfŠfP [fVf‡f“,Í **IDirectSound::SetCooperativeLevel** f\fbfh,ðŽg—  
p,µ,ÄfTfEf“fh EfffofCfX,Ì‘<sup>2</sup>fƎfxf<,ð Ý‘è,·,é B,Ü,½ A ‘,«±,Ý—D æ,ð æ,-  
,·,×,Ä,Ì‘<sup>2</sup>fƎfxf<“à,ÉfOf [fof< EfTfEf“fh Efofbftf@ A,à,µ,-  
,ÍfXfefBfbfL [ EfTfEf“fh Efofbftf@,ð Ì ¬,·,é±,Æ,ª,Ä,«é B

u•W € v‘<sup>1</sup>’<sup>2</sup>fƎfxf<,Í,à,Ä,Æ,à‰°Ê,ÌfƎfxf<,Ä,·,é B•W €fƎfxf<,Ä,Í A  
**IDirectSoundBuffer::SetFormat** A,·,æ,Ñ**IDirectSound::Compact** f\fbfh,ÌEÄ,Ñ o,µ,Í•s‰Ä”,Ä,·,é B  
,³,ç,É AfAfvfŠfP [fVf‡f“,Ä,Ìfvf‰ofCf}fŠ Efofbftf@,Ö,Ì ‘,«±,Ý,ª,Ä,«É,¢ B,±  
,Ì‘<sup>2</sup>fƎfxf<,ÄfAfvfŠfP [fVf‡f“,ðŽg—p,µ,Ä,¢,éŽŽ,ÉfXf€ [fY,Èf^fXfN Ø,è‘Ö,!,ð s,□,É,Í A22 kHz,Ìfvf‰ofCf}  
fŠ Efofbftf@ AfXfefƎfIfTfEf“fh A,»,µ,Ä8ftrfbfgfTf“fvfŠf“fO,ÌftfH [f}fbfg,ðŽg—p,·,é B

DirectSoundIfufWfFfNfg,ð u—D æ v‘<sup>1</sup>’<sup>2</sup>fƎfxf<,ÄŽg—  
p,·,é,Æ AfAfvfŠfP [fVf‡f“,Í Afn [fhEfFfA Ef~LfVf“fO,È,Ç,Ìfn [fhEfFfA EfŠf\ [fX,É‘Í,µ,Ä‘æ‘è<‰,Ì—  
D æ“x,ðŽ ,Ä,±,Æ,ª,Ä,« A**IDirectSoundBuffer::SetFormat** ,Æ **IDirectSound::Compact**,ðEÄ,Ñ o,·,±,Æ,ª,Ä,«é B

DirectSoundIfufWfFfNfg,ð u”r¼ v‘<sup>1</sup>’<sup>2</sup>fƎfxf<,ÄŽg—p,·,é,Æ AfAfvfŠfP [fVf‡f“,Í—  
D æfƎfxf<,É,·,é,·,×,Ä,Ì“ÁE,ðŽ ,Ä,±,Æ,ª,Ä,«é B,µ,©,µ A,»,ÌfAfvfŠfP [fVf‡f“,“ü—  
ÍftfH [fJfX,ðŽ ,Ä è ‡ A,»,Ìfobftf@,Ì,Y,©,ç,µ,©‰!,ª,±,!,É,¢ B“ü—  
ÍftfH [fJfX,ÌŠl“¾Eä ADirectSound,ÌfAfvfŠfP [fVf‡f“,Ä—D æ,³,è,éwaveftfH [f}fbfg,ðfŠfXfgfA,·,é B—  
D æ,³,è,éwaveftfH [f}fbfg,Æ,Í A**IDirectSoundBuffer::SetFormat**,ÌEÄ,Ñ o,µ,Ä,à,Ä,Æ,à Ä<ß,É‘è<‘,³,è,½,à,Ì,±  
,Æ,Ä,·,é (DirectSound,Í—D æfƎfxf<,ÉŠÖEW,È,wave,ðfŠfXfgfA,·,é) B

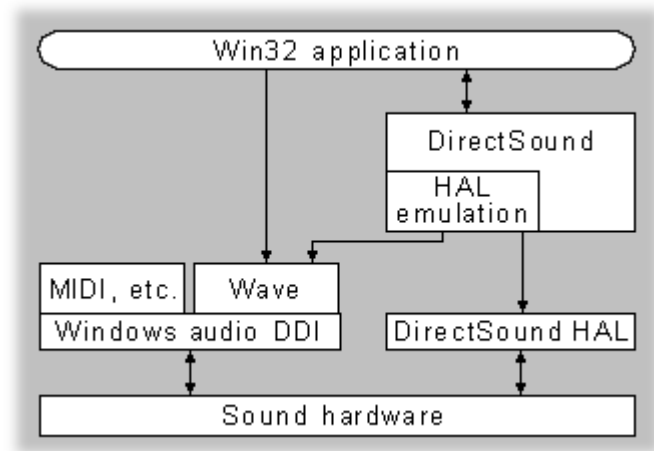
Ä,à ãÊ,Ì‘<sup>2</sup>fƎfxf<,Í u ‘,«±,Ý—D æ v,Ä,·,é B DirectSoundIfufWfFfNfg,ð ‘,«±,Ý—D æ‘<sup>1</sup>’<sup>2</sup>fƎfxf<,ÄŽg—  
p,·,é,Æ AfTfEf“fh Efofbftf@,Öf\_fCfƎfNfg,ÉfAfNfZfX,Ä,«é B,±  
,Ìf, [fh,Ä,Í AfAfvfŠfP [fVf‡f“,ª**IDirectSoundBuffer::Lock** f\fbfh,ð—p,¢,Äfobftf@,ðf fbfn,µ Afvf‰ofCf}  
fŠ Efofbftf@,É‘¼ Ü ‘,« ž,b,±,Æ,É,È,é B,±,Ì Ü AfZfJf“f\_fŠ Efofbftf@,Ì Ä ¶,Í,Ä,«É,¢ B

‘,«±,Ý—D æ‘<sup>1</sup>’<sup>2</sup>fƎfxf<,É Ý‘è,³,è,Ä,¢,éfAfvfŠfP [fVf‡f“,“ü—  
ÍftfH [fJfX,ðŽæ“¾,·,é,Æ A‘¼,ÌfAfvfŠfP [fVf‡f“,ÌfZfJf“f\_fŠ Efofbftf@,Í,·,×,Ä‘äŽ~,³,è Aff [f^,ÍŽ,·,í,è,é(±  
,è,ç,Ìfobftf@,ð Ä,Ñ Ä ¶,³,¹,é,É,Í A**IDirectSoundBuffer::Restore** f\fbfh,ÄfŠfXfgfA,ð s,□•K—v,ª,·,é) B,±  
,ÌfAfvfŠfP [fVf‡f“,“ü—ÍftfH [fJfX,ðŽ,!,Í Afvf‰ofCf}  
fŠ Efofbftf@,Ìff [f^,ÍŽ,·,í,è,é,ª AfAfvfŠfP [fVf‡f“,“ü—ÍftfH [fJfX,ð ÄŽæ“¾,·,è,ÌfŠfXfgfA,à‰Ä”,Ä,·,é B

‘,«±,Ý—D æfƎfxf<,Í Afvf‰ofCf}fŠ Efofbftf@,ð Ì ¬,·,é,½,ß,Ì•K—  
v â‘Î ðE ,Ä,Í,È,¢ B,µ,©,µ Afvf‰ofCf}  
fŠ Efofbftf@“à,ÌTf“fvfŠf“fO EfI [ffBfL,ÖfAfNfZfX,·,é,½,ß,É,Í AfAfvfŠfP [fVf‡f“,ª ‘,« ž,Ý—  
D æfƎfxf<,É Ý‘è,³,è,Ä,¢,é•K—v,ª,·,é B,±,ÌfƎfxf<,ÉfZfbfg,³,è,Ä,¢,È,¢  
,Æ A,½,Æ, **IDirectSoundBuffer::GetFormat**, **IDirectSoundBuffer::SetFormat**,  
**IDirectSoundBuffer::GetVolume**,È,Ç,Ìf f\fbfh,ÌEÄ,Ñ o,µ,É ¬E÷,µ,½,Æ,µ,Ä,à A **IDirectSoundBuffer::Lock**  
A,·,æ,Ñ **IDirectSoundBuffer::Play**,ÌEÄ,Ñ o,µ,É,ÍŽ,·,s,·,é B

**fvfxfef€l,İ“ ‡**

ŽŸ,İ },İDirectSound,Æ,»,İ¼,İfvfxfef€fI [ffBfI EfRf“f| [flf“fg,Æ,İŠÖEW,ðŽ,İ,µ,Ä,€,é B



DirectSound HAL—p,É ì,ç,ê,½fTfEf“fh EfffofCfX Efhf%oCfo,Í AfI [ffBfI Ä ¶Žž,É Ä „,İ”—Í,ð”-Šö,.,é BfffofCfX Efhf%oCfo,İHAL,İ<@”\,ðŠe XŽÄ s,µ,ÄfTfEf“fh<@Ší,İfA [fLfefNf`ff,Ö“-«,©,“ A,»,İ<@”\ «,ÆfpftfH [f}f“fX,ð”ø,« o. BHAL,İfn [fhEfFfA,İ”\—Í,ðDirectSound,Ö,Æ’m,ç,¹ ADirectSound,©,ç,İ—v< ,ðfn [fhEfFfA,Ö,Æ““,é B,à,µfn [fhEfFfA,ª—v< ,É%ž,İ,é”\—Í,ª,É,€ ê ‡,İ ADirectSound,ªfvtfgfEfFfA,ÄfGf~f...f€ [fg,.,é B

DirectSoundfhf%oCfo,ª,É,€ ê ‡,Ä,àAfvfŠfP [fVf‡f“,Ä,İDirectSoundŠÖ ”,İžg—p,İ%Ä”\,Ä, ,é BfTfEf“fh<@Ší,É DirectSoundfhf%oCfo,ªfCf“fXfg [f<,³,ê,Ä,€,É,€ ê ‡ ADirectSound,Žg—p,.,é,İ,İHALfGf~f...f€ [fVf‡f“ Ef€fCf,,Ä, ,é B,±,İf€fCf,,Ä,İWindowsf}f<f fffBfA,İfEfF [fuftfH [f€ EfI [ffBfIŠÖ ”,ðŽg—p,µ,Ä,€,é B

DirectSoundŠÖ ”,ÆfEfF [fu EfI [ffBfIŠÖ ”,ð—p,€ ,é,Æ AfTfEf“fh<@Ší,İfEfF [fuftfH [f€ EfI [ffBfI,Ö,İfpfX,ÉT’ðŽ^,ª—^,İ,ç,ê,é B ,Đ,Æ,Ä,İfffofCfX,Ä,İ A“ê“x,ÉfAfNfZfX,ð”ñ<Ÿ,.,éfpfX,İ,Đ,Æ,Ä,Ä, ,é BfEfF [fuftfH [f€ EfI [ffBfI Efhf%oCfo,ª,Đ,Æ,Ä,İfffofCfX,ðŠ,,è“—,Ä,é ê ‡ ADirectSound,Ä,İ“fffofCfX,Ö,İŠ,,è“—,Ä,İŽ,”s,.,é B“—l,É ADirectSound,ª,Đ,Æ,Ä,İfffofCfX,ðŠ,,è“— ,Ä,é,Æ AfEfF [fuftfH [f€ EfI [ffBfI Efhf%oCfo,Ä,İfffofCfX,İŠ,,è“—,Ä,İŽ,”s,.,é B

fAfvfŠfP [fVf‡f“,ª—¼•ü,İŠÖ ”,ðŽg—p,.,éK—v,ª, ,éŽž,É,Í A,»,ê,¼,ê,İŠÖ ”,ð€ð€Ý,Éžg—p,.,é,İ,æ,€ B,Ä,Ü,è A **DirectSoundCreateŠÖ** ”,ÄfTfEf“fh Efn [fhEfFfA,ðfI [fvf“,µ A **IDirectSound**,”,æ,Ñ**IDirectSoundBufferCf**“f^ [ftfFfCfX,ÄfTfEf“fh,ð Ä ¶,µ A **IDirectSound::Release**f fVbfh,Ä“fn [fhEfFfA,ðfNf [fY,.,é,Æ,€,Ä,½,±,Æ,ª%Ä”\,Ä, ,é BfTfEf“fh Efn [fhEfFfA,ª—L€ø,Æ,É,é,İ,İ AWin32 SDK,İfEfF [fuftfH [f€ EfI [ffBfIŠÖ ”,É,æ,é B

,Ó,½,Ä,İTfEf“fh EfffofCfX,ªfvfxfef€,ÉfCf“fXfg [f<,³,ê,Ä,€,é ê ‡,à,Ü,½“—l,É ADirectSoundŠÖ ”,ÆfEfF [fuftfH [f€ EfI [ffBfIŠÖ ”,İ,Ç,¿,ç,ð—p,€ ,Ä,à AfAfvfŠfP [fVf‡f“,İ,»,ê,¼,ê,İfffofCfX,É“Æ—ş,µ,½fAfNfZfX,ª%Ä”\,Ä, ,é B

, ,éŽí,İAfvfŠfP [fVf‡f“,É,““éEfF [fuftfH [f€ EfI [ffBfIŠÖ ”,İžg—p,Í A”ñ í,É—L€ø,È%øð€^—@,Æ,É,é,±,Æ,ª,µ,İ,µ,İ, ,é B,½,Æ,İ A **PlaySound**,”,æ,Ñ**WaveOutŠÖ** ”,İžg—p,É,æ,Ä,Ä A“±“ü%¹,É,Ç,İP”è,İTfEf“fh,âfI [ffBfI EfXfgfŠ [f€,İ Ä ¶,ª—e^Ö,É,È,é B

#### Note

Microsoft Video for Windows,İ A€» Ýavi(audio visual interleaved)ftf@fCf<,İfI [ffBfI Efgf%oBfN,ð o—Í,.,é,İ,ÉfEfF [fuftfH [f€ EfI [ffBfIŠÖ ”,ðŽg—p,µ,Ä,€,é B,»,İ,½,B AfAfvfŠfP [fVf‡f“,ªDirectSound,ðŽg—p,µ,Ä,©,çaviftf@fCf<,ð Ä ¶,µ,æ,ª,Æ,µ,Ä,à A,»,İfI [ffBfI Efgf%oBfN,İ Ä ¶,Ä,«,É,€ B“—l,É Aaviftf@fCf<,ð Ä ¶,µ,Ä,©,çDirectSoundIfufWfFfNfg,ð ì ¬,µ,æ,ª ,Æ,µ,Ä,à A ì ¬Žž,İŠÖ ”,İfGf%o [,ð•Ö,· B

€» Ý,İ,Æ,±

,è,Ä,İ AfAfvfŠfP [fVf‡f“,ªDirectSoundIfufWfFfNfg,ð%øð“ú,.,é,½,B,É,Í Aaviftf@fCf<,İ Ä ¶“O,É**IDirectSound::**

**Release,** ÌĈÄ,Ñ o,μ,ð s,▯ BfAfvfŠfP [fVf‡f“,Ífrrffl,Ì Ä ¶ I—  
'Ĉã,ÉDirectSoundIfufWfFfNfg,Æ,»,ìDirectSoundBufferIfufWfFfNfg,Ì Ä ì ñ,Æ Ä Ý'è,ð s,,é B

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**DirectSoundŠT—v**

,±,ì ß,Å,ÍDirectSoundfRf“f| [flf“fg,îê”Ê“l,È î•ñ,É,Â,¢,Ä%ø ò,·,é B

DirectSound,î“Á’Ÿ

3DfTfEf“fh

DirectSound,İ“Á’Ÿ

,±,ì ß,Å,ÍDirectSound,ìfI [ffBfI Ef~fLfVf“fO,Æ Afn [fhfEfFfA EfAfNfZf%ofŒ [fVf±f“,ð—~—p,µ,½”\—  
Í,É,Â,¢,Ä%ð à,·,é B,³,ç,É AfAfvfŠfP [fVf±f“,ðffUfCf“,·,é Ū,ìfvf%ofCf}  
fŠ EfTfEf“fh Efofbftf@,Ö,İ ‘,«,±,ÝŽž,É l—¶,·,×,«“\_,É,Â,¢,Ä,à%ð à,·,é B

f~fLfVf“fO

fn [fhfEfFfA EfAfNfZf%ofŒ [fVf±f“

fvf%ofCf}fŠ Efofbftf@,Ö,İ ‘,«,±,ÝfAfNfZfX



*f~fLfVf“fO*

DirectSound,ÄŽg—p•p“x,ª,à,Á,Æ,à ,ç,ì,Í A,í,,©,ÈfCefCfef“fV,ÂfI [ffBfI Ef~fLfVf“fO,ð s,«@”\,Á, ,é BfCefCfef“fV,Æ,Í AfTfEf“fh Efofbftf@,ª ì ¬,³,ê,Ä,©,çfXfs [fJ,Ä Ä ¶,³,ê,é,Ü,Ä,É,©,©,éŽžŠÔ,Ì,±,Æ,Ä, ,é BfAf vfŠfP [fVf‡f“,Í A,Ð,Æ,Ä,Ü,½,Í,»,êÈ ã,ìfZfJf“f fŠ EfTfEf“fh Efofbftf@,ð ì ¬,µ,Ä,»,ê,ç,ÉfI [ffBfI Eff [f^,ð ‘,«,±,Ð,± ,Æ,ª,Ä,«,é B,»,µ,Ä A Ä ¶ A,Ü,½,Í’âŽ~,·,éfofbftf@,ì‘ð,ª,Ä,«,é BDirectSound,Í Ä ¶†,ìfofbftf@,ð,·,×,Äf~fLfVf“fO,·,é B,»,µ,Ä Af~fLfVf“fO,µ,½E:‰Ê,ð AfTfEf“fh<@Ší,Ö,ìfI [ffBfI Eff [f^,ìY<<,ð,µ,Ä,ç,évf‰ofCf} fŠ EfTfEf“fh Efofbftf@,É ‘,«,±,Ð,±,Æ,ª,Ä,«,é BDirectSound,ªf~fLfVf“fO,Ä,«,éfofbftf@,ì ”,Í A—LÆØ,È ^— ŽžŠÔ,É,æ,Ä,Ä,Ì,Y §ÆÄ,ðŽó,¬,é B

fCefCfef“fV,ª20f~fŠ•b~È‰°,Ì ê ± Af† [fU,ªfofbftf@,ì ì ¬,©,çfXfs [fJ,Ì Ä ¶,Ü,Ä,Ì’x‰,,ðŠ’,¶,é,± ,Æ,Í,È,ç BDirectSoundf~fLfT [,ÌfCefCfef“fV,Í20f~fŠ•b,È,Ì,Ä A Ä ¶,ªŽn,Ü,é,Ü,Ä,Ì’x‰,,Í’mŠo,³,ê,È,ç,ì,Ä, ,é B, ± ,Ì ðE ‰°,¾,Æ Afobftf@,ð Ä ¶,·,é,Æ“Žž,ÉfXfNfŠ [f“ EfAfjf [fVf‡f“,ðŠJŽn,·,ê,Í AfI [ffBfI,ÆfrrffI, Í“Žž,ÉfXf^ [fg,·,é B,µ,©,µ ADirectSound,ªHEL,ðŽg—p,µ,È,,Ä,Í,È,ç,È,ç ê ‡(fTfEf“fh<@Ší— p,ÌDirectSoundfhf‰ofCfo,ª,È,ç ê ‡) Afñ [fhfEfFfA,É~É‘¶,·,é’x‰,,(‘È í100 `500f~fŠ•b) ,ª AfTfEf“fh,ª Ä ¶,³,ê,é‘O,É” ¶,·,é B

,Ç,Ì,æ,¤,È ê ±,Ä,à A Ä ¶,Ä,«,é,Ì,Í,Ð,Æ,Ä,ÌfAfvfŠfP [fVf‡f“,ìfofbftf@,ì,Y,Æ,È,é B,± ,ê,Í A^ê“x,É“Á’è,ÌDirectSoundfhf‰ofCfo,ðfI [fvf“,Ä,«,é,ì,ª,Ð,Æ,Ä,ÌfAfvfŠfP [fVf‡f“,ì,Y,Ä, ,é,½,ß,Ä, ,é B

**fn [fhfEfFfA EfAfNfZf%ofŒ [fVf‡f“**

DirectSound,Ífn [fhfEfFfA Ef~fLfVf“fO,âfn [fhfEfFfA EfTfEf“fh Efofbftf@f f,fŠ“™,ìfTfEf“fh@Ší,ðŽ©“  
®“I,É ,‘¬%»,·,é BfAfvfŠfP [fVf‡f“,©,ç,Í A“Á,Éfn [fhfEfFfA EfAfNfZf%ofŒ [fVf‡f“,ì Ý’u—v< ,ð s,□•K  
—v,Í,È,Œ B

,½,¾,µ AŒ» Ý,ìfn [fhfEfFfA,ìfŠf\ [fX,ð Ā‘âŒÀ,É—~p,µ,½,Œ,Æ l,ì,é,È,ç A  
DirectSound,É‘î,µ,ĀfTfEf“fh EfffofCfX,ìfn [fhfEfFfA «”\ î•ñ,ì•Ž!,ð—v< ,·,é•û-@,ª, ,é B,±  
,ì î•ñ,©,ç Afñ [fhfEfFfA EfAfNfZf%ofŒ [fVf‡f“,ð s,□ Ū,ì‘î Ū,Æ,È,éfTfEf“fh Efofbftf@,ìŽw’è,ª,Ā,«,é,æ,  
□,É,È,é B

,±,ê,Í A,»,ê,¼,ê,ìŒø%êŽg—p,âfTfEf“fh Efofbftf@ Ā ¶,ìf^fCf~f“fO Afofbftf@Žæ“¾,ì—  
D æ“x,È,Ç,ðfAfvfŠfP [fVf‡f““□,ĀŒ^è,·,é,±,Æ,ª,Ā,« A•K—  
v,Èfn [fhfEfFfA,ìfŠf\ [fX,ìŠ,,,è U,è,ª,Ā,«,é,©,ç,Ā, ,é B

***f*v*f*%*f*C*f*}*f*Š *E*f*o**f**b**f**t**f*@,Ö,İ ‘,«,±,Ý*f*A*f*N*f*Z*f*X**

*f*v*f*%*f*C*f*}*f*Š *E*f*T**E**f*“*f*h *E*f*o**f**b**f**t**f*@,İ*f**T**E**f*“*f*h *E*f*f**o**f*C*f*X,©,ç*f**T**f*“*f*v*f*Š*f*“*f*O *E**f*I [*f**f**f*B*f*I,đ o—

İ,·,é B*D*i*r*e*c*t*S*o*u*n*d*,Ä,İ*f*v*f*%*f*C*f*}*f*Š *E*f*o**f**b**f**t**f*@,Ö,İ’¼ Ú ‘,«,±,Ý*f*A*f*N*f*Z*f*X,<sup>a</sup>Ä,«,é B,±,İ<@”\

,İ A”ñ í,É*Æ*À,ç,ê,½Ží—

b,İ*A**f*v*f*Š*f*P [*f*V*f*‡*f*“ A,Ä,Ü,è“Á%»,<sup>3</sup>ê,½*f*~*f*L*f*V*f*“*f*O,â A,»,İ’¼*f*Z*f*J*f*“*f*\_*f*Š *E*f*o**f**b**f**t**f*@,Ä*f**T**f* [*f*g,µ,Ä,ç  
,È,ç<@”\•t,«*A**f*v*f*Š*f*P [*f*V*f*‡*f*“,Ä,İ,Ý—L—p,Ä, ,é B*A**f*v*f*Š*f*P [*f*V*f*‡*f*“,©,ç*f*v*f*%*f*C*f*}*f*Š *E*f*o**f**b**f**t**f*@,Ö’¼ Ú ‘,«,±  
,Ý,đ s,²,Æ A,Ç,²,µ,Ä,à*T**E**f*“*f*h,<sup>a</sup>“r Ø,ê,â,·,.,È,é B*f*v*f*%*f*C*f*}

*f*Š *E*f*o**f**b**f**t**f*@,Ö’¼ Ú*f*A*f*N*f*Z*f*X,đ s,²*A**f*v*f*Š*f*P [*f*V*f*‡*f*“,İ *A**f*p*f**t**f*H [*f*] *f*“*f*X đ*Æ* ,<sup>a</sup>Æµ,µ,.,È,é,İ,Ä, ,é B

*f*v*f*%*f*C*f*}*f*Š *E*f*o**f**b**f**t**f*@,İ’Ê í,Æ,Ä,à ¬,<sup>3</sup>ç B,»,İ,½,ß A,±,İŽí,İ*f**o**f**b**f**t**f*@,Ö’¼ Ú ‘,«,±

,Ý,đ s,² ê ±,İ A,·,Ä,É*f**o**f**b**f**t**f*@“à,É, ,é*u**f* *f*b*f*N,<sup>a</sup>ÆJ,è•Ö,µ Ä ¶,<sup>3</sup>ê,È,ç,æ,² *A**f**f* [*f*^ *E**f**u**f* *f*b*f*N,Ö,İ ‘,«,±  
,Ý,đ’Z,çŠÖŠu,Ä s,í,È,¬,ê,İ,È,ç,È,ç B*f**o**f**b**f**t**f*@ ì ¬’†,İ*f**o**f**b**f**t**f*@,İ*f**T**f*C*f*Y,İŽw’è,Ä,«,È,ç,½,ß A ì ¬ ì<Æ I—

<sup>1</sup>Æä,É,Ä,«, ,<sup>a</sup>Ä,½*T**f*C*f*Y,đŽó, ¬“ü,ê,é,±,Æ,É,È,é B

*f*v*f*%*f*C*f*}*f*Š *E*f*T**E**f*“*f*h *E*f*o**f**b**f**t**f*@,É’Î,·,é ‘,«,±,Ý*f*A*f*N*f*Z*f*X,đŠİ“¾,·,é,Æ A’¼,İ*D*i*r*e*c*t*S*o*u*n*d*,İ<@”\,İ—

<sup>3</sup>Æø,É,È,é B*f*Z*f*J*f*“*f*\_*f*Š *E*f*o**f**b**f**t**f*@,İ*f*~*f*L*f*V*f*“*f*O,<sup>3</sup>ê,È,ç

,½,ß *A**f*n [*f*h*E**f*F*f*A *E**f*A*f*N*f*Z*f*%*f*Æ [*f*V*f*‡*f*“ *E**f*~*f*L*f*V*f*“*f*O,İ¬Æø,É,È,é

(*D*i*r*e*c*t*S*o*u*n*d*,<sup>a</sup>*f*Z*f*J*f*“*f*\_*f*Š *E*f*o**f**b**f**t**f*@,Ä*f*~*f*L*f*V*f*“*f*O,đ s,²,Æ *A**f*~*f*L*f*V*f*“*f*O,<sup>3</sup>ê,½*f*I [*f**f**f*B*f*I *E**f**f* [*f*^,İ*f*v*f*%*f*C*f*}  
*f*Š *E*f*o**f**b**f**t**f*@,É’u,©,ê,é) B

*A**f*v*f*Š*f*P [*f*V*f*‡*f*“,İ’½,.,İ *A**f*v*f*%*f*C*f*}*f*Š *E*f*o**f**b**f**t**f*@,Ö’¼ Ú*f*A*f*N*f*Z*f*X,<sup>1</sup>,.,É*f*Z*f*J*f*“*f*\_*f*Š *E*f*o**f**b**f**t**f*@,đŽg—

p,·,é B*f*Z*f*J*f*“*f*\_*f*Š *E*f*o**f**b**f**t**f*@,Ö,İ ‘,«,±,Ý,İŽ©—R,É s,!,é B’â,«,È*f**o**f**b**f**t**f*@,<sup>a</sup>ŽŸ,İ*f**f* [*f*^ *E**f**u**f* *f*b*f*N,Ö,İ ‘,«,±  
,Ý,Ü,Ä,İŽžŠÖ,đ%Ö,¬ A,»,ê,È,æ,Ä,Ä*f*I [*f**f**f*B*f*I,Ä%<sup>1</sup>,<sup>a</sup>“r Ø,ê,éŠè*Æ* ,đ Ä ¬ÆÄ,É,Æ,Ç,ß,é,İ,Ä, ,é B,½,Æ,,<sup>1</sup> *A**f*A*f*v  
*f*Š*f*P [*f*V*f*‡*f*“,©,ç,İ*f*I [*f**f**f*B*f*I,Ö,İ—v< ,<sup>a</sup> *A**f*~*f*L*f*V*f*“*f*O,đ•K—v,Æ,µ,È,ç*f*I [*f**f**f*B*f*I *E**f*X*f*g*f*Š [*f*€,İ,æ,²  
,È*f*V*f*“*f*v*f*<,È,à,İ,Ä, ,Ä,Ä,à A,»,İ*f*I [*f**f**f*B*f*I *E**f**f* [*f*^,İ Ä ¶,É*f*Z*f*J*f*“*f*\_*f*Š *E*f*o**f**b**f**t**f*@,đŽg—p,·,é,±  
,Æ,Ä ,ç*p**f**t**f*H [*f*] *f*“*f*X,đŽÄ*Æ*»,·,é,±,Æ,<sup>a</sup>Ä,«,é B

3DfTfEf“fh

DirectSound,É,æ,è AfAfvfŠfP [fVf‡f“,Í%¹CE¹,ªŽ¯•Ê,³ê,éˆÊ'u i'èÊ j,ð•İ X,·,é,±,Æ,ª,Â,«,é B,± ,ê,É,Í AIDirectSound3DBuffer A,“,æ,ŃIDirectSound3DListenerfCf“f^ [ftfFfCfX,ðŽg— p,·,é B,ž,È,Ý,É%¹CE¹,Æ,Í A%¹,ª“S•ûCEü,Ö L,ª,é,Æ,«„İ'† SˆÊ'u A,à,µ,,Í%¹,ª%~ ó,É ¬,³,,È,Á,Ä,¢,- ,Æ,«„İ',“\_İ,±,Æ,Â, ,é B,Û,½ Afhfbfbvf% [CEø%øÊ,ð,©,¯,é,±,Æ,à,Â,«,é B•W €“I,Èf%ofEf h EfXfs [fJ,ðŽg— p,µ,Ä,à,±,è,ç,İCEø%øÊ,Í••,«Žæ,è%øÂ”\,¾,ª Afwfbfbfzf“,ðŽg,İ,İ,±,è,ç,İCEø%øÊ,ª,³,ç,É–¾Šm,É••,«Žæ,è,é B

3DfTfEf“fh,İŠT—v,Æ,µ,Ä A,±,±,Â,ÍÈ%ø°,İfgfsfbfN,É,Â,¢,Ä à–¾,·,é B

- %¹'æ'èˆÊ,İ”FŽ¯
- fŠfXfi\_l
- fTfEf“fh EfR [f“
- Â'Z<—£,Æ Â'·<—£
- ˆÊ'u,Æ'¬“x
- Direct3D,Ö,İ“ ±
- “ª”è'PˆÊ,Æ<—£—v'f
- f,fmf%øf<%¹CE¹,ÆfXfefCEfI%¹CE¹

01234567891011121314151617181920212223242526272829303132333435363738394041424344454647484950515253545556575859606162636465666768697071727374757677787980818283848586878889909192939495969798991001011021031041051061071081091101111121131141151161171181191201211221231241251261271281291301311321331341351361371381391401411421431441451461471481491501511521531541551561571581591601611621631641651661671681691701711721731741751761771781791801811821831841851861871881891901911921931941951961971981992002012022032042052062072082092102112122132142152162172182192202212222232242252262272282292302312322332342352362372382392402412422432442452462472482492502512522532542552562572582592602612622632642652662672682692702712722732742752762772782792802812822832842852862872882892902912922932942952962972982993003013023033043053063073083093103113123133143153163173183193203213223233243253263273283293303313323333343353363373383393403413423433443453463473483493503513523533543553563573583593603613623633643653663673683693703713723733743753763773783793803813823833843853863873883893903913923933943953963973983994004014024034044054064074084094104114124134144154164174184194204214224234244254264274284294304314324334344354364374384394404414424434444454464474484494504514524534544554564574584594604614624634644654664674684694704714724734744754764774784794804814824834844854864874884894904914924934944954964974984995005015025035045055065075085095105115125135145155165175185195205215225235245255265275285295305315325335345355365375385395405415425435445455465475485495505515525535545555565575585595605615625635645655665675685695705715725735745755765775785795805815825835845855865875885895905915925935945955965975985996006016026036046056066076086096106116126136146156166176186196206216226236246256266276286296306316326336346356366376386396406416426436446456466476486496506516526536546556566576586596606616626636646656666676686696706716726736746756766776786796806816826836846856866876886896906916926936946956966976986997007017027037047057067077087097107117127137147157167177187197207217227237247257267277287297307317327337347357367377387397407417427437447457467477487497507517527537547557567577587597607617627637647657667677687697707717727737747757767777787797807817827837847857867877887897907917927937947957967977987998008018028038048058068078088098108118128138148158168178188198208218228238248258268278288298308318328338348358368378388398408418428438448458468478488498508518528538548558568578588598608618628638648658668678688698708718728738748758768778788798808818828838848858868878888898908918928938948958968978988999009019029039049059069079089099109119129139149159169179189199209219229239249259269279289299309319329339349359369379389399409419429439449459469479489499509519529539549559569579589599609619629639649659669679689699709719729739749759769779789799809819829839849859869879889899909919929939949959969979989991000100110021003100410051006100710081009101010111012101310141015101610171018101910201021102210231024102510261027102810291030103110321033103410351036103710381039104010411042104310441045104610471048104910501051105210531054105510561057105810591060106110621063106410651066106710681069107010711072107310741075107610771078107910801081108210831084108510861087108810891090109110921093109410951096109710981099110011011102110311041105110611071108110911101111111211131114111511161117111811191120112111221123112411251126112711281129113011311132113311341135113611371138113911401141114211431144114511461147114811491150115111521153115411551156115711581159116011611162116311641165116611671168116911701171117211731174117511761177117811791180118111821183118411851186118711881189119011911192119311941195119611971198119912001201120212031204120512061207120812091210121112121213121412151216121712181219122012211222122312241225122612271228122912301231123212331234123512361237123812391240124112421243124412451246124712481249125012511252125312541255125612571258125912601261126212631264126512661267126812691270127112721273127412751276127712781279128012811282128312841285128612871288128912901291129212931294129512961297129812991

[illegible]

“ž’B,ĭ,.,ê BfŠfXfi [,ĭ%oE•uĖÜ,©,ç”,1,ç,ê,½%o¹,ĭ,²fŠfXfi [,ĭ%oEž”,É“ž’B,.,é,ĭ,ĭ A ¶ž”,æ,è,à,Ŭ,ñ,ĭ ,µ æ,Ā, ,é (±,ĭ,.,ê,ĭž “±žžšŌ,ĭ A–ñ1f–fš•b,Ā, ,é) B

[illegible]

$\pm, \hat{e}, \mathbb{C}, \hat{I} \ A \ 1, \%0, \hat{l}, \hat{E}^u, \partial \tilde{Z}^* \cdot \hat{E}, \hat{e}, \frac{1}{2}, B, \hat{l} \ A, \cdot, \times, \hat{A}, \hat{A}, \hat{I}, \hat{E}, \mathbb{C}, \hat{z} \hat{A}, \hat{E} \rightarrow v^f, \hat{A}, \hat{e} \ B, \rangle, \mu, \hat{A}, \pm, \hat{e}, \mathbb{C}, \hat{l} \rightarrow v^f, {}^a \text{DirectSound}, \hat{l} f |$   
 $f W f W f \nmid f j f \nmid f O \ E f W f X f e f \in, \hat{l}^+ \hat{A}, \hat{n}, \tilde{Y}, {}^3, \hat{e}, \hat{A}, \mathbb{C}, \hat{e}, \hat{l}, \hat{A}, \hat{e} \ B \ \leftarrow \sim 3 D f T f E f \nmid f h, \delta f T f |$

[fg,·,éfn [fhfEfFfA,<sup>a</sup>ê"EĹ,Ė,Ė,êĹ A,±,ê"ĖŠO,Ĺf[WfVf±fjff"fo—v'f,<sup>a</sup>fVfXfefĖ,Ė'g,Ÿ ž,Ÿ,ê,ê,±  
,Æ,¾,ë,□ B,½,Æ,½,Ĺ AfŠfXfi [Ĺ<sup>ia</sup>,ĹžĹ—  
Ė,Ÿ,½,ĹĖ"âŠOŽ",Ÿ,½"žĖ,Ė,æ,é Å%<sup>1</sup>,Ĺ A ,žü"g,Æ'ážü"g,Æ,Ĺ,Ÿ,Ė,Ĺ,Ĺ,é B

,μ,⊙,μ A Å,à d—v,È%0!,îÈ'ûZ~Ê—v f,Í A%0!Æ! ,ÏŽŠo“Í,ÌÈÊ'û,Å, é B,½,Æ,!,Í A%0“ ,É, é A ¬,³,È“\_,Æ,μ,ÄÆ  
 ©,!,Ä,ç,½”ŽÈ'¹,à AÆ©,Ä,ç,é 1,î“à ã,ð%ž,!,é‘O,É'â—ŠÔÈ“¹f~fTfCf,!,à“,«³,É,È,È,Á,Ä,ç,ê,Î A±,  
 Ü,²,Ü,Æ,μ,½ŽÈ²,à,©,è,È,Ç,à,È,,Ä,à A%0¹,ÍŠmŽÄ,É,»,ÍfŠfXfÍ [,É,ß,Ä,« AŽ,Á,Ä,Ä,ç,,¾,è,□ B

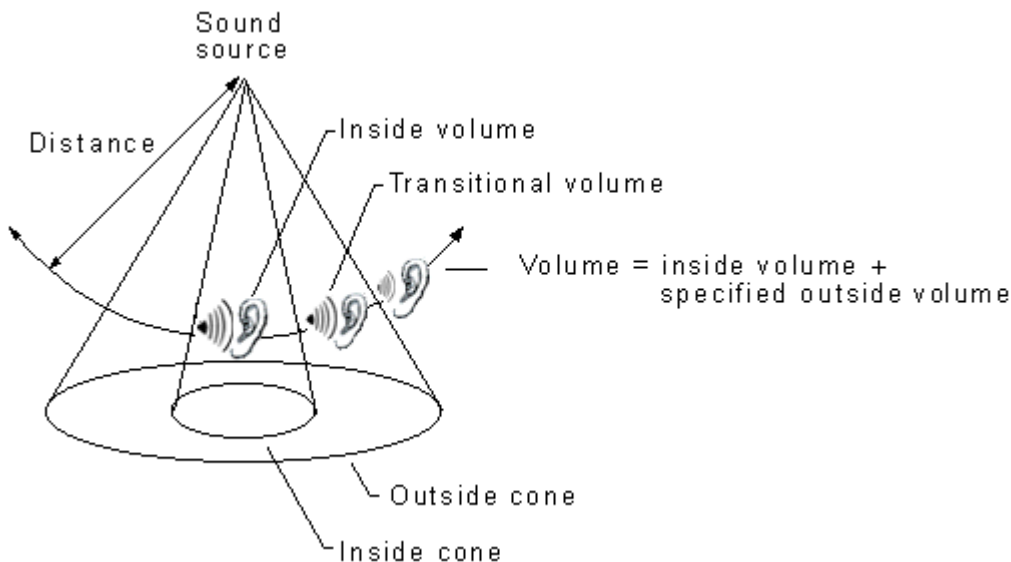
*fŠfXfi* [

•“İ,ªfŠfXfi [,İŽü,è,ð90“x%ñ“],µ,½ ê ‡,Æ AfŠfXfi [,ª•“İ,É‘Š‘İ,µ,Ä90“x“ª,ð%ñ“]  
,³,¹,½ ê ‡,Æ,Å,Í AfŠfXfi [,ªŒoŒ±,·,é%¹çŒø%ŒÊ,Í“˘ê,Å, ,é B,µ,©,µfvf fOf%of€ ã,Å,Í AfŠfXfi [,İˆÊ‘u,â•û  
Œü,ð•İ X,·,é•û,ª A ê–Ê,İ‘†,İ‘¼,İ,·,×,Å,İ•“İ,İˆÊ‘u,ð•İ,|,é,æ,èŠÈ‘P,È,±  
,Æ,ª“½,¢ BDirectSound,Í ADirectSound3DListenerfCf“f^ [ftfFfCfX,ð’Ê,¶,Ä,±,İ”\—Í,ð’ñçŸ,µ,Ä,¢,é B

**fTfEf“fh EfR [f“**

ˆÊ'u,Í, ,é,•ûĈÛ,Ì,È,ĉ%o¹,Í“\_‰¹Ĉ¹,Ā, ,é B,Ç,Ì•ûĈÛ,Ā, ,Ā,Ā,àfŠfXfi [,“‰¹,©,ç—Ł,ê,ê,Î A‰¹,Í ¬,³,-  
 ,È,é BˆÊ'u,Ā•ûĈÛ,Ì, ,é%o¹,ðfTfEf“fh EfR [f“,Ā,ĉ,□ B

DirectSound,ÌfTfEf“fh EfR [f“,É,Í“à•”fR [f“,ĀŠO•”fR [f“,ˆ, ,é B“à•”fR [f“,Ì,È,©,Ā,Í Af{fŠf... [fĉ  
 ,Í,» ,Ì‰¹Ĉ¹,Ì Ā‘âfĈfxf<,Ā,È,é(DirectSound,Ā,Í‘ • ,ðfTf| [fg,µ,Ā,˘,ç, , A Ā‘âf{fŠf... [fĉ EfĈfxf<,Í0,Ā, ,é B,»  
 ,Í¼,Ì,˙,×,Ā,Ìf{fŠf... [fĉ EfĈfxf<,Í A Ā‘âf{fŠf... [fĉ,©,çĈ, Š,µ,Ā,ĉ, ,Ā,ĉ,□Ó-ĵ,Ā A•‰  
 ,Ì¹,È,È,é) BŠO•”fR [f“,ÌŠO˙,Ā,Í Af{fŠf... [fĉ,Í A“à•”f{fŠf... [fĉ,É“Ā“è,ÌŠO•”f{fŠf... [fĉ  
 ,ð‰Ā,¼,½,à,Ì,Ā,È,é B,½,Ā,¼,Í AfAfvfŠfP [fVf‡f“,“ŠO•”f{fŠf... [fĉ  
 ,ð-10,000,ÉfZfbfg,˙,é,Ā A,» ,Ì‰¹Ĉ¹,ÍŠO•”fR [f“,ÌŠO,Ā,Í•,«Žæ,ê,È,ĉ BŠO•”fR [f“,Ā“à•”fR [f“,ÌŠŌ,Ā,Í Af{fŠf  
 ... [fĉ,Í, ,éĈfxf<,©,ĉ•Ê,ÌfĈfxf<,É ™ X,É•İ‰»,˙,é BfTfEf“fh EfR [f“,ÌŠT”O,ðŽŸ,Ì },ÉŽ,˙ B



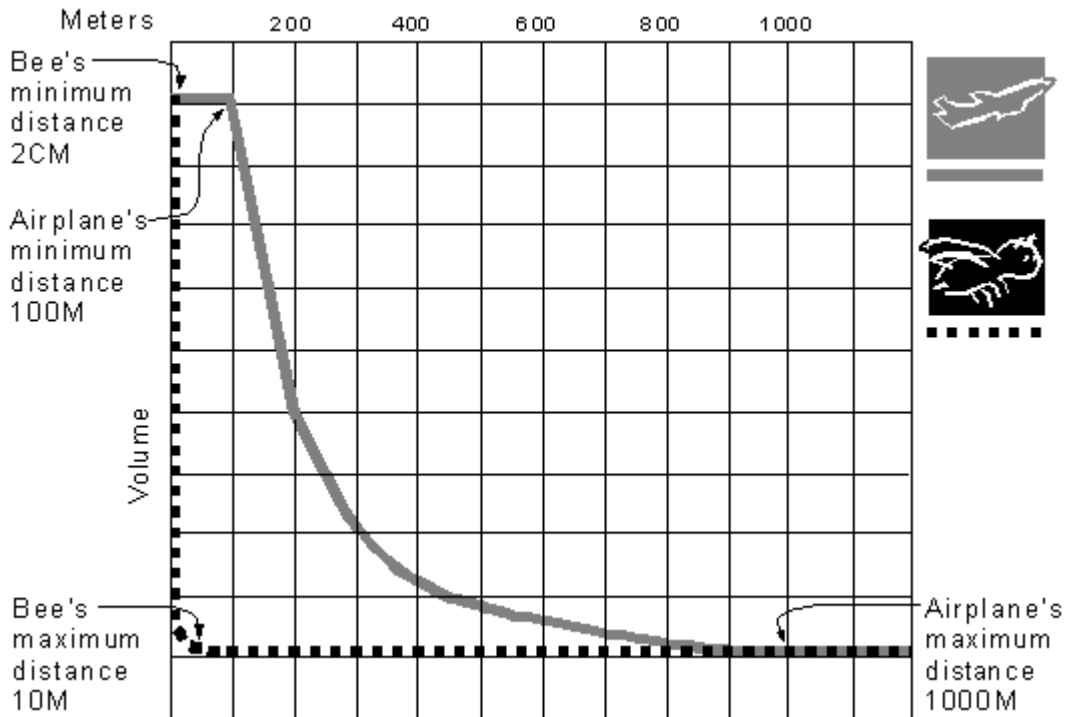
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IDirectSound3DbufferfCf“f^ [ftfFfCfX,Ā, ,éTfEf“fh Efobftf@,Í,˙,×,ĀfTfEf“fh EfR [f“,Ā, ,é B,½,Ā,¼,Í AfT  
 fEf“fh EfR [f“,ÌŠO•”,Ìf{fŠf... [fĉ,Ì %oŠú¹,Í0,Ā, ,é BfAfvfŠfP [fVf‡f“,Ā,±,Ì¹,ð•İ,Ā,à Af{fŠf... [fĉ  
 ,ÍfR [f“,Ì“à•”,Ā,àŠO•”,Ā,à˘,¶,Ā A‰¹,Í-  
 ¼Šm,È•ûĈÛ,ðê Ø,à,½,È,ĉ B,³,ç,É AfTfEf“fh EfR [f“,ÌŠp“x,Í D,«È,¾,¯ L,°  
 ,ç,ê,é,ª AŽĀ Ũ,ÌfTfEf“fh EfR [f“,Í<... ó,É ì,ç,ê,Ā,ĉ, B

À'Z<—£,Æ À'·<—£

fŠfXfi [,%o¹CE¹,É<ß,Ä,¯,Î A%o¹,Í'â,«,.,È,Á,Ä,¢ B,µ,©,µ A Ä'ä'l(0),É“ž'B,µ,½,è A%o¹CE¹,Ì «Ž¿ ä¯—  
 “I,ÈCEÀŠE,ÉŽŠ,Á,½ ê ±,È,Ç A^è'è,Ìf|fCf“fg,ð'È%oß,µ,½Žž^ÈCEä,Í Af{fŠf... [f€,Í'â,«,.,È,è'±,¯,È,¢ B,±  
 ,è,ð%o¹CE¹,Ì À'Z<—£,Æ,¢,µ B“—l,É A%o¹CE¹,Ì À'·<—£,Æ,Í A,±,è^È ä%o¹,a ¬,³,,È,Ç,È,¢,Æ,¢  
 ,µ^È'u,ð'·,½ ê ±,Ì<—£,ðCE¾,µ B

•Ê X,ì%o¹,Ì ä'Îf{fŠf... [f€ EfCEfxf<,Ì'á,¢,ð•â ž,µ,È,¯,è,Î,È,Ç,È,¢ ê ± A À'Z<—£,Í'Á,É—L—p,Ä, ,é B,½,Æ,Ì  
 ,Ì AfWfFfbfg<@,ì%o¹,Í,Ý,Ä,Ì,¿,ì%oH%o¹,æ,è,â'â,«,.,È,¯,è,Î,È,Ç,È,¢,a A, ,é— —R,©,Ç,±,è,Ç,ì%o¹,Í'¯,¶ ä'Îf{fŠf...  
 [f€ EfCEfxf<,Ä^%o¹,³,è,È,¯,è,Î,È,Ç,È,¢(16ftrfbfg,ÌfI [ffBfI,É,Í,±,Ì,æ,µ,Èf{fŠf...  
 [f€ EfCEfxf<,Ì ·^á,ð¿žû,·,é,¾,¯,Ì—]n,a,È,¢) B,½,Æ,Ì,Í A  
 fWfFfbfg<@,É,Í100f [fgf<,Ì A,Ý,Ä,Ì,¿,É,Í2fZf“f“f [fgf<,Ì À'Z<—£,ðŽg—p,µ,½,Æ,·,é B,±,Ì Ý'è,Ä, ,è,Î A  
 fWfFfbfg<@,ÍfŠfXfi [,²200f [fgf<—£,è,½,Æ,«,Éf{fŠf... [f€  
 ,²¼•,É,È,é,a A,Ý,Ä,Ì,¿,ÍfŠfXfi [,²4fZf“f“f [fgf<—£,è,½,¾,¯,Ä”¼•,Ìf{fŠf... [f€,É,È,é B,±,ÌŠT”O,ÍŽÝ,Ì }  
 ,ÉŽ',· B





Ê'u,Æ¬“x

,·,×,Ä,ÌDfTfEf“fh Efofbftf@,Æ3DfŠfXfi [,É,Í, ,éÊ'u,Æ, ,é¬“x,<sup>a</sup>, ,é BfOf%oftfBfbfN,ÆfAfjf [fVf‡f“,ÌE©' n,©,ç,Í A,±,ê,ç,Ì“Á «,Í,Û,Á,½,-

“¬,¶,É,Y,<sub>||</sub>,é B,»,ìC,É,È,ê,Î A3DfTfEf“fh Efofbftf@,Û,½,Í3DfŠfXfi [,ÌÊ'u,ð A,»,Ì3D<óŠÔ“à,É,¬, ,éÊ'u,Æ,μ,Ä •\,·,±,Æ,Í,Ä,«<sup>a</sup>,é B,μ,©,μ Afofbftf@,âfŠfXfi [,<sup>a</sup>,»,Ì¬“Ì,<sup>a</sup><óŠÔ,ð~Ú“@,μ,Ä,ç,é¬<sup>3</sup>,ð¬“x,Ä•\,·,± ,Æ,Í,Ä,«<sup>a</sup>,É,ç Bfofbftf@,âfŠfXfi [,Ì¬“x,Í A DirectSound,Ä,Ífhfbfvf% [Eø%Ê,ÌEvŽŽ,ÉŽg—p,<sup>3</sup>,ê,é B

‘¬“x’<sup>2</sup> B,Í A¬“Ì,Ìfhfbfvf% [Eø%Ê,ð<<sup>2</sup>,μ,½,ç ê ‡,É—L—p,Ä, ,é B,½,Æ,<sub>||</sub>,Î A,□,È,è,ð, ,°,Ä¬,Á,Ä,- ,éfE [fVf“fOfJ [,<sup>a</sup>fŠfXfi [,Ì%<sub>o</sub>],ð'Ê,è%ß,¬,é,Æ,«,Ì%<sup>1</sup>,<sup>a</sup>—~,μ,ç ,Æ,μ,æ,□ B,à,μfŠfXfi [,É'Î,μ,Äfhfbfvf% [Eø%Ê,ð<<sup>2</sup>,<sup>3</sup>,<sup>1</sup>,½,Æ,·,é,Æ A,»,Ì<<sup>2</sup>,ÍfŠfXfi [,É•,«Žæ,è%Ä”\ ,È,·,×,Ä,ÌfTfEf“fh Efofbftf@,Ê%e<ç,ð<y,Ú,μ,Ä,μ,Û,□ B fE [fVf“fOfJ [,É,<sup>3</sup>/<sub>4</sub>,¬,±,ÌEø%Ê,ð<-<sup>2</sup>,<sup>3</sup>,<sup>1</sup>,é,É,Í AfE [fVf“fOfJ [,Ì3DfTfEf“fh Efofbftf@,Ì¬“x Ý'è,ðŠg‘â,·,é,Î,æ,ç B

fVfXfef€,Ífhfbfvf% [Eø%Ê,ð—Ý İ“I,É~μ,□ BfAfvfŠfP [fVf‡f“,ÌfŠfXfi [,Æ%<sup>o</sup>!E<sup>1</sup>,<sup>a</sup>¬“x,ðŽ ,Á,Ä,ç ,ê,Í AfVfXfef€,ÍŽ©“@“I,É,»,Ì¬“xŠÔ,ÌŠÖEW,ðEvŽŽ,μ Afhfbfvf% [Eø%Ê,ð¬,â,©,É'<sup>2</sup> B,·,é B

Direct3D,Ö,ì“ ‡

IDirectSound3DBuffer A,“,æ,ÑIDirectSound3DListenerfCf“f^ [ftfFfCfX,ÍDirect3D™,Æ^ê ,É“® ì,·,é,æ,□  
,É ÝÆv,³,ê,Ä,¢,é B Direct3D,“¼‘zŠÄ««,Ì,È,©,ÌfIfufWfFfNfg,ðfAfÆf“fW,·,é,½,ß,ÉŽg—p,·,éf|  
fWfVf‡fjf“fO îñ,Í A%¹Æ¹,ðfAfÆf“fW,·,é,½,ß,É,àŽg—p,³,ê,é B Direct3DŠJ”-  
ŽÖ,É,ÍŽü’m,ÌD3DVECTOR,ÆD3DVALUEf^fCfv,Í A

**IDirectSound3Dbuffer**,Æ**IDirectSound3DListener**fCf“f^ [ftfFfCfX,Ä,àŽg—p,³,ê,é B ,Ü,½ ADirect3D,ÄŽg—  
p,³,ê,Ä,¢,é ¶Žè Ä•WÆn,Æ““,¶,à,Ì,ªDirectSound,Ä,à Ì—p,³,ê,Ä,¢,é( Ä•WÆn,É,Ä,¢,Ä,Í A *Direct3DŠT—*  
v,Ì’†,Ì3D Ä•WÆn,ðŽQ Æ,·,é,±,Æ) B

3DfTfEf“fh,Ì Ä ¶,ðŠÈ’P,É,·,é,½,ß,É,Í A Direct3D,ÌfVfXfef€ EfR [f<fofbfN<@ \,ð—~—p,·,é B,½,Æ,,Ì A  
**D3DRMFRAMEMOVECALLBACK**fR [f<fofbfNŠÖ ”,ðŽg—p,·,é,Î AfAfvfŠfP [fVf‡f““à,ÌftfÆ [f€  
,Ì“®,«,ðŠÄŽ<,µ A“Á’è,Ì ó‘Ô,É’B,µ,½,Æ,«,¾,¬%¹,ÌŠÄ««,ð•Ì,¹,é,±,Æ,ª,Ä,«,«,é B

‘‘a’P^Ê,Æ<—£—v‘f

3DfTfEf“fhŒø%oÊ,ÌfftfHf<fg’l,Í AŽ©‘RŠE,ð-Í•í,μ,½,Ì,à,Å, ,é B,μ,©,μ A‘½,,Ì ÝŒvŽŒ,Í A,æ,èfhf%of}  
fefBfbfN,ÈŒø%oÊ,ð‘Ç< ,μ,Ä,±,Ì’l,ð•Ĭ X,μ,æ,□  
,Æ,·,é BfAfvfŠfP [fVf‡f“,Í,æ,èfGfLfTfCfefBf“fO,È,à,Ì,Æ,·,é,½,B,É,Í Afhfbfvf%o [Œø%oÊ,ð<’²,μ,½,è A<—£  
,É,æ,é%¹,ÌŒ, Š,ð<’²,³,¹,é B

DirectSound,Ì3DŒø%oÊ,Å,Í A<—£,Ì‘a’è’P^Ê,Æ,μ,Ä Af [fgf<,ðŽg—  
p,·,é B,à,μfAfvfŠfP [fVf‡f“,Åf [fgf<,ðŽg—p,μ,Ä,¢,È,¢ è ‡,à A,»,ÌfRf“f [flf“fg,Ì”—  
Í,ð^ŬŽ ,·,é,½,B,É‘a’è’P^Ê,Ĭ•ĬŠ,Í•s—v,Å, ,é B‘ā,í,è,ÉfAfvfŠfP [fVf‡f“,Å,Í<—£—v‘f,ð Ý’è,·,é,±,Æ,ª,Å,«,é B,±  
,ê,ÍfAfvfŠfP [fVf‡f“,ÄŽw’è,μ,½<—£’P^Ê,ðf [fgf<,ÉŠ·ŽZ,·,é•,“® ¬ ”“\_,Ì’l,Å, ,é B,½,Æ,,Ĭ AfAfvfŠfP [fV  
f‡f“,‘a’è’P^Ê,Æ,μ,ÄftfB [fg,ðŽg—p,μ,½ è ‡ A<—£—v‘f,Æ,μ,Ä0.30480006096,ðŽw’è,Å,«,é B,±  
,Ì’l,Í A1ftfB [fg,ðf [fgf<,ÉŠ·ŽZ,μ,½’l,Å, ,é B

*f,fmf%of<%o¹Œ¹,ÆfXfefŒfI%o¹Œ¹*

3DfTfEf“fh,İŠÂ«„Å,ÍfXfefŒfI%o¹Œ¹,Í“Á,É—  
LŒø,Å,Í,È,¢ B’P^ê,İfXfefŒfI M †,Í AŒ<%oÊ“I,É A“~Žž,É•Ê X,İfXfs [fJ,Å Ä ¶,³,ê,é,Ó,½,Â,İ•Š,,,³,ê,½f,fmf  
%of< Efgf%ofbfN,Æ,µ,Ä \ ¬,³,ê,é B

DirectSound,İ3D<@”\,ð—~—p,·,é,Æ,«„Í Af,fmf%of<%o¹Œ¹,ð—p^Ó,·,é,±,Æ BfVfXfef€  
,ªfXfefŒfI%o¹Œ¹,ðf,fmf%of<,É•İŠ·,·,é<@”\,ð”ö,,İ,¢,½,Æ,µ,à AfXfefŒfI,ðŽg—p,·,é~Ó—i,Í,È, A•İŠ·ŽžŠÔ,İ–  
³Ê,Ê,È,é B

**DirectSound***fCf“f^ [ftfFfCfXŠT—v*

,±,ì ß,Å,Í^È%°,ìDirectSound*fCf“f^ [ftfFfCfX*,É,Â,¢,Ä^ê”Ê“I,È î•ñ,ð%ð à,·,é B

*IDirectSound**fCf“f^ [ftfFfCfX*

*IDirectSound3D**Buffer fCf“f^ [ftfFfCfX*

*IDirectSound3D**Listener fCf“f^ [ftfFfCfX*

*IDirectSound**Buffer fCf“f^ [ftfFfCfX*

## IDirectSoundfCf“f^ [ftfFfCfX

DirectSoundIfufWfFfNfg,ÍfVfXfef€ ã,Ìfn [fhfEfFfA,ð•\,µ,Ä,¢  
,é BfI [ffBfI Eff [f^Ž©‘Ì,ÍDirectSoundBufferIfufWfFfNfg,ðCEÄ,Ñ o,µ,½fofbftf@“à,É í’“,·,é BDirectSoundfo  
fbftf@,É,Â,¢,Ä,Ì Ú ×,Í AIDirectSoundBufferfCf“f^ [ftfFfCfX,ðŽQ Æ,·,é,±  
,Æ BIDirectSoundfCf“f^ [ftfFfCfX,ðŽg—  
p,·,é,Æ AfTfEf“fh EfJ [fh AfXfs [fJ Af f,fŠŠÂ««,ÌfAfvfŠfP [fVf‡f“,©,ç,Ì’è`,“%oÂ”\,É,È,é B  
,±,Ì ß,Â,Í AfVfXfef€“à,ÌfTfEf“fh EftfofCfX,Ì «”\,ÌŽæ“¾•û—@ AfTfEf“fh Efofbftf@,Ì ì Ñ—  
@ AfVfXfef€ EfXfs [fJ,ÌŠÂ«« Ý’è—@,“,æ,Ñfn [fhfEfFfA,ÌfRf“fpfNfg,Èf f,fŠ Ý’è•û—@,Ì‰ð à,ð,·,é B  
fffofCfX,Ì «”\  
fobftf@,Ì ì Ñ  
fXfs [fJ,ÌŠÂ«« Ý’è  
fn [fhfEfFfAf f,fŠŠÇ—

**ffofCfX,ì «”\**

**DirectSoundCreate**ŠÖ ”,ðĈÄ,Ñ o,μ,ÄDirectSoundIfufWfFfNfg,ð ì ¬,μ,½Ĉä,Í **AIDirectSound::GetCapsf** f\fbf  
h,ðŽg—p,·,·,é,±,Æ,ÄfTfEf“fh EffofCfX,ì «”\,ðŽæ“¾,Ä,«,é B Ä“K,ÈpfH [f}f“fX,ð“¾,é,½,ß,É,Í A,±  
,ìĈÄ,Ñ o,μ,ð s,ϣ,±,Æ,Ä í“,ìfTfEf“fh EfJ [fh,ì «”\  
,ð“è,μ AfTfEf“fh,ìpf%of [f^,ð“K ³,È,à,ì,É·Í X,·,é B

*f*o*f*b*f*t*f*@,İ ì ¬

DirectSoundCreateŠÖ ”,ðŒÄ,Ñ o,µ,ÄDirectSoundIlfufWfFfNfg,ð ì ¬,µ AfTfEf“fh EfffofCfX,İ «”\ ,ð’<sup>2</sup> „µ,½Œã,Í AfAfvfŠfP [fVf‡f“,Í AfI [ffBfI Eff [f^,ðŠÜ,ðfTfEf“fh Efofbftf@,ð ì ¬ E—ñ<“,·,é,± ,Æ,<sup>a</sup>Ä,«,é **BIDirectSound::CreateSoundBuffer** f\fbfh,ÍfTfEf“fh Efofbftf@,ð ì ¬,·,é **BIDirectSound::DuplicateSoundBuffer** f\fbfh,Í A Ä %o,Æ““,¶·— fofbftf@ Ef f,fŠ,ðŽg— p,µ,ÄfZfJf“fh EfTfEf“fh Efofbftf@,ð ì ¬,·,é BfTfEf“fh Efofbftf@,ðfRfs [,µ,½ ê ‡ Afobftf@ Ef f,f Š,ð Á”i,·,é,±,Æ,È,—¼•û,İfobftf@,ð•Ê X,É Ä ¶,·,é,±,Æ,<sup>a</sup>Ä,«,é B

fTfEf“fh EfffofCfX,É’İ,µ,Äç’<sup>2</sup>fŒfxfç,ð Ý’è,·,é,É,Í**IDirectSound::SetCooperativeLevel** f\fbfh,ðŽg—p,·,é B,± ,ê,Í AfTfEf“fh Efofbftf@,ð Ä ¶,·,é‘O,É s,□•K—v,<sup>a</sup> ,é B,Û,Æ,ñ,Ç,İfAfvfŠfP [fVf‡f“,Í•W €,İç’<sup>2</sup>fŒfxfç,Ä, ,é DSSCL\_NORMAL,ðŽg—p,·,é B,±,İfŒfxfç,Í A’¼,İfAfvfŠfP [fVf‡f“,Æç ‡,·,é,±,Æ,ÍŒ^,µ,Ä,È,¢ B



*fXfs [fJ,İŠÂ«» Ý’è*

*IDirectSoundfCf“f^ [ftfFfCfX,É,Í AfVfXfef€“à,İfXfs [fJ,İ’<sup>2</sup> , EŠÂ«» Ý’è,ð s,□,Ó,½,Â,İf f\fbfh,ªŠÜ,Ü,ê,Ä,¢  
,é **BIDirectSound::GetSpeakerConfig**,”æ,Ñ**IDirectSound::SetSpeakerConfig** f\fbfh,Å, ,é BCE» Ý,İ,Æ,±  
,ë AŠÂ«»,Æ,µ,Ä,Í AfCf„fzf“ Afwfbfhfzf“ AfXfefƎfI A4f`fff“flf<,İ^%<sup>1</sup> Ä ¶ AfTf%oEf“fh EfTfEf“fh,<sup>a</sup>,  
,é B*

*fn* [fhfEfEfAf *f*,fŠŠÇ—

**IDirectSound::Compact***f* f\fbfh,ðŽg—

p,·,é,Æ AfIf“f{ [fh,lTfEf“fh Ef *f*,fŠ,ð,·,×,Ä~A‘±fuf fbfN,Ö`Ú“®,μ,Ä Å‘â,lftfŠ [f *f*,fŠ—l^æ,ð ì ¬,·,é,±  
,Æ,<sup>a</sup>,Ä,«,é B

**IDirectSound3DBuffer***fCf“f^ [ftfFfCfX*

*IDirectSound3DBuffer**fCf“f^ [ftfFfCfX,Í AfTfEf“fh Efofbftf@,ì3Dfpf%of [f^,É:Î,·,é fAfNfZfX,ð'ñ<Ÿ,μ,Ä,¢*  
*,é B,±,ìfCf“f^ [ftfFfCfX,Í,·,×,Ä,ìfTfEf“fh Efofbftf@,ÄfTf [fg,³,ê,Ä,¢,é,í,¯,Ä,Í,È,¢ B*

*,±,ì B,Ä,ÍIDirectSound3DBuffer**fCf“f^ [ftfFfCfX,ìf|fCf“f^,ðŽæ“¾,·,é•û–*  
*@,Æ AfCf“f^ [ftfFfCfX Ef f\fbfh,ðŽg—p,μ,½fofbftf@ Efpf%of [f^,ìŠÇ— ,É,Ä,¢,Ä à–*  
*¾,·,é B`È%°,ìfgfsfbfN,É,Ä,¢,Ä à–¾,·,é B*

*IDirectSound3DBuffer**fCf“f^ [ftfFfCfX Ef|fCf“f^,ìŽæ“¾*

*fobbf`fpf%of [f^€ ì*

*Ä'Z<—£'l,Æ Ä'·<—£'l*

*‘€ ìf, [fh*

*ˆÊ'u,Æ‘¬“x*

*fTfEf“fh Efvf fWfEfNfVf‡f“ EfR [f“*

**IDirectSound3DBuffer***f*“*f*^ [*ftfFfCfX Ef*]*fCf*“*f*^,ìŽæ“¾

*IDirectSound3DBuffer*,ì|*fCf*“*f*^,ðŽæ“¾,·,é,É,Í A,Û,,*fZfJf*“*f*\_š3D*fTfEf*“*fh Ef*of*bftf*@,ð ì ¬,·,é•K—*v*,<sup>a</sup>,,é B ì ¬•û—@,Í A **IDirectSound::CreateSoundBuffer**,ðŽg—  
p,μ,Ä **ADSBUFFERDESC** \‘ç‘İ,É•t ,·,édw*Flagsf* *f*“fo,ì‘†,ÉDSBCAPS\_CTRL3D,ðŽw’è,·,é B,»,μ,Ä A ì ¬,<sup>3</sup>,ê,½  
fo*f*b*f*t*f*@ ä,Ä**IDirectSoundBuffer::QueryInterface** *f*\f*b*f*h*,ðŽg—  
p,μ,Ä A,»,ìfo*f*b*f*t*f*@,ì**IDirectSound3DListener***fCf*“*f*^ [*ftfFfCfX*,Ö,ì|*fCf*“*f*^,ðŽæ“¾,·,é B

// DSBCAPS\_CTRL3D,ðŽg—p,μ,ÄlpDsbSecondary,ð ì ¬,·,é  
hr = lpDsbSecondary->QueryInterface(IID\_IDirectSound3DBuffer,  
    &lpDs3dBuffer);  
if (SUCCEEDED(hr)) {  
    // ,±,ì*fTfEf*“*fh*,ì3D*f*p*f*%*f* [*f*^,ð Ý’è,·,é

·  
·  
·  
}

DirectSound,Í3D*fTfEf*“*fh Ef*of*bftf*@,Æ,μ,Ä *Af*,*f*m*f*%*f*< AfX*fef*Œ*f*I—¼•û,ì”gŒ`ð*fTf*| [*f*g,μ,Ä,ç  
,é,<sup>a</sup> A3D*fTfEf*“*fh*,ì ^%ö,ð”Šö,·,é,É,Í*f*,*f*m*f*%*f*< Ef*TfEf*“*fh*,ðŽg—p,μ,½•û,<sup>a</sup>,ç B,±,ê,Í3D ^—  
,<sup>a</sup>*f*,*f*m*f*%*f*< Ef*TfEf*“*fh*,©,ç*fXfef*Œ*f*I o—Í,ð ì ¬,·,é,½,ß,Ä, ,é B,à,μ*fXfef*Œ*f*I Ef*TfEf*“*fh Ef*of*bftf*@,ðŽg—  
p,μ,½ ê ‡ A3D ^—  
,<sup>a</sup>Ž{,·,é,é‘O,É ¶%ö,ì*fTf*“*f*v*f*<,ì‘l,Í•½<İ%ö»,<sup>3</sup>,ê,é B,Ó,½,Ä,ì*fXfef*Œ*f*I Ef`*f**f**f*“*f*l*f*<,ð•Ê X,É”z’u,·,é,É,Í *AfXfef*Œ*f*I  
EfX*f*g*f*Š [*f*€,&Ó,½,Ä,ì*f*,*f*m*f*%*f*< EfX*f*g*f*Š [*f*€,É•Š,,,μ A,±  
,ì*f* [*f*^,ð,Ó,½,Ä,ì*f*,*f*m*f*%*f*< Ef*TfEf*“*fh Ef*of*bftf*@,É ‘,«,±,b•K—*v*,<sup>a</sup>,,é B

---

**Note**

*f*p*f*“ §Œä,Í3D ^— ,Æ<£ ‡,·,é B,»,ì,½,ß A DSBCAPS\_CTRL3D,ÆDSBCAPS\_CTRLPAN,ì—¼•û,<sup>a</sup>Žw’è,<sup>3</sup>,ê,Ä,ç  
,é,ÆDirectSound,Í—*v*< ,ì ì ¬,ÉŽ,”s,·,é B

---

**f of b f` f p f % o f [ f ^ ' € ì**

f A f v f Š f P [ f V f ‡ f “, Í 3 D f T f E f “ f h E f p f % o f [ f ^, Ì Ž æ “ ¼ E Ý ’ è, ð A Ć Ê X, É Ä ¶, ·, é, ±, Æ, à A f o f b f ` , ð Ž g —  
p, μ, Ä Ä ¶, ·, é, ±, Æ, à, Ä, «, é B Ć Ê X, Ì l, ð Ý ’ è, ·, é, ½, ß, Ê, Í A “ K — p % o Â ” \  
, È  IDirectSound3DBuffer f C f “ f ^ [ f t f F f C f X E f f \ b f h, ð Ž g —  
p, ·, é B, μ, ©, μ A f o f b f t f @, ð • \ Ć » , ·, é, ·, ×, Ä, Ì l, ð ^ ê “ x, Ê Ž æ “ ¼ E Ý ’ è, ·, é • K — v, <sup>a</sup>, , é, ±, Æ, à, , é B, » , Ì ê ‡, Í A  
 IDirectSound3DBuffer :: GetAllParameters , , æ, Ñ IDirectSound3DBuffer :: SetAllParameters f f \ b f h, ð Ž g —  
p, ·, é, Æ A f o f b f ` E f p f % o f [ f ^ ' € ì, ð 1 % o ñ, Ì Ć Ê, Ñ o, μ, Ä Ž Ä s, Ä, «, é B

Å'Z<—£'l,Æ Å'·<—£'l

3DfTfEf“fh Efofbftf@,É'Î,μ,Ä A Å'Z<—£'l,Æ Å'·<—£'l,ðŽw'è,·,é,±,Æ,<sup>a</sup>Å,«,é B Å'Z<—£,Æ,Í A%<sup>o</sup>l,<sup>a</sup>,±,ê^È ã'â,«,È,ç,È,£<—£,Å, ,é B<sup>”</sup>½'Î,É A Å'·<—£,Æ,Í%<sup>o</sup>l,<sup>a</sup>,±,ê^È ã ¬,<sup>3</sup>,È,ç,È,£<—£,Å, ,é B,±,ê,ç,ì'l,İŠÖEW,É,Â,£,Ä,Í Å'Z<—£,Æ Å'·<—£,ðŽQ Æ,·,é,±,Æ B

Å'Z<—£'l,Ì Ý'è,ÆŽæ“¾,É,Í IDirectSound3DBuffer::SetMinDistance A,“,æ,Ñ  
IDirectSound3DBuffer::GetMinDistance f\fbfh,ðŽg—p,·,é B“—l,É A Å'·<—  
£'l,Ì Ý'è,ÆŽæ“¾,É,Í IDirectSound3DBuffer::SetMaxDistance A,“,æ,Ñ  
IDirectSound3DBuffer::GetMaxDistance f\fbfh,ðŽg—p,·,é B

‘€ ìf, [fh

fTfEf“fh Efofbftf@,Í A•W € A““Š‘Î A<sup>−3</sup>E∅,ì,R,Â,ì ^— f, [fh,đŽ ,Â B•W € ^—  
f, [fh,ÍfftfHf<fg,ìf, [fh,Â, ,é B““Š‘Îf, [fh,Â,ÍfTfEf“fhfpf%of [f^(Ê’u A‘¬“x A•ûŠp)  
,ÍfŠfXfi [ Efpf%of [f^,Æ‘Š‘ÎŠÖEW,É, ,é B,±  
,ìf, [fh,Â,Í AfTfEf“fh,ì âÎfpf%of [f^,Í AfŠfXfi [ Efpf%of [f^,³Î X,³,ê,½,Æ,«,ÉŽ©“®“I,É X V,³,ê,é,ì,  
Â A‘Š‘Îfpf%of [f^,Í•Î,i,ç,È,c,Ü,Ü,Â, ,é B

3DfTfEf“fh Efofbftf@,ìf, [fh Ý’è,É,ÍDirectSound3DBuffer::SetModef f\fbfh,đŽg—p,·, ,é B,±  
,ìf f\fbfh,Í AdwModetf%ofO,ð,à,Æ,É‘€ ìf, [fh,đ Ý’è,·, ,é B,±,Ìftf%ofO,Í1”Ô–Ú,ìfpf%of [f^,Æ,μ,ĂŽw’è,·, ,é B

Ê'u,Æ'¬“x

3D,óŠÔ,É,,¬,é3DfTfEf“fh,ÎÊ'u,ð Ý'è EŽæ“¼,·,é,É,Í A**IDirectSound3DBuffer::SetPosition** A,,æ,Ñ  
**IDirectSound3DBuffer::GetPosition** f f\fbfh,ðŽg—p,·,é B

DirectSound,<sup>a</sup>fŠfXfi [,É'Î,·,éfhfbfvf%o [Œø%oÊ,ÛŒvŽŽ,ÉŽg—  
p,·,é'¬“x'l,ð Ý'è EŽæ“¼,·,é,É,Í A**IDirectSound3DBuffer::SetVelocity** A,,æ,Ñ  
**IDirectSound3DBuffer::GetVelocity** f f\fbfh,ðŽg—  
p,·,é Bfofbftf@,ÎÊ'u,Î A,»,Î'¬“x,l%oeç,ðŽó,¬,È,¢ BÊ'u,Æ'¬“x,İŠŒEW,É,Â,¢  
,Ä,Ï Ú ×,Î AÊ'u,Æ'¬“x,ðŽQ Æ,·,é,±,Æ B



**fTfEf“fh Efvf fWfFfNfVf‡f“ EfR [f“**

3DfTfEf“fh Efobfhtf@,Í A“à”fR [f“,ÆŠO”fR [f“,Ì,Ó,½,Â,ÌfR [f“,ðŽ ,Â B,³,Ü,‘,Ü,ÈIDirectSound3DBufferf  
f\fbfh,ðŽg—p,μ,Ä AfR [f“,ÌŠp“x A Ä’◀—£,Æ Ä’Z◀—  
£ Afobfhtf@,ÌfTfEf“fh Efvf fWfFfNfVf‡f“ EfR [f“,ÌÊ’u E•ûŠp,Æ,¢,Ä,½,±,Æ,ð Ý’è EŽæ“¾,‘,é,±  
,Æ,ª,Ä,«,é BfTfEf“fh Efvf fWfFfNfVf‡f“ EfR [f“,Ì® ì A“Á’Ų,Ä,¢,Ä,Í AfTfEf“fh EfR [f“,ðŽQ Æ,‘,é,±  
,Æ B

fTfEf“fh EfR [f“,ð“K Ø,É Ý’è,‘,ê,Î AfAfvfŠfP [fVf‡f“,Éfhf%of}fefBfbfN,ÈÆø%oÊ,ð%oÄ,‘,é,±  
,Æ,ª,Ä,«,é B,½,Æ,,Ì—H—ì,Ì °,ª•K—v,Ê ê ± AfTfEf“fh,ð’W X,Æ Ä ¶,‘,é,©,í,è,É  
IDirectSound3DBufferf f\fbfh,ðŽg—p,‘,ê,Î AŽŸ,ì,æ,μ,Ä^ê’wfTfXfyf“fXÆø%oÊ,ð,‘,é,±  
,Æ,ª,Ä,«,é B%o¹Æ¹,ð•”%o®,Ì’† S,ÊÊ’u’t,μ A•ûŠp,ðfhfA,ÉÆü,©,Ä,Ä Ý’è,‘,é B,»,μ,Ä AfTfEf“fh EfR [f“,ðfh  
fA,Ì• ,Ê ±,í,¹ AŠO”fR [f“,Ìf{fŠf... [f€,ð-10,000(\*s%oÄ’®%o¹),Ê Ý’è,‘,é B,±  
,ê,ç,Ì“Ä «,ªÆ◀ ±,³,ê,é,Æ AfhfA,©,ç%o¹,™,¹,ç,ê,é,æ,μ,É•,±,‘,é,Ì,Ä ,é B

,±,ì ß,Ä,Í A^È%o,ÌfTfEf“fh“Ä «,ð,Ç,ì,æ,μ,É Ý’è,‘,é,©,ð à-¾,‘,é B

fR [f“,ÌŠp“x,Æ•ûŠp

“à•” EŠO•”fR [f“ Ef{fŠf... [f€

**fR [f“,ÌŠp“x,Æ•ûŠp**

fR [f“,Ì”ÍÌ,ð’è,ß,éŠp“x,ð Ý’è EŽæ“¾,‘,é,É,Í IDirectSound3DBuffer::SetConeAngles A,“,æ,Ñ  
IDirectSound3DBuffer::GetConeAnglesf f\fbfh,ðŽg—  
p,‘,é BfTfEf“fh EfR [f“,Ì•ûŠp,ð Ý’è EŽæ“¾,‘,é,É,ÍIDirectSound3DBuffer::SetConeOrientation A,“,æ,Ñ  
IDirectSound3DBuffer::GetConeOrientationf f\fbfh,ðŽg—p,‘,é B

fR [f“Šp“x,ÌffftfHf<fg’l,Í360“x A,Â,Ü,è,·,×,Ä,Ì•ûÆü,É’Î,μ,Ä“^,¶f{fŠf... [f€,Ä%o¹,™,¹,ç,ê,é,æ,μ,É,È,Ä,Ä,¢  
,é B¹,ð%o°,° ,é,Æ A’è◀,³,ê,½fR [f“,ÌŠO“²,Ä,Íf{fŠf... [f€  
,º%o°,ª,é BŠO•”fR [f“Šp“x,Í,Ä,Ë,Ë“à•”fR [f“Šp“x,Æ“^,¶,©,»,ê,æ,è,à’â,«,È¹l,Ä ,é•K—v,ª ,é B

**“à•” EŠO•”fR [f“ Ef{fŠf... [f€**

ŠO•”fR [f“ Ef{fŠf... [f€,Æ,Í AfŠfXfi [,ªfobfhtf@,ÌfTfEf“fh EfR [f“,ÌŠO“²,É,¢,é,Æ,«,Ì’t%oÄ“l,Èf{fŠf...  
[f€,ìÆ, Š,ì,±,Æ,Ä ,é B,±,Ì—v’f,Í100dB,Ä•Æ”,³,ê,é BŠO•”f{fŠf... [f€,ÌffftfHf<fg’l,Í0,Ä ,é B,Ä,Ü,  
èfTfEf“fh EfR [f“,Í A,±,Ìfpf%of [f^,ª¹ X,³,ê,È,¢ÆÀ,è“Ä•Ê,ÈÆø%oÊ,ðŽ¹,³,È,¢ B

ŠO•”fR [f“ Ef{fŠf... [f€,Ì Ý’è EŽæ“¾,É,ÍIDirectSound3DBuffer::SetConeOutsideVolume A,“,æ,Ñ  
IDirectSound3DBuffer::GetConeOutsideVolumef f\fbfh,ðŽg—p,‘,é B,½,¾,μ%oÄ’®,ÈŠO•”fR [f“ Ef{fŠf... [f€,Ä,  
,Ä,Ä,à A%o¹Æ¹,©,ç—£,ê,é,²,Æ,ÉÆ, Š,μ,Ä,¢, B

fŠfXfi [,ªfTfEf“fh EfR [f“,Ì’†,É,¢,é,Æ,«,Ífm [f}f◀,Èfobfhtf@ Ef{fŠf... [f€,ªŽg—p,³,ê,é,(±  
,Ì¹,ÍIDirectSoundBuffer::GetVolumef f\fbfh,Ê,æ,è•Ö,³,ê,é) BfŠfXfi [,ªfTfEf“fh EfR [f“,ÌŠO,É,¢  
,é,Æ,«,Íf{fŠf... [f€,ÌŠO“²,ÌfR [f“,à—p,ç,ç,ê A,±,ì,Ó,½,Ä,ª ±,í,³,Ä,½f{fŠf... [f€,Æ,È,é BfR [f“,Ì«ŠE◀ß,-  
,Ä,ì%o¹,ÍfXf€ [fY,É Ä,¹,Ä,¢,« AŽ©’R,ÈÆø%oÊ,ð“¾,é,±,Æ,ª,Ä,«,é B

**IDirectSound3DListenerfCf“f^ [ftfFfCfX**

3DfŠfXfi [,Æ,Í A3DˆóŠÔ“à,ìfTfEf“fh Efofbftf@ EflfufWfFfNfg,É,æ,Á,Ä” ¶,µ,½‰¹,ð•·, l,ì,±  
,Æ,ðŽw,· B**IDirectSound3DListenerfCf“f^ [ftfFfCfX,ÍfŠfXfi** [,Ì3DˆóŠÔ,É,ˆ,ˆ,éÊ’u,ÆƐ» Ý,ìˆ–“x,ð §Ɛä,·,é B,Ü,  
½,Í AfŠfXfi [,©,ç—£,ê,½ ê ‡,ìfhfbfvf‰ [Ɛø‰Ê,ì—Ê,âf{fŠf... [f€,ìƐ, Š,Æ,¢,Á,½ ADirectSoundfRf“f|  
[flf“fg,Ì“® ì,É‰œç,·,éŠÂ««fpf‰of [f^,ð §Ɛä,·,é B

,±,ì ß,Â,Í A**IDirectSound3DListenerfCf“f^ [ftfFfCfX,ìf|fCf“f^,ðŽæ“¾,·,é•û–**  
**@,Æ AfCf“f^ [ftfFfCfX Ef f\fbfh,ðŽg—p,µ,½fŠfXfi** [ Efpf‰of [f^,ìŠÇ— •û–@,É,Â,¢,Ä à–¾,·,é B  
Ê‰°ò,ìfgfsfbfN,É,Â,¢,Ä à–¾,·,é B

IDirectSound3DListenerfCf“f^ [ftfFfCfX Ef|fCf“f^,ìŽæ“¾  
fofbf` Efpf‰of [f^‘€ ì  
˜,‘u,« Ý’è  
←—£—v’f  
fhfbfvf‰ [—v’f  
fŠfXfi [,ìÊ’u,Æ‘–“x  
fŠfXfi [,ì•ûƐü  
f [f<fIf t—v’f

**IDirectSound3DListener** fCf“f^ [ftfFfCfX Ef|fCf“f^,İŽæ“¾

IDirectSound3DListener fCf“f^ [ftfFfCfX,Öf|fCf“f^,ðŽæ“¾,·,é,É,Í A,Ü,,fvf%ofCf}

fŠ3DfTfEf“fh Efofbftf@,ð ì ¬,·,é•K—v,<sup>a</sup>,,é B,±

,ê,ð ì ¬,·,é,É,Í A**IDirectSound::CreateSoundBuffer** f\fbfh,ðŽg—p,μ A

**DSBUFFERDESC** \‘İ,İdwFlagsf f“fo’†,ÉDSBCAPS\_CTRL3Dftf%ofO,ðŽw’è,·,é B,»,μ,Ä ì ¬,<sup>3</sup>ê,½fofbftf@ ã,Ä

**IDirectSoundBuffer::QueryInterface** f\fbfh,ðŽg—

p,μ,Ä A,»,İfofbftf@,İ**IDirectSound3DListener** fCf“f^ [ftfFfCfX,Ö,İf|fCf“f^,ðŽæ“¾,·,é B`È%°,İ—á,ðŽQ Æ,·,é,±,Æ B

// DSBCAPS\_CTRL3D,ðŽg—p,μ,ÄlpDsbPrimary,ð ì ¬,·,é

hr = lpDsbPrimary->QueryInterface(IID\_IDirectSound3DListener,  
&lpDs3dListener);

if(SUCCEEDED(hr)) {  
    // 3D`€ İ,ðŽÄ s,·,é

·  
·  
·

}

**f ofbf` Efpf%of [f^'€ ì**

fAfvfŠfP [fVf‡f“,Ă,ì3DfTfEf“fhfpf%of [f^,ìŽæ“¼ E Ý’è,Í ACEÂ X,ìŽÀ s,Ă,à Af ofbf`,ðŽg—  
p,μ,½ŽÀ s,Ă,à%oÂ”\,Ă, ,é BCEÂ X,ì¹,ð Ý’è,·,é,½,ß,É A“K—p%oÂ”\  
,ÈDirectSound3DListenerfCf“f^ [ftfFfCfX Ef f\fbfh,ðŽg—p,·,é,±  
,Æ,ª,Ă,« ,é B,μ,©,μ Af ofbf tf@,ð•\CE»,·,é,·,×,Ă,ì¹,ðê“x,ÉŽæ“¼ E Ý’è,·,é•K—v,ª, ,é ê ‡,à, ,é B,» ,ì Û,É,Í A\_  
IDirectSound3DListener::GetAllParameters A,·,æ,Ñ IDirectSound3DListener::SetAllParametersf f\fbfh,ðŽg—  
p,·,é,Æ Af ofbf` Efpf%of [f^'€ ì,ð1%oñ,ìCEĂ,Ñ o,μ,ĂŽÀ s,Ă,« ,é B

~, 'u, « Ý'è

3DfŠfXfi [ Efpf%of [f^,ð•İ X,·,é,½,Ñ,É A3DˆÊ'u ftfBf<f^ Efpf%of [f^,İ ÄEvŽZ,ª•K—  
v,Æ,È,é B,»,İ,½,B AfAfvfŠfP [fVf‡f“,Í A“K—p%oÂ”\  
,Èf f\fbfh,İdwApplypf%of [f^“à,ÉDS3D\_DEFERREDftf%ofO,ðŽg—p,μ,Ä,¢,éŠÔ,Ífpf%of [f^,ð•İ X,Ä,« A,±  
,ê,É,æ,è Ä „,İfpftfH [f}f“fX,ð“¼,é,±,Æ,ª,Ä,«,é B,»,μ,Ä Ý'è,ª,·,×,ÄŠ@—  
¹,·,ê,İ AIDirectSound3DListener::CommitDeferredSettings,ðÄÄ,Ñ o,·,±,Æ,ª,Ä,«,éj

---

**Note**

,Ç,İ ~, 'u, « Ý'è,à AIDirectSound3DListener::CommitDeferredSettings,ðÄÄ,Ñ o,·,Ü,Ä,Í A“¬,¶ Ý'è,ðDS3D\_IMME  
DIATEftf%ofO,ðŽg—p,μ,ÄÄÄ,Ñ o,¹,İ A ã ‘,ª s,İ,ê,é B ~, 'u, «ftf%ofO,ðŽg—p,μ,ÄfŠfXfi [‘¬“x,ð(1,2,3)  
,É Ý'è,μ A,»,ê,©,Ç“¬,¶ftf%ofO,ðŽg—p,μ,ÄfŠfXfi [‘¬“x,ð(4,5,6),É Ý'è,μ,½,Æ,·,é,Æ AfŠfXfi [‘¬“x,İ(4,5,6)  
,Æ,È,é B,»,İÄä DirectSound3DListener::CommitDeferredSettingsf f\fbfh,ðÄÄ,Ñ o,·,Æ A‘¬“x,İ(4,5,6),Æ,È,é B

---

←—£—v'f

DirectSound,ÍffftfHf<fg,l'←—£'a'è'PÊ,Æ,μ,Äf [fgf<,ðŽg—p,μ,Ä,¢,é B,à,μfAfvfŠfP [fVf‡f“,af [fgf<,ðŽg—  
p,μ,Ê,¢ ê ‡ A←—£—v'f,ð Ý'è,·,é,±,Æ,a,Ä,«,é B←—£—v'f,Ê,Ä,¢,Ä,l' îñ,Í A'è'PÊ,Æ←—£—  
v'f,ðŽQ Æ,·,é,±,Æ B

ftfB [fg,ðŽg—p,μ,Ä,¢,éfAfvfŠfP [fVf‡f“,Ö←—£—  
v'f,ð Ý'è,·,é,Ê,Í AIDirectSound3DListener::SetDistanceFactor,ðŽg—p,μ,ÄfDistanceFactorpf%of [f^,Ê  
0.30480006096,ðŽw'è,·,é(±,l'l,Í A1ftfB [fg,ðf [fgf<,ÊŠ·ŽZ,μ,½'l,Ä, ,é) B←—£—  
v'f,l' Ý'èÆã,Í AfŠfXfi [,Ê“K—p%Ä”,Èf f\fbfh,Ä, ,ê,Î AfAfvfŠfP [fVf‡f“ÆÄ—L,l'←—£—v'f,ðŽg—  
p,μ,ÄÆÄ,Ñ o,μ,Ä,«,é B

fAfvfŠfP [fVf‡f“,Í,Ü,½ AÆ» Ý,l'←—£—v'f Ý'è,ðIDirectSound3DListener::GetDistanceFactorf f\fbfh,ðŽg—  
p,μ,ÄŽæ“¾,·,é,±,Æ,a,Ä,«,é BffftfHf<fg'l,ÍDS3D\_DEFAULTDISTANCEFACTOR (1.0),Ä, ,é B,±,ê,Í,Ð,Æ,Ä,l'←—  
£'PÊ,a1f [fgf<,Ê'S—,·,é,Æ,¢,□Ó—j,Ä, ,é BffftfHf<fg'l,Ä,Í A^Ê'ufxfNfgf<(3.0,7.2,-20.9),Æ,¢,□  
,l,Í•“l,aÆ³,l'Ê'u,æ,è3m%oE A7.2m ã A20.9mÆã,ë,Ê, ,é,Æ,¢,□Ó—j,Ê,È,é B←—£—  
v'f,a2.0,Ê•l X,³,ê,é,Æ A“„¶Ê'ufxfNfgf<,Ä,à•“l,a6m%oE A14.4m ã A41.8mÆã,ë,Ê, ,é,Æ,¢,□Ó—j,Ê,È,é B

**fhfbfvf%o [—v'f**

DirectSound,Í,Ð,Æ,Â,Û,½,Í,»,ê`È ã,ì3DfTfEf“fh Efofbftf@,É,Î,μ,Ä AfŠfXfi [,Ì'¬“x,ð,à,Æ,ÉfTfEf“fh,Éfhfbfvf  
%o [Cø%oÊ,ð%oÁ,|,é,±,Æ,ª,Ä,«,é Bfhfbfvf%o [—v'f,ð Ý'è,·,é,±,Æ,É,æ,è A DirectSound,Í ACE»ŽÀ ċŠE,Â'ìCE±  
,Ä,«,éfhfbfvf%o [Cø%oÊ,ð AfTfEf“fh,É'Î,·,éCø%oÊ,ð10”{,Û,Ä<,ß,Ä ¶,¶,³,¹,é,±,Æ,ª,Ä,«,é B,±,ì—  
v'f,ð Ý'è,·,é,É,Í**DirectSound3DListener::SetDopplerFactor** f\fbfh,ðŽg—p,·,é Bfhfbfvf%o [—  
v'f,Í0,©,ç10,Ì”ÍÍ,Ä Ý'è,Ä,«,é B0,Ífhfbfvf%o [Cø%oÊ,ªfTfEf“fh,É%oÁ,|,ç,ê,Ä,ç,È,ç,±  
,Æ,ðŽ',· B¼4,Ì¹,Í,·,×,Ä ACE»ŽÀ ċŠE,Â'ìCE±,Ä,«,éfhfbfvf%o [Cø%oÊ,Ì”{ ”,ð•\,· B,Ä,Û,è A1,Í ACE»ŽÀ ċŠE,ÄŠ  
,¶,ç,ê,éfhfbfvf%o [Cø%oÊ,ª%oÁ,|,ç,ê,é,±,Æ,ð•\,μ A2,ÍCE»ŽÀ ċŠE,ÄŠ',¶,ç,ê,éfhfbfvf%o [Cø%oÊ,²”{ %oÁ,|,ç,ê,é,±  
,Æ,ð•\,· B3DfŠfXfi [,É Ý'è,³,ê,Ä,ç,éfhfbfvf%o [—  
v'f,ðŽæ“¾,·,é,É,Í**DirectSound3DListener::GetDopplerFactor** f\fbfh,ðŽg—p,·,é B

*fŠfXfi* [,İÊ'u,Æ'¬“x

**IDirectSound3DListener::SetPosition** A,“,æ,Ń **IDirectSound3DListener::GetPosition***f f\fbfh,ðŽg—*  
p,μ,Ä A3D«óŠÔ,É,“,̄,éfŠfXfi [,İÊ'u,ð Ý'è EŽæ“¾,Â,«,é B

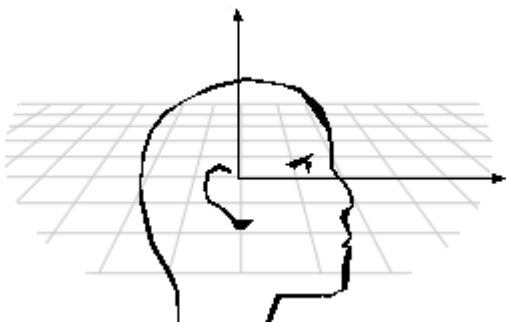
*fŠfXfi* [,Ö,İfhfbfvf%o [Æø%oÊ,ðŒvŽZ,·,é,½,ß,ÉŽg—  
p,·,é'¬“x,ð Ý'è EŽæ“¾,·,é,É,İ **IDirectSound3DListener::SetVelocity** A,“,æ,Ń **IDirectSound3DListener::GetVelocity**  
*f f\fbfh,ðŽg—*p,·,é B*fŠfXfi* [,İÊ'u,İ,»,İ'¬“x,É,İ%oeĸ,ðŽó,̄,È,¢ B^Ê'u,Æ'¬“x,İŠÖŒW,É,Â,¢  
,Ä,İ Ú ×,İ A^Ê'u,Æ'¬“x,ðŽQ Æ,·,é,±,Æ B



fŠfXfi [,l•uEü

fŠfXfi [,l•uEü,Í3DEø%Ê,l ^— ,É,“,ç,Ä—Í,È–ðŠ,,ð%Ê,½,· B<óŠÔ“à,l`è`è,l`Ê`u,Â%l,“” ¶,µ,½,æ,□  
,È òŠo,ð l,è o,·,½,ß,É ADirectSound,ÍfTfEf“fh EfLf... [,ðŠTŽZ,·,é BfLf... [,É,Â,ç  
,Ä,l Ú ×,Í A%l‘æ’è`Ê,l”FŽ\_,ðŽQ Æ,·,é,±,Æ B

fŠfXfi [,l•uEü,Í A ã•ûfxfNfgf<,Æ‘O•ûfxfNfgf<,Æ,ç,□ ACE’“\_,ð<□—  
L,·,é,Ó,½,Â,ḷfxfNfgf<,ḷŠŒW,Ê,æ,Ä,Ä’è<³,ê,é B ã•ûfxfNfgf<,ÍfŠfXfi [,ḷ“a,ḷ’† S,©,çŽn,Ü,è A“a,ḷ`è”Ô ã,ÉEü,  
©,Ä,Ä^è`¼ ü,Ê’Ê%ß,·,é B‘O•ûfxfNfgf<,à,Ü,½fŠfXfi [,ḷ“a,ḷ’† S,©,çŽn,Ü,é,a A ã•ûfxfNfgf<,©,çE©,é,Æ%E,ÖE  
ü,©,ç AfŠfXfi [,ḷŠç,ḷ‘O–Ê,ð’Ê%ß,·,é BŽŸ,ḷ },Í,±,ê,ç,ḷfxfNfgf<,ḷŠŒW,ðŽ,ḷ,µ,Ä,ç,é B



fŠfXfi [,l•uEü,ð Ý’è EŽæ“¾,·,é,É,ÍIDirectSound3DListener::SetOrientation A,“,æ,N  
IDirectSound3DListener::GetOrientationf f\bfh,ðŽg—p,·,é BftftfHf<fg’l,Í A‘O•ûfxfNfgf<,a  
(0,0,1.0) A ã•ûfxfNfgf<,a(0,1.0,0),É,Ê,Ä,Ä,ç,é B

**f** [f<fIft—v‘f

f [f<fIft,Í AfŠfXfi [,ÆfTfEf“fh,ì<—£,É,æ,Á,Ä ¶,¶,é%o¹,ìCE, Š,ì“x ‡,Á, ,é BDirectSound,Í Af [f<fIft,ðCE  
»ŽÀ ¢ŠE,Á‘ìCE±,Á,«,é10”{,Û,Á,ì”íí,Á ¶,¶,³,¹,é,±,Æ,ª,Á,«,é B,±,ì—  
v‘f,ð Ý’è,·,é,É,í**IDirectSound3DListener::SetRolloffFactor**f f\fbfh,ðŽg—p,·,é Bf [f<fIft—  
v‘f,Í0,©,ç10,ì”íí,Á Ý’è,Á,«,é B0,Íf [f<fIft,ªfTfEf“fh,É%oÁ,!,ç,ê,Á,¢,É,¢,±  
,Æ,ðŽ!,· B,»,ì“¼,ì ”l,íCE»ŽÀ ¢ŠE,Á‘ìCE±,Á,«,éf [f<fIft,ì”{ ”,ð•\,· B,Â,Û,è A1,í ACE»ŽÀ ¢ŠE,ÁŠ  
’,¶,ç,ê,éf [f<fIft,ª%oÁ,!,ç,é,±,Æ,ð•\,µ A2,íCE»ŽÀ ¢ŠE,ÁŠ’,¶,ç,ê,éf [f<fIft,ª”{ %oÁ,!,ç,ê,é,±,Æ,ð•\  
,· Bf [f<fIft—v‘f,ðŽæ“¼,·,é,É,í**IDirectSound3DListener::GetRolloffFactor**f f\fbfh,ðŽg—p,·,é B

## IDirectSoundBufferfCf“f^ [ftfFfCfX

IDirectSoundBufferfCf“f^ [ftfFfCfX,É,æ,è AfAfvfŠfP [fVf‡f“,ÍfI [ffBfI Eff [f^,lfofbftf@,ð‘€ ì,Ä,«,é,æ,□  
,É,È,é BfI [ffBfI Eff [f^,ÍDirectSoundfofbftf@,É í“,·,é B Ä ¶,³,è,éTfEf“fh,âfI [ffBfI EfXfgfŠ [f€  
,l,D,Æ,Â,D,Æ,Â,É‘î,µ,ÄfAfvfŠfP [fVf‡f“,ÍDirectSoundfofbftf@,ð ì ¬,·,é B

fvf%oCf}fŠ EfTfEf“fh Efofbftf@,Í AfTfEf“fh EfffofCfX,Ö€» Ý‘—,ç,è,Ä,¢  
,éTf“fvfŠf“fO EfI [ffBfI,ð•\,· B,±,è,ç,ÌTf“fvfç,Í‘Pˆè,ÌfXfgfŠ [f€,Ä,à A•i ”,lfi [ffBfI EfXfgfŠ [f€  
,ðf~fLfVf“fO,µ,Ä o—Í,µ,½,à,ì,Ä,à,æ,¢ B‘Ê í,Ìfvf%oCf}  
fŠ EfTfEf“fh Efofbftf@“à,lfI [ffBfI Eff [f^,É,Í¼ ÚfAfNfZfX,Í s,í,È,¢ B,½,¾,µ A o—Íf{fŠf...  
[f€ A”g€`,ì Ý‘è,È,Ç A §€ä,ì–Ú“l,Äfvf%oCf}fŠ Efofbftf@,ðŽg—p,·,é,±,Æ,Í,Ä,«,é B

fZfJf“f fŠ EfTfEf“fh Efofbftf@,Í‘Pˆè,ÌfXfgfŠ [f€ o—Í,·,æ,ÑfTfEf“fh o—Í,ð•\,· B,±,lfofbftf@,Ìfvf%oCf}  
fŠ EfTfEf“fh Efofbftf@,Ä Ä ¶,·,é,±,Æ,ª,Ä,«,é B“Žž,É Ä ¶,³,è,½fZfJf“f\_fŠ Efofbftf@,Ìfvf%oCf}  
fŠ Efofbftf@,Äf~fLfVf“fO,³,è A,»,è,©,çTfEf“fh EfffofCfX,Ö‘—,ç,è,é B

---

## Note

DirectSoundBufferIfufWfFfNfg,Í,»,è,ç,ð ì ¬,µ,½DirectSoundIfufWfFfNfg,Ì Š—  
L,Æ,È,é BDirectSoundIfufWfFfNfg,ª%ð•ú,³,è,é,Æ A,»,lIfufWfFfNfg,ª ì ¬,µ,½fofbftf@,à,·,×,Ä%ð•ú,³,è AŽQ  
Æ,³,è,é,±,Æ,Í,È,¢ B

---

,±,ì B,Ä,Í AfTfEf“fh Efofbftf@,Ìˆ%¹ E Ä ¶,lŠÇ— •û–@ Af{fŠf... [f€  
,lfgf%oBfLf“fO,Æ §€ä AŽü”g ” Afpf“ Ý‘è AfTfEf“fh Efofbftf@ î•ñ,ìŽæ“¾ Af f,fŠŠÇ— ,É,Ä,¢,Ä à–  
¾,·,é B

Ä ¶ŠÇ—  
fTfEf“fhŠÄ«ŠÇ—  
î•ñ,ìŽæ“¾  
f\_f,fŠŠÇ—

Ä ¶ŠÇ—

*fTfEf“fh,İfŠfAf<f^fCf€,È~^%o<sup>1</sup> E Ä ¶,ð §CEä,·,é,½,ß,É,Í A***IDirectSoundBuffer::Play**,Æ=  
**IDirectSoundBuffer::Stop***f f\fbfh,ðŽg—p,·,é BfTfEf“fh,İ Ä ¶,É,İIDirectSoundBuffer::Play,ðŽg—*  
*p B ÄCEä,Ü,Ä,,é,Æfobftf@,İŽ©“@“I,É’âŽ~,·,é B,½,¾,µ Af< [fv,ðŽw’è,·,é,Æ A*  
**IDirectSoundBuffer::Stop**,ðCEÄ,Ñ o,·,Ü,Äfobftf@,Í,,è•Ö,µ Ä ¶,<sup>3</sup>,ê,é B

**IDirectSoundBuffer::Lock***f f\fbfh,ÍCE» Ý,İfTfEf“fh Efobftf@,İ ‘,«,±,Ýf|*  
*fCf“f^,ðŽæ“¾,·,é Bfobftf@,ÖfI [fffBfI Eft [f^,ð ‘,«,±,ñ,¾CEä,Í A***IDirectSoundBuffer::Unlock***f f\fbfh,ðŽg*  
*—p,µ,Äfobftf@,İf fbfN,ð%ð æ,·,é•K—v,<sup>a</sup>, ,é B’·ŠúŠÖ,É,í,½,Á,Äfobftf@,ðf fbfN,µ,Ä,“,×,«,Ä,Í,È,ç B*

*fTfEf“fh Efobftf@,İfJfEf“fg^Ê’u,ðŽæ“¾,·,é,É,Í A***IDirectSoundBuffer::GetCurrentPosition***A,à,µ,,Í*  
**IDirectSoundBuffer::SetCurrentPosition**,ðŽg—p,·,é B

*fTfEf“fhšĀ«šÇ—*

**IDirectSoundBuffer::GetVolume** A,“,æ,Ñ **IDirectSoundBuffer::SetVolume***f f\fbfh,ðŽg—*  
p,“,é,Æ A Ä ¶’†,l̂fofbftf@,l̂f{fšf... [f€,,l̂žæ“¾ E Ý’è,“ s,,é Bfvf%oCf}fš EfTfEf“fh Efofbftf@,l̂f{fšf...  
[f€,ð Ý’è,“,é,±,Æ,Ā AfTfEf“fh EfJ [fh,l̂fEfF [fuftfH [f€ EfI [ffBfI Ef{fšf... [f€,“İ X,³,ê,é B

“—l,É A **IDirectSoundBuffer::GetFrequency** A,“,æ,Ñ **IDirectSoundBuffer::SetFrequency** *f f\fbfh,ðŽg—*  
p,µ,Ā AfTf“fvfšf“fO EfI [ffBfI,“ Ä ¶,³,ê,éžü”g ”,ðžæ“¾ E Ý’è,“,é,±,Æ,“Ā,«é Bfvf%oCf}  
fš Efofbftf@,l̂žü”g ”,ð•İ X,“,é,±,Æ,Í,Ā,«È,¢ B

*fpf“,l̂žæ“¾ E Ý’è,É,Í A* **IDirectSoundBuffer::GetPan** A,“,æ,Ñ  
**IDirectSoundBuffer::SetPan***f f\fbfh,ðĒÄ,Ñ o,· Bfvf%oCf}fš Efofbftf@,l̂fpf“,ð•İ X,“,é,±,Æ,Í,Ā,«È,¢ B*

îñ,İŽæ“¾

**IDirectSoundBuffer::GetCaps**,Í ADirectSoundBufferIfufWfFfNfg,Ì «”\,ðŽæ“¾,·,é B

**IDirectSoundBuffer::GetStatus** f\fbfh,ðŽg—

p,μ,Ä AfJfŒf“fg,İfTfEf“fh Efofbftf@,ª Ä ¶†,©’âŽ~’†,©,ðŒÀ’è,·,é,±,Æ,ª,Ä,«,é B

**IDirectSoundBuffer::GetFormat** f\fbfh,ðŽg—p,μ,Ä Afofbftf@“à,İfTfEf“fh Eff [f^,İŒ`Ž®,ðŽæ“¾,·,é,±

,Æ,ª,Ä,«,é B,Û,½ A **IDirectSoundBuffer::GetFormat** ,“,æ,Ñ **IDirectSoundBuffer::SetFormat** f\fbfh,ðŽg—

p,μ,Ä Afvf%o{Cf}{fŠ EfTfEf“fh Efofbftf@“à,İfTfEf“fh Eff [f^,İŒ`Ž®,ð Ý’è,·,é,±,Æ,à,Ä,«,é

---

#### Note

fZfJf“f fŠ EfTfEf“fh Efofbftf@,ª ì ¬,³,ê,é,Æ A,»,ÌŒ`Ž®,ÍŒÂ’è,³,ê,é B,à,μ•ÊŒ`Ž®,İfZfJf“f\_fŠ Efofbftf@,ª  
•K—v,È,ç A,»,İftfH [f}fbfg,Ä V«K,Éfofbftf@,ð ì ¬,·,é•K—v,ª, ,é B

---

*f f,fŠŠÇ—*

**IDirectSoundBuffer::Restore***f f\bfh,ðŽg—*

p,μ,Ä AŽw'è,<sup>3</sup>,ê,½DirectSoundBufferIfufWfFfNfg,lfTfEf“fh Efofbftf@f f,fŠ,ðfŠfXfgfA,·,é,±,Æ,<sup>a</sup>,Ä,«,é B,±  
,ê,Ífofbftf@,<sup>a</sup>Ž,,í,ê,½ ê ‡,É—L—p,<sup>¾</sup>,<sup>a</sup> A

**IDirectSoundBuffer::Restore**,<sup>a</sup>fŠfXfgfA,·,é,ì,Í,»,lf f,fŠŽ©·ì,ì,Ý,Ä, ,é Bf f,fŠ,lfRf“fgf [f<,ÍfŠfXfgfA,μ,È,¢  
Bfofbftf@ Ef f,fŠ,<sup>a</sup>fŠfXfgfA,<sup>3</sup>,ê,½Çä,Í A,»,±,Ö—LÇø,ÈfTfEf“fhf [f^,ð ‘,«,±,b•K—v,<sup>a</sup>, ,é B

## DirectSound, ĨŽg—p—á

DirectSound, ð Ä ¶, ·, é, É, Í ÒÈ%°, ĨŽè ±, É ], ▢•K—v, ª, , é B

1 **DirectSoundCreate**ŠÖ ”, ðÄÄ, Ñ o, µ, ÄDirectSoundfIfufWfFfNfg, ð ì ¬, ·, é B

2

**IDirectSound::SetCooperativeLevel**f f\fbfh, ðÄÄ, Ñ o, µ, Ä¶'²fÇfxf<, ðŽw'è, ·, é B, Û, Æ, ñ, Ç, ĨfAvfššP [fVf±f“, Ä, Í Ä%°°ÊfÇfxf<, Ä, , éDSSCL\_NORMAL, ðŽg—p, ·, é B

3 **IDirectSound::CreateSoundBuffer**f f\fbfh, ðŽg—p, µ, ÄfZfJf“f fŠ EfTfEf“fh Efofbftf@, ð ì ¬, ·, é **BDSBUFFERDESC** \‘ç'İ, Ĩ†, Ä, Í A, », Ĩfofbftf@, ªfZfJf“f fŠ Efofbftf@, Ä, , é, ±, Æ, ðŽw'è, ·, é•K—v, Í, È, Ç BfftfHf<fg, ÄfZfJf“f fŠ Efofbftf@, ª ì ¬, º, é, æ, ▢, É, È, Ä, Ä, Ç, é B

4 fZfJf“f fŠ Efofbftf@, Êff [f^, ð“Ç, Ý ž, ▢ Bff [f^—İæ, Éf|fCf“f^, ðŽæ“¾, ·, é, É, **IDirectSoundBuffer::Lock** f f\fbfh, ðŽg—p, µ A, », ĨfffofCfX, Êff [f^, ðfZfbfg, ·, é, É, **IDirectSoundBuffer::Unlock**f f\fbfh, ðŽg—p, ·, é B

5 **IDirectSoundBuffer::Play**f f\fbfh, ðŽg—p, µ, ÄfZfJf“f fŠ Efofbftf@, ð Ä ¶, ·, é B

6 fAvfššP [fVf±f“, ªfTfEf“fh, Ĩ Ä ¶, ð I—¹, µ, ½, Ç ADirectSoundBufferfofbftf@, Ĩ**IDirectSoundBuffer::Stop**f f\fbfh, ðŽg—p, µ, Ä, ·, ×, Ä, Ĩfofbftf@, ð'âŽ~, º, ¹, é B

7 fZfJf“f fŠ Efofbftf@, ð%ð•ú, ·, é B

8 DirectSoundfIfufWfFfNfg, ð%ð•ú, ·, é B

, Û, ½ A^È%°, ĨfIfvVf±f“, ðŽÄ s, ·, é, ±, Æ, à, Ä, «, , é B

fvf%ofCf}fŠ Efofbftf@, ð ì ¬, µ, Ä**IDirectSoundBuffer::SetFormat**f f\fbfh, ðÄÄ, Ñ o, µ Afvf%ofCf}fŠ EfTfEf“fh Efofbftf@, Ĩ o—ÍÇ`Ž®, ð Ý'è, ·, é B, ±

, Ĩ Ý'è, Ĩ'O, É AfAvfššP [fVf±f“, Ĩ¶'²fÇfxf<, ªDSSCL\_PRIORITY, É Ý'è, º, é, Ä, Ç, é•K—v, ª, , é B

fvf%ofCf}fŠ EfTfEf“fh Efofbftf@, ð ì ¬, µ A**IDirectSoundBuffer::Play**f f\fbfh, ðŽg—p, µ, Ä, », Ĩfofbftf@, ð Ä ¶, ·, é B, ±, ê, Í A, ½, Æ, |fZfJf“f fŠ Efofbftf@, ª Ä ¶, º, é, Ä, Ç, È, , Ä, à Afvf%ofCf}fŠ Efofbftf@, ª, Ä, È, É Ä ¶, º, é, Ä, Ç, é, ±, Æ, ð•Û Ø, ·, é B, ±, Ĩ“® Ĩ, ĨCPUfpf [ , ð, Ç, -, Ç, © Á”i, ·, é, ª AfZfJf“f fŠ Efofbftf@, ª Ä ¶, º, é, é, Æ, «, ĨŠŽnŽžŠÖ, ð'Z k, ·, é B

, ±, Ĩ ß, É, Í ADirectSoundRf“f| [f|f“fg, ÉŠÖ~A, µ, ½È%°, Ĩê”Ê“I, Èf^fXfN, ðŽÄ s, ·, éfR [fh, ĨfTf“fvf<, ªŽû, ß, Ç, é, Ä, Ç, é BfR [fh, Ĩ%ð à, ÍŠe X, ĨfTf“fvf<, Ä s, ▢ B

DirectSoundfIfufWfFfNfg, Ĩ ì ¬

CoCreateInstance, ðŽg—p, µ, ½DirectSoundfIfufWfFfNfg, Ĩ ì ¬

fn [fhfEfFfA «”\, Ĩ Æ%öĭ

fTfEf“fh Efofbftf@, Ĩ ì ¬

fTfEf“fh Efofbftf@, Ö, Ĩ ‘, «, ±, Ý

DirectSoundf~fLfT [ , ĨŽg—p

fJfXf^fÇ Ef~fLfT [ , ĨŽg—p

³ kwave, ĨŽg—p



**DirectSoundIfufWfFfNfg,İ à ¬**

DirectSoundIfufWfFfNfg,đ à ¬,·,é Å,àŠÈ'P,È•û-@,Í A **DirectSoundCreate**ŠÖ ",đĖÄ,Ň o,µ,ÄNULL  
GUID,đŽw'è,·,é•û-@,Ä, ,é B,±  
,İŠÖ ",İfftfHf<fg EfEfBf"fhfE,İEfF [fu EfffofCfX,Æ"™,İfIfufWfFfNfg,đ à ¬,µ,æ,□,Æ,·,é B,»,İ, ,  
Æ**DirectSound::SetCooperativeLevel**f\fbfh,đĖÄ,Ň o,·K—v,<sup>a</sup>, ,é B,±  
,İf f\fbfh,İĖÄ,Ň o,µ,<sup>a</sup> s,İ,è,è,Ü,Ä,İfTfEf"fh Efobf tf@,Í à ¬,<sup>3</sup>,è,È,¢ BŽŸ,İ—á,Ä A,±,İfvf fZfX,đŽ',· B

```
LPDIRECTSOUND lpDirectSound;  
if(DS_OK == DirectSoundCreate(NULL, &lpDirectSound,  
    NULL)) {  
    // à ¬,É -Æ±,µ,½ ê ±  
    lpDirectSound->lpVtbl->SetCooperativeLevel(lpDirectSound,  
        hwnd, DSSCL_NORMAL);  
    // .  
    // . DirectSound,ÖfAfNfZfX,·,é,½,ß,İfR [fh,đ,±,±,É"z'u,·,é  
    // .  
} else {  
    // à ¬,ÉŽ,"s,µ,½ ê ±  
    // .  
    // .  
    // .  
    // .  
}
```

**DirectSoundEnumerate**ŠÖ ",đŽg—p,·,é,Æ A"Á'è,İfTfEf"fhffofCfX,İ à ¬,đŽw'è,·,é,±,Æ,<sup>a</sup>,Ä,« ,é B,±,İŠÖ ",đŽg  
—p,·,é,É,Í **ADSEnumCallback**ŠÖ ",Æ A,Ü,Æ,ñ,Ç,İ ê ±fCf"fxf^f"fx Eff [f^ \¢'İ,à à à ¬,·,é BŽŸ,É—  
á,đŽ',· B

```
typedef struct {  
    // GUIDs,Ö«L%—,·,é  
    // fffofCfX,İffBfXfvfŠfNfVf±f"•Źš—ñ,Ö«L%—,·,é  
} APPINSTANCEDATA, *LPAPPINSTANCEDATA;  
BOOL AppEnumCallbackFunction(  
    LPGUID lpGuid,  
    LPTSTR lpstrDescription,  
    LPTSTR lpstrModule,  
    LPVOID lpContext)  
{  
    LPAPPINSTANCEDATA lpInstance = (LPAPPINSTANCEDATA)  
        lpContext;  
    // lpInstance \¢'İ,ÖGUID,đfRfs [,·,é  
    // Strcpy«L q•Źš—ñ,đlpInstance \¢'İ,Ö  
    return TRUE; // —ñ« ,đ'±, ,é  
}
```

,<sup>3</sup>,ç,É AŽŸ,İ—á,đŽg—p,µ,ÄDirectSoundIfufWfFfNfg,đ à ¬,·,é,±,Æ,à,Ä,« ,é B

```
AppInitDirectSound()  
{  
    APPINSTANCEDATA AppInstanceData;  
    LPGUID lpGuid;  
    LPDIRECTSOUND lpDirectSound;  
    HRESULT hr;  
    DirectSoundEnumerate(AppEnumCallbackFunction,  
        &AppInstanceData);  
    lpGuid = AppLetUserSelectDevice(&AppInstanceData);  
  
    // DirectSoundCreate,afGf% [İ,Æ,«,Í  
    // •Ö'İ,đf`fFfbfN,·,é•K—v,a, ,é  
  
    hr = DirectSoundCreate(lpGuid, &lpDirectSound, NULL);  
    // .
```

// .  
// .  
}

fTfEf“fh EfffofCfX,ªÈ,©,Á,½,è A  
lpGuidfpf%of [f^,ÅŽw’è,³,ê,½fTfEf“fh EfffofCfX,ÉfEfF [fufH [f€ EfI [ffBfIŠÖ ”,ªŠ,,,è U,ç,ê,Ä,¢  
,é,Æ A **DirectSoundCreate**ŠÖ ”,ÍŽ,”s,·,é BfTfEf“fh,È,µ,Á‘±,¯,é,É,¹,æ Af† [fU,É,»,İfTfEf“fh EfffofCfX,ðŽg—  
p,µ,Ä,¢,éAfvfŠfP [fVf‡f“,İ I—¹,ð‘£,·,É,¹,æ A,±,İCEÄ,Ň o,µ,ªŽ,”s,µ,½ ê ‡,É”ö,!,é•K—v,ª ,é B

**CoCreateInstance**, $\delta\check{Z}g-p,\mu,\frac{1}{2}$ **DirectSound***fIfufWfFfNfg*, $\check{I}$   $\dot{\iota}$   $\neg$

**CoCreateInstance**, $\delta\check{Z}g-p,\mu,\check{A}$ **DirectSound***fIfufWfFfNfg*, $\delta$   $\dot{\iota}$   $\neg$ , $\cdot$ , $\acute{e}$ , $\acute{E}$ , $\acute{I}$  $\hat{E}\%^\circ$ , $\check{I}\check{Z}\grave{e}$   $\ddot{z}$ , $\delta$   $s,\square$  B

1  $\check{S}\check{O}$   $\text{”},\acute{E}$ NULL, $\delta\check{Z}w'\grave{e},\mu,\check{A}$  ACOM, $\delta$   $\%_o\check{S}\acute{u}\%_o$ », $\cdot$ , $\acute{e}$  B

```
if (FAILED(CoInitialize(NULL)))  
    return FALSE;
```

2 **DirectSoundCreate**  $\check{S}\check{O}$   $\text{”},\delta\check{Z}g-p,\cdot$ , $\acute{e}$ , $\mathfrak{a}$ , $\grave{e}$  A**CoCreateInstance**, $\text{”},\mathfrak{a},\check{N}$  **IDirectSound::Initialize***f\fbfh*, $\delta\check{Z}g-p,\mu,\check{A}$ **DirectSound***fIfufWfFfNfg*, $\delta$   $\dot{\iota}$   $\neg$ , $\cdot$ , $\acute{e}$  B

```
dsrcval = CoCreateInstance(&CLSID_DirectSound,  
    NULL, &IID_IDirectSound, &lpds);  
if (!FAILED(dsrcval))  
    dsrcval = IDirectSound_Initialize(lpds, NULL);
```

*CLSID\_DirectSound*, $\acute{I}$ **DirectSound***fhf%ofCfo EfIfufWfFfNfg EfNf%ofX,\grave{I}fNf%ofX\check{Z}^- \hat{E}\check{Z}q,\check{A} A  
*IID\_IDirectSound*, $\acute{I}$ **DirectSound***fCf“f^ [ftFfCfX,\check{A}, \acute{e} B *lpdsfpf%of [f^,\acute{I}**CoCreateInstance**, $\text{”},\hat{O},-\mathfrak{C}$   $\%_o\check{S}\acute{u}\%_o$ »*fIfufWfFfNfg,\check{A}, \acute{e} B****

**DirectSound***fIfufWfFfNfg*, $\delta\check{Z}g-p,\cdot$ , $\acute{e}$ ‘O, $\acute{E}$ **IDirectSound::Initialize**, $\delta\mathfrak{C}\check{E}\check{A},\check{N}$   $o,\textsuperscript{3},\grave{E},,\check{A},\acute{I},\grave{E},\mathfrak{C},\grave{E},\mathfrak{C}$  B, $\pm$ , $\grave{I}f$  *f\fbfh*, $\acute{I}$  A  
**DirectSoundCreate**, $\text{”}\hat{E}$   $\dot{\iota}\check{Z}g-p,\cdot$ , $\acute{e}fhf%ofCfo,\grave{I}$ GUID*fpf%of [f^(\pm,\check{I}  $\grave{e}$   $\ddot{z}$ , $\acute{I}$ NULL), $\delta$   $\grave{I}-$   
 $p,\cdot$ , $\acute{e}$  B**DirectSound**, $\text{”}$   $\%_o\check{S}\acute{u}\%_o$ », $\textsuperscript{3},\grave{e},\acute{e},\mathfrak{A}$  A**DirectSoundCreate**, $\check{A}$   $\dot{\iota}$   $\neg$ , $\textsuperscript{3},\grave{e},\frac{1}{2},\mathfrak{A},\langle,\mathfrak{A}$ “ $\neg$ , $\P$ , $\mathfrak{a},\square$   
, $\acute{E}$ **DirectSound***fIfufWfFfNfg*, $\delta\check{Z}g-p,\mu,\frac{1}{2},\grave{e}\%_o\delta\bullet\acute{u},\mu,\frac{1}{2},\grave{e},\cdot$ , $\acute{e}$ , $\pm$ , $\mathfrak{A},\textsuperscript{a},\check{A},\langle,\acute{e},\mathfrak{a},\square,\acute{E},\grave{E},\acute{e}$  B*

*fAfvfŠfP [fVf $\ddot{z}$ f“*, $\delta$   $I-\neg$ , $\cdot$ , $\acute{e}$ ‘O, $\acute{E}$ , $\acute{I}$  A $\hat{E}\%^\circ$ , $\grave{I},\mathfrak{a},\square,\acute{E}$ **CoUninitialize**, $\delta\check{Z}g-p,\mu,\check{A}$ COM, $\grave{I}fVfffbfgf_fEf“$ , $\delta$   $s,\square$  B

**CoUninitialize**();

**fn [fhfEfFfA «”\ì Æ%öï**

DirectSound,Ä,Í AfAvfŠfP [fVf‡f“,ÄfIfufWfFfNfg,Žg—p,·,éTfEf“fh EfffofCfX,ìfn [fhfEfFfA «”\ ,ðŽæ“¾,·,é,±,Æ,ª,Ä,«,é BDirectSound,ÍŽ©“®“I,Éfn [fhfEfFfA EfAfNfZf%œ [fVf‡f“,ð s,□ ,ì,Ä A,Ü,Æ,ñ,Ç,ìfAvfŠfP [fVf‡f“,Ä,Í,±,ê,ð•K—v,Æ,µ,È,¢ B,µ,©,µfnfCfpftfH [f} f“fX,ÈfAvfŠfP [fVf‡f“,Ä,Í A,»,ìfTfEf“fh—v< ,É%ž,!,éfn [fhfEfFfA,ì<@”\,ð’m,é,½,ß,É,±,ì î•ñ,ðŽg—p,·,é,± ,Æ,ª,Ä,«,é B,½,Æ,,ì Afn [fhfEfFfA Ef~fLfVf“fO,ª—LÆø,È,ç A Ä ¶,Ä,«,éTfEf“fh,ª,æ,è‘½,,É,é B

**fn [fhfEfFfA «”\,ðŽæ“¾,·,é,½,ß,É,ÍIDirectSound::GetCapsf f\fbfh,ðŽg—p,·,é B,±,ìf f\fbfh,Í AŽŸ,ì—á,ì,æ,□ ,ÉDSCAPS \‘¢‘ì“à,É—,,ß ž,Ü,ê,Ä,¢,é B**

AppDetermineHardwareCaps(LPDIRECTSOUND lpDirectSound)

```
{
    DSCAPS dscaps;
    HRESULT hr;
    dscaps.dwSize = sizeof(DSCAPS);
    hr = lpDirectSound->lpVtbl->GetCaps(lpDirectSound,
    &dscaps);
    if(DS_OK == hr) {
        // ¬Æ÷,µ,½,çDSCAPS \‘¢‘ì,ð•%øð,·,é
        // .
        // .
        // .
    }
    // .
    // .
    // .
}
```

**DSCAPS \‘¢‘ì,É,Í A,»,ê,¼,ê,ìf^fCfv,ì Ä‘âfŠf\ [fX,âÆ» Ý—**

LÆø,ÈfŠf\ [fX î•ñ,È,Ç AfTfEf“fh EfffofCfX,ìfpftfH [f}f“fX,ÆfŠf\ [fX,ÉŠÖ,·,é î•ñ,ªŠÜ,Ü,ê,Ä,¢,é B,± ,ê,ç,í,³,Ü,‘,Ü,ÈfŠf\ [fXŠÖ,Ä—µ ,,ð ¶,¶,³,¹,é ê ‡,ª, ,é B,½,Æ,,ì A’Pê,ìfn [fhfEfFfA EfXfgfŠ [f€ EfTfEf“fh Efofbftf@,ìŠ,,è“— ,Ä,Í A,Ö,½,Ä,ìfXf^fefBfbfN Ef~fLfVf“fO Ef`fff“flf<,ð Á”i,·,é Bfn [fhfEfFfA «”\ ,ð“è,·,é ê ‡ Afobftf@,ìŠ,,è“—,Ä,ÆŠ,,è“— ,Ä,ìŠÖ,ÉIDirectSound::GetCaps,ðÆÄ,Ñ o,µ,Ä Afobftf@ ì ¬,É \ª,ÈfŠf\ [fX,ª, ,é,©,ðf`FFfbfN,·,é•K—v,ª, ,é B

fTfEf“fhfffofCfX,ì“® ì,É,Ä,¢,Ä ŸŽè,É%¼’è,·,é,±,Æ,Í”ð,¯,é,×,«,Ä, ,é B,³,à,È,¢ ,Æ ì ¬,µ,½fAvfŠfP [fVf‡f“,ª A ,éTfEf“fh EfffofCfX,Ä,Í“®,,,ì,É•Ê,ìfffofCfX,Ä,Í“®,©,È,¢,Æ,¢,Ä,½,± ,Æ,É,È,é B,»,ì ä A «—¬ñ<Ÿ,³,ê,éfffofCfX,ª AÆ»‘¶,·,éfffofCfX,Æ,ÍÜ,È,é“® ì,ð,·,é,±,Æ,à l,!,ç,é,é B

**fn [fhfEfFfA,ìfŠf\ [fXŠ,,è“—,Ä,ð s,□,Æ AfAvfŠfP [fVf‡f“,Í‘á,í,è,É,»,ê,ç,ðf\ftfgfEfFfA Efofbftf@,ÖŠ,,è“— ,Ä,æ,□ ,Æ,·,é B,Ä,È,É,·,×,Ä,ìfn [fhfEfFfA EfŠf\ [fX,É‘ì,µ,ÄŠ“S,ÈfAfNfZfX,ð s,!,é,í,¯,Ä,Í,È,¢ B,½,Æ,,ìIDirectSound::GetCapsf f\fbfh,Íó,«fŠf\ [fX,ð•Ž!,·,é,ª AWindows,ìf}f<f^fXfN,ÈfIfyfÆ [fefBf“fO EfVfXfef€,Ä, ,é,½,ß A fŠf\ [fXŠ,,è“—,Ä,ð,µ,æ,µ,Æ,µ,Ä,à•Ê,ìfAvfŠfP [fVf‡f“,ÉŠ,,è“—,Ä,ç,è,é%â”\ «,ª, ,é B**

**fTfEf“fh Efofbftf@,l̇ ì ñ**

,±,l̇ B,Ä,İŞÈ’P,ÈfTfEf“fh Efofbftf@,l̇ ì ñ•û-@,ð à-  
¾,.,é B,Ü,½ A ì ñ,µ,½,»,ê,¼,ê,İfTfEf“fh Efofbftf@,É Ý’è%oÂ”\,È §ŒäfIfvfVf‡f“,É,Â,¢,Ä,à à-  
¾,.,é B,<sup>3</sup>,ç,É AfXf^fefBfbfN EfTfEf“fh Efofbftf@,ÆfXfgfŠ [f€ EfTfEf“fh Efofbftf@ Afñ [fhfEfFfA  
EfTfEf“fh Efofbftf@,Æf\ftfgfEfFfA EfTfEf“fh Efofbftf@ Afvf%oCf}  
fŠ EfTfEf“fh Efofbftf@,ÆfZfJf“f\_fŠ EfTfEf“fh Efofbftf@,l̇fI [ffBflff [f^,l̇L%o^æ,Îâ,¢,É,Â,¢  
,Ä,à G,ê,Ä,¢,é B

Šî-{"L,ÈfTfEf“fh Efofbftf@,l̇ ì ñ

§ŒäfIfvfVf‡f“

fXf^fefBfbfN EfTfEf“fh Efofbftf@,ÆfXfgfŠ [f€ EfTfEf“fh Efofbftf@  
fn [fhfEfFfA EfTfEf“fh Efofbftf@,Æf\ftfgfEfFfA EfTfEf“fh Efofbftf@  
fvf%oCf}fŠ EfTfEf“fh Efofbftf@,ÆfZfJf“f\_fŠ EfTfEf“fh Efofbftf@

Ši-{"l,ÈfTfEf"f h Efofbftf@,ì ì ¬

fTfEf"f h Efofbftf@,ð ì ¬,·,é,É,Í A DSBUFFERDESC \`c`ì,ð`ø`",É A IDirectSound::CreateSoundBuffer  
f f\fbfh,ðÆÄ,Ñ o,· B,±,ê,ÍDirectSoundBufferfIfufWfFfNfg,ð ì ¬,µ A IDirectSoundBuffer fCf"f^ [ftfFfCfX,Öf|  
fCf"f^,ð•Ö,· B,±,ìfCf"f^ [ftfFfCfX,Í Afofbftf@,ì `«,±,Ý E ^— ;,æ,Ñ Ä ¶,ÉŽg—p,Ä,«,é B

,Ü,Žn,ß,É A Ä,à d—v,ÈfTfEf"f h,ìfofbftf@,ð ì ¬,µ,Ä,©,ç A,»,Ì'¼,ìfofbftf@,ð d—  
v"x,ì ,ç ‡,É ì ¬,·,é BDirectSound,Ífn [fhfEfFfA,ÍfŠf\ [fX,ð A—~p%oÄ",Èê"Ô Ä %o,ìfofbftf@,ÖŠ,,è"—  
,Ä,é B

ŽŸ,ì—á,Ä,Í AfZfJf"f šš EfTfEf"f h Efofbftf@,ì ì ¬•û—@,ðŽ',µ,Ä,ç,é B

```
BOOL AppCreateBasicBuffer(  
    LPDIRECTSOUND lpDirectSound,  
    LPDIRECTSOUNDBUFFER *lplpDsb)  
{  
    PCMWAVEFORMAT pcmwf;  
    DSBUFFERDESC dsbdesc;  
    HRESULT hr;  
    // waveftfH [f}fbfg \`c`ì,ð`Ý`è,·,é  
    memset(&pcmwf, 0, sizeof(PCMWAVEFORMAT));  
    pcmwf.wf.wFormatTag = WAVE_FORMAT_PCM;  
    pcmwf.wf.nChannels = 2;  
    pcmwf.wf.nSamplesPerSec = 22050;  
    pcmwf.wf.nBlockAlign = 4;  
    pcmwf.wf.nAvgBytesPerSec =  
        pcmwf.wf.nSamplesPerSec * pcmwf.wf.nBlockAlign;  
    pcmwf.wBitsPerSample = 16;  
    // DSBUFFERDESC \`c`ì,ð`Ý`è,·,é  
    memset(&dsbdesc, 0, sizeof(DSBUFFERDESC)); // 0,É`Ý`è`B  
    dsbdesc.dwSize = sizeof(DSBUFFERDESC);  
    // ffftHf<fg,ìfRf"f gf [f<,ð—v< ,·,é(fpf" Af{fšf... [f€ AŽü" g ") B  
    dsbdesc.dwFlags = DSBCAPS_CTRLDEFAULT;  
    // 3•b,ìfofbftf@  
    dsbdesc.dwBufferBytes = 3 * pcmwf.wf.nAvgBytesPerSec;  
    dsbdesc.lpwfxFormat = (LPWAVEFORMATEX)&pcmwf;  
    // fofbftf@,ð ì ¬,·,é  
    hr = lpDirectSound->lpVtbl->CreateSoundBuffer(lpDirectSound,  
        &dsbdesc, lplpDsb, NULL);  
    if(DS_OK == hr) {  
        // ¬Æ÷ B—LÆø,ÈfCf"f^ [ftfFfCfX,Í*lplpDsb  
        return TRUE;  
    } else {  
        // Ž,"s B  
        *lplpDsb = NULL;  
        return FALSE;  
    }  
}
```

## §ĈäflfvfVf‡f“

fTfEf“fh Efofbftf@,ð ì ¬,·,é,Æ,«,Í Afobftf@,É< ,ß,ç,ê,é §ĈäflfvfVf‡f“,ðŽw’è,·,é•K—v,<sup>a</sup>, ,é B,± ,ê,É,ÍDSBUFFERDESC \‘ċ‘İ,İdwFlagsf f“fo,ðŽg—

p,·,é BfTfEf“fh Efofbftf@,Éfn [fhfEfFfA EfŠf\ [fX,<sup>a</sup>Š,,è“—,Ä,ç,ê,Ä,¢

,é,Æ ADirectSound,ÍAfvfŠfP [fVf‡f“,<sup>a</sup>Žw’è,μ,½fIfvfVf‡f“,ðŽg—

p,·,é B,½,Æ,İ,İ AfffoCfX,<sup>a</sup>fn [fhfEfFfA Efofbftf@,ðfTf| [fg,μ,Ä,¢

,Ä,à A,»,İfobftf@,É‘İ,·,éfpf“ §Ĉä,Í’ñ<Ÿ,μ,Ä,¢,È,¢ ê ‡,<sup>a</sup>, ,é B,±

,İ ê ‡DirectSound,Í ADSBCAPS\_CTRLPANftf%oO,<sup>a</sup>Žw’è,<sup>3</sup>,ê,Ä,¢,é ê ‡,ð œ,¢

,Ä Afn [fhfEfFfA EfAfNfZf%oO [fVf‡f“,ðŽg—p,·,é B

,·,×,Ä,İfTfEf“fh EfJ [fh,©,ç Ä ,,İ”—Í,ðˆø,« o,·,É,Í AfAfvfŠfP [fVf‡f“,<sup>a</sup>Ž©•<sup>a</sup>,ÄŽg—

p,·,éIfvfVf‡f“,İ,Ÿ,ðŽw’è,·,é B

fobftf@,<sup>a</sup>Ž ,Ä,Ä,¢,È,¢f f\fbfh,ðĈÄ,Ñ o,μ,Ä,àŽ,”s,É I,í,é B,½,Æ,İ,İ A<sub>2</sub>

**IDirectSoundBuffer::SetVolume**f f\fbfh,ðŽg—p,μ,Äf{fŠf... [f€,ð•İ X,μ,æ,□

,Æ,μ,½ ê ‡ A,»,İfobftf@,İ ì ¬ŽŽ,É DSBCAPS\_CTRLVOLUMEftf%oO,<sup>a</sup>Žw’è,<sup>3</sup>,ê,Ä,¢

,ê,İf f\fbfh,İ ¬Ĉ÷,·,é Bftf%oO,<sup>a</sup>Žw’è,<sup>3</sup>,ê,Ä,¢,È,¬,ê,İf f\fbfh,İŽ,”s,É I,í,è A

DSERR\_CONTROLUNAVAILfGf% [fR [fh,<sup>a</sup>•Ö,<sup>3</sup>,ê,é Bfobftf@,İ §Ĉä,É,æ,è AĈ»‘¶,àšŮ,ñ,Ä «—

ˆ’ñ<Ÿ,<sup>3</sup>,ê,éfffoCfX ä,Ä,İfAfvfŠfP [fVf‡f“,İ“® ì•Ů Ø,<sup>a</sup>,æ,èŠmŽÄ,É,È,é B

***fXf^fefBfbfN EfTfEf“fh Efofbftf@,ÆfXfgfŠ [f€ EfTfEf“fh Efofbftf@***

*fXf^fefBfbfN EfTfEf“fh Efofbftf@,Í Af f,fŠ“à,ÉfTfEf“fh‘S‘ì,ðŠi”[.,é B,±  
,Ìfofbftf@,Í AfTfEf“fh‘S‘ì,ðfofbftf@,Ö1%ñ,¾, ¯ ‘,«,±,ß,Î,æ,c,Ì,ÅŽèEy,Å, ,é  
BfXfgfŠ [f€ EfTfEf“fh Efofbftf@,ÍfTfEf“fh,Ìê•”,ðŽw,· B,½,Æ,,Î A2•ªŠÖ Ä ¶,³,ê,éfTfEf“fh,Ì,□  
,ç,Ì3•bŠÖ,ÌfI [ffBfIf [f^,¾,¯ ,ð•ÜŽ ,Å,«,éfofbftf@,Å, ,é B,±  
,Ì ê ± AfAfvfŠfP [fVf±f“,ÌèŠú“Ì,É V,µ,çff [f^,ðfTfEf“fh Efofbftf@,Ö ‘,«,±  
,Ü,È,¯,ê,Ì,È,ç,È,¢ B,µ,©,µ AfXfgfŠ [f€ Efofbftf@,ÍfXf^fefBfbfN Efofbftf@,æ,è,àf f,fŠ,Ì Á”i,ª ,È,-  
,Å,·,Ð B*

*fTfEf“fh Efofbftf@,ð ì ¬,·,é,Æ,« ADSBCAPS\_STATICftf%fo,ðŽw’è,·,é,Æ Afofbftf@,ªfXf^fefBfbfN,Å, ,é,±  
,Æ,ðŽ,·,±,Æ,ª,Å,«,é B,±,Ìftf%fo,ðŽw’è,µ,È,¯,ê,Î Afofbftf@,ÍfXfgfŠ [f€ Efofbftf@,Æ,È,é B*

*,à,µfTfEf“fh EfffofCfX,ªfIf“f{ [fh,ÌfTfEf“fhf f,fŠ,Ì ê ± ADirectSound,ÍfXf^fefBfbfN Efofbftf@,ðfn [fhf  
EfFfA à,Ìf f,fŠ,É”z’u,µ,æ,²,Æ,·,é B,±,Ìfofbftf@,Ífn [fhEfFfA Ef~fLfVf“fo,ð—~—p,·,é,±  
,Æ,ª,Å,« AfVfXfef€,Í,±,ê,ç,ÌfTfEf“fh Ef~fLfVf“foŽž,ÌfI [fo [fwfbfh,ð Å ¬ÆÀ,É%Ÿ,³,,é,±  
,Æ,ª,Å,«,é BfTfEf“fh Eff [f^,ªfn [fhEfFfA Ef f,fŠ,Éê~xf [fh,³,ê,é,¾,¯ ,Å Ĩ,Ð,½,ß A,±  
,ê,Í“Á,É‘«%¹,â• Ší,È,Ç,Ì,,è•Ö,µ Å ¶,³,ê,éfTfEf“fh,É—LEø,Å, ,é B*

*fXfgfŠ [f€ Efofbftf@,Í APCL,â,»,Ì‘¼,Ì ,‘¬fofX à,Åfn [fhEfFfA Ef~fLfVf“fo,ð—~—  
p,Å,«,é ê ±,Å,à A,æ,èÆø—“I,È ‘,«,±,Ý,ª,Å,«,é,æ,²  
,Éf fCf“ EfVfXfef€ Ef f,fŠ,É”z’u,³,ê,é BfXfgfŠ [f€ Efofbftf@,ðŽg—p,·,é,½,ß,Ì•K—  
v ðÆ ,Í“Á,É,È,¢ B,½,Æ,,Î Afofbftf@,É \ª,È‘â,«,³,ª ,ê,Î AfTfEf“fh‘S‘ì,ðfXfgfŠ [f€ Efofbftf@,Ö ‘,«,±,Ð,±  
,Æ,ª,Å,«,é BŽÀ Û,Ì,Æ,±,è A1%ñ,µ,©Žg—p,µ,È,¢,Å,à,è,ÌfTfEf“fh,È,ç AfXfgfŠ [f€ Efofbftf@,ðŽg—  
p,µ,½•û,ª Afn [fhEfFfA Ef f,fŠ,Éf [fh,·,é•K—v,ª,È,¢,½,ßÆø—“I,Å, ,é B*

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**Note**

*fofbftf@,ðfXf^fefBfbfN,É,·,é,©fXfgfŠ [f€É,É,·,é,©,ðŽw’è,·,é,Ì,ÍpftfH [f}f“fX,Ì Å“K%»,Ì,½,ß,Å, ,é Bfofbftf  
@,ð,Ç,Ì,æ,²,ÉŽg—p,·,é,©,ð §ÆÀ,·,é,à,Ì,Á,Í,È,¢ B*

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**fn [fhEfFfA EfTfEf“fh Efofbftf@,Æf\ftfgfEfFfA EfTfEf“fh Efofbftf@**

fn [fhEfFfA EfTfEf“fh Efofbftf@,ÍfTfEf“fh EfffofCfX ã,Ìfn [fhEfFfA Ef~fLfT [,É,æ,Á,Äf~fLfVf“fO,<sup>a</sup>ŽÀ s,<sup>3</sup>,ê,é Bf\ftfgfEfFfA EfTfEf“fh Efofbftf@,ÍCPU,É,æ,Á,Äf~fLfVf“fO,<sup>a</sup>ŽÀ s,<sup>3</sup>,ê,é B,Û,Æ,ñ,Ç,Ì ê ‡ A fAfvfŠfP [fVf‡f“,Ê•K—v,Ê,±,Æ,Ífofbftf@,ðfXf^fefBfbfN,Ê,·,é,©fXfgfŠ [f€,É,·,é,©Žw’è,·,é,¾,—,Ä,·,é BDirect Sound,<sup>a</sup>fn [fhEfFfA,©f\ftfgfEfFfA A,Ç,·,é,©“K Ø,È•ù,Öfofbftf@,ð”z’u,·,é B

,µ,©,µ Afobftf@,ðfn [fhEfFfA,Æf\ftfgfEfFfA,Ì,Ç,·,é,Ö”z’u,·,é,©,ð—¾Šm,ÉŽw’è,µ,È,—,ê,Î,È,ç,È,¢ ê ‡,É,Í A **DSBUFFERDESC** \‘¢‘Ì,Ì†,ÄSBCAPS\_LOCHARDWARE A,à,µ,,Í DSBCAPS\_LOCSOFTWAREftf%oF,ðŽw’è,·,é,Î,æ,¢ BDSBCAPS\_LOCHARDWAREftf%oF,<sup>a</sup>Žw’è,<sup>3</sup>,ê,Ä,¢ ,Ä Afn [fhEfFfA Ef f,fŠ,âf~fLfVf“fO”—Í,<sup>a</sup>s \‘<sup>a</sup>,È,Æ,«„Í Afobftf@,Ì ì ¬— v< ,ÍŽ,”s,·,é B,Û,½ AÆ» Ý,ÌfTfEf“fh EfffofCfX,Í,Û,Æ,ñ,Ç,<sup>a</sup>fn [fhEfFfA Ef f,fŠ,âf~fLfVf“fO”— Í,ðŽ ,½,È,¢,Ì,Ä A,»,Ì,æ,²,ÈfffofCfX ã,Ä,Ífn [fhEfFfA Efofbftf@,ð ì ¬,Ä,«„È,¢ B

fobftf@,ÌÊ’u,ÌÆÀ’è,É,Í**DirectSoundBuffer::GetCaps**f f\fbfh,ðŽg— p,µ,Ä **ADSBCAPS** \‘¢‘Ì,Ìdw**Flags**f f“fo,ÄDSBCAPS\_LOCHARDWARE,à,µ,,Í DSBCAPS\_LOCSOFTWAREftf%oF,ðŠm”F,·,é,Î,æ,¢ B,Ä,È,È,Ç,·,é,©,ÉŽw’è,<sup>3</sup>,ê,Ä,¢,é B

**fvf%ofCf}fŠ EfTfEf“fh Efofbftf@,ÆfZfJf“f\_fŠ EfTfEf“fh Efofbftf@**

fvf%ofCf}fŠ EfTfEf“fh Efofbftf@,Í AŽÀ Û,ÉfŠfXfi [,ª,«Žæ,éfTf“fvfŠf“fO EfI [ffBfI,Ä, é BfZfJf“f\_fŠ EfTfEf“fh Efofbftf@,Í,»,ê,¼,èP^è,İfTfEf“fh,“,æ,ÑfI [ffBfI EfXfgfŠ [f€,Ä, é Bfvf%ofCf} fŠ Efofbftf@,ð ì ¬,·,é,É,Í A\_

**DSBUFFERDESC** \‘Ç‘İ,İ†,ÄSBCAPS\_PRIMARYBUFFERftf%ofO,ðŽw’è,·,é,İ,æ,Ç BfZfJf“f\_fŠ Efofbftf@,ª ì ¬ ,³,è,é,İ,Í A,±,İftf%ofO,ªŽw’è,³,è,È,ÇŽž,Ä, ,é B

‘Ê í,İ,Đ,Æ,Ä,İfAfvfŠfP [fVf‡f“,É,·,¬,é,·,×,Ä,İfTfEf“fh,É‘İ,µ,ÄfZfJf“f\_fŠ Efofbftf@,ð ì ¬,·,é BĖÄ,Çff [f^, É V,µ,Çff [f^,ð ã ‘,·,é,±,Æ,ÄfTfEf“fh Efofbftf@,İ Ä—~p,ª%Ä”,Ä, é BDirectSound,ª s,□ ~— ,Í Afn [fhfEfFA,İfŠ\ [fXŠ,,è—,Ä,â A Ä ¶†,İ,·,×,Ä,İfobftf@,İf~fLfVf“fO,Ä, ,é B

fAfvfŠfP [fVf‡f“,ªfZfJf“f\_fŠ Efofbftf@,ðŽg—p,µ,Ä,Ç,é,È,Ç,Í A“Á’è,İ §Ėä,ð s,□,½,ß,Éfvf%ofCf} fŠ Efofbftf@,ð ì ¬,·,é,±,Æ,ä,Ä,«,é B,½,Æ,İ,Í Afvf%ofCf}

fŠ Efofbftf@ ã,Ä**IDirectSoundBuffer::SetFormat** f\fbfh,ðĖÄ,Ñ o,·,Æ Afn [fhfEfFA,İ o— İĖŽ®,ð §Ėä,·,é,±,Æ,ª,Ä,«,é B,½,¾,µ

**IDirectSoundBuffer::Lock**,â**IDirectSoundBuffer::GetCurrentPosition**,È,Ç,İ Afobftf@ Ef f,fŠ,ÖfAfNfZfX,ð s,□f f\fbfh,İ,·,×,ÄŽ,“s,·,é B

fAfvfŠfP [fVf‡f“,ªf~fLfVf“fO,ðŽÀ s,·,é Û ADirectSound,İfvf%ofCf}fŠ Efofbftf@,Ö,İ ‘,«,± ,ÝfAfNfZfX,ð’ñ‘Y,·,é B,±,İfobftf@,Ö,İ ‘,« ž,Ý,Í A,·,İ,â, s,İ,é,é•K—v,ª, é B,à,µff [f^,ª X V,³,è,È,Ç ,Æ Afobftf@,İ‘O%ñ,İff [f^,ðĖJ,è•Ö,µ A%o¹ °,É,,è,ª ¶,¶,é Bfvf%ofCf}fŠ Efofbftf@,Ö,İ ‘,«,± ,ÝfAfNfZfX,Í AfAfvfŠfP [fVf‡f“,ªDSSCL\_WRITEPRIMARY,Ç¹²fĖfxf<,ð Ý’è,µ,Ä,Ç,é ê ‡,İ,Y—LĖø,Ä, é B,± ,İ,¹²fĖfxf<,Ä,İfZfJf“f\_fŠ Efofbftf@,İ,Û,Ä,½, Ä ¶,³,è,È,Ç B

fvf%ofCf}fŠ EfTfEf“fh Efofbftf@,İf< [fv,Ä Ä ¶,³,è,é,± ,Æ,É’ ^Ö,·,é B•K,DSBPLAY\_LOOPINGftf%ofO,ðfZfbfg,·,é,±,Æ B

fvf%ofCf}fŠ Efofbftf@,Ö,İ ‘,«,±,ÝfAfNfZfX,ðŽæ“¾,·,éû—@,ðŽŸ,İ—á,ÄŽ,µ,Ä,Ç,é B

```
BOOL AppCreateWritePrimaryBuffer(
    LPDIRECTSOUND lpDirectSound, LPDIRECTSOUNDBUFFER *lpDsb,
    LPDWORD lpdwBufferSize, HWND hwnd)
{
    DSBUFFERDESC dsbdesc;
    SBCAPS dsbcaps;
    HRESULT hr;
    // wave format,İ \‘Ç‘İ,ð Ý’è,·,é
    memset(&pcmwf, 0, sizeof(PCMWAVEFORMAT));
    pcmwf.wf.wFormatTag = WAVE_FORMAT_PCM;
    pcmwf.wf.nChannels = 2;
    pcmwf.wf.nSamplesPerSec = 22050;
    pcmwf.wf.nBlockAlign = 4;
    pcmwf.wf.nAvgBytesPerSec =
        pcmwf.wf.nSamplesPerSec * pcmwf.wf.nBlockAlign;
    pcmwf.wBitsPerSample = 16;
    // DSBUFFERDESC \‘Ç‘İ,ð Ý’è,·,é
    memset(&lpDsb, 0, sizeof(DSBUFFERDESC)); // 0,É Ý’è
    dsbdesc.dwSize = sizeof(DSBUFFERDESC);
    dsbdesc.dwFlags = SBCAPS_PRIMARYBUFFER;
    // fobftf@fTfCfY,İfTfEf“fh<@Ší,É,æ,è §ĖÄ,³,è,é
    dsbdesc.dwBufferBytes = 0;
    dsbdesc.lpwfxFormat = NULL; // fvf%ofCf}fŠ Efofbftf@,İNULL,Ä,È,,Ä,İ,È,Ç,È,Ç

    // ‘,« ž,Ý—D æ¹²fĖfxf<,ðŽæ“¾
    hr = lpDirectSound->lpVtbl->SetCooperativeLevel(lpDirectSound,
        hwnd, DSSCL_WRITEPRIMARY);
    if(DS_OK == hr) {
        // ¬Ė÷ Bfobftf@,İ ì ¬,ðŽž,Ý,é
        hr = lpDirectSound->lpVtbl->CreateSoundBuffer(lpDirectSound,
            &dsbdesc, lpDsb, NULL);
        if(DS_OK == hr) {
            // ¬Ė÷ Bfvf%ofCf}fŠ Efofbftf@,ð—v< ,³,è,½ĖŽ®,É Ý’è
            hr = (*lpDsb)->lpVtbl->SetFormat(*lpDsb, &pcmwf);
```

```

        if(DS_OK == hr) {
            // fofbftf@fTfCfY,ð'm,è,½,¢,Æ,«,ÍGetCaps,ðĒÄ,Ñ o,
            dsbcaps.dwSize = sizeof(DSBCAPS);
            (*lpDsb)->lpVtbl->GetCaps(*lpDsb, &dsbcaps);
            *lpdwBufferSize = dsbcaps.dwBufferBytes;
            return TRUE;
        }
    }
}

// SetCooperativeLevel,ÉŽ,"s
// CreateSoundBuffer A,à,μ,,ÍSetFormat
*lpDsb = NULL;
*lpdwBufferSize = 0;
return FALSE;
}

```

**fTfEf“fh Efofbftf@,Ö,İ ‘,«±,Ý**

fTfEf“fh Efofbftf@,Ö,İ ‘,«±,ÝfAfNfZfX,ðŽæ“¾,·,é,É,İ**DirectSoundBuffer::Lock**f f\fbfh,ðŽg—  
p,·,é Bfofbftf@,Ö,İff [f^ ‘,«±,Ý AfRfs [,İ AfTfEf“fh Efofbftf@(f f,fŠ),<sup>a</sup>f fbfN,<sup>3</sup>,é,½,Æ,É%Å”\  
,É,È,é Bfofbftf@ Ef f,fŠ,İf fbfN,İ,»),İÆ**DirectSoundBuffer::Unlock**f f\fbfh,Å%ð æ,·,é±,Æ B

·Ê í AfXfgfŠ [f€ EfTfEf“fh Efofbftf@,İ^A±  
,µ,Ä Ä ¶,<sup>3</sup>,é,è,İ,Ä AfTfEf“fh Efofbftf@,ðf fbfN,·,é,½,ß,ÉDirectSound,İ,Ó,½,Ä,İf%oCfG Ef|  
fCf“f^,ð•Ö,· B,½,Æ,,İ A400fofCfG,İfofbftf@,İ“r”t,Ä300fofCfG,ðf fbfN,µ,½ ê ± A  
**IDirectSoundBuffer::Lock**,İ Ä %o,İfofbftf@,ðŽc,è,İ300fofCfG,İf|fCf“fg,Æ,µ,Ä•Ö,µ A Ä %o  
,İ100fofCfG,ðŽÝ,İfofbftf@,Æ,µ,Ä•Ö,· Bfofbftf@,İIfIfZfbfg,Æ’·,<sup>3</sup>,É,æ,Ä,Ä,İ A,Ó,½,Ä,ß,İf|  
fCf“f^,İNULL,É,È,é ê ±,à, ,é B

fTfEf“fh Efofbftf@,İf f,fŠ,İŽ,·,í,è,é±,Æ,à, ,é B±  
,è,İ“Ä,Éfofbftf@,·fn [fhfEfFA EfTfEf“fh Ef f,fŠ,É”z”u,<sup>3</sup>,è,Ä,ç,é ê ±,É<N,±,è,â,·,ç B Ä,à’½,ç,İ,İŽg—  
p”t,ÉfTfEf“fh EfJ [fhŽ©’İ,”²,«Žæ,ç,è,Ä,µ,Ü,² ê ±,Ä, ,é B±,è,İPCMCIA,İTfEf“fh EfJ [fh,Ä,æ,<N,±  
,é B,Ü,½ A ‘,« ž,Ý—D æ’<sup>1</sup>²fÆfxf<,İfAfvfŠfP [fVf±f“,“ü—İftfH [fJfX,ð“¾,½ ê ±,É,à<N,±,è,â,·,ç B±  
,İftf%ofo,” Ý’è,<sup>3</sup>,è,Ä,ç,é,Æ AfIfH [fJfX,ðŽ ,ÄfAfvfŠfP [fVf±f“,<sup>a</sup>fvf%oCf)fŠ Efofbftf@,Ö’¼ Ü ‘,«±  
,Ý,ð s,·,é,½,ß ADirectSound,İ’¼,İ,·,×,Ä,İTfEf“fh Efofbftf@,ð ÄŽ,µ,Ä,µ,Ü,² B±  
,è,<sup>a</sup><N,«½ ê ± ADirectSound,İ **IDirectSoundBuffer::Lock**,·,æ,Ñ  
**IDirectSoundBuffer::Play**f f\fbfh,É’İ,µ,ÄDSERR\_BUFFERLOSTfGf%o [fR [fh,ð•Ö,· B,»,İfAfvfŠfP [fVf±f“,<sup>a</sup> ‘  
,« ž,Ý—D æ’<sup>1</sup>²fÆfxf<,©,ç’¼,İfÆfxf<,É%o°,·,Ä,½,è A“ü—  
İftfH [fJfX,ðŽ,Ä,½,è,·,é,Æ A’¼,İfAfvfŠfP [fVf±f“,İ**IDirectSoundBuffer::Restore**f f\fbfh,ðÆÄ,Ñ o,µ,Äfofbftf  
@ Ef f,fŠ,İ ÄŠ,,è—,Ä,ðŽÄ s,Ä,«é B ¬Æ÷,·,é,Æ A±,İf f\fbfh,İfofbftf@ Ef f,fŠ,â A,»,İ’¼,İf{fŠf...  
[f€  
,âfpf“ Ý’è,È,Ç,İfofbftf@,İ Ý’è,·,×,Ä,ðfŠfXfgfA,·,é B,µ,©,µ AfŠfXfgfA,<sup>3</sup>,è,½fofbftf@,İTfEf“fh Eff [f^,İ”]  
%oó,<sup>3</sup>,è,Ä,ç,é B efAfvfŠfP [fVf±f“,İfŠfXfgfA,<sup>3</sup>,è,½fofbftf@,Öff [f^,ð Ä ‘,«±,Ý,·,é•K—v,<sup>a</sup>, ,é B

ŽÝ,İ—á,Ä,İ**DirectSoundBuffer::Lock**,·,æ,Ñ **IDirectSoundBuffer::Unlock** f f\fbfh,ðŽg—  
p,µ,ÄTfEf“fh Efofbftf@,Öff [f^,ð ‘,«±,ñ,Ä,ç,é B

```
BOOL AppWriteDataToBuffer(  
    LPDIRECTSOUNDBUFFER lpDsb, DWORD dwOffset, LPBYTE lpbSoundData,  
    DWORD dwSoundBytes)  
{  
    LPVOID lpvPtr1;  
    DWORD dwBytes1;  
    LPVOID lpvPtr2;  
    DWORD dwBytes2;  
    HRESULT hr;  
    // f%oCfGf|fCf“f^,İŽæ“¾  
    hr = lpDsb->lpVtbl->Lock(lpDsb, dwOffset, dwSoundBytes, &lpvPtr1,  
        &dwBytes1, &lpvPtr2, &dwBytes2, 0);  
  
    // BUFFERLOST,·Ö,3,è,½ ê ± AfŠfXfgfA,Æ Äf fbfN,ð s,²  
    if(DSERR_BUFFERLOST == hr) {  
        lpDsb->lpVtbl->Restore(lpDsb);  
        hr = lpDsb->lpVtbl->Lock(lpDsb, dwOffset, dwSoundBytes,  
            &lpvPtr1, &dwAudio1, &lpvPtr2, &dwAudio2, 0);  
    }  
    if(DS_OK == hr) {  
        // f|fCf“f^,Ö ‘,«±,Ý,ð s,²  
        CopyMemory(lpvPtr1, lpbSoundData, dwBytes1);  
        if(NULL != lpvPtr2) {  
            CopyMemory(lpvPtr2, lpbSoundData+dwBytes1, dwBytes2);  
        }  
        // DirectSound,Öff [f^,ð•Ö,·  
        hr = lpDsb->lpVtbl->Unlock(lpDsb, lpvPtr1, dwBytes1, lpvPtr2,  
            dwBytes2);  
        if(DS_OK == hr) {  
            // ¬Æ÷ B  
            return TRUE;  
        }  
    }  
}
```

```
}  
// f b f N A f b f N % o d æ A , à , µ , , í — v < , Ì Ž , ” s  
return FALSE;  
}
```

## DirectSound~fLFT [,İŽg—p

DirectSound,Â;ı ”,İfXfgfŠ [f€,đf~fLfVf“fO,·,é,İ,İŠÈ’P,Â, ,é B’P,  
ÉfZfJf“f fŠ EfTfEf“fh Efobftf@,đ ì ¬,μ A,»,é,¼,é,İfobftf@,ÉIDirectSoundBufferfCf“f^ [ftfFfCfX,đŽó,¬Žæ  
,ç,¹,é,¾,¬,Â,æ,ç B,±,é,ç,İfCf“f^ [ftfFfCfX,đŽg—p,μ,Ä A IDirectSoundBuffer::Lock,¬,æ,Ñ  
IDirectSoundBuffer::Unlockf f\fbfh,Äfobftf@,Éff [f^,đ ‘,«,±,Ý A  
IDirectSoundBuffer::Play,Äfobftf@,đ Ä ¶,·,é,±,æ,ª,Ä,«,é B,Ü,½ A IDirectSoundBuffer::Stopf f\fbfh,đŽg—  
p,μ,Ä A Ä ¶†,İfobftf@,đ,ç,Ä,Ä,à’âŽ~,·,é,±,æ,ª,Ä,«,é B

IDirectSoundBuffer::Playf f\fbfh,İ,Ä,É,Éfobftf@,İfJfEf“fg Ef|fWfVf±f“,©,ç Ä ¶,đŽn,ß,é BfJfEf“fg Ef|  
fWfVf±f“,Í Afobftf@“à,İfİftfZfbfg,ÄfofCf’P’Ê,ÄŽw’è,³,é,é B V·K ì ¬,³,é,½fobftf@,İfJfEf“fg Ef|  
fWfVf±f“,İ0,Ä, ,é Bfobftf@,“âŽ~,·,é,æ AfJfEf“fg Ef|fWfVf±f“,Í,Žž,ÉŽÝ,É Ä ¶,³,é,éTf“fvf<,ÖÜ“®,·,é B  
IDirectSoundBuffer::SetCurrentPositionf f\fbfh,đĈÄ,Ñ o,¹,İfJfEf“fg Ef|fWfVf±f“,đ—¾Šm,É Ý’è,·,é,±  
,æ,ª,Ä,« A IDirectSoundBuffer::GetCurrentPositionf f\fbfh,đĈÄ,Ñ o,¹,İfJfEf“fg Ef|fWfVf±f“,đŽæ“¾,Ä,«,é B

ffftfHf<fg,Ä,İIDirectSoundBuffer::Play,İfobftf@,İ I,İ,è,É“Ž’B,μ,½,æ,«,É Ä ¶,đ I—¹,·,é B,±  
,é,İf< [fv,É,μ,İfXf^fefBfbfN Efobftf@,İ“K ØĈ® ì,Ä, ,é(fJfEf“fg Ef|fWfVf±f“,Í,±  
,İŽŽ“¬Äfobftf@,İŠJŽn’Ê’u,Ü,ÄfŠfZfbfg,³,é,é) B  
fXfgfŠ [f€ Efobftf@,¬,æ,ÑfXf^fefBfbfN Efobftf@,đ‘A’±“I,É Ä ¶,·,é ê ±,Í A  
IDirectSoundBuffer::Play,đĈÄ,Ñ o,μ,Ä AdwFlagsfpf%of [f^“à,ÉDSBPLAY\_LOOPINGftf%ofO,đŽw’è,·,é B,±  
,é,É,æ,è Afobftf@,¹ I,İ,è,Ü,Ä“Ž’B,·,é,æ,Ü,½JŽn’Ê’u,Ü,Ä—ß,é,æ,μ,É,É,é B

fXfgfŠ [f€ EfTfEf“fh Efobftf@,Ä,Í A Ä ¶fJ [f<,³JŽn’Ê’u,Ü,ÄŠª,«—  
ß,é‘O,É AŽÝ,İfuf fbfN,İff [f^,ª ‘,«,±,Ü,é,Ä,ç,é•K—v,ª, ,é B,±,İ,½,ß,É,İWin32ŠÖ ”,İSetTimer,à,μ,,Í  
SetEvent,đŽg—p,μ,Ä A’èŠú“I,Éf fbfZ [fW,âfR [f<fobfNŠÖ ”,ªŽÄ s,³,é,é,æ,μ,É,·,é,İ,æ,ç B,³,ç,É A’½,-  
,İDirectSoundfAfvfŠfP [fVf±f“,Í AfŠfAf<f^fCfĈDirectDrawfRf“f|  
[f|f“fg,đŽ ,Ä,Ä,¬,è AfffBfXfvfEfC,É‘I,μ,Ä’èŠú“I,ÉfT [ftrX,đ s,μ,à,İ,Ä, ,é B,±,İfRf“f|  
[f|f“fg,İDirectSoundfobftf@,É,à“—l,ÉfT [ftrX,đčÝ<,·,é,±,æ,ª,Ä,«,é BEØ—  
,İĈEü ä,đ I,¹ A Ä ¶†,İfI [ffBfI o—  
İ,İ,,é,đ Ä ¬ĈÄ,É,¬,³,¹,é,½,ß,É,Í AfAfvfŠfP [fVf±f“,İfJfEf“fg,İ Ä ¶fJ [f<,æ,è ,É,,æ,à¹b,Í æ,É ‘,«,±  
,Ý,đ s,μ•K—v,ª, ,é B

,à,μfXf^fefBfbfN Efobftf@,É‘I,μ,ÄDSBCAPS\_STATICftf%ofO,đŽw’è,μ,Ä,ç  
,é,İ ADirectSoundf~fLFT [,İfn [fhfEfFfA EfAfNfZf%ofĈ [fVf±f“,İĈØ—p,đ Ä‘âĈÄ,ÉŽó,¬,é,±,æ,ª,Ä,«,é B,±  
,İftf%ofO,Í Ä—~p,³,é,éXf^fefBfbfN Efobftf@,Ä,İ•K,Žw’è,μ,½,Ü,μ,ª,æ,ç BDirectSound,İ,±,é,ç,İfobftf@,đ—  
LĈØ,Éfn [fhfEfFfA Ef f,fŠ,Éf [fh,·,é,İ,Ä Af~fLfVf“fOŽž,İfI [fo [fwfbfh,İ,É,ç B Ä,à d—  
v,ÉfXf^fefBfbfN EfTfEf“fh Efobftf@,Í Afn [fhfEfFfA EfAfNfZf%ofĈ [fVf±f“,đ—D æ“I,ÉŽó,¬,ç,é,é,æ,μ  
,É“è”Ö Ä %ø,É ì ¬,·,é,Ü,μ,ª,æ,ç B

fAfvfŠfP [fVf±f““à,İfTfEf“fh,ª,·,×,Ä“¬,¶wave,đŽg—p,μ Afn [fhfEfFfA,Ö,İ o—  
İĈŽ®,ª,»,é,ç,İfTfEf“fh,æ ±,Ä,Ä,ç,é,İ ADirectSoundf~fLFT [,Í Ä ,<%ø•iŽç,İfTfEf“fh,đ ì,è o,· B,±  
,İ đĈE %ø,Ä,Í Af~fLFT [,İĈŽ®•İŠ·,đ,·,é•K—v,ª,É,ç,½,ß,Ä, ,é B

fn [fhfEfFfA,Ö,İ o—İĈŽ®,đ•İ X,·,é,É,Í Afvf%ofCf|  
fŠ EfTfEf“fh Efobftf@,đ ì ¬,μ,ÄIDirectSoundBuffer::SetFormatf f\fbfh,đĈÄ,Ñ o,· B,½,¾,μ A,±  
,İvf%ofCf|fŠ Efobftf@,Í §Ĉä,İ—Ü“I,Ä,μ,çŽg—p,Ä,«, , A,±  
,İŠÖ ”,đĈÄ,Ñ o,¹,éAfvfŠfP [fVf±f“,Í ADSSCL\_PRIORITY,à,μ,,Í,»,é“È ä,İç’²fEfxf<,É Ý’è,³,é,æ,ç,é,à,İ,Ý,Ä,  
,é B,»,μ,ÄDirectSound,Í AfAfvfŠfP [fVf±f“,“ü—  
İftfH [fJfX,đ“¾,é,½,Ñ,É Afn [fhfEfFfA,İĈŽ®,đ‘O%ñ,İIDirectSoundBuffer::SetFormatf f\fbfh,İĈÄ,Ñ o,μ,Ä  
Ý’è,μ,½ĈŽ®,É•Ö,· B

**fJfXf^f€ Ef~fLFT [,lžg—p**

,Û,Æ,ñ,ç,lfAfVfŠfP [fVf‡f“,Ä,ÍDirectSoundf~fLFT [,đŽg—p,·,é,ª A,±,ê,Í A,Û,Ú,·,×,Ä,lf~fLfvf“fO,ì—v, ,đ-  
ž,½,µ A,Û,½ AŽ@“@“I,Éfn [fhEfFfA EfAfNfZf%of€ [fVf‡f“,đ—  
p,·,é B,µ,©,µ ADirectSound,“ñŸ,µ,È,¢<@“\,đfAfVfŠfP [fVf‡f“,ªK—v,Æ,·,é ê ‡ Afvf%ofCf}  
fŠ EfTfEf“fh Efofbftf@,Ö,ì ‘,«,±,ŸfAfNfZfX,đŠl“¾,µ A,»,±,Ä’¼ ÚfXfgfŠ [f€,đf~fLfvf“fO,·,é,±  
,Æ,ª,Ä,«,é B,±,ì<@“\,fRf“f| [flf“fg,²,Æ,È’ñŸ,³,ê A,²,ÆÄ,ç,ê,½fnfCfpftfH [f}f“fX,lfAfVfŠfP [fVf‡f“,Ä,ì,Ÿ  
—LÆø,Ä, ,é B,±,ì<@“\,đ—p,µ,½fAfVfŠfP [fVf‡f“,ÍfI [ffBfI,ì,,ê,ð%ñ”ð,·,é,ì,“i,µ,È,é,ì,Ä AfpftfH [f}  
f“fX—v, ,ª€µ,µ,È,é B

fJfXf^f€ Ef~fLFT [,đ ì ¬,·,é,É,Í A,Û,,DSSCL\_WRITEPRIMARY<’²f€fxf<,đŽæ“¾,µ Afvf%ofCf}  
fŠ EfTfEf“fh Efofbftf@,đ ì ¬,·,é BŽŸ,É**IDirectSoundBuffer::Lock**f f\fbfh,ðÆÄ,Ñ o,µ A•Ö,³,ê,½f|  
fCf“f^,Öff [f^,đ ‘,«,±  
,Ÿ A,»,µ,Ä**IDirectSoundBuffer::Unlock**f f\fbfh,ðÆÄ,Ñ o,µ,ÄDirectSound,Öff [f^,ð•Ö,· BfAfVfŠfP [fVf‡f“,Í**IDirectSoundBuffer::Play**f f\fbfh,ìÆÄ,Ñ o,µ,Äfvf%ofCf}fŠ Efofbftf@,đ Ä ¶,µ Aff [f^,đfXfs [fJ,É o—Í,µ,È,-  
,Ä,Í,È,ç,È,¢ BDSBPLAY\_LOOPINGftf%ofO,©Žw’è,³,ê,Ä,¢,È,¢,Æ  
**IDirectSoundBuffer::Play**,ìÆÄ,Ñ o,µ,ÉŽ,“s,·,é,ì,Ä’ ^Ó,·,é,±,Æ B

fJfXf^f€ Ef~fLFT [,l ì ¬û—@,đŽŸ,ÉŽ!,µ,Ä,¢,é B—á,ì†,É, ,éAppMixIntoPrimaryBufferŠÖ ”,Í AfTfEf“fh Eff  
ofCfX,ªff [f^ Efuf fbfN,ì Ä ¶,ðÆJ,è•Ö,³,È,¢,æ,ª^è,ìŠÖŠu,ÄÆÄ,Ñ o,µ,³,ê,é•K—v,ª, ,é BCustomMixerŠÖ ”,Íf  
AfVfŠfP [fVf‡f“,ª^è<,µ,½ŠÖ ”,Ä A  
fAfVfŠfP [fVf‡f“,ª^è<,µ,½CustomMixer,ì†,ÄŽw’è,³,ê,½,Æ,«,É•i ”,lfXfgfŠ [f€  
,đf~fLfvf“fO,µ AÆ%œÈ,đŽw’è,³,ê,½f|fCf“f^,Ö ‘,«,±,B B

```
BOOL AppMixIntoPrimaryBuffer(  
    LPAPPSTREAMINFO lpAppStreamInfo, LPDIRECTSOUNDBUFFER lpDsbPrimary,  
    DWORD dwDataBytes, DWORD dwOldPos, LPDWORD lpdwNewPos)  
{  
    LPVOID lpvPtr1;  
    DWORD dwBytes1;  
    LPVOID lpvPtr2;  
    DWORD dwBytes2;  
    HRESULT hr;  
    // ‘,«,±,Ÿf|fCf“f^,đŽæ“¾  
    hr = lpDsbPrimary->lpVtbl->Lock(lpDsbPrimary, dwOldPos, dwDataBytes,  
        &lpvPtr1, &dwBytes1, &lpvPtr2, &dwBytes2, 0);  
    // DSERR_BUFFERLOST,ª•Ö,Ä,Ä,«,½ ê ‡,É AfŠfXfgfA,µ,Ä Af fbfN,ð,©,¬,é  
    if(DSERR_BUFFERLOST == hr) {  
        lpDsbPrimary->lpVtbl->Restore(lpDsbPrimary);  
        hr = lpDsbPrimary->lpVtbl->Lock(lpDsbPrimary, dwOldPos,  
            dwDataBytes, &lpvPtr1, &dwBytes1, &lpvPtr2, &dwBytes2, 0);  
    }  
    if(DS_OK == hr) {  
        // •Ö,³,ê,½f|fCf“f^,Öff [f^,đf~fLfvf“fO,·,é  
        CustomMixer(lpAppStreamInfo, lpvPtr1, dwBytes1);  
        *lpdwNewPos = dwOldPos + dwBytes1;  
        if(NULL != lpvPtr2) {  
            CustomMixer(lpAppStreamInfo, lpvPtr2, dwBytes2);  
            *lpdwNewPos = dwBytes2; // Šª,«-ß,Ä,½,½,ß  
        }  
        // DirectSound,Öff [f^,ð•Ö,·  
        hr = lpDsbPrimary->lpVtbl->Unlock(lpDsbPrimary, lpvPtr1,  
            dwBytes1, lpvPtr2, dwBytes2);  
        if(DS_OK == hr) {  
            // ¬Æ÷  
            return TRUE;  
        }  
    }  
    // f fbfN,ª,æ,Ñf fbfN%ð œ,ìŽ,“s  
    return FALSE;  
}
```

<sup>3</sup> **kwave,İŽg—p**

Œ» Ý,İDirectSound,Í A<sup>3</sup> kwave,ðfTf| [fg,µ,Ä,¢  
,È,¢ B<sup>3</sup> k,<sup>3</sup>,ê,½fI [ffBfI Eff [f^,ð AfTfEf“fh Efofbftf@,É ‘,«,±,b‘O,ÉPCM(pulse-coded  
modulation)ff [f^,Ö,Æ•İŠ·,·,é,É,Í A Win32 SDK,Ä’ñ<Ÿ,µ,Ä,¢,éI [ffBfI<sup>3</sup> kf}fI [fWff(ACM) ŠÖ ”,ðŽg—p,·,é•K  
—v,<sup>a</sup>,,é BŽÀ Û,É,Í Af|fCf“f^,ðfTfEf“fh Efofbftf@ Ef f,fŠ,İf|fCf“f^,ðf fbfN,µ,Ä ACM,É“n,<sup>1</sup>,İ A Ä,àŒø  
—<sup>1</sup>,æ,ff [f^,ð’¼ ÚTfEf“fh Efofbftf@,ÖffR [fh,Ä,«,é B



DirectSoundŠftf@fÆf“fX

šö ”

## DirectSoundCreate

```
HRESULT DirectSoundCreate(GUID FAR * lpGuid,  
    LPDIRECTSOUND * ppDS, IUknown FAR * pUnkOuter);
```

IDirectSoundfCf“f^ [ftFFfCfX,İ ì ¬,Æ %Šú%»»,đ s,▯ B

¬Æ÷,·,ê,İDS\_OK AŽ,”s,·,ê,İŽŸ,İfGf% [fR [fh,đ•Ô,· B

DSERR\_ALLOCATED

DSERR\_INVALIDPARAM

DSERR\_NOAGGREGATION

DSERR\_NODRIVER

DSERR\_OUTOFMEMORY

lpGuid

fTfEf“fhffofCfX,đŽ¬•Ê,·,éGUID,Ö,İf|fCf“f^ B,±  
 ,İfpf%of [f^,İ'l,İDirectSoundEnumerate,É,æ,è•Ô,<sup>3</sup>,ê,éGUIDs,İ,Đ,Æ,Â A,à,µ,,ÍfftfHf<fg,İffofCfX,đ—  
 v< ,·,é,½,ß,ÉNULL,Æ,Ê,é B

ppDS

,±,İŠÖ ”,É%ž“š,µ,Ä ì ¬,<sup>3</sup>,ê,éDirectSoundIfufWfFfNfg,Ö,İf|fCf“f^ B

pUnkOuter

¬¢'è<,İø ” B,±,İ'l,ÍNULL,Ä,Ê,¬,ê,Î,È,ç,È,¢ B

DirectSoundIfufWfFfNfg,İ ì ¬Æă,Í A,·,Ý,â,©,ÉIDirectSound::SetCooperativeLevelf f\fbfh,đÆÄ,Ñ o,<sup>3</sup>,È,-  
,Ä,Í,È,ç,È,¢ B

ŽQ Æ @IDirectSound::GetCaps, IDirectSound::SetCooperativeLevel

## DirectSoundEnumerate

```
BOOL DirectSoundEnumerate(  
    LPDSENUMCALLBACK lpDSEnumCallback, LPVOID lpContext);
```

$fVfXfef\epsilon,\acute{E}fCf\text{“}fXfg$   $[f\text{◁},^3,\hat{e},\ddot{A},\text{¢},\acute{e}\text{DirectSound}fhf\%o fCfo,\delta\text{—}\tilde{n}\text{◁“},\cdot,\acute{e}$  B

$\neg\text{€}\div,\cdot,\hat{e},\hat{I},c,r\_n,j$  AŽ,”s, $\cdot,\hat{e},\hat{I}$ **DSERR\_INVALIDPARAM**, $\grave{I}fGf\%o$   $[fR$   $[fh,\delta\bullet\hat{O},\cdot$  B

*lpDSEnumCallback*

**DSEnumCallback**šÖ ”,Ö, $\grave{I}f|fCf\text{“}f^{\wedge}$  B, $\pm,\hat{e},\hat{I}fVfXfef\epsilon,\acute{E}fCf\text{“}fXfg$   $[f\text{◁},^3,\hat{e},\ddot{A},\text{¢}$   
 $,\acute{e},\gg,\hat{e},\frac{1}{4},\hat{e},\grave{I}\text{DirectSound}IfufWfFfNfg,\text{©},\varsigma\text{€}\ddot{A},\tilde{N}$  o, $^3,\hat{e},\acute{e}$  B

*lpContext*

$f\dagger$   $[fU'\acute{e}\text{◁}fRf\text{“}fefLfXfg,\acute{O},\grave{I}f|fCf\text{“}f^{\wedge}$  B, $\pm,\hat{I}fRf\text{“}fefLfXfg,\acute{I}$  A—  
 $\tilde{n}\text{◁“}fR$   $[f\text{◁}fofbfN\acute{S}\acute{O}$  ”, $^a\text{€}\ddot{A},\tilde{N}$  o, $^3,\hat{e},\acute{e},\frac{1}{2},\tilde{N},\acute{E}$  A, $\gg,\grave{I}\acute{S}\acute{O}$  ”,Ö“n, $^3,\hat{e},\acute{e}$  B

ŽQ Æ **@DSEnumCallback**

***f*R [f<fofbfNŠÖ ”**

## DSEnumCallback

```
BOOL DSEnumCallback(GUID FAR * lpGuid,  
    LPSTR lpstrDescription, LPSTR lpstrModule,  
    LPVOID lpContext);
```

DirectSoundf hf%o fCfo, ð—ñ<“,·,é,½,ß, Ì AfAfvfŠfP [fVf‡f““è`fR [f<fofbfNŠÖ ” BfVfXfef€  
,Í¼‘O, ÌDirectSoundEnumerateŠÖ ”, ÌÆÄ, Ñ o, µ, É%ž“š, µ, Ä, ±, ÌŠÖ ”, ðÆÄ, Ñ o, · B

fhf%o fCfo, Ì—ñ<“,·,é,½,ß, Ì AfAfvfŠfP [fVf‡f““è`fR [f<fofbfNŠÖ ” BfVfXfef€  
,Í¼‘O, ÌDirectSoundEnumerateŠÖ ”, ÌÆÄ, Ñ o, µ, É%ž“š, µ, Ä, ±, ÌŠÖ ”, ðÆÄ, Ñ o, · B

lpGuid

—ñ<“,·,é,½,ß, Ì AfAfvfŠfP [fVf‡f““è`fR [f<fofbfNŠÖ ” BfVfXfef€  
,Í¼‘O, ÌDirectSoundEnumerateŠÖ ”, ÌÆÄ, Ñ o, µ, É%ž“š, µ, Ä, ±, ÌŠÖ ”, ðÆÄ, Ñ o, · B

lpstrDescription

DirectSoundfffofCfX, ÌfefLXfg<L q, ð—^,·,é,½,ß, Ì AfAfvfŠfP [fVf‡f““è`fR [f<fofbfNŠÖ ” BfVfXfef€  
,Í¼‘O, ÌDirectSoundEnumerateŠÖ ”, ÌÆÄ, Ñ o, µ, É%ž“š, µ, Ä, ±, ÌŠÖ ”, ðÆÄ, Ñ o, · B

lpstrModule

,±, ÌfffofCfX, É‘Š“—,·,é,½,ß, Ì AfAfvfŠfP [fVf‡f““è`fR [f<fofbfNŠÖ ” BfVfXfef€  
,Í¼‘O, ÌDirectSoundEnumerateŠÖ ”, ÌÆÄ, Ñ o, µ, É%ž“š, µ, Ä, ±, ÌŠÖ ”, ðÆÄ, Ñ o, · B

lpContext

fAfvfŠfP [fVf‡f““è`fR [f<fofbfNŠÖ ” BfVfXfef€  
,Í¼‘O, ÌDirectSoundEnumerateŠÖ ”, ÌÆÄ, Ñ o, µ, É%ž“š, µ, Ä, ±, ÌŠÖ ”, ðÆÄ, Ñ o, · B

lpstrDescription, ·, æ, Ñ lpstrModulefpf%o f [f^, É“n,³,é,½,ß, Ì AfAfvfŠfP [fVf‡f““è`fR [f<fofbfNŠÖ ” BfVfXfef€  
,Í¼‘O, ÌDirectSoundEnumerateŠÖ ”, ÌÆÄ, Ñ o, µ, É%ž“š, µ, Ä, ±, ÌŠÖ ”, ðÆÄ, Ñ o, · B

ŽQ æ @DirectSoundEnumerate

## IDirectSound

*fAfvfŠfP [fVf‡f“,ÍDirectSoundIfufWfFfNfg,ì ì ¬,ÆŠÂ«« Ý’è,ÉIDirectSoundfCf“f^ [ftfFfCfX,ìf f\fbfh,ðŽg —p,.,é B,±,ì ß,Í,±,ìfCf“f^ [ftfFfCfX,ìf f\fbfh,ìfŠftf@fEf“fX,Æ,È,Á,Ä,¢,é BŠT”O,É,Á,¢,Ä,ìŠT— v,ìIDirectSoundfCf“f^ [ftfFfCfX,ðŽQ Æ,.,é,±,Æ B*

**IDirectSoundfCf“f^ [ftfFfCfX,ìf f\fbfh,ÍÈ%°,ìfOf< [fv,Â•Ò ¬,³,ê,Ä,¢,é**

***f f,fŠŠ,,è“–,Ä***

**Compact**

**Initialize**

***fOfbftf@ ì ¬***

**CreateSoundBuffer**

**DuplicateSoundBuffer**

**SetCooperativeLevel**

***ffOfCfX «”\***

**GetCaps**

***fXfs [fJ Ý’è***

**GetSpeakerConfig**

**SetSpeakerConfig**

*,.,×,Ä,ìCOMfCf“f^ [ftfFfCfX,Æ“—l AIDirectSoundfCf“f^ [ftfFfCfX,Í\_ IUunknownfCf“f^ [ftfFfCfXf f\fbfh,ðEp ³,µ,Ä,¢,é BIUnknownfCf“f^ [ftfFfCfX,ÍÈ%°,ì,R,Â,ìf f\fbfh,ðfTf| [fg,µ,Ä,¢,é B*

**AddRef**

**QueryInterface**

**Release**

**IDirectSound::Compact**

HRESULT Compact ( ) ;

fIf“f{ [fh EfTfEf“fhf f,fŠ,ì-ŒŽg—p”•“a,ð~A‘±fuf fbfN,Ö~Ú“@,µ A Ä‘â,ÏftfŠ [f f,fŠ—Ïæ,ðŽg—p‰Ä”\ ,É,·,é B

-Œ÷,·,ê,ÎDS\_OK AŽ,”s,·,ê,ÎŽŸ,ÏfGf‰ [fR [fh,ð•Ô,· B

**DSERR\_INVALIDPARAM**

**DSERR\_PRIOLEVELNEEDED**

**DSERR\_UNINITIALIZED**

,±  
,Ïf f\fbfh,ðŒÄ,Ñ o,·,Æ AfAfvfŠfP [fVf±f“,ÍDirectSoundfIfufWfFfNfg,Æ”r‘¼“I,È<’²fŒfxf<,ðŽ ,½,È,¯,ê,Î,È,ç, È,Œ (“r‘¼“IfAfNfZfX,ð“¾,é,É,Í A **IDirectSound::SetCooperativeLevel**  
f f\fbfh,Ï†,ÂSSCL\_EXCLUSIVE,ðŽw’è,·,é) B i s’†,Ï‘€ ì,a,Đ,Æ,Â,Â,à, ,é,Æ A,±,Ïf f\fbfh,ÍŽ,”s,·,é B

ŽQ Æ @*IDirectSound*, **IDirectSound::SetCooperativeLevel**



## IDirectSound::CreateSoundBuffer

```
HRESULT CreateSoundBuffer(LPDSBUFFERDESC lpDSBufferDesc,  
    LPLPDIRECTSOUNDBUFFER lplpDirectSoundBuffer,  
    IUknown FAR * pUnkOuter);
```

*fTf“fvfŠf“fO EfI [ffBfI,lfV [fPf“fX,đ•ŮŽ ,·,é,½,ß,İDirectSoundBufferIfufWfFfNfg,đ ì ¬,·,é B*  
*¬Ė÷,·,é,İDS\_OK AŽ,”s,·,é,İŽŸ,İfGf%o [fR [fh,đ•Ô,· B*

**DSERR\_ALLOCATED**

**DSERR\_BADFORMAT**

**DSERR\_INVALIDPARAM**

**DSERR\_NOAGGREGATION**

**DSERR\_OUTOFMEMORY**

**DSERR\_UNINITIALIZED**

**DSERR\_UNSUPPORTED**

*lpDSBufferDesc*

*ì ¬,³,ê,½fTfEf“fh Efofbftf@,ìL q,ªŠŮ,Ů,ê,Ä,¢,é**DSBUFFERDESC** \‘¢‘İ,Ö,İf|fCf“f^ B*

*lplpDirectSoundBuffer*

*V<K,İDirectSoundBufferIfufWfFfNfg,Ö,İf|fCf“f^ Bfofbftf@,ª ì ¬,³,ê,È,©,Á,½ ê ±,İNULL,Æ,È,é B*

*pUnkOuter*

*¬¢‘èç,İ¬∅ ” B,±,ì¹,İNULL,Ä,È,,Ä,Í,È,ç,È,¢ B*

*fTfEf“fh Efofbftf@,đ Ä ¶%oÂ”\,É,·,é,½,ß,É AŽ–‘O,É**IDirectSound::SetCooperativeLevel**f f\fbfh,đŽg—*  
*p,µ,ÄDirectSoundfIfufWfFfNfg,İç’²fĖfxfç,đŽw’è,µ,Ä,¬,©,È,,Ä,Í,È,ç,È,¢ B*

*lpDSBufferDescfpf%of [f^,Í AĖ`Ž® AfTfCfY A «”\,Æ,¢,Á,½ A—*

*v< ,³,ê,½fofbftf@,İf^fCfv îñ,đŠŮ,þ \‘¢‘İ,đŽ,· BfAfvfŠfP [fVf±f“,ªK—v,Æ,·,é”\—Í,É,Ä,¢,ÄŽw’è,µ,Ä,¢,È,¢*  
*,Æ,±,ê,ç,İ–³Ėø,É,È,é B,½,Æ,,İDirectSoundfIfufWfFfNfg,đ ì ¬,·,é,Æ,«,É*

*DSBCAPS\_CTRLFREQUENCYftf%ofO,đŽw’è,µ,Ä,¬,©,È,¢,Æ A*

**IDirectSoundBuffer::SetFrequency**,İĖÄ,Ň o,µ,Í,·,×,ÄŽ,”s,·,é B

*fn [fhfEfFfA Ef~fLfVf“fO,İ—~—p,ì,½,ß,É AŽg—p%oÂ”\*

*,ÈfIf“f{ [fh Ef f,fŠ ä,İfofbftf@,đ“Ç,Ÿ ž,þ ê ±,Í A DSBCAPS\_STATICftf%ofO,đŽw’è,·,é,±*

*,Æ,à,Ä,«,é Bfn [fhfEfFfA Ef~fLfVf“fO,Æf\ftfgEfFfA Ef~fLfVf“fO A,±,İ,Ç,ç,ç,đŽg—p,·,é,©,đfofbftf@,Ö<-*  
*§“I,ÉŽw’è,·,é,É,Í ADSBCAPS\_LOCHARDWARE A,à,µ,,İ DSBCAPS\_LOC SOFTWAREftf%ofO,đŽg—p,·,é B*

*ŽQ Æ @**DSBUFFERDESC**, **IDirectSound**,*

**IDirectSound::DuplicateSoundBuffer**, **IDirectSound::SetCooperativeLevel**, **IDirectSoundBuffer**,

**IDirectSoundBuffer::GetFormat**, **IDirectSoundBuffer::GetVolume**, **IDirectSoundBuffer::Lock**,

**IDirectSoundBuffer::Play**, **IDirectSoundBuffer::SetFormat**, **IDirectSoundBuffer::SetFrequency**

## IDirectSound::DuplicateSoundBuffer

```
HRESULT DuplicateSoundBuffer(  
    LPDIRECTSOUNDBUFFER lpDsbOriginal,  
    LPLPDIRECTSOUNDBUFFER lplpDsbDuplicate);
```

DirectSoundBufferIfufWfFfNfg,ð V<K ì ¬,·,é B,±  
,ê,Í“¬,¶f ofbftf@ Ef f,fŠ,ðfIfŠfWfiƒ,ìfIfufWfFfNfg,Æ,µ,ÄŽg—p,·,é B  
¬Æ÷,·,ê,ÎDS\_OK AŽ,”s,·,ê,ÎŽŸ,ìfGf%o [fR [fh,ð•Ô,· B

**DSERR\_ALLOCATED**

**DSERR\_INVALIDCALL**

**DSERR\_INVALIDPARAM**

**DSERR\_OUTOFMEMORY**

**DSERR\_UNINITIALIZED**

*lpDsbOriginal*

•i »<sup>3</sup>,ê,½DirectSoundBufferIfufWfFfNfg,Ö,ìf|fCf“f^ B

*lplpDsbDuplicate*

V<K,ìDirectSoundIfufWfFfNfg,Ö,ìf|fCf“f^ B

V<K,ìfIfufWfFfNfg,ÍfIfŠfWfiƒ,Æ“¬,¶,æ,ϣ,ÉŽg—p,Â,«,é B

•i »¼Æä,ìf ofbftf@,Í AfIfŠfWfiƒƒ ofbftf@,Æ“¬,¶fpf%of [f^,ðŽ ,Â B,½,¾,µ A,»,ê,¼,ê,ìfpf%of [f^,ðÆÂ  
X,É•İ X,µ,Â A‘ŠŽè,É%oe<¿,ð<y,Ú,·,±,Æ,È, A Ä ¶,¬,æ,Ñ’âŽ~,ð s,ϣ,±,Æ,<sup>a</sup>,Â,«,é B

f ofbftf@“à,ìff [f^,<sup>a</sup>,Ç,¿,ç,©,ìfIfufWfFfNfg,É,æ,Á,Ä•İ X,<sup>3</sup>,ê,é,Æ Af f,fŠ,<sup>a</sup><ϣ—L,<sup>3</sup>,ê,Ä,¢  
,é,½,ß,É A,»,l•İ X,Í,à,ϣ“ê•û,ìfIfufWfFfNfg,É,à”½%of,<sup>3</sup>,ê,é B

ÅÆä,ìfIfufWfFfNfgŽQ Æ,<sup>a</sup>%ð•ú,<sup>3</sup>,ê,é,Æ Af ofbftf@ Ef f,fŠ,Í%ð•ú,<sup>3</sup>,ê,é B

ŽQ Æ @IDirectSound, IDirectSound::CreateSoundBuffer

## IDirectSound::GetCaps

HRESULT GetCaps(LPDSCAPS lpDSCaps);

DirectSoundIfufWfFfNfg,Æ,È,Ä,Ä,¢,éfn [fhfEfFfA EfffofCfX,ì «”\,ðŽæ“¾,·,é B

¬Æ÷,·,ê,ÎDS\_OK AŽ,”s,·,ê,ÎŽŸ,ÏfGf%o [fR [fh,ð•Ô,· B

### DSERR\_GENERIC

### DSERR\_INVALIDPARAM

### DSERR\_UNINITIALIZED

lpDSCaps

fTfEf“fh EfffofCfX,ì «”\,ªŽ,³,ê,Ä,¢,éDSCAPS \‘¢‘İ,Ö,Ïf|fCf“f^ B

**DSCAPS** \‘¢‘İ,İ’†,©,çŽæ“¾,³,ê,½ î•ñ,Í AfTfEf“fh EfffofCfX,ì Å‘â «”\,Æ A,»,ê,ªÆ» ÝŽg—p%oÂ”\,©,Ç,□,©,ðŽ,µ,Ä,¢,é B,½,Æ,,Î Afn [fhfEfFfA Ef~fLfVf“fO Ef`fff“flf<,Ì ”,ÆfIf“f{ [fh EfTfEf“fh Ef f,fŠ,ì—Ê,È,Ç,Ä, ,é B,±,Ì î•ñ,ðfpftfH [f}f“fX,ÏÆü ã,ÆfŠf\ [fXŠ,,è“—,Ä,Ì Å“K%o»,É—~—p,·,é,±,Æ,ª,Ä,«,é B

fŠf\ [fX,Ï□—L,É,æ,è A,Ð,Æ,Â,ÏfGfŠfA,Ä «”\

,ð Å‘â,Ê^ø,« o,·,Æ‘¼,ÏfGfŠfA,ª<] µ,É,È,é B,½,Æ,,Î A Å‘â ”,ÏfXfgfŠ [f€ EfTfEf“fh Efofbftf@,Ïf~fLfVf“fO,ªfn [fhfEfFfA ã,ÅŽg—p%oÂ”\

,É,È,é,Ì,Í Afn [fhfEfFfA ã,ÊfXf^fefBfbfN EfTfEf“fh Efofbftf@,ª,Ð,Æ,Â,à,È,¢ ê ‡,Ì,Ý,Ä, ,é B

ŽQ Æ @DirectSoundCreate, DSCAPS, IDirectSound

## **IDirectSound::GetSpeakerConfig**

HRESULT GetSpeakerConfig(LPDWORD lpdwSpeakerConfig);

DirectSoundIfufWfFfNfg,ÅŽw'è,<sup>3</sup>,ê,½fXfs [fJ Ý'è,ðŽæ“¾,·,é B  
¬Æ÷,·,ê,ÎDS\_OK AŽ,”s,·,ê,ÎŽŸ,ÌfGf%o [fR [fh,ð•Ô,· B

**DSERR\_INVALIDPARAM**

**DSERR\_UNINITIALIZED**

*lpdwSpeakerConfig*

,±,ÎDirectSoundIfufWfFfNfg,ÌfXfs [fJ Ý'è,Ö,Ìf|fCf“f^ BfXfs [fJ Ý'è,Í`È%°,Ì'l,ÅŽw'è,<sup>3</sup>,ê,é B

DSSPEAKER\_HEADPHONE

fI [fffbfI,Ífwfbfhfzf“,©,ç o—Í,·,é B

DSSPEAKER\_MONO

fI [fffbfI,Íf,fmf%of< EfXfs [fJ,©,ç o—Í,·,é B

DSSPEAKER\_QUAD

fI [fffbfI,Í4f`fff“flf< EfXfs [fJ,©,ç o—Í,·,é B

DSSPEAKER\_STEREO

fI [fffbfI,ÍfXfefÆfI EfXfs [fJ,©,ç o—Í,<sup>3</sup>,ê,é(ffftfHf<fg'l) B

DSSPEAKER\_SURROUND

fI [fffbfI,ÍfTf%ofEf“fh EfXfs [fJ,©,ç o—Í,<sup>3</sup>,ê,é B

ŽQ Æ @*IDirectSound*, **IDirectSound::SetSpeakerConfig**

## IDirectSound::Initialize

HRESULT Initialize(GUID FAR \* lpGuid);

**CoCreateInstance**ŠÖ ”,É,æ,è ì ¬,³,ê,½DirectSoundfIfufWfFfNfg,ð %oŠú%o»,·,é B

¬Œ÷,·,ê,ÎDS\_OK AŽ,”s,·,ê,ÎŽŸ,ÌfGf%o [fR [fh,ð•Ô,· B

**DSERR\_ALREADYINITIALIZED**

**DSERR\_GENERIC**

**DSERR\_INVALIDPARAM**

**DSERR\_NODRIVER**

lpGuid

fOf [fof<f†fj [fNŽ¬•ÊŽq(GUID),Ö,Ìf|fCf“f^ B,±,ÌŽ¬•ÊŽq,Í A,±  
,ÌDirectSoundfIfufWfFfNfg,ðŒ< ‡,·,é,½,ß,ÌfTfEf“fhfhf%oCfo,ðŽw”è,·,é BNULL,Ì ê ‡,Ífvf%oCf}  
fŠ EfTfEf“fh Efofbftf@,”I’ð,³,ê,é B

,±,Ìf f\fbfh,ÍCOMfvf fgfrf<,É €’,μ,Ä,¢,é B,à,μDirectSoundfIfufWfFfNfg,Ì ì ¬,É**DirectSoundCreate**ŠÖ ”,Žg  
—p,³,ê,Ä,¢,é,Æ A,±,Ìf f\fbfh,ÍDSERR\_ALREADYINITIALIZED,ð•Ô,· B **CoCreateInstance**,ðŽg—  
p,μ,ÄDirectSoundfIfufWfFfNfg,ð ì ¬,μ,½,Æ,«,É**IDirectSound::Initialize**,“ŒÄ,Ñ o,³,ê,È,¢  
,Æ A,»,ÌŒã,ÉŒÄ,Ñ o,³,ê,éf f\fbfh,Í,·,×,Ä**DSERR\_UNINITIALIZED**,ð•Ô,· B

**CoCreateInstance**,ð—~p,μ,½**IDirectSound::Initialize**,ÌŽg—p,É,Â,¢,Ä,Í A *CoCreateInstance*,ðŽg—  
*p,μ,½DirectSoundfIfufWfFfNfg,Ì ì ¬,ðŽQ* Æ,·,é,±,Æ B

ŽQ Æ **@DirectSoundCreate**

```
HRESULT SetCooperativeLevel(HWND hwnd, DWORD dwLevel);
```

$$\begin{aligned} & fTfEf\text{“fh EfffofCfX,É}\hat{1}\text{,},\acute{e}fAfv\check{S}fP\ [fVf\pm f\text{“},\grave{\text{I}}_1\text{“}^2f\mathbb{E}fxf<\grave{\text{d}}\ \acute{Y}\acute{e}\text{“},,\acute{e}\ B \\ & \neg\mathbb{E}\div,\text{,}\acute{e},\hat{\text{I}}\text{S\_OK}\ \acute{A}\check{Z}\text{“}_s,\text{,}\acute{e},\hat{\text{I}}\check{Z}\ddot{Y},\grave{\text{I}}fGf\%_0\ [fR\ [fh,\grave{\text{d}}\hat{\text{O}},\cdot\ B \end{aligned}$$

DSERR\_ALLOCATED

**DSERR\_INVALIDPARAM**

**DSERR\_UNINITIALIZED**

**DSERR\_UNSUPPORTED**

## hwnd

$$fAfvf\check{S}fP \quad [fVf\neq f\text{“}, \dot{\imath}fEfBf\text{“}fhfE \quad Efnf\text{“}fhf\prec \quad B$$

*dwLevel*

—v< ,<sup>3</sup>,ê,<sup>1/2</sup><<sub>1</sub>'<sup>2</sup>f⊆fxf< B ŽŸ,ì'l,<sup>a</sup>Žw'è,Å,«,é B

DSSCL\_EXCLUSIVE

fAfvfŠfP [fVf‡f“,ð”¼fƒfxf,É Ý’ê,·é B“ü—  
ÍftfH [fJfX,ð”¾,é,Æ A,»lAfvfŠfP [fVf‡f“,¾,—,ª—B“ê—  
Â,ç,¹,é,æ,²,É,Ê,é  
(DSBCAPS\_GLOBALFOCUSftf%o Ý’ê,lAfvfŠfP [fVf‡f“,©,ç,l  
TfEf“fh,Íf~f... [fg,³,ê,é) B,±,lfƒfxf,É,—,é  
fAfvfŠfP [fVf‡f“,Í ADSSCL\_PRIORITYfƒfxf,Ì,·,×,Ä,Ì“Áƒ,ð—  
L,· B Ä V,ÍDirectSoundBuffer::SetFormat f\fbfh,ÌƒÄ,Ñ o,µ,Ä  
Žw’è,³,ê,é, Ä ADirectSound,Ífn [fhEfFfƒƒŽ’ð,ðfŠfXfgfA,·,é  
(,½,¾,µ ADirectSound,Í Ý’è,³,ê,½—  
D æfƒfxf,ÉŠÖ,í,ç, A,Â,Ë,Éwave,ðfŠfXfgfA,·,é) B

DSSCL\_NORMAL

fAfvfšfP [fvfšf“„É ‘•,Èç”<sup>2</sup> ô Ô,ð Ýè,„é B Å,àfXf€ [fY,Èf}  
f<f’f’XfLf“fO,Æfšf\ [fXç—L,ð s,ç  
„ì,Å A,Û,È,ñ,Ç,ìfAfvfšfP [fvfšf“„ì,±,ìf€fxfç,É Ýè,„,×„ B

DSSCL\_PRIORITY

fAfvfŠfP [fVf‡f“,đ—D æfEfxf,É Ý`è,`é B,±  
 ĩfEfxf,İfAfvfŠfP [fVf‡f“,İ**ndirectSoundBuffer::SetFormat**,,æ,Ñİ  
**DirectSound::Compact**f ffbfh,đEÄ,Ñ o,.,±,Æ,<sup>a</sup>Ä,«,é B

DSSCL\_WRITEPRIMARY

$\pm, \hat{e}, \hat{1} \text{ \AA } \hat{e} \hat{n} \hat{e}, \hat{l} f(E f x f, \hat{A}, \hat{e} B f A f v f \hat{S} \hat{P} [f V f \pm f, \hat{I} f v f \hat{o} f C f] f \hat{S} E f T f E f " f h E f o f b f t f @, \hat{O}, \hat{I} ', \pm, \hat{Y} f A f N f Z f X, \hat{d} - L, \mu, \hat{A}, \hat{c} \hat{e} B f Z f J f " f f \hat{S} E f T f E f " f h E f o f b f t f @, \hat{l} \hat{A} \P, \hat{I} \hat{e} \hat{O}, \hat{A}, \hat{c}, \hat{E}, \hat{c} B$

f of b f t f @, ð Ä ¶, ·, é ' O, É A, ±, l f f \ f b f h, ð E Ä, Ñ o, µ, Ä, ' 2 f C f x f, ð Ý ' è, µ, Ä, ", ±, Ä, É, · K {, Ä, , é B ,, §, ì, ' 2 f C f x f  
 <, Ì D S S L \_ N O R M A L, Ä, , é B ' ¼, Ì — æ f C f x f, Í · K — v, É % ö, ¶, Ä Ž g — p, ·, é B Ú ×, É, Ä, ¶  
 , Ä, Í A, ' 2 f C f x f, ð Ž Q Ä, ·, é, ±, Ä B

**ŽQ** **Æ** **@IDirectSound, IDirectSound::Compact, IDirectSoundBuffer::GetFormat, IDirectSoundBuffer::GetVolume, IDirectSoundBuffer::Lock, IDirectSoundBuffer::Play, IDirectSoundBuffer::Restore, IDirectSoundBuffer::SetFormat**

## **IDirectSound::SetSpeakerConfig**

HRESULT SetSpeakerConfig(DWORD dwSpeakerConfig);

DirectSoundIfuFWfFfNfg,IfXfs [fJ Ý'è,ðŽw'è,·,é B

¬Œ÷,·,ê,ÎDS\_OK AŽ,”s,·,ê,ÎŽŸ,IfGf%o [fR [fh,ð•Ô,· B

**DSERR\_INVALIDPARAM**

**DSERR\_UNINITIALIZED**

*dwSpeakerConfig*

DirectSoundIfuFWfFfNfg,IfXfs [fJ Ý'è B`È%°,Ì'l,ðŽw'è,Â,«,«,é B

DSSPEAKER\_HEADPHONE

fXfs [fJ,Ífwfbfhfzf“,É,È,é B

DSSPEAKER\_MONO

fXfs [fJ,Íf,fmf%of,É,È,é B

DSSPEAKER\_QUAD

fXfs [fJ,Í4f`fff“flf,É,È,é B

DSSPEAKER\_STEREO

fXfs [fJ,ÍfXfefŒfl,É,È,é(fftfHf,fg'l) B

DSSPEAKER\_SURROUND

fXfs [fJ,ÍfTf%ofEf“fh EfTfEf“fh,É,È,é B

ŽQ Æ @IDirectSound, **IDirectSound::GetSpeakerConfig**

## IDirectSound3DBuffer

*fŠfXfi* [,l3D<ôŠÔ,É,“,ˆÊ’u A•ûĈü AfTfEf“fh Ef**ofbftf**@ŠÂ««,ð•\,·fpf%of [f^,İŽæ“¼,“,æ,Ń Ý’è,ð s,□  
,½,ß,Ê,Í **IDirectSound3DBuffer**fCf“f^ [ftfFfCfX,İf f\fbfh,ðŽg—p,·,é B,±,İ ß,İ,±  
,İfCf“f^ [ftfFfCfX,İf f\fbfh,İfŠftf@fĈf“fX,Ä, ,é BŠT”O,É,Â,ĉ,Ä,İŠT—v,Í A  
IDirectSound3DBufferfCf“f^ [ftfFfCfX,ðŽQ Ä,·,é,±,Ä B

**IDirectSound3DBuffer** fCf“f^ [ftfFfCfX,İf f\fbfh,İŽŸ,İfOf< [fv,Ä \ ¬,³,ê,Ä,ĉ,é

f**ofbf`**fpf%of [f^

**GetAllParameters**

‘Ĉ İ

**SetAllParameters**

←—Ł

**GetMaxDistance**

**GetMinDistance**

**SetMaxDistance**

**SetMinDistance**

‘Ĉ İf, [fh

**GetMode**

**SetMode**

ˆÊ’u

**GetPosition**

**SetPosition**

fTfEf“fh Ef**vf** fWfFfNfVf‡f“

**GetConeAngles**

fR [f“

**GetConeOrientation**

**GetConeOutsideVolume**

**SetConeAngles**

**SetConeOrientation**

**SetConeOutsideVolume**

‘¬“x

**GetVelocity**

**SetVelocity**

,·,×,Ä,İCOMfCf“f^ [ftfFfCfX,Ä“—l A**IDirectSound3DBuffer** fCf“f^ [ftfFfCfX,Í  
IUnknownfCf“f^ [ftfFfCfX Ef f\fbfh,ðĈp ³,µ,Ä,ĉ,é BI**Unknown**fCf“f^ [ftfFfCfX,İŽŸ,İ,R,Â,İf f\fbfh,ðfTf|  
[fg,µ,Ä,ĉ,é B

**AddRef**

**QueryInterface**

**Release**



**IDirectSound3DBuffer::GetAllParameters**

HRESULT GetAllParameters(LPDS3DBUFFER lpDs3dBuffer);

Žw’è,μ,½Žž“\_,Ă,İfTfEf“fhfofbftf@,İ3D“Á «,É,Â,¢,Ă,İ î•ñ,ðŽæ“¾,·,é B

¬Ǝ÷,·,ê,İDS\_OK AŽ,”s,·,ê,İ**DSERR\_INVALIDPARAM**fGf%o [fR [fh,ð•Ô,· B

*lpDs3dBuffer*

**DS3DBUFFER** \‘¢‘İ,Ö,İf|fCf“f^ B,±,İ \‘¢‘İ,İfTfEf“fh Efofbftf@,İ3D“Á «,É,Â,¢,Ă,İ î•ñ,ðŽ ,Á,Ă,¢,é B

## IDirectSound3DBuffer::GetConeAngles

```
HRESULT GetConeAngles(  
    LPDWORD lpdwInsideConeAngle, LPDWORD lpdwOutsideConeAngle);  
  
fTfEf“fh Efofbftf@,İfTfEf“fh Efvf fWfFfNfVf‡f“ EfR [f“,İ“à•”Šp,ÆŠO•”Šp,ðŽæ“¼,·,é B  
    -Œ÷,·,ê,İDS_OK AŽ,”s,·,ê,İDSERR_INVALIDPARAM fGf%∞ [fR [fh,ð•Ô,· B  
  
lpdwInsideConeAngle ,”,æ,Ň lpdwOutsideConeAngle  
    fTfEf“fh Efvf fWfFfNfVf‡f“ EfR [f“,İ“à•”Šp,ÆŠO•”Šp,ðŽ!,·İ ”,Ö,İf|fCf“f^ B
```

**IDirectSound3DBuffer::GetConeOrientation**

```
HRESULT GetConeOrientation(LPD3DVECTOR lpvOrientation);
```

fTfEf“fh Efofbftf@,İfTfEf“fh Efvf fWfFfNfVf‡f“ EfR [f“,İ•ûĖü,đŽæ“¾,·,é B  
¬Ė÷,·,ê,İDS\_OK AŽ,”s,·,ê,İ**DSERR\_INVALIDPARAM**fGf%o [fR [fh,đ•Ô,· B

lpvOrientation

**D3DVECTOR** \‘ċ‘İ,Ö,İf|fCf“f^ B,±  
,İ \‘ċ‘İ,İfTfEf“fh Efvf fWfFfNfVf‡f“ EfR [f“,İĖ» Ý,İ•ûĖü,đŽ',μ,Ä,ċ  
,é BfxfNfgfĸ îñ,İfTfEf“fh EfR [f“,İ'† S,đ•\,· B

f f\fbfh,İfR [f“Šp“x,ÆfR [f“f{fŠf... [fĖ,İ—v'f,à Ý'è,³,ê,Ä,ċ,È,ċ,ÆĖø%oÊ,<sup>a</sup>È,ċ BffftfHf<fg'l,Í(0,0,1),Å, ,é B  
ŽQ Æ @**IDirectSound3DBuffer::SetConeAngles, IDirectSound3DBuffer::SetConeOutsideVolume**

## IDirectSound3DBuffer::GetConeOutsideVolume

HRESULT GetConeOutsideVolume (LPLONG lplConeOutsideVolume);

fTfEf“fh Efofbftf@,É,“,̄,éŒ» Ý,ÌfR [f“ŠO•”f{fŠf... [f€,đŽæ“¾,·,é B  
¬Œ÷,·,ê,ÎDS\_OK AŽ,”s,·,ê,ÎDSERR\_INVALIDPARAM fGf%<sub>o</sub> [fR [fh,đ•Ô,· B

lplConeOutsideVolume  
fofbftf@,ÌŒ» Ý,ÌfR [f“ŠO•”f{fŠf... [f€,đŽ!,·İ ”,Ö,Ìf|fCf“f^ B

f{fŠf... [f€ EfŒfxf<,ÍŒ, Š,đ•\,· B<—e”ÍÍ,Í0(Œ, Š,È,μ),©,ç-10,000(−³%<sub>o</sub>!),Ü,Â,Â, ,é B‘ • ,ÍŒ» Ý,ÎDirectSoun  
d,Â,ÍfTf| [fg,<sup>3</sup>,ê,Ä,ç,È,ç B

fR [f“ŠO•”f{fŠf... [f€,É,Â,ç,Ä,Ì Ú × î•ñ,Í AfTfEf“fh Efvf fWfFfNfVf‡f“ EfR [f“,đŽQ Œ,·,é,±,Œ B  
ŽQ Œ @IDirectSoundBuffer::SetVolume

```
HRESULT GetMaxDistance(LPD3DVALUE lpflMaxDistance);
```

$\neg \mathbb{E} \vdash \cdot, \hat{e}, \hat{\text{IDS\_OK}} \quad \text{A\text{Z}, "s, \cdot, \hat{e}, \hat{\text{DSERR\_INVALIDPARAM}} \quad fGf\%_0 \quad [fR \quad [fh, \partial \cdot \hat{O}, \cdot \quad B$

«E» Ý,Ì Å'·«—£ Ý'è,ðŽ|,•İ ”,Ö,İf|fCf“f^ B

ŽQ E @IDirectSound3DBuffer::GetMinDistance, IDirectSound3DBuffer::SetMaxDistance

## IDirectSound3DBuffer::GetMinDistance

HRESULT GetMinDistance(LPD3DVALUE lpflMinDistance);

*fTfEf*“fh Efofbftf@,lŒ» Ý,l Å’Z<—£,ðŽæ“¾,·,é B

¬Œ÷,·,ê,ÎDS\_OK AŽ,”s,·,ê,Î**DSERR\_INVALIDPARAM**fGf%o [fR [fh,ð•Ô,· B

*lpflMinDistance*

Œ» Ý,l Å’Z<—£ Ý’è,ðŽ!,·İ ”,Ö,l|fCf“f^ B

*ffftHf*<fg,Ä,Í Å’Z<—£’l,Í1.0,É,È,Ä,¢,é B,±,ê,ÍffftHf<fg,l<—£’l,ì’P^Ê,Éf [fgf< Ý’è,³,ê,Ä,¢  
,é ê ±,Í1.0f [fgf<,Æ,¢,±,±,Æ,Ä,,é B Å’Z<—£,Æ Å’·<—£,É,Ä,¢,Ä,l Ú × î•ñ,Í A\_Å’Z<==  
£’l,Æ Å’·<—£’l,ðŽQ Æ,·,é,±,Æ B

ŽQ Æ @**IDirectSound3DBuffer::SetMinDistance, IDirectSound3DBuffer::GetMaxDistance**

## IDirectSound3DBuffer::GetMode

HRESULT GetMode(LPDWORD lpdwMode);

3DfTfEf“fh ^— ,lŒ» Ý,l'€ ìf, [fh,ðŽæ“¾,·,é B

¬Œ÷,·,ê,ÎDS\_OK AŽ,”s,·,ê,Î**DSERR\_INVALIDPARAM**fGf%o [fR [fh,ð•Ô,· B

lpdwMode

Œ» Ý,l'€ ìf, [fh,ðŽ|,·İ ”,Ö,l|fCf“f^ BŽŸ,l'l,Å•Ô,é B

DS3DMODE\_DISABLE

3DfTfEf“fh ^— ,İ-

³Œø,É,È,é BfTfEf“fh,ÍfŠfXfi [,lì“a,l'† S,©,ç•·,±,!,é,æ,▯,ÉŠ',¶,é B

DS3DMODE\_HEADRELATIVE

fTfEf“fhfpf%of [f^(Ê'u A'¬“x A•ûŒü)

,ÍfŠfXfi [,lfpf%of [f^,Æ'Š'ÎŠÖŒW,É, ,é B,±

,lìf, [fh,Å,Í AfTfEf“fh,l âîfpf%of [f^,ÍfŠfXfi [ Efpf%of [

f^,ªİ X,³,ê,½,Æ,«,ÉŽ©“@“I,É X V,³,ê,é,l,Å A'Š'îfpf%of [f^,É,Í

•İ%o»,Í,È,ç,Û,Û,Å, ,é B

DS3DMODE\_NORMAL

•W € ,lì ^— B,±,ê,ªffftfHf<fgf, [fh,É,È,Á,Ä,ç,é B

## IDirectSound3DBuffer::GetPosition

```
HRESULT GetPosition(LPD3DVECTOR lpvPosition);
```

*fTfEf“fh Efofbftf@,ìĈ» Ý,ìÊ’u,ð<——Ě’P^Ê,ĀŽæ“¾,·,é BfftfHf<fg,Ā,Í<——  
Ě’P^Ê,Íf [fgf<,¾,ª A’P^Ê,ìĪ X,ÍIDirectSound3DListener::SetDistanceFactor f\fbfh,ðŽg—p,µ,Ā s,!,é B  
¬Ĉ÷,·,ê,ĪDS\_OK AŽ,”s,·,ê,ĪDSERR\_INVALIDPARAMfGf%∞ [fR [fh,ð•Ô,· B*

*lpvPosition*

**D3DVECTOR** \‘ċ’ì,Ö,ìf|fCf“f^ B,±,ì \‘ċ’ì,ÍfTfEf“fh Efofbftf@’†,ìfJfĈf“fg Ef|fWfVf‡f“,ðŽ!,µ,Ā,ċ,é B



## IDirectSound3DBuffer::GetVelocity

HRESULT GetVelocity(LPD3DVECTOR lpvVelocity);

fTfEf“fh Efofbftf@,lŒ» Ý,l'¬“x,đŽæ“¾,·,é B

¬Œ÷,·,ê,ŒDS\_OK AŽ,”s,·,ê,ŒDSERR\_INVALIDPARAM fGf% [fR [fh,đ•Ô,· B

lpvVelocity

D3DVECTOR \‘Œ‘l,Ö,l|fCf“f^ B,±,l \‘Œ‘l,ŒfTfEf“fh Efofbftf@,lŒ» Ý,l'¬“x,đŽ|,μ,Ä,Œ,é B

‘¬“x,Œfhfbfvf% [Œø%Œ,Ä,l,ÝŽg—p,³,ê,é BŽÀ Ũ,Œfofbftf@,đ~Ú“®,·,é,±  
,Œ,Œ,Œ,Œ B Ũ ×,Œ~~Œ~~u,ŒŒ‘¬“x,đŽQ Œ,·,é,±,Œ B

ŽQ Œ @IDirectSound3DBuffer::SetPosition, IDirectSound3DBuffer::SetVelocity

## IDirectSound3DBuffer::SetAllParameters

```
HRESULT SetAllParameters(  
    LPDS3DBUFFER lpDs3dBuffer, DWORD dwApply);
```

*fTfEf“fh Efofbftf@,l̂, é ušŌ, l̂ ó‘Ô, l̂, ·, ×, Ä, đŽ̂, μ, Ä, ¢, é DS3DBUFFER \‘¢‘l̂, ©, ¢—  
^, !, ¢, ê, ½ A, ·, ×, Ä, l̂3DfTfEf“fh Efofbftf@ Efpf%of [f^, đ Ý’è, ·, é B*

*¬Æ÷, ·, ê, l̂DS\_OK AŽ, ”s, ·, ê, l̂DSERR\_INVALIDPARAMfGf%o [fR [fh, đ•Ô, · B*

*lpDs3dBuffer*

***DS3DBUFFER** \‘¢‘l̂, Ö, l̂f|fCf“f^ B, ±, l̂ \‘¢‘l̂, l̂fTfEf“fh Efofbftf@, l̂3D“Á «, đŽ̂, μ, Ä, ¢, é B*

*dwApply*

*Ý’è, l̂f^fCf~f“fO, đŽ̂, ·, l̂ BŽŸ, l̂l̂, ÄŽ̂, ³, ê, é B*

*DS3D\_DEFERRED fAfvfŠfP [fVf‡f“, “IDirectSound3DListener::CommitD  
eferredSettingsf f\fbfh, đÆÄ, Ñ o, ·, Ü, Ä Ý’è, l̂ s, í, ê, È  
, ¢ B•i ”, l̂ Ý’è, đ•l̂ X, μ, ½, è A’P“Æ, l̂ ÄÆvŽŽ, đŽ̂Ä s  
, ·, é, ±, Æ, “%oÄ”\ B*

*DS3D\_IMMEDIATE Ý’è, l̂l̂ŽŽ, É s, í, ê AfVfXfef€  
, l̂, ·, ×, Ä, l̂3DfTfEf“fh Efofbftf@, É‘l̂, ·, é3D À•w, l̂ Ä  
ÆvŽŽ, đ s, □ B*

## IDirectSound3DBuffer::SetConeAngles

```
HRESULT SetConeAngles(  
    DWORD dwInsideConeAngle,  
    DWORD dwOutsideConeAngle, DWORD dwApply);
```

fTfEf“fh Efofbftf@,lfTfEf“fh Efvf fWfFfNfVf‡f“ EfR [f“,l“à•”Šp,ÆŠO•”Šp,đ Ý’è,.,é B  
¬Æ÷,.,ê,ÎDS\_OK AŽ,”s,.,ê,ÎDSERR\_INVALIDPARAMfGf%o [fR [fh,đ•Ô,· B

dwInsideConeAngle,.,æ,Ñ dwOutsideConeAngle  
fTfEf“fh Efvf fWfFfNfVf‡f“ EfR [f“,l“à•”Šp,ÆŠO•”Šp B

dwApply  
Ý’è,<sup>a</sup> s,í,ê,éf^fCf~f“fO,đŽ!,.l BŽŸ,ìl,ĂŽ!,<sup>3</sup>,ê,é B

DS3D\_DEFERRED fAfvfŠfP [fVf‡f“,aIDirectSound3DListener::Comm  
tDeferredSettingsf f\fbfh,đÆĂ,Ñ o,.,Û,Ă Ý’è,Í s,í  
,ê,È,¢ B•i ”,l Ý’è,đ•l X,μ,½,è A’P“Æ,ì ĂÆvŽZ,đ  
ŽĂ s,.,é,±,Æ,“%oĂ”\ B

DS3D\_IMMEDIATE Ý’è,Í‘lŽž,É s,í,ê AfVfXfef€  
,l,.,×,Ă,ł3DfTfEf“fh Efofbftf@,É‘l,.,é3D À•w,ì  
ĂÆvŽZ,đ s,□ B

Šp“x,ì”l’l,Í0“x(fR [f“,È,μ),©,ç360“x(‘S”l’l),Û,Ă,Ă, ,é BfftfHf<fg’l,Í360,Ă, ,é B Ú ×,  
ÍfTfEf“fh Efvf fWfFfNfVf‡f“ EfR [f“,đŽQ Æ,.,é,±,Æ B

ŽQ Æ @IDirectSound3DBuffer::GetConeOutsideVolume, IDirectSound3DBuffer::SetConeOutsideVolume

## IDirectSound3DBuffer::SetConeOrientation

HRESULT SetConeOrientation(D3DVALUE x,  
D3DVALUE y, D3DVALUE z, DWORD dwApply);

fTfEf“fh Efofbftf@,İ AfTfEf“fh Efvf fWfFfNfVf‡f“ EfR [f“,İ•ûĚü,đ Ý’è,·,é B,±  
,İf f\fbfh,İ AfR [f“Šp“x,ÆfR [f“f{fŠf... [f€,İ—v’f,à Ý’è,³,ê,Ä,¢,Ě,¢,ÆĚø‰Ě,“¾,ç,ê,Ě,¢ B

–Ě÷,·,ê,İDS\_OK AŽ,”s,·,ê,İDSERR\_INVALIDPARAM fGf‰ [fR [fh,đ•Ô,· B

x, y, , ,æ,Ń z

D3DVALUE,İf^fCfv,đŽ!,·! B,±,ê,İ V◊K,İfTfEf“fh EfR [f“,İ•ûĚüxfNfgf◊,İ Ä•W,đ•\,· B

dwApply

Ý’è,ª s,í,ê,éf^fCf~f“fO,đŽ!,·! B^È‰°,İ!l,ÄŽ!,³,ê,é B

DS3D\_DEFERRED fAfvfŠfP [fVf‡f“,ªIDirectSound3DListener::Comm  
tDeferredSettingsf f\fbfh,đĚÄ,Ń o,·,Û,Ä Ý’è,İ s,í  
,ê,Ě,¢ B•ı ”,İ Ý’è,đ•İ X,µ,½,è A’P“Æ,İ ÄĚvŽŽ,đ  
ŽÄ s,·,é,±,Æ,ª‰Ä”\ B

DS3D\_IMMEDIATE Ý’è,İ‘!ŽŽ,É s,í,ê AfVfXfef€  
,İ,·,×,Ä,İ3DfTfEf“fh Efofbftf@,É.İ,·,é3D Ä•W,İ  
ÄĚvŽŽ,đ s,ª B

## IDirectSound3DBuffer::GetConeOrientation f f\fbfh,İ

lpvOrientationfpf‰of [f^“à,İfxfNfgf◊ î•ň,İ AfTfEf“fh EfR [f“,İ† S,đ•\,µ,Ä,¢,é BffftfHf◊fg’l,İ(0,0,1),Ä, ,é B

ŽQ Æ @IDirectSound3DBuffer::SetConeAngles, IDirectSound3DBuffer::SetConeOutsideVolume

## IDirectSound3DBuffer::SetConeOutsideVolume

```
HRESULT SetConeOutsideVolume(  
    LONG lConeOutsideVolume, DWORD dwApply);
```

fTfEf“fh Efofbftf@,İE» Ý,İfR [f“ŠO•”f{fŠf... [f€,đ Ý’è,·,é B  
-Œ÷,·,ê,İDS\_OK AŽ,”s,·,ê,İDSERR\_INVALIDPARAMfGf%o [fR [fh,đ•Ô,· B

lConeOutsideVolume

fTfEf“fh Efofbftf@,İfR [f“ŠO•”f{fŠf... [f€  
,đ100ffVfxf< idB j,İ”ÍÍ,ĂŽw’è,·,é B”F’è%oÂ”\”ÍÍ,Í0(Œ, Š,È,µ),©,ç-10,000(-3%o¹),Û,Ă,Ă, ,é B  
dwApply  
Ý’è,<sup>a</sup> s,í,ê,éf^fCf~f“fO,đŽ!,·! B^È%o°,İ!l,ĂŽ!,<sup>3</sup>,é,é B

**DS3D\_DEFERRED** fAfvfŠfP [fVf‡f“,“IDirectSound3DListener::CommitD  
eferredSettingsf f\fbfh,đŒĂ,Ň o,·,Û,Ă Ý’è,İ s,í,ê,È  
,Œ B•j ”,İ Ý’è,đ•İ X,µ,½,è A’P“Æ,İ ĂŒvŽŽ,đŽĂ s  
,·,é,±,Æ,“%oÂ”\ B

**DS3D\_IMMEDIATE** Ý’è,İ‘!ŽŽ,É s,í,ê AfVfXfef€  
,İ,·,×,Ă,İ3DfTfEf“fh Efofbftf@,É‘İ,·,é3D Â•W,İ Ă  
ŒvŽŽ,đ s,□ B

f{fŠf... [f€ EfŒfxf<,İŒ, Š,đ•\,· B’ • ,İDirectSound,Ă,İŒ» ÝfTf| [fg,<sup>3</sup>,ê,Ă,Œ,È,Œ B

fR [f“ŠO•”f{fŠf... [f€,İŠT”O,É,Ă,Œ,Ă,İ Ú ×,İ AfTfEf“fh Efvf fWfFfNfVf‡f“ EfR [f“,đŽQ Œ,·,é,±,Æ B  
ŽQ Œ @IDirectSoundBuffer::SetVolume

## IDirectSound3DBuffer::SetMaxDistance

```
HRESULT SetMaxDistance(  
    D3DVALUE flMaxDistance, DWORD dwApply);
```

«» Ý,İ Ä'·«——£'l,ð Ý'è,·,é B

¬«÷,·,ê,İDS\_OK ÄŽ,»s,·,ê,İDSERR\_INVALIDPARAMfGf%o [fR [fh,ð•Ô,· B

*flMaxDistance*

V,µ,« Ä'·«——£'l B

*dwApply*

Ý'è,<sup>a</sup> s,í,ê,éf^fCf~f“fO,ðŽl,·'l B^È%°,İ'l,ÄŽl,<sup>3</sup>,ê,é B

**DS3D\_DEFERRED**      fAfvfŠfP [fVf‡f“,“IDirectSound3DListener::CommitD  
eferredSettingsf f\fbfh,ð«Ä,Ň o,·,Ü,Ä Ý'è,İ s,í,ê,È  
,« B•j ”,İ Ý'è,ð•İ X,µ,½,è A'P“Ä,İ Ä«vŽZ,ðŽÄ s  
,·,é,±,Ä,“%oÄ”\ B

**DS3D\_IMMEDIATE**      Ý'è,İ'Žž,É s,í,ê AfVfXfef€  
,İ,·,×,Ä,İ3DfTfEf“fh Efofbftf@,Éİ',·,é3D Ä•W,İ Ä  
«vŽZ,ð s,□ B

ffftfHf<fg,Ä,İ Ä'·«——£'l,İ¬«Ä,É,È,Ä,Ä,«,é B Ä'Z«——£,Ä Ä'·«——£,É,Ä,«,Ä,İ Ú × î•ñ,İ A\_Ä'Z«  
£'l,Ä Ä'·«——£'l,ðŽQ Ä,·,é,±,Ä B

ŽQ Ä @IDirectSound3DBuffer::GetMaxDistance, IDirectSound3DBuffer::SetMinDistance

## IDirectSound3DBuffer::SetMinDistance

```
HRESULT SetMinDistance(  
    D3DVALUE flMinDistance, DWORD dwApply);
```

«» Ý,Ì Á'Z<—£'l,ð Ý'è,·,é B

¬«÷,·,ê,îDS\_OK AŽ,"s,·,ê,îDSERR\_INVALIDPARAMfGf%o [fR [fh,ð•Ô,· B

*flMinDistance*

V,µ,« Á'Z<—£'l B

*dwApply*

Ý'è,<sup>a</sup> s,í,ê,éf^fCf~f“fO,ðŽ!,·'l B^È%o°,ì'l,ÄŽ!,<sup>3</sup>,ê,é B

**DS3D\_DEFERRED**      fAfvfŠfP [fVf‡f“,<sup>a</sup>IDirectSound3DListener::CommitDeferredSettingsf f\fbfh,ð«Ä,Ń o,·,Ü,Ä Ý'è,Í s,í,ê,È  
,« B•i ”,Ì Ý'è,ð•İ X,µ,½,è A'P“Æ,ì Ä«vŽŽ,ðŽÄ s  
,·,é,±,Æ,%Ä”\ B

**DS3D\_IMMEDIATE**      Ý'è,Í'Žž,É s,í,ê AfVfXfef€  
,Í,·,×,Ä,ì3DfTfEf“fh Efofbftf@,É'î,·,é3D Ä•W,ì Ä  
«vŽŽ,ð s,² B

ffftfHf<fg,Ä,Í Á'Z<—£'l,ì1.0(ffftfHf<fg,ì<—£'l'P^Ê,Íf [fgf<,È,ì,Ä A1.0f [fgf<,ð´Ó-j,·,é),É,È,Ä,Ä,«  
,é B Á'Z<—£,Æ Á'·<—£,É,Ä,«Ä,ì Ú × î•ñ,Í A Á'Z<—£'l,Æ Á'·<—£'l,ðŽQ Ä,·,é,±,Æ B

ŽQ Ä @IDirectSound3DBuffer::SetMaxDistance

## IDirectSound3DBuffer::SetMode

```
HRESULT SetMode(  
    DWORD dwMode, DWORD dwApply);
```

3DfTfEf“fh ^— ,É‘Î,·,é‘€ ìf, [fh,ð Ý’è,·,é B

¬Ǝ÷,·,ê,ÎDS\_OK AŽ,”s,·,ê,ÎDSERR\_INVALIDPARAMfGf%o [fR [fh,ð•Ô,· B

dwMode

3DfTfEf“fh ^— f, [fh,ð Ý’è,·,é BŽŸ,ì¹,ÄŽ¹,³,ê,é B

DS3DMODE\_DISABLE

3DfTfEf“fh ^— ,Í¬Ǝø BfTfEf“fh,ÍfŠfXfi [,ì“ª,ì¹† S,©,ς•,±  
!,,é,æ,α,ÉŠ´,¶,é B

DS3DMODE\_HEADRELATIVE

fTfEf“fh Efpf%of [f^(^Ê’u A’¬“x A•ûƎü)  
,ÍfŠfXfi [,ìfpf%of [f^,Æ‘Š‘ÎŠÖƎW,É, ,é B,±  
,ìf, [fh,Ä,Í AfTfEf“fh,Ì â‘Îfpf%of [f^,ÍfŠfXfi [ Efpf%of [f^,  
ª‘Î X,³,ê,½,Æ,«„ÉŽ©“®“I,É X V,³,ê,é,Ì,Ä A‘Š‘Îfpf%of [f^,Í•İ  
!,,ς,È,¢,Û,Ä, ,é B

DS3DMODE\_NORMAL

•W €,ì ^— B,±,ê,ªfftfHf<fg Ef, [fh,É,È,Ä,Ä,¢,é B

dwApply

Ý’è,ª s,í,ê,éf^fCf~f“fO,ðŽ¹,·¹ B^È%o,ì¹¹,ÄŽ¹,³,ê,é B

DS3D\_DEFERRED

fAfvfŠfP [fVf‡f“,ªIDirectSound3DListener::CommitDeferredSettingsf f\fbfh,ðƎÄ,Ñ o,·,Û,Ä Ý’è,Í s,í,ê,È,¢  
B•¡ ”,Ì Ý’è,ð•İ X,µ,½,è A’P“Æ,Ì ÄƎvŽŽ,ðŽÄ s,·,é,±  
,Æ,ª%oÄ”\ B

DS3D\_IMMEDIATE

Ý’è,Í¹ŽŽ,É s,í,ê AfVfXfef€  
,Í,·,×,Ä,ì3DfTfEf“fh Efobftf@,É‘Î,·,é3D Ä•W,Ì ÄƎ  
vŽŽ,ð s,α B



```
HRESULT SetPosition(D3DVALUE x,
    D3DVALUE y, D3DVALUE z, DWORD dwApply);
```

$$\frac{x,y,z}{\text{D3DVALUE}}, \text{ , } \tilde{x}, \tilde{z}$$
DS3D\_DEFERRED fAfVfŸfP [fVfŸf“,<sup>a</sup>DirectSound3DListener::CommitDeferredSettings  
f f\fbfh,ðĈĈĈ,Ÿ o,.,Ÿ,Ĉ Ÿ’è,Ĭ s,ĭ,è,Ĉ,Ĉ B•<sub>i</sub> ”,ĭ Ÿ  
’è,ðĈĈ Ÿ,μ,½,è A’P“Ĉ,Ĭ ĈĈvŽŽ,ðŽĈ s,.,é,±  
,Ĉ,“%ĈĈ“\ B

DS3D\_IMMEDIATE      Ÿ'è,Í'ŹŽ,É s,Í,ê AfVfXfef€  
,Í,·,×,Ä,ßDfTfEf“fh Efofbftf@,É,Î,·,é3D Ä•W,Ì Ä  
€vŽŽ,ð s,□ B

## IDirectSound3DBuffer::SetVelocity

```
HRESULT SetVelocity(D3DVALUE x,  
    D3DVALUE y, D3DVALUE z, DWORD dwApply);
```

fTfEf“fh Efofbftf@,lE» Ý,l‘-“x,ð Ý’è,·,é B

¬CE÷,·,ê,ÎDS\_OK AŽ,”s,·,ê,ÎDSERR\_INVALIDPARAMfGf%o [fR [fh,ð•Ô,· B

x, y, ,·,æ,Ñ z

D3DVALUE,l^fCfv,ðŽ!,·l B,±,ê,Í V,μ,¢““xfxfNfgf<,l À•W,ð•\,· B

dwApply

Ý’è,<sup>a</sup> s,í,ê,é^fCf~f“fO,ðŽ!,·l B^È%°,l,l,ÄŽ!,<sup>3</sup>,ê,é B

**DS3D\_DEFERRED** fAfvfŠfP [fVf‡f“,“IDirectSound3DListener::CommitD  
eferredSettingsf f\fbfh,ðCEÄ,Ñ o,·,Ü,Ä Ý’è,Í s,í,ê,È  
,¢ B•j ”,l Ý’è,ð•l X,μ,½,è A’P“Æ,l ÄCevŽZ,ðŽÄ s  
,·,é,±,Æ,“%oÂ”\ B

**DS3D\_IMMEDIATE** Ý’è,Í,Žž,É s,í,ê AfVfXfef€  
,Í,·,×,Ä,l3DfTfEf“fh Efofbftf@,ÉÍ,·,é3D À•W,l Ä  
CevŽZ,ð s,□ B

“¬“x,Ífhfbfvf%o [CEø%oÊ,Ä,l,ÝŽg—p,<sup>3</sup>,ê,é BŽÄ Û,Éfofbftf@,ð~Ú“®,·,é,±  
,Æ,Í,È,¢ B Û ×,Í<sup>Ê</sup>u,Æ“¬“x,ðŽQ Ä,·,é,±,Æ B

ŽQ Ä @IDirectSound3DBuffer::SetPosition, IDirectSound3DBuffer::GetVelocity

## IDirectSound3DListener

*fŠfXfi* [,l3D<ôšÔ,É,“,éÊ’u A•ûĖü AfšfXfjf“fOšÂ<«,ð•\,·fpf%of [f^,lžæ“¾,“,æ,Ń Ý’è,ð s,¼,É,Í  
**IDirectSound3DListener***fCf“f^ [ftfFfCfX,lf f\fbfh,ðŽg—p,·,é B,±,ì ß,Í,±*  
*,lfCf“f^ [ftfFfCfX Ef f\fbfh,lfŠftf@fĖf“fX,Â, ,é BŠT”O,É,Â,ĉ,Ä,ìŠT—*  
*v,Í AIDirectSound3DListenerfCf“f^ [ftfFfCfX,ðŽQ Æ,·,é,±,Æ B*

**IDirectSound3DListener** *fCf“f^ [ftfFfCfX,lf f\fbfh,ÎÈ%°,lfOf< [fv,Â \ ¬,³,ê,Ä,ĉ,é*

*fofbf`fpf%of [f^‘Ė ì*

[GetAllParameters](#)

[SetAllParameters](#)

*~,!’u,« Ý’è*

[CommitDeferredSettings](#)

*←—Ě—v’f*

[GetDistanceFactor](#)

[SetDistanceFactor](#)

*fhfbfvf%o [—v’f*

[GetDopplerFactor](#)

[SetDopplerFactor](#)

*•ûĖü*

[GetOrientation](#)

[SetOrientation](#)

*^Ê’u*

[GetPosition](#)

[SetPosition](#)

*f [f<fIf t—v’f*

[GetRolloffFactor](#)

[SetRolloffFactor](#)

*‘¬“x*

[GetVelocity](#)

[SetVelocity](#)

*,·,×,Ä,ìCOMfCf“f^ [ftfFfCfX,Æ“—l AIDirectSound3DBuffer fCf“f^ [ftfFfCfX,Í=*  
*IUunknownfCf“f^ [ftfFfCfXf f\fbfh,ðĖp ³,µ,Ä,ĉ,é BIUunknownfCf“f^ [ftfFfCfX,ÎÈ%°,ì,R,Â,lf f\fbfh,ðfTf|*  
*[fg,µ,Ä,ĉ,é B*

[AddRef](#)

[QueryInterface](#)

[Release](#)

**IDirectSound3DListener::CommitDeferredSettings**

HRESULT CommitDeferredSettings();

‘O%oñ,ì,±,ìf f\fbfh,ìĈĈ,Ñ o,μ^ÈĈã,É ì ¬,³,ê,½ ~,|’u,« Ý’è,ðfRf~fbfg,·,é B  
¬Ĉ÷,·,ê,îDS\_OK AŽ,”s,·,ê,î**DSERR\_INVALIDPARAM**fGf%o [fR [fh,ð•Ô,· B  
Â‘â,ì”—,|,Â ~,|’u,« Ý’è,ðŽg—p,·,é•û-@,É,Â,ĉ,Ă,Ì Ú ×,í ~,|’u,« Ý’è,ðŽQ Æ,·,é,±,Æ B

## IDirectSound3DListener::GetAllParameters

HRESULT GetAllParameters(LPDS3DLISTENER lpListener);

3Df [f<fh,“,æ,Ñ3DfŠfXfi [,lÆ» Ý,Ì ó‘Ô,ð•\,· î•ñ,ðŽæ“¾,·,é B

¬Æ÷,·,ê,ÎDS\_OK AŽ,”s,·,ê,ÎDSERR\_INVALIDPARAMfGf%o [fR [fh,ð•Ô,· B

*lpListener*

DS3DLISTENER \‘¢‘İ,Ö,İf|fCf“f^ B,±,İ \‘¢‘İ,Í3Df [f<fh,“,æ,Ñ3DfŠfXfi [,lÆ» Ý,Ì ó‘Ô,ðŽ!,· B

ŽQ Æ @IDirectSound3DListener::SetAllParameters

## IDirectSound3DListener::GetDistanceFactor

HRESULT GetDistanceFactor(LPD3DVALUE lpflDistanceFactor);

«» Ý,ì«—£—v‘f,ðŽæ“¾,·,é B

¬«÷,·,ê,ÎDS\_OK AŽ,”s,·,ê,ÎDSERR\_INVALIDPARAMfGf%o [fR [fh,ð•Ô,· B

lpflDistanceFactor

D3DVALUEf^fCfv,ì•İ ”,Ö,ìf|fCf“f^ B,±,ê,Í«» Ý,ì«—£—v‘f,ì'l,aŽ',³,ê,é B

«—£—v‘f,É,Â,¢,Ä,ì Ú ×,Í A«—£—v‘f,ðŽQ Æ,·,é,±,Æ B

ŽQ Æ @IDirectSound3DListener::SetDistanceFactor

## IDirectSound3DListener::GetDopplerFactor

HRESULT GetDopplerFactor(LPD3DVALUE lpflDopplerFactor);

«» Ý,ìfhfbfvf% [Eø%Ê,ðŽæ“¾,·,é B

¬E÷,·,ê,ÎDS\_OK AŽ,”s,·,ê,ÎDSERR\_INVALIDPARAMfGf% [fR [fh,ð•Ô,· B

lpflDopplerFactor

D3DVALUEf^fCfv,ì•ĭ ”,Ö,ìf|fCf“f^ B,±,ê,ÍE» Ýfhfbfvf% [—v‘f,ì’l,<sup>a</sup>Ž,<sup>3</sup>,ê,é B

fhfbfvf% [—v‘f,ì”ĭÍ,Í0(fhfbfvf% [—v‘f,È,µ),©,ç10.0(ŽÀ Ũ,ì ¢ŠE,ì10”{,ìfhfbfvf% [—v‘f),Ă, ,é

BffftfHf<fg’l,ÎDS3D\_DEFAULTDOPPLERFACTOR(1.0),Ă, ,é Bfhfbfvf% [—v‘f,É,Ă,¢  
,Ă,ĭ Ũ ×,ĭ Afhfbfvf% [—v‘f,ðŽQ Æ,·,é,±,Æ B

ŽQ Æ @IDirectSound3DListener::SetDopplerFactor

## IDirectSound3DListener::GetOrientation

```
HRESULT GetOrientation(  
    LPD3DVECTOR lpvOrientFront,  
    LPD3DVECTOR lpvOrientTop);
```

*fŠfXfi* [,lŒ» Ý,l•ûŒü,ð‘O•ûfxfNfgf<,Æ ã•ûfxfNfgf<,l,Ó,½,Â,l̂fxfNfgf<,ĂŽæ“¾,•,é B  
-Œ÷,•,ê,ŒDS\_OK ĂŽ,”s,•,ê,l̂DSERR\_INVALIDPARAM fGf%o [fR [fh,ð•Ô,• B

*lpvOrientFront*

**D3DVECTOR** \‘ç‘ì,Ö,l̂f|fCf“f^ BfŠfXfi [,l̂‘O•ûfxfNfgf<,ðŽ‘,μ,Ă,ç,é B

*lpvOrientTop*

**D3DVECTOR** \‘ç‘ì,Ö,l̂f|fCf“f^ BfŠfXfi [,l̂ ã•ûfxfNfgf<,ðŽ‘,μ,Ă,ç,é B

‘O•ûfxfNfgf<,l̂fŠfXfi [,l̂•@,É^Ê‘u,μ A ã•ûfxfNfgf<,l̂fŠfXfi [,l̂“ã ã,©,ç^Ê‘u,•,é BfftfHf<fg,Ă,l̂‘O•ûfxfNfgf<,l̂(0,0,1.0) A ã•ûfxfNfgf<,l̂(0,1.0,0),Æ,È,Ă,Ă,ç,é B

ŽQ Æ @IDirectSound3DListener::SetOrientation



## IDirectSound3DListener::GetPosition

HRESULT GetPosition(LPD3DVECTOR lpvPosition);

*fŠfXfi* [,lŒ» Ý,îÊ'u,ð«—£'P^Ê,ÅŽæ“¾,·,é BfftfHf<fg,ì«—  
£'P^Ê,Íf [fgf<,¾,<sup>a</sup> AIDirectSound3DListener::SetDistanceFactor f\fbfh,ðŽg—p,µ,Ä«—£'P^Ê,ð•İ X,·,é,±  
,Æ,à,Ä,«,é B

¬Œ÷,·,ê,îDS\_OK AŽ,”s,·,ê,îDSERR\_INVALIDPARAM fGf%o [fR [fh,ð•Ô,· B

*lpvPosition*

D3DVECTOR \Œ‘ì,Ö,îf|fCf“f^ BfŠfXfi [,lŒ» Ý,îÊ'u,ðŽ',· B

ŽQ Æ @IDirectSound3DListener::SetPosition

## IDirectSound3DListener::GetRolloffFactor

HRESULT GetRolloffFactor(LPD3DVALUE lpflRolloffFactor);

» Ý, ìf [f<fIft—v‘f, ðŽæ“¾, ·, é B

¬æ÷, ·, ê, ÎDS\_OK AŽ, ”s, ·, ê, ÎDSERR\_INVALIDPARAM fGf%o [fR [fh, ð•Ô, · B

lpflRolloffFactor

D3DVALUEf^fCfv, ì•ĭ ”, Ö, ìf|fCf“f^ B» Ý, ìf [f<fIft—v‘f, ì'l, ðŽ', μ, Ä, ¢, é B

ffftHf<fg'l, ÎDS3D\_DEFAULTROLLOFFFACTOR(1.0), Ä, , é Bf [f<fIft—v‘f, É, Â, ¢, Ä, Ĩ Ú ×, Ĩ Af [f<fIft—  
v‘f, ðŽQ Æ, ·, é, ±, Æ B

ŽQ Æ @IDirectSound3DListener::SetRolloffFactor

## IDirectSound3DListener::GetVelocity

HRESULT GetVelocity(LPD3DVECTOR lpvVelocity);

fŠfXfi [,lŒ» Ý,l'¬“x,ðŽæ“¾,·,é B

¬Œ÷,·,ê,ÎDS\_OK AŽ,”s,·,ê,ÎDSERR\_INVALIDPARAM fGf%o [fR [fh,ð•Ô,· B

lpvVelocity

D3DVECTOR \‘Œ‘l,Ö,l|fCf“f^ B,±,l \‘Œ‘l,ÍfTfEf“fh Efofbftf@,lŒ» Ý,l'¬“x,ðŽ|,μ,Ä,Œ,é B

‘¬“x,Ífhfbfvf%o [—v‘f,Ä,l,ÝŽg—

p,<sup>3</sup>,ê,é BŽÀ Ū,ÉfŠfXfi [,lˆÊ’u,lˆÚ“@,Í,È,Œ BfŠfXfi [,lˆÊ’u,ð•l X,·,é,É,ÍIDirectSound3DListener::SetPosition  
f f\fbfh,ðŽg—p,·,é BfftHf<fg,l'¬“x,Í (0,0,0),Ä, ,é B

ŽQ Æ @IDirectSound3DListener::SetVelocity

## IDirectSound3DListener::SetAllParameters

```
HRESULT SetAllParameters(  
    LPDS3DLISTENER lpListener, DWORD dwApply);
```

**DS3DLISTENER** \‘Ćİ,ÉŽw’è,³,ê,½,·,×,Ä,İ3DfŠfXfi [ Efpf%of [f^,ð Ý’è,·,é B,±,İ \‘Ćİ,Í, ,é uŠÔ,İfŠfXfi [,İ  
ó‘Ô,ð,·,×,ÄŽ!,μ,Ä,¢,é B

¬Ç÷,·,ê,İDS\_OK ÄŽ,”s,·,ê,İDSERR\_INVALIDPARAMfGf%o [fR [fh,ð•Ô,· B

lpListener

**DS3DBUFFER** \‘Ćİ,Ö,İf|fCf“f^ BÇ» Ý,İ3DfŠfXfi [ Efpf%of [f^ îñ,ð,·,×,ÄŽ!,μ,Ä,¢,é B

dwApply

Ý’è,ª s,í,ê,éf^fCf~f“fO,ðŽ!,·l B`È%o,İ’l,ÄŽ!,³,ê,é B

DS3D\_DEFERRED fAfvfŠfP [fVf‡f“,ªIDirectSound3DListener::CommitD  
eferredSettingsf f\fbfh,ðÇÄ,Ñ o,·,Ü,Ä Ý’è,Í s,í,ê,È  
,¢ B•i ”,İ Ý’è,ð•İ X,μ,½,è A’P“Æ,İ ÄÇvŽZ,İŽÄ s  
,ª%oÄ”\,Ä, ,é B

DS3D\_IMMEDIATE Ý’è,Í‘ŽŽ,É s,í,ê AfVfXfef€  
,Í,·,×,Ä,İ3DfTfEf“fh Efofbftf@,Éİ,·,é3D Ä•w,İ Ä  
ÇvŽZ,ð s,ª B

ŽQ Æ @IDirectSound3DListener::GetAllParameters

```
HRESULT SetDistanceFactor(
    D3DVALUE flDistanceFactor, DWORD dwApply);
```

$$flDistanceFactor$$
[illegible]

ŽQ æ @IDirectSound3DListener::GetDistanceFactor

## IDirectSound3DListener::SetDopplerFactor

```
HRESULT SetDopplerFactor(  
    D3DVALUE flDopplerFactor, DWORD dwApply);
```

«» Ý, ðfhfbfvf%o [—v‘f, ð—v‘f, ð Ý’è, ·, é B

¬«÷, ·, ê, ÎDS\_OK AŽ, ”s, ·, ê, ÎDSERR\_INVALIDPARAM fGf%o [fR [fh, ð•Ô, · B

*flDopplerFactor*

V, µ, ¢fhfbfvf%o [—v‘f, ð’l B

*dwApply*

Ý’è, <sup>a</sup> s, í, ê, éf^fCf~f“fO, ðŽ, ‘, ‘l B^È%o, ð’l, ÅŽ, <sup>3</sup>, ê, é B

DS3D\_DEFERRED      fAfvfŠfP [fVf‡f“, **IDirectSound3DListener::CommitD  
eferredSettings**f f\fbfh, ðCEÄ, Ñ o, ·, Ü, Ä Ý’è, ð’l s, í, ê, È  
, ¢ B•<sub>i</sub> ”, ð Ý’è, ð•Ï X, µ, ½, è A’P“Æ, ð ÄEvŽZ, ðŽÄ s  
, ·, é, ±, Æ, <sup>a</sup>%oÄ”\, Ä, , é B

DS3D\_IMMEDIATE      Ý’è, ð’l ŽŽ, É s, í, ê AfVfXfef€  
, ð, ·, ×, Ä, ð3DfTfEf“fh Efofbftf@, ÉÏ, ·, é3D Ä•W, ð Ä  
CEvŽZ, ð s, <sup>□</sup> B

fhfbfvf%o [—v‘f, ð”ÏÏ, ð0(fhfbfvf%o [—v‘f, È, µ), ©, ¸10.0(ŽÄ Û, ð ¢ŠE, ð10”{, ðfhfbfvf%o [—v‘f), Ä, , é B  
ffftfHf<fg’l, ÎDS3D\_DEFAULTDOPPLERFACTOR(1.0), Ä, , é Bfhfbfvf%o [—v‘f, É, Ä, ¢, Ä, ð Ú ×, ð Afhfbfvf%o [—  
v‘f, ðŽQ Ä, ·, é, ±, Æ B

ŽQ Ä @IDirectSound3DListener::GetDopplerFactor

## IDirectSound3DListener::SetOrientation

```
HRESULT SetOrientation(D3DVALUE xFront,  
    D3DVALUE yFront, D3DVALUE zFront,  
    D3DVALUE xTop, D3DVALUE yTop,  
    D3DVALUE zTop, DWORD dwApply);
```

fŠfXfi [,lŒ» Ý,l•ûŒü,ð‘O•ûfxfNfgf<,Æ ã•ûfxfNfgf<,l,Ó,½,Â,l̂fxfNfgf<,ĂŽæ“¾,•,é B  
-Œ÷,•,ê,ÎDS\_OK ĂŽ,”s,•,ê,ÎDSERR\_INVALIDPARAMfGf%o [fh,ð•Ô,• B

xFront, yFront, ,•,æ,Ŧ zFront

D3DVALUEf^fCfv,l'l B‘O•ûfxfNfgf<,l À•W,ðŽ',μ,Ă,¢,é B

xTop, yTop, ,•,æ,Ŧ zTop

D3DVALUEf^fCfv,l'l B ã•ûfxfNfgf<,l À•W,ðŽ',μ,Ă,¢,é B

dwApply

Ý'è,ª s,í,ê,é f^fCf~f“fO,ðŽ',•'l B^È%º,l'l,ĂŽ',¾,ê,é B

DS3D\_DEFERRED fAfvfŠfP [fVf‡f“,ªIDirectSound3DListener::CommitD  
eferredSettings

f f\fbfh,ðŒĂ,Ŧ o,•,Ü,Ă Ý'è,Í s,í,ê,È,¢ B•i ”,l Ý  
'è,ð•l̂ X,μ,½,è A'P“Æ,l̂ ĂŒvŽZ,ðŽĂ s,•,é,±  
,Æ,“%oĂ”\,Ă, ,é B

DS3D\_IMMEDIATE Ý'è,Í'ŽŽ,É s,í,ê AfVfXfef€  
,Í,•,×,Ă,l̂3DfTfEf“fh Efofbftf@,É'Í,•,é3D À•W,l̂ Ă  
ŒvŽZ,ð s,▯ B

‘O•ûfxfNfgf<,ÍfŠfXfi [,l•@,É^Ê'u,μ A ã•ûfxfNfgf<,ÍfŠfXfi [,l̂“ã ã,É^Ê'u,•,é BfftfHf<fg,Ă,Í‘O•ûfxfNfgf<,Í(0,0,  
1.0) A ã•ûfxfNfgf<,Í(0,1.0,0),Æ,È,Ă,Ă,¢,é B

ŽQ Æ @IDirectSound3DListener::GetOrientation

## IDirectSound3DListener::SetPosition

HRESULT SetPosition(D3DVALUE x, D3DVALUE y,  
D3DVALUE z, DWORD dwApply);

$f\check{S}fXfi$  [,l€» Ý,İÊ'u,đ«—£'P^Ê,Ä Ý'è,·,é BfftfHf<fg,l«—  
£'P^Ê,Íf [fgf<,¾,a A**IDirectSound3DListener::SetDistanceFactor** f\fbfh,đŽg—p,μ,Ä'P^Ê,l·İ X,à s,,é B  
¬€÷,·,ê,İDS\_OK AŽ,"s,·,ê,İ**DSERR\_INVALIDPARAM**fGf%o [fR [fh,đ•Ô,· B

x, y, ·, æ, Ñ z  
**D3DVALUE**f^fCfv,İ'l BfŠfXfi [,İ V<K,İÊ'ufxfNfgf<,İ À•W,đŽ',μ,Ä,¢,é B

dwApply  
Ý'è,a s,í,ê,éf^fCf~f“fO,đŽ',·'l B^È%o,İ'l,ÄŽ',¾,é,é B

DS3D\_DEFERRED  $fAfvf\check{S}fP$  [fVf‡f“,a**IDirectSound3DListener::CommitD  
eferredSettings**f f\fbfh,đ€Ä,Ñ o,·,Ü,Ä Ý'è,Í s,í,ê,È  
,¢ B•i ”,İ Ý'è,đ•İ X,μ,½,è A'P“Æ,İ Ä€vŽŽ,đŽÄ s  
,μ,½,è,Ä,«,é B

DS3D\_IMMEDIATE Ý'è,Í'Žž,É s,í,ê AfVfXfef€  
,Í,·,×,Ä,İ3DfTfEf“fh Efofbftf@,É'İ,·,é3D À•W,đ Ä  
€vŽŽ,·,é B

ŽQ Æ @**IDirectSound3DListener::GetPosition**



## IDirectSound3DListener::SetRolloffFactor

```
HRESULT SetRolloffFactor(  
    D3DVALUE flRolloffFactor, DWORD dwApply);
```

*f* [f<fIf t—v'f,đ Y'è,·,é B  
¬Æ÷,·,ê,ÎDS\_OK AŽ,„s,·,ê,ÎDSERR\_INVALIDPARAMfGf%o [fR [fh,đ•Ô,· B

*flRolloffFactor*  
V<K,İf [f<fIf t—v'f B

*dwApply*  
Y'è,ª s,í,ê,éf^fCf~f“fO,đŽ,İ,·l B^È%°,İ'l,ÄŽ,İ,³,ê,é B

DS3D\_DEFERRED *fAfvfŠfP* [fVf±f“,ªIDirectSound3DListener::CommitD  
eferredSettingsf f\fbfh,đÆÄ,Ň o,·,Ü,Ä Y'è,İ s,í,ê,È  
,¢ B•j „,İ Y'è,đ•İ X,µ,½,è A'P“Æ,İ ÄÆvŽZ,İŽÄ s  
,ª%oÄ”\,Ä, ,é B

DS3D\_IMMEDIATE Y'è,İ,İŽŽ,É s,í,ê AfVfXfef€  
,İ,·,×,Ä,İ3DfTfEf“fh Efofbftf@,Éİ,·,é3D Ä•W,İ Ä  
ÆvŽZ,đ s,ª B

*ffftfHf<fg'l,ÎDS3D\_DEFAULTROLLOFFFACTOR* (1.0),Ä, ,é Bf [f<fIf t—v'f,É,Ä,¢,Ä,İ Ú ×,İ Af [f<fIf t—  
v'f,đŽQ ÄE,·,é,±,Æ B

ŽQ ÄE @IDirectSound3DListener::GetRolloffFactor

## IDirectSound3DListener::SetVelocity

HRESULT SetVelocity(D3DVALUE x,  
D3DVALUE y, D3DVALUE z, DWORD dwApply);

*fŠfXfi* [,l'¬“x,đ Ý'è,·,é B

¬Œ÷,·,ê,ÎDS\_OK AŽ,”s,·,ê,ÎDSERR\_INVALIDPARAM fGf%o [fR [fh,đ•Ô,· B

x, y, ·,·,æ,Ñ z

D3DVALUEf^fCfv,l'l BfŠfXfi [,l V<K,l'¬“x,l À•W,đŽ',μ,Ä,¢,é B

*dwApply*

Ý'è,<sup>a</sup> s,í,ê,éf^fCf~f“fO,đŽ',·'l B^È%o°,l'l,ÄŽ',<sup>3</sup>,ê,é B

DS3D\_DEFERRED *fAfvfŠfP* [fVf‡f“,“IDirectSound3DListener::CommitDeferredSettings  
*f f\fbfh,đŒÄ,Ñ o,·,Ü,Ä Ý'è,Í s,í,ê,È,¢ B•j ”,l Ý*  
*'è,đ•İ X,μ,½,è A'P“Æ,İ ÄŒvŽZ,İŽÄ s,“%oÄ”\,Ä, ,é*  
B

DS3D\_IMMEDIATE Ý'è,Í'Žž,É s,í,ê AfVfXfef€  
,Í,·,×,Ä,İ3DfTfEf“fh Efobf tf@,É.Í,·,é3D Ä•W,İ Ä  
ŒvŽZ,đ s,□ B

‘¬“x,Ífhfbfvf%o [—v'f,Ä,l,ÝŽg—p,<sup>3</sup>,ê,é BŽÄ Ū,ÉfŠfXfi [,đ˘Ú“@,·,é,±  
,Æ,Í,È,¢ BfŠfXfi [,l'Ê'u,đ•İ X,·,·,é,É,İIDirectSound3DListener::SetPositionf f\fbfh,đŽg—p,·,é BffftfHf<fg,l'¬“x,Í  
(0,0,0),Ä, ,é B

ŽQ Æ @IDirectSound3DListener::GetVelocity

## IDirectSoundBuffer

DirectSoundBufferIfufWfFfNfg,ð ì ¬,µ,ÄŠÂ«« Ý'è,ð s,ϱ,É,Í A

IDirectSoundBufferfCf“f^ [ftfFfCfX,Ìf f\fbfh,ðŽg—p,·,é Bf f\fbfh,ÍÈ%°,ÌfOf< [fv,Ä \ ¬,³,ê,Ä,¢,é B

î•ñ

GetCaps

GetFormat

GetStatus

SetFormat

f f,fššÇ—

Initialize

Restore

Ä ¶šÇ—

GetCurrentPosition

Lock

Play

SetCurrentPosition

Stop

Unlock

fTfEf“fhšÇ—

GetFrequency

GetPan

GetVolume

SetFrequency

SetPan

SetVolume

,·,×,Ä,ÌCOMfCf“f^ [ftfFfCfX,Æ“—l AIDirectSound3DBuffer fCf“f^ [ftfFfCfX,Í  
IUunknownfCf“f^ [ftfFfCfXf f\fbfh,ðŒp ³,µ,Ä,¢,é B,±,ÌfCf“f^ [ftfFfCfX,ÍÈ%°,Ì,R,Â,Ìf f\fbfh,ðfTf|  
[fg,µ,Ä,¢,é B

AddRef

QueryInterface

Release

## IDirectSoundBuffer::GetCaps

HRESULT GetCaps(LPDSBCAPS lpDSBufferCaps);

DirectSoundBufferIfufWfFfNfg,ì”—Í,ðŽæ“¾,·,é B

¬Æ÷,·,ê,ÎDS\_OK AŽ,”s,·,ê,ÎDSERR\_INVALIDPARAMfGf%o [fR [fh,ð•Ô,· B

lpDSBufferCaps

DSBCAPS \‘¢‘İ,Ö,İf|fCf“f^ BfTfEf“fh Efofbftf@,İ «”\,ðŽ!,µ,Ä,¢,é B

DSBCAPS \‘¢‘İ,É,ÍIDirectSound::CreateSoundBufferf f\fbfh,Ö“n,<sup>3</sup>,ê,éDSBUFFERDESC \‘¢‘İ,Æ“™,İ î•ñ,É%Á,İ, Ä X,È,é‘Ç%Á î•ñ,<sup>a</sup>,¢,,Ä,©ŠÜ,Ü,ê,Ä,¢,é B,±,İ‘Ç%Á î•ñ,Æ,Í Afn [fhfEfFfA Af\ftfgfEfFfA— ¼•û,İfofbftf@,İ ê Š,Æ AfRfXfg,Ä, ,é BfRfXfg,É,Í Afn [fhfEfFfA Efofbftf@,Ö,İfEf“f [fh,É,©,éŽžŠ Ô,â AfVfXfef€f f,fŠ ã,É, ,éfofbftf@,İf~fLfVf“fO,â Ä ¶Žž,İ ^— ,İfI [fo [fwfbfh,È,Ç,Æ,¢,Ä,½,à,İ,<sup>a</sup>, ,é B

DSBCAPS \‘¢‘İ,İdwFlagsf f“fo“à,ÄŽw’è,<sup>3</sup>,ê,½ftf%oO,ÍDSBUFFERDESC \‘¢‘İ,ÄŽg—p,<sup>3</sup>,ê,éftf%oO,Æ“¬,¶,à,İ,Ä, ,é B,µ,©,µ A DSBCAPS \‘¢‘İ,ÄŽg—p,·,éftf%oO,İ•û,ÎDSBCAPS\_LOCHARDWARE,à,µ,,Í DSBCAPS\_LOC SOFTWARE,İ,Ç,¿,Ç,©,<sup>a</sup>fofbftf@—pf f,fŠ,İ ê Š,É,æ,Ä,ÄŽw’è,<sup>3</sup>,ê,é“¬,—B^ê,Ìá,¢,Ä, ,é BDSBUFFERDESC \‘¢‘İ,Ä,Í,±,ê,Ç,İftf%oO,Í‘İ’ð%Á”\,Ä, ,è AŽw’è,<sup>3</sup>,ê,Ä,¢ ,éftf%oO,É,æ,Ä,Äfofbftf@,İ”z’u,ðfn [fhfEfFfA,Æf\ftfgfEfFfA,İ,Ç,¿,Ç,©,É,·,é±,Æ,<sup>a</sup>,Ä,«é B

ŽQ Æ @DSBCAPS, DSBUFFERDESC, IDirectSoundBuffer, IDirectSound::CreateSoundBuffer

## IDirectSoundBuffer::GetCurrentPosition

```
HRESULT GetCurrentPosition(LPDWORD lpdwCurrentPlayCursor,  
    LPDWORD lpdwCurrentWriteCursor);
```

fTfEf“fh Efofbftf@“à,ìĚ» Ý,ì Ā ¶fJ [f\f<,,æ,Ñ ‘,«,±,ÝfJ [f\f<,lŔÊ’u,ðŽæ“¾,,é B  
-Ė÷,,ê,îDS\_OK AŽ,”s,,ê,îŽŸ,ìGf% [fR [fh,ð•Ô,· B

### DSERR\_INVALIDPARAM

### DSERR\_PRIOLEVELNEEDED

lpdwCurrentPlayCursor

DirectSoundBufferIfufWfFfNfg“à,ìfJfĚf“fg EfvfĚfC Ef|fWfVf±f“,ðŽ|,·İ ”,Ö,ìf|fCf“f^ B,±  
,lŔÊ’u,ÍfTfEf“fh Efofbftf@“à,ìfIftfZfbfg,Ā,,è AfofCfg,ĀŽw’è,³,ê,é B

lpdwCurrentWriteCursor

DirectSoundBufferIfufWfFfNfg“à,ìfJfĚf“fg Ef%ofCfg Ef|fWfVf±f“,ðŽ|,·İ ”,Ö,ìf|fCf“f^ B,±  
,lŔÊ’u,ÍfTfEf“fh Efofbftf@“à,ìfIftfZfbfg,Ā,,è AfofCfg,ĀŽw’è,³,ê,é B

‘,,«,±,ÝfJ [f\f<,Í Afofbftf@,Ö,ìff [f^ ‘,«,±,Ý,^À‘S,É,Ā,«,éÊ’u,ð•Ž|,·,é B ‘,«,±  
,ÝfJ [f\f<,Í A Ā ¶fJ [f\f<,æ,è’Ê í15f~fŠ•b‘Š“-,ìfI [ffBfI Eff [f^•³,¾,¯ æ,É,,é B

lpdwCurrentPlayCursorpf%of [f^,ĀŽ|,³,ê,½^Ê’u,æ,è,àĖă,ë,ìff [f^,ð•İ X,·,é,ì,Í,Ā,Ė,É^À‘S,Ā,,é B

ŽQ Æ @IDirectSoundBuffer, IDirectSoundBuffer::SetCurrentPosition

## IDirectSoundBuffer::GetFormat

```
HRESULT GetFormat(LPWAVEFORMATEX lpwfxFormat,  
    DWORD dwSizeAllocated, LPDWORD lpdwSizeWritten);
```

fofbftf@“à,İfTfEf“fh Eff [f^,İĈŽ®,É,Â,ĉ,Ä,İ î•ñ,ðŽæ“¾,·,é B,à,μ,,ÍĈŽ®,É,Â,ĉ,Ä,İ î•ñ,İŽæ“¾,É•K—  
v,Èfofbftf@ EfTfCfY,ðŽæ“¾,·,é B

—Ĉ÷,·,ê,İDS\_OK AŽ,”s,·,ê,İDSERR\_INVALIDPARAMfGf‰ [fR [fh,ð•Ô,· B

lpwfxFormat

fofbftf@“à,İfTfEf“fh Eff [f^,É,Â,ĉ,Ä,İ î•ñ,ðŠÛ,þWAVEFORMATEX \‘ĉ‘İ,Ö,İf|fCf“f^ BĈŽ®,İ î•ñ,É•K—  
v,Èfofbftf@ EfTfCfY,ðŽæ“¾,·,é ê þ,İNULL,ðŽw’è,·,é B

dwSizeAllocated

WAVEFORMATEX \‘ĉ‘İ,İfofCfɡ’PˆÊ,İfTfCfY BDirectSound,İf|fCf“f^,Ö ‘,«,±,þ,İ,İ,¹,ĉ  
,°,ĉdwSizeAllocated,İfofCfɡ ”,İ,Y,Ä, ,é B,à,μWAVEFORMATEX \‘ĉ‘İ,ª,à,Á,Æ‘½,,İf f,fŠ,ð—  
vĉ ,μ,½ ê þ,İ í,ç,ê,Ä,μ,Û,□ B

lpdwSizeWritten

WAVEFORMATEX \‘ĉ‘İ,Ö ‘,«,±,Û,ê,½fofCfɡ ”,ðŽ!,·İ ”,Ö,İf|fCf“f^ B,±,İfpf‰f [f^,İNULL,Ä,à,æ,ĉ B

WAVEFORMATEX \‘ĉ‘İ,İ‰Ä•İ’·,Ä, ,é BfAfvfŠfP [fVfþf“,ÍĈŽ®,İ î•ñ,ðŽæ“¾,·,é‘O,É A,±,İf f\fbfh,ðŽg—  
p,μ,ÄDirectSoundBuffer,Ö A,»,İĈŽ®,İfTfCfY,ð Æ‰ı,·,é•K—v,ª, ,é B \‘ĉ‘İ,İfTfCfY,  
İlpdwSizeWrittenfpf‰f [f^,Ö•Ô,³,ê,é B,»,İĈăfAfvfŠfP [fVfþf“,Í \ª,Èf f,fŠ,ðŠ,,è—  
,Ä,Ä Ä“xIDirectSoundBuffer::GetFormat,ðĈÄ,Ñ o,·,±,Æ,Ä AĈŽ®,É,Â,ĉ,Ä,İ î•ñ,İŽæ“¾,ª,Ä,«,é B

ŽQ Æ @IDirectSoundBuffer, IDirectSoundBuffer::SetFormat

## IDirectSoundBuffer::GetFrequency

HRESULT GetFrequency(LPDWORD lpdwFrequency);

fofbftf@,ª Ä ¶,³,ê,Ä,¢,é ê Š,ì1•bŠÔ,ìŽü”g ”,ðŽæ“¾,·,é B  
¬Œ÷,·,ê,ÎDS\_OK AŽ,”s,·,ê,ÎŽŸ,ìfGf%∞ [fR [fh,ð•Ô,· B

DSERR\_CONTROLUNAVAIL

DSERR\_INVALIDPARAM

DSERR\_PRIOLEVELNEEDED

lpdwFrequency

fI [ffBfI Efofbftf@,ª Ä ¶,³,ê,Ä,¢,é ê Š,ìŽü”g ”,ðŽ,·•Ĭ ”,Ö,ìf|fCf“f^ B

Žü”g ”,ì¹,Í100,©,ç 100,000,ì”ÍÍ,Æ,È,Á,Ä,¢,é B

ŽQ Æ @IDirectSoundBuffer, IDirectSoundBuffer::SetFrequency

## IDirectSoundBuffer::GetPan

HRESULT GetPan(LPLONG lplPan);

¶,Æ%œ,İfI [ffBfI Ef`fff“flf<,İ‘Š‘İf{fŠf... [f€‚ðŽ‘,•İ ”‚ðŽæ“¾,•,é B

¬Ɛ÷,•,ê‚İDS\_OK AŽ„s,•,ê‚İŽŸ‚İfGf%o [fR [fh‚ð•Ö,• B

DSERR\_CONTROLUNAVAIL

DSERR\_INVALIDPARAM

DSERR\_PRIOLEVELNEEDED

lplPan

%œ,Æ ¶‚İ‘Š‘İf~fbfNfX‚ðŽ‘,•İ ”‚Ö‚İf|fCf“f^ B

•Ô‘l‚İ-10,000‚©‚ç10,000‚İ”İ‘İ‚Ä10,000‚ð100dB‘Š“¬‚Æ‚µ‚Ä‘a’è‚³‚ê‚é B-10,000‚İ‘l‚İ%œ‚İf`fff“flf<‚ª100dBŽã‚‚È‚Ä‚Ä‚¢‚é‚±‚Æ‚ðˆÓ–i‚‚,•,é B10,000‚İ‘l‚İ ¶‚İf`fff“flf<‚ª100dBŽã‚‚È‚Ä‚Ä‚¢‚é‚±‚Æ‚ðˆÓ–i‚‚,•,é BffftfHf<fg‚İ‘l‚İ0‚Ä‚‚é B  
lplPanfpf%of [f^‚Ä‚İ0‚İ—¼•û‚İf`fff“flf<‚ªftf<f{fŠf... [f€‚Ä‚‚é‚±‚Æ‚ðˆÓ–i‚‚,•,é(‚Ç‚ç‚ç‚à0dBŽã‚‚È‚Ä‚Ä‚¢‚é) B0ˆÈŠÖ‚İ Ÿ’è‚İ‚Ç‚ê‚à A•Ð•û‚ªftf<f{fŠf... [f€‚Ä A‚à‚¤•Ð•û‚ªŽã‚‚È‚Ä‚Ä‚¢‚é B

-2173‚İfpf“‚İ A ¶f`fff“flf<‚ªftf<f{fŠf... [f€‚Ä A%œEf`fff“flf<‚ª21.73 dBŽã‚‚È‚Ä‚Ä‚¢‚é‚±‚Æ‚ðˆÓ–i‚‚,•,é B“—  
l‚É870‚İfpf“‚İ A ¶f`fff“flf<‚ª8.7 dBŽã‚‚È‚Ä‚Ä‚“,è A%œEf`fff“flf<‚ªftf<f{fŠf... [f€‚Ä‚‚é‚±‚Æ‚ðˆÓ–  
i‚‚,•,é B-10,000‚İfpf“‚İ A%œEf`fff“flf<‚ª–³%œ¹‚Ä AfTfEf“fh‚ª u ¶‘¤‚İ‚Ÿ v‚Ä‚‚é‚±‚Æ‚ðˆÓ–  
i‚‚,•,é Bˆê•û A10,000‚İfpf“‚İ A ¶f`fff“flf<‚ª–³%œ¹‚Ä AfTfEf“fh‚ª u%œE‘¤‚İ‚Ÿ v‚Ä‚‚é‚±‚Æ‚ðˆÓ–i‚‚,•,é B

fpf“ §Ɛä‚İf{fŠf... [f€ EfRf“fgf [f<‚É—Ÿ İ‚µ‚Ä“® İ‚,•,é B

ŽQ Æ @IDirectSoundBuffer, IDirectSoundBuffer::GetVolume, IDirectSoundBuffer::SetPan,

IDirectSoundBuffer::SetVolume



## IDirectSoundBuffer::GetStatus

HRESULT GetStatus(LPDWORD lpdwStatus);

fTfEf“fh Efofbftf@,lŒ» Ý,l ó‘Ô,ðŽæ“¾,·,é B

¬Œ÷,·,ê,ÎDS\_OK AŽ,”s,·,ê,Î**DSERR\_INVALIDPARAM**fGf%o [fR [fh,ð•Ô,· B

lpdwStatus

fTfEf“fh Efofbftf@,l ó‘Ô,ðŽl,•l ”,Ö,l|fCf“f^ B ó‘Ô,ÍŽŸ,l'l,Å Ý'è,³,ê,é B

DSBSTATUS\_BUFFERLOST

fofbftf@,ÍŽ,,í,ê,Ä,“,è A Ä ¶,“,æ,Nf fbfN,ð s,¤‘O,ÉfŠfXfgfA,µ,ª•  
K—v,Å, ,é B

DSBSTATUS\_LOOPING

fofbftf@,Íf< [fv,µ,Ä,¢,é B'l,ª–  
¢ Ý'è,l,Æ,«,Í Afofbftf@,lfTfEf“fhff [f^,l ÅŒã,Å Ä ¶,Í'âŽ~,·,é  
B,±,l'l,l Ý'èŽŽ,É,Í Afofbftf@,l Ä ¶,à s,í,ê,Ä,¢,é,±,Æ,É' ^Ó,·,é B

DSBSTATUS\_PLAYING

fofbftf@,Í Ä ¶'†,Ä, ,é B,±,l'l,ª Ý'è,³,ê,Ä,¢,È,¢  
,Æfofbftf@,Í'âŽ~,µ,Ä,¢,é B

ŽQ Æ @IDirectSoundBuffer

## IDirectSoundBuffer::GetVolume

HRESULT GetVolume(LPLONG lplVolume);

fTfEf“fh Efofbftf@,ìĚ» Ý,ìf{fŠf... [f€,đŽæ“¾,·,é B  
-Ě÷,·,ê,îDS\_OK AŽ,”s,·,ê,îŽŸ,ìfGf% [fR [fh,đ•Ô,· B

DSERR\_CONTROLUNAVAIL

DSERR\_INVALIDPARAM

DSERR\_PRIOLEVELNEEDED

lplVolume

Žw’è,<sup>3</sup>,ê,½DirectSoundfofbftf@,ìf{fŠf... [f€,đŽ!,·İ ”,Ö,ìf|fCf“f^ B

f{fŠf... [f€,í100dB,ì”ÍÍ,đ0,©,ç-10,000,ì”ÍÍ,Å AŽw’è,<sup>3</sup>,ê,é B0,Í Å % ,ì AfXfgfŠ [f€,l-ċ·İ X,ìf{fŠf... [f€,đ•\ ,· B-10,000,ÍfI [ffBfIf{fŠf... [f€,ª 100 dBŽã,,È,Á,Ä,ċ,é,±,Æ,đ•\,· B‘ • ,ÍĚ» Ý,ìDirectSound,Á,ÍfTf|  
[fg,<sup>3</sup>,ê,Ä,ċ,È,ċ B

ffVfxfċ,ìŽÚ“x,í’®—Í,É‘Î,μ,Ä‘Î ”,Ä‘Î%ž,μ,Ä,ċ  
,é B,½,Æ,,Î A10dBĚ, Š,·,é,Æ,Ífofbftf@,ìfTfEf“fh,Í”¼ª,É,È,è A20dBĚ, Š,·,é,Æ4ª,ì1,É,È,é B

ŽQ Æ @IDirectSoundBuffer, IDirectSoundBuffer::SetVolume

## IDirectSoundBuffer::Initialize

```
HRESULT Initialize(LPDIRECTSOUND lpDirectSound,  
    LPDSBUFFERDESC lpDSBufferDesc);
```

‰Šú‰»<sup>3</sup>,ê,Ä,¢,È,¢DirectSoundBufferIfufWfFfNfg,ð ‰Šú‰»<sup>3</sup>,·,é B

**DSERR\_ALREADYINITIALIZED**fGf‰ [fR [fh,ð•Ö,· B

*lpDirectSound*

DirectSoundBufferIfufWfFfNfg,ÆÆ< ‡,µ,½DirectSoundIfufWfFfNfg,Ö,ìf|fCf“f^ B

*lpDSBufferDesc*

fTfEf“fh Efofbftf@,ì ‰Šú‰»<sup>3</sup>,ÉŽg—p,·,é'l,ðŽ',µ,Ä,¢,é**DSBUFFERDESC** \‘¢‘ì,Ö,ìf|fCf“f^ B

**IDirectSound::CreateSoundBuffer**f f\fbfh,í“à•”,Å**IDirectSoundBuffer::Initialize**,ðÆÄ,Ñ o,·,ì,Ä AÆ» Ý,ìfŠfŠ [fX  
,ìDirectSound,Ä,í•K—v,È,¢ B,±,ê,í «—^,ìŠg’£ «,ì,½,ß,É—p^Ó<sup>3</sup>,ê,½,à,ì,Ä, ,é B

ŽQ Æ @**DSBUFFERDESC**, **IDirectSound::CreateSoundBuffer**, *IDirectSoundBuffer*

## IDirectSoundBuffer::Lock

```
HRESULT Lock(DWORD dwWriteCursor, DWORD dwWriteBytes,
    LPVOID lplpvAudioPtr1, LPDWORD lpdwAudioBytes1,
    LPVOID lplpvAudioPtr2, LPDWORD lpdwAudioBytes2,
    DWORD dwFlags);
```

fh Efofbftf@,lfi [ffBfI Efi [f^,É'Î,μ,Ä—LÆø,È '«,±,ÝfAfNfZfX,ðŽæ“¾,·,é B  
-Æ÷,·,ê,ÎDS\_OK AŽ,”s,·,ê,ÎŽŸ,lfGf%o [fR [fh,ð•Ö,· B

### DSERR\_BUFFERLOST

### DSERR\_INVALIDCALL

### DSERR\_INVALIDPARAM

### DSERR\_PRIOLEVELNEEDED

dwWriteCursor

fobftf@,lšJŽn^Ê'u,©,çf fbfN,ðšJŽn,·,éÊ'u,Ü,Ä,Ì AfofCf g'P^Ê,lfIfZfbfg B  
dwFlagsfpf%o [f^,ÄDSBLOCK\_FROMWRITECURSORftf%o fO,^Žw'è,³,ê,Ä,ç,é ê ±,Í A,±,lfpf%o [f^,Í-  
³Ž<,³,ê,é B

dwWriteBytes

f fbfN,·,éfobftf@—Îæ,Ì AfofCf g'P^Ê,lfTfCfY BfTfEf“fh Efofbftf@,lŠT”O“l,É,Í%o~,É,È,Ä,Ä,ç  
,é ifŠf“fOfobftf@ j,±,Æ,É' ^Ö,·,é,±,Æ B

lplpvAudioPtr1

f fbfN,³,ê,éfobftf@,l Ä %o,lfuf fbfN,Ö,lf|fCf“f^ B

lpdwAudioBytes1

lplpvAudioPtr1fpf%o [f^,ÄŽl,³,ê,½fofCf g ”,ðŽl,·,İ ”,Ö,lf|fCf“f^ B,±  
,l¹,^dwWriteBytesfpf%o [f^,æ,è ¬,³,ç ê ± A lplpvAudioPtr2,^fTfEf“fhff [f^,lŽŸ,lfuf fbfN,ðŽl,· B

lplpvAudioPtr2

f fbfN,³,ê,éTfEf“fh Efofbftf@,l2”Ô—Ú,Ì—Îæ,Ö,lf|fCf“f^ B,±,lfpf%o [f^,l¹,^NULL,Ì ê ± A  
lplpvAudioPtr1fpf%o [f^,lfTfEf“fh Efofbftf@,lf fbfN,³,ê,½—Îæ'S'Î,ðŽl,· B

lpdwAudioBytes2

lplpvAudioPtr2 fpf%o [f^,Äf|fCf“fg,³,ê,½fofCf g ”,ðŽl,·,İ ”,lAfhfÆfX B lplpvAudioPtr2,^NULL,Ì ê ± A,±  
,l¹,l0,Æ,È,é B

dwFlags

f fbfN,lfCxf“fg,ð C ³,·,éftf%o fO B^È%o,l¹,ÄŽl,³,ê,é B

DSBLOCK\_FROMWRITECURSOR

«» Ý,Ì '«,±,ÝfJ [f\ç,©,çf fbfN,ð s,ç A,±  
,ê,É,æ,èIDirectSoundBuffer::GetCurrentPosition,lÆÄ,Ñ o,μ,^s•K—  
v,É,È,é B,±,lfTf%o fO,^Žw'è,³,ê,é,ÆdwWriteCursorfpf%o [f^,Í-  
³Ž<,³,ê,é B,±,lfTf%o fO,Í”C^Ö,ÉŽw'è,Ä,«,é B

,±,lf f\fbfh,lfIfZfbfg,Æ—ÎæfJfEf“fg,ðŽó,~Žæ,è A,Ó,½,Ä,Ì '«,±,Ýf|fCf“f^,Æ,±

,ê,ð ±,i,¹,½TfCfY,ð•Ö,· B,Ó,½,Ä,lf|fCf“f^,ð•K—

v,Æ,·,é,Ì,lfTfEf“fh Efofbftf@,^ŠÄ ó ifŠf“fO Efofbftf@ j,½,½,B,Ä, ,é Bf fbfN,³,ê,½fofbftf@,^ I—

¹Ê'u,Ä zŠÄ,μ,È,ç ê ± A,Ó,½,Ä,B,lf|fCf“f^,Ä, ,

élplpvAudioBytes2,ÎNULL,É,È,é B,½,¾,μ zŠÄ,·,é ê ±,Í A,Ó,½,Ä,B,lf|fCf“f^,Ífofbftf@,lšJŽn^Ê'u,ðŽl,· B

lplpvAudioPtr2,~,æ,Ñ

lpdwAudioBytes2fpf%o [f^,É'Î,μ,ÄNULL,ð“n,·,Æ ADirectSound,lfobftf@,lf%obfvfAf%o fEf“fh—  
Îæ,ðf fbfN,μ,È,ç B

fAfvfŠfP [fVf±f“,ÍIDirectSoundBuffer::Lockf f\fbfh,É,æ,è•Ö,³,ê,½f|fCf“f^,Öff [f^,ð '«,±  
,Ý ADirectSound,Öfofbftf@,ð•Ö,·,½,ß,ÉIDirectSoundBuffer::Unlockf f\fbfh,ðÆÄ,Ñ o,•K—v,^ ,é BfTfEf“fh E  
fofbftf@,Ö,lf fbfN,Í·ŽžŠÖ,·,×,«,Ä,Í,È,ç B·ŽžŠÖf fbfN,³,ê,é,Æ A Ä ¶fJ [f\ç,^f fbfN,³,ê,½—  
Îæ,Ö“ž”B,μ,Ä,μ,Ü,ç Af%o f“f\_çfmfCfY,Æ,ç,Ä,½ A^@Ší \ ¬Ê“¶,lfi [ffBfI—â“è,” ¶,·,é B

## Warning

,±,lf f\fbfh,Í '«,±,Ýf|fCf“f^,l,Ý,ð•Ö,· B,±,lf|

fCf“f^,©,çfTfEf“fhff [f^,İ“Ç,Ý ž,Ý,Í s,í,È,¢ B,½,Æ,|DirectSoundBufferfIfufWfFfNfg,ª—  
LŒø,ÈfTfEf“fh Eff [f^,ðŠŮ,ñ,À,¢,À,à A,»,İff [f^,İ³Œø,À, ,é B,½,Æ,,İ Afofbftf@,ªfIf“f{ [fh Ef f,fŠ,É”z  
'u,³,ê,À,¢,½ ê ‡ Af|fCf“f^,Íf fCf“ EfVfXfef€f f,fŠ“à,İfef“f|  
f%ofŠ Efofbftf@,İfAfhfŒfX,Æ,È,é B**IDirectSoundBuffer::Unlock**,ªŒÄ,Ñ o,³,ê,é,Æ A,±,İfef“f|  
f%ofŠ Efofbftf@,İfIf“f{ [fh Ef f,fŠ,É“]‘—,³,ê,é B

---

ŽQ Æ @IDirectSoundBuffer, **IDirectSoundBuffer::GetCurrentPosition**, **IDirectSoundBuffer::Unlock**

## IDirectSoundBuffer::Play

```
HRESULT Play(DWORD dwReserved1, DWORD dwReserved2,  
             DWORD dwFlags);
```

fTfEf“fh Efofbftf@,ðŒ» Ý,îÊ'u,©,ç Ä ¶,<sup>3,1</sup>é B

¬Œ÷,·,ê,îDS\_OK AŽ,”s,·,ê,îŽŸ,îfGf%o [fR [fh,ð•Ô,· B

### DSERR\_BUFFERLOST

### DSERR\_INVALIDCALL

### DSERR\_INVALIDPARAM

### DSERR\_PRIOLEVELNEEDED

dwReserved1

,±,îfpf%of [f^,í—¬ñ Ĩ,Ý,Ä, ,é B,±,ì'l,íO,Ä,È,¬,ê,î,È,ç,È,Œ B

dwReserved2

,±,îfpf%of [f^,í—¬ñ Ĩ,Ý,Ä, ,é B,±,ì'l,íO,Ä,È,¬,ê,î,È,ç,È,Œ B

dwFlags

fofbftf@,ì Ä ¶•û—@,ðŽw'è,·,é B`È%°,ì'l,ÄŽ',<sup>3</sup>,ê,é B

### DSBPLAY\_LOOPING

fI [ffBfI Efofbftf@,ì I—

¹Ê'u,Ü,Ä“ž'B,·,é,Æ Afofbftf@,îŠJŽn^Ê'u,©,ç Ä,Ñ Ä ¶,ð s,Œ

A'âŽ~,ð—¾Ž',·,é,Ü,ÄŒJ,è•Ô,· B,±,îftf%ofo,Í[vf%ofoCf}

fŠ EfTfEf“fh Efofbftf@,ì Ä ¶'†,É Ý'è,·,é•K—v,<sup>a</sup>, ,é B

,±,îf f\fbfh,É,æ,è AfZfJf“f fŠ EfTfEf“fh Efofbftf@,Í[vf%ofoCf}

fŠ Efofbftf@“à,Äf~fLfVf“fO,<sup>3</sup>,ê,Ä,©,çfTfEf“fh EfffofCfX,Ö—,ç,ê,é B,±,ê,<sup>a</sup> Ä %o,É Ä ¶,<sup>3</sup>,ê,éfofbftf@,Ä, ,  
é ê ± A“à”,Äfvf%ofoCf}

fŠ Efofbftf@,ð ì ¬,µ A,»,îfofbftf@,ì Ä ¶,ðŠJŽn,·,é BfAfvfŠfP [fVf‡f“,Í[vf%ofoCf}

fŠ Efofbftf@,ð¼ Ü Ä ¶,·,é•K—v,Í,È,Œ B

,à,µf f\fbfh,ÄŽw'è,<sup>3</sup>,ê,½fofbftf@,<sup>a</sup>,·,Ä,É Ä ¶'†,¾,Ä,½ ê ± Af f\fbfh,îŒÄ,Ñ o,µ,Í ¬Œ÷,µ Afofbftf@,Í Ä  
¶,ð±,¬,é B,½,¾,µ^%o¹ E Ä ¶«@”,<sup>a</sup>è<,<sup>3</sup>,ê,½ftf%ofo,Íê"Ö Ä•B,É'è<,<sup>3</sup>,ê,½ftf%ofo,ÉŽæ,Ä,Ä'ã,í,ç,ê,é B

fvf%ofoCf}fŠ Efofbftf@,îDSBPLAY\_LOOPINGftf%ofoO,Ö,ì Ý'è,É,æ,è Ä ¶,µ,È,¬,ê,î,È,ç,È,Œ B

fvf%ofoCf}fŠ EfTfEf“fh Efofbftf@,Í,±

,îf f\fbfh,É,æ,Ä,ÄfTfEf“fhftfofCfX,ì Ä ¶,ðŠJŽn,·,é BfAfvfŠfP [fVf‡f“,<sup>a</sup> ‘,« ž,Ý—

D æ<'²fŒfxf<,É Ý'è,<sup>3</sup>,ê,Ä,Œ,é ê ± Afvf%ofoCf}

fŠ Efofbftf@“à,îfI [ffBfI Eff [f^,ðfTfEf“fh EfffofCfX,Ö,Æ—

,é B,µ,©,µ AfAfvfŠfP [fVf‡f“,<sup>a</sup>¼,ì<'²fŒfxf<,É Ý'è,<sup>3</sup>,ê,Ä,Œ,é ê ±,Í A,±

,îf f\fbfh,É,æ,éfZfJf“f\_fŠ Efofbftf@,ì Ä ¶,<sup>a</sup>,D,Æ,Ä,à s,í,ê,Ä,Œ,È,,Ä,àfvf%ofoCf}

fŠ Efofbftf@,<sup>a</sup> Ä ¶,<sup>3</sup>,ê,é B,±,ì ê ±,Í—¾o¹,Æ,É,é B,±,ì ê ± AfTfEf“fh,<sup>a</sup> ‡ŽŸ,É Ä ¶ E'âŽ~,·,é,Æ,«,ì ^—

fI [fo [fwfbfh,ð Ä ¬ŒÄ,É,·,é,±,Æ,<sup>a</sup>,Ä,«<sup>a</sup>,é B,±,ê,Í A'âŽ~ A Ä ¶,ðfZfJf“f\_fŠ Efofbftf@ŠÖ,Ä s,µ

,æ,è,à A,æ,è“A±“l,Éfofbftf@,<sup>a</sup> Ä ¶,<sup>3</sup>,ê,é,½,ß,Ä, ,é B

---

## Note

,Ç,îTfEf“fh Efofbftf@,É,¬,Œ,à AfAfvfŠfP [fVf‡f“,Í,±

,îf f\fbfh,<sup>a</sup>ŒÄ,Ñ o,<sup>3</sup>,ê,é•O,É**IDirectSound::SetCooperativeLevel**f f\fbfh,ðŒÄ,Ñ o,µ A<'²fŒfxf<,ðŽw'è,·,é•K—  
v,<sup>a</sup>, ,é B'Ê í,îSSCL\_NORMAL,ðŽw'è,·,é B,à,µ**IDirectSound::SetCooperativeLevel**f f\fbfh,<sup>a</sup>ŒÄ,Ñ o,<sup>3</sup>,ê,Ä,Œ,È,Œ,Œ  
,Æ A **IDirectSoundBuffer::Play** f\fbfh,î**DSERR\_PRIOLEVELNEEDED**fGf%o [¹,ð•Ô,· B

---

ŽQ Æ @**IDirectSoundBuffer**, **IDirectSound::SetCooperativeLevel**

## IDirectSoundBuffer::Restore

HRESULT Restore();

“Á”è,ÌDirectSoundBufferIfufWfFfNfg,Ì AŽ,í,ê,½TfEf“fh Efofbtf@,É‘Î,·,éf f,fŠ,ÌŠ,,è“–,Ä,ðfŠXfgfA,·,é B  
–Æ÷,·,ê,ÎDS\_OK AŽ,”s,·,ê,ÎŽŸ,ÌfGf%o [fR [fh,ð•Ô,· B

### DSERR\_BUFFERLOST

### DSERR\_INVALIDCALL

### DSERR\_INVALIDPARAM

### DSERR\_PRIOLEVELNEEDED

fAfvfŠfP [fVf‡f“,““ü—ÍftfH [fJfX,ðŽ ,Á,Ä,¢,È,¢,ÆDirectSoundBuffer::Restore,Í –Æ÷,µ,È,¢ B,½,Æ,,Î A“ü—  
ÍftfH [fJfX,ðŽ ,ÂfAfvfŠfP [fVf‡f“,“DSSCL\_WRITEPRIMARY<’²fœfxf<,É Ý’è,³,ê,Ä,¢  
,é ê ‡ A‘¼,Ì,·,×,Ä,ÌfAfvfŠfP [fVf‡f“,Ífofbtf@,ÌfŠfXfgfA,ª,Ä,«,È,¢ ó‘Ô,É,È,é B“—  
l,ÉDSSCL\_WRITEPRIMARY ‘,« ž,Ý—D æ<’²fœfxf<,ÌfAfvfŠfP [fVf‡f“,“fvf%oCf}  
fŠ EfTfEf“fh Efofbtf@,ðfŠXfgfA,·,é,½,ß,É,Í A“ü—ÍftfH [fJfX,ðŽ ,Á,Ä,¢,é•K—v,ª, ,é B

DirectSound,ªfofbtf@ Ef f,fŠ,ðfŠXfgfA,µ,½ ê ‡ A—LÆø,ÈfTfEf“fh Eft [f^,Ì Ä ‘,«±,Ý,ª•K—v,Ä, ,é BD  
irectSound,Íf f,fŠ,Ì“à—e,ðfŠXfgfA,·,é,±,Æ,Í,Ä,«, Af f,fŠ,ÌfŠXfgfA,Ì,Ý,ð s,□ B

**IDirectSoundBuffer::Lock**,à,µ,,Í **IDirectSoundBuffer::Play**f f\fbfh,ÌÆÄ,Ñ o,µŽž,Éfofbtf@,ðŽw’è,µ,Ä,“, -  
,Æ A,»,Ìfofbtf@,ªŽ,,í,ê,½,Æ,¢,□’m,ç,¹,ðŽó,–,é,±,Æ,ª,Ä,«,é B,±  
,ê,ç,Ìf f\fbfh,Í Afofbtf@,ªŽ,,í,ê,½ ê ‡,ÎDSERR\_BUFFERLOST,ð•Ô,· B**IDirectSoundBuffer::GetStatus**f f\fbfh,  
à,Ů,½ AfTfEf“fh Efofbtf@,Ì ó‘Ô,Ìžæ“¼,ÆDSBSTATUS\_BUFFERLOSTftf%oO,ÌfefXfg,ÉŽg—p,³,ê,é B

ŽQ Æ @IDirectSoundBuffer, **IDirectSoundBuffer::Lock**, **IDirectSoundBuffer::Play**, **IDirectSoundBuffer::GetStatus**

## IDirectSoundBuffer::SetCurrentPosition

HRESULT SetCurrentPosition(DWORD dwNewPosition);

«» Ý, Ì Ä ¶fJ [f\ƒ<, ðfZfJf“f fŠ EfTfEf“fh Efofbftf@, ÌŽw’è, ÌÊ’u, ÖÚ“@, ·, é B  
–Æ÷, ·, ê, ÎDS\_OK AŽ, ”s, ·, ê, ÎŽŸ, ÌfGf% [fR [fh, ð•Ô, · B

DSERR\_INVALIDCALL

DSERR\_INVALIDPARAM

DSERR\_PRIOLEVELNEEDED

dwNewPosition

fTfEf“fh Efofbftf@, Ì Ä ¶, ÉŽg—p,<sup>3</sup>, ê, é ofCf g’PÊ, ÌlftfZfbfg’l B

, ±, Ìf f\fbfh, Ífvf% ofCf}fŠ EfTfEf“fh Efofbftf@ ã, Å, ÍÆÄ, Ñ o,<sup>1</sup>, È, ¢ B

f ofbftf@, <sup>a</sup> Ä ¶’†, Ì ê ‡, Í A‘| Ä, É V<K, ÌÊ’u, ÖÚ“@, µ, ÄÆp’±,<sup>3</sup>, ê, é B’âŽ~’†, Ì ê ‡, Í A  
**IDirectSoundBuffer::Play** f f\fbfh, <sup>a</sup>ÆÄ, Ñ o, µ,<sup>3</sup>, ê, <sup>1</sup>/<sub>2</sub>, , Æ, Å A V<K, ÌÊ’u, ©, çŠŽn, ·, é B

ŽQ Æ @IDirectSoundBuffer, **IDirectSoundBuffer::GetCurrentPosition**, **IDirectSoundBuffer::Play**



## IDirectSoundBuffer::SetFormat

HRESULT SetFormat(LPWAVEFORMATEX lpfxFormat);

*fvf%ofCf}fŠ E fTfEf“fh Efofbftf@,lfAfvfŠfP [fVf‡f“,Ä,ÏE`Ž®,ð Ý’è,·,é B,±,lfAfvfŠfP [fVf‡f“,“ü—  
ÍftfH [fJfX,ðŽ ,Ä,½,Ñ,ÉDirectSound,Ífvf%ofCf}fŠ Efofbftf@,ð“Á’è,ÏE`Ž®,É Ý’è,·,é B*

*—CE÷,·,ê,ÎDS\_OK AŽ,”s,·,ê,ÎŽŸ,lfGf%o [fR [fh,ð•Ô,· B*

**DSERR\_BADFORMAT**

**DSERR\_INVALIDCALL**

**DSERR\_INVALIDPARAM**

**DSERR\_OUTOFMEMORY**

**DSERR\_PRIOLEVELNEEDED**

**DSERR\_UNSUPPORTED**

*lpfxFormat*

**WAVEFORMATEX** \‘c’İ,Ö,lf|Cf“f^ Bfvf%ofCf}fŠ E fTfEf“fh Efofbftf@,Ï V,µ,CE`Ž®,ð•\,· B

*‘,« ž,Ý—D æç’²f(Exfç,ÄfAfNfZfX,³,ê,Ä,ç,éfvf%ofCf}fŠ Efofbftf@ ä,Ä,±  
,lf f\fbfh,ðCEÄ,Ñ o,· ê ‡ Afobftf@,ð**IDirectSoundBuffer::SetFormat**,“CEÄ,Ñ o,³,ê,é‘O,É’âŽ~,µ,Ä,“,©,È,¯,ê,Î,È,  
ç,È,ç B,±,lf f\fbfh,“ ‘,« ž,Ý—D æ`ÈŠO,İç’²f(Exfç ä,ÄCEÄ,Ñ o,³,ê,½ ê ‡,Í ADirectSound,Í“à•”,Äfvf%ofCf}  
fŠ Efofbftf@,ð’âŽ~,µ ACE`Ž®,ð•İ X,µ Afvf%ofCf}fŠ,ðfŠfXf^ [fg,·,é BfAfvfŠfP [fVf‡f“,³,±,ê,ç,İ ìÆ,ð—  
¾Ž’,·,é•K—v,İ,È,ç B*

*—vç ,³,ê,½PCMCE`Ž®,ðfn [fhfEfFfA,“¼ ÚfTf| [fg,µ,Ä,ç,È,ç ê ‡ A,±  
,lf f\fbfh,ÏCEÄ,Ñ o,µ,İŽ,”s,·,é BfAfvfŠfP [fVf‡f“,“DSSCL\_NORMALç’²f(Exfç,ðŽ ,Ä,Ä,ç,é ê ‡,àŽ,”s,·,é B*

*fZfJf“f fŠ E fTfEf“fh Efofbftf@,ÏE`Ž®,ð•İ X,·,é•K—  
v,“ ¶,¶,½ ê ‡ A V<KDirectSoundBufferfIfufWfFfNfg,ð V,µ,CE`Ž®,Ä ì ¬,·,é•K—v,“ ,é B*

*DirectSound,ÍPCMCE`Ž®,ðfTf| [fg,µ,Ä,ç,é BCE» Ý,Í³ kCE`Ž®,ÍfTf| [fg,µ,Ä,ç,È,ç B*

*ŽQ Æ @IDirectSoundBuffer, **IDirectSoundBuffer::GetFormat***

## IDirectSoundBuffer::SetFrequency

HRESULT SetFrequency(DWORD dwFrequency);

ftf“fvfŠf“fO EfI [ffBfI,ª Ä ¶,³,ê,Ä,¢,éÊ’u,ìŽü”g ”,ð Ý’è,·,é B  
¬¢÷,·,ê,ÎDS\_OK AŽ,”s,·,ê,ÎŽŸ,ÌfGf%o [fR [fh,ð•Ô,· B

**DSERR\_CONTROLUNAVAIL**

**DSERR\_GENERIC**

**DSERR\_INVALIDPARAM**

**DSERR\_PRIOLEVELNEEDED**

dwFrequency

ftf“fvfŠf“fO EfI [ffBfI,ª Ä ¶,³,ê,Ä,¢,éÊ’u,ìŽü”g ” B’PÊ,Ífwf<fc(Hz) B’l,Ì”ÍÍ,Í100,©,ç  
100,000,Ü,Ä,Æ,È,é B  
’l,ª0,ì ê ‡ AŽü”g ”,Í¢» Ý,Ìfobftf@¢`Ž®,ÉfŠfZfbfg,³,ê,é B,±  
,ì¢`Ž®,Í**IDirectSound::CreateSoundBuffer**f f\fbfh,ÄŽw’è,³,ê,Ä,¢,é B

Žü”g ”,ì’ • E¢, Š,É,æ,è AfI [ffBfI Eff [f^,Ì<Ÿ<<fsfbf`,ªİ,í,é B,±  
,Ìf f\fbfh,Ífobftf@,ì¢`Ž®,É,Í%oe<ç,µ,È,¢ B

ŽQ Æ @IDirectSoundBuffer, **IDirectSound::CreateSoundBuffer**, **IDirectSoundBuffer::GetFrequency**,  
**IDirectSoundBuffer::Play**, **IDirectSoundBuffer::SetFormat**

## IDirectSoundBuffer::SetPan

HRESULT SetPan(LONG lPan);

¶%oE,lf`fff“flf<,l’S‘İf{fŠf... [f€,đ Ý’è,·,é B  
-Œ÷,·,ê,İDS\_OK AŽ,”s,·,ê,İŽŸ,İfGf%o [fR [fh,đ•Ô,· B

DSERR\_CONTROLUNAVAIL

DSERR\_GENERIC

DSERR\_INVALIDPARAM

DSERR\_PRIOLEVELNEEDED

lPan

¶%oE,lf`fff“flf<,l’S‘İf{fŠf... [f€,đŽæ“¾,·,é B,±,ì'l,ì”ÍÍ,Í-10,000,©,ç 10,000,Å, ,è A100dB,ì”ÍÍ,ÅŽw’è,·,é B

lPan,İŽ©‘R,Èf{fŠf... [f€,Í0,Å, ,é B,±,ê,Í—¼•û,lf`fff“flf<,<sup>a</sup>ftf<f{fŠf... [f€,Å, ,é,±,Æ,đŽ!,·(0dBŽã,,È,Å,Ä,¢,é) B,±  
,êˆÈŠO,İ Ý’è,Í,Ç,ê,à A•Đ•û,<sup>a</sup>ftf<f{fŠf... [f€,Å A,à,▯•Đ•û,<sup>a</sup>Žã,,È,Å,Ä,¢  
,é B,½,Æ,!,İ A-2173,İfpf“,Í A ¶f`fff“flf<,<sup>a</sup>ftf<f{fŠf... [f€,Å A%oEf`fff“flf<,<sup>a</sup>21.73 dBŽã,,È,Å,Ä,¢,é,±,Æ,đˆÓ–  
j,·,é B“—l,É870,İfpf“,Í A ¶f`fff“flf<,<sup>a</sup>8.7 dBŽã,,È,Å,Ä,“,è A%oEf`fff“flf<,<sup>a</sup>ftf<f{fŠf... [f€,Å, ,é,±,Æ,đˆÓ–  
j,·,é B

-10,000,İfpf“,Í A%oEf`fff“flf<,<sup>a-3%o¹</sup>,Å AfTfEf“fh,<sup>a</sup> u ¶‘▯,İ,Ý v,Å, ,é,±,Æ,đˆÓ–  
j,·,é Bˆê•û A10,000,İfpf“,Í A ¶f`fff“flf<,<sup>a-3%o¹</sup>,Å AfTfEf“fh,<sup>a</sup> u%oE‘▯,İ,Ý v,Å, ,é,±,Æ,đˆÓ–  
j,·,é Bfpf“ §Œä,İf{fŠf... [f€ EfRf“fgf [f<,É—Ý İ,µ,Ä“® İ,·,é B

ŽQ Æ @IDirectSoundBuffer, IDirectSoundBuffer::GetPan, IDirectSoundBuffer::GetVolume,  
IDirectSoundBuffer::SetVolume

## IDirectSoundBuffer::SetVolume

HRESULT SetVolume(LONG lVolume);

ŦŦŦEŦ“fh EfofbŦŦf@,İf{fŠf... [f€„đ•İ X,•,é B

–Ŧ÷,•,ê,İDS\_OK AŽ„s,•,ê,İŽŸ,İfGf% [fR [fh,đ•Ŧ,• B

**DSERR\_CONTROLUNAVAIL**

**DSERR\_GENERIC**

**DSERR\_INVALIDPARAM**

**DSERR\_PRIOLEVELNEEDED**

lVolume

ŦŦŦEŦ“fh EfofbŦŦf@,É—v< „3,ê,é V<K,İf{fŠf... [f€ B'l,İ”İİ,İ0(0dB(dB) Bf{fŠf... [f€•İ X,È,μ)  
,©,ç-10,000 i-100Db BŽÀ Ũ,İ–3%<sup>1</sup> j,Ů,Ä,É,È,é BDirectSound,ÍŦ» Ý,İ' • ,đŦŦf| [fg,μ,Ä,Ŧ,È,Ŧ B

f{fŠf... [f€,İ'P^Ê,İ100dB,Ä, ,è A0,ªfXfgfŠ [f€,İfIfŠfWfiŦ<,İf{fŠf... [f€,Ä, ,é B

³,İ'l,İffŦŦŦf<,İ' • ,đ•\,μ A•%,İ'l,ÍŦ, Š,đ•\,μ,Ä,Ŧ,é BŦŦŦŦŦf<,İŽŮ“x,İ'®—Í,É‘İ,μ,Ä‘İ ”,Ä‘İ%ž,μ,Ä,Ŧ  
,é B10dBŦ, Š,•,é,Æ,İfofbŦŦf@,İŦŦŦEŦ“fh,İ”¼ª,É,È,è A20dBŦ, Š,•,é,Æ4ª,İ1,É,È,é BŦ» Ý,İDirectSound,İ' • ,  
đŦŦf| [fg,μ,Ä,Ŧ,È,Ŧ B

ŦŦŦ“ §Ŧä,İf{fŠf... [f€ EŦRŦ“Ŧgf [Ŧ<,É—Ÿ İ,μ,Ä“® İ,•,é B

ŽQ Æ @IDirectSoundBuffer, **IDirectSoundBuffer::GetPan**, **IDirectSoundBuffer::GetVolume**,  
**IDirectSoundBuffer::SetPan**

## IDirectSoundBuffer::Stop

HRESULT Stop();

fTfEf“fh Efofbftf@,İ Ä ¶,ð’âŽ~,·,é B

—Æ÷,·,ê,ÎDS\_OK AŽ,”s,·,ê,ÎŽŸ,İfGf%o [fR [fh,ð•Ô,· B

### DSERR\_INVALIDPARAM

### DSERR\_PRIOLEVELNEEDED

fZfJf“f fŠ E fTfEf“fh Efofbftf@,É’Î,μ,Ä A

**IDirectSoundBuffer::Stop**,ÍÆ» Ý,İfofbftf@,İÊ’u,ð A‘O%oñ,İfTf“fvf< Ä ¶,É’ø,«‘±, fTf“fvf<,Ö,Æ Ý’è,·,é B,±,ê,İ**IDirectSoundBuffer::Play**f f\fbfh,afobftf@,ÉÆÄ,Ñ o,³,ê,½ ê ±,É,»,İ Ä ¶,ð’âŽ~,μ,½,Æ,±,ë,©,ç’±,·,é,Æ,¢,□,±,Æ,Ä, ,é B

fAfvfŠfP [fVf±f“,ª fvf%oCf}fŠ E fTfEf“fh Efofbftf@,É’Î,μ,Ä A ‘,« ž,Ý—D æ fÆfxf<,ðŽ ,Ä,Ä,¢,é,È,ç A,±,İf f\fbfh,İfofbftf@,ð’âŽ~,μ,Ä AÆ» Ý,İf|fWfVf±f“,ð,O ifobftf@,İŽn,ß j,ÉfŠfZfbfg,·,é•K—v,ª, ,é B,±,ê,İfofbftf@,İ æ“ª,©,ç,μ,© Ä ¶,ª s,!,È,¢fTfEf“fh EfJ [fh,ªâ ¨,ð è,ß,Ä,¢,é,½,ß,Ä, ,é B

,μ,©,μ Afvf%oCf}fŠ Efofbftf@ ä,Ä **IDirectSoundBuffer::Stop**,ªÆÄ,Ñ o,³,ê AfAfvfŠfP [fVf±f“,ª ‘,« ž,Ý—D æ ÊŠO,İ’²²fÆfxf<,ðŽ ,Ä,Ä,¢,é,È,ç,İ A,±,İf f\fbfh,İ **IDirectSoundBuffer::Play**,İÆø%oÊ,ð—³Æø,É,·,é,¾,¯,Ä, ,é B fZfJf“f\_fŠ Efofbftf@,ª Ä ¶,³,ê,Ä,¢,È,¢ ê ±,É,İ Afvf%oCf}fŠ Efofbftf@,ð’âŽ~,·,é,æ,µ,É Ý’è,·,é B ‘¼,İfofbftf@,ª,±,±,Ä i,·,é,¢,İ’¼,İfAfvfŠfP [fVf±f“,Ä j Ä ¶,³,ê,Ä,¢,é,È,ç A,»,ê,ç,ªâŽ~,·,é,Ü,Äfvf%oCf}fŠ Efofbftf@,àŽÄ Ū,É,İ’âŽ~,μ,È,¢ B,½,Æ,İfofbftf@,ª,OdB,ÄfTfEf“fh Eff [f^,ð Ä ¶,μ,Ä,¢,é ê ±,Ä, ,Ä,Ä,à ^— ,İfI [fo [fwfbfh,İ Ä”i,³,ê,é,İ,Ä, ,é,©,ç A,±,İf f\fbfh,Äfvf%oCf}fŠ Efofbftf@,Ä Ä ¶,·,é,±,Æ,İ A—L—p,È,İ,Ä, ,é B

ŽQ Æ @IDirectSoundBuffer, **IDirectSoundBuffer::Play**

## IDirectSoundBuffer::Unlock

```
HRESULT Unlock(LPVOID lpvAudioPtr1, DWORD dwAudioBytes1,  
    LPVOID lpvAudioPtr2, DWORD dwAudioBytes2);
```

fTfEf“fh Efofbftf@,İf fbfN,ð%ð•ú,•,é B

–œ÷,•,ê,İDS\_OK AŽ,”s,•,ê,İŽŸ,İfGf% [fR [fh,ð•Ô,• B

## DSERR\_INVALIDCALL

## DSERR\_INVALIDPARAM

## DSERR\_PRIOLEVELNEEDED

lpvAudioPtr1

IDirectSoundBuffer::Lock f\fbfh,İ lplpvAudioPtr1 fpf%of [f^,ĂŽæ“¾,³,ê,é•İ ”,Ö,İf|fCf“f^ B

dwAudioBytes1

ŽÀ Û,ÉlpvAudioPtr1 fpf%of [f^,É ‘,«,±

,Û,ê,½fofCf g ” BIDirectSoundBuffer::Lock f\fbfh,É,æ,Á,Ă•Ô,³,ê,½fofCf g ”,ð%oz,!,é,×,«,Ă,Í,È,¢ B

lpvAudioPtr2

IDirectSoundBuffer::Lock f\fbfh,İ lplpvAudioPtr2 fpf%of [f^,ĂŽæ“¾,³,ê,é•İ ”,Ö,İf|fCf“f^ B

dwAudioBytes2

ŽÀ Û,ÉlpvAudioPtr2 fpf%of [f^,É ‘,«,±

,Û,ê,½fofCf g ” BIDirectSoundBuffer::Lock f\fbfh,É,æ,Á,Ă•Ô,³,ê,½fofCf g ”,ð%oz,!,é,×,«,Ă,Í,È,¢ B

fAfvfŠfP [fVf‡f“,Í IDirectSoundBuffer::Lock f\fbfh,Ă•Ô,³,ê,½—¼•û,İf|fCf“f^ lpvAudioPtr1 ,Æ  
lpvAudioPtr2,ð A ³,µ,‘İ,É,µ,Ă A IDirectSoundBuffer::Unlock,É“n,³,È,–,ê,İ,È,ç,È,¢ B ,Q”Ô–Û,İf|  
fCf“f^,Í A,½,Æ,|,Of ofCf g,ª,Q”Ô–Û,İf|fCf“f^,É ‘,«,±,Û,ê,½,Æ,µ,Ă,à•K—v,Ă, ,é B

fAfvfŠfP [fVf‡f“,ÍŽÀ Û,É ‘,«,±,Û,ê,½fofCf g,İ ”,ð AdwAudioBytes1 ,Æ dwAudioBytes2  
f pf%of [f^,İ,Ó,½,Ă,İf|fCf“f^,É“n,³,È,,Ă,Í,È,ç,È,¢ B

fTfEf“fh Efofbftf@,ð’•ŠúŠÔf fbfN,µ,½,Û,Û,É,µ,È,¢,±,Æ B

ŽQ Æ @IDirectSoundBuffer, IDirectSoundBuffer::GetCurrentPosition, IDirectSoundBuffer::Lock

٧٤١

## DS3DBUFFER

```
typedef struct {
    DWORD      dwSize;
    D3DVECTOR   vPosition;
    D3DVECTOR   vVelocity;
    DWORD      dwInsideConeAngle;
    DWORD      dwOutsideConeAngle;
    D3DVECTOR   vConeOrientation;
    LONG        lConeOutsideVolume;
    D3DVALUE     flMinDistance;
    D3DVALUE     flMaxDistance;
    DWORD      dwMode;
} DS3DBUFFER;
```

,R,cfTfEf“fh Efofbftf@,l ê Š A•ûEü,“,æ,Ñ“® i,l ACEÂ•ÊL q,É•K—v,È,·,×,Ä,l î•ñ,ðŠÜ,ñ,Â,¢,é B,±,l \‘¢‘l,Í  
IDirectSound3DBuffer::GetAllParameters,“,æ,Ñ IDirectSound3DBuffer::SetAllParametersf f\fbfh,Æ,Æ,à,ÉŽg—  
p,³,ê,é B

### dwSize

,±,l \‘¢‘l,lfofCfƒg’PˆÊ,lIfTfCfY B

### vPosition

,R,cfTfEf“fh Efofbftf@,lE» Ý,lˆÊ’u,ðL q,·,é D3DVECTOR \‘¢‘l B

### vVelocity

,R,cfTfEf“fh Efofbftf@,lE» Ý,lˆ—“x,ðL q,·,é D3DVECTOR \‘¢‘l B

### dwInsideConeAngle

“à‘ƒTfEf“fh Efvf fWfFfNfVf‡f“ EfR [f“,lŠp“x B

### dwOutsideConeAngle

ŠO‘ƒTfEf“fh Efvf fWfFfNfVf‡f“ EfR [f“,lŠp“x B

### vConeOrientation

,±,l,R,cfofbftf@fTfEf“fh Efvf fWfFfNfVf‡f“ EfR [f“,lE» Ý,l•ûEü,ðL q,·,é D3DVECTOR \‘¢‘l B

### lConeOutsideVolume

ŠO“”f{fŠf... [f€,lfr [f“ B

### flMinDistance

Ä ¬«——£ B

### flMaxDistance

Ä‘â«——£ B

### dwMode

,R,cfTfEf“fh ^— f, [fh BŽŸ,l’l,ÄŽ’,³,ê,é B

DS3DMODE\_DISABLE

3DfTfEf“fh ^— ,l—

³Eø,É,È,é BfTfEf“fh,ÍfŠfXfi [l,“a,l’† S,©,Ç•,±,!,é,æ,²,ÉŠ’,¶,é B

DS3DMODE\_HEADRELATIVE

fTfEf“fhfpf%of [f^(ˆÊ’u A‘¬“x A•ûEü)

,ÍfŠfXfi [,lfpf%of [f^,Æ‘Š‘îŠÖEW,É, ,é B,±

,lf, [fh,Ä,Í AfTfEf“fh,l âˆlfpf%of [f^,ÍfŠfXfi [ Efpf%of [

f^,³•l X,³,ê,½,Æ,«,ÉŽ©“®“l,É X V,³,ê,é,l,Ä A‘Š‘îfpf%of [f^,Í•l

,í,ç,È,¢,Ü,Ü,Ä, ,é B

DS3DMODE\_NORMAL

•W €,l ^— B,±,ê,³fftfHf<fgf, [fh,É,È,Ä,Ä,¢,é B



## DS3DLISTENER

```
typedef struct {
    DWORD      dwSize;
    D3DVECTOR   vPosition;
    D3DVECTOR   vVelocity;
    D3DVECTOR   vOrientFront;
    D3DVECTOR   vOrientTop;
    D3DVALUE     flDistanceFactor;
    D3DVALUE     flRolloffFactor;
    D3DVALUE     flDopplerFactor;
} DS3DLISTENER;
```

,R,cf [f<fhfpf%of [f^,“,æ,ÑfŠfXfi [,lÊ’u,ð AÆÂ X,É<L q,·,é,½,ß,É•K—v,È,·,×,Ä,l î•ñ,ðŠÜ,ñ,Å,¢,é B,±  
,l \‘‘l,Í IDirectSound3DListener::GetAllParameters ,“,æ,Ñ IDirectSound3DListener::SetAllParameters  
f f\fbfh,Æ,Æ,à,ÉŽg—p,³,ê,é B

### dwSize

,±,Ì \‘‘l,lfofCfg’P’Ê,lTfCfY B

### vPosition, vVelocity, vOrientFront, ,“,æ,Ñ vOrientTop

fŠfXfi [,lÊ’u A‘¬“x A‘O•ûÆü,“,æ,Ñ â•ûÆü,»,ê,¼,ê,ð<L q,·,é D3DVECTOR \‘‘l B

### flDistanceFactor,flRolloffFactor, ,“,æ,ÑflDopplerFactor

,»,ê,¼,êÆ» Ý,l<—£ Af [f<flft,“,æ,Ñfhfbfvf%o [—v’f B

## DSBCAPS

```
typedef struct _DSBCAPS {
    DWORD dwSize;
    DWORD dwFlags;
    DWORD dwBufferBytes;
    DWORD dwUnlockTransferRate;
    DWORD dwPlayCpuOverhead;
} DSBCAPS, *LPDSBCAPS;
```

**IDirectSoundBuffer::GetCaps** f f\bfh,É,æ,èŽg—p,³,é,éDirectSound fofbftf@ EfIfufWfFfNfg,ì”—Í,ðŽw’è,·,é B

dwSize

,±,Ì \‘İ,İfofCf’PˆÊ,İfTfCY B

dwFlags

fofbftf@ EfIfufWfFfNfg”—Í,ðŽw’è,·,étf%o B

DSBCAPS\_CTRL3D

fofbftf@,Í,R,c §Œä,ðŽg—p,·,évf%oCf}fŠ Efofbftf@,Ä, ,é B

DSBCAPS\_CTRLFREQUENCY

fofbftf@,İŽü”g ” §Œä”—Í,ðŽ ,½,È,,Ä,İ,È,ç,È,¢ B

DSBCAPS\_CTRLPAN

fofbftf@,İf’p” §Œä”—Í,ðŽ ,½,È,,Ä,İ,È,ç,È,¢ B

DSBCAPS\_CTRLVOLUME

fofbftf@,İf{fŠf... [f€ §Œä”—Í,ðŽ ,½,È,,Ä,İ,È,ç,È,¢ B

DSBCAPS\_GETCURRENTPOSITION2

**IDirectSoundBuffer::GetCurrentPosition**

,ª Ä ¶fJ [f\‘,İ V,µ,¢“® ì,ðŽg—p,·,é,×,«Ä, ,é,±,Æ,ðŽ,· B DirectX  
,P,İDirectSound,Ä,İ A ‘,«,±  
,ÝfJ [f\‘,İ¼Œä,É, ,Ä,½ Ä ¶fJ [f\‘,İfTfEf“fh EfJ [fh,ªfGf~f...  
fŒ [fg,µ,½%¹,İ AŽÄ Ū,İ%¹,æ,è,à Ū—§,Ä,Ä i,ñ,Ä,¢  
,½ BŒ» Ý,Ä,İ  
DSBCAPS\_GETCURRENTPOSITION2ftf%o,ªŽw’è,³,é,è,İ AfAfvfŠfP  
[fVf‡f“,É,æ,é,æ,è ³Sm,È Ä ¶Œ’u,İŽæ“¾,ª%Ä”,É,È,Ä,½ B,±  
,İftf%o,ªŽw’è,³,é,È,¢ óŒ,Ä, ,è,İ%ß,Ž,İ“® ì,ªŒÝŠ· «,İ,½,ß,ÉˆŪŽ ,  
³,è,Ä,¢,é B,±,İftf%o,ª%œ‘ç,ð—  
^,!,é,İ,İfTfEf“fh EfJ [fh EfGf~f...fŒ [fg,Œ,İ,Ý,Ä, ,é,±  
,Æ,É’ ŒŒ,·,é,±,Æ B,à,µ DirectSound  
fhf%oCfo,ª,è,İ ADirectX,İ, ,ç,ä,éfo [fWf‡f“,İDirectSound,Ä,İ Ä ¶  
fJ [f\‘,İ ³Sm,È,È,é B

DSBCAPS\_GLOBALFOCUS

fofbftf@,İfOf [fof‘,ÈfTfEf“fh Efofbftf@,Ä, ,é B,±  
,İftf%o,ðfZfbfg,·,é,±  
,Æ,È,æ,è A,à,µf† [fU,ª¼,İfAfvfŠfP [fVf‡f“,ÉftfH [fJfX,ð Ø,è‘  
Œ,½,è A V,µ,¢AfAfvfŠfP [fVf‡f“,ªDirectSound,ðŽg,ª è ‡ A  
DirectSound,ðŽg,Ä,Ä,¢,éAfAfvfŠfP [fVf‡f“,İ,»,İfofbftf@,ð Ä ¶,µ‘±  
,—,é,±,Æ,ª,Ä,«é B,µ,©,µ AftfH [fJfX,ð DSSCL\_EXCLUSIVE , ,é,¢,İ  
DSSCL\_WRITEPRIMARYftf%o,İ,‘²fŒfxf‘,ðŽg,ªDirectSound  
fAfAfvfŠfP [fVf‡f“,É Ø,è‘Œ,½ è ‡,İ—ášŒ,Ä, ,é B,±  
,İ è ‡ A¼,İfAfvfŠfP [fVf‡f“,©,ç,İfOf [fof‘,È%¹,İ·,±,½,È,-  
,È,é B

DSBCAPS\_LOCHARDWARE

DSBCAPS\_STATIC ,ªŽw’è,³,é,È,,Ä,à Afofbftf@,İ‘  
§“İ,Éfn [fhfEfFA Ef~LfVf“fO,ðŽg—p,·,é B  
,à,µfffoCfX,ªfn [fhfEfFA Ef~LfVf“fO,ðfTf] [fg,µ,Ä,¢,È,¢  
,© A, ,é,¢,İ•K—v,Æ,³,è,éfn [fhfEfFA Ef f,Š,ª—p•s%Ä”\  
,È è ‡,İ A **IDirectSound::CreateSoundBuffer** ,İŒÄ,Œ o,µ,İŽ,“s,·,é B  
fAfAfvfŠfP [fVf‡f“,İf~LfVf“fO Ef`ffflf‘,ª,±,İfofbftf@,İ,½,ß,É—  
—p%Ä”,Ä, ,é,±,Æ,ðˆŪ Ø,·,é•K—v,ª, ,é B

## DSBCAPS\_LOCSOFTWARE

DSBCAPS\_STATIC ,<sup>a</sup>Žw'è,<sup>3</sup>ēfn [fhfEfFfA EfŠf\ [fX,<sup>a</sup>—p%Ŧ"\  
,Ā, ,Ā,Ā,à Afobftf@,Ī,-  
§"Ī,Ēf\ftfgEfFfA Ef f,fŠ,ÉŠi"[<sup>3</sup>,ē Af\ftfgEfFfA Ef~fLfVf"f  
O,ðŽg—p,·,é B

## DSBCAPS\_PRIMARYBUFFER

fobftf@,<sup>a</sup>fvf%ofCf}\fŠ EfTfEf"fh Efofbftf@,Ā, ,é,±,Ā,ð·\,· B  
,à,μ,±,Ī'Ī,<sup>a</sup>Žw'è,<sup>3</sup>ē,Ē,¢  
,Ē,ç AfZfJf"f fŠ EfTfEf"fh Efofbftf@,<sup>a</sup> ĩ,ç,ē,é B

## DSBCAPS\_STATIC

fobftf@,<sup>a</sup>fXf^fefBfbfN EfTfEf"fh Eff [f^,Ī,½,ß,ÉŽg,Ī,ē,é,±,Ā,ð·\  
,· B"ē"Ē,Ē,±  
,ē,ç,Īfobftf@,Ī,P"x f [fh,<sup>3</sup>,ē,Ā A,»,μ,Ā%½"x,à Ā ¶,<sup>3</sup>,ē,é B,±  
,ē,ç,Īfobftf@,Īfn [fhfEfFfA Ef f,fŠ,ð—v< ,·,é B

## DSBCAPS\_STICKYFOCUS

fTfEf"fh Efofbftf@,ĪftfH [fJfX,Ī"® ĩ,ð·Ī,Ī,é B,±  
,Īftf%ofO,ĪDirectSound::CreateSoundBuffer,ĪĒĀ,Ñ o,μ,ĀŽw'è,·,é,±  
,Ā,<sup>a</sup>,Ā,«<sup>a</sup>,é B,±  
,Īftf%ofO,<sup>a</sup>fZfbfg,<sup>3</sup>,ē,é,Ā A,à,μf† [fU,<sup>a</sup>¼,ĪDirectSound ,ðŽg,Ā,Ā,¢  
,Ē,¢fAfvfŠfP [fVf‡f",Ē Ø,è'Ö,Ī,Ā,à A DirectSound ,ðŽg,Ā,Ā,¢  
,éfAfvfŠfP [fVf‡f",Ī,»,ĪfXfefBfbfL [ EftfH [fJfX Efofbftf@,Ā  
Ā ¶,μ'±,·,é,±,Ā,<sup>a</sup>,Ā,«<sup>a</sup>,é B,±  
,Ī ó'Ö,ĀfAfvfŠfP [fVf‡f",Ī·W €fobftf@,Ī Ā%<sup>1</sup>,<sup>3</sup>,ē,é,<sup>a</sup> AfXfefBf  
bfl [ EftfH [fJfX Efofbftf@,Ī-Ā,è±  
,·,é B,½,Ā,Ī,Īf† [fU,<sup>a</sup>f [fh , ,é,¢  
,ĪGfNfZf<,Āf^fCfv,·,éŠÖ,ĒfTfEf"fhfgf%ofbfN,ð·,·,æ,□  
,ĒŽŽ AfQ [f€"ÈŠÖ,ĪfAfvfŠfP [fVf‡f" A,½,Ā,Ī,Ī%of%æ Ā ¶  
(ActiveMovie™),Ē,Ç,Ā-ð—§,Ā B,μ,©,μ Af† [fU,<sup>a</sup>,μ'¼,Ī  
DirectSound fAfvfŠfP [fVf‡f",Ē Ø,è'Ö,Ī,é,Ē,ç A·W €  
,ĀfXfefBfbfL [ EftfH [fJfX—  
¼·û,ĪfTfEf"fh Efofbftf@,<sup>a</sup>,·,x,Ā Ā%<sup>1</sup>,<sup>3</sup>,ē,é B

## dwBufferBytes

,±,Īfobftf@,ĪfofCf g'P^Ē,ĪTfCfY B

## dwUnlockTransferRate

ĪDirectSoundBuffer::Unlock,<sup>a</sup>ĒĀ,Ñ o,<sup>3</sup>,ē,½,Ā,«<sup>a</sup>,Éfobftf@ Ef f,fŠ,Éff [f^,<sup>a</sup>"]'—,<sup>3</sup>,ē,é fĒ [fg,ð A,P·b—  
^,ĪkofCf g,ĀŽw'è,·,é BfnfCfpftfH [f}f"X,ĒfAfvfŠfP [fVf‡f",<sup>a</sup> ĪDirectSoundBuffer::Unlock,ðŽĀ s,·,é,½,ß,Ē  
—v,·,éŽžŠÖ,ðĒ"è,·,é,Ī,Ē A,±,Ī'Ī,ðŽg,μ,±,Ā,<sup>a</sup>,Ā,«<sup>a</sup>,é B fVfXfef€f f,fŠ,É"z'u,<sup>3</sup>,ē,Ā,¢  
,éf\ftfgEfFfA Efofbftf@,Ī,½,ß,ĪĒ [fg,Ī A ^— ,<sup>a</sup>s—v,Ē,Ī,Ā"ñ ĩ,Ē ,·,¢ B  
fn [fhfEfFfA Efofbftf@,Ī,½,ß,ĪĒ [fg,Ī Afobftf@,<sup>a</sup>fTfEf"fh EfJ [fh,Ēf [fh,<sup>3</sup>,ē,é%Ŧ"\  
«<sup>a</sup>, ,é,½,ß A,  
æ,è'x,,Ē,é%Ŧ"\  
«<sup>a</sup>, ,é B,»,μ,Ā"]'—'—x,<sup>a</sup>Ē'è,<sup>3</sup>,ē,é ê ‡,<sup>a</sup>,é B

## dwPlayCpuOverhead

,±,ĪfTfEf"fh Efofbftf@,ðf~fLfVf"fO,·,é,Ī,Ē·K—v,ĒfI [fo [fwfbfh,ðŽā,Ē ^—  
fTfCfNf<,Īp [fZf"fe [fW,ĀŽw'è,·,é B fn [fhfEfFfA Efofbftf@,Ē,·,¢,Ā,Ī A,±  
,Īf f"fo,Īf~fLfVf"fO,<sup>a</sup>fTfEf"fh EftfofCfX,Ē,æ,Ā,Ā s,Ī,ē,é,Ī,Ā A,O,Ā, ,é B f\ftfgEfFfA Efofbftf@,Ē,·,¢  
,Ā,Ī A,±,Īf f"fo,Īfobftf@ EftfH [f}fbfg,ĀfVfXfef€ Ef vf fZfbfT,Ī'—x,Ē'Ē·¶,<sup>3</sup>,ē,é B

## DSBCAPS \^c'Ī,Ī ĪDirectSound::CreateSoundBuffer f f\fbfh,Ē"n,<sup>3</sup>,ē,é DSBUFFERDESC \^c'Ī,Ē—pŽ—

,μ,ĀĒ©,ç,ē,é ĩ·ñ,ðŠÜ,ñ,Ā,¢,Ā A'Ç%Ŧ,Ī ĩ·ñ,ð,¢,,Ā,©Ž ,Ā,Ā,¢,é B  
'Ç%Ŧ ĩ·ñ,Ē,Ī Afobftf@ ifn [fhfEfFfA, ,é,¢,Īf\ftfgEfFfA j,ĪĒ'u,Ā,¢,-  
,Ā,©,ĪfRfXfg'P^Ē ifn [fhfEfFfA,Ē'Ē'u,μ,Ā,¢  
,é,Ē,çfobftf@,ðf [fh,·,éŽžŠÖ Af\ftfgEfFfA,Āfobftf@,<sup>a</sup>f~fLfVf"fO,<sup>3</sup>,ē,é,Ē,ç Ā ¶,·,é,Ā,«<sup>a</sup>,Ī ^—  
,ĪfI [fo [fwfbfh,Ī,æ,Ē,Ē ĩ·ñ j,<sup>a</sup>ŠÜ,Ü,é,é B

## DSBCAPS \^c'Ī,Ī dwFlags f f"fo,<sup>a</sup> DSBUFFERDESC \^c'Ī,Ē,æ,Ā,ĀŽg,Ī,ē,½"~,¶ftf%ofO,ðŠÜ,ñ,Ā,¢,é,±

,Ā,Ē' ^Ö,·,é,±,Ā B—B'ē,ĪŠ^á,Ī **DSBCAPS** \^c'Ī,Ē,·,¢,Ā ADSBCAPS\_LOCHARDWARE , ,é,¢,Ī  
DSBCAPS\_LOCSOFTWARE ftf%ofO,<sup>a</sup>fobftf@f f,fŠ,Ī ē Š,Ē,æ,Ā,ĀŽw'è,<sup>3</sup>,ē,é,Ā,¢,μ,±,Ā,Ā, ,é B  
**DSBUFFERDESC** \^c'Ī,Ā A,±,ē,ç,Īftf%ofO,Ī^C^Ö,Ā, ,ē A,»,μ,Āfn [fhfEfFfA, ,é,¢

,Íf\ftfgfEfFfA,Ö,Ìfofbftf@,Ì”z’u,ð §,·,é,½,ß,ÉŽg,í,ê,é B

ŽQ Æ @IDirectSound::CreateSoundBuffer, IDirectSoundBuffer::GetCaps

## DSBUFFERDESC

```
typedef struct _DSBUFFERDESC{
    DWORD          dwSize;
    DWORD          dwFlags;
    DWORD          dwBufferBytes;
    DWORD          dwReserved;
    LPWAVEFORMATEX lpwfxFormat;
} DSBUFFERDESC, *LPDSBUFFERDESC;
```

V,µ,¢ DirectSoundBuffer fIfufWfFfNfg,İ'â Ø,È'Á'¥,ðŽ',· B ,±,İ \¢'İ,İ IDirectSound::CreateSoundBuffer  
f f\fbfh,È,æ,Ä,ÄŽg,İ,é,é B

### dwSize

,±,İ \¢'İ,İf ofCf g'P'È,İfTfCfY B

### dwFlags

V,µ,¢ DirectSoundBuffer fIfufWfFfNfg,ð İ,é,Æ,«,ÉŠÜ,p"İ—İ,ðŽ'•È,·,é B ^È%°,İ,Đ,Æ,Ä, ,é,¢,İ•j " ,ðŽw'è,·,é,± ,Æ B

### DSBCAPS\_CTRL3D

f ofbftf@,İ,R,c §Œä,ðŽg,²f vf% ofCf}fŠ E f ofbftf@,Ä, ,é B

### DSBCAPS\_CTRLALL

f ofbftf@,İ,·,×,Ä,İ §Œä"İ—İ,ðŽ ,½,È,,Ä,İ,È,ç,È,¢ B

### DSBCAPS\_CTRLDEFAULT

f ofbftf@,İfftfHf<fg,İfRf"fgf [f< EfIfvfVf±f",ðŽ ,Ä,×,«,Ä, ,é  
B ,±,ê,İDSBCAPS\_CTRLPAN A  
DSBCAPS\_CTRLVOLUME," ,æ,ÑDSBCAPS\_CTRLFREQUENCYftf% ofO,  
ðŽw'è,·,é,±,Æ,Æ" ,Ä, ,é B

### DSBCAPS\_CTRLFREQUENCY

f ofbftf@,İŽü"g " §Œä"İ—İ,ðŽ ,½,È,,Ä,İ,È,ç,È,¢ B

### DSBCAPS\_CTRLPAN

f ofbftf@,İfpf" §Œä"İ—İ,ðŽ ,½,È,,Ä,İ,È,ç,È,¢ B

### DSBCAPS\_CTRLVOLUME

f ofbftf@,İf{fŠf... [f€ §Œä"İ—İ,ðŽ ,½,È,,Ä,İ,È,ç,È,¢ B

### DSBCAPS\_GETCURRENTPOSITION2

#### IDirectSoundBuffer::GetCurrentPosition

,ª Ä ¶fJ [f<f,İ V,µ,¢ Ý'è,ðŽg—p,·,é,×,«,Ä, ,é,±,Æ,ðŽ',· B DirectX  
,P,İDirectSound ,Ä,İ A ' ,«,±  
,ÝfJ [f<f,İ¼Œä,È, ,Ä,½ Ä ¶fJ [f<f,İfTfEf"fh EfJ [fh,ªfGf~f...  
fŒ [fg,µ,½%º¹,İ AŽÄ Ū,İ%º¹,æ,è,à Ū—§,Ä,Ä i,ñ,Ä,¢  
,½ BŒ» Ý,Ä,İ  
DSBCAPS\_GETCURRENTPOSITION2ftf% ofO,ªŽw'è,³,ê AfAfvfŠfP [f  
Vf±f",É,æ,é,æ,è ³Šm,È Ä ¶^È'u,İŽæ"¾,ª%Ä" ,É,È,Ä,½ B ,±  
,İftf% ofO,ªŽw'è,³,ê,È,¢ óÔ,Ä, ,ê,İ%ºß<Ž,İ"® İ,ªŒÝŠ· «,İ,½,ß,É^ŪŽ ,  
³,ê,Ä,¢,é B ,±,İftf% ofO,ª%œ<ç,ð—  
^,İ,é,İ,İfTfEf"fh EfJ [fh EfGf~f...fŒ [fg,Ö,İ,Ý,Ä, ,é,±  
,Æ,È' ^Ó,·,é,±,Æ B,à,µDirectSound  
fhf% ofCfo,ª ,é,İ ADirectX,İ ,ç,ä,éfo [fWf±f",İDirectSound,Ä,İ Ä ¶  
fJ [f<f,İ ³Šm,Ä, ,é B

### DSBCAPS\_GLOBALFOCUS

f ofbftf@,İfOf [f of<f,ÈfTfEf"fh E f ofbftf@,Ä, ,é B ,±  
,İftf% ofO,ðfZfbfg,·,é,±  
,Æ,È,æ,è A,à,µf† [fU,ª¼,İAfvfŠfP [fVf±f",ÉftfH [fJfX,ð Ø,è'Ö,İ,½,è A  
V,µ,¢ AfvfŠfP [fVf±f",ªDirectSound ,ðŽg,² ê ± A DirectSound ,ðŽg,Ä,Ä,¢  
,é AfvfŠfP [fVf±f",İ,» ,İf ofbftf@,ð Ä ¶,µ'±, ,é,±,Æ,ª,Ä,«,é B  
,µ,©,µ AftfH [fJfX,ð DSSCL\_EXCLUSIVE , ,é,¢,İ  
DSSCL\_WRITEPRIMARYftf% ofO,İ<'²fŒfxf<,ðŽg,²DirectSound  
f AfvfŠfP [fVf±f",É Ø,è'Ö,İ,½ ê ±,İ—áŠO,Ä, ,é B ,±

,ì ê ± A¼,ÌfAfvfŠfP [fVf‡f“,©,ç,ÌfOf [fof,È‰¹,Í•,±,ì,È,,È,é B

#### DSBCAPS\_LOCHARDWARE

DSBCAPS\_STATIC ,ªŽw’è,³,ê,È,,Ä,à Afobftf@,Í-  
§“I,Éfn [fhfEfFA Ef~fLVf“fO,ðŽg—p,·,é B  
à,µfffofCfX,ªfn [fhfEfFA Ef~fLVf“fO,ðfTf [fg,µ,Ä,¢,È,© A, ,é,¢  
,Í•K—v,Æ,³,ê,éfn [fhfEfFA Ef f,fŠ,ª—p•s‰Ä”,È ê ±,Í A  
IDirectSound::CreateSoundBuffer,ìĖÄ,Ñ o,µ,ÍŽ,”s,·,é B  
fAfvfŠfP [fVf‡f“,Ìf~fLVf“fO Ef ffflf,ª,±,Ìfobftf@,ì,½,ß,É—p‰Ä”  
Ä, ,é,±,Æ,ð•Û Ø,·,é•K—v,ª, ,é B

#### DSBCAPS\_LOCSOFTWARE

DSBCAPS\_STATIC ,ªŽw’è,³,éfn [fhfEfFA EfŠf\ [fX,ª—p‰Ä”  
,Ä, ,Ä,Ä,à Afobftf@,Í-  
§“I,ÉftfgfEfFA Ef f,fŠ,ÉŠi”[,³,ê Af\ftfgfEfFA Ef~fLVf“fO,ðŽg—  
p,·,é B

#### DSBCAPS\_PRIMARYBUFFER

fobftf@,ªfvf‰ofCf}fŠ EfTfEf“fh Efobftf@,Ä, ,é,±,Æ,ð•\,· B ,à,µ,±  
,ì¹,ªŽw’è,³,ê,È,¢,È,ç AfZfJf“f fŠ EfTfEf“fh Efobftf@,ª ì,ç,ê,é B

#### DSBCAPS\_STATIC

fobftf@,ªfXf^fefBfbfN EfTfEf“fh Eff [f^,ì,½,ß,ÉŽg,í,ê,é,±,Æ,ð•\,· B  
~è”È,É,±,ê,ç,Ìfobftf@,Í,P“xf [fh,³,ê,Ä A,»,µ,Ä‰½“x,à Ä ¶,³,ê,é B ,±  
,ê,ç,Ìfobftf@,Ífn [fhfEfFA Ef f,fŠ,ð—v,·,é B

#### DSBCAPS\_STICKYFOCUS

fTfEf“fh Efobftf@,ÌftfH [fJfX,ì“® ì,ð•Ì,ì,é B ,±  
,Ìftf‰ofO,ªIDirectSound::CreateSoundBuffer,ìĖÄ,Ñ o,µ,ÄŽw’è,·,é,±  
,Æ,ª,Ä,«„é B ,±,Ìftf‰ofO,ªfZfbfg,³,ê,é,Æ A,à,µf† [fU,ª¼,ÌDirectSound  
,ðŽg,Ä,Ä,¢,È,¢fAfvfŠfP [fVf‡f“,É Ø,è“Ö,ì,Ä,à A DirectSound ,ðŽg,Ä,Ä,¢  
,éfAfvfŠfP [fVf‡f“,Í,»,ÌfXfefBfbfL [ EftfH [fJfX Efobftf@,Ä Ä ¶,µ‘  
±,·,é,±,Æ,ª,Ä,«„é B ,±  
,ì ó•Ö,ÄfAfvfŠfP [fVf‡f“,ì•W €fobftf@,Í Á‰¹,³,ê,é,ª AfXfefBfbfL [ EftfH [fJfX Efobftf@,Í-Ä,è“±,·,é B,½,Æ,ì,† [fU,ªf [fh , ,é,¢  
,ÌfGfNfZf,Äf^Cfv,·,éŠÖ,ÉfTfEf“fhfgf‰ofbfn,ð•,·,æ,□  
,ÉŽŽ Afq [fĖÈŠÖ,ÌfAfvfŠfP [fVf‡f“ A,½,Æ,ì,Ì‰of‰œ Ä ¶  
(ActiveMovie™),È,Ç,Ä—§,Ä B,µ,©,µ Af† [fU,ª,à,µ¼,Ì DirectSound  
fAfvfŠfP [fVf‡f“,É Ø,è“Ö,ì,é,È,ç A•W €,ÆfXfefBfbfL [ EftfH [fJfX—  
¼•û,ÌfTfEf“fh Efobftf@,ª,·,x,Ä Á‰¹,³,ê,é B

#### dwBufferBytes

,±,Ìfobftf@,ÌfofCf’P^È,ÌTfCfY B,±,ì¹,Ìfvf‰ofCf}fŠ Efobftf@,ð ì,é,Æ,«„Í,O,Ä,È,—,è,Ì,È,ç,È,¢ B

#### dwReserved

,±,Ìf f“fo,Í—\—ñ,³,ê,Ä,¢,é B Žg—p,Ä,«„È,¢ B

#### lpwfxFormat

fobftf@,ì,½,ß,ÉwaveftfH [f}fbfg,ðŽw’è,µ,Ä,¢,é \“ì,Ö,Ìf|fCf“f^ B ,±,ì¹,Ìfvf‰ofCf}  
fŠ Efobftf@,È,çNULL,Ä,È,—,è,Ì,È,ç,È,¢ B fAfvfŠfP [fVf‡f“,Ìfvf‰ofCf}fŠ Efobftf@,ÌftfH [f}  
fbfg,ðfZfbfg,·,é,½,ß,È IDirectSoundBuffer::SetFormat,ðŽg,□,±,Æ,ª,Ä,«„é B

#### dwFlags f f“fo,ÄŽg,í,ê,é DSBCAPS\_LOCHARDWARE ,Æ DSBCAPS\_LOCSOFTWARE

ftf‰ofO,ÌfIfvVf‡f“,Ä, ,è A,»,µ,Ä•ŠĖÝ,É”r¼“L,Ä, ,é B DSBCAPS\_LOCHARDWARE  
,Ìfobftf@,ðfTfEf“fh EfJ [fh,Ìf f,fŠ,É”z’u,·,é B DSBCAPS\_LOCSOFTWARE ,Í‰Ä”  
,Ä, ,é,È,ç Afobftf@,ðf fCf“fVfXfef€ Ef f,fŠ,É”z’u,·,é B

,±,ê,ç,Ìftf‰ofO,Ì DSBCAPS \“ì,ì **dwFlags** f f“fo,Ä,äŽg,í,ê,é B,»,±,Ä,Í AŽw’è,³,ê,½ftf‰ofO,ª DirectSoundBuffer  
fIfufWfFfNfg,ÌŽÄ Û,ì ê Š,ðŽ,· B

fvf‰ofCf}fŠ Efobftf@,ð ì,é,Æ,« AfAfvfŠfP [fVf‡f“,Ä,Í **dwBufferBytes** f f“fo,ð,O,ÉfZfbfg,·,é B  
DirectSound ,ÍŽg—

p†,Ì“Ä”è,ÈfTfEf“fh EfffofCfX,Ä, ,é,ì,Ä Ä“K,Èfobftf@,Ì“ä,«³,ðĖ~è,·,é B ì ¬,³,ê,½fvf‰ofCf}  
fŠ Efobftf@,Ì“ä,«³,ðŽæ“¾,·,é,É,Í A IDirectSoundBuffer::GetCaps,ðĖÄ,Ñ o,· B

ŽQ Æ @IDirectSound::CreateSoundBuffer

## DSCAPS

```
typedef struct _DSCAPS {
    DWORD dwSize;
    DWORD dwFlags;
    DWORD dwMinSecondarySampleRate;
    DWORD dwMaxSecondarySampleRate;
    DWORD dwPrimaryBuffers;
    DWORD dwMaxHwMixingAllBuffers;
    DWORD dwMaxHwMixingStaticBuffers;
    DWORD dwMaxHwMixingStreamingBuffers;
    DWORD dwFreeHwMixingAllBuffers;
    DWORD dwFreeHwMixingStaticBuffers;
    DWORD dwFreeHwMixingStreamingBuffers;
    DWORD dwMaxHw3DAllBuffers;
    DWORD dwMaxHw3DStaticBuffers;
    DWORD dwMaxHw3DStreamingBuffers;
    DWORD dwFreeHw3DAllBuffers;
    DWORD dwFreeHw3DStaticBuffers;
    DWORD dwFreeHw3DStreamingBuffers;
    DWORD dwTotalHwMemBytes;
    DWORD dwFreeHwMemBytes;
    DWORD dwMaxContigFreeHwMemBytes;
    DWORD dwUnlockTransferRateHwBuffers;
    DWORD dwPlayCpuOverheadSwBuffers;
    DWORD dwReserved1;
    DWORD dwReserved2;
} DSCAPS, *LPDSCAPS;
```

**IDirectSound::GetCaps** *f\fbfh,É,æ,Á,Žg—p,<sup>3</sup>,é,é DirectSound fffofCfX,ì”—Í,ðŽw’è,·,é B*

### dwSize

*,±,ì \‘‘ì,ìfofCfg’PˆÊ,ìTfCfY B*

### dwFlags

*ffofCfX,ì”—Í,ðŽw’è,·,é B ˆÈ%°,ì,Ð,Æ,Â, ,é,‘,Í•j ”,“Žw’è,Â,«é B*

DSCAPS\_CERTIFIED

*,±,ìfhf%ofCfo,ÍMicrosoft,É,æ,Á,ŽŽÆ±,<sup>3</sup>,ê•Û Ø,<sup>3</sup>,é,Ä,‘,é B*

### DSCAPS\_CONTINUOUSRATE

*ffofCfX,ÍdwMinSecondarySampleRate*

*,ÆdwMaxSecondarySampleRate*

*f f“fo”l,İŜÔ,Â,·,×,Ä,ìTf“fvfŠf“fOfŒf| [fg,ðfTf| [fg,·,é B*  
*ˆè”Ê,É,±,ê,ÍŽÀ Û,ì o—ÍfŒ [fg,<sup>a</sup>—v< ,·,éŽü”g ”,ì { ^ |*  
*,P,Ofwf<fc i Hz j ,ì†,Â, ,é,±,Æ,ðˆÓ—j,·,é B*

### DSCAPS\_EMULDRIVER

*ffofCfX,É,ÍfCf“fXfg [f<,<sup>3</sup>,é,½DirectSound*

*fhf%ofCfo,Í,È,‘ B,»è,ÍfEfF [fuftfH [f€ EfI [ffBfI<@”\*

*,ð’Ê,µ,ÄGf~f...fŒ [fg,<sup>3</sup>,é,Ä,‘,é B ŽÀ s”—Í,ì’á%°,<sup>a</sup>—\z,<sup>3</sup>,é,é B*

### DSCAPS\_PRIMARY16BIT

*ffofCfX,Í,P,UfrfbfgfTf“fvfŠf“fO,Äfvf%ofCf}*

*fŠ EfTfEf“fh Efofbftf@,ðfTf| [fg,·,é B*

### DSCAPS\_PRIMARY8BIT

*ffofCfX,Í,WfrfbfgfTf“fvfŠf“fO,Äfvf%ofCf}fŠ Efofbftf@,ðfTf|*  
*[fg,·,é B*

### DSCAPS\_PRIMARYMONO

*ffofCfX,ÍP%<sup>a</sup>fvf%ofCf}fŠ Efofbftf@,ðfTf| [fg,·,é B*

### DSCAPS\_PRIMARYSTEREO

*ffofCfX,ÍfXfefŒfIfvf%ofCf}fŠ Efofbftf@,ðfTf| [fg,·,é B*

### DSCAPS\_SECONDARY16BIT



fffofCfX,Í16frfbfgfTf“fvfŠf“fO,Åfn [fhEfFfA Ef~fLfVf“fO E  
fZfJf“f fŠ EfTfEf“fh Efobftf@,ðfTf| [fg,·,é B

#### DSCAPS\_SECONDARY8BIT

fffofCfX,Í,WfrfbfgfTf“fvf,Åfn [fhEfFfA Ef~fLfVf“fO EfZfJ  
f“f\_fŠ EfTfEf“fh,ðfTf| [fg,·,é B

#### DSCAPS\_SECONDARYMONO

fffofCfX,Ífn [fhEfFfA Ef~fLfVf“fO’P%<sup>1</sup>fZfJf“f\_fŠ EfTfEf“fh  
,ðfTf| [fg,·,é B

#### DSCAPS\_SECONDARYSTEREO

fffofCfX,Ífn [fhEfFfA Ef~fLfVf“fO EfXfefEfI EfZfJf“f\_fŠ  
EfTfEf“fh,ðfTf| [fg,·,é B

#### dwMinSecondarySampleRate ,·,æ,Ñ dwMaxSecondarySampleRate

,±,ìfffofCfX,ìfn [fhEfFfA EfZfJf“f\_fŠ Efobftf@,ÅfTf|  
[fg,³,ê,é Å’á E Å ,·,ìTf“fvfŠf“fOfEf [fg,ðŽw’è B

#### dwPrimaryBuffers

fTf| [fg,³,ê,éfvf%ofCf}fŠ Efobftf@,ì ” B ;%ñ,ìfŠfŠ [fX,Å,Í,P,Å, ,é B

#### dwMaxHwMixingAllBuffers

fn [fhEfFfA,Å~fLfVf“fO,Å,«,éfofbftf@,ì ±Ev,ì ”,ðŽw’è,·,é B ,±,ìf f“fo,Í dwMaxHwMixingStaticBuffers  
,Æ dwMaxHwMixingStreamingBuffers ,ì ±Ev,æ,è ,È,¢ B fŠf\ [fX,ìfgfEf [fhfIf<sup>a</sup>,μ,ì,μ,Î” ¶,·,é B

#### dwMaxHwMixingStaticBuffers

fXf^fefBfbfN EfTfEf“fh Efobftf@,ì Å’á ”,ðŽw’è,·,é B

#### dwMaxHwMixingStreamingBuffers

fXfgfŠ [fEf EfTfEf“fh Efobftf@,ì Å’á ”,ðŽw’è,·,é B

#### dwFreeHwMixingAllBuffers, dwFreeHwMixingStaticBuffers, ,·,æ,Ñ dwFreeHwMixingStreamingBuffers

Š,,,è“–,Å,ç,è,Å,¢,È,¢fffofCfX,ì AfN [fhEfFfA Ef~fLfVf“fO”–Í,ì Ý’è B  
fAfvfŠfP [fVf±f““Í AfN [fhEfFfA EfŠf\ [fX,<sup>a</sup>fZfJf“f\_fŠ EfTfEf“fh Efobftf@,ìŠ,,,è“–,Å,ì,½,ß,É~—  
p%Å”\,Å, ,é,©,Ç,²,©”»’f,·,é,½,ß,É A,±,è,ç,ì¹,ðŽg,²,±,Æ,<sup>a</sup>Å,«,é B “–,¶,±,è,ç,ì¹,ð Å’á,ìf~fLfVf“fO”–  
Í,ðŽw’è,·,é f f“fo,Æ”àŠr,·,é,Î A,·,Å,ÈŠ,,,è“–,Å,ç,è,Å,¢,éŠf\ [fX,ð“Á’è,·,é,±,Æ,<sup>a</sup>Å,«,é B

#### dwMaxHw3DAllBuffers, dwMaxHw3DStaticBuffers, ,·,æ,Ñ dwMaxHw3DStreamingBuffers

fffofCfX,ìfn [fhEfFfA,R,c’èÊ”–Í,ìL q B,±,è,ç,Í,·,×,Å Å %o,ìfŠfŠ [fX,ì,½,ß,O,Å, ,é B

#### dwFreeHw3DAllBuffers, dwFreeHw3DStaticBuffers, ,·,æ,Ñ dwFreeHw3DStreamingBuffers

Š,,,è“–,Å,ç,è,Å,¢,È,¢fffofCfX,ì AfN [fhEfFfA,R,c’èÊ”–Í,ìL q B,±,è,ç,Í,·,×,Å Å %o  
,ìfŠfŠ [fX,ì,½,ß,O,Å, ,é B

#### dwTotalHwMemBytes

fXf^fefBfbfN EfTfEf“fh Efobftf@,ðŠi”[,·,éTfEf“fh EfJ [fh ã,ìf f,fŠ—e—Ê,ìfofCfg’P^Ê,ìfTfCfY B

#### dwFreeHwMemBytes

fTfEf“fh EfJ [fh ã,ìftfŠ [f f,fŠ,ìfofCfg’P^Ê,ìfTfCfY B

#### dwMaxContigFreeHwMemBytes

fTfEf“fh EfJ [fh ã,ìftfŠ [f f,fŠ,Å A Å,à’á,«,¢^A’±uf fbfN,ìfofCfg’P^Ê,ìfTfCfY B

#### dwUnlockTransferRateHwBuffers

fn [fhEfFfAfXf^fefBfbfN EfTfEf“fh Efobftf@ iflf“f{ [fhfTfEf“fhf f,fŠ,É”z’u,³,è,Å,¢  
,é j,Éff [f^,“”]’—,³,è,éEfEf [fg,ð,P•b—,ìk

fofCfg,ÅL q,·,é B,±,ìEfEf [fg,ÆfofCfg,Å,ì”]’——Ê,Í

**IDirectSoundBuffer::Unlock** f fbfhEfÅ,Ñ o,μ,ìEp’±ŽžŠÔ,ðEf”è,·,é B

#### dwPlayCpuOverheadSwBuffers

f\ftgfEfFfA Efobftf@ if fCf“fvfXfefEf f,fŠ,É”z’u,μ,Å,¢,é j,ðf~fLfVf“fO,·,é,½,ß,É•K—  
v,È ACPU,ìfp [fZf“fe [fW,ì ^— fI [fo [fwfbfh,ì¹ B,±  
,è,ìfofXf^fCfv Afvf fZfbfTf^fCfv,·,æ,ÑfNf fbfN’—“x,ÉÊ¶,μ,Å,İ%o»,·,é B

f fbfN,³,è,Å,¢,È,¢f\ftgfEfFfA Efobftf@,ì”]’—fEf [fg,Í Aff [f^,ð,Ç,±,É,à”]’—,·,é•K—v,<sup>a</sup>È,¢,½,ß,O,Å, ,é  
B “—l,Éfn [fhEfFfAfofbftf@,ì Å ¶fI [fo [fwfbfh,Í Af~fLfVf“fO,<sup>a</sup>fTfEf“fh EfffofCfX,É,æ,Å,Å ^  
— ,³,è,é,½,ß,O,Å, ,é B

#### dwReserved1 ,·,æ,Ñ dwReserved2

,±,è,ç,ìf f“fo,Í—\–ñ,³,è,Å,¢,é B Žg—p,Å,«,È,¢ B

#### ŽQ Æ @IDirectSound::GetCaps

## •Ô'l

$fGf\%_0$  [,Í•%\_0 ”l,Â•,³,ê'g,Ý ±,í,³,ê,±,±,Æ,Í,È,¢ B,±,ì•,Í A,·,×,Ä,ìIDirectSound ,Æ IDirectSoundBuffer  
f f\fbfh,É,æ,è•Ô,³,ê,é'l,Îê——,Ä, ,é BÆÄ X,ìf f\fbfh,ì•Ô,·fGf%\_0 [fR [fh,ìfŠfXfg,É,Ä,¢  
,Ä,Í A,»,ìf f\fbfh,ìL q,ðŽQ Æ,·,é,±,Æ B

## DS\_OK

—v< ,Í ¬Æ÷,μŠ®—¹,μ,½ B

## DSERR\_ALLOCATED

—v< ,Í—D æfÆfxf<,ì,æ,²,ÈfŠf\ [fX,ª¼,ìÆÄ,Ñ o,μ,É,æ,Ä,Ä,·,Ä,ÉŽg  
—p'†,Ä, ,é,½,ßŽ, ”s,μ,½ B

## DSERR\_ALREADYINITIALIZED

flfufWfFfNfg,Í,·,Ä,É %Šú%\_0»,³,ê,Ä,¢,é B

## DSERR\_BADFORMAT

Žw'è,³,ê,½wave,ÍfTf| [fg,³,ê,È,¢ B

## DSERR\_BUFFERLOST

fobftf@f f,fŠ,ªŽ,í,ê,½,½,ß AfŠfXfgfA,μ,È,¬,ê,Î,È,Ç,È,¢ B

## DSERR\_CONTROLUNAVAIL

ÆÄ,Ñ o,μ,É,æ,Ä,Ä—v< ,·,é §Æä if{fŠf... [f€ Afpf“,È,Ç j,Í—~—  
p%\_0Ä“,Ä,Í,È,¢ B

## DSERR\_GENERIC

¬Šm'è,ÈfGf%\_0 [,ª DirectSound fTfufVfXfef€,Î'†,Ä<N,±,Ä,½ B

## DSERR\_INVALIDCALL

,±,ìŠÖ ”,Í,±,ìfIfufWfFfNfg,ìÆ» Ý,ì ó'Ô,É,“,¢,Ä—LÆø,Ä,Í,È,¢ B

## DSERR\_INVALIDPARAM

¬³Æø,Èfpf%\_0f [f^,ªŠÖ ”,É“n,³,ê,½ B

## DSERR\_NOAGGREGATION

flfufWfFfNfg,ÍCOM W ¬%\_0»,ðfTf| [fg,μ,È,¢ B

## DSERR\_NODRIVER

Žg—p,·,éfTfEf“fh Efhf%\_0Cfo,ª—~—p,Ä,«,È,¢ B

## DSERR\_OTHERAPPHASPRIO

,±,ì'l,Í%\_0ß<Ž,ì,à,ì,Ä, ,èŽg—p,³,ê,È,¢ B

## DSERR\_OUTOFMEMORY

DirectSound fTfufVfXfef€,ÍÆÄ,Ñ o,μ,ì—v< ,ðŠ®—  
¹,·,é,½,ß,É \ª,Èf f,fŠ,ðŠ,,,è“—,Ä,é,±,Æ,ª,Ä,«,È,©,Ä,½ B

## DSERR\_PRIOLEVELNEEDED

ÆÄ,Ñ o,μ,ÍŠÖ ”,ª ¬Æ÷,·,é,½,ß,É•K—v,Æ,·,é—D æfÆfxf<,ðŽ ,Ä,Ä,¢  
,È,¢ B

## DSERR\_UNINITIALIZED

ª¼,ìf f\fbfh,ªÆÄ,Ñ o,³,ê,é'O,ÉIDirectSound::Initialize  
f f\fbfh,ªÆÄ,Ñ o,³,ê,È,©,Ä,½,© A, ,é,¢  
,ÍÆÄ,Ñ o,μ,ª ¬Æ÷,μ,È,©,Ä,½ B

## DSERR\_UNSUPPORTED

ÆÄ,Ñ o,μ,½ŠÖ ”,Í,±,±,Ä,ÍfTf| [fg,³,ê,Ä,¢,È,¢ B

## DirectPlay,É,Â,¢,Ä

Microsoft Windows®flfyfE [fefBf“fO EfVfXfef€—p,ÌMicrosoft®

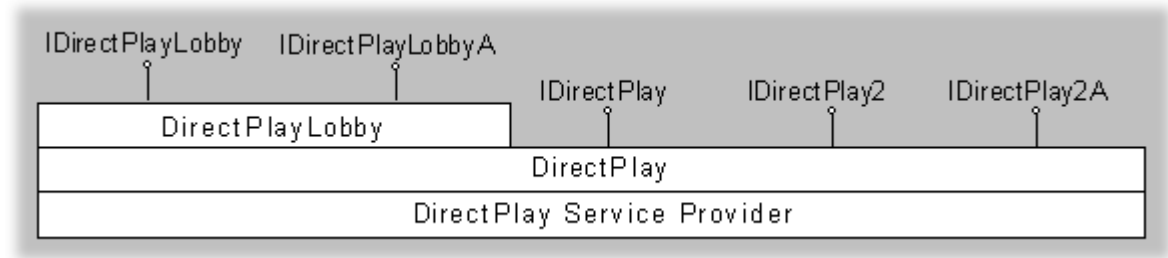
DirectPlay®fAfvfŠfP [fVf‡f“ Efvf fOf%of~f“fO EfCf“f^ [ftfFfCfX (API)

,Í AfAfvfŠfP [fVf‡f“,©,ç,ÌÊ MfT [frfX,Ö,ÌfAfNfZfX,ð’P f%»,.,éf\ftfgfEfFfA EfCf“f^ [ftfFfCfX,Â, ,é  
BDirectPlay,Í Afgf%of“fXf [fg,âfvf fgfRf< A, ,é,¢,ÍfIf“f%ofCf“ EfT [frfX,ÉÊ‘¶,µ,È,¢’Ê M•û–  
@,ð AfAfvfŠfP [fVf‡f“,¾, ,Ä,È, Af fr [ EfT [fo [,É,à’ñ<Ÿ,.,éfefNfmf fW,Æ,È,Ä,Ä,¢,é B

fŠfAf< EfvfEfcf,,,½,ç,“Î í,.,é,æ,ϣ,ÈfAfvfŠfP [fVf‡f“ i“Á,ÉfQ [f€ j,Í A,à,Á,Æ«–j,ð,»,»,é,à,Ì,Ä, ,Á,Ä,¢  
,¢ Bfp [f\if< EfRf“fsf... [f^,Í A%ß<Ž,Ì,Ç,ñ,ÈfQ [f€,Ìfvf%ofbfgftfH [f€,æ,è,à—  
D,ê,½ Ú‘±IfvfVf‡f“,ðŽ ,Á,Ä,¢,é,Ì,Ä, ,é BDirectPlay,Í A,±,ê,ç,ÌŠe Ú‘±•û–@,Ì’á,¢,ÉÎ ^,.,é•K—  
v «,ðŽæ,è æ,« A–¾Šm,Èê”Ê%»,³,ê,½’Ê M<@”\,ð’ñ<Ÿ,.,é B DirectPlay ,ð—p,¢,ê,Í A’½—l,È Ú‘±•û–  
@,ðfCf“fvfŠf f“fg,.,é Û,Ì•iŽG,³,ð<C,É,¹, A—D,ê,½fAfvfŠfP [fVf‡f“,ð ì,è o,.,±,Æ,É’S—Í,ð’ ,®,±  
,Æ,ª,Ä,«,é B

## DirectPlayA [fLfefNf`ff

DirectPlay,Í A`P f,È'—Žó M'Ê Mf,ffç,ðŽg—p,µ,Ä Af}f<f`fvf(EfCf,, E fAfvfŠfP [fVf‡f“,ì—  
v< ,É'Î%ž,µ,½ Ú'±API,ðfCf“fvfŠf f“fg,µ,Ä,ç  
,é BDirectPlayA [fLfefNf`ff,Í ADirectPlayLobby ADirectPlay ADirectPlayT [frfX Efvf fofCf\_,ì,R,Ä,ìfRf“f|  
[flf“fg,©,ç \ ¬,³,ê,é BŽŸ,Î },Í A,±,ê,ç,ìfRf“f|  
[flf“fg,Æ A,»,ê,É'Î%ž,·,éfCf“f^ [ftFFfCfX,Æ,ìŠÖEW,ðŽ',µ,Ä,ç,é B



,±,ìfZfNfVf‡f“,Ä,Í A,±,ê,ç,ìfRf“f| [flf“fg,É,Ä,ç,Ä,îê”Ê“l,È î•ñ,ð à–¾,·,é B

DirectPlayRf“f| [flf“fg

DirectPlayLobbyRf“f| [flf“fg

fT [frfX Efvf fofCf\_

## DirectPlayRf“f| [flf“fg

DirectPlay,ÍMicrosoft,É,æ,Á,Ä'ñ<ÿ,³,ê AfAvfŠfP [fVf‡f“,ì<ÊfCf“f^ [ftFfCfX,ðŒöŠJ,·,é B  
DirectPlayfCf“f^ [ftFfCfX,Í A·;ŽG,³,â A”C”Ó,Ì’Ê MfŠf“fN,ðŠm—§,·,é,½,ß,É·K—  
v,È“ÁŽê,Èf^fXfN,ð ADirectPlayfT [frfX Efvf fofCf\_,Ì“à•”,É%B•Á,·,é B DirectPlay,ð—~—  
p,·,éfAvfŠfP [fVf‡f“,Í A’Ê M”}’Ì,ÌfpftfH [f}f“fX,Ì,Ý,ð”z—¶,·,ê,Ì,æ, A,»,Ì”}’Ì,ð’ñ<ÿ,·,é,f,f,f€  
,âflfbfgf [fN A, ,é,ç,Íflf“f%ofCf“ EfT [frfX,É,Â,ç,Á<C,É,·,é•K—v,Ì,È,ç B

DirectPlay,Í Af† [fU,ÌfVfXfef€ â,ÉfCf“fXfg [f<,³,ê,½,Ç,ñ,È  
DirectPlayfT [frfX Efvf fofCf\_,É,à“@“l,ÉŒ< ‡,·,é BfAvfŠfP [fVf‡f“,Í ADirectPlayIfufWfFfNfg,ÆŒÝ,ç  
,ÉfAfNfZfX,·,é B DirectPlayIfufWfFfNfg,Í AŽg—p%Œ””,ÈDirectPlayfT [frfX Efvf fofCf\_,Ì,ð,Æ,Á,ÆŒÝ,ç  
,É’Ê M,µ A’l’ð,³,ê,½,fT [frfX Efvf fofCf\_,Í Afgf%of“fXf| [fg,âfvf fgfRf<,Æ,â,êŽæ,è,ð,·,é B

DirectPlay API,Í ACOMfCf“f^ [ftFfCfX,ð’Ê,µ,ÄfAvfŠfP [fVf‡f“,ÉŒöŠJ,³,ê,Ä,ç,é B  
DirectPlayfo [fWf‡f“3,Á,Í AIDirectPlay2,“,æ,NIDirectPlay2A,Ì,Ó,½,Â,ÌfCf“f^ [ftFfCfX,ª—~—  
p,Á,«,é BIDirectPlay2A,ªANSI•¶Žš—ñ,ðŽg,□,Ì,É’l,µ AIDirectPlay2,Á,Í A,·,×,Ä,ÌDirectPlay \‘ç’l,ÁUnicode•¶Žš—  
ñ,ðŽg,□ B  
IDirectPlayfCf“f^ [ftFfCfX,Í ADirectPlayfo [fWf‡f“1,Æ2,Á ,·,©,ê,½fAvfŠfP [fVf‡f“,Æ,Ì%°ÊŒÝŠ· «,Ì,½,ß  
,ÉffftfHf<fg,ÌfCf“f^ [ftFfCfX,Æ,µ,Ä—p”Ó,³,ê,Ä,“,è AANSI•¶Žš—ñ,Ì,Ý,ðŽg—p,·,é B

fAvfŠfP [fVf‡f“,Í,ð,Æ,Â,ÌDirectPlayIfufWfFfNfg,ÌfCf“fXf^f“fX,ð ì ¬,µ A,½,Æ,|fAvfŠfP [fVf‡f“,ª·i ”,Ì  
fvfŒfCf,,ðŠÇ— ,·,é,Æ,µ,Ä,à A,»,ÌflufWfFfNfg,ð’Ê,µ,Ä,·,×,Ä,Ì’Ê M,ðŽÄ s,·,é BfpftfH [f}  
f“fX,ð”ÜŽ ,·,é,½,ß ADirectPlayIfufWfFfNfg,¾,“,ª¼ Ú,“ŒÝ,ç  
,Æ’Ê M,ð s,□ Bf fbfZ [fW,ðŽó M,µ,½Œâ ADirectPlayIfufWfFfNfg,Í Af [fJf<,ÈfAvfŠfP [fVf‡f“,ª ì  
¬,µ,½,·,×,Ä,ÌfvfŒfCf,,Ì,½,ß,É,»,Ìf fbfZ [fW,ð ì,â,µ•K—v,È,ç,Î j·i »,µ Af fbfZ [fW EfLf...  
[,É’Ç%ŒÁ,·,é B

,±,Ìfo [fWf‡f“,ÌDirectPlay,Í AfsfA Efc [ EfsfA,ÌfQ [f€ Efpf%of\_fCf€,ðfTf| [fg,·,é B  
,Ä,Ü,è A,·,×,Ä,ÌfvfŒfCf,,Í AfZfbfVf‡f“†,Ì¼,Ì,ç,©,È,éfvfŒfCf,,É,Ä,àf fbfZ [fW,ð— M,·,é,±,Æ,ª,Ä,«,é B  
fZfbfVf‡f“ EfzfXfg,Í AfZfbfVf‡f“,É%ŒÁ,í,é V,µ,çRf“fsf...  
[f^,ð”²â,µ A V,µ,çfvfŒfCf,,ÆfOf< [fv,ª ì ¬,³,ê,é,Æ,«,ÉID”Ô †,ðŠ,,è—,Ä,é BŠJ”-  
ŽÖ,Í AfNf%ofCfAf“fg ^fT [fo Ef,f,f<,ÁfQ [f€,ð ÝŒv,·,é,±  
,Æ,ª,Ä,«,é BfNf%ofCfAf“fg ^fT [fo Ef,f,f<,Á,Í A,·,×,Ä,Ìf fbfZ [fW,ªfzfXfg EfRf“fsf...  
[f^ â,ÌfT [fo EfvfŒfCf,,É’—  
,ç,ê,é B,·,é,ÆfT [fo EfvfŒfCf,,Í A“K Ø,ÈfNf%ofCfAf“fg EfvfŒfCf,,Éf fbfZ [fW,ð”]‘—,·,é B «—  
^,Ìfo [fWf‡f“,ÌDirectPlay,Á,Í AfAvfŠfP [fVf‡f“ EfT [fo,ðfTf| [fg,·,é—’è,Ä, ,é B

## DirectPlayLobbyRf“f| [f|f“fg

DirectPlayLobby,Í ADirectPlayfAfvfŠfP [fVf‡f“,Æ’Ê M,·,é,½,ß,Ì A`ê”Ê“I,ÈJfXf^f€ Ef fr [ Ef\ŸfŠf...  
[fVf‡f“,Ä, ,é B’Ê í AfJfXf^f€ Ef fr [ Ef\ŸfŠf... [fVf‡f“,Í A%½Ži—

p,©,Ìf fr [ EfNf%oCfAf“fg Ef\ftfgEfFfA,ðŠÜ,ñ,Ä,¢

,é Bf fr [ EfNf%oCfAf“fg Ef\ftfgEfFfA,Íf† [fU,ÌfRf“fsf...

[f^ ã,Ä“@ i,µ Af fr [ EfT [fo [,Æ’Ê M,·,é Bf† [fU,Í Af fr [ EfNf%oCfAf“fg,“ŽÄ‘,µ,Ä,¢

,éf† [fU EfCf“f^ [ftfFfCfX,É,æ,Ä,Ä A’¼,ÌfvfœfCf,,ðœ©,Ä,¯,ÄfQ [f€ EfZfbfVf‡f“,ÈŽQ%Ä,·,é,±

,Æ,“Ä,«„é BfvfœfCf,, EfOf< [fv,“fZfbfVf‡f“,ðŠJŽn,·,é,±

,Æ,ðœ^,ß,é,Æ Af fr [ EfNf%oCfAf“fg,Í,»,é,¼,è,ÌfRf“fsf...

[f^ ã,ÄfAfvfŠfP [fVf‡f“,ðŠJŽn,µ AfT [frfX Efvf fofCf\_,Ì‘ð,âfZfbfVf‡f“,Æ,Ì Ú±,Ì,½,ß,É•K—

v,È îñ,ð’ñ•Y,·,é B DirectPlayLobby APIŠÖ ”,ð’Ê,µ,Ä Ú±,³,è AŠJŽn%Ä”\

,Æ,È,Ä,½DirectPlayfAfvfŠfP [fVf‡f“,Í Af fr [%Ä”\

,ÆEÄ,Ì,é,é B,Ü,½ ADirectPlayLobby,Í AfZfbfVf‡f“,Ì i s’†,ÉfAfvfŠfP [fVf‡f“,“f fr [ EfNf%oCfAf“fg,Æ’

Ê M,µ,½,è AfAfvfŠfP [fVf‡f“,Ì i—†,ðf fr [ EfNf%oCfAf“fg,É’m,ç,¹,é,½,ß,Ìf ffbfh,ð—p^Ó,µ,Ä,¢,é B

f fr [ EfNf%oCfAf“fg,Í AIDirectPlayLobby::EnumLocalApplicationsf ffbfh,ðŽg—p,µ,Ä Af† [fU,“Ž ,Ä,Ä,¢

,éDirectPlayfAfvfŠfP [fVf‡f“,ð”»è,·,é,±,Æ,“Ä,«„é B,Ü,½ ADirectPlayEnumerateŠÖ ”,É,æ,Ä,ÄŽg—p%Ä”\

,ÈfT [frfX Efvf fofCf\_,ð”»è,·,é,±,Æ,à,Ä,«„é Bf fr [ EfNf%oCfAf“fg,Í Af† [fU,“fZfbfVf‡f“,È%Ä,í,é,±

,Æ,ðœ^,ß A•K—

v,ÈfAfvfŠfP [fVf‡f“,ÆfT [frfX Efvf fofCf\_,Ì“Ÿ,ðŠm”F,µ,½Eä AIDirectPlayLobby::RunApplicationf ffb

fh,ð—p,¢,ÄfAfvfŠfP [fVf‡f“,ÌŠJŽn,ÆfZfbfVf‡f“,Ö,Ì Ú±,ðŽÄ s,Ä,«„é B,±

,ÌEÄ,Ñ o,µ,È,æ,Ä,Ä Af fr [ EfNf%oCfAf“fg,Í AŽÄ s,·,éfAfvfŠfP [fVf‡f“ AŽg—

p,·,éDirectPlayfT [frfX Efvf fofCf\_ AfT [frfX Efvf fofCf\_,“fZfbfVf‡f“,Æ Ú±,·,é,½,ß,É•K—

v,È îñ iIDirectPlayLobby::CreateAddress,“,æ,ÑIDirectPlayLobby::EnumAddress,ðŽg—

p,µ,Ä j Af fr [ŠÄ«„Ä,Ìf† [fU,Ì¼‘O,ðŽw’è,·,é B

DirectPlayLobby,ÌŽÄ s%Ä”\fAfvfŠfP [fVf‡f“,Ì è Š,ð‘Ä’è,µ A“K Ø,ÈfRf}

f“fhf%oCf“ EfXfCfbf“,ÄŠJŽn,·,é B,³,ç,É ADirectPlayLobby,Í A,·,×,Ä,ÌfT [frfX Efvf fofCf\_,Æ Ú± îñ,ðŠi

”[,µ,Ä,“, B

f fr [ EfNf%oCfAf“fg,ÆfAfvfŠfP [fVf‡f“,Í AIDirectPlayLobby::SendLobbyMessage,ÆIDirectPlayLobby::Rec

eiveLobbyMessagef ffbfh,ð—p,¢,Ä’Ê M,·,é,±,Æ,“Ä,«„é BIDirectPlayLobby::RunApplication

f ffbfh,É,æ,Ä,Äf fbfZ [fW,ðŽó M,·,é,Æ Af fr [ EfNf%oCfAf“fg,Ì”-

“,·,éCfxf“fg,ðfZfbfgfAfbfv,·,é BfAfvfŠfP [fVf‡f“,©,çCfxf“fg,ðfZfbfgfAfbfv,·,é,É,Í AIDirectPlayLobby::

SetLobbyMessageEventf ffbfh,ðŽg—p,·,é B,±,Ìf ffbfh,ðŽg,±,±,Æ,É,æ,è Af fr [,ÌfCfxf“fg,ð•Ì X,·,é,±

,Æ,à,Ä,«„é B

fAfvfŠfP [fVf‡f“,“f fr [%Ä”\,Ä, ,é,½,ß,É,Í AIDirectPlayLobbyfCf“f^ [ftfFfCfX,ð ì ¬,·,é•K—v,“ ,é BfAfvfŠ

fP [fVf‡f“,Í AIDirectPlayLobby::GetConnectionSettingsf ffbfh,É,æ,Ä,Äf fr [ EfNf%oCfAf“fg,“

’ñ•Y,µ,½ Ú±fpf%o [f^,ð’²,×,é,±,Æ,“Ä,«„é B,±

,è,ð•Ì X,·,é,É,Í AIDirectPlayLobby::SetConnectionSettingsf ffbfh,ðŽg—p,·,é B Ú±

,Ì Y’è,ðŽg,Ä,ÄfZfbfVf‡f“,Æ Ú±,·,é,Æ,«„Í AfAfvfŠfP [fVf‡f“,©,çIDirectPlayLobby::Connect,ðEÄ,Ñ o,· B,±

,ÌŠôf fr [ EfNf%oCfAf“fg,Í AfAfvfŠfP [fVf‡f“ŠJŽnfvf fZfX,ðŽi,·fVfXfef€ Ef fbfZ [fW,ðŽó M,·,é B

fvfœfCf,,“ ì ¬,³,è,é,Æ,« AfAfvfŠfP [fVf‡f“,Í AfvfœfCf,,—

¼ff [f^,ð iIDirectPlayLobby::GetConnectionSettings,É,æ,Ä,Ä jŽæ“¾,µ A,»,ÌfvfœfCf,,ÉŠ,,è“-,Ä,È,-

,Ä,Ì,È,ç,È,¢ BIDirectPlayLobby::ConnectEÄ,Ñ o,µ,Í i ¬E÷,·,è,Ì j A`È%°,ÌEÄ,Ñ o,µŽè ‡,ð’ä s,·,é B

1 DirectPlayEnumerate if fr [,ÌfT [frfX Efvf fofCf\_,ðŽw’è,·,é j

2 DirectPlayCreate iIDirectPlayLobby::Connect,ÍDirectPlayfIfufWfFfNfg,ð ì ¬,·,é)

3 IDirectPlay2::EnumSessions if fr [,“fZfbfVf‡f“ îñ,ðŽw’è,·,é,½,ß Af† [fU,“,»,Ì,ð,Ä,Ä,ð‘I,Ô•K—  
v,Ì,È,¢ j

4 IDirectPlay2::Open ifZfbfVf‡f“,ÍŽ©“@“I,ÉŠJŽn,³,è,é)

IDirectPlayLobby::GetConnectionSettings,“DPERR\_NOTLOBBIEDfGf%o [,ð•Ô,·,Æ,«„Í Af fr [ EfNf%oCfAf“fg,“

fAfvfŠfP [fVf‡f“ŠJŽnŽŽ,Ì %Šú%» ^— ,ð s,í,È,©,Ä,½,±,Æ,ðŽi,µ,Ä,¢,é B,±

,Ì è ‡ AfAfvfŠfP [fVf‡f“,Í A•W €“I,È DirectPlay,Ì %Šú%»,ðŽÄ s,·,é,×,«„Ä, ,é B

*fT [frfX Efvf fofCf\_*

*fT [frfX Efvf fofCf\_,Í ADirectPlay,̀—v< ,É%œž,¶ A”}·İ,É^È“¶,μ,½’Ê MfT [frfX,ð’ñ<Ÿ,·,·,é B  
flf“f%ofCf“ EfT [frfX,ðŠŸ,b,·,×,Ä,İ’g D,Í A ê—pfn [fhfEfFfA,â’Ê M”}·İ,İ,½,ß,İfT [frfX Efvf fofCf\_,ð  
—p^Ó,·,·,é,±,Æ,ª,Ä,«,é BDirectDraw,É,Í Af,ff€ŠÔ’¼ Ú Ú‘± iTAPI j AfVfŠfAf< Ú‘± AfCf“f^ [flfbfg  
TCP/IP AIPX,Æ,¢,Á,½fT [frfX Efvf fofCf\_,ªŠŸ,Ÿ,ê,Ä,¢,é B*

**DirectPlay,İŠT—v**

,±,İfZfNfVf‡f“,É,Í ADirectPlayfRf“f| [flf“fg,É,Â,¢,Ä,ì`ê”Ê“l,È î•ñ,ªŠÜ,Ü,ê,Ä,¢,é BŽŸ,İfgfsfbfN,É,Â,¢,Ä à–  
¾,.,é B

fZfbfVf‡f“ŠÇ—

fvfŒfCf„ŠÇ—

fOf< [fvŠÇ—

f fbfZ [fWŠÇ—

ff [f^ŠÇ—

fVfXfef€ Ef fbfZ [fW,İŽq—p

“Šú

DirectPlayfAfhfŒfX

DirectPlayfo [fWf‡f“ 3,Å%½,ª V,µ,,È,Á,½,©?



fZfbfVfzf“ŠÇ—

DirectPlayfZfbfVfzf“,Í A,“CEY,¢,É’Ê M,µ,Ä,¢,éfŠf, [fg EfRf“fsf... [f^ ã,ì,¢,-  
,Ä,©,ìfAfvfŠfP [fVfzf“,ìfCf“fXf^f“fX,Ä, ,é B  
fAfvfŠfP [fVfzf“,Í A’Ê Mf`ffflf<,ìfI [fvf“,ÆfNf [fY,ì,½,ß,É A DirectPlay ,ìfZfbfVfzf“ŠÇ— <@”\,ðŽg—  
p,·,é BfAfvfŠfP [fVfzf“,Í A V,µ,¢fZfbfVfzf“,ð ì ¬,·,é,©Šù“¶,ìfZfbfVfzf“,ð—  
ñ<“,µ,Ä A Ú± æ,ìfZfbfVfzf“,ðCE`è,·,é BfZfbfVfzf“,ð ì ¬,·,éfAfvfŠfP [fVfzf“,Í AfzfXfg,Æ,µ,ÄŽQ Æ,³,è,  
é B fzfXfg,ìfvf¢fCf,,ID,ÆfOf< [fvID,ðŠ,,,è—  
,Ä AfZfbfVfzf“,ÉŽQ%oÁ,·,é V,µ,¢fAfvfŠfP [fVfzf“,ð’² ®,·,é B

fAfvfŠfP [fVfzf“,Í AIDirectPlay2::EnumSessionsf f\fbfh,ð—  
p,¢ Af\fbfgf [fN ã,Ä i s’†,ì,·,×,Ä,ìŠù“¶,ìfZfbfVfzf“,ðŽæ“¾,·,é,±  
,Æ,ª,Ä,«,é B V,µ,¢fZfbfVfzf“,ð ì ¬,µ,½,è AŠù“¶,ìfZfbfVfzf“,É Ú±,·,é,É,Í A  
IDirectPlay2::Openf f\fbfh,ðŽg—p,·,é BfZfbfVfzf“,Í’í%ž,·,éDPSESSIONDESC2 \‘¢‘ì,É,æ,Á,Ä•\,³,è,é B,±  
,ì \‘¢‘ì,É,Í AfAfvfŠfP [fVfzf“CEÄ—L,ì’l,Æ AfZfbfVfzf“,ì¬¼‘O,âf\fvfVfzf“,ìfpfXf [fh AŽQ%oÁ%oÄ”\  
,Èfvf¢fCf,,,ì ”,Æ,¢,Ä,½ AfZfbfVfzf“,ì“Ä «,ªŠÜ,Ü,è,Ä,¢  
,é BfZfbfVfzf“,ðfI [fvf“,µ,½CEã,Í AfAfvfŠfP [fVfzf“,©,¢IDirectPlay2::GetCapsf f\fbfh,ðCEÄ,Ñ o,µ,Ä A’Ê  
M’¬“x,â A’¼,ìf\fbfgf [fN,âfT [frfX Efvf fofCf\_,ì“Ä «,ðŽæ“¾,·,é,±,Æ,ª,Ä,«,é B

fZfbfVfzf“,ìCE» Ý,ì“Ä «,ðŽæ“¾,·,é,É,Í AIDirectPlay2::GetSessionDescf f\fbfh,ðŽg—p,·,é B

fZfbfVfzf“,©,ç”²,¬,È,,Ä,Í,È,ç,È,¢,Æ,«,Í AIDirectPlay2::Closef f\fbfh,ð—p,¢,é,±  
,Æ,ª,Ä,«,é BfZfbfVfzf“ EfzfXfg,ªfZfbfVfzf“,©,ç”²,¬,é ê ‡ A,»,ìfZfbfVfzf“,ªDPSESSIONDESC2 \‘¢‘ì,ÉDPSE  
SSION\_MIGRATEHOSTftf%ofO,ðŽw’è,µ,ÄŠJŽn,³,è,½,à,ì,Ä, ,è,ì AfZfbfVfzf“”†,ì¼,ìfvf¢fCf,,,ì,ð,Æ,Ä,ªfzfXfg,É,  
È,è ADPSYS\_HOSTfVfXfef€ Ef fbfZ [fW,ª” s,³,è,é B

**fvfŒfCf,,ŠÇ—**

fAfvfŠfP [fVf‡f“,Í ADirectPlay,İfvfŒfCf,,ŠÇ— f f\fbfh,ðŽg—p,µ,Ä AfZfbfVf‡f““†,İfvfŒfCf,,ðŠÇ— ,·,é,±,Æ,<sup>a</sup>,Ä,«,é BfvfŒfCf,,<sup>a</sup> İ ¬,<sup>3</sup>,ê,Æ AfAfvfŠfP [fVf‡f“,İfvfŒfCf,,İ<sup>□</sup> İ,Æ <sup>3</sup>Ž@—¼ İ A,“,æ,Ñ,Œ,-,Ä,©,İ %ŠúfŠf, [fg Eff [f^,ðŽw’è,·,é,±,Æ,<sup>a</sup>,Ä,«,é i Ú ×,É,Ä,Œ,Ä,İff [f^ŠÇ—,ðŽQ Æ j B DirectPlay,İfvfŒfCf,,ÉfvfŒfCf,,ID,ðŠ,,è“—,Ä,é BfAfvfŠfP [fVf‡f“,ÆDirectPlay,İ A,±,İf† [fUID,ð—p,Œ,Äf fbfZ [fW Efgf%oftfBfbfN,İŒo~H,ðŒ^è,·,é BDirectPlay,<sup>a</sup>□ İ,â <sup>3</sup>Ž@—¼ İ,ðŽg,□,±,Æ,İ,È,Œ,<sup>a</sup> AfAfvfŠfP [fVf‡f“,İ A,»,ê,ç,ð—~—p,µ,ÄfvfŒfCf,,ðŽ~•Ê,·,é,±,Æ,<sup>a</sup>,Ä,«,é B

**İDirectPlay2::CreatePlayer,**“,æ,Ñ**İDirectPlay2::DestroyPlayer**f f\fbfh,İ AfZfbfVf‡f““†,İfvfŒfCf,,İ İ ¬,“,æ,Ñ í œ,ð s,□ BfvfŒfCf,,<sup>a</sup> İ ¬,<sup>3</sup>,ê,Æ AfAfvfŠfP [fVf‡f“,İfvfŒfCf,,İ<sup>□</sup> İ,Æ <sup>3</sup>Ž@—¼ İ A,“,æ,Ñ,Œ,Œ,©,İ %ŠúfŠf, [fg Eff [f^,ðŽw’è,·,é,±,Æ,<sup>a</sup>,Ä,«,é i Ú ×,É,Ä,Œ,Ä,İff [f^ŠÇ—,ðŽQ Æ j B DirectPlay,İfvfŒfCf,,ÉfvfŒfCf,,ID,ðŠ,,è“—,Ä,é BfAfvfŠfP [fVf‡f“,ÆDirectPlay,İ A,±,İf† [fUID,ð—p,Œ,Äf fbfZ [fW Efgf%oftfBfbfN,İŒo~H,ðŒ^è,·,é BDirectPlay,<sup>a</sup>□ İ,â <sup>3</sup>Ž@—¼ İ,ðŽg,□,±,Æ,İ,È,Œ,<sup>a</sup> AfAfvfŠfP [fVf‡f“,İ A,»,ê,ç,ð—~—p,µ,ÄfvfŒfCf,,ðŽ~•Ê,·,é,±,Æ,<sup>a</sup>,Ä,«,é B

fAfvfŠfP [fVf‡f“,Í A**İDirectPlay2::EnumPlayers**f f\fbfh,ðŽg—p,µ,Ä AŒ» Ý,İfZfbfVf‡f“,É,Œ,éfvfŒfCf,,â A,»,İ<sup>□</sup> İ,Æ <sup>3</sup>Ž@—¼ İ,ð”»’è,·,é,±,Æ,<sup>a</sup>,Ä,«,é B’Ê íAfvfŠfP [fVf‡f“,Í A**İDirectPlay2::Open**f f\fbfh,É,æ,Ä,ÄfZfbfVf‡f“,ðŠJŽn,µ,½’¼Œâ,É,±,İf f\fbfh,ðŒÄ,Ñ o,· BfZfbfVf‡f““à,İ,·,×,Ä,İfvfŒfCf,,ð—ñ“,·,é,É,Í A**İDirectPlay2::EnumPlayers**f f\fbfh,ð—~—p,·,é BfZfbfVf‡f“,Ö,İfvfŒfCf,,İ Ú‘±¬“x,É,Ä,Œ,Ä,İ î•ñ,<sup>a</sup>•K— v,ÈfAfvfŠfP [fVf‡f“,Ä,Í A**İDirectPlay2::GetPlayerCaps**f f\fbfh,ð—p,Œ,é,±,Æ,<sup>a</sup>,Ä,«,é B

fvfŒfCf,,ÉŠÖ~A•t,¬,ç,ê,½—¼‘O,ð•İ X,·,é,É,Í**İDirectPlay2::SetPlayerName**f f\fbfh,ðŽg—p,·,é B,±,İf f\fbfh,İ AfvfŒfCf,,İ—¼‘O,<sup>a</sup>•İ X,<sup>3</sup>,ê,½,±,Æ,ð’Ê’m,·,é,½,ß A¼,İfvfŒfCf,,ÖfVfXfefŒ Ef fbfZ [fW,ð’— M,·,é BŠefvfŒfCf,,İ **ADPMSG\_SETPLAYERORGROUPNAME** fVfXfefŒ Ef fbfZ [fW,©**İDirectPlay2::GetPlayerName**,É,æ,è V,µ,Œ—¼‘O,ðŽæ“¼,·,é,±,Æ,<sup>a</sup>,Ä,«,é B

fOf< [fvŠÇ—

fAfvfŠfP [fVf‡f“,Í AfOf< [fvŠÇ— f f\fbfh,É,æ,Ä,Ä AfZfbfVf‡f““†,ÉfvfŒfCf,,ÌfOf< [fv,ð ì ¬,·,é,±,Æ,ª,Ä,«,é B **IDirectPlay2::Send**f f\fbfh,ð1“xŒÄ,Ñ o,·,Æ A1“x,É,P 1,ÌfvfŒfCf,,É‘Î,µ,Ä,Ä,Í,È,-

AfOf< [fv,É‘Î,µ,Äf fbfZ [fW,ð‘— M,·,é,±,Æ,ª,Ä,«,é BfT [ftrX\_Efvf\_fofCf\_,É,æ,Ä,Ä,Í Af fbfZ [fW,ðfOf< [fv,É‘— M i”z M j,µ,½,Û,□,ª AfOf< [fv“à,ÌŒÄ•Ê,ÌfvfŒfCf,,É‘— M,·,é,æ,è,àŒø—|“I,È è ‡,ª, ,é BfOf< [fv,ðŽg—p,·,é,Æ AfvfŒfCf,,ŠÇ— ,ð’P f%»»,Ä,«,é,¾,¬,Ä,È, A’Ê Mf`ffflf< Efof“fh• ,ð ß-ñ,·,é,±,Æ,à%Â”\,Ä, ,é B

**IDirectPlay2::CreateGroup,ÆIDirectPlay2::DestroyGroup**f f\fbfh,Í AfvfŒfCf,,ÌfOf< [fv,Ì ì ¬,·,æ,Ñ í æ,ð s,□ BfOf< [fv,ª ì ¬,³,è,é,Æ AfvfŒfCf,,Ì ì ¬Žž,Æ“—l,É AfAfvfŠfP [fVf‡f“,Í□ Ì,Æ ³Ž@—¼ Ì,ðŠ,,è“-,Ä,é,±,Æ,ª,Ä,«,é BDirectPlay,ÍfOf< [fv,ÉfOf< [fvID,ðŠ,,è“-,Ä,é B %»Šú ó‘Ô,Ä,ÍfOf< [fv,Íó,Ä, ,é,ª A

**IDirectPlay2::AddPlayerToGroup,âIDirectPlay2::DeletePlayerFromGroup**f f\fbfh,É,æ,Ä,Ä AfAfvfŠfP [fVf‡f“,©,çfvfŒfCf,,Ì’Ç%»Ä,Æ í æ,ð s,□,±,Æ,ª,Ä,«,é BfOf< [fv,Ì ì ¬ AfvfŒfCf,,Ì’Ç%»Ä A, ,é,Œ,Í í æ,Ì<@”\ ,Í AfZfbfVf‡f“,Ì’è<,Ì†,Ä Ý’è,µ,½DPSESSION\_NEWPLAYERSDISABLEDftf%»fO,Ì ó‘Ô,É%»œ<¿,³,è,é,±,Æ,Í,È,Œ B

,·,Ä,É‘¶ Ý,·,éfOf< [fv,ð”»’è,·,é,½,ß,É,Í AfAfvfŠfP [fVf‡f“,©,ç**IDirectPlay2::EnumGroups**f f\fbfh,ðŽg,□,±,Æ,ª,Ä,«,é BfOf< [fv“à,ÌfvfŒfCf,,ð—ñ<“,·,é,É,Í A**IDirectPlay2::EnumGroupPlayers**f f\fbfh,ðŽg—p,·,é B

fAfvfŠfP [fVf‡f“,Í A**IDirectPlay2::SetGroupName**f f\fbfh,ð—p,Œ,ÄfOf< [fv,Ì—¼‘O,ð‘Î X,·,é,±,Æ,ª,Ä,«,é B,±,ÌŒÄ,Ñ o,µ,É,æ,Ä,Ä‘¼,ÌfvfŒfCf,,ÉfVfXfefŒ Ef fbfZ [fW,ª’Ê’m,³,è A‘¼,ÌfvfŒfCf,,Í A**IDirectPlay2::GetGroupNames**f f\fbfh,ðŽg—p,µ,Ä V,µ,Œ—¼‘O,ðŽæ“¾,·,é B

f fbZ [fWŠÇ—

f fbZ [fWŠÇ— <@”\

,Í AfAfVfŠfP [fVfzf“,É,æ,éfvfŒfCf,,ŠÖ,lf fbZ [fW,lf [fefBf“fO,ðŽx%±,·,é BfAfVfŠfP [fVfzf“,Í AfVfXfef€,·,Ä,É’è’,µ,Ä,ç,é ”,lf fbZ [fW,ð æ,« A•K—v,É%ž,¶,Ä”C^Ó,lf fbZ [fW,ð’è’,·,é,±,Æ,·,Ä,«,é BfAfVfŠfP [fVfzf“,Í**DirectPlay2::Sendf** f\fbfh,ðŽg—

p,µ,Ä AfvŒfCf,,âfOf [fv A,Ü,½,ÍfZfbfVfzf““†,ì,·,×,Ä,lfvŒfCf,,Éf fbZ [fW,ð’—,é,±,Æ,·,Ä,«,é B’—  
M æ,É,Í A,»,é,¼,é AfvŒfCf,,ID AfOf [fvID A,Ü,½,ÍDPID\_ALLPLAYERS,ðŽw’è’,·,é BDirectPlay,“—

M,Ä,«,éf fbZ [fW,ì’â,«,<sup>3</sup>,É,Í §EÄ,·,È,ç BfAfVfŠfP [fVfzf“,Í**DirectPlay2::GetCaps**,ðEÄ,Ñ o,µ,Ä A,Ð,Æ,Ä,lfpPfbbfg,Ä’— M,·,é,±,Æ,·,Ä,«,é Ä’âfOfCf ”,ðŽæ“¾,·,é,±,Æ,·,Ä,«,é B,»,é,æ,è,à’â,«,çf fbZ [fW,Í A·i ”,lfpPfbbfg,É•Š,,,µ,Ä’— M,<sup>3</sup>,é,é B

fvŒfCf,,âfOf [fv,lfOf [fof ó’Ô,·,İ X,<sup>3</sup>,é AfZfbfVfzf““†,ì’¼,ì,·,×,Ä,lfvŒfCf,,É,»,·,İ X,ð’Ê’m,µ,È,-,Ä,Í,È,ç,È,ç è ±,Í A V,µ,çff [f^,É,Ä,ç,Ä,lf fbZ [fW,ðfvŒfCf,,É’—,é,æ,è,à Aff [f^ŠÇ— ŠÖ ”,ð—~  
p,µ,½,Ü,²,·,Ö—,Ä, ,é B Ú ×,É,Ä,ç,Ä,Íff [f^ŠÇ—,ðŽQ Æ B

f fbZ [fW EfLf... [,©,çf fbZ [fW,ðŽó,~Žæ,é,É,Í A**DirectPlay2::Receivef** f\fbfh,ðŽg—

p,·,é Bf fbZ [fW,“Ä’è,lfvŒfCf,,É’—,ç,è,½,à,ì A, ,é,ç,Í“Ä’è,lfvŒfCf,,©,ç’Ê’m,<sup>3</sup>,é,½,à,ì,Ä, ,é è ± AfAfVfŠfP [fVfzf“,Í,±,lf f\fbfh,É,æ,Ä,Ä AfLf... [,ì Ä %o,lf fbZ [fW,ðŽó,~Žæ,é,©,Ç,²,©,ðŽw’è,Ä,«,é B, ,éfvŒfCf,,É’İ,µ,ÄfLf... [,É’u,©,è,Ä,ç,éf fbZ [fW,ì ”,ðŽæ“¾,·,é,É,Í A**DirectPlay2::GetMessageCountf** f\fbfh,ðŽg—p,·,é B

DirectPlay,Í AfZfbfVfzf““†,ÄN,«,<sup>½</sup>·,İ X,ðfvŒfCf,,É’Ê’m,·,éVfXfef€ Ef fbZ [fW,ð ¶ ¬,·,é B,·,×,Ä,lfVfXfef€ Ef fbZ [fW,Í ADPID\_SYSMMSG,É,æ,Ä,Ä’è’è’,<sup>3</sup>,é,é%¼’zfŒfCf,,©,ç’—

M,<sup>3</sup>,é,é BfVfXfef€ Ef fbZ [fW,Í Af fbZ [fW,lf^fCfv,ðŽ·Ê,·,é32frfbfg’l,©,çŽn,Ü,é BfVfXfef€ Ef fbZ [fW,ð·\,·,è ”,ÍDPSYS\_,ÄŽn,Ü,Ä,Ä,·,è A’İ%ž,·,éf fbZ [fW \’ç’ì,ðŠÜ,ñ,Ä,ç,é B,±

,ì \’ç’ì,Íf fbZ [fW,ð%ð“Ç,·,é,½,ß,É•K—v,Ä, ,é BfAfVfŠfP [fVfzf“,Í

**ADPSESSIONDESC2** \’ç’ì,lf%fvŒfCf,ðŽw’è,µ,Ä A ¶ ¬,<sup>3</sup>,é,éVfXfef€ Ef fbZ [fW,ð §Eä,·,é,±,Æ,·,Ä,«,é B

·Ê,lfXfŒfbfh,ðŽg—

p,µ,Äf fbZ [fW,ðŽó,~Žæ,é è ± AfAfVfŠfP [fVfzf“,Í Af fbZ [fW,ìŽó MŽž,ÉfZfbfg,<sup>3</sup>,é,é“~ŠúfCfxf“fg,ð Žw’è,·,é,±,Æ,·,Ä,«,é B

ff [f^ŠÇ—

«» Ý,ìDirectX™ 3,Ä,Í A DirectPlay,ì<@”\  
,É,æ,Ä,Ä AfAvfŠfP [fVf‡f“,^ff [f^,ðfvfœfCf,,,âfOf< [fv,ÉŠÖ~A•t,^,é,±  
,Æ,^,Ä,«,é BDirectPlay,^fvfœfCf,,,ÆfOf< [fv,ð’Ç Ö,µ,Ä,¢  
,é,½,ß AfAvfŠfP [fVf‡f“Ž© g,Í AfvfœfCf,,,âfOf< [fv î•ñ,ð•ÛŽ ,·,é,½,ß,ìfŠfXfgŠÇ— ,ðŽÀ‘•,·,é•K—  
v,^,É,¢ B,³,ç,É ADirectPlay,É,æ,Ä,Ä AfAvfŠfP [fVf‡f“,Íf [fJf<,“,æ,ÑfŠf, [fg,ìŽžì—  
b,ì î•ñ,ðŠi”[,Ä,«,é Bf [fJf< Eff [f^,Í A,»,ê,ðfZfbfg,·,éflfufWfFfNfg,¾,^,Žg—p‰Ä”\,Ä, ,é B,±  
,ê,É’Î,µ,ÄfŠf, [fg Eff [f^,Í AfZfbfVf‡f“”†,ì,»,ê,¼,ê,ìfRf“fsf... [f^,É’Ê’m,³,ê,é B,±  
,ìœ‰‰Ê AfŠf, [fg Eff [f^,Í,·,×,Ä,ìfŠf, [fg EfRf“fsf... [f^ŠÖ,ì<□—Lf f,fŠ,Æ,È,é B,Ü,è•Î X,³,ê,é,±  
,Æ,^,È, A,·,×,Ä,ìfRf“fsf... [f^,^AfNfZfX,·,é•K—v,^, ,éff [f^,ðŠi”[,·,é,Æ,«,Í AfŠf, [fg Eff [f^,ð—  
p,·,é,×,«,Ä, ,é B¼,ìfRf“fsf... [f^,©,çfAfNfZfX,·,é•K—v,^,È,¢ff [f^,ð•ÛŽ ,·,é,É,Í Af [fJf< Eff [f^,ðŽg,□  
,×,«,Ä, ,é B

fAfvfŠfP [fVf‡f“,Í AIDirectPlay2::SetPlayerData f f\fbfh,ð—p,¢,Äff [f^,ðfvfœfCf,,,É Ý’è,·,é,±  
,Æ,^,Ä,«,é B“K Ø,Èftf‰ofO,ð“n,µ,ÄœÄ,Ñ o,·,±,Æ,É,æ,è Aff [f^,^f [fJf<,Ä, ,é,©fŠf, [fg,Ä, ,é,©,ðŽw’è,·,é,±  
,Æ,^,Ä,«,é Bff [f^,^fŠf, [fg,Ä, ,é,Î A•Û Ø•t,«,ìf fbZ [fW,ðŽg,Ä,Äff [f^,ð“”B,·,é,© A—  
³•Û Ø,ìf fbZ [fW,ðŽg,□,©,ðŽw’è,·,é,±  
,Æ,à,Ä,«,é BfvfœfCf,,,ìff [f^,ðŽæ“¾,·,é,É,Í AIDirectPlay2::GetPlayerData f f\fbfh,ðŽg—p,·,é B,±  
,ì,Æ,« A,à,□1“x Af [fJf< Eff [f^,ÆfŠf, [fg Eff [f^,ì,Ç,¿,ç,ðŽó, Žæ,é,©,ðŽw’è,·,é B“—  
l,É AfOf< [fv Eff [f^,É,Ä,¢,Ä,Í AIDirectPlay2::SetGroupData,ÆIDirectPlay2::GetGroupData f f\fbfh,ðŽg,□,±  
,Æ,^,Ä,«,é B

*fVfXfef€ Ef fbfZ [fW,İŽg—p*

**IDirectPlay2::Receive** *f\fbfh,ª•Ô,· AfvfƎfCf„ID,âDPID\_SYSMMSG,©,ç,İf fbfZ [fW,Í AfVfXfef€ Ef fbfZ [fW,Â, ,é B,·,×,Ä,İfVfXfef€ Ef fbfZ [fW,Í AdwType,É,æ,Ä,ÄŽ',³,ê,éf\_fuf<f [fh'l,ÄŽn,Ü,Ä,Ä,¢ ,é BIDirectPlay2::Receive f\fbfh,É,æ,Ä,Ä•Ô,³,ê,½fofbftf@,Í A”Ä— pf fbfZ [fW **DPMSG\_GENERIC** j,ÉfLfffXfg,µ,Ä ADPSYS\_fvfƎftfBfNfX,ÄŽn,Ü,éf fbfZ [fW,İ,Ð,Æ,Ä,Æ “™,µ,¢'l,İdwType—v'f,ð—LƎø,É,·,é,± ,Æ,ª,Ä,« ,é BfAfvfŠfP [fVf‡f“,Í AfVfXfef€ Ef fbfZ [fW,ðŽ~•Ê,µ,½,ç Aff [f^,ð“Ç,Ý o,·,½,ß,É iDPMSG\_fvfƎftfBfNfX,ÄŽn,Ü,é j“K Ø,È \¢'İ,Éfofbftf@,ðfLfffXfg,·,é,×,« ,Ä, ,é B*

*fAfvfŠfP [fVf‡f“,Í A`È%º,İfVfXfef€ Ef fbfZ [fW,İ ^— ,ð—p^Ó,µ,È,,Ä,Í,È,ç,È,¢ B*

<b>dwType,İ'l</b>	<i>f fbfZ [fW \¢'İ</i>
DPSYS_ADDPLAYERTOGROUP	<u><b>DPMSG_ADDPLAYERTOGROUP</b></u>
DPSYS_CREATEPLAYERORGROUP	<u><b>DPMSG_CREATEPLAYERORGROUP</b></u>
DPSYS_DELETEPLAYERFROMGROUP	<u><b>DPMSG_DELETEPLAYERFROMGROUP</b></u>
DPSYS_DESTROYPLAYERORGROUP	<u><b>DPMSG_DESTROYPLAYERORGROUP</b></u>
DPSYS_HOST	<u><b>DPMSG_HOST</b></u>
DPSYS_SESSIONLOST	<u><b>DPMSG_SESSIONLOST</b></u>
DPSYS_SETPLAYERORGROUPDATA	<u><b>DPMSG_SETPLAYERORGROUPDATA</b></u>
DPSYS_SETPLAYERORGROUPNAME	<u><b>DPMSG_SETPLAYERORGROUPNAME</b></u>

**IDirectPlayLobby::ReceiveLobbyMessage** *f\fbfh,ª•Ô,· fbfZ [fW,İ,□ ,ç AdwFlagsfpf%of [f^,ÉDPLAD\_SYSTEM,ª Y'è,³,ê,Ä,¢,é,à,İ,Í AfVfXfef€ Ef fbfZ [fW,Â, ,é B,·,×,Ä,İfVfXfef€ Ef fbfZ [fW,ÍdwType,É,æ,Ä,ÄŽ',³,ê,éf\_fuf<f [fh'l,ÄŽn,Ü,Ä,Ä,¢ ,é BIDirectPlayLobby::ReceiveLobbyMessage,ª•Ô,·fofbftf@,Í A”Ä— pf fbfZ [fW **DPLMSG\_GENERIC** j,ÉfLfffXfg,µ,Ä ADPLSYS\_fvfƎftfBfNfX,ÄŽn,Ü,éf fbfZ [fW,İ,Ð,Æ,Ä,Æ “™,µ,¢'l,İdwType—v'f,ð—LƎø,É,·,é,±,Æ,ª,Ä,« ,é B*

“Šú

DirectPlay,Í AfAfvfŠfP [fVf‡f“,ì“Šú,É,Â,¢,Ä,íê”Ê“l,È•û—@,ð’ñ<Ÿ,µ,Ä,¢  
,È,¢ B’ñ<Ÿ,µ,½ ê ‡,Í AfAfvfŠfP [fVf‡f“”Ê Mfpf%of\_fCf€,É §ÆÀ,ð—^,!,Ä,µ,Ü,¤,É^á,¢  
,È,¢ B,µ,©,µ AfVfXfef€,É,Í A,±,ê,¢,lf^fXfN,ðŽx%o‡,·,é,½,ß,É ÝÆv,<sup>3</sup>,ê,½,¢,,Ä,©,lfT [frfX,<sup>a</sup>ŠÜ,Ü,ê,Ä,¢  
,é B,½,Æ,,!,Í AfAfvfŠfP [fVf‡f“,<sup>a</sup>fvfÆfCf,,,ð ì ¬,µ,½,Æ,«,Í A’Ê’mfCfxf“fg,ðŽw’è,·,é,±  
,Æ,<sup>a</sup>,Ä,«,é B,»,ê,©,çWin32®,lWaitForSingleObjectŠÖ ”,ðŽg—p,µ,Ä Af fbfZ [fW,<sup>a</sup> ^— ’†,Ä, ,é,©,Ç,¤  
,©,ð’m,é,±,Æ,<sup>a</sup>,Ä,«,é B

## DirectPlayfAfhfŒfX

,±,lfZfNfVf‡f“,l î•ñ,Í ADirectPlayLobbyfNf%oCfAf“fg,ìŠJ”ŽÒ,ì,½,B,ì,à,ì,Ä, ,è A`ê”Ê“l,ÈfAfvfŠfP [fVf‡f“ŠJ”-ŽÒ,É,ÍŠÖEW,ì,È,¢ î•ñ,àŠÜ,Ü,ê,Ä,¢,é B

DirectPlay,Í Aflfbfgf [fN EfAfhfŒfX Eff [f^,ðfJfvfZf<%o»,·,é,±,Æ,ª,Ä,«,é B  
DirectPlay,É,Í ADirectPlayfZfbfVf‡f“,Æ,ì Ú±,É•K—v,È,·,×,Ä,ì î•ñ,ªŠÜ,Ü,ê,Ä,¢,é B,±,ì î•ñ,ì-Ú“l,Í Aft [fU,É î•ñ,ì“ü—Í,ð‘£,·f\_CfAf fO Ef{fbfNfX,ì•Ž!,ð s,ª,æ,ª,ÈfT [frfX Efvf fofCf\_,ð—p,¹, AfAfvfŠfP [fVf‡f“,©,çfZfbfVf‡f“,É Ú±,Ä,«,é,æ,ª,É,·,é,±,Æ,É, ,é B’Ê ifT [frfX Efvf fofCf\_,Í Aft [fU,©,ç î•ñ,ð“¼,é,½,B,Éf\_CfAf fO Ef{fbfNfX,ð•Ž!,·,é,ª AŠ@‘S,ÈDirectPlayfAfhfŒfX,ð’ñ<Ÿ,·,é,±,Æ,É,æ,Ä,Ä A,±,lf\_CfAf fO,ð%oñ”ð,·,é,±,Æ,ª,Ä,«,é B

DirectPlayfAfhfŒfX,ìftfH [f}fbfg,Í AfŠf\ [fXŒðŠ·ftf@fCf<Œ`Ž® iRIFf j,ÉŽ—,Ä,¢,é B,±,ê,Îê~A,Ìf`fff“fN,Ä \ ¬,³,ê,Ä,¢,é B,»,ê,¼,ê,Ìf`fff“fN,Í AZŸ,Ì—v‘f,©,ç ¬,è—\$,Ä,Ä,¢,é B

f`fff“fN,ªŠÜ,bff [f^,lf^fCfv,ðŽ!,·fOf [fof< Eftfj [fNŽ~•ÊŽq iGUID j  
ff [f^ EftfCY  
ff [f^ EftfB [f<fh

DirectPlay,Ä,Í A`È%°,lf`fff“fNŽ~•ÊŽq,ª`è<³,ê,Ä,¢,é B

## GUID

ff [f^,lf^fCfv

DPAID\_ComPort

DPCOMPORTADDRESS \‘¢‘l BŽŸ,ì—v‘f,ðŽw’è,·,é B

Žg—p,·,éCOMf [fg i1-4 j  
f{ [fŒ [fg i100-256k j  
fXfgfbfv Efrfbfg’· i1-2 j  
fpfŠfefB i0—³,µ A1-Ši ” A2-«ô ” A3-f}  
[fN j  
ftf [ \$Œä i0—³,µ A1-xon/xoff A2-RTS A3-DTR A4-RTS/DTR j

DPAID\_Inet

"xxx.xxx.xxx.xxx" ‘Ž®,lIPfAfhfŒfX,Ü,½,Í"dplay.mi  
crosoft.com",l,æ,ª,ÈfT [fo [-¼,ð•\,· ASCII•¶Žš—ñ B

DPAID\_Phone

“d`b”Ô †,l ,lŒ...,ð•\,µ,Ä,¢,é ASCII•¶Žš—ñ B

DPAID\_ServiceProvider

,±,lfAfhfŒfX,ª l,ç,ê,½fT [frfX Efvf fofCf\_,l16f ofCfg,ìGUID B,¢,-,Ä,©,ÎÜ,È,éfT [frfX Efvf fofCf\_,ª““,¶lf^fCfv,ì flfbfgf [fN EfAfhfŒfX,ðŽg,ª,±,Æ,ª,Ä,«,é,½,B A,±,lf`fff“fN,Í³Ž<³,ê,é,±,Æ,ª,Ä,«,é B

f`fff“fN Ž~•ÊŽq,Í16f ofCfg,ìGUID ,Ä, ,é B



**DirectPlayfo** [fWfzf“ 3,Ä%½,ª V,µ,,È,Ä,½,©?

DirectPlayfo [fWfzf“3 API

,Í A`È'O,Ìfo [fWfzf“,ÌDirectPlay,Ä ' ,©,ê,½,Ç,ñ,ÈfAfvfŠfP [fVfzf“,Æ,àŠ@‘S,ÉŒÝŠ· «,ª ,é B,Ä,Ü,è AfR [fh ,É%½,Ì·Í X,à%Ä,!,,,É ADirectX 3 SDK,ÌDirectPley,ð—p,Ç,ÄfAfvfŠfP [fVfzf“,ð ÄfRf“fpfCfç,·,é,± ,Æ,ª,Ä,«,é BDirectX 3 SDK,ªñ·ÿ,·,éDirectPlay,Í A`È'O,Ìfo [fWfzf“,ÌDirectPlay,Ì,·,×,Ä,ÌAPI,Æ“@ ì,ðfTf| [fg,·,é B

DirectPlay 3,ÌDLL,Ì—¼'O,ÍŒfo [fWfzf“,Æ`Ü,È,Ä,Ä,Ç,é,½,ß ADirectX

2`È'O,Ìfo [fWfzf“,ÄfRf“fpfCfç,ª,½fAfvfŠfP [fVfzf“,Í A V,µ,ÇDirectPlay DLL,ðŽg—p,µ,È,Ç B V,µ,ÇDLL,ð —p,·,é,È,Í AfAfvfŠfP [fVfzf“,ð ÄfRf“fpfCfç,µ ADplayx.libfCf“f| [fg Ef%ofCfuf%ofŠ,ÆfŠf“fN,µ,È,- ,Ä,Í,È,ç,È,Ç B

V,µ,ÇIDirectPlay2, ,é,Ç,ÍIDirectPlay2AfCf“f^ [ftfFfCfX,ðŽg— p,µ,ÄfAfvfŠfP [fVfzf“,ðfAfbfvff [fg,µ Af fr [%Ä““,ÈfAfvfŠfP [fVfzf“,ð ì ¬,·,é,½,ß,É•K— v,ÈfR [fh,ð'Ç%Ä,·,é,±,Æ,ª Aç, „ S,ª,È,Ä,Ç,é B,±,è,È,æ,Ä,Ä AŠO•“,Ìf fr [, ,é,Ç,Íf fr [ Efvf fOf%ofŒ ,ªfAfvfŠfP [fVfzf“,ðŠJŽn,µ AfZfbfVfzf“,Æ Ú±,·,é,½,ß,É•K—v,È,·,×,Ä,Ì îñ,ð'ñ·ÿ,·,é,± ,Æ,ª,Ä,«,é BfAfvfŠfP [fVfzf“,Í AfT [frfX Efvf fofCf\_,ÌŒ`è,âfZfbfVfzf“,ÌT'ð A,»,ì¼,Ì îñ i“d`b”Ô †,âf lfbf g [fN EfAfhfŒfX,È,Ç j,Ìñ·ÿ,Ì,½,ß,É Af† [fU,É-â,Ç ç,ì,¹,ð,·,é•K—v,ª,È,Ç B

DirectPlay,É,Í A,±,Ì,Ü,©,Ì V,µ,Çç@““,ª,Ç,,Ä,©'Ç%Ä,ª,È,Ä,Ç,é B

fCf“f^ [flfbfg EfTf| [fg B

¼ ÚfVfŠfAfç Ú± B

,æ,è ,Ç`Ä`è «,Æç x « B

ñ`æ'Î%ž,ð,æ,èfTf| [fg,·,é,½,ß,É AUnicode,ÌfTf| [fg B

fzfXfg,ÌÚ s B,à,µfZfbfVfzf“,ÌfzfXfg,ªfZfbfVfzf“,©,ç”²,—é ê ± AfzfXfg,Ì Ó± ,Ì·È,ÌfvfŒfCfç,,É“ñ,ª,È,é BDirectPlayfo [fWfzf“2,Ä,Í AfzfXfg ifl [fŒ EfT [fo j,ªfZfbfVfzf“,©,ç”²,—½ ê ± A V,µ,ÇfvfŒfCfç,,ð ì ¬,·,é,±,Æ,ª,Ä,«,È,©,Ä,½ B

fAfvfŠfP [fVfzf“,Ìf fr [ Efvf fOf%ofŒ,Æ,Ì`È Mç@““ B,±,è,È,æ,Ä,Ä A %Šú ó'Ô,É,Ä,Ç ,Ä,Ì îñ,ðŽð,—Zæ,Ä,½,è AfQ [fŒ,Ì ó'Ô,ð X V,·,é,±,Æ,ª,Ä,«,é B

1`ä,ÌfRf“fsf... [f^,Ì ä,Ä·j ”,ÌfAfvfŠfP [fVfzf“ EfZfbfVfzf“,ªfzfXfg,ð±,ß,é“—Í B

šf, [fg EfRf“fsf... [f^,Ì Ú±,Ì Ø'f,ð”»è,µ A“K Ø,Èf fbfZ [fW,ð ¶ ¬,·,é“—Í B

,Ü,½ A`È MŠÇ— ,Ì,½,ß,ÌfR [fh,Ì—È,ðŒ,ç,·,½,ß AŽÿ,Ì,æ,ð,Èç@““,DirectPlay 3,É'Ç%Ä,ª,È,Ä,Ç,é B

fAfvfŠfP [fVfzf“ŒÄ—L,Ìff [f^,ðDirectPlayfOfç [fvID,âfvfŒfCfç,,ID,ÆŠÖ`A·t,—éç@““ B,± ,è,È,æ,Ä,ÄfAfvfŠfP [fVfzf“,Í ADirectPlay,Ì1•“,Ä, ,éfvfŒfCfç,,âfOfç [fv,ÌšfXfgŠÇ— fR [fh,ðŠg'Œ,·,é,± ,Æ,ª,Ä,«,é Bf [fJfç Eff [f^,Æ,Í AfvfŒfCfç,,ð·,·fRfbfgf}fbfv,Ì,æ,ð ,È Af [fJfç EfAfvfŠfP [fVfzf“,ª¼ ÚŽg—p,·,éff [f^,Ä, ,é Bf [fJfç Eff [f^,flfbfgf [fN ä,É— M,ª,è,é,±,Æ,Ì,È,Ç BfŠf, [fg Eff [f^,Í AfvfŒfCfç,, ,é,Ç ,ÌfOfç [fv,ÈŠÖ`A·t,—ç,è,é BfŠf, [fg Eff [f^,É%Ä,!,ç,ê,½·Í X,Í ADirectPlay,É,æ,Ä,Ä AfZfbfVfzf“†,Ì¼,Ì ,·,×,Ä,ÌfAfvfŠfP [fVfzf“,É`È'm,ª,è,é BfŠf, [fg Eff [f^,Í AfvfŒfCfç,,Ì`È'u,âŒü,« A`¬,ª,Ì,æ,ð ,È AfZfbfVfzf“†,Ì,·,×,Ä,ÌfAfvfŠfP [fVfzf“ŠÖ,Äç—L,ª,è,È,,Ä,Í,È,ç,È,Ç,à,Ì,Ä, ,é B,± ,Ìff [f^,Ì“`B,ÉDirectPlay,ðŽg—p,·,é,Í AfAfvfŠfP [fVfzf“,ª îñ,Ì—Žó M,Ì,½,ß,Ì`È`A,Ìf f\fbfh,ð—p,Ç ,Äff [f^,ðŠÇ— ,·,é•K—v,Í,È,,È,é B

fAfvfŠfP [fVfzf“,ªfOfç [fv,É—¼'O,ðŠÖ`A·t,—éç@““ B,±,è,Íf` [fŒçZ,É-ð—§,Ä B

DirectPlay 3,Ì Vç@““,Ì,ð,ç,Ì,Ç,,Ä,©,Í AfAfvfŠfP [fVfzf“,Æ,Í¼ ÚŠÖŒEW,ª,È,Ç,à,Ì,Ä, ,é B

f fr [ EfNf%ofCfAf“fg Ef\ftfgfEfFfA,ªf fr [%Ä““,ÈDirectPlayfAfvfŠfP [fVfzf“,ÌŠJŽn,ä Ú±,ÉŽg— p,·,éAPI B,Ü,½ AfZfbfVfzf“,ÌŠÖ,ÈfAfvfŠfP [fVfzf“,Æf fr [,ª îñ,ðŒðŠ·,Ä,«,é,æ,ð,É,·,éAPI,àŠÜ,Ü,è,Ä,Ç ,é B

fT [frfX Efvf fofCf\_ŠJ”-

fLfbfg B“ÆŽ©,ÌfT [frfX Efvf fofCf\_,ð ì ¬,·,é,½,ß,Ì·¶ ‘,ÆfTf“fvfçfR [fh,ªŠÜ,Ü,è,Ä,Ç,é B

,±,ÌfZfNfVfzf“,Ä,Í ADirectPlay 3,Ì V,µ,Çf f\fbfh AIDirectPlay2fCf“f^ [ftfFfCfX,É`Ú s,·,é,½,ß,É•K— v,ÈŽè ± AfAfbfvff [fg,ª,È,½DirectPlay,Ìç@““,ÉfAfNfZfX,·,éü-@,É,Ä,Ç,Ä -

¾,·,é B`È%º,ÌfgfsfbfN,ªŠÜ,Ü,è,Ä,Ç,é B

V,µ,ÇDirectPlay 3f f\fbfh

*IDirectPlay2fCf“f^ [ftfEfCfX,Ö,ìÚ s*

V,µ,¢DirectPlay 3f f\fbfh

DirectPlayfo [fWf‡f“3,Í A^È%º,Ì V,µ,¢f f\fbfh,ðfTf| [fg,·,é B

IDirectPlay2::SetGroupData,“,æ,ÑIDirectPlay2::GetGroupData

fAfvfŠfP [fVf‡f“ĈĀ—

L,Ìff [f^,ðDirectPlayfOf< [fvID,ÆŠÖ~A•t,¯,é BfAfvfŠfP [fVf‡f“ Ef [fJf<,É,à AfŠf, [fg Eff [f^ EfX  
fy [fX,É,àŠÖ~A•t,¯,é,±,Æ,<sup>a</sup>Ā,«,«,é B

IDirectPlay2::SetGroupName,“,æ,ÑIDirectPlay2::GetGroupName

—¼‘O,ðfOf< [fv,ÉŠÖ~A•t,¯,é B

IDirectPlay2::SetPlayerData,“,æ,ÑIDirectPlay2::GetPlayerData

fAfvfŠfP [fVf‡f“ĈĀ—

L,Ìff [f^,ðDirectPlayfvfĈfCf,,ID,ÆŠÖ~A•t,¯,é BfAfvfŠfP [fVf‡f“ Ef [fJf<,É,à AfŠf, [fg Eff [f^ EfX  
fy [fX,É,àŠÖ~A•t,¯,é,±,Æ,<sup>a</sup>Ā,«,«,é B

IDirectPlay2::GetSessionDesc

fZfbfVf‡f“,Ì i s’t,ÉfZfbfVf‡f“,Ì“Á «,ðŽæ“¾,·,é B

**IDirectPlay2fCf**“f^ [ftFfCfX,Ö,İÚ s

fAfvfŠfP [fVf‡f“,đIDirectPlay2fCf“f^ [ftFfCfX,ÉÚ s,·,é,É,İ AŽŸ,İfXfefbfv,đŽÀ s,·,é•K—v,ª,·,é B

- 1 fAfvfŠfP [fVf‡f“,ªf fr [ EfNf%ofCfAf“fg,©,ç,N“@,³,ê,½,©,Ç,ª,©,đ²,×,é B Ú ×,É,Â,¢  
,Ä,İ ADirectPlayf^f... [fgfŠfAfç,İ uStep 2: Ú“+ŠÄ«„İŽæ“¾ v,đŽQ Æ,³,ê,½,¢ B
- 2 fAfvfŠfP [fVf‡f“,ªfT [frfX Efvf fofCf\_,đ—ñ“,µ,Ä,¢  
,é ê ‡,İ A**DirectPlayEnumerate**fR [fçfobfNŠÖ ”,đ—p,¢,Ä AfT [frfX Efvf fofCf\_,ªŽg—p%oÄ”\,©,Ç,ª  
,©,đ²»“è,·,é BŽg—p%oÄ”\,Ä,·,ê,İ A,»,İfT [frfX Efvf fofCf\_,É,Ä,¢  
,Ä**DirectPlayCreate**ŠÖ ”,đÆÄ,Ň o,· B**DirectPlayEnumerate**fR [fçfobfNŠÖ ”,ªfGf%o [,đ•Ö,µ,½,Æ,«„İ A,»,İ  
fT [frfX Efvf fofCf\_,đfVfXfe€ ä,ÄŽÀ s,·,é,±,Æ,İ,Ä,«„É,¢,İ,Ä Af† [fU,É•Ž!,·,éfŠfXfg,É’Ç%oÄ,µ,É,¢  
,æ,ª,É,·,é BÆÄ,Ň o,µ,ª ÑÆ÷,·,é,İ A**Release**f f\bfh,đŽg—  
p,µ,ÄDirectPlayfIfufWfFfNfg,đ%ođ•ú,µ A,»,İfT [frfX Efvf fofCf\_,đfŠfXfg,É’Ç%oÄ,·,é B

3

IDirectPlay2 iUnicode j,â**IDirectPlay2A** iANSI jfCf“f^ [ftFfCfX,đŽæ“¾,·,é,É,İ A**IDirectPlay**fCf“f^ [ftFfCfX,İ**QueryInterface**f f\bfh,đÆÄ,Ň o,· B,±,ê,ç,Ó,½,Ä,İfCf“f^ [ftFfCfX,İ—B^ê,İā,¢,İ A \‘ç‘İ,É,“,·,é•Žš—  
ñ,İ“Ç,Ÿ ‘,«„İû—@,Ä,·,é BUnicodefCf“f^ [ftFfCfX,Ä,İ **ALPWSTR**Æ^,İ \‘ç‘İf f“fo,ÉUnicode•Žš—  
ñ,“Ç,Ÿ ‘,«„³,ê,é BANSIfCf“f^ [ftFfCfX,Ä,İ **ALPSTR**Æ^,İ \‘ç‘İf f“fo,ÉANSI•Žš—ñ,“Ç,Ÿ ‘,«„³,ê,é B

- 4 Šù“Ÿ,İAPI,Ä V,µ,¢ \‘ç‘İ,đŽg,ª,½,ß,É•K—v,È A,·,×,Ä,İ•İ X,đ s,ª B,½,Æ,İ,İ AŽŸ,İfR [fh,İā,İ,é,É A  
lpDP->SetPlayerName(pidPlayer, lpzFriendlyName, lpzFormalName)

lpDP,ª**IDirectPlay**fCf“f^ [ftFfCfX,Ä,·,é,È,ç A^È%o,İ,æ,ª,É,·,é B

DPNAME PlayerName, \*lpPlayerName;  
PlayerName.dwSize = sizeof(DPNAME);  
lpPlayerName = &PlayerName;

lpPayerName->lpzShortNameA = lpzFriendlyName;  
lpPlayerName->lpzLongNameA = lpzFormalName;  
lpDP2A->SetPlayerName(pidPlayer, lpPlayerName, 0)

lpDP2,İ**IDirectPlay2AfCf**“f^ [ftFfCfX,Ä,·,é B fAfvfŠfP [fVf‡f“,ªUnicode•Žš—ñ,đŽg—  
p,·,é i,µ,½,ª,Ä,Ä**IDirectPlay2fCf**“f^ [ftFfCfX,İfCf“fXf^f“fX,đ i ¬,·,é j ê ‡,İ AŽŸ,İ,æ,ª,É,·,é B

lpPayerName->lpzShortName = lpwszFriendlyName;  
lpPlayerName->lpzLongName = lpwszFormalName;  
lpDP2->SetPlayerName(pidPlayer, lpPlayerName, 0)

lpDP2,İ**IDirectPlay2fCf**“f^ [ftFfCfX,Ä,·,é B

- 5 ŽŸ,İfVfXfe€ Ef fbfZ [fW,đ X V,·,é B  
DPSYS\_ADDPLAYER,İDPSYS\_CREATEPLAYERORGROUP,É•İ X,³,ê,½ B  
DPSYS\_DELETEPLAYER,ÆDPSYS\_DELETEGROUP,İ A,Đ,Æ,Ä,İDPSYS\_DESTROYPLAYERORGROUP  
f fbfZ [fW,É“ ‡,³,ê,½ B  
DPSYS\_DELETEPLAYERFROMGRP,İDPSYS\_DELETEPLAYERFROMGROUP,É•İ X,³,ê,½ B

- 6 fvfÆfCf,,âfOfç [fv—¼,ª•İ X,³,ê,½,Æ,« ADPSYS\_SETPLAYERORGROUPNAMEf fbfZ [fW,đ” s,·,é,æ,ª  
,ÉfAfvfŠfP [fVf‡f“,đ X V,·,é B,Ü,½ AfvfÆfCf,,âfOfç [fv Eff [f^,ª•İ X,³,ê,½,Æ,«„É,İ ADPSYS\_SETP  
LAYERORGROUPDATAf fbfZ [fW,đ Ÿ ¬,·,é,æ,ª,É,·,é B

- 7 **DPSESSIONDESC** \‘ç‘İ,đ**DPSESSIONDESC2** \‘ç‘İ,É X V,µ **ADPCAPS** \‘ç‘İ,É V,µ,¢f f“fo,đ’Ç%oÄ,·,é B

8

IDirectPlay2::EnumSessions A**IDirectPlay2::EnumGroups** A**IDirectPlay2::EnumGroupPlayers** A,·,æ,Ň**IDirectPla**  
**y2::EnumPlayers**,İfR [fçfobfNŠÖ ”,đ X V,·,é B

9

**IDirectPlay2::CreatePlayer**f f\bfh,Ö,İbEventfpf%of [f^,İ“n,µ•û,đ C ³,·,é B^È•O,İfo [fWf‡f“,İDirectPlay,Ä,  
İ A,±,İfpf%of [f^,İlpEvent,Ä,·,Ä,½ B,±  
,İfo [fWf‡f“,İDirectPlay,İfCfxf“fg,đ•Ö,³,È,¢ B,»,İā,İ,è AfAfvfŠfP [fVf‡f“,ªfCfxf“fg,đ i ¬,µ,È,-

,Ä,Í,È,Ç,È,Ç B,±  
,ê,É,æ,Ä,ÄfAfVfŠfP [fVf‡f“,ì \_“î «,ª•Û,½,ê A,·,×,Ä,lfvfŒfCf,,É‘Í,·,é,D,Æ,Ä,lfCfxf“fg,ð ì ¬,·,é,±  
,Æ,ª,Ä,«,é B

10 fvfŒfCf,,ªfQ [f€ ,ð` ï í I—¹,µ,½,±,Æ,ðDirectPlay,ÉŒÿ o,³,¹,é•K—v,ª ,éfAfVfŠfP [fVf‡f“,Ä,Í  
ADPSESSIONDESC2 \‘ç‘ì,ÉDPSESSION\_KEEPLIVEftf%oO,ðfZfbfg,·,é B

11 fZfbfVf‡f“,ð ì ¬,·,é Û ADPSESSION\_MIGRATEHOSTftf%oO,ð Ý‘è,·,é,æ,□  
,ÉfAfVfŠfP [fVf‡f“,ð X V,·,é B,±,ê,É,æ,Ä,Ä AŒ» Ý,lfzfXfg,ªfZfbfVf‡f“,ð”²,¬,Ä,à A•Ê,lfRf“fsf...  
[f^,ªfzfXfg,É,È,é,±,Æ,ª,Ä,«,é BfzfXfg,ðN“@,·,é,½,ß,ì“Á•Ê,ÈfR [fh,ð‘è` ,µ,Ä,Ç  
,é ê ‡,Í AfZfbfVf‡f“,ì ì ¬Žž,É,±  
,lf tf%oO,ðfZfbfg,µ A,³,ç,É ADPSYS\_HOSTfVfXfef€ Ef fbfZ [fW,lfTf] [fg,ð‘Ç%oÁ,·,é,×,«,Ä, ,é BfVfXf  
ef€ Ef fbfZ [fW,lfŠfXfg,É,Ä,Ç,Ä,Í A ufVfXfef€ Ef fbfZ [fW,lfŽg—p v,ðŽQ Æ,³,ê,½,Ç B

12 IDirectPlay2fCf“f^ [ftfFfCfX,ì V,µ,Çf ffbfh,ð,æ,— %oð,µ,Äžg—p,·,é,±  
,Æ B“Á,È AIDirectPlay2::SetPlayerData,ÆIDirectPlay2::GetPlayerData ffbfh,É,Í’ ^Ó,ª•K—v,Ä, ,é BfvfŒf  
Cf,,ì ó‘Ô,ð‘¼,ì,·,×,Ä,lfvfŒfCf,,Éfuf [fhfLfffXfg,·,éfR [fh,Í AIDirectPlay2::Send,ÆIDirectPlay2::Receive  
f ffbfh,ð—p,Ç,Ä ‘,«Š,·,é,±,Æ,ª,Ä,«,é,Ä, ,ë,□ B

**DirectPlayfCf“f^ [ftfFfCfX,İŠT—v**

DirectPlay,Í AfRf“f| [flf“fg EfIfufWfFfNfg Ef,fff< iCOM j,ÉŠİ,Ä,¢  
,½fIfufWfFfNfg,ÆfCf“f^ [ftfFfCfX,Ä \ ¬,³,ê,Ä,¢,é BCOM,Í AfCf“f^ [ftfFfCfX,İ Ä—~—p,É Ä“\_,ð“—  
,Ä,½fIfufWfFfNfgfx [fX EfVfXfef€,İŠİ‘b,Ä, ,è AOLEfvf fOf%of~f“fO,İ‘+ Sf,fff<,Ä, ,é B,Ü,½ A”CˆÓ,İ ”,İ  
fCf“f^ [ftfFfCfX,ð \‘z,·,é,±,Æ,ª,Ä,«,éŽd—l,É,È,Ä,Ä,¢,é B

ˆÈ‘O,İfo [fWf±f“,İDirectX,Ä,Í ADirectPlayIfufWfFfNfg,İ,½,¾,Đ,Æ,Ä,İfCf“f^ [ftfFfCfX AIDirectPlay,¾,¯,Ä \  
¬,³,ê,Ä,¢,½ B ;%ñ ADirectPlay,Í A,æ,è‘½—l,È’Ê M•û—@,Ö,İ,æ,è—Ç,¢fAfNfZfX,ð’ñ<Ÿ,·,é V,µ,¢<@”\  
,ª’Ç%Á,³,ê AŠg’£,³,ê,Ä,¢,é BUnicode,ÆANSI•¶Žš—ñ,İfTf|  
[fg Af fr [ EfT [frfX,İ ì ¬,ì,½,ß,İfuf fbfN \‘z,İfTf|  
[fg,È,Ç A V,µ,¢fCf“f^ [ftfFfCfX,ªDirectPlay,É’Ç%Á,³,ê,½ B

,±,İfZfNfVf±f“,É,Í AˆÈ%°,İDirectPlay COMfCf“f^ [ftfFfCfX,É,Ä,¢,Ä,İˆê”Ê“l,È î•ñ,ªŠÜ,Ü,ê,Ä,¢,é B

IDirectPlayfCf“f^ [ftfFfCfX

IDirectPlay2fCf“f^ [ftfFfCfX

IDirectPlayLobbyfCf“f^ [ftfFfCfX

## IDirectPlayfCf“f^ [ftfFfCfX

IDirectPlay COMfCf“f^ [ftfFfCfX,Í ADirectPlayfo [fWf‡f“3,Îê•”,É,·,¬,È,¢ B,±  
,İfCf“f^ [ftfFfCfX,É,Í ADirectX SDKfo [fWf‡f“1,Æ2,Ä ‘,©,ê,½fAfvfŠfP [fVf‡f“,İŽÄ s,É•K—  
v,Èf f\fbfh,³ŠÜ,Ü,ê,Ä,¢,é B,±,İfCf“f^ [ftfFfCfX,ð—p,¢,Ä V,µ,¢fAfvfŠfP [fVf‡f“,ð ì ¬,·,é,±  
,Æ,à,Ä,«,é,ª AŠg’£,³,ê,½<@”\,ð~—p,·,é,½,ß AIDirectPlay2,ÆIDirectPlay2A,Æ,¢  
,² V,µ,¢DirectPlayfCf“f^ [ftfFfCfX,ðŽg,²,±,Æ,ð „ š,·,é B

## IDirectPlay2fCf“f^ [ftfFfCfX

DirectPlay,Í AUnicode•¶Žš—ñf|fCf“f^ iLPWSTR j,ÆANSI•¶Žš—ñf|fCf“f^ iLPSTR j,l↯—p`l,Æ,μ,Ä \‘c‘l,l•¶Žš—ñf|fCf“f^,ð’è` ,·,é,±,Æ,É,æ,è AUnicode,ÆANSI•¶Žš—ñ,l—¼•û,ðfTf| [fg,μ,Ä,¢,é B,Ó,½,Â,l•¶Žš—ñf|fCf“f^,Í`Ù,È,é—¼‘O,ðŽ ,Á,Ä,¢,é B^ê”Ê,É AANSI•¶Žš—ñf|fCf“f^,Í"A",l•¶Žš,Ä l,i,é BfAfvfŠfP [fVf‡f“,Í A,Ç,¿,ç,lIDirectPlayfCf“f^ [ftfFfCfX,“I‘ð,<sup>3</sup>,ê,é,© iUnicode,lIDirectPlay2,© AANSI,lIDirectPlay2A j,É,æ,Á,Ä A \‘c‘l,©,ç“K Ø,È•¶Žš—ñ,ð“Ç,Y ‘,«,μ A,à,σ^ê•û,δ—3Ž,μ,È,-,Ä,Í,È,ç,È,¢ B



**IDirectPlayLobbyfCf“f^ [ftfFfCfX**

ŽŸ,ìfgfsfbfN,É,Í AIDirectPlayLobbyfCf“f^ [ftfFfCfX,ÉŠÖ,·,é’Ç%Á î•ñ,ªŠÜ,Ü,ê,Ä,¢,é B

Unicode,ÆANSI,ìDirectPlayLobbyfCf“f^ [ftfFfCfX

f fr [%oÂ”\fAfvfŠfP [fVf#f“,ì“o~^

Unicode,ÆANSI,ÌDirectPlayLobbyfCf“f^ [ftFfCfX

DirectPlayLobby,Í AUnicode•¶Žš—ñf|fCf“f^ iLPWSTR j,ÆANSI•¶Žš—ñf|fCf“f^ iLPWSTR j,Ì—  
p‘Ì,Æ,μ,Ä \‘c‘Ì,Ì•¶Žš—ñf|fCf“f^,ð‘è<‘,‘,é,±,Æ,É,æ,è AUnicode,ÆANSI•¶Žš—ñ,Ì—¼•û,ðfTf| [fg,·,é B,Ó,½,Â,Ì•¶Žš  
—ñ,ÍÛ,È,é—¼‘O,ðŽ ,Á,Ä,ç,é B^ê”Ê,É AANSI •¶Žš—ñf|  
fCf“f^,Í"A",Ì•¶Žš,Ä I,í,é BfAfvfŠfP [fVf‡f“,Í A,Ç,¿,ç,ÌIDirectPlayfCf“f^ [ftFfCfX,“T‘ð,³,ê,é,© iUnicode,ÌIDi  
rectPlay2,© AANSI,ÌIDirectPlay2A j,É,æ,Á,Ä A \‘c‘Ì,©,ç“K Ø,È•¶Žš—ñ,ð“Ç,Y ‘,«,μ A,à,σ^ê•û,ð—³Ž<,μ,È,-  
,Ä,Í,È,ç,È,ç B

**f fr [%0A"]\fAfvfŠfP [fVf‡f“,İ“o~^**

DirectPlayLobby,É,æ,Á,Ä—ñ“,³,ê AŠJŽn,³,ê,éfAfvfŠfP [fVf‡f“,Í AfCf“fXfg [f<Žž,ÉWindows,İfƎfWfXfgfŠ,É,¢  
,,Â,©,İ i•ñ,đ'Ç%0Á,µ,È,,Ä,Í,È,Ç,È,¢ B,±,İ,½,B,É A`È%°,İfƎfWfXfgfŠ EfL [,“è<³,ê,Ä,¢,é B"Application  
Name",Í ADirectPlayLobby,³fAfvfŠfP [fVf‡f“,đ—ñ“,µ,½,Æ,«,É•Ô,³,ê,é AfAfvfŠfP [fVf‡f“,İ–¼‘O,Ä, ,é B,±  
,ê,ç,İ €–Ú,đ'Ç%0Á,·,é,É,Í ADirectSetup,İDirectXRegisterApplicationŠÖ ”,đŽg—p,·,é,±,Æ,ª,Ä,«,é B

[HKEY\_LOCAL\_MACHINE\Software\Microsoft\DirectPlay\Applications\Application Name]

"Guid" fAfvfŠfP [fVf‡f“,İGUID

"Filename" ŽÀ s%0A",Èftf@fCf<–¼

"CommandLine" i•K—v,È,ç jfAfvfŠfP [fVf‡f“,İfRf}f“fhf%oCf“ EfXfCfbf`

"Path" ŽÀ s%0A",ÈfAfvfŠfP [fVf‡f“,İfpfX

"CurrentDirectory" fAfvfŠfP [fVf‡f“,đŠJŽn,·,éftfBfƎfNfgfŠ,İfpfX

**DirectPlay**f`f... [fgfŠfAf<

,±,lfZfNfVf‡f“,É,Í Af fr [,ð—~—p,μ,ÄfAfvfŠfP [fVf‡f“,ð Ú‘±,·,é•û—@ A,Û,½,Íf fr [,ð—~—p,¹,,É Ú‘±  
,·,é•û—@,É,Â,¢,Ä AfXfefbfv EfofC EfXfefbfv,É à—¾,μ,½,Ó,½,Â,lf`f... [fgfŠfAf<,ªŠÛ,Û,ê,Ä,¢  
,é BLOBBYfTf“fvf<,Í ADirectPlayf fr [,ð—p,¢,ÄfAfvfŠfP [fVf‡f“,ð Ú‘±,·,é•û—@,ð à—¾,μ,Ä,¢  
,é BDIALOGfTf“fvf<,Ä,Í A Ú‘± î•ñ,ðf† [fU,É—â,¢ ‡,í,¹,éf\_fCfAf fO Ef{fbfNfX,ðŽg—  
p,μ,ÄfAfvfŠfP [fVf‡f“,ð Ú‘±,·,é•û—@,ðŽ,μ,Ä,¢  
,é BfAfvfŠfP [fVf‡f“,ð<L q,·,é,Æ,«,Í A,Ç,ç,©,Ìf f\fbfh,É,æ,Ä,ÄfAfvfŠfP [fVf‡f“,ðŠJŽn,Ä,«,é,æ,²,É,μ,È,-  
,Ä,Í,È,ç,È,¢ B

f`f... [fgfŠfAf<1: f fr [,ðŽg—p,μ,½ Ú‘± iLOBBY j

f`f... [fgfŠfAf<2: f fCfAf fO Ef{fbfNfX,ðŽg—p,μ,½ Ú‘± iDIALOG j

---

**f f,**

,±,ê,ç,lf`f... [fgfŠfAf<,lfTf“fvf< Eftf@fCf<,ÍC++,Ä ‘,©,ê,Ä,¢,é B,bfRf“fpfCf%,ðŽg—p,μ,Ä,¢  
,é ê ‡,Í AfRf“fpfCf<,ð’Ê,·,½,ß Aftf@fCf<,É“K Ø,È•İ X,ð‰Ä,!,È,,Ä,Í,È,ç,È,¢ B ,È,-  
,Æ,à AfCf“f^ [ftfFfCfX Ef f\fbfh,Ö,İvtable,Æthisf|fCf“f^,ð’Ç‰Ä,μ,È,,Ä,Í,È,ç,È,¢ B Ú ×,É,Ä,¢  
,Ä,Í,Ä,İCOMfIfufWfFfNfq,Ö,İfAfNfZfX,ðŽQ Æ,³,ê,½,¢ B

---

$f^f \dots$  [fgfŠfAf<1: f fr [,ðŽg—p,μ,½ Ú‘±

IDirectPlayLobbyfCf“f^ [ftfFfCfX,ðŽg—

p,μ,Ä ‘,©,ê,½fAfvfŠfP [fVf‡f“,Í Af† [fU,ªŽè ì<Æ,Ä Ú‘± î•ñ,ðf\_fCfAf fO Ef{fbfNfX,É“ü—Í,·,é,±,Æ,È,-  
Ú‘±,Ä,«,é BLOBBYfTf“fvf<,Í AŽŸ,ìfXfefbfv,Äf fr [,<sup>3</sup>,ê,½fAfvfŠfP [fVf‡f“,ð ì ¬,·,é•û-@,ð à-¾,·,é B

Step 1: DirectPlayLobbyfIfufWfEfNfg,Ĵ ì ¬

Step 2: Ú‘±ŠÂ««,ìŽæ“¾

Step 3: fZfbfVf‡f“<L q,Ĵ Ý’è

Step 4: fZfbfVf‡f“,Ö,Ĵ Ú‘±

Step 5: fvfŒfCf„,Ĵ ì ¬

**Step 1: DirectPlayLobbyIfufWfFfNfg,İ ì Ñ**

DirectPlayf fr [˘@”\,đŽg,ϣ,½,ß A,Ü,,  
**DirectPlayLobbyCreate**ŠÖ ”,đĖĂ,Ň o,μ,ĂDirectPlayLobbyIfufWfFfNfg,İfCf“fXf^f“fX,đ ì Ñ,·,é B,±  
,İŠÖ ”,İ5,Ă,İfpf%of [f^,đŠÜ,ñ,Ă,¢,é B‘æ1 A‘æ3 A‘æ4pf%of [f^,Í A «—^,İŠg’E,İ,½,ß,É—\—  
ñ,³,ê,Ă,“,è A,Ă,Ě,ÉNULL,đ Ý’è,·,é B‘æ2pf%of [f^,É,İDirectPlayLobbyIfufWfFfNfg,İf|  
fCf“f^,İfAfhfĖfX,đŽw’è,·,é BfIfufWfFfNfg,ª ì Ñ,³,ê,é,Æ A,±,İf|fCf“f^,đ—p,¢  
,ĂfIfufWfFfNfg,İĚ’u,đŽ•Ě,·,é,±,Æ,ª,Ă,«,é B‘æ5pf%of [f^,à «—^,İŠg’E,İ,½,ß,É—\—  
ñ,³,ê,Ă,“,è A,Ă,Ě,É0,É Ý’è,·,é B

ŽŸ,İ—á,Í ADirectPlayLobbyIfufWfFfNfg,İ ì Ñ•û—@,İ,Đ,Æ,Ă,Ă, ,é B

// ANSI DirectPlayf fr [ Efcf“f^ [ftfFfCfX,đŽæ“¾,·,é B  
hr = DirectPlayLobbyCreate(NULL, &lpDirectPlayLobbyA, NULL, NULL, 0);  
if FAILED(hr)  
goto FAILURE;

## Step 2: Ú'±ŠÂ««,İŽæ“¾

```
DirectPlayLobbyIfufWfFfNfg,ª ì ¬,³,ê,½Eã AIDirectPlayLobby::GetConnectionSettingsf f\fbfh,ðŽg—
p,µ,Ä Af fr [,©,ç•Ô,³,ê,é Ú'±ŠÂ««,ðŽæ“¾,·,é B,±,İf f\fbfh,ª DPERR_NOTLOBBIED,ð•Ô,·,Æ Af fr [,Í,±
,İfAfvfŠfP [fVf±f“,ðŠJŽn,µ,È,ç B,±,İ ê ± Af† [fU,ªŽè“®,Ä Ú'±
,ð Ý'è,µ,È,¯,ê,İ,È,ç,È,ç B'¼,İ%½,ç,©,İfGf% [,ª”-
¶,µ,½,Æ,«,İ AfAfvfŠfP [fVf±f“,İ Af fr [,İŽ,”s,ðŽ',·fGf% [,ð•ñ ,·,é,×,«,Å, ,é B
^È%º,İ—á,İ A Ú'± Ý'è,ðŽæ“¾,·,é•û—@,ðŽ',µ,Ä,ç,é B

// f fr [,©,ç Ú'± Ý'è,ðŽæ“¾,·,é B
// ,±,İf< [f f“,ªDPERR_NOTLOBBIED,ð•Ô,·,Æ Af fr [,ÍfAfvfŠfP [fVf±f“,ðŠJŽn,µ,È,ç B
// ,±,İ ê ± Af† [fU,ª Ú'±,ð,·,é•K—v,ª, ,é B

// Ú'± Ý'è,İfTfCfY,¾,¯,ðŽæ“¾,·,é ê ±,İ ANULLf|fCf“f^,ð“n,· B
hr = lpDirectPlayLobbyA->GetConnectionSettings(0, NULL, &dwSize);
if (DPERR_BUFFERTOOSMALL != hr)
    goto FAILURE;

// Ú'± Ý'è,İ,½,ß,İf f,fŠ,ðŠm•Û,·,é B
lpConnectionSettings = (LPDPLCONNECTION) GlobalAllocPtr(GHND, dwSize);
if (NULL == lpConnectionSettings)
{
    hr = DPERR_OUTOFMEMORY;
    goto FAILURE;
}

// Ú'± Ý'è,ðŽæ“¾,·,é B
hr = lpDirectPlayLobbyA->GetConnectionSettings(0,
    lpConnectionSettings, &dwSize);
if FAILED(hr)
    goto FAILURE;
```

### Step 3: $fZfbfVf\ddagger f\langle L \ q, \dot{I} \ \dot{Y}'\grave{e}$

```
fAfvfŠfP [fVf‡f“,É•K—v,È,·,×,Ä,ìftf%ofo,Æ“Á «,a 3,μ, Ḃ'è,3,ê,Ä,¢,é,±
,Æ,đŠm”F,·,é,É,Í ADPSESSIONDESC2 \‘¢‘ì,đ’2,×,é,×,«,Ä, ,é B C 3,a•K—
v,È ê ‡,Í AIDirectPlayLobby::SetConnectionSettings f\fbfh,đŽg—p,μ,Ä A•İ X,μ,½ Ú± Ḃ'è,đL%o“,·,é B
ŽŸ,ì—á,Ä,Í AfZfbfVf‡f“L q,đ \ ¬,μ A Ú±,đ Ḃ'è,·,é•û—@,đŽ!,μ,Ä,¢,é B
// Ú±‘O,É•K—v,ÈfZfbfVf‡f“L q,đ \ ¬,·,é B

// fQ [f€,ÄŽg—p,3,ê,éftf%ofo,Æ Ä‘âfvfŒfCf,, ”,đfZfbfg,·,é B
lpConnectionSettings->lpSessionDesc->dwFlags = DPSESSION_MIGRATEHOST |
DPSESSION_KEEPLIVE;
lpConnectionSettings->lpSessionDesc->dwMaxPlayers = MAXPLAYERS;

// C 3,3,ê,½ Ú± Ḃ'è,đL%o“,·,é B
hr = lpDirectPlayLobbyA->SetConnectionSettings(0, 0,
lpConnectionSettings);
if FAILED(hr)
goto FAILURE;
```



**Step 4: fZfbfVf‡f“,Ö,İ Ú±**

fZfbfVf‡f“<L q,<sup>a</sup> 3,μ, Ý'è,<sup>3</sup>ê,é,Æ AfAfvfŠfP [fVf‡f“,Í fZfbfVf‡f“,Æ Ú±  
,·,é,½,ß,É**IDirectPlayLobby::Connect**f f\fbfh,ðŽg—p,·,é,±,Æ,<sup>a</sup>Ä,«,é B,±,İf f\fbfh,<sup>a</sup>DP\_OK,ð•Ö,<sup>1</sup>Î A,Đ,Æ,Ä, ,é,¢  
,Í·j ”,İfvfƎfCf,,,ð ì ¬,·,é,±,Æ,<sup>a</sup>Ä,«,é B,±  
,İf f\fbfh,<sup>a</sup>DPERR\_NOTLOBBIED,ð•Ö,μ,½,Æ,«,Í Af† [fU,ÍÊ M”}·İ,ðŽè“®,Ä‘ð,μ,È,¯,ê,Î,È,ç,È,¢ ifVfXfef€  
,ÉfCf“fXfg [f<,<sup>3</sup>ê,Ä,¢,éfT [frfX Efvf fofCf\_,ðŽ¯•Ê,·,é,É,Í A**IDirectPlayEnumerate**ŠÖ ”,ð—~—p,·,é,±  
,Æ,<sup>a</sup>Ä,«,é j B‘¼,İ%½,ç,©,İfGf% [,”” ¶,μ,½ ê ‡,Í AfAfvfŠfP [fVf‡f“,Í Af fr [,“Ž,”s,μ,½,±  
,Æ,ðŽ',·fGf% [ ,ð•ñ ,·,é,×,«,Ä, ,é B

ŽŸ,İ—á,Í AfZfbfVf‡f“,Æ,İ Ú±•û—@,ðŽ',μ,Ä,¢,é B

```
// fZfbfVf‡f“,É Ú±,·,é BANSI IDirectPlay2AfCf“f^ [ftfFfCfX,ð•Ö,· B  
hr = lpDirectPlayLobbyA->Connect(0, &lpDirectPlay2A, NULL);  
if FAILED(hr)  
    goto FAILURE;
```

Step 5:  $f v f \mathbb{C} f C f,, \dot{\mathbb{I}} \dot{\mathbb{I}} \neg$

IDirectPlayLobby::Connect

$f \ f \backslash f b f h, \dot{\mathbb{E}}, \mathbb{a}, \dot{\mathbb{A}}, \dot{\mathbb{A}}^3 \dot{\mathbb{I}}, \dot{\mathbb{E}} f A f v f \dot{\mathbb{S}} f P \ [f V f \ddagger f^{\prime \prime}, {}^a \dot{\mathbb{S}} \dot{\mathbb{J}} \dot{\mathbb{Z}} n, {}^3 \dot{\mathbb{e}}, \dot{\mathbb{e}}, \mathbb{A} \ A, \mathbb{D}, \mathbb{A}, \dot{\mathbb{A}}, \dot{\mathbb{U}}, \frac{1}{2}, \dot{\mathbb{I}} \cdot_i \ ]$ ,  $\dot{\mathbb{I}} f v f \mathbb{C} f C f,, \dot{\mathbb{d}} \dot{\mathbb{I}} \neg, \dot{\mathbb{A}}, \ll, \dot{\mathbb{e}}, \mathbb{a}, \square$   
 $, \dot{\mathbb{E}}, \dot{\mathbb{E}}, \dot{\mathbb{e}} \ B f A f v f \dot{\mathbb{S}} f P \ [f V f \ddagger f^{\prime \prime}, \dot{\mathbb{I}} \textbf{IDirectPlay2::CreatePlayer} \ f \backslash f b f h, \dot{\mathbb{d}} \dot{\mathbb{Z}} g - p, \mu, \dot{\mathbb{A}} \ \underline{\textbf{ADPNAME}}$   
 $\backslash^{\mathbb{C}} \dot{\mathbb{I}} \ \dot{\mathbb{I}} \textbf{IDirectPlayLobby::GetConnectionSettings} \ f \ f \backslash f b f h, \dot{\mathbb{E}}, \mathbb{a}, \dot{\mathbb{A}}, \dot{\mathbb{A}} \ \dot{\mathbb{Y}}^{\prime} \dot{\mathbb{e}}, {}^3 \dot{\mathbb{e}}, \frac{1}{2}, \dot{\mathbb{a}}, \dot{\mathbb{I}} \ \dot{\mathbb{j}}, {}^a \dot{\mathbb{Z}} w^{\prime} \dot{\mathbb{e}}, \cdot, \dot{\mathbb{e}} -$   
 $\frac{1}{4}^{\prime} \mathbb{O}, \dot{\mathbb{I}} f v f \mathbb{C} f C f,, \dot{\mathbb{d}} \dot{\mathbb{I}} \neg, \cdot, \dot{\mathbb{e}}, \pm, \mathbb{A}, {}^a, \dot{\mathbb{A}}, \ll, \dot{\mathbb{e}} \ B$

$\wedge \dot{\mathbb{E}} \% ^{\circ}, \dot{\mathbb{E}} f v f \mathbb{C} f C f,, \dot{\mathbb{I}} \dot{\mathbb{I}} \neg \cdot \hat{\mathbb{u}} - @, \dot{\mathbb{I}} - \acute{\mathbb{a}}, \dot{\mathbb{d}} \dot{\mathbb{Z}}, \cdot \ B$

//  $\dot{\mathbb{U}}^{\prime} \pm \ \dot{\mathbb{Y}}^{\prime} \dot{\mathbb{e}}, \dot{\mathbb{E}} \cdot \dot{\mathbb{O}}, {}^3 \dot{\mathbb{e}}, \frac{1}{2} - \frac{1}{4}^{\prime} \mathbb{O}, \dot{\mathbb{A}} f v f \mathbb{C} f C f,, \dot{\mathbb{d}} \dot{\mathbb{I}} \neg, \cdot, \dot{\mathbb{e}} \ B$

hr = lpDirectPlay2A->CreatePlayer(&dpidPlayer,

lpConnectionSettings->lpPlayerName,

lpDPInfo->hPlayerEvent, NULL, 0, 0);

if FAILED(hr)

goto FAILURE;

$, \pm, \dot{\mathbb{e}}, \dot{\mathbb{A}} f A f v f \dot{\mathbb{S}} f P \ [f V f \ddagger f^{\prime \prime}, \dot{\mathbb{I}} \ \dot{\mathbb{U}}^{\prime} \pm, {}^3 \dot{\mathbb{e}} \ A f v f \mathbb{C} f C \ \epsilon^{\prime \prime} \dot{\mathbb{d}}, {}^a \dot{\mathbb{S}} @ - {}^1, \mu, \frac{1}{2} \ B$

***f`f... [fgfŠfAf<2: f\_fCfAf fO Ef{fbfNfX,ðŽg—p,μ,½ Ú‘±***

*f fr [,ªfAfvfŠfP [fVf‡f“,ðŠJŽn,μ,È,©,Á,½ ê ‡,Í Af† [fU,ª Ú‘± î•ñ,ðŽè“®,Á“ü—Í,Á,«,é,æ,□  
,ÈfR [fh,ðŠÜ,ß,Ä,¨,,×,«,Á, ,é BDIALOGfTf“fvf<,Í A^È%°,lfXfefbfv,Á AfZfbfVf‡f“,ÉŽè“®,Á Ú‘±,·,é•û—  
@,Æ A,Ð,Æ,Ä^È ã,lfvfÆfCf,,ð ì ¬,·,é•û—@,ð à–¾,·,é B*

*Step 1: fT [frfX Efvf fofCf\_,ì—ñ<“*

*Step 2: DirectPlayfIfufWfFfNfg,Ì ì ¬*

*Step 3: fZfbfVf‡f“,Ö,ìŽQ%°Á*

*Step 4: fZfbfVf‡f“,Ì ì ¬*

*Step 5: fvfÆfCf,,Ì ì ¬*

**Step 1: *fT [frfX Efvf fofCf\_,l—ñ***

Žè“®,Å Ú±,ðŠm—š,·,é,½,ß,ì‘æˆ•à,Í Af† [fU,ÉfAfvfŠfP [fVf‡f“,ì,½,ß,ì‘Ê M”}‘ì,ì‘I‘ð,ð—v< ,·,é,±,Æ,Å, ,é Bf AfvfŠfP [fVf‡f“,Í **DirectPlayEnumerate**ŠÖ ”,ðŽg—p,μ,Ä Afp [f\fi f< EfRf“f sf... [f^ ã,ÉfCf“fXfg [f<,³,ê,Ä,¢ ,éfT [frfX Efvf fofCf\_,ðŽˆ•Ê,·,é,±,Æ,ª,Ä,« ,é B

ŽŸ,ì—á,Í AfT [frfX Efvf fofCf\_,l—ñ“•û—@,ðŽ!,μ,Ä,¢,é B

DirectPlayEnumerate(DirectPlayEnumerateCallback, hWnd);

**DirectPlayEnumerate**ŠÖ ”,ì‘æ1fpf%of [f^,Í ADirectPlay,É,æ,Ä,Ä“oˆ^,³,ê,½fT [frfX Efvf fofCf\_,ð— ñ<“,·,é fR [f<fofbfNŠÖ ”,Ä, ,é BŽŸ,ì—á,Í A,±,ìfR [f<fofbfNŠÖ ”,ðfCf“fvfŠf f“fg,·,é•û—@,ì,Ð,Æ,Ä,ðŽ!,μ,Ä,¢ ,é B

BOOL FAR PASCAL DirectPlayEnumerateCallback(  
LPGUID lpSPGuid, LPTSTR lpszSPName, DWORD dwMajorVersion,  
DWORD dwMinorVersion, LPVOID lpContext)

{  
HWND hWnd = lpContext;  
LRESULT iIndex;  
LPGUID lpGuid;

// fT [frfX Efvf fofCf\_,l—¼‘O,ðfRf“f{ Ef{fbfNfX,ÉŠi”[ ,·,é B  
iIndex = SendDlgItemMessage(hWnd, IDC\_SPCOMBO, CB\_ADDSTRING,  
0, (LPARAM) lpszSPName);  
if (iIndex == CB\_ERR)  
goto FAILURE;

// fAfvfŠfP [fVf‡f“GUID,ì—ìˆæ,ð ì ¬,·,é B  
lpGuid = (LPGUID) GlobalAllocPtr(GHND, sizeof(GUID));  
if (lpGuid == NULL)  
goto FAILURE;

// fRf“f{ Ef{fbfNfX,ÉGUID,Ö,ìf|fCf“f^,ðŠi”[ ,·,é B  
\*lpGuid = \*lpSPGuid;  
SendDlgItemMessage(hWnd, IDC\_SPCOMBO, CB\_SETITEMDATA,  
(LPARAM) iIndex, (LPARAM) lpGuid);

FAILURE:  
return (TRUE);  
}

## Step 2: IDirectPlay1IfuFWfFNfg, Ĩ ĩ ñ

f† [fU,žg—p,·,éT [frfX Efvf fofCf\_,đ'I'đ,·,é,Æ A'I'đ,ÉŠi,Ä,¢  
,ÄDirectPlayIfuFWfFNfg,đ ĩ ñ,µ A“K Ø,ÈT [frfX Efvf fofCf\_,lOf [fof< Ef†fj [fNŽ~·ÊŽq iGUID j,  
đŽw'è,·,é,±,Æ,ª,Ä,«é BDirectPlayIfuFWfFNfg,Ĩ ĩ ñ,É,Í A**DirectPlayCreate**ŠÖ ”,đŽg—p,·,é B,±  
,İŠÖ ”,İEÄ,Ñ o,µ,É,æ,Ä,Ä ADirectPlay,İ'I'đ,³,ê,½fT [frfX Efvf fofCf\_,İ,½,ß,İf%ofCfuf%ofŠ,đf [fh,µ A**Idi**  
**rectPlay**Cf“f^ [ftfFfCfX,đ•Ô,· B

**IDirectPlay**Cf“f^ [ftfFfCfX,İ V,µ,¢fQ [f€,İ ĩ ñ,É—p,¢,é,±,Æ,ª,Ä,«é,ª A,æ,è,æ,¢•û—  
@,İ A Ä V,İDirectPlayCf“f^ [ftfFfCfX,Ä, ,é**DirectPlay2**,,æ,Ñ**IDirectPlay2A**,đ—~—p,·,é,±,Æ,Ä, ,é B,±  
,ê,ç,İfCf“f^ [ftfFfCfX,É,İ A'Ç%Ä,³,ê,½DirectPlay,İ'S<@”\,ªŠÜ,Ü,ê,Ä,¢  
,é B**DirectPlay2**,ä**IDirectPlay2A**Cf“f^ [ftfFfCfX,đŽæ“¾,·,é,É,İ A**DirectPlayCreate**ŠÖ ”,ª•Ô,·**IDirectPlay**Cf“f^ [  
ftfFfCfX,İ**QueryInterface** f\fbfh,đEÄ,Ñ o,· B

ŽŸ,İ—á,Ä,İ**IDirectPlay**Cf“f^ [ftfFfCfX,İ ĩ ñ•û—@,đŽ|,µ A**QueryInterface**,đŽg—  
p,µ,Ä**IDirectPlay2A**Cf“f^ [ftfFfCfX,đ ĩ ñ,µ,Ä,¢,é B

HRESULT CreateDirectPlayInterface(LPGUID lpguidServiceProvider,  
LPDIRECTPLAY2A \*lpDirectPlay2A)

```
{  
LPDIRECTPLAY lpDirectPlay1 = NULL;  
LPDIRECTPLAY2A lpDirectPlay2A = NULL;  
HRESULT hr;
```

```
// DirectPlay 1.0fCf“f^ [ftfFfCfX,đŽæ“¾,·,é B  
hr = DirectPlayCreate(lpguidServiceProvider, &lpDirectPlay1, NULL);  
if FAILED(hr)  
    goto FAILURE;
```

```
// ANSI DirectPlay2fCf“f^ [ftfFfCfX,đ ÄE%œi,·,é B  
hr = lpDirectPlay1->QueryInterface(IID_IDirectPlay2A,  
    (LPVOID *) &lpDirectPlay2A);  
if FAILED(hr)  
    goto FAILURE;
```

```
// ĩ ñ,³,ê,½fCf“f^ [ftfFfCfX,đ•Ô,· B  
*lpDirectPlay2A = lpDirectPlay2A;
```

```
FAILURE:  
if (lpDirectPlay1)  
    lpDirectPlay1->Release();
```

```
return (hr);  
}
```

### Step 3: fZfbfVfzf“,Ö,İŽQ%Á

```
f† [fU,ªŠù‘¶,İfZfbfVfzf“,ÉŽQ%Á,·,é,É,Í AIDirectPlay2::EnumSessionsf f\fbfh,ðŽg—p,µ,ÄŽg—p%Á”\
,ÈfZfbfVfzf“,ð—
ñ“,µ Af† [fU,É‘İðŽˆ,ðˆñˆYˆ,·,é B,»,µ,Ä ADPOPEN_JOINftf%ofo,ðŽw’è,µ,ÄIDirectPlay2::Openf f\fbfh,ðŒÄ,Ñ
o,µ A,»,İfZfbfVfzf“,Æ Úˆ±,·,é BfZfbfVfzf“,ð—
ñ“,·,é‘O,É AfT [frfX Efvf fofCf_,Í Af_CfAf fo Ef{fbfNfX,ðˆŽ!,µ,Äf† [fU,É îñ,İ“ü—Í,ð—
v< ,·,é ê ±,ª,·,é B
—~—p%Á”\,ÈfZfbfVfzf“,ð—ñ“,·,é•û—@,ðŽYˆ,ÉŽ!,· B
```

```
// ,±,İŽi—Đ,İfZfbfVfzf“,ðŒYˆ ð,·,é B
ZeroMemory(&sessionDesc, sizeof(DPSESSIONDESC2));
sessionDesc.dwSize = sizeof(DPSESSIONDESC2);
sessionDesc.guidApplication = DPCHAT_GUID;
```

```
hr = lpDirectPlay2A->EnumSessions(&sessionDesc, 0, EnumSessionsCallback,
hWnd, DPENUMSESSIONS_AVAILABLE);
if FAILED(hr)
goto FAILURE;
```

```
IDirectPlay2::EnumSessionsf f\fbfh,İ‘æ3fpf%of [f^,Í A—~—p%Á”\,ÈfZfbfVfzf“,ð—
ñ“,·,éfR [f<fofbfNŠÖ ”,Ä,·,é BŽYˆ,İ—á,Ä,Í A,±,İfR [f<fofbfNŠÖ ”,ðfCf“fvfŠf f“fg,·,é•û—
@,İ,Đ,Æ,Ä,ðŽ!,µ,Ä,¢,é B
```

```
BOOL FAR PASCAL EnumSessionsCallback(
LPDPSESSIONDESC2 lpSessionDesc, LPDWORD lpdwTimeOut,
DWORD dwFlags, LPVOID lpContext)
{
HWND hWnd = lpContext;
LPGUID lpGuid;
LONG iIndex;
```

```
// f^fCf€fAfEfƒg,ð”»’è,·,é B
if (dwFlags & DPESC_TIMEDOUT)
return (FALSE); // ÄŽŽ s,µ,È,¢ B
```

```
// fZfbfVfzf“—¼,ðfŠfXfƒg,ÉŠi”[,·,é B
iIndex = SendDlgItemMessage(hWnd, IDC_SESSIONLIST, LB_ADDSTRING,
(WPARAM) 0, (LPARAM) lpSessionDesc->lpszSessionNameA);
if (iIndex == CB_ERR)
goto FAILURE;
```

```
// fZfbfVfzf“ EfCf“fXf^f“fXGUID,İ—İˆæ,ð ì ¬,·,é B
lpGuid = (LPGUID) GlobalAllocPtr(GHND, sizeof(GUID));
if (lpGuid == NULL)
goto FAILURE;
```

```
// GUID,İf|fCf“f^,ðfŠfXfƒg,ÉŠi”[,·,é B
*lpGuid = lpSessionDesc->guidInstance;
SendDlgItemMessage(hWnd, IDC_SESSIONLIST, LB_SETITEMDATA,
(WPARAM) iIndex, (LPARAM) lpGuid);
```

```
FAILURE:
return (TRUE);
}
```

```
f† [fU,ªfZfbfVfzf“,ð‘İð,·,é,Æ AfAfvfŠfP [fVfzf“,Íf† [fU,ÉŠù‘¶,İfZfbfVfzf“,Ö,İŽQ%Á,ð<-,·,±,Æ,ª,Ä,«.,é B
Šù‘¶,İfZfbfVfzf“,ÉŽQ%Á,·,é•û—@,ðˆE%°,ÉŽ!,· B
```

```
// Šù‘¶,İfZfbfVfzf“,ÖŽQ%Á,·,é B
ZeroMemory(&sessionDesc, sizeof(DPSESSIONDESC2));
sessionDesc.dwSize = sizeof(DPSESSIONDESC2);
```

```
sessionDesc.guidInstance = *lpguidSessionInstance;

hr = lpDirectPlay2A->Open(&sessionDesc, DPOPEN_JOIN);
if FAILED(hr)
    goto OPEN_FAILURE;
```

#### Step 4: fZfbfVfzf“,İ ì ñ

f† [fU,ª V,µ,¢fZfbfVfzf“,ð ì ñ,·,é,É,Í ADPOPEN\_CREATEftf%ofo,ðŽw’è,µ,ÄIDirectPlay2::Open f\fbfh,ðCEÄ  
,Ñ o,· B,±,±  
,Ä,àfT [frfX Efvf fofCf\_,Í AfZfbfVfzf“,ª ì ñ,³,ê,é‘O,Éf\_fCfAf fO Ef{fbfNfX,ð•Ž!,µ Af† [fU,É î•ñ,İ“ü  
—İ,ð—v< ,·,é ê ‡,ª, ,é B

V,µ,¢fZfbfVfzf“,İ ì ñ•û—@,ðŽŸ,ÉŽ!,· B

```
// V,µ,¢fZfbfVfzf“,İfzfXfg,ð—±,ß,é B
ZeroMemory(&sessionDesc, sizeof(DPSESSIONDESC2));
sessionDesc.dwSize = sizeof(DPSESSIONDESC2);
sessionDesc.dwFlags = DPSESSION_MIGRATEHOST | DPSESSION_KEEPAIVE;
sessionDesc.guidApplication = DPCHAT_GUID;
sessionDesc.dwMaxPlayers = MAXPLAYERS;
sessionDesc.lpszSessionNameA = lpszSessionName;
```

```
hr = lpDirectPlay2A->Open(&sessionDesc, DPOPEN_CREATE);
if FAILED(hr)
    goto OPEN_FAILURE;
```



# Step 5: *fvfCf,,l* i ~

*fZfbfVf+f“„đ i ~ A, ,é,¢*  
*,ÍfZfbfVf+f“„ÉŽQ%Á,µ,½Ėã AfAfvfŠfP [fVf+f“„Í AIDirectPlay2::CreatePlayerf f\fbfh,É,æ,Á,Ä,Đ,Æ,Â^È ã,ì*  
*fvfCfCf,,đ i ~,·,é,±,Æ,ª,Ä,«„é BŽŸ,ì—á,Á,Í AfvfCfCf,,đ i ~,·,é•û—@,ì,Đ,Æ,Â,đŽ',µ,Ä,¢„é B*

*// -¼‘O \‘ċĬ,đ Ÿ’è,·,é B*  
*ZeroMemory(&dpName, sizeof(DPNAME));*  
*dpName.dwSize = sizeof(DPNAME);*  
*dpName.lpszShortNameA = lpszPlayerName;*  
*dpName.lpszLongNameA = NULL;*

*// ,±,ì-¼‘O,ÄfvfCfCf,,đ i ~,·,é B*  
*hr = lpDirectPlay2A->CreatePlayer(&dpidPlayer, &dpName,*  
*lpDPInfo->hPlayerEvent, NULL, 0, 0);*  
*if FAILED(hr)*  
*goto CREATEPLAYER\_FAILURE;*

*fAfvfŠfP [fVf+f“„Í AIDirectPlay2::GetCaps,âIDirectPlay2::GetPlayerCapsf f\fbfh,đŽg—p,µ,ÄfvfCfCf,,ì’Ê M”\*  
*—Ĭ,đ”»’è,·,é,±,Æ,ª,Ä,«„é B,Ů,½ A’¼,ìfvfCfCf,,đĖ©,Ä, ,é,É,Í AIDirectPlay2::EnumPlayersf f\fbfh,đŽg—*  
*p,·,é B*

*,±,ê,ÄAfvfŠfP [fVf+f“„Í Ú±,³,ê AfvfCfC,·,é,½,ß,ì €”ö,ªŠ@—¹,µ,½ B*

DirectPlay\$ftf@fEf“fX

šö ”

## DirectPlayCreate

HRESULT WINAPI DirectPlayCreate(LPGUID lpGUID,  
LPDIRECTPLAY \*lpDP, IUnknown \*pUnkOuter);

DirectPlayIfufWfFfNfg,lfCf“fXf^“fX,đ ì ¬,·,é B

¬Ė÷,·,ê,ÎDD\_OK AŽ, ”s,·,ê,ÎŽŸ,lfGf%o [’l,ì,ċ,,ê,©,đ•Ô,· B

### CLASS\_E\_NOAGGREGATION

### DPERR\_EXCEPTION

### DPERR\_INVALIDPARAMS

### DPERR\_UNAVAILABLE

lpGUID

ì ¬,³,ê,éfT [frfX Efvf fofCf\_,đŽ!,·fof [fof< Ef÷fj [fNŽ~•ÊŽq iGUID j,Ö,lf|fCf“f^ B

lpDP

—LĖø,ÈDirectPlayfCf“f^ [ftfFfCfX,Ā %Šú%o»,³,ê,éf|fCf“f^,Ö,lf|fCf“f^ B*DirectPlay2* iUnicode•¶Žš—  
ñ j,â*DirectPlay2A* iANSI•¶Žš—ñ jfCf“f^ [ftfFfCfX,đŽæ“¾,·,é,½,ß,É,Í A*QueryInterface* f\fbfh,đŽg—  
p,·,é•K—v,ª, ,é B

pUnkOuter

*Unknown*fCf“f^ [ftfFfCfX,Ö,lf|fCf“f^ B,±,lfpf%of [f^,Í A «—^,ÌCOM W ¬%o»<@”\  
,Æ,ÌĖŸŠ· «,ì,½,ß,É’ñ<Ÿ,³,ê,é BĖ» Ý,ÌDirectPlayCreateŠÖ ”,Í A,±  
,lfpf%of [f^,ÉNULL^ÈŠO,ì’l,ªŽw’è,³,ê,Ā,ċ,é,ÆfGf%o [,đ•Ô,· B  
,±,ìŠÖ ”,ÍDirectPlayIfufWfFfNfg,ì %Šú%o»,đ s,ċ A ³ í I—,µ,½ ê ±,Íf|  
fCf“f^,đfZfbfg,·,é BfAfvfŠfP [fVf±f“,Í A %Šú%o»,ì’¼‘O,É A—~p%oĀ”\  
,ÈfT [frfX Efvf fofCf\_,lf^fCfv,đ”»è,·,é,½,ß,É*DirectPlayEnumerate*ŠÖ ”,đĖĀ,Ñ o,·,×,«,Ā, ,é iDirectPlayEnu  
merateŠÖ ”,Í ADirectPlayCreate,ìlpGUIDfpf%of [f^,đ Ÿ’è,·,é j B  
,±,ìŠÖ ”,Í AIDirectPlayfCf“f^ [ftfFfCfX,Ö,lf|fCf“f^,đ•Ô,· BĖ» Ý,ÌDirectX  
3fCf“f^ [ftfFfCfX,ÍIDirectPlay2,~,æ,ÑIDirectPlay2A,Ā, ,é B,±  
,ê,ċ,lfCf“f^ [ftfFfCfX,đŽæ“¾,·,é,É,Í ADirectPlayCreate,É,æ,Ā,Ā•Ô,³,ê,½IDirectPlayfCf“f^ [ftfFfCfX,ì*QueryInte  
rface* f\fbfh,đĖĀ,Ñ o,·•K—v,ª, ,é B

ŽQ Æ @*DirectPlayEnumerate*

## DirectPlayEnumerate

HRESULT WINAPI DirectPlayEnumerate(  
LPDPENUMDPCALLBACK lpEnumDPCallback, LPVOID lpContext);

*fVfXfef€*,É*fCf“fXfg* [*f<*,<sup>3</sup>,ê,Ä,¢,é*DirectPlayfT* [*ftrfX* *Efvf* *fofCf\_*,ð—ñ<“,·,é B

—€÷,·,ê,ÎDD\_OK AŽ,”s,·,ê,ÎŽŸ,Ì*fGf%o* [‘l,Ì,¢,,ê,©,ð•Ô,· B

### DPERR\_EXCEPTION

### DPERR\_GENERIC

### DPERR\_INVALIDPARAMS

*lpEnumDPCallback*

*fVfXfef€*,É*fCf“fXfg* [*f<*,<sup>3</sup>,ê,Ä,¢  
,é*DirectPlayfT* [*ftrfX* *Efvf* *fofCf\_* *EfCf“f^* [*ftfFfCfX*,<sup>2</sup>,Æ,É€Ä,Ñ o,<sup>3</sup>,ê,é A*EnumDPCallback*ŠÖ ”,Ö,Ì*f*  
*fCf“f^* B

*lpContext*

ŠÖ ”,ª€Ä,Ñ o,<sup>3</sup>,ê,é,½,Ñ,É*fR* [*f<fofbfNŠÖ* ”,É“n,<sup>3</sup>,ê,é A*fAfvfŠfP* [*fVf‡f““è<*,Ì \‘¢‘ì,Ö,Ì*f*|*fCf“f^* B

,±,ìŠÖ ”,Í A*fVfXfef€*,É*fCf“fXfg* [*f<*,<sup>3</sup>,ê,Ä,¢,é*T* [*ftrfX* *Efvf* *fofCf\_*,È,§ A*fVfXfef€*,ª—p,·,é,±,Æ,<sup>a</sup>,Ä,«,È,¢  
,à,ì,Ä,à—ñ<“,·,é B,½,Æ,,Ì A*fVfXfef€*,É*f*,*ftf€*,ª*fCf“fXfg* [*f<*,<sup>3</sup>,ê,Ä,¢,È,,Ä,à A—  
ñ<“,É,Í*TAPIfT* [*ftrfX* *Efvf* *fofCf\_*,ŠÜ,Ü,ê,é B

## DirectPlayLobbyCreate

HRESULT WINAPI DirectPlayLobbyCreate(  
LPGUID lpguidSP, LPDIRECTPLAYLOBBY \*lpDPL,  
IUnknown \*lpUnk, LPVOID lpData, DWORD dwDataSize);

DirectPlayLobbyIfufWfFfNfg,ìfCf“fXf^f“fX,ð ì ¬,·,é B,±  
,İŠÖ ”,İDirectPlayLobbyIfufWfFfNfg,ì %Šú%»,ð s,¢ Af|fCf“f^,ðfZfbfg,·,é B  
-Œ÷,·,ê,İDD\_OK AŽ,”s,·,ê,İŽŸ,İfGf% [’l,ì,¢,,ê,©,ð•Ô,· B

### CLASS E\_NOAGGREGATION

### DPERR\_INVALIDPARAMS

### DPERR\_OUTOFMEMORY

lpguidSP

«—^,İ,½,ß,É—\~ñ,<sup>3</sup>,ê,Ä,¢,é BNULL,ÉfZfbfg,µ,Ä,“,©,È,¬,ê,Î,È,ç,È,¢ B

lpDPL

—LŒø,ÈİDirectPlayLobbyfCf“f^ [ftfFfCfX,Ä %Šú%»,<sup>3</sup>,ê,éf|fCf“f^,Ö,İf|fCf“f^ B

lpUnk

İUnknownfCf“f^ [ftfFfCfX,Ö,İf|fCf“f^ B,±,İpf%of [f^,Í «—^,İCOM W ¬%»«@”\  
,Æ,İŒŸŠ· «,İ,½,ß,É’ñ<Ÿ,<sup>3</sup>,ê,Ä,¢,é BŒ» Ÿ,İDirectPlayLobbyCreateŠÖ ”,Ä,Í A,±  
,İpf%of [f^,ÉNULL^ÈŠÖ,İ’l,<sup>a</sup>Žw’è,<sup>3</sup>,ê,é,ÆfGf% [ð•Ô,· B

lpData

DirectPlayLobbyIfufWfFfNfg,ð ì ¬,·,é,½,ß,É’Ç%Äff [f^,ð•K—v,Æ,·,é B,±,İpf%of [f^,Í  
NULL,ÉfZfbfg,µ,Ä,“,©,È,¬,ê,Î,È,ç,È,¢ B

dwDataSize

,±,İpf%of [f^,Í0,ÉfZfbfg,µ,Ä,“,©,È,¬,ê,Î,È,ç,È,¢ B

**fR [f<fofbfNŠÖ ”**

## EnumAddressCallback

BOOL WINAPI EnumAddressCallback(REFGUID guidDataType,  
DWORD dwDataSize, LPCVOID lpData,  
LPVOID lpContext);

**IDirectPlayLobby::EnumAddress** *f* *f\fbfh*,*ÅŽg*—*p*,*·*,*·*,*é**f**Af**v**f**Š**f**P* [*f**V**f**‡**f*““*è*‘, *l**f**R* [*f*‘*f**o**f**b**f**N*ŠÖ ” B

—*ñ*““,*ð*‘*±*,*¯*,*é* *ê* *‡*,*Í**TRUE* A *I*—*1*,*·*,*é* *ê* *‡*,*Í**FALSE*,*ð*•*Ö*,*·* B

*guidDataType*

*ff* [*f*^ *E**f*^*fff*“*f**N*,*Ì**É*^,*ð*•\,*·**f**O**f* [*f**o**f*‘ *E**f**†**f**j* [*f**N*Ž<sup>¯</sup>•*Ê*Ž<sub>q</sub> *i**GUID* *j* B

*dwDataSize*

*ff* [*f*^*f*^*fff*“*f**N*,*Ì**f**T**f**C**f**Y*,*ð**f**o**f**C**f**g*’*P*^*Ê*,*Å*Ž<sub>w</sub>’*è*,*·*,*é* B

*lpData*

’*è* ”*ff* [*f*^,*Ö*,*l**f*|*f**C**f*“*f*^ B

*lpContext*

*f**R* [*f*‘*f**o**f**b**f**N*ŠÖ ”,*É*“*n*,<sup>3</sup>*ê*,*é**f**R**f*“*f**e**f**L**f**X**f**g* B

*f**T* [*f**r**f**X* *E**f**v**f* *f**o**f**C**f*\_,*Í* *A**guidDataType**f**p**f*%*o**f* [*f*^,*l**GUID*,*ð*’<sup>2</sup>,*×*,*Ä* *A**lpData*,*Å*Ž<sub>l</sub>’<sup>3</sup>*ê*,*é*’*l*,*ð* ^— ,*Ü*,<sup>½</sup>,*Í*‘*L*%<sup>¯</sup>,*μ*,*È*,*-*,*Ä*,*Í*,*È*,*ç*,*È*,*¢* B”*F*Ž<sup>¯</sup>,*Ä*,«*È*,*¢**guidDataType*,*l*’*l*,*Í*—<sup>3</sup>Ž<,*·*,*é*,*±*,*Æ*,<sup>a</sup>,*Ä*,«*é* B

*f**R* [*f*‘*f**o**f**b**f**N*ŠÖ ”,*É*•*Ö*,<sup>3</sup>*ê*,*é*,*·*,*×*,*Ä*,*l**f*|*f**C**f*“*f*^,*Í*^*ê*ŽŽ“*I*,*È*,*à*,*l*,*Ä*,*·**è* *A**f**R* [*f*‘*f**o**f**b**f**N*ŠÖ ”“*à*,*Ä*,*l*,*Ý*—*L*Æø,*Ä*,*é* *B**f*|  
*f**C**f*“*f*^ *î*•*ñ*,*ð*•*Ü*“*¶*,*·*,*é*•*K*—*v*,<sup>a</sup>,*é**f**A**f**v**f**Š**f**P* [*f**V**f**‡**f*“*Í* *A**f**f* [*f*^,*ð*•*Ü*Ž<sup>·</sup>,*·*,*é**f* *f*,*f*Š,*ð*Š<sub>m</sub>•*Ü*,*μ* *A**f**f* [*f*^,*ð**f**R**f**s* [<sub>μ</sub> *A* *V*  
*μ*,*¢**ff* [*f*^,*l**f*|*f**C**f*“*f*^,*ð*•*Ü*“*¶*,*μ*,*È*,<sup>¯</sup>,*ê*,*l*,*È*,*ç*,*È*,*¢* B,*±*,*l*ŠÖ ”“*à*,*l**lpData*,*Í*^*ê*ŽŽ“*I*,*È**f*|*f**C**f*“*f*^,*Ä*,*é* B



## EnumAddressTypeCallback

```
BOOL WINAPI EnumAddressTypeCallback(  
    REFGUID guidDataType, LPVOID lpContext,  
    DWORD dwFlags);
```

**IDirectPlayLobby::EnumAddressTypes** *f f\fbfh,ĀŽg—p,·,é fAfvfŠfP [fVf‡f“”è`,ìfR [f<fofbfNŠÖ ” B*  
*—ñ<“,ð‘±,¯,é ê ‡,ÍTRUE A I—¹,·,é ê ‡,ÍFALSE,ð•Ô,· B*

*guidDataType*

*fAfhfĈfXŽí•Ê,ð•\,·fOf [fof< Ef†fj [fNŽ¯•ÊŽq(GUID) B’è< Ĭ,Ý,Ö,Ìf|*  
*fCf“f^Ží•Ê,Ĭ ADPAID\_Phone ADPAID\_Inet ADPAID\_ComPort,Ā, ,é BfAfhfĈfXŽí•Ê,É,Ā,¢*  
*,Ä,Ĭ Ú ×DirectPlayfAfhfĈfX,ðŽQ Æ,³,ê,½,¢ B*

*lpContext*

*fR [f<fofbfNŠÖ ”,É“n,³,ê,é fRf“fefLfXfg B*

*dwFlags*

*—\—ñ,³,ê,Ä,¢,é BŽg—p,μ,Ä,Ĭ,¢,¯,È,¢ B*

## EnumDPCallback

BOOL WINAPI EnumDPCallback(LPGUID lpguidSP,  
LPSTR/LPWSTR lpSPName, DWORD dwMajorVersion,  
DWORD dwMinorVersion, LPVOID lpContext);

**DirectPlayEnumerate**ŠÖ ”,ÄŽg—p,·,éAfvfŠfP [fVf‡f“”è` ,lR [f<fofbfNŠÖ ” BUNICODE,“è` ,3,ê,é,©,Ç,□  
,©,É,æ,Ä,Ä AfR [f<fofbfNŠÖ ”,lfvf fgf^fCfv,lpSPName,Í ALPWSTR iUnicode,l ê ‡ j, ,é,¢  
,ÍLPSTR iANSI,l ê ‡ j,Æ,µ,Ä’è` ,3,ê,é B

—ñ“,ð‘±,¬,é ê ‡,ÍTRUE A I—,·,é ê ‡,ÍFALSE,ð•Ö,· B

lpguidSP

DirectPlayfT [frfX Efvf fofCf\_,lf†fj [fNŽ~•ÊŽq,lfAfhfÆfX B

lpSPName

fhf%ofCfo,ðŽ!,•¶Žš—ñ,lfAfhfÆfX BUNICODEfVf“f{f<,“è` ,3,ê,é,©,Ç,□  
,©,É,æ,Ä,Ä Afpf%of [f^,ÍLPWSTRÆ^ iUnicode j, ,é,¢,ÍLPSTRÆ^ iANSI j,Æ,È,é B

dwMajorVersion and dwMinorVersion

fhf%ofCfo,lf fWff [,¬,æ,Ñf}fCfi [ Efo [fWf‡f“”Ô † B

lpContext

fAfvfŠfP [fVf‡f“”è` ,lRf“fefLfXfg,Ö,lf|fCf“f^ B

fR [f<fofbfNŠÖ ”,É•Ö,3,ê,é,·,×,Ä,lf|fCf“f^,ÍêŽž“l,È,à,l,Ä, ,è AfR [f<fofbfNŠÖ ”“à,Ä,l,Ý—LÆø,Ä, ,é B|  
fCf“f^ îñ,ð•Ũ•¶,·,é•K—v,ª, ,éAfvfŠfP [fVf‡f“,Í Aff [f^,ð•ŨŽ ,·,éf f,fŠ,ðŠm•Ũ,µ Aff [f^,ðfRfs [,µ A V  
,µ,¢ff [f^,lf|fCf“f^,ð•Ũ•¶,µ,È,¬,ê,l,È,Ç,È,¢ B,±,lŠÖ ”“à,lpguidSP AlpSPName AlpData,ÍêŽž“l,È|fCf“f^,Ä, ,é B

## EnumLocalApplicationsCallback

BOOL WINAPI EnumLocalApplicationsCallback(  
LPCDPLAPPINFO lpAppInfo, LPVOID lpContext, DWORD dwFlags);

**IDirectPlayLobby::EnumLocalApplications** f f\fbfh,ÅŽg—p,·,é fAfvfŠfP [fVf‡f““èˆ,ÌfR [f<fofbfNŠÖ ” B

—ñ<“,ð‘±,¬,é ê ‡,ÍTRUE A I—,·,é ê ‡,ÍFALSE,ð•Ô,· B

lpAppInfo

—ñ<“,³,ê,½fAfvfŠfP [fVf‡f“,Ì î•ñ,ðŠÜ,Ð A“Ç,Ý o,µ ê—p,ÌDPLAPPINFO \‘¢‘İ,Ö,Ìf|fCf“f^ B

lpContext

**IDirectPlayLobby::EnumLocalApplications** ĄÄ,Ñ o,µ,©,ç“n,³,ê,éRf“fefLfXfg,Ö,Ìf|fCf“f^ B

dwFlags

—\—ñ,³,ê,Ä,¢,é BŽg—p,µ,Ä,Í,¢,¬,È,¢ B

fR [f<fofbfNŠÖ ”,É•Ô,³,ê,é,·,×,Ä,Ìf|fCf“f^,ÍêŽž“I,È,à,Ì,Ä, ,è AfR [f<fofbfNŠÖ ”“à,Ä,Ì,Ý—LÆø,Ä, ,é Bf|  
fCf“f^ î•ñ,ð•Ü‘¶,·,é•K—v,ª, ,é fAfvfŠfP [fVf‡f“,Í Aff [f^,ð•ÜŽ ,·,é f,fŠ,ðŠm•Ü,µ Aff [f^,ðfRfs [,µ A V  
,µ,¢ff [f^,Ìf|fCf“f^,ð•Ü‘¶,µ,È,¬,ê,Ì,È,ç,È,¢ B,±,ÌŠÖ ”“à,ÌlpAppInfo,ÍêŽž“I,Èf|fCf“f^,Ä, ,é B,Ü,½  
AlpAppInfopf%of [f^,ÄŽ¹,³,ê,é \‘¢‘İ,İ’†,Ìf|fCf“f^ AlpszAppNameA,“,æ,ÑlpszAppName,âêŽž“I,È,à,Ì,Ä, ,é,±  
,Æ,É’ ^Ö,ª•K—v,Ä, ,é B

## EnumPlayersCallback2

BOOL WINAPI EnumPlayersCallback2(DPID dpId,  
DWORD dwPlayerType, LPCDPNAME lpName,  
DWORD dwFlags, LPVOID lpContext);

**IDirectPlay2::EnumGroups**, **IDirectPlay2::EnumGroupPlayers**,  
**IDirectPlay2::EnumPlayers** f fbfh,ÅŽg—  
p,³,ê,é fAfvfŠfP [fVf±f“”è`ìfR [f<fofbfNŠÖ ” B

—ñ<“,ð‘±,\_,é ê ±,ÍTRUE A I—ì,·,é ê ±,ÍFALSE,ð•Ô,· B

dpId

—ñ<“,³,ê,½fvfŒfCf,,,Ü,½,ÍfOf< [fv,ìID B

dwPlayerType

fvfŒfCf,,,ìŒ^ BDPPLAYERTYPE\_GROUP,Ü,½,ÍDPPLAYERTYPE\_PLAYER,É,È,é B

lpName

fvfŒfCf,,,Ü,½,ÍfOf< [fv,ì–¼‘O,ðŠÜ,ñ,¾•İ X•s%oÂ”\,È**DPNAME** \‘Œ‘İ,Ö,ìf|fCf“f^ B

dwFlags

**IDirectPlay2::EnumGroups**,

**IDirectPlay2::EnumGroupPlayers**,Ü,½,Í**IDirectPlay2::EnumPlayers** f fbfh,Å“n,³,ê,éftf%ofo,ðŽw’è,·,é B

lpContext

fAfvfŠfP [fVf±f“”è`fRf“fefLfXfg,Ö,ìf|fCf“f^ B

fR [f<fofbfNŠÖ ”,É•Ô,³,ê,é,·,×,Ä,ìf|fCf“f^,ÍêŽŽ“I,È,à,ì,Ä, ,è AfR [f<fofbfNŠÖ ”“à,Ä,ì,Ý—LŒø,Ä, ,é Bf|  
fCf“f^ îñ,ð•Ü‘Œ,·,é•K—v,ª, ,é fAfvfŠfP [fVf±f“,Í Aff [f^,ð•ÜŽ ,·,é f,f,Š,ðŠm•Ü,µ Aff [f^,ðfRfs [,µ A V  
,µ,Œff [f^,ìf|fCf“f^,ð•Ü‘Œ,µ,È,\_,ê,ì,È,ç,È,Œ B,±,ìŠÖ ”“à,ìlpName,ÍêŽŽ“I,Èf|fCf“f^,Ä, ,é B,Ü,½  
AlpNamepf%of [f^,ÄŽ,³,ê,é \‘Œ‘İ,ì‘†,ìf|fCf“f^ AlpszShortName / lpszShortNameA,“,æ,ÑlpszLongName /  
lpszLongNameA,àêŽŽ“I,È,à,ì,Ä, ,é,±,Æ,É’ ^Ó,ª•K—v,Ä, ,é B

## EnumSessionsCallback2

BOOL EnumSessionsCallback2(LPDSESSIONDESC2 lpThisSD,  
LPDWORD lpdwTimeOut, DWORD dwFlags  
LPVOID lpContext);

**IDirectPlay2::EnumSessions** f fbfh,Žg—p,·,éAfvfŠfP [fVf‡f““èç,ìfR [f<fofbfNŠÖ ” B

—ñ<“,ð‘±,¯,é ê ‡,íTRUE A I—1,·,é ê ‡,íFALSE,ð•Ô,· B

lpThisSD

—ñ<“,³,ê,½fZfbfVf‡f“,ð•\,·**DPSESSIONDESC2** \‘ç‘ì,Ö,ìf|fCf“f^ B—ñ<“,ªf^fCf€ EfAfEfƒg,µ,½ ê ‡ A,±  
,ìfpf%of [f^,É,íNULL,ªfZfbfƒg,³,ê,é B

lpdwTimeOut

Œ» Ý,ìf^fCf€ EfAfEfƒg’l,ðŠÜ,b•İ ”,Ö,ìf|fCf“f^ B%ž“š,ì,½,B,ÉfZfbfVf‡f“,ìf^fCf€ EfAfEfƒg’l,ð’,-  
,µ,½,Œ ê ‡,í ADPESC\_TIMEDOUTftf%ofO,ª•Ô,³,ê,½,Æ,«É,±,ìfpf%of [f^,ðfŠfZfbfƒg,·,é,±,Æ,ª,Å,«é B

dwFlags

’Ê í,ì,±,ìftf%ofO,É,Í0,ªfZfbfƒg,³,ê,é B

DPESC\_TIMEDOUT

—ñ<“,ªf^fCf€ EfAfEfƒg,µ,½,±,Æ,ðŽ’,· BlpdwTimeOut  
,ðfŠfZfbfƒg,µ A—ñ<“,ð‘±,¯,é ê ‡,íTRUE A I—  
1,·,é ê ‡,íFALSE,ð•Ô,· B

lpContext

fAfvfŠfP [fVf‡f““èç,ìfRf“fefLfXfƒ,ìfAfhfŒfX B

fR [f<fofbfNŠÖ ”,É•Ô,³,ê,é,·,×,Ä,ìf|fCf“f^,íêŽž“l,È,à,ì,Å, ,è AfR [f<fofbfNŠÖ ”“à,Å,ì,Ý—LŒø,Å, ,é Bf|  
fCf“f^ îñ,ð•Ü•Œ,·,é•K—v,ª, ,éAfvfŠfP [fVf‡f“,í Aff [f^,ð•ÜŽ ,·,éf f,fŠ,ðŠm•Ü,µ Aff [f^,ðfRfs [,µ A V  
,µ,Œff [f^,ìf|fCf“f^,ð•Ü•Œ,µ,È,¯,ê,ì,È,ç,È,Œ B,±,ìŠÖ ”“à,ìlpThisSD,íêŽž“l,È,èf|fCf“f^,Å, ,é B  
,Ü,½ AlpThisSDfpf%of [f^,ÄŽ’,³,ê,é \‘ç‘ì,ì‘†,ìf|fCf“f^ AlpszSessionName / lpszSessionNameA,~,æ,ÑlpszPassword  
/ lpszPasswordA,àêŽž“l,È,à,ì,Å, ,é,±,Æ,É’ ^Ó,³,ê,½,Œ B

## IDirectPlay2

DirectPlayIfufWfFfNfg,ð ì ¬,µ AfVfXfef€ EfƎfxf<,l•l ”,ð‘€ ì,.,é,É,Í AIDirectPlay2fCf“f^ [ftFfCfX,lf f\fbfh,ðŽg—p,.,é i IDirectPlay2AfCf“f^ [ftFfCfX,Í AIDirectPlay2A,ªANSI•¶Žš,ðŽg—p,µ AIDirectPlay2,ªUnicode,ðŽg—p,.,é,±,Æ,ð æ,¬,Î AIDirectPlay2fCf“f^ [ftFfCfX,Æ“™,Â, ,é j B,± ,lfZfNfVf‡f“,Í AIDirectPlay2fCf“f^ [ftFfCfX,lf f\fbfh,lfŠftf@fƎf“fX,Â, ,é B

IDirectPlay2fCf“f^ [ftFfCfX,lf f\fbfh,Í AŽŸ,lfOf< [fv,Éª—p,.,é,±,Æ,ª,Â,«,é B

ff [f^ŠÇ— GetGroupData  
GetPlayerData  
SetGroupData  
SetPlayerData

fOf< [fvŠÇ— AddPlayerToGroup  
CreateGroup  
DeletePlayerFromGroup  
DestroyGroup  
EnumGroupPlayers  
EnumGroups  
GetGroupName  
SetGroupName

%oŠú%o» Initialize

f fbZ [fWŠÇ— GetMessageCount  
Receive  
Send

fvfƎfCf,ŠÇ— CreatePlayer  
DestroyPlayer  
EnumPlayers  
GetPlayerAddress  
GetPlayerCaps  
GetPlayerName  
SetPlayerName

fZfbfVf‡f“ŠÇ— Close  
EnumSessions  
GetCaps  
GetSessionDesc  
Open  
SetSessionDesc

IDirectPlay2fCf“f^ [ftFfCfX,Í A,.,x,Â,ÌCOMfCf“f^ [ftFfCfX,Æ“—  
l AUnknownfCf“f^ [ftFfCfX Ef f\fbfh,ðƎp ³,.,é BIUnknownfCf“f^ [ftFfCfX,íŽŸ,ì,R,Â,lf f\fbfh,ðfTf|  
[fg,.,é B

AddRef  
QueryInterface  
Release



## IDirectPlay2::AddPlayerToGroup

HRESULT AddPlayerToGroup(DPID idGroup, DPID idPlayer);

«»‘¶,ÏfvfŒfCf,,,ð«»‘¶,ÏfOf< [fv,É’Ç%Á,·,é B  
¬Œ÷,·,ê,ÎDD\_OK AŽ,”s,·,ê,ÎŽŸ,ÏGf%o [’l,Ï,ç,,ê,©,ð•Ô,· B

DPERR\_CANTADDPLAYER

DPERR\_INVALIDOBJECT

DPERR\_INVALIDPLAYER

idGroup

’Ç%Á,·,éfOf< [fv,ÏfOf< [fvID B

idPlayer

fOf< [fv,É’Ç%Á,·,éfvfŒfCf,,,ÏfvfŒfCf,,,ID B

fOf< [fv,ð‘¼,ÏfOf< [fv,É’Ç%Á,·,é,±,Æ,Í,Â,«,È,ç,<sup>a</sup> AfvfŒfCf,,,Í•i ”,ÏfOf< [fv,Ïf f“fo [,É,È,é,±  
,Æ,<sup>a</sup>,Â,«,é BfvfŒfCf,,,<sup>a</sup>’Ç%Á,<sup>3</sup>,ê,é,Æ ADPSYS\_ADDPLAYERTOGROUPfvfXfef€ Ef fbfZ [fW,<sup>a</sup> ¶ ¬,<sup>3</sup>,ê A‘¼  
,Ï,·,×,Ä,ÏfvfŒfCf,,,É‘—,ç,ê,é BfvfXfef€ Ef fbfZ [fW,ÏŠfXfg,É,Â,ç,Ä,ÍVfXfef€ Ef fbfZ [fW,ÏŽq—p  
,ðŽQ Æ,<sup>3</sup>,ê,½,ç B

ŽQ Æ @IDirectPlay2::CreateGroup, IDirectPlay2::DeletePlayerFromGroup, DPMSG\_ADDPLAYERTOGROUP



## IDirectPlay2::Close

HRESULT Close();

fI [fvf“,μ,Ä,¢,½fZfbfVf‡f“,ðfNf [fY,·,é B  
¬Æ÷,·,ê,ÎDD\_OK AŽ,”s,·,ê,ÎŽŸ,İfGf%o [‘l,İ,¢,,ê,©,ð•Ô,· B

DPERR\_INVALIDOBJECT

DPERR\_INVALIDPARAMS

DPERR\_NOSESSIONS

,±  
,İf f\fbfh,ðÆÄ,Ň o,·,Æ Af [fJf<,É ì ¬,³,ê,½,·,×,Ä,İfvfÆfCf,,,”jŠü,³,ê A‘İ%ž,·,éDPSYS\_DESTROYPLAYER  
ORGROUfVfXfef€ Ef fbfZ [fW,“¼,İfZfbfVf‡f“ŠÖEWŽÖ,É’Ê’m,³,ê,é B,μ,©,μ AfOf< [fv,İ”jŠü,³,ê,È,¢ ifO  
f< [fv,ð”jŠü,·,é,É,İ A**IDirectPlay2::DestroyGroup**,ðŽg—p,·,é j BfVfXfef€ Ef fbfZ [fW,İfŠfXfg,É,Ä,¢  
,Ä,İfVfXfef€ Ef fbfZ [fW,İŽg—p,ðŽQ Æ,³,ê,½,¢ B

ŽQ Æ @**IDirectPlay2::DestroyPlayer**, **DPMSG\_DESTROYPLAYERORGROUP**, **IDirectPlay2::Open**

## IDirectPlay2::CreateGroup

HRESULT CreateGroup(LPDPID lpidGroup,  
LPDPNAME lpGroupName, LPVOID lpData,  
DWORD dwDataSize, DWORD dwFlags);

«» Ý, ÌfZfbfVfþf“„É“¶ Ý,·,·,éfvfœfCf,,,Ì— fOf< [fv,ð Ì ¬,·,é B  
—œ÷,·,ê,ÎDD\_OK AŽ,”s,·,ê,ÎŽŸ,ÌfGf%o [‘l,Ì,œ,,ê,©,ð•Ô,· B

DPERR\_CANTADDPLAYER

DPERR\_INVALIDOBJECT

DPERR\_INVALIDPARAMS

DPERR\_OUTOFMEMORY

lpidGroup

DirectPlayfOf< [fvID,Ä—,,ß s,,³,ê,é•Í ”,Ö,Ìf|fCf“f^ B ,±,Ì‘l,ÍDirectPlay,É,æ,Ä,Ä’è<³,ê,é B

lpGroupName

fOf< [fv,Ì—¼‘O,ðŽ ,ÄDPNAME \‘ç‘İ,Ö,Ìf|fCf“f^ B NULL,ÍfOf< [fv,ª %oŠú—¼,ðŽ ,Á,Ä,œ,È,œ,±,Æ,ð•\,· B

lpData

fOf< [fvID,ÆŠÖ~A•t,¬,éfAfvfŠfP [fVfþf“è<ÌfŠf, [fg Eff [f^ Efuf fbfN,Ö,Ìf|fCf“f^ B  
NULL,ÍfOf< [fv,ª %oŠúff [f^,ðŽ ,Á,Ä,œ,È,œ,±,Æ,ð•\,· B ,±,±  
,ÄŽw’è,³,ê,½ff [f^,Í AIDirectPlay2::SetGroupData,ªœÄ,Ń o,³,ê,é,Æ,«„Æ“—  
l AfZfbfVfþf“‘‘‘‘,Ì,·,×,Ä,ÌfAfvfŠfP [fVfþf“„É“¬,‘,ç,ê,éfŠf, [fg Eff [f^,Ä, ,é,Æœ©,È,³,ê,é B

dwDataSize

lpData,ªŽw,·ff [f^ Efuf fbfN,ÌfTfCfY,ðfofCf’P^Ê,ÄŽw’è,·,é B

dwFlags

—\~ñ,³,ê,Ä,œ,é BŽg—p,µ,Ä,Í,œ,¬,È,œ B  
f fbfZ [fW,ÍfOf< [fv,É‘— M,·,é,±,Æ,ª,Ä,« ADirectPlay,ªfOf< [fv’‘‘,ÌŠefvfœfCf,,,Éf fbfZ [fW,ð“‘—  
,·,é BfAfvfŠfP [fVfþf“„É•Ö,³,ê,½fOf< [fvID,Í Af fbfZ [fW““‘B,Æff [f^œ< þ,É,¬,œ  
,ÄfOf< [fv,ðŽ~•Ê,·,é,½,ß,É—p,œ,ç,ê,é BDirectPlay,É,æ,Ä,ÄŠ,,,è—  
,Ä,ç,ê,½fvfœfCf,,,ID,ÆfOf< [fvID,Í A,Ä,Ê,ÉfZfbfVfþf“„Ì‘‘,Äf‘‘fj [fN,Ä, ,é B,±  
,Ìf f\fbfh,ÍDPSYS\_CREATEPLAYERORGROUPfvfXfef€ Ef fbfZ [fW,ð ¶ ¬,µ A‘¼,Ì,·,×,Ä,ÌfvfœfCf,,,É‘  
— M,³,ê,é BfVfXfef€ Ef fbfZ [fW,ÌfŠfXfg,É,Ä,œ,Ä,ÍfVfXfef€ Ef fbfZ [fW,ÌŽg—p,ðŽQ Ä,³,ê,½,œ B

fAfvfŠfP [fVfþf“„Í AIDirectPlay2::SetGroupNamef f\fbfh,ðŽg,Á,Ä AfOf< [fv,Ì Ì ¬Žž,É %oŠúfOf< [fv—  
¼,ðŠÖ~A•t,¬,é,±,Æ,ª,Ä,«é BlpGroupName,Ì—¼‘O,Í lŠÖ,ª—p,·,é,½,ß,¾,¬,É’ñ<Ÿ,³,ê A“à•”,Ä,ÍŽg—p,³,ê,È,œ  
,Ì,Ä Af‘‘fj [fN,Ä, ,é•K—  
v,Í,È,œ BfAfvfŠfP [fVfþf“„Í AIDirectPlay2::SetGroupDataf f\fbfh,É,æ,Ä,Ä AfOf< [fv,Ì Ì ¬Žž,É %oŠúff [f  
^,ðŠÖ~A•t,¬,é,±,Æ,ª,Ä,«„é B

ŽQ Ä @DPNAME, DPMSG\_CREATEPLAYERORGROUP, IDirectPlay2::DestroyGroup,  
IDirectPlay2::EnumGroups, IDirectPlay2::EnumGroupPlayers, IDirectPlay2::Send, IDirectPlay2::SetGroupData,  
IDirectPlay2::SetGroupName

## IDirectPlay2::CreatePlayer

HRESULT CreatePlayer(LPDPID lpidPlayer,  
LPDPNAME lpPlayerName, HANDLE hEvent,  
LPVOID lpData, DWORD dwDataSize, DWORD dwFlags);

«» Ý, ðZfbfVfþf“, Éf [fJf< EfvfÆfCf,,, ð ì ¬, ·, é B  
¬Æ÷, ·, ê, ÎDD\_OK AŽ, ”s, ·, ê, ÎŽŸ, ðGf%o [¹l, ð, ·, ê, ©, ð•Ô, · B

### DPERR\_CANTADDPLAYER

### DPERR\_CANTCREATEPLAYER

### DPERR\_GENERIC

### DPERR\_INVALIDOBJECT

### DPERR\_INVALIDPARAMS

### DPERR\_NOCONNECTION

#### lpidPlayer

DirectPlayvfÆfCf,,, ID, Ä–,,, ß s,,, ³, ê, é•İ ”, Ö, ðf|fCf“f^ B ±, ð¹l, ÎDirectPlay, É, æ, Ä, Ä’è`³, ê, é B

#### lpPlayerName

fvfÆfCf,,, ð¼‘O, ðŽ , ÄDPNAME \‘‘¹, Ö, ðf|fCf“f^ B NULL, ðfvfÆfCf,,, ^ %Šú¼¼ îñ, ðŽ , Ä, Ä, Ç, È, Ç, ±, Æ, ð•\ , · B

#### hEvent

, ±  
, ðfvfÆfCf,,, ¶, Ä, ðf bfbZ [fWŽó M, µ, ½, Æ, «, ÉDirectPlay, É, æ, Ä, ÄN“®, ³, ê, é AfAfvfŠfP [fVfþf“, ^ ¶ ¬, µ, ½f Cfxf“fg EfIfuWfFfNfg B

#### lpData

fvfÆfCf,,, ID, ÉŠÖ~A•t, ¬, éfAfvfŠfP [fVfþf“è`³, ðfŠf, [fg Eff [f^ Efuf fbfN, Ö, ðf|fCf“f^ B  
NULL, ðfvfÆfCf,,, ^ %Šúff [f^, ðŽ , Ä, Ä, Ç, È, Ç, ±, Æ, ð•\, · B, ±, ±  
, ÄŽw’è, ³, ê, ½ff [f^, Í AIDirectPlay2::SetPlayerData, ^Ä, Ñ o, ³, ê, é, Æ, «, Æ“—  
l AfZfbfVfþf“t, ð¹, ×, Ä, ðfAfvfŠfP [fVfþf“, É“”B, ³, ê, éfŠf, [fg Eff [f^, Ä, , é, ÆÆ©, È, ³, ê, é B

#### dwDataSize

lpData, ^Žw, ·ff [f^ Efuf fbfN, ðfTfCfY, ðfofCfY, ðfPÊ, ÄŽw’è, ·, é B

#### dwFlags

—\ñ, ³, ê, Ä, Ç, é BŽg—p, µ, Ä, Í, Ç, ¬, È, Ç B

, Ð, Æ, Ä, ðfvf fZfX, Í·j ”, ðf [fJf< EfvfÆfCf,,, ðŽ , Ä, ±  
, Æ, ^, Ä, «, é Bf [fJf< EfvfÆfCf,,, Í ADirectPlayIfufWfFfNfg, ð’Ê, µ A•j ”, ðfRf“fsf...  
[f^ ä, ÄŽA s’t, ð¹CÖ, ð¹ ”, ðf [fJf< EfvfÆfCf,,, ä AfŠf, [fg, ðfvfÆfCf,,, Æ¹b, ·, é, ±  
, Æ, ^, Ä, «, é BfAfvfŠfP [fVfþf“, Í A•Ô, ³, ê, ½fvfÆfCf,,, ID, ðŽg—  
p, µ, Ä Af bfbZ [fW“”B, äff [f^Æ< ±, ÄŽw’è, ·, éfvfÆfCf,,, ðŽ¬•Ê, ·, é BDirectPlay, É, æ, Ä, ÄŠ,,, è“—  
, Ä, Ç, è, ½fvfÆfCf,,, ID, Æfof< [fvID, Í A, Ä, È, ÉfZfbfVfþf“, ð¹t, Äftfj [fN, Ä, , é B

fAfvfŠfP [fVfþf“, Í AIDirectPlay2::SetPlayerNamef ffbfh, ðŽg, Ä, Ä AfvfÆfCf,,, ð ì ¬Žž, É %Šú–  
¼, ðŠÖ~A•t, ¬, é, ±, Æ, ^, Ä, «, é BlpPlayerName, ^Ž, ·¼‘O, Í lŠÖ, ^—p, ·, é, ½, ß, ¼, ¬, È’ñ<Ÿ, ³, ê A“à•”, Ä, ÎŽg—p, ³, ê, È, Ç  
, ½, ß Af†fj [fN, Ä, , éK—  
v, Í, È, Ç BfAfvfŠfP [fVfþf“, Í AIDirectPlay2::SetPlayerDataf ffbfh, É, æ, Ä, Ä AfvfÆfCf,,, ð ì ¬Žž, É %Šúff [f  
^, ðŠÖ~A•t, ¬, é, ±, Æ, ^, Ä, «, é B

, ±, ðf ffbfh, ^ ³ íÉ I—¹, ·, é, Æ A V, µ, ÇfvfÆfCf,,, ^fZfbfVfþf“, É%Ä“ü, µ, ½, ±  
, Æ, ð’Ê’m, ·, é, ½, ß AfZfbfVfþf“t, ð¹¼, ð¹, ·, ×, Ä, ðfvfÆfCf,,, ÉDPSYS\_CREATEPLAYERORGROUPfvfXfef€ Ef bfbZ  
[fW, ^—, Ç, è, é BfvfXfef€ Ef bfbZ [fW, ðfŠfXfg, É, Ä, Ç, Ä, ÍfVfXfef€ Ef ffbZ [fW, ÎŽg—p, ðŽQ Æ, ³, ê, ½, Ç B

DirectPlayf bfbZ [fW, ÎŽæ“¼, ð•Ê, ðfXfÆfbfh, Ä s, ÇAfvfŠfP [fVfþf“, Ä, Í AhEventfpf%of [f^, ð—p, Ç  
, Ä“ŠúfCxf“fg, ðñ<Ÿ, ·, é, ±, Æ, ^, Ä, «, é B, ±, ðfCxf“fg, Í A, ±  
, ðfvfÆfCf,,, ^f bfbZ [fW, ðŽó, ¬Žæ, Ä, ½, Æ, «, ÉfZfbf³, ³, ê, é BhEvent, ÄŽ¹, ³, ê, éfCxf“fg, Í A•j ”, ðfvfÆfCf,,, ©, ÇŽg—  
p, ·, é, ±, Æ, ^, Ä, «, é B

ŽQ Æ @DPNAME, DPMSG\_CREATEPLAYERORGROUP, IDirectPlay2::DestroyPlayer,

IDirectPlay2::EnumPlayers, IDirectPlay2::Receive, IDirectPlay2::Send, IDirectPlay2::SetPlayerData,  
IDirectPlay2::SetPlayerName

## IDirectPlay2::DeletePlayerFromGroup

HRESULT DeletePlayerFromGroup(DPID idGroup,  
DPID idPlayer);

*fOf* < [fv,©,çfvfƎfCf,,,ð í œ,·,é B

¬Ǝ÷,·,ê,ÎDD\_OK AŽ,”s,·,ê,ÎŽŸ,ÌfGf%o [’l,Ì,¢,,ê,©,ð•Ô,· B

**DPERR\_INVALIDOBJECT**

**DPERR\_INVALIDPLAYER**

*idGroup*

*fvfƎfCf,,,<sup>a</sup>* í œ,<sup>3</sup>,ê,éfOf < [fvID B

*idPlayer*

*fOf* < [fv,©,ç í œ,<sup>3</sup>,ê,éffvfƎfCf,,,ÌfvfƎfCf,,,ID B

*fvfƎfCf,,,<sup>a</sup>* í œ,<sup>3</sup>,ê,é,Æ A•İ X,ð¼,ÌfvfƎfCf,,,É’Ê’m,·,é,½,ß,ÉDPSYS\_DELETEPLAYERFROMGROUPfvfXfef€  
Ef fbfZ [fW,<sup>a</sup> ¶ ¬,<sup>3</sup>,ê,é BfvfXfef€ Ef fbfZ [fW,ÌfŠfXfg,É,Â,¢,Ä,İfVfXfef€ Ef fbfZ [fW,İŽg=  
p,ðŽQ Æ,<sup>3</sup>,ê,½,¢ B

ŽQ Æ @**IDirectPlay2::AddPlayerToGroup, DPMSG\_DELETEPLAYERFROMGROUP**

## IDirectPlay2::DestroyGroup

HRESULT DestroyGroup(DPID idGroup);

*fZfbfVf‡f“*,©,çfOf< [*f*v,đ í œ,·,é B ,±,ìfOf< [*f*v,É‘@,μ,Ä,¢,éID,Í ACE» Ý,ìfZfbfVf‡f“,ÌŠÔ A Ä—  
p,<sup>3</sup>,ê,é,±,Æ,Í,Ê,¢ B

¬œ÷,·,ê,ÎDD\_OK AŽ,”s,·,ê,ÎŽŸ,ìfGf%o [*l*,ì,¢,,ê,©,ð•Ô,· B

**DPERR\_INVALIDOBJECT**

**DPERR\_INVALIDPARAMS**

**DPERR\_INVALIDPLAYER**

*idGroup*

*fQ* [*f*€,©,ç í œ,<sup>3</sup>,ê,éfOf< [*f*vID B

í œ,·,é‘O,ÉfOf< [*f*v,ð<ó,É,·,é•K—v,Í,Ê,¢ BfOf< [*f*v,É‘@,μ,Ä,¢,éœÂ•Ê,ìfvfœfCf,,Í”jŠü,<sup>3</sup>,ê,È,¢ B,±  
,ìf f\fbfh,Í AfOf< [*f*v,É‘@,μ,Ä,¢  
,éŠefvfœfCf,,ÉDPSYS\_DELETEPLAYERFROMGROUPfVfXfef€ Ef fbfZ [*f*W,ð”-  
s,μ AŽŸ,ÉDPSYS\_DESTROYPLAYERORGROUPfVfXfef€ Ef fbfZ [*f*W,ð ¶ ¬,·,é BfVfXfef€ Ef fbfZ [*f*  
W,ìfŠfXfg,É,Â,¢,Ä,ÍfVfXfef€ Ef fbfZ [*f*W,ìŽg—p,ðŽQ Æ,<sup>3</sup>,ê,½,¢ B

ŽQ Æ @**IDirectPlay2::CreateGroup**, **DPMMSG\_DESTROYPLAYERORGROUP**

## IDirectPlay2::DestroyPlayer

HRESULT DestroyPlayer(DPID idPlayer);

fZfbfVf‡f“,©,çfvfœfCf,,,đ í œ,·,é B,»,ìfvfœfCf,,¶,Ä,Ì,·,×,Ä,Ì-¢ ^— f fbfZ [fW,Íf fbfZ [fW EfLf...

[,©,ç í œ,³,ê AfvfœfCf,,,Í A‘®,µ,Ä,¢  
,½,·,×,Ä,ìfOf< [fv,©,ç í œ,³,ê,é Bœ» Ý,ìfZfbfVf‡f“,ìšÔ,Í AfvfœfCf,,ID,ª Ä—~p,³,ê,é,±,Æ,Í,È,¢ B

¬œ÷,·,ê,îDD\_OK AŽ,”s,·,ê,îžŸ,ìfGf%o [‘l,ì,¢,,ê,©,ð•Ô,· B

DPERR\_INVALIDOBJECT

DPERR\_INVALIDPLAYER

idPlayer

fZfbfVf‡f“,©,ç í œ,³,ê,éfvfœfCf,, ID B

,±,ìf f\fbfh,Í AfvfœfCf,,,ª‘®,µ,Ä,¢

,½fOf< [fv,ÉDPSYS\_DELETEPLAYERFROMGROUPfvfXfef€ Ef fbfZ [fW,ð”-

s,µ AŽŸ,ÉDPSYS\_DESTROYPLAYERORGROUP

fVfXfef€ Ef fbfZ [fW,ð ¶ ¬,·,é BfvfXfef€ Ef fbfZ [fW,ìfŠfXfg,É,Â,¢,Ä,ÍfVfXfef€ Ef fbfZ [fW,ìžq  
=p,ðžQ Æ,³,ê,½,¢ B

žQ Æ @IDirectPlay2::CreatePlayer, DPMSG\_DESTROYPLAYERORGROUP

```
HRESULT EnumGroupPlayers(DPID idGroup,
    LPGUID lpguidInstance,
    LPDPENUMPLAYERSCALLBACK2 lpEnumPlayersCallback2,
    LPVOID lpContext, DWORD dwFlags);
```

**DPERR\_EXCEPTION**  
**DPERR\_INVALIDFLAGS**  
**DPERR\_INVALIDOBJECT**  
**DPERR\_INVALIDPLAYER**

```

idGroup
    fvfƎfCf,,a—ñ<“,3,ê,éOf< [fv,lfOf< [fvID B

lpguidInstance
    ŠÖEW,·,éDirectPlayfZfbfVf‡f“,lfCf“fXf^f“fX BDPENUMPLAYERS_SESSIONftf%oF,ªŽw`è,3,ê,È,¢,Æ,«,Í A,±
    ,lfpf%of [f^,ðNULL,ÉfZfbfg,µ,Ê,,Ä,Í,È,ç,Ê,¢ B

lpEnumPlayersCallback2
    fOf< [fv†,lŠefvfƎfCf,,É,Â,¢,ÄÄÄ,Ñ o,3,ê,éEnumPlayersCallback2ŠÖ ”,Ö,lfCf“f^ B

lpContext
    fR [f<fofbfNŠÖ ”,É“n,3,ê,éAfvfŠfP [fVf‡f““è<,lfRf“fefLfXfg,Ö,lfCf“f^ B

dwFlags
    fR [f<fofbfNŠÖ ”,ldwFlagsfpf%of [f^,É“n,3,ê,éftf%oF B

    DPENUMPLAYERS_SESSION
        lpguidInstance,é,æ,Ä,ÄŽ~•Ê,3,ê,éfZfbfVf‡f““à,lfOf< [fv,lfvfƎfCf
        ,,ð—ñ<“,·,é B

`É í,±,lf ffbfh,Í A¢» Ý,lfZfbfVf‡f“,lf [fJf< EfvfƎfCf,, EfŠfXfg,ðŽg—p,µ,Ä—ñ<“,·,é B
DPENUMPLAYERS_SESSIONftf%oF,ðfZfbfVf‡f“ EfCf“fXf^f“fXGUID,Æ,Æ,à,ÈŽw`è,·,é,Æ AfZfbfVf‡f“,lfzfX
fg,É—ñ<“fŠfXfg,lfñŸ,ð—v< ,·,é B,±,lf ffbfh,Í AIDirectPlay2::EnumSessions —ñ<“,l†,©,çÄÄ,Ñ o,·,±
,Æ,Í,Ä,«,È,¢ B3,ç,É ADPENUMPLAYERS_SESSIONftf%oF,ðŽg—p,·,é ê ‡ A,±
,lf ffbfh,ÍÄÄ,Ñ o,µ,Í AIDirectPlay2::EnumSessionsf ffbfh,ÍÄÄ,Ñ o,µ,Íæä,©,ÄIDirectPlay2::Close
,·,æ,ÑIDirectPlay2::Openf ffbfh,ÍÄÄ,Ñ o,µ,lfO,É s,í,È,~ê,Í,È,ç,Ê,¢ B

ŽQ æ @IDirectPlay2::CreatePlayer, IDirectPlay2::DestroyPlayer, IDirectPlay2::AddPlayerToGroup,
IDirectPlay2::DeletePlayerFromGroup

```



## IDirectPlay2::EnumGroups

HRESULT EnumGroups(LPGUID lpguidInstance,  
LPDPENUMPLAYERSCALLBACK2 lpEnumPlayersCallback2,  
LPVOID lpContext, DWORD dwFlags);

*fZfbfVfzf*“,Ä—LÆø,ÈfOf< [fv,ð—ñ<“,·,é B  
—Æ÷,·,ê,ÎDD\_OK AŽ,“s,·,ê,ÎŽŸ,ÌfGf%o [‘l,Ì,¢,,ê,©,ð•Ô,· B

**DPERR\_INVALIDOBJECT**

**DPERR\_INVALIDPARAMS**

**DPERR\_UNSUPPORTED**

*lpguidInstance*

ŠÖÆW,·,éDirectPlayfZfbfVfzf“,ÌfCf“fXf^f“fX BDPENUMPLAYERS\_SESSIONftf%ofo,ðŽw’è,μ,È,¢ ê ±,Í A,  
±,Ìfpf%of [f^,ðNULL,ÉfZfbf,μ,È,,Ä,Í,È,¢,¢ B

*lpEnumPlayersCallback2*

*fZfbfVfzf*“,ÌŠefOf< [fv,É,Ä,¢,ÄÆÄ,Ñ o,³,ê,é**EnumPlayersCallback2**ŠÖ ”,Ö,Ìf|fCf“f^ B

*lpContext*

fR [f<fofbfNŠÖ ”,É“n,³,ê,éAfvfŠfP [fVfzf““è<,ÌRf“fefLfXfg,Ö,Ìf|fCf“f^ B

*dwFlags*

fR [f<fofbfNŠÖ ”,ÌdwFlagsfpf%of [f^,É“n,³,ê,éftf%ofo B

DPENUMPLAYERS\_SESSION

*lpguidInstance* ,É,æ,Ä,ÄŽ~•Ê,³,ê,½fZfbfVfzf““à,ÌfOf< [fv,ð—  
ñ<“,·,é B

’Ê í,±,Ìf f\fbfh,Í AÆ» Ý,ÌfZfbfVfzf“,Ìf [fJf< EfvfÆfCf,, EfŠfXfg,ðŽg—p,μ,Ä—ñ<“,·,é B  
DPENUMPLAYERS\_SESSIONftf%ofo,ðfZfbfVfzf“ EfCf“fXf^f“fXGUID,Æ,Æ,à,ÉŽw’è,·,é,Æ AfZfbfVfzf“,ÌfzfX  
fg,É—ñ<“fŠfXfg,Ì’ñ<Ÿ,ð—v< ,·,é B,±,Ìf f\fbfh,Í A**IDirectPlay2::EnumSessions**—ñ<“,Ì’†,©,¢ÆÄ,Ñ o,·,±  
,Æ,Í,Ä,«,È,¢ B,³,¢,É ADPENUMPLAYERS\_SESSIONftf%ofo,ðŽg—p,·,é ê ± A,±  
,Ìf f\fbfh,ÌÆÄ,Ñ o,μ,Í A**IDirectPlay2::EnumSessions**f f\fbfh,ÌÆÄ,Ñ o,μ,ÌÆä,Ä,©,Ä**IDirectPlay2::Close**  
,“,æ,Ñ**IDirectPlay2::Open** f f\fbfh,ÌÆÄ,Ñ o,μ,Ì‘O,É s,í,È,~,ê,Í,È,¢,È,¢ B

ŽQ Æ @**IDirectPlay2::CreateGroup**, **IDirectPlay2::DestroyGroup**, **IDirectPlay2::EnumSessions**

## IDirectPlay2::EnumPlayers

HRESULT EnumPlayers(LPGUID lpguidInstance,  
LPDPENUMPLAYERSCALLBACK2 lpEnumPlayersCallback2,  
LPVOID lpContext, DWORD dwFlags);

*fZfbfVfþf“ , ð—ñ“ , · , é B*

*—œ÷ , · , ê , îDD\_OK AŽ , ”s , · , ê , îŽŸ , ðGf% [ ’l , ð , · , ê , © , ð•Ô , · B*

### DPERR\_EXCEPTION

### DPERR\_GENERIC

### DPERR\_INVALIDOBJECT

### DPERR\_UNSUPPORTED

*lpguidInstance*

*ŠÖœW , · , éDirectPlay fZfbfVfþf“ , ðCf“fXf^f“fX BDPENUMPLAYERS\_SESSIONftf%fo, aŽw’è , ³ , ê , È , œ ê þ A , ± , ðfpf%of [ f^ , ðNULL , ÉfZfbfg , µ , È , , Ä , Í , È , ç , È , œ B*

*lpEnumPlayersCallback2*

*fZfbfVfþf“+ , ðSefOf< [fv , É , Ä , œ , Ä , Æ , Ñ o , ³ , ê , éEnumPlayersCallback2ŠÖ ” , Ö , ð|fCf“f^ B*

*lpContext*

*fR [ f<fofbfNŠÖ ” , É“n , ³ , ê , éAfvfŠfP [fvfþf“è< , ðRf“fefLfXfg , Ö , ð|fCf“f^ B*

*dwFlags*

*fR [ f<fofbfNŠÖ ” , ðdwFlagsfpf%of [ f^ , É“n , ³ , ê , éftf%fo B*

*DPENUMPLAYERS\_GROUP*

*fvfœfCf , , ð—ñ“ , ÉfOf< [fv , ðŠÜ , Þ B*

*DPENUMPLAYERS\_LOCAL*

*, ± , ð*

*DirectPlayIfufWfFfNfg , É , æ , Ä , Äf [fJf< , É ð ñ , ³ , ê , ½fvfœfCf , , ¾ , — , ð—ñ“ , · , é B*

*DPENUMPLAYERS\_REMOTE*

*fŠf , [fg , ðDirectPlayIfufWfFfNfg , É , æ , Ä , Ä ð ñ , ³ , ê , ½fvfœfCf , , ¾ , — , ð—ñ“ , · , é B*

*DPENUMPLAYERS\_SESSION*

*lpguidInstance , É , æ , Ä , ÄŽ•Ê , ³ , ê , ½fZfbfVfþf““à , ðOf< [fv , ð—ñ“ , · , é B*

*’Ê í , ± , ðf f\fbfh , Í Aœ» ÝfI [fvf“ , ³ , ê , Ä , œ , éfZfbfVfþf“ , ðfvfœfCf , , ð—ñ“ , · , é B fOf< [fv , àŠÜ , ß , Ä—ñ“ , ð s , □ , É , Í ADPENUMPLAYERS\_GROUPftf%fo , ðŽg—*

*p , · , é BDPENUMPLAYERS\_SESSIONftf%fo , ðfZfbfVfþf“ EfCf“fXf^f“fXGUID , Æ , Æ , à , ÉŽw’è , · , é , Æ AfZfbfVfþf“ , ðZfXfg , É—ñ“fŠfXfg , ðñ•Ÿ , ð—v< , · , é B , ± , ðf f\fbfh , Í AIDirectPlay2::EnumSessions —ñ“ , ð+ , © , çœÄ , Ñ o , · , ± , Æ , Í , Ä , « , È , œ B , ³ , ç , È ADPENUMPLAYERS\_SESSIONftf%fo , ðŽg—p , · , é ê þ A , ± , ðf f\fbfh , ðœÄ , Ñ o , µ , Í AIDirectPlay2::EnumSessionsf f\fbfh , ðœÄ , Ñ o , µ , ðœä , Ä , © , ÄIDirectPlay2::Close , ” , æ , ÑIDirectPlay2::Openf f\fbfh , ðœÄ , Ñ o , µ , ðO , É s , í , È , — , ê , î , È , ç , È , œ B*

*ŽQ Æ @IDirectPlay2::CreatePlayer , IDirectPlay2::DestroyPlayer , IDirectPlay2::EnumSessions*

## IDirectPlay2::EnumSessions

HRESULT EnumSessions(LPDPSESSIONDESC2 lpsd,  
DWORD dwTimeout,  
LPDPENUMSESSIONSCALLBACK2 lpEnumSessionsCallback2,  
LPVOID lpContext, DWORD dwFlags);

,±,ì DirectPlayfIfufWfFfNfg,Ä—LÆø,ÈfZfbfVf±f“,ð—ñ“,·,é B  
—Æ÷,·,ê,ÎDD\_OK AŽ,”s,·,ê,ÎŽŸ,ÌfGf%o [‘l,ì,¢,,ê,©,ð•Ô,· B

### DPERR\_EXCEPTION

### DPERR\_INVALIDOBJECT

### DPERR\_INVALIDPARAMS

lpsd

—ñ“,³,ê,éfZfbfVf±f“,ð•,·**DPSESSIONDESC2** \‘c‘ì,Ö,Ìf|fCf“f^ B,±,ì \‘c‘ì,ÌŠî €fZfbfg,ð—  
ž,½,·fZfbfVf±f“,Ì,Ÿ,ª—  
ñ“,³,ê,é **BDPSESSIONDESC2** \‘c‘ì,Ì**guidApplication** f“fo,É,Í AfAfvfŠfP [fVf±f“,ÉŠÖ~A,·,éOf [fof< E  
f+fj [fNŽ•ÊŽq iGUID j,ðfZfbfg,·,é,© A,·,×,Ä,ÌfAfvfŠfP [fVf±f“,ðŽw’è,·,é,É,ÎNULL,ð Ÿ’è,·,é B  
**guidInstance** f“fo,É,Í AfZfbfVf±f“ EfCf“fXf^f“fX,ÉÆÄ—  
L,ÌGUID,ª,©,ê,Î,»,,é,ð Aª,©,ç,È,—,ê,Î A,·,×,Ä,ÌfZfbfVf±f“,ð“¾,é,½,ß,ÉNULL,ðfZfbfg,·,é BfpfXf [fh,ªK  
—v,È ê ± **AlpszPassword** f“fo,ð“K Ø,ÈfZfbfg,·,é B

dwTimeout

DirectPlay,ª—ñ“f fbfZ [fW,Ö,ì%ž“š,ð•Ö,Ä‘S‘ì,ÌŽžŠÖ,ðf~fŠ•b,ÄŽw’è,·,é i—ñ“,ÌŠÖŠu,Ä,Í,È,¢ j B,±  
,Ìfpf%of [f^,É,Í0,ð Ÿ’è,·,é,±,Æ,ð „ §,·,é B,±,ì ê ± AfT [ftrfX Efvf fofCf\_,É“K“—  
,ÈftftfHf<fg,Ìf^fCfEfAfEf,ðDirectPlay,ªEvŽZ,·,é B

lpEnumSessionsCallback2

ŠeDirectPlayfZfbfVf±f“,É%ž“š,µ,ÄÆÄ,Ñ o,³,ê,é**EnumSessionsCallback2**ŠÖ ”,Ö,Ìf|fCf“f^ B

lpContext

fR [f<fofbfNŠÖ ”,É“n,³,ê,éft [fU’è<,ÌfRf“fefLfXfg B

dwFlags

,±,Ìfpf%of [f^,É0,ª Ÿ’è,³,ê,½ ê ± AŽg—p%Ä”,ÈfZfbfVf±f“,¾,—,ª—  
ñ“,³,ê,é iDPENUMSESSIONS\_AVAILABLE j B  
DPENUMSESSIONS\_AVAILABLE  
,±,ÌfAfvfŠfP [fVf±f“,ªŽQ%Ä,Ä,«,é,·,×,Ä,ÌfZfbfVf±f“,ð—ñ“,·,é B

### **DPENUMSESSIONS\_ALL**

%Ä“ü,Ä,«,é,©,Ç,□  
,©,ÉŠÖ,ì,ç,, A,·,×,Ä,ÌfAfNfefBfu,ÈfZfbfVf±f“,ð—  
ñ“,·,é BfvfEfCf,, §ÆÄ,É‘B,µ,½fZfbfVf±f“,à A V,µ,¢fvfEfC  
f,,ª—³Æø,É,³,ê,½fZfbfVf±f“,à AŽQ%Ä,ª—  
³Æø,É,È,Ä,½fZfbfVf±f“,à—ñ“,³,ê,é B fAfvfŠfP [fVf±f“,Í,±  
,ì \‘c‘ì,Ì**dwFlags** f“fo,ð’²,× AfZfbfVf±f“,ª V,µ,¢fAfvfŠfP [f  
Vf±f“,ÌŽQ%Ä,ð<—%Ä,·,é,©,Ç,□,©,ð”»’è,·,é,±,Æ,ª,Ä,«,é B

’Ê í,±,Ìf f\fbfh,Í **ADirectPlayCreate** ŠÖ ”,ð—p,¢

,ÄDirectPlayfIfufWfFfNfg,ª ì ¬,³,ê,½’¼Æä,ÉÆÄ,Ñ o,³,ê,é BfZfbfVf±f“,É Ú±,µ,Ä,¢  
,ÉŠÖ,â AfAfvfŠfP [fVf±f“,ªfZfbfVf±f“,ð ì ¬,µ,½Æä,ÉÆÄ,Ñ o,·,±  
,Æ,Í,Ä,«,È,¢ **BIDirectPlay2::EnumSessions**,Í AfT [ftrfX Efvf fofCf\_,Éflfbfgf [fN ä,É,ð,Æ,Ä`È ä,ÌzfXfg,Ì  
Ÿ—§,ð—v<, µ A,»,ê,ç,È—ñ“,ÌfŠfNfGfXfg,ð’ M,·,é,Æ“® ì,·,é B%ž“š,ðŽó M,·,é,Æ A—  
ñ“,³,ê,éfZfbfVf±f“,ª—p^Ö,³,ê,é BDirectPlay,ª±  
,ê,ç,ì%ž“š,ð•Ö,ÄŽžŠÖ,ÌdwTimeoutpf%of [f^,É,æ,Ä,Ä §Æä,³,ê,é B,±,ÌŽžŠÖ,ª—  
^,é,ç,ÌÆÄ AfR [f<fofbfNŠÖ ”,ÉDPESC\_TIMEDOUTftf%ofO,ªÊ’m,³,ê **AlpThisSDpf%of** [f^,ÉNULL’l,ª“n,³,ê,é B,±  
,ÌŽž“\_,Ä A—ñ“,ð±,—,é,É,Í AdwTimeout,É V,µ,¢’l,ðfZfbfg,µ,ÄTRUE,ð•Ô,· B—  
ñ“,ð’†ž~,·,é,É,Í AFALSE,ð•Ô,· BdwTimeout,É,Í A0,ð Ÿ’è,µ,Ä,“,·,Æ,æ,¢ B,±  
,ì ê ± ADirectPlay,ªfT [ftrfX Efvf fofCf\_,É“K Ø,Èf^fCfEfAfEf,ðEvŽZ,·,é B

’Ê í,Í AŽQ%Ä,·,é,±,Æ,ª,Ä,«,éfZfbfVf±f“,¾,—,ª—ñ“,³,ê,é BDPENUMSESSIONS\_ALLftf%ofO,ªŽw’è,³,ê,Ä,¢  
,é,Æ A V,µ,¢fvfEfCf,,ð ì ¬,·,é,±,Æ,ª,Ä,«,È,¢fZfbfVf±f“,à—ñ“,³,ê,é B,±  
,ì ê ± AfAfvfŠfP [fVf±f“,ÍfZfbfVf±f“,ÉŽQ%Ä,Ä,«,È,¢,±,Æ,É’ ^Ö,µ,È,,Ä,Í,È,ç,È,¢ B

$f$   $fr$  [,<sup>a</sup> $fAfvf\check{S}fP$  [ $fVf\ddot{+}f$ “, $\check{d}\check{S}J\check{Z}n,\mu,\grave{E},\odot,\acute{A},\frac{1}{2},\mathcal{A},\ll,\acute{I}$   $AfT$  [ $frfX$   $Efvf$   $fofCf_{-},\acute{I}f\ddot{+}$  [ $fU,\odot,\zeta$   $\hat{\imath}\bullet\check{n},\check{d}\check{Z}\mathfrak{a}^{\text{“}\mathfrak{3}\mathfrak{4},\cdot,\acute{e}f_{-}fCfA$   
 $f$   $fO,\check{d}\bullet\check{Z}$ ], $\cdot,\acute{e}$   $\hat{e}$   $\ddot{+},^a$ , $\acute{e}$   $B,\frac{1}{2},\mathcal{A},,\acute{I}$   $Af\}$  $fCfNf$   $f\backslash ftf\mathfrak{g}$   $EfVf\check{S}fAf\lessdot$   $EfT$  [ $frfX$   $Efvf$   $fofCf_{-},\acute{I}COMf$ ]  
[ $f\mathfrak{g},\grave{l}$   $\acute{Y}'\grave{e},\check{d}-\hat{a},\pounds$   $\ddot{+},\acute{I},^1,\acute{e}$   $A,\ddot{U},\frac{1}{2}f,f\mathfrak{f}\mathfrak{f}\mathfrak{e}$   $EfT$  [ $frfX$   $Efvf$   $fofCf_{-},\acute{I}$ “ $d\grave{b}$ ” $\hat{O}$   $\ddot{+},\check{d}-$   
 $\hat{a},\pounds$   $\ddot{+},\acute{I},^1,\acute{e}$   $B,\ddot{U},\frac{1}{2}$   $AfCf$ “ $f^{\wedge}$  [ $f\mathfrak{l}f\mathfrak{b}f\mathfrak{g}$   $EfT$  [ $frfX$   $Efvf$   $fofCf_{-},\acute{I}fzfXf\mathfrak{g},\grave{l}IPfAf\mathfrak{h}f\mathfrak{C}fX,\grave{l}$ “ $\ddot{u}-\acute{I},\check{d}-v\lessdot$   $\cdot,\acute{e}$   $B$   
 $fpfXf$  [ $f\mathfrak{h}$   $Efvf$   $fefNf\mathfrak{g},\grave{l},\odot,\odot,\acute{A},\frac{1}{2}fZfbfVf\ddot{+}f$ “, $\acute{A},\acute{I}$   $A$   $^3,\mu,\pounds fpfXf$  [ $f\mathfrak{h},^a$ “ $\ddot{u}-\acute{I},^3,\hat{e},\acute{e},\ddot{U},\acute{A}$   $A-\check{n}\lessdot$ “, $\acute{I}$   $s,\acute{I},\hat{e},\grave{E},\pounds$   $B$   
 $\check{Z}Q$   $\mathcal{A}$  @DPSESSIONDESC2, IDirectPlay2::Open

## IDirectPlay2::GetCaps

HRESULT GetCaps(LPDPCAPS lpDPCaps,  
DWORD dwFlags);

DirectPlayIfufWfFfNfg,ì”\—Í,ðŽæ“¾,·,é B

¬Ĉ÷,·,ê,ÎDD\_OK AŽ,”s,·,ê,ÎŽŸ,ÌfGf%o [’l,ð•Ô,· B

DPERR\_INVALIDOBJECT

DPERR\_INVALIDPARAMS

lpDPCaps

DirectPlayIfufWfFfNfg,ì”\—Í,ðŽó,¬Žæ,éDPCAPS \‘ċ‘Ì,Ö,Ìf|fCf“f^ B IDirectPlay2::GetCaps,ðŽg—  
p,·,·,é‘O,É ADPCAPS \‘ċ‘Ì,ÌdwSizef f“fo,ð Ý’è,μ,È,,Ä,Î,È,ç,È,ĉ B

dwFlags

,±,Ìfpf%of [f^,É0,ªfZfbfg,³,ê,é,Æ A¬³•Ô Ø,Èf fb fZ [fWĈðŠ·,É‘Î,·,é”\—Í,ªĈvŽZ,³,ê,é B

DPGETCAPS\_GUARANTEED

•Ô Ø,³,ê,½f fb fZ [fW”z M,É‘Î,·,é”\—Í,ðŽæ“¾,·,é B

IDirectPlay2::GetPlayerCapsf f\fbfh,ª—vċ ,³,ê,½fvfĈfCf,,,ì”\—Í,ð•Ô,·,Ì,É‘Î,μ A,±  
,Ìf f\fbfh,ÌĈ» Ý,ÌfZfbfVf‡f“,ì”\—Í,ð•Ô,· B

ŽQ Æ @DPCAPS, IDirectPlay2::GetPlayerCaps, IDirectPlay2::Send

## IDirectPlay2::GetGroupData

HRESULT GetGroupData(DPID idGroup,  
LPVOID lpData, LPDWORD lpdwDataSize,  
DWORD dwFlags);

**IDirectPlay2::SetGroupData**,É,æ,Á,ÄfOf< [fvID,ÆŠÖ~A•t,¯,ç,ê,½ AfAfvfŠfP [fVf±f“ÆÅ—  
L,İff [f^ Efuf fbfN,ðŽæ“¾,·,é B

¬Æ÷,·,ê,ÎDD\_OK AŽ,”s,·,ê,ÎŽŸ,İfGf%o [‘l,İ,¢,,ê,©,ð•Ô,· B

**DPERR\_BUFFERTOOSMALL**

**DPERR\_INVALIDOBJECT**

**DPERR\_INVALIDPARAMS**

**DPERR\_INVALIDPLAYER**

idGroup

ff [f^,ª—v< ,³,ê,½fOf< [fv,İfOf< [fvID B

lpData

fAfvfŠfP [fVf±f“ÆÅ—L,İfOf< [fv Eff [f^,ª ‘,« ž,Ü,ê,éfofbftf@,İfAfhfÆfX Bff [f^,İTfCfY,İ,Ý,ª•K—  
v,Ê ê ±,Í A,±,İpf%of [f^,ÉNULL,ðfZfbfg,·,é B,±  
,İ,Æ,« AlpdwDataSizef%pf [f^,É,Í Aff [f^,ð•ÛŽ ,·,é,½,ß,Ê•K—v,ÊfTfCfY,ª Ý’è,³,ê,é B

lpdwDataSize

f f\fbfh,ðÆÄ,Ñ o,·‘O,Éfofbftf@,İfTfCfY,Ä %Šú%o»,³,ê,é•İ ”,Ö,İf|fCf“f^ Bf f\fbfh,ª §Æä,ð—  
ß,µ,½Æä A,±  
,İpf%of [f^,É,İfOf< [fv Eff [f^,İTfCfY,ªfofCfY’P^Ê,ÄfZfbfg,³,ê,é Bfofbftf@,ª ¬,³,·,¬,é iDPERR\_BUF  
ERTOOSMALL j ê ± A,±,İpf%of [f^,É,Í A•K—v,Êfofbftf@ EfTfCfY,ª Ý’è,³,ê,é B

dwFlags

,±,İpf%of [f^,É0,ðfZfbfg,µ,½ ê ±,Í AfŠf, [fg Eff [f^,ðŽæ“¾,·,é B

DPGET\_REMOTE

fŠf, [fg<ª—

L,³,ê,½ff [f^ EfXfy [fX,©,çÆ» Ý,İff [f^,ðŽæ“¾,·,é B

DPGET\_LOCAL

fAfvfŠfP [fVf±f“,İf [fJf<,Èff [f^ EfZfbfg,ðŽæ“¾,·,é B

DirectPlay,Í Af [fJf<,·,æ,ÑfŠf, [fg,İ,Ó,½,Ä,İf^fCfv,İfOf< [fv Eff [f^,ð•ÛŽ ,·,é,±  
,Æ,ª,Ä,«,é BfAfvfŠfP [fVf±f“,İŽæ“¾,·,éff [f^,İf^fCfv,ðŽw’è,µ,Ê,,Ä,Í,Ê,ç,È,¢ BDPSET\_LOCALftf%ofO,ðŽg,□  
,Æ ADirectPlayfIfufWfFfNfg,Ê,æ,Á,Äf [fJf< Eff [f^,ªfZfbfg,³,ê,é B DPSET\_REMOTEftf%ofO,ðŽg,□  
,Æ AfZfbfVf±f““†,İ”C^Ó,İfAfvfŠfP [fVf±f“,É,æ,Á,Ä AfŠf, [fg Eff [f^,ª Ý’è,³,ê,é B

ŽQ Æ @IDirectPlay2::SetGroupData

## IDirectPlay2::GetGroupName

HRESULT GetGroupName(DPPID idGroup,  
LPVOID lpData, LPDWORD lpdwDataSize);

*fOf< [fv,ÆŠÖ~A•t,¯,ç,ê,½–¼‘O,ð•Ô,· B*

*–Œ÷,·,ê,ÎDD\_OK AŽ,”s,·,ê,ÎŽŸ,ÌfGf%o [‘l,Ì,¢,,ê,©,ð•Ô,· B*

**DPERR\_BUFFERTOOSMALL**

**DPERR\_INVALIDOBJECT**

**DPERR\_INVALIDPARAMS**

**DPERR\_INVALIDPLAYER**

*idGroup*

*–¼‘O,ð—v< ,·,éfOf< [fv,ÌfOf< [fvID B*

*lpData*

*–¼‘Off [f^,ª ‘,« ž,Ü,ê,éfofbftf@,ÌfAfhfŒfX Bff [f^,ÌfTfCfY,¾,¯,ðŽæ“¾,·,é ê ‡,Í A,±  
,Ìfpf%of [f^,ÉNULL,ðfZfbfg,·,é B,±,Ì,Æ,« AlpdwDataSize,É,Í Aff [f^,ð•ÛŽ ,·,é,½,ß,É•K—  
v,ÈfTfCfY,ª Ý’è,³,ê,é B*

*lpdwDataSize*

*f f\fbfh,ðŒÄ,Ñ o,·‘O,Éfofbftf@,ÌfTfCfY,Å %Šú%o»,³,ê,é•Í ”,Ö,Ìf|fCf“f^ Bf f\fbfh,ª §Œä,ð–  
ß,µ,½Œä A,±,Ìfpf%of [f^,É,Í–  
¼‘Off [f^,ÌfTfCfY,ªfofCfP’Ê,ÄfZfbfg,³,ê,é Bfofbftf@,ª ¬,³,·,¬,é iDPERR\_BUFFERTOOSMALL j ê ‡ A  
,±,Ìfpf%of [f^,É,Í A•K—v,Èfofbftf@,ÌfTfCfY,ª Ý’è,³,ê,é B*

*ŠÖ ”,ª §Œä,ð–ß,µ,½Œä AfOf< [fv–¼ff [f^,ð“Ç,Ý o,·,É,Í Af|fCf“f^lpData,ð**DPNAME** \‘¢‘Ì,ÉfLfffXfg,µ,È,-  
,Ä,Í,È,ç,È,¢ B*

*ŽQ Æ @**DPNAME**, **IDirectPlay2::SetGroupName***

## IDirectPlay2::GetMessageCount

HRESULT GetMessageCount(DPID idPlayer, LPDWORD lpdwCount);

“Á’è,ìf [fJf< EfvfŒfCf,,ìŽó MfLf... [,É’u,©,ê,Ä,¢,éf fbfZ [fW,ì ”,ð-â,¢ ‡,í,<sup>1</sup>,é B  
-Œ÷,·,ê,ÎDD\_OK AŽ,”s,·,ê,ÎŽŸ,ìfGf%o [,ì,¢,,ê,©,ð•Ô,· B

**DPERR\_INVALIDOBJECT**

**DPERR\_INVALIDPARAMS**

**DPERR\_INVALIDPLAYER**

*idPlayer*

f fbfZ [fW,ì ”,ðŽæ“¾,·,éfvfŒfCf,,ìfvfŒfCf,,ID BfvfŒfCf,,Íf [fJf<,Ä,È,¯,ê,Î,È,ç,È,¢ B

*lpdwCount*

,±,ìf ffbfh,<sup>a</sup> §Œä,ð-ß,·,Æ,« Af fbfZ [fW,ì ”,“Ši”[,<sup>3</sup>,ê,é•Ĭ ” B

ŽQ Æ @IDirectPlay2::Receive



## IDirectPlay2::GetPlayerAddress

HRESULT GetPlayerAddress(DPID idPlayer,  
LPVOID lpAddress, LPDWORD lpdwAddressSize);

*f* *v* *f* *Œ* *f* *C* *f* *,* *,* *É* *ˆ* *Î* *,* *·* *é* *DirectPlay* *f* *A* *f* *h* *f* *Œ* *f* *X* *,* *ð* *Ž* *æ* *“* *¾* *,* *·* *é* *B* *DirectPlay* *f* *A* *f* *h* *f* *Œ* *f* *X*  
*,* *Í* *A* *“* *Á* *’* *è* *,* *Ì* *f* *T*  *[* *f* *r* *f* *X*  *E* *f* *v* *f*  *f* *o* *f* *C* *f* *\_* *,* *ð* *Ž* *g* *,* *²* *f* *v* *f* *Œ* *f* *C* *f* *,* *,* *Ì* *f* *l* *f* *b* *f* *g* *f*  *[* *f* *N*  *E* *f* *A* *f* *h* *f* *Œ* *f* *X* *,* *Å* *,* *·* *é* *B*

*–* *Œ* *÷* *,* *·* *é* *Î* *D* *D* *\_* *O* *K*  *A* *Ž* *,* *”* *s* *,* *·* *é* *Ì* *Ž* *Ÿ* *,* *Ì* *f* *G* *f* *%*  *[* *ˆ* *l* *,* *Ì* *,* *Œ* *,* *·* *é* *©* *,* *ð* *•* *Ô* *,* *·* *B*

**DPERR\_BUFFERTOOSMALL**

**DPERR\_INVALIDOBJECT**

**DPERR\_INVALIDPARAMS**

**DPERR\_INVALIDPLAYER**

*idPlayer*

*f* *A* *f* *h* *f* *Œ* *f* *X* *,* *ð* *Ž* *æ* *“* *¾* *,* *·* *é* *f* *v* *f* *Œ* *f* *C* *f* *,* *,* *Ì* *f* *v* *f* *Œ* *f* *C* *f* *,* *ID* *B*

*lpAddress*

*DirectPlay* *f* *A* *f* *h* *f* *Œ* *f* *X* *,* *ˆ* *‘* *«* *Ž* *Ü* *,* *è* *é* *f* *o* *f* *b* *f* *t* *f* *@* *,* *Ö* *Ì* *f* *|* *f* *C* *f* *“* *f* *^* *B* *f* *f*  *[* *f* *^* *,* *Ì* *f* *T* *f* *C* *f* *Y* *,* *¾* *\_* *–* *ð* *Ž* *æ* *“* *¾* *,* *·* *é* *ê* *‡* *Í* *A* *,* *±*  
*,* *Ì* *f* *p* *f* *%* *o* *f*  *[* *f* *^* *,* *É* *N* *U* *L* *L* *,* *ð* *f* *Z* *f* *b* *f* *g* *,* *·* *é* *B* *,* *±* *,* *Ì* *,* *Æ* *,* *«* *lpdwAddressSize* *f* *p* *f* *%* *o* *f*  *[* *f* *^* *,* *É* *Í* *A* *f* *f*  *[* *f* *^* *,* *ð* *•* *Ô* *Ž* *,* *·* *é* *½* *,* *ß* *,* *É* *•* *K* *—*  
*v* *,* *É* *f* *T* *f* *C* *f* *Y* *,* *ˆ* *Ý* *’* *è* *,* *³* *,* *è* *é* *B*

*lpdwAddressSize*

*,* *±* *,* *Ì* *f*  *f* *\* *b* *f* *h* *,* *ð* *Œ* *Ä* *,* *Ñ* *o* *,* *ˆ* *‘* *O* *é* *f* *o* *f* *b* *f* *t* *f* *@* *,* *Ì* *f* *T* *f* *C* *f* *Y* *,* *Å*  *%* *Š* *ú* *%* *»* *,* *³* *,* *è* *é* *•* *Ì* *”* *,* *Ö* *Ì* *f* *|* *f* *C* *f* *“* *f* *^* *B* *f*  *f* *\* *b* *f* *h* *,* *ˆ* *§* *Œ* *ä* *,* *ð*–  
*ß* *,* *μ* *,* *½* *Œ* *ä* *A* *,* *±*  
*,* *Ì* *f* *p* *f* *%* *o* *f*  *[* *f* *^* *,* *É* *Í* *A* *f* *O* *f* *ˆ* *[* *f* *v* *E* *f* *f*  *[* *f* *^* *,* *Ì* *f* *T* *f* *C* *f* *Y* *,* *ˆ* *f* *o* *f* *C* *f* *g* *’* *P* *ˆ* *Ê* *,* *Å* *Z* *f* *b* *f* *g* *,* *³* *,* *è* *é* *B* *f* *o* *f* *b* *f* *t* *f* *@* *,* *ˆ* *¬* *,* *³* *,* *·* *é* *i* *D* *P* *E* *R* *R* *\_* *B*  
*U* *F* *F* *E* *R* *T* *O* *O* *S* *M* *A* *L* *L*  *j* *ê* *‡* *A* *,* *±* *,* *Ì* *f* *p* *f* *%* *o* *f*  *[* *f* *^* *,* *É* *Í* *•* *K* *—* *v* *,* *É* *f* *o* *f* *b* *f* *t* *f* *@* *,* *Ì* *f* *T* *f* *C* *f* *Y* *,* *ˆ* *Ý* *’* *è* *,* *³* *,* *è* *é* *B*

## IDirectPlay2::GetPlayerCaps

HRESULT GetPlayerCaps(DPID idPlayer,  
LPDPCAPS lpPlayerCaps, DWORD dwFlags);

Žw'è,<sup>3</sup>,ê,½fvfĈfCf,,ĬĈ» Ý,Ĭ"―Ĭ,ðŽæ"¼,·,é B

¬Ĉ÷,·,ê,ĬDD\_OK AŽ,"s,·,ê,ĬŽŸ,ĬfGf%o [!l,Ĭ,Ĉ,,ê,©,ð•Ô,· B

DPERR\_INVALIDOBJECT

DPERR\_INVALIDPARAMS

DPERR\_INVALIDPLAYER

*idPlayer*

"\―Ĭ,ðĈvŽZ,·,éfvfĈfCf,,ĬfvfĈfCf,,ID B

*lpPlayerCaps*

"\―Ĭ,ðŽó,-Žæ,éDPCAPS \‘Ĉ'Ĭ,Ö,Ĭf|fCf"f^ B**IDirectPlay2::GetPlayerCaps**,ðŽg—  
p,·,é'O,Ě ADPCAPS \‘Ĉ'Ĭ,ĬdwSizef f"fo,ð Ý'è,μ,Ě,,Ă,Ĭ,Ě,ç,Ě,Ĉ B

*dwFlags*

,±,Ĭfpf%of [f^,É0,ðŽw'è,·,é,Ĉ A-<sup>3</sup>•Ŭ Ø,Èf fbZ [fWĈðŠ·,É'Ĭ,·,é"―Ĭ,ªĈvŽZ,<sup>3</sup>,ê,é B

DPGETCAPS\_GUARANTEED

•Ŭ Ø,<sup>3</sup>,ê,½f fbZ [fW"z M,É'Ĭ,·,é"―Ĭ,ðŽæ"¼,·,é B

**IDirectPlay2::GetCaps**f f\fbfh,ªĈ» Ý,ĬfZfbfVf±f",Ĭ"―Ĭ,ð•Ô,·,Ĭ,É'Ĭ,μ A,±,Ĭf f\fbfh,Ĭ A—  
v< ,<sup>3</sup>,ê,½fvfĈfCf,,Ĭ"―Ĭ,ð•Ô,· B

ŽŹ Ĉ @DPCAPS, **IDirectPlay2::GetCaps**, IDirectPlay2::Send

## IDirectPlay2::GetPlayerData

HRESULT GetPlayerData(DPID idPlayer,  
LPVOID lpData, LPDWORD lpdwDataSize,  
DWORD dwFlags);

**IDirectPlay2::SetPlayerData**,É,æ,Á,ÄfvfŒfCf,,,ÉŠÖ~A•t,¯,ç,ê,½ AfAfvfŠfP [fVf‡f“ŒÄ—  
L,İff [f^ Efuf fbfn,ðŽæ“¾,·,é B

¬Œ÷,·,ê,İDD\_OK AŽ,”s,·,ê,İŽŸ,İfGf%o [‘l,İ,¢,,ê,©,ð•Ô,· B

## DPERR\_BUFFERTOOSMALL

## DPERR\_INVALIDFLAGS

## DPERR\_INVALIDOBJECT

## DPERR\_INVALIDPLAYER

idPlayer

ff [f^,ðŽæ“¾,·,évfŒfCf,,,İfvfŒfCf,,ID B

lpData

fAfvfŠfP [fVf‡f“ŒÄ—L,İfvfŒfCf,, Eff [f^,a ‘,« ž,Û,ê,éofbftf@,Ö,İf|fCf“f^ B  
ff [f^,İfTfCfY,¾,¯,ðŽæ“¾,·,é ê ‡,Í A,±,İfpf%of [f^,ÉNULL,ðfZfbfg,·,é B,±  
İ,Æ,« AlpdwDataSizefpf%of [f^,É,Í Aff [f^,ð•ÛŽ ,·,é,½,ß,É•K—v,ÈfTfCfY,a Ý’è,³,ê,é B

lpdwDataSize

,±,İf f\fbfh,ðŒÄ,Ñ o,·‘O,Éofbftf@,İfTfCfY,Ä %oŠú%o»,³,ê,é•İ ”,Ö,İf|fCf“f^ B  
f f\fbfh,a §Œä,ð-ß,µ,½Œä A,±  
İfpf%of [f^,É,Í AfOf< [fv Eff [f^,İfTfCfY,afofCfg’P^Ê,ÄfZfbfg,³,ê,é Bfofbftf@,a ¬,³,·,¬,é iDPERR\_B  
UFFERTOOSMALL j ê ‡ A,±,İfpf%of [f^,É,Í•K—v,Èofbftf@,İfTfCfY,a Ý’è,³,ê,é B

dwFlags

,±,İfpf%of [f^,É0,ðfZfbfg,·,é,Æ AfŠf, [fg Eff [f^,ðŽæ“¾,·,é B

DPGET\_REMOTE

fŠf, [fg,Ä<—

L,³,ê,½ff [f^ EfXfy [fX,©,çŒ» Ý,İff [f^,ðŽæ“¾,·,é B

DPGET\_LOCAL

,±,İfAfvfŠfP [fVf‡f“,É,æ,éf [fJf<,Èff [f^ EfZfbfg,ðŽæ“¾,·,é B

DirectPlay,Í Af [fJf<,”æ,ÑfŠf, [fg,İ,Ó,½,Ä,İf^fCfv,İOf< [fv Eff [f^,ð•ÛŽ ,·,é,±  
,Æ,,a,Ä,«,é BfAfvfŠfP [fVf‡f“,İŽæ“¾,·,éff [f^,İf^fCfv,ðŽw’è,µ,È,,Ä,Í,È,ç,È,¢ BDPSET\_LOCALftf%ofO,ðŽg,□  
,Æ ADirectPlayIfufWfFfNfg,È,æ,Á,Äf [fJf< Eff [f^,afZfbfg,³,ê,é B DPSET\_REMOTEftf%ofO,ðŽg,□  
,Æ AfZfbfVf‡f““†,İ”C^Ó,İfAfvfŠfP [fVf‡f“,É,æ,Á,Ä AfŠf, [fg Eff [f^,a Ý’è,³,ê,é B

ŽQ Æ @IDirectPlay2::SetPlayerData

## IDirectPlay2::GetPlayerName

HRESULT GetPlayerName(DPID idPlayer,  
LPVOID lpData, LPDWORD lpdwDataSize);

$f v f \mathbb{C} f C f,, \acute{E} \ddot{S} \ddot{O} \sim A \cdot t, \bar{\cdot}, \varsigma, \hat{e}, \frac{1}{2} - \frac{1}{4} ' O, \delta \check{Z} \mathfrak{a} " \frac{3}{4}, \cdot, \acute{e} \text{ } B$

$\neg \mathbb{C} \div, \cdot, \hat{e}, \hat{I} D D\_O K \text{ } A \check{Z}, " s, \cdot, \hat{e}, \hat{I} \check{Z} \ddot{Y}, \grave{I} f G f \% \text{ } [ ' l, \grave{I}, \mathbb{C},,, \hat{e}, \odot, \delta \cdot \hat{O}, \cdot \text{ } B$

**DPERR\_BUFFERTOOSMALL**

**DPERR\_INVALIDOBJECT**

**DPERR\_INVALIDPLAYER**

*idPlayer*

$-\frac{1}{4} ' O, \delta \check{Z} \mathfrak{a} " \frac{3}{4}, \cdot, \acute{e} f v f \mathbb{C} f C f,, \grave{I} f v f \mathbb{C} f C f,, I D \text{ } B$

*lpData*

$-\frac{1}{4} ' O f f \text{ } [ f^{\wedge}, ^{\circ}, \ll \check{Z}, \ddot{U}, \hat{e}, \acute{e} f o f b f t f @, \grave{I} f A f h f \mathbb{C} f X \text{ } B f f \text{ } [ f^{\wedge}, \grave{I} f T f C f Y, \frac{3}{4}, \bar{\cdot}, \delta \check{Z} \mathfrak{a} " \frac{3}{4}, \cdot, \acute{e} \hat{e} \ddagger, \acute{I} \text{ } A, \pm$   
 $, \grave{I} f p f \% o f \text{ } [ f^{\wedge}, \acute{E} N U L L, \delta f Z f b f g, \cdot, \acute{e} \text{ } B, \pm, \grave{I}, \mathbb{A}, \ll \text{ } A l p d w D a t a S i z e f p f \% o f \text{ } [ f^{\wedge}, \acute{E}, \acute{I} \text{ } A f f \text{ } [ f^{\wedge}, \delta \cdot \ddot{U} \check{Z} \text{ } , \cdot, \acute{e}, \frac{1}{2}, \mathbb{B}, \acute{E} \cdot K \text{---}$   
 $v, \acute{E} f T f C f Y, ^{\circ} \text{ } \acute{Y} ' \grave{e}, ^3, \hat{e}, \acute{e} \text{ } B$

*lpdwDataSize*

$, \pm, \grave{I} f \text{ } f \backslash b f h, \delta \mathbb{C} \ddot{A}, \tilde{N} \text{ } o, \cdot ' O, \acute{E} f o f b f t f @, \grave{I} f T f C f Y, \mathbb{A} \text{ } \% \acute{o} \acute{S} \acute{u} \% \circ \rangle, ^3, \hat{e}, \acute{e} \cdot \acute{I} \text{ } " \text{ } B \text{ } f \text{ } f \backslash b f h, ^{\circ} \text{ } \S \mathbb{C} \ddot{a}, \delta - \mathbb{B}, \mu, \frac{1}{2} \mathbb{C} \ddot{a} \text{ } A, \pm$   
 $, \grave{I} f p f \% o f \text{ } [ f^{\wedge}, \acute{E}, \acute{I} \text{ } A f O f < \text{ } [ f v \text{ } E f f \text{ } [ f^{\wedge}, \grave{I} f T f C f Y, ^{\circ} f o f C f g ' P ^{\circ} \acute{E}, \mathbb{A} f Z f b f g, ^3, \hat{e}, \acute{e} \text{ } B f o f b f t f @, ^{\circ} \neg, ^3, \cdot, \neg, \acute{e} \text{ } i D P E R R\_B$   
 $U F F E R T O O S M A L L \text{ } j \hat{e} \ddagger \text{ } A, \pm, \grave{I} f p f \% o f \text{ } [ f^{\wedge}, \acute{E}, \acute{I} \cdot K \text{---} v, \acute{E} f o f b f t f @, \grave{I} f T f C f Y, ^{\circ} \text{ } \acute{Y} ' \grave{e}, ^3, \hat{e}, \acute{e} \text{ } B$

$, \pm, \grave{I} f \text{ } f \backslash b f h, ^{\circ} \text{ } \S \mathbb{C} \ddot{a}, \delta - \mathbb{B}, \mu, \frac{1}{2} \mathbb{C} \ddot{a} \text{ } A f O f < \text{ } [ f v - \frac{1}{4} f f \text{ } [ f^{\wedge}, \delta " \mathbb{C}, \acute{Y} \text{ } o, \cdot, \frac{1}{2}, \mathbb{B}, \acute{E}, \acute{I} \text{ } A f | f C f " f^{\wedge} l p D a t a, \delta \underline{\underline{DPNAME}}$   
 $\backslash ^{\circ} \mathbb{C} ' \grave{I}, \acute{E} f L f f f X f g, \mu, \acute{E}, , \mathbb{A}, \acute{I}, \acute{E}, \varsigma, \acute{E}, \mathbb{C} \text{ } B$

$\check{Z} \mathbb{Q} \text{ } \mathbb{A} \text{ } @ \underline{\underline{DPNAME}}, \underline{\underline{IDirectPlay2::SetPlayerName}}$

## IDirectPlay2::GetSessionDesc

HRESULT GetSessionDesc(LPVOID lpData,  
LPDWORD lpdwDataSize);

«» ÝfI [fvf“,3,ê,Ä,¢,éfZfbfVf‡f“,ì“Á «,ðŽæ“¾,·,é B  
¬œ÷,·,ê,îDD\_OK AŽ,”s,·,ê,îŽŸ,ìfGf%o [‘l,ì,¢,,ê,©,ð•Ô,· B

**DPERR\_BUFFERTOOSMALL**

**DPERR\_INVALIDOBJECT**

**DPERR\_NOCONNECTION**

lpData

fZfbfVf‡f“«L qff [f^,^ ‘,« ž,Ü,ê,éfofbftf@,Ö,ìf|fCf“f^ Bff [f^,ìfTfCfY,¾,¬,ðŽæ“¾,·,é ê ‡,Í A,±  
,ìfpf%of [f^,ÉNULL,ðfZfbfg,·,é B,±,ì,Æ,« AlpdwDataSizefpf%of [f^,É,Í Aff [f^,ð•ÜŽ ,·,é,½,ß,Ê•K—  
v,ÊfTfCfY,^ Ý’è,3,ê,é B

lpdwDataSize

,±,ìf f\fbfh,ðœÄ,Ň o,·“O,Éfobftf@,ìfTfCfY,Ä %oŠú%o»,3,ê,é•İ ”,Ö,ìf|fCf“f^ B f f\fbfh,^ §œä,ð–  
ß,µ,½œä A,±  
,ìfpf%of [f^,É,Í AfOf< [fv Eff [f^,ìfTfCfY,^f ofCf g’P^Ê,ÄfZfbfg,3,ê,é Bfobftf@,^ ¬,3,·,¬,é iDPERR\_B  
UFFERTOOSMALL j ê ‡ A,±,ìfpf%of [f^,É,Í•K—v,Êfobftf@,ìfTfCfY,^ Ý’è,3,ê,é B

,±,ìf f\fbfh,^ §œä,ð–ß,µ,½œä AfZfbfVf‡f“«L qff [f^,ð“Ç,Ý o,·,½,ß,É,Í Af|fCf“f^lpData,ð**DPSESSIONDESC2**  
‘‘ç‘ì,ÊfLffffXfg,µ,Ê,,Ä,Í,Ê,ç,È,¢ B

ŽQ Æ @**DPSESSIONDESC2**, **IDirectPlay2::EnumSessions**, **IDirectPlay2::Open**

## IDirectPlay2::Initialize

HRESULT Initialize(LPGUID lpGUID);

,±,łf f\fbfh,ÍCOMfvf fgfRf<,Ö,ì'î%ž,Ì,½,ß,É'ñ<Ÿ,³,ê,é B

DPERR\_ALREADYINITIALIZED,ð•Ô,· B

lpGUID

fCf“f^ [ftfFfCfX,ðŽ⁻•Ê,·,é,½,ß,łOf [fof< Ef†fj [fNŽ⁻•ÊŽq iGUID j,łfAfhfÆfX B

DirectPlayIfufWfFfNfg,Í ì ¬Žž,É %Šú%»»,³,ê,é,½,ß A,±

,łf f\fbfh,Í,Â,Ë,É•Ô'l,Æ,μ,ÄDPERR\_ALREADYINITIALIZED ,ð•Ô,· B

ŽQ Æ @IUnknown::AddRef, IUnknown::QueryInterface

## IDirectPlay2::Open

HRESULT Open(LPDPSESSIONDESC2 lpsd,  
DWORD dwFlags);

fQ [f€ EfZfbfVf‡f“, ÌfCf“fXf^f“fX, ðŠm—š, ·, é B  
¬Œ÷, ·, ê, Î DD\_OK AŽ, ”s, ·, ê, ÎŽŸ, ÌfGf‰ [’l, Ì, Œ, ·, ê, ©, ð•Ô, · B

DPERR\_ACTIVEPLAYERS

DPERR\_ALREADYINITIALIZED

DPERR\_GENERIC

DPERR\_INVALIDFLAGS

DPERR\_INVALIDOBJECT

DPERR\_INVALIDPARAMS

DPERR\_UNAVAILABLE

DPERR\_UNSUPPORTED

DPERR\_USERCANCEL

lpsd

ì ¬, Û, ½, ÎŽQ‰Á, ·, éfZfbfVf‡f“, ð•\, · DPSESSIONDESC2 \‘Œ’İ, Ö, Ìf|fCf“f^ B

dwFlags

ˆÈ‰°, Ìftf‰fO, Ì, Œ, ·, ê, © B

DOPEN\_CREATE

fQ [f€ EfZfbfVf‡f“, Ì V, µ, ŒfCf“fXf^f“fX, ð ì ¬, ·, é B

DOPEN\_JOIN

fQ [f€ EfZfbfVf‡f“, ÌŠù‘¶fCf“fXf^f“fX, ÉŽQ‰Á, ·, é B

fAfvfŠfP [fVf‡f“, Í A V, µ, ŒfZfbfVf‡f“, ð ì ¬, ·, é, © i, », ÌfZfbfVf‡f“, É, Í‘¼, ÌfŠf, [fg EfAfvfŠfP [fVf‡f“, aŽ  
Q‰Á, ·, é j AŠù‘¶, ÌfZfbfVf‡f“, ÉŽQ‰Á, ·, é, ±  
, Æ, a, Á, «, é Bf [fJf< EfvfŒfCf,, a ì ¬, ³, ê, é‘O, É AfAfvfŠfP [fVf‡f“, ÍIDirectPlay2::Open, ðŒÄ, Ñ o, ³, È, -  
, Á, Í, È, ç, È, Œ BfAfvfŠfP [fVf‡f“, aŠù‘¶, ÌfZfbfVf‡f“, ÉŽQ‰Á, ·, é‘O, É, Í AŽQ‰Á‰‰\, ÈfZfbfVf‡f“, Ìê——  
, Æ, », ê, ç, ÌfZfbfVf‡f“, <L q, ðŽæ“¾, ·, é, ½, ß, É IDirectPlay2::EnumSessions, ðŽg—p, ·, é, ×, «, Á, é B V, µ, ŒfvfŒfCf,, a-  
³Œø, É, ³, ê, Á, Œ, éfZfbfVf‡f“, ÉŽQ‰Á, µ, æ, □, Æ, µ, ½ ê ‡ A, Û, ½, ÎŽQ‰Á, Á, «, È, Œ ê ‡ A, , é, Œ  
, ÍfvfŒfCf,, §ŒÄ, É’B, µ, ½ ê ‡ ADPERR\_UNAVAILABLEfGf‰ [·•Ô, ³, é, éŒ‰‰Ê, Æ, È, é B

ŽQ Æ @DPSESSIONDESC2, IDirectPlay2::Close, IDirectPlay2::EnumSessions

## IDirectPlay2::Receive

HRESULT Receive(LPDPID lpidFrom, LPDPID lpidTo,  
DWORD dwFlags, LPVOID lpData, LPDWORD lpdwDataSize);

f fbfZ [fW Eflf... [,©,ç,lf fbfZ [fW,ðŽæ“¾,·,é B  
¬Æ÷,·,ê,ÎDD\_OK AŽ,”s,·,ê,ÎŽŸ,lfGf%o [’l,î,ç,,ê,©,ð•Ô,· B

### DPERR\_BUFFERTOOSMALL

### DPERR\_GENERIC

### DPERR\_INVALIDOBJECT

### DPERR\_INVALIDPARAMS

### DPERR\_INVALIDPLAYER

### DPERR\_NOMESSAGES

lpidFrom

f f\fbfh,ª §Æä,ð-ß,·,Æ,« A’— M’²,lfvfÆfCf,,ID,ªfZfbfg,³,ê,é•İ ”,Ö,lf|fCf“f^ B  
DPRECEIVE\_FROMPLAYERftf%oF,ªŽw’è,³,ê,Ä,ç,é ê ±,Í A,±  
,î•İ ”,ðf f\fbfh,ðÆÄ,Ñ o,·‘O,ÉfvfÆfCf,,ID,Ä %Šú%o»,µ,È,,Ä,Í,È,ç,È,ç B

lpidTo

f f\fbfh,ª §Æä,ð-ß,·,Æ,« AŽó M’²,lfvfÆfCf,,ID,ªfZfbfg,³,ê,é•İ ”,Ö,lf|  
fCf“f^ BDPRECEIVE\_TOPLAYERftf%oF,ªŽw’è,³,ê,Ä,ç,é ê ±,Í A,±  
,î•İ ”,ðf f\fbfh,ðÆÄ,Ñ o,·‘O,ÉfvfÆfCf,,ID,Ä %Šú%o»,µ,È,,Ä,Í,È,ç,È,ç B

dwFlags

È%o,İ §Æäftf%oF,İ,Ð,Æ,Ä`È ä,İ’g,Ý ±,í,¹,ð Ý’è,·,é,±  
,Æ,ª,Ä,«,é BDPRECEIVE\_TOPLAYER,ÆDPRECEIVE\_FROMPLAYER,İ—¼•û,ðŽw’è,·,é,Æ A Ä %  
,ÉÆ©,Ä,©,Ä,½,Û,²,lf fbfZ [fW,ª•Ô,³,ê,é B

DPRECEIVE\_ALL

Ä %o,İŽg—p%oÄ”,Èf fbfZ [fW,ð•Ô,· BfftfHf<fg,Ä, ,é B

### DPRECEIVE\_FROMPLAYER

lpidFrompf%of [f^,ªŽw,·fvfÆfCf,,ID,©,ç’—,ç,ê,½ Ä %  
,lf fbfZ [fW,ð•Ô,· BfvfXfef€ Ef fbfZ [fW,Í AfvfÆfCf,,ID  
DPID\_SYSMMSG,©,ç’—,ç,ê,é

### DPRECEIVE\_PEEK

¼,İftf%oF,İŽw’è,É%ž,¶,Äf fbfZ [fW,ð•Ô,·,ª Af fbfZ [fW,ðf  
fbfZ [fW Eflf... [,©,ç í æ,µ,È,ç B

### DPRECEIVE\_TOPLAYER

lpidTofpf%of [f^,ªŽw,·fvfÆfCf,,ID,É [,Ä,ç,ê,½ Ä %  
,lf fbfZ [fW,ð•Ô,· B

lpData

f fbfZ [fW Eff [f^,ª ‘,« ž,Û,ê,éfbftf@,Ö,lf|fCf“f^ Bff [f^,İTfCfY,¾,¬,ðŽæ“¾,·,é ê ±,Í A,±  
,İpf%of [f^,ÉNULL,ðfZfbfg,·,é B,±,İ,Æ,« AlpdwDataSizepf%of [f^,É,Í Aff [f^,ð•ÜŽ ,·,é,½,ß,É•K—  
v,ÉfTfCfY,ª Ý’è,³,ê,é Bf fbfZ [fW,ªfvfÆfCf,,ID DPID\_SYSMMSG,©,ç’—  
,ç,ê,½,à,İ,Ä, ,é,Æ,« AfAfvfŠfP [fVf±f“,İlpData,ðDPMSB\_GENERIC \‘ç’İ,ÉfLffXfg,µ A ^—  
,ð s,ª‘O,ÉfvfXfef€ Ef fbfZ [fW,İf^fCfv,ð²,x,é,½,ß AdwTypef f“fo,ðf fFfbfN,·,é,x,«,Ä, ,é B

lpdwDataSize

,±,lf f\fbfh,ðÆÄ,Ñ o,·‘O,Éfbftf@,İTfCfY,Ä %Šú%o»,³,ê,é•İ ”,Ö,lf|fCf“f^ Bf f\fbfh,ª §Æä,ð-  
ß,µ,½Æä A,±  
,İpf%of [f^,É,Í AfOf< [fv Eff [f^,İTfCfY,ªfOfCf’PÊ,ÄfZfbfg,³,ê,é Bfbftf@,ª ¬,³,·,¬,é iDPERR\_B  
UFFERTOOSMALL j ê ± A,±,İpf%of [f^,É,Í•K—v,Éfbftf@,İTfCfY,ª Ý’è,³,ê,é Bflf...  
[.É’u,©,ê,½f fbfZ [fW,İ ± ,Í AIDirectPlay2::Receive,İÆÄ,Ñ o,µ’†,É•İ%o»,·,é,±,Æ,ª, ,é B,µ,½,ª,Ä,Ä A`È  
O,İIDirectPlay2::ReceiveÆÄ,Ñ o,µ,Ä—v< ,³,ê,½f f,fŠ,ðŠ,,è“—,Ä,½Æä,Ä, ,Ä,Ä,à A Ä,NDPERR\_BUFFERTO  
SMALLfGf%o [,ª•Ô,³,ê,é,±,Æ,ª, ,é B Ä’P,İû—@,Í ADPERR\_BUFFERTOOSMALLfGf%o [,ðŽó,¬Žæ,ç,È,-  
,É,é,Û,Ä Af f,fŠ,ð ÄŠ,,è“—,Ä,µ’±,¬,é,±,Æ,Ä, ,é B



$f v f \mathbb{C} f C f,, ID \quad DPID\_SYSMSG, \odot, \zeta' \text{---}$

$M,^3,\hat{e},\dot{,},\times,\ddot{A},\grave{\text{I}} f \quad f b f Z \quad [f W, \acute{I} \quad A f z f X f g, \acute{E}, \mathfrak{a}, \ddot{A}, \ddot{A} \quad \P \quad \neg,^3,\hat{e}, \frac{1}{2} f V f X f e f \in \quad E f \quad f b f Z \quad [f W, \ddot{A}, \quad , \acute{e} \quad B, \pm$   
 $, \grave{\text{I}} \quad \hat{e} \quad \ddagger \quad A f V f X f e f \in \quad E f \quad f b f Z \quad [f W, \grave{\text{I}} p D a t a, \delta \underline{DPMSG\_GENERIC}, \acute{E} f L f f X f g, \mu, \ddot{A} \quad A, \rangle, \grave{\text{I}} f V f X f e f \in \quad E f \quad f b f Z \quad [f W,$   
 $^{\circ} \% \frac{1}{2}, \ddot{A}, \quad , \acute{e}, \odot, \delta " \ddot{A}' \hat{e}, \cdot, \acute{e}, \frac{1}{2}, B, \acute{E} d w T y p e f \quad f " f o, \delta ' 2, \times, \acute{e}, \times, \ll, \ddot{A}, \quad , \acute{e} \quad B$

$, \cdot, \times, \ddot{A}, \grave{\text{I}} f v f \mathbb{C} f C f,, \acute{E} f u f \quad [f h f L f f f X f g, \mu, \frac{1}{2}, \hat{e} \quad A f O f \prec \quad [f v " \grave{a}, \grave{\text{I}}, \cdot, \times, \ddot{A}, \grave{\text{I}} f v f \mathbb{C} f C f,, \acute{E}' \text{---}$

$M, \cdot, \acute{e}, \frac{1}{2}, B, \acute{E} f O f \prec \quad [f v, \acute{E} " \P, \ddot{A}, \zeta, \hat{e}, \frac{1}{2} f \quad f b f Z \quad [f W, \acute{I} \quad A f v f \mathbb{C} f C f,, ID \quad DPID\_SYSMSG, \acute{E}' \text{---}, \zeta, \hat{e}, \ddot{A}, \grave{a} \quad A' \text{---} \quad M' \sqcap$   
 $, \grave{\text{I}} f v f \mathbb{C} f C f,, ID, \odot, \zeta \text{---} \wedge, \frac{1}{2}, \grave{a}, \grave{\text{I}}, \mathbb{A}, \mu, \ddot{A} \cdot \backslash$   
 $,^3,\hat{e}, \acute{e} \quad B f A f v f \acute{S} \acute{P} \quad [f V f \ddagger f " , \acute{I} \quad A f \quad [f J f \prec, \grave{E} f v f \mathbb{C} f C f,, \acute{E} " \P, \ddot{A}, \zeta, \hat{e}, \frac{1}{2} f \quad f b f Z \quad [f W, \frac{3}{4}, \quad , \delta \acute{Z} \acute{o}, \quad \acute{Z} \mathfrak{a}, \acute{e} \quad B l p i d F r o m, \mathbb{A} l p i d T o f p$   
 $f \% o f \quad [f ^, {}^{a " T M}, \mu, \P ' 1, \delta \acute{Z} ' , \cdot f \quad f b f Z \quad [f W, \acute{I} \quad A f v f \mathbb{C} f C f,, {}^a \acute{Z} \acute{o} \quad M, \cdot, \acute{e}, \pm, \mathbb{A}, {}^a \ddot{A}, \ll, \grave{E}, \P \quad B$

$DPSESSION\_NOMESSAGEID f t f \% o f O, {}^a f Z f b f V f \ddagger f " , \acute{E} \acute{Z} w' \hat{e},^3,\hat{e}, \ddot{A}, \P, \acute{e}, \mathbb{A} \quad A l p i d F r o m, \mathbb{A} l p i d T o f p f \% o f \quad [f ^, \acute{I} \% \frac{1}{2}, \grave{a} \acute{O} \text{---}$   
 $\grave{\text{I}}, \delta \acute{Z} \quad , \frac{1}{2}, \grave{E}, \P \quad B$

$DirectPlay, \mathbb{A}, \mathbb{A}, \grave{a}, \acute{E} " \textcircled{R} \quad \grave{\text{I}}, \cdot, \acute{e}, \cdot, \times, \ddot{A}, \grave{\text{I}} T \quad [f r f X \quad E f v f \quad f o f C f _ , \acute{I} \quad A f f \quad [f ^, \grave{\text{I}} " j' {}^1, \delta " \delta, \quad , \acute{e}, \frac{1}{2}, B \quad A \acute{S} \textcircled{R} ' S \quad \ll, \grave{\text{I}} f ` f F f b f N, \delta \acute{Z} \grave{A}$   
 $s, \cdot, \acute{e} \quad B, \cdot, \times, \ddot{A}, \grave{\text{I}} \acute{Z} \acute{o} \quad M f \quad f b f Z \quad [f W, \acute{I} \mathbb{E} \acute{Y} \quad \emptyset,^3,\hat{e} \quad A f f \quad [f ^, \grave{\text{I}} " j' {}^1, {}^a \mathbb{E} \acute{Y} \quad o,^3,\hat{e}, \frac{1}{2} \quad \hat{e} \quad \ddagger \quad A, \rangle, \grave{\text{I}} f f \quad [f ^, \acute{I} " p \acute{S} \ddot{u} \quad \text{i} \cdot \hat{U} \quad \emptyset,^3,\hat{e}, \ddot{A}, \P$   
 $, \grave{E}, \P \quad \hat{e} \quad \ddagger \quad j, \grave{U}, \frac{1}{2}, \acute{I} \quad \ddot{A}' \text{---} \quad \text{i} \cdot \hat{U} \quad \emptyset,^3,\hat{e}, \ddot{A}, \P, \acute{e} \quad \hat{e} \quad \ddagger \quad j,^3,\hat{e}, \acute{e} \quad B$

$\acute{Z} Q \quad \mathbb{A} \quad @ \underline{DPMSG\_GENERIC}, \underline{IDirectPlay2::Send}$

## IDirectPlay2::Send

HRESULT Send(DPID idFrom, DPID idTo, DWORD dwFlags,  
LPVOID lpData, DWORD dwDataSize);

¼, ðf v f C f C f,, A f O f < [ f v “ à, ðf v f C f C f,, A, Ü, ½, Í, ·, ×, Ä, ðf v f C f C f,, É f f b f Z [ f W, ð’ — M, ·, é B

³ í I — 1, µ, ½, Æ, «, â A, ½,, ³, ñ, ðf f b f Z [ f W, “DirectPlay, ð’ à” f L f... [ , Ä’ —  
M’ Ò, ç, ð è ‡, IDP\_OK, ð• Ö, · B, » , è Ê Š O, Í Ž Ÿ, ðf G f % [ , ð, ·, è, ©, ð• Ö, · B

### DPERR\_BUSY

### DPERR\_INVALIDOBJECT

### DPERR\_INVALIDPARAMS

### DPERR\_INVALIDPLAYER

### DPERR\_SENDTOOBIG

idFrom

‘ — M’ ò, ðf v f C f C f,, ID B f v f C f C f,, ID, Í A, ±, ðf R f “ f s f... [ f ^, ð à, ðf [ f J f <, È f v f C f C f,, ð, Ð, Æ, Ä, É’ Î % ž, µ, Ä, Ç  
, È,, Ä, Í, È, ç, È, Ç B

idTo

f f b f Z [ f W, “ —  
M, ³, è, é f v f C f C f,, ID A f O f < [ f v ID A, Ü, ½, Í DPID\_ALLPLAYERS BDPID\_ALLPLAYERS, ð Ž w’ è, ·, é, Æ A f Z f b f  
V f ‡ f “ “ à, ð, ·, ×, Ä, ðf v f C f C f,, É f f b f Z [ f W, ð’ —  
M, ·, é BDPSEND\_OPENSTREAM, â DPSEND\_CLOSESTREAM f t f % o f O, ð Ž g — p, ·, é è ‡, Í A, ±  
, ðf p f % o f [ f ^, È f v f C f C f,, ID, ð Ÿ’ è, ·, é B

dwFlags

f f b f Z [ f W, ð’ — M • û — @, ð Ž’, · B, ±, ðf p f % o f [ f ^, È, O, ð f Z f b f g, ·, é, Æ A f f b f Z [ f W, Í • Û Ø, ³, è, A • W € “ I, È  
— D æ ‡ Ê, Ä’ — M, ³, è, é B, ½,, ³, ñ, ðf f b f Z [ f W, ð’ —, è, ò, Æ, µ, Ä, Ç, é, ±  
, Æ, ð DirectPlay, â f T [ f r f X E f v f f o f C f\_, É “ , , é, È, Í ADPSSEND\_OPENSTREAM, Æ DPSEND\_CLOSESTREAM, ð Ž g  
— p, ·, é B f R f ~ f... f j f P [ f V f ‡ f “ E f p f C f v i f X f g f Š [ f € j, ð f I [ f v f “ ^ f N f [ f Y, ð s, í,, É f f b f Z [ f W, ð’ —  
M, ·, é, Ü, ò, “ E Ø —  
“ I, È è ‡ A f T [ f r f X E f v f f o f C f\_, Í ADPSSEND\_CLOSESTREAM f t f % o f O, ð Ž w’ è, µ, Ä IDirectPlay2::Send f f  
b f h, ð E Ä, Ñ o, ·, Ü, Ä A, » , ðf v f C f C f,, ID, ðf X f g f Š [ f € , ð f I [ f v f “ , µ, ½, Ü, Ü, È, µ, Ä, “ , B  
DPSEND\_OPENSTREAM, Æ DPSEND\_CLOSESTREAM, ð idTo, “ — L E Ø, È f v f C f C f,, ID, Ä, , é f f b f Z [ f W, È, Ä, Ç, Ä, ð, Ý  
— L E Ø, Ä, , é B f T [ f r f X E f v f f o f C f\_, Í A • K,, µ, à DPSEND\_OPENSTREAM, Æ DPSEND\_CLOSESTREAM, ð f T f |  
[ f g, ·, é • K — v, Í, È, Ç B

DPSEND\_GUARANTEED

% Ä “ \, Ä, , è, Í • Û Ø • t, «, ð” z M • û — @, Ä f f b f Z [ f W, ð’ — M, ·, é B

DPSEND\_HIGHPRIORITY

Ä — D æ f f b f Z [ f W, ð’ —  
M, ·, é B, ·, @, È” z M, ·, é, ½, ß A f f b f Z [ f W, Í < § “ I, É’ — M f L f...  
[ , ð æ “ a, È’ u, ©, è A Ž ó M f A f v f Š f P [ f V f ‡ f “ , È, “ , Ç  
, Ä, à A Ž ó M f o f b f t f @, ð æ “ a, È’... M, ³, è, é B

DPSEND\_OPENSTREAM

f v f C f C f,, É “ ½,, ðf f b f Z [ f W, ð’ —, è, ò, Æ, µ, Ä, Ç  
, é, Æ, « A f T [ f r f X E f v f f o f C f\_, É Ä “ K % », ðf q f “ f g, ð Ž’, · B

DPSEND\_CLOSESTREAM

f v f C f C f,, É’ —, è, ò, Æ, µ, Ä, Ç, é f f b f Z [ f W, ð’ “ , a, » , è, Ü, Ç’ ½,, È, -  
, È, Ä, ½, ±, Æ, ð Ž’, · B

lpData

‘ — M, ³, è, é f f [ f ^, Ö, ð f C f “ f ^ B Ž Ä Û, É’ — M, ·, é f f b f Z [ f W, a, È, Ç, Æ, «, Í A, ±, ðf p f % o f [ f ^, ð  
NULL, È f Z f b f g, ·, é BDPSEND\_OPENSTREAM, â DPSEND\_CLOSESTREAM f t f % o f O, ð Ž w’ è, ·, é è ‡ ANULL, È, µ, È  
, Ä, Í, È, ç, È, Ç B

dwDataSize

‘ — M, ³, è, é f f [ f ^, ð’ , ³ B

f fbfZ [fW,ð'¼,İfvfƎfCf,,É'—  
M,·,é,É,İ A'Ų æ,İfvfƎfCf,,ID,ðŽw'è,·,é Bf fbfZ [fW,ðfvfƎfCf,,İfOf< [fv,É'—  
M,·,é,É,İ AfOf< [fv,ÉŠ,,è'—,Ä,ç,è,½ID,ðŽw'è,·,é Bf fbfZ [fW,ðfZfbfVfþf'“S'İ,É'—  
,é ê þ,İ ADPID\_ALLPLAYERSfvfƎfCf,,ID,ðŽw'è,·,é BIDirectDrawSurface2::Lock /  
IDirectDrawSurface2::Unlock,İĖÄ,Ŋ o,µ,İŠÖ A,Ü,½,İIDirectDrawSurface2::GetDC /  
IDirectDrawSurface2::ReleaseDCf f\fbfh,İĖÄ,Ŋ o,µ,İŠÖ,Ä,İ AIDirectPlay2::Sendf f\fbfh,ðŽg—p,·,é,±  
,Æ,İ,Ä,«,È,ç B

fvfƎfCf,,İ AŽ©•Ž© g,Éf fbfZ [fW,ð'— M,·,é,±  
,Æ,İ,Ä,«,È,ç Bf fbfZ [fW,ðŽ©•,ª Š'®,·,éOf< [fv,âDPID\_ALLPLAYERS,É'—  
,Ä,Ä,à A,»,İf fbfZ [fW,İfRfs [ðfvfƎfCf,,ªŽó,Žæ,é,±,Æ,İ,È,ç B

DPSESSION\_NOMESSAGEID,ªŽw'è,³,è,Ä,ç,éfZfbfVfþf',Ä,İ AfOf< [fv,É'—  
M,µ,½f fbfZ [fW,ðfvfƎfCf,,ªŽó M,·,é,±,Æ,ª%Ä",Ä, ,é B,±  
,İ ê þ,İDirectPlayf fbfZ [fWIDfwfbf\_ if fbfZ [fW,İ'— MŽÖ,ðŽ,· j,ªt%Ä,³,è,È,ç  
,½,ß AfT [frfX Efvf fofCf\_,É,æ,Ä,ÄŽ©•Ž© g,©,ç,İf fbfZ [fW,ª æŠÖ,³,è,é,±  
,Æ,İ,È,ç BfAfvfŠfP [fvfþf',İ Af fbfZ [fW,İ'ä—e,ÉŠİ,Ä,ç,Ä AŽ©•,©,ç,İf fbfZ [fW,ð"»'è,Ä,«,È,-  
,Ä,İ,È,ç,È,ç B

DPSESSION\_NOMESSAGEID,ªŽw'è,³,è,é,Æ Af fbfZ [fW,İ'— M æ,İfRf"fsf...  
[f^ ä,İf [fJf<,ÈfvfƎfCf,,İ,Đ,Æ,Ä,É'—,ç,è,é B

f fbfZ [fW,İ'Ų Øt,«,Ä,à'Ų Ø,È,µ,Ä,à'— M,Ä,«,é BfftfHf<fg,Ä,İ'Ų Ø,È,µ,Ä'— M,³,è,é B,±  
,İ ê þ ADirectPlay,İ AŽóŽæ l,Éf fbfZ [fW,ª"İ,ç,½,±,Æ,ðŠm"F,µ,È,ç B'Ų Øt,«,İf fbfZ [fW,ð'—  
M,·,é,É,İ A'Ų Ø,È,µ,İf fbfZ [fW,æ,è,à Ä'á2 A3"[,İŽžŠÖ,ªK—v,Ä, ,é BfAfvfŠfP [fvfþf',İ A'Ų Øt,«,İf  
fbfZ [fW,ð'— M,·,é%œ " ,ð Ä -ĖÄ,É—},!é,×,«,Ä, ,é B,Ų,½fAfvfŠfP [fvfþf',İ Af fbfZ [fW,İ'rŽ,É'İ%  
ž,Ä,«,È,,Ä,İ,È,ç,È,ç B

DirectPlay,Æ,Æ,à,É"İ i,·,é,·,×,Ä,İfT [frfX Efvf fofCf\_,İ Aff [f^,İ"j¹,ð"ð,\_,é,½,ß AŠ@'S «,İf`FFfbfN,ðŽÄ  
s,·,é B,·,×,Ä,İŽÖ Mf fbfZ [fW,İĖŲ Ø,³,è Aff [f^,İ"j¹,ªĖŲ o,³,è,½ ê þ A,»,İff [f^,İ"pŠü i'Ų Ø,³,è,Ä,ç  
,È,ç ê þ j,Ų,½,İ Ä'— i'Ų Ø,³,è,Ä,ç,é ê þ j,³,è,é B

---

f f,  
,±,İfo [fwfþf',İDirectPlay,Ä,İ ADPSEND\_GUARANTEED,İ AfT [frfX Efvf fofCf\_,ªfTf|  
[fg,·,é ê þ,É,¼,~"z M,ð'Ų Ø,·,é BfAfvfŠfP [fvfþf',İ AIDirectPlay2::GetCaps,ðĖÄ,Ŋ o,µ ADPCAPS\_GUA  
RANTEEDSUPPORTEDftf%fo,ðf`fffbfN,·,é,±,Æ,É,æ,è A"z M,ª'Ų Ø,³,è,Ä,ç,é,©,ç,µ,©,ðŠm"F,Ä,«,é B,±  
,İftf%foO,ªfZfbfg,³,è,Ä,ç,È,\_,è,İ ADPSEND\_GUARANTEEDftf%foO,İ-  
³Ž<,³,è Af fbfZ [fW,İ'Ų Ø,³,è,È,ç BŽŲ,İfo [fwfþf',İDirectPlay,Ä,İ A'Ų Ø,È,µ,İfT [frfX Efvf fofCf\_ ä,  
Ä,à"z M,İ'Ų Ø,ðfCf"fvfŠf f"fg,·,é—'è,Ä, ,è A'Ų Ø,İfTf| [fg,ðŽ,·CAPSftf%foO,İ,Ä,È,É'Ó-i,ðŽ ,Ä,æ,µ  
,É,È,é B  
fAfvfŠfP [fvfþf',ª'Ų Øt,«,İf fbfZ [fW"z M,ð"ÆŽ©,ÉfCf"fvfŠf f"fg,·,é ê þ ACE^,µ,ADPSEND\_GUARAN  
TEEDftf%foO,ðŽg,Ä,Ä,İ,ç,\_,È,ç BfAfvfŠfP [fvfþf',İpfTFH [f}  
f"fX,ðfefXfg,·,é,Æ,«,İ AfT [frfX Efvf fofCf\_,ª'Ų Øt,«,İf fbfZ [fWĖðŠ,ðfTf| [fg,·,é,©,ç,µ,©,ð'm,é,±  
,Æ,ª d—v,Ä, ,é BfTf| [fg,µ,Ä,ç  
,é ê þ AŽŲ,İfo [fwfþf',İDirectPlay,İŽÄ s'—"x,İ ADPSEND\_GUARANTEED,ðŽw'è,µ,Ä,ç  
,é,·,×,Ä,İ%Ó Š,Ä A j,æ,è,à'x,,È,é,¼,è,µ B

---

ŽQ Æ @IDirectPlay2::Receive

## IDirectPlay2::SetGroupData

HRESULT SetGroupData(DPID idGroup,  
LPVOID lpData, DWORD dwDataSize,  
DWORD dwFlags);

*fOf< [fvID,ÉfAfvfŠfP [fVf‡f“ĒĀ—L,łff [f^ Efuf fbfN,ðŠÖ~A•t,¯,é B*

*—Ē÷,·,ê,ĪDD\_OK AŽ,”s,·,ê,ĪŽŸ,łGf%o [’l,ð•Ô,· B*

**DPERR\_INVALIDOBJECT**

**DPERR\_INVALIDPARAMS**

**DPERR\_INVALIDPLAYER**

*idGroup*

*ff [f^,ð Ý’è,·,éfOf< [fv,łfOf< [fvID B*

*lpData*

*fZfbfg,³,ê,éff [f^,Ö,łf|fCf“f^ BŠù‘¶,łfOf< [fv Eff [f^,ðfNfŠfA,·,é ê ‡,ĪNULL,ðŽw’è,·,é B*

*dwDataSize*

*ff [f^ Efofbftf@,łfTfCfY B*

*dwFlags*

*,±  
,łfpf%of [f^,É0,ðŽw’è,·,é,Æ AfŠf, [fg EfOf< [fv Eff [f^,ªfZfbfg,³,ê A•Ū Ø,È,µ,łf fbfZ [fW,É,æ,Ā,  
Ā’Ê’m,³,ê,é B*

**DPSET\_REMOTE**

*,±,łff [f^,Ī,·,×,Ā,łfAfvfŠfP [fVf‡f“,É,æ,Ā,ĀŽg—  
p,³,ê AfZfbfVf‡f““à,Ī¼,Ī,·,×,Ā,łfAfvfŠfP [fVf‡f“,É“’B,³,ê,é B*

**DPSET\_LOCAL**

*,±,łff [f^,Īf [fJf<,ÈŽg—p,Ī,½,ß,¾,¯,É—p^Ó,³,ê A“’B,³,ê,é,±  
,Æ,Ī,È,¢ B*

**DPSET\_GUARANTEED**

*i%oĀ”\,Ā, ,ê,Ī j•Ū Ø•t,«f fbfZ [fW,É,æ,Ā,Āff [f^,ð“’B,·,é B,±  
,łftf%ofO,ĪDPSET\_REMOTE,Æ^ê ,ÉŽw’è,µ,È,,Ā,Ī,È,¢,¢ B*

*DirectPlay,Ī Af [fJf<,·,æ,ŇfŠf, [fg,Ī,Ó,½,Ā,Īf^fCfv,łfOf< [fv Eff [f^,ð•ŪŽ ,·,é,±  
,Æ,ª,Ā,«„é Bf [fJf< Eff [f^,Ī Af [fJf< EfRf“fsf... [f^ ã,łfAfvfŠfP [fVf‡f“,É’Ī,µ,Ā,Ī,Ý—LĒø,Ā, ,é Bf  
Šf, [fg Eff [f^,Ī AfZfbfVf‡f““à,Ī,·,×,Ā,Ī¼,łfAfvfŠfP [fVf‡f“,É“’B,³,ê,é BDPSESSION\_NODATAMESSAGES  
,ªŽw’è,³,ê,Ā,¢  
,È,¢fZfbfVf‡f“,Ā,Ī Aff [f^,ĪĪ X,ð’Ê’m,·,é,½,ß A,·,×,Ā,Ī¼,łfvfĒfCf,,ÉDPsys\_SETPLAYERORGROUPDATAf  
VfXfef€ Ef fbfZ [fW,ª—,ç,ê,é BfŠf\ [fX,Ö,łf|fCf“f^,Īf [fJf< Eff [f^,ÉŠi”[.,·,é,Ī,ªĀ’S,Ā, ,é Bf [fJf<  
Eff [f^ Efuf fbfN,Ī **IDPMSG\_DESTROYPLAYERORGROUP** fVfXfef€ Ef fbfZ [fW,ª—  
,ç,ê,Ā jfOf< [fv,ª”jŠü,³,ê,æ,µ,Æ,µ,Ā,¢,é,Æ,«„É,à—LĒø,Ā, ,é,½,ß AfAfvfŠfP [fVf‡f“,Ī,±  
,ê,ç,łfŠf\ [fX,ð%oð•ú,·,é,±,Æ,ª,«„é B fVfXfef€ Ef fbfZ [fW,łfŠfXfg,É,Ā,¢,Ā,ĪfVfXfef€ Ef fbfZ [fW,ĪŽg  
=p,ðŽQ Æ,³,ê,½,¢ B*

*ŽQ Æ @DPMSG\_SETPLAYERORGROUPDATA, IDirectPlay2::GetGroupData, IDirectPlay2::Send*

## IDirectPlay2::SetGroupName

HRESULT SetGroupName(DPID idGroup,  
LPDPNAME lpGroupName, DWORD dwFlags);

fOf< [fv,ì ì -Œä,ÉfOf< [fv,ì-¼'O,ðfZfbfg,·,é B DPSESSION\_NODATAMESSAGES ,ªŽw'è,³,ê,Ä,¢  
,È,¢fZfbfVf‡f“,Ä,Í A-  
¼'O,ì•İ X,ð'Ê'm,·,é,½,B A'¼,ì,·,×,Ä,ìfvfŒfCf,,ÉDP SYS\_SETPLAYERORGROUPNAMEfvfXfef€ Ef fbfZ [fW,  
“—,ç,ê,é BfvfXfef€ Ef fbfZ [fW,ìfŠfXfg,É,Ä,¢,Ä,ífVfXfef€ Ef fbfZ [fW,ìŽq—p,ðŽQ Æ,³,ê,½,¢ B  
-Œ÷,·,ê,îDD\_OK AŽ,“s,·,ê,îŽŸ,ìfGf%o [‘l,ì,¢,,ê,©,ð•Ô,· B

DPERR\_INVALIDOBJECT

DPERR\_INVALIDPARAMS

DPERR\_INVALIDPLAYER

idGroup

-¼'O,ðfZfbfg,·,éOf< [fv,ìfOf< [fvID B

lpGroupName

fOf< [fv,ì-¼'O î•ñ,ðŠÜ,bDPNAME \‘¢‘İ,Ö,ìf|fCf“f^ BfOf< [fv,ª-¼'O î•ñ,ðŽ ,½,È,¢ ê ±,Í A,±  
,ìpf%of [f^,ÉNULL,ðfZfbfg,·,é B

dwFlags

,±,ìpf%of [f^,É0,ðŽw'è,·,é,Æ A,·,×,Ä,ìfŠf, [fg EfVfXfef€,É•Û Ø,È,µ,ìf fbfZ [fW,É,æ,Ä,Ä-  
¼'O,ª““,ì,ç,ê,é B

DPSET\_GUARANTEED

i%oÂ”\,Ä, ,ê,î j•Û Ø•t,«,ìf fbfZ [fW,É,æ,Ä,Äff [f^,ð“‘B,·,é B

ŽQ Æ @DPNAME, DPMSG\_SETPLAYERORGROUPNAME, IDirectPlay2::GetGroupName, IDirectPlay2::Send



## IDirectPlay2::SetPlayerName

HRESULT SetPlayerName(DPID idPlayer,  
LPDPNAME lpPlayerName, DWORD dwFlags);

*f v f C f , , , İ İ - Ć ä , É f v f C f , , , İ - ¼ ' O , ð Ý ' è , , é B DPSESSION\_NODATAMESSAGES , º Ž w ' è , ³ è , Ä , Ć , È , Ć f Z f b f V f ‡ f " , Å , Í A - ¼ ' O , İ • İ X , ð ' Ê ' m , , , é , ½ , ß A ' ¼ , İ , , × , Ä , İ f v f C f , , , É DPSYS\_SETPLAYERORGROUPNAME f V f X f e f € E f f b f Z [ f W , º — , Ć , è , é B f V f X f e f € E f f b f Z [ f W , İ f Š f X f g , É , Ä , Ć , Ä , İ f V f X f e f € E f f b f Z [ f W , İ Ž q — p , ð Ž Q Æ , ³ è , ½ , Ć B - Ć ÷ , , è , Î DD\_OK A Ž , " s , , è , İ Ž Ÿ , İ f G f % º [ ' l , İ , Ć , , è , © , ð • Ô , , B*

**DPERR\_INVALIDOBJECT**

**DPERR\_INVALIDPLAYER**

*idPlayer*

*- ¼ ' O , º Ý ' è , , é f v f C f , , , İ f v f C f , , , ID B*

*lpPlayerName*

*f v f C f , , , İ - ¼ ' O î • ñ , ð Š Ÿ , p DPNAME \ ' Ć ' İ , İ f A f h f C f X B f v f C f , , , º - ¼ ' O î • ñ , ð Ž , ½ , È , Ć ê ‡ , Í A , ± , İ f p f % º f [ f ^ , É NULL , ð Ý ' è , , é B*

*dwFlags*

*, ± , İ f p f % º f [ f ^ , É 0 , ð Ž w ' è , , é , Æ A , , × , Ä , İ f Š f , [ f g E f V f X f e f € , É • Ů Ø , È , µ , İ f f b f Z [ f W , É , æ , Ä , Ä - ¼ ' O , º " , , , Ć , è , é B*

**DPSET\_GUARANTEED**

*i % º Â " \ , Ä , , è , İ j • Ů Ø • t , « , İ f f b f Z [ f W , É , æ , Ä , Ä f f [ f ^ , ð " ' B , , é B*

Ž Q Æ @ DPNAME , DPMMSG\_SETPLAYERORGROUPNAME , IDirectPlay2::GetPlayerName , IDirectPlay2::Send

## IDirectPlay2::SetSessionDesc

HRESULT SetSessionDesc(LPDPSESSIONDESC2 lpSessDesc,  
DWORD dwFlags);

,±,ìf f\fbfh,íŒ» ÝfTf| [fg,<sup>3</sup>ê,Ä,¢,È,¢ B

Œ» Ý,ìfZfbfVf‡f“,ì“Á «,ð•ĩ X,·,é B,±,ìf f\fbfh,í AfZfbfVf‡f“,ìfzfXfg,Ä, ,éfRf“fsf...  
[f^ ã,ÄŒÄ,Ñ o,<sup>3</sup>ê,½,Æ,«,ì,Ý“® ì,·,é B

DPERR\_UNSUPPORTED,ð•Ô,· B

lpSessDesc

V,µ,¢ Ý'è,ðŠÜ,ñ,Ä,¢,éfZfbfVf‡f“«L q \‘¢'İ,Ö,İf|fCf“f^ B

dwFlags

,±,ìf f\fbfh,Ä,íŒ» Ýftf%ofo,ÍŽg—p,<sup>3</sup>ê,Ä,¢,È,¢ B

ŽQ Æ @DPSESSIONDESC2, IDirectPlay2::GetSessionDesc



## IDirectPlayLobby

*fAfvfŠfP [fVf‡f“,Í AIDirectPlayLobbyfCf“f^ [ftfFfCfX,lf f\fbfh,ðŽg—*  
*p,µ,Ä AfAfvfŠfP [fVf‡f“,ÆfAfvfŠfP [fVf‡f“,ÉŠÖ~A•t,¯,ç,ê,½ff [f^,ð §Œä,·,é B,±*  
*,lfZfNfVf‡f“,Í AIDirectPlayLobbyfCf“f^ [ftfFfCfX Ef f\fbfh,lfŠftf@fŒf“fX,Ä, ,é BŠT”O,É,Â,¢,Ä,İŠT—*  
*v,ÍIDirectPlayLobbyfCf“f^ [ftfFfCfX,ðŽQ Æ,³,ê,½,¢ B*

*fAfhfŒfXŠÇ—*

CreateAddress

EnumAddress

EnumAddressTypes

*fAfvfŠfP [fVf‡f“ŠÇ—*

Connect

EnumLocalApplications

RunApplication

*ff [f^ŠÇ—*

GetConnectionSettings

ReceiveLobbyMessage

SendLobbyMessage

SetConnectionSettings

SetLobbyMessageEvent

## IDirectPlayLobby::Connect

HRESULT WINAPI Connect(DWORD dwFlags,  
LPDIRECTPLAY2 FAR \*lpDP, IUnknown FAR \*pUnk);

fAfVfŠfP [fVf‡f“,đfZfbfVf‡f“,É Ú‘±,·,é B Ú‘±,É,Í AIDirectPlayLobby::RunApplication  
f f\fbfh,Ì†,Åf fr [ EfNf%o fCfAf“fg,©,ç’ñ<Ÿ,³,ê,é Ú‘±ff [f^ A,Ü,½,ÍIDirectPlayLobby::SetConnectionSettings  
,ÌĖÄ,Ñ o,µ,É,æ,Ä,Ä Ÿ’è,³,ê,éff [f^,đŽg—p,·,é B

¬Ė÷,·,é,İDD\_OK AŽ,”s,·,é,İŽŸ,İfGf%o [‘l,Ì,ç,,é,©,đ•Ô,· B

## CLASS E\_NOAGGREGATION

## DPERR\_INVALIDFLAGS

## DPERR\_INVALIDINTERFACE

## DPERR\_INVALIDOBJECT

## DPERR\_INVALIDPARAMS

## DPERR\_NOTLOBBIED

## DPERR\_OUTOFMEMORY

dwFlags

—\¬ñ,³,ê,Ä,ç,é B0,Ä,È,,Ä,Í,È,ç,È,ç B

lpDP

—LĖø,ÈfCf“f^ [ftfFfCfX,Ä %Šú%o»,³,ê,éff|fCf“f^,Ö,İf|  
fCf“f^ BIDirectPlay2 iIDirectPlayLobby,©,çĖÄ,Ñ o,³,ê,é ê ‡ j,Ü,½,ÍIDirectPlay2A iIDirectPlayLobbyA,©,ç  
ĖÄ,Ñ o,³,ê,é ê ‡ jfCf“f^ [ftfFfCfX,Ì,ç,,é,©,Ä, ,é B

pUnk

Unknown fCf“f^ [ftfFfCfX,İfAfhfĖfX B,±,İfpf%of [f^,Í «—^,İCOM W ¬%o»<@”\  
,Æ,İĖŸŠ· «,Ì,½,ß,É’ñ<Ÿ,³,ê,Ä,ç,é BĖ» Ÿ,İIDirectPlayLobby::Connect,Ä,Í A,±  
,İfpf%of [f^,ÉNULL^ÈŠO,Ì‘l,ªŽw’è,³,ê,é,ÆfGf%o [,đ•Ô,· B

¬Ė÷,·,é,Æ A ³,µ,çfT [frfX EfVf fofCf\_,ÉDirectPlayfIfufWfFfNfg,đ ì ¬,µ A ³,µ,çfZfbfVf‡f“,đfI [fVf“,·  
,é Bf† [fU,É—â,ç ‡,í,¹,İf\_fCfAf fO Ef{fbfNfX,đ•Ž|,·,é,±,Æ,Í,È,ç B,±  
,İf f\fbfh,ªŽ,”s,µ,ÄDPERR\_NOTLOBBIEDfGf%o [,đ•Ô,· ê ‡ AfAfVfŠfP [fVf‡f“,Í’Ê í,İŽè ‡,đŽÀ s,µ ADirect  
tPlayEnumerate ADirectPlayCreate AIDirectPlay2::EnumSessions AIDirectPlay2::Open,đĖÄ,Ñ o,³,È,-  
,Ä,Í,È,ç,È,ç B¼,İfGf%o [‘l,ÄŽ,”s,·,é ê ‡,Í AfZfbfVf‡f“,Ö,İ Ú‘±,É—â’è,ª, ,é B

,±,İf f\fbfh,đĖÄ,Ñ o,·‘O,É AfAfVfŠfP [fVf‡f“,đŠJŽn,·,é,½,ß,É—p,ç,ç,é,é Ú‘± Ÿ’è,đ²,×,é,±,Æ,ª,Ä,«é B,±  
,Ì,½,ß,É,İIDirectPlayLobby::GetConnectionSettingsf f\fbfh,đŽg—p,·,é BfAfVfŠfP [fVf‡f“,Í A,±  
,ê,ç,Ì Ÿ’è,đ•İ X,µ AIDirectPlayLobby::SetConnectionSettingsf f\fbfh,É,æ,Ä,ÄfZfbfg,µ¼,·,±  
,Æ,ª,Ä,«é BDPSESSIONDESC2 \‘ç‘İ,É,Í A“K Ø,ÈfZfbfVf‡f““Ä «,ª Ÿ’è,³,ê,é,æ,ª,É“Ä•Ê,É’ ^Ó,đ•Ÿ,í,È,-  
,Ä,Í,È,ç,È,ç B“Ä,É AdwFlags AdwMaxPlayers AdwUserf f“fo,É,Í’ ^Ó,ª•K—v,Ä, ,é B

ŽQ Æ @DirectPlayCreate

## IDirectPlayLobby::CreateAddress

HRESULT CreateAddress(REFGUID guidSP,  
REFGUID guidDataType, LPCVOID lpData,  
DWORD dwDataSize, LPVOID lpAddress,  
LPDWORD lpdwAddressSize);

—^,!,ç,ê,½fT [frfX Efvf fofCf\_Ĉ—  
L,ìflfbfgf [fN EfAfhfĈfX,©,ç ADirectPlayfAfhfĈfX,ð ì ¬,·,é BĈ<%Ĉ,ìfAfhfĈfX,É,Í AfT [frfX Efvf  
fofCf\_,ìfOf [fof< Ef+fj [fNŽ·ĈŽq iGUID j A,“,æ,ŃfT [frfX Efvf fofCf\_,^flfbfgf [fN EfAfhfĈfX,  
Æ,μ,Ä%ðŽß,·,é,±,Æ,^,Ä,«,éff [f^,^ŠÜ,Ü,ê,é B

—Ĉ÷,·,ê,îDD\_OK AŽ,“s,·,ê,îŽŸ,ìGf% [‘l,ì,ç,,ê,©,ð•Ô,· B

## DPERR\_BUFFERTOOSMALL

## DPERR\_INVALIDPARAMS

guidSP

fT [frfX Efvf fofCf\_,ìGUID,Ö,ìf|fCf“f^ iC++,Ä,íGUID,Ö,ìŽQ Æ,Ä, ,é j B

guidDataType

Ĉ—

L,ìflfbfgf [fN EfAfhfĈfX Ef^fCfv,ðŽ·Ĉ,·,éGUID,ìfAfhfĈfX B’è<` İ,Ÿ,ìflfbfgf [fN EfAfhfĈfX  
Ef^fCfv,É,Ä,ç,Ä,íDirectPlayfAfhfĈfX,ðŽQ Æ,³,ê,½,ç iC++,Ä,íGUID,Ö,ìŽQ Æ,Ä, ,é j B

lpData

Ĉ—L,ìflfbfgf [fN EfAfhfĈfX,ðŠÜ,ðfobftf@,Ö,ìf|fCf“f^ B

dwDataSize

lpData,ìflfbfgf [fN EfAfhfĈfX,ìfTfCfY,ðfofCfY,P^Ĉ,ÄŽw’è,·,é B

lpAddress

¶ ¬,³,ê,½DirectPlayfAfhfĈfX,^ ‘,« ž,Ü,ê,éfobftf@,Ö,ìf|fCf“f^ B

lpdwAddressSize

DirectPlayfAfhfĈfX Efobftf@,ìfTfCfY,ðŠÜ,ð•İ ”,Ö,ìf|fCf“f^ BfT [frfX Efvf fofCf\_,Í A,±  
,ìf f\fbfh,ðĈÄ,Ń o,·‘O,ÉlpdwAddressSize,ðfobftf@,ìfTfCfY,Ä %Šú%»,μ,È,,Ä,Í,È,ç,É,ç B  
f f\fbfh,^ §Ĉä,ð–ß,·,Æ A,±  
,ìfpf%of [f^,É,ìlpAddress,É ‘,« ž,Ü,ê,½fofCfY ”,^Ši”[,³,ê,é Bfobftf@,^ ¬,³,·,¬,é iDPERR\_BUFFERTOOSM  
ALL j ê ‡ A,±,ìfpf%of [f^,É,íDirectPlayfAfhfĈfX,ðŠi”[,·,é,½,ß,É•K—v,ÈfTfCfY,^fZfbfg,³,ê,é B

ŽQ Æ @IDirectPlayLobby::EnumAddress

## IDirectPlayLobby::EnumAddress

HRESULT EnumAddress(LPDPENUMADDRESS lpEnumAddressCallback,  
LPCVOID lpAddress, DWORD dwAddressSize,  
LPVOID lpContext);

DirectPlayfAfhfEfX Efofbftf@,©,çf`fff“fN,ð%ð Í,·,é B

–Œ÷,·,ê,ÎDD\_OK AŽ,”s,·,ê,ÎŽŸ,ÌfGf%o [’l,Ì,¢,,ê,©,ð•Ô,· B

### DPERR\_EXCEPTION

### DPERR\_INVALIDOBJECT

### DPERR\_INVALIDPARAMS

lpEnumAddressCallback

DirectPlayfAfhfEfX,ÌŠe î•ñf`fff“fN,É,Â,¢,ÄŒÄ,Ñ o,<sup>3</sup>,ê,éEnumAddressCallback ŠÖ ”,Ö,Ìf|fCf“f^ B

lpAddress

DirectPlayfAfhfEfX Efofbftf@,Ì æ“<sup>a</sup>,Ö,Ìf|fCf“f^ B

dwAddressSize

DirectPlayfAfhfEfX,ÌfTfCfY B

lpContext

fR [f<fofbfNŠÖ ”,É“n,<sup>3</sup>,ê,éfRf“fefLfXfg B

ŽQ Æ @DirectPlayfAfhfEfX, IDirectPlayLobby::CreateAddress

## IDirectPlayLobby::EnumAddressTypes

HRESULT EnumAddressTypes(  
LDDPLENUMADDRESSTYPESCALLBACK lpEnumAddressTypeCallback,  
REFGUID guidSP, LPVOID lpContext,  
DWORD dwFlags);

Žw'è,<sup>3</sup>,ê,½fT [frfX Efvf fofCf\_,^DirectPlayfAfhfŒfX,ð \z,·,é,½,ß,É•K—  
v,Æ,·,é A,·,×,Ä,İfAfhfŒfX Ef^fCfv,ð—ñ<“,·,é B

–Œ÷,·,ê,İDD\_OK AŽ,“s,·,ê,İŽŸ,İfGf%o [‘l,İ,Œ,,ê,©,ð•Ô,· B

### DPERR\_EXCEPTION

### DPERR\_INVALIDOBJECT

### DPERR\_INVALIDPARAMS

lpEnumAddressTypeCallback

fT [frfX Efvf fofCf\_,İŞefAfhfŒfX Ef^fCfv,É,Â,Œ,ÄŒÄ,Ñ o,<sup>3</sup>,ê,eEnumAddressTypeCallbackŠÖ ”,Ö,İf|  
fCf“f^ B fT [frfX Efvf fofCf\_,^AfhfŒfX Ef^fCfv,ð,Æ,ç,È,Œ,ç AfR [f<fofbfN,İŒÄ,Ñ o,<sup>3</sup>,ê,È,Œ B

guidSP

fAfhfŒfXf^fCfv,ð—ñ<“,·,éfT [frfX Efvf fofCf\_,İGUID,İfAfhfŒfX iC++,Ä,İGUID,Ö,İŽQ Æ,Ä, ,é j B

lpContext

fR [f<fofbfNŠÖ ”,É“n,<sup>3</sup>,ê,éfRf“fefLfXfg B

dwFlags

—\–ñ,<sup>3</sup>,ê,Ä,Œ,é B0,Ä,È,,Ä,Í,È,ç,È,Œ B

ŽQ Æ @DirectPlayfAfhfŒfX, IDirectPlayLobby::CreateAddress

## IDirectPlayLobby::EnumLocalApplications

HRESULT EnumLocalApplications(  
LPDPENUMLOCALAPPLICATIONS lpEnumLocalAppCallback,  
LPVOID lpContext, DWORD dwFlags);

DirectPlay,É“o~^,³,ê,Ä,¢,é fAfvfŠfP [fVf‡f“,ð—ñ<“,·,é B  
—Æ÷,·,ê,ÎDD\_OK AŽ,”s,·,ê,ÎŽŸ,ÌfGf‰ [¹l,Ì,¢,,ê,©,ð•Ô,· B

DPERR\_GENERIC

DPERR\_INVALIDINTERFACE

DPERR\_INVALIDOBJECT

DPERR\_INVALIDPARAMS

DPERR\_OUTOFMEMORY

lpEnumLocalAppCallback  
—ñ<“,³,ê,½ŠefAfvfŠfP [fVf‡f“,É,Â,¢,ÄÆÄ,Ñ o,³,ê,éEnumLocalApplicationsCallback ŠÖ ”,Ö,Ìf|fCf“f^ B

lpContext  
fR [f<fofbfNŠÖ ”,É“n,³,ê,éRf“fefLfXfg B

dwFlags  
—\—ñ,³,ê,Ä,¢,é B0,Ä,È,,Ä,Í,È,Ç,È,¢ B

ŽQ Æ @DPLAPPINFO

## IDirectPlayLobby::GetConnectionSettings

HRESULT GetConnectionSettings(DWORD dwAppID,  
LPVOID lpData, LPDWORD lpdwDataSize);

fAfvfŠfP [fVf‡f“,İŠJŽn,â Ú‘±,É•K—v,È,·,×,Ä,İ î•ñ,ðŠÜ,ðDPLCONNECTION  
‘‘ċ‘İ,ðŽæ“¾,·,é B•Ô,³,ê,½ff [f^,Í Af fr [ EfNf%ofCfAf“fg,É,æ,Ä,ÄIDirectPlayLobby::RunApplication  
f f\fbfh,É“n,³,ê,é,à,İ A,Ü,½,İIDirectPlayLobby::SetConnectionSettings  
f f\fbfh,İĈÄ,Ñ o,µ,Ä Ý’è,³,ê,é,à,İ,Æ““,¶,Ä, ,é B

¬Ĉ÷,·,ê,İDD\_OK AŽ, ”s,·,ê,İŽŸ,İfGf%o [‘İ,İ,ċ,,ê,©,ð•Ô,· B

DPERR\_BUFFERTOOSMALL

DPERR\_GENERIC

DPERR\_INVALIDINTERFACE

DPERR\_INVALIDOBJECT

DPERR\_INVALIDPARAMS

DPERR\_NOTLOBBIED

DPERR\_OUTOFMEMORY

dwAppID

f fr [ EfNf%ofCfAf“fg,“ĈÄ,Ñ o,· ê ‡ A Ú‘± Ý’è,ðŽæ“¾,·,é fAfvfŠfP [fVf‡f“,ðŽ¬•Ĉ,·,é if fr [ EfN  
f%ofCfAf“fg,İ,ċ,,Ä,©,İ fAfvfŠfP [fVf‡f“,Æ’Ĉ M,·,é j B fAfvfŠfP [fVf‡f“,“ĈÄ,Ñ o,·,Æ,«,Í A,±  
,İfpf%of [f^,İÖ,Ä,È,-  
,Ä,İ,È,ċ,È ċ ifAfvfŠfP [fVf‡f“,Í A,Đ,Æ,Ä,İf fr [ EfNf%ofCfAf“fg,Æ,µ,©’Ĉ M,µ,È,ċ j B,±  
,İID”Ö †,İIDirectPlayLobby::RunApplication,©,ċŽæ“¾,³,ê,é B

lpData

Ú‘± Ý’è,“ ‘,« ž,Ü,ê,é ofbftf@,Ö,İf|fCf“f^ B ff [f^,İfTfCfY,¾,¬,ðŽæ“¾,·,é ê ‡,Í A,±  
,İfpf%of [f^,ÉNULL,ð Ý’è,·,é B,±,İ,Æ,« AlpdwDataSizepf%of [f^,É,Í Aff [f^,ð•ŰŽ ,·,é,½,ß,É•K—  
v,È Ä ¬,İfTfCfY,“Ši”[,³,ê,é B

lpdwDataSize

,±,İf f\fbfh,ðĈÄ,Ñ o,“O,É ofbftf@,İfTfCfY,Ä %Šú%o»,³,ê,éİ ”,Ö,İf|fCf“f^ Bf f\fbfh,“ §Ĉä,ð—  
ß,µ,½Ĉä A,±  
,İfpf%of [f^,É,İff [f^,İfTfCfY,“fofCf’P’Ĉ,ÄfZfbfg,³,ê,é Bf ofbftf@,“ ¬,³,·,¬,é iDPERR\_BUFFERTOOSMA  
LL j ê ‡,Í A,±,İfpf%of [f^,É,Í•K—v,È Ä ¬,İ ofbftf@ EfTfCfY,“ Ý’è,³,ê,é B

ŠÖ ”,“ §Ĉä,ð—

ß,µ,½,Æ,« Aff [f^,ð“Ĉ,Ý o,·,½,ß,É,Í AlpDataf f“fo,ðLPDPLCONNECTION ‘‘ċ‘İ,ÉfLfffXfg,µ,È,-  
,Ä,İ,È,ċ,È,ċ B

ŽQ Ä @DPLCONNECTION, IDirectPlayLobby::RunApplication, IDirectPlayLobby::SetConnectionSettings

## IDirectPlayLobby::ReceiveLobbyMessage

HRESULT ReceiveLobbyMessage(DWORD dwFlags,  
DWORD dwAppID, LPDWORD lpdwMessageFlags,  
LPVOID lpData, LPDWORD lpdwDataSize);

f fr [ EfNf%ofCfAf“fg EfAfvfŠfP [fVf‡f“,ÆDirectPlayfAfvfŠfP [fVf‡f“,İŠÖ,Ä‘—  
M,³,ê,éf fbfZ [fW,ðŽæ“¾,·,é Bf fbfZ [fW,İfLf... [É’~,!,ç,ê,é,½,ß A“Ç,Ý o,³,ê,È,¢  
,È,çff [f^,ðŽ,·,ðŠëE⁻,İ,È,¢ B

~E÷,·,ê,İDD\_OK AŽ,·s,·,ê,İŽŸ,İfGf%o [¹,İ,¢,,ê,©,ð•Ö,· B

DPERR\_APPNOTSTARTED

DPERR\_BUFFERTOOSMALL

DPERR\_GENERIC

DPERR\_INVALIDINTERFACE

DPERR\_INVALIDOBJECT

DPERR\_INVALIDPARAMS

DPERR\_NOMESSAGES

DPERR\_OUTOFMEMORY

dwFlags

—\~ñ,³,ê,Ä,¢,é B0,Ä,È,,Ä,İ,È,ç,È,¢ B

dwAppID

f fr [ EfNf%ofCfAf“fg,ªEÄ,Ñ o,· ê ‡ A Ú± Ý’è,ðŽæ“¾,·,éAfvfŠfP [fVf‡f“,ðŽ⁻•Ê,·,é if fr [ EfN  
f%ofCfAf“fg,İ,¢,,Ä,©,İfAfvfŠfP [fVf‡f“,Æ’Ê M,·,é j BfAfvfŠfP [fVf‡f“,ªEÄ,Ñ o,·,Æ,«,İ A,±  
,İfpf%of [f^,İ0,Ä,È,-  
,Ä,İ,È,ç,È,¢ ifAfvfŠfP [fVf‡f“,İ A,Đ,Æ,Ä,İf fr [ EfNf%ofCfAf“fg,Æ,µ,©’Ê M,µ,È,¢ j B,±  
,İID”Ö †,İIDirectPlayLobby::RunApplication,©,çŽæ“¾,³,ê,é B

lpdwMessageFlags

•Ö,³,ê,Ä,¢,éf fbfZ [fW,İf^fCfV,ðŽ!,·ftf%ofO B

DPLAD\_SYSTEM

fAfvfŠfP [fVf‡f“,ÊfCfxf“fg,ð’Ê’m,·,éVfXfef€ Ef fbfZ [fW,  
Ä,·,é,±,Æ,ðŽ!,· B” ¶,µ,½fCfxf“fg,İŽi—p,ðEⁿè,·,é,É,İ AlpDataf|  
fCf“f^,ðDPLMSG\_GENERICfVfXfef€ Ef fbfZ [fW,ÊfLfffXf  
g,µ,ÄdwTypef f“fo,ð—LÆø,É,µ AfVfXfef€ Ef fbfZ [fW,İŽi  
—p,ð’²,×,é B

lpData

f fbfZ [fW,ª ‘,« ž,Ü,ê,éfofbftf@,Ö,İf|fCf“f^ Bf fbfZ [fW,İfTfCfY,¾,⁻,ðŽæ“¾,·,é ê ‡,İ A,±  
,İfpf%of [f^,ÉNULL,ð Ý’è,·,é B,±,İ,Æ,« AlpdwDataSizepf%of [f^,É,İ Af fbfZ [fW,ð•ÛŽ ,·,é,½,ß,É•K  
—v,È Ä ⁻,İfTfCfY,ªŠi”[,³,ê,é B

lpdwDataSize

,±,İf f\fbfh,ðEÄ,Ñ o,·‘O,Éfobftf@,İfTfCfY,Ä %Šú%o»,³,ê,éİ ”,İfAfhfEfX Bf f\fbfh,ª §Eä,ð—  
ß,µ,½Eä A,±  
,İfpf%of [f^,É,İf fbfZ [fW,İfTfCfY,ªfocfg’P^Ê,ÄZfbfg,³,ê,é Bfobftf@,ª ⁻,³,·,⁻,é iDPERR\_BUFFERT  
OOSMALL j ê ‡,İ A,±,İfpf%of [f^,É,İ•K—v,È Ä ⁻,İfobftf@ EfTfCfY,ª Ý’è,³,ê,é B

ŽQ Ä @IDirectPlayLobby::RunApplication, IDirectPlayLobby::SendLobbyMessage



## IDirectPlayLobby::RunApplication

HRESULT RunApplication(DWORD dwFlags,  
LPDWORD lpdwAppID, LPDPLCONNECTION lpConn,  
HANDLE hReceiveEvent);

fAfVfŠfP [fVf‡f“,đŠJŽn,µ AfZfbfVf‡f“,Æ,Ì Ú‘±,É•K—v,È,·,×,Ä,Ì îñ,đ“n,· B,±  
,İf f\fbfh,İf fr [ EfNf%oCfAf“fg,É,æ,Á,Ä—p,¢,ç,ê,é B

—Æ÷,·,ê,İDD\_OK AŽ,”s,·,ê,İŽŸ,İfGf%o [‘l,İ,¢,,ê,©,đ•Ô,· B

DPERR\_CANTCREATEPROCESS

DPERR\_GENERIC

DPERR\_INVALIDINTERFACE

DPERR\_INVALIDOBJECT

DPERR\_INVALIDPARAMS

DPERR\_OUTOFMEMORY

DPERR\_UNKNOWNAPPLICATION

dwFlags

—\ñ,³,ê,Ä,¢,é B0,Ä,È,,Ä,Í,È,ç,È,¢ B

lpdwAppId

ŠJŽn,³,ê,½fAfVfŠfP [fVf‡f“,đŽ•Ê,·,éID,“Ši”[³,ê,éİ ”,Ö,İf|  
fCf“f^ Bf fr [ EfNf%oCfAf“fg,Í AIDirectPlayLobby::SendLobbyMessage,âIDirectPlayLobby::ReceiveLobby  
Messagef f\fbfh,İEÄ,Ñ o,µ,ÄŽg—p,·,é,½,ß,É AfAfVfŠfP [fVf‡f“ID,đ•Ü•¶,µ,Ä,“,©,È,“,ê,İ,È,ç,È,¢ B

lpConn

ŠJŽn,·,éAfVfŠfP [fVf‡f“,đŽw’è,µ Af\_fCfAf fO Ef{fbfNfX,đ•Ž‘l,,ÉfZfbfVf‡f“ EfCf“fXf^f“fX,É Ú±  
,·,é,½,ß,É•K—v,È,·,×,Ä,Ì îñ,đŠÜ,ñ,¾ ADPLCONNECTION \‘¢‘İ,Ö,İf|fCf“f^ B

hReceiveEvent

f fr [ Ef fbfZ [fW,“Žó M,³,ê,é,Æ,«,ÉfZfbfG,³,ê,é“ŠúfCfxf“fg,đŽw’è,·,é B,±  
,İfCfxf“fg,Í AIDirectPlayLobby::SetLobbyMessageEventf f\fbfh,đ—p,¢,ÄEä,Ä•İ X,·,é,±,Æ,ª,Ä,«,é B

,±,İf f\fbfh,İfAfVfŠfP [fVf‡f“ EfVf fZfX,ª İ ¬,³,ê,é,Æ §Eä,đ—  
ß,· Bf fr [ EfNf%oCfAf“fg,Í AfAfVfŠfP [fVf‡f“,İ ó‘Ô,đŽ‘,·fVfXfef€ Ef fbfZ [fW,đŽó,¬Žæ,é Bf fr [  
EfNf%oCfAf“fg,ªfZfbfVf‡f“,İfzfXfg EfAfVfŠfP [fVf‡f“,đŠJŽn,µ,Ä,¢  
,é ê ‡,İ ADPLSYS\_SESSIONCREATEDfVfXfef€ Ef fbfZ [fW,đŽó M,·,é,Ü,Ä AfZfbfVf‡f“,ÉŽQ%oÁ,·,é¼,İf  
AfVfŠfP [fVf‡f“,İŠJŽn,đ‘Ö,Ä,×,«,Ä, ,é BfAfVfŠfP [fVf‡f“,ªfZfbfVf‡f“,İ İ ¬,âfZfbfVf‡f“,Ö,İŽQ%oÁ,ÉŽ,”s,·,é  
,Æ ADPLSYS\_DPLAYCONNECTFAILEDf fbfZ [fW,“”-  
s,³,ê,é B,Ü,½ Af fr [ EfNf%oCfAf“fg,Í AfAfVfŠfP [fVf‡f“,ª Ú‘± Ý’è,đ“Ç,Ý o,·,ÆDPLSYS\_CONNECTI  
ONSETTINGSREADfVfXfef€ Ef fbfZ [fW,đŽó, Žæ,é BfAfVfŠfP [fVf‡f“,ª I—  
1,·,é,ÆDPLSYS\_APPTERMINATEDfVfXfef€ Ef fbfZ [fW,đŽó M,·,é B

f fr [ EfNf%oCfAf“fg,Í ADPLSYS\_CONNECTIONSETTINGSREADfVfXfef€ Ef fbfZ [fW,đŽó M,·,é‘O,ÉID  
irectPlayLobbyfCf“f^ [ftfFfCfX,đ%ođ•ú,µ,Ä,Í,¢,¬,È,¢ B,±  
,İf fbfZ [fW,İ AŽó M,·,é,Ü,ÄIDirectPlayLobby::ReceiveLobbyMessage,đf< [fv,µ,Äf`fFfbfN,·,é,© A“ŠúfCfxf  
“fg,đ‘ñ•Ÿ,·,é,±,Æ,É,æ,Á,ÄŽó,¬Žæ,é,±,Æ,ª,Ä,«,é B

ŽQ Æ @IDirectPlayLobby::ReceiveLobbyMessage, IDirectPlayLobby::GetConnectionSettings,  
IDirectPlayLobby::SetLobbyMessageEvent

## **IDirectPlayLobby::SendLobbyMessage**

HRESULT SendLobbyMessage( DWORD dwFlags,  
DWORD dwAppID, LPVOID lpData,  
DWORD dwDataSize);

fAfvfŠfP [fVf‡f“,Æf fr [ EfNf%ofCfAf“fg,İŠÔ,Âf fbZ [fW,ð‘— M,·,é B  
—Æ÷,·,ê,İDD\_OK AŽ,”s,·,ê,İŽŸ,İfGf%o [‘l,İ,¢,,ê,©,ð•Ô,· B

**DPERR\_APPNOTSTARTED**

**DPERR\_BUFFERTOOLARGE**

**DPERR\_GENERIC**

**DPERR\_INVALIDINTERFACE**

**DPERR\_INVALIDOBJECT**

**DPERR\_INVALIDPARAMS**

**DPERR\_OUTOFMEMORY**

**DPERR\_TIMEOUT**

dwFlags

—\—ñ,<sup>3</sup>,ê,Ä,¢,é B0,Â,È,,Ä,İ,È,ç,È,¢ B

dwAppID

f fr [ EfNf%ofCfAf“fg,ªÆÄ,Ñ o,· ê ‡ A Ú± Ý’è,ðŽæ“¾,·,é fAfvfŠfP [fVf‡f“,ðŽ~•Ê,·,é if fr [ EfN  
f%ofCfAf“fg,İ,¢,,Â,©,İfAfvfŠfP [fVf‡f“,Æ’Ê M,·,é j BfAfvfŠfP [fVf‡f“,ªÆÄ,Ñ o,·,Æ,«,İ A,±  
,İfpf%of [f^,İ0,Â,È,-  
,Â,İ,È,ç,È,¢ ifAfvfŠfP [fVf‡f“,İ A,Đ,Æ,Â,İf fr [ EfNf%ofCfAf“fg,Æ,µ,©’Ê M,µ,È,¢ j B,±  
,İID”Ô †,İ**IDirectPlayLobby::RunApplication**,©,çŽæ“¾,<sup>3</sup>,ê,é B

lpData

‘— M,·,é fbZ [fW,ðŠÜ,Đfobftf@,Ö,İf|fCf“f^ B

dwDataSize

fobftf@,İfTfCfY,ðf ofCf g’P^Ê,ÂŽw’è,·,é B

ŽQ Æ @**IDirectPlayLobby::RunApplication**, **IDirectPlayLobby::ReceiveLobbyMessage**

## IDirectPlayLobby::SetConnectionSettings

HRESULT SetConnectionSettings(DWORD dwFlags,  
DWORD dwAppID, LPDPLCONNECTION lpConn);

*fAfvfŠfP [fVf‡f“,İŠJŽn,Æ Ú‘±,É•K—v,È,·,×,Ä,İ î•ñ,ðŠŬ,ñ,¼DPLCONNECTION \‘ç‘İ,ð•İ X,·,é B*

*¬Ç÷,·,ê,İDD\_OK AŽ,”s,·,ê,İŽŸ,İfGf‰o [‘l,İ,ç,,ê,©,ð•Ô,· B*

**DPERR\_GENERIC**

**DPERR\_INVALIDINTERFACE**

**DPERR\_INVALIDOBJECT**

**DPERR\_INVALIDPARAMS**

**DPERR\_OUTOFMEMORY**

*dwFlags*

*—\¬ñ,³,ê,Ä,ç,é B0,Ä,È,,Ä,İ,È,ç,È,ç B*

*dwAppID*

*f fr [ EfNf‰oCfAf“fg,ªÇÄ,Ñ o,· ê ‡ A Ú‘± Ý’è,ðŽæ“¼,·,éfAfvfŠfP [fVf‡f“,ðŽ¬•Ê,·,é if fr [ EfNf‰oCfAf“fg,İ,ç,,Ä,©,İfAfvfŠfP [fVf‡f“,Æ’Ê M,·,é j BfAfvfŠfP [fVf‡f“,ªÇÄ,Ñ o,·,Æ,«,İ A,±,İfpf‰o [f^,İ0,Ä,È,-,Ä,İ,È,ç,È,ç ifAfvfŠfP [fVf‡f“,İ A,Đ,Æ,Ä,İf fr [ EfNf‰oCfAf“fg,Æ,µ,©’Ê M,µ,È,ç j B,±,İID”Ô †,İIDirectPlayLobby::RunApplication ,çŽæ“¼,³,ê,é B*

*lpConn*

*ŠJŽn,·,éfAfvfŠfP [fVf‡f“,ðŽw’è,µ Af\_fCfAf fO Ef{fbfNfX,ð•Ž‘,¹,,ÉfZfbfVf‡f“ EfCf“fXf^f“fX,É Ú‘±,·,é,½,ß,É•K—v,È,·,×,Ä,İ î•ñ,ðŠŬ,ñ,¼ ADPLCONNECTION \‘ç‘İ,Ö,İf|fCf“f^ B*

*ŽQ Æ @IDirectPlayLobby::GetConnectionSettings*

## IDirectPlayLobby::SetLobbyMessageEvent

HRESULT SetLobbyMessageEvent(DWORD dwFlags,  
DWORD dwAppID, HANDLE hReceiveEvent);

f fr [ Ef fbfZ [fW,đŽó,Žæ,é,Æ,«,ÉfZfbfg,³,ê,éfCfxf“fg,đ“o~^,·,é Bf fbfZ [fW,Æ“Šú,đ,Æ,é•K—v,ª, ,éfAf  
vfŠfP [fVf‡f“,Í A,±,İf f\fbfh,đÆÄ,Ñ o,³,È,,Ä,Í,È,ç,È,¢ Bf fr [ EfNf%oCfAf“fg,Í A,±  
,İf f\fbfh,É,æ,Ä,Ä**IDirectPlayLobby::RunApplication** f f\fbfh,İÆÄ,Ñ o,µ,ÄŽw’è,³,ê,½fCfxf“fg,đ•İ X,·,é,±  
,Æ,ª,Ä,«,é B

–Æ÷,·,ê,İDD\_OK AŽ,”s,·,ê,İŽŸ,İfGf%o [’l,İ,¢,,ê,©,đ•Ô,· B

### DPERR\_GENERIC

### DPERR\_INVALIDINTERFACE

### DPERR\_INVALIDOBJECT

### DPERR\_INVALIDPARAMS

### DPERR\_OUTOFMEMORY

dwFlags

—\–ñ,³,ê,Ä,¢,é B0,Ä,È,,Ä,Í,È,ç,È,¢ B

dwAppID

f fr [ EfNf%oCfAf“fg,ªÆÄ,Ñ o,· ê ‡ A Ú± Ý’è,đŽæ“¾,·,éfAfvfŠfP [fVf‡f“,đŽ•Ê,·,é if fr [ EfN  
f%oCfAf“fg,Í,¢,,Ä,©,İfAfvfŠfP [fVf‡f“,Æ’Ê M,·,é j BfAfvfŠfP [fVf‡f“,ªÆÄ,Ñ o,·,Æ,«,Í A,±  
,İfpf%o [f^,İ0,Ä,È,-  
,Ä,Í,È,ç,È,¢ ifAfvfŠfP [fVf‡f“,Í A,Đ,Æ,Ä,İf fr [ EfNf%oCfAf“fg,Æ,µ,©’Ê M,µ,È,¢ j B,±  
,İİ”Ô †,İ**IDirectPlayLobby::RunApplication**,©,çŽæ“¾,³,ê,é B

hReceiveEvent

f fbfZ [fW,đŽó M,µ,½,Æ,«,ÉfZfbfg,³,ê,éfCfxf“fg Efnf“fhf< B

ŽQ Æ @**IDirectPlayLobby::ReceiveLobbyMessage**, **IDirectPlayLobby::SendLobbyMessage**

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## DPCAPS

```
typedef struct {
    DWORD dwSize;
    DWORD dwFlags;
    DWORD dwMaxBufferSize;
    DWORD dwMaxQueueSize;
    DWORD dwMaxPlayers;
    DWORD dwHundredBaud;
    DWORD dwLatency;
    DWORD dwMaxLocalPlayers;
    DWORD dwHeaderLength;
    DWORD dwTimeout;
} DPCAPS, FAR *LPDPCAPS;
```

**IDirectPlay2::GetCaps**, Ü, ½, Í **IDirectPlay2::GetPlayerCaps** f\fbfh, ÌÆÄ, Ñ o, µ, É, æ, Ä, Ä ADirectPlay fIfufWfFfNfg, Ì" — Í, ðŠi" [, ·, é B — v< , ³, ê, ½" — Í, · Æ Ø•t, «, ©, », ρ, Ä, È, ¢, ©, É, æ, Ä, Ä A, ±, ê, ç, Ì" — Í, Í Ò, È, Ä, Ä, -, é B, ±, Ì '¢' Í, Í ¢, Ý o, µ ê — p, Ä, , é B

### dwSize

DPCAPS '¢' Ì, ÌfTfCfY, ðf ofCf g'P'Ê, ÄŽw'è, ·, é BfAfvfŠfP [fVf‡f" , IDPCAPS '¢' Ì, ðŽg — p, ·, é 'O, É, ±, Ìf f"fo, ð Ý'è, µ, È, , Ä, Í, È, ç, È, ¢ B, », ρ, Ä, È, ¢ ê ‡, ÍfGf%o [, Æ, È, é B

### dwFlags

DirectPlayfIfufWfFfNfg, Ì" Ä «, ð•\, · B

DPCAPS\_GROUPOPTIMIZED

, ±, ÌDirectPlayfIfufWfFfNfg, É Ú'±  
, ³, ê, ½fT [frfX Efvf fofCf\_ , · AfOf< [fv if}  
f<f'fLfffXfg j"z M, ð Ä"K%o», ·, é, ±, Æ, ·, Ä, «, é, ±, Æ, ðŽ', · B

DPCAPS\_GUARANTEEOPTIMIZED

, ±, ÌDirectPlayfIfufWfFfNfg, É Ú'±  
, ³, ê, ½fT [frfX Efvf fofCf\_ , · A•Ü Ø•t, «, Ìf fbZ [fW"z M, ðfT  
f| [fg, ·, é, ±, Æ, ðŽ', · B

DPCAPS\_GUARANTEEDSUPPORTED

DirectPlayfIfufWfFfNfg, · Æ Ø•t, «, Ìf fbZ [fW"z M, ðfTf|  
[fg, µ, Ä, ¢, é, ±, Æ, ðŽ', · BfT [frfX Efvf fofCf\_ , · fTf| [fg, µ, Ä, ¢  
, é A, , é, ¢  
, IDirectPlay, · Æ Ø, È, µ, ÌfT [frfX Efvf fofCf\_ ã, ÉfCf"fvfŠf f"f  
g, µ, Ä, ¢, é, ±, Æ, È, æ, é B

DPCAPS\_ISHOST

ÆÄ, Ñ o, µÆ³, ÌfAfvfŠfP [fVf‡f" , É, æ, Ä, Ä Ì ¬, ³, ê, ½DirectPlayfIfufWfFfNfg, · AfZfbfVf‡f" EfzfXfg, Ä, , é, ±, Æ, ðŽ', · B

DPCAPS\_KEEPAALIVEOPTIMIZED

fT [frfX Efvf fofCf\_ , Í AfZfbfVf‡f" , Ò, Ì Ú'±, ·Ž, , í, ê, ½, ±  
, Æ, ðÆÿ o, Ä, «, é B

### dwMaxBufferSize

, ±, ÌfT [frfX Efvf fofCf\_ , · PÆÄ, ÌfpfPfbfg, Ä' —  
M, Ä, «, é Ä'áfTfCfY B, », ê, æ, è, à'ä, «, Èf fbZ [fW, Í, Ð, Æ, Ä^È ã, ÌfpfPfbfg, ð — p, ¢, Ä' — M, ³, ê, é B

### dwMaxQueueSize

Žg — p, ³, ê, È, ¢ B

### dwMaxPlayers

, ±, ÌDirectPlayfIfufWfFfNfg, ÄfTf| [fg, ³, ê, Ä, ¢, éf [fJf<, ·, æ, ÑfŠf, [fg, Ì Ä'áfvfÆfCf, , " B

### dwHundredBaud

1•b" — , ½, è, Ìf of"fh• if{ [ EfÆ [fg j, ð100frfbfg'P'Ê, ÄŽ', · B, ½, Æ, , Í, ±, Ì'Ì, ·24, Ì ê ‡ A2400f{ [, ðŽ', µ, Ä, ¢  
, é B

### dwLatency

fT [frfX Efvf fofCf\_ , Ì , 'è"½%oŽŽšŠÔ, ðf~fŠ•b, ÄŽw'è, ·, é BDirectPlay, ·"½%oŽŽšŠÔ, ð , 'è, Ä, «, È, ¢ ê ‡ A, ±  
, Ì'Ì, Í0, Ä, , é BfT [frfX Efvf fofCf\_ , É, æ, Ä, Ä, Í Af fbZ [fW EfTfCfY, Ì•½, ð —

¶,µ AfAfvfŠfP [fVf‡f“ŠÔfefXfg,ÉŠî,Ä,¢  
,½ ,“x,È,È,é B”½‰žžŠÔ,Í A•Û Ø•t,«,Û,½,Í•Û Ø,È,µ,Ì,Ç,¿,Ç,Ìf fbZ [fW”z M,ðfAfvfŠfP [fVf‡f“,ªŽg—  
p,·,é,©,É,æ,Á,Ä^Û,È,é B

**dwMaxLocalPlayers**

fZfbfVf‡f“,ÅfTf| [fg,³,ê,éf [fJf< EfvfŒfCf,,,Ì Å‘â ” B

**dwHeaderLength**

DirectPlayIfufWfFfNfg,É,æ,Á,ÄfvfŒfCf,, Ef fbZ [fW,É•t‰Á,³,ê,éwfbf\_,ÌfTfCfY,ðf ofCf g’P^Ê,ÅŽ|,· Bf  
wfbf\_ EfTfCfY,ÍŽg—p,µ,Ä,¢,éfT [frfX Efvf f ofCf\_,É,æ,Á,Ä^Û,È,é B

**dwTimeout**

fT [frfX Efvf f ofCf\_,ª „ §,·,éf^fCfŒfAfEf g’l B’Ê íDirectPlay,Í Af fbZ [fW,Ì‰ž“š,ð’Ò,Â,Æ,«,É,±  
,Ìf^fCfŒfAfEf g’l,ðŽg—p,·,é B

ŽQ Æ @IDirectPlay2::Send

## DPCOMPORTADDRESS

```
typedef struct DPCOMPORTADDRESS{
    DWORD dwComPort;
    DWORD dwBaudRate;
    DWORD dwStopBits;
    DWORD dwParity;
    DWORD dwFlowControl;
} DPCOMPORTADDRESS;
```

```
typedef DPCOMPORTADDRESS FAR* LPDPCOMPORTADDRESS;
```

COMf| [fg,İ \ ¬,É,Â,¢,Ä,İ î•ñ,ðŠÜ,Ð B

### dwComPort

Žg—p,·,éCOMf| [fg,İ”Ô †,ðŽ!,· B,±,İf f“fo,İ’l,Í1 A2 A3 A,Ü,½,Í4,Ä, ,é B

### dwBaudRate

COMf| [fg,İf{ [,ðŽ!,· B`È%°,İ’l,İ,¢,,ê,©,Ä, ,é B

CBR_110	CBR_300	CBR_600
CBR_1200	CBR_2400	CBR_4800
CBR_9600	CBR_14400	CBR_19200
CBR_38400	CBR_56000	CBR_57600
CBR_115200	CBR_128000	CBR_256000

### dwStopBits

fXfgfbfv Efrfbfg’,ðŽ!,· B,±,İf f“fo,İ’l,ÍONESTOPBIT AONE5STOPBITS A,Ü,½,ÍTWOSTOPBITS,Ä, ,é B

### dwParity

COMf| [fg,ªŽg—p,·,épfŠfefBf`fFfbfN,ðŽ!,· B,±,İf f“fo,İ’l,Í  
NOPARITY AODDPARITY AEVENPARITY A,Ü,½,ÍMARKPARITY,Ä, ,é B

### dwFlowControl

COMf| [fg,ªŽg—p,·,éftf [ §Œä,İ•û—@,ðŽ!,· B`È%°,İ’l,İ,¢,,ê,©,ðŽg—p,Ä,«,é B

**DPCPA\_DTRFLOW** DTR,ðŽg—  
p,µ,½fn [fhfEfFfA Eftf [ §Œä,ðŽ!,· B

**DPCPA\_NOFLOW** ftf [ §Œä,ð s,í,È,¢,±,Æ,ðŽ!,· B

**DPCPA\_RTSDTRFLOW** RTS,“,æ,ÑDTR,ðŽg—  
p,µ,½fn [fhfEfFfA Eftf [ §Œä,ðŽ!,· B

**DPCPA\_RTSFLOW** RTS,ðŽg—p,µ,½fn [fhfEfFfA Eftf [ §Œä,ðŽ!,· B

**DPCPA\_XONXOFFFLOW** f\ftfgfEfFfA Eftf [ §Œä ixon/xoff j,ðŽ!,· B

f{ [fŒ [fg AfXfgfbfv Efrfbfg AfpfŠfefB,ð’è‘,·,é’è ”,Í AWinbase.h,Ä’è‘,³,ê,Ä,¢,é B



## DPLAPPINFO

```
typedef struct DPLAPPINFO {
    DWORD dwSize;
    GUID guidApplication;
    union
    {
        LPSTR lpszAppNameA;
        LPWSTR lpszAppName;
    };
} DPLAPPINFO, * LPDPLAPPINFO;
```

*f* *CEfWfXfgfŠ*,*ÉŠi*"[,<sup>3</sup>,*ê* **AIDirectPlayLobby::EnumLocalApplications***f*R [*f*◁*f*of*b**f*NŠÖ ”,É“*n*,<sup>3</sup>,*ê*,*é* *AfAfvfŠfP* [*fVf*◄*f*“,*É*,*Ä*,*ç*,*Ä*,*İ* *î*•*ñ*,*ðŠÜ*,*p* B

### dwSize

DPLAPPINFO \‘*ç*‘*İ*,*İfTfCfY*,*ðf*of*Cf**g*’*P*^*Ê*,*ÂŽw*’*è*,*·*,*é* *BfAfvfŠfP* [*fVf*◄*f*“,*İ*DPLAPPINFO \‘*ç*‘*İ*,*ðŽg*—*p*,*·*,*é*‘*O*,*É*,*±*,*İf* *f*“*f*o,*ð* *Ý*’*è*,*μ*,*È*,*·*,*Ä*,*İ*,*È*,*ç*,*È*,*ç* B,*»*,*Ɑ*,*Ä*,*È*,*ç* *ê* *‡*,*İfGf*%*o* [,*Æ*,*È*,*é* B

### guidApplication

*fAfvfŠfP* [*fVf*◄*f*“,*İfOf* [*f*of◁ *Ef*†*f*j [*f*NŽ<sup>~</sup>•*ÊŽq* *i*GUID *j* B

### lpszAppNameA, lpszAppName

*fAfvfŠfP* [*fVf*◄*f*“,*İ*—¼‘*O*,*ðŽ*!,*·*ANSI,*Ü*,½,*İ*Unicode•*¶Žš*—*ñ* B•*¶Žš*—*ñ*,*İ*CE^,*İŽg*—*p*,*μ*,*Ä*,*ç*,*é**fCf*“*f*^ [*f*t*fFfCfX*,*É*,*æ*,*é* B

## DPLCONNECTION

```
typedef struct {
    DWORD          dwSize;
    DWORD          dwFlags;
    LPDPSESSIONDESC2 lpSessionDesc;
    LPDPNAME       lpPlayerName;
    GUID           guidSP;
    LPVOID         lpAddress;
    DWORD          dwAddressSize;
} DPLCONNECTION, *LPDPLCONNECTION;
```

*fAfVfŠfP [fVf‡f“,đfZfbfVf‡f“,É Ú‘±,·,é,½,ß,É•K—v,È î•ñ,đŠÜ,Đ B*

### dwSize

*DPLCONNECTION \‘Ć‘İ,İfTfCfY,đfofCfY’PˆÊ,ĂŽw’è,·,é BfAfVfŠfP [fVf‡f“,ÍDPLCONNECTION \‘Ć‘İ,đŽg—p,·,é‘O,É,±,İf f“fo,đ Ý’è,μ,È,,Ă,İ,È,Ç,È,Ć B,»,¤,Ă,È,Ć ê ‡,İfGf‰ [„Æ,È,é B*

### dwFlags

*Ú‘±•û—@,đŽ‘,· B*

*DPLCONNECTION\_CREATESESSION*

*fZfbfVf‡f“L q,É,μ,½,ª,Ă,Ă V,μ,ĆfZfbfVf‡f“,đ ì ¬,·,é B*

*DPLCONNECTION\_JOINSESSION*

*fZfbfVf‡f“L q,É,μ,½,ª,Ă,ĂŠù‘¶,İfZfbfVf‡f“,ÉŽQ‰Ă,·,é B*

### lpSessionDesc

*ì ¬,Ü,½,İŽQ‰Ă,·,é fZfbfVf‡f“,đ•\,·DPSESSIONDESC2 \‘Ć‘İ,Ö,İf|fCf“f^ B*

### lpPlayerName

*fVfŒfCf,, ì ¬ŽŽ,ÉŽg—p,³,ê,é—¼‘O,đŽ‘,·DPNAME \‘Ć‘İ,Ö,İf|fCf“f^ B,±,ê,Í Af fr [„Ă“o^,³,ê,½ l,İ—¼‘O,É,È,é BfAfVfŠfP [fVf‡f“,Í A,±,İ—¼‘O,đ—³Ž<,·,é,±,Æ,ª,Ă,«,é B*

### guidSP

*fZfbfVf‡f“,É Ú‘±,·,é,½,ß,ÉŽg—p,·,é fT [frfX EfVf fofCf\_,İfOf [fof< Ef+fj [fNŽˉ•ÊŽq iGUID j B*

### lpAddress

*fT [frfX EfVf fofCf\_,ªfZfbfVf‡f“,É Ú‘±,·,é,½,ß,É•K—v,È î•ñ,đŠÜ,ĐDirectPlayfAfhfŒfX,Ö,İf|fCf“f^ B*

### dwAddressSize

*fAfhfŒfX Eff [f^,İfTfCfY,đfofCfY’PˆÊ,ĂŽw’è,·,é B*

## DPNAME

```
typedef struct {
    DWORD dwSize;
    DWORD dwFlags;
    union {
        LPWSTR lpszShortName;
        LPSTR lpszShortNameA;
    };
    union {
        LPWSTR lpszLongName;
        LPSTR lpszLongNameA;
    };
} DPNAME, FAR *LPDPNAME;
```

*f v f C f , , , â f O f < [ f v , È , Ç , Ì DirectPlay f G f “ f e f B f e f B , Ì - ¼ ‘ O î ñ , ð Š Ů , Ð B*

### dwSize

*DPNAME \ ‘ ç ‘ Ì , Ì f T f C f Y , ð f o f C f g ‘ P ^ Ê , Å Ž w ‘ è , . , é B f A f v f Š f P [ f V f ‡ f “ , Ì DPNAME \ ‘ ç ‘ Ì , ð Ž g — p , . , é ‘ O , É , ± , Ì f f “ f o , ð Ý ‘ è , µ , È , , Å , Ì , È , Ç , È , ç B , » , ¢ , Å , È , ç ê ‡ , Ì f G f % ¢ [ , Æ , È , é B*

### dwFlags

*\ ‘ ç ‘ Ì , É Ç Å — L , Ì f t f % ¢ f O B Ç » Ý , Í 0 , Å , , é B*

### lpszShortName and lpszLongName

*‘ Z , ç - ¼ ‘ O i f j f b f N f l [ f € j , Æ ‘ . , ç i ³ Ž ® , È j f v f C f C f , , - ¼ , Ů , ½ , Ì f O f < [ f v - ¼ , ð Š Ů , Ð Unicode • ¶ Ž š — ñ , Ö , Ì f | f C f “ f ^ , Ì IDirectPlay2 f C f “ f ^ [ f t f F f C f X , ð Ž g — p , µ , Å , ç , é ê ‡ , Ì , Ý Ž g — p , . , é B*

### lpszShortNameA and lpszLongNameA

*‘ Z , ç - ¼ ‘ O i f j f b f N f l [ f € j , Æ ‘ . , ç i ³ Ž ® , È j f v f C f C f , , - ¼ , Ů , ½ , Ì f O f < [ f v - ¼ , ð Š Ů , Ð ANSI • ¶ Ž š — ñ , Ö , Ì f | f C f “ f ^ B , ± , Ì f f “ f o , Ì IDirectPlay2A f C f “ f ^ [ f t f F f C f X , ð Ž g — p , µ , Å , ç , é ê ‡ , Ì , Ý Ž g — p , . , é B*

*Ž Q Æ @ IDirectPlay2::CreateGroup , IDirectPlay2::CreatePlayer , IDirectPlay2::GetGroupName , IDirectPlay2::GetPlayerName , IDirectPlay2::SetGroupName , IDirectPlay2::SetPlayerName*

## DPSESSIONDESC2

```
typedef struct {
    DWORD dwSize;
    DWORD dwFlags;
    GUID guidInstance;
    GUID guidApplication;
    DWORD dwMaxPlayers;
    DWORD dwCurrentPlayers;
    union {
        LPWSTR lpszSessionName;
        LPSTR lpszSessionNameA;
    };
    union {
        LPWSTR lpszPassword;
        LPSTR lpszPasswordA;
    };
    DWORD dwReserved1;
    DWORD dwReserved2;
    DWORD dwUser1;
    DWORD dwUser2;
    DWORD dwUser3;
    DWORD dwUser4;
} DPSESSIONDESC2, FAR *LPDPSESSIONDESC2;
```

IDirectPlay2 fZfbfVfzf“„İ”—İ,É,Â,Ç,Ä,İL q,ðŠÜ,Ð B  
İDPSESSIONDESC \‘Çİ,İIDirectPlay2fCf“f^ [ftfFfCfX,Ä,İŽg—p,<sup>3</sup>,ê,È,Ç j

### dwSize

DPSESSIONDESC2 \‘Çİ,İfTfCfY,ðfCfY,ðfCfY’PÊ,ÄŽw’è,·,é BfAfvfŠfP [fVfzf“,İDPSESSIONDESC2 \‘Çİ,ðŽg—  
p,·,é‘O,É,±,İf f“fo,ð Ý’è,µ,È,·,Ä,İ,È,Ç,È,Ç B,»,µ,Ä,È,Ç ê ±,İfGf%o [,Æ,E,é B

### dwFlags

È%o,İftf%ofo,İ‘g,Ý ±,ı,¹ B

DPSESSION\_JOINDISABLED

V,µ,ÇfAfvfŠfP [fVfzf“,İ,±,İfZfbfVfzf“,É%oÄ,ı,é,±  
,Æ,ª,Ä,«,È,Ç B DOPEN\_JOINftf%ofo,Æ,±  
,İfZfbfVfzf“ EfCf“fXf^f“fX,İfOf [fof< Eftfj [fNŽ~•ÊŽq iG  
UID j,ðŽw’è,µ,ÄIDirectPlay2::Open f\fbfh,ðÆÄ,Ñ o,µ,Ä,à A•K,  
fGf%o [,Æ,È,é B,±,İftf%ofo,ªŽw’è,<sup>3</sup>,ê,Ä,Ç  
,È,¯,ê,İ AfZfbfVfzf“ EfvfÆfCf,, ”,İ §ÆÄ,É‘B,·,é,Ü,Ä A V,µ,Ç  
fŠf, [fg EfAfvfŠfP [fVfzf“,İfZfbfVfzf“,ÉŽQ%oÄ,·,é,±  
,Æ,ª,Ä,«,é B

### DPSESSION\_KEEPLIVE

fŠf, [fg EfvfÆfCf,,ªfQ [f€,ð~Ü í I—¹,µ,½,±  
,Æ,ðŽ©“@“İ,ÉÆÏ o,·,é B,±  
,ê,Ç,İfvfÆfCf,,İfZfbfVfzf“,©,Ç í æ,<sup>3</sup>,ê,é BêŽŽ“İ,Éflfbfgf [fN,  
İ<@”\,ªâŽ~,µ,½,±  
,Æ,É,æ,Ä,ÄfvfÆfCf,,ª í æ,<sup>3</sup>,ê,½ ê ± A,»,İfvfÆfCf,,ª—  
ß,Ä,Ä,«,½,Æ,« AfZfbfVfzf“,©,Ç æŠO,<sup>3</sup>,ê,½,±  
,Æ,ªÊ‘m,<sup>3</sup>,ê,é B Ü,µ,İ AfVfXfef€ Ef fbfZ [fW,İŽg—  
p,İ‘†,İDPSYS\_SESSIONLOSTfVfXfef€ Ef fbfZ [fW,È,Ä,Ç  
,Ä,İL q,ðŽQ Ä,<sup>3</sup>,ê,½,Ç B,±,İftf%ofo,ªŽw’è,<sup>3</sup>,ê,Ä,Ç  
,È,¯,ê,İ ADirectPlay,İ,±,İ<@”\,ðfTf [fg,µ,È,Ç B

### DPSESSION\_MIGRATEHOST

Æ» Ý,İfZfXfg,ª I—¹,·,é ê ± A V,µ,ÇfvfÆfCf,,İŽQ%oÄ,ð‘±,¯,é,±  
,Æ,ª,Ä,«,é,æ,µ,È AfzfXfg,ð•Ê,İfRf“fsf... [f^,É‘Ü,»,µ,Æ,·,é B,±  
,İftf%ofo,ªŽw’è,<sup>3</sup>,ê,Ä,Ç  
,È,¯,ê,İ AfzfXfg,İ‘Ü“@,¹, A V,µ,ÇfvfÆfCf,,ð İ ¬,·,é,±  
,Æ,İ,Ä,«,È,Ç B

## DPSESSION\_NEWPLAYERSDISABLED

V,μ,¢fvfŒfCf,,ðfZfbfVf‡f“,É ì ¬,Ä,«,È,¢,±,Æ,ðŽ!,· B  
fAfvfŠfP [fVf‡f“,ª,±  
,ìfZfbfVf‡f“,É‘İ,μ,ÄIDirectPlay2::CreatePlayer  
f f\fbfh,ðŒÄ,Ñ o,μ,Ä,à A•K,,fGf%o [ ,Æ,È,é B V,μ,¢fAfvfŠfP  
[fVf‡f“,ªfZfbfVf‡f“,ÉŽQ%oÄ,·,é,±,Æ,à,Ä,«,È,¢ B,±  
,ìftf%ofo,ªŽw’è,³,ê,Ä,¢  
,È,¬,ê,İ AfZfbfVf‡f“ EfvfŒfCf,, ”,ì §ŒÄ,É‘B,·,é,Ü,ÄfvfŒfCf,,  
ð ì ¬,·,é,±,Æ,ª,Ä,«,é B

## DPSESSION\_NODATAMESSAGES

IDirectPlay2::SetPlayerData AIDirectPlay2::SetGroupData AIDirect  
Play2::SetPlayerName AIDirectPlay2::SetGroupNamef f\fbfh,É,æ,Ä  
,ÄfŠf, [fg EfvfŒfCf,, Eff [f^,âfŠf, [fg EfOf< [fv Eff [f^,ª  
İ X,³,ê,½,Æ,« AfVfXfef€ Ef fbfZ [fW,ð‘— M,μ,È,¢ B,±  
,ìftf%ofo,ªŽw’è,³,ê,Ä,¢  
,È,¬,ê,İ Af f [f^,İ•İ X,ðŽ!,·f fbfZ [fW,ª ¶ ¬,³,ê,é B

## DPSESSION\_NOMESSAGEID

f fbfZ [fW,İ‘—  
MŽÖ,ÆŽó MŽÖ,ðŽ!,·ff [f^,ðf fbfZ [fW,É•t%oÄ,μ,È,¢ B,±  
,ì îñ,ª d—v,Ä,È,¬,ê,İ Af fbfZ [fW EfI [fo [fwfbfh,ð ß—  
ñ,·,é,±  
,Æ,ª,Ä,«,é B i Ú ×,İIDirectPlay2::Receive f\fbfh,ðŽQ Æ j,±  
,ìftf%ofo,ªŽw’è,³,ê,Ä,¢,È,¬,ê,İ Af fbfZ [fW,h,c,ªt%oÄ,³,ê,é B

## guidInstance

fZfbfVf‡f“ EfCf“fXf^f“fX,İGUID B

## guidApplication

fZfbfVf‡f“ EfCf“fXf^f“fX,ÄŽÄ s,·,éfAfvfŠfP [fVf‡f“,İGUID B,±  
,ê,İf†fj [fN,ÉfAfvfŠfP [fVf‡f“,ðŽ•Ê,·,é,½,ß ADirectPlay,İ‘¬,¶fAfvfŠfP [fVf‡f“,ð‘—,ç,¹,Ä,¢,é‘¼,İfRf“fsf...  
[f^,É,¾,¬ Ú±,·,é B,·,×,Ä,İfAfvfŠfP [fVf‡f“,É‘İ,·,éfZfbfVf‡f“,ð—ñ<“,·,é,É,İ A,±  
,ìf f“fo,ÉGUID\_NULL,ðŽw’è,·,é B

## dwMaxPlayers

,±,ìfZfbfVf‡f“,Ä<¬,³,ê,é Ä‘âfvfŒfCf,, ” B

## dwCurrentPlayers

,±,ìfZfbfVf‡f“,İŒ» Ý,İfvfŒfCf,, ” B

## lpzSessionName and lpzPassword

fZfbfVf‡f“,İ—¼‘O,ÆfpfXf [fh,ðŠÜ,bUnicode•¶Žš—ñ,Ö,İf|fCf“f^ B,±  
,ìf f“fo,İIDirectPlay2fCf“f^ [ftfFfCfX,ðŽg—p,μ,Ä,¢,é ê ±,İ,ÝŽg—p,·,é B

## lpzSessionNameA and lpzPasswordA

fZfbfVf‡f“,İ—¼‘O,ÆfpfXf [fh,ðŠÜ,bANSI•¶Žš—ñ,Ö,İf|fCf“f^ B,±  
,ìf f“fo,İIDirectPlay2AfCf“f^ [ftfFfCfX,ðŽg—p,μ,Ä,¢,é ê ±,İ,ÝŽg—p,·,é B

## dwReserved1 and dwReserved2

«—,İ,½,ß,È—\ñ,³,ê,Ä,¢,é B

## dwUser1, dwUser2, dwUser3, and dwUser4

fZfbfVf‡f“,İ,½,ß,İfAfvfŠfP [fVf‡f“ŒÄ—L,İff [f^ B

ŽQ Æ @IDirectPlay2::EnumSessions, IDirectPlay2::GetSessionDesc

*fVfXfef€ Ef fbfZ [fW*

## DPLMSG\_GENERIC

```
typedef struct {  
    DWORD dwType;  
} DPL_GENERIC, *LPDPLMSG_GENERIC;
```

*f fr [ EfNf%oCfAf“fg,ÆfAfvfŠfP [fVf‡f“ŠÔ,Â“n,<sup>3</sup>ê,éfVfXfef€ Ef fbfZ [fW,Ì”Ä—p \‘č‘Ì B*

### dwType

*Žó,¬Žæ,Á,½fVfXfef€ Ef fbfZ [fW,ÌŽí—b,ðŽ¬•Ê,·,é B*

DPLSYS\_APPTERMINATED

**IDirectPlayLobby::RunApplication,**<sup>a</sup> I—

*<sup>1</sup>,μ AfAfvfŠfP [fVf‡f“,<sup>a</sup>ŠJŽn,μ,½,±,Æ,ð•\,· B*

### DPLSYS\_CONNECTIONSETTINGSREAD

**IDirectPlayLobby::RunApplication***f f\fbfh,<sup>a</sup> Ú‘± Ý’è,ð“Ç,Ý o,μ*

*AfAfvfŠfP [fVf‡f“,<sup>a</sup>ŠJŽn,μ,½,±,Æ,ð•\,· B*

### DPLSYS\_DPLAYCONNECTFAILED

**IDirectPlayLobby::RunApplication,**<sup>a</sup>*fZfbfVf‡f“,Ö,Ì Ú‘±*

*,ÉŽ,”s,μ AfAfvfŠfP [fVf‡f“,<sup>a</sup>ŠJŽn,μ,½,±,Æ,ð•\,· B*

### DPLSYS\_DPLAYCONNECTSUCCEEDED

**IDirectPlayLobby::RunApplication,**<sup>a</sup>*fZfbfVf‡f“,ð ì ¬,μ,Ä‘¼,ÌfAfvf*

*ŠfP [fVf‡f“,ðŽQ%oÁ,<sup>3</sup>,<sup>1</sup>é €”ö,<sup>a</sup>Ä,«,½,© AfZfbfVf‡f“,Ö,ÌŽQ%oÁ,<sup>a</sup>*

*¬Ç÷,μ,½,±,Æ,É,æ,è AfAfvfŠfP [fVf‡f“,<sup>a</sup>ŠJŽn,μ,½,±,Æ,ð•\,· B*

## DPMSG\_ADDPLAYERTOGROUP

```
typedef struct{
    DWORD dwType;
    DPID dpIdGroup;
    DPID dpIdPlayer;
} DPMSG_ADDPLAYERTOGROUP, *LPDPMSG_ADDPLAYERTOGROUP;
```

DPSYS\_ADDPLAYERTOGROUP, ",æ,ÑDPSYS\_DELETEPLAYERFROMGROUPfVfXfef€ Ef fbfZ [fW,ì î•ñ,ðŠÜ,þ  
B fVfXfef€,Í AfvfƎfCf,,,"fOf< [fv,É'Ç%Á,Ü,½,Í í æ,³,ê,½,Æ,«,«±,±,ê,ç,Ìf fbfZ [fW,ð'— M,·,é B

### dwType

f fbfZ [fW,ðŽ~•Ê,·,é B,±  
,Ìf f"f0,ÍDPSYS\_ADDPLAYERTOGROUP,Ü,½,ÍDPSYS\_DELETEPLAYERFROMGROUP,Å, ,é B

### dpIdGroup

fvfƎfCf,,,"Ç%Á,Ü,½,Í í æ,³,ê,éfOf< [fv,ÌfOf< [fvID B

### dpIdPlayer

Žw'è,³,ê,½fOf< [fv,É'Ç%Á,³,ê,é A,Ü,½,ÍŽw'è,³,ê,½fOf< [fv,©,ç í æ,³,ê,éfvfƎfCf,,,"fvfƎfCf,,ID B

ŽQ Æ @IDirectPlay2::AddPlayerToGroup, IDirectPlay2::DeletePlayerFromGroup



## DPMSG\_CREATEPLAYERORGROUP

```
typedef struct{
    DWORD dwType;
    DWORD dwPlayerType;
    DPID dpId;
    DWORD dwCurrentPlayers;
    LPVOID lpData;
    DWORD dwDataSize;
    DPNAME dpnName;
} DPMSG_CREATEPLAYERORGROUP, *LPDPMSG_CREATEPLAYERORGROUP;
```

DPSYS\_CREATEPLAYERORGROUP fVfXfef€ Ef fbfZ [fW,İ î•ñ,ðŠÜ,Đ BfVfXfef€  
,Í Afvf€fCf,,„,æ,ÑfOf< [fv,ªfZfbfVf‡f“,É ì ¬,³,ê,½,Æ,«,É,±,İf fbfZ [fW,ð‘— M,.,é B

**dwType**  
f fbfZ [fW,ðŽ~•Ê,.,é B,±,İf f“fo,É,ÍDPSYS\_CREATEPLAYERORGROUP,ªfZfbfg,³,ê,é B

**dwPlayerType**  
f fbfZ [fW,ªfvf€fCf,, iDPPLAYERTYPE\_PLAYER j,ÆfOf< [fv iDPPLAYERTYPE\_GROUP j,İ,Ç,ç,ç,É“K—  
p,³,ê,é,©,ðŽ!,· B

**dpId**  
fvf€fCf,,ID,ÆfOf< [fvID,İ,Ç,ç,ç,ª ì ¬,³,ê,½,©,ðŽ!,· B

**dwCurrentPlayers**  
,»,İfZfbfVf‡f“,Á,İ€» Ý,İfvf€fCf,,„,æ,ÑfOf< [fv,İ ” B,»,İ,Æ,«'Ç%oÁ,³,ê,½,à,İ,àŠÜ,Đ B

**lpData**  
,±,İfvf€fCf,,Ü,½,ÍfOf< [fv,ÉŠÖ~A•t,¬,ç,ê,½ AfAfvfŠfP [fVf‡f“€Á—L,İfŠf, [fg Efb [f^,Ö,İf|fCf“f^ B  
,±,İf f“fo [,ªNULL,İ,Æ,«,Í AfŠf, [fg Efb [f^,İ,È,¢ B

**dwDataSize**  
**lpData**,É,æ,Á,ĂŽQ Æ,³,ê,éfofbftf@,ðŠÜ,Đfb [f^,İfTfCfY B

**dpnName**  
fvf€fCf,,Ü,½,ÍfOf< [fv,İ–¼‘O,ðŠÜ,Đ \‘¢İ B

ŽQ Æ @IDirectPlay2::CreateGroup, IDirectPlay2::CreatePlayer

## DPMSG\_DELETEPLAYERFROMGROUP

typedef DPMSG\_ADDPLAYERTOGROUP DPMSG\_DELETEPLAYERFROMGROUP;

typedef DPMSG\_DELETEPLAYERFROMGROUP \*LPDPMSG\_DELETEPLAYERFROMGROUP;

DPSYS\_DELETEPLAYERFROMGROUPfVfXfef€ Ef fbfZ [fW,Ì î•ñ,ðŠÜ,Ð B ,±,Ì \‘¢‘Ìf f“fo,Ì,É,Â,¢  
,Ä,Í**DPMSG\_ADDPLAYERTOGROUP** \‘¢‘Ì,ðŽQ Æ,<sup>3</sup>,ê,<sup>1</sup>/<sub>2</sub>,¢ B

## DPMSG\_DESTROYPLAYERORGROUP

```
typedef struct{
    DWORD dwType;
    DWORD dwPlayerType;
    DPID dpId;
    LPVOID lpLocalData;
    DWORD dwLocalDataSize;
    LPVOID lpRemoteData;
    DWORD dwRemoteDataSize;
} DPMSG_DESTROYPLAYERORGROUP, *LPDPMSG_DESTROYPLAYERORGROUP;
```

DPSYS\_DESTROYPLAYERORGROUP fVfXfef€ Ef fbfZ [fW,Ì î•ñ,ðŠÜ,þ B fVfXfef€  
,Í Afvf€fCf,,âfOf< [fv,ªfZfbfVf‡f“,É í œ,³,ê,½,Æ,«É,±,ê,ç,lf fbfZ [fW,ð‘— M,·,é B

### dwType

f fbfZ [fW,ðŽ~•Ê,·,é B,±,lf f“fo,É,ÍDPSYS\_DESTROYPLAYERORGROUP,ªfZfbfg,³,ê,é B

### dwPlayerType

f fbfZ [fW,ªfvf€fCf,, iDPPLAYERTYPE\_PLAYER j,ÆfOf< [fv iDPPLAYERTYPE\_GROUP j,Ì,Ç,ç,ç,É“K—  
p,³,ê,é,©,ðŽ!,· B

### dpId

fvf€fCf,,ID,ÆfOf< [fvID,Ì,Ç,ç,ç,ª í œ,³,ê,½,©,ðŽ!,· B

### lpLocalData

,±,lfvf€fCf,,Ü,½,ÍfOf< [fv,ÉŠÖ~A•t,¯,ç,ê,½f [fJf< E ff [f^,Ö,lf|fCf“f^ B

### dwLocalDataSize

f [fJf< E ff [f^,lfTfCfY B

### lpRemoteData

,±,lfvf€fCf,,Ü,½,ÍfOf< [fv,ÉŠÖ~A•t,¯,ç,ê,½fŠf, [fg E ff [f^,Ö,lf|fCf“f^ B

### dwRemoteDataSize

fŠf, [fg E ff [f^,lfTfCfY B

ŽQ Æ @IDirectPlay2::DestroyGroup, IDirectPlay2::DestroyPlayer

## DPMSG\_GENERIC

```
typedef struct{
    DWORD dwType;
} DPMSG_GENERIC, *LPDPMSG_GENERIC;
```

,±,ì \‘ç‘ì,Íf fbfZ [fW ^— ,ì,½,ß,É’ñ<Ÿ,³,ê,é B

### dwType

fVfXfef€ Ef fbfZ [fW,ìŽí—p,ðŽ<sup>−</sup>•Ê,·,é B

fVfXfef€ Ef fbfZ [fW,ðŽó M,μ,½,Æ,« i,Â,Ü,è AlpidFromfpf%of [f^,É,æ,Á,ÄŽ|,³,ê,½'l,ªDPID\_SYSMSG,  
É“™,μ,ç,Æ,« j A,Ü,,-

ç’m,Ìf fbfZ [fW Eff [f^,ðDPMSG\_GENERICĈ^,ÉfLffXfg,μ AŽŸ,É**dwType**,Ì'l,ÉŠî,Ã,ç,Ä`ÈĈä,ì ^—  
,ð s,□ Bf fbfZ [fW,ìŽí—p,ªĈ~`è,³,ê,é,Æ A`ÈĈä,ì ^—

,ì,½,ß,É Af fbfZ [fW,ðŠù’m,ìfVfXfef€ Ef fbfZ [fW,ì,Đ,Æ,Â,ÉfLffXfg,·,é,±,Æ,ª,Â,«,é B

**DPMSG\_HOST**

```
typedef DPMSG_GENERIC    DPMSG_HOST;
typedef DPMSG_HOST      *LPDPMSG_HOST;
```

œ» Ÿ, ìfZfbfVf‡f“ EfzfXfg, afZfbfVf‡f“, ð I—¹, ·, é, Æ, « A, ±, ìf fbZ [fW, ÍfzfXfg”C–±, ðœp ³, ·, éfRf“fsf...  
[f^, ì ã, ì, ·, ×, Ä, ìfvfœfCf,,, É‘— M, ³, ê, é B

**DPMSG\_SESSIONLOST**

```
typedef DPMSG_GENERIC    DPMSG_SESSIONLOST;
typedef DPMSG_SESSIONLOST *LPDPMSG_SESSIONLOST;
```

*fZfbfVf‡f““†,ì‘¼,ì,·,×,Ä,ÌfvfŒfCf,,,Ö,Ì Ú‘±,ªŽ,,í,ê,½,Æ,« ADirectPlay,É,æ,Á,Ä,±*  
*,Ìf fbfZ [fW,ª ¶ ¬,³,ê,é BfZfbfVf‡f“,ªŽ,,í,ê,½Œä,Ì AfŠf, [fg EfvfŒfCf,,,Éf fbfZ [fW,ð‘—,é,±*  
*,Æ,Í,Ä,«,È,ƒ B,µ,©,µ AfZfbfVf‡f“,ªŽ,,í,ê,½ŽŽ“\_,ì,·,×,Ä,Ìff [f^,ª,Û,¾—LŒø,Ä, ,é B,±*  
*,Ìf fbfZ [fW,ðŽó,¬Žæ,Ä,½,ç AfAfvfŠfP [fVf‡f“,Í‘¬,â,©,É•æ•Œ,µ A I—¹,·,é,×,«,Ä, ,é B*

## DPMSG\_SETPLAYERORGROUPDATA

```
typedef struct {
    DWORD dwType;
    DWORD dwPlayerType;
    DPID dpId;
    LPVOID lpData;
    DWORD dwDataSize;
} DPMSG_SETPLAYERORGROUPDATA, *LPDPMSG_SETPLAYERORGROUPDATA;
```

C DPSYS\_SETPLAYERORGROUPDATA fVfXfef€ Ef fbfZ [fW,İ îñ,ðŠÜ,Đ B

### dwType

f fbfZ [fW,ðŽ~•Ê,•,é B,±,İf f“fo,Í,Â,Ê,ÉDPSYS\_SETPLAYERORGROUPDATA,Â, ,é B

### dwPlayerType

f fbfZ [fW,ªfvf€fCf,, iDPPLAYERTYPE\_PLAYER j,ÆfOf< [fv iDPPLAYERTYPE\_GROUP j,İ,Ç,ç,Ç,É“K—  
p,³,ê,é,©,ðŽ',• B

### dpId

ff [f^,ª•İ X,³,ê,½fvf€fCf,,ID, ,é,¢,İfOf< [fv ID B

### lpData

ff [f^,İfAfvfŠfP [fvf±f““Á—Lff [f^ Efuf fbfN,Ö,İf|fCf“f^ B

### dwDataSize

lpData ,É,æ,Á,ÄŽQ Æ,³,ê,éfbftf@,ðŠÜ,Đff [f^,İfTfCfY B

fVfXfef€,Í AfAfvfŠfP [fvf±f“,ªfŠf, [fg Efvf€fCf,,âfŠf, [fg EfOf< [fv,İff [f^,ð•İ X,µ,½,Æ,«,É,±  
,İf fbfZ [fW,ð‘— M,•,é BfAfvfŠfP [fvf±f“,Í,±,İf fbfZ [fW,©,ç,İff [f^,ð•Û‘¶,•,é•K—v,Í,Ê,-

AIDirectPlay2::GetGroupData,Û,½,İIDirectPlay2::GetPlayerDataf f\bfh,ÉDPGET\_REMOTEftf%ofO,ðŽw’è,µ,ÄŒ  
Ä,Ñ o,¹,İ A,¢,Ä,Ä,àff [f^,ðŽæ,è–ß,•,±,Æ,ª,Ä,«,é BDPSESSION\_NODATAMESSAGESftf%ofO,ªŽw’è,³,ê,Ä,¢  
,éfZfbfVf±f“,Ä,Í A,±,İf fbfZ [fW,İ ¶ ¬,³,ê,Ê,¢ B

ŽQ Æ @IDirectPlay2::GetGroupData, IDirectPlay2::GetPlayerData, IDirectPlay2::SetGroupData,  
IDirectPlay2::SetPlayerData

## DPMSG\_SETPLAYERORGROUPNAME

```
typedef struct {
    DWORD dwType;
    DWORD dwPlayerType;
    DPID dpId;
    DPNAME dpnName;
} DPMSG_SETPLAYERORGROUPNAME, *LPDPMSG_SETPLAYERORGROUPNAME;
```

DPSYS\_SETPLAYERORGROUPNAME *fVfXfef€ Ef fbfZ [fW,Ì î•ñ,ðŠÜ,b B*

### dwType

*f fbfZ [fW,ðŽ~•Ê,•,é B,±,Ìf f“fo,Í,Â,Ë,ÉDPSYS\_SETPLAYERORGROUPNAME,Â, ,é B*

### dwPlayerType

*f fbfZ [fW,ªfvf€fCf,, iDPPLAYERTYPE\_PLAYER j,ÆfOf< [fv iDPPLAYERTYPE\_GROUP j,Ì,Ç,¿,ç,É“K—  
p,³,ê,é,©,ðŽ!,• B*

### dpId

*–¼‘O,ª•İ X,³,ê,½fvf€fCf,,ID, ,é,¢,ÍfOf< [fvID B*

### dpnName

*fvf€fCf,, ,é,¢,ÍfOf< [fv,Ì V,µ,¢–¼‘O,Ì î•ñ,ðŠÜ,b \‘¢‘İ B*

*fVfXfef€,Í Afvf€fCf,,âfOf< [fv,Ì–¼‘O,ª•İ X,³,ê,½,Æ,«,É,±,Ìf fbfZ [fW,ð‘— M,•,é BfAfvfŠfP [fVf±f“,Í,±  
,Ìf fbfZ [fW,©,ç,Ìff [f^,ð•Ũ‘¶,•,é•K—v,Í,È,-*

*AIDirectPlay2::GetGroupName,Ü,½,ÍIDirectPlay2::GetPlayerNamef f\fbfh,ðŽg—p,•,ê,Î A,¢,Â,Â,àff [f^,ðŽæ,è–  
ß,•,±,Æ,ª,Â,«,é BDPSESSION\_NODATAMESSAGESftf%ofo,ªŽw’è,³,ê,Â,¢,éfZfbfVf±f“,Â,Í A,±  
,Ìf fbfZ [fW,Í ¶ ¬,³,ê,È,¢ B*

*ŽQ Æ @IDirectPlay2::GetGroupName, IDirectPlay2::GetPlayerName, IDirectPlay2::SetGroupName,  
IDirectPlay2::SetPlayerName*



•Ô¹

fGf%o [ ,Í•%o,ì¹,Ä•\,³,ê A•i ”,ì¹,a°g,Ý ‡,í,³,ê,é,±,Æ,Í,È,¢ B,±,ì•\,Í A,·,×,Ä,ì  
IDirectPlay2,ÆIDirectPlayLobbyf f\fbfh,É,æ,Ä,Ä•Ô,³,ê,é¹,ðŽ,µ,Ä,¢  
,é B,»,ê,¼,ê,ìf f\fbfh,ª•Ô,·fGf%o [¹,ìfŠfXfg,É,Ä,¢,Ä,Í AŠef f\fbfh,ì à–¼,ðŽQ Æ,³,ê,½,¢ B

CLASS\_E\_NOAGGREGATION

DirectPlayCreate ADirectPlayLobbyCreate AIDirectPlayLobby::Conn  
ect,ÌpUnkOuterfpf%of [f^,ÉNULL^ÈŠO,ì¹,a“n,³,ê,½ B

DP\_OK

—v< ,Í ³ í,ÉŠ@—¹,µ,½ B

DPERR\_ACCESSDENIED

fZfbfVf‡f“,ª–ž~õ,© AŠÔ^á,Ä,½pfXf [fh,a—^,¹,ç,ê,½ B

DPERR\_ACTIVEPLAYERS

—LÆø,ÈfvfÆfCf,,,ª“¶ Ý,·,é,½,ß A—v< ,³,ê,½ ^—  
,ªŽÀ s,Ä,«,È,¢ B

DPERR\_ALREADYINITIALIZED

,±,ìfIfufWfFfNfg,Í,·,Ä,É %oŠú%o»,³,ê,Ä,¢,é B

DPERR\_APPNOTSTARTED

,±,ìfAfvfŠfP [fVf‡f“,Í,Û,¾ŠJŽn,³,ê,Ä,¢,È,¢ B

DPERR\_BUFFERTOOLARGE

ff [f^ Efofbftf@,ª°â,«,·,¬,é,½,ß AŠi”[,·,é,±,Æ,ª,Ä,«,È,¢ B

DPERR\_BUFFERTOOSMALL

—^,¹,ç,ê,½fofbftf@,Í A—v< ,µ,½ff [f^,ðŽû—  
e,·,é,ì,É \ª,Èª,«,³,Ä,Í,È,¢ B

DPERR\_BUSY

DirectPlayf fbfZ [fW EfLf... [,ª,¢,Ä,ì,¢,Ä, ,é B

DPERR\_CANTADDPLAYER

fvfÆfCf,,,ðfZfbfVf‡f“,É’Ç%oÄ,Ä,«,È,¢ B

DPERR\_CANTCREATEGROUP

V,µ,¢fOf< [fv,ð ì ¬,Ä,«,È,¢ B

DPERR\_CANTCREATEPLAYER

V,µ,¢fvfÆfCf,,,ð ì ¬,Ä,«,È,¢ B

DPERR\_CANTCREATEPROCESS

fAfvfŠfP [fVf‡f“,ðŽÀ s,Ä,«,È,¢ B

DPERR\_CANTCREATESESSION

V,µ,¢fZfbfVf‡f“,ð ì ¬,Ä,«,È,¢ B

DPERR\_CAPSNOTAVAILABLEYET

DirectPlayfIfufWfFfNfg,ì”\—Í,ª,Û,¾Æ^è,³,ê,Ä,¢,È,¢ B,±  
,ìfGf%o [,Í AŽg—p%oÄ”\,Èfof“fh• ,Æ’Ô,çŽžŠÔ,ìÆ^è,Éf|  
[fŠf“fO,ª•K—  
v,È Úª±•ûŽ® ã,ÉDirectPlayfIfufWfFfNfg,ªfCf“fvfŠf f“fg,³,ê,Ä,¢  
,é ê ‡,É” ¶,·,é,±,Æ,ª, ,é B

DPERR\_EXCEPTION

—v< ,ð ^— ,·,é,Æ,«,É—áŠO,ª” ¶,µ,½ B

DPERR\_GENERIC

’è< ,³,ê,Ä,¢,È,¢fGf%o [,ª ó’Ô,ª” ¶,µ,½ B

DPERR\_INVALIDFLAGS

ŠÖ ”,É“n,³,ê,½ftf%ofO,ª–³Æø,Ä, ,é B

DPERR\_INVALIDINTERFACE

$fCf^{\wedge} [ftfFfCfX, \dot{I}fPf\%of \quad [f^{\wedge}, {}^a{}^3\mathbb{E}\emptyset, \hat{A}, , \acute{e} \ B$   
**DPERR\_INVALIDOBJECT**  
 $DirectPlayIfufWfFfNfg, \dot{I}f|fCf^{\wedge}, {}^a{}^3\mathbb{E}\emptyset, \hat{A}, , \acute{e} \ B$   
**DPERR\_INVALIDPARAMS**  
 $\check{S}\ddot{O} \text{ ”}, \acute{E}^{\text{“}n, {}^3, \hat{e}, \frac{1}{2}, \mathbb{D}, \mathbb{A}, \hat{A}^{\wedge}\ddot{E} \ \ddot{a}, \dot{I}fPf\%of \quad [f^{\wedge}, {}^a{}^3\mathbb{E}\emptyset, \hat{A}, , \acute{e} \ B$   
**DPERR\_INVALIDPLAYER**  
 $fvf\mathbb{E}fCf,,ID, \acute{I} \ A, \pm, \dot{I}fQ \ [f\in \ EfZfbfVf\ddagger f^{\text{“}}, \hat{A} \text{—}$   
 $L\mathbb{E}\emptyset, \ddot{E}fvf\mathbb{E}fCf,,ID, \mathbb{A}, \mu, \hat{A}^{\text{“}}\check{F}\check{Z}^{\text{—}}, {}^3, \hat{e}, \ddot{E}, \mathbb{C} \ B$   
**DPERR\_NOCAPS**  
 $DirectPlay, {}^a\check{Z}g, \ddot{\text{”}}, \varpi, \mathbb{A}, \mu, \hat{A}, \mathbb{C}, \acute{e}^{\wedge}\hat{E} \ Mf\check{S}f^{\text{“}}fN, \acute{I} \ A, \pm$   
 $, \check{I}\check{S}\ddot{O} \text{ ”}, \hat{A}, \acute{I}\check{Z}\hat{A} \ s, \hat{A}, \langle, \mathbb{E}, \mathbb{C} \ B$   
**DPERR\_NOCONNECTION**  
 $^{\wedge}\hat{E} \ Mf\check{S}f^{\text{“}}fN, {}^a\check{S}m \text{—}\S, {}^3, \hat{e}, \hat{A}, \mathbb{C}, \ddot{E}, \mathbb{C} \ B$   
**DPERR\_NOINTERFACE**  
 $, \pm, \dot{I}fCf^{\wedge} [ftfFfCfX, \acute{I}fTf| \ [fg, {}^3, \hat{e}, \hat{A}, \mathbb{C}, \ddot{E}, \mathbb{C} \ B$   
**DPERR\_NOMESSAGES**  
 $\check{Z}\acute{o} \ M, {}^3, \hat{e}, \frac{1}{2}f \ fbfZ \ [fW, {}^a, \ddot{E}, \mathbb{C} \ B$   
**DPERR\_NONAMESERVERFOUND**  
 $f\dot{I} \ [f\in fT \ [fo \ ifzfXfg \ j, {}^a\mathbb{E}\odot, \hat{A}, \odot, \mathbb{C}, \ddot{E}, \mathbb{C} \ Bfvf\mathbb{E}fCf,,, \dot{I} \ \dot{I} \ \neg, \acute{E}, \acute{I}fzfXf$   
 $g, {}^a\bullet K \text{—}v, \hat{A}, , \acute{e} \ B$   
**DPERR\_NOPLAYERS**  
 $, \pm, \dot{I}fZfbfVf\ddagger f^{\text{“}}, \acute{E}, \acute{I} \text{—}L\mathbb{E}\emptyset, \ddot{E}fvf\mathbb{E}fCf,,, {}^a, \mathbb{C}, \ddot{E}, \mathbb{C} \ B$   
**DPERR\_NOSESSIONS**  
 $, \pm, \dot{I}fQ \ [f\in, \acute{E}, \acute{I}\check{S}\ddot{u}^{\text{“}}\P, \dot{I}fZfbfVf\ddagger f^{\text{“}}, {}^a, \ddot{E}, \mathbb{C} \ B$   
**DPERR\_NOTLOBBIED**  
 $\underline{IDirectPlayLobby::RunApplication}, \acute{E}, \mathfrak{a}, \hat{A}, \hat{A}fAfvf\check{S}fP \ [fVf\ddagger f^{\text{“}}, {}^a\check{S}J\check{Z}n, {}^3,$   
 $\acute{e}, \ddot{E}, \odot, \hat{A}, \frac{1}{2} \ \hat{e} \ \ddagger \ A \underline{IDirectPlayLobby::Connect}, {}^a\hat{O}, \cdot fGf\%o \ [^{\text{“}}\dot{I} \ B$   
**DPERR\_OUTOFMEMORY**  
 $\text{—}v\leftarrow, {}^3, \hat{e}, \frac{1}{2} \ \text{—} \ , \check{d}\check{Z}\hat{A} \ s, \cdot, \acute{e}, \dot{I}, \acute{E} \ \backslash {}^a, \ddot{E}f \ f, f\check{S}, {}^a, \ddot{E}, \mathbb{C} \ B$   
**DPERR\_PLAYERLOST**  
 $fZfbfVf\ddagger f^{\text{“}}, \acute{E} \ \acute{U}^{\text{“}}\pm, \mu, \hat{A}, \mathbb{C}, \frac{1}{2}fvf\mathbb{E}fCf,,, {}^a, \mathbb{C}, \ddot{E}, \ddot{E}, \hat{A}, \frac{1}{2} \ B$   
**DPERR\_SENDTOOBIG**  
 $\underline{IDirectPlay2::Send}f \ f\backslash fbfh, \acute{E}^{\text{“}n, {}^3, \hat{e}, \frac{1}{2}f \ fbfZ \ [fW \ Efofbftf@, {}^a \leftarrow$   
 $\%o\hat{A}, {}^3, \hat{e}, \hat{A}, \mathbb{C}, \acute{e}, \mathfrak{a}, \acute{e}, \hat{a}, \hat{a}, \langle, \mathbb{C} \ B$   
**DPERR\_SESSIONLOST**  
 $fZfbfVf\ddagger f^{\text{“}}, \ddot{O}, \dot{I} \ \acute{U}^{\text{“}}\pm, {}^a\check{Z}, \acute{I}, \hat{e}, \frac{1}{2} \ B$   
**DPERR\_TIMEOUT**  
 $\check{Z}w^{\text{“}}\acute{e}, {}^3, \hat{e}, \frac{1}{2}\check{Z}\check{Z}\check{S}\ddot{O}^{\text{“}}\grave{a}, \acute{E} \ \text{—} \ , {}^a \ I \text{—}1, \mu, \ddot{E}, \odot, \hat{A}, \frac{1}{2} \ B$   
**DPERR\_UNAVAILABLE**  
 $\text{—}v\leftarrow, {}^3, \hat{e}, \frac{1}{2}\check{S}\ddot{O} \text{ ”}, \acute{I}\mathbb{E} \rangle \ \acute{Y} \text{—}L\mathbb{E}\emptyset, \hat{A}, \acute{I}, \ddot{E}, \mathbb{C} \ B$   
**DPERR\_UNKNOWNAPPLICATION**  
 $\bullet s \text{—}\mathbb{H}, \ddot{E}fAfvf\check{S}fP \ [fVf\ddagger f^{\text{“}}, {}^a\check{Z}w^{\text{“}}\acute{e}, {}^3, \hat{e}, \frac{1}{2} \ B$   
**DPERR\_UNSUPPORTED**  
 $, \pm, \check{I}\check{S}\ddot{O} \text{ ”}, \acute{I}\mathbb{E} \rangle \ \acute{Y}, \dot{I}fo \ [fWf\ddagger f^{\text{“}}, \hat{A}, \acute{I} \text{—}L\mathbb{E}\emptyset, \hat{A}, \acute{I}, \ddot{E}, \mathbb{C} \ B$   
**DPERR\_USERCANCEL**  
 $\underline{IDirectPlay2::Open}f \ f\backslash fbfh\mathbb{E}\hat{A}, \check{N} \ o, \mu, \dot{I}^{\text{“}}r^{\text{“}}\dagger, \hat{A} \ A \ \acute{U}^{\text{“}}\pm fvf \ fZfX, {}^a f \ddagger$   
 $[fU, \acute{E}, \mathfrak{a}, \hat{A}, \hat{A}fLfff^{\text{“}}fZf\leftarrow, {}^3, \hat{e}, \frac{1}{2} \ B$

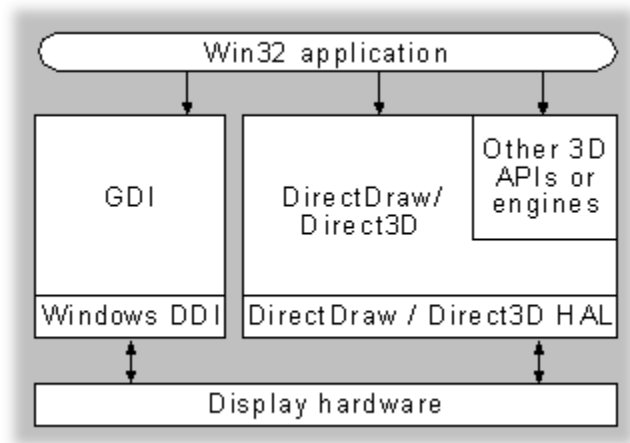
## Direct3D,É,Â,¢,Ä

Microsoft,İŠg'£3DfOf%oftfBfbfNfX Ef\fŠf...

[fVf‡f“,É,İ ADirect3D™,“,æ,ŃOpenGL,İfAfvfŠfP [fVf‡f“ Efvf fOf%of~f“fO EfCf“f^ [ftfFfCfX iAPI j,“Š  
Ü,Ü,ê,Ä,¢,é B

ŽŸ,İ },İ AWindows,İfOf%oftfBfbfNfX EfVfXfef€,Æ AWin32@

API,ÄL q,³,ê,½fAfvfŠfP [fVf‡f“ A,»,İ¼,İWindowsfVfXfef€ A,“,æ,Ńfn [fhfEfFfA,Æ,İŠÖŒW,đŽ',µ,½,à,İ,Ä, ,  
é B



## Direct3D

Direct3D,Í ACE» ÝŽă—¬,Æ,È,Á,Ä,Ç,éfp [f\fi<fRf“fsf... [f^ iPC j,ðffXfNfgfbfv,âfCf“f^ [flfbfg â,ĂŽg—p,·,éft [fU,İ,½,ß,ÉMicrosoft,“ñŸ,·,é AfŠfAf<f^fCfÇ,ÄfCf“f^f%ofNfefBfu,È3D<Z p,Ä,·,é BDirect3D,Í ,‘¬“® ì,ð‘æê,ÉffUfCf“,³,ê,Ä,Ç,é B

Direct3D,Í AŠJ”ŽÖ,ª•K—

v,Æ,·,éAPIfT [frfX,ÆfffofCfX”ñÊ•¶ «,ð’ñ<Ÿ,µ Afn [fhfEfFfA Efxf“f\_ [É,Íê”Ê“I,Èfhf%ofCfo Ef,ff<,ð<Ÿ<<·,é BDirect3D,È,æ,Ä,Ä Afp [f\fi< EfRf“fsf... [f^,İ »‘Ç³,İ3DfOf%oftfBfbfNŠÄ<<,ð,·,®,ÉfTf [fg,·,é,±,Æ,ª,Ä,« AfGf“fh Ef† [fU,ªfVfXfefÇ,ÉfnfCfGf“fh,È3DfOf%oftfBfbfNŠÄ<<,ð’Ç%oÄ,·,é,±,Æ,àŠÈ’P,É,È,é BfVfXfefÇ,Í,Í,·,©,Éf f,fŠ,µ,©•K—v,Æ,µ,È,Ç,½,ß AfCf“fXfg [f< İ,Ÿ,İ,Ü,Æ,ñ,Ç,İRf“fsf... [f^ EfVfXfefÇ â,Ä%oð“K,Ê“® ì,·,é B

Direct3D,İfŠfAf< Ef^fCfÇ 3D

fOf%oftfBfbfNfX EfT [frfX,İŠ®‘SfZfbfg,Ä,·,è Af\ftfgEfFfA EfX [fX,İ ,‘¬,ÈfÇf“f\_Šf“fO EfpfCfvf%ofCf“ i•İŠ. A Æ¾ Af%ofXf^ ^—j,â Afn [fhfEfFfA EfAfNfZf%ofÇ [f^,Ö,İ’¼ Ú“I,ÈfAfNfZfX,ðŽÀÇ»,·,é BAPIfT [frfX,É,Í A“ ê,³,ê,½,ÇEfxf<,È•ŰŽ f, [fhAPI,Æ A’áfÇEfxf<,È’¼ Úf, [fhAPI,ª,è ADirect3D,ðŽg—p,µ,Ä3Dfn [fhfEfFfA EfAfNfZf%ofÇ [f^,ÉfAfNfZfX,·,éVfXfefÇ,ðfTf [fg,·,é BDirect3D,İŠ®‘S,ÉfXfP [f%ofuf<,Ä Afn [fhfEfFfA,Í ADirect3D,È,æ,Ä,Ä3DfÇf“f\_Šf“fO EfpfCfvf%ofCf“,İê”,Ü,½,İ‘S”,ð ,‘¬%o»,·,é,±,Æ,ª,Ä,«é BDirect3D,Í AZfofbftf@fŠf“fO AfAf“f’fGfCfŠfAfVf“fO AfAf<ftf@ EfufÇf“ffBf“fO Af~fbfv f}fbfv AfGftfFfNfg A ³Sm,Èfp [fX,É,æ,éfefNfXf`ff Ef}fbfsf“fO,È,Ç,İ A3Dfn [fhfEfFfA EfAfNfZf%ofÇ [f^,İŠg’EfOf%oftfBfbfNfX”—Í,ð ¶,©,·,±,Æ,ª,Ä,«é BDirect3D,İ’¼,İDirectXfefNfmf fW [ÆŠ®‘S,Ê“ ±,³,ê,Ä,Ç,é,½,ß Afrffl Ef}fbfsf“fO A2D,İfI [fo [fÇfC EfvfÇ [f“,Ä,İ3DfÇf“f\_Šf“fO AfXfvf%ofCfÇ,Æ,Ç,Ä,½Šg’Ç<@”,à< Ú,µ,Ä,Ç,é B,±,è,É,æ,Ä,Ä AfCf“f^f%ofNfefBfu,Èf ffbfA Ef^fCfÇ,Ä AfV [fÇfÇfX,É2D,Æ3D,İfOf%oftfBfbfNfX,ðŽg—p,·,é,±,Æ,ª,Ä,«é B

Direct3D,İfCf“fvfŠf f“fg•û—@,É,Í A•ŰŽ f, [fh,Æ’¼ Úf, [fh,Æ,Ç,ª A,Ü,Ä,½,^Ü,È,é,Ó,½,Ä,İf, [fh,ª,·,é B•ŰŽ f, [fh,Í AfAfvfŠfP [fVf±f“,ªfOf%oftfBfbfN Eft [f^,ð•ŰŽ ,·,é ,fÇxf<API,Ä,·,é B’¼ Úf, [fh,Í AfAfvfŠfP [fVf±f“,ª¾Ž,“I,ÉŽÄ sfobftf@,Éff [f^,ð o—Í,·,é’áfÇxf<API,Ä,·,é B

,±,İ Í,Ä,Í ADirect3D,İ’¼ Úf, [fh,Æ•ŰŽ f, [fh,É,Ä,Ç,Ä à¾,·,é,Æ,Æ,à,É ADirect3D,ð’Ê,µ,Ä—~p,·,é,±,Æ,ª,Ä,«éfn [fhfEfFfA EfAfufXfgf%ofNfVf±f“ i’Š Ű%o» j,ÆfGf~f...fÇ [fVf±f“,É,Ä,Ç,Ä,àŽæ,èµ,ª B

•ŰŽ f, [fh

’¼ Úf, [fh

fn [fhfEfFfA EfAfufXfgf%ofNfVf±f“ i’Š Ű%o» j,ÆfGf~f...fÇ [fVf±f“

•ŮŽ f, [fh

Direct3D,ì•ŮŽ f, [fhAPI,Í A3DfIfufWfFfNfg,ì'€ ì,Æ3DfOf%oftfBfbfNfX,ì ^— ,ì,½,ß,É ÝEv,³,ê,Ä,¢  
,é B•ŮŽ f, [fh,ð—p,¢,ê,Î AŠù'¶,ì WindowsfAfvfŠfP [fVf‡f“,Ö,ì3D<@”\  
,ì'Ç%oÁ,â A V,µ,¢3DfAfvfŠfP [fVf‡f“,ì ì ¬,ð—eˆÖ,É s,±,±,Æ,ª,Ä,«,é B•ŮŽ f, [fh,É'g,Ý ž,Û,ê,Ä,¢  
,éfWfIf fgfŠ EfGf“fWf“,Í AfL [ftfŒ [f€ EfAfjf [fVf‡f“,ì,æ,±,ÈŠg'£<@”\,ðfTf|  
[fg,µ,Ä,¬,è AfIfufWfFfNfg Eff [f^fx [fX,ì ì ¬,âfIfufWfFfNfg,ì“à” \‘¢'ì,ìŠÇ— ,ð•K—  
v,Æ,µ,È,¢ B,Ä,Û,èfAfvfŠfP [fVf‡f“,Í A'è< Ĭ,Ý,ì 3D  
fIfufWfFfNfg,ðf [fh,·,éŒÄ,Ñ o,µ,ð1%oñ s,!,Í AAPI,“ñ<Ÿ,·,éŠÈ'P,Èf f\fbfh,ðŽg—  
p,µ,Ä AfŠfAf<f^fCf€ EfV [f“,ìfIfufWfFfNfg,ð“à”,ìfWfIf fgfŠ EfGf“fWf“,ðˆÖŽˉ,¹,,É'€ ì,Ä,«,é,æ,±  
,É,È,é B

•ŮŽ f, [fh,Í'¼ Úf, [fh,ì ã•”,É'g,Ý—  
§,Ä,ç,ê,Ä,¬,è AŠ®'S,ÉDirectDraw®fAfvfŠfP [fVf‡f“ Efvf fOf%of~f“fO EfCf“f^ [ftfFfCfX iAPI j,É“ ‡,³,  
ê,Ä,¢,é BMicrosoft,Í A «—^,ìfo [fWf‡f“,ìWindows,É•ŮŽ f, [fh,ð'g,Ý“ü,ê,é—\’è,Ä, ,é B Ú,µ,-  
,Í uDirectDraw v,¬,æ,Ñ ufCf“fgf f\_fNfVf‡f“:Direct3D,ì•ŮŽ f, [fh EfIfufWfFfNfg v,ðŽQ Æ,³,ê,½,¢ B

¼ Úf, [fh

Direct3D,¼ Úf, [fh,Í AMicrosoft,¼áfƎfxƎ3D API,Á, ,é B¼ Úf, [fh,ð—p,Ǝ,é,Æ AfQ [fƎ  
,â,»,¼,¼fnfC EfpftfH [f}f“fX,Èf}  
fƎf`f fffBfA EfAfvfŠfP [fVf‡f“,ð AWindowsfIfyfƎ [fefBf“fO EfVfXfefƎ ã,ÃŽÀƎ»,.,é,±,Æ,ª,Ã,«,é B

¼ Úf, [fh,Í Afn [fhEfFfA<@”\,Ö,¼AfNfZfX,ð%Â”\  
,É,.,éfŠfAf<f^fCfƎ3DfAfNfZf%Ǝ [f^,¼ ã,ÉÊ`u,.,é A”—,ƎƎfCf,,Á, ,é B,Ü,½ Afn [fhEfFfA,ª`ñ<Ÿ,µ,È,Ǝ<@  
”\,É,Á,Ǝ,À,à A Á „,¼f\ftfgEfFfA EfƎf“f\_Šf“fO,ð`ñ<Ÿ,.,é ê ‡,ª, ,é B¼ Úf, [fh,Á,Í AŠJ”-  
ŽÒŽ© g,¼fƎf“f\_Šf“fO<Z p,â`Ǝ ì<Z p,É \_“î «,ðŽ ,½,¹,é,±,Æ,ª,Ã,«,é B

¼ Úf, [fh,Æ,Í A`áfƎfxƎ<,ÁfAfNfZf%Ǝ [f^ Efn [fhEfFfA,Æ`Ê M,.,é,½,ß,¼ AfffofCfX,ÉÊ`¶,µ,È,Ǝ•û—  
@,Á, ,é B

•ŮŽ f, [fh,Æ`Ü,È,è A¼ Úf, [fh,ÍfWfIf fgfŠ EfGf“fWf“,ð`ñ<Ÿ,µ,È,Ǝ B,±,¼,½,ß A¼ Úf, [fh,ð—~—  
p,.,éfAfvfŠfP [fVf‡f“,Í A“ÆŽ©,¼IfufWfFfNfg,â%œ—Ê §Ǝäf< [f`f“,ð—p^Ó,µ,È,-  
,Á,Í,È,ç,È,Ǝ B,µ,½,ª,Á,Ä A¼ Úf, [fh,ðƎø—“I,É—p,Ǝ,é,½,ß,É,Í A3DfOf%oftfBfbfN,¼fvf fOf%of~f“fO,É,Á,Ǝ  
,Á,¼ \ª,Ê`mŽ—ª•K—v,Á, ,é B

Direct3D,ÍOLEfRf“f| [fIf“fg EfIfufWfFfNfg Ef,fff< iCOM j,ÉŠî,Ã,Ǝ,Ä,.,è ADirectDraw,ÆŠ@‘S,É“ ‡,³,è,Ä,Ǝ  
,é BMicrosoft,Í A «—^,¼fo [fWf‡f“,¼Windows,ÉDirect3D,ð`g,Ÿ ž,ƃ—`è,Á, ,é B Ú,µ,,Í ufCf“fgf f\_fNfVf‡f“:  
Direct3D,¼ Úf, [fh EfIfufWfFfNfg v,ðŽQ Æ,³,è,½,Ǝ B

**fn [fhfEfFfA EfAfufXfgf%fNfVf‡f“(’Š Ű%»),ÆfGf~f...fŒ [fVf‡f“**

Direct3D API,Í A‘¼,ÌDirectX API,Æ“—

l,É Afn [fhfEfFfA EfAfufXfgf%fNfVf‡f“ EfŒfCf,, iHAL j,Ì ã,É‘g,Ý ž,Ü,ê,Ä,Œ

,é BHAL,Ífn [fhfEfFfA,ÏffofCfX`Ë‘¶ «,ð%»B•Ä,·,é BDirect3D HAL,É,æ,Ä,ÄfTf|

[fg,<sup>3</sup>,ê,È,Œ•”•ª,Í Afn [fhfEfFfA EfGf~f...fŒ [fVf‡f“ EfŒfCf,, iHEL j,É,æ,Ä,Ä•âŠ®,<sup>3</sup>,ê,é B Direct3D

HEL,Í Afn [fhfEfFfA,ª”ñ<Ÿ,µ,È,Œ<@”\,ðf\ftfgfEfFfA“l,ÉfGf~f...fŒ [fg,·,é B,±

,ê,ç,Ïfn [fhfEfFfA EfAfufXfgf%fNfVf‡f“ i’Š Ű%» j,ÆfGf~f...

fŒ [fVf‡f“,l’g,Ý ‡,í,<sup>1</sup>,É,æ,Ä,Ä AAPIfT [frfX,<sup>a</sup>,Ä,Ë,É—~p,Ä,«é,æ,¤,É,È,Ä,Ä,Œ,é B

Direct3D HAL,Í ADirectDraw HAL,âGDIffBfXfvfŒfC Efhf%oCfo,ÆŠ®‘S,É“ ‡,<sup>3</sup>,ê,Ä,Œ

,é BHAL,Í AMicrosoft,ÏfO%oftfBfbfNAPI,Ö,Ì’P`êfCf“f^ [ftfFfCfX,Æ A3DfAfNfZf%oŒ [f^,l“ ^ê,<sup>3</sup>,ê,½fhf%oCfo Ef,ftf<,ðfn [fhfEfFfA »•i,É’ñ<Ÿ,·,é Bfn [fhfEfFfA »•i,Í ADirect3D,âDirectDraw AGDI AOpenGL,ð ,‘¬%»»,·,éfhf%oCfo’P‘l,Ï,Ý,ð—

p`Ó,·,ê,Î,æ,Œ Bfhf%oCfo,É,æ,Ä,Ä Afn [fhfEfFfA,Í AfWfIf fgfŠ•lŠ•,ðŠÜ,b3DfOf%oftfBfbfNfX,ÏfŒf“f\_fŠf“f O EfpfCfv A3DfNfŠfbfsf“fO Af%oXf^ ^— ,l’S•”,Ü,½,Í`ê•”,ð ,‘¬%»»,·,é,±,Æ,<sup>a</sup>,Ä,«é BDirect3D

HAL,Í AŒ» Ý—~p,Ä,«éfOf%oftfBfbfN EfAfNfZf%oŒ [f^,É%»Ä,| A «—^,l,à,l,É,à‘Î%»ž,Ä,«é,æ,¤

,É ÝŒv,<sup>3</sup>,ê,Ä,Œ,é B

## DirectDraw

DirectDraw,Í A f f B f X f v f C f C,É f O f % o f t f B f b f N f X,ð·Ž!·,é Å,à ,‘¬,ÈŽè'i,ð'ñ<ÿ·,·,é BDirectDraw,Í A2DfOf%oftfBfbfN,â3DfOf%oftfBfbfN A,·,æ,Ñ“@%œ,ì,½,B,ìWindows,ð \ ¬,·,é f G f “fWf“,Å, ,é BDirectDraw,Í f C f [fW,ì·%œ,Æ^Ú“@,ð”ñ í,É ,‘¬,É s,¢ A f X f € [fY,È f A f j f [fV f ‡ f “,ðŽÅ¢»,·,é B,±,ì,æ,µ,ÈDirectDraw,ì<@”\ ,É,æ,Å,Ä A ,‘¬,È f Q [f€,âf}

f<f`f f f B f A E f A f v f Š f P [fV f ‡ f “,ð ì ¬,µ,½,è AŠù‘¶,ì f ^ f C f g f <,ìWindows,Ö,ìÚ A,ð'ZŠúŠÔ,ì,µ,¿,É—e^Ö,É s,µ ,±,Æ,“%oÂ”\,Å, ,é B,Û,½ ADirectDraw,Í AMicrosoft,ì,·,×,Ä,ì Å V f O f % o f t f B f b f N f X E f T f u f V f X f e f € ,ì \ ¬ f G f “fWf“,Å,à, ,é BDirectDraw,ð—p,¢,ê,ì AWindows GDI,âDirect3D AActiveMovie™ AOpenGL,É,æ,Å,Ä ¶ ¬,³,ê,½ f C f [fW,ð,·,®,É—~—p,Å,« ,é B

DirectDraw,Í A f f B f X f v f C f C E f n [f h f E f F f A â,ÉÊ'ü,·,é”—,¢ f C f C f ,,,Å, ,é BDirectDraw,É,æ,Å,Ä A ,‘¬ f u f f b f N “]‘—

A•âŠ@fXfgfCfbf` AfI [fo [fCfC,È,Ç AWindowsCëü,É ÝCv,³,è,½fOf%oftfBfbfN EfAfNfZf%ofC [f^,ì<— Í,È<@”\,ðŠÈ'P,É—~—p,·,é,±,Æ,ª,Å,« ,é B,Û,½ A F<óŠÔ•İŠ:,âfTf] [fg,µ A f r f f f I,ì Ä ¶,ð ,‘¬,É s,µ,±,Æ,“%oÂ”\ ,Å, ,é BDirect3D,Æ“—l,É ADirectDraw,Í A f f o f C f X,ÉÊ'¶,¹,,É f n [f h f E f F f A,Æ'Ê M,·,é•û—@,Å, ,é BMicrosoft,ìMS-DOS®,Å,Í A f ^ [f Q f b f g,Æ,È,é f f o f C f X,É f R [f h,ð ‡,í,¹,È,- ,Ä,Í,È,ç,È,©,Å,½ B,µ,©,µDirectDraw,Å,Í ADirectDraw,É'î%ž,µ,½,·,×,Ä,ì f n [f h f E f F f A,É,Ä,¢ ,Ä A f n f C E f p f t f H [f}f“fX,ÈC%oÊ,ð“¼,é,±,Æ,ª,Å,« ,é B

DirectDraw,ÍCOMfx [fX,ìAPI,Å, ,é BMicrosoft,Í A «—^,ìfo [fWf‡f“,ìWindows,ÉDirectDraw,ð'g,Ý ž,ð—\`è,Å, ,é B Û,µ,,Í uDirectDraw,É,Ä,¢,Ä v,ðŽQ Æ,³,è,½,¢ B



## OpenGL

OpenGL,Í AfnfC EfGf“fh,ÈCAD/CAM,Ā—p,¢,ç,ê,é ,—š,È3D<Z p,Ā Af,ffŧŠf“fO AfAfjŧ [fVf‡f“ AfVf~f...  
fŒ [fVf‡f“ A%œÈŠw“I,È%œ‘œ ^—  
,È,Ç,Ì A3DfCf [fW,ÌfŒf“f\_ŧŠf“fO,ð s,□ BOpenGL,ÍWindowsNT,Ā’ñ<Ÿ,<sup>3</sup>ê AWindows95 ã,Ā,à“® ì,·,é BWi  
ndows95,ĀOpenGL,ð—~p,·,é,É,Í AWin32f [fNfXfe [fVf‡f“ ã,ĀWin32 OpenGL,<sup>a</sup>ŽĀ s,<sup>3</sup>ê,Ā,¢,é•K—  
v,<sup>a</sup>, ,é BŒ» Ý,ÌOpenGL,Í AOpenGL—  
p,É ÝŒv,<sup>3</sup>ê,½fNf%oCfAf“fg Efhf%oCfo Ef,ffŧ<,É,æ,Ā,Ā AOpenGL,Ì<@”\,ðfTf|  
[fg,μ,½fnfC EfGf“fh,Èfn [fhfEfFfA,ð~—p,μ,Ā,¢,é B «—  
^,Ìfo [fWf‡f“,Ā,Í ADirect3D,ð•âŠ®,·,éfn [fhfEfFfA Ef\ŧŠf... [fVf‡f“,ð’ñ<Ÿ,μ ADirect3D API,ð’Ê,μ,Ā’á%  
¿Ši,È3Dfn [fhfEfFfA iOpenGL,<sup>a</sup>•K—v,Æ,·,é ,—š,È ðŒ ,ðfTf| [fg,μ,½,à,Ì j,ð—~p,Ā,«,é,æ,□,É,·,é—\’è,Ā, ,é  
B

**Direct3DfA [fLfefNf`ff**

,±,ì í,É,í ADirect3DfRf“f| [flf“fg,Æ,»,ì‘¼,ìDirectXfRf“f|  
[flf“fg,âflfyfĖ [fefBf“fO EfVfXfefĖ A,“,æ,ÑfVfXfefĖ Efn [fhfEfFfA,Æ,ÏŠÖEW,É,Â,¢  
,Ä,ì‘ þ“I,È î•ñ,ªL Ú,³,ê,Ä,¢,é B,±,±,Ä,ÍÈ%°,ìfgfsfbfN,É,Â,¢,Ä à-¾,·,é B

- Direct3D,ÌfrfWf±f“
- fĖf“f fŠf“fO EfGf“fWf“
- ŽÀ sfofbftf@
- Š·f,fWf... [f<
- Æ-¾f,fWf... [f<
- f%oXf^ ^— f,fWf... [f<
- F,ÆftfHfO
- fXfe [fg,ÆfXfe [fg EfI [fo [f%oCfh
- Direct3Dftf@fCf< EftfH [f}fbfq

## Direct3D, ĩrfWf‡f“

Direct3D, ĩ A Windows, “® ĩ, ., éfRf“fsf... [f^ ã, Å Af [f<fhf fCfh, ÈfQ [f€ , âfCf“f^f%ofNfefBfu, È3DfOf%oftfBfbfNfX, ðŽÀÆ», ., é, ½, B, È ÝÆv, ³, è, Å, ¢ , é BDirect3D, ĩ Af fofCfX, È`È“¶, ½3Dfrffl Ef fBfXfvfÆfC Efn [fhEfFfA, Ö, ĩfAfNfZfX, ð Afff ofCfX, È`È “¶, µ, È, ¢, û-@, Å, ñ, Ÿ, ., é-ðŠ,,, ð’S, Å, Å, ¢, é BfAfvfŠfP [fVf‡f“, ĩ AfefNfXf`ff Ef} fbfsf“fO, â ³Šm, È“šŽ, “Š%œ AfAf<ftf@ EfufÆf“ffBf“fO, È, Ç, ¢, Û, Ç, ± , ³, è, ½3DfvfŠf~fefBfu, ð`%œæ, ., é, Æ, « Af n [fhEfFfA, È`È“¶, µ, ½“Å•È, Èfvf fV [fWff, ĩÆÅ, Ñ o, µ, ðfCf“fvfŠf f “fg, ., é•K— v, ĩ, È, ¢ BfvfŠf~fefBfu, ð Ý`è, ., é, ¾, -, Å ADirect3D, ¢fn [fhEfFfA, Æ, ĩ`%œæfCf“f^ [ftfFfCfX, Æ, È, é BDirect3D, ĩ fofbftf@ŠÇ— fVfXfef€ , ĩDirectDraw, ÆŠ@‘S, È“ ±, ³, è, Å, ., è ADirectDraw, ĩ A3DfÆf“f\_Šf“fO, ĩf^ [fQfbfg, Æ, µ, Å, à AfefNfXf`ff Ef} fbfv, ĩf\ [fX, Æ, µ, Å, àŽg—p, ., é, ±, Æ, ¢, Å, «, é B, ±, ĩ, ½, ß A, ½, Æ, ĩ, ĩ Af, [fVf‡f“ Eftrffl Ef} fbfsf“fO A2D, ĩfI [fo [fÆfC EfvfÆ [f“, Å, ĩ3D, ĩfÆf“f\_Šf“fO A fXfvf%ofCfG, È, Ç, ðŽÀÆ», ., é, ±, Æ, à, Å, «, é B

Direct3D, ĩ AfWfIf fgfŠ•İŠ• A3DfNfŠfbfsf“fO A Æ— ¾Æø%œÈ, ðŠÛ, ð A•W €“I, Èfn [fhEfFfA EfAfNfZf%ofÆ [fVf‡f“•KŠi, ð`ñ•Ÿ, ., é, à, ĩ, Æ, µ, Å ÝÆv, ³, è, Å, ¢ , é BDirect3D, ð—p, ¢ , è, ĩ A Å“K%œ”, ³, è, ½3DfÆf“f\_Šf“fO EfpfCfvf%ofCf“, ĩ, ., ×, Å, ðf\ftfgfEfFfA“I, ÈfCf“fvfŠf f“fg, ., é, ± , Æ, ¢, Å, «, é B, ± , ĩfppCfvf%ofCf“, ĩ`è•”, Û, ½, ĩ‘S•”, ĩ”C`Ó, ĩfvf fZfX, ĩ Af n [fhEfFfA EfAfNfZf%ofÆ [f^, È, æ, Å, Å ^— ., ., é, ± , Æ, %œÅ”\, Å, , é B, ±, ĩ, ½, ßDirect3DfAfvfŠfP [fVf‡f“, ĩ A V, µ, ¢fn [fhEfFfA, ¢ŠJ”, ³, è, ½, Æ, «, È, ĩ A, æ, è— D, è, ½fn [fhEfFfA EfAfNfZf%ofÆ [fVf‡f“, ð—~—p, ., é, ±, Æ, ¢, Å, «, é B

Direct3D, ĩDirectDraw, ÆŠ@‘S, È“ ±, ³, è, Å, ¢ , é BDirectDrawfhf%ofCfo, ĩCOMfCf“f^ [ftfFfCfX, Å, àDirect3D, ĩCOMfCf“f^ [ftfFfCfX, Å, à A“~, ¶Ši— {fIfufWfFfNfg, ÈfAfNfZfX, ., é, ±, Æ, ¢, Å, «, é B Û, µ, - , ĩ uDirectDraw, ÆDirect3D, ĩ“ ± v, ðŽQ Æ, ³, è, ½, ¢ BDirectDraw, ĩ3DfT [ftfFfX, ĩfTf| [fg, È, Å, ¢ , Å, ĩ A u3DfT [ftfFfX, ĩfTf| [fg v, ðŽQ Æ, ³, è, ½, ¢ B

, ±, ĩfZfNfVf‡f“, ĩ ĩ•ñ, ĩ`½, , ĩ ADirect3D, ĩfCf“fvfŠf f“fg, È, Å, ¢, Å Û, µ, à-¾, µ, Å, ¢ , é B•ŰŽ f, [fh, ĩfCf“f^ [ftfFfCfX, ð—p, ¢, é ê ±, ĩ A, ±, ĩ ĩ•ñ, ¢¼ Ű“K—p, ³, è, é, ± , Æ, ĩ, È, ¢ B, µ, ©, µ A¼ Űf, [fh, ĩfCf“f^ [ftfFfCfX, ð—~—p, ., é ê ±, È, ĩ A, ±, è, ç, ĩfCf“fvfŠf f“fg, ĩ Ű ×, ð, æ, — %œð, µ, Å, ., •K—v, ¢, é B, Û, ½ A•ŰŽ f, [fh, ð—p, ¢, é, Æ, «, ĩ AfVfXfef€ EfA [fLfefNf`ff, È, Å, ¢, Å, ĩ— ~—“I, ÈŠi‘b‘mŽ~ , ¢-ð, È—š, Å, Å, , è, ¢ B

**fÆf“f\_Šf“fO EfGf“fWf“**

Direct3DfA [fLfefNf`ff,Í A,R,Â,Ì“Æ—§f,fWf...

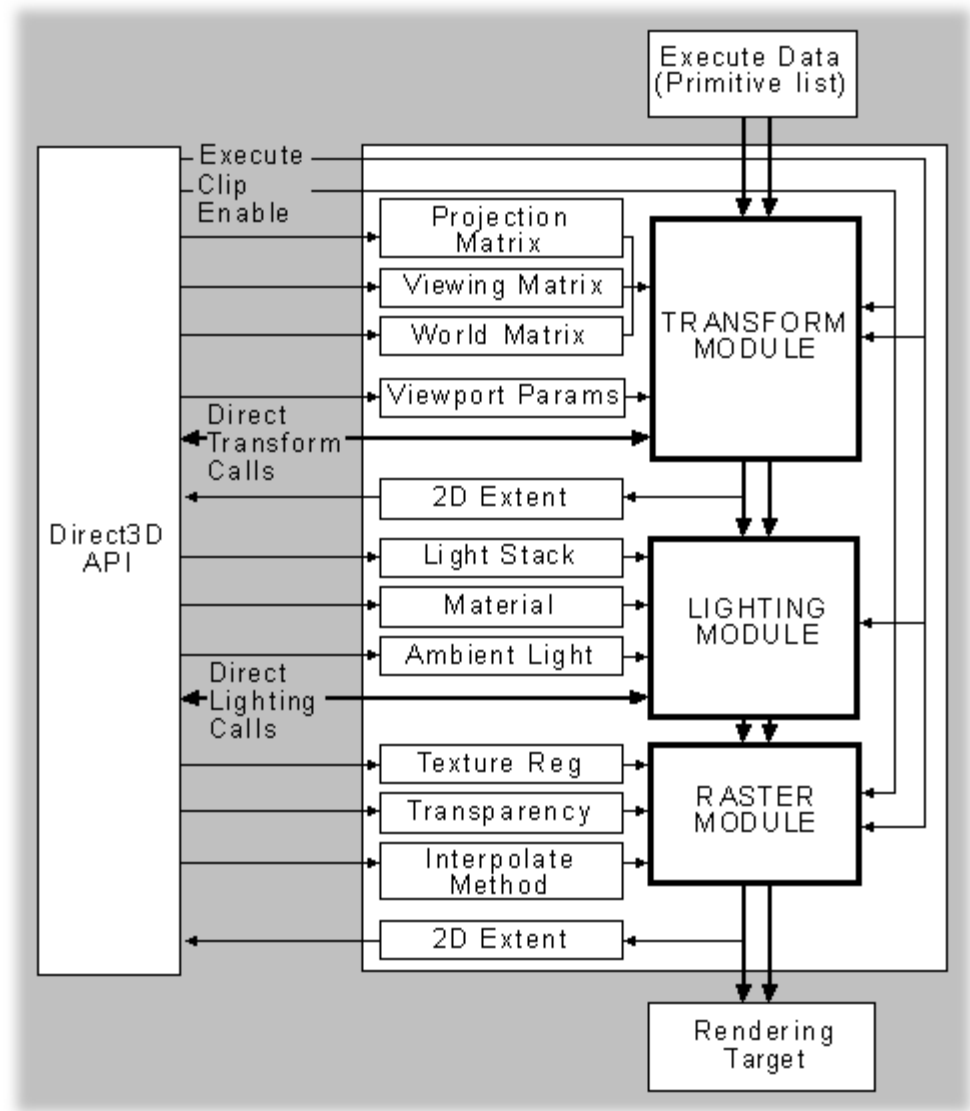
[f<,©,ç \ ¬,³,ê,é A%¼‘z3DfÆf“f\_Šf“fO EfGf“fWf“,ÉŠi,Ã,¢,Ä,¢,é B

•İŠ·f,fWf... [f< B,R,Â,İ4 s4—ñ,İ s—ñ,ðŽg—p,µ,Ä AfWfIf fgfŠ·İŠ· ^— ,ð s,²f,fWf... [f<,Ä, ,é B s—  
ñ,İ,D,Æ,Ä,İftrf... [f| [fg·İŠ·,İ,½,ß A,D,Æ,Ä,İf [f<fh Ä·W·İŠ·,İ,½,ß A,D,Æ,Ä,İŽÈ%œ·İŠ·,İ,½,ß,É—p,¢  
,ç,ê,é B,±,İf,fWf... [f<,İ”CˆO,İŽÈ%œ,ðfTf| [fg,µ A“ŠŽ<“Š%œ,â·½ s“Š%œ,É,æ,éfrf... [,ðŽÄÆ»,·,é B

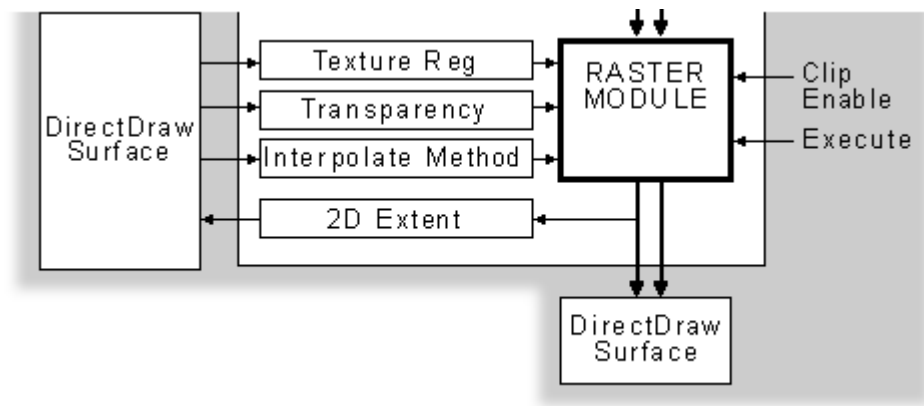
Æ—¾f,fWf... [f< B,±,İf,fWf... [f<,İŠð%½“İ,ÈÈðÈ¹EvŽŽ,ð s,¢ A‘S‘İ,İÈð AÆð,İ·ûÈü Af|  
fCf“fgf%ofCfg,âfXf|fbfgf%ofCfg,İÈðÈ¹,ðfTf| [fg,·,é B

f%oFXf^ ^— f,fWf... [f< B,±,İf,fWf... [f<,Í AfV [f<,İfÆf“f\_Šf“fO,ÉfWfIf fgfŠ Ef,fWf... [f<,Æ Æ—  
¾f,fWf... [f<,İ o—İÈ%œÈ,ðŽg—p,·,é B ¶ ¬,³,ê,½fV [f<,Í AfffBfXfvfÆfC EfŠfXfg,ÉŠi,Ã,¢  
,½ L k%œÄ”,ÈÈtfH [f]fbfg,Ä,è A2D,â3D,İfvfŠf~fefBfu,ðfTf| [fg,·,é B

ŽŸ,İ },Í AfÆf“f\_Šf“fO EfGf“fWf“,Ì,R,Â,İf,fWf... [f<,ª A,Ç,Ì,æ,²,É¼,ÌDirect3DfA [fLfefNf`ff,Æ ì—  
p,·,é,©,ðŽi,µ,Ä,¢,é B



f%oFXf^ ^— f,fWf... [f<,Í A%° },ÉŽi,·,æ,²,ÉDirectDraw,É ì—  
p,·,é BDirect3D,Í AfÆf“f\_Šf“fO,İf^ [fQfbfg,âfefNfXf`ff,İf [fX,Æ,µ,Ä ADirectDrawfT [ftfFfX,ðŽg—  
p,·,é B



Šef,fWf... [f<Í Afn [fhfEfFfA“l,É ,‘-‰»,·,é,±,Æ,à Af\ftfgfEfFfA“l,ÉfGf~f...fœ [fg,·,é,±,Æ,à‰Â”\,Â, ,é B  
,Ü,½ ADirect3D,É-â,¢ ±,í,1,Â AfGf~f...fœ [fVf±f“ Ef, [fh,Â“® ì,µ,Ä,¢,éfRf“f [flf“fg,đŠm,©,ß,é,±  
,Æ,ª,Â,«é B,±,ê,ç,ìf,fWf... [f<“~Žž,ÉŽg—  
p,³,ê,é,Æ,«Í ADirect3D,ìfœf“f\_Šf“fO EfpfCfvf%ofCf“,đœ` ¬,·,é B

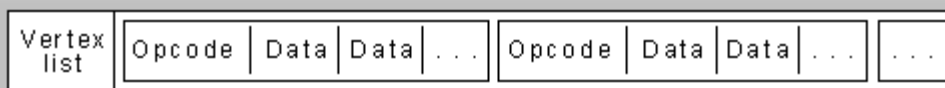
,±,ì,R,Â,ìf,fWf... [f<Í“®“l,Éf [fh,·,é,±,Æ,ª‰Â”\,Â, ,è Afœf“f\_Šf“fO,³,ê,½ftfœ [fœŠÔ,Â•İ X,·,é,±  
,Æ,ª,Â,«é B,±,ì,½,ß A V,µ,¢f,fWf...  
[f<,đ ì ¬,µ Afn [fhfEfFfA EfAfNfZf%ofœ [fVf±f“,â¼,ìfœf“f\_Šf“fOœ‰Ê,đŽÀœ»,·,é,±  
,Æ,ª,Â,«é BDirect3D,žg,¤İŠ·f,fWf... [f<Í,D,Æ,Â,Â, ,éª A Æ-¾f,fWf... [f<,Æf%ofXf^ ^— f,fWf...  
[f<Í A,Ó,½,Â,©,ç‘I’đ,·,é,±,Æ,ª,Â,«é B,±,ê,É,æ,Â,Â A,½,Æ,İ A Æ-¾f,fWf...  
[f<,đ Ø,è‘Ö,!,é,¾, ,Â,æ,èfŠfAf<,ÈfV [f“,đfœf“f\_Šf“fO,Â,«é‰Â”\ «ª, ,è A“Á,É Æ-  
¾œ‰Ê,âfœf“f\_Šf“fO,É,“,¢,Ä A‘â,«È \_“i «,đ•Ü,Â,±  
,Æ,ª,Â,«é BISV,ª A“ÆŽ©,ì“ÁŽêœ‰Ê,đŽÀœ»,·,éf%ofXf^ ^— f,fWf... [f<,đ<Ÿ<<,·,é,±,Æ,à‰Â”\,Â, ,é B

ŽÀ sfobftf@

fŒf“f\_Šf“fO EfGf“fWf“,ìR,Â,İf,fWf... [f<,Í ADirect3D API,ð—p,Œ,Ä Ý’è,µ,½ ó‘Ô,ð,»,ê,¼,ê•ÔŽ ,µ,Ä,Œ ,é B,.,x,Ä,İ ó‘Ô,ª Ý’è,³,ê,é,Æ AfŒf“f\_Šf“fO EfGf“fWf“,Í AŽÀ sfobftf@,Æ,µ,Ä’m,ç,ê,éffBfXfvfŒfC E fŠfXfg,ð ^— ,Ä,«,é,æ,µ,É,É,é BfAfvfŠfP [fVf‡f“,ŽÀ sfobftf@,ð— ¼Šm,ÉˆÖŽˆ,.,é,İ,Í A¼ Úf, [fh,İ ê ‡,¾,–,Ä, ,é B•ÜŽ f, [fh EfAfvfŠfP [fVf‡f“,Í A,»,ê,æ,è,à ,ŒfŒfxf<,Ä “@ ì,.,é B

ŽÀ sfobftf@,Í AŠ®‘S,ÉŽ©ŒÈ“à•iŒ^,İ A“Æ—§,µ,½ î•ñ,İfpPfbbfg,Ä, ,é BŽÀ sfobftf@,É,Í,“\_fŠfXfg,ªŠÜ,Ü, ê,Ä,“,é A,»,İŒÄ,É–½—ßfXfgfŠ [fŒ,ª±, B–½—ßfXfgfŠ [fŒ ,Í AfİfyfŒ [fVf‡f“ EfR [fh ifİfyfR [fh j,Æ A,±,İfİfyfR [fh,“Œ ì,.,éff [f^,©,ç \ ¬,³,ê,Ä,Œ ,é BDirect3D,İfİfyfR [fh,Í **AD3DOPCODE**—ñ“Œ^,É’è<³,ê,Ä,Œ,é BŽÀ sfobftf@“à,İ–½— ß,Í **AD3DINSTRUCTION** \‘Œ‘İ,ÉŠi”[³,ê,Ä,“,é AfİfyfR [fh AŠe–½—ßf [f^ Ef†fjfbfg,İfTfCfY A,»,İŒÄ,É‘±,– ŠÖAff [f^ Ef†fjfbfg,İ ”,ªŠÜ,Ü,ê,Ä,Œ,é B

ŽÀ sfobftf@,İfTfH [f}fbfg,ð‰° } ,ÉŽ,· B



–½—ß,Í A’ “\_Ö,İŒðŒ,İ“K—p•û—@,â A’ “\_İfŒf“f\_Šf“fO•û—@,ð’è<µ,Ä,Œ,é B Ä,àê”É“İ,É–½— ß,İ,Đ,Æ,Ä,Éfgf‰fCfAf“fOf< EfŠfXfg i**D3DOP TRIANGLE** j,ª, ,é B,± ,ê,Í “\_fŠfXfg†,İ” “\_ðŽQ Æ,·,éŽÖSpŒˆfvfŠf~fefBfu,İfŠfXfg,Ä, ,é B–½—ßfXfgfŠ [fŒ ,ÉŠÜ,Ü,ê,é,·,x,Ä,İfvfŠf~fefBfu,Í “\_fŠfXfg†,İ” “\_µ,©ŽQ Æ,µ,È,Œ,½,ß AfvfŠf~fefBfu,İ” “\_Ž<—“ä,İŠO•”,É, ,é ê ‡ A•İŠˆf,fWf... [f<,É,»,İfobftf@‘S‘İ,ð–³Ž<³,¹,é,±,Æ,İŠÈ’P,Ä, ,é B

ŽÀ sfobftf@,İfTfCfY,İfn [fhfEfFfA,É,æ,Ä,ÄŒˆ”è,³,ê,é B,± ,İfTfCfY,ðŽæ“¾,.,é,É,Í AIDirect3DDevice::GetCapsf f\fbfh,ðŒÄ,Ñ o,µ **AD3DDEVICEDESC** \‘Œ‘İ,İdwMaxBufferSizef f“fo,ð²,x,é Bf\ftfgfEfFfA Efhh‰fCfo,ðŽg—p,µ,Ä,Œ ,é ê ‡ Aê”É“İ,É A Ä“K,ÉŽÀ sfobftf@,İfTfCfY,İ64KfofCfG,Ä, ,é B,±,İ,Æ,« A Ä,à— LŒø,ÉfZfJf“f\_Š EfLfffbbfVf...,ª~— p,³,ê,é B,µ,©,µ AfAfvfŠfP [fVf‡f“,ªfn [fhfEfFfA EfAfNfZf‰fŒ [fVf‡f“,ð—~— p,.,é ê ‡,Í AŽÀ sfobftf@,İfTfCfY,ð,à,Ä,Æ ¬,³,µ Afvf‰fCf) fŠ EfLfffbbfVf...,ðŽg,µ,x,«,Ä, ,é B

ŽÀ sfobftf@,ð‘Œ ì,µ,Ä,Œ,éŠÖ,Í A Æ–¾f,fWf... [f< A,Ü,½,Í Æ–¾f,fWf... [f<,Æ•İŠˆf,fWf... [f<,İ–¼•û,ð–³Œø,É,.,é,±,Æ,ª,Ä,«,é B,±,İ ê ‡ A’ “\_fŠfXfg,ð‰ð Í,.,é•û— @,ª¹ X,³,ê AfŒf“f\_Šf“fO EfpfCfvf‰fCf“\_İf‰fXf^ ^— ’iŠK,Ä,İ,Ý A•İŠˆ,â Æ–¾ ^— ,ð,Ü,Ç,± ,µ,½’,“\_ðŽg,µ,±,Æ,ª,Ä,«,é,æ,µ,É,É,é BSeŽÀ sfobftf@,Ä,Í A,Đ,Æ,Ä,İf^fCfv,İ’ “\_ î•ñ,µ,©Žg—p,Ä,«,É,Œ,± ,Æ,É’ ˆÖ,.,é,±,Æ B

ŽÀ sfobftf@,Æ ó‘Ô•İ‰»,É‰Ä,!,Ä ADirect3D,Í,à,µ,Đ,Æ,Ä,İŒÄ,Ñ o,µ<@ \,ð”ð,!,Ä,Œ,é B•İŠˆf,fWf... [f<,à Æ–¾f,fWf... [f<,à Af\_fCfŒfNfg,ÉŒÄ,Ñ o,.,±,Æ,ª,Ä,«,é B,±,İ<@”\ ,Í A•ûŒ“«ŠE ü,İfefXfg,Ä•İŠˆf,fWf... [f<,ðŽg,µ,Æ,«,É,Ç Af‰fXf^ ^— ,ð•K—v,Æ,µ,È,Œ ê ‡,É•Ö—,Ä, ,é B

•İŞ·f,fWf... [f<

•İŞ·f,fWf... [f<,É,Í Afrf... [f| [fg Afrf... [Cf“fO s—ñ Af [f<fh s—ñ AŽĚ‰oe s—ñ,İ A4,Â,İ•İ X‰oÂ”\  
ÈfĈfWfXf^,^, é B,±,ê,ç,İfpf‰of [f^,İ,Đ,Æ,Â,^İ X,³,ê,é,Æ A V,μ,Ĉ•İŠ· s—ñ,^EvŽZ,³,ê A•İŠ·f,fWf...  
[f<,^•ŮŽ ,μ,Ä,ç,é s—ñ,Ě Ý’è,³,ê,é B•İŠ· s—ñ,Í A3DfIfufWfFfNfg,İ’,“\_,İfZfbfg,İ‰on”]  
,ÆŽĚ‰oe,đ’è<,μ Af,fffc Ä•W,©,ç2DfEfBf“fhfE,Ö•İŠ·,·,é B

fAfvfŠfP [fVf‡f“,İ•İŠ· s—ñ,đ’¼ Ú,É Ý’è,·,é,±,Æ,à,Â,«é,^ A,Â,«é,¾,“đ,\_,é,×,«,Ä, ,é B Ä“K‰o»,³,ê,½•İŠ·ĈEv  
ŽZ,đŽg,□Ĉ< ‡ftfF [fY,Ä,Í A•İŠ· s—ñ,İfNf‰ofX^,\_,^‰o½“x,à s,í,ê,é B,μ,©,μ AfAfvfŠfP [fVf‡f“,^ s—  
ñ,đŽw’è,·,é,Æ AfNf‰ofX^,\_,İŽÄ s,^—W,°,ç,ê,Ä,μ,Ů,□ B

fffbfXfvfĈfC EfŠfXfg,Í A,½,³,ñ,İ’Ù,È,éf^fCfv,İ’,“\_ îñ,đfTf| [fg,·,é B

f‰ofXf^ ^— ,İ,Ý,đfTf| [fg,·,éfn [fhfEfFA,Ä,Í AfAfvfŠfP [fVf‡f“,ÍD3DTLVERTEX \‘Ĉ’İ,đŽg—p,·,é,×,«,Ä, ,  
é BD3DTLVERTEX \‘Ĉ’İ,İ•İŠ·,â Æ—¾ ^— ,đ s,Ä,½ĈÄ,İ’,“\_,đŽ,μ,Ä,Ĉ  
,é,½,ß AfXfNfŠ [f“ Ä•W,Æ F,đŠŮ,ñ,Ä,Ĉ,é Bfn [fhfEfFA,^•İŠ·‘Ĉ İ,đfTf|  
[fg,·,é ê ‡ AfAfvfŠfP [fVf‡f“,ÍD3DLVERTEX \‘Ĉ’İ,đŽg—p,·,é B,±  
,İ \‘Ĉ’İ,Í Aff [f^,Æ AĈöĈ¹,đf\ftfgfEfFA“L,Ě ^— ,·,é,Æ,«,Ě Ý’è,³,ê,é F,İ îñ,đŠŮ,ñ,Ä,Ĉ  
,é BfNfŠfbfsf“fO,đ•K—  
v,Æ,·,éf,fffc Ä•Wff [f^,đfAfvfŠfP [fVf‡f“,^ñ<Ÿ,·,é,Æ,« AD3DLVERTEX \‘Ĉ’İ,É,æ,Ä,Ä A“K Ø,È’,“\_,^è<,³,ê  
,é Bfn [fhfEfFA,^ĈöĈ¹,đfTf| [fg,·,é ê ‡,Í AfAfvfŠfP [fVf‡f“,İ’P f,ĚD3DVERTEX \‘Ĉ’İ,đ—  
p,·,ê,İ,æ,Ĉ B,±,İf^fCfv,İ’,“\_,É,Í AfĈf“f\_Šf“fO,İŠÖ,É•İŠ·,â Æ—¾ ^— ,^“K—p,³,ê,é Bf\ftfgfEfFA EfGf~f...  
fĈ [fVf‡f“ Efhf‰ofCfo,Í A,±,ê,ç,İ,·,×,Ä,İf^fCfv,İ’,“\_ îñ,đfTf| [fg,·,é B

•İŞ·f,fWf... [f<,É,Í,Ó,½,Â,İf^fCfv,İf f\fbfh,^, ,é B,Đ,Æ,Â,İ•İŞ·f,fWf... [f<,İ ó’Ô,đ Ý’è,·,é,à,İ,Ä, ,è A,à,□  
,Đ,Æ,Ä,Í A•İŠ·f,fWf... [f<,đ’¼ ŮŽg—p,μ,Ä A’“\_fZfbfg,đ’Ĉ İ,·,é,à,İ,Ä, ,é B•İŠ·f,fWf...  
[f<,İ’¼ ÚĈÄ,Ň o,μ,Í A<«ŠE ũ,İf{fŠf... [fĈ,đfefXfg,μ,½,è AfxfNfgf< EfZfbfg,đ•İŠ·,·,é,Æ,«,Ě•Ö—,Ä, ,é B  
,±,ê,ç,İ’Ĉ İ,Í AĈ» Ý,İ•İŠ· s—ñ,đ—p,Ĉ,Ä AfWfIf fgfŠ•İŠ·,đŽÄ s,·,é B,Ů,½ AĈ» Ý,İfrf...  
[,É’İ,μ,ÄfNfŠfbfsf“fO EfefXfg,đ s,□,±,Æ,à,Ä,«,é B•İŠ·f,fWf...  
[f<,đ’¼ ÚĈÄ,Ň o,ŠÖ ”ĈEQ,Í A,·,×,Ä AD3DTRANSFORMDATA \‘Ĉ’İ,đŽg—p,·,é B

•İŠ·,É,Ä,Ĉ,Ä,İ’è”Ě”L,È îñ,Í A•ŮŽ f, [fh,İfrf... [f| [fg,É,Ä,Ĉ,Ä à—¾,μ,½fZfNfVf‡f“ u•İŠ· v,Ä“¾,é,±  
,Æ,^,Ä,«,é BftfĈ [fĈ“à,Ä,İ•İŠ·,É,Ä,Ĉ,Ä,Í u•İŠ· v,đŽQ Æ,³,ê,½,Ĉ B,Ç,·,ç,İfZfNfVf‡f“,à•ŮŽ f, [fh,İAPI,É,Ä,Ĉ  
,Ä à—¾,μ,Ä,Ĉ,é,^ A•İŠ·,İfA [fLfefNf`ff,Æ ”Ž®,Í A•ŮŽ f, [fh,Æ’¼ Úf, [fh,İ—¼•û,É“K—p,·,é,±  
,Æ,^,Ä,«,é B•İŠ·,Ä—p,Ĉ,ç,ê,é ”Šw“TmŽ\_,İŠT—v,É,Ä,Ĉ,Ä,Í u3D•İŠ· v,đŽQ Æ,³,ê,½,Ĉ B

Æ-¾f,fWf... [f<

Æ-¾f,fWf... [f<,Í AÆ» Ý,ÌÆðŒ¹,âfAf“frfGf“fg Ef%oCf g A,»,µ,Äf}fefŠfAf<,É,Â,¢  
,Ä,ÌfXf^fbfN,ð•ÛŽ ,µ,Ä,¢,é B

Æ-¾f,fWf... [f<,ð'¼ ÚŽg—p,·,é ê ± A,±,Ìf,fWf... [f< **id3DLIGHTINGELEMENT** \‘¢‘ì j,É“ü—  
Í,³,ê,½ff [f^,ÌŠe—v‘f,É,Í A•ûŒüxfNfgf<,Æ^Ê‘u i f|fCf“fgf%oCf g,âfXf|fbfgf%oCf g,Ì,æ,¤  
,Ê A<Ç Š“Í,ÊÆðŒ¹,Ì,½,ß j,ªŠÛ,Û,ê,Ä,¢,é B

fTf| [fg,·,éŒðŒ¹f,ff<,Í Af,fmfNf ,“,æ,ÑRGB,Ì,Ó,½,Ä,Â, ,é  
**BD3DLIGHTDATA** \‘¢‘ìf f“fo,ÌD3DLIGHTINGELEMENT \‘¢‘ì,ÌÆä,É,Í A,Â,Ë,ÉfJf%o [ EftfB [f<fh,ªŠi”[,³,ê,é  
B

f,fmfNf ŒðŒ¹f,ff< i”f%o f“fv”ŒðŒ¹f,ff<,ÆŒÄ,Î,ê,é,±,Æ,à, ,é j,Í A,Ð,Æ,Â,Ì%oA%oe¹,ðŒvŽZ,·,é,½,ß,É A,»,ê,  
¼,³,ê,ÌŒðŒ¹,ÌfOfŒ [—v‘f,ðŽg—p,·,é BRGBŒðŒ¹f,ff<,Ä,Í A F,ÌŒvŽZ,Ì,½,ß,ÉŒðŒ¹,Æf}fefŠfAf<,Ì F—  
v‘f,ðf<,É—p,¢ A,æ,èfŠfAf<,ËŒŒ%oÊ,ð ¶ ¬,·,é B

Œð,ð”½ŽË,µ,Ë,¢f}  
fefŠfAf<,Ä,ÍŒð“x,ðŠgŽU,µ,Ä%oe,ð•\Œ»,·,é B%oe,Ì”ÍÍ,Í A0 ifAf“frfGf“fg Ef%oCf g,Ì,Ý j,©,ç1 iŒð“x,ª Ä‘â,ÌŒ  
ð j,Ä, ,é BŒð,ð”½ŽË,·,é—v‘f,ðŽ ,Äf}fefŠfAf<,Ä,Í AŽŸ,Ì•û’öŽ®,É,æ,è AŒð,Ì”½ŽË,ÆŠgŽU,Ì—  
¼•û,ðŒŒ< ±,µ,Ä%oe,ðŒvŽZ,·,é B

$shade = \frac{3}{4} (diffuse \times (1 - specular) ) + specular$

,±,Ì%oA%oe¹,Í ifn [fhfEfFfA,ÌfJf%o [ Ef<fbfNfAfbfv Efe [fuf<,É, ,é F,à Af\ftfgfEfFfA“Í,ÉŽÄ‘•,³,ê,½f<fbfN  
fAfbfv Efe [fuf<,É, ,é F,Ä,à jf%o f“fv,ð, ,ç,©,¶,ßŒvŽZ,µ,Ä,©,ç—p,¢,é,æ,¤,É ÝŒv,³,ê,Ä,¢,é B,±  
,ÌŒvŽZ Í,Ý,Ìf%o f“fv,Í A,Ó,½,Ä,Ì•ª,É•ª, ,ç,ê,Ä,¢,é BŒvŽZ,³,ê,½f%o f“fv,Ì Ä %o  
,Ì3/4,ÍŠgŽU,µ,½ F,Ìf%o f“fv,Ä A,»,Ì”ÍÍ,ÍfAf“frfGf“fg EfJf%o [ iŠÄ<Œð F j,©,ç Ä,à^Ä,¢ F,Û,Ä,Ä, ,é B Ä  
Œä,Ì4ª,Í1,É,Í A Ä,à^Ä,¢ F,©,ç Ä,à-¾,é,¢ F,Ì”ÍÍ,Ìf%o f“fv,ª±, BfŒf“f\_Šf“fO,É,“,¢  
,Ä,Í A%oA%oe¹,Ìf%o f“fv,ÌfTfCfY,É,æ,Ä,ÄfXfP [fŠf“fO,³,ê A•K—v,Ë F,ðŽæ“¾,·,éfCf“fffbfNfX,Æ,µ,Ä—p,¢  
,ç,é,é B

fpfbfN,³,ê,½RGBfJf%o [Í AŽŸ,Ì,æ,¤,É’è<³,ê,Ä,¢,é B

```
#define RGB_MAKE (red, green, blue) \  
    ((red) << 16) | \  
    ((green) << 8) | \  
    (blue))
```

,Û,½ AfpfbfN,³,ê,½RGBAfJf%o [,Ì’è<,ð^È%°,ÉŽ,· B

```
#define RGBA_MAKE(red, green, blue, alpha) \  
    (((alpha) << 24) | \  
    ((red) << 16) | \  
    ((green) << 8) | \  
    (blue))
```

Direct3D,Ì F,Í AŽŸ,Ì,æ,¤,É’è<³,ê,Ä,¢,é B

typedef unsigned long D3DCOLOR;

ŒðŒ¹,Ìf^fCf v,Í **AD3DLIGHTTYPE**—  
ñ“Œ^,Ìf f“fo,Ì,Ð,Æ,Ä A,·,É,Í,¿ AD3DLIGHT\_DIRECTIONAL AD3DLIGHT\_POINT AD3DLIGHT\_PARALLELPO  
INT AD3DLIGHT\_SPOT AD3DLIGHT\_GLSPOt,Ì,¢,,ê,©,Ä,È,,Ä,Í,É,ç,È,¢ B,±,Ì—  
ñ“Œ^,Í **AD3DLIGHT** \‘¢‘ì,Ì’ê”,Ä, ,é B,±  
,Ì \‘¢‘ì,É,Í A¼,É**D3DCOLORVALUE** \‘¢‘ì,ªŠÛ,Û,ê,Ä,“,è AŒðŒ¹,Ì F,ðŽw’è,µ,Ä,¢,é B Ô A—Î A Ä,Ì—  
v‘f,Ì,Ì”ÍÍ,Í A’ê”É,É0,ç1,Û,Ä,Ä, ,é Bf%o f“fvŒðŒ¹f,ff<,Ì,Í AŽŸ,Ì“™Ž®,ÉŠî,Ä,¢,Ä,¢,é B

$shade = 0.30red + 0.59green + 0.11blue$

Še—v‘f,É,Í0,©,ç1,Ì”ÍÍŠO,Ì¹,àŽw’è%oÄ”,Ä A if\_ [fN Ef%oCf g,Ì,æ,¤,É j Æ-¾Œð%Ê,ðŠg’Œ,·,é,±  
,Æ,ª,Ä,«é **BD3DLIGHT** \‘¢‘ì,ª•ÛŽ ,·,é•ûŒüxfNfgf<,Í Af,ff<,©,çŒðŒ¹,Û,Ä,Ì•ûŒü,ð•\,µ,Ä,¢,é B,±  
,ÌfxfNfgf<,Í A—LEüŒðŒ¹,Ì,½,ß,É•W €‚É-ß,³,Ë,,Ä,Í,É,ç,È,¢ BfxfNfgf<,Í,·,×,Äf [f<fh Ä•W,ÄŽw’è,·,é B,±



,ê,ç,ìfxfNfgf<,í ACE» Ý,ìf [f<fh s—ñ,É,æ,Á,Äf,fff< Ä•W,É•İŠ•,<sup>3</sup>,ê,é B,±  
,ì,½,ß AfxfNfgf<,ðf [f<fh Ä•W,É•İŠ•,·,é,±,Æ,È, ACEø—|“I,Éf,fff<,É Æ-¾CEø%oÊ,ðŽ{,·,±,Æ,<sup>a</sup>Ä,«<sub>1</sub>,é Bf|  
fCf“fgf%ofCf g,âfXf|fbfgf%ofCf g,Ä,í A”ÍÍfpf%of [f^,í A—LCEø,ÈCEøCE¹,ì”ÍÍ,ðŽ|,µ,Ä,Ç,é B,±,ì”ÍÍ,İŠO•”,É, ,é’,  
“\_,É,í ACEð,“—,½,ç,È,Ç,±,Æ,É,È,é BCEð,ì<,<sup>3</sup>İ2ŽÝCE, ŠCEW ”,É,æ,Á,Ä•İ%o»,·,é BCEð,ì“—,½,Ä,Ä,Ç  
,é’,“\_,©,çCEøCE¹,Ü,Ä,ì——Ł,ðd,Æ,·,é,Æ AŽÝ,İ•û’öŽ®,<sup>a</sup> ¬—§,·,é B

$$attenuation = attenuation_0 + attenuation_1 \times d + attenuation_2 \times d^2$$

**D3DLIGHT** \‘Ç‘İ,İŽc,è,ìf f“fo idvTheta,“,æ,ÑdvPhi j,í A,»,ê,¼,ê AfXf|fbfgf%ofCf g,Ä—p,Ç  
,é%oe,ÆCEð ü,İŠp“x,ð’è<,·,é BCE, CEW ” idvFalloff j,í AfXf|fbfgf%ofCf g,İ%oe,ÆCEð ü,İŠÖ,É“K—p,<sup>3</sup>,ê,é B

Æ-¾f,fWf... [f<,É,í A ó‘Ô,ð Ý’è,·,éf f\fbfh,Æ A Æ-¾f,fWf...  
[f<,ð’¼ ÚCEÄ,Ñ o,·f f\fbfh,ì A,Ó,½,Ä,İf^fCfv,İf f\fbfh,<sup>a</sup>, ,é B

•İŠ•f,fWf... [f<,Æ“—l,É A Æ-¾f,fWf... [f<,ð’¼ ÚCEÄ,Ñ o,·,±,Æ,à%oÄ”,Ä, ,é B,·,×,Ä,İ Æ-¾f,fWf...  
[f<ŠÖ ”,İCEÄ,Ñ o,µ,É,í **AD3DLIGHTDATA** \‘Ç‘İ,<sup>a</sup>—p,Ç,ç,ê,é B

f%oFXf^ ^— f,fWf... [f<

f%oFXf^ ^— f,fWf... [f<,Í AŽÀ sĚÄ,Ň o,μ A,·,È,í,ċ AŽÀ sfofbftf@,ðfĚf“f\_Šf“fO,·,éĚÄ,Ň o,μ,ð ^—  
·,·,é BŽÀ sfofbftf@,l-½—B,Í Af%oFXf^ ^— f,fWf... [f<,l ó’Ô,ð Ý’è,·,é B

ŽÀ sfofbftf@,Í A Ä %o,É•İŠ·f,fWf... [f<,É,æ,Ä,Ä ^— ,<sup>3</sup>,ê,é B•İŠ·f,fWf... [f<,Í AŠe’,“\_ î•ñ,ÉŠi,Ä,ĉ  
,Ä•İŠ·,·,é BfNfŠfbfsf“fO,—LĚø,É,È,è A,»,l’Î Û,Æ,È,éfrf... [f|

[fg,lfpf%of [f^,É,æ,Ä,ÄfNfŠfbfsf“fO î•ñ,<sup>a</sup> ¶ ¬,<sup>3</sup>,ê,é B,±,±,Äfrf...

[“à,É’,“\_,<sup>a</sup>,Đ,Æ,Ä,à,È,ĉ ê ‡ Afofbftf@‘S’l,<sup>a-3</sup>Ěø,É,<sup>3</sup>,ê,é,±,Æ,<sup>a</sup>,·,é BŽŸ,É A Æ-¾f,fWf...

[f<,É,æ,Ä,Ä’,“\_,<sup>a</sup> ^— ,<sup>3</sup>,ê AŽÀ sfofbftf@,lŽwŽl,É,μ,½,<sup>a</sup>,Ä,Ä F,<sup>a</sup> Ý’è,<sup>3</sup>,ê,é B ÄĚä,Éf%oFXf^ ^— f,fWf...

[f<,<sup>a-½</sup>—BfXfgfŠ [fĚ,ð%ð Í,μ A ¶ ¬,<sup>3</sup>,ê,½’,“\_ î•ñ,ð—p,ĉ

,ÄfvfŠf~fefBfu,ðfĚf“f\_Šf“fO,·,é BfAfvfŠfP [fVf‡f“,“**Direct3DDevice::Executef** f\fbfh,ðĚÄ,Ň o,·,·,Æ AfVf  
XfefĚ,Í A’,“\_fŠfXfg,<sup>a</sup>İŠ·,¾,¬,ð•K—v,Æ,μ,Ä,ĉ,é,l,© A,Û,½,l’İŠ·,Æ Æ-¾,ð•K—v,Æ,μ,Ä,ĉ,é,l,©,ð”»’è,·,é B,±  
,ê,ç,l’Ě î,<sup>a</sup>Š®—l,μ,½Ěä,É-½—BfŠfXfg,<sup>a</sup>%ð“Ç,<sup>3</sup>,ê AfĚf“f\_Šf“fO,<sup>a</sup> s,í,ê,é B

fXfNfŠ [f“ Ä•W,ì”Íl,Í AfffofCfX ifXfNfŠ [f“,Û,½,l’EfBf“fhfE j,l ¶ ä(0,0),©,ç AfffofCfX,l%E%o“(• -1,  
·,·,¾-1),Û,Ä,Ä,·,é B [“x,ì”Íl,Ío iŽ<\_ ‘ä,lftf f“fg j,©,çl ifofbfN j,Û,Ä,Ä,·,é B,Ó,½,Ä,lŽOŠpĚ`,<sup>a</sup>,Ó,½,Ä,l’,“\_,  
ð<□—L,μ,Ä,ĉ,é ê ‡ Af%oFXf^ ^— ,Í A<□—L,<sup>3</sup>,ê,½’,“\_l Ú ü,É%o^,Ä,½fsfNfZf<,ð•i ”%oñfĚf“f\_Šf“fO,·,é,±  
,Æ,<sup>a</sup>,È,ĉ,æ,ð,É s,í,ê,é Bf%oFXf^f%ofCfU,Í AŽOŠpĚ`,l,R,Ä,l’,“\_,l•Ä,Ň ‡,ð”»’è,μ A—-Ê,lŽOŠpĚ`,ðŽæ,è æ,-  
BfĚf“f\_Šf“fO,<sup>3</sup>,ê,éŽOŠpĚ`,Í A,»,l’,“\_,“ŽžĚv%oñ,è,lĚü,«,É•Ä,ñ,Ä,ĉ,é,à,l,¾,¬,Ä,·,é B

**F,ÆftHfO**

Direct3D,É,¨,´,é F,Æ,Í A',“\_„âfefNfXf`ff Af}fefŠfAf< A–Ê A Æ–¾ AfpfŒfbfg,Ì“Á «,ðŽ',µ,Ä,¢,é B  
,±,ÌfZfNfVf‡f“,Å,Í ADirect3D,ÌfpfŒfbfg,Æ A”½ŽËŒö,Ì F,³Žæ,è“¾,é'l,É,Â,¢,Ä à–¾,´,é B

fpfŒfbfg\_EfGf“fgfŠ  
ftfHfO

**fpfŒfbfg EfGf“fgfŠ**

fAfvfŠfP [fVf‡f“,Í AIDirect3DRM::CreateDeviceFromSurface,ð—p,Œ,ÄDirectDrawfT [ftfFfX,ð•%œ,·,é,±  
,Æ,ª,Ä,«,é BDirect3DfAfvfŠfP [fVf‡f“,Í A•s•K—v,È F,ð—Œø,É,·,é,½,ß ADirectDraw,lfvf%ofCf}  
fŠ EfT [ftfFfX,ÉDiretDrawfpfŒfbfg,ðfAf^fbf`,µ,È,,Ä,Í,È,ç,È,Œ B,±  
,İSDK,İDirect3DfTf“fvf< EfR [fh,Ä,Í AfEfBf“fhfE,ªWM\_ACTIVATEf fbfZ [fW,ðŽó,~Žæ,é,½,Ñ,É Afvf%ofCf}  
fŠ EfT [ftfFfX,É‘İ,µ,ÄfpfŒfbfg,ðfAf^fbf`,µ,Ä,Œ  
,é BDirect3D,ª8frfbfg,İDirectDrawfT [ftfFfX,İfpfŒfbfg,É‘İ,µ,Ä s,Á,½•İ X,ð’Ç Ö,·,é,É,Í AIDirectDrawPalette::  
GetEntriesf f\fbfh,ðŽg—p,·,é B

fAfvfŠfP [fVf‡f“,Í AŽŸ,İ,R,Â,İftf%ofO,ðŽg—p,µ,Ä A,Ç,İ,æ,µ,ÉfpfŒfbfg EfGf“fgfŠ,ðfVfXfefŒ,Æ<µ—  
L,·,é,©,ðŽw’è,·,é,±,Æ,ª,Ä,«,é B

**D3DPAL\_FREE** Ž©—R,ÉŽg,µ,±,Æ,ª,Ä,«,éfgf“fgfŠ,Ä, ,é  
B

**D3DPAL\_READONLY** Ý’è,·,é,±,Æ,ª,Ä,«,È,Œfgf“fgfŠ,Ä, ,é B

**D3DPAL\_RESERVED** Žg—p,Ä,«,È,Œfgf“fgfŠ,Ä, ,é B

,±,ê,ç,İftf%ofO,Í AWin32•W €,İPALETTEENTRY \‘ç‘İ,İpeFlagsf f“fo,É Ý’è,·,é ifpfŒfbfg,İ<µ—L•û—  
@,ðŽw’è,·,é,É,Í AD3DRMPALETTEENTRY \‘ç‘İ,İD3DRMPALETTEFLAGS—ñ<“Œ^f f“fo,ðŽg,µ,±  
,Æ,à,Ä,«,é j BRGBfŒf“f\_Šf“fo,É,“,Œ,Ä,àf,fmfNf if%of“fv jfŒf“f\_Šf“fo,É,“,Œ  
,Ä,à AfAfvfŠfP [fVf‡f“,Í,±,ê,ç,İftf%ofO,ðŽg—p,·,é,±,Æ,ª,Ä,«,é BRGBfŒf“f\_Šf“fo,Ä,Í A“Ç,ÝŽæ,è ê—  
p,İfpfŒfbfg,ð’ñ<Ÿ,µ,½,Æ,µ,Ä,à Af%of“fv EfŒf“f\_Šf“fo,æ,è,à–],Ü,µ,ŒŒ%œË,ð“¾,é,±,Æ,ª,Ä,«,é B

**ftfHfO**

ftfHfO,Í AD3DTLVERTEX \‘ç‘ì,ìspecularf f“fo,ÉŽw’è,<sup>3</sup>ê,½ F,ì AfAf<ftf@—v‘f•”•,Á, ,é B”½ŽĚĚö,ÍŽÀ Ů,Í RGBFJf% [,Á, ,é,Æ 1,ì,ê,î A”F”,Æ,í”fog”,ìF,ðŽw,µ,Ä,ç,é B

f,fmfNf Æ—¾f, [fh,Á,ìftfHfO,Í A,»,ì F,<sup>a</sup> •,ç,Æ,« A,Û,½,ÍĚöĚ¹,<sup>a</sup>È,ç ,Æ,«,É,¾,¯ ³Šm,É“® ì,·,é BĚöĚ¹,<sup>a</sup>È,ç,Æ,«,É,Í AftfHfO,<sup>a</sup>%½ F,Á, ,Á,Ä,à“¯,¶Ě<%Ě,Æ,È,é B

ftfHfO Ef, [fh,É,Í AfŠfjA AŽw ” A•½•ûŽw ”,ì,R,Ä,ìf, [fh,<sup>a</sup> ,é BĚ» ó,Á,Í AfŠfjA EftfHfO Ef, [fh, ì,Ý,<sup>a</sup>fTf| [fg,<sup>3</sup>ê,Ä,ç,é B

fŠfjA EftfHfO,ð—p,ç,é,Æ,«,Í AftfHfOĚø%Ě,ìŠJŽn“\_,Æ I— 1“\_,ðŽw’è,·,é BftfHfOĚø%Ě,ìŽw’è,<sup>3</sup>ê,½ŠJŽn“\_,©,çŽn,Û,è A I—1“\_Á Á‘â—§“x,É’B,·,é,Û,Á A”ä— á“Ĭ,É‘ %Á,·,é B

Žw ”ftfHfO Ef, [fh,Í A,í,,©,É”FŽ¯,Á,«,é’ö“x,ìftfHfO,©,çŽn,Û,è A Á‘â— §“x,Û,ÄŠö%½<% ”“Ĭ,É‘ %Á,·,é BŽw ”ftfHfO Ef, [fh,Á,íŽŸ,ìĚöŽ®,<sup>a</sup> ¬—§,·,é B

$f = e^{-(density \times z)}$

•½•ûŽw ”ftfHfO Ef, [fh,Á,Í AŽw ”ftfHfO Ef, [fh,æ,è,à<}‘¬,ÉftfHfOĚø%Ě,<sup>a</sup> %Á,·,é BŽŸ,ìĚöŽ®,<sup>a</sup> ¬— §,·,é B

$f = e^{-(density \times z)^2}$

,±,ê,ç,ìĚöŽ®,É,·,ç,Äe,ÍŽ©‘R‘î ”,ì’è,ðŽì,µ A,»,ì’l,Í—ñ2.71828,Á, ,é BftfHfO,Í“§—¾“x,ð•\,·Šî € ,Á, ,é i ftfHfO,ì’l,<sup>a</sup> ¬,<sup>3</sup>ç,Û,Ç AfIfufWfFfNfg,ÍĚ©,ì,É,,È,é j B

fAfvfŠfP [fVf‡f“,<sup>a</sup>Žw ”ftfHfO Ef, [fh,ðŽg—p,·,é ê ‡ AftfHfO,ì—§“x,<sup>a</sup>0.5,Á, ,é,Æ,·,é,Æ AŽŸ,ì—á,ÉŽì,·,æ,□ ,É AfJf f%®,©,ç0.8,ì<—£,É, ,éˆÊ’u,ìftfHfO,ì’l,ì0.6703,É,È,é B

$f = \frac{1}{2.71828^{(0.5 \times 0.8)}} = \frac{1}{1.4918} = 0.6703$

**fXfe [fg,ÆfXfe [fg EfI [fo [f%ofCfh**

Direct3D,Í ACE» Ý,ì ó'Ô,ì Ý'è,É,μ,½,ª,Á,Ä AŽÄ sfobftf@'†,ìff [f^,ð%ð Í,·,é BfAfvfŠfP [fVf‡f“,Í AfVfXfef€,Éff [f^,ðfƒf“f\_fŠf“fO,·,é,æ,ª,ÉŽwŽ!,·,é'O,É ó'Ô,ðfZfbfgfAfbfv,·,é **BD3DSTATE** \`¢'ì,É,Í A,±,ìfA [fLfefNf`ff,ðŽ!´,·,éŽÝ,ì,R,Ä,ì—ñ“ƒ^,ªSÜ,Ü,ê,Ä,¢,é **BD3DTRANSFORMSTATETYPE**,Í•İŠ·f,fWf... [f<,ì ó'Ô,ð Ý'è,·,é B,Ü,½ **AD3DLIGHTSTATETYPE**,Í Æ~¾f,fWf... [f<,ì ó'Ô,ð **AD3DRENDERSTATETYPE**,Íf%ofXf^ ^— f,fWf... [f<,ì ó'Ô,ð Ý'è,·,é B

,»,é,¼,ê,ì ó'Ô,Í A“C,ÝŽæ,è ê—p,ðŽ!,·BOOL'l,ìftf%ofO,ðŽ ,Á,Ä,¢,é B,±,ìftf%ofO,\*TRUE,ì ê ‡ A,»,êÈ ã,ì•İ X,Í s,í,ê,È,¢ B

fAfvfŠfP [fVf‡f“,Í **AD3DSTATE\_OVERRIDE**f}fNf ,ðŽg—p,μ,Ä A“C,ÝŽæ,è ê—p ó'Ô,ð~ƒEø,É,·,é,±,Æ,ª,Ä,«,é B,±,ì<@”\,É,æ,Ä,ÄfAfvfŠfP [fVf‡f“,Í AŽÄ sfobftf@,ð Ä~—p,μ AfVfXfef€,ì ó'Ô,ð•İ!,é,±,Æ,Ä,»,ì“© ì,ð•İ X,·,é,±,Æ,ª,Ä,«,é BDirect3D,ì•ÜŽ f, [fh,Ä,Í AfXfe [fg EfI [fo [f%ofCfh,ð~—p,μ,ÄŽÄ s,ª,ê,éf^fXfN,ª,é BfXfe [fg EfI [fo [f%ofCfh,ð—p,¢,È,¢,Æ AŽÄ sfobftf@,ðŠ@‘S,É Ä \‘z,·,éK—v,ª ¶,¶,Ä,μ,Ü,□ B,½,Æ,!,Í Af fbfVf...,ìf}fefŠfAf<,ðftfƒ [f€,ìf}fefŠfAf<,É‘u,«Š·,ì,é,Æ,« A•ÜŽ f, [fhAPI,ÍfXfe [fg EfI [fo [f%ofCfh,ð~—p,·,é B

fAfvfŠfP [fVf‡f“,Í A fOf [ EfVfF [ffBf“fO Ef, [fh,ðf fbfN,Ü,½,ÍfAf“f fbfN,·,é,Æ,«,É,ð**AD3DSTATE\_OVERRIDE**f}fNf ,ðŽg—p,·,é,±,Æ,ª,Ä,«,é B,±,ì—á,ð^È%°,ÉŽ!,· ifVfF [ffBf“fO Ef, [fh,ìfƒf“f\_fŠf“fO EfXfe [fg,Í**D3DRENDERSTATETYPE**—ñ“ƒ^,ì**D3DRENDERSTATE\_SHADEMODE**f f“fo,Ä'è`³,ê,é j B

OP\_STATE\_RENDER(2, lpBuffer);  
STATE\_DATA(D3DRENDERSTATE\_SHADEMODE, D3DSHADE\_GOURAUD, lpBuffer);  
STATE\_DATA(D3DSTATE\_OVERRIDE(D3DRENDERSTATE\_SHADEMODE), TRUE, lpBuffer);

OP\_STATE\_RENDERf}fNf ,Í **AD3DOP\_STATERENDER**fIfyfR [fh,ð^Ä–Ü,ÉŽg—p,·,é **BD3DOP\_STATERENDER**fIfyfR [fh,Í**D3DOPCODE**—ñ“ƒ^,ìf f“fo,ì,Ð,Æ,Ä,Ä,·,é B,Ü,½ **AD3DSHADE\_GOURAUD**,Í**D3DSHADEMODE**—ñ“ƒ^,ìf f“fo,ì,Ð,Æ,Ä,Ä,·,é B

ŽÄ sfobftf@,ð ^— ,μ,½ƒEä AfVfF [ffBf“fO Ef, [fh,ð•İ X,Ä,«,é,æ,□,É,·,é,½,B,É AfAfvfŠfP [fVf‡f“,Í,à,□1“**x3DSTATE\_OVERRIDE**f}fNf ,ðŽg—p,·,é,±,Æ,ª,Ä,«,é B

STATE\_DATA(D3DSTATE\_OVERRIDE(D3DRENDERSTATE\_SHADEMODE), FALSE, lpBuffer);

OP\_STATE\_RENDER,ÆSTATE\_DATAf}fNf ,Í ADirectX SDK,ìMiscftHf<f\_,É, ,éD3dmacs.h,Ä'è`³,ê,Ä,¢,é B,±,ê,ç,ìf}fNf ,É,Ä,¢,Ä,Í A Step 5: ¼ Úf. [fh,ìfƒf“f\_fŠf“fO EfXfe [fq,ì Ý'è v,Ä,à à~¾,μ,Ä,¢,é B

## Direct3Dftf@fCf< EftfH [f}fbfg

Direct3D,Ìftf@fCf< EftfH [f}fbfg,Í Af fbfVf...

AfefNfXf`ff AfAfjf [fVf‡f“ EfZfbfg Af† [fU’è`fIfufWfFfNfg,ðŠi”[.µ AfAfvfŠfP [fVf‡f“ŠÔ,ÅŠÈ’P,É 3D î•ñ,ðŒðŠ.·,é,±,Æ,%oÂ”\,Å, ,é BfAfjf [fVf‡f“ EfZfbfg,ÌfTf|

[fg,É,æ,Á,Ä A’è` İ,Ý,İfpfX,ð•Û‘¶,µ AfŠfAf<f^fCf€,É Ä ¶,·,é,±

,Æ,ª,Ä,«,é B,Û,½ AfCf“fXf^f“fX,âŠK’w \‘¢,àfTf|

[fg,³,è,Ä,“,è A,Đ,Æ,Ä,Ìftf@fCf<,Ìff [f^,ð,Đ,Æ,Ä,ÌfIfufWfFfNfg if fbfVf...,È,Ç j,É,µ,©Ši”[.µ,Ä,¢ ,È,¢ ê ±,Ä,à A,»,ÌfIfufWfFfNfg,É‘İ,µ,Ä•j ”,ÌŽQ Æ,ðŽ ,Ä,±,Æ,%oÂ”\,Å, ,é B

Direct3D,Ìftf@fCf<-¼,É,Í AŠg’£Žq.x,ª•t%oÂ,³,è,Ä,¢,é B,±,ÌDirectX™f\ftfgfEfFfAŠJ”-

fLfbfg iSDK j,É,Í AAutodesk 3D

Studio,ª ¶ ¬,·,é,3dsftf@fCf<,â ADirect3D,Ì’È’O,Ìfo [fWf‡f“,ª ¶ ¬,·,é.xofftf@fCf<,ðfRf“fo [fg,·,é,½,B,Ì•İŠ·fc

[f< iConv3ds.exe,“,æ,ÑConvxof.exe j,ªŠÛ,Û,è,Ä,¢,é B

Direct3D,Ì•ÛŽ f, [fhAPI,Í ADirect3Dftf@fCf< EftfH [f}fbfg,ðflfCfefBfu,ÉŽg—

p,µ AfAfvfŠfP [fVf‡f“,É’è` İ,Ý,ÌfIfufWfFfNfg,ðf [fh,µ,½,è AfAfvfŠfP [fVf‡f“,ªfŠfAf<f^fCf€

,É ¶ ¬,µ,½f fbfVf... î•ñ,ð ‘,« ž,ñ,¾,è,Ä,«,é B

3Dfvf fOf%of~f“fO,ìŠî'b◊Z p

^È%°,ìfZfNfVf‡f“,Å,Í A3DfOf%oftfBfbfNfX,ð'g,Ý ž,ñ,¾fvf fOf%of€,ð ',‘O,É— %øð,μ,Ä,“,©,È,-  
,Ä,Í,È,ç,È,¢ A,¢,,Â,©,ì◊Z p“l,ÈfRf“fZfvg,É,Â,¢,Ä à-¾,·,é B,±,ê,ç,ìfZfNfVf‡f“,Å,Í A Ä•WÆn,â•İŠ·,É,Â,¢  
,Ä' ‡“l,ÉŽæ,êμ,Ä,Ä,¢,é B,±,±,Ä,Í Af,fffc A Æ-¾ Afrf...  
[,ìfpf%of [f^,È,Ç,ì• L,¢fA [fLfefNf`ff,ì Ú ×,É,Â,¢,Ä,Í à-¾,μ,Ä,¢,È,¢ B,±,ê,ç,ìfgfsfbfN,É,Â,¢,Ä Ú,μ,-  
,Í A uDirect3D,ì•ŮŽ f, [fh EfIfufWfEfNfg v,ðŽQ Æ,³,ê,½,¢ B

3DfOf%oftfBfbfNfX,É ,’Ê,μ,½ŠJ”ŽÒ,à ADirect3D,ì•ŮŽ f, [fh,É“Á—L,È î•ñ,ð“¾,é,½,ß,É A,±,ìfZfNfVf‡f“,É-  
Ú,ð’Ê,μ,Ä,¢,½,¾,«,½,¢ B



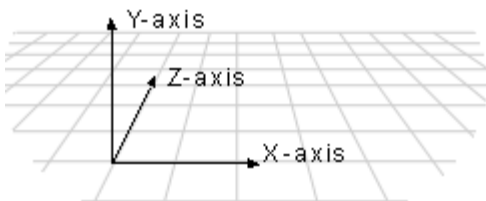
3D
A•WĈn

3DfOf%ftfBfbfNfX,É,Í A ¶Žè À•WĈn,Æ%ŒŽè À•WĈn,Ì2Ží—p,Ì fffJf<fg À•WĈn,<sup>a</sup>,,é B,Ç,ç,ç,Ì À•WĈn,Ā,à A <sup>3</sup>•ûĈü,ÌxŽ<sup>2</sup>,Í%Œ,ðĈü,« A <sup>3</sup>•ûĈü,ÌyŽ<sup>2</sup>,Í ã,ðĈü,¢,Ā,¢ ,é B <sup>3</sup>•ûĈü,Ìz À•W,<sup>a</sup>,Ç,ç,ç,ðĈü,¢,Ā,¢ ,é,©,Í A ¶Žè,Û,½,Í%ŒŽè,ÌŽw,ð <sup>3</sup>,ÌxŽ<sup>2</sup>•ûĈü,ÉĈü,<sup>−</sup> A,»,ê,ð <sup>3</sup>,ÌyŽ<sup>2</sup>•ûĈü,É%ñ“],<sup>3</sup>,<sup>1</sup>,é,±,Æ,É,æ,Ā,Ā'm,é,± ,Æ,<sup>a</sup>,Ā,«,é B eŽw,ÌŽ',••ûĈü,<sup>a</sup> AŽ©•<sup>a</sup>,ðŽw,μ,Ā,¢,Ā,à,»,ϩ,Ā,È,,Ā,à A,»,Ì À•WĈn,Ā,Ì <sup>3</sup>,ÌzŽ<sup>2</sup>,ÌĈü,«,Ā,,é B ,±,ÌfZfNfVf‡f“,Ā,Í AfAfvfŠfP [fVf‡f“,Ā—~—p,·,·,é,±,Æ,<sup>a</sup>,Ā,«,é Direct3D À•WĈn,Æ À•W,Ìf^fCfv,É,Ā,¢,Ā à−¾,·,·,é B

Direct3D,Ì À•WĈn
U À•W,ÆV À•W

## Direct3D, Ĩ À•WĈEn

Direct3D, Ĩ ¶Žè À•WĈEn, ð ĩ—p, μ, Ä, ĸ, é B, Â, Ü, è A^È%º, ĩ }, ÉŽ', ·, æ, ▯, É A ³•ûĈÛ, ĩzŽ², Ĩf r f... [f A, ĩ%œ, ðĈÛ, ĸ, Ä, ĸ, é B



¶Žè À•WĈEn, Â, Ĩ A f r f... [f A, ĩ, Ç, ĩŽ², ðŠ ĩ € ,Æ, μ, Ä, à A%œ Ĩ“], ĨŽžĈv%œ ĩ, è, É s, í, ê, é B

, à, μ%ºEŽè À•WĈEn, ð—p, ĸ, é•K—v, ª, , é ê ± i, ½, Æ, ĩ, Ĩ A%ºE—, «, ĩf† [fUĈÛ, ¯, ĩfAfvfŠfP [fVf±f“, ð ĩ ¬, μ, Ä, ĸ, é ê ± j, Ĩ ADirect3D, É“n, ³, ê, éff [f^, ð , μ•Ĩ X, ·, ê, Ĩ, æ, ĸ B

fVfXfef€, ª“O—Ê, ©, çŽžĈv%œ ĩ, è, É’H, é, æ, ▯  
, É AŽOŠpĈ` ĩ’, “\_ ĩ ±”Ö, ð”½‘Ĩ, É, ·, é BĈ¾, ĸŠ·, ĩ, ê, Ĩ A’, “\_v0 Av1 Av2, ª, , é, Æ, « Av0 Av2 Av1, Æ, μ, ÄDirect3D, É“n, · B

ŽĖ%ºe s—ñ, ðZŽ²•ûĈÛ, É—1fXfP [fŠf“fO, ·, é B, ±  
, ĩ, ½, ß, É, Ĩ AD3DMATRIX \‘Ĉ‘Ĩ, Ĩ\_13 A\_33 A\_43f f“fo, Ĩ•, , †, ð”½“, ], ·, é B

U Å•W,ÆV Å•W

Direct3D,ÍfefNfXf`ff Å•W,àŽg—p,·,é B,±,ê,ç,Ì Å•W iu,“,æ,Ñv j,Í AfIfufWfFfNfg ã,ÉfefNfXf`ff,ð“\  
,è•t,¯,é,Æ,«,É——p,<sup>3</sup>,ê,é BvxfNfgf<,Í AfefNfXf`ff,Ì•ûŒü,Û,½,ÍŒü,«,ðŽ!,µ AzŽ<sup>2</sup>,É%<sup>^</sup>,Á,Ä,¢  
,é BvxfNfgf< i,Û,½,Í ãvxfNfgf< j,Í A^ê”Ê,É AŒ““\_ [0,0,0] ,ðŽn“\_,Æ,µ,ÄyŽ<sup>2</sup>,É%<sup>^</sup>,Á,Ä,¢  
,é Bu Å•W,“,æ,Ñv Å•W,É,Â,¢,Ä Ú,µ,,Í A uDirect3DRMWrapfCf“f^ [ftfFfCfX v,ðŽQ Æ,<sup>3</sup>,ê,½,¢ B

3D•İŠ•

3DfOf%oftfBfbfNfX,đ'€ ì,.,éfvf fOf%of€,Ă,Í AŽŸ,ì ê ‡,ÉfWfIf fgfŠ•İŠ•,đ—p,¢,é,±,Æ,ª,Ă,«,é B

,,éIfufWfFfNfg,Ì A•Ê,ÌIfufWfFfNfg,É'Î,.,é'Š'ÎÊ'u,đ•\E»,.,é ê ‡ B

fIfufWfFfNfg,Ì%õñ“] A í æ AfTfCfY•İ X,đ s,² ê ‡ B

Ž<“\_ A•ûEü A“ŠŽ<“Š%œ,đ•İ X,.,é ê ‡ B

”C´Ó,ì“\_„đ'¼,ì“\_„É•İŠ•,.,é,É,Í A4 s4—ñ,ì s—ñ,đ—~—p,.,é BŽŸ,ì—á,Ă,Í A s—ñ,đ—p,¢,Ă A“(x, y, z)  
„đ V,µ,¢“(x', y', z'),É•İŠ•,.,é B

$$\begin{bmatrix} x' & y' & z' & 1 \end{bmatrix} = \begin{bmatrix} x & y & z & 1 \end{bmatrix} \begin{bmatrix} M_{11} & M_{12} & M_{13} & M_{14} \\ M_{21} & M_{22} & M_{23} & M_{24} \\ M_{31} & M_{32} & M_{33} & M_{34} \\ M_{41} & M_{42} & M_{43} & M_{44} \end{bmatrix}$$

,±,ì—á,Ă,Í A“(x', y', z'),đ ¶ ¬,.,é,½,ß,É A“(x, y, z),Æ s—ñ,É'Î,µ,Ă^È%œ°,ì'€ ì,ª s,í,ê,é B

x' = (M<sub>11</sub> × x) + (M<sub>21</sub> × y) + (M<sub>31</sub> × z) + (M<sub>41</sub> × 1)

y' = (M<sub>12</sub> × x) + (M<sub>22</sub> × y) + (M<sub>32</sub> × z) + (M<sub>42</sub> × 1)

z' = (M<sub>13</sub> × x) + (M<sub>23</sub> × y) + (M<sub>33</sub> × z) + (M<sub>43</sub> × 1)

Ă,ăê”Ê“İ,Ê•İŠ•,É,Í A´Ú“® A%õñ“] A,;,æ,ÑfXfP [fŠf“fO,ª,.,é B^ê“x,É•ı ”,ì•İŠ•ÆvŽZ,đ s,²  
„É,Í A„»,ê,ç,ìÆø%Ê,đ ¶,Ý o,•ı ”,ì s—ñ,đ,Đ,Æ,Ă,ì s—ñ,É,Û,Æ,ß,ê,Î,æ,¢ B,½,Æ,ı,Î A,Đ,Æ,Ă,ì s—  
ñ,đ ì ¬,µ,Ă A“(„ì•Ă,Ñ,ì´Ú“®„Æ%õñ“,đ s,²,±,Æ,ª,Ă,«,é B

s—ñ,Í A—ñ,đ ‡”Ô,É•Ă,×,ĂŽw'è,.,é B,½,Æ,ı,Î AŽŸ,ì s—ñ,đ”z—ñ,Ă•\E»,.,é ê ‡,đ l,ı,é B

$$\begin{bmatrix} s & 0 & 0 & 0 \\ 0 & s & t & 0 \\ 0 & 0 & s & v \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

,±,ì s—ñ,đŽ,ı,“z—ñ,íŽŸ,ì,æ,²,É,È,é B

D3DMATRIX scale = {  
D3DVAL(s) , 0 , 0 , 0 ,  
0 , D3DVAL(s) , D3DVAL(t) , 0 ,  
0 , 0 , D3DVAL(s) , D3DVAL(v) ,  
0 , 0 , 0 , D3DVAL(1)  
};

,±,ìfZfNfVf‡f“,Ă,Í ADirect3D,đ'Ê,µ,ĂfAfvfŠfP [fVf‡f“,©,ç—~—p,Ă,«,é3D•İŠ•,É,Ă,¢,Ă à—¾,.,é B

´Ú“®

%õñ“]

fXfP [fŠf“fO

•İŠ•,É,Ă,¢,Ă,Í A„±,ìfhfLf...f f“fg,ì'¼,ì”ª,Ă,ăŽæ,è`µ,Ă,Ă,¢,é B•ŰŽ f, [fh,É,¬,~éfrf... [f] [fg,É,Ă,¢,Ă à—  
¾,µ,½fZfNfVf‡f“ u•İŠ• v,É,Í A•İŠ•,É,Ă,¢,Ă,ìê”Ê“İ,È îñ,ªL Ú,³,ê,Ă,¢,é BftfÆ [f€•İŠ•,É,Ă,¢  
„Ă,Í u•İŠ• v,đŽQ Æ,³,ê,½,¢ B,Ç,;ç,ç,ìfZfNfVf‡f“,à•ŰŽ f, [fh,ÌAPI,É,Ă,¢,Ă à—¾,µ,Ă,¢  
„é,ª A•İŠ•,ìfA [fLfefNf`ff,Æ ”Ž®,Í A•ŰŽ f, [fh,Æ'¼ Úf, [fh,ì—¼•û,É“K—p,.,é,±  
„Æ,ª,Ă,«,é B,³,ç,É AfZfNfVf‡f“ uDirect3DfA [fLfefNf`ff v,É,Í A•İŠ•f,fWf... [f<,É,Ă,¢,Ă à—  
¾,µ,½ u•İŠ•f,fWf... [f< v,Æ,¢,²fZfNfVf‡f“,ªŠÜ,Û,ê,Ă,¢,é B

Ů“®

ŽŸ, Ì•İŠ, Í A“(x, y, z), ð V, μ, €“(x', y', z'), ÊˆÚ“(®, ·, é B

$$[x' \ y' \ z' \ 1] = [x \ y \ z \ 1] \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ \mathcal{T}_x \mathcal{T}_y \mathcal{T}_z & 1 \end{bmatrix}$$

%ñ“]

,±,ìfZfNfVf±f“,Å à¾,µ,Ä,¢,é•İŠ·,Í A ¶Žè À•WĖn,É,“,̄,é ê ±,ð‘z’è,µ,Ä,¢,é,½,ß A‘¼,ìfVfXfef€,ÅŽg—  
p,³,ê,é•İŠ· s—ñ,Æ,í‘Û,È,é‰Â”\ «,ª, ,é B

ŽŸ,ì•İŠ·,Í A“(x, y, z),ðxŽ²,ðŠî € ,Æ,µ,Ä%ñ“,³,¹ A V,µ,¢“(x’, y’, z’),ð ¶ ¬,·,é B

$$[x' \ y' \ z' \ 1] = [x \ y \ z \ 1] \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & \cos \theta & \sin \theta & 0 \\ 0 & -\sin \theta & \cos \theta & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

ŽŸ,ì•İŠ·,Å,Í AyŽ²,ðŠî € ,Æ,µ,Ä“\_ð%ñ“,³,¹,é B

$$[x' \ y' \ z' \ 1] = [x \ y \ z \ 1] \begin{bmatrix} \cos \theta & 0 & -\sin \theta & 0 \\ 0 & 1 & 0 & 0 \\ \sin \theta & 0 & \cos \theta & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

ŽŸ,ì•İŠ·,Å,Í AzŽ²,ðŠî € ,Æ,µ,Ä“\_ð%ñ“,³,¹,é B

$$[x' \ y' \ z' \ 1] = [x \ y \ z \ 1] \begin{bmatrix} \cos \theta & \sin \theta & 0 & 0 \\ -\sin \theta & \cos \theta & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

ã«L,ì s—ñ‘†,ìfMfŠfVff•¶Žš,ìfV [f^ ifÆ j,Í A%ñ“]Šp“x,ðf%ofWfAf“,Å•\,µ,½,à,Ì,Å, ,é BŠp“x,Í A%ñ“]Ž²,É%  
,Å,ÄĖ“(̄,ð’,ß,½ ê ± AŽžĖvŽü,è,É‘ª’è,µ,½’l,ª—p,¢,ç,ê,é B

$$fXfP\ [f\check{S}f^{\text{“}}fO$$

$$\check{Z}\check{Y},\grave{\text{ł}}\text{•}\check{\text{I}}\check{S}\text{•},\acute{\text{I}}\text{ }A^{\text{“}}_{\text{ }}(x,y,z),\partial x\text{ }Ay,\text{”},\text{æ},\tilde{N}z\check{Z}^2\text{•}\hat{u}\mathbb{E}\ddot{u},\acute{E}^{\text{”}}C^{\text{^}}\acute{O},\grave{\text{ł}}\check{S},,\text{ }\ddagger,\hat{A}fXfP\ [f\check{S}f^{\text{“}}fO,\mu\text{ }A\text{ }V,\mu,\P^{\text{“}}_{\text{ }}(x',y',z'),\partial\text{ }\P\text{ }\neg,\text{•},\acute{e}\text{ }B$$

$$[x'\ y'\ z'\ 1]=[x\ y\ z\ 1]\begin{bmatrix}s_x&0&0&0\\0&s_y&0&0\\0&0&s_z&0\\0&0&0&1\end{bmatrix}$$

f|fŠfSf“

Direct3D,ì3ŽŸŒ³fIfufWfFfNfg,Í Af fbfVf...,Ä \ ¬,³,ê,Ä,¢,é Bf fbfVf...,Æ,Í-Ê,ì W ‡,Ä, ,è A,»,ê,¼,ê,ì-Ê,Í'P f,Èf|fŠfSf“,Ä•\Œ»,³,ê,é Bf|fŠfSf“,ÌŠi-{Œ^,ÍŽOŠpŒ`,Ä, ,é B•ŮŽ f, [fhfAfvfŠfP [fVf‡f“,Í,R,Â^È ã,Ì',“\_ ,ðŽ ,Âf|fŠfSf“,ð^µ,±,±,Æ,ª,Ä,«,é,ª A,»,ê,ç,ÍfVfXfefŒ ,É,æ,Ä,Ä AfIfufWfFfNfg,ªŒf“f\_fŠf“fO,³,ê,é'O,ÉŽOŠpŒ`,É•İŠ·,³,ê,é B'¼ Úf, [fhfAfvfŠfP [fVf‡f“,Í AŽOŠpŒ`,ðŽg—p,µ,È,,Ä,Í,È,ç,È,¢ B

,±,ìfZfNfVf‡f“,Ä,Í AfAfvfŠfP [fVf‡f“,ÅDirect3Df|fŠfSf“,ðŽg—p,·,é•û-@,É,Â,¢,Ä à-¾,·,é B

Šô%½“I ðŒ

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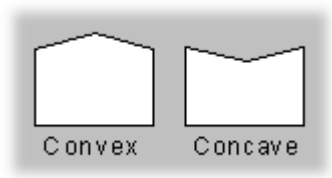
fVfF [fffBf“fO Ef, [fh

ŽOŠpŒ`,İ•âŠ®—v'f

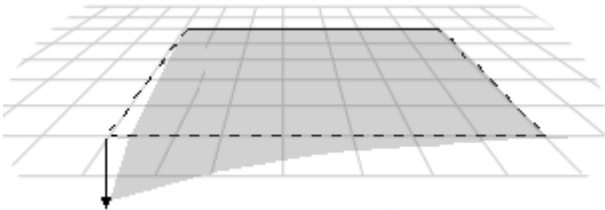


Šđ%½“İ đĲ

ŽOŠpĲ`İ A“Ê ó,©,Â•½-Ê,Â, ,é,Æ,¢,▣ AfĲf“f\_fŠf“fO,Â—v< ,³,ê,é ,Ó,½,Â,Ì đĲ ,đ,Â,Ë,É-ž,½,μ,Ä,¢  
,é,½,ß A^μ,¢,â,·,¢Ĳ`İf|fŠfSf“,Â, ,é Bf|fŠfSf“,İ”C^Ó,Ì,Ó,½,Â,İ’ “\_đĲ<,Ô ü,ª A,Â,Ë,É,»İf|fŠfSf“,İ“à•”,É, ,é,Æ,«  
Af|fŠfSf“,İ“Ê ó,Â, ,é,Æ,¢,▣ B

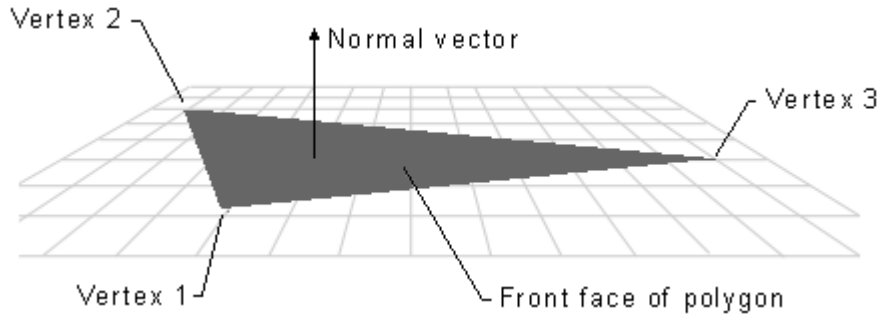


ŽOŠpĲ`İ,R,Â,İ’ “\_İ•½-Ê,đ•\,·,ª A,»,±,É•Ê,İ’ “\_đ”Ç%Á,·,é,±,Æ,É,æ,Á,Ä A—e^Ö,É—§‘İf|fŠfSf“,đ İ ¬,·,é,±  
,Æ,ª,Â,«é B

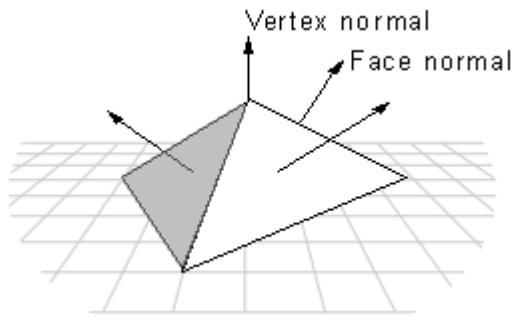


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f fbfVf... ä,ì,»,ê,¼,ê,ì–Ê,É,Í A ,¼,È–Ê,ðŽ’,–@ üfxfNfgf<,<sup>a</sup>,,é B–@ üfxfNfgf<,lÈü,«,Í A’,“–<sup>a</sup>è<<sup>3</sup>,ê,Ä,¢  
,é ‡ ~,Æ A À•WĈEn,<sup>a</sup>%EŽè À•WĈEn,Æ ¶Žè À•WĈEn,ì,Ç,ç,ç,Ä, ,é,©,É,æ,Ä,ÄĈE’è,<sup>3</sup>,é,é B–@ üfxfNfgf<,<sup>a</sup>frf...  
[fA,ÉĈEü,©,Ä,Ä,¢,é‘□,<sup>a</sup>–Ê,ì•,Ä, ,é BDirect3D,Ä,Í A–Ê,ì•,ì,Y,<sup>a</sup>Ž< ‘ä,Ä, ,é B,Û,½Direct3D,Ä,Í A•\,©,ç–  
Ê,ðĈE©,½ ê ‡ A•K,ŽžĈEv%oñ,è,É’,“–<sup>a</sup>è<<sup>3</sup>,ê,Ä,¢,é B



Direct3DfAfvfŠfP [fVf‡f“,Í A–Ê–@ ü,ðŽw’è,·,é•K–v,Í,È,¢ B•K–vŽž,É,Í AfVfXfef€,<sup>a</sup>Ž©“@“l,É–Ê–  
@ ü,ðĈEvŽž,·,é BfVfXfef€,<sup>a</sup>–Ê–@ ü,ðŽg–p,·,é,ì,Í Aftf%ofbfg EfVfF [ffBf“fO Ef, [fh,ì ê ‡,Ä, ,é  
BftfHf“ EfVfF [fffBf“fO Ef, [fh,ÆfOf [ EfVfF [fffBf“fO Ef, [fh,ì ê ‡ A,“,æ,NĈEðĈE¹,âfefNfXf`ffĈE  
ø%oÊ,ð §ĈEä,·,é ê ‡,É,Í AfVfXfef€,Í’,“–@ ü,ðŽg–p,·,é B



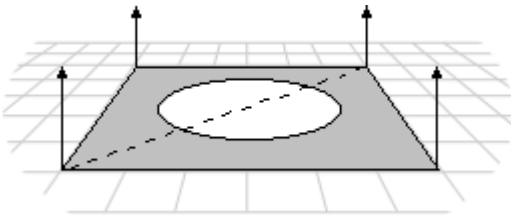
**fVfF [ffBf“fO Ef, [fh**

ftf%fbfg EfVfF [ffBf“fO Ef, [fh,Å,Í AfVfXfef€,Í A,D,Æ,Â,Ì’,“\_ì F,ðfvfŠf~fefBfu,Ì¼,Ì-  
Ê‘S’ì,Ê•î »,.é BfOf [ EfVfF [ffBf“fO Ef, [fh,ÆftHf“ EfVfF [ffBf“fO Ef, [fh,Å,Í A’,“-@ ü,ð-  
p,ç,Äf|fŠfSf“ EfIfufWfFfNfg,ÌŠÖŠ,ðfXf€ [fY,É,µ A,»,ÌŠÖ,ÌfXfy [fX,É,Í-  
× Ú,µ,½’,“\_ì F,ÆP“x,“}“ü,³,ê,é BftHf“ EfVfF [ffBf“fO Ef, [fh,Å,Í AfVfXfef€,“  
Ê,ÌŠefsNfZfç,É“K Ø,ÈfVfF [ffBf“fO’l,ðEvŽZ,.,é B

**Note**

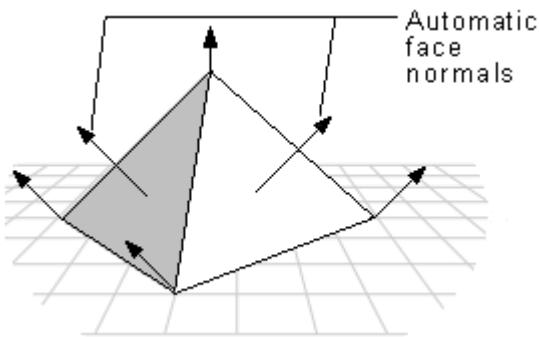
ftfHf“ EfVfF [ffBf“fO Ef, [fh,Í AÆ» Ý,ÍfTf| [fg,³,ê,Ä,ç,È,ç B

fOf [ EfVfF [ffBf“fO Ef, [fh,Í AfIfufWfFfNfgŠÖŠ,ðfXf€ [fY,É•Ž’,µ AÆvŽZ ãÆø-“I,Å, ,é B,±  
ì,½,ß A¼,ÌfAfvfŠfP [fVf±f“,ÍfOf [ EfVfF [ffBf“fO Ef, [fh,ð-~—  
p,.,é B,µ,©,µ AfOf [ EfVfF [ffBf“fO Ef, [fh,Í AftHf“ EfVfF [ffBf“fO Ef, [fh,Å,ÍçN,±  
,ç,È,ç ×,©,Èf~fX,ð ¶,¶,é,±,Æ,“, ,é B,½,Æ,!,Í A%° } ,ÉŽ’,.,æ,ç,É-Ê,ÉŠ®‘S,ÉfXf|fbfgf%oCfg,““-½,Ä,Ä,ç  
,é ê ± AfOf [ EfVfF [ffBf“fO Ef, [fh,ÆftHf“ EfVfF [ffBf“fO Ef, [fh,Å,Í‘S,-  
^Ü,Ê,Ä,½Æ%oÊ,ðø,«N,±,. B

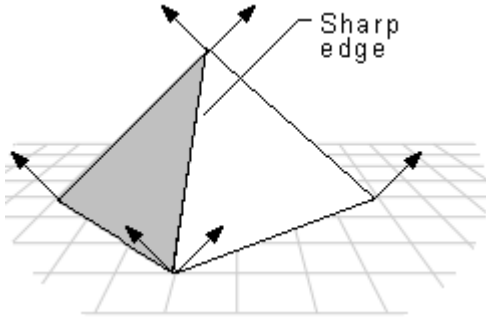


,±,ì ê ± AftHf“ EfVfF [ffBf“fO Ef, [fh,Å,Í AŠefsNfZfç,Ì’l,ðEvŽZ,µ,ÄfXf|  
fbfgf%oCfg,ð^Ž’,.,é B’,“\_ìŠÖ,ÉfsfNfZfç,ð’}“ü,.,é fOf [ EfVfF [ffBf“fO Ef, [fh,Å,Í AfXf|  
fbfgf%oCfg,ð’S,-³Žç,µ,Ä,µ,Ü,ç AfXf|fbfgf%oCfg,“¶ Ý,µ,È,ç,©,Ì,æ,ç,É-Ê,“fÆf“f\_Šf“fO,³,ê,é B

ftf%fbfg EfVfF [ffBf“fO Ef, [fh,Å,Í AŽŸ,Ì,æ,ç,Èfsf%o~fbfh,Í A-Ê,Æ-Ê,“ Ú,µ,Ä,ç  
,éÓ igGfbfW j,“fVff [fv,É•Ž’,³,ê AfVfXfef€,“Ž©“@“I,É-Ê-  
@ ü,ð ¶ ¬,.,é B,µ,©,µ AfOf [ EfVfF [ffBf“fO Ef, [fh,âftHf“ EfVfF [ffBf“fO Ef, [fh,Å,Í A%oA  
%oe’l,“Ó,Ìžü•Ó,É•âŠ®,³,ê A Å I“l,É,ÍÈ-Ê,Å \ ¬,³,ê,½ŠÖŠ,Æ,È,é B



fOf [ EfVfF [ffBf“fO Ef, [fh,âftHf“ EfVfF [ffBf“fO Ef, [fh,ð-p,ç,ÄçÊ-  
Ê,ð•Ž’,µ A,³,ç,ÉfVff [fv,É•Ó,ðŽ ,Å,½fIfufWfFfNfg,âŠÜ,ß,½,ç ê ± AfAfvfŠfP [fVf±f“,Í A•Ó,“K-v,È-  
Ê,Ì,.,×,Ä,ÌÈð ü,Ê,Ä,ç,Ä A’“-@ ü,ð•î »,.µ,È,,Ä,Í,È,ç,È,ç B



$fOf \quad [ \quad EfVfF \quad [ffBf“fO \quad Ef, \quad [fh, \acute{I} \quad A, \mathfrak{D}, \mathcal{A}, \hat{A}, \grave{I}fIfufWfFfNfg \quad \tilde{a}, \acute{E} \cdot \grave{E} - \hat{E}, \mathcal{A} \cdot \frac{1}{2} - \hat{E}, \partial \check{U}, \mathfrak{B}, \acute{e}, \pm, \mathcal{A}, \partial \% \hat{A} \backslash$   
 $, \acute{E}, \cdot, \acute{e}, \frac{3}{4}, \neg, \hat{A}, \hat{E}, \quad A \bullet \frac{1}{2} - \hat{E}, \acute{E} “ -$   
 $, \frac{1}{2}, \hat{A}, \frac{1}{2} \mathbb{C} \tilde{o}, \partial ftf \% ofbfg \quad EfVfF \quad [ffBf“fO \quad Ef, \quad [fh, \mathfrak{x}, \grave{e}, \grave{a} f \check{S} f A f \langle, \acute{E} \bullet \backslash \mathbb{C} \rangle, \cdot, \acute{e} \quad B ftf \% ofbfg \quad EfVfF \quad [ffBf“fO \quad Ef, \quad [f$   
 $h, \grave{I} - \hat{E}, \grave{I} \quad F, \acute{I} \grave{I} \hat{e}, \hat{A}, \quad , \acute{e}, ^a \quad A fOf \quad [ \quad EfVfF \quad [ffBf“fO \quad Ef, \quad [fh, \hat{A}, \acute{I} \quad A - \hat{E}, \partial \quad ^3 \check{S} m, \hat{E} \sim \hat{A}, \cdot, \cdot, \acute{e}, \pm, \mathcal{A}, ^a, \hat{A}, \langle, \acute{e} \quad B, \pm$   
 $, \grave{I} \mathbb{C} \emptyset \% \hat{E}, \acute{I} \quad A, \cdot, @ \langle \mathfrak{B}, , \acute{E} \mathbb{C} \tilde{o} \mathbb{C} \mathbb{E}^1, ^a, \quad , \acute{e} \quad \hat{e} \quad \ddagger, \acute{E} \mathbb{C} \mathbb{E}^{\circ} \sim, \hat{A}, \quad , \acute{e} \quad B$   
 $, \grave{U}, \mathcal{A}, \tilde{n}, \check{C}, \grave{I} Direct3D f A f v f \check{S} f P \quad [ f V f \ddagger f “, \acute{E} “ K \quad \emptyset, \hat{E} \hat{E} V f F \quad [ffBf“fO \quad Ef, \quad [fh, \acute{I} \quad A fOf \quad [ \quad EfVfF \quad [ffBf“fO \quad Ef, \quad [$   
 $fh, \hat{A}, \quad , \acute{e} \quad B$

ŽOŠpĚ, ĭ•ăš®—v‘f

fVfXfef€ĭ A-Ê,đfĚf“f\_fŠf“fO,·,é Ů AŽOŠpĚ‘S‘ĭ,É,»,ĭ‘,“\_ĭ“Á‘Ÿ,đ“K—p,·,é B

F

”½ŽĚĚõ

ftfHfO

fAf<ftf@

ŽOŠpĚ,É%Á,,ĭ,ç,ê,½“Á‘Ÿ,ĭ AĚ» Ý,ĭfVfF [ffBf“fO Ef, [fh,É,æ,Á,Ä’² ®,³,ê,é B

ftf%fbfg %½,â•ăš®,³,ê,Ě,ĉ B,»,ĭ‘ă,ĭ,è AŽOŠpĚ,ĭ Ā %  
,ĭ‘,“\_ĭ F,ª-Ê‘S‘ĭ,É“K—p,³,ê,é B

fOf [ ,R,Ā,ĭ‘,“\_ĭŠÔ,ÉfŠfjA•ăš®,ª s,ĭ,ê,é B

ftfHf“ Ě» Ý,ĭ Ą-¾,đ—p,ĉ A-Ê,ĭŠefsfNfZf<,É,Ā,ĉ  
,Ā‘,“\_ĭfpf%of [f^,ª Ā•]%  
ċ,³,ê,é BftfHf“ EfVfF [ffBf“fO Ef, [fh,ĭĚ» ó,Ā,ĭfT  
f| [fg,³,ê,Ā,ĉ,Ě,ĉ B

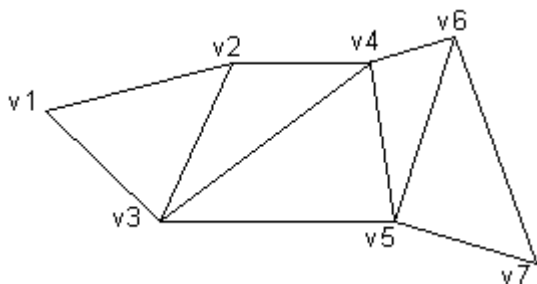
F,Ą”½ŽĚĚõ,ĭ•ăš®—  
v‘f,ĭ•Ê X,Éˆµ,ĭ,ê AfJf% [ Ef,fffc,ÉˆÊ‘¶,·,é BRGBfJf% [•ûŽ® iD3DCOLOR RGB j,Ā,ĭ AfVfXfef€  
,ĭ A Ô A—ĭ A Ā,ĭ F—v‘f,đŽg—p,·,é Bf,fmfNf Ef,fffc iD3DCOLOR MONO j,Ā,ĭ AfVfXfef€  
,ĭ A‘,“\_ĭ F,ĭ Ā,ĭ—v‘f,¾,¯,đŽg—p,·,é B

,½,Ą,,ĭ Ā‘,“\_ĭ ĭ F,ĭ Ô,ĭ—v‘f,ª0.8,Ā A‘,“\_ĭ Ô,ĭ—v‘f,ª0.4,ĭ,Ą,« A,±  
,ĭ,Ô,½,Ā,ĭ‘,“\_ĭ,đĚ<,Ô ü,ĭ† S,ĭfsfNfZf<,ÉfVfXfef€,ªŠ,,è“-,Ā,é Ô,ĭ—  
v‘f,ĭ AfOf [ EfVfF [ffBf“fO Ef, [fh,ĭRGBfJf% [ Ef,fffc,Ā,ĭ0.6,Ā, ,é B

F,ĭfAf<ftf@—v‘f,ĭ A“Ą—ş,µ,½•ăš®—v‘f,Ą,µ,ĂŽæ,èˆµ,ĭ,ê,é B,±  
,ê,ĭ AfffofCfX Efhf%ofCfo,ª AfefNfXf`ff EfufĚf“ffBf“fO,Ů,½,ĭ“ Ě-@,ĭ A,Ó,½,Ā,ĭŮ,È,é•û-  
@,É,æ,Ā,Ā“ş-¾“x,đfCf“fvfŠf f“fg,Ā,«é,½,ß,Ā, ,é B

fAfvfŠfP [fVf±f“,ĭ AĚ» Ý,ĭfffofCfX Efhf%ofCfo,ªfTf| [fg,·,é  
•ăš®ĚŽ®,đŽæ“¾,·,é,½,ß,Ě AD3DPRIMCAPS,ĭdwShadeCapsf f“fo,đŽQ Ą,·,é,±,Ą,ª,Ā,«é B

fT [ftfFfX'S'ì,ðŁ q,·,é,É,Í AŠeŽOŠpE',ì',·,·,ð,·,×,ÄŽw'è,·,é,ì,Ä,Í,È, A"WŠJ } ,â ïE',ðŽg—p,·,é,± ,Æ,ª,Ä,« ,é B,½,Æ,ì,îŽŸ,ì,æ,ð,È"WŠJ } ,ð'è',·,é ê ‡ A•K—v,È',·,·,î,Ä,¾,·,Ä, ,é B



fVfXfεf€Í A',“\_v0 Av1 Av2,ð—p,¢,Ä Å %o,ÌŽOŠp€',ð•%œæ,;é B2"Ô—  
 Ú,ÌŽOŠp€',Ì•%œæ;É,Í A',“\_v0 Av2 Av3,ðŽg—p,;é B

“WŠJ }},â î€',ðŽg—p,;é,É,Í **AD3DTRIANGLE** \‘¢‘Ì,ÌwFlagsf f“f0,Éftf%ofo,ðŽw'è,;é B

$fxfNfgf\langle A', \_ AfNfH [f^{\wedge}fjIf\langle$

Direct3D,Â,Í A',“\_ÍÊ'u,ÆEü,«ðŽ',μ,Ä,¢,é BfvfŠf~fefBfu't,İše',“\_Í AÊÊ'u,ðŽ',·fxfNfgf\langle ACEü,«ðŽ',·= @ üfxfNfgf\langle AfefNfXf'ff,İ Â·W A,“,æ,Ñ F,Ê,æ,Ä,Ä·L q,³,ê,é i·ÛŽ f, [fh,Â,Í A,± ê,ç,İ'l,İD3DRMVERTEX \‘¢İ,ÊŠi”[³,ê,é j B

fNfH [f^{\wedge}fjIf\langle,Í AfxfNfgf\langle,ð'è\langle,·,é[x, y, z]'l,É4,Â,ß,İ—v'f,ð'Ç%Á,·,é B,±,ê,Í A3D%ñ“],Â^ê”Ê“Í,É—p,¢,ç,ê,Ä,¢ ,é s—ñf f\fbfh,Ê'â,î,é,à,İ,Â, ,é BfNfH [f^{\wedge}fjIf\langle,Í A3D<óŠÖ,İŽ²,Æ A,»,İŽ²,É%ˆ,Ä,½%ñ“],ð·\,μ,Ä,¢ ,é B,½,Æ,İ,İfNfH [f^{\wedge}fjIf\langle,Í AŽ²(1, 1, 2),Æ1f%oFWfAf\langle,İ%ñ“],ðŽ',·,±,Æ,ª,Ä,«é BfNfH [f^{\wedge}fjIf\langle,Í—ð,É— §,Â î·ñ,ð·ÛŽ ,μ,Ä,¢,é,ª A,»,İ ^%ö,Í ≠ ¬,Æ·âŠ®,Æ,¢,²,Ó,½,Â,İ'€ i,ðŽÀ s,·,é,Æ,«É”Šö,³,ê,é B

fNfH [f^{\wedge}fjIf\langle,İ ± ¬,Í AfNfH [f^{\wedge}fjIf\langle,ðE\langle ±,·,é,æ,²,È,à,İ,Â, ,é B,Â,Û,è A,Ó,½,Â,İfNfH [f^{\wedge}fjIf\langle,İE\langle ± iq1 o q2 j,Æ,Í A u%ñ“]2,É,æ,Ä,ÄŽ²2,ðŠî €,\,μ,Ä%ñ“],μ,½Eä A%ñ“]1,É,æ,Ä,ÄŽ²1,ðŠî €,\,μ,Ä%ñ“],·,é v,± ,Æ,Â, ,é B ”Šw“Í,É,Í Aq1,Æq2,İ ± ¬,ðQ = q1 o q2,Æ·\L,·,é B,μ,½,ª,Ä,ÄQ,Í Aq2,Æq1,ð“K—p,μ,Ä“¾,½1— {,İŽ²,É%ˆ,Ä,½%ñ“],ðŽ',μ,Ä,¢,é B

fNfH [f^{\wedge}fjIf\langle·âŠ®,ðŽg—p,·,é,Æ AfAfvfŠfP [fVf±f\langle,Í A, ,éŽŽ,âEü,«©,ç·Ê,İŽ²,âEü,«Ö,İpfX,ð AfXf€ [fY, ©,Â ±— “Í,ÉEvŽŽ,·,é,±,Æ,ª,Ä,«é B

± ¬,Æ·âŠ®,ð“ŽŽ,É—p,¢,é ê ± AfNfH [f^{\wedge}fjIf\langle,Í AfWfIf fgfŠEvŽŽ,ð s,²ŠÊ'P,È·û—@,ð'ñ\Y,·,é B,±,İ·û— @,Í A^êE©·jŽG,»,²,ÉE©,İ,é B,½,Æ,İ,Í A—^,İ,ç,ê,½Eü,«É%ñ“],·,éEvŽŽ,É,Â,¢,Ä 1,İ,é B,± ,İ,½,ß,É,Í AŽ²2,ðŠî €,\,μ,Är2“x,İ%ñ“],ð s,Ä,½Eä AŽ²1,İ%ñ,è,ðr2“x%ñ“],³,¹,ê,İ,æ,¢ ,Æ,·,é B,μ,©,μ A Â I¹,İfNfH [f^{\wedge}fjIf\langle,Í,í,©,Ä,Ä,¢,È,¢ B ± ¬,ð—p,¢,é,Æ A,Ó,½,Â,İ%ñ“] ,ð'g,Ý ±,¹ AÇ%ñÊ,Æ,μ,Ä,Ð,Æ,Â,İfNfH [f^{\wedge}fjIf\langle,ð“¾,é,± ,Æ,ª,Ä,«é B,»,İEä AfXf€ [fY,É^Û s,·,é,½,ß,É AÇ³,İfNfH [f^{\wedge}fjIf\langle,©,ç ± ¬,³,ê,½fNfH [f^{\wedge}fjIf\langle,ð·âŠ®,Ö s ,²,±,Æ,ª,Ä,«é B

Direct3D,İ·ÛŽ f, [fh,Í AfNfH [f^{\wedge}fjIf\langle,İ'€ i,ðŽx%±,·,é,¢,,Â,©,İŠÖ ”,ð—p^Ó,μ,Ä,¢ ,é B,½,Æ,İ,İD3DRMQuaternionFromRotationŠÖ ”,Í A%ñ“]ŽŽ,ð'è\langle,·,éxfNfgf\langle,É%ñ“]¹l,ð'Ç%Á,μ AD3DRMQUATERNION \‘¢İ,ÄŽ',³,ê,é fNfH [f^{\wedge}fjIf\langle,ÉÇ%ñÊ,ð·Ö,· B,³,ç,É AD3DRMQuaternionMultiplyŠÖ ”,İfNfH [f^{\wedge}fjIf\langle,ð ± ¬,μ AD3DRMQuaternionSlerpŠÖ ”,Í,Ó,½,Â,İfNfH [f^{\wedge}fjIf\langle,İŠÖ,Ä<...¹,İfŠffjA·âŠ®,ð s,² B

·ÛŽ f, [fh EfAfvfŠfP [fVf±f\langle,Â,Í AfxfNfgf\langle,âfNfH [f^{\wedge}fjIf\langle,ð~μ,²fafXfN,ðŠÊ— %»,·,é,½,ß A^Ê%»,İŠÖ ”EQ,ð—p,·,é,±,Æ,ª,Ä,«é B

D3DRMQuaternionFromRotation

D3DRMQuaternionMultiply

D3DRMQuaternionSlerp

D3DRMVectorAdd

D3DRMVectorCrossProduct

D3DRMVectorDotProduct

D3DRMVectorModulus

D3DRMVectorNormalize

D3DRMVectorRandom

D3DRMVectorReflect

D3DRMVectorRotate

D3DRMVectorScale

D3DRMVectorSubtract

•,“® ¬ ”“ \_ ,“x

Direct3D,Å,Í A¼,ÌDirectXfA [fLfefNf`ff,Æ“—l,É A53frfbfg,Ì•,“® ¬ ”“ \_ ,“x,ª—p,¢  
,ç,ê,é BfAfvfŠfP [fVf‡f“,Å,±,Ì ,“x,ð•İ X,·,é•K—v,ª, ,é ê ‡,İ AÆvŽZ,ªŠ®—¹,µ,½,Æ,«,É53frfbfg,É-ß,³,È,-  
,Ä,Í,È,ç,È,¢ B,»,⊠,µ,È,¢,Æ AfftfHf<fg,Ì¹l,É^È¶,·,éfVfXfef€,ÌfRf“f| [flf“fg,Í A ^— ,ª,Ä,«,È,,È,é B



**fpftfH [f}f“fX,ì Å“K%»**

3DfOf%ftfBfbfNfX,ð—p,¢,½fŠfAf<f^fCf€ EfAfvfŠfP [fVf‡f“,ð ì ¬,·,éŠJ”ŽÒ,Í,·,×,Ä AfpftfH [f}  
f“fX,ì Å“K%»»,ÉŠÖ S,ðŽ ,Á,Ä,¢,é B,±,ìfZfNfVf‡f“,Á,Í AfR [fh,©,ç Å ,ìfpftfH [f}  
f“fX,ð“¾,é,½,ß,ìfKfCfhf%oCf“,ð’ñ<Ÿ,·,é B

,±,ìfKfCfhf%oCf“,ì`È%°,ìfZfNfVf‡f“,Í A,·,×,Ä,ì Direct3D fAfvfŠfP [fVf‡f“,É“K—p,·,é,±,Æ,ª,Å,«,é B

ŽÀ sŽž.ìfNfŠfbfsf“fO EfefXfq

fvfŠf~fefBfu,ìfofbf` ^—

fefNfXf`ff,ìfTfCfY

fqf%oCfAf“fOf< Eftf%ofo

Direct3DfAfvfŠfP [fVf‡f“,Í Af%of“fv Efhhf%oCfo if,fmfNf EfJf%o [ Ef,ff<,ì,½,ß j,ÆRGBfhf%oCfo,ì,¢  
,,ê,©,ðŽg—p,·,é,±,Æ,ª,Å,«,é B`È%°,ìfZfNfVf‡f“,Ä q,×,ç,ê,Ä,¢,éfpftfH [f}f“fX,Í Af%of“fv Efhhf%oCfo,É,Ä,¢  
,Ä“K—p,³,ê,é B

f%of“fv EfpftfH [f}f“fX,ìfqf“fg

f%of“fv EfefNfXf`ff

Zfofbftf@

fRfs [ Ef, [fh

ŽÀ sŽž,İfNfŠfbfsf“fO EfefXfg

fAfvfŠfP [fVf‡f“,İ**Direct3DDevice::Execute**f f\bfh,đŽg—p,μ,Ä AŽ©“@fNfŠfbfsf“fO,đ—p,¢  
 ,Ä A,Ü,½,İfNfŠfbfsf“fO,đ s,ı,,É AfvfŠf~fefBfu,đfCef“f\_Šf“fO,·,é,±,Æ,ª,Ä,«é B•İŠ·,âf%ofXf^ ^—  
 ’iŠK,Ä,İfNfŠfbfsf“fO EfefXfg,İfvf fZX,İŽÀ s‘“x,đ’x,,·,é,½,ß AfNfŠfbfsf“fO,đ s,ı,,É,±,İf f\bfh,đŽg—  
 p,μ,½,Ü,¤,ª AfNfŠfbfsf“fO Eftf%ofO,đ Ý’è,μ,½ ê ‡,æ,è,à ,¬,Ä, ,é BŽ©“@fNfŠfbfsf“fO,đ s,¤fAfvfŠfP [f  
 Vf‡f“,Ä,İ AfCef“f\_Šf“fO Eft [f^,ªŽ<\_ ‘ä,ÉŠ@‘S,ÉŽû,Ü,é,±,Æ,đ•Ü Ø,μ,È,,Ä,İ,È,ç,È,¢ B,±,ì,½,ß,İ Ä“K,È•û—  
 @,İ A’P f,ÈC< ‡f{fŠf... [f€,đf,ff<,É“K—p,μ A,»,ê,đ Ä %o,É•İŠ·,·,é,±,Æ,Ä, ,é B,±  
 ,İ•İŠ·C<%oÈ,đŽQ Æ,·,ê,İ Aff [f^‘S’İ,đ—³Cø,É,·,é,©,Ç,¤,© iff [f^,ª—İæ,İŠO•”,É, ,é ê ‡ j AfNfŠfbfsf“fO,đ s  
 ,ı,È,¢fo [fWf‡f“,İ**Direct3DDevice::Execute**f f\bfh,đ—p,¢,é,©,Ç,¤,© i,·,×,Ä,İff [f^,ª—  
 İæ“à,É•¶ Ý,·,é ê ‡ j AfNfŠfbfsf“fO Eftf%ofO,đŽg—p,·,é,©,Ç,¤,© iff [f^,İê•”,ª—İæ“à,É, ,é ê ‡ j,đC’è,·,  
 é,±,Æ,ª,Ä,«é B’¼ Úf, [fh,Ä,İ **AD3DSTATUS** \‘c’ì,İftf%ofO,đ—~—p,μ,Ä A,±,ê,ç,İ<@”\  
 ,đ,Đ,Æ,Ä,İŽÀ sfobftf@’†,É—pˆÓ,·,é B,»,μ,Ä**D3DOPCODE**—  
 ñ<“C^,İ**D3DOP\_BRANCHFORWARD**f f“fo,đŽw’è,μ AC< ‡f{fŠf... [f€,ª—İæŠO,É, ,é,Æ,«é,İ•İŠ·,đfXfLfbfv,·,é  
 ,æ,¤,É,·,é BDirect3D,İ•ŮŽ f, [fh,Ä,İ AŽÀ sfobftf@,İŽg—p,đ ,‘¬%o»,·,é,½,ß AŽ©“@‘I,É,±,İ<@”\,đ—~—  
 p,·,é B

***fvfŠf~fefBfu,İfofbf` ^—***

ŽÀ s'†,É Å .,İfƎf“f\_fŠf“fO EfpftfH [f}f“fX,ð“¾,é,½,ß,É,Í AfvfŠf~fefBfu,ðfofbf` ^—  
 ,µ AfƎf“f\_fŠf“fO EfXfe [fg,İ• X,ð,Å,«,é,¾,¯ ,È,-  
 ,·,é B,½,Æ,İ A,Ó,½,Â,İfefNfXf`ff,ðŽ ,ÂIfufWfFfNfg,<sup>a</sup>, ,é,Æ,« A,Ü,, Å %  
 ,İfefNfXf`ff,ðŽg,²ŽOŠpƎ`,ðfOf< [fv%»»,µ A'±,Ɖ,Â AfefNfXf`ff,ð•İ X,·,é,½,ß,É•K—  
 v,ÈfƎf“f\_fŠf“fO EfXfe [fg,ð Ý'è,·,é B,»,µ,Â A,Ó,½,Â,ß,İfefNfXf`ff,ðŽg,²  
 ,·,×,Ä,İŽOŠpƎ`,ðfOf< [fv%»»,·,é BDirect3D,ðfTf|  
 [fg,·,é Å,à'P f,Èfn [fhfEfFfA,Í Afn [fhfEfFfA EfAfufXfgf%ofNfVf‡f“ EfƎfCf,, iHAL j,ð'Ê,µ,Ä AfƎ  
 f“f\_fŠf“fO EfXfe [fg,âfvfŠf~fefBfu,İfofbf` ^— ,ð s,² Bfofbf`½—ß,³Ǝø—|“I,Å, ,é,Ù,Ç AŽÀ s'†,ÉHAL,³Ǝ  
 Ä,Ñ o,³,è,é,±,Æ,<sup>a</sup> ,È,,È,é B

## ***fefNfXf`ff,lfTfCfY***

*fefNfXf`ff Ef}fbfsf“fO,lfpftfH [f}f“fX,Í Af f,fŠ,ì‘¬“x,É‘â,«^È‘¶,·,é BfefNfXf`ff,lfLfffbfVf...  
EfpftfH [f}f“fX,ð Å‘â,É,·,é,½,ß,É,Í A,½,,³,ñ,ì•û—@,ª l,!,ç,ê,é B*

*fefNfXf`ff,ð ¬,³,,·,é BfefNfXf`ff,ª ¬,³,¢,Û,Ç ACPU,lfZfJf“f\_fŠ EfLfffbfVf...,É•ÛŽ ,³,ê,é%Å”\ «,ª ,,-  
,È,é B*

*fvfŠf~fefBfu,²,Æ,É^Û,È,éfefNfXf`ff,ðŽg—p,µ,È,¢ B,Û,½ AŽg—p,·,éfefNfXf`ff,ì ‡,Éf|  
fŠfSf“,ðfOf< [fv%»»,µ,Ä,,æ,µ,É,·,é B*

*,Å,«,éÆÀ,è ³•ûE`,lfefNfXf`ff,ð—p,¢,é B i—@,²256 ~256,lfefNfXf`ff,ª Å,à ,‘¬,Å, ,é B,½,Æ,!,Î A4—  
‡,Ì128 ~128,lfefNfXf`ff,ð—p,¢,é ê ‡,Í A“^,¶fpfÆfbfg,ðŽg—p,·,é,æ,µ,É,µ A256 ~256,lfefNfXf`ff1—  
‡,ÉŽû,ß,é,Æ,æ,¢ B,±,lfefNfjfbfN,É,æ,Á,Ä AfefNfXf`ff EfXf fbfsf“fO,ì%ñ ”,ðE,,ç,·,±,Æ,à,Å,«,é B‘½,-  
,lfefNfXf`ff,ð•K—v,Æ,µ,È,¢AfvfŠfP [fVf‡f“,Í A“—R A256 ~256,lfefNfXf`ff,ðŽg—  
p,·,é,x,«,Å,Í,È,¢ B,È,º,È,ç A‘O q,µ,½,æ,µ,É AfefNfXf`ff,Í,Å,«,é,¾,¬ ¬,³,—},!,½,Û,µ,ª,æ,¢,©,ç,Å, ,é B*

**fgf%oCfAf“fOf◁ Eftf%ofo**

**D3DTRIANGLE** \‘c`ì,ìw**Flags**f f“fo,É,Í AfVfXfef€,”ŽOŠpĚ`ì`ê•”,â îĚ`ð \ ¬,·,é Ů,É A’,“\_ð Ä—  
p,Ä,«,é,æ,□,É,·,éftf%ofo,ª Y’è,³,ê,Ä,¢,é B,±,ê,ç,ìftf%ofo,ð—LĚø,ÉŽg,□  
,Æ A ê ‡,É,à,æ,é,ª A,Í,é,©,É ,‘¬,É“@,©,·,±,Æ,ª,Ä,«,é B

fAfvfŠfP [fVf‡f“,ÍŽŸ,ì,Ó,½,Ä,ìftf%ofo,ðŽg—p,µ,Ä Afhf%oCfo,ÉfAfNfZf%ofoĚ [fVf‡f“,Ì•û—@,ðŽ!´,·,é,±  
,Æ,ª,Ä,«,é B

D3DTRIFLAG\_STARTFLAT(len)

Ě» Ý,ìŽOŠpĚ`ªŽæ,è o,³,ê,é,Æ Afhf%oCfo,à A“WŠJ }  
,â îĚ`©,ç AĚã,É‘±,ŽOŠpĚ`ðlen,ªŽ!· ”,¾,¬Žæ,è o,·,±  
,Æ,ª,Ä,«,é B

D3DTRIFLAG\_ODD,ÆD3DTRIFLAG\_EVEN

fhf%oCfo,Í AŽOŠpĚ`©,ç,Ð,Æ,Ä,ì V,µ,¢’,“\_¾,¬ð Äf [fh,·,ê,Î  
,æ, A¼,Ì,Ó,½,Ä,Ì’,“\_ÍfĚf“f\_fŠf“fo,³,ê,½ Ä V,ìŽOŠpĚ`©,ç Ä  
—~—p,·,é B

%oÂ”\,ÈĚÄ,è Ä ,,ìpftfH {f}

f“fX,ð“¾,é,É,Í AfAfvfŠfP [fVf‡f“,©,ç AD3DTRIFLAG\_STARTFLATftf%ofo,Æ AD3DTRIFLAG\_ODDftf%ofo,Ü  
,½,ÍD3DTRIFLAG\_EVEN,Ì—¼•û,ðŽg—p,·,é B

D3DTRIFLAG\_STARTFLATftf%ofo,ðf`fFfbfN,µ,È,¢fhf%oCfo,à ,é,Ì,Ä A,±,ìftf%ofo,ðŽg—p,·,é,É,Í’ ´Ó,ªK—v,Ä,  
,é B,±,ìftf%ofo,ðf`fFfbfN,µ,È,¢fhf%oCfo,ðŽg,□fAfvfŠfP [fVf‡f“,Ä,Í AfĚf“f\_fŠf“fo,³,ê,é,Í,,ìf|  
fŠfSf“,ªfĚf“f\_fŠf“fo,³,ê,È,¢ ê ‡,ª , é B

fAfvfŠfP [fVf‡f“,Í AD3DTRIFLAG\_ODD,âD3DTRIFLAG\_EVENftf%ofo,ð—p,¢,é‘O,É A

D3DTRIFLAG\_STARTftf%ofo,ðŽw’è,µ,È,,Ä,Ì,È,ç,È,¢ BD3DTRIFLAG\_STARTftf%ofo,ðŽg—  
p,·,é,Æ Afhf%oCfo,Í,·,×,Ä,ìŽOŠp’,“\_ð Äf [fh,·,é BD3DTRIFLAG\_STARTftf%ofo,ðŽw’è,µ,½Ěã,ìŽOŠpĚ`Í A  
D3DTRIFLAG\_ODD,ÆD3DTRIFLAG\_EVENftf%ofo,ð—p,¢,Ä•Ó,ð◁—L,·,é,±,Æ,ª,Ä,«,é B

fffofbfo Efo [fWf‡f“,ìSDK,Í AD3DTRIFLAG\_ODD,ÆD3DTRIFLAG\_EVENftf%ofo,ð—LĚø,É,µ,Ä,¢,é B

Ú,µ,,Í uŽOŠpĚ`ì“WŠJ },Æ îĚ` v,ðŽQ Æ,³,ê,½,¢ B

**f%of“fv EfpftfH [f}f“fX,lfqf“fg**

f,fmfNf if%of“fv j Efhf%ofCfo,ðŽg—p,·,é ê ‡ AfAvfŸfP [fVf‡f“,Í A,Â,«,éĖÀ,è Å ,,lfpftfH [f}  
f“fX,ð“¾,é,½,B,ÉŽŸ,lfefNfjfbfN,ð“K—p,·,é,×,«,Â ,é B

,·,×,Ä,lfefNfXf`ff,Â“¬,¶fpfĖfbfg,ð◻—L,·,é B

fpfĖfbfg,l̇ F ”,ð,Â,«,é,¾,¬ ,È,,·,é B64 F`È%°,ª Â“K,Â ,é B

f}fefŸfAf<,lf%of“fv EfTfCfY,ð16`È%°,É,·,é B

,·,×,Ä,lf}fefŸfAf< ifefNfXf`ff Efnf“fhf<,ð œ, j,ð“¬ê,É,µ AfefNfXf`ff,ªJf%o [fŸf“fO,ðŽw`è,Â,«,é,æ,◻  
,É,·,é B,½,Æ,|,Î A,·,×,Ä,lf}fefŸfAf<,ð”,,µ,Ä A”½ŽĖfpf\_\_\_\_\_,ð“™,µ,•Ů,Â B`½,-  
,lfAvfŸfP [fVf‡f“,Â,Í A,Đ,Æ,Â,lfV [f“,É,Ó,½,Â`È ã,lf}fefŸfAf<,Í•K—v,È,¢ B,Đ,Æ,Â,ÍĖō,ª½ŽĖ,µ,Ä,¢  
,éfIfufWfFfNfg,Â ,è A,à,◻,Đ,Æ,Â,Í”½ŽĖ,µ,È,¢IfufWfFfNfg,Â ,é B

,Â,«,éĖÀ,èfefNfXf`ff,ð ¬,³,,·,é B

•i ”,l̇ ¬,³,ÈfefNfXf`ff,Í A256 ~256fsfNfZf<,l̇1-‡,lfefNfXf`ff,É ‡,í,¹,é B

¬,³,ÈŽOŠpĖ`,ÍOf [ EfVfF [ffBf“fO Ef, [fh,Â A`ª,«,ÈŽOŠpĖ`,Íftf%fbfg EfVfF [ffBf“fO Ef, [fh,ÂfĖf“f\_Ÿf“fO,·,é B

,Đ,Æ,Â`È ã,lpfĖfbfg,ðŽg—p,·,é•K—v,ª ,éŠJ”ŽÒ,Í A,Đ,Æ,Â,lpfĖfbfg,ðf}fXf^ [ EfpfĖfbfg,Æ,µ,Ä—  
p,¢ A`¼,lpfĖfbfg,Íf}fXf^ [ EfpfĖfbfg,l̇TfufZfbfg,ðŠŮ,Đ,æ,◻,É ÝĖv,·,é,Î AfR [fh,ð Â“K%o»,·,é,±  
,Æ,ª,Â,«,é B

**f%of“fv EfefNfXf`ff**

f%of“fv Efhf%ofCfo,ðŽg,▫fAfvfŠfP [fVf‡f“,Å,Í AfefNfXf`ff,ì F ”,ðŒÀ`è,·,é,×,«,Å, ,é Bf,fmfNf ,l̃fefNfXf`ff,Å—p,ç,ç,è,é F,Í AfŒf“f\_fŠf“fO,ì%øß’ö,Å,»,è,¼,ê“ÆŽ©,l̃f<fbfNfAfbfv Efe [fuf<,ð•K—v,Æ,·,é BfV [f“,l̃fŒf“f\_fŠf“fO’†,É”ñ í,É‘½,,l̃ F,ðŽg—p,·,éfAfvfŠfP [fVf‡f“,l̃ ê ‡ AfVfXfef€,Í,½,-³,ñ,l̃f<fbfNfAfbfv Efe [fuf<,ðŽQ Æ,μ,È,,Ä,Í,È,ç,, AfLfffbfVf...,ª \ª,É“- ,©,È,ç B,Ü,½ AfefNfXf`ff“Žm,Å,È,é,×, F,ð<▫—L,·,é,æ,▫,É,·,é,×,«,Å, ,é B8frrfbfg^È ä,ì F ”,ðfTf| [fg,μ,½f%of“fv Efhf%ofCfo,ðŽg,▫ ê ‡,Å,à AfAfvfŠfP [fVf‡f“,l̃,·,×,Ä,l̃fefNfXf`ff,Í,Đ,Æ,Â,l̃pfŒfbfg,É ‡,í ,¹,é,ì,ª — ‘z“l,Å, ,é B

## Zfofbftf@

f%of“fv Efhhf%ofCfo,ðŽg—p,·,éfAfvfŠfP [fVf‡f“,Í AfV [f“,“O,©,çEä,ë,ÖfEf“f\_Šf“fO,³,é,é,æ,□  
,ÉZfofbftf@fŠf“fO,ð—p,ç,ÄfefNfXf`ff,ð ^— ,·,é,Æ AfpftfH [f}f“fX,ðEü ä,³,¹,é,±  
,Æ,ª,Ä,«,é BfefNfXf`ff,ð“K—p,µ AZfofbftf@,ð—~—p,µ,½fvfŠf~fefBfu,É,Í AŠî €  
,Æ,É,éfXfLfff“f%ofCf“ ä,ÄZfofbftf@,É,Ä,ç,Ä,İfvfEfXfg,ª s,í,é,é B‘O,à,Ä,ÄfEf“f\_Šf“fO,³,é,½f|  
fŠfSf“,İ,½,ß,ÉfXfLfff“f%ofCf“,ªB,é,Ä,ç,é ê ±,Í AfVfXfef€,ªf|fŠfSf“,ð ,¬,©,ÄEø—“I,ÉŽæ,è æ,-  
BZfofbftf@fŠf“fO,É,æ,Ä,ÄpftfH [f}f“fX,İ%ü‘P,³,é,é,ª A,±  
,İfefNfjfbfN,Í AfV [f“,ª%½“x,àfI [fo [fhf [ ,ð•K—v,Æ,·,é,Æ,«,É Ä,àEø%öÊ“I,Ä, ,é BfI [fo [fhf [ ,Æ,Í  
AfXfNfŠ [f“ EfSfNfZf< ,ª“%æ,³,é,é•½,İ%öñ ”,ðŽ!,· BfI [fo [fhf [ ,ð ³Šm,ÉEvŽZ,·,é,±,Æ,Í ç“İ,¾,ª A·ßŽ  
—‘l,ð< ,ß,é,±,Æ,İ%öÄ“,Ä, ,é BfI [fo [fhf [ ,İ•½,İ,²,æ,è,à ¬,³,ç  
,Æ,«,Í AZfofbftf@fŠf“fO,ðfIf,É,·,é,Æ Ä ,İpftfH [f}f“fX,ð“¾,é,±,Æ,ª,Ä,«,é B

,Ü,½ AfvfŠf~fefBfu,ÉZfefXfg,ð s,µ,±,Æ,É,æ,Ä,Ä A,Ä,Ü,è AZfofbftf@,É,Ä,ç,Ä—  
^,‘,ç,é,½fvfŠf~fefBfu EfŠfXfg,ðfefXfg,·,é,±,Æ,É,æ,Ä,Ä AfAfvfŠfP [fVf‡f“,İpftfH [f}f“fX,ðEü ä,·,é,±  
,Æ,ª,Ä,«,é B,±,é,É,æ,è A‘İ%öŽ,·,é,éE”ÍÍ,İŽæ“¾,ª ,¬,É s,í,é,é,æ,µ,É,É,é B

•ÜŽ f, [fhAPI,Í AZfofbftf@,İ Ä“K%»,ð—  
e‘Ö,É,·,é,½,ß A‘O,©,çEä,ë,ÖŽ©“@“I,ÉfV [f“,ð•Ä,×‘Ö,‘,é B,³,ç,É•ÜŽ f, [fh,Í A, ,é‘ö“x,İŽÖŠpE`,ðŠÜ,þf þbfVf  
...,É,Ä,ç,Ä,Í AfvfŠf~fefBfu,İZfefXfg,à s,µ B

Žw`è,µ,½fhf%ofCfo,İfI [fo [fhf [ “”,ðŽŽ,·,½,ß,É A,±,İSDK,İD3dtest.exeAfVfŠfP [fVf‡f“,ð—p,ç  
,ÄtfBf< EfE [fg,İfefXfg,ð s,µ,±  
,Æ,ª,Ä,«,é iftBf< EfE [fg EfefXfg,Ä,Í A4,Ä,İfgf“flf<,ð A‘O,©,çEä,ë A,Ü,½,ÍEä,ë,©,ç‘O,Ö A‘İð,³,é,½ Ý’  
è,Ä•%æ,·,é j B

,·,¬,Èfp [fVif< EfRf“fsf... [f^,Ä,Í Af\ftgfEfFfA“I,ÉfVfXfef€ Ef f,Š,ÉfEf“f\_Šf“fO,µ,½,Ü,□  
,ª AfrffI Ef f,Š,Ö,İfEf“f\_Šf“fO,æ,è,à¬,ç,±,Æ,ª ,È,,È,ç B,½,¾,µ,±  
,İ ê ± Af\_fuf< Efofbftf@fŠf“fO,âfñ [fhEfFfA EfAfNfZf%ofE [f^,İ‘€ i,ð s,µ,±,Æ,ª,Ä,«,È,ç,Æ,ç  
,çff fŠfbfg,ª, ,é BfVfXfef€ Ef f,Š,É,âfrffI Ef f,Š,É,âfEf“f\_Šf“fO,·,é,±,Æ,ª,Ä,« A,ç,è,ç,ª ,¬,Ä, ,é,©,  
ðfefXfg,·,éf< [f“f“,ðŠÜ,ñ,Ä,ç,é,Í AfAfvfŠfP [fVf‡f“,İŽÄ sŽž,İfVfXfef€,É Ä“K,ÈfAfvf [f“,ð—~—p,·,é,±  
,Æ,ª,Ä,«,é B,±,İSDK,İDirect3DfTf“fvf< EfR [fh,Í A ä·L,İ·ü—@,ðŽÄE»,µ,Ä,ç,é BfXfs [fh,ðfefXfg,·,é•ü—  
@,İ‘¼,É,È,ç,½,ß A,±,İ—¼•ü,İŽè ±,ðfCf“fvfŠf f“fg,·,éK—v,ª, ,é BfRf“fsf... [f^,É,æ,Ä,ÄfXfs [fh,Í‘S,-  
`Ü,È,è Af fCf“ Ef f,Š,İ ‘ç,âŽg—p,³,é,Ä,ç,éfOf%oftfBfbfN EfAf\_fvf^,İŽi—  
p,É`E`¶,·,é BD3dtest.exe,Í AfVfXfef€ Ef f,Š,İfrffI Ef f,Š,É‘İ,·,éXfs [fh,İfefXfg,ÉŽg—p,·,é,±  
,Æ,Í,Ä,«,éª Af† [fU,İfp [fVif< EfRf“fsf... [f^,İpftfH [f}f“fX,ð—\ª,·,é,±,Æ,Í,Ä,«,É,ç B

Direct3D,İ,·,×,Ä,İTf“fvf<,Í AsystemmemoryfRf}f“fhf%ofCf“ EfIfvVf‡f“,ðŽw`è,·,é,Æ AfVfXfef€ Ef f,Š,ð  
—~—p,µ,Ä“@ İ,·,é B,±,İfIfvVf‡f“,İfR [fh,İŠJ” ä—L—p,Ä, ,é B,±  
,é,É,æ,Ä,Ä AfAfvfŠfP [fVf‡f“,ðŽ,”s ifail j,³,¹,é Ü AfVfXfef€,ð’âŽ~,¹,,ÉfEf“f\_Šf“fO,ð’t‘f,·,é•ü—@,ð’m,é,±  
,Æ,ª,Ä,«,é B,½,Æ,,İDirectDraw,Í AfVfXfef€ Ef f,Š EfT [ftfFX,ÉWIN16f fbfn,ð,©,¬,é,±  
,Æ,Í,É,ç iWIN16f fbfn,Í AGDI,âUSER,Ö,İfAfNfZfX,ðfVfŠfAf·%»,µ AIDirectDrawSurface2::Lock,ÆIDirectDr  
awSurface2::Unlockf ffbfh,İEÄ,Ñ o,µ,İŠÖ,ÉWindows,ðfVfffbfg Ef\_fEf“,·,é BIDirectDrawSurface2::GetDC,ÆI  
DirectDrawSurface2::ReleaseDC,İEÄ,Ñ o,µ,İŠÖ,É,Ä,ç,Ä,à“—l,Ä, ,é j B



**fRfs [ Ef, [fh**

f%of“fv Efhf%ofCfo,ð—p,¢,é fAfvfŠfP [fVf‡f“,Í AD3DTEXTUREBLEND—  
ñ“Œ^,İD3DTBLEND\_COPYefNfXf`ff EfufŒf“ffBf“fO Ef, [fh,ðŽw`è,·,é,Œ Afpfth [f}  
f“fX,ð%ü‘P,Ä,«,é ê ‡,ª, ,é B

fRfs [ Ef, [fh,ð—~—p,·,é,É,Í AfAfvfŠfP [fVf‡f“,İfefNfXf`ff,Í Afvf%ofCf}  
fŠ Eft [ftfFX,Œ““ŒfsfNfZf< EftfH [f}fbfg,âfpfŒfbfg,ðŽg,í,È,,Ä,Í,È,ç,È,¢ BfRfs [ Ef, [fh,ÍŒð,ð“K—  
p,¹,, A‘P f,ÉfsfNfZf<,ðfXfNfŠ [f“,ÉfRfs [·,é B,·,Ä,ÉŒðŒ¹,ðŽ{,µ,½fefNfXf`ff,ð—p,¢,é fV [f“,Ä,Í A,±  
,İfefNfjfbfN,ª–ð,É—§,Ä B

8frfbfg EfJf% [ ,İŒðŒ¹,ª,È,¢f,fmfNf Ef,ff<,ðŽg,ƆfAfvfŠfP [fVf‡f“,Í AfRfs [ Ef, [fh,É,æ,Ä,ÄfpftfH [  
f}f“fX,ªŒü ä,·,é B,µ,©,µ16frfbfg EfJf% [ ,ðŽg—  
p,·,é ê ‡,Í AfefNfXf`ff,ð’² ®,·,é ê ‡,Œ,»,ê,Û,Ç•İ,í,ç,È,¢Xfs [fh,É,È,é B16frfbfg EfJf% [ ,Ä,Í AfefNfXf  
`ff,İfTfCfY,ª8frfbfg,İ ê ‡,İ2”{ ,É,È,è A—]Œv,È•%×,ªfLfffbfVf...,É,©,©,é,½,ß Afpfth [f}  
f“fX,İ8frfbfg,İfefNfXf`ff,æ,è,à,í,,©,É’á%°,·,é B,±,İ ê ‡,É,à AfVfXfefŒ,İfpftfH [f}  
f“fX,ðŠm”F,·,é,½,ß,ÉD3dtest.exe,ð—~—p,·,é,±,Œ,ª,Ä,«,é B

•ŮŽ f, [fh,lŠT—v

•ŮŽ f, [fh,É,Ā,¢,Ā

,±,lfZfNfVf‡f“,Ā,Í ADirect3D,ĭ•ŮŽ f, [fh,É,Ā,¢,Ā à¾,·,é B•ŮŽ f, [fh,Í Afp [f\fi< EfRf“fsf...  
[f^ ã,Ā3DfOf%oftfBfbfNfX,đŽĀĒ»,·,é,½,ß,ÉMicrosoft,“ñ<Ÿ,·,é f\Ÿf... [fVf‡f“,Ā, ,é B3DŠĀ««,đ ĭ ¬,µ AfŠf  
Af<f^fCf€,É ^— ,µ,½,¢ ê ‡,Í ADirect3D,ĭ•ŮŽ f, [fhAPI,đŽg—p,·,é,x,«,Ā, ,é B

Direct3D,ÍDirectDraw,ÆŠ@‘S,É“ ‡,³,ê,Ā,¢,é BDirectDrawIfufWfFfNfg,Í ADirectDraw,ÆDirect3D,ĭ—  
¼•û,ĭ ó‘Ō,đ•ŮŽ ,µ,Ā,¢,é BfAfvfŠfP [fVf‡f“,Í AIDirectDraw::QueryInterface f\fbfh,đ—p,¢  
,Ā ADirectDrawIfufWfFfNfg,ĭIDirect3DfCf“f^ [ftfFfCfX,đŽæ“¾,·,é,±  
,Æ,ª,Ā,«,é BDirect3D,ÆDirectDraw,ĭ“ ‡,É,Ā,¢,Ā Ů,µ,-  
,Í A uDirect3Dfhf%ofCfo EfCf“f^ [ftfFfCfX v,đŽQ Æ,³,ê,½,¢ B

•ŮŽ f, [fh,ĭŠi‘b,É, ,éŠT”O,Í A^È‘O,É3DfOf%oftfBfbfNfX,ĭfR [fh,đ ‘,¢,½,±,Æ,ĭ, ,éŠJ”ŽŌ,É,Æ,Ā,Ā,Í“é õ,Ÿ [,¢  
,à,ĭ,¾,ë,▯ B,µ,©,µ A %o,ß,Ā3Dfvf fOf%of~f“fO,đ s,▯ŠJ”ŽŌ,Í A ufCf“fgf f\_fNfVf‡f“:.  
Direct3D,ĭ•ŮŽ f, [fh EfIfufWfFfNfg v,Æ u3Dfvf fOf%of~f“fO,ĭŠi‘b<Z p v,đ \ª,É— %ođ,·,é•K—v,ª, ,é B,±  
,ê,©,ç3Dfvf fOf%of~f“fO,đŽn,ß,éŠJ”ŽŌ,à AŽn,ß,½,ĭ,©,è,ĭŠJ”ŽŌ,à A,±,ĭSDK,ÉŠŮ,Ů,ê,Ā,¢  
,éfTf“fvf< EfR [fh,đ’ ^Ó [,“Ç,ñ,Ā,¢  
,½,¾,«,½,¢ BfTf“fvf< EfR [fh,Í AŽĀ Ů,ĭfAfvfŠfP [fVf‡f“,É•ŮŽ f, [fh,đŽĀ•,·,é•û—@,đŽ!,µ,Ā,¢,é B

,±,lfZfNfVf‡f“,Í A3D fvf fOf%of~f“fO,Ō,ĭfCf“fgf f\_fNfVf‡f“,Ā, ,é B,±,±,Ā,Í AMicrosoft,ĭ3D  
fOf%oftfBfbfNfX,É‘ĭ,·,é f\Ÿf... [fVf‡f“,Æ A3 ŽŸĒ³ ã,ĭ“\_,đ‘€ ĭ,·,é,½,ß,É•K—v,È A,¢,,Ā,©,ĭ<Z p“ĭ,È—  
“õ’mŽ-,É,Ā,¢,Ā à¾,·,é B,±,ê,Í ADirect3D,ĭ•ŮŽ f, [fh,ĭfvf fOf%of~f“fO,ĭ %o•à,É,Ā,¢,Ā à-  
¾,µ,½,à,ĭ,Ā,ĭ,É,¢ B•ŮŽ f, [fh,ĭfvf fOf%of~f“fO,É,Ā,¢,Ā,Í A uDirect3D,ĭ•ŮŽ f, [fh,ĭf`f...  
[fgfŠfAf< v,đŽQ Æ,³,ê,½,¢ B

**fCf“fgf f\_fNfVf‡f“: Direct3D,İ•ŮŽ f, [fh EfIfufWfFfNfg**

Direct3D,İ•ŮŽ f, [fh,Ö,İfAfNfZfX,Í A,í,,©,È ”,İfIfufWfFfNfg,đ’Ê,µ,Ä s,í,ê,é B^È%°,İ•\,É,± ,ê,ç,İfIfufWfFfNfg,đfŠfXfgfAfbfv,µ A,»,ê,¼,ê,É,Â,¢,ÄŠÈ’P,É à–¼,.,é B

**fIfufWfFfNfg**

à–¼

Direct3DRMAnimation

Žă,ÉDirect3DRMFramefIfufWfFfNfg,đŽQ Æ,.,é,Æ ,«,É A,Ç,İ,æ,□ ,É•İŠ•,ÉŽè,đ%Á,!,é,©,đ’èç,.,éIfufWfFfNfg,Ä, ,é B,± ,İfIfufWfFfNfg,Í ADirect3DRMVisual ADirect3D RMLight ADirect3DRMViewportfIfufWfFfNfg,İ^Ê’ u,âĈü,« AfXfP [f<,đfAfjf [fVf‡f“,.,é,½,ß,ÉŽg ,□,±,Æ,ª,Ä,«,é B

Direct3DRMAnimationSet

Direct3DRMAnimationfIfufWfFfNfg,đfOf< [fv%», .,éIfufWfFfNfg,Ä, ,é B

Direct3DRMDevice

fĈf“f\_fŠf“fO,İ o— Í æ,İ%ŌŽ<ffBfXfvfĈfC,đŽ!,.fIfufWfFfNfg,Ä, , é B

Direct3DRMFace

f fbfVf... ä,İ,D,Æ,Â,İf|fŠfSf“,đ•\ ,.fIfufWfFfNfg,Ä, ,é B

Direct3DRMFrame

,± ,İfIfufWfFfNfg,Í AfV [f“,ÉfIfufWfFfNfg,đ”z’u, µ AfrfWf... fAf< EfIfufWfFfNfg,İ^Ê’u,âĈü,«,đ’èç,.,é B

Direct3DRMLight

,±,İfIfufWfFfNfg,Í A5Ží— b,İĈĈĈ¹,İ,D,Æ,Â,đ’èç,µ AfV [f“,İfrfWf... fAf< EfIfufWfFfNfg,đ Ê F,.,é,½,ß,É—p,¢ ,ç,ê,é B

Direct3DRMMaterial

,±,İfIfufWfFfNfg,Í AfT [ftfFfX,ª,Ç,İ,æ,□ ,ÉĈĈ,đ”½ŽĚ,.,é,©,đ’èç,.,é B

Direct3DRMMesh

f|fŠfSf“,İ-Ê,İfZfbfg,đŠŮ,bfIfufWfFfNfg,Ä, ,é B -Ê,â’,“\_,İfOf< [fv,đ’Ĉ İ,.,é,½,ß,ÉŽg,□,± ,Æ,ª,Ä,«,é B

Direct3DRMMeshBuilder

,±,İfIfufWfFfNfg,É,æ,Ä,Ä Af fbfVf...,É, ,éĈÄ X,İ’,“\_,â-Ê,đ’Ĉ İ,.,é,±,Æ,ª,Ä,«,é B

Direct3DRMObject

Direct3D,İ•¼,İ,.,×,Ä,İ•ŮŽ f, [fh EfIfufWfFfNfg ,ª—p,¢,éŠî-{fNf%oX,Ä, ,é B,.,×,Ä,İfIfufWfFfNfg,É,Ĉ’Ê,Ê“Á”Ÿ,đ•ŮŽ ,µ,Ä,¢,é B

Direct3DRMPickedArray

,±,İfIfufWfFfNfg,Í A— ^,!,ç,ê,½2D,İ“\_,É’İ%ž,.,éfrfWf... fAf< EfIfufWfFfNfg,đŽ~•Ê,.,é B

Direct3DRMShadow

%oA%oe,đ’èç,.,éIfufWfFfNfg,Ä, ,é B

Direct3DRMTexture

F,İ•t,¢,½fsfNfZf<,ª,éĈ`,É•Ä,ñ,¼fIfufWfFfNfg,Ä, ,é B

Direct3DRMUserVisual

fVfXfefĈ,ªñ<Ÿ,µ,È,¢<@”\ ,đŽÄĈ»,.,é,½,ß AfAfvfŠfP [fVf‡f“,ª”èç,.,éIfuf WfFfNfg,Ä, ,é B

Direct3DRMViewport

,±,İfIfufWfFfNfg,Í A3DfV [f“,ª,Ç,İ,æ,□ ,É2DfEfBf“fhfE,ÉfĈf“f\_fŠf“fO,³,ê,é,©,đ’èç,.,é B

Direct3DRMVisual

fV [f“,ÉfĈf“f\_fŠf“fO,.,é,± ,Æ,ª,Ä,«,éIfufWfFfNfg,Ä, ,é BfrfWf... fAf< EfIfufWfFfNfg,İ%ŌŽ< ó’Ō,Ä,È,- ,Ä,à,æ,¢ B,½,Æ,!,Î AftfĈ [fĈ,đfrfWf... fAf< EfIfufWfFfNfg,Æ,µ,Ä’Ç%ŌÄ,.,é,± ,Æ,à,Ä,«,é B

Direct3DRMWrap

,±,İfIfufWfFfNfg,Í A-Ê,âf fbfVf...  
,İfefNfXf`ff Â•W,ðƐvŽŽ,·,é B

‘½,,İfIfufWfFfNfg,Í A”z—ñfIfufWfFfNfg,ÆƐĂ,Î,ê,é”z—ñ,ÉfOf< [fv%o»,·,é,±,Æ,<sup>a</sup>Ă,«,é B”z—  
ñfIfufWfFfNfg,É,æ,Ă,Ă AfOf< [fv‘S‘İ,É‘Ɛ İ,ð“K—p,·,é,±,Æ,<sup>a</sup>—e˘Ö,É,È,é B”z—ñfIfufWfFfNfg,ðŽg,²,±  
,Æ,<sup>a</sup>Ă,«,éCOMfCf“f^ [ftfFfCfX,É,Í AGetElement,ÆGetSizef f\fbfh,<sup>a</sup>ŠÜ,Ü,ê,Ă,Ɛ,é B,±,ê,ç,İf f\fbfh,Í A”z—ñ  
—v‘f,Ö,İf|fCf“f^,Æ”z—ñ,İfTfCfY,ðŽó,˘Žæ,é B”z—ñfCf“f^ [ftfFfCfX,É,Ă,Ɛ,Ă Ú,µ,,Í A uDirect3DRM”z—  
ñfCf“f^ [ftfFfCfX v,ðŽQ Æ,<sup>3</sup>,ê,½,Ɛ B

**flfufWfFfNfg,ÆfCf“f^ [ftfFfCfX**

*IObjectName::QueryInterface*,Í AfIfufWfFfNfg,»,»l,fCf“f^ [ftfFfCfX,ðfTf| [fg,µ,Ä,¢,é ê ±,ì,Ý A—  
LÆø,ÈfCf“f^ [ftfFfCfX,Ö,ìf|  
fCf“f^,ðŽæ“¾,·,é B,µ,½,ª,Ä,Ä **AIDirect3DRMDevice::QueryInterface**,ðÆÄ,Ñ o,µ,Ä**AIDirect3DRMWinDevice**fCf“f^  
[ftfFfCfX,ðŽó,¬Žæ,é,±,Æ,Í,Ä,«,é,ª **AIDirect3DRMVisual**fCf“f^ [ftfFfCfX,ðŽó,¬Žæ,é,±,Æ,Í,Ä,«,É,¢ B

**flfufWfFfNfg—¼** **fTf| [fg,³,ê,éfCf“f^ [ftfFfCfX**

Direct3DRMAnimation	<u><a href="#">IDirect3DRMAnimation</a></u>
Direct3DRMAnimationSet	<u><a href="#">IDirect3DRMAnimationSet</a></u>
Direct3DRMDevice	<u><a href="#">IDirect3DRMDevice</a></u> , <u><a href="#">IDirect3DRMWinDevice</a></u>
Direct3DRMFace	<u><a href="#">IDirect3DRMFace</a></u>
Direct3DRMFrame	<u><a href="#">IDirect3DRMFrame</a></u> , <b>IDirect3DRMVisual</b>
Direct3DRMLight	<u><a href="#">IDirect3DRMLight</a></u>
Direct3DRMMaterial	<u><a href="#">IDirect3DRMMaterial</a></u>
Direct3DRMMesh	<u><a href="#">IDirect3DRMMesh</a></u> , <b>IDirect3DRMVisual</b>
Direct3DRMMeshBuilder	<u><a href="#">IDirect3DRMMeshBuilder</a></u> , <b>IDirect3DRMVisual</b>
Direct3DRMShadow	<u><a href="#">IDirect3DRMShadow</a></u> , <b>IDirect3DRMVisual</b>
Direct3DRMTexture	<u><a href="#">IDirect3DRMTexture</a></u> , <b>IDirect3DRMVisual</b>
Direct3DRMUserVisual	<u><a href="#">IDirect3DRMUserVisual</a></u> , <b>IDirect3DRMVisual</b>
Direct3DRMViewport	<u><a href="#">IDirect3DRMViewport</a></u>
Direct3DRMWrap	<u><a href="#">IDirect3DRMWrap</a></u>

ŽŸ,ìfTf“fvf< fR [fh,Ä,Í A,Ð,Æ,Ä,ìDirect3DRMDeviceIfufWfFfNfg,É,Ó,½,Ä,ìfCf“f^ [ftfFfCfX,ð ¶ ¬,·,é•û—  
@,ð ã—¾,µ,Ä,¢,é B **IDirect3DRM::CreateObject** f\fbfh,Í A %Šú%»»,³,ê,Ä,¢  
,È,¢Direct3DRMDeviceIfufWfFfNfg,ð ¶ ¬,·,é BflfufWfFfNfg,ì %Šú%»»,Í **AIDirect3DRMDevice::InitFromClip**  
**perf** f\fbfh,È,æ,Ä,Ä s,í,ê,é B**IDirect3DRMDevice::QueryInterface** f\fbfh,ìÆÄ,Ñ o,µ,Í A**Direct3DRMDevice**If  
ufWfFfNfg,Ö,ì,Ó,½,Ä,ß,ìfCf“f^ [ftfFfCfX iWM\_PAINT,ª,ÑWM\_ACTIVATEf fbfZ [fW,Ö,ì%ž“šŽž,É—p,¢  
,ç,ê,é**IDirect3DRMWinDevice**fCf“f^ [ftfFfCfX j,ð ¶ ¬,·,é B

```
d3drmapi->CreateObject(CLSID_CDirect3DRMDevice, NULL,  
IID_IDirect3DRMDevice, (LPVOID FAR*)&dev1);  
dev1->InitFromClipper(lpDDClipper, IID_IDirect3DRMDevice,  
r.right, r.bottom);  
dev1->QueryInterface(IID_IDirect3DRMWinDevice, (LPVOID*) &dev2);
```

,Ó,½,Ä,ìfCf“f^ [ftfFfCfX,“¬ê,ìfIfufWfFfNfg,ðŽQ Æ,µ,Ä,¢,é,©,Ç,ª  
,©,ð”»’è,·,é,È,Í A,»,ê,¼,ê,ìfCf“f^ [ftfFfCfX,É,Ä,¢,Ä**QueryInterface** f\fbfh,ðÆÄ,Ñ o,µ A•Ö,³,ê,éf|  
fCf“f^,ì¹,ð”äŠr,·,é B|fCf“f^,ì¹,“™,µ,¢ ê ± AfCf“f^ [ftfFfCfX,Í““,¶flfufWfFfNfg,ðŽQ Æ,µ,Ä,¢,é B

Direct3D,ì,·,×,Ä,ì•ŰŽ f, [fh EfIfufWfFfNfg,Í A•O q,µ,½fŠfXfg’†,ìfCf“f^ [ftfFfCfX,É%Ä,ì **AIDirect3DRMO**  
**bject**fCf“f^ [ftfFfCfX,Æ**IUnknown**fCf“f^ [ftfFfCfX,ðfTf| [fg,µ,Ä,¢  
,é B,µ,©,µ **AIDirect3DRMObject**flfufWfFfNfg,Í”z—ñIfufWfFfNfg,ð’ñ<Ÿ,µ,È,¢ B”z—ñIfufWfFfNfg,Í A•K—  
v,ª,È,¢,½,ß AfNf%ofXŽ•ÊŽq iCLSID j,ðŽ ,Ä,Ä,¢  
,È,¢ **BIDirect3DRM::CreateObject** f\fbfh,ìÆÄ,Ñ o,µ,Ä,Í A”z—ñIfufWfFfNfg,ð ì ¬,·,é,±  
,Æ,Í,Ä,«,È,¢ B,»,ì’ä,í,é AŠefCf“f^ [ftfFfCfX,É,Ä,¢,Ä^È%°,ì ¶ ¬f f\fbfh,ðŽg—p,·,é B

**”z—ñfCf“f^ [ftfFfCfX ¶ ¬f f\fbfh**

[IDirect3DRMDeviceArray](#) **IDirect3DRM::GetDevices**

[IDirect3DRMFaceArray](#) **IDirect3DRMMeshBuilder::GetFaces**

[IDirect3DRMFrameArray](#) **IDirect3DRMPickedArray::GetPick**

,Ü,½,Í

<u><i>IDirect3DRMLightArray</i></u>	<u><b>IDirect3DRMFrame::GetChildren</b></u>
	<u><b>IDirect3DRMFrame::GetLights</b></u>
<u><i>IDirect3DRMPickedArray</i></u>	<u><b>IDirect3DRMViewport::Pick</b></u>
<u><i>IDirect3DRMViewportArray</i></u>	<u><b>IDirect3DRM::CreateFrame</b></u>
<u><i>IDirect3DRMVisualArray</i></u>	<u><b>IDirect3DRMFrame::GetVisuals</b></u>

**fIfufWfFfNfg,ÆŽQ ÆfJfEf“fg**

fIfufWfFfNfg,ª ¶ ¬,³,ê,é,Æ A,Â,Ë,Ê,»,ìŽQ ÆfJfEf“fg,ªfCf“fNfŠf f“fg,³,ê,é BfAfvfŠfP [fVf‡f“,ªfIfufWfFfNfg,ìŽq,ð ì ¬,µ,½,è Af f\fbfh,ªfIfufWfFfNfg,Ö,ìf|fCf“f^,ð•Ö,µ,½,è,·,é,½,Ñ,É AfVfXfef€  
 ,Í,»,ìfIfufWfFfNfg,ìŽQ ÆfJfEf“fg,ð‘ %oÁ,³,¹,é BfIfufWfFfNfg,Í AŽQ ÆfJfEf“fg,ª0,É,È,é,Ü,À í œ,³,ê,é,± ,Æ,Í,Ë,¢ B

fAfvfŠfP [fVf‡f“,Í AfV [f“,ìf< [fgfIfufWfFfNfg,É,Â,¢,Ä,ì,Ý AŽQ ÆfJfEf“fg,ð•ÜŽ ,·,é•K—v,ª ,é B‘¼,ìfIfufWfFfNfg,ìŽQ ÆfJfEf“fg,Í AŽ©“®“I,ÉfVfXfef€,ªŠÇ— ,·,é BfAfvfŠfP [fVf‡f“,Í A I—  
¹,·,é‘O,ÉfV [f“,âf rf... [f] [fg AffofCfX,ð%ð•ú,·,é,¾,¯,Å,æ,¢ ifAfvfŠfP [fVf‡f“,ªf rf... [f]  
 [fg,ð%ð•ú,·,é,Æ AfVfXfef€,ÍŽ©“®“I,ÉfJf f%,ìŽQ ÆfJfEf“fg,ð ^— ,·,é j B— ~“I,É,Í A V,µ,¢f rf... [f]  
 [fg,ðfffofCfX,É‘Ç%oÁ,·,é ê ‡,ì,æ,º,É AfAfvfŠfP [fVf‡f“,ÍfffofCfX,ð%ð•ú,¹,,Éf rf... [f] [fg,ð%ð•ú,·,é,± ,Æ,ª,Ä,«,é B,µ,©,µ AffofCfX,ð%ð•ú,·,é,Æ,«,Í A“—l,Éf rf... [f] [fg,à%ð•ú,µ,È,,Ä,Í,È,ç,È,¢ B

ŽqfIfufWfFfNfg,âf rfWf...fAf< EfIfufWfFfNfg,ìŽQ ÆfJfEf“fg,Í AftfŒ [f€  
 ,É‘Ç%oÁ,³,ê,é,Æ,«,É‘ ,â,³,ê,é B**IDirect3DRMFrame::AddChild**f f\fbfh,ðŽg—p,µ,Ä A ,é efIfufWfFfNfg,©,ç•Ê,ì  
 e,ÉŽqfIfufWfFfNfg,ð˘Ú“®,·,é,Æ AfVfXfef€,ÍŽ©“®“I,ÉŽQ ÆfJfEf“fg,ð‘€ ì,·,é B

fAfvfŠfP [fVf‡f“,ªf rfWf...  
 fAf< EfIfufWfFfNfg,ðfV [f“,Éf< [fh,µ,½Œä,Í AfV [f“,ªfIfufWfFfNfg,ìŽQ ÆfJfEf“fg,ðŠÇ—  
 ,·,é BfAfvfŠfP [fVf‡f“,É,Æ,Á,Ä,Í Af rfWf...fAf< EfIfufWfFfNfg,Í,à,ºs—v,Æ,È,è A%ð•ú,·,é,± ,Æ,ª,Ä,«,é B

f%ofbfv,ì ì ¬,Æ“K—  
 p,Í A,Ç,ìfIfufWfFfNfg,ìŽQ ÆfJfEf“fg,à‘ %oÁ,³,¹,È,¢ Bf%ofbfsf“fO,Í A‘P,ÉfefNfXf`ff,ì À•W,ðŒvŽZ,·,é,¾,¯,  
 ì•Ö—~,Éf f\fbfh,É,·,¬,È,¢,½,ß,Ä, ,é B



**IDirect3DRMfCf“f^ [ftfFfCfX**

fAfvfŠfP [fVf‡f“,Í A**IDirect3DRMfCf“f^ [ftfFfCfX**,İf f\fbfh,ð—p,¢  
,Ä ADirect3DRMfIfufWfFfNfg,ð ì ¬,µ AfVfXfef€ EfƎfxf<,İ•İ ”,ðŽg—p,·,é,±,Æ,<sup>a</sup>,Å,«,«<sup>é</sup> B,±  
,İfCf“f^ [ftfFfCfX,İf f\fbfh,É,Ä,¢,Ä,Í A u**IDirect3DRM** v,ðŽQ Æ,<sup>3</sup>,ê,½,¢ B

**IDirect3DRMfCf“f^ [ftfFfCfX,İf f\fbfh,Í A`È%°,İfIfufWfFfNfg,ð ¶ ¬,·,é,±,Æ,<sup>a</sup>,Å,«,«<sup>é</sup> B**

fAfjf [fVf‡f“,ÆfAfjf [fVf‡f“ EfZfbfg

fffofCfX

–Ê iface j

ftfƎ [f€

%Šú%»,<sup>3</sup>,ê,Ä,¢,È,¢^ê”ÊIfufWfFfNfg

Ǝö

f}fefŠfAf<

f fbfVf...,Æf fbfVf... frf<f\_

%A%œ

fefNfXf`ff

f† [fU EfrfWf...fAf<

frf... [f| [fg

f%fbfv

**IDirect3DRMAnimation,ÆIDirect3DRMAnimationSetfCf“f^ [ftfFfCfX**

•ŮŽ f, [fh,lfAfjf [fVf‡f“,Í AfL [,lfZfbfg,Ä’è‘,³,ê,é BfL [,Æ,Í AfXfP [fŠf“fO‘€ ì ACEü,« A, ,é,¢  
,ÍÊ’u,ÉŠÖ~A•t,¯,ç,ê,½f^fCf€’l,Ä, ,é BDirect3DRMAnimationIfufWfFfNfg,Í Af^fCf€’l,É,æ,Ä,Ä,Ç,Ì,æ,¤,É•İŠ· ^—  
,<sup>a</sup> s,í,ê,é,©,ð’è‘,·,é,à,Ì,Ä, ,é BfAfjf [fVf‡f“,Í ADirect3DRMFrameIfufWfFfNfg ä,Ä“@ ì,·,é,æ,¤  
,É Ý’è,·,é,±,Æ,<sup>a</sup>,Ä,«é B,±  
,Ì,½,ßDirect3DRMAnimationIfufWfFfNfg,Í ADirect3DRMVisual ADirect3DRMLight A,¯,æ,ÑDirect3DRMViewport  
fIfufWfFfNfg,ÌÊ’u E€ü,«,lfAfjf [fVf‡f“,âfXfP [fŠf“fO,ÉŽg—p,·,é,±,Æ,<sup>a</sup>,Ä,«é B

**IDirect3DRMAnimation::AddPositionKey A**

**IDirect3DRMAnimation::AddRotateKey AIDirect3DRMAnimation::AddScaleKey** f\fbfh,Í A,»,ê,¼,ê”C^Ó,Ì’P^Ê,lf^  
fCf€’l,ð Ý’è,·,é B,½,Æ,Ì,Í AfAfvfŠfP [fVf‡f“,<sup>a</sup>f^fCf€’l99,lf|  
fWfVf‡f“ EfL [,ð’Ç%oÄ,µ,½ è ‡ Af^fCf€’l49,Ì V,µ,¢f|  
fWfVf‡f“ EfL [,Í AfAfjf [fVf‡f“,Ì i0,©,çŽn,Ü,é jŠJŽnŽž“\_,Æ Ä %o,lf|fWfVf‡f“ EfL [,Ì,¿,â,¤  
,Ç+ŠÖ,ÄfCfxf“fg,ð ¶ ¬,·,é B

fAfjf [fVf‡f“,Í **AIDirect3DRMAnimation::SetTime** f\fbfh,ÌEÄ,Ñ o,µ,É,æ,Ä,Ä §Eä,³,ê,é B,±  
,lf f\fbfh,Í AfrfWf...  
fAf< EfIfufWfFfNfg,ð V,µ,¢Ê’u,ÆEü,«,É•İŠ·,µ A Ä,à&,¢fL [,lfXfP [f<,É Ý’è,·,é BfAfjf [fVf‡f“ EfL  
[,ð’Ç%oÄ,·,é f\fbfh,É,¯,¢  
,Ä **AIDirect3DRMAnimation::SetTime**,lf^fCf€’l,Í AfAfvfŠfP [fVf‡f“,<sup>a</sup>,·,Ä,É’Ç%oÄ,µ,½fL [,ÌÊ’u,ÉŠî,Ä,¢  
,½”C^Ó,Ì’l,Ä, ,é B

Direct3DRMAnimationSetfIfufWfFfNfg,Í ADirect3DRMAnimationSetfIfufWfFfNfg,ðfOf< [fv%o»,·,é,±  
,Æ,<sup>a</sup>,Ä,«é B,±,ê,É,æ,Ä,Ä AfAfjf [fVf‡f“ EfZfbfg’t,Ì,·,×,Ä,lfAfjf [fVf‡f“,Í““¶f^fCf€ Efpf%of [f^,ð<¤  
—L,µ A•jŽG,ÈfAfjf [fVf‡f“,Ì Ä ¶,äŠÈ—  
“%o»,³,ê,é BfAfvfŠfP [fVf‡f“,Í **AIDirect3DRMAnimationSet::AddAnimation** f\fbfh,ð—p,¢  
,ÄfAfjf [fVf‡f“,ðfAfjf [fVf‡f“ EfZfbfg,É’Ç%oÄ,·,é,±  
,Æ,<sup>a</sup>,Ä,«é BfAfjf [fVf‡f“,ð í æ,·,é,É,Í **AIDirect3DRMAnimationSet::DeleteAnimation** f\fbfh,ðŽg—  
p,·,é BfAfjf [fVf‡f“ EfZfbfg,Í **AIDirect3DRMAnimationSet::SetTime** f\fbfh,ÌEÄ,Ñ o,µ,É,æ,Ä,Ä §Eä,³,ê,  
é B

ŠÖ~A î•ñ,É,Ä,¢

,Ä,Í A **IDirect3DRMAnimation** v,¯,æ,Ñ **IDirect3DRMAnimationSet** vfCf“f^ [ftfFfCfX,ðŽQ Ä,³,ê,½,¢ B

**IDirect3DRMDevice,ÆIDirect3DRMDeviceArrayfCf“f^ [ftfFfCfX**

fŒf“f\_Œf“fO,³,ê,½,·,×,Ä,Ì o—ÍŒ`Ž®,Í A o—ÍfffofCfX,ÆŠÖ`A,µ,Ä,Œ,È,-  
,Ä,Í,È,ç,È,Œ BfffofCfX EfIfufWfFfNfg,Í AfŒf“f\_Œf“fO,Ì o—Í æ,Ì%oÄŽ<ffBfXfvŒfC,ð•\,µ,Ä,Œ,é B

fŒf“f\_Œf“fO,Ì“® ì,Í AŽw’è,³,ê,½ o—ÍfffofCfX,Ìf^fCfv,É`È‘¶,·,é BfffofCfX,É•i ”,Ìfrf... [f|  
[fg,ð’è<,µ A“`Žž,É•Ž!,³,ê,éfv [f“,É`Û,È,éŽ<“\_,ð—^!,é,±,Æ,à,Ä,«é B,Û,½ AfffofCfX,Í,Œ,-  
,Ä,Ä,àŽw’è,Ä,« A““,¶fv [f“,É•i ”,Ì o—Í æ,ð—p^Ó,·,é,±,Æ,à%oÄ”\,Ä, ,é B

•ÛŽ f, [fh,Í AfXfNfŠ [f“,âfEfBf“fhfE A,Û,½,ÍfAfvfŠfP [fVf‡f“ Ef f,fŠ,É’¼ ÚfŒf“f\_Œf“fO,·,éfffofCf  
X,ðfTf| [fg,·,é B

ŠÖ`A îñ,É,Ä,Œ,Ä,Í uIDirect3DRMDevice v,ðŽQ Æ,³,ê,½,Œ B

,±,ÌfZfNfVf‡f“,Ä,Í ADirect3DfCf [fW,ð o—ÍfffofCfX,É•Ž!,·,é Û,É—LŒø,ÈfIfvfVf‡f“,É,Ä,Œ,Ä à–¼,·,é B

fNfIfŠfefB

fJf%o [ Ef,fff<

fEfBf“fhfEŠÇ—

**fNfIfŠfefB**

fV [f“,â,»,ì \ ¬—v‘f,Í AfffofCfX,É,æ,Á,Ä AfŠfAfç,³,ð,³,Ü,‘,Ü,É•İ,!,ÄfÇf“f\_Šf“fO,·,é,±  
,Æ,<sup>a</sup>,Ä,«,«,é BŠef fbfVf...,Í“ÆŽ©,İfNfIfŠfefB,ðŽ ,Á,Ä,Ç,é,<sup>a</sup> Af fbfVf...,<sup>a</sup>—  
p,Ä,«,éfNfIfŠfefB,İ ãÇÄ,İfffofCfX,ÉˆÈ‘¶,·,é B

fAfvfŠfP [fVf‡f“,Í AIDirect3DRMDevice::SetQuality,â IDirect3DRMMeshBuilder::SetQualityf f\fbfh,ð—p,Ç  
,Ä AfffofCfX,İfÇf“f\_Šf“fO “x,ð•İ X,·,é,±  
,Æ,<sup>a</sup>,Ä,«,é BfffofCfX,İfÇf“f\_Šf“fO ,“x,ðŽæ“¾,·,é,É,Í AIDirect3DRMDevice::GetQuality,âIDirect3DRMMeshBu  
ilder::GetQualityf f\fbfh,ðŽg—p,·,é B

fJf% [ Ef,ff<

•ŮŽ f, [fh,Í ARGBf,ff<,Æf,fmfNf if%of“fv jf,ff<,l,Ó,½,Â,lJf% [ Ef,ff<,ðfTf|  
[fg,·,é BfJf% [ Ef,ff<,ðŽæ“¾,·,é,½,B,É,Í AfAvfŠfP [fVf‡f“,©,çIDirect3DRMDevice::GetColorModelf f\fb  
fh,ðŽg—p,·,é B

RGBf,ff<,Í A F,ð Ô A—Î A Â,ìœð,ì'g,Ý ‡,í,<sup>1</sup>,Æ,μ,Ä^μ,¢ A F,ì•t,¢,½•i ”,ìœðœ¹,ðfTf|  
[fg,·,é BfV [f“,ÄŽg,í,ê,é F ”,É,Í §œÄ,<sup>a</sup>,È,¢ B,±,ìf,ff<,Í A8 A16 A24 A32frfbfg,ìffBfXfvfœfC,Ä—  
p,·,é,±,Æ,<sup>a</sup>,Ä,«„é BffBfXfvfœfC,ì•Ž'‰Ä”\ F ”,²²⁴frfbfg,æ,è,à ,È,¢  
,Æ A F%ð'œ“x,ì §œÄ,É,æ,Á,ÄŠK'i ó,ÉŠK'²,ª•l‰»,·,é,ì,<sup>a</sup>—Ÿ,Äfof“ffBf“fO if}fbfnfof“fh,Æ,àœÄ,Ô j,“  
¶,·,é ê ‡,ª,·,é B,±,ê,Í AfIfvfvf‡f“,ìffBfU ^— ,ð—p,¢,é,±,Æ,Ä%ñ”ð,·,é,±,Æ,<sup>a</sup>,Ä,«„é B

f,fmfNf Ef,ff<,Ä,à•i ”,ìœðœ¹,ìfTf| [fg,<sup>3</sup>,ê,é,<sup>a</sup> A,»,Ì F—v'f,Í—  
³Ž<,<sup>3</sup>,ê,é B,»,ê,¼,ê,ìœðœ¹,Í AfOfœ [,ìœð“x,Ä Ý'è,<sup>3</sup>,ê,é B',“\_,ìRGBfJf% [,Í<P“x,Æ,μ,Ä%ðŽB,<sup>3</sup>,ê A ifOf [   
EfVfF [ffBf“fO Ef, [fh,Ä,Í j^Ü,È,é—  
¾,é,<sup>3</sup>,Ä',“\_,ìŠÖ,ð•âŠ®,·,é Bf,fmfNf Ef,ff<,Ä,Í AfV [f“ ã,ìIfufWfFfNfg,ì F ”,ª §œÄ,<sup>3</sup>,ê,é BfVfXfef€  
Efpfœfbfg,ì'ó,«fGf“fgfŠ,ð,·,×,ÄŽg,¢ s,,·,Æ AfVfXfef€“à•”,ìpfœfbfg Ef}  
fl [fWff,Í ÄŽw'è,<sup>3</sup>,ê,½ F,É Ä,à&,¢ F,ðpfœfbfg“à,©,ç'T,· Bf,fmfNf Ef,ff<,Í ARGBf,ff<,Æ“—  
l,É A8 A16 A24 A32frfbfg,ìffBfXfvfœfC,ÄŽg—p,·,é,±  
,Æ,<sup>a</sup>,Ä,«„é B i,½,¾,μ Af,fmfNf Ef,ff<,Í8frfbfg,ìfefNfXf`ff,μ,©fTf|  
[fg,μ,È,¢ B jRGBf,ff<,ì'ã,í,è,Éf,fmfNf Ef,ff<,ðŽg—p,·,é—~“\_,Í AfpftfH [f}f“fX,ªœü ã,·,é,±,Æ,¾,¯,Ä,·,é  
B

Direct3DffofCfX,ìfJf% [ Ef,ff<,Í A•l X,·,é,±,Æ,<sup>a</sup>,Ä,«„È,¢ BfAvfŠfP [fVf‡f“,Í A•K—  
v,ÈfJf% [ Ef,ff<,ðfTf|  
[fg,μ,½fhf%ofCfo,ðŽ~•È,·,é,½,B,É AIDirect3D::EnumDevicesf f\fbfh,©IDirect3D::FindDevicef f\fbfh,ðŽg—  
p,μ AftfofCfX ì ¬f f\fbfh,ì'†,Ä,»,ìfhf%ofCfo,ðŽw'è,μ,È,,Ä,Í,È,ç,È,¢ B

fEfBf“fhfEŠÇ—

<sup>3</sup>,μ,¢‘€ ì,ð s,σ,½,ℓ,É AfIfyfŒ [fefBf“fO EfVfXfef€  
,©,çWM\_MOVE,âWM\_PAINT AWM\_ACTIVATEf fbfZ [fW,ðŽó, ¯Žæ,Á,½,Æ,« AfAfvfŠfP [fVf±f“,Í A IDirect3  
DRMWinDevice::HandlePaint,“,æ,ŃIDirect3DRMWinDevice::HandleActivatef f\fbfh,ðŽg—  
p,μ,ÄDirect3D,É’Ê’m,μ,Ê,,Ä,Í,È,ç,È,¢ B

ŠÖ`A î•ñ,É,Â,¢,Ä,Í uIDirect3DRMWinDevice v,ðŽQ Æ,<sup>3</sup>,ê,½,¢ B

**IDirect3DRMFace,ÆIDirect3DRMFaceArray fCf“f^ [ftfFfCfX**

–Ê,Í Af fbfVf... â,ì,Đ,Æ,Â,ìf|fŠfSf“,ð•\,μ,Ä,¢,é BfAfvfŠfP [fVf‡f“,Í AIDirect3DRMFace::SetColor A  
IDirect3DRMFace::SetColorRGB AIDirect3DRMFace::SetTexture A IDirect3DRMFace::SetMaterialf f\fbfh,ðŽg—  
p,μ,Ä A–Ê,Ì F,âfefNfXf`ff Af}fefŠfAf<,ð Ý’è,·,é,±,Æ,ª,Ä,«,é B

–  
Ê,Í AIDirect3DRMFace::AddVertex,âIDirect3DRMFace::AddVertexAndNormalIndexedf f\fbfh,Ê,æ,Á,Ä A’,“,©,ç  
\\ ¬,³,ê,é BfAfvfŠfP [fVf‡f“,©,ç–  
Ê,ì’,“,ð“Ç,ÝŽæ,é,Ê,Í AIDirect3DRMFace::GetVertices,âIDirect3DRMFace::GetVertexf f\fbfh,ðŽg—p,·,é B  
ŠÖ~A î•ñ,Ê,Â,¢,Ä,Í uIDirect3DRMFace v,ðŽQ Æ,³,ê,½,¢ B

**IDirect3DRMFrame,ÆIDirect3DRMFrameArrayfCf“f^ [ftfFfCfX**

ftfŒ [f€,Æ,¢,□—pŒê,Í AfIfufWfFfNfg,Ì•— ftfŒ [f€,ðŽQ Æ,µ,Ä,¢,é,±,Æ,©,ç—^,Ä,¢  
,é B•ŰŽ f, [fh,É,“,̄,éftfŒ [f€,Ì-ðŠ,,,Í AfEfBf“fhfE EfVfXfef€,É,“,̄,éEfBf“fhfE,Ì-ðŠ,,,ÉŽ—,Ä,¢  
,é BfIfufWfFfNfg,Í A’P,Éf [f<fh<óŠÖ,É’u,©,ê,é,Ì,Ä,Í,È, AŠÖ~A,·,éŽQ ÆftfŒ [f€  
,Æ,Ì<óŠÖ“I,ÈfŠfŒ [fVf‡f“fVfbfv i“ŠŒÝŠÖŒW j,ð<L q,·,é,±,Æ,É,æ,Ä,ÄfV [f“,É”z’u,<sup>3</sup>,ê,é BftfŒ [f€  
,ÍfIfufWfFfNfg,ðfV [f“,É”z’u,·,é B,Ü,½ AfrfWf...fAf< EfIfufWfFfNfg,ð^Ž!,·,é,Æ,«,É,Í AftfŒ [f€  
,©,ç^É’u,âŒÛ,«,ðŽæ“¾,·,é B

•ŰŽ f, [fh,ÌfV [f“,Í A eftfŒ [f€,ðŽ ,½,È,¢ftfŒ [f€ A,Â,Ü,è AftfŒ [f€ŠK‘w,Ìfgfbfv,É, ,éftfŒ [f€  
,É,æ,Ä,Ä’è<,<sup>3</sup>,ê,é B,±,ÌftfŒ [f€,Í Af< [fg EftfŒ [f€  
,ÆŒÄ,Î,ê,é BfV [f“,Í A’¼,Ì,·,×,Ä,ÌfIfufWfFfNfg,Ö,ÌŽQ ÆftfŒ [f€,à’è<,µ,Ä,¢,é B

fV [f“,Í A’¼,Ì,·,×,Ä,ÌfIfufWfFfNfg,É,Â,¢,ÄŽQ ÆftfŒ [f€,ð’è<,µ,Ä,¢  
,é B’æ1fpf%of [f^,ÉNULL,ðŽw’è,µ,Ä**IDirect3DRM::CreateFrame**ŠÖ ”,ðŒÄ,Ñ o,µ AfV [f“,ð ì ¬,·,é,±  
,Æ,<sup>a</sup>,Ä,«,é B

ftfŒ [f€,ð’€ Ì,·,é,½,ß,É,Í ADirect3D,Ì ¶Žè Ä•WŒn,ð— %ð,µ,È,,Ä,Í,È,ç,È,¢ B Ä•WŒn,É,Â,¢,Ä Ú,µ,-  
,Í u3D Ä•WŒn v,ðŽQ Æ,<sup>3</sup>,ê,½,¢ B

ŠÖ~A î•ñ,É,Â,¢,Ä,Í uIDirect3DRMFrame v,ðŽQ Æ,<sup>3</sup>,ê,½,¢ B

,±,ÌfZfNfVf‡f“,Ä,Í AftfŒ [f€,Æ,»,ÌŽg—p-@,É,Â,¢,Ä à-¾,·,é B

ŠK‘w

•İŠ•

“®,« if, [fVf‡f“ i

fR [f<fofbfNŠÖ ”



ŠK'w

fV [f“,lftfCE [f€,íŠK'w \`¢,É,È,Á,Ä,¢,é BftfCE [f€,Í eftfCE [f€,âŽqftfCE [f€,ðŽ ,Á,±  
,Æ,ª,Ä,«,é B eftfCE [f€,ðŽ ,½,È,¢ftfCE [f€,Íf< [fg EftfCE [f€,ÆCEÄ,Î,ê AfV [f“,ð'è<`,·,é B

ŽqftfCE [f€,Í A eftfCE [f€,É'Î,µ,Ä'Š'Î'I,È'Ê'u,ÆEü,«,ðŽ,µ,Ä,¢,é B eftfCE [f€,ª'Ú“®,·,é,Æ AŽqftfCE [f€  
,à'Ú“®,·,é B

ftfCE [f€,ì'Ê'u,âEü,«,Í AfV [f“ ä,ì'¼,lftfCE [f€,©,ç,ì'Š'Î'l,Ä Ý'è,·,é,±,Æ,ª,Ä,«,é B â'Î'Ê'u,ð Ý'è,·,é•K—v,ª, ,  
é ê ‡,Í Af< [fg EftfCE [f€,©,ç,ì'Š'Î'l,ªŽg—p,Ä,«,é B,Û,½ A, ,é eftfCE [f€,©,çftfCE [f€  
,ð í œ,µ AIDirect3DRMFrame::AddChildf f\fbfh,É,æ,è A,¢,Ä,Ä,à'¼,lftfCE [f€,É'Ç%Ä,·,é,±  
,Æ,ª,Ä,«,é BŽqftfCE [f€,ðŠ®'S,É í œ,·,é,É,ÍIDirect3DRMFrame::DeleteChildf f\fbfh,ðŽg—p,·,é BŽqftfCE [f€  
,â eftfCE [f€,ðŽæ“¾,·,é,É,Í AIDirect3DRMFrame::GetChildren,âIDirect3DRMFrame::GetParentf f\fbfh,ðŽg—  
p,·,é B

ftfCE [f€,Í A'¼,lftfCE [f€,ÎrfWf...fAf< EfIfufWfFfNfg,Æ,µ,Ä'Ç%Ä,Ä,« A—^,!,ç,ê,½ŠK'w \`¢  
,ð AfV [f“‘S'Î,É“n,Ä,Ä%½“x,à—~—p,·,é,±,Æ,ª%Ä”\  
,É,È,é B V,µ,¢ŠK'w,ÍfCf“fXf^f“fX,ÆCEÄ,Î,ê,é BfpftfH [f}f“fX,ì'á%°,ð—h,®,½,ß A eftfCE [f€,ðŽqftfCE [f€  
,É“ü,ê ž,Û,È,¢,æ,¤,É' ^Ó,ª•K—v,Ä, ,é B•ÛŽ f, [fh,Í AŽÄ sŽž,É „%ñŠK'w,Îf`fFfbfN,ð s,í,È,¢ B „%ñŠK'w,  
Ì ì ¬,Í AIDirect3DRMFramefCf“f^ [ftfFfCfX,Îf f\fbfh,Ä,Í,Ä,«, AftfCE [f€,ðfrfWf...  
fAf< EfIfufWfFfNfg,Æ,µ,Ä'Ç%Ä,·,é,Æ,«,É,ì,Ý%Ä^,Ä, ,é B

•İŠ•

$f\text{tf}\in [f\in, \text{îÊ}^{\text{'u,âEü,«},\text{Í A eftf}\in [f\in, \text{©}, \text{ç}^{\text{'Š'î"l,É l,,'é,±,Æ,à,Â,«},\text{é B,±,î ê ‡ A üE}^{\text{'İŠ,É,æ,Á,Ä eftf}\in [f\in, \text{©}, \text{çŽqftf}\in [f\in, \text{Ö}, \text{î}^{\text{'Š'îfxfNfgf<}, \text{ðŽæ}^{\text{'¾,µ A eftf}\in [f\in, \text{Ö}, \text{î}^{\text{'Š'îfxfNfgf<}, \text{ð< }, \text{ß,é B}$

•İŠ•,Í4 s4—ñ,î s—ñ,É,æ,Á,Ä•E»<sup>3</sup>,ê,é B Ä•W,ðŽî,•,É,Í A[x,y,z,1],î,æ,µ,É—ñ,î—v‘f,ðŽg—p,•,é B

$\text{Žqftf}\in [f\in, \text{É}, \text{,}, \text{,}^{\text{'é Ä•W,ðvchild,Æ,•,é,Æ A}^{\text{'-,¶ Ä•W,ð eftf}\in [f\in, \text{Ä•\,}^{\text{'Ž®},\text{Í AŽŸ,î,æ,µ,É'è<}, \text{³,ê,é B}$

vparent=vchildTchild

Tchild,Í AŽqftf $\in [f\in, \text{î}^{\text{'İŠ• s—ñ,Ä, },\text{é B}$

$\text{Žqftf}\in [f\in, \text{©}, \text{çf< } [fg\_Eftf\in [f\in, \text{Ü,Ä,î,•,×,Ä,î eftf}\in [f\in, \text{î}^{\text{'İŠ•,Í AŽqftf}\in [f\in, \text{,}^{\text{'af } [f<fh \text{ Ä•W,ð ¶ ¬,•,é}^{\text{'İŠ•,ÆE<,N•t,¬,ç,ê,Ä,ç,é B,±$   
 $,\text{İf } [f<fh\text{ İŠ•,Í AfE}^{\text{'f“f_Šf“fO,İ'O,É AŽqftf}\in [f\in \text{ ã,İf}^{\text{'fWf...fAf< EfIfu}^{\text{'fWfFfNfg,É'î,µ,Ä“K—$   
 $p,^{\text{'3,ê,é BŽqftf}\in [f\in, \text{É'î,}^{\text{'•,é'Š'î Ä•W,Í Af,fff< Ä•W,ÆEÄ,İ,ê,é,±,Æ,^{\text{'a, },\text{é Bf } [f<fh\text{ İŠ•,}^{\text{'a s,í,ê,½ Ä•W,Í$   
 $Af } [f<fh \text{ Ä•W,ÆEÄ,İ,ê,é B}$

$f\text{tf}\in [f\in$   
 $,\text{î}^{\text{'İŠ•,Í AIDirect3DRMFrame::AddTransform AIDirect3DRMFrame::AddScale AIDirect3DRMFrame::AddRotation$   
 $AIDirect3DRMFrame::AddTranslation,İŠef f\text{fbfh,É,æ,Á,Ä A}^{\text{'¼ Ü'İ X,•,é,±$   
 $,Æ,^{\text{'a,Ä,«},\text{é B,»},\text{ê,¼,ê,İf f\text{fbfh,É,İD3DRMCOMBINETYPE—ñ“}^{\text{'E^,İf f“fo,ð“n,µ A,Ç,î,æ,µ$   
 $,ÉfAf}^{\text{'v}^{\text{'ŠfP } [fVf‡f“,”ñ<Ÿ,µ,½ s—ñ,ðE» Ÿ,İf\text{tf}\in [f\in, \text{î s—ñ,Æ ‡ ¬,•,é,©,ðŽw'è,•,é B}$

$\text{IDirect3DRMFrame::GetRotation,ÆIDirect3DRMFrame::GetTransformf f\text{fbfh,Í Aftf}\in [f\in, \text{î‰ñ“}]^{\text{'Ž²,Æ•İŠ• s—$   
 $\text{ñ,ðŽæ}^{\text{'¾,•,é Bftf}\in [f\in, \text{î‰ñ“}],\text{ð•İ X,•,é,É,Í AIDirect3DRMFrame::SetRotationf f\text{fbfh,ð—~—p,•,é B}$

$f } [f<fh \text{ Ä•W,Æf,fff< Ä•W,ð}^{\text{'İŠ•,•,é,É,Í AIDirect3DRMFrame::Transform,ÆIDirect3DRMFrame::InverseTransfo$   
 $\text{rmf f\text{fbfh,ðŽg—p,•,é B}$

•İŠ•,É,Ä,ç,Ä,î‘ ‡“İ,È îñ,Í Af}^{\text{'rf... } [f| } [fg,É,Ä,ç,Ä à–¾,µ,½fZfNfVf‡f“ u•İŠ• v,Ä“¾,é,±  
 $,Æ,^{\text{'a,Ä,«},\text{é B}^{\text{'İŠ•f,fWf... } [f<,É,Ä,ç,Ä,Í A uDirect3DfA } [fL}^{\text{'fefNf`ff v,ÉŠÜ,Ü,ê,é u•İŠ•f,fWf...}$   
 $\underline{\underline{f< vfZfNfVf‡f“}},\text{ÄŽæ,è}^{\text{'µ,Ä,Ä,ç,é B}^{\text{'İŠ•E}^{\text{'vŽŽ,İŠT—v,É,Ä,ç,Ä,Í A u3D}^{\text{'İŠ• v,ðŽQ }^{\text{'Æ,³,ê,½,ç B}$

“®,« if, [fVf‡f“ j

ŠeftfƎ [f€,ÍƎÅ—L,l%õñ“],â‘¬“x,Å“®, B%õñ“],àˆÚ“®,à,µ,È,ƎftfƎ [f€,Å,Í A,±,ê,ç,l‘® «,Í0,Å, ,é B,± ,ê,ç,l‘® «,Í AfV [f“,ðfƎf“f\_fŠf“fO,µ,ÄfIfufWfFfNfg,ð“®,©,·‘O,ÉŽg— p,<sup>3</sup>,ê A’P f,ÈfAfjf [fVf‡f“,ð ì ¬,·,é,±,Æ,à,Å,«,é B

**fR [f<fofbfNŠÖ ”**

ftfŒ [f€,Í A,æ,è;ŽG,ÈfAfjf [fVf‡f“,ðŽÀŒ»,·,é,½,ß AfR [f<fofbfNŠÖ ”,ðfTf] [fg,µ,Ä,¢  
,é BfAfvfŠfP [fVf‡f“,“““o~^,µ,½fR [f<fofbfNŠÖ ”,Í Af, [fVf‡f““® «,“K—p,³,ê,é‘O,ÉftfŒ [f€  
,©,çŒÄ,Ñ o,³,ê,é BŠK‘w,É•j ”,ÌftfŒ [f€,ª, ,è A,»,ê,¼,ê,ªfR [f<fofbfNŠÖ ”,ÉŠÖ~A•t,¯,ç,ê,Ä,¢  
,é ê ‡,Í AŽqftfŒ [f€,Ì‘O,É eftfŒ [f€,ªŒÄ,Ñ o,³,ê,é B,±,Ì,æ,□  
,ÈŠK‘w,Ä,Í AfR [f<fofbfNŠÖ ”,Ì,·,×,Ä,ªŒÄ,Ñ o,³,ê,é,Ü,Ä AfŒf“f\_Šf“fO,ÍŽÀ s,³,ê,É,¢ B

fR [f<fofbfNŠÖ ”,ð‘Ç‰Á,·,é,É,Í AIDirect3DRMFrame::AddMoveCallbackf f\fbfh,ðŽg—  
p,·,é BfR [f<fofbfNŠÖ ”,ð í æ,·,é,É,Í AIDirect3DRMFrame::DeleteMoveCallbackf f\fbfh,ðŽg—p,·,é B

,±,ê,ç,ÌfR [f<fofbfNŠÖ ”,ð—p,¢  
,é,Æ Afvf fOf‰of€ Ĭ,Ý,ÌfAfjf [fVf‡f“ EfV [fPf“fX,É V,µ,¢~Ê‘u,âŒü,«,ð Ý’è,µ,½,è AfV [f“ ã,Ì‘¼,ÌfIfu  
fWfFfNfg,ÌÊ‘u,É,æ,Ä,ÄfrfWf...fAf< EfIfufWfFfNfg,Ì“® Ì,ð“®“I,ÉfCf“fvfŠf f“fg,·,é,±,Æ,ª,Ä,«,é B

**IDirect3DRMLight,ÆIDirect3DRMLightArrayfCf“f^ [ftfFfCfX**

fV [f“,ðfŠfAf<,ÉŒ©,¹,é,½,ß,É,Í A Æ-¾Œø%ŒÊ,ð—~—p,·,é BfVfXfefŒ  
,Í AfV [f“,ÌŒðŒ¹,É·Î,·,éfIfufWfFfNfg,ÌŒü,«,ÉŠî,Ã,Œ  
,Ã A,·,×,Ã,ÌfIfufWfFfNfg,ð Ê F,·,é BfIfufWfFfNfg,Ì F,Í AfŒf“f\_Šf“fO’†,ÉŠeŒðŒ¹,Ì%œ<¿,ð l—  
¶,µ,ÃŒ^è,³,ê,é B,·,×,Ã,ÌŒðŒ¹,Í F,Æ,P“x,ðŽ ,Ã,Ã,“,è A•Ê X,É•İ%œ»,³,¹,é,±,Æ,ª,Ã,«,é B

fAfvfŠfP [fVf‡f“,ÍftfŒ [fŒ,ÉŒð,ðfAf^fbf`,µ AfV [f“,ÉŒðŒ¹,ð—^,!,é,±,Æ,ª,Ã,«,é BftfŒ [fŒ  
,ÉfAf^fbf`,³,ê,½Œð,Í AfV [f“ ã,ÌftrfWf...fAf< EfIfufWfFfNfg,ð-¾,é,,·,é BftfŒ [fŒ,Í AŒð,Ì^Ê’u,ÆŒü,«,Ì—  
¼•û,ð’ñ<Ÿ,·,é BŒ¾,ŒŠ,!,ê,Î AŒð,ÍfAf^fbf`,³,ê,½ftfŒ [fŒ,ÌŒ“\_,©,Œ L,ª,Ã,Ã,Œ,Œ,-  
BfAfvfŠfP [fVf‡f“,Í AŒðŒ¹,ªfAf^fbf`,³,ê,½ftfŒ [fŒ,ð“@,©,µ,½,è%œñ“,·,é,±  
,Æ,É,æ,Ã,Ã AŒðŒ¹,ÌÚ“@,â•ûŒü“]Š·,ðŠÊ’P,ÉŽÀŒ»,·,é,±,Æ,ª,Ã,«,é B

ftrf... [f| [fg,Í,»,ê,¼,ê,ð,Æ,Â^È ã,ÌŒðŒ¹,ð,à,Ã,Ã,Œ,é B,µ,©,µ A,ð,Æ,Â,ÌŒðŒ¹,ª,ð,Æ,Â^È ã,Ìftrf... [f|  
[fg,É•ÛŽ ,³,ê,é,±,Æ,Í,È,Œ BDirect3DfRf“f| [f|f“fg,Ì’ŠŒŸ ì—p,É,Ã,Œ,Ã Ú,µ,-  
,Í A ufIfufWfFfNfg,ÌŒ< ± « v,ðŽQ Æ,³,ê,½,Œ B

Œ» ó,Ã,Í A•ÛŽ f, [fh,Í AfAf“ftrfGf“fg iŠÂ«Œð j AffBfŒfNfVf‡fif< Afpf%œfŒf< Ef|fCf“fg Af|  
fCf“fg AfXf|fbfgf%œfCfg,Ì5Ží—p,ÌŒðŒ¹,ð’ñ<Ÿ,µ,Ã,Œ,é B

**IDirect3DRMLightfCf“f^ [ftfFfCfX,Ìf f\fbfh,ÌfŠftf@fŒf“fX,Í A uDirect3DRMLight v,ðŽQ Æ,³,ê,½,Œ B**  
,±,ÌfZfNfVf‡f“,Ã,Í ADirect3D,Ã—~—p,·,é,±,Æ,ª,Ã,«,é Æ-¾Œø%ŒÊ,Æ,»,ÌŽg,Œ•û,É,Ã,Œ à-¾,·,é B

fAf“ftrfGf“fg iŠÂ«Œð j  
fffBfŒfNfVf‡fif<  
fPf%œfŒf< Ef|fCf“fg  
f|fCf“fg  
fXf|fbfgf%œfCfg

*fAf“frfGf“fg iŠÂ««Œö j*

*fAf“frfGf“fgŒöŒ¹,Í AfIfufWfFfNfg,ìŒü,« A^Ê'u AfT [ftfFfX,ì“Á «,È,Ç,ÆŠÖŒEW,È,-  
AfV [f“ ã,ì,·,×,Ä,ð Æ,ç,·Œö,Ä, ,é BfV [f“,ì,·,×,Ä,ì ê Š,ð““,¶Œö“x,Ä Æ,ç,·,½,ß AfAf^fbf`³,ê,½ftfŒ [f€  
,ìÊ'u,âŒü,«,Í d—v,Ä,È,¢ B,Đ,Æ,Ä,ìfV [f“,É,Í A•i ”,ìfAf“frfGf“fg Ef%oCfg,ªŒ< ‡,³,ê,Ä,¢,é B*

**ffBfCfNfVf‡fif<**

—LŒÛŒðŒ¹,ÍŒÛ,«,ðŽ ,Â,<sup>a</sup> A<sup>^</sup>Ê'u,ÍŽ ,Á,Ä,¢,È,¢ BftfŒ [f€  
,ÉfAf^fbf<sup>^</sup>,<sup>3</sup>,ê,é,Æ,·,×,Ä,ÌfIfufWfFfNfg,ð“<sup>—</sup>,¶P“x,Ä Æ,ζ,μ AŒðŒ¹,<sup>a</sup>fIfufWfFfNfg,©,ζ,,Á,Æ—£,ê,½<sup>^</sup>Ê'u,É, ,é,æ,  
□,ÈŒø‰Ê,ð—^,!,é BffBfCfNfVf‡fif<ŒðŒ¹,Í A‘¾—z,Ì,æ,□,È‰“,—£,ê,½ŒðŒ¹,ðfVf~f...fŒ [fg,·,é,½,ß,É—~—  
p,<sup>3</sup>,ê,é B

**fpf%oƒŒf< Ef|fCf“fg**

fpf%oƒŒf< Ef|  
fCf“fgŒðŒ¹,Ífpf%oƒŒf< Ef%oƒCfg,ÅfIfufWfFfNfg,ð Æ,ç,·,ª AŒð,ÌŒü,«,ÍŒðŒ¹,ÌÊ’u,©,çŒ’è,³,ê,é B,Â,Û,è A  
fpf%oƒŒf< Ef|fCf“fgŒðŒ¹,Ê,ÍffBfŒfNfVf‡fif<ŒðŒ¹,Ì,æ,□,ÉŒü,«ª, ,è A,³,ç,ÉÊ’u,àŽ ,Á,Ä,¢  
,é B,½,Æ,,Î Afpf%oƒŒf< Ef|fCf“fgŒðŒ¹,Ì¼□,Éf fbfVf...,ª, ,é ê ‡ AŒðŒ¹,Ê-Ê,µ,Ä,¢,é,Û,□,Ìf fbfVf...,ª-  
¼,é,,Ê,é Bfpf%oƒŒf< Ef|fCf“fgŒðŒ¹,ÌŒf“f\_Šf“fO EfXfs [fh,Í AffBfŒfNfVf‡fif<ŒðŒ¹,Æ““™,Á, ,é B

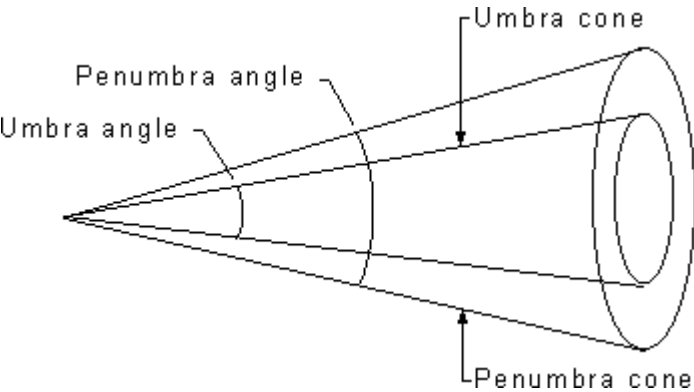


*f|fCf“fg*

*f|fCf“fg*ŒðŒ¹,Í AŒðŒ¹,©,ς•úŽĚ ó,ÉŒð,ð•ú,Â BŒð,ª“–,½,é–Ê,â–@ ü,Ì,»,ê,¼,ê,É,Â,¢  
,Ă A V,μ,ŒŒð,ÌfxfNfgf<,ðŒvŽZ,·,é•K—v,ª, ,é,½,ß Afpf%ŒfŒf< Ef|  
*fCf“fg*ŒðŒ¹,æ,è,àŒvŽŽŽžŠŒ,ª,©,©,é B,μ,©,μ A,æ,è ³Šm,È Æ–¾Œø%ŒÊ,ªŽÀŒ»,Ă,«,é,Ì,Ă AfŠfAf<,È•Ž',ª—  
v< ,³,ê,é ê ‡,É—~p,·,é,×,«,Ă, ,é B

fXf|fbfgf%ofCfg

fXf|fbfgf%ofCfgŒŒ¹,Í%~      ó,ÌŒð,ð ¶ ¬,·,é BŒð,Í A%~      ,Ì“à•”,É, ,éIfufWfFfNfg,É,Ì,Ý“-  
,Ä,ç,ê,é B%~      ,Í,Ó,½,Â,Ì:P“x,ð ¶ ¬,·,é B’†%o,Ì-¾,é,ç•”•ª i-¾•” j,Íf|fCf“fgŒŒ¹,Æ“- ,¶“«,«ð,µ AŽü´Í,Ì”-  
^Ä,ç•”•ª i^Ä%oe•” j,Í A,» ,ìŽü•Ó,Ì^Ä,ç%oe,Æf} [fW,³,ê,é B,±  
,Ì,Ó,½,Â,Ì•”•ª ,ìŠp“x,Í AIDirect3DRMLight::GetPenumbra AIDirect3DRMLight::GetUmbra AIDirect3DRMLight::S  
etPenumbra A,¨,æ,ÑIDirect3DRMLight::SetUmbra,É,æ,Á,ÄŒÂ X,ÉŽw’è,·,é,±,Æ,ª,Ä,« ,é B



**IDirect3DRMMaterial**fCf“f^ [ftfFfCfX

f}fefŠfAf<,Í AfT [ftfFfX,<sup>a</sup>,Ç,Ì,æ,□,ÉÆð,ð”½ŽĚ,·,é,©,ð’è<’,·,é Bf}  
fefŠfAf<,É,Í AÆð,ð”½ŽĚ,·,é,©,Ì•úŽĚ“Á « iemissive j,Æ”½ŽĚ“Á « ispecular j,Ì,Ó,½,Â,Ì \ ¬—v‘f,<sup>a</sup>, ,é B”½ŽĚ,  
Ì—¾,é,<sup>3</sup>,Í A<“x,Ì Ý’è,É,æ,Á,ÄÆ”è,<sup>3</sup>,è,é B<“x,Ì’l,Í”½ŽĚ,ÌfnfCf%ofCf<sup>g</sup>••<sup>a</sup>,Ì‘N—¾“x,ðÆ”è,·,é B<-  
“x,<sup>a</sup>5,Ì,Æ,«,Íà‘®“I,ÈŠOŠÌ,É,È,è A,»,ê~È ã,Ì’l,Â,Í A,æ,è —,ç,©,ÇŠOŠÌ,Æ,È,é B

fAfvfŠfP [fVf‡f“,©,çf}  
fefŠfAf<,Ì•úŽĚ“Á «,ð §Æä,·,é,É,Í AIDirect3DRMMaterial::GetEmissive,ÆIDirect3DRMMaterial::SetEmissivef f\  
fbfh,ðŽg—  
p,·,é B”½ŽĚ“Á «,ÍIDirect3DRMMaterial::GetSpecular,ÆIDirect3DRMMaterial::SetSpecularf ffbfh,É,æ,Á,Ä A<“  
x,ÍIDirect3DRMMaterial::GetPower,ÆIDirect3DRMMaterial::SetPowerf ffbfh,ð—p,Ç,Ä §Æä,·,é B

**IDirect3DRMMaterial**fCf“f^ [ftfFfCfX,Ìf ffbfh,ÌfŠftf@fÆf“fX,Í A uDirect3DRMMaterial v,ðŽQ Æ,<sup>3</sup>,è,½,Ç  
B

**IDirect3DRMMesh,ÆIDirect3DRMMeshBuilderfCf“f^ [ftFfCfX**

f fbfVf...,Æ,Í Af|fŠfSf“,l-Ê,lZfbfg,Å \ ¬,³,ê,½frfWf...fAf< EfIfufWfFfNfg,Å, ,é Bf fbfVf...  
,Í,“\_,lZfbfg,Æ-Ê,lZfbfg,ð'è<“, ,é i-Ê,Í,“\_,Æf fbfVf...,l-@ ü,Ê,æ,Å,Ä'è<³,ê,é j B,¢,,Å,©,l-Ê,ÅŽg,í,ê,Å,¢  
,é,“\_,â-@ ü,ð'Í X,“,é,Æ A,»,ê,ð<—L,“,é,×,Ä,l-Ê,lŠOŠl,ªl X,³,ê,é B

f fbfVf...,l,“\_,Í Af fbfVf... ä,l-Ê,lÊ'u,ð'è<“, ,é B,Ü,½ AfefNfXf`ff Ef}fbfv,l2D Å•W,ðE“è, ,é,½,ß,É,â—  
p,¢,ç,ê,é B

•ŮŽ f, [fh,Å,Í AIDirect3DRMMesh,ÆIDirect3DRMMeshBuilder,l,Ó,½,Ä,lCOMfCf“f^ [ftFfCfX,ð—  
p,µ,Äf fbfVf...,ð'€ i, ,é,±,Æ,ª,Ä,«,é BIDirect3DRMMeshfCf“f^ [ftFfCfX,l'ñ í,É ,‘¬,Ä Af, [ftBf“fO,l,æ,µ  
,É•p”É,Éf fbfVf...,ª,İ%», ,é ê ‡,Í A,±,ê,ðŽg—p, ,é,×,«,Ä, ,é  
BIDirect3DRMMeshBuilder,Í AIDirect3DRMMeshfCf“f^ [ftFfCfX,l ä•”,É'g,Y ž,Ü,ê,Ä,¢  
,é BIDirect3DRMMeshBuilderfCf“f^ [ftFfCfX,ÍEÄ X,l-Ê,â,“\_,ð'€ i, ,é Ü,É•Ö—~ ,Ä, ,é,ª AfVfXfef€  
,ÍfE“f\_fŠf“fO,ðŽÄ s, ,é'O,É AIDirect3DRMMeshBuilderfIfufWfFfNfg,ðDirect3DRMMeshfIfufWfFfNfg,É•İŠ•,µ,È  
,Ä,Í,È,ç,È,¢ Bf fbfVf...,ª“S,ªİ%»,µ,È,¢ A, ,é,¢,Í-Ä'½,É•İ%»,µ,È,¢ ê ‡,Í A,±,l•İŠ•,ªfpftfH [f}f“fX,É—  
^, ,é%œ<ç,Í-³Ž<,Ä,«,é“œ“x,l,à,l,Ä, ,é B

,¢,,Å,©,l,“\_,â-Ê,É“¬,¶“Ä « if}fefŠfAf<,âfefNfXf`ff j,ðŠ,,é¬,Ä,éK—v,ª, ,éfAfvfŠfP [fVf‡f“,Ä,Í  
AIDirect3DRMMeshfCf“f^ [ftFfCfX,ð—p,¢,ÄfOf< [fv%», ,é,±,Æ,ª,Ä,«,é B,Ó,½,Ä,lÜ,È,éfOf< [fv,Ä',“\_,ð<—  
L,µ,½,¢ ê ‡ i,½,Æ, ,l Af fbfVf... ä,l—× Ü,µ,½—  
Ê,l F,ªÜ,È,é ê ‡ j,Í A,»,ê,¼,ê,lOf< [fv,Ä',“\_,ð•i » ,µ,È,-  
,Ä,Í,È,ç,È,¢ BIDirect3DRMMesh::AddGroupf f\fbfh,Í A-Ê,l W ‡,ÉfOf< [fvŽ-ÊŽq,ðfAtfCf“, ,é B,±  
,lŽ•ÊŽq,Í A,»,lEä,lEä,Ñ o,µ,ÄfOf< [fv,ðŽQ Æ, ,é,½,ß,ÉŽg—p, ,é,±,Æ,ª,Ä,«,é B

fAfvfŠfP [fVf‡f“,Í AIDirect3DRMMeshBuilder,ÆIDirect3DRMMeshfCf“f^ [ftFfCfX,É,æ,Ä,Ä A,R,ÄÈ ä,l•-  
Ê,ðŽ ,Ä-Ê,ð i ¬, ,é,±  
,Æ,ª,Ä,«,é B,Ü,½ A,½,Æ, ,l AfE“f\_fŠf“fO, ,éfn [fhEfFfA,ª64,jfofCfG,l §EÄ,ðŽ ,Ä,Ä,“,è Af fbfVf...  
,lTfCY,ª,»,ê,æ,è,ä,ª,¢ ê ‡,É,Í A,±,ê,ç,lCf“f^ [ftFfCfX,Íf fbfVf...  
,ðŽ©“@“l,É•i ”,lfofbftf@,É•Š,, ,é B,±,ê,ç,l<@“\  
,l,½,ß,É AIDirect3DRMMesh,ÆIDirect3DRMMeshBuilder,lAPI,ÍDirect3D API,©,ç—£,ê,½,à,l,É,È,Ä,Ä,¢,é B

f fbfVf...,É,“\_,â-  
Ê,ðEÄ X,É'Ç%Ä, ,é,É,Í AIDirect3DRMMeshBuilder::AddVertex AIDirect3DRMMeshBuilder::AddFace A, ,æ,ÑI  
Direct3DRMMeshBuilder::AddFacesf f\fbfh,ðŽg,µ,±,Æ,ª,Ä,«,é B

**IDirect3DRMMesh::SetGroupColor AIDirect3DRMMesh::SetGroupColorRGB AIDirect3DRMMesh::SetGroupTextu**  
**re AIDirect3DRMMesh::SetGroupMaterial,lŠef f\fbfh,ð—p,¢,é,Æ A-Ê,l F,âfefNfXf`ff Af}**  
fefŠfAf<,l“Ä «,ðEÄ X,É'è<“, ,é,±,Æ,ª,Ä,«,é B,±,ê,ç,l fbfVf... ä,l,»,ê,¼,ê,l-Ê,É,Ä,¢,Ä Y'è, ,é,±  
,Æ,à A, ,×,Ä,l-Ê,É,Ä,¢,Äl“x,É Y'è, ,é,±,Æ,à%Ä“,Ä, ,é B

f fbfVf...,ðfE“f\_fŠf“fO, ,é,É,Í A,Ü, ,IDirect3DRMFrame::AddVisualf f\fbfh,ðŽg—p,µ,Ä Af fbfVf...  
,ðftfE [fE,É'Ç%Ä,µ,È,,Ä,Í,È,ç,È,¢ Bf fbfVf...,lCf“fXf^f“fX,ð•i ” ¶ ¬,µ,Ä A,Ð,Æ,Ä,l fbfVf...  
,ð•i ”,lftfE [fE,É'Ç%Ä, ,é,±,Æ,ª,Ä,«,é B

fAfvfŠfP [fVf‡f“,Í AIDirect3DRMMesh::SetGroupQualityf f\fbfh,lEÄ,Ñ o,µ,ÄŽw'è, ,é,±  
,Æ,É,æ,è Aftf%fbfg AfOf [ AftfHf“,l,R,Ä,l%Ä%œef, [fh,ðŽg—p, ,é,±  
,Æ,ª,Ä,«,é i,½,¾,µ AÇE» ó,Ä,ÍftfHf“ EfVfF [ftfBf“fO Ef, [fh,Íftf [fg,³,ê,Ä,¢,È,¢ j B,±  
,l f\fbfh,É,Í AD3DRMRENDERQUALITY—ñ“E^,l'l,ðŽw'è, ,é BfVfF [ftfBf“fOf, [fh,É,Ä,¢,Ä Ü,µ,Í uf|  
fŠfSf“ v,ðŽQ Æ,³,ê,½,¢ B

fAfvfŠfP [fVf‡f“,Í A-@ ü i,Ð,Æ,Ä,lfxfNfgf<,Ä,È,,Ä,Í,È,ç,È,¢ j,ð Y'è, ,é,±  
,Æ,ª,Ä,«,é B,Ü,½ AIDirect3DRMMeshBuilder::GenerateNormalsf f\fbfh,É,æ,è AŽü'Í,l-Ê,l-Ê-@ ü,ð•½<l,µ,Ä-  
@ ü,ðEvŽZ, ,é,±,Æ,à,Ä,«,é B

## Direct3DRMObject

Direct3DRMObject,Í AfVfXfef€,ì,·,×,Ä,ÌfIfufWfFfNfg,É,ò'Ê,ÈŠî-{fNf%ofX,Ä, ,é BDirect3DRMObjectfIfufWfFfNfg,Í A,·,×,Ä,ÌfIfufWfFfNfg,É,ò'Ê,È"Ä «,ð"ð,ì,Ä,¢,é B

Direct3DRMObjectfIfufWfFfNfg,Í ACOMfIfufWfFfNfg,Æ,μ,ÄfCf"fXf^f"fX ¶ ¬,ª s,í,ê,é BŠefIfufWfFfNfg,Í AUnknownfCf"f^ [ftfFfCfX,É%Ä,ì A^ê"Ê"Ì,Èf f\fbfh,Ì•W €fZfbfg,ðŠÜ,ñ,Ä,¢,é B

fIfufWfFfNfg,ð ì ¬,·,é,É,Í A,Ü,,Direct3DRMCreateŠÖ ",ðCEÄ,Ñ o,μ ADirect3D,Ì•ÜŽ f, [fh EfIfufWfFfNfg,ÌfCf"fXf^f"fX,ð ¶ ¬,μ,È,-,Ä,Í,È,ç,È,¢ BŽŸ,ÉfAfvfŠfP [fVf‡f",Í AfIfufWfFfNfg,ð ì ¬,·,éCf"f^ [ftfFfCfX,Ìf f\fbfh,ðCEÄ,Ñ o,μ AfIfufWfFfNfg,ÉCEÄ—

L,Ìpf%of [f^,ðŽw'è,·,é B,½,Æ,ì,Î ADirect3DRMAnimationfIfufWfFfNfg,ð ì ¬,·,é,É,ÍDirect3DRM::CreateAnimationf f\fbfh,ÌCEÄ,Ñ o,μ,ð s,ð B ì ¬f f\fbfh,Í V,μ,¢fIfufWfFfNfg,ð ì ¬,μ Afpf%of [f^,Ä"n,³,ê,½ff [f^,©,ç A,¢,-

,Ä,©,ÌfIfufWfFfNfg,Ì•® «,ð %Šú%»,μ A,»,ÌfIfufWfFfNfg,ð•Ö,· Bpf%of [f^,ÄŽw'è,³,ê,È,¢•® «,É,ÍfftfHf<fg,Ì'l,ð—,ì,Ä,·, BfAfvfŠfP [fVf‡f",Í A,±,ÌfIfufWfFfNfg,ÌfCf"f^ [ftfFfCfX,ðŽw'è,μ,Ä•® «,ð•İ X,μ AfIfufWfFfNfg,ÌŽg—p,ðŠJŽn,·,é,±,Æ,ª,Ä,«,é B

,·,×,Ä,ÌfIfufWfFfNfg,Í AfAfvfŠfP [fVf‡f""è<,Ì32frfbfg,Ìff [f^,ðŠi"[,·,é,±,Æ,ª,Ä,«,é B•ÜŽ f, [fh,Ä,Í A,±,Ìff [f^,%ðð Í,³,ê,½,è,·,é,±,Æ,Í,È,¢ BfAfvfŠfP [fVf‡f",©,ç,±,Ìff [f^,ð"Ç,YŽæ,é,É,Í ADirect3DRMObject::GetAppDataf f\fbfh,ðŽg—

p,·,é Bff [f^,ì '« ž,Y,É,Í ADirect3DRMObject::SetAppDataf f\fbfh,ðŽg,ð,±,Æ,ª,Ä,«,é BfAfvfŠfP [fVf‡f",ªŠeDirect3DRMFramefIfufWfFfNfg,Ì \¢'İ,ð•ÜŽ ,μ,Ä,¢,ê,Î A,±,Ìff [f^,ðŽæ"¾,·,é,Ì,İŠ'P,Ä, ,é B,½,Æ,ì,Î ADirect3DRMFrame::GetParentf f\fbfh,ðCEÄ,Ñ o,μ,ÄDirect3DRMFramefIfufWfFfNfg,ðŽó,Žæ,é ê ‡ AfAfvfŠfP [fVf‡f",Ívf%ofCfx [fg,È \¢'İ,Ö,Ìf|fCf"f^,ð—p,¢ AŽžŠÖ,Ì,©,©,¢EY òð s,í,,É—e"Ö,Éff [f^,ðŽæ"¾,·,é,±,Æ,ª,Ä,«,é B

fAfvfŠfP [fVf‡f",Ì \z,ðâ •,·,é,½,ß,É A,Ü,½,ÍfAfvfŠfP [fVf‡f",Ì† [fU EfCf"f^ [ftfFfCfX,Ì1•",Æ,μ,Ä A fIfufWfFfNfg,É-¼'O,ðŠ,,è"—,Ä,½,¢,±,Æ,ª, ,é,¾,è,ð BfIfufWfFfNfg,Ì-¼'O,ð Y'è EŽæ"¾,·,é,É,Í ADirect3DRMObject::SetName,ÆDirect3DRMObject::GetNamef f\fbfh,ðŽg—p,·,é B

fAfvfŠfP [fVf‡f"CEÄ—L,Ìff [f^,ÌŽg,¢•û,ì,à,ð,Ð,Æ,Ä,Ì—á,Æ,μ,Ä AfAfvfŠfP [fVf‡f",ªf fbvf... ã,Ì-È,ðTfufZfbfg,ÉfOf< [fv%»,μ,½,¢ ê ‡ i,½,Æ,ì,Î Aftf f"fg,ÆfobfN,Ì W ‡,ÉfOf< [fv%»,·,é ê ‡ j,ª l,,ç,ê,é B,±,Ì,Æ,« A, ,é-È,ª,Ç,ç,ç,ÌfOf< [fv,É'®,·,©,ð<L%~,·,é,½,ß,É AfAfvfŠfP [fVf‡f""è<,Ìff [f^,ð—p,·,é,±,Æ,ª,Ä,«,é B

fAfvfŠfP [fVf‡f",Í AfIfufWfFfNfg,"jŠü,³,ê,é,Æ,«,ÉCEÄ,Ñ o,·ŠÖ ",ðŽw'è,·,é,±,Æ,ª,Ä,«,é B,±,ÌŠÖ ",ªCEÄ,Ñ o,³,ê,½,Æ,« AfAfvfŠfP [fVf‡f",Í AfIfufWfFfNfg,ÉŠÖ~A•t,¬,ç,ê,½f f,fŠ,ð%ð•ú,μ,È,-,Ä,Í,È,ç,È,¢ BŠÖ ",ðŽw'è,·,é,É,Í A Direct3DRMObject::AddDestroyCallbackf f\fbfh,ðŽg—p,·,é BÈ'O,É,±,Ìf f\fbfh,É,æ,Ä,Ä"o^,³,ê,½ŠÖ ",ð í œ,·,é,É,Í ADirect3DRMObject::DeleteDestroyCallbackf f\fbfh,ðCEÄ,Ñ o,· B

fR [f<ofbfNŠÖ ",Í AfIfufWfFfNfg,"jŠü,³,ê,é,Æ,«¾,¬CEÄ,Ñ o,³,ê,é B,Ä,Ü,è AfIfufWfFfNfg,ÌŽQ ÆfJfEf"fg,ª0,É'B,μ AfVfXfef€,ªfIfufWfFfNfg,Ìf f,fŠ,ð%ð•ú,μ,æ,ð,Æ,μ,Ä,¢,é,Æ,«,Ä, ,é BfAfvfŠfP [fVf‡f",ªfIfufWfFfNfg,É,Ä,¢,Ä,ì•ñ,ð•ÜŽ ,μ,Ä,¢,é ê ‡ A,±,ÌfR [f<ofbfNŠÖ ",ð—p,μ,Ä Aff [f^,ð"jŠü,μ,Ä,æ,¢,±,Æ,ðfAfvfŠfP [fVf‡f"Ž© g,É'È'm,·,é,±,Æ,ª,Ä,«,é B

ŠÖ~A î•ñ,É,Ä,¢,Ä,Í uDirect3DRMObject v,ðŽQ Æ,³,ê,½,¢ B

**IDirect3DRMPickedArray***fCf“f^ [ftfFfCfX*

2D À•W,ðfrf... [f| [fg,É“n,µ AfV [f“ ã,lfufWf...  
fAf< EfIfufWfFfNfg,ðŒ©,Â,¯,évf fZfX,ðfsfbfLf“fO,Æ,¢  
,▣ **IDirect3DRMPickedArray***fCf“f^ [ftfFfCfX,ðŽæ“¾,·,é,É,Í AIDirect3DRMViewport::Pick*f f\fbfh,ðŽg—  
p,·,é,±  
,Æ,<sup>a</sup>,Â,«,é B,»,ê,©,ς**IDirect3DRMPickedArray::GetPick***f f\fbfh,ðŒÄ,Ñ o,µ,Ä AIDirect3DRMFrameArray**fCf“f^*  
*[ftfFfCfX,ÆfrfWf...fAf< EfIfufWfFfNfg,ðŽó,¯Žæ,é,±,Æ,<sup>a</sup>,Â,«,é BftfŒ [f€,ì”z—ñ,Í AŠK‘w,ðŒeo,ÄfrfWf...*  
*fAf< EfIfufWfFfNfg,É“Ž‘B,·,éfpfX A,Â,Ü,èfrfWf...fAf< EfIfufWfFfNfg,ì eftfŒ [f€,ìŠK‘wfŠfXfg,Â, ,é BŠ*  
*K‘w,Ìfgfbfv,É, ,é eftfŒ [f€,Í A”z—ñ,Ì æ“<sup>a</sup>,ÉŠì”[,<sup>3</sup>,ê,é B*

**IDirect3DRMShadowfCf“f^ [ftFfCfX**

fAfvfŠfP [fVf‡f“,Í AIDirect3DRM::CreateShadowf f\fbfh,ðŒÄ,Ñ o,·,¾,¯,Å A %Šú%» Ĩ,Ý,ÌŽg—p%Â”\  
,È%A%œ,ð ¶ ¬,·,é,±  
,Æ,<sup>a</sup>,Ä,«,é BIDirect3DRMShadowfCf“f^ [ftFfCfX,ì“¶ Ý,É,æ,Ä,Ä AIDirect3DRM::CreateObjectf f\fbfh,ð—p,¢  
,Ä%A%œ,ð ì ¬,·,é fAfvfŠfP [fVf‡f“,Í A,»,Ì %Šú%»,ðIDirect3DRMShadow::Init,ðŒÄ,Ñ o,μ,Ä s,□,±  
,Æ,<sup>a</sup>,Ä,«,é B

**IDirect3DRMTexture**fCf“f^ [ftfFfCfX

fefNfXf`ff,Í A F•t,«,ìfsfNfZf<‚éCE`É•À,ñ,¾,à,ì,À, ,é i<éCE`Í•K,,μ,à ³•ûCE`À,È,,Ä,à,æ,¢,ª AfVfXfef€  
,ª Ä,àCEø—|“I,É“® ì,‚,é,ì,Í ³•ûCE`Ì ê ±,Ä, ,é j BfefNfXf`ff,ÍfefNfXf`ff Ef}fbfsf“fO,ì-Ê,Æ,μ,ÄŽg,ª,±  
,Æ,à,Ä,«,é,ª A,±,Ì ê ±,Í ³•ûCE`À,È,,Ä,Í,È,Ç,È,¢ B

**IDirect3DRMTexture**fCf“f^ [ftfFfCfX,Í AŽÀ Û,ÍDirectDrawSurfaceIfufWfFfNfg,Ö,ÌfCf“f^ [ftfFfCfX,Ä, ,è A  
“Ä•Ê,EDirect3D,ÌfefNfXf`ff EfIfufWfFfNfg,Æ,¢,ª  
,í,¯,Ä,Í,È,¢ BDirect3D,ÌfefNfXf`ff,ÆDirectDraw,ÌfT [ftfFfX,ÌŠÖCEW,É,Ä,¢  
,Ä,Í A uDirect3DfefNfXf`ff EfCf“f^ [ftfFfCfX v,ðŽQ Æ,³,ê,½,¢ B

fAfvfŠfP [fVf±f“,Í AD3DRMIMAGE ‚¢‘Ì,©,çfefNfXf`ff,ð ì ¬,‚,é,½,ß,É AIDirect3DRM::CreateTexture f\fbfh,ðŽg,ª,±  
,Æ,ª,Ä,«,é B,Û,½ AIDirect3DRM::CreateTextureFromSurface f\fbfh,É,æ,Ä,ÄDirectDrawfT [ftfFfX,©,çfefNfXf`ff,ð ì ¬,‚,é,±,Æ,à,Ä,«,é B,³,Ç,É AIDirect3DRM::LoadTexture f\fbfh,ð—p,¢  
,é,Æ Aftf@fCf<,©,çfefNfXf`ff,ðf [fh,‚,é,±,Æ,ª,Ä,«,é B,±,Ì ê ± AfefNfXf`ff,ÍWindows,Ìftrfbfgf}  
fbfv i.bmp j,© Af| [f^fuf< EfsfNfXf}fbfv EftfH [f}fbfg i.ppm j,Ä,È,,Ä,Í,È,Ç,È,¢ B

Še-Ê,ÌfefNfXf`ff À•W,Í A,»),Ì“Á’è,ì-Ê,Éf}fbfsf“fO,³,è,éfefNfXf`ff,ÌfŠ [fWf±f“,ð’è<,μ,Ä,¢  
,é BfAfvfŠfP [fVf±f“,Í AfefNfXf`ff À•W,ðCEvŽZ,‚,é,½,ß,Éf%ofbvv,ð—~—p,‚,é,±,Æ,ª,Ä,«,é B Û,μ,-  
,Í uDirect3DRMWrapfCf“f^ [ftfFfCfX v,ðŽQ Æ,³,ê,½,¢ B

,±,ÌfCf“f^ [ftfFfCfX,Ìf f\fbfh,ÌfŠftf@fCEf“fX,Í A uIDirect3DRMTexture v,ðŽQ Æ,³,ê,½,¢ B

,±,ÌfZfNfVf±f“,Ä,Í ADirect3D,ªTf| [fg,‚,éfefNfXf`ff,ÌŽi—p,ÆŽg,¢•û,ð à-¾,‚,é B

fffJ [f<

fefNfXf`ff,Ì F

f~fbfvf}fbfv

fefNfXf`ff EftfBf<f^fŠf“fO

fefNfXf`ff,Ì“§-¾%»



fffJ [f<

fefNfXf`ff,Í AfrfWf...fAf< EflfufWfFfNfg,Æ,μ,Ä'¼ Úfœf“f\_Ÿf“fO,·,é,±,Æ,<sup>a</sup>Ä,«<sub>é</sub> B,±,ì,æ,²,É—p,¢  
,ç,ê,éfefNfXf`ff,Í A fffJ [f<,Æ,μ,Ä'm,ç,ê,Ä,¢,é BfffJ [f<,Æ,Í•ŨŽ f, [fh,Ä ì—p,<sup>3</sup>,ê,½—  
pCê,Ä, ,é BfffJ [f<,Í Afrf... [f| [fg,Æˆê'v,μ,½<éC`,Éfœf“f\_Ÿf“fO,<sup>3</sup>,ê,é B,±  
,ì<éC`,Í AfrfVfVf‡f“,Æ,μ,Ä AfffJ [f<,ì—§ˆİÊ'u,É,æ,éfXfP [fŸf“fO,%oÄ”,Ä, ,é  
BIDirect3DRMTexture::SetDecalSizef f\fbfh,ðŽg—p,·,é,Æ Aftfœ [f€  
,Éˆİ,μ,ÄˆŠˆİ“I,É'è<,<sup>3</sup>,ê,½<éC`,©,çfffJ [f<,ìfTfCfY,ð Ý'è,·,é,±  
,Æ,<sup>a</sup>Ä,«<sub>é</sub> B ifAfvfŠfP [fVf‡f“,Í ADirect3DRMTexture::GetDecalSizef f\fbfh,É,æ,Ä,ÄfffJ [f<,ìfTfCfY,ð'm,  
é,±,Æ,<sup>a</sup>Ä,«<sub>é</sub> B j,»,ìCã AfffJ [f<,Í•İŠˆ,<sup>3</sup>,ê A“§Ž<“Š%oe,<sup>3</sup>,ê,é B

fffJ [f<,ìC““\_,Í AfrfvfŠfP [fVf‡f“,©,ç Ý'è,ˆ,æ,ÑŽæ“¾,·,é,±,Æ,<sup>a</sup>Ä,«<sub>é</sub> B,±  
,ê,É,ÍDirect3DRMTexture::SetDecalOrigin,âDirect3DRMTexture::GetDecalOriginf f\fbfh,ð—p,¢,é BÉ  
“\_,Í AfffJ [f<,Ì ¶ ã<÷,©,ç,ìfIfzfZfbfg,Ä•,<sup>3</sup>,ê,é BffftfHf<fg,ìC““\_,Í[0, 0]  
,Ä, ,é Bfœf“f\_Ÿf“fO,Ì Ũ,É,Í AfffJ [f<,ìC““\_,Íftfœ [f€,İÊ'u,É ‡,í,<sup>1</sup>,ç,ê,é B

**fefNfXf`ff,İ F**

fefNfXf`ff,İfŒf“f\_Œf“fO,Å—p,Œ  
,ç,ê,é F ”,ðŽæ“¾ E Ý’è,·,é,É,İ AIDirect3DRMTexture::SetColors,ÆIDirect3DRMTexture::GetColorsf f\fbfh,ð—  
~—p,·,é B

RGBfJf%o [ Ef,fff<,ð—p,Œ,éfAfvfŠfP [fVf‡f“,Å,İ A8rfbfg A24rfbfg A32rfbfg,İfefNfXf`ff,ðŽg—p,·,é,±  
,Æ,ª,Å,«,é B,µ,©,µ Af,fmfNf if%of“fv j EfJf%o [ Ef,fff<,ð—p,Œ,é ê ‡,É,İ A8rfbfg,İfefNfXf`ff,İ,ÝŽg—  
p,Å,«,é B

fV [f“,ÉŒö,ð“K—p,·,é,Æ,« A,»,ê,¼,ê,İ F,İ%oe,ªŽg—p,³,ê,é BŽg,í,ê,Ä,Œ,é%oe,İ ”,İ Ý’è,âŽæ“¾,ð s,□  
,É,İ AfAfvfŠfP [fVf‡f“,©,çIDirect3DRMTexture::SetShades,âIDirect3DRMTexture::GetShadesf f\fbfh,ðŒÄ,Ñ o  
,· B

Direct3DRMTextureIfufWfFfNfg,İ AfefNfXf`ff,ªŒf“f\_Œf“fO,³,ê,éŒ³,Æ,È,éfrfbfgf}  
fbfv,ð’è<`,·,é,½,ß,ÉD3DRMIMAGE \‘Œ‘İ,ðŽg—  
p,·,é BfAfvfŠfP [fVf‡f“,ªD3DRMIMAGE \‘Œ‘İ,ð’ñ<Ÿ,·,ê,İ AfŒf“f\_Œf“fO’†,ÉŠÈ’P,ÉfefNfXf`ff,ð“@,©,µ,½,è•İ  
X,Å,«,é B

***f~fbfvf}fbfv***

*f~fbfvf}fbfv*,Æ,Î^A'±  
,μ,½efNfXf`ff,ðŽ|,μ AŠefefNfXf`ff,Í A“¬¶fCf [fW,ÉftfBf<f^,ð,©,¯,Ä ™ X,É'á%ð'œ“x,É,μ,½,à,ì,Å, ,é B  
*f~fbfvf}fbfv*,Í AÆvŽZ ã'áfRfXfg,ÉfefNfXf`ff,ìfœf“f\_Šf“fO ,“x,ð ,,ß,éŽè'i,Å, ,é B*f~fbfvf}*  
*fbfv'*†,ìftfBf<f^,³,ê,½fCf [fW,âfœfxf<,Í A'O,ìfœfxf<,æ,è,à ¬,³,,È,Å,Å,¢, B*f~fbfvf}*  
*fbfv*,Í ADirect3DRMDevice::SetTextureQualityf f\fbfh,ðÆÄ,Ń o,μ,ÄfefNfXf`ff,ðftfBf<f^fŠf“fO,·,é,Æ,«,ÉŽw'è  
,·,é,±,Æ,³,Å,«,é B  
*f~fbfvf}fbfv*,ì ì ¬,É,Å,¢,Ä Ú,μ,,Í u*f~fbfvf}fbfv* v,ðŽQ Æ,³,ê,½,¢ B

**fefNfXf`ff EftfBf<f^fŠf“fO**

fefNfXf`ff,ª-Ê,Éf}fbfsf“fO,³,ê,½Œã,Í AfefNfXf`ff—  
v‘f ifefNfZf< j,ª Å IfCf [fW,ìŒÂ X,ìfsfNfZf<,Æ^ê‘v,·,é,±,Æ,Í-  
Å‘½,É,È,¢ B Å IfCf [fW’†,ìfsfNfZf<,Í AfefNfZf<,ì‘ã,«,È W ‡‘ì,© A,D,Æ,Â,ìfefNfZf<,ì ¬·”ª,É‘Š-  
,·,é BfsfNfZf<,ÉfefNfZf<,ì‘l,ð•áŠ®,·,é•û-@,ðŽw’è,·,é,É,Í AfefNfXf`ff EftfBf<f^fŠf“fO,ð—~—p,·,é B  
fAfvfŠfP [fVf‡f“,Í AIDirect3DRMDevice::SetTextureQualityf f\fbfh,ÆD3DRMTEXTUREQUALITY—ñ<“Œ^,ðŽg  
—p,µ,Ä AfefNfXf`ff EftfBf<f^fŠf“fO Ef, [fh,ðŽw’è,·,é,±,Æ,ª,Ä,«,é B

**fefNfXf`ff,İ“§-¾%»**

“§-¾,ÈfefNfXf`ff,ð ¶ ¬,·,é,É,ÍIDirect3DRMTexture::SetDecalTransparencyf f\fbfh,ð—~—  
p,·,é BfefNfXf`ff,ð“§-¾%»,·,é¼,İ•û-@,Æ,µ,Ä,Í ADirectDraw,<sup>a</sup>fTf| [fg,·,éfJf%o [ EfL [,ðŽg—p,·,é•û-@,<sup>a</sup>, ,é  
BfJf%o [ EfL [,Æ,Í Afuf fbfN“]‘—,âfI [fo [fŒfC‘€ ì,É,·, ,é A“]‘—Œ<sup>3</sup>, ,é,¢,Í“]‘—  
æ•”<sup>a</sup>,ì F,Û,½,Í F,ì”ÍÍ,Ä, ,é B,±,ê,ç,İ F,Í A,Ä,Ë,É ã ‘,«<sup>3</sup>,ê,é,æ,▯,É,à AŒ^,µ,Ä•İ X,<sup>3</sup>,ê,È,¢,æ,▯,É,ðŽw’è,·,é,±  
,Æ,<sup>a</sup>,Ä,«,é B

DirectDraw,İfJf%o [ EfL [ EfTf| [fg,É,Ä,¢,Ä Ú,µ,,Í A ufJf%o [ EfL [fCf“fQ v,ðŽQ Æ,<sup>3</sup>,ê,½,¢ B

ŠÖ`A î•ñ,É,Ä,¢,Ä,Í uIDirect3DRMTexture v,ðŽQ Æ,<sup>3</sup>,ê,½,¢ B

**IDirect3DRMUserVisualfCf“f^ [ftfFfCfX**

f† [fU EfrfWf...fAf< EflfufWfFfNfg,Í AfV [f“,âfœf“f\_Šf“fO,É’Ç%Á,·,é,±  
,Æ,<sup>a</sup>,Ä,«,é fAfvfŠfP [fVf‡f““è<,Ìff [f^,Ä, ,é B^ê”Ê“I,É,Í AfJfXf^f}fCfY,<sup>3</sup>ê,½fœf“f\_Šf“fO Ef,fWf...

[f<,<sup>a</sup>Žg—p,·,é B,½,Æ,,Ì fAfvfŠfP [fVf‡f“,Í Af† [fU EfrfWf...  
fAf< EflfufWfFfNfg,Æ,μ,ÄfV [f“,ÉfTfEf“fh,ð’Ç%Á,μ A Ä ¶†,ÉfTfEf“fh,ðfœf“f\_Šf“fO,·,é,±,Æ,<sup>a</sup>,Ä,«,é B

f† [fU EfrfWf...fAf< EflfufWfFfNfg,ð ì ¬,·,é,É,Í **IDirect3DRM::CreateUserVisual**f f\fbfh,ðŽg—  
p,·,é B,Û,½ A**IDirect3DRMUserVisual::Init**f f\fbfh,Í Af† [fU EfrfWf...  
fAf< EflfufWfFfNfg,Ì %Šú%»,ð s,□ B

**IDirect3DRMViewport,ÆIDirect3DRMViewportArrayfCf“f^ [ftfFfCfX**

f<sub>r</sub>f... [f] [fg,Í A3DfV [f“,ªÇ,ìæ,ϩ,É2DfEfBf“fhfE,ÉfEf“f\_fŠf“fO,³,ê,é,©,ð’èç`,·,é Bf<sub>r</sub>f... [f]  
[fg,Í AfIfufWfFfNfg,ªfEf“f\_fŠf“fO,³,ê,éfffofCfX ã,ì<éE`—Ìæ,ð’èç`,·,é B

,±,ìfCf“f^ [ftfFfCfX,ìf f\fbfh,ìfŠftf@fEf“fX,Í A uIDirect3DRMViewport v,ðŽQ Æ,³,ê,½,¢ B

,±,ìfZfNfVf‡f“,Å,Í Af<sub>r</sub>f... [f] [fg,Æ,»,Ì \ ¬—v‘f AŽg—p ã,ìfefNfjfbfN,É,Â,¢,Ä à–¼,·,é B

fJf f%o

Ž< ‘ä

•řš.

fsfbfLf“fO

**fJf f%**

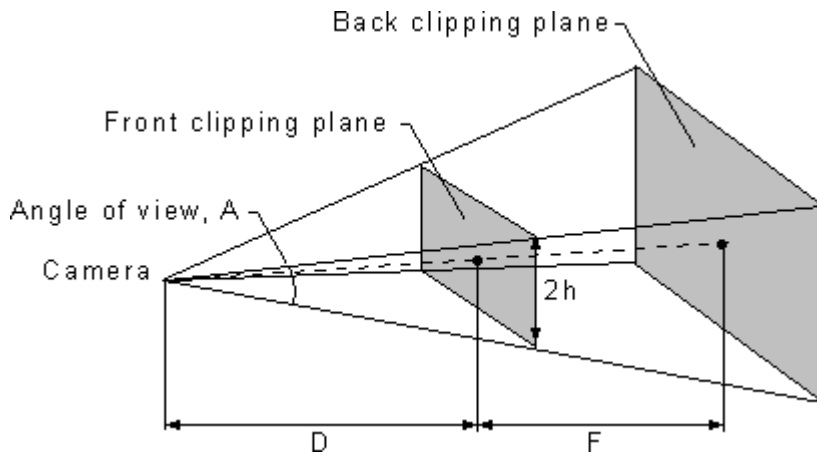
f<sub>r</sub>f... [f] [fg,ÍDirct3DRMFrame,ðfJf f%,Æ,μ,ÄŽg—p,·,é BfJf f% EftfƎ [f€  
,Í AfƎf“f\_Šf“fO,<sup>3</sup>,ê,éfV [f“ A•Ž,Ê’u,“,æ,Ń•ûƎü,ð’è‘,·,é Bfrf... [f] [fg,Í AfJf f% EftfƎ [f€  
,l̇<sup>3</sup>,l̇zŽ<sup>2</sup> ã,É, ,é%ŌŽ<fIfufWfFfNfg,<sup>¾</sup>,¯,ð AyŽ<sup>2</sup> ã,l̇<sup>3</sup>•ûƎü,ÉƎf“f\_Šf“fO,·,é B

fAfvfŠfP [fVf‡f“,Í A—^,|,ç,ê,½frf... [f] [fg,ÉfJf f%  
,ðfZfbfg,·,é,½,ß,É A**IDirect3DRMViewport::SetCamera**f f\fbfh,ð—p,¢,é,±,Æ,<sup>a</sup>,Ä,«é B,±,l̇f f\fbfh,Í Afrf... [f]  
[fg,l̇Ê’u A•ûƎü AƎü,«ðfJf f% EftfƎ [f€,É Y’è,·,é BƎ» Y,l̇fJf f%,l̇ Y’è,ðŽæ“¾,·,é,É,Í A  
**IDirect3DRMViewport::GetCamera**f f\fbfh,ðƎÄ,Ń o,· B



Ž< ‘ä

Ž< ‘ä,Í Afrf... [f] [fg,İfJf f%o,É‘İ,μ,Ä‘Š‘İ“I,É”z’u,³,ê,½ AfV [f“ ä,İ3Df{fŠf... [f€,Ä, ,é BŽ< ‘ä,İ‘†,É, ,é fIfufWfFfNfg,Í%oÄŽ< ó‘Ö,Ä, ,é B“šŽ<“š%oe,Ä,Í A‘O•ûfNfŠfbfv–Ê,ÆÆä•ûfNfŠfbfv–Ê,İŠÖ,İ%o¼‘zfsf%of~fbfh,İf{fŠf... [f€,ðŽw,• B



fJf f%o,İfsf%of~fbfh,İ‘“„É, ,é A‘“„©,ç‘ê‘Ö,İ‘†%o,ÉÆü,©,Ä,ÄžŽ²,“%o,,,Ñ,Ä,¢,é B‘O•ûfNfŠfbfv–Ê,İfJf f%o ,©,ç<—£D,İ‘Ê‘u,É, ,é B,Û,½ AÆä•ûfNfŠfbfv–Ê,Í A‘O•ûfNfŠfbfv–Ê,©,ç<—£F,İ‘Ê‘u,É, ,é B,± ,ê,ç,İ‘l,Í AIDirect3DRMViewport::SetFront AIDirect3DRMViewport::SetBack AIDirect3DRMViewport::GetFront A,“,æ,ÑIDirect3DRMViewport::GetBackf f\fbfh,ðÆÄ,Ñ o,μ,Ä Ý’è EŽæ“¾,•,é,±,Æ,ª,Ä,«„é B‘O•ûfNfŠfbfv–Ê,İ ,³,İ2h,Ä Afrf... [,İftfB [f<fh,ð’è<‘,•,é Bh,İ‘l,ð Ý’è EŽæ“¾,•,é,É,Í AIDirect3DRMViewport::SetField,“,æ,ÑIDirect3DRMViewport::GetFieldf f\fbfh,ðŽg—p,•,é B

frf... [,İšp“xA,İŽŸ,İ“™Ž®„É,æ,Ä,Ä’è<‘,³,ê,é BfJf f%o EfAf“fOf<„Ä’è,³,ê,Ä,¢,é,Æ,« A,± ,İŽ®,É,æ,Ä,Äh,İ‘l,ðEvŽZ,•,é,±,Æ,ª,Ä,«„é B

$$A = 2 \tan^{-1} \frac{h}{D}$$

Ž< ‘ä,İfsf%of~fbfh,Í A“šŽ<“š%oe,İ ê ‡,É,İ,Ý“K—p,³,ê,é B•½ s“š%oe,É,“,¢,Ä,Í AŽ< ‘ä,Í—š•û‘l,É,È,é Bfrf... [,İf^fCfv i, ,é,¢,Í“š%oe•û–@ j,ÍD3DRMPROJECTIONTYPE— ñ<“Æ^,Ä’è<‘,³,ê,Ä,“,è AIDirect3DRMViewport::GetProjection,“,æ,ÑIDirect3DRMViewport::SetProjectionf f\fbfh,ÄŽ g,í,ê,é B

•İŠ•

3D À•W,İfİfufWfFfNfg,đ2DfEfBf“fhfE,ÉfĚf“f\_ŧŠf“fO,·,é,½,ß,É,Í AfİfufWfFfNfg,đfİf\_f%o EftfĚ [fĚ“à,É•İ Š·,µ,È,,Ä,Í,È,ç,È,ĉ B,»,±,Ä A4,Ä,İ—v‘f,đŽ ,Ä“Žĉ,İ À•W[xyzw],đĉ ,ß,é,½,ß AŽĚ%oe s—ñ,ª—p,ĉ ,ç,é,é B À•W[xyzw],Í A3—v‘f,İ À•W[x/wy/wz/w],đŽæ“¾,·,é,½,ß,ÉŽg,í,é,é B[x/wy/w],ÍfEfBf“fhfE,ªŽg— p,·,é À•W,Ä, ,é B,Û,½ Az/w,İ%oe s,«,đ0,©,ç1,İ”ÍÍ,ÄŽ!,µ A0,Í‘O•ûfNfŠfbfv—Ê A1,ÍĚã•ûfNfŠfbfv— Ê,Æ,È,é BŽĚ%oe s—ñ,Í A“ŠŽ•İŠ·,İĚã,ÉfİfufWfFfNfg,İfXfP [fŠf“fO,ÆˆÚ“®,đĚĉ ‡,µ,½,à,İ,Ä, ,é B

ŽŸ,İ s—ñ,ªŽĚ%oe s—ñ,Ä, ,é B,±,İ“™Ž®,É,“,ĉ,Ä Ah,ÍŽĉ ‘ä,İ”¼ª,İ ,,³ AF,ÍĚã•ûfNfŠfbfv— Ê,İz À•W AD,Í‘O•ûfNfŠfbfv—Ê,İz À•W,đŽ!,µ,Ä,ĉ,é B

$$P = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & \frac{hF}{D(F-D)} & \frac{h}{D} \\ 0 & 0 & \frac{-hF}{F-D} & 0 \end{bmatrix}$$

Direct3D,Ä,Í AŽĚ%oe s—ñ,İ4,4—v‘f,É•%,İ‘l,đ Ý’è,·,é,±,Æ,Í,Ä,«,È,ĉ B

ŽŸ,İ s—ñ,Í AfEfBf“fhfE EfXfP [fŠf“fO,đ s,ª ifXfP [fĉ,ÍfEfBf“fhfE,İTfCfY,ÆˆÊ‘u,ÉˆĚ‘¶,·,é j B,± ,İĚöŽ®,Ä,Í As,ÍfEfBf“fhfE,İfXfP [fŠf“fOĚW ” Ao,ÍfEfBf“fhfE,İĚ“\_,Ä, ,é B

$$W = \begin{bmatrix} s_x & 0 & 0 & 0 \\ 0 & -s_y & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0_x & 0_y & 0 & 1 \end{bmatrix}$$

ŽŸ,İ s—ñ,İftrf... [ s—ñ,Ä, ,é B,±,ê,Í AŽĚ%oe s—ñ,ÆfEfBf“fhfE s—ñ,İ ‡ ¬ AĚ¾,ĉŠ·,‘,ê,İP,ÆW,İ İ,Ä, ,é B

$$V = P \cdot W = \begin{bmatrix} s_x & 0 & 0 & 0 \\ 0 & -s_y & 0 & 0 \\ \frac{ho_x}{D} & \frac{ho_y}{D} & \frac{hF}{D(F-D)} & \frac{h}{D} \\ 0 & 0 & \frac{-hF}{F-D} & 0 \end{bmatrix}$$

fXfP [fŠf“fOĚW ”,ÆĚ“\_sx Asy Aox Aoy,Í A[-h-hD],©,ç[h hD],  
Û,Ä,İfŠ [fWf‡f“,ªfEfBf“fhfE,İ ,,³,â• ,É ³Šm,ÉftfBfbfg,·,é,æ,ª,Éˆ‘İˆđ,³,ê,é B

fXfNfŠ [f“ À•W,©,çf [fĉfh À•W A,Û,½ĉt,Éf\_ [fĉfh À•W,©,çfXfNfŠ [f“ À•W,ÉfxfNfgfĉ,đİŠ·,·,é,É,Í Aİ Direct3DRMViewport::Transform,âİDirect3DRMViewport::InverseTransform f\fbfh,đŽg—p,·,é BŽŸ,İ—á,İ,æ,ª ,É AfAfvfŠfP [fVf‡f“,Í A,±,ê,ç,İf f\fbfh,đ—~—p,µ,Äfhf%fbfO,đfTf [fg,·,é,±,Æ,ª,Ä,«,é B

```
/*
 * Drag a frame by [delta_x delta_y] pixels in the view.
 */
void DragFrame(LPDIRECT3DRMVIEWPORT view,
    LPDIRECT3DRMFRAME frame,
    LPDIRECT3DRMFRAME scene,
    int delta_x, int delta_y)
{
    D3DVECTOR p1;
    D3DRMVECTOR4D p2;

    frame->GetPosition(scene, &p1);
    view->Transform(&p2, &p1);
```

frf... [f] [fg;İŠ,ð—p,¢,é,Æ Af [f<fh À•W,Â,İfİfufWfFfNfg,İŨ“®—£,ðfJf f%o,©,ç%œ s,¢,Ü,Â,İ¢—£  
,Æè˘v,³,¹,é,±,Æ,ª,Â,¢,é **BIDirect3DRMViewport:Transform** f vfbfh,İÊ¢%œİ,Í A4,Â,İ—v˘f,ðŽ ,ÂfxfNfgf¢,Â\  
,³,ê,é,±,Æ,Ê˘ Ö,³,ê,½,¢ B,±,ê,Ê,æ,Â,Â AfJf f%o,İÊ˘u,ÉÊÀ,è,È,¢,® À•W,Â ¶,¶,è—â˘è,ð%œñ˘ð,˘,é,±,Æ,ª,Â,¢,é B

frf... [f] [fg;İŽÊ%œ s—ñ,ª ¶ ¬,˘,é3D À•W,Í AŽ< ¨ä,İ“à”,İ“—,¾,¬,ð—¾šm,É,µ,Ä,¢,é B“Š%œÊâ,İ“—[x y z w]  
,É,Â,¢,Ä,Í A^Ê%œ,İ“™Ž®,ª ¬—š,˘,é B

$$\begin{aligned} wx_{min} &\leq x < wx_{max} \\ wy_{min} &\leq y < wy_{max} \\ 0 &\leq z < w \\ \text{where} \\ x_{min} &= viewport_x - viewport_w / 2 \\ x_{max} &= viewport_x + viewport_w / 2 \\ y_{min} &= viewport_y - viewport_h / 2 \\ y_{max} &= viewport_y + viewport_h / 2 \end{aligned}$$
[illegible]

fsfbfLf“fO

fsfbfLf“fO,Æ,Í Afrf... [f] [fg,lfEfBf“fhfE,Å A2D À•W,©,çfV [f“ ã,lfwf...  
fAf< EfIfufWfFfNfg,ð’T ð,·,évf fZfX,Å, ,é BfAfvfŠfP [fVf‡f“,íDirect3DRMViewport::Pickf f\fbfh,ðŽg—  
p,µ,Ä AfV [f“ ã,Ì Å,àð,çfIfufWfFfNfg A,Ü,½,ÍfIfufWfFfNfg,Ì d,È,è ‡,lfŠfXfg,ðŽæ“¼,·,é,±,Æ,ª,Å,«,é B

**IDirect3DRMVisual,ÆIDirect3DRMVisualArray** fCf“f^ [ftfFcX

frfWf...fAf< EfIfufWfFfNfg,Í AfV [f“ ã,ÉfŒf“f\_Šf“fO,·,é,±,Æ,ª,Å,«,«éIfufWfFfNfg,Å, ,é BfrfWf...  
fAf< EfIfufWfFfNfg,“%ÂŽ<,È,È,é,Ì,Í A,»,ÌfV [f“,ÌftfŒ [f€,É’Ç%Â,³,ê,½,Æ,«,¾,¯,Å, ,é BfAfvfŠfP [fVf‡f“,Í  
**AIDirect3DRMFrame::AddVisual**f f\bfh,ð—p,¢,ÄfrfWf...fAf< EfIfufWfFfNfg,ðftfŒ [f€  
,É’Ç%Â,·,é BftfŒ [f€,Í AfŒf“f\_Šf“fO,É”ö,¡ AfrfWf...fAf< EfIfufWfFfNfg,ÉÊ’u,ÆŒü,«,ð’ñ<ÿ,·,é B

frfWf...fAf< EfIfufWfFfNfg,ÌfOf< [fv,ð’€ ì,·,é,É,Í **AIDirect3DRMVisualArray**fCf“f^ [ftfFcX,ðŽg—p,µ,È,-  
,Ä,Í,È,ç,È,¢ **BIDirect3DRMVisual** COMfCf“f^ [ftfFcX,Í‘¶ Ý,·,é,ª Af f\bfh,ð%½,àŽ ,Ä,Ä,¢,È,¢ B

Å,à`ê”Ê“l,ÈfrfWf...  
fAf< EfIfufWfFfNfg,Ìf^fCfv,Í ADirect3DRMMeshBuilder,ÆDirect3DRMTexturefIfufWfFfNfg,Å, ,é B

**IDirect3DRMWrapCf“f^ [ftFfCfX**

f%ofbfv,Í A-Ê,âf fbfVf...,lfeNfXf`ff À•W,ìEvŽZ,ÉŽg—p,.,é,±  
,Æ,<sup>a</sup>,Â,«,é Bf%ofbfv,ð ì ¬,.,é,É,Í AfAfvfŠfP [fVf‡f“,Í Af%ofbfv,lf^fCfv,âŽQ ÆftfŒ [f€ AŒ  
‘“ A•ûŒüxfNfgf< A ãxfNfgf<,ðŽw’è,µ,È,,Ä,Í,È,ç,È,¢ B,Û,½ AfXfP [fŠf“fOŒW ”,ÆfefNfXf`ff À•W,ìŒ  
‘“\_àŽw’è,.,é•K—v,<sup>a</sup>,,é B

fAfvfŠfP [fVf‡f“,Í A**IDirect3DRM::CreateWrap** f\fbfh,ðŒÄ,Ñ o,µ,Ä**IDirect3DRMWrapCf“f^ [ftFfCfX,ð**  
¶ ¬,.,é B,±,lfCf“f^ [ftFfCfX,É,Í A**IDirect3DRMWrap::Apply,ÆIDirect3DRMWrap::ApplyRelative**,ì,Ó,½,Ä,ì“Á  
—L,Èf f\fbfh,<sup>a</sup>ŠÛ,Û,ê,Ä,¢,é B**IDirect3DRMWrap::Apply**,Í AfIfufWfFfNfg,ì’,“\_Éf%ofbfv,ð“K—  
p,.,é B**IDirect3DRMWrap::ApplyRelative**,Í A“K—p,<sup>3</sup>,ê,½f%ofbfv,ì’,“\_ð•İŠ,.,é B

fTf“fvf<,Ä,Í A•ûŒüxfNfgf< ivxfNfgf< j,ÍzŽ<sup>2</sup>,É%o^,¢ A ãxfNfgf< iufxfNfgf< j,ÍyŽ<sup>2</sup>,É%o^,Ä,Ä,¢,é BŒ  
‘“\_Í[0, 0, 0],Ä, ,é B

**IDirect3DRMWrapCf“f^ [ftFfCfX,lf f\fbfh,lfŠftf@fŒf“fX,Í u**IDirect3DRMWrap** v,ðŽQ Æ,<sup>3</sup>,ê,½,¢ B**

,±,ìZfNfVf‡f“,Ä,Í Af%ofbfsf“fO Eftf%ofO,Æ4,Ä,lf%ofbfsf“fO Ef^fCfv,É,Ä,¢,Ä à-¾,.,é B

f%ofbfsf“fO Eftf%ofO

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fNf f€

f%o**b**fsf“fO Eftf%o**f**O

**D3DRMMAPPING**Ė^,É,Í AD3DRMMAP\_WRAPUftf%o**f**O,ÆD3DRMMAP\_WRAPVftf%o**f**O,ªŠÜ,Ü,ê,Ä,ċ,é B,±  
,ê,ç,İftf%o**f**O,É,æ,Ä,Ä Af%o**f**Xf^f%o**f**CfU,ªfefNfXf`ff Ä•W,ð%o**ð** Í,·,é•û—  
@,ªĖ`è,³,ê,é Bf%o**f**Xf^f%o**f**CfU,Í A,Â,Ë,ÉfefNfXf`ff Ä•WŠÖ,İ Ä'Z<—£ i,Â,Ü,è'¼ ü j•âŠ@,·,é B,±  
,İ'¼ ü,İfpfX,Æ A—LĖø,Ëu,¨,æ,Ńv Ä•W,İ'l,Í Af%o**f**bfsf“fO Eftf%o**f**O,İŽg,ċ•û,É,æ,Ä,Ä`Ü,É,é Bftf%o**f**O,İ•Đ•û, ,  
é,ċ,Í—  
¼•û,ªfZfbfg,³,ê,é,Æ A'¼ ü,Í Au,Ü,½,İv•ûĖü,İfefNfXf`ff,İ•Ó,É%o^,Ä,Ä A%o~'Ė ó,©fh [fifc ó,İĖ` ó,©,İ,æ,□  
,Éf%o**f**bvfAf%o**f**Ef“fh,³,ê,é B

f%o**b**fsf“fO Eftf%o**f**O,ªfZfbfg,³,ê,Ä,ċ,È,ċ•½—Êf%o**b**fsf“fO Ef, [fh,Ä,Í Au,Ü,½,İv Ä•W,ÄŽw'è,³,ê,½•½—  
É,É,Í AfefNfXf`ff,ª—ĖÄ,Éf^fCfŠf“fO,³,ê,é B,±,İ ê ‡ A—LĖø,Ëu,¨,æ,Ńv Ä•W'l,İ1.0`È ä,Ä, ,é B“(0.1,  
0.1),Æ(0.9,0.9),ðĖ<,Ô Ä'Z,İ'¼ ü,Í A“(0.5,0.5),ð'Ê%o**ß**,·,é B

D3DRENDERSTATE\_WRAPU,Ü,½,ÍD3DRENDERSTATE\_WRAPV,İ,ċ  
,,ê,©,ªfZfbfg,³,ê,½ ê ‡ AfefNfXf`ff,İ%o~Žü1.0,İ I,İ,è,İ,È,ċ  
%o~“Ė`É,È,é B1.0`È ä,İfefNfXf`ff Ä•W,Í Af%o**f**bvf,³,ê,Ä,ċ,È,ċ”ÍÍ“à,Ì,Ý—LĖø,Ä, ,é BfefNfXf`ff Ä•WŠ  
Ö,İ Ä'Z<—£,İf%o**b**fsf“fO Eftf%o**f**O,É,æ,Ä,Ä`Ü,É,é BD3DRENDERSTATE\_WRAPU,ªfZfbfg,³,ê,Ä,ċ  
,é,Æ,«,Í A“(0.1,0.1),©,ç(0.9,0.9),Ü,Ä,İ Ä'Z,İ'¼ ü,Í A“\_i0,0.5 j,ð'Ê%o**ß**,·,é B

D3DRENDERSTATE\_WRAPU,ÆD3DRENDERSTATE\_WRAPVftf%o**f**O,İ—  
¼•û,ªfZfbfg,³,ê,½,Æ,«,Í AfefNfXf`ff,İ%o~ŠÄ'İ ifh [fifc j ó,É,È,é BfVfXfefĖ,Í•Ä ½,µ,Ä,ċ  
,é,½,ß A1.0`È ä,İfefNfXf`ff Ä•W,İ—Ėø,Ä, ,é B“(0.1,0.1),©,ç(0.9,0.9),Ü,Ä,İ Ä'Z,İ'¼ ü,Í A“(0,0)  
,ð'Ê%o**ß**,·,é B

—Ėø—İ`æ,É, ,Ä,½fefNfXf`ff Ä•W,ð—LĖø—İ`æ,ÉŽû,ß,½,Æ,µ,Ä,à A,»,İ,Æ,«,İ“® İ,Í•Û Ø,³,ê,Ä,ċ,È,ċ B

ˆê”Ê,ÉfAfvfŠfP [fVf‡f“,Í AfefNfXf`ff,İĖð ü,ª—Ê,İ•Ó,Æˆè'v,µ,È,ċ  
,Æ,« A%o~'Ė ó,Éf%o**f**bvf,·,é,½,ß,Éf%o**b**fsf“fO Eftf%o**f**O,ðfZfbfg,·,é B,Đ,Æ,Ä,İ—Ê,ÉfefNfXf`ff,İ”¼•“È ä,ªŽg  
—p,³,ê,é ê ‡,É,Í Af%o**b**fsf“fO Eftf%o**f**O,Í Ý'è,µ,È,ċ B

•½-Ê

•½-Êf%ofbfv,Â,Í AfefNfXf`ff,Í AfIfufWfFfNfg ã,ÉfXfgfƐfbf`,³,ê,½fSf€,Ì,æ,ϣ,ÉfIfufWfFfNfg,Ì-Ê,Ê^ê`v,·,é B

ŽŸ,Ì“™Ž®,É,æ,è AfxfNfgf<[x y z],©,ç[u v] À•W,ª< ,ß,ç,ê,é B

u=SuX-Ou

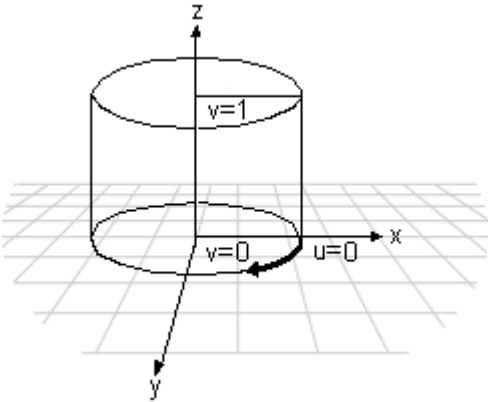
v=Svy-Ov

,±,ê,ç,ÌƐöŽ®,É,“,ç,Ä As,ÍfEfBf“fhfE,ÌfXfP [fŠf“fOƐW ” Ao,ÍfEfBf“fhfE,ÌƐ´“,ðŽ!,μ,Ä,ç  
,é BfAfvfŠfP [fVf‡f“,Í A1‘g,ÌfXfP [fŠf“fOƐW ”,Æ Au,“,æ,Ñv,ª—LƐø,È'l,ðŽæ,é,æ,ϣ,Éx,Æy,ð0,©,ç1,Ì”ÍÍ,Éf}  
fbfv,·,é,½,ß,ÌfIftfZfbfg,ðƐ˘è,μ,È,,Ä,Í,È,ç,È,ç B



%o~'Œ

%o~'Œ%ofbfv,Â,Í AfefNfXf`ff,Í%o~'Œ,ì%oñ,è,ð•i,ĐŽ†,ì,æ,ϱ,É^μ,í,ê A,»,ì ¶'[,Í%oE'[,É,Â,È,<sup>a</sup>,Á,Ä,¢  
,é BfIfufWfFfNfg,Í%o~Žü,ì'†%o>,É"z'u,<sup>3</sup>,ê AfIfufWfFfNfg,ìfT [ftfFfX,É ‡,í,<sup>1</sup>,ÄfefNfXf`ff,<sup>a</sup>•İŒ`<sup>3</sup>,ê,é B  
%o° },Í A%o~'ŒfefNfXf`ff Ef}fbfv,É,"-,éŠefxfNfgf<,ìŒø%oÊ,ðŽ',μ,½,à,ì,Â, ,é B



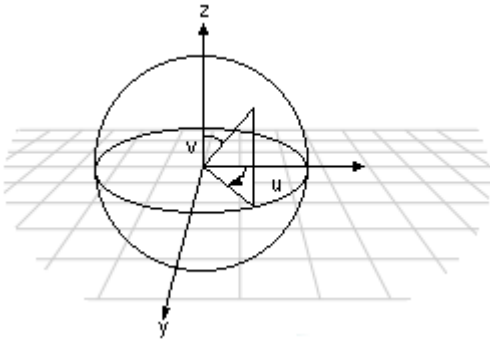
•ûŒüfxfNfgf<,Í%o~'Œ,ìŽ²,ðŽ',μ A ãfxfNfgf<,Í%o~<,ìŠO'ϱ,ìu = 0,Â, ,é“\_,ðŽ',· BfVfXfefŒ,Í AfxfNfgf<[x y z]  
,É'Î,·,éfefNfXf`ff,ì[u v] Â•W,ðŒvŽZ,·,é,½,ß,É AŽŸ,ì“™Ž®,ðŽg—p,·,é B

$$u = \frac{s_u}{2\pi} \tan^{-1} \frac{x}{y} - o_y$$
$$v = s_v z - o_v$$

'Ê í Au,ÍfXfP [fŠf“fO,<sup>3</sup>,ê,È,¢,Ü,Ü,Â, ,é Bv,<sup>a</sup>—LŒø,È'l,ðŽæ,é,æ,ϱ,Éz,ð0,©,ç1,ì”Í'Í,Éf}  
fbfv,μ,Â Av,ìfXfP [fŠf“fO,Æ•İŠ·,<sup>a</sup> s,í,ê,é B

...đ

...‘ìf%ofbfv,Â,Í AfxfNfgf{[x y 0],ÆxŽ²,ìŠp“x,©,ç i%o~‘Ef%ofbfv,Æ“—  
l,É ju Â•W,ª,ß,ç,ê,é Bv Â•W,Í AfxfNfgf{[x y z],ÆzŽ²,ìŠp“x,©,ç,ß,ç,ê,é B,±,ìf}  
fbfsf“fO,Â,Í AzŽ² ã,É~c,Y,ª ¶,¶,é,±,Æ,É’ ^Ó,ªK—v,Â, ,é B



,±,ê,íŽŸ,ì“™Ž®,Â•\,³,ê,é B

$$u = \frac{S_u}{2\pi} \tan^{-1} \frac{x}{y} - o_u$$
$$v = \frac{S_v}{\pi} \tan^{-1} \frac{z}{\sqrt{x^2 + y^2 + z^2}} - o_v$$

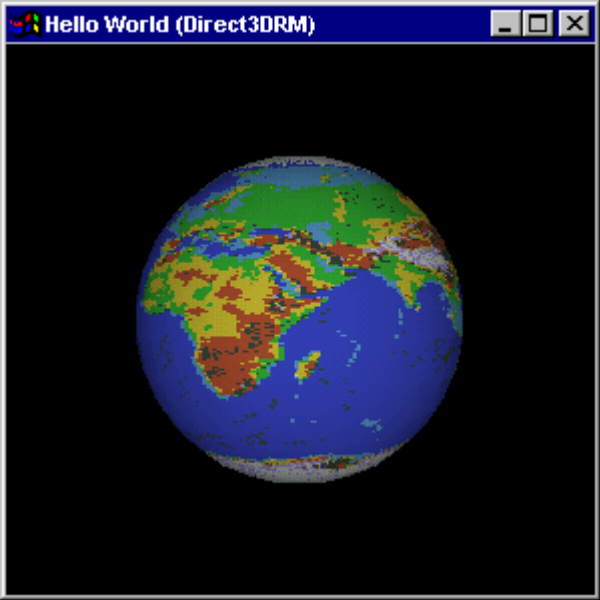
,±,±,Â,Í AfXfP [fŠf“fO,³,ê,Â,c,È,¢u,Æv,ì”Íí,Í,Â,È,É0,©,ç1,Â, ,é,½,ß AfXfP [fŠf“fOÆW ”,ÆfefNfXf`ff,ìÆ  
“\_,Í•K—v,Æ,³,ê,È,c,±,Æ,ª“½,¢ B

**fNf f€**

fNf f€ Ef%ofbfv,Í AfefNfXf`ff,<sup>a</sup>fIfufWfFfNfg ä,É”½ŽĚ,μ,ĂĈ©,,! ,é,æ,ϣ,ÉfefNfXf`ff À•W,ðŠ,,,è“–  
,Ă,é BfNf f€ Ef%ofbfv,ÍŽQ ÆftfĈ [f€,ìÊ’u,ðŽæ“¾,μ A”½ŽĚfxfNfgf<,ðĈvŽZ,·,é,½,ß,Éf fbfVf...,ì’,“–  
@ ü,ðŽg—p,·,é B,»,ìĈă Af fbfVf...,ðŽæ,è~Í,p%¼‘z,ì<...‘ì,ð—~—  
p,μ,Ă A”½ŽĚfxfNfgf<,ìĈð ü,©,çfefNfXf`ff,lu,“,æ,Ñv À•W,ðĈvŽZ,·,é B,±  
,ê,Ê,æ,Á,Ă A<...‘ì,É%½,<sup>a</sup>f%ofbfv,<sup>3</sup>,ê,Ă,ĉ,Ă,à Af fbfVf...,É”½ŽĚĈø%Ĉ,<sup>a</sup>—^,,! ,ç,ê,é B

Direct3D,İ•ŮŽ f, [fh,İf`f... [fgfŠfAf<

Windowsfx [fX,İDirect3D,İ•ŮŽ f, [fh EfAfvfŠfP [fVf‡f“,đ ì ¬,.,é,½,ß,É,Í A`Ů,È,é,Ó,½,Â,İŠÂ««,đ Ý’è,µ,È,-  
,Ä,Í,È,ç,È,¢ B,Đ,Æ,Â,Í AffofCfX Afrf... [f] [fg A F%đ‘œ“x,Æ,¢,Á,½WindowsŠÂ««,Ä, ,è A,à,□  
,Đ,Æ,Â,Í Af,fff< AfefNfXf`ff ACEôCE¹ A`Ê’u,Æ,¢,Á,½%¼4‘zŠÂ««,Ä, ,é B,±,İf`f...  
[fgfŠfAf<,Ä,Í AŠÊ’P,È•ŮŽ f, [fh EfAfvfŠfP [fVf‡f“,İ‘SfR [fh,đ Đ%ôî,µ,Ä,¢,é B%° }  
,Í A“® ì’†,İfAfjf [fVf‡f“,İftfCE [f€,İ,Đ,Æ,Â,Ä, ,é B



,±,İf`f... [fgfŠfAf<,Í A`È%°,İfZfNfVf‡f“,É•ª,¬,ç,ê,Ä,¢,é B

Helworld.c,É,Ä,¢,Ä  
f}fNf `è`,ÆfOf [fof•İ ”  
Windows,İfZfbfqfAfbfv,Æ %Šú%»  
ffofCfX E fhf%ofCfo,İ—ñ<“  
3DŠÂ««,İfZfbfqfAfbfv  
fCEf“f fŠf“fO Ef< [fv  
fV [f“,İ ì ¬  
I¬¹ ^—

Helworld.c,É,Â,¢,Ä

fAfvfŠfP [fVf‡f“,É3DfOf%ftfBfbfNfX,ð“±“ü,·,é,±,Æ,ÍŠÈ’P,Â,Í,È,¢,ª AÆ^,µ,Ä•s%oÂ”\,ÈŽdŽ–,Â,Í,È,¢ B,±  
,ÌfhfLf...f f“fg,É,Í ADirect3D,Ì•ÛŽ f, [fh EfAfvfŠfP [fVf‡f“,Ì Ì ¬,É•K—v,È,·,×,Ä,ÌfR [fh,ªL Ú,³,ê,Ä,¢  
,é B,±,Ìfˆf... [fgfŠfAfˆ,ÌfR [fh,ð A,Ð,Æ,Â,Ì.cftf@fCfˆ,ÉfRfs [,·,ê,Î AfRf“fpfCfˆ,µ,ÄŽÀ s,·,é,±  
,Æ,ª,Â,«é i,½,¾,µ AfRf“fpfCf%,ªDirectX SDK,ÌffBfÆfNfgfŠ,É, ,éSphere3.xftf@fCfˆ,ðÆ©,Â,¯,é,±  
,Æ,ª,Â,« A,³,ç,È AHello.ppm,Æ,¢,¬¼‘O,Ìfrfbfgf}fbfv ftf@fCfˆ,ª—pˆÓ,³,ê,Ä,¢,é,±,Æ j B,±  
,ÌfTf“fvfˆ,Â,Í A3DÆø%oÈ,ðŽÀÆ»,·,éfR [fh,Ì,Û,Æ,ñ,Ç,ÍÆÂ X,ÌŠÖ ”,É•ª,¯,ç,ê,Ä,¢,é,½,ß AŽ© g,ÌÆoÆ±  
,É%ž,¶,Ä AfVfXfef€,Ìˆê•”,É ,µ,,Ä•Ì X,ð%oÁ,!,é,±,Æ,ª,Â,«é B,æ,è•jŽG,ÈDirect3D,Ìˆ@”\  
,ðfCf“fvfŠf f“fg,·,é,½,ß,É,Í ASDK,ÌfTf“fvfˆ,ðŽQ Æ,·,é,Æ,æ,¢ B

,±,ÌfZfNfVf‡f“,Â,Í AŠÈ’P,ÈDirect3D,Ì•ÛŽ f, [fh EfAfvfŠfP [fVf‡f“,ðŠJ”,·,é ä,Â,Ì–âˆè“\_,É,Â,¢,Ä A,¢,-  
,Ä,© à–¾,·,é B

fTf“fvfˆ,Ì §ÆÀ

fXf^fefBfbfN\_Ef%oCfuf%ofŠ

DirectDraw,ÌfEfBf“fhfE\_Ef, [fh

fTf“fvf,ì §œÀ

,±,ìf`f... [fgfŠfAf<,É,Í AHelworld.cfTf“fvf< EfR [fh,ªŠÜ,Ü,ê,Ä,¢  
,é BHelworld.c,Í A<...ì,ð ì ¬,µ A,»,ê,ÉfefNfXf`ff,ð“\,è•t,¯ AfEfBf“fhfE“à,Å%õñ“],³,¹,é B,±  
,ìfAfvfŠfP [fVf‡f“,ðfrf<fh,·,é,½,ß,É•K—v,Èf\ [fX Eftf@fCf<,Í AHelworld.c,¾,¯,Ä, ,é B,±,ì‘¼,É ADirectX  
SDK,ìffBfœfNfgfŠ,ÉfRfs [,³,ê,½Shpere3.x,Æ,¢,²f fbfVf... Eftf@fCf<,Æ AHello.ppm,Æ,¢,²—¼‘O,ìfrfbfgf}  
fbfvftf@fCf<,ªK—v,Ä, ,é B

,±,ìTf“fvf<,Í ADirectX SDK,ìˆê”,Ä, ,éGlobefTf“fvf<,ÉŠî,Ä,¢,Ä,¢,é,ª A à—¾,ì,½,ß,É,æ,èŠÈ—ª%»,³,ê,Ä,¢  
,é BSDK,ÉŠÜ,Ü,ê,é‘¼,ìDirect3D•ÛŽ f, [fh,ìTf“fvf<,Æ“—l AGlobefTf“fvf<,É,Í ARmmain.cpp,Æ,¢  
,²ftf@fCf<,Æ ”‘½,,ìfwfbf\_ Eftf@fCf<,ìfCf“fNf< [fh,ªK—v,Ä, ,Ä,½,ª AHelworld.c,Ä,Í ARmmain.cpp,ìŠÖ~A,µ,  
½%ó Š,ðC++,©,çC,É ‘,«‘¼,µ Af\ [fX fR [fh’†,É’g,Ý ž,ñ,Ä,¢,é B

,±,ìf`f... [fgfŠfAf<,Ä Ð%ôî,µ,Ä,¢,éfR [fh,Í A,»,ì,Ü,Ü »•i,ìfR [fh,É“K—p,Ä,«,é,í,¯,Ä,Í,È,¢ B,±,ìfvf fOf%of€  
,Äf† [fU,ª,Ä,«,é,±,Æ,Í Afvf fOf%of€,ðŽÀ s,µ A I—¹,µ AŽÀ s’†,ÉfEfBf“fhfE,ð Ä ¬%»,·,é,±,Æ,¾,¯,Ä, ,é  
B ^— ,ð,í,©,è,â,·,·,·,é,½,ß,É A,Ü,Æ,ñ,Ç,ìfGf% [ Ef`fffbfN,Í È—ª,³,ê,Ä,¢,é B,±,ìTf“fvf<,ìÓ },Í A%œ—  
Ê,É”Hello!” ,ð•Žì,·,é,¾,¯,ì—L—¼,Èfvf fOf%of€,ªŽì,·,Æ,±,è,Æ—pŽ—,µ,Ä,“,è A,Ä,«,é,¾,¯,ì,©,è,â,·,-  
A3DfOf%oftfBfbfNfX,ì o—Í,ð s,²,±,Æ,Ä, ,é B

$fXf^{\wedge}f\text{efBfbfN}\text{ Ef}\%fCfuf\%f\check{S}$

Direct3D,ì•ŮŽ  $f$ , [fh EfAfvfŠfP [fVf‡f“,Í AfXf^f\text{efBfbfN}\text{ Ef}\%fCfuf\%f\check{S}Winmn.lib,ÆD3drm.lib,ðfŠf“fN,·,é•  
K—v,<sup>a</sup>,,é B

**DirectDraw,İfEfBf“fhfE Ef, [fh**

,Û,Æ,ñ,Ç,·,×,Ä,İDirect3DfAfvfŠfP [fVf‡f“,Í ADirectDraw,ð—p,¢,ĂfXfNfŠ [f“,ÉfOf%oftfBfbfNfX,ð•Ž!,·,é B,±  
,ê,ç,İfAfvfŠfP [fVf‡f“,Í ADirectDraw,İftf<fXfNfŠ [f“ Ef, [fh i”r‘¼f, [fh j,Û,½,İfEfBf“fhfE Ef, [fh,İ,¢  
,,ê,©,ðŽg—p,·,é B

ftf<fXfNfŠ [f“ Ef, [fh,É,Í AfpftfH [f}f“fX,â•Ö—~³,É,¨,¢,Ă,¢,,Â,©,Ì—“\_,ª, ,é,ª AfEfBf“fhfE Ef, [fh,Â ‘,  
©,ê,½fR [fh,İ,Û,ª,ª AfffofbfO,İ,İ,é,©,É—e~Ö,Â, ,é BŠJ”ŽÖ,İ‘½,,İ A Â %  
,İfEfBf“fhfE Ef, [fh,ÂfR [fh,ð<L q,µ A,Û,Æ,ñ,Ç,İfofO,ª%ü C,³,ê,½ŠJ”-  
,İ Â İiŠK,Â Aftf<fXfNfŠ [f“ Ef, [fh,É~Ú s,·,é•û—@,ðŽæ,é,¾,ë,ª B



**fNf 'è',ÆOf [fof•İ "**

^È%o,İfR [fh,Í AHelworld.cfTf"fvf<,İ Å %o,İ••,Å, ,é BHelwold.c.Í A,±,İfAfvfŠfP [fVf‡f",ðf rf<fh,·,é,½,ß,É•K  
—v,È—B^ê,İftf@fCf<,Å, ,è A'¼,İfwfbf\_ Eftf@fCf<,âf\ [fX Eftf@fCf<,Ís—v,Å, ,é B

INITGUID,Í A'¼,İfCf"fNf< [fh,âf}fNf 'è<,æ,è,à'O,Édefine,³,è,Ä,ç,È,,Ä,Í,È,ç,È,ç B,±,è,Í ADirectX,ð %  
,ß,Ä'€ ì,·,éŠJ"ŽÖ,ªŠÖ^á,ç,â,·,ç A'â Ø,Èf|fCf"fg,Å, ,é B

////////////////////////////////////  
//  
// Copyright (C) 1996 Microsoft Corporation. All Rights Reserved.  
//  
// File: Helworld.c  
//  
// "Globe" SDKfTf"fvf<,ÉŠİ,Ä,ç,½ AŠÈ'P,ÈDirect3D•ŮŽ f, [fh,İfTf"fvf<  
//  
////////////////////////////////////

#define INITGUID // '¼,İf}fNf 'è<,âfCf"fNf< [fh,İ'O,É  
// 'è<,µ,È,,Ä,Í,È,ç,È,ç

#include <windows.h>  
#include <malloc.h> // memset,İĈÄ,Ñ o,µ,É•K—v  
#include <d3drmwin.h>

#define MAX\_DRIVERS 5 // D3Dfhf%oCfo,İ Å'â "

// fOf [fof•İ "

LPDIRECT3DRM lpD3DRM; // Direct3DRMfIfufWfFfNfg  
LPDIRECTDRAWCLIPPER lpDDClipper; // DirectDrawClipperfIfufWfFfNfg

struct \_myglobs {  
LPDIRECT3DRMDEVICE dev; // Direct3DRMfffofCfX  
LPDIRECT3DRMVIEWPORT view; // fV [f",ª•Ž',³,è,éDirect3DRMrf... [f] [fg  
LPDIRECT3DRMFRAME scene; // '¼,İfIfufWfFfNfg,"z'u,³,è,éf}fXf^ [ EftfĈ [fĈ  
LPDIRECT3DRMFRAME camera; // f† [fU,İPOV,ðŽ',·ftfĈ [fĈ

GUID DriverGUID[MAX\_DRIVERS]; // —LĈø,ÈD3Dfhf%oCfo,İGUID  
char DriverName[MAX\_DRIVERS][50]; // —LĈø,ÈD3Dfhf%oCfo,İ—¼'O  
int NumDrivers; // —LĈø,ÈD3Dfhf%oCfo,İ "  
int CurrDriver; // Ĉ» ÝŽg,í,è,Ä,ç,éD3Dfhf%oCfo,İ "

BOOL bQuit; // fvf fOf%o fĈ,ª I—¹,µ,æ,²,Æ,µ,Ä,ç,é  
BOOL bInitialized; // ,·,×,Ä,İD3DRMfIfufWfFfNfg,ª %oŠú%o»,³,è,½  
BOOL bMinimized; // fEfBf"fhfE,ª Ä —%o»,³,è,½

int BPP; // Ĉ» Ý,İffBfXfvfĈfC Ef, [fh,İf rfbfg [x

} myglobs;

// ŠÖ ",İfvf fgf^fCfv

static BOOL InitApp(HINSTANCE, int);  
long FAR PASCAL WindowProc(HWND, UINT, WPARAM, LPARAM);  
static BOOL EnumDrivers(HWND win);  
static HRESULT WINAPI enumDeviceFunc(LPGUID lpGuid,  
LPSTR lpDeviceDescription, LPSTR lpDeviceName,  
LPD3DDEVICEDESC lpHWDesc, LPD3DDEVICEDESC lpHELDesc,  
LPVOID lpContext);  
static DWORD BPPToDDBD(int bpp);  
static BOOL CreateDevAndView(LPDIRECTDRAWCLIPPER lpDDClipper,  
int driver, int width, int height);

```

static BOOL SetRenderState(void);
static BOOL RenderLoop(void);
static BOOL MyScene(LPDIRECT3DRMDEVICE dev, LPDIRECT3DRMVIEWPORT view,
    LPDIRECT3DRMFRAME scene, LPDIRECT3DRMFRAME camera);
void MakeMyFrames(LPDIRECT3DRMFRAME lpScene, LPDIRECT3DRMFRAME lpCamera,
    LPDIRECT3DRMFRAME * lpplpLightFrame1,
    LPDIRECT3DRMFRAME * lpplpWorld_frame);
void MakeMyLights(LPDIRECT3DRMFRAME lpScene, LPDIRECT3DRMFRAME lpCamera,
    LPDIRECT3DRMFRAME lpLightFrame1,
    LPDIRECT3DRMLIGHT * lpplpLight1, LPDIRECT3DRMLIGHT * lpplpLight2);
void SetMyPositions(LPDIRECT3DRMFRAME lpScene,
    LPDIRECT3DRMFRAME lpCamera, LPDIRECT3DRMFRAME lpLightFrame1,
    LPDIRECT3DRMFRAME lpWorld_frame);
void MakeMyMesh(LPDIRECT3DRMMESHBUILDER * lpplpSphere3_builder);
void MakeMyWrap(LPDIRECT3DRMMESHBUILDER sphere3_builder,
    LPDIRECT3DRMWRAP * lpWrap);
void AddMyTexture(LPDIRECT3DRMMESHBUILDER lpSphere3_builder,
    LPDIRECT3DRMTEXTURE * lpplpTex);
static void CleanUp(void);

```

**Windows,İfZfbfgfAfbfv,Æ %Šú%»**

,±,İfZfNfVf‡f“,Å,Í AHelworld.cfTf“fvfĸ EfR [fh,ÉfCf“fvfŠf f“fg,<sup>3</sup>,ê,Ä,č,é AWindowsfvf fOf%of€  
,İ•W €“I,ÈfZfbfgfAfbfv,Æ %Šú%»ŠÖ ”,É,Â,č,Ä à–¾,·,é B

WinMainŠÖ ”

InitAppŠÖ ”

f fCf“ EfEfBf“fhfE Efvf fV [fWff

## WinMainŠÖ ”

```
Helworld.c,ÌWinMainŠÖ ”,É,Í ADirectDraw,âDirect3D,Ì•ÛŽ f, [fh,ð—~p,·,éAfvfŠfP [fVf‡f“,É“Á—  
L,ÈfR [fh,ª ,µ,¾,ŠÜ,Û,ê,Ä,¢,é BInitAppŠÖ ”,ÆCleanUpŠÖ ”,ÍWindowsfvf fOf%of€,Ì•W €“I,È•”ª,Ä, ,é,ª AHel  
world.c,Ä,Í A,³,ç,É,¢,,Ä,©,Ì“Á•Ê,Èf^fXfN,ðŽÄ s,·,é BDirect3D,É,“,¢,Ä AWinMainŠÖ ”,ª s,ª Ä,à d—v,È ^—  
 ,Í ARenderLoopŠÖ ”,ÌEÄ,Ñ o,µ,Ä, ,é BRenderLoopŠÖ ”,Í AfAfjf [fVf‡f“,Ì,»„ê,¼,ê,Ìftf€ [f€  
,ð•%œ,·,é,½,ß,É•K—v,Ä, ,é BRenderLoopŠÖ ”,É,Ä,¢,Ä Ú,µ,,Í uf€f“f_Šf“fO Ef€ [fv v,ðŽQ Æ,³,ê,½,¢ B
```

```
////////////////////////////////////
```

```
//
```

```
// WinMain
```

```
// fAfvfŠfP [fVf‡f“,ð %Šú%»„µ Af fbfZ [fW Ef€ [fv,ðŠJŽn,·,é B
```

```
// f fbfZ [fW Ef€ [fv,Í A I—f fbfZ [fW,ðŽó,Žæ,é,Û,ÄfV [f“,ðf€f“f_Šf“fO,·,é B
```

```
//
```

```
////////////////////////////////////
```

```
int PASCAL
```

```
WinMain (HINSTANCE this_inst, HINSTANCE prev_inst, LPSTR cmdline,
```

```
int cmdshow)
```

```
{
```

```
MSG msg;
```

```
HACCEL accel = NULL;
```

```
int failcount = 0; // RenderLoop,ªŽ,“s,µ,½%œ ”
```

```
prev_inst;
```

```
cmdline;
```

```
// fEfBf“fhfE,ð ì ¬,µ Af€f“f_Šf“fO,ðŠJŽn,·,é,½,ß,É•K—v,È,·,×,Ä,ÌfIfufWfFNfg,ð
```

```
// %Šú%»„,·,é B
```

```
if (!InitApp(this_inst, cmdshow))
```

```
return 1;
```

```
while (!myglobs.bQuit) {
```

```
// ^— ,·,é fbfZ [fW,ª,È,,È,é,Û,Ä Af fbfZ [fW EfLf... [,ðŠÄŽ€,·,é B
```

```
while (PeekMessage(&msg, NULL, 0, 0, PM_REMOVE)) {
```

```
if (!TranslateAccelerator(msg.hwnd, accel, &msg)) {
```

```
TranslateMessage(&msg);
```

```
DispatchMessage(&msg);
```

```
}
```

```
}
```

```
// fAfvfŠfP [fVf‡f“,ª Ä ¬%»„³,ê,Ä,“,ç,, A I—¹,µ,æ,ª,Æ,à,µ,Ä,“,ç,, A,©,Ä
```

```
// D3DRM,ª %Šú%»„³,ê,Ä,¢,ê,Ì Af€f“f_Šf“fO,ðŠJŽn,·,é B
```

```
if (!myglobs.bMinimized && !myglobs.bQuit &&
```

```
myglobs.bInitialized) {
```

```
// ftf€ [f€,Ìf€f“f_Šf“fO,ðŽŽ,Ý,é Bf€f“f_Šf“fO,ª2%œ~È ãŽ,“s,µ,½,ç A
```

```
// ŽÄ s,ð•†f,·,é B
```

```
if (!RenderLoop())
```

```
++failcount;
```

```
if (failcount > 2) {
```

```
Cleanup();
```

```
break;
```

```
}
```

```
}
```

```
}
```

```
return msg.wParam;
```



## InitAppŠÖ ”

Helwold.c,İ %Šú%»ŠÖ ”,İ A,Ü,Æ,ñ,Ç,İWindowsfAfvfŠfP [fVf‡f“,Æ“—  
l,É AfEfBf“fhfE EfNf%oX,đ“o^,µ Af fCf“ EfAfvfŠfP [fVf‡f“ EfEfBf“fhfE,đ Ì ¬,·,é B,»,İÆā ADirect  
Draw,âDirect3D,đ—p,¢,éfAfvfŠfP [fVf‡f“,É“Á—L,İ ^— ,đ s,¤ B

InitAppŠÖ ”,İ A,Ü,Æ, ACE» Ý,İffBfXfvfÆfC,İfsNfZf<“—,½,è,İrfbfg ”,đŽæ“¾,·,é B,±  
,İl,İ AfAfvfŠfP [fVf‡f“,afÆf“f\_Šf“fO,İiŽ,đ Ý’è,·,é Ü,ÉŽg—p,³,è,é B Ü,µ,-  
,İ ufÆf“f\_Šf“fO EfXfe [fg,İ Ý’è v,đŽQ Æ,³,è,½,¢ B

,»,İÆā A,Ç,İDirect3Dfhf%oCfo,ª—LÆø,Å, ,é,©,đÆ”è,µ A“K Ø,Èfhf%oCfo,đ‘I’đ,·,é,½,ß,É Af [fJf<’è<,İEnum  
DriversŠÖ ”,đÆĀ,Ñ o,· Bfhf%oCfo,İ—ñ<“,É,Ā,¢,Ā Ü,µ,,İ A ufffofCfX Efhf%oCfo,İ—  
ñ<“ v,đŽQ Æ,³,è,½,¢ B

ŽŸ,É ADirect3DRMCreateŠÖ ”,đÆĀ,Ñ o,µ AIDirect3DRMfCf“f^ [ftfFfCfX,đ Ì ¬,·,é B,±  
,İfCf“f^ [ftfFfCfX,İ AfV [f“,âJf f%o EftfÆ [f€,đ Ì ¬,µ,½,è AfJf f%o  
,đfV [f“,É Ý’u,·,é,½,ß AIDirect3DRM::CreateFrame,âIDirect3DRMFrame::SetPosition,đÆĀ,Ñ o,·,Æ,«,ÉŽg—  
p,³,è,é B

DirectDrawClipperfIfufWfFfNfg,İ A3DfV [f“,İ%ĀŽ<”ª,đ §Æā,·,éfNfŠfbfsf“fO fvfÆ [f“,İŠÇ—  
,đŠÈ’P,É,·,é BHelwold.c,Ā,İ AIDirectDrawClipperfCf“f^ [ftfFfCfX,đ Ì ¬,·,é,½,ß,ÉDirectDrawCreateClipperŠÖ  
,đÆĀ,Ñ o,µ AIDirectDrawClipper::SetHWndf ffbfh,đŽg—  
p,µ,Ā AfNfŠfbfsf“fO îñ,đŽæ“¾,·,éfEfBf“fhfE,İfnf“fhf<,đ Ý’è,·,é B

,»,µ,Ā Af [fJf<’è<,İCreateDevAndViewŠÖ ”,đÆĀ,Ñ o,µ ADirect3DffofCfX,Æfrf... [f] [fg,đ Ì ¬,·,é B,±  
,İŠÖ ”,É,Ā,¢,Ā Ü,µ,,İ ufffofCfX,Æfrf... [f] [fg,İ Ì ¬ v,đŽQ Æ,³,è,½,¢ B

Direct3DfAfvfŠfP [fVf‡f“,afTf [fg,·,é,·,×,Ā,İ \‘ċ,İ %Šú%»,ªŠ@—1,·,é,Æ A3DfV [f“,đ ×,©, \ ¬,·,é,±  
,Æ,ª,Ā,«,é,æ,¤,É,É,é B,±,İ ^— ,İMySceneŠÖ ”ª s,Ā,Ā,¢,é BMySceneŠÖ ”,É,Ā,¢,Ā Ü,µ,,İ ufffofCfX,Æfrf...  
[f] [fg,İ Ì ¬ v,đŽQ Æ,³,è,½,¢ B

ĀÆā,ÉInitAppŠÖ ”,İ A•W €“I,È %Šú%»ŠÖ ”,Æ“—l,É AfEfBf“fhfE,İ•Ž!,Æ X V,đ s,¤ B

```
////////////////////////////////////  
//  
// InitApp  
// fEfBf“fhfE,đ Ì ¬,µ AfÆf“f_Šf“fO,đŠJŽn,·,é,½,ß,É•K—v,È,·,×,Ā,İIfufWfFfNfg,đ  
// %Šú%»,·,é B  
//  
////////////////////////////////////
```

```
static BOOL  
InitApp(HINSTANCE this_inst, int cmdshow)  
{
```

```
    HWND win;  
    HDC hdc;  
    WNDCLASS wc;  
    RECT rc;
```

```
    // fZfbfgfAfbfv,đ s,¢ AfEfBf“fhfE EfNf%oX,đ“o^,·,é B
```

```
    wc.style = CS_HREDRAW | CS_VREDRAW;  
    wc.lpfnWndProc = WindowProc;  
    wc.cbClsExtra = 0;  
    wc.cbWndExtra = sizeof(DWORD);  
    wc.hInstance = this_inst;  
    wc.hIcon = LoadIcon(this_inst, "AppIcon");  
    wc.hCursor = LoadCursor(NULL, IDC_ARROW);  
    wc.hbrBackground = (HBRUSH)GetStockObject(BLACK_BRUSH);  
    wc.lpszMenuName = NULL;  
    wc.lpszClassName = "D3DRM Example";  
    if (!RegisterClass(&wc))  
        return FALSE;
```

```

// fOf [fof<•İ ",đ %Šú%»»,·,é B

memset(&myglobs, 0, sizeof(myglobs));

// fEfBf"fhfE,đ ì ¬,·,é B

win =
    CreateWindow
    (
        "D3DRM Example", // fEfBf"fhfE EfNf%oX
        "Hello World (Direct3DRM)", // f^fCf g f<fo [
        WS_VISIBLE | WS_OVERLAPPED | WS_CAPTION | WS_SYSMENU |
        WS_MINIMIZEBOX | WS_MAXIMIZEBOX,
        CW_USEDEFAULT, // %Šúx Å•W
        CW_USEDEFAULT, // %Šúy Å•W
        300, // %Šú,İ•
        300, // %Šú,İ „³
        NULL, // efEfBf"fhfE
        NULL, // f fjf... [ Efnf"fhf<
        this_inst, // fvf fOf%of€,İfCf"fXf^f"fX Efnf"fhf<
        NULL // ì ¬fpf%of [f^
    );
if (!win)
    return FALSE;

// Ą» Ý,İffBfXfvf(EfC,İfsfNfZf<“-½,è,İrfbfg ",đ<L%¬,·,é B

hdc = GetDC(win);
myglobs.BPP = GetDeviceCaps(hdc, BITSPIXEL);
ReleaseDC(win, hdc);

// D3Dfhf%oCfo,đ—ñ<“,µ A,D,Æ,Â,đ‘İ’đ,·,é B

if (!EnumDrivers(win))
    return FALSE;

// D3DRMfIfufWfFfNfg,ÆD3DRMfIfufWfFfNfg,đ ì ¬,·,é B

lpD3DRM = NULL;
Direct3DRMCreate(&lpD3DRM);

// f}fXf^ [ EfV [f“,İftfĄ [f€,ÆfJf f% EftfĄ [f€,đ ì ¬,·,é B

lpD3DRM->lpVtbl->CreateFrame(lpD3DRM, NULL, &myglobs.scene);
lpD3DRM->lpVtbl->CreateFrame(lpD3DRM, myglobs.scene,
    &myglobs.camera);
myglobs.camera->lpVtbl->SetPosition(myglobs.camera, myglobs.scene,
    D3DVAL(0.0), D3DVAL(0.0), D3DVAL(0.0));

// DirectDrawClipperfIfufWfFfNfg,đ ì ¬,µ AfEfBf"fhfE,ÆŠÖ~A•t,¬,é B

DirectDrawCreateClipper(0, &lpDDClipper, NULL);
lpDDClipper->lpVtbl->SetHWND(lpDDClipper, 0, win);

// ‘İ’đ,³,½D3Dfhf%oCfo,đ—p,Ą,ÄD3DRMffofCfX,đ ì ¬,·,é B

GetClientRect(win, &rc);
if (!CreateDevAndView(lpDDClipper, myglobs.CurrDriver, rc.right,
    rc.bottom)) {
    return FALSE;
}

```

```

// fŒf“f_Šf“fO,³,ê,éfV [f“,đ ì ¬,·,é B

if (!MyScene(myglobs.dev, myglobs.view, myglobs.scene,
             myglobs.camera))
    return FALSE;

myglobs.bInitialized = TRUE; // %oŠú%o»Š@—¹

// fEfBf“fhfE,đ•Ž!,·,é B

ShowWindow(win, cmdshow);
UpdateWindow(win);

return TRUE;
}

```



**f fCf“ EfEfBf“fhfE Efvf fV [fWff**

Helworld.cfTf“fvf<,lf fCf“ EfEfBf“fhfE Efvf fV [fWff,Í”ñ í,É’P f,Ä, ,é BŽÀ Ů,Í A,±  
 ,lfTf“fvf<,Íf† [fU,Í“ü—Í,ð’S,Žó,~t,~,È,¢fAfvfŠfP [fVf‡f“,Æ,È,é B

fEfBf“fhfE Efvf fV [fWff,Í AWM\_DESTROYf fbfZ [fW,ðŽó,~Žæ,é,ÆCleanUpŠÖ ”,ðĖÄ,Ň o,· B

,Ů,½WM\_ACTIVATEf fbfZ [fW,ðŽó,~Žæ,Ä,½,Æ,«,É,Í AfEfBf“fhfE Efvf fV [fWff,ÍIIDirect3DRMWinDevice,ð  
 Žæ“¾,µ AfAfNfefBfu,ÈfĖf“f\_Šf“fO EfEfBf“fhfE,Ì F,ð ³,µ,-  
 •Ž,·,é,½,ß,ÉIIDirect3DRMWinDevice::HandleActivate f\fbfh,ÌĖÄ,Ň o,µ,ð s,□ B“—  
 l,É AWM\_PAINTf fbfZ [fW,É%ž“š,µ,Ä AfEfBf“fhfE Efvf fV [fWff,ÍIIDirect3DRMWinDevice::HandlePaint  
 f f\fbfh,ðĖÄ,Ň o,· B

////////////////////////////////////  
//  
// WindowProc  
// f fCf“ EfEfBf“fhfE,lf fbfZ [fW Efnf“fhf%  
//  
////////////////////////////////////

```
LONG FAR PASCAL WindowProc(HWND win, UINT msg,
    WPARAM wparam, LPARAM lparam)
{
    RECT r;
    PAINTSTRUCT ps;
    LPDIRECT3DRMWINDEVICE lpD3DRMWinDev;

    switch (msg)    {

    case WM_DESTROY:
        Cleanup();
        break;

    case WM_ACTIVATE:
        {

            // ,±,lf fbfZ [fW,ð ^— ,·,é AfEfBf“fhfEĖÄ—L,ÌD3DRMfEfBf“fhfE EfffofCfX,ð
            //  ì ¬,·,é B

            LPDIRECT3DRMWINDEVICE lpD3DRMWinDev;
            if (!myglobs.dev)
                break;
            myglobs.dev->lpVtbl->QueryInterface(myglobs.dev,
                &IID_IDirect3DRMWinDevice, (void **) &lpD3DRMWinDev);
            lpD3DRMWinDev->lpVtbl->HandleActivate(lpD3DRMWinDev,
                (WORD) wparam);
            lpD3DRMWinDev->lpVtbl->Release(lpD3DRMWinDev);
        }
        break;

    case WM_PAINT:
        if (!myglobs.bInitialized || !myglobs.dev)
            return DefWindowProc(win, msg, wparam, lparam);

            // ,±,lf fbfZ [fW,ð ^— ,·,é AfEfBf“fhfEĖÄ—L,ÌD3DRMfEfBf“fhfE EfffofCfX,ð
            //  ì ¬,·,é B

        if (GetUpdateRect(win, &r, FALSE)) {
            BeginPaint(win, &ps);
            myglobs.dev->lpVtbl->QueryInterface(myglobs.dev,
                &IID_IDirect3DRMWinDevice, (void **) &lpD3DRMWinDev);
            if (FAILED(lpD3DRMWinDev->lpVtbl->HandlePaint(lpD3DRMWinDev,
                ps.hdc)))
```

```
        lpD3DRMWinDev->lpVtbl->Release(lpD3DRMWinDev);
        EndPaint(win, &ps);
    }
    break;
default:
    return DefWindowProc(win, msg, wparam, lparam);
}
return 0L;
}
```

**fffofCfX Efhf%oCfo,İ—ñ“**

Direct3D,ð—~p,·,éfAfvfŠfP [fVf‡f“,Í A•K,, A—LŒø,Èfhf%oCfo,ð—ñ“,µ A•K—v,È‘€ ì,ð s,□  
,½,ß,É Å“K,Èfhf%oCfo,ð‘I‘ð,µ,È, ¯,ê,Î,È,ç,È,¢ B`È%°,İfZfNfVf‡f“,Å,Í A,±,İ ^— ,ðŽÀ s,·,éŠÖ ”,É,Â,¢  
,ÄŒÂ X,É à~¾,·,é B

EnumDriversŠÖ ”

enumDeviceFuncfR [f<fofbfNŠÖ ”

BPPToDDBDfwf<fpŠÖ ”

## EnumDriversŠÖ ”

EnumDriversŠÖ ”,Í AInitAppŠÖ ”,ªfAfvfŠfP [fVf‡f“,ìfV [f“,ÆfJf f‰,ð ¶ ¬,·,é¼‘O,ÉEÄ,Ñ o,³,ê,é B

### IDirect3D

COMfCf“f^ [ftfFfCfX,Í AŽÀ Û,É,ÍDirectDrawIfufWfFfNfg,Ö,ìfCf“f^ [ftfFfCfX,Ä, ,é B,µ,½,ª,Ä,Ä A,±,ì—  
ñ<“ŠÖ ”,Í A Ä ‰,ÉDirectDrawCreateŠÖ ”,ðEÄ,Ñ o,µ,ÄDirectDrawIfufWfFfNfg,ð ¶ ¬,·,é B±,¢  
,ÄEnumDriversŠÖ ”,Í AQueryInterface f\fbfh,ð—p,¢  
,ÄIDirect3DfCf“f^ [ftfFfCfX,ð ¶ ¬,·,é BCE¾Eê,ÄQueryInterface,ðfCf“fvfŠf f“fg,·,é ê ‡ A‘æ2fpf‰of [f  
^,É,Í A iC++,Ä,ìfCf“fvfŠf f“fg,ì,æ,ª,É j’è ”,»,ì,à,ì,ð’P,ÉŽw’è,·,é,ì,Ä,Í,È,-  
AfCf“f^ [ftfFfCfX,ìŽ•ÉŽq,ìfAfhfCfX,ð“n,³,È,,Ä,Í,È,Ç,È,¢ B

fhf‰ofCfo,ì—

ñ<“,Í AIDirect3D::EnumDevices f\fbfh,É,æ,Ä,Ä s,í,ê,é BIDirect3D::EnumDevices f\fbfh,Í Af [fJf<,É’è<³,ê  
,½enumDeviceFuncR [f<fofbfNŠÖ ”,ð—~p,·,é B,±,ìfR [f<fofbfNŠÖ ”,É,Ä,¢,Ä Ú,µ,-  
,Í A uenumDeviceFuncR [f<fofbfNŠÖ ” v,ðŽQ Æ,³,ê,½,¢ B

IDirect3D::EnumDevices,ÍDirect3Df f\fbfh,Ä, ,è ADirect3DRMf f\fbfh,Ä,Í,È,¢,±,Æ,É’ Ó,ªK—v,Ä, ,é B•ÛŽ f,  
[fh,ìAPI,É,Í A—ñ<“,ð s,ªf f\fbfh,Í¶ Ý,µ,È,¢ B,±  
,ê,Í A,Ð,Æ,Ä,ìfAfvfŠfP [fVf‡f“,Ä•ÛŽ f, [fh,Æ¼ Úf, [fh,ì—¼•û,ðŽg—p,·,é ê ‡,ì—Ç,¢—á,Ä, ,é B

////////////////////////////////////  
//  
// EnumDrivers  
// —LÆØ,ÈD3Dfhf‰ofCfo,ð—ñ<“,µ A,Ð,Æ,Ä,ð’T’ð,·,é B  
//  
////////////////////////////////////

static BOOL

EnumDrivers(HWND win)

{

LPDIRECTDRAW lpDD;

LPDIRECT3D lpD3D;

HRESULT rval;

// DirectDrawIfufWfFfNfg,ð ì ¬,µ Afhf‰ofCfo,ì—ñ<“,É—p,¢,éDirect3D  
// fCf“f^ [ftfFfCfX,ð—ä,¢ ‡,í,¹,é B

DirectDrawCreate(NULL, &lpDD, NULL);  
rval = lpDD->lpVtbl->QueryInterface(lpDD, &IID\_IDirect3D,  
(void\*\*) &lpD3D);  
if (rval != DD\_OK) {  
lpDD->lpVtbl->Release(lpDD);  
return FALSE;  
}

// enumDeviceFunc,ìfhf‰ofCfo‘I’ðfR [fh,ð ‰Šú‰»,·,é,½,ß ACurrDriver,É  
// -¹,ð Ý’è,µ Afhf‰ofCfo,ð—ñ<“,·,é B

myglobs.CurrDriver = -¹;  
lpD3D->lpVtbl->EnumDevices(lpD3D, enumDeviceFunc,  
&myglobs.CurrDriver);

// ,È,,Æ,—LÆØ,Èfhf‰ofCfo,ª,Ð,Æ,Ä,Í, ,é,±,Æ,ð•Û Ø,·,é B

if (myglobs.NumDrivers == 0) {  
return FALSE;  
}  
lpD3D->lpVtbl->Release(lpD3D);  
lpDD->lpVtbl->Release(lpDD);

return TRUE;

}



**enumDeviceFuncR [f<fofbfNŠÖ ”**

enumDeviceFunkŠÖ ”,Í **AD3DENUMDEVICESCALLBACK**Ĉ^,ĭfR [f<fofbfNŠÖ ”,Ā, ,é **BD3DENUMDEVICESCALLBACK**Ĉ^,ĭfwfbf\_ Eftf@fCf<D3dcaps.h,Ē’è`^,3,ê,Ā,Ĉ,é BfVfXfefĈ,Ī,±,ĭŠÖ ”,É AfCf“fXfg [f<,3,ê,Ā,Ĉ,éŠeDirect3Dfhf%ofCfo,ĭŽ`•ĒŽq,Ā—¼‘O A,,æ,Ñfn [fhfEfFfA,ĀfGf~f...fĈ [fg,3,ê,½fhf%ofCfo,ĭ”——  
Ī,đ’Ē’m,,é B

fR [f<fofbfNŠÖ ”,Í **AD3DDEVICEDESC** \‘Ĉ’ĭ,ĭdcmColorModelf f“fo,đŽg—p,μ,Ā Afn [fhfEfFfA,Ā—  
ñ<“,3,ê,½fhf%ofCfo,Ī,Ĉ,ĭ,Ĉ,đ’2,×,é,Ĉ,đĈ^”è,,é B,±,ĭf f“fo,Éfn [fhfEfFfA,^ Y’è,3,ê,Ā,Ĉ,  
é ê ± AŠÖ ”,ĭfn [fhfEfFfA,Ī «”,đ’2,×,é B

ŽŸ,É AfR [f<fofbfNŠÖ ”,Ī A—ñ<“,3,ê,½fhf%ofCfo,^Ĉ» Y,ĭfJf% [ Efrfbfg ”,ĀfĈf“f\_Šf“fo,đ s,±,±  
,Ā,^,Ā,«,,é,Ĉ,±,Ĉ,đ”»’è,,é B\*s%Ā”,Ē ê ±,ĪD3DENUMRET\_OK,đ•Ö,μ A,»,ĭfhf%ofCfo,ĒŠÖ,,éŽc,è,Ī ^—  
,đfXfLfbfv,μ,Ā AŽŸ,ĭfhf%ofCfo,Ī—ñ<“,đ’±,,é BfR [f<fofbfNŠÖ ”,Ī Af [fJf<’è<’,ĪBPPToDDBDŠÖ ”,đ—  
p,Ĉ A’Ē’m,3,ê,½fJf% [ Efrfbfg ”,Ā AĭnitAppŠÖ ”,Ā,ĭGetDeviceCapsŠÖ ”,ĭĈĀ,Ñ o,μ,Ē,é,Ā,Ā,ĀŽæ“¼,3,ê,½ F  
%đ’æ“x,Ā,đ”ăŠr,,é ĭBPPToDDBD,Ībits-per-pixel to DirectDraw bit-depth,Ī—  
^,Ā, ,é j BPPToDDBDŠÖ ”,ĭfR [fh,Ē,Ā,Ĉ,Ā,Ī A uBPPToDDBDfwf<fpŠÖ ” v,đŽQ Ā,3,ê,½,Ĉ B

—ñ<“,3,ê,½fhf%ofCfo,Ē,Ā,Ĉ  
,ĀŠĒ’P,ĒfefXfg,đ s,Ā,½ĈĀ,Ī **AD3DDEVICEDESC** \‘Ĉ’ĭ,ĭ¼,ĭf f“fo,đ”»’è,,é BfR [f<fofbfNŠÖ ”,Ī Af\ftgfEfFfA fGf~f...fĈ [fVf±f“,æ,è,àfn [fhfEfFfA,đ Af,fmfNf Ef%ofCfg,æ,è,àRGBf%ofCfg,đ’Īđ,,é B

////////////////////////////////////  
//  
// enumDeviceFunc  
// Žg—p%Ā”,ĒD3Dfhf%ofCfo,Ī—¼‘O,ĀGUID,đL%—,,éfR [f<fofbfNŠÖ ” B  
// fhf%ofCfo,đ’Īđ,μ A\*lpContext,Ē Y’è,,é B  
//  
////////////////////////////////////

```
static HRESULT
WINAPI enumDeviceFunc(LPGUID lpGuid, LPSTR lpDeviceDescription,
    LPSTR lpDeviceName, LPD3DDEVICEDESC lpHWDesc,
    LPD3DDEVICEDESC lpHELDesc, LPVOID lpContext)
{
    static BOOL hardware = FALSE; // Ĉ» Y,ĭŠJŽnfhf%ofCfo,ĭfn [fhfEfFfA,Ā, ,é
    static BOOL mono = FALSE; // Ĉ» Y,ĭŠJŽnfhf%ofCfo,ĭf,fmfNf ĈĈĈĈ¹,Ā, ,é
    LPD3DDEVICEDESC lpDesc;
    int *lpStartDriver = (int *)lpContext;

    // ,Ĉ,ĭfffofCfX<L q,đ’2,×,é,Ĉ,đĈ^”è,,é B

    lpDesc = lpHWDesc->dcmColorModel ? lpHWDesc : lpHELDesc;

    // Ĉ» Y,ĭffBfXfvfĈfC,ĭfrfbfg [“x,Ā,Ī A,±,ĭfhf%ofCfo,^fĈf“f_Šf“fo,đ s,Ī,Ē,Ĉ ê ± A
    // fhf%ofCfo,đfXfLfbfv,μ,Ā—ñ<“,đ’± s,,é B

    if (!(lpDesc->dwDeviceRenderBitDepth & BPPToDDBD(myglobs.BPP)))
        return D3DENUMRET_OK;

    // ,±,ĭfhf%ofCfo,Ī—¼‘O,ĀGUID,đL%—,,é B

    memcpy(&myglobs.DriverGUID[myglobs.NumDrivers], lpGuid,
        sizeof(GUID));
    strcpy(&myglobs.DriverName[myglobs.NumDrivers][0], lpDeviceName);

    // f\ftgfEfFfA,æ,è,àfn [fhfEfFfA,đ Af,fmfNf ĈĈĈĈ¹,æ,è,àRGBĈĈĈĈ¹,đ’Īđ,,é B

    if (*lpStartDriver == -1) {

        // ,±,Ē,^ Ā %o,Ī—LĈĈ,Ēfhf%ofCfo,Ā, ,é B

        *lpStartDriver = myglobs.NumDrivers;
```

```

        hardware = lpDesc == lpHWDesc ? TRUE : FALSE;
        mono = lpDesc->dcmColorModel & D3DCOLOR_MONO ? TRUE : FALSE;
    } else if (lpDesc == lpHWDesc && !hardware) {

        // ,±,ĭfhf%oCfo,Ífn [fhfEfFA,Ä,è AŠJŽnfhf%oCfo,Íf\ftfgfEfFA,Ä,é B

        *lpStartDriver = myglobs.NumDrivers;
        hardware = lpDesc == lpHWDesc ? TRUE : FALSE;
        mono = lpDesc->dcmColorModel & D3DCOLOR_MONO ? TRUE : FALSE;
    } else if ((lpDesc == lpHWDesc && hardware) ||
        (lpDesc == lpHELDesc && !hardware)) {
        if (lpDesc->dcmColorModel == D3DCOLOR_MONO && !mono) {

            // ,±,ĭfhf%oCfo,ÆŠJŽnfhf%oCfo,Í““,Źí—b,Ä,é BŠJŽnfhf%oCfo,ÍRGBEðE¹
            // ,¾,Ä,½,ĭ,É‘ĭ,µ A,±,ĭfhf%oCfo,Íf,fmfNf ,Ä,é B

            *lpStartDriver = myglobs.NumDrivers;
            hardware = lpDesc == lpHWDesc ? TRUE : FALSE;
            mono = lpDesc->dcmColorModel & D3DCOLOR_MONO ? TRUE : FALSE;
        }
    }
    myglobs.NumDrivers++;
    if (myglobs.NumDrivers == MAX_DRIVERS)
        return (D3DENUMRET_CANCEL);
    return (D3DENUMRET_OK);
}

```

## BPPToDDBDwf<fpŠÖ ”

```
enumDeviceFuncR [f<fofbfNŠÖ ”,Í ABPPToDDBDwf<fpŠÖ ”,ð—p,¢,Ä AÆ» Ý,ìfffofCfX,ªfTf|
[fg,·,é F%øð‘æ“x,ð A—
ñ<“,³,ê,½fhf%ofCfo,ìfJf% [ Efrfbfg ”,Æ”äŠr,Ä,«,éE`Ž®,É•İŠ·,·,é BenumDeviceFunc,É,Ä,¢,Ä Ú,µ,-
,Í A uenumDeviceFuncR [f<fofbfNŠÖ ” v,ðŽQ Æ,³,ê,½,¢ B
```

```
////////////////////////////////////
//
// BPPToDDBD
// fsfNfZf<“,½,è,ìfrfbfg ”,ðDirectDraw,ìfrfbfg [“x,É•İŠ·,·,é B
//
////////////////////////////////////
```

```
static DWORD
BPPToDDBD(int bpp)
{
    switch(bpp) {
        case 1:
            return DDBD_1;
        case 2:
            return DDBD_2;
        case 4:
            return DDBD_4;
        case 8:
            return DDBD_8;
        case 16:
            return DDBD_16;
        case 24:
            return DDBD_24;
        case 32:
            return DDBD_32;
        default:
            return 0;
    }
}
```



3DŠÂ««,İfZfbfgfAfbfv

,±,İfZfNfVf‡f“,Â,Í AHelworld.c,İfR [fh,İ,ı,ç A3DŠÂ««,ð `z,·,é•”•ª,É,Â,¢,Ä à-  
¾,·,é B`E%º,İfZfNfVf‡f“,Í A,±,İ ^— ,ðŽÂ s,·,é,½,ß,İ,Ó,½,Â,İŠÖ ”,É,Â,¢,Ä à¾,µ,Ä,¢,é B

ffofCfX,Æfrf... [f| [fg,İ ì ¬  
fÆf“f\_fŠf“fO EfXfe [fg,İ Ý`è

,±  
,ê,ç,İŠÖ ”,Í A3DŠÂ««,ÉfIfuWfFfNfg,âftfÆ [f€ ACEð,ð”z’u,·,é,à,İ,Â,Í,È,¢ BfV [f“,İ ì ¬,Í AMySceneŠÖ ”,  
Æ AMySceneŠÖ ”,ªÆÄ,Ñ o,·ŠÖ ”ÆQ,É,æ,Â,ÄŽÀÆ»,³,ê,é B3DŠÂ««,ÉfV [f“,ð Ý`è,·,é•û-@,É,Â,¢  
,Ä,Í A ufV [f“,İ ì ¬ v,ðŽQ Æ,³,ê,½,¢ B

**ffofCfX,Æfrf... [f] [fg,İ Ì Ñ**

Direct3DffofCfX,Æfrf... [f]

[fg,İ AfAvfŠfP [fVf‡f“,İ %Šú%»,İēŠÂ,Æ,μ,Ä Ì Ñ,³,ē,é BInitAppŠÖ ”,İ ADirectDrawClipperfIfufWfFfNfg,đ ¶ Ñ,μ,½Ēā ADirectDrawClipperfIfufWfFfNfg,Æ‘İđ,³,ē,½fhf%ofCfo A,“,æ,ÑfNf%ofCfAf“fg,éĒ,İ ĩ-@,đfpf%of [f^,Æ,μ,Ä ACreateDevAndViewŠÖ ”,đĒÄ,Ñ o,· B

CreateDevAndViewŠÖ ”,İ A—ñ“fvf fZfX,Ä‘İđ,³,ē,½fhf%ofCfo,đŽg—

p,μ,Ä A**IDirect3DRM::CreateDeviceFromClipper**f f\fbfh,Ē,æ,Ä,ÄDirect3DRMffofCfX,đ Ì Ñ,·,é B,±,İ**IDirect3DRMDevice**fCf“f^ [ftFfCfX,İ AffofCfX,İ· ,“,æ,Ñ ,³,đŽæ“¾,·,é**IDirect3DRMDevice::GetWidth**,Æ**IDirect3DRMDevice::GetHeight**f f\fbfh,İĒÄ,Ñ o,μ,ÄŽg,İ,ē,é BCreateDevAndViewŠÖ ”,İ AffofCfX,İ· ,â ,³,İ îñ,đ Žó,~Žæ,Ä,½Ēā A**IDirect3DRM::CreateViewport**f f\fbfh,đĒÄ,Ñ o,μ,Ä**IDirect3DRMViewport**fCf“f^ [ftFfCfX,đŽæ“¾,·,é B

ŽŸ,ÉCreateDevAndViewŠÖ ”,·**IDirect3DRMViewport::SetBack**f f\fbfh,Ē,æ,Ä,Äfrf... [f] [fg,İĒā·ûNfŠfbfv-Ē,đ Ÿ’è,·,é,Æ Af [fJf<’è<,İSetRenderStateŠÖ ”,“ĒÄ,Ñ o,³,ē,é BSetRenderStateŠÖ ”,Ē,Ä,¢,Ä,İ AŽŸ,İZfNfVf‡f“ ufĒf“f\_Šf“fO EfXfe [fg,İ Ÿ’è v,Ä à¾,·,é B

////////////////////////////////////  
//  
// CreateDevAndView  
// Žw’è,³,ē,½D3Dfhf%ofCfo,Ä,ÆTfCfY,ÄD3DRMffofCfX,Æfrf... [f] [fg,đ Ì Ñ,·,é B  
//  
////////////////////////////////////

static BOOL

CreateDevAndView(LPDIRECTDRAWCLIPPER lpDDClipper, int driver,  
int width, int height)

```
{
    HRESULT rval;

    // Žw’è,³,ē,½D3Dfhf%ofCfo,đ—p,¢ A,±,İEfBf“fhfE,©,çD3DRMffofCfX,đ Ì Ñ,·,é B

    lpD3DRM->lpVtbl->CreateDeviceFromClipper(lpD3DRM, lpDDClipper,
        &myglobs.DriverGUID[driver], width, height, &myglobs.dev);

    // fJf f%o EftfĒ [fĒ,đŽg,Ä,ÄD3DRMfrf... [f] [fg,đ Ì Ñ,·,é B”wĒEi,İ [,³,đ‘â,«,Ē ”,É
    // Ÿ’è,·,é B· ,Æ ,³,İ,¾,¢,½,¢² B,³,ē,Ä,¢,é,İ,Ä AffofCfX,©,çŽæ“¾,·,é B

    width = myglobs.dev->lpVtbl->GetWidth(myglobs.dev);
    height = myglobs.dev->lpVtbl->GetHeight(myglobs.dev);
    rval = lpD3DRM->lpVtbl->CreateViewport(lpD3DRM, myglobs.dev,
        myglobs.camera, 0, 0, width, height, &myglobs.view);
    if (rval != D3DRM_OK) {
        myglobs.dev->lpVtbl->Release(myglobs.dev);
        return FALSE;
    }
    rval = myglobs.view->lpVtbl->SetBack(myglobs.view, D3DVAL(5000.0));
    if (rval != D3DRM_OK) {
        myglobs.dev->lpVtbl->Release(myglobs.dev);
        myglobs.view->lpVtbl->Release(myglobs.view);
        return FALSE;
    }

    // fĒf“f_Šf“fO,İ·iŽċ A“h,è,Ä,Ô,μf, [fh AĒöĒ¹,İ ó‘Ô AfJf%o [ EfVfF [ffBf“fO,İ îñ,đ
    // Ÿ’è,·,é B

    if (!SetRenderState())
        return FALSE;
    return TRUE;
}
```

fŒf“f\_ŒŒf“fO EfXfe [fg,İ Ý'è

Direct3D,İfXfe [fg Ef}fVf“,Ä, ,é BfAfvfŒŒP [fVf‡f“,Í A Œ—Œf,fWf... [f< AfŒf“f\_ŒŒf“fO Ef,fWf...  
[f< A,“,æ,Œ•İŒ•f,fWf... [f<,İ ó'Ô,đ Ý'è,µ A,»,é,ç,đ'Ê,µ,Äff [f^,đ— o,.,é B,±,İŽd'g,Y,đ'ÓŽ—,.,é,±  
,Œ,Í A'¼ Úf, [fh,É,Œ,Ä,Ä,İs%ŒŒ±,Ä, ,é,ª A•ŪŽ f, [fh,Ä,İ•”ª“İ,É%B•Ä,³,ê,Ä,ç  
,é B•ŪŽ f, [fh EfAfvfŒŒP [fVf‡f“,Í ASetRenderStateŒŒ ”,É,æ,Ä,Ä AfŒf“f\_ŒŒf“fO EfXfe [fg,đŒÈ'P,É Ý'  
è,.,é,±,Œ,ª,Ä,«,é B

,Ü, ASetRenderStateŒŒ ”,Í AŒđ,đfİf“ A“h,è,Ä,Ô,µf, [fh,đf\ŒŒbfh,É,µ AfOf [ EfVfF [ffBf“fO Ef, [f  
h,đ—p,ç,é,æ,ç,ÉŽw'è,µ,Ä AIDirect3DRMDevice::SetQualityf f\fbfh,İŒÄ,Œ o,µ,đ s,ç B,±  
,İ,Œ,« AfffBfU Ef, [fh,âfefNfXf`ff,İ•İŽđ,đ•İ X,.,é•K—v,ª, ,éfAfvfŒŒP [fVf‡f“,Í  
AIDirect3DRMDevice::SetDitherf f\fbfh,âİDirect3DRMDevice::SetTextureQualityf f\fbfh,đŒÄ,Œ o,.,±  
,Œ,ª,Ä,«,é B

,±,İŒŒ ”,İŽç,è,İ•”ª,İswitch•¶,Ä AŒ» Ý,İffofCfX,ªfTf|  
[fg,.,é F%đ'æ“x,İ'l,É,æ,Ä,Äfpf%of [f^,đ•İ,İ AIDirect3DRMDevice::SetShades AIDirect3DRM::SetDefaultTextu  
reColors A,“,æ,ŒİDirect3DRM::SetDefaultTextureShadesf f\fbfh,đŒÄ,Œ o,µ,Ä,ç,é B

////////////////////////////////////  
//  
// SetRenderState  
// fŒf“f\_ŒŒf“fO,İ•İŽđ,Œ%ŒŒ%œ î•ñ,đ Ý'è,.,é B  
//  
////////////////////////////////////

BOOL  
SetRenderState(void)  
{

HRESULT rval;  
  
// fŒf“f\_ŒŒf“fO,İ•İŽđ İŒđŒŒ,İfgOf< A“h,è,Ä,Ô,µf, [fh A%ŒŒ%œf, [fh j,đ Ý'è,.,é B  
  
rval = myglobs.dev->lpVtbl->SetQuality(myglobs.dev,  
D3DRMLIGHT\_ON | D3DRMFILL\_SOLID | D3DRMSHADE\_GOURAUD);  
if (rval != D3DRM\_OK) {  
return FALSE;  
}  
  
// fffBfU Ef, [fh,đ•İ X,µ,½,ç ê ‡ A,±,±,ÄSetDither,đŒÄ,Œ o,· B  
  
// fefNfXf`ff,İ•İŽđ,đD3DRMTEXTURE\_NEAREST iffftHf<fg j'ÈŒŒ,É,µ,½,ç ê ‡ A  
// ,±,±,ÄSetTextureQuality,đŒÄ,Œ o,· B  
  
// Œ» Ý,İfsfNfZf<—,½,è,İf\fbfg ”,ÉŒİ,Ä,ç,Ä A%ŒŒ%œf, [fh,đ Ý'è,.,é B

switch (myglobs.BPP) {  
case 1:  
if (FAILED(myglobs.dev->lpVtbl->SetShades(myglobs.dev, 4)))  
goto shades\_error;  
if (FAILED(lpD3DRM->lpVtbl->  
SetDefaultTextureShades(lpD3DRM, 4)))  
goto shades\_error;  
break;  
case 16:  
if (FAILED(myglobs.dev->lpVtbl->SetShades(myglobs.dev, 32)))  
goto shades\_error;  
if (FAILED(lpD3DRM->lpVtbl->  
SetDefaultTextureColors(lpD3DRM, 64)))  
goto shades\_error;  
if (FAILED(lpD3DRM->lpVtbl->  
SetDefaultTextureShades(lpD3DRM, 32)))  
goto shades\_error;  
break;

```
case 24:
case 32:
    if (FAILED(myglobs.dev->lpVtbl->
        SetShades(myglobs.dev, 256)))
        goto shades_error;
    if (FAILED(lpD3DRM->lpVtbl->
        SetDefaultTextureColors(lpD3DRM, 64)))
        goto shades_error;
    if (FAILED(lpD3DRM->lpVtbl->
        SetDefaultTextureShades(lpD3DRM, 256)))
        goto shades_error;
    break;
}
return TRUE;
shades_error:
return FALSE;
}
```

**fœf“f\_šf“fO Ef< [fv**

WinMainšÖ ”,Í AŽŸ,łtfœ [f€,đ•`%œ,·,é,½,ß ARenderLoopšÖ ”,đœÄ,Ń o,· BRenderLoopšÖ ”,Í A,¢,-  
,Ä,©,ł'P f,È ^— ,đŽÄ s,·,é B

**IDirect3DRMFrame::Move**f f\fbfh,đœÄ,Ń o,μ AŠK‘w%°,ł,·,×,Ä,łtfœ [f€,ł%ň“],â‘¬“x,ł“K—p,đ s,□ B

**IDirect3DRMViewport::Clear**f f\fbfh,đœÄ,Ń o,μ Aœ» Ý,łfrf... [f| [fg,đ”wœi F,ÄfNfšfA,·,é B

**IDirect3DRMViewport::Render**f f\fbfh,đœÄ,Ń o,μ Aœ» Ý,łfV [f“,đfrf... [f| [fg,Éfœf“f\_šf“fO,·,é B

**IDirect3DRMDevice::Update**f f\fbfh,đœÄ,Ń o,μ Afœf“f\_šf“fO,³,ê,½fCf [fW,đfXfNfš [f“,ÉfRfs [,·,é  
B

////////////////////////////////////  
//  
// RenderLoop  
// frf... [f| [fg,đfNfšfA,μ,ÄŽŸ,łtfœ [f€,đfœf“f\_šf“fO,μ AfEfBf“fhfE,đ X V,·,é B  
//  
////////////////////////////////////

```
static BOOL
RenderLoop()
{
    HRESULT rval;

    // œ» Ý,łfV [f“,đšm”F,·,é B

    rval = myglobs.scene->lpVtbl->Move(myglobs.scene, D3DVAL(1.0));
    if (rval != D3DRM_OK) {
        return FALSE;
    }

    // frf... [f| [fg,đfNfšfA,·,é B

    rval = myglobs.view->lpVtbl->Clear(myglobs.view);
    if (rval != D3DRM_OK) {
        return FALSE;
    }

    // fV [f“,đfrf... [f| [fg,Éfœf“f_šf“fO,·,é B

    rval = myglobs.view->lpVtbl->Render(myglobs.view, myglobs.scene);
    if (rval != D3DRM_OK) {
        return FALSE;
    }

    // fEfBf“fhfE,đ X V,·,é B

    rval = myglobs.dev->lpVtbl->Update(myglobs.dev);
    if (rval != D3DRM_OK) {
        return FALSE;
    }
    return TRUE;
}
```

**fV [f“,l̇ ì ñ**

3DŠÂ««,l̇fZfbfgfAfbfv ifhf%oƒCfo,l̇I'ð A3DfffoƒCfX,Æfrf... [f]  
[fg,l̇ ì ñ AfŒf“f\_fŠf“fO EfXfe [fg,l̇ Ý'è,È,Ç j,"Š@—1,·,é,Æ AHelworld.c,Í A,±  
,l̇3DŠÂ««,ÉfIfufWfFfNfg,âftfŒ [f€ AŒð,ð”z'u,·,é,½,ß,l̇ŠÖ ”ŒQ,ðŒÄ,Ñ o,· B

MySceneŠÖ ”

MakeMyFrames ŠÖ ”

MakeMyLights ŠÖ ”

SetMyPositions ŠÖ ”

MakeMyMesh ŠÖ ”

MakeMyWrap ŠÖ ”

AddMyTexture ŠÖ ”

## MySceneŠÖ ”

```
Helworld.c,ÌMySceneŠÖ ”,Í A DirectX SDK,Ì,·,×,Ä,ÌDirect3DfTf“fvfç,ÉfCf“fvfŠf f“fg,³,ê,Ä,ç
,é ABuildSceneŠÖ ”,É‘Š“–,·,é BfAfvfŠfP [fVf‡f“,ÌIfufWfFfNfg,ðfefNfXf`ff,â Æ–¾Æø%Ê,Æ,Æ,â,É^Ž!,·,é ^
— ,Í A,·,×,Ä,±,ÌŠÖ ”“à,Ä s,í,ê,é B
```

```
MySceneŠÖ ”,Í A ì ¬,³,ê,éV [f“,ÌŠe“Á «,ð Ýè,·,é Af [fJfç`èç,ÌŠÖ ”EQ,ðCEÄ,Ñ o,· B,±
,ê,ç,ÌŠÖ ”,ð^È%°,ÉŽ!,· B
```

MakeMyFramesŠÖ ”

MakeMyLightsŠÖ ”

SetMyPositionsŠÖ ”

MakeMyMeshŠÖ ”

MakeMyWrapŠÖ ”

AddMyTextureŠÖ ”

```
,±,ê,ç,ÌŠÖ ”,ªf rfWf...fAfç EfIfufWfFfNfg,ÌfZfbfgfAfbfv,ðŠ®—
¹,·,é,Æ AMySceneŠÖ ”,ÍDirect3DRMFrame::AddVisualf f\fbfh,ðCEÄ,Ñ o,µ AfIfufWfFfNfg,ð3DŠÄ«„Ìworldftf
Æ [fç,É‘Ç%Ä,·,é B,»,ÌCEä,Í ì ¬,³,ê,½fCf“f^ [ftfFfCfX,Í·s—
v,É,È,é,½,ß ACEJ,è·Ö,µReleasef f\fbfh,ðCEÄ,Ñ o,µ,Ä A,·,×,Ä,ÌCf“f^ [ftfFfCfX,ð%ð•ú,·,é,±,Æ,ª,Ä,«,é B
```

```
////////////////////////////////////
//
// MyScene
// ftfÆ [fç ACEðCE¹ Af fbfVf... AfefNfXf`ff,ð ì ¬,·,éŠÖ ”,ðCEÄ,Ñ o,· BŠ®—¹,µ,½,ç A,·,×,Ä,Ì
// fCf“f^ [ftfFfCfX,ð%ð•ú,·,é B
//
////////////////////////////////////
```

BOOL

```
MyScene(LPDIRECT3DRMDEVICE dev, LPDIRECT3DRMVIEWPORT view,
        LPDIRECT3DRMFRAME lpScene, LPDIRECT3DRMFRAME lpCamera)
```

```
{
    LPDIRECT3DRMFRAME lpLightframe1 = NULL;
    LPDIRECT3DRMFRAME lpWorld_frame = NULL;
    LPDIRECT3DRMLIGHT lpLight1      = NULL;
    LPDIRECT3DRMLIGHT lpLight2      = NULL;
    LPDIRECT3DRMTEXTURE lpTex       = NULL;
    LPDIRECT3DRMWRAP lpWrap         = NULL;
    LPDIRECT3DRMMESHBUILDER lpSphere3_builder = NULL;

    MakeMyFrames(lpScene, lpCamera, &lpLightframe1, &lpWorld_frame);
    MakeMyLights(lpScene, lpCamera, lpLightframe1, &lpLight1,
                &lpLight2);
    SetMyPositions(lpScene, lpCamera, lpLightframe1, lpWorld_frame);
    MakeMyMesh(&lpSphere3_builder);
    MakeMyWrap(lpSphere3_builder, &lpWrap);
    AddMyTexture(lpSphere3_builder, &lpTex);
```

```
// f}fefŠfAfç,ð ì ¬,·,é•K—v,ª,é ê ‡ i,½,Æ,!,Î ACEð,èçP,–Ê,ð ì ¬,·,é ê ‡ j A
// ,±,±,ÄCreateMaterial,ÆSetMaterial,ðCEÄ,Ñ o,· B
```

```
// ,±,ê,Äf rfWf...fAfç EfIfufWfFfNfg,ª ì ¬,³,ê,½,Ì,Ä Af [fçfh EftfÆ [fç,É‘Ç%Ä,·,é B
```

```
lpWorld_frame->lpVtbl->AddVisual(lpWorld_frame,
    (LPDIRECT3DRMVISUAL) lpSphere3_builder);
```

```
lpLightframe1->lpVtbl->Release(lpLightframe1);
lpWorld_frame->lpVtbl->Release(lpWorld_frame);
lpSphere3_builder->lpVtbl->Release(lpSphere3_builder);
lpLight1->lpVtbl->Release(lpLight1);
```

```
    lpLight2->lpVtbl->Release(lpLight2);  
    lpTex->lpVtbl->Release(lpTex);  
    lpWrap->lpVtbl->Release(lpWrap);  
  
    return TRUE;  
}
```



## MakeMyFramesŠÖ ”

```
MySceneŠÖ ”,ÍMakeMyFramesŠÖ ”,ðĀ,Ñ o,μ AHelworld.c,Ā—p,ĉ,ç,ê,éffBfĒfNfVf‡fifĀĒĒ¹ftfĒ [fĒ
,âf [fĀfh EftfĒ [fĒ
,ð ì ¬,·,é BMakeMyFramesŠÖ ”,Í AIDirect3DRM::CreateFrame f\fbfh,ðĀ,Ñ o,μ,Ā A,±,ì ^—
,ðŽĀ s,·,é B
```

```
////////////////////////////////////
//
// MakeMyFrames
// fV [f“,ĀŽg—p,·,éftfĒ [fĒ,ð ì ¬,·,é B
//
////////////////////////////////////
```

```
void MakeMyFrames(LPDIRECT3DRMFRAME lpScene, LPDIRECT3DRMFRAME lpCamera,
    LPDIRECT3DRMFRAME * lpplLightFrame1,
    LPDIRECT3DRMFRAME * lpplWorld_frame)
{
    lpD3DRM->lpVtbl->CreateFrame(lpD3DRM, lpScene, lpplLightFrame1);
    lpD3DRM->lpVtbl->CreateFrame(lpD3DRM, lpScene, lpplWorld_frame);
}
```

## MakeMyLightsŠÖ ”

MySceneŠÖ ”,ÍMakeMyLightsŠÖ ”,ðŒÄ,Ň o,µ AHelworld.c,Ä—p,Œ,Œ,ê,é—  
LŒüŒŒŒ,âfAf“frfGf“fg Ef%oCf g,ð ì ¬,.,é BMakeMyLightsŠÖ ”,ÍDirect3DRM::CreateLightRGB,ÆIDirect3D  
RMFrame::AddLightf f\fbfh,ðŒÄ,Ň o,µ A•ûŒü,ðŽ ,Á,½–¾,é,ŒŒŒŒ,ð ¶ ¬,µ A,»,ê,ðftŒ [fŒ  
,É’Œ%Œ,.,é B,Û,½ A”—  
^Ä,ŒfAf“frfGf“fg Ef%oCf g,ð ¶ ¬,µ AfV [f““S`Ì,É’Œ%Œ,.,é ifAf“frfGf“fg Ef%oCf g,Í A,Ä,Ë,ÉfV [f““S`Ì,  
ÉŠÖ~A•t,¬,Œ,ê,é j B

```
////////////////////////////////////  
//  
// MakeMyLights  
// fV [f“,ÄŽg—p,.,éŒŒŒŒ,ð ì ¬,.,é B  
//  
////////////////////////////////////
```

```
void MakeMyLights(LPDIRECT3DRMFRAME lpScene, LPDIRECT3DRMFRAME lpCamera,  
    LPDIRECT3DRMFRAME lpLightFrame1,  
    LPDIRECT3DRMLIGHT * lpLight1, LPDIRECT3DRMLIGHT * lpLight2)  
{  
    lpD3DRM->lpVtbl->CreateLightRGB(lpD3DRM, D3DRMLIGHT_DIRECTIONAL,  
        D3DVAL(0.9), D3DVAL(0.9), D3DVAL(0.9), lpLight1);  
  
    lpLightFrame1->lpVtbl->AddLight(lpLightFrame1, *lpLight1);  
  
    lpD3DRM->lpVtbl->CreateLightRGB(lpD3DRM, D3DRMLIGHT_AMBIENT,  
        D3DVAL(0.1), D3DVAL(0.1), D3DVAL(0.1), lpLight2);  
  
    lpScene->lpVtbl->AddLight(lpScene, *lpLight2);  
}
```

## SetMyPositionsŠÖ ”

```
MySceneŠÖ ”,ÍSetMyPositionsŠÖ ”,ðŒÄ,Ŧ o,µ AHelworld.c,ªŽg,¼ftfŒ [fŒ
,ÎÊ’u,ÆŒü,«,ð Ý’è,·,é BSetMyPositionsŠÖ ”,Î A,±,Î ^—
,ðIDirect3DRMFrame::SetPosition,“,æ,ŦIDirect3DRMFrame::SetOrientation/ f\fbfh,ÎŒÄ,Ŧ o,µ,Ê,æ,Ä,ŽÄ s,·,é
BIDirect3DRMFrame::SetRotationf f\fbfh,Î A<...‘Î,ªÇ%oÄ,³,ê,éftfŒ [fŒ,Ê%oñ“,ð Ý’è,·,é B

////////////////////////////////////
//
// SetMyPositions
// ŒöŒ¹ AfJf f% Af [f<fh EftfŒ [fŒ,ÎÊ’u,ÆŒü,«,ð Ý’è,·,é B
// <...‘Î,Î%oñ“,ð Ý’è,·,é B
//
////////////////////////////////////

void SetMyPositions(LPDIRECT3DRMFRAME lpScene,
    LPDIRECT3DRMFRAME lpCamera, LPDIRECT3DRMFRAME lpLightFrame1,
    LPDIRECT3DRMFRAME lpWorld_frame)
{

    lpLightFrame1->lpVtbl->SetPosition(lpLightFrame1, lpScene,
        D3DVAL(2), D3DVAL(0.0), D3DVAL(22));

    lpCamera->lpVtbl->SetPosition(lpCamera, lpScene,
        D3DVAL(0.0), D3DVAL(0.0), D3DVAL(0.0));
    lpCamera->lpVtbl->SetOrientation(lpCamera, lpScene,
        D3DVAL(0.0), D3DVAL(0.0), D3DVAL(1),
        D3DVAL(0.0), D3DVAL(1), D3DVAL(0.0));

    lpWorld_frame->lpVtbl->SetPosition(lpWorld_frame, lpScene,
        D3DVAL(0.0), D3DVAL(0.0), D3DVAL(15));
    lpWorld_frame->lpVtbl->SetOrientation(lpWorld_frame, lpScene,
        D3DVAL(0.0), D3DVAL(0.0), D3DVAL(1),
        D3DVAL(0.0), D3DVAL(1), D3DVAL(0.0));

    lpWorld_frame->lpVtbl->SetRotation(lpWorld_frame, lpScene,
        D3DVAL(0.0), D3DVAL(0.1), D3DVAL(0.0), D3DVAL(0.05));
}
```

## MakeMyMeshŠÖ ”

```
MySceneŠÖ ”,Í AHelworld.c,ÅŽg,í,ê,é<... ó,İf fbVf...
,ðf [fh,µ AfZfbfg,·,é,½,ß,ÉMakeMyMeshŠÖ ”,ðĖÄ,Ñ o,· BMekeMyMeshŠÖ ”,ÍIDirect3DRM::CreateMeshBuild
derf f\fbfh,ðĖÄ,Ñ o,µ,ÄIDirect3DRMMeshBuilderfCf“f^ [ftFfCfX,ð ¶ ¬,·,é BŽŸ,É AIDirect3DRMMeshBuild
er::Load AIDirect3DRMMeshBuilder::Scale A,»,µ,ÄIDirect3DRMMeshBuilder::SetColorRGBf f\fbfh,ðĖÄ,Ñ o,µ
ASphere3.xftf@fCf<,ª Ž,·f fbVf...,ð—p`Ó,·,é iSphere3.xftf@fCf<,Í AfTf“fvf< EfR [fh,ªŽg—
p,·,éf ffbfA,İ,Ð,Æ,Ä,Æ,µ,ÄDirectX SDK,ÉŽû^,³,ê,Ä,¢,é j B

////////////////////////////////////
//
// MakeMyMesh
// MeshBuilderfIfufWfFfNfg,ð ì ¬,µ Af [fh AfXfP [fŠf“fO Af fbVf...,İ F•t,¯,ð s,□ B
//
////////////////////////////////////

void MakeMyMesh(LPDIRECT3DRMMESHBUILDER * lpSphere3_builder)
{
    lpD3DRM->lpVtbl->CreateMeshBuilder(lpD3DRM, lpSphere3_builder);

    (*lpSphere3_builder)->lpVtbl->Load(*lpSphere3_builder,
        "sphere3.x", NULL, D3DRMLoadFromFile, NULL, NULL);

    (*lpSphere3_builder)->lpVtbl->Scale(*lpSphere3_builder,
        D3DVAL(2), D3DVAL(2), D3DVAL(2));

    // —\zŠÖ,İfefNfXf`ff EfufEf“ffBf“fO,ð”ð,¯,é,½,ß A<...‘İ,ð”,É Ý’è,·,é B

    (*lpSphere3_builder)->lpVtbl->SetColorRGB(*lpSphere3_builder,
        D3DVAL(1), D3DVAL(1), D3DVAL(1));
}
```

## MakeMyWrapŠÖ ”

```
MySceneŠÖ ”,ÍMakeMyWrapŠÖ ”,ðĈĖÄ,Ń o,μ,ÄfefNfXf`ff Ä•W,ð ì ¬,μ AMakeMyMeshŠÖ ”,af [fh,μ,½<...‘
Ì,É“K—
p,.,é BMakeMyWrapŠÖ ”,Í A<...‘Ì,ðŠÜ,p•ûĈ`«ŠĖ ü,ðŽæ“¾,.,é,½,ß,ÉIDirect3DRMMeshBuilder::GetBoxf f\fbfh,
ðĈĖÄ,Ń o,μ A,»,İ•ûĈ`«ŠĖ ü,ÌfTfCfY,ðIDirect3DRM::CreateWrapf f\fbfh,ÌĈĖÄ,Ń o,μŽž,ÉŽg—
p,.,é BIDirect3DRMWrapf f\fbfh,Ì%~’Ĉ,ÌfefNfXf`ff Ef%fbfv,ð ì ¬,μ AIDirect3DRMWrapfCf“f^ [ftfFfCfX
,ðŽæ“¾,.,é BfefNfXf`ff Ä•W,ð<...‘Ì,É“K—p,.,é,É,Í AIDirect3DRMWrap::Applyf f\fbfh,ÌĈĖÄ,Ń o,μ,ð s,▯ B

////////////////////////////////////
//
// MakeMyWrap
// f%fbfv,ð ì ¬,μ AfefNfXf`ff,É“K—p,.,é B
//
////////////////////////////////////

void MakeMyWrap(LPDIRECT3DRMMESHBUILDER sphere3_builder,
                LPDIRECT3DRMWRAP * lpWrap)
{
    D3DVALUE miny, maxy, height;
    D3DRMBOX box;

    sphere3_builder->lpVtbl->GetBox(sphere3_builder, &box);

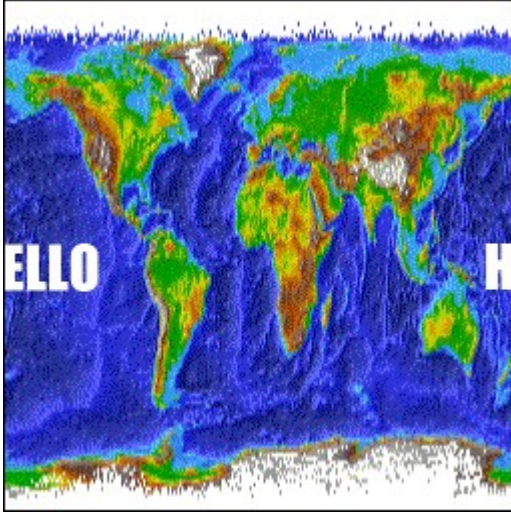
    maxy = box.max.y;
    miny = box.min.y;
    height = maxy - miny;

    lpD3DRM->lpVtbl->CreateWrap
        (lpD3DRM, D3DRMWRAP_CYLINDER, NULL,
         D3DVAL(0.0), D3DVAL(0.0), D3DVAL(0.0),
         D3DVAL(0.0), D3DVAL(1.0), D3DVAL(0.0),
         D3DVAL(0.0), D3DVAL(0.0), D3DVAL(1.0),
         D3DVAL(0.0), D3DDivide(miny, height),
         D3DVAL(1.0), D3DDivide(-D3DVAL(1.0), height),
         lpWrap);

    (*lpWrap)->lpVtbl->Apply(*lpWrap, (LPDIRECT3DRMOBJECT)
        sphere3_builder);
}
}
```

## AddMyTextureŠÖ ”

MySceneŠÖ ”,ÍAddMyTextureŠÖ ”,ðĖÄ,Ñ o,µ,Ä AfefNfXf`ff,Ìf [fh,â<...‘ì,Ö,ìŠÖ~A•t,¯,ð s,▯ BAddMyTexture  
ŠÖ ”,Í AIDirect3DRM::LoadTexturef f\fbfh,ð—p,¢ AHello.ppm,Æ,¢,▯¼‘O,Ìfrfbfgf}  
fbfv,ðf [fh,·,é B,»ê,©,çIDirect3DRMMeshBuilder::SetTexture,ðĖÄ,Ñ o,µ Afrfbfgf}fbfv,ð<...‘ì,É“\  
,è•t,¯,é BHello.ppm,Ì256 ~256,Ì256 Ffrfbfgf}fbfv,Ä, ,é B



```
////////////////////////////////////  
//  
// AddMyTexture  
// f%fbfv,ð ì ¬,µ AfefNfXf`ff,É“K—p,·,é B  
//  
////////////////////////////////////  
  
void AddMyTexture(LPDIRECT3DRMMESHBUILDER lpSphere3_builder,  
    LPDIRECT3DRMTEXTURE * lpplpTex)  
{  
    lpD3DRM->lpVtbl->LoadTexture(lpD3DRM, "hello.ppm", lpplpTex);  
  
    // fftfHf<fg i16 j`ÈŠÖ,ÌfJf% [ [“x,ª•K—v,È ê ‡ A,±,±,Ä  
    // IDirect3DRMTexture::SetShades,ðĖÄ,Ñ o,· B  
  
    lpSphere3_builder->lpVtbl->SetTexture(lpSphere3_builder, *lpplpTex);  
}
```

I-1 ^—

Helworld.c,Í AWM\_DESTROYf fbfZ [fW,đŽó,Žæ,Á,½,Æ,« A,Ü,½,ÍRenderLoopŠÖ ”,lĚÄ,Ň o,μ,É%½“x,©Ž,”s,  
μ,½,Æ,« ACleanUpŠÖ ”,đĚÄ,Ň o,· B

////////////////////////////////////  
//  
// Cleanup  
// ,·,x,Ä,łD3DRMfIfufWfFfNfg,đ%đ•ú,μ AbQuitftf%ofO,đfZfbfg,·,é B  
//  
////////////////////////////////////

```
void  
Cleanup(void)  
{  
    myglobs.bInitialized = FALSE;  
    myglobs.scene->lpVtbl->Release(myglobs.scene);  
    myglobs.camera->lpVtbl->Release(myglobs.camera);  
    myglobs.view->lpVtbl->Release(myglobs.view);  
    myglobs.dev->lpVtbl->Release(myglobs.dev);  
    lpD3DRM->lpVtbl->Release(lpD3DRM);  
    lpDDClipper->lpVtbl->Release(lpDDClipper);  
  
    myglobs.bQuit = TRUE;  
}
```

'¼ Úf, [fh,iŠT—v



¼ Úf, [fh,É,Â,¢,Ä

,±,lfZfNfVf‡f“,Á,Í AMicrosoft,lfáfƎfxf<3D API,Ä, ,é¼ Úf, [fh,É,Â,¢,Ä à-  
¾,.,é BDirect3D,lf¼ Úf, [fh,Í AfQ [f€„â,»,lf¼,lfnfC EfpftfH [f}f“fX,Èf}  
f<f`f fffBfA EfAfvfŠfP [fVf‡f“,ð AMicrosoft Windows flfyfƎ [fefBf“fO EfVfXfef€ ä,É \z,.,é•K—  
v,Ì, ,éŠJ”ŽÖ,É,Æ,Ä,Ä— ‘z“I,È,à,Ì,Ä, ,é B¼ Úf, [fh EfAfvfŠfP [fVf‡f“,Í AfffofCfX,É`É“¶,µ,È,¢•û-  
@,ÄfAfNfZf%ofƎ [f^ Efn [fhfEfFfA,Æ¼ ÚÊ M,.,é BDirect3D,lfÜŽ f, [fh,Í A¼ Úf, [fh,Ì Ä ä•”,É‘g,  
Ý—§,Ä,ç,ê,Ä,¢,é B

ˆê”Ê,É A•ÜŽ f, [fh,lfã,í,è,É¼ Úf, [fh,ð—~—p,.,éŠJ”ŽÖ,Í AfnfC EfpftfH [f}f“fX,Èfvf fOf%of~f“fO,lfŽè-  
@,É ,’Ê,µ,Ä,“,è A,³,ç,É A3DfOf%oftfBfbfNfX,É,Ä,¢,Ä,lf \•ª,È’mŽ~,àŽ ,Ä,Ä,¢,é,©,à,µ,ê,È,¢ B,»,lf,æ,µ,ÈŠJ”-  
ŽÖ,Ä,à A u3Dfvf fOf%of~f“fO,lfŠi`b<Z\_p v,lfê“Ç,.,é•K—v,ª, ,é B,±,lfZfNfVf‡f“,Ä,Í AfVfXfef€„ðƎø—  
!“I,É §Ǝä,.,é,½,ß,É’m,Ä,Ä,“,©,È,,Ä,Í,È,ç,È,¢ ADirect3D,lfCf“fvfŠf f“fg,lf Ú ×,É,Ä,¢,Ä à¾,µ,Ä,¢  
,é BDirect3D,lfA [fLfefNf`ff`S`l,É,Ä,¢,Ä,Í uDirect3DfA [fLfefNf`ff v,ÄŽæ,èµ,Ä,Ä,¢  
,é B uDirect3DfA [fLfefNf`ff v,Í A¼ Úf, [fh,lfŠJ”ŽÖ,É,Æ,Ä,Ä•s%oÄƎ±,ÈfhfLf...f f“fg,Ä, ,é B¼ Úf, [f  
h,lfŠT—v,ð’m,è,½,¢ è ±,Í A ufCf“fgf f fNfVf‡f“;.  
Direct3D,lf¼ Úf, [fh EfIfufWfFfNfg v,ðŽQ Æ,³,ê,½,¢ B,µ,©,µ A¼ Úf, [fh,É,Ä,¢  
,Ä,lf Ä ,lf î•ñƎ¹,Í A,“,»,ç, A,±,lSDK,ÉŠÜ,Ü,ê,Ä,¢,éTf“fvf< EfR [fh,Ä, ,è,µ BfTf“fvf<  
fR [fh,É,Í AŽÄ Ü,lfAfvfŠfP [fVf‡f“,ÄDirect3D,lf¼ Úf, [fh,ð“® ì,³,¹,é•û-@,ª à¾,³,ê,Ä,¢,é B

,±,lfZfNfVf‡f“,Í ADirect3D,lf¼ Úf, [fh Efvf fOf%of~f“fO,lf %oª,ð à¾,µ,½,à,lf,Ä,Í,È,¢ B,»,lf î•ñ,É,Ä,¢  
,Ä,Í A uDirect3D,lf¼ Úf, [fh,lf`f... [fgfŠfAf< v,ðŽQ Æ,³,ê,½,¢ B

**fCf“fgf f\_fNfVf‡f“: Direct3D,İ’¼ Úf, [fh EfIfufWfFfNfg**

Direct3D,İ’¼ Úf, [fh,Í AfIfufWfFfNfg,Ì ì ¬,âff [f^,Ì Ý’è AfIfufWfFfNfg“¬Žm,ÌCE< ‡,ð s,□API,©,ç ¬,è—  
§,Á,Ä,¢,é BDirect3D,Ì•ŮŽ f, [fh,Í A’¼ Úf, [fh,Ì Ä ã”„É’g,Ý—§,Ä,ç,ê,Ä,¢  
,é BfVfXfef€‘S’Ì,Ì \ ¬,â A’¼ Úf, [fh,É“Á—L,Ì \ ¬,É,Ä,¢  
,Ä,Í A Direct3DfA [fLfefNf`ff v,ðŽQ Æ,³,ê,½,¢ B

ŽŸ,Ì•,Í A’¼ Úf, [fh,Ì8,Ä,ÌIfufWfFfNfgE^ A,»,ÌfRf“f|  
[flf“fg EfIfufWfFfNfg Ef,fff< iCOM jfCf“f^ [ftfFfCfX A,¬,æ,Ñ,»,ê,¼,ê,É,Ä,¢,Ä,Ì à¬¼,ðŽ’,µ,Ä,¢,é B

**fIfufWfFfNfgE^** **COMfCf“f^ [ftfFfCfX,Æ à¬¼**  
**fCf“f^ [ftfFfCfX** **IDirect3DfCf“f^ [ftfFfCfX**  
COMfCf“f^ [ftfFfCfX fIfufWfFfNfg  
**fffofCfX** **IDirect3DDevicefCf“f^ [ftfFfCfX**  
**fn [fhEfFfA EfffofCfX**  
**fefNfXf`ff** **IDirect3DTexturefCf“f^ [ftfFfCfX**  
**fCf [fW,ðŠÜ,ÐDirectDrawfT [ftfFfX**  
**f}fefŠfAf<** **IDirect3DMaterialfCf“f^ [ftfFfCfX**  
F,âfefNfXf`ff,È,Ç,Ì AfT [ftfFfX,Ì“Á «  
**CEöCE¹** **IDirect3DLightfCf“f^ [ftfFfCfX**  
**CEöCE¹**  
**tf... [f] [fg** **IDirect3DViewportfCf“f^ [ftfFfCfX**  
•%œæ,·,éfXfNfŠ [f“ EfŠ [fWf‡f“  
**s—ñ** **IDirect3DDevicefCf“f^ [ftfFfCfX**  
4 s4—ñ,Ì•İŠ· s—ñ  
**ŽÀ sfofbftf@** **IDirect3DExecuteBufferfCf“f^ [ftfFfCfX**  
,“\_ff [f^,ÌfŠfXfg,ÆfCEf“f\_Šf“fO•û—@,ÌŽwŽ’

fCEf“f\_Šf“fO,ÍŽÀ sfofbftf@,É,æ,Ä,Ä s,í,ê,é B,±,Ìfofbftf@,É,Í A’,“\_Ìff [f^,ÆfIfyfR [fh,ªŠÜ,Ü,ê,Ä,¢  
,é BfIfyfR [fh,Í A%ð“Ç,³,ê,é,Æ AfCEf“f\_Šf“fO fGf“fWf“,ÉfCf [fW,ð ¶ ¬,·,é,æ,□  
,ÉŽwŽ’,·,é BŽÀ sfofbftf@ COMfIfufWfFfNfg,É,Í Af|fCf“f^,Æ Afofbftf@ EftfH [f}fbfg,É,Ä,¢,Ä,Ì à¬  
¼,¼,¬,ªŠÜ,Ü,ê,Ä,¢,é B,±,Ìfofbftf@,Í“@“I,ÉŠm•Ů,³,é AfOf%oftfBfbfN fJ [fh,Ìf f,fŠ“à,É•ŮŽ ,·,é,±,Æ,ª,Ä,¢,é B

ŠefIfufWfFfNfg,Í A`È%°,ÌCE`Ž®,Ì,Ð,Æ,Ä`È ã,Ì’g,Ý ‡,í,¹,Ä—p,¢,é,Ì,ªCEø%Ê“I,Ä, ,é B

COMfIfufWfFfNfg B

COMfIfufWfFfNfg’†,Ìff [f^,ðCEø—|“I,ÉŠi”[,µ,½ \‘¢’Ì B,±  
,ÌCE`Ž®,Í`ê”Ê“I,É AŽÀ Ů,ÌCOMfIfufWfFfNfg,ÌfRfs [ Eft [f^,Ä, ,é B

fnf“fhf< B,±,Ì ê ‡ Aff [f^,Ífn [fhEfFfA ã,É•ŮŽ ,³,ê Afn [fhEfFfA,©,ç‘€ ì,·,é,±,Æ,ª,Ä,¢,é B

ŽŸ,Ì•,Í ADirect3D,ÌŠefIfufWfFfNfg,ª¶ Ý,Ä,«,éCE`Ž®,ðŽ’,µ,Ä,¢,é B

	<b>COMfCf“f^ [ftfFfC</b> <b>fX</b>	<b>\‘¢’Ì</b>	<b>fnf“fhf&lt;</b>
<b>fffofCfX</b>	~		
<b>fefNfXf`ff</b>	~	~	~
<b>f}fefŠfAf&lt;</b>	~	~	~
<b>CEöCE¹</b>	~	~	
<b>tf... [f] [fg</b>	~		
<b>s—ñ</b>	~	~	~
<b>ŽÀ sfofbftf@</b>	~	~	

**Direct3DIfufWfFfNfg**

,±,ìfZfNfVf±f“,Å,Í ADirect3D,ìfIfufWfFfNfg^,ÆfCf“f^ [ftfFfCfX,É,Â,¢,Ä à–  
¾,.,é BfAfvfŠfP [fVf±f“,Í AŽŸ,ì·â,Ü,©,È ± ~,Å ADirect3DfIfufWfFfNfg,ÆfCf“f^ [ftfFfCfX,ð ì ¬,.,é,±  
,Æ,<sup>a</sup>,Ä,«,é B

IDirect3DfCf“f^ [ftfFfCfX fIfufWfFfNfg

DevicefIfufWfFfNfg

TexturefIfufWfFfNfg

MaterialfIfufWfFfNfg

LightfIfufWfFfNfg

ViewportfIfufWfFfNfg

Execute-bufferfIfufWfFfNfg

**IDirect3DfCf“f^ [ftfFfCfX**

IDirect3DfCf“f^ [ftfFfCfX,Í ADirectDrawIfufWfFfNfg,Ö,ìfCf“f^ [ftfFfCfX,Â, ,é B**IDirect3DfCf“f^ [ftfFfCfX,ð ¶ ¬,.,é,É,Í AŽŸ,ì,æ,ð,É****IDirectDraw2::QueryInterface** f\fbfh,ìĈĀ,Ń o,μ,ð s,ð B

lpDirectDraw->QueryInterface(  
IID\_IDirect3D, // IDirect3DfCf“f^ [ftfFfCfX,ìID  
lpD3D); // Direct3DfIfufWfFfNfg,ìfAfhfĈfX

**IDirect3DfCf“f^ [ftfFfCfX,É,æ,Á,ĂŽQ Æ,<sup>3</sup>,ê,éfIfufWfFfNfg,Í Afrf... [f] [fg AĈðĈ<sup>1</sup> Af}**  
**fefŠfAf< A,“,æ,ŃfffofCfX,ìfŠfXfg,ðŠŮ,ñ,Ā,¢**  
**,é B**IDirect3D**,ìf f\fbfh,Í A‘¼,ìfIfufWfFfNfg,ð ì ¬,μ,½,è ADirect3DfffofCfX,ðĈ©,Ā, ¯,é,½,ß,ÉŽg—p,·,é,±**  
**,Æ,<sup>a</sup>,Ā,«,é B**

## IDirect3DDeviceCf“f^ [ftFfCfX

IDirect3DDeviceCf“f^ [ftFfCfX,Í ADirectDrawSurfaceIfufWfFfNfg,Ö,lfCf“f^ [ftFfCfX,Ä, ,é BIDirect3DDeviceCf“f^ [ftFfCfX,ð ¶ ¬,.,é,É,Í AfobfNfobftf@,lIDirectDrawSurface2::QueryInterface f\fbfh,ìĖÄ,Ñ o,µ, ð s,□ BŽŸ,ì—

á,Ä,Í AIDirectDraw::CreateSurface,ÆIDirectDrawSurface::GetAttachedSurface f\fbfh,ðĖÄ,Ñ o,µ AfobfN\_Ef obftf@,lT [ftFfX,ðŽæ“¾,.,é BIDirectDraw2,ÆIDirectDrawSurface2fCf“f^ [ftFfCfX,Ä,± ,lfAfNfVf‡f“,ðŽÄ s,.,é,É,Í AQueryInterface f\fbfh,ð—p,ĉ,Ä V,µ,ĉfCf“f^ [ftFfCfX,Ö,lfCf“f^,ð— v< ,.,é B

```
lpDirectDraw->CreateSurface(  
    lpDDSurfDesc,    // DDSURFACEDESC \‘Ĭ,Ö,lfCf“f^  
    lpFrontBuffer,    // DIRECTDRAWSURFACE \‘Ĭ,Ö,lfCf“f^  
    pUnkOuter);        // NULL  
lpFrontBuffer->GetAttachedSurface(  
    &ddscaps,          // DDSCAPS \‘Ĭ,Ö,lfCf“f^  
    &lpBackBuffer);    // DIRECTDRAWSURFACE \‘Ĭ,Ö,lfCf“f^  
lpBackBuffer->QueryInterface(  
    GUIDforID3DDevice, // IDirect3DDeviceCf“f^ [ftFfCfX,ìID  
    lpD3DDevice);      // DIRECT3DDEVICEIfufWfFfNfg,Ö,lfCf“f^
```

fobfNfobftf@,l,½,ß,lIDirectDrawSurface::QueryInterface f\fbfh,ìĖÄ,Ñ o,µ,ÄŽw’è,.,é Ä %o ,lfpf%of [f^,Í AIDirect3DDeviceCf“f^ [ftFfCfX,ðŽ,· AfOf [fof< EfĖfxf<,Ä—B^è,ìŽ~•ÊŽq iGUID j,Ä, , é B,±,ìGUID,Í AIDirect3D::EnumDevices f\fbfh,ìĖÄ,Ñ o,µ,É,æ,Ä,ÄŽæ“¾,.,é,±,Æ,^,Ä,«é BfVfXfefĖ ,Í AIDirect3D::EnumDevicesŠÖ ”,ìĖÄ,Ñ o,µ,ì†,ÄfAfvfŠfP [fVf‡f“,”ñ<Ÿ,.,éD3DENUMDEVICESCALLBACKf R [f<fobfNŠÖ ”,ðĖÄ,Ñ o,.,Æ,« A,±,ìGUID,ð<Ÿ<<,.,é B

Direct3D,lfƒfofCfX EfIfufWfFfNfg,Í AfCf“f^ [ftFfCfX EfŠfXfg,É‘¶ Ý,µ i,.,é,ĉ ,Í u’®,µ v j AŽ© g,ìŽÄ sfobftf@,Æf rf... [f] [fg,lfŠfXfg,ðŽ ,Ä,Ä,ĉ,é B,Û,½ AfefNfXf`ff,âf} fefŠfAf<,lfŠfXfg,àŠÛ,ñ,Ä,“,è A,»,è,ĉ,ÍfŠfXfg’t,ìŽŸ,lfefNfXf`ff,âf}fefŠfAf<,Ö,lfCf“f^,Æ A‘O,lfƒfofCfX,Ö,lfCf“f^,ì—¼•û,ð•ÛŽ ,µ,Ä,ĉ,é B,±,ìŠK‘w \‘Ė,É,Ä,ĉ,Ä Ú,µ,- ,Í ufIfufWfFfNfg,ìĖ< ± « v,ðŽQ Æ,³,è,½,ĉ B

IDirect3DDeviceCf“f^ [ftFfCfX,lf f\fbfh,Ífn [fhfEfFfA”—Í,ð’Ê’m,µ Afrf... [f] [fg EfŠfXfg,ìŰŽ Af} fefŠfAf<fIfufWfFfNfg,ì‘Ė ì AŽÄ sfobftf@ EfIfufWfFfNfg,ìŽÄ s,ð s,□ B

s—ñ,Ífnf“fhf<,Æ,µ,Ä,ì,ŸŽæ“¾,.,é,±,Æ,^,Ä,«é BDirect3D,ì s— ñ,ð ì ¬,.,é,É,ÍIDirect3DDevice::CreateMatrix f\fbfh,ðĖÄ,Ñ o,µ AIDirect3DDevice::SetMatrix f\fbfh,É,æ,Ä,Ä s—ñ,ì“à—e,ð Ÿ’è,.,é,±,Æ,^,Ä,«é B s—ñ,Ífnf“fhf<,ìŽÄ sfobftf@,Ä—p,ĉ,ĉ,è,é B

**IDirect3DTexture***fCf“f^ [ftfFfCfX*

*fefNfXf`ff,Í A F•t,«,ìfsfNfZf<‚éCE`É•À,ñ,¾,à,ì,À, ,é iéCE`Í•K,,μ,à ³•ûCE`À,È,,Ä,à,æ,¢,ª AfVfXfef€  
,ª Ä,àCEø—|“I,É“® ì,‚,é,ì,Í ³•ûCE`,ì ê ±,Ä, ,é j BfefNfXf`ff,ÌfefNfXf`ff Ef}fbfsf“fO,ì-Ê,Æ,μ,ÄŽg,ª,±  
,Æ,à,Ä,«,é,ª A,±,ì ê ±,Í ³•ûCE`,Ä,È,,Ä,Í,È,ç,È,¢ BRGBfJf% [ Ef,ff<,ð—p,¢  
,éfAfvfŠfP [fVf±f“,Ä,Í A8 A24 A32ftrfbfg,ÌfefNfXf`ff,ðŽg—p,‚,é,±  
,Æ,ª,Ä,«,é Bf,fmfNf if%of“fv j EfJf% [ Ef,ff<,Ä,Í A8ftrfbfg,ÌfefNfXf`ff,ì,Ý,ªŽg,‚,é B*

*IDirect3DTexture**fCf“f^ [ftfFfCfX,Í A*DirectDrawSurfaceIfufWfFfNfg,Ö,ÌfCf“f^ *[ftfFfCfX,Ä, ,é B*Direct3DText  
**urefCf“f^ [ftfFfCfX,ð ¶ ¬,‚,é,É,Í A**IDirectDrawSurface2::QueryInterface *f\fbfh,ðŽg—*  
*p,μ,ÄIID\_IDirect3DTexture,ðŽw`è,‚,é B*Direct3D,ÌfefNfXf`ff,ÆDirectDraw,ÌfT [ftfFfX,ÌŠÖEW,É,Ä,¢,Ä Ú,μ,-  
,Í A *uDirect3DfefNfXf`ff EfCf“f^ [ftfFfCfX* v,ðŽQ Æ,³,ê,½,¢ B

ˆÈ%º,ì—á,Ä,Í A**IDirect3DTexture***fCf“f^ [ftfFfCfX,ì ì ¬•û—*  
*@,Æ A*Direct3DTexture::GetHandle,“,æ,Ñ**IDirect3DTexture::Load***f f\fbfh,ð—p,¢,ÄfefNfXf`ff,ðf [fh,‚,é•û—*  
*@,ðŽ,μ,Ä,¢,é B*

```
lpDDS->QueryInterface(IID_IDirect3DTexture,  
    lpD3DTexture); // DIRECT3DTEXTUREfIfufWfFfNfg,Ö,ÌfCf“f^  
lpD3DTexture->GetHandle(  
    lpD3DDevice, // DIRECT3DDEVICEfIfufWfFfNfg,Ö,ÌfCf“f^  
    lpTexture); // D3DTEXTUREHANDLE,Ö,ÌfCf“f^  
lpD3DTexture->Load(  
    lpD3DTexture); // DIRECT3DTEXTUREfIfufWfFfNfg,Ö,ÌfCf“f^
```

*fefNfXf`ff EfIfufWfFfNfg,ÍfCf“f^ [ftfFfCfX EfŠfXfg,ÉŠÜ,Ü,ê,Ä,“,è AfffofCfX EfŠfXfg`†,ìŽÝ,ÌfefNfXf`  
ff,Æ AŠÖ•A•t,¬,ç,ê,½ffofCfX,Ì A—¼•û,ðŽw,·fCf“f^,ðŽ ,Ä,Ä,¢,é i,±,ÌŠK`w \`¢,É,Ä,¢,Ä Ú,μ,-  
,Í ufIfufWfFfNfg,ÌCE< ± « v,ðŽQ Æ,³,ê,½,¢ j BfefNfXf`ff Efnf“fhf<,Íf}fefŠfAf<,âŽÄ sfofbftf@,Ä—p,¢  
,ç,ê Afrf... [f]  
[fg,Ä,ÌZfofbftf@,Æ,μ,ÄŽg,í,ê,é BfefNfXf`ff,Ìf [fh,ÆfAf“f [fh Afnf“fhf<,ÌŽæ“¾ AfpfCEfbfg•İ%º»,ÌŽæ“  
¾,É,Í A**IDirect3DTexture***fCf“f^ [ftfFfCfX,ªŽg—p,Ä,«,é B**

*,±,ÌfZfNfVf±f“,Ä,Í A*Direct3D,ÌfefNfXf`ff,Æ,»,ÌŽg,¢•û,ð à-¾,μ,Ä,¢,é B

*fefNfXf`ff Ef%fbfsf“fO*

*fefNfXf`ff EftfBf<f^fŠf“fO,ÆfufCEf“fffBf“fO*

*f~fbfvf}fbfv*

*“§-¾%º»Æ”¼“§-¾%º»*

fefNfXf`ff Ef%fbfsf“fO

,»,ê,¼,ê,ì-Ê,ìfefNfXf`ff À•W,Í AfefNfXf`ff,ªf}fbfsf“fO,³,ê,é-Ìæ,ð`èç,µ,Ä,¢  
,é BfAfvfŠfP [fVf‡f“,Í AfefNfXf`ff À•W,ðE∇ŽZ,·,é,½,ß,Éf%fbfv,ðŽg,²,±,Æ,ª,Ä,«,é B

fefNfXf`ff À•W,ì%ð Í,ì•ü-

@,ðf%oXf^f%oCfU,ÉŽw`è,·,é,½,ß,É AfAfvfŠfP [fVf‡f“,Í iD3DRENDERSTATETYPE—

ñ<“E^,©,ç jD3DRENDERSTATE\_WRAPU,âD3DRENDERSTATE\_WRAPVfEƒ“f\_Šf“fO EfXfe [fg,ðŽg—

p,·,é Bf%oXf^f%oCfU,Í A,Â,É,É Á`Z<—£,ìfefNfXf`ff À•W A,·,É,í,ç¼ ü,ð•âŠ@,·,é B,±

,ì¼ ü,ìfpfX,Æ A—

LÆø,Èu,·,æ,Ñv À•W,ì¹,Í Af%fbfsf“fO Eftf%oF,ìŽg,¢•ü,É,æ,Ä,Ä`Ü,È,é B`O q,ìftf%oF,ì•Ð•ü, ,é,¢,Í—

¼•ü,ªfZfbfg,³,ê,é,Æ A¼ ü,Í Au,Ü,½,Ív•üEü,ìfefNfXf`ff,ì•Ö,É%ˆ,Ä,Ä A%o~`E ó,©fh [fifc ó,ìE` ó,ðŽ ,Ä,©

,ì,æ,²,Éf%fbfvfAf%Ef“fh,³,ê,é B

f%fbfsf“fO Eftf%oF,ªfZfbfg,³,ê,Ä,¢

,È,¢ftf%ofbfg Ef%fbfsf“fO Ef, [fh,Ä,Í Au,Ü,½,Ív À•W,ÄŽw`è,³,ê,½•½-Ê,É,Í AfefNfXf`ff,ª-

³EÄ,Éf^fCfŠf“fO,³,ê,é B,±,ì ê ‡ A—LÆø,Èu,·,æ,Ñv À•W¹,Í1.0`È ã,Ä, ,é B“(0.1, 0.1),Æ(0.9, 0.9)

,ðEç,Ö Á`Z,ì¼ ü,Í A“(0.5, 0.5),ð`Ê%ß,·,é B

D3DRENDERSTATE\_WRAPU,Ü,½,ÍD3DRENDERSTATE\_WRAPV,ì,¢

,,ê,©,ªfZfbfg,³,ê,½ ê ‡ AfefNfXf`ff,Í%o~Žü1.0,ì I,í,è,ì,È,¢

%o~“`E`É,È,é B1.0`È ã,ìfefNfXf`ff À•W,Í Af%fbfv,³,ê,Ä,¢,È,¢”ÍÍ“à,ì,Ý—LÆø,Ä, ,é BfefNfXf`ff À•WŠ

Ö,ì Á`Z<—£,Íf%fbfsf“fO Eftf%oF,É,æ,Ä,Ä`Ü,È,é BD3DRENDERSTATE\_WRAPU,ªfZfbfg,³,ê,Ä,¢

,é,Æ,«,Í A“(0.1, 0.1),©,ç(0.9, 0.9),Ü,Ä,ì Á`Z,ì¼ ü,Í A“ i0, 0.5 j,ð`Ê%ß,·,é B

D3DRENDERSTATE\_WRAPU,ÆD3DRENDERSTATE\_WRAPVftf%oF,ì—

¼•ü,ªfZfbfg,³,ê,½,Æ,«,Í AfefNfXf`ff,Í%o~ŠÄ ó ifh [fifc ó j,É,È,é BfVfXfefç,Í•Ä,¶,Ä,¢

,é,½,ß A1.0`È ã,ìfefNfXf`ff À•W,Í-³Eø,Ä, ,é B“(0.1, 0.1),©,ç(0.9, 0.9),Ü,Ä,ì Á`Z,ì¼ ü,Í A“(0, 0)

,ð`Ê%ß,·,é B

-³Eø—ìæ,É, ,Ä,½fefNfXf`ff À•W,ð—LÆø—ìæ,ÉŽü,ß,½,Æ,µ,Ä,à A,»,ì,Æ,«,ì“® ì,Í•Ü Ø,³,ê,Ä,¢,È,¢ B

ˆê”Ê,ÉfAfvfŠfP [fVf‡f“,Í AfefNfXf`ff,ìEð ü,ª-Ê,ì•Ö,Æˆèv,µ,È,¢

,Æ,« A%o~`E ó,Éf%fbfv,·,é,½,ß,Éf%fbfsf“fO Eftf%oF,ðfZfbfg,·,é B,Ð,Æ,Ä,ì-Ê,ÉfefNfXf`ff,ì¼•“È ã,“K

—p,³,ê,é ê ‡,É,Í Af%fbfsf“fO Eftf%oF,Í Ý`è,µ,È,¢ B

f%fbfsf“fO,É,Ä,¢,Ä Ü,µ,Í A ufCf“fgf f\_NfVf‡f“:

Direct3D,ì•ÜŽ f, [fh EfIfufWFfFNfg v,ì u[D3DRenderStateWrapCf“f^ [ftfEfCfX v,ðŽQ Æ,³,ê,½,¢ B

**fefNfXf`ff EftfBf<f^fŠf“fO,ÆfufŒf“ffBf“fO**

fefNfXf`ff,ªFT [ftfFfX,Éf}fbfsf“fO,³,ê,½Œã,Í AfefNfXf`ff—  
v‘f ifefNfZf< j,ª Å IfCf [fW,ìŒÂ X,ìfsfNfZf<,Æ`ê‘v,·,é,±,Æ,Í—  
Å‘½,É,È,¢ B Å IfCf [fW’†,ìfsfNfZf<,Í AfefNfZf<,ì‘â,«,È W ‡‘ì,© A,D,Æ,Â,ìfefNfZf<,ì ¬”ª,É‘Š—  
,·,é BfsfNfZf<,ÉfefNfZf<,ì‘l,ð•áŠ®,·,é•û—@,ðŽw’è,·,é,É,Í AfefNfXf`ff EftfBf<f^fŠf“fO,ð—~—p,·,é B

Žg—p,·,éfefNfXf`ff EftfBf<f^fŠf“fO,Í A iD3DRENDERSTATETYPE—  
ñ“Œ^,©,ç jD3DRENDERSTATE\_TEXTUREMAG,ÆD3DRENDERSTATE\_TEXTUREMINfŒf“fŠf“fO EfXfe [f  
fg,ð—p,¢,ÄŽw’è,·,é B

**D3DRENDERSTATE\_TEXTUREMAPBLEND**fŒf“fŠf“fO EfXfe [fg,Å,Í AfefNfXf`ff EfufŒf“ffBf“fO,ìf^  
fCfv,ðŽw’è,·,é,±,Æ,ª,Â,«,é BfefNfXf`ff EfufŒf“ffBf“fO,Í AfefNfXf`ff,ì F,Æ“K—  
p æ,ìfT [ftfFfX,ì F,ð ¬,º ‡,í,¹,é B,±,ìŽè‘i,Í A”¼“§—¾,ìŠOŠĬ,ðŽÂŒ»,·,é ê ‡,ÉŒø%œÊ“l,Â, ,é B,µ,©,µ AfefN  
fXf`ff EfufŒf“ffBf“fO,Í A—Šú,µ,È,¢ F,ð ¶ ¬,·,é ê ‡,ª, ,é B,±,ê,ð—h,@,½,B,É,Í Af}fefŠfAf<,ì F,ð”’,-  
,·,é,ì,ª Å—Ç,ì•û—@,Â, ,é BfefNfXf`ff EfufŒf“ffBf“fO,ìfIfvfVf‡f“,Í AD3DTEXTUREBLEND—  
ñ“Œ^,ÉŽ‘,³,ê,Ä,¢,é B

“]—Œ³,Æ“]— æ,ì F,ð ¬ ‡,·,é•û—  
@,ðŽw’è,·,é,É,Í AD3DRENDERSTATE\_SRCBLEND,ÆD3DRENDERSTATE\_DESTBLENDfŒf“fŠf“fO EfXfe [f  
fg,ðŽg—p,·,é B ¬ FfIfvfVf‡f“ i ¬ Fftf@fNf^ l,ÆŒÂ,Î,ê,é j,Í AD3DBLEND—ñ“Œ^,ÉŽ‘,³,ê,Ä,¢,é B



*f~fbfvf}fbfv*

*f~fbfvf}fbfv,Æ,ÎˆAˆ±*

,μ,½<sup>efNfXf`ff,ðŽ|,μ</sup> AŠ<sup>efNfXf`ff,Í</sup> A“<sup>¯,¶fCf</sup> [fW,É<sup>ftfBf<f^,ð,©,¯,Ä</sup> ™ X,É’á%ð‘œ“x,É,μ,½,à,Ì,Å, ,é B  
*f~fbfvf}fbfv,Í* AÆ<sup>vŽZ</sup> ã’á<sup>fRfXfg,É</sup><sup>efNfXf`ff,ÌfÆf“f\_Šf“fO</sup> ,“x,ð ,,ß,éŽ<sup>è’i,Å</sup>, ,é B<sup>f~fbfvf}</sup>  
*fbfv’†,ÌftfBf<f^,³,ê,½fCf* [fW,â<sup>fÆfxf<,Í</sup> A‘O,Ì<sup>fÆfxf<,æ,è,à</sup> ¬,³,,È,Å,Ä,¢, B

**D3DTEXTUREFILTER**—ñ“<sup>Æ^,Ì“K</sup> Ø,È<sup>ftfBf<f^</sup> Ef, [fh,ðŽ<sup>w’è,μ,Ä</sup><sup>efNfXf`ff</sup> E<sup>ftfBf<f^fŠf“fO,ð</sup> s,□  
,Æ,« Af~fbfvf}fbfv,ðŽ<sup>g—p,·,é,±,Æ,ª,Å</sup>,«<sup>,é</sup> B<sup>ffofCfX,ª,Ç,Ì</sup><sup>f^Cfv,Ì</sup><sup>f~fbfvf}fbfv,ðfTf|</sup> [fg,μ,Ä,¢  
,é,©,ð’m,é,É,Í **AD3DPRIMCAPS** \‘¢‘<sup>Ì,ÌdwTextureFilterCapsf</sup> f“fo,ªŽ<sup>‘,μ,Ä,¢,é</sup><sup>tf%ofo,ðf`fFfbfN,·,ê,Î,æ,¢</sup> B

DirectDraw,Å,Ì<sup>f~fbfvf}fbfv,Ì</sup> ì ¬•û-@,É,Â,¢,Ä Ú,μ,,Í *uf~fbfvf}fbfv* v,ðŽQ Æ,³,ê,½,¢ B

“§-¾‰»„Æ”¼“§-¾‰»

,·,Â,É q,×,½,æ,²,ÉfEfNfXf`ff,ð“§-¾,Û,½,Í”¼“§-¾,É•Ž|,·,é,É,Í AfEfNfXf`ff EfufÆf“ffBf“fO,ð—~—  
p,·,é B,³,ç,É AfAf<ftf@ Ef`fffflf<,â iD3DRENDERSTATETYPE—  
ñ<“Æ^,ì jD3DRENDERSTATE\_BLENDENABLEfÆf“f\_Šf“fO EfXfe [fg,ð—p,ç,é,±,Æ,à,Â,«,é B

“§-¾ A”¼“§-¾,É,·,é,½,ß,ì,æ,è’¼ Ú“l,ÈfAfvf [f`,Æ,µ,Ä ADirectDraw,ªfTf| [fg,·,éfJf‰ [ EfL [,ð—~—  
p,·,é•û—@,ª,·,é BfJf‰ [ EfL [,Æ,Í Afuf fbfn“]—,âfI [fo [fÆfC‘€ ì,É,“,é A“]—Æ³,·,é,ç,Í“]—  
æ•”ª,ì F,Û,½,Í F,ì”Í,Â,·,é B,±,ê,ç,ì F,Í A,Â,Ê,É ã ‘,«,³,ê,é,æ,²,É,à AÆ^,µ,Ä•l X,³,ê,È,ç,æ,²,É,àŽw’è,·,é,±  
,Æ,ª,Â,«,é B

DirectDraw,ìfJf‰ [ EfL [ EfTf| [fg,É,Â,ç,Ä Ú,µ,,Í ufJf‰ [ EfL [fCf“fO v,ðŽQ Æ,³,ê,½,ç B

**IDirect3DMaterial**fCf“f^ [ftfFfCfX

IDirect3DMaterialfCf“f^ [ftfFfCfX,ð ¶ ¬,·,é,É,Í AIDirect3D::CreateMaterial f\fbfh,ìŒÄ,Ñ o,µ,ð s,□ BŽŸ,ì —á,Í AIDirect3DMaterialfCf“f^ [ftfFfCfX,ì ¶ ¬•û—@,ðŽì,µ,Ä,Œ ,é B,»,µ,Ä AIDirect3DMaterial::SetMaterial,âIDirect3DMaterial::GetHandlef f\fbfh,ð—p,Œ Af} fefŠfAf<,ì Ý’è,Æfnf“fhf<,ìŽæ“¾,ð s,Ä,Ä,Œ,é B

```
lpDirect3D->CreateMaterial(  
    lpDirect3DMaterial, // V,µ,Œf}fefŠfAf<,Ö,ìf|fCf“f^  
    pUnkOuter); // NULL  
lpDirect3DMaterial->SetMaterial(  
    lpD3DMat); // D3DMATERIAL `Œ‘ì,Ö,ìf|fCf“f^  
lpDirect3DMaterial->GetHandle(  
    lpD3DDevice, // DIRECT3DDEVICE `Œ‘ì,Ö,ìf|fCf“f^  
    lpD3DMat); // D3DMATERIAL `Œ‘ì,Ö,ìf|fCf“f^
```

f}fefŠfAf<fIfufWfFfNfg,ìfCf“f^ [ftfFfCfX EfŠfXfg,ÉŠÜ,Ü,ê,Ä,“,è AfffofCfX EfŠfXfg’†,ìŽŸ,ìf} fefŠfAf<,Ö,ìf|fCf“f^,Æ AŠÖ`A•t,¬,Œ,ê,½ffofCfX,Ö,ìf|fCf“f^,ì—¼•û,ðŽ ,Ä,Ä,Œ,é i,±,ìŠK‘w `Œ‘É,Ä,Œ,Ä Ú,µ,- ,Í ufIfufWfFfNfg,ìŒ< ‡ « v,ðŽQ Æ,³,ê,½,Œ j Bf} fefŠfAf<,É,Í F,ŠÜ,Ü,ê,Ä,“,è AfefNfXf`ff Efnf“fhf<,ðŽ ,Ä,Ä,Œ,é ê ‡,à, ,é Bf} fefŠfAf<fnf“fhf<,Í AŽÀ sfofbftf@,ì†,ÄŽg,í,ê,½,è Afrf... [f] [fg,ì”wŒEi,ð Ý’è,·,é,½,ß,ÉŽg— p,³,ê,é **BIDirect3DMaterial**fCf“f^ [ftfFfCfX,ð—p,Œ,é,Æ Af} fefŠfAf<,ìŽæ“¾,â Ý’è Afnf“fhf<,ìŽæ“¾ A F,ì•Ü‘¶,ð s,□,±,Æ,ª,Ä,«,é B

**IDirect3DLight***fCf“f^ [ftfFfCfX*

*IDirect3DLight**fCf“f^ [ftfFfCfX,đ ì ¬,·,é,É,Í AIDirect3D::CreateLight* *f\fbfh,đĈĈ,Ń o,· BŽŸ,ì—*  
*á,ÍIDirect3DLight**fCf“f^ [ftfFfCfX,ì ì ¬•û—@,đŽ,μ,Ä,ĉ*  
*,é B,Ŭ,½ A ì ¬Ĉă,É,ÍIDirect3DLight::SetLight* *f\fbfh,đĈĈ,Ń o,μ AĈđĈ¹,đ Ý’è,·,é B*

```
lpDirect3D->CreateLight(  
    lpDirect3DLight, // V,μ,ĉĈđĈ¹,Ŏ,Ìf|fCf“f^  
    pUnkOuter);      // NULL  
lpDirect3DLight->SetLight(  
    lpLight);        // D3DLIGHT \‘ĉ‘Ì,Ŏ,Ìf|fCf“f^
```

*ĈđĈ¹fIfufWfFfNfg,ÍfCf“f^ [ftfFfCfX EfŠfXfg,Æfıf... [f| [fg EfŠfXfg,ÉŠŬ,Ŭ,ê,Ä,ĉ*  
*,é BIDirect3DLight**fCf“f^ [ftfFfCfX,đŽg—p,μ,Ä AĈđĈ¹,ÌŽæ“¾,â Ý’è,đ s,²,±,Æ,ª,Ä,«,é B*

**IDirect3DViewportfCf“f^ [ftfFfCfX**

IDirect3DViewportfCf“f^ [ftfFfCfX,Í AIDirect3D::CreateViewportf f\fbfh,ðŒÄ,Ñ o,μ,Ä ¶ ¬,·,é BŽŸ,ì—  
á,Í AIDirect3DViewportfCf“f^ [ftfFfCfX,Ì ì ¬•û-@,ðŽ,μ,Ä,Œ,é B,Û,½ A,±,ì—

á,Í AIDirect3DDevice::AddViewportf f\fbfh,É,æ,éfrf... [f|  
[fg,Ì’Ç%oÄ,Ì,μ,©,½,â AIDirect3DViewport::SetViewport AIDirect3DViewport::SetBackground AIDirect3DViewpo  
rt::AddLightf f\fbfh,ð—p,Œ,Äfrf... [f| [fg,ðfZfbfgfAfbfv,·,é•û-@,à â-¾,μ,Ä,Œ,é B

```
lpDirect3D->CreateViewport(  
    lpDirect3DViewport, // V,μ,Œfrf... [f| [fg,Ö,Ìf|fCf“f^  
    pUnkOuter); // NULL  
lpD3DDevice->AddViewport(  
    lpD3DViewport) // frf... [f| [fg,ðfffofCfX,ÉfAf^fbf`,·,é  
lpD3DViewport->SetViewport(  
    lpData); // fXfNfŠ [f“ â,Ìfrf... [f| [fg,ÌÊ’u,ð Ý’è,·,é  
// D3DVIEWPORT `Œ’Ì,Ö,Ìf|fCf“f^  
lpD3DViewport->SetBackground(  
    lphMat); // ”wŒi,ÌD3DMATERIALHANDLE `Œ’Ì,Ö,Ìf|fCf“f^  
lpD3DViewport->AddLight(  
    lpD3DLight); // ŒöŒ¹fIfufWfFfNfg,Ö,Ìf|fCf“f^
```

frf... [f| [fg,ÌfCf“f^ [ftfFfCfX EfŠfXfg,ÆfffofCfX EfŠfXfg,ÉŠÛ,Û,è,Ä,Œ  
,é BfIfufWfFfNfg,Í AfXfNfŠ [f“ Eff [f^,Æ,Æ,à,ÉŒöŒ¹fŠfXfg,ð•ÛŽ ,μ,Ä,¬,è A”wŒi,Ìf}  
fefŠfAf<fnf“fhf<,âfefNfXf`ff Efnf“fhf<,ðŽ ,Ä ê ‡,à, ,é BIDirect3DViewportfCf“f^ [ftfFfCfX,ðŽg—  
p,μ,Ä A”wŒi,âfrf... [f| [fg,ÌŽæ“¾,Æ Ý’è AŒöŒ¹,Ì’Ç%oÄ,Æ í æ A’,“\_,Ì•İŠ,ð s,ð,±,Æ,ª,Ä,«,é B

**IDirect3DExecuteBufferCf“f^ [ftFfCfX**

ŽÀ sfofbftf@,É,Í,“\_fŠfXfg,ŠÜ,Ü,ê,Ä,“,è A,»,ÌEä,É—½—ßfXfgfŠ [f€,“±, B—½—ßfXfgfŠ [f€  
,Í AfIfyfE [fVf‡f“ EfR [fh ifIfyfR [fh j,Æ A,±,ÌfIfyfR [fh,“€ ì,.,éff [f^,©,ç \ ¬,³,ê,Ä,¢  
,é BŽÀ sfofbftf@,Ì à—¾,Í uŽÀ sfofbftf@ v,ðŽQ Æ,³,ê,½,¢ B

IDirect3DExecuteBufferCf“f^ [ftFfCfX,ð ì ¬,.,é,É,Í AIDirect3DDevice::CreateExecuteBuffer f\fbfh,ÌEÄ,Ñ o,  
μ,ð s,□ B

```
lpD3DDevice->CreateExecuteBuffer(  
    lpDesc,          // DIRECT3DEXECUTEBUFFERDESC \‘¢‘ì,Ö,Ìf|fCf“f^  
    lplpDirect3DExecuteBuffer, // Direct3DExecuteBufferfIfufWfFfNfg,Ö,Ì  
                                // f|fCf“f^,ðŽó,¬Žæ,é,½,ß,Ö,Ìf|fCf“f^  
    pUnkOuter);      // NULL
```

ŽÀ sfofbftf@,ÍffofCfX EfŠfXfg,ÉŠÜ,Ü,ê,Ä,¢,é BŽÀ Û,Ìfofbftf@—  
Ìæ,ðŠm•Û,.,é,É,Í AIDirect3DDevice::CreateExecuteBuffer f\fbfh,ðŽg—p,.,é B,±,Ìfofbftf@—  
Ìæ,Í Afn [fhEfFfA EfffofCfX ã,É‘¶ Ý,.,é,±,Æ,à, ,é B

ŽÀ sfofbftf@,Í AIDirect3DExecuteBuffer::Lock AIDirect3DExecuteBuffer::Unlock AIDirect3DExecuteBuffer::Set  
ExecuteData f\fbfh,ðŽg—p,.,é,±,Æ,É,æ,Ä,Ä A’,“\_,ÆfIfyfR [fh,ðŠÜ,ß,Ö,½,Ä,ÌA‘±,μ,½”z—ñ,Ä—,,ß s,,³,ê,é B

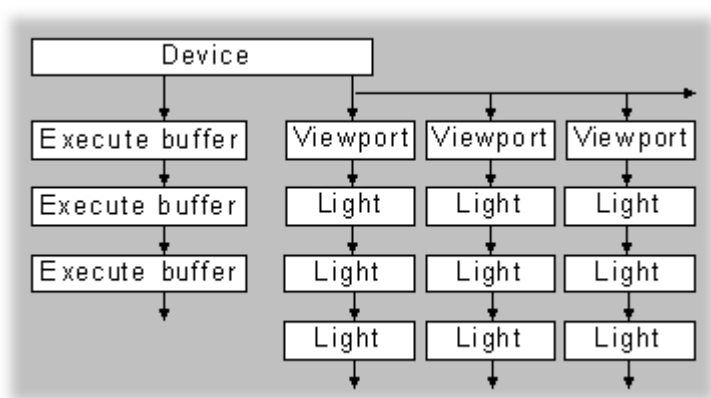
```
lpD3DExBuf->Lock(  
    lpDesc);.          // DIRECT3DEXECUTEBUFFERDESC \‘¢‘ì,Ö,Ìf|fCf“f^  
// .  
// . Store contents through the supplied address  
// .  
lpD3DExBuf->Unlock();  
lpD3DExBuf->SetExecuteData(  
    lpData);           // D3DEXECUTEDATA \‘¢‘ì,Ö,Ìf|fCf“f^
```

,±,Ì—á,Ì ÄEä,É,ÍIDirect3DExecuteBuffer::SetExecuteData f\fbfh,ÌEÄ,Ñ o,μ,ð s,Á,Ä,¢,é B,±  
,Ìf f\fbfh,Í ADirect3D,Éfobftf@“à,Ì,Ö,½,Ä,Ì”z—ñ,ÌÊ‘u,ð“n,· B”z—  
ñ,ÌÊ‘u,Í AIDirect3DExecuteBuffer::Lock f\fbfh,“•Ö,·fAfhfÆfX,©,ç,ÌŠ‘ÎÊ‘u,ÄŽw‘è,.,é B

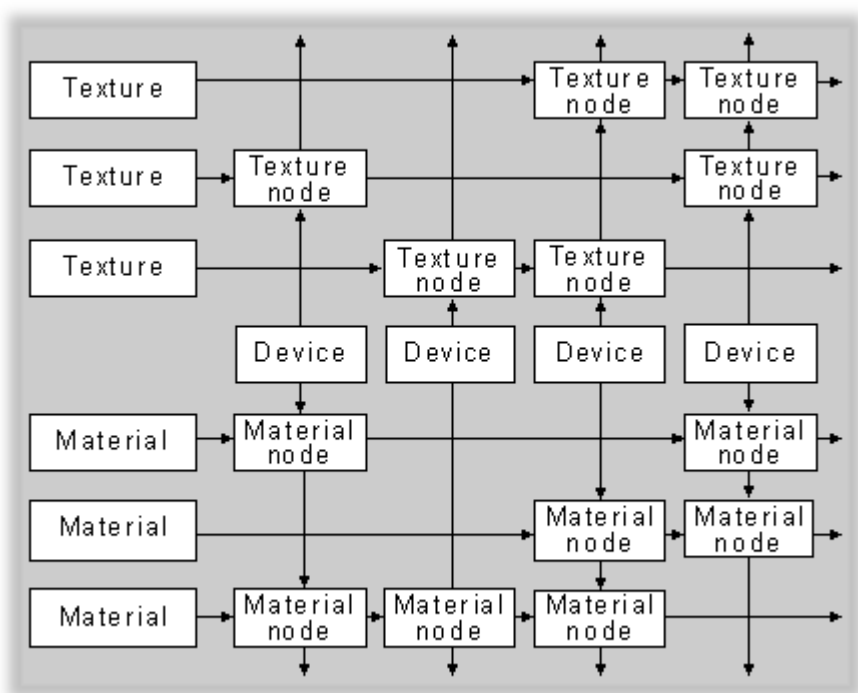
ŽÀ sff [f^,ÌŽæ“¾,â Ý‘è Af fbfN AfAf“f fbfN A Ä“K%» A,“,æ,ÑŽÀ sfofbftf@,ÌEÿ Ø,ð s,□  
,É,Í AIDirect3DExecuteBufferCf“f^ [ftFfCfX,ðŽg—p,.,é B

*fIfufWfFfNfg,ÌÆ< ‡ «*

ŽŸ,Ì } ,Í A,½,¾,Đ,Æ,Â,ÌfffofCfX,ª,Ç,Ì,æ,ª,ÉŽÀ sfofbftf@,âfrf... [f] [fg,đ Š—L,µ,Ä,¢  
 ,é,© A,½,¾,Đ,Æ,Â,Ìfrf... [f] [fg,ª,Ç,Ì,æ,ª,ÉŠeÖöÆ¹,đ•ŮŽ ,µ,Ä,¢,é,©,đŽ,µ,½,à,Ì,Ä, ,é B



*f)fefŠfAf<,âfefNfXf`ff,ÌIfufWfFfNfg,Í A,Đ,Æ,ÂÈ ã,ÌfffofCfX,ÉŠÖ~A•t,¯,é,±,Æ,ª,Ä,«é BŽŸ,Ì }  
 ,ÉŽ,³,ê,éŠefm [fh,Í AfŠfXfg,Ì æª,Ö,Ìf|fCf“f^,đ•ŮŽ ,µ,Ä,¢,é i,½,¾,µ } ,Ì†,É,Íf|fCf“f^,Í•Ž,³,ê,Ä,¢  
 ,É,¢ j B,Ç,ÌfefNfXf`ff,Ìfm [fh,©,ç,à A,Ç,Ìf}  
 fefŠfAf<,Ìfm [fh,©,ç,à A,» ,ÌIfufWfFfNfg,Ì æª,ãŠÖ~A,µ,½fffofCfX,Ö,Ìf|fCf“f^,đŽæ“¾,·,é,±,Æ,ª,Ä,«é B*



*fCf“f^ [ftfFfCfX,âftfofCfX AfefNfXf`ff,ÌIfufWfFfNfg,đ Ì ¬,·,é,É,ÍQueryInterfacef ffbfh,đÆÄ,Ñ o,· Bf  
 }fefŠfAf< AÆöÆ¹ Afrf... [f]  
 [fg,ÌIfufWfFfNfg,Í AIDirect3DfCf“f^ [ftfFfCfX,Ìf ffbfh,đÆÄ,Ñ o,µ,Ä Ì ¬,·,é,±  
 ,Æ,ª,Ä,«é BŽÀ sfofbftf@,â s—  
 ñ,Í AIDirect3DDevicefCf“f^ [ftfFfCfX,É,æ,Ä,Ä Ì ¬,³,ê,é BfCf“f^ [ftfFfCfX EfIfufWfFfNfg iDirect3D  
 object j,É,Í A Ì ¬,³,ê,½,·,×,Ä,ÌfffofCfX,âfrf... [f] [fg AÆöÆ¹ Af}  
 fefŠfAf<,ÌIfufWfFfNfg,ÌfŠfXfg,ª•ŮŽ ,³,ê,é,ª AŽÀ sfofbftf@,âfefNfXf`ff,ÌIfufWfFfNfg,ÍŠÜ,Ü,ê,È,¢ B*

fV [f“,İŞÇ—

,·,×,Ä,İ'¼ Úf, [fh EfAfvfŠfP [fVf‡f“,Í AfŒf“f\_fŠf“fO,ðŽÀ s,·,é‘O,É**IDirect3DDevice::BeginScene**f f\fbfh,ð  
ŒÄ,Ñ o,³,È,,Ä,Í,È,ç,È,¢ B,Ü,½ AfŒf“f\_fŠf“fO,ªŠ®—

¹,µ,½,Æ,«,«,É,Í **AIDirect3DDevice::EndScene**f f\fbfh,ðŒÄ,Ñ o,·K—v,ª, ,é BfAfvfŠfP [fVf‡f“,Í A ;Œä,İ3Dfn  
[fhfEfFfA ä,Ä“® ì,³,¹,é,½,ß,É A,±,ê,ç,İf f\fbfh,ð ³,µ,Žg—p,µ,È,,Ä,Í,È,ç,È,¢ B

fV [f“,Í',“\_,Æ•%æfvfŠf~fefBfu iŽOŠpŒ` A'¼ ü A“\_ j,İ W ‡İ,Ä, ,é B',“\_,Í A“®%æ,âfAfjf [fVf‡f“,İ,  
Đ,Æ,Ä,İftfŒ [fŒ,ð•%æ,·,é,½,ß,ÉŽg—

p,³,ê,é **BIDirect3DDevice::BeginScene**f f\fbfh,ÍfV [f“,İŽn,Ü,è,ð i,µ,½,ª,Ä,ÄftfŒ [fŒ  
,İŠJŽn,à jŽ!,µ **AIDirect3DDevice::EndScene**f f\fbfh,ÍfV [f“,ÆftfŒ [fŒ,İ I—¹,ð'Ê'm,·,é B,Đ,Æ,Ä,İftfŒ [fŒ  
,İ•%æ,ÉŽg,í,ê,éŽÀ sfobftf@-½—

ß,Í A1“x,İ**IDirect3DDevice::BeginScene**,Æ**IDirect3DDevice::EndScene**,İŒÄ,Ñ o,µ,İŠÔ,É,Ü,Æ,ß,È,,Ä,Í,È,ç,È,¢ B

,±,İfZfNfVf‡f“,ÍÈ%°,İfgfsfbfN,É,Ä,¢,Ä à-¾,µ,Ä,¢,é B

%a-Ê ÄŽ

2D,Æ3D,İ:ŠŒÝ ì—p

fV [f“ŠÇ— fvf fV [fWff



%oA-Ê ÁŽ

3DfAfNfZf%ofŒ [f^,l^h ¶fNf%ofX,Á,Í A ]—,lZfobftf@,ð—p,Œ,½%oA-Ê ÁŽ,Í s,í,ê,È,Œ B,±  
,ê,ç,lfAfNfZf%ofŒ [f^,ð ³,µ,fTf]

[fg,·,é,½,ß,Ê,Í AIDirect3DDevice::BeginScene,ÆIDirect3DDevice::EndScene f\fbfh,ðŽg—p,·,é•K—v,ª, ,é B“à•”f^  
fCfŠf“fO,âf|fŠfSf“ Ef\ [fg,È,Ç A%oA-Ê ÁŽ,Ì,½,ß,Ì ”“½,,l<@”\,ðfCf“fvfŠf f“fg,µ,½fAfNfZf%ofŒ [f^,à, ,é,ª  
A,»ê,ç,È,Í◻Ê,Ì“Á”Ÿ,ª, ,é B,»ê,Í A%oA-Ê ÁŽ,Ì,½,ß,Ê,Í A,Đ,Æ,Â,ltfŒ [fŒ  
,lfWfIf fgfŠ Eff [f^fx [fX‘S‘l,lfRfs [ð ^— ,µ,È,,Á,Í,È,ç,È,Œ,Œ,Œ,±,Æ,¾ B

,Đ,Æ,Â,ltfŒ [fŒ,lfWfIf fgfŠ•lŠ·,ð,·,×,Ä ^—

,·,·,é,½,ß,Ê A V,µ,ŒfAfNfZf%ofŒ [f^,Â,ÍfV [f“ EfLfffvf`ff,ðfTf| [fg,·,é•K—v,ª, ,é B,Â,Û,è V,µ,ŒfAfNfZf  
%ofŒ [f^,Í AŒâ,Ì ^— ,l,½,ß,Ê AŽÂ sfobftf@,ð%oi,µ,Ä“n,³,ê,éWfIf fgfŠ î•ñ,ð<L%o—,µ,È,-  
,Á,Í,È,ç,È,Œ B%oB-Ê,Ê·l,·,é ^— ,ª ³ í,Ê s,í,ê,é,±,Æ,ð•Û Ø,·,é,½,ß A,Đ,Æ,Â,ltfŒ [fŒ,Ê o,³,ê,é,·,×,Ä,Ì·%oæ-  
½—ß,Í A1%oñ,ÌIDirect3DDevice::BeginScene,ÆIDirect3DDevice::EndSceneŒÄ,Ñ o,µ,ÌŠÖ,Ê,Û,Æ,ß,È,-

,Á,Í,È,ç,È,Œ B,Đ,Æ,Â,ltfŒ [fŒ

,l \ ¬‘†,Ê A•j ”%oñ,ÌIDirect3DDevice::BeginScene,ÆIDirect3DDevice::EndScene f\fbfh,ªŒÄ,Ñ o,³,ê,é,Æ A^Û,È  
,éfv [f“,lfRf“fefLfXfg,ÁŽÂ s,³,ê,½ŽOŠpŒ,Ö A%oB,ê,½fIfufWfFfNfg,ª—^,!,é i—p,ðfAfNfZf%ofŒ [f^,ª ³,µ,-  
%oðŒ^,·,é,±,Æ,ª,Ä,«,È,,È,é B

fAvfŠfP [fVf‡f“,Í A,½,Æ,!\*Ê,lfRf“fefLfXfg,ÌŽOŠpŒ,Ê%oe<ç,ð—

^,!,é%oB,µfT [ftfFfX,ª,È,Œ ê ‡,Á,à A•j ”%oñ,Ê“n,Á,Ä

IDirect3DDevice::BeginScene,âIDirect3DDevice::EndScene f\fbfh,ðŒÄ,Ñ o,µ,Ä,Í,Œ

, ,È,Œ BfAfNfZf%ofŒ [f^,Ê,æ,Á,Ä,Í A%oA-Ê ÁŽ,Ì,½,ß,¾, ,Ä,È,-

A , ,“x,ÊŒfŒf“f\_Šf“fOŒø%oÊ,ðŽÂŒŒ»,·,é,½,ß,Êfv [f“ EfLfffvf`ff,ð—~p,·,é ê ‡,ª, ,é B,½,Æ,!,Î AfV [f“  
EfLfffvf`ff,ðfTf| [fg,µ,½fAfNfZf%ofŒ [f^,Ê,Í A%oe,â”¼“Œ—¾fIfufWfFfNfg,ðfŒf“f\_Šf“fO,Ä,«,é,à,Ì,ª, ,é,©,  
à,µ,ê,È,Œ B,±,l,æ,◻,ÈŒø%oÊ,Í AftfŒ [fŒ,lfWfIf fgfŠ Eff [f^fx [fX‘S‘l,ð ^— ,·,éAfNfZf%ofŒ [f^,l^—  
Í,Ê^Ê“¶,µ,Ä, ,è A•j ”,ÌIDirect3DDevice::BeginScene,ÆIDirect3DDevice::EndSceneRf“fefLfXfg,ª, ,é ê ‡,Ê,Í“® ì,µ  
,È,Œ B

2D,Æ3D,İŠŒÝ ì—p

fV [f“ EfLffffvf`ff,ðŽÀ s,·,éfAfNfZf%œ [f^,Å,Í AIDirect3DDevice::BeginScene,©,çIDirect3DDevice::EndScene  
nef f\fbfh,Ü,Å,Ì3D,Ì·`%œ‘€ ì,ÌŠÔ,É A2D,Ì·`%œ‘€ ì ifuf fbfN“]‘—,â’¼ Ü ‘,« ž,Ý,É,Ç j,ðŠÜ,ß,é,±  
,Æ,<sup>a</sup>,Å,«,È,¢ ê ‡,<sup>a</sup>,,é B,±,Ì §ŒÄ,ðŽ ,ÅfAfNfZf%œ [f^,Í ADirectDraw,Ì”\—  
ÍfrfbfgDDCAPS2\_NO2DDURING3DSCENE,É,æ,Å,ÄŽ!,<sup>3</sup>,ê,é BfAfvfŠfP [fVf‡f“,Í,±  
,Ìfrfbfg,ðf`fFfbfN,µ ADirectDraw,Ìfuf fbfN“]‘—  
,âf fbfN AGetDCf f\fbfh,ÌŒÄ,Ñ o,µ,Í AIDirect3DDevice::EndScene,ÌŒÄ,Ñ o,µ,<sup>a</sup> s,í,ê,é,Ü,Å‘Ò,½,È,-  
,Ä,Í,È,ç,È,¢ B

*fV [f“ŠÇ— fvf fV [fWff*

*^È%°,l̃fŠfXfg,É à–¾,·,éfXfefbfv,ð“Ÿ,p,±  
,Æ,É,æ,Ä,Ä AfAvfŠfP [fVf‡f“,Í A,·,×,Ä,l̃3DfAfNfZf%ofŒ [f^ ifV [f“,l̃fLfffvf`ff,ðŽÀ s,·,é,à,l̃,àŠÜ,p j,Ä  
³Šm,ÉfŒf“f\_fŠf“fO,ð s,□,±,Æ,ª,Ä,«,é B,±,ê,ç,l̃fXfefbfv,Í A‘O q,μ,½fZfNfVf‡f“,ÄŠT à,³,ê,Ä,ç,é î•ñ,ð—v–  
ñ,μ,Ä,ç,é B*

- 1 ,Đ,Æ,Ä,l̃ftfŒ [f€  
,l̃•`%œfvfŠf~fefBfu,ðŠÜ,bŽÀ sfobftf@,ðŽÀ s,·,é‘O,É A1“x**IDirect3DDevice::BeginScene**f f\fbfh,ðŒÄ,Ñ o,  
μ AŽÀ sŒä,É,Í ÄŒä,É**IDirect3DDevice::EndScene**f f\fbfh,ðŒÄ,Ñ o,· B*
- 2 DirectDraw,l̃”—Í,ðŽl̃,·ftrfbfg**DDCAPS2\_NO2DDURING3DSCENE**,ðf`fFfbfN,·,é B,±,l̃ftrfbfg,ªfZfbfg,³,ê,Ä,ç  
,½,ç A**IDirect3DDevice::BeginScene**,l̃ŒÄ,Ñ o,μ,©,ç**IDirect3DDevice::EndScene**,l̃ŒÄ,Ñ o,μ,Ü,Ä,l̃ŠÖ,É AfŒf“f  
\_fŠf“fO EfT [ftfFfX,É‘l̃,μ,ÄDirectDraw,l̃fuf fbfN“]—,âf fbfN AGetDCf f\fbfh,ðŽg—p,μ,È,ç,æ,□  
,É,·,é B,±,ê,ç,l̃2D‘€ ì,Í A**IDirect3DDevice::EndScene**,ðŒÄ,Ñ o,μ,½Œä,ÉŽÀ s,·,é,±,Æ,ª,Ä,«,é B*
- 3 **IDirect3DDevice::Execute**f f\fbfh,ª §Œä,ð–  
ß,μ,Ä,à A,Đ,Æ,Ä,l̃ŽÀ sfobftf@,ÉŠÜ,Ü,ê,éfŒf“f\_fŠf“fO EfvfŠf~fefBfu,l̃,·,×,Ä,ªf^ [fQfbfg EfT [ftfFfX  
,ÉfŒf“f\_fŠf“fO,³,ê,½,ÆŒ©,È,μ,Ä,l̃,ç,–,È,ç BfV [f“ EfLfffvf`ff EfJ [fh,Í AfV [f“,ªŠ@—  
l̃,·,é,Ü,Ä i,Ä,Ü,è A**IDirect3DDevice::EndScene**f f\fbfh,ªŒÄ,Ñ o,³,ê,é,Ü,Ä jfŒf“f\_fŠf“fO,ð%,Šú,·,é B*

**Direct3D,İ¼ Úf, [fh,İf`f... [fgfŠfAf<**

Windowsfx [fX,İDirect3D,İ¼ Úf, [fh EfAfvfŠfP [fVf‡f“,đ ì ¬,·,é,É,Í ADirectDraw,ÆDirect3DfIfufWfFfNfg  
,đ ¶ ¬,µ AfEf`f\_fŠf`fO EfXfe [fg,đ Ý`è,µ AŽÀ sfofbftf@,đ Ý`è,µ A,»,İfobftf@,đŽÀ s,·,é B,±  
,İfZfNfVf‡f“,Í A’P f,È¼ Úf, [fh,İfAfvfŠfP [fVf‡f“,İfCf`fvfŠf f`fg,É,Ä,¢,Ä A ‡,đ’Ç,Ä,Ä à¾,µ,½f`f...  
[fgfŠfAf<,Ä, é B,±,İf`f... [fgfŠfAf<,İfTf`fvf< EfR [fh,Í ASDK,İê”,Ä, é B

,±,İSDK,¨ñ<Ÿ,·,éTf`fvf<,İ†,İD3dmain.cppftf@fCf<,Í A¼,İ,·,×,Ä,İ¼ Úf, [fh,İfTf`fvf<,İŠî-{,Æ,µ,Ä—p,¢,ç,ê,Ä,¢  
,é BD3dmain.cpp,É,Í AWindowsftfE [fEf [fN,İ•W €,İ %Šú%» ^—

Af fbfZ [fW Ef< [fv,İ Ý`è A,¨,æ,Ñf fbfZ [fW ^—  
,İ,½,ß,İEfBf`fhfE Efvf fV [fWff,İ ì ¬,³ŠÜ,Ü,ê,Ä,¢  
,é,ª A,³,ç,É ADirect3D,İ¼ Úf, [fh EfAfvfŠfP [fVf‡f“,É“Á—L,È ^— ,à,¢,,Ä,© s,Ä,Ä,¢  
,é B`È%º,İfZfNfVf‡f“,Ä,Í A,±,İ ^— ,É,Ä,¢,Ä à¾,·,é B

Step 1: %Šú%»,İŠJŽn

Step 2: DirectDraw,¨,æ,ÑDirect3DfIfufWfFfNfg,İ ì ¬

Step 3: fffofCfX ì ¬fR [f<fobfNŠÖ ”,İfZfbfqfAfbfv

Step 4: frf... [f| [fg,İ %Šú%»

Step 5: ¼ Úf, [fh,İfEf`f\_fŠf`fO EfXfe [fg,İ Ý`è

Step 6: %Šú%»,İŠ®—¹

Step 7: fEf`f\_fŠf`fO Ef< [fv,İŽÀ s

Step 8: I—¹ ^—

,±,İSDK,İ†,İ¼ Úf, [fh,İfTf`fvf<,É,Í A,±,±,É,ÍL Ú,³,ê,Ä,¢,È,¢fR [fh,ª,¢,,Ä,©ŠÜ,Ü,ê,Ä,¢,é B“Á,É,±  
,İSDK,É,Í AD3DappŠÖ ”,Æ,µ,ÄÆÄ,Ñ o,³,ê,éfwf<fpŠÖ ”,İfRfEfNfVf‡f“,³ŠÜ,Ü,ê,Ä,¨,è A“ÆŽ©,İ¼ Úf, [fh,İf  
AfvfŠfP [fVf‡f“,đL q,·,é ê ‡,É—đ—§,Ä,Ä, ,ë,□ B,±,İfhfLf...f f`fg,Ä,İfwf<fpŠÖ ”,đ•p”É,ÉŽQ Æ,µ,Ä,¢  
,é,ª A,»,İ,·,×,Ä,É,Ä,¢,ÄfJfo [,µ,Ä,¢,é,i,¬,Ä,Í,È,¢ Bfwf<fpŠÖ ”,Í Af\ [fX Eftf@fCf<D3dapp.c ADdcalls.c  
AD3dcalls.c ATexture.c,¨,æ,Ñ Misc.c,ÄfCf`fvfŠf f`fg,³,ê,Ä,¢,é Bf\ [fX Eftf@fCf<Stats.cpp  
,Í AftfE [fE EfE [fg,âfXfNfŠ [f“ Ef, [fh,İ îñ,đfXfNfŠ [f“É,—,é B

D3main.cpp,đ—p,¢,é,·,×,Ä,İfTf`fvf<,Í A,»,İ“® ì,đfJfXf^f}fCfY,Ä,«,é,æ,□  
,É,·,é,½,ß,É A`È%º,İŠÖ ”,đfCf`fvfŠf f`fg,µ,È,,Ä,Í,È,ç,È,¢ B

InitScene

InitView

RenderScene

ReleaseView

ReleaseScene

OverrideDefaults

,³,ç,É AfTf`fvf<,ÍSetMouseCallbackŠÖ ”,âSetKeyboardCallbackŠÖ ”,đÆÄ,Ñ o,µ Af}fEfX,âfL [f{ [fh,©,İ“ü—  
Í,đŽæ“¾,·,é B

## Step 1: %Šú%»,İŠJŽn

D3dmain.cpp,İWinMainŠÖ ",<sup>a</sup> s,<sup>□</sup> Å %  
,İf^fXfN,İ Af [fJf<,É'è<,<sup>3</sup>,ê,½AppInitŠÖ ",ðĖÄ,Ñ o,<sup>μ</sup> AfAfvfŠfP [fVf‡f“ EfEfBf“fhfE,ð ì ¬,<sup>μ</sup> AfĖf“f  
\_fŠf“fO,İŠJŽn,É•K—  
v,È,·,×,Ä,İfIfufWfFfNfg,ð %Šú%»,·,é B,Û,½ AWinMainŠÖ ",İD3dmain.cpp,Éf fbfZ [fW Ef|  
f“fv,ðfCf“fvfŠf f“fg,<sup>μ</sup> Af [fJf<'è<,İRenderLoopŠÖ ",ÆCleanupAndPostQuitŠÖ ",ðĖÄ,Ñ o,· BAppInitŠÖ ",İ  
A ^— ,ð•â«·,·,é¼,İŠÖ ”ĖQ,ðĖÄ,Ñ o,<sup>μ</sup> A,±,ê,ç,İŠÖ ",İ A,<sup>3</sup>,ç,É•Ê,İŠÖ ”ĖQ,İĖÄ,Ñ o,<sup>μ</sup>,ð s,<sup>□</sup> B,±,İf`f...  
[fgfŠfAf<,İ,Û,Æ,ñ,Ç,İ A %Šú%»ŠÖ ",İfOf< [fv,É,Ä,Ç,ÄŽæ,è^<sup>μ</sup>,Ä,Ä,Ç,é B  
WindowsfAfvfŠfP [fVf‡f“,İ•W €“I,È %Šú%» ^—  
,ðŽÄ s,<sup>μ</sup> AfOf [fof•İ ",ðfftHf<fg,İ Ý'è,Ä %Šú%»,<sup>μ</sup>,½Ėä AAppInitŠÖ ",İInitSceneŠÖ ",ðĖÄ,Ñ o,· B  
3Dmain.cpp,ðŽg,<sup>□</sup>ŠefTf“fvf<,İ A,»,ê,¼,èInitSceneŠÖ ",ðfCf“fvfŠf f“fg,<sup>μ</sup>,È,,Ä,İ,È,ç,È,Ç BOct1.c,İ,æ,<sup>□</sup>  
,È'P f,ÈTf“fvf< EfAfvfŠfP [fVf‡f“,Ä,İ AInitSceneŠÖ ",İ%½,à,<sup>1</sup>,, ATRUE,ð•Ö,·,¾,¯,Ä, ,é BTunnel.c,È,Ç A,à  
,Ä,Æ•;ŽG,ÈTf“fvf<,Žg,<sup>□</sup>InitSceneŠÖ ",İ Af f,fŠ,ðŠm•Û,<sup>μ</sup> A“\_ð ¶ ¬,<sup>μ</sup> AfOf [fof•İ ",ðŽæ“¾,·,é B  
ÄĖä,ÉAppInitŠÖ ",İ AD3dmain.cpp,ÉfCf“fvfŠf f“fg,<sup>3</sup>,ê,Ä,Ç  
,éCreateD3DAppŠÖ ",ðĖÄ,Ñ o,· BCreateD3DAppŠÖ ",É,æ,Ä,ÄĖÄ,Ñ o,<sup>3</sup>,ê,éŠÖ ”ĖQ,İ A %Šú%» ^— ,İ'½,-  
,İ••,ðŽó,¯Ž ,Ä,Ä,Ç,é B

## Step 2: DirectDraw, „æ, ÑDirect3DfIfufWfFfNfg, Ì ì ñ

D3dmain.cpp, ÌCreateD3DAppŠÖ „, Ì AfŒf“f\_Šf“fO, ŠJŽn, ³, é, O, ÉDirectDraw, ÆDirect3DfIfufWfFfNfg, ð %Šú%»  
„, é-ðŠ„, ðŽ „, Æ BCreateD3DAppŠÖ „, ÆÄ, Ñ o, f [fJf, ŠÖ „, Ì, ð, ÷ d—  
v, È, à, Ì, Ì AD3DAppCreateFromHWND AD3DAppGetRenderState AOverrideDefaults AD3DAppSetRenderState AReleaseView AInitView, ÌŠeŠÖ „, Æ, é BD3DApp, ÆŽn, Û, é-¼O, ÌŠÖ „, Ì AD3DAppfVfŠ [fY, Ìfwf, fpŠÖ „, Ìè„, Æ, é B  
WinMainŠÖ „, É“n, ³, é, éRf}f“fh Ef%ŒfCf“ EfIfvfVfŠf“, Æ“„, Ì, à, Ì, Æ ACreateD3DAppŠÖ „, É, à“n, ³, é, é B—  
LŒø, ÈfIfvfVfŠf“, Ì A-systemmemory, Æ-emulation, Æ, é B-systemmemoryfIfvfVfŠf“, Ì AfffofbfO è—p, È—p, Œ  
„, ç, é, é B-  
**emulation**fIfvfVfŠf“, ðŽw’è, „, é, Æ AfAfvfŠfP [fVfŠf“, ÌDirectDraw, ÆDirect3D, Ìfn [fhEfFfA EfAfNfZf%Œ [f^  
„, ðŽg—p, Ì, È, Œ B  
CreateD3DAppŠÖ „, Ì AfefNfXf`ff, ð ¶ ñ, „, é, ½, Æ, ÉD3DAppAddTextureŠÖ „, ðŒÄ, Ñ o, „ B, „, é, Æ AD3DAppAddTextureŠÖ „, Ì Af\ [fX EfefNfXf`ff, ðT [ftFfX, ÆfIfufWfFfNfg, ðfVfXfefŒ Ef f, fŠ“à, È ¶ ñ, „, é Bfn [fhEfFfA, Æfrffl Ef f, fŠ, ðŽ „, Æ, Æ, Œ  
„, é è †, Ì A %Šú ó, Æ, Ì, ó, ÌfefNfXf`ff EfT [ftFfX, ðfrffl Ef f, fŠ“à, È ¶ ñ, „, é Bf\ [fX EfefNfXf`ff, Ì A“]— æ, ÌfefNfXf`ff EfT [ftFfX, Èf [fh, ³, é, ½, ÆÄ, Æ”jŠÖ, ³, é, é B, ±  
„, Ì2, ÌŠK, ÌfVf fZfX, È, æ, Æ, Æ AfffofCfX, Ì Afrffl Ef f, fŠ, È“]—, ³, é, é, Æ, „, ÈfefNfXf`ff Ef}  
fbfv, ð³ k, Û, ½, Ì ÄftfH [f}fbfg, „, é, ±  
„, Æ, Æ, „, é BfTf“fvf, EfR [fh, Æ, Ì AIDirect3DTexturefCf“f^ [ftFfCfX, ðŽæ“¼, „, é, ½, Æ, ÈIDirectDrawSurface::QueryInterface f\fbfh, ðŒÄ, Ñ o, Ì AIDirect3DTexture::Loadf f\fbfh, ð—p, Œ  
„, ÆfefNfXf`ff, ðf [fh, „, é BfefNfXf`ff Efnf“fhf, ÌfŠfXfg, ð Ì ñ, „, é, È, Ì AIDirect3DTexture::GetHandlef f\fbfh, ðŽg—p, „, é B  
fefNfXf`ff, ÌfŠfXfg, ð Ì ñ, Ì, ½, ÆÄ ACreateD3DAppŠÖ „, Ì AfŒf“f\_Šf“fO, ÌŠJŽn, È•K—  
v, ÉDirectDraw, ÆDirect3DfIfufWfFfNfg, ð ¶ ñ, „, é BfTf“fvf, EfR [fh, Æ, Ì AD3DAppCreateFromHWNDfwf, fpŠÖ  
„, ðŽg—p, Ì, Æ, Œ  
„, é BD3DAppCreateFromHWNDŠÖ „, Ì Af\ [fX Eftf@fCf, ð3dapp.c AD3dcalls.c ATexture.c Addcalls.c, ÈfCf“fvfŠf f“fg, ³, é, Æ, Œ, ÈŠÖ „ŒQ, ð—~—p, „, é B  
„, Û, „ AD3DAppCreateFromHWNDŠÖ „, Ì AIDirectDrawEnumerate, ÆDirectDrawCreateŠÖ „, ð—p, Œ  
„, ÆDirectDrawfIfufWfFfNfg, Ì ¶ ñ, Æ %Šú%»„, ð s, ð B, ±, ±  
„, ÆfOf [fof, Ì“] „, Ì, ð Ýè, Ì AIDirectDraw::EnumDisplayModesf f\fbfh, ðŒÄ, Ñ o, Ì, ÆffBfXfvfŒfC Ef, [fh, ð—ñ“„, „, é B  
V, Ì, ŒAfAfvfŠfP [fVfŠf“, Ì½, Ì, Ì AIDirectDrawfCf“f^ [ftFfCfX, Ì, Æ, Ì, è, ÈIDirectDraw2fCf“f^ [ftFfCfX, ð—~—p, „, é B, ±, ÌfhLf...f f“fg, ÌTf“fvf, EfR [fh, Ì AIDirectDrawfCf“f^ [ftFfCfX, ðŽg—p, Ì, Æ, Œ  
„, é BfŠftf@fŒf“fX, ÌfZfNfVfŠf“, ÆDirectDrawf f\fbfh, ð², ×, „, é, Æ, „, Ì A V, Ì, Œfo [fWfŠf“, Ìf f\fbfh, ðŽQ „, ³, é, ½, ç B, Æ, Û, è AIDirectDraw::EnumDisplayModes, Ì, Æ, Ì, è, ÈIDirectDraw2::EnumDisplayModes, ð², ×, è, Ì, æ, Œ B  
ŽÝ, È AD3DAppCreateFromHWNDŠÖ „, ÌDirect3DfIfufWfFfNfg, ð ¶ ñ, Ì ADirect3DffofCfX Efhf%ŒfCfo, ð—ñ“„, „, é BDirect3DfIfufWfFfNfg, Ì ¶ ñ, È, Ì AIID\_IDirect3DfCf“f^ [ftFfCfX, ÌŽ~•ÈŽq, ð“n, Ì, ÆIDirectDraw::QueryInterface f\fbfh, ðŒÄ, Ñ o, „ BffofCfX Efhf%ŒfCfo, ð—ñ“„, „, é, È, Ì AIDirect3D::EnumDevicesf f\fbfh, ðŽg—p, „, é B  
„, Ì, ©, Ì AIDirect3D::EnumDevices, ÌŒÄ, Ñ o, Ì, Ì ADirect3DffofCfX Efhf%ŒfCfo, ðŒŒ, Æ, „, é, ½, Æ, Ì Æ, àŠÈ’P, Æ Æ—Ç, È•û—@, Æ, „, é, Æ, ÌŒ¾, „, È, Œ B’¼ Úf, [fh, ÌfAfAfvfŠfP [fVfŠf“, Ì, Û, Æ, ñ, Ç, Ì A—  
ñ“f, [f“f“, ÌfZfbfgfAfbfv, Ì, Æ, Ì, è, ÈIDirect3D::FindDevicef f\fbfh, ð—~—p, „, é B, ±, Ìf f\fbfh, Ì A—  
„, Û, Ì, ŒffofCfX, Ì“]—, ðŽw’è, „, é, ¾, „, ÆVfXfefŒ, ðŽg—p%Ä“„, Èfhf%ŒfCfo, ð², × A Æ %Œ, Èf}  
fbf, Ì, ½ffofCfX, ÌŽ~•ÈŽq iGUID j, ð•Œ, „ BfVfXfefŒ, Ì, Æ, È, È Æ %Œ  
„, Èfn [fhEfFfA, ðfFfbfN, Ì Afn [fhEfFfA, ÆfVfXfefŒ, Ì—¼•û, ÌffofCfX, Æ—v, ³, é, ½“]—, ðfTf|  
[fg, „, é è †, Ì Afn [fhEfFfA EfffofCfX, ÌGUID, ð•Œ, „ B  
ffofCfX Efhf%ŒfCfo, ÆffBfXfvfŒfC Ef, [fh iftf, ÌXfNfŠ [f“, ©EfBf“fhfE, © j, ð¹, ð, Ì, ½, ÆÄ AD3DAppCreateFromHWNDŠÖ „, Ì A, „, ÌffBfXfvfŒfC Ef, [fh, Ì, ½, Æ, Ìf f“fg Efobftf@, ÆfobfN Efobftf@, ð Ì ñ, „, é BfAfAfvfŠfP [fVfŠf“, ÆEfBf“fhfE, Æ“® Ì, „, é, ©tf, ÌXfNfŠ [f“, Æ“® Ì, „, é, © A, Û, ½ Afrffl Ef f, fŠ, ÆfVfXfefŒ Ef f, fŠ, Ì, Ç, „, ç, ðŽg—p, „, é, ©, È, æ, Æ, Æ Afr [fh, Ì“à—e, Ì, Û, È, Æ, Æ, Æ—  
„, é BfEfBf“fhfE, ÆŽÄ s, ³, é, èfAfAfvfŠfP [fVfŠf“, Æ, Ì AIDirectDraw::CreateClipperf f\fbfh, ðŒÄ, Ñ o, Ì, ÆDirectDrawClipperfIfufWfFfNfg, ð ¶ ñ, Ì AIDirectDrawClipper::SetHwndf f\fbfh, È, æ, Æ, ÆfIfufWfFfNfg, ðEfBf“fhfE, ÈŠÖ•A, Ì AIDirectDrawSurface::SetClipperf f\fbfh, È, æ, Æ, Æftf f“fg Efobftf@, ÈfAf\fbf, „, é B  
ŽÝ, ÈD3DAppCreateFromHWNDŠÖ „, Ìftf f“fg Efobftf@, ÈfpfŒfbfg, Æ Ýè, ³, é, Æ, Œ, é, ©, Ç, ð  
„, ©, ðfFfbfN, „, é B Ýè, ³, é, Æ, Œ, é è †, È, Ì A, „, ÌpfŒfbfg, ð %Šú%»„, „, é B Æ %Œ  
„, ÈIDirectDraw::CreatePalettef f\fbfh, ðŽg—

p,μ,ÄfpfCfbfg,δ ì ¬,μ AŽŸ,ÉIDirectDrawSurface::SetPalettef f\fbfh,ðEÄ,Ñ o,μ,Ä A,»ê,ðftf f“fg Eft [ft fFfX,ÆfofbfN Eft [ftFfX,İfpfCfbfg,Æ,μ,Ä Ý’è,·,é B

,±,±

,ÄfR [fh,İIDirectDraw::CreateSurfacef f\fbfh,İEÄ,Ñ o,μ,ð s,¢ AZfofbftf@,ð ì ¬,·,é BIDirectDrawSurface::AddAttachedSurface,É,æ,Ä,ÄZfofbftf@,ðfofbfN Efofbftf@,ÉfAf^fbf`,μ AZfofbftf@,ªfrrffl Ef f,fŠ,É, ,é,©,Ç ,²,©,ð”»’è,·,é,½,ß,ÉIDirectDrawSurface::GetSurfaceDescf f\fbfh,ðŽg—p,·,é B

ŽŸ,ÉIDirect3DDevicefCf“f^ [ftFfCfX,ð ¶ ¬,μ A,±,ê,ð—p,¢,ÄfefNfXf`ff EftfH [f}fbfg,ð— ñ<“,·,é BfTf“fvf<,İ AfCf“f^ [ftFfCfX,ð ¶ ¬,·,é,½,ß,ÉIDirectDrawSurface::QueryInterfacef f\fbfh,ðEÄ,Ñ o, μ AIDirect3DDevice::EnumTextureFormatsf f\fbfh,É,æ,Ä,ÄfefNfXf`ff EftfH [f}fbfg,ð—ñ<“,μ,Ä,¢ ,é BfefNfXf`ff,İ—ñ<“,ªŠ@—¹,·,é,Æ ACreateD3DApp ,ª“,¶ŠÖ ”EQ,ðEÄ,Ñ o,μ AfefNfXf`ff,İf [fh,Æ AfefNfXf`ff Efnf“fhf<,İfŠfXfg,İ ì ¬,ð s,² B

fffofCfX,İ F%øð‘x,Æ A“K Ø,ÈffBfXfvfC Ef, [fh,ðftBf<f^,·,éfg [f^f< Efrffl Ef f,fŠ,ðŽg— p,μ,½Eä,İ AfffofCfX ì ¬fR [f<fofbfNŠÖ ”,ðfZfbfgfAfbfv,·,é B,±,İfR [f<fofbfNŠÖ ”,É,Ä,¢,Ä,İ uStep 3: fffofCfX ì ¬fR [f<fofbfNŠÖ ”,İfZfbfgfAfbfv v,ðŽQ Æ,³,ê,½,¢ B

fffofCfX ì ¬fR [f<fofbfNŠÖ ”,İfZfbfgfAfbfv,ªŠ@— ¹,·,é,Æ AD3DAppCreateFromHWNDSÖ ”,İfAvfŠfP [fVf‡f“,İfCf“f\_Šf“fO EfXfe [fg,ð Ý’è,·,é BfCf“f\_Šf “fO EfXfe [fg,É,Ä,¢,Ä,İ uStep 5: ¼ Ůf, [fh,İfCf“f\_Šf“fO EfXfe [fg,İ Ý’è v,Ä à—¾,μ,Ä,¢,é B

•K—v,ÈDirect3DfIfufWfFfNfg,ð ¶ ¬,μ AfCf“f\_Šf“fO EfXfe [fg,İfZfbfgfAfbfv,ð s,²,Æ A,¾,¢,½,¢,İ ^— ,ª I,İ,Ä,½,± ,Æ,É,È,é BD3DAppCreateFromHWNDSÖ ”,İ Aftf f“fg Efofbftf@,ÆfofbfN Efofbftf@,İ<éE`,ðfNf%oCfAf“fg — Ìæ’S`İ,É Ý’è,·,éfg [fJf<ŠÖ ”,ðEÄ,Ñ o,μ AfAvfŠfP [fVf‡f“,ª %øŠú%»,³,ê AfCf“f\_Šf“fO,ªŽÄ s,Ä,«é,± ,Æ,ðŽ!,·ftf%ofo,ð Ý’è,μ,Ä ATRUE,ð•Ö,· B

D3DAppCreateFromHWNDSÖ ”,İ ÅEä,İ AfGf%o [ ^— ,ð s,²•ª,Ä, ,é BEÄ,Ñ o,μ,ÉŽ,”s,μ,½,Æ,«É,İ AfGf %o [ ^— fR [fh,İfGf%o [ Ef%ofxf<,ÉfWfff“fv,μ,Ä I—¹,·,é B,± ,İ•ª,Ä,İ AfffofCfX,ð”jŠü,·,éfR [f<fofbfNŠÖ ”,ðEÄ,Ñ o,· BfAvfŠfP [fVf‡f“,ªftf<fXfNfŠ [f“ Ef, [fh,ÄŽ Ä s,³,ê,Ä,¢ ,é ê ‡,İ AffBfXfvfC Ef, [fh,Æ<’²fCfxf<,ðfŠfZfbfg,·,é B,»,μ,Ä A ¶ ¬,³,ê,½,·,×,Ä,İDirect3DfIfufWfFfN fg,ÆDirectDrawfIfufWfFfNfg,ð%øð•ú,μ AFALSE,ð•Ö,· B

### Step 3: `ffofCfX` à `~fR` [`f<fofbfNŠÖ` ",`İfZfbfgfAfbfv`

`D3DAppCreateFromHWNDSÖ` ",`İ'æ3fpf%of` [`f^,İ` `AAfterDeviceCreatedŠÖ` ",`Æ,μ,ÄD3dmain.cpp,ÉfCf“fvfŠf` `f“fg`  
`,3,ê,Ä,¢,é fR` [`f<fofbfNŠÖ` ",`İfAfhfCfX,Å,` `,é` `BAfterDeviceCreatedŠÖ` ",`İDirect3Df rf...` [`f`]  
`[fg,ð` `ì` `¬,μ` `A,»`,`ê,ðD3DAppCreateFromHWNDSÖ` ",`É•Ö,` `·` `B`

`Å` `%o,É``IDirect3D::CreateViewport``f` `f\fbfh,ðÆÄ,Ñ` `o,μ,Äf rf...` [`f`]  
`[fg,ð` `ì` `¬,μ` `IDirect3DDevice::AddViewport`,`É,æ,Ä,¢,ç,İ,ñ` `V,μ,¢Direct3DffofCfX,Éf rf...` [`f`]  
`[fg,ð'Ç%oÄ,·,é` `BD3DVIEWPORT` `\‘¢'İ,İ'†,İf rf...` [`f`] [`fg,İfTfCfY,ð` `%oŠú%o»`,`μ,½Æä` `Af rf...` [`f`]  
`[fg,ð,»`,`İfTfCfY,É` `Ý'è,` `·,é,½,ß,É` `IDirect3DViewport::SetViewport``f` `f\fbfh,İÆÄ,Ñ` `o,μ,ð` `s,□` `B`

`ŽŸ,É` `AAfterDeviceCreatedŠÖ` ",`İInitViewŠÖ` ",`ðÆÄ,Ñ` `o,·` `BInitViewŠÖ` ",`İ` `AD3dmain.cpp,a` `Å` `%o`  
`,İ•û,ÄÆÄ,Ñ` `o,·InitSceneŠÖ` ",`Æ“—l,É` `AD3dmain.cpp,ðŽg—p,` `·,éŠefTf“fvf<,ÄfCf“fvfŠf` `f“fg,μ,È,-`  
`,Ä,İ,È,ç,È,¢` `BInitViewŠÖ` ",`İfCf“fvfŠf` `f“fg,İ—á,İ` `uStep 4: frf...` [`f`] [`fg,İ` `%oŠú%o»`] `v,Ä` `à—¼,3,ê,Ä,¢,é` `B`

`InitViewŠÖ` ",`İÆÄ,Ñ` `o,μ,Æ,¢,,Ä,©,İf` `fjf...` [`EfAfCfef€`  
`,İ•İ` `X,İÆä` `ACleanUpAndPostQuitŠÖ` ",`ðÆÄ,Ñ` `o,μ,ÄAfterDeviceCreatedŠÖ` ",`İ` `I—`  
`1,·,é` `BCleanUpAndPostQuitŠÖ` ",`É,Ä,¢,Ä,İ` `uStep 8: I—l ^—` `v,ðŽQ` `Æ,3,ê,½,¢` `B`



#### Step 4: frf... [f] [fg,î %Šú%»

```
D3dmain.cpp,ðŽg—p,·,éTf“fvf< EfR [fh,í A,»ê,¼,ê Afrf... [f]
[fg,îZfbfgfAfbfv,ÆŽÀ sfofbtft@,î ï ¬,ð s,µInitViewŠÖ ”,ðfCf“fvfŠf f“fg,µ,È,,Ä,Í,È,ç,È,¢ B,±
,îfZfNfVf‡f“,Ä,Í AOct1.cfTf“fvf<,É,¬,éInitViewŠÖ ”,îfCf“fvfŠf f“fg,É,Ä,¢,Ä à¾,·,é B
,Ü,InitViewŠÖ ”,Í Af}fefŠfAf<,âf}fefŠfAf<,îfnf“fhf< if}fefŠfAf< Efnf“fhf< j AfefNfXf`ff Efnf“fhf<,ð,¢,-
,Ä,© ï ¬,µ %Šú%»,·,é Bf}fefŠfAf<,ð ï ¬,·,é,É,ÍIDirect3D::CreateMaterial f\fbfh,ðŽg—
p,·,é B,Ü,½ AIDirect3DMaterial::SetMaterial f\fbfh,ðCEÄ,Ñ o,µ A %Šú%»,µ,½,Í,©,è,lf}
fefŠfAf<,îff [f^,ð Ý’è,·,é B,±,îf}fefŠfAf<,ðfrf... [f]
[fg,î”wEi,É Ý’è,·,é,É,Í AIDirect3DMaterial::GetHandle,ÆIDirect3DViewport::SetBackgroundf f\fbfh,ð—p,¢
,é B

,±,è,ÄInitViewŠÖ ”,Í Afrf... [f] [fg,îfrf... [ Af [f<fh Af}fefŠfAf<,ì“Š%e,î Ý’è,ð s,Ä,½ Bf}
fefŠfAf<,ð ï ¬,µ A Ý’è,·,é,½,ß,É AInitViewŠÖ ”,ÍMAKE_MATRIXf}fNf ,ðŽg—p,·,é BMAKE_MATRIXf}
fNf ,ÍD3dmacs.h,ÄŽÝ,î,æ,µ,É’è<³,è,Ä,¢,é B

#define MAKE_MATRIX(lpDev, handle, data) \
    if (lpDev->lpVtbl->CreateMatrix(lpDev, &handle) != D3D_OK) \
        return FALSE; \
    if (lpDev->lpVtbl->SetMatrix(lpDev, handle, &data) != D3D_OK) \
        return FALSE

CE©,Ä,í,©,é’È,èMAKE_MATRIX,Í AIDirect3DDevice::CreateMatrix,ÆIDirect3DDevice::SetMatrixf f\fbfh,ðfVf“fo
f< EfXfefbvf,ÄCEÄ,Ñ o,·,¾,¬,î•Ö—,Éf}fNf ,Ä,·,é B

ŽÝ,ÉInitViewŠÖ ”,Í AŽÀ sfofbtft@,î ï ¬,ÆfZfbfgfAfbfv,ð s,µ BD3DEXECUTEBUFFERDESC \‘ç’î,îf f“fo
,ð %Šú%»,µ,Ä,©,ç AIDirect3DDevice::CreateExecuteBuffer f\fbfh,ðCEÄ,Ñ o,µ,ÄŽÀ sfofbtft@,ð ï ¬,µ A“à
—e,ð Ý’è,·,é,½,ßIDirect3DExecuteBuffer::Lockf f\fbfh,É,æ,Ä,Äfobtftf@,ðf fbfN,·,é B

InitViewŠÖ ”,Í AD3dmacs.h,Ä’è<³,è,Ä,¢,éOP_STATE_TRANSFORM,ÆSTATE_DATAf}fNf ,ðŽg—
p,µ,ÄŽÀ sfofbtft@,ð Ý’è,·,é B,±,è,ç,lf}fNf ,É,Ä,¢,Ä,Í uStep 5:
¼ Úf, [fh,îfCEf“f fŠf“fo EfXfe [fg,î Ý’è v,ðŽQ Ä,³,è,½,¢ B,»,îfZfNfVf‡f“,É,Í AŽÀ sfofbtft@,î€ ï,É,
Ä,¢,Ä A,æ,è’½,î îñ,ªL Ú,³,è,Ä,¢,é B

ŽÀ sfofbtft@,ªfZfbfgfAfbfv,³,è,é,Æ AInitViewŠÖ ”,ÍIDirect3DExecuteBuffer::Unlockf f\fbfh,ðCEÄ,Ñ o,µ,Äfob
tftf@,ðfAf“f fbfN,µ AIDirect3DExecuteBuffer::SetExecuteDataf f\fbfh,É,æ,Ä,Äfobtftf@,Éff [f^,ð Ý’è,·,é B
IDirect3DDevice::BeginScene AIDirect3DDevice::Execute AIDirect3DDevice::EndScenef f\fbfh,ð—p,¢
,ÄŽÀ sfofbtft@,ðŽÀ s,·,é B,»,îCEä,Í,±,îŽÀ sfofbtft@,ðŽg—p,·,é,±,Æ,Í,È,¢
,î,Ä AIDirect3DExecuteBuffer::ReleaseŠÖ ”,ðCEÄ,Ñ o,·,±,Æ,ª,Ä,«é B

,±,±,ÄInitViewŠÖ ”,Í A,Ó,½,Ä,lf}fefŠfAf<,ðfZfbfgfAfbfv,·,é B,±,è,É,Í A`È’O,Éf}
fefŠfAf<,ð Ý’è,µ,½,Æ,«„Æ“„,¶Žè ‡,ð—p,¢,é Bf}fefŠfAf<,î ï ¬,É,ÍIDirect3D::CreateMaterial f\fbfh,ðŽg—
p,µ Af}
fefŠfAf<,îff [f^,ð Ý’è,·,é,É,Í A iD3DMATERIAL \‘ç’î,îf f“fo,ð Ý’è,µ,½CEä,É jIDirect3DMaterial::SetMateri
alf f\fbfh,ðCEÄ,Ñ o,· B,³,ç,ÉIDirect3DMaterial::GetHandlef f\fbfh,ð—p,¢,Äf}
fefŠfAf<,Ö,îfnf“fhf<,ðŽæ“¾,·,é B,±,îfnf“fhf<,Í A V,µ,¢f}fefŠfAf<,ÉCEö,ð“—,Ä,é,½,ß AD3DLIGHTSTATETYPE
—ñ<“E^,îD3DLIGHTSTATE_MATERIALf f“fo,Æ,Æ,à,ÉCEä,ÄŽg—p,³,è,é B

,»,µ,ÄInitViewŠÖ ”,Í A’ „,îfZfbfgfAfbfv,ð s,µ B•,“© ¬ ”“„,î,ðD3DVERTEX \‘ç’î,îD3DVALUEf f“fo,É•İŠ·,
·,é,½,ß Afr [fh,îD3DVALPf}fNf ,ð—p,µ,Ä,¢,é B,Ü,½ AŠe’ „,î—
@ üxfNfgf<,lx Ä•W,ð ³K%»,·,é,½,ß AD3DRMVectorNormalizeŠÖ ”,àŽg—p,·,é B

’, „,îfZfbfgfAfbfv,ªŠ@—
¹,·,é,Æ AInitViewŠÖ ”,Í•É,îŽÀ sfofbtft@,ð ï ¬,µ A’ „,ðfRfs [µ,ÄŽÀ sff [f^,ð Ý’è,·,é B,µ,©,µ A,±
,îŽz“—Ä,îŽÀ sfofbtft@,îŽÀ s,³,è,È,¢ BŽÀ sfofbtft@,îŽÀ s,Í AfCEf“f_fŠf“fo Ef< [fv,î’†,Ä s,í,è,é B

ÄCEä,É AInitViewŠÖ ”,ÍOct1.c,îCEöE¹,ðfZfbfgfAfbfv,·,é BD3DLIGHT \‘ç’î,ð %Šú%»,µ,½CEä AIDirect3D::Cr
eateLight AIDirect3DLight::SetLight A,¬,æ,ÑIDirect3DViewport::AddLight f\fbfh,ðCEÄ,Ñ o,µ,Äfrf... [f]
[fg,ÉCEöE¹,ð’Ç%öÄ,·,é B
```

Step 5: ¼ Úf, [fh,ífĈf“f\_Œf“fO EfXfe [fg,ì Ý’è

```
D3dcalls.cf\ [fX Eftf@fCf<,É,,éD3DAppISetRenderStateŠÖ ”,Í AĈ» Ý,ìfrf... [f]
[fg,ífĈf“f_Œf“fO EfXfe [fg,âĈð,ì ó‘Ô,ð Ý’è,·éŽÀ sfofbftf@,ì ì ¬,ÆŽÀ s,ð s, B3DAppCreateFromH
WNDSÖ ”,Í AD3dapp.c,©,çD3DAppISetRenderStateŠÖ ”,ðĈÄ,Ñ o,· B^ê”Ê,I,ÉTf“fvf< EfR [fh,Í A Ý’è,âfŒfZ
fbfg,·K—v,É,É,é,½,Ñ,ÉD3DAppISetRenderStateŠÖ ”,ìĈÄ,Ñ o,μ,ð s, B,±
,ìfZfNfVf‡f“,Ä,Í AD3DAppISetRenderStateŠÖ ”,ð ifGf%o [ Ef fFfbfN,ìfR [fh,ð æ,Ĉ,Ä j Ð%ô,·,é B
```

```
D3DAppISetRenderStateŠÖ ”,Í AD3DEXECUTEBUFFERDESC \‘Ĉ‘ì,âD3DEXECUTEDATA \‘Ĉ‘ì,ðŠÜ,ð,Ĉ,-
,Ä,©,ìf [fJf<·ì ”,ð Ý’è,μ,½Ĉä AIDirect3DDevice::CreateExecuteBuffer f\fbfh,ðŽg—
p,μ,ÄŽÀ sfofbftf@,ð ì ¬,·,é BŽÀ sfofbftf@,· ì ¬,³,ê,é,Æ A,»,ì† g,ð Ý’è,·,é,½,ß,ÉIDirect3DExecuteBuffer:
:Lock f\fbfh,ðĈÄ,Ñ o,μ,Äfobftf@,ðf fbfn,·,é B
```

```
BOOL D3DAppISetRenderState()
{
D3DEXECUTEBUFFERDESC debDesc;
D3DEXECUTEDATA d3dExData;
LPDIRECT3DEXECUTEBUFFER lpD3DExCmdBuf = NULL;
LPVOID lpBuffer, lpInsStart;
size_t size;
```

```
// —v< ,³,ê,½fTfCfY,ìŽÀ sfofbftf@,ð ì ¬,μ A“à—e,ð Ý’è,Ä,«,é,æ,μ,Éf fbfn,·,é B
```

```
size = 0;
size += sizeof(D3DINSTRUCTION) * 3;
size += sizeof(D3DSTATE) * 17;
memset(&debDesc, 0, sizeof(D3DEXECUTEBUFFERDESC));
debDesc.dwSize = sizeof(D3DEXECUTEBUFFERDESC);
debDesc.dwFlags = D3DDEB_BUFSIZE;
debDesc.dwBufferSize = size;
```

```
LastError = d3dappi.lpD3DDevice->lpVtbl->CreateExecuteBuffer(
d3dappi.lpD3DDevice, &debDesc, &lpD3DExCmdBuf, NULL);
```

```
LastError = lpD3DExCmdBuf->lpVtbl->Lock(lpD3DExCmdBuf, &debDesc);
memset(debDesc.lpData, 0, size);
```

```
lpInsStart = debDesc.lpData;
lpBuffer = lpInsStart;
```

```
IDirect3DDevice::CreateExecuteBuffer f\fbfh,ì†,ìd3dappi.lpD3DDevicefpf%of [f^,Í ADirect3DDeviceIfufWfFf
Nfg,Ö,ìf|fCf“f^,Ä, ,é
BdebDesc·ì ” ID3DEXECUTEBUFFERDESC \‘Ĉ‘ì j,ìlpDataf f“fo,Í AŽÀ sfofbftf@“à,ìŽÀ Û,ìff [f^,Ö,ìf|
fCf“f^,Ä, ,é B
```

```
,³,Ä AD3DAppISetRenderStateŠÖ ”,Í AfĈf“f_Œf“fO EfXfe [fg,ì Ý’è,ð s, B ^—
,ðŠË’P,É,·,é,½,ß,É AD3DAppISetRenderStateŠÖ ”,ÍOP_STATE_DATAf}fNf ,ðŽg—p,μ,Ä,Ĉ,é B,±,ìf}
fNf ,ÍPUTD3DINSTRUCTIONf}fNf ,ðĈÄ,Ñ o,· B,±,ê,ç,Ó,½,Ä,ìf}fNf ,Í A,±
,ìSDK,ìD3dmacs.hfwfbf_ Eftf@fCf<,Ä^È%o,ì,æ,μ,É’è<,³,ê,Ä,Ĉ,é B
```

```
#define PUTD3DINSTRUCTION(op, sz, cnt, ptr) \
((LPD3DINSTRUCTION) ptr)->bOpcode = op; \
((LPD3DINSTRUCTION) ptr)->bSize = sz; \
((LPD3DINSTRUCTION) ptr)->wCount = cnt; \
ptr = (void *)(((LPD3DINSTRUCTION) ptr) + 1)
#define OP_STATE_RENDER(cnt, ptr) \
PUTD3DINSTRUCTION(D3DOP_STATERENDER, sizeof(D3DSTATE), cnt, ptr)
```

```
PUTD3DINSTRUCTIONf}fNf ,ìø ”,ìD3DINSTRUCTION \‘Ĉ‘ì,ìf f“fo,æ,è ,È,Ĉ,±,Æ,É’ ^Ó,·K—v,Ä, ,é BOP_S
TATE_RENDERf}fNf ,ìPUTD3DINSTRUCTION,ìæìfpf%of [f^D3DOP_STATERENDER,Í AD3DOPCODE—
ñ“Ĉ^†,ìIfyfR [fh,ì,ð,Æ,Ä,Ä, ,é B2”Ô—Ú,ìfpf%of [f^,ìD3DRENDERSTATETYPE \‘Ĉ‘ì,Ö,ìf|
fCf“f^,ÆD3DSTATE \‘Ĉ‘ì,ìfTfCfY,ðŽ,μ,Ä,Ĉ,é B
```

```
,â,ì,èD3dmacs.h,Ä’è<,³,ê,éSTATE_DATAf}fNf ,Í AfĈf“f_Œf“fO EfXfe [fg,ð‘Ĉ ì,·,é B,±,ìf}
```

fNf ,ID3DSTATE \^C'İ,Ö,İf|fCf" f^,ÆD3DRENDERSTATETYPE—ñ<"(E^,İ'l,đ•K—v,Æ,.,é B

```
#define STATE_DATA(type, arg, ptr) \
    ((LPD3DSTATE) ptr)->drstRenderStateType = (D3DRENDERSTATETYPE)type; \
    ((LPD3DSTATE) ptr)->dwArg[0] = arg; \
    ptr = (void *)(((LPD3DSTATE) ptr) + 1)
```

D3DAppISetRenderStateŠÖ ",©,ç"2 ^,μ,½ŽŸ,İfR [fh,Å,İ AOP\_STATE\_RENDER,ÆSTATE\_DATAf}fNf ,đŽg—  
p,μ,Ä A14CEÄ,İfCEf"f\_fŠf"fO EfXfe [fg,đ Ÿ'è,μ,Ä,ç  
,é Bd3dapprs,İ AD3dapp.hfwfbf\_ Eftf@fCf<,Ä'è<'3,ê,½D3DAppRenderState \^C'İ,Ä,.,é B

```
OP_STATE_RENDER(14, lpBuffer);
    STATE_DATA(D3DRENDERSTATE_SHADEMODE, d3dapprs.ShadeMode, lpBuffer);
    STATE_DATA(D3DRENDERSTATE_TEXTUREPERSPECTIVE,
        d3dapprs.bPerspCorrect, lpBuffer);
    STATE_DATA(D3DRENDERSTATE_ZENABLE, d3dapprs.bZBufferOn &&
        d3dappi.ThisDriver.bDoesZBuffer, lpBuffer);
    STATE_DATA(D3DRENDERSTATE_ZWRITEENABLE, d3dapprs.bZBufferOn,
        lpBuffer);
    STATE_DATA(D3DRENDERSTATE_ZFUNC, D3DCMP_LESSEQUAL, lpBuffer);
    STATE_DATA(D3DRENDERSTATE_TEXTUREMAG, d3dapprs.TextureFilter,
        lpBuffer);
    STATE_DATA(D3DRENDERSTATE_TEXTUREMIN, d3dapprs.TextureFilter,
        lpBuffer);
    STATE_DATA(D3DRENDERSTATE_TEXTUREMAPBLEND, d3dapprs.TextureBlend,
        lpBuffer);
    STATE_DATA(D3DRENDERSTATE_FILLMODE, d3dapprs.FillMode, lpBuffer);
    STATE_DATA(D3DRENDERSTATE_DITHERENABLE, d3dapprs.bDithering,
        lpBuffer);
    STATE_DATA(D3DRENDERSTATE_SPECULARENABLE, d3dapprs.bSpecular,
        lpBuffer);
    STATE_DATA(D3DRENDERSTATE_ANTI_ALIAS, d3dapprs.bAntialiasing,
        lpBuffer);
    STATE_DATA(D3DRENDERSTATE_FOGENABLE, d3dapprs.bFogEnabled,
        lpBuffer);
    STATE_DATA(D3DRENDERSTATE_FOGCOLOR, d3dapprs.FogColor, lpBuffer);
```

OP\_STATE\_RENDER,ÆSTATE\_DATAf}fNf ,İ ACEđCE'İ ó'Ö,đ,R,Ä Ÿ'è,.,é BOP\_EXITf}fNf ,İ AD3DOPCODE  
—ñ<"(E^,©,ç,D3DOP\_EXITfIfyfR [fh,đŽæ,è o,.,½,B,É APUTD3DINSTRUCTIONf}fNf ,đCEÄ,Ň o,.,¾,Ä,.,é B

```
OP_STATE_LIGHT(3, lpBuffer);
    STATE_DATA(D3DLIGHTSTATE_FOGMODE, d3dapprs.bFogEnabled ?
        d3dapprs.FogMode : D3DFOG_NONE, lpBuffer);
    STATE_DATA(D3DLIGHTSTATE_FOGSTART,
        *(unsigned long*)&d3dapprs.FogStart, lpBuffer);
    STATE_DATA(D3DLIGHTSTATE_FOGEND, *(unsigned long*)&d3dapprs.FogEnd,
        lpBuffer);
OP_EXIT(lpBuffer);
```

fCEf"f\_fŠf"fO EfXfe [fg,İ Ÿ'è,"Š@—  
1,.,é,Æ AD3DAppISetRenderStateŠÖ ",İ AIDirect3DExecuteBuffer::Unlockf f\fbfh,đCEÄ,Ň o,μ,ÄŽÄ sfobftf@,đ  
fAf"f fbN,.,é B,Ü,½ AIDirect3DExecuteBuffer::SetExecuteData,É,æ,Ä,ÄŽÄ sf [f^,đ Ÿ'è,.,é B ÄCEä,É AID  
irect3DDevice::BeginScene AIDirect3DDevice::Execute AIDirect3DDevice::EndScene f f\fbfh,đCEÄ,Ň o,μ,Ä AfV  
[f",đŠJžn,μ AŽÄ sfobftf@,đŽÄ s,μ A Ä,ŇfV [f",đ I—1,.,é B

LastError = lpD3DExCmdBuf->lpVtbl->Unlock(lpD3DExCmdBuf);

```
memset(&d3dExData, 0, sizeof(D3DEXECUTEDATA));
d3dExData.dwSize = sizeof(D3DEXECUTEDATA);
d3dExData.dwInstructionOffset = (ULONG) 0;
d3dExData.dwInstructionLength = (ULONG) ((char*)lpBuffer -
    (char*)lpInsStart);
lpD3DExCmdBuf->lpVtbl->SetExecuteData(lpD3DExCmdBuf, &d3dExData);
```

```

LastError =
    d3dappi.lpD3DDevice->lpVtbl->BeginScene(d3dappi.lpD3DDevice);
LastError =
    d3dappi.lpD3DDevice->lpVtbl->Execute(d3dappi.lpD3DDevice,
        lpD3DExCmdBuf, d3dappi.lpD3DViewport);
LastError = d3dappi.lpD3DDevice->lpVtbl->EndScene(d3dappi.lpD3DDevice);

D3DAppISetRenderState,Í AŽÀ sfofbftf@,đ I,í,è,Ü,ĂŽÀ s,;é,Æ I—
¹,.,é BŽŸ,ÉDirect3DExecuteBuffer::Releasef f\fbfh,đ“Ç,ñ,Ă AfŠf^ [f“,.,é B

lpD3DExCmdBuf->lpVtbl->Release(lpD3DExCmdBuf);
return TRUE;
}

```

# Step 6: %Šú%»,İŠ@—¹

WinMainŠÖ ”“à,İAppInitŠÖ ”,©,çĖÄ,Ń o,³,ê,éCreateD3DAppŠÖ ”,Í ADirect3DfAfvfŠfP [fVf‡f“,İ“y‘ä,İ,Ù,Æ,ñ,Ç ,đ ì ¬,·,é,ª A,»,ê,Ä İ,í,è,Ä,İ,È,ĸ BD3dmain.cpp,ªĖf“f\_Šf“fO Ef< [fv,đĖÄ,Ń o,·‘O,É ACreateD3DAppŠÖ ”, İ, ,Æ ,µ,İf^fXfN,đŠ@—¹,µ,È,,Ä,İ,È,ç,È,ĸ B

CreateD3DAppŠÖ ”,İ AĖ» Ý,İĖf“f\_Šf“fO EfXfe [fg,đfAfvfŠfP [fVf‡f“ Ef [fJf<,ÈD3DAppRenderState \‘ĸİ,ÉfRfs [,µ,½Ėä AOverrideDefaultsŠÖ ”,đĖÄ,Ń o,· BOverrideDefaultsŠÖ ”,İ AD3dmain.cpp,đŽg— p,·,é,·,×,Ä,İfAfvfŠfP [fVf‡f“,ªfTf| [fg,µ,È,,Ä,İ,È,ç,È,ĸŠÖ ”,İ,Đ,Æ,Ä,Ä, ,é BOverrideDefaultsŠÖ ”,Ä,İ,Ù,Æ,ñ,Ç %½,à s,í,È,ĸfAfvfŠfP [fVf‡f“,à, ,é B,½,Æ,!,İOct1.cfTf“fvf<,Í AfftfHf<fg,İf^fCfgf•Źš—ñ,đ"Octagon D3D Example",É’u,«Š,·,é,¾,–,Ä, ,é B

ŽŸ,ÉCreateD3DAppŠÖ ”,İ AD3DAppSetRenderStateŠÖ ”,đĖÄ,Ń o,· BD3DAppSetRenderStateŠÖ ”,İ A•Ů‘Ź,³,ê,½f Ėf“f\_Šf“fO EfXfe [fg,İ ó‘Ů,đf`fFfbfN,µ A i,à,µfĖf“f\_Šf“fO EfXfe [fg,É%½,à Ý’è,³,ê,Ä,ĸ ,È,©,Ä,½,ç jfŠfZfbfg,·,é,© AD3DAppISetRenderStateŠÖ ”,İĖÄ,Ń o,µ,İ‘O,É•Ů‘Ź,·,é,©,đ”’è,·,é BD3DAppISetRen derStateŠÖ ”,É,Ä,ĸ,Ä,İ uStep 5: ‘¼ Ůf, [fh,İĖf“f\_Šf“fO EfXfe [fg,İ Ý’è v,ÄŽæ,èµ,Ä,Ä,ĸ,é B

fĖf“f\_Šf“fO Ef< [fv,đŠŽn,·,é‘O,İ ÄĖä,İfXfefbfv,Æ,µ,Ä ACreateD3DAppŠÖ ”,İReleaseView,ÆInitViewŠÖ ”,İ ĖÄ,Ń o,µ,đ s,± B,±,ê,ç,İŠÖ ”,İ AOverrideDefaultsŠÖ ”,Æ“— İ,É AŠefTf“fvf< EfAfvfŠfP [fVf‡f“,ªfCf“fvfŠf f“fg,·,é BReleaseViewŠÖ ”,İ AInitViewŠÖ ”,İĖÄ,Ń o,µ,Ä ì ¬,³,ê,½fIfufWfFfNfg,đ%đ•ú,·,é,¾,–,Ä, ,é iInitViewŠÖ ”,İĖÄ,Ń o,µ,İ2“x–Ů,Ä, ,é B Ä % İĖÄ,Ń o,µ,İ AAfterDeviceCreatedfR [f<fobfNŠÖ ”,ª s,Ä,Ä,ĸ,é j B,± ,İInitViewŠÖ ”,İ ÄĖä,İĖÄ,Ń o,µ,Ä A iffofCfX ì –Žž,©,ç,İ X,ª%Ä,!,ç,è,Ä,ĸ,é ê ‡,İ jfrf... [f| [fg,İ ÄfZfbfgfAfbfv,đ s,ĸ AfTf“fvf<,İŽÄ sfofbftf@,đ Ä \z,·,é BInitViewŠÖ ”,É,Ä,ĸ,Ä Ů,µ,,İ uStep 4: frf... [f| [fg,İ %Šú%» v,đŽQ Ä,³,ê,½,ĸ B

,±,ê,ÄD3dmain.cpp,İCreateD3DAppŠÖ ”,ª I—¹,·,é B,»,ê,¾,–,Ä,È, AAppInitŠÖ ”,İ I—¹,Ä,à, ,é B %Šú%» ^— ,ªŠ@—¹,µ,½,İ,Ä AfR [fh,İĖf“f\_Šf“fO Ef< [fv,đŠŽn,Ä,«,é B

**Step 7:**  $f \in f[f]f[f]O$   $E_f \leftarrow [v, i] \Delta s$

fAfAvfŠfP [fVfƒ“,ì %Šú%»,İĖĀ AD3dmain.cpp,İWinMainŠÖ ”,İf fbfZ [fW Ef< [fv,δfZfbfgfAfbfv,.,é BfR [fh,İ AĖĖm,³,ē,éf fbfZ [fW,ª,Ė,.,Ė,é,Ü,Āf fbfZ [fW EfLf... [,δŠĀŽ<,μ A,»,İĖĀRenderLoopŠÖ ”,İĖĀ,Ŋ o,· BRenderLoopŠÖ ”,İD3dmain.cpp,Ė’è<,³,ē,Ā,¢ ,é BWinMainŠÖ ”,İRenderLoopŠÖ ”,Ž”,s,Ā,«,é%œĥ ”,ð·ŪŽ ,μ,Ā,,è A3%œĥĖ āŽ”,s,μ,½,Ė,«,Ė,İ AfAfAvfŠfP [f Vfƒ“,İ I—,.,é B

$$\text{RenderLoop} \rightarrow \lambda fV.[f^*, \lambda ZY. \lambda t f \in [f \epsilon, \delta f \in f^* f_{\check{S}} f^* f O, \mu A f E f B f^* f h f E, \lambda X V, \delta s, \square B$$

RenderLoopSÖ ",l Å %,l f\ fXfN,Í A%Å",Å, ê,ÎŽ,í,é,½DirectDrawfT [ftfFfX,ð•œE³,·,é,±,Æ,Å, é BŽ,í,é,½fT [ftfFfX,ðŽ~•Ê,·,é,½,½,É,ÍIDirectDrawSurface::IsLostf f\fbfh,ðCEÄ,Ñ o,µ AIDirectDrawSurface::Restoref f\fbfh,É,æ,Å,Ä,»,ê,ð•œE³,·,é B,»,ê,©,çRenderLoopSÖ ",Í AIDirect3DRMViewoport::Clearf f\fbfh,ðCEÄ,Ñ o,µ,ÄfobfN Efobfbft@,ðfNfŠfA,µ AZfobfbft@,ª-LÆø,Å, é ê ‡,Í A,»,ê,äfNfŠfA,·,é B

,»µÄ ARenderLoopŠÖ ",Í AD3dmain.cpp,đŽg—

p.,éfTf“fvvf( EfAfvfšFP [fvf‡f“,afCf“fvšřf f“fg„.éRenderSceneŠÖ ”,ðĖÄ,Ň o,. BfTf“fvvf„lRenderSceneŠÖ  
”,Í A„;ŽG,Ê ê ‡,ð l—¶,É“ü,ê,½,à,l,Æ AOct1.c.l,æ„v,ÊŠĚ‘P,ĖfCf“fvšřf f“fg,l,à,l^, ,é B„»,lĖā ARenderSceneŠ  
Ö ”,Í AJDirect3DDevice::BeginScene AJDirect3DDevice::Execute A„,æ„ŇIDirect3DDevice::EndScenef f\fbfh,ðĖ  
Ä,Ň o„µ AZÄ sfobfbtf„ðžÄ s„,é B,Ü,½ AJDirect3DExecuteBuffer::GetExecuteData f\fbfh,Ê„æ„Ä V„µ„¢  
ŽÄ sff [fa„ðžÄ“4„µ AfXfnfš [f“„rŕl,ð X V„µ Af [fJf“èc„lTickSceneŠÖ ”,ðĖÄ,Ň o„. BTickSceneŠÖ ”,  
İIDirect3DDevice::SetMatrix,ð—p„¢,Äž“„,ðİ X„,é B

ÄÊã,ÉRenderLoopŠÖ ",Í AD3DAppRenderExtentsfwf<fpŠÖ ",ðÊÄ,Ñ o,µ,Ä Aftf f"fg Efofbtft@,ÆfofbfN Efofbtft@,Ì,Í X,3,ê,½,""ª,ð'²,× AfofbfN Efofbtft@,©,çftf f"fg Efofbtft@,Öfuf fbfn"']— ,Ü,½,ÍftfŠfbfv,ð s,² B

Step 8: I<sup>1</sup> ^—

•æ<A,Ä,«,«,È,¢fGf% [,^”-  
¶,µ,½,è AWM\_QUIT,Ü,½,ÍMENU\_EXITf fb fZ [fW,ðŽó,~Žæ,Á,½,Æ,«,Í AfAfvfŠfP [fVf‡f“,ÍCleanupAndPost  
QuitŠÖ ”,ðĈÄ,Ñ o,· BCleanupAndPostQuitŠÖ ”,ÍŠÈ’P,ÈfGf% [ Ef`fFbfN,ð s,¢ReleaseSceneŠÖ ”,ðĈÄ,Ñ o,·  
BReleaseSceneŠÖ ”,Í AD3dmain.cpp,ð—~—p,·,éfTf“fvf< EfAfvfŠfP [fVf‡f“,ªfCf“fvfŠf f“fg,µ,È,-  
,Ä,Í,È,ç,È,¢ŠÖ ”,ì,ϣ,¿ A ÄĈã,ì,à,Ì,Ä, ,é B,±,Ì,Æ,«fAfvfŠfP [fVf‡f“,Í AŽc,Ä,Ä,¢  
,éfIfufWfFfNfg,ð”)Šü,µ Af f,fŠ,ð%ð•ú,·,é BOct1.c,ì,æ,ϣ  
,ÈŠÈ’P,ÈfAfvfŠfP [fVf‡f“,Ä,Í AReleaseSceneŠÖ ”,Í’P,È,éfXf^fu,É%ß,¬,È,¢ B  
ÄĈã,É ACleanupAndPostQuitŠÖ ”,ÍPostQuitMessageŠÖ ”,ðĈÄ,Ñ o,µ,Ä AfAfvfŠfP [fVf‡f“,ð I—1,·,é B

**Direct3DRMCreate**

HRESULT Direct3DRMCreate(LPDIRECT3DRM FAR \* lpD3DRM);

Direct3DRMfIfufWfFfNfg,İfCf“fXf^f“fX,đ ì ¬,·,é B

¬Œ÷,·,é,ÆDP\_OK AŽ,”s,·,é,ÆfGf%o [ ,đ•Ô,· B•Ô'l,îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŬŽ f, [fh,İ•Ô'l v,đŽQ Æ,·,é,±,Æ B

lpD3DRM  
ŒÄ,Ñ o,µ,<sup>a</sup> ¬Œ÷,µ,½ ê ‡ A—LŒø,ÈDirect3DRMf|fCf“f^,“ü,éf|fCf“f^,İfAfhfŒfX B

ŽQ Æ @Direct3DRMObject



D3DRMColorGetAlpha

D3DVALUE D3DRMColorGetAlpha(D3DCOLOR d3drmc);

F,İfAf<ftf@—v‘f,ðŽæ“¾,·,·,é B  
¬Æ÷,·,·,é,ÆfAf<ftf@’l,ð•Ô,· BŽ,”s,·,·,é,Æ0,ð•Ô,· B

d3drmc  
fAf<ftf@—v‘f,ðŽæ“¾,·,·,é F B

ŽQ Æ @D3DRMColorGetBlue, D3DRMColorGetGreen, D3DRMColorGetRed

D3DRMColorGetBlue

D3DVALUE D3DRMColorGetBlue(D3DCOLOR d3drmc);

F,Ì Â—v‘f,ðŽæ“¾,·,é B  
¬Ɛ÷,·,é,Æ Â F’l,ð•Ô,· BŽ,”s,·,é,Æ0,ð•Ô,· B

d3drmc  
Â—v‘f,ðŽæ“¾,·,é F B

ŽQ Æ @D3DRMColorGetAlpha, D3DRMColorGetGreen,  
D3DRMColorGetRed

## D3DRMColorGetGreen

D3DVALUE D3DRMColorGetGreen(D3DCOLOR d3drmc);

F, Ì— Î— v‘f, ðŽæ“¾, ·, é B

¬Æ÷, ·, é, Æ— Î F’l, ð•Ô, · BŽ,”s, ·, é, Æ0, ð•Ô, · B

*d3drmc*

— Î— v‘f, ðŽæ“¾, ·, é F B

ŽQ Æ @D3DRMColorGetAlpha, D3DRMColorGetBlue, D3DRMColorGetRed

D3DRMColorGetRed

D3DVALUE D3DRMColorGetRed(D3DCOLOR d3drmc) ;

F,Ì Ô—v‘f,ðŽæ“¾,·,é B

¬Æ÷,·,é,Æ Ô F’l,ð•Ô,· BŽ,”s,·,é,Æ0,ð•Ô,· B

d3drmc

Ô—v‘f,ðŽæ“¾,·,é F B

ŽQ Æ @D3DRMColorGetAlpha, D3DRMColorGetBlue, D3DRMColorGetGreen

**D3DRMCreateColorRGB**

D3DCOLOR D3DRMCreateColorRGB(D3DVALUE red, D3DVALUE green,  
D3DVALUE blue);

—^,!,ç,ê,½ Ô A—Î,“,æ,Ñ Â—v‘f,©,ç RGB F,ð ì ¬,·,é B  
¬Œ÷,·,é,Æ V,µ,¢RGB’l,ð•Ô,· BŽ,”s,·,é,Æ0,ð•Ô,· B

*red, green, blue*  
RGB F,Ì \ ¬—v‘f B

ŽQ Æ @**D3DRMCreateColorRGBA**

D3DRMCreateColorRGBA

D3DCOLOR D3DRMCreateColorRGBA(D3DVALUE red, D3DVALUE green,  
D3DVALUE blue, D3DVALUE alpha);

—^,!,ç,ê,½ Ô A—Î A Â F A,¨,æ,ÑfAf<ftf@—v‘f,©,ç RGBA F,ð ì ¬,·,é B  
¬Œ÷,·,é,Æ V,µ,¢RGBA‘l,ð•Ô,· BŽ,”s,·,é,Æ0,ð•Ô,· B

red, green, blue, alpha  
RGBA F,İ \ ¬—v‘f B

ŽQ Æ @D3DRMCreateColorRGB

D3DRMFREEFUNCTION

```
typedef VOID (*D3DRMFREEFUNCTION) (LPVOID lpArg);
typedef D3DRMFREEFUNCTION *LPD3DRMFREEFUNCTION;
```

f f,fŠ,ð%ð•ú,·,é B,±,İŠÖ ”,İŽÀ‘İ,ÍfAfvfŠfP [fVf‡f“,Á’è`,³,ê,é B  
•Ô’l,Í,È,¢ B

lpArg  
fAfvfŠfP [fVf‡f“è`,İff [f^,İfAfhfŒfX B

•W €Cf%of“f^fCf€ Ef< [f`f“,Å,Í•s \•ª,È ê ‡ AfAfvfŠfP [fVf‡f“,Í A“ÆŽ©,İf f,fŠ%ð•úŠÖ ”,ð’è`,·,é,±  
,Æ,ª,Å,«,é B

D3DRMMALLOCFUNCTION

```
typedef LPVOID (*D3DRMMALLOCFUNCTION) (DWORD dwSize);
typedef D3DRMMALLOCFUNCTION *LPD3DRMMALLOCFUNCTION;
```

f f,fŠ,ðŠ,,,è“–,Ä,é B,±,ìŠÖ ”,ìŽÀ‘ì,ÍfAfvfŠfP [fVf‡f“,Ä’è‘,³,ê,é B  
–Œ÷,·,é,Æ AŠ,,,è“–,Ä,ç,ê,½f f,fŠ,ìfAfhfŒfX,ð•Ô,· BŽ,”s,·,é,Æ0,ð•Ô,· B

dwSize  
Š,,,è“–,Ä,ç,ê,é f f,fŠ,ì‘â,«,³,ðfofCf g’P^Ê,ÄŽw’è,·,é B

•W €Cf%of“f^fCf€ Ef< [f`f“,Ä,Í•s \•ª,È ê ‡ AfAfvfŠfP [fVf‡f“,Í A“ÆŽ©,ìf f,fŠŠ,,,è“–,ÄŠÖ ”,ð’è‘,·,é,±  
,Æ,ª,Ä,«,é B



D3DRMMatrixFromQuaternion

```
void D3DRMMatrixFromQuaternion (D3DRMMATRIX4D mat,
    LPD3DRMQUATERNION lpquat);
```

%oñ“],đŽ!,· s—ñ,đŒvŽŽZ,·,é B

•Ô'l,Í,È,¢ B

mat ŠÖ ”,ª §Œä,đ•Ô,·,Æ,« AŒvŽŽZ,³,ê,½ s—ñ,ª“ü,éfAfhfŒfX B iD3DRMMATRIX4DŒ^,Í”z—ñ,Ä, ,é j

lpquat D3DRMQUATERNION \‘¢‘İ,Ö,ìf|fCf“f^ B.

D3DRMQuaternionFromRotation

LPD3DRMQUATERNION D3DRMQuaternionFromRotation(LPD3DRMQUATERNION lpquat,  
LPD3DVECTOR lpv, D3DVALUE theta);

Žw’è,<sup>3</sup>,ê,½Ž²,đ’† S,É AŽw’è,<sup>3</sup>,ê,½Šp“x if%oWfAf““P^Ê j,l%oñ“],đ s,▯ B  
¬Œ÷,·,é,Æ A‘æ1fpf%of [f^,Æ,μ,Ä“n,<sup>3</sup>,ê,½4ŽŸ s—ñ,Ö,İf|fCf“f^,đ•Ô,· BŽ,”s,·,é,Æ0,đ•Ô,· B

lpquat  
‘€ ìŒ<%oÊ,đŽó,¬Žæ,éD3DRMQUATERNION \‘¢‘İ B

lpv  
%oñ“],İŽ²,đŽw’è,·,éD3DVECTOR \‘¢‘İ,İfAfhfŒfX B

theta  
lpv fpf%of [f^,É,æ,Á,ÄŽw’è,<sup>3</sup>,ê,½Ž²,İŽü,è,đ%oñ“],·,éŠp“x if%oWfAf““P^Ê j B

D3DRMQuaternionMultiply

LPD3DRMQUATERNION D3DRMQuaternionMultiply(LPD3DRMQUATERNION lpq,  
LPD3DRMQUATERNION lpa, LPD3DRMQUATERNION lpb);

,Ó,½,Â,ÌfxfNfgf<,Ì Ì,ðŒvŽZ,·,é B

¬Œ÷,·,é,Æ A‘æ1fpf%of [f^,Æ,µ,Ä“n,<sup>3</sup>,ê,½ \‘Œ‘İ,Ö,Ìf|fCf“f^,ð•Ô,· BŽ,”s,·,é,Æ0,ð•Ô,· B

lpq

æŽZ,ÌŒ<%oÊ,ðŽó,¬Žæ,éD3DRMQUATERNION \‘Œ‘İ,ÌfAfhfŒfX B

lpa, lpb

Š|,¬ ‡,í,<sup>1</sup>,éD3DRMQUATERNION \‘Œ‘İ B

D3DRMQuaternionSlerp

```
LPD3DRMQUATERNION D3DRMQuaternionSlerp(LPD3DRMQUATERNION lpq,  
LPD3DRMQUATERNION lpa, LPD3DRMQUATERNION lpb, D3DVALUE alpha);
```

⋈...-Ê üCE`•âŠÔ,ðŽg—p,μ,Ä,Ó,½,Â,Ì \‘Œ‘İ,ð•âŠ@,·,é B

¬CE÷,·,é,Æ A‘æ1fpf%of [f^,Æ,μ,Ä“n,<sup>3</sup>,ê,½ \‘Œ‘İ,ð•Ô,· BŽ,”s,·,é,Æ0,ð•Ô,· B

lpq  
•âŠ@,μ,½CE<%oÊ,ðŽó,¬Žæ,éD3DRMQUATERNION \‘Œ‘İ B

lpa, lpb  
•âŠ@,ìŠJŽn^Ê‘u,Æ I—<sup>1</sup>^Ê‘u,Æ,μ,Ä—p,Œ,ç,ê,éD3DRMQUATERNION \‘Œ‘İ B

alpha  
lpa,Ælpb,ìŠÔ,É•âŠ@,·,é<——£,ðŽ|,· A0,©,ç1,ìŠÔ,Ì‘l B

D3DRMREALLOCFUNCTION

```
typedef LPVOID (*D3DRMREALLOCFUNCTION) (LPVOID lpArg,
    DWORD dwSize);
typedef D3DRMREALLOCFUNCTION *LPD3DRMREALLOCFUNCTION;
```

f f,fŠ,ì ÄŠ,,,è“-Ä,ð s,□ B,±,ìŠÖ ”,ìŽÀ‘ì,íAfvfŠfP [fVf‡f“,Ä’è‘,³,é,é B  
-Æ÷,·,é,Æ A ÄŠ,,,è“-Ä,³,ê,½f f,fŠ,ìfAfhfÆfX,ð•Ô,· BŽ,”s,·,é,Æ0,ð•Ô,· B

lpArg  
fAfvfŠfP [fVf‡f““è‘,ìff [f^ B

dwSize  
ÄŠ,,,è“-Ä,·,é f,fŠ,ìfTfCfY,ðfofCf g’P^Ê,ÄŽw’è,·,é B

•W €Cf%of“f^fCf€ Ef< [f`f“,Ä,Í•s \•ª,È ê ‡ AfAfvfŠfP [fVf‡f“,Í A“ÆŽ©,ìf f,fŠ ÄŠ,,,è“-  
,ÄŠÖ ”,ð’è‘,Ä,«,é B

D3DRMVectorAdd

```
LPD3DVECTOR D3DRMVectorAdd(LPD3DVECTOR lpd, LPD3DVECTOR lps1,
    LPD3DVECTOR lps2);
```

,Ó,½,Â,ÌfxfNfgf<,ð%ÁŽZ,·,é B

¬Œ÷,·,é,Æ A‘æ1fpf%of [f^,Æ,µ,Ä“n,<sup>3</sup>,ê,½fxfNfgf<,ð•Ô,· BŽ,”s,·,é,Æ0,ð•Ô,· B

lpd  
%ÁŽZ,ÌŒ<%Ê,ðŽó,¬žæ,éD3DVECTOR \‘Œ‘Ì B

lps1, lps2  
%ÁŽZ,<sup>3</sup>,ê,éD3DVECTOR \‘Œ‘Ì B

D3DRMVectorCrossProduct

```
LPD3DVECTOR D3DRMVectorCrossProduct(LPD3DVECTOR lpd, LPD3DVECTOR lps1,
LPD3DVECTOR lps2);
```

,Ó,½,Â,ÌfxfNfgf<,ÌŠO Ĭ,ðEvŽZ,·,é B

¬Œ÷,·,é,Æ A‘æ1fpf%of [f^,Æ,µ,Ä“n,³,ê,½fxfNfgf<,ð•Ô,· BŽ,”s,·,é,Æ0,ð•Ô,· B

lpd ŠO Ĭ,ÌŒ<%oÊ,ðŽó,¬Žæ,éD3DVECTOR \‘Œ‘Ĭ B

lps1, lps2 ŠO Ĭ,ªŒvŽZ,³,ê,éD3DVECTOR \‘Œ‘Ĭ B

D3DRMVectorDotProduct

D3DVALUE D3DRMVectorDotProduct(LPD3DVECTOR lps1, LPD3DVECTOR lps2);

fxfgf,à Ĩ,đ•Ô,· B

¬Ĉ÷,·,é,Æ“à Ĩ,ĭĈ◊%oÊ,đ•Ô,· BŽ,”s,·,é,Æ0,đ•Ô,· B

lps1, lps2

“à Ĩ,\*ĈvŽZ,3,ê,éD3DVECTOR \‘ċ‘ĭ B



D3DRMVectorModulus

D3DVALUE D3DRMVectorModulus(LPD3DVECTOR lpv) ;

È%°,ìŽ®,É,μ,½,<sup>a</sup>,Á,ÄfxfNfgf€,Ì',<sup>3</sup>,ð•Ô,· B

*length* =  $\sqrt{x^2 + y^2 + z^2}$

¬Ɛ÷,·,é,ÆD3DVECTOR \‘¢‘Ì,É',<sup>3</sup>,ð•Ô,· BŽ,”s,·,é,Æ0,ð•Ô,· B

lpv

',<sup>3</sup>,ðƐvŽZ,·,éD3DVECTOR \‘¢‘Ì B

D3DRMVectorNormalize

LPD3DVECTOR D3DRMVectorNormalize(LPD3DVECTOR lpv);

â‘İ’l,ª1,É,È,é,æ,²,ÉfxfNfgf<,ðfXfP [fŠf“fO,·,é B

¬Œ÷,·,é,Æ A‘æ1fpf%of [f^,Æ,µ,Ä“n,³,ê,½fxfNfgf<,ð•Ô,· B,½,Æ,!,Îf[f EfxfNfgf<,ª“n,³,ê,½ ê ‡,È,Ç A  
fGf%o [,ª” ¶,·,é,Æ0,ð•Ô,· B

lpv  
fXfP [fŠf“fO‘€ ì,ÌŒ<%oÊ,ðŽó,¬Žæ,éD3DVECTOR \‘¢‘İ B

D3DRMVectorRandom

LPD3DVECTOR D3DRMVectorRandom(LPD3DVECTOR lpd);

f%of“f\_f€,\xfNfgf< Ef†fjfbfg,đ•Ô,· B

¬€÷,·,é,Æ A‘æ1fpf%of [f^,Æ,µ,Ä“n,<sup>3</sup>,ê,½fxNfgf<,đ•Ô,· BŽ,”s,·,é,Æ0,đ•Ô,· B

lpd

f%of“f\_f€,\xfNfgf< Ef†fjfbfg,đŽó,¬Žæ,éD3DVECTOR \‘Ŧ‘İ B

D3DRMVectorReflect

```
LPD3DVECTOR D3DRMVectorReflect(LPD3DVECTOR lpd, LPD3DVECTOR lpRay,
                                LPD3DVECTOR lpNorm);
```

Žw’è,<sup>3</sup>,ê,½-@ ü,É,Â,¢,Ä AŒð ü,ð”½ŽĚ,·,é B

¬Œ÷,·,é,Æ A‘æ1fpf%of [f^,Æ,μ,Ä“n,<sup>3</sup>,ê,½fxfNfgf◁,ð•Ô,· BŽ,”s,·,é,Æ0,ð•Ô,· B

lpd ^— Œ◁%oÊ,ðŽó,¬Žæ,éD3DVECTOR \‘Œ‘İ B

lpRay -@ ü,Â”½ŽĚ,<sup>3</sup>,ê,éD3DVECTOR \‘Œ‘İ B

lpNorm lpRay,ÂŽw’è,<sup>3</sup>,ê,½Œð ü,ð”½ŽĚ,·,é-@ ü,ðŽı,· AD3DVECTOR \‘Œ‘İ B

D3DRMVectorRotate

```
LPD3DVECTOR D3DRMVectorRotate(LPD3DVECTOR lpr, LPD3DVECTOR lpv,  
                                LPD3DVECTOR lpaxis, D3DVALUE theta);
```

Žw’è,<sup>3</sup>,ê,½Ž²,đ’† S,ÉfxfNfgf◁,đ%ñ“],<sup>3</sup>,<sup>1</sup>,é B

¬(E÷,·,é,Æ A‘æ1fpf%of [f^,Æ,μ,Ä“n,<sup>3</sup>,ê,½fxfNfgf◁,đ•Ô,· BŽ,”s,·,é,Æ0,đ•Ô,· B

lpr  
^— C(‰Ê,đŽó,¬Žæ,éD3DVECTOR \‘¢‘İ B

lpv  
—^,!,ς,ê,½Ž²,ì%ñ,è,đ%ñ“],·,éD3DVECTOR \‘¢‘İ B

lpaxis  
%ñ“],ìŽ²,đŽ‘,·D3DVECTOR \‘¢‘İ B

theta  
f%fWfAf“‘‘P^Ê,Ä,ì%ñ“]Šp“x B

D3DRMVectorScale

```
LPD3DVECTOR D3DRMVectorScale(LPD3DVECTOR lpd, LPD3DVECTOR lps,
                               D3DVALUE factor);
```

,R,Â,ÏŽ²,É,Â,¢,Ä“¬,¶”ä—!,Â AfxfNfgf<,ðfXfP [fŠf“fO,·,é B

¬Œ÷,·,é,Æ‘æ1fpf%of [f^,Æ,µ,Ä“n,³,ê,½fxfNfgf<,ð•Ô,· BŽ,”s,·,é,Æ0,ð•Ô,· B

lpd ^— Œ‰Œ,ðŽó,¬Žæ,éD3DVECTOR \‘¢‘İ B

lps fXfP [fŠf“fO,³,ê,éD3DVECTOR \‘¢‘İ B

factor kŽÚŒW ” B,±,İ¹,¹1,Ì,Æ,« AfXfP [fŠf“fO,Í s,í,ê,È,¢ B,±,İ¹,²,Ì,Æ,«Í2”{,É,È,é B

D3DRMVectorSubtract

LPD3DVECTOR D3DRMVectorSubtract(LPD3DVECTOR lpd, LPD3DVECTOR lps1, LPD3DVECTOR lps2);

,Ó,½,Â,ìfxfNfgf◁ŠÔ,ÂÆ,ŽZ,ð s,▯ B

¬Æ÷,·,é,Æ A‘æ1fpf%of [f^,Æ,μ,Ä“n,³,ê,½fxfNfgf◁,ð•Ô,· BŽ,”s,·,é,Æ0,ð•Ô,· B

lpd ^— Ć%oÊ,ðŽó,¬Žæ,éD3DVECTOR \‘ċ‘İ B

lps1 lps2 ,ª^ø,©,ê,éD3DVECTOR \‘ċ‘İ B

lps2 lps1 ,©,ζ^ø,D3DVECTOR \‘ċ‘İ B

**fR [f<fofbfNŠÖ ”**



### D3DRMDEVICEPALETTECALLBACK

```
void (*D3DRMDEVICEPALETTECALLBACK)  
    (LPDIRECT3DRMDEVICE lpDirect3DRMDev, LPVOID lpArg, DWORD dwIndex,  
     LONG red, LONG green, LONG blue);
```

*fPfŒfbfg EfGf“fgfŠ,ð—ñ““,·,é B,±,ìfR [f<fofbfNŠÖ ”,ìŽÀ‘Ì,ÍfAfvfŠfP [fVf‡f“,Â‘èˆ,³,ê,é B*  
*•Ô‘l,Í,È,¢ B*

*lpDirect3DRMDev*  
*,±,ÌfffofCfX,Ì IDirect3DRMDevice fCf“f^ [ftfFfCfX B*  
*lpArg*  
*fR [f<fofbfNŠÖ ”,É“n,³,ê,éfAfvfŠfP [fVf‡f““èˆ,Ìff [f^ B*  
*dwIndex*  
*—ñ““,³,ê,½fPfŒfbfg EfGf“fgfŠ,ìfCf“fffbfNfX B*  
*red, green, blue*  
*Žw’è,³,ê,½fPfŒfbfg EfCf“fffbfNfX,Ì Ô A—Î A Â—v‘f B*

*fVfXfef€,ÍfR [f<fofbfNŠÖ ”,ðŒĂ,Ñ o,· ‡ ~,ðŒˆè,·,é,½,ß A,Û,,ŠK‘w,ìfgfbfv EfŒfxf<,É, ,éfIfufWfFfNfg,ð*  
*ŒŸ ò,·,é BŽŸ,É A,»,ê,ç,<sup>a</sup> ì ¬,³,ê,½ ‡”Ô,ÉfR [f<fofbfNŠÖ ”,ðŒĂ,Ñ o,· B*

```
void (*D3DRMFRAMEMOVECALLBACK)(LPDIRECT3DRMFRAME lpD3DRMFrame,
    LPVOID lpArg, D3DVALUE delta);
```

•Ô'1,Í,È,¢ B

•İ X,μ,æ,ϣ,Æ,μ,Ä,¢,éDirect3DRMFramefIfufWfFfNfg B

$fR \ [f\langle fofbfN\check{S}\check{O} \ ]$ ,É“n,<sup>3</sup>,ê,éfAfvfŠfP  $[fVf\mp f$ “è` ,Ìff  $[f^{\wedge} \ B$

•i‰\_—Ê Bftfœ [fœ,îÊ'û,ð'î X,,'é,É,í A'Ú'@,Æ%ôn''],Æ,ç,²,Ó,½,Â,î—v'f,ª, 'é BSe—  
v'f,É,², 'é•î X,ívelocity\_of\_component 'delta,Â•,³,é,é B,±,é,ç,îÊ•û,Û,½,î—¼•û,î'¬—x,í A'C'Ó,îftfœ [fœ,É"ä—  
á,µ,Ä Ý'è,,'é,±,Æ,ª,Ä,«,é B,µ,©,µfVfXfefœ,í Afff<f'ŽžŠÖ,ð'K—p,,'é,½,ß AŽ©'@'I,É eftfœ [fœ,É"ä—  
á,µ,½'¬—x,É•îŠÖ,,'é B.

FAfAfvfŠfP [fVf†f“Í A e†f†f [fÉ,É”ä—á,µ,Ä†f†f [fÉ,Ì%Á“¬,ð ‡ ¬,“é,±  
 ,Æ,ª,Ä,«é B,»,Ì,½,ß,É,Í AŠe uŠÖ,É,“ç,Ä AZq†f†f [fÉ,Ì“—x,ðFAfAfvfŠfP [fVf†f“ŽÖ g,É”ä—á,µ,½  
 (1fefBfbfN, ½,ëaf†f†fbbfg)´ 1,ÉfZfbfg,µ,È,Ä,Í,É,ç,È,Ç B,±,±,Ä Aa,Í—v¬,³,è,½%Á“¬—x,Ä,“é B,±  
 ,ê,ÍfefBfbfN“—½,è´ a´delta, A“™,µ,Ç B“ª““Í,É,Í AZq†f†f [fÉ,É”ä—á,µ,½fefBfbfN“—½,è,è´ a´delta  
 Í A e†f†f [fÉ,É”ä—á,µ,½ (v + (a´delta)†f†fbbfg,É,İŠ,³,è,è B,±,Ì,Æ,« Av,Í A e,É,Í,“éÇ Y,ÌZq†f†f [fÉ  
 ,Ì“—x,ðŠ“Í“Í,ÉZ,µ,½,à,Ì,Ä,“é B

,ìR [f\fofbfNŠÖ „ð'Ç%Á E í æ,,:é,É,Í AIDirect3DRMFrame::AddMoveCallback,,:æ,ÑIDirect3DRMFrame::DeleteMoveCallback f\fbfh,ðŽg–p,,:é B

$fVfXfef\epsilon, \dot{I} \ AfR \ [f\langle ofbfN\ddot{S}\ddot{O} \ \rangle, \delta\epsilon\ddot{A}, \ddot{N} \ o, \cdot \ \ddagger \ \sim, \delta\epsilon\ddot{E}^{\sim}, \cdot, \acute{e}, \frac{1}{2}, B \ A, \ddot{U}, \check{S}K^{\sim}w, \dot{l}fgfbfv \ E f\epsilon fxf, \acute{E}, \acute{e}fIfufWfFfNf$   
 $g, \delta\epsilon\ddot{Y} \ \ddot{o}, \cdot, \acute{e} \ B\check{Z}\check{Y}, \acute{E} \ A \ \dot{\iota}, \cdot^3, \acute{e}, \frac{1}{2} \ \ddagger \ \ddot{O}, \acute{E}fR \ [f\langle ofbfN\ddot{S}\ddot{O} \ \rangle, \delta\epsilon\ddot{A}, \ddot{N} \ o, \cdot \ B$

## D3DRMLOADCALLBACK

```
void (*D3DRMLOADCALLBACK) (LPDIRECT3DRMOBJECT lpObject, REFIID ObjectGuid,  
    LPVOID lpArg);
```

**IDirect3DRM::Load**  $f\backslash fbfh\text{“}\grave{\text{a}}\text{”},\grave{\text{A}}fIfufWfFfNfg,\grave{\text{I}}f\quad [fh,\delta\text{ }s,\sqsupset\text{ }B,\pm$   
 $,\grave{\text{I}}fR\quad [f\text{<}fofbfN\check{\text{S}}\check{\text{O}}\quad ”,\grave{\text{I}}\check{\text{Z}}\grave{\text{A}}\text{‘}\grave{\text{I}},\grave{\text{I}}fAfvf\check{\text{S}}fP\quad [fVf\mp f\text{“},\grave{\text{A}}\text{’}\grave{\text{e}}\text{`},^3,\grave{\text{e}},\acute{\text{e}}\text{ }B$

$\bullet\hat{\text{O}}^1,\acute{\text{I}},\grave{\text{E}},\text{€}\text{ }B$

*lpObject*

$f\quad [fh,^3,\grave{\text{e}},\acute{\text{e}}\text{Direct3DRMObject}\text{ }B$

*ObjectGuid*

$f\quad [fh,^3,\grave{\text{e}},\acute{\text{e}}fIfufWfFfNfg,\grave{\text{I}}fOf\quad [fof\text{<}\text{ }Ef\text{†}fj\quad [fN\check{\text{Z}}\text{`}\bullet\hat{\text{E}}\check{\text{Z}}q\text{ }iGUID\text{ }j\text{ }B$

*lpArg*

$fR\quad [f\text{<}fofbfN\check{\text{S}}\check{\text{O}}\quad ”,\acute{\text{E}}\text{“}n,^3,\grave{\text{e}},\acute{\text{e}}fAfvf\check{\text{S}}fP\quad [fVf\mp f\text{“}\text{’}\grave{\text{e}}\text{`},\grave{\text{I}}ff\quad [f^\wedge\text{ }B$

$fVfXfef\text{€},\acute{\text{I}}fR\quad [f\text{<}fofbfN\check{\text{S}}\check{\text{O}}\quad ”,\delta\text{€}\grave{\text{A}},\check{\text{N}}\text{ }o,\cdot\text{ }\mp\text{ }\sim,\delta\text{€}\text{~}\grave{\text{e}},\cdot,\acute{\text{e}},\tfrac{1}{2},\beta\text{ }A,\ddot{\text{U}},\check{\text{S}}K\text{‘}w,\grave{\text{I}}fgfbfv\text{ }Ef\text{€}fxf\text{<},\acute{\text{E}},\text{ ,}\acute{\text{e}}fIfufWfFfNfg,\delta$   
 $\text{€}\check{\text{Y}}\text{ }\grave{\text{o}},\cdot,\acute{\text{e}}\text{ }B\check{\text{Z}}\check{\text{Y}},\acute{\text{E}}\text{ }A\text{ }\grave{\text{i}}\text{ }^3,\grave{\text{e}},\tfrac{1}{2}\text{ }\mp\text{”}\hat{\text{O}},\acute{\text{E}}fR\quad [f\text{<}fofbfN\check{\text{S}}\check{\text{O}}\quad ”,\delta\text{€}\grave{\text{A}},\check{\text{N}}\text{ }o,\cdot\text{ }B$

$\check{\text{Z}}Q\text{ }\mathcal{A}\text{ }\text{@}\textbf{\text{IDirect3DRM::Load}}$

## D3DRMLOADTEXTURECALLBACK

```
HRESULT (*D3DRMLOADTEXTURECALLBACK) (char *tex_name, void *lpArg,  
    LPDIRECT3DRMTEXTURE *lpD3DRMTex);
```

**Load** *f\fbfh,î“à•”,Å AfefNfXf`ff Eftf@fCf< i,à,μ,,ÍfŠf\ [fX j,îŽÀ Û,î“Ç,Ý ž,Ý,ð s,□ B,± ,îfR [f<fofbfNŠÖ ”,îŽÀ‘î,ÍfAfvfŠfP [fVf‡f“,Å’è‘,³,è,é B*

*¬Ɛ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf% [,ð•Ô,· B•Ô’l,îê——,É,Â,¢ ,Ä,Í A uDirect3D•ÛŽ f, [fh,î•Ô’l v,ðŽQ Æ,·,é,±,Æ B*

*tex\_name*

*fefNfXf`ff¬¼ B*

*lpArg*

*fAfvfŠfP [fVf‡f“ƐÅ—L,îf [f^ B*

*lpD3DRMTex*

*Direct3DRMTextureIfufWfFfNfg B*

*fAfvfŠfP [fVf‡f“,Í AWindowsrfrfbfgf}fbfv i.bmp j,âf| [f^fuf< EfsfNfXf}fbfv i.ppm jP6 Ɛ`Ž®`ÈŠÖ,îfefNfXf`ff,îfTf| [fg,ðfCf“fvfŠf f“fg,·,é,½,ß A,±,îfR [f<fofbfNŠÖ ”,ðŽg—p,·,é,±,Æ,a,Å,«,é B*

*fVfXfef€,Í AfR [f<fofbfNŠÖ ”,ðƐÄ,Ñ o,· ‡ ~,ðƐ`è,·,é,½,ß A,Û,,ŠK‘w,îfgfbfv EfƐfxf<,É, ,éfIfufWfFfNf g,ðƐŸ ò,·,é BŽŸ,É A ì ¬,³,è,½ ‡”Ô,ÉfR [f<fofbfNŠÖ ”,ðƐÄ,Ñ o,· B*

**ŽQ Æ @IDirect3DRM::Load, IDirect3DRMAnimationSet::Load, IDirect3DRMFrame::Load, IDirect3DRMMeshBuilder::Load**

## D3DRMOBJECTCALLBACK

```
void (*D3DRMOBJECTCALLBACK)(LPDIRECT3DRMOBJECT lpD3DRMObj,  
    LPVOID lpArg);
```

**IDirect3DRM::EnumerateObjects***f\fbfh, ðĀ, Ñ o, μ, É%ž“Š, ·, éIfufWfFfNfg, ð—ñ“, ·, é B, ±, ÌfR [f<fofbfNŠÖ ”, ÌŽÀ‘Ì, ÌfAfvfŠfP [fVf‡f““è“, Ì, ·, é B*

*•Ô‘l, Ì, È, ¢ B*

*lpD3DRMObj*

*fIfufWfFfNfg, ð—ñ“, ·, éIDirect3DRMObjectfCf“f^ [ftfFfCfX BfAfvfŠfP [fVf‡f“, Ì A—ñ“, ·, ³, è, ½ŠefIfufWfFfNfg, É, Ì, ¢, ÄReleasef f\fbfh, ðĀ, Ñ o, ³, È,, Ì, Ì, È, ¢, È, ¢ B*

*lpArg*

*fR [f<fofbfNŠÖ ”, É“n, ³, è, éfAfvfŠfP [fVf‡f““è“, Ìff [f^ B*

*fVfXfef€, ÌfR [f<fofbfNŠÖ ”, ðĀ, Ñ o, · ‡ ~, ðĒ“è, ·, é, ½, ß A, Û,, ŠK‘w, Ìfgfbfv EfĒfxf<, É, , éIfufWfFfNfg, ðĒŸ ò, ·, é BŽŸ, É A ì ¬, ³, è, ½ ‡”Ô, ÉfR [f<fofbfNŠÖ ”, ðĀ, Ñ o, · B*

ŽQ Æ @**IDirect3DRM::EnumerateObjects**

## D3DRMUPDATECALLBACK

```
void (*D3DRMUPDATECALLBACK)(LPDIRECT3DRMDEVICE lpobj, LPVOID lpArg,  
    int iRectCount, LPD3DRECT d3dRectUpdate);
```

fffofCfX,•İ X,<sup>3</sup>,ê,½,Æ,«fAfvfŠfP [fVf‡f“,ÉEx ,·,é B,±  
,İfR [f<fofbfNŠÖ ”,İŽÀ‘İ,İfAfvfŠfP [fVf‡f““è“,Å, ,é B

•Ô¹,Í,È,¢ B

lpobj

fR [f<fofbfNŠÖ ”,đ“K—p,·,éDirect3DRMDeviceIfufWfFfNfg B

lpArg

fR [f<fofbfNŠÖ ”,É“n,<sup>3</sup>,ê,éfAfvfŠfP [fVf‡f““è“,İff [f^ B

iRectCount

d3dRectUpdatefpf%of [f^,ÉŽw’è,<sup>3</sup>,ê,½,é€`,İ ” B

d3dRectUpdate

X V,<sup>3</sup>,ê,é—İæ,đ•\,· A,D,Æ,Â`È ã,İ**D3DRECT** \‘¢‘İ,İ”z—ñ B À•W,İfffofCfX’P^Ê,ÅŽw’è,<sup>3</sup>,ê,é B

fVfXfef€,Í AfR [f<fofbfNŠÖ ”,ð€Ä,Ñ o,· ‡ ~,ð€”è,·,é,½,ß A,Ü,,ŠK‘w,İfgfbfv Ef€fxf<,É, ,éfIfufWfFfNf  
g,ð€Ÿ ò,·,é BŽŸ,É A ì ¬,<sup>3</sup>,ê,½ ‡”Ô,ÉfR [f<fofbfNŠÖ ”,ð€Ä,Ñ o,· B

ŽQ Æ @**IDirect3DRMDevice::AddUpdateCallback, IDirect3DRMDevice::DeleteUpdateCallback,  
IDirect3DRMDevice::Update**

## D3DRMUSERVISUALCALLBACK

```
int (*D3DRMUSERVISUALCALLBACK)(LPDIRECT3DRMUSERVISUAL lpD3DRMUV,  
    LPVOID lpArg, D3DRMUSERVISUALREASON lpD3DRMUVreason,  
    LPDIRECT3DRMDEVICE lpD3DRMDev, LPDIRECT3DRMVIEWPORT lpD3DRMview);
```

$f \uparrow$  [fU EfrfWf...fAf<fIfufWfFfNfg,ð'ñ<Ÿ,·,éfAfvfŠfP [fVf‡f“,É AŽÀ sfobftf@,ðŽÀ s,·,éK—v,<sup>a</sup>,é,±,Æ,ð'Ê'm,·,é B,±,İfR [f<fobfNŠÖ ”,İŽÀ'İ,İfAfvfŠfP [fVf‡f““è<,Ä, ,é B

lpD3DRMUVreasonfpf%of [f^,ÉD3DRMUSERVISUAL\_CANSEE,<sup>a</sup>Žw'è,<sup>3</sup>,ê Af† [fU EfrfWf...  
fAf< EfIfufWfFfNfg,<sup>a</sup>frr... [f| [fg“à,Ä%oÄŽ< ó'Ô,İ,Æ,«,İ ATRUE,ð•Ô,· B,»,<sup>□</sup>  
,Ä,È,~,ê,İFALSE,ð•Ô,· BlpD3DRMUVreason fpf%of [f^,ÉD3DRMUSERVISUAL\_RENDER,<sup>a</sup>Žw'è,<sup>3</sup>,ê,Ä,¢  
,é,Æ,«,İ AfAfvfŠfP [fVf‡f““è<,İ•Ô'l,Æ,È,é B,±,İ ê ‡ A,Ä,È,ÉTRUE,ð•Ô,·,İ,<sup>a</sup>À'S,Ä, ,é B

lpD3DRMUV

Direct3DRMUserVisualfIfufWfFfNfg B

lpArg

fR [f<fobfNŠÖ ”,É“n,<sup>3</sup>,ê,éfAfvfŠfP [fVf‡f““è<,İff [f^ B

lpD3DRMUVreason

D3DRMUSERVISUALREASON—ñ<“Æ^,İf f“fo,İ,Đ,Æ,Ä B

D3DRMUSERVISUAL\_CANSEE

f† [fU EfrfWf...fAf< EfIfufWfFfNfg,<sup>a</sup>frr... [f|  
[fg“à,Ä%oÄŽ< ó'Ô,Ä, ,ê,İ AfAfvfŠfP [fVf‡f“,İTRUE,ð•Ô,· B,  
±,İ ê ‡ AfAfvfŠfP [fVf‡f“,İ AlpD3DRMview  
fpf%of [f^,ÄŽw'è,<sup>3</sup>,ê,½ffofCfX,ðŽg—p,·,é B

D3DRMUSERVISUAL\_RENDER

fAfvfŠfP [fVf‡f“,İ Af† [fU EfrfWf...  
fAf< EfGfÆf f“fg,ðfÆf“f\_Šf“fO,μ,È,,Ä,İ,È,¢,È,¢ B,±  
,İ ê ‡ AfAfvfŠfP [fVf‡f“,İ AlpD3DRMDevfpf%of [f^,ÄŽw'  
è,<sup>3</sup>,ê,½ffofCfX,ðŽg,□ B

lpD3DRMDev

Direct3DRMUserVisualfIfufWfFfNfg,ðfÆf“f\_Šf“fO,·,é,½,ß,ÉŽg,İ,ê,éDirect3DRMDevicefIfufWfFfNfg B

lpD3DRMview

Direct3DRMUserVisual fIfufWfFfNfg,<sup>a</sup>oÄŽ< ó'Ô,©,Ç,□,©,ðŒ~è,·,é,½,ß,ÉŽg,İ,ê,é Direct3DRMViewport  
fIfufWfFfNfg B

fVfXfef€,İfR [f<fobfNŠÖ ”,ðŒÄ,Ñ o,· ‡ ~,ðŒ~è,·,é,½,ß A,Ü,ŠK'w,İfgfbfv EfŒfxf<,É, ,éfIfufWfFfNfg,ð  
ŒŸ ò,·,é BŽŸ,É A ì ¬,<sup>3</sup>,ê,½ ‡”Ô,ÉfR [f<fobfNŠÖ ”,ðŒÄ,Ñ o,· B

ŽQ Æ @IDirect3DRMUserVisual::Init

### D3DRMWRAPCALLBACK

```
void (*D3DRMWRAPCALLBACK)(LPD3DVECTOR lpD3DVector,  
    int* lpU, int* lpV, LPD3DVECTOR lpD3DRMVA, LPD3DVECTOR lpD3DRMVB,  
    LPVOID lpArg);
```

,±,̀fR [f◁fofbfNŠÖ ”,ÍfTf| [fg,³ê,Ä,¢,È,¢ B



**IDirect3DRM”z—ñfCf“f^ [ftfFfCfX**

”z—ñfCf“f^ [ftfFfCfX,ð—p,¢,é,Æ AfAfvfŠfP [fVf‡f“,Í AfIfufWfFfNfg,ð”z—  
ñ,ÉfOf< [fv%o»,µ,ÄŠÈ’P,ÉfOf< [fv‘S’İ,É ^— ,ð“K—p,·,é,±,Æ,ª,Ä,«,é B^È%o,ì”z—ñfCf“f^ [ftfFfCfX,ðŽg—  
p,·,é,±,Æ,ª,Ä,«,é B

IDirect3DRMArray

IDirect3DRMDeviceArray

IDirect3DRMFaceArray

IDirect3DRMFrameArray

IDirect3DRMLightArray

IDirect3DRMPickedArray

IDirect3DRMViewportArray

IDirect3DRMVisualArray

## IDirect3DRMArray

**IDirect3DRMArray***fCf“f^ [ftfFfCfX,ÍfIfufWfFfNfg,lfOf< [fv,ðŠÇ— ,·,é B`Ê í AfAfvfŠfP [fVf‡f“;Í,± ,lfCf“f^ [ftfFfCfX,ð’¼ ÚŽg,í, A,±,lfCf“f^ [ftfFfCfX,©,ç”h ¶,µ,½”z—ñfIfufWfFfNfg,ð—~—p,·,é B,± ,lfZfNfVf‡f“;Í AIDirect3DRMArray**fCf“f^ [ftfFfCfX Ef f\fbfh,lfŠftf@fŒf“fX,Å, ,é B*

**IDirect3DRMArray***fCf“f^ [ftfFfCfX,Í***GetSize***f f\fbfh,ðfTf| [fg,·,é B*

,·,×,Ä,ÌCOM*fCf“f^ [ftfFfCfX,Æ“—*

l **AIDirect3DRMArray***fCf“f^ [ftfFfCfX,Í***Unknown***fCf“f^ [ftfFfCfX Ef f\fbfh,ðŒp<sup>3</sup>,·,é B,± ,lfCf“f^ [ftfFfCfX,ÍŽŸ,Ì,R,Â,lf f\fbfh,ðfTf| [fg,·,é B*

## AddRef

## QueryInterface

## Release

**IDirect3DRMArray::GetSize**

DWORD GetSize();

Direct3DRMArray fIfufWfFfNfg,İfTfCfY,đ AfIfufWfFfNfg’P~Ê,ÂŽæ“¾,.é B  
fTfCfY,đ•Ô,. B

## **IDirect3DRMDeviceArray**

fffofCfX EfIfufWfFfNfg,ðfOf< [fv%o».,,é,É,Í A**IDirect3DRMDeviceArray**fCf“f^ [ftfFfCfX,lf f\fbfh,ð—~— p.,,é B,±,lfZfNfVf‡f“,Í A**IDirect3DRMDeviceArray**fCf“f^ [ftfFfCfX Ef f\fbfh,lfŠftf@fœf“fX,Â, ,é BŠT”O, É,Â,¢,Â,İŠT—v,Í A u**IDirect3DRMDevice,ÆIDirect3DRMDeviceArray**fCf“f^ [ftfFfCfX. v,ðŽQ Æ.,,é,±,Æ B

**IDirect3DRMDeviceArray** fCf“f^ [ftfFfCfX,Í AŽŸ,lf f\fbfh,ðfTf| [fg.,,é B

### **GetElement**

### **GetSize**

**IDirect3DRMDeviceArray** fCf“f^ [ftfFfCfX,Í A,.,×,Â,İCOMfCf“f^ [ftfFfCfX,Æ“— l A**IUnknown**fCf“f^ [ftfFfCfX Ef f\fbfh,ðEp ³.,,é B**IUnknown**fCf“f^ [ftfFfCfX,İŽŸ,İ,R,Â,lf f\fbfh,ðfTf| [fg.,,é B

### **AddRef**

### **QueryInterface**

### **Release**

,³,ç,É A**IDirect3DRMDeviceArray**fCf“f^ [ftfFfCfX,Í A**IDirect3DRMObject**fCf“f^ [ftfFfCfX,©,çŽŸ,lf f\fbfh,ð Ep ³.,,é B

### **AddDestroyCallback**

### **Clone**

### **DeleteDestroyCallback**

### **GetAppData**

### **GetClassName**

### **GetName**

### **SetAppData**

### **SetName**

**IDirect3DRMDeviceArray** fIfufWfFfNfg,Í A **IDirect3DRM::GetDevices** method f\fbfh,İCEÂ,Ň o,μ,É,æ,Â,ÄŽæ“¾,³,ê,é B

**IDirect3DRMDeviceArray::GetElement**

HRESULT GetElement(DWORD index, LPDIRECT3DRMDEVICE \* lpD3DRMDevice);

Direct3DRMDeviceArrayIfufWfFfNfg,©,čŽw’è,<sup>3</sup>ê,<sup>1</sup>/<sub>2</sub>—v‘f,đŽæ“<sup>3</sup>/<sub>4</sub>,·,é B

¬Ė÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%<sub>0</sub> [,đ•Ô,· B•Ô’l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, fh,j•Ó’l v,đŽQ Æ,·,é,±,Æ B

index

”z—ñ—v‘f B

lpD3DRMDevice

IDirect3DRMDevice fCf“f^ [ftfFfCfX,Ö,Ìf|fCf“f^ B

**IDirect3DRMDeviceArray::GetSize**

DWORD GetSize();

Direct3DRMDeviceArray fIfufWfFfNfg,ÉŠÜ,Ü,ê,é—v‘f ”,ðŽæ“¾,·,é B  
—v‘f ”,ð•Ô,· B

## **IDirect3DRMFaceArray**

*f fbfVf... ā,î-Ê,ðfOf< [fv%«»,.,é,É,Í AIDirect3DRMFaceArrayCf“f^ [ftFfCfX,îf f\bfh,ð—p,.,é B,± ,îfZfNfVf‡f“,Í AIDirect3DRMFaceArrayCf“f^ [ftFfCfX Ef f\bfh,îfŠftf@fŒf“fX,Â, ,é BŠT”O,É,Â,¢ ,Â,îŠT—v,Í A uIDirect3DRMFace,ÆIDirect3DRMFaceArrayCf“f^ [ftFfCfX v,ðŽQ Æ,.,é,±,Æ B*

**IDirect3DRMFaceArrayCf“f^ [ftFfCfX,Í AŽŸ,îf f\bfh,ðfTf| [fg,.,é B**

### **GetElement**

### **GetSize**

**IDirect3DRMFaceArrayCf“f^ [ftFfCfX,Í A,.,×,Â,ÌCOMfCf“f^ [ftFfCfX,Æ“— l A[UnknownfCf“f^ [ftFfCfX Ef f\bfh,ðŒp ³,.,é BIUnknownfCf“f^ [ftFfCfX,Í AŽŸ,îR,Â,îf f\bfh,ðfTf| [fg,.,é B**

### **AddRef**

### **QueryInterface**

### **Release**

*,³,ç,É AIDirect3DRMFaceArrayCf“f^ [ftFfCfX,Í AIDirect3DRMObjectfCf“f^ [ftFfCfX,©,çŽŸ,îf f\bfh,ðŒp ³,.,é B*

### **AddDestroyCallback**

### **Clone**

### **DeleteDestroyCallback**

### **GetAppData**

### **GetClassName**

### **GetName**

### **SetAppData**

### **SetName**

**Direct3DRMFaceArrayIfufWfFfNfg,Í**

**IDirect3DRMMeshBuilder::GetFacesf f\bfh,îŒÄ,Ń o,µ,É,æ,Á,ĂŽæ“¾,³,ê,é B**

**IDirect3DRMFaceArray::GetElement**

HRESULT GetElement (DWORD index, LPDIRECT3DRMFACE \* lpD3DRMFace);

Direct3DRMFaceArrayIfufWfFfNfg,©,çŽw'è,<sup>3</sup>,ê,<sup>1</sup>/<sub>2</sub>—v'f,ðŽæ“¾,·,é B

¬Æ÷,·,é,ÆD3DRM\_OK AŽ,"s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, fh,Ĵ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

index

”z—ñ—v'f B

lpD3DRMFace

IDirect3DRMFacefCf“f^ [ftfFfCfX,Ö,Îf|fCf“f^ B



**IDirect3DRMFaceArray::GetSize**

DWORD GetSize();

Direct3DRMFaceArrayIfufWfFfNfg,ÉŠÜ,Ü,ê,—v‘f ”,ðŽæ“¾,·,é B  
—v‘f ”,ð•Ô,· B

## **IDirect3DRMFrameArray**

*ftf*€ [*f*€ *EfIfufWfFfNfg*,*ðfOf*« [*f*v%»»,·,·,é,É,Í **AIDirect3DRMFrameArray***fCf*“*f*^ [*ftfFfCfX*,*lf f\bfbh*,*ð—*—  
p,·,é B,±,*lfZfNfVf‡f*“,Í **AIDirect3DRMFrameArray***fCf*“*f*^ [*ftfFfCfX Ef f\bfbh*,*lfŠftf@fÆf*“*fX*,*Â*,·,é BŠT”O,  
É,Â,¢,Â,*İŠT—v*,Í A **IDirect3DRMFrame**,**AIDirect3DRMFrameArray***fCf*“*f*^ [*ftfFfCfX v*,*ðŽQ* *Æ*,·,é,±,*Æ* B

**IDirect3DRMFrameArray***fCf*“*f*^ [*ftfFfCfX*,Í *AŽŸ*,*lf f\bfbh*,*ðfTf*| [*f*g,·,é B

### **GetElement**

### **GetSize**

**IDirect3DRMFrameArray***fCf*“*f*^ [*ftfFfCfX*,Í A,·,×,Â,*İCOMfCf*“*f*^ [*ftfFfCfX*,*Æ—*—  
l **AUnknownfCf**“*f*^ [*ftfFfCfX Ef f\bfbh*,*ðEp* <sup>3</sup>,·,é **BIUnknownfCf**“*f*^ [*ftfFfCfX*,Í *AŽŸ*,*İ*,*R*,*Â*,*lf f\bfbh*,*ðfT*  
*f*| [*f*g,·,é B

### **AddRef**

### **QueryInterface**

### **Release**

,<sup>3</sup>,ç,É **AIIDirect3DRMFrameArray***fCf*“*f*^ [*ftfFfCfX*,Í **AIDirect3DRMObjectfCf**“*f*^ [*ftfFfCfX*,*©*,çŽŸ,*lf f\bfbh*,*ð*  
*Ep* <sup>3</sup>,·,é B

### **AddDestroyCallback**

### **Clone**

### **DeleteDestroyCallback**

### **GetAppData**

### **GetClassName**

### **GetName**

### **SetAppData**

### **SetName**

**Direct3DRMFrameArray***fIfufWfFfNfg*,Í **AIDirect3DRMPickedArray::GetPick**,*Ü*,½,Í**IDirect3DRMFrame::GetChildre**  
**n***f f\bfbh*,*İE*Â,*Ň* o,µ,É,æ,Â,ÂŽæ“¾,<sup>3</sup>,ê,é B

**IDirect3DRMFrameArray::GetElement**

HRESULT GetElement(DWORD index, LPDIRECT3DRMFRAME \* lpD3DRMFrame);

Direct3DRMFrameArrayIfufWfFfNfg,©,çŽw'è,<sup>3</sup>,ê,<sup>1</sup>/<sub>2</sub>—v‘f,ðŽæ“¾,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŨŽ f, fh,j•Ô'l v,ðŽQ Æ,·,é,±,Æ B

index

”z—ñ—v‘f B

lpD3DRMFrame

IDirect3DRMFrame fCf“f^ [ftfFfCfX,Ö,Ìf|fCf“f^,ðŽó,¬Žæ,éfAfhfŒfX B

**IDirect3DRMFrameArray::GetSize**

DWORD GetSize();

Direct3DRMFrameArrayIfufWfFfNfg,ÉŠÜ,Ü,ê,Ä,¢,é—v‘f ”,ðŽæ“¾,.,é B  
—v‘f ”,ð•Ô,· B

## IDirect3DRMLightArray

CE0E1fIfufWfFfNfg,ðfOf< [fv%o»,·,é,É,Í AIDirect3DRMLightArrayCf“f^ [ftfFfCfX,lf f\fbfh,ð—~p,·,é B,± ,lfZfNfVf‡f“,Í AIDirect3DRMLightArrayCf“f^ [ftfFfCfX Ef f\fbfh,lfŠtf@fEf“fX,Å, ,é BŠT”O,É,Â,¢ ,Ä,ŠT—v,Í A uIDirect3DRMLight,ÆIDirect3DRMLightArrayCf“f^ [ftfFfCfX v,ðŽQ Æ,·,é,±,Æ B

IDirect3DRMLightArrayCf“f^ [ftfFfCfX,Í AŽŸ,lf f\fbfh,ðfTf| [fg,·,é B

### GetElement

### GetSize

IDirect3DRMLightArrayCf“f^ [ftfFfCfX,Í A,·,×,Ä,ÌCOMfCf“f^ [ftfFfCfX,Æ“— l A[UnknownfCf“f^ [ftfFfCfX Ef f\fbfh,ðEp ³,·,é BIUnknownfCf“f^ [ftfFfCfX,ÍŽŸ,Ì,R,Â,lf f\fbfh,ðfTf| [fg,·,é B

### AddRef

### QueryInterface

### Release

,³,ç,É AIDirect3DRMLightArrayCf“f^ [ftfFfCfX,Í AIDirect3DRMObjectfCf“f^ [ftfFfCfX,©,çŽŸ,lf f\fbfh,ðEp ³,·,é B

### AddDestroyCallback

### Clone

### DeleteDestroyCallback

### GetAppData

### GetClassName

### GetName

### SetAppData

### SetName

Direct3DRMFrameArrayfIfufWfFfNfg,Í A

IDirect3DRMFrame::GetLightsf f\fbfh,ÌEÄ,Ñ o,μ,É,æ,Á,ÄŽæ“¾,³,ê,é B

**IDirect3DRMLightArray::GetElement**

HRESULT GetElement(DWORD index, LPDIRECT3DRMLIGHT \* lpD3DRMLight);

Direct3DRMLightArray fIfufWfFfNfg,©,çŽw’è,<sup>3</sup>ê,½—v‘f,ðŽæ“¾,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô’l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ĵ•Ô’l v,ðŽQ Æ,·,é,±,Æ B

index

”z—ñ—v‘f B

lpD3DRMLight

IDirect3DRMLightfCf“f^ [ftfFfCfX,Ö,Ìf|fCf“f^,ðŽó,¬Žæ,éfAfhfŒfX B

**IDirect3DRMLightArray::GetSize**

DWORD GetSize();

Direct3DRMLightArray fIfufWfFfNfg,ÉŠÜ,Ü,ê,Ä,č,é—v‘f ”,ǒŽæ“¾,·,é B  
—v‘f ”,ǒ•Ô,· B

## **IDirect3DRMPickedArray**

*fsfbfN EfIfufWfFfNfg,ðfOf [fv%o».,é,É,Í AIDirect3DRMPickedArrayfCf“f^ [ftfFfCfX,lf f\fbfh,ð—  
p.,é B,±,lfZfNfVf‡f“,Í AIDirect3DRMPickedArrayfCf“f^ [ftfFfCfX Ef f\fbfh,lfŠftf@fŒf“fX,Â, ,é BŠT”O,  
É,Â,¢,Ä,İŠT—v,Í A uIDirect3DRMPickedArrayfCf“f^ [ftfFfCfX v,ðŽQ Æ.,é,±,Æ B*

**IDirect3DRMPickedArrayfCf“f^ [ftfFfCfX,Í AŽŸ,lf f\fbfh,ðfTf| [fg.,é B**

### **GetPick**

### **GetSize**

**IDirect3DRMPickedArrayfCf“f^ [ftfFfCfX,Í A,.,×,Ä,İCOMfCf“f^ [ftfFfCfX,Æ“—  
l A[UnknownfCf“f^ [ftfFfCfX Ef f\fbfh,ðŒp ³.,é BIUnknownfCf“f^ [ftfFfCfX,İŽŸ,İ,R,Â,lf f\fbfh,ðfTf|  
[fg.,é B**

### **AddRef**

### **QueryInterface**

### **Release**

,³,ç,É AIDirect3DRMPickedArrayfCf“f^ [ftfFfCfX,Í AIDirect3DRMObjectfCf“f^ [ftfFfCfX,©,çŽŸ,lf f\fbfh,ð  
Œp ³.,é B

### **AddDestroyCallback**

### **Clone**

### **DeleteDestroyCallback**

### **GetAppData**

### **GetClassName**

### **GetName**

### **SetAppData**

### **SetName**

Direct3DRMPickedArrayfIfufWfFfNfg,Í AIDirect3DRMViewport::Pickf f\fbfh,İŒÄ,Ň o,μ,É,æ,Ä,Äžæ“¾,³,ê,é B



## IDirect3DRMPickedArray::GetPick

```
HRESULT GetPick(DWORD index, LPDIRECT3DRMVISUAL * lplpVisual,  
    LPDIRECT3DRMFRAMEARRAY * lplpFrameArray,  
    LPD3DRMPICKDESC lpD3DRMPickDesc);
```

Žw'è,<sup>3</sup>,ê,½fsfbfN,É,æ,Á,ÄĈð ·,·,éDirect3DRMVisual,ÆDirect3DRMFramefIfufWfFfNfg,ðŽæ“¾,·,é B

–Ĉ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,ĉ  
,Ä,Í A uDirect3D•ŬŽ f. [fh,Î•Ô'l v,ðŽQ Æ,·,é,±,Æ B

*index*

î•ñ,ðŽæ“¾,·,éfsfbfN,ðŽ–•Ê,·,é AfsfbfN”z—ñ,Ö,lfCf“fffbfNfX B

*lplpVisual*

Žw'è,<sup>3</sup>,ê,½fsfbfN,ÉŠÖ~A•t,–,ç,ê,½Direct3DRMVisual fIfufWfFfNfg,Îf|fCf“f^,ÎfAfhfĈfX B

*lplpFrameArray*

Žw'è,<sup>3</sup>,ê,½fsfbfN,ÉŠÖ~A•t,–,ç,ê,½Direct3DRMFrameArrayfIfufWfFfNfg,Îf|fCf“f^,ÎfAfhfĈfX B

*lpD3DRMPickDesc*

fsfbfN,ÎÊ'u A–

Ê AŽæ“¾,·,éIfufWfFfNfg,ÎOf< [fvŽ–•ÊŽq,ðŽw'è,·,éD3DRMPICKDESC \‘ĉ'Î,Ö,ÎfAfhfĈfX B

ŽQ Æ @IDirect3DRMViewport::Pick

**IDirect3DRMPickedArray::GetSize**

DWORD GetSize ( ) ;

Direct3DRMPickedArray *fIfufWfFfNfg*,ÉŠÜ,Ü,ê,Ä,č,é—v‘f ”,đŽæ“¾,·,é B  
—v‘f ”,đ•Ô,· B

## IDirect3DRMViewportArray

frf... [f] [fg EfIfufWfFfNfg,ðfOf< [fv%o»»,·,é,É,Í AIDirect3DRMViewportArrayfCf“f^ [ftfFfCfX,lf f\fbfh,ð —~—p,·,é B,±,lfZfNfVf±f“,ÍIDirect3DRMViewportArrayfCf“f^ [ftfFfCfX Ef f\fbfh,lfŠftf@fÆf“fX,Ä,·,é BŠ T”O,É,Ä,ç,Ä,İŠT—v,Í A uIDirect3DRMViewport,ÆIDirect3DRMViewportArrayfCf“f^ [ftfFfCfX v,ðŽQ Æ,·,é,± ,Æ B

IDirect3DRMViewportArrayfCf“f^ [ftfFfCfX,İŽŸ,lf f\fbfh,ðfTf| [fg,·,é B

### GetElement

### GetSize

IDirect3DRMViewportArrayfCf“f^ [ftfFfCfX,Í A,·,×,Ä,İCOMfCf“f^ [ftfFfCfX,Æ“—l AIUnknown fCf“f^ [ftfFfCfX Ef f\fbfh,ðÆp ³,·,é BIUnknownfCf“f^ [ftfFfCfX,İŽŸ,İ,R,Ä,lf f\fbfh,ðfTf| [fg,·,é B

### AddRef

### QueryInterface

### Release

,³,ç,É AIDirect3DRMViewportArray fCf“f^ [ftfFfCfX,Í AIDirect3DRMObjectfCf“f^ [ftfFfCfX,©,çŽŸ,lf f\fbfh,ðÆp ³,·,é B

### AddDestroyCallback

### Clone

### DeleteDestroyCallback

### GetAppData

### GetClassName

### GetName

### SetAppData

### SetName

Direct3DRMViewportArrayIfufWfFfNfg,Í A  
IDirect3DRM::CreateFramef f\fbfh,İÆÄ,Ň o,μ,É,æ,Ä,ÄŽæ“¾,³,ê,é B

**IDirect3DRMViewportArray::GetElement**

HRESULT GetElement(DWORD index, LPDIRECT3DRMVIEWPORT \* lpD3DRMViewport);

Direct3DRMViewportArray fIfufWfFfNfg,©,çŽw'è,<sup>3</sup>,ê,½—v'f,ðŽæ“¾,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ,"s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ĵ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

index

”z—ñ—v'f B

lpD3DRMViewport

IDirect3DRMViewportfCf“f^ [ftfFfCfX,ðŽó,¬Žæ,éfAfhfŒfX,Ö,İf|fCf“f^ B

**IDirect3DRMViewportArray::GetSize**

DWORD GetSize();

Direct3DRMViewportArray fIfufWfFfNfg,ÉŠÜ,Ü,ê,Ä,č,é—v‘f ”,đŽæ“¾,·,é B  
—v‘f ”,đ•Ô,· B

## **IDirect3DRMVisualArray**

*f* *r* *f* *W* *f*...*f* *A* *f* *⋖* *E* *f* *l* *u* *f* *W* *f* *F* *N* *f* *g*, *ð* *f* *O* *f* *⋖* [*f* *v* % *o* » , · , é , É , Í **AIDirect3DRMVisualArray** *f* *C* *f* “ *f* ^ [*f* *t* *F* *f* *C* *f* *X*, Ì *f* *f* *b* *f* *h*, ð — ~ — *p*, · , é *B*, ± , Ì *f* *Z* *f* *N* *f* *V* *f* ± *f* “ , Í **AIDirect3DRMVisualArray** *f* *C* *f* “ *f* ^ [*f* *t* *F* *f* *C* *f* *X* *E* *f* *f* *b* *f* *h*, Ì *f* *Š* *f* *t* *f* @ *f* *Ⓔ* *f* “ *f* *X*, Â , , é *BŠT*” *O*, É , Â , ¢ , Ä , Ì *ŠT* — *v*, Í *A* *u* *IDirect3DRMVisual*, *ÆIDirect3DRMVisualArray* *f* *C* *f* “ *f* ^ [*f* *t* *F* *f* *C* *f* *X* *v*, ð *ŽQ* *Æ*, · , é , ± , *Æ* *B*

### **GetElement**

### **GetSize**

**IDirect3DRMVisualArray** *f* *C* *f* “ *f* ^ [*f* *t* *F* *f* *C* *f* *X*, Í *A*, · , × , Ä , Ì *COM* *f* *C* *f* “ *f* ^ [*f* *t* *F* *f* *C* *f* *X*, *Æ* “ — *l* *A* [*Unknown* *f* *C* *f* “ *f* ^ [*f* *t* *F* *f* *C* *f* *X* *E* *f* *f* *b* *f* *h*, ð *Ⓔ* *p* <sup>3</sup> , · , é *BIUnknown* *f* *C* *f* “ *f* ^ [*f* *t* *F* *f* *C* *f* *X*, Í *Ž* *Ÿ*, Ì , *R*, Â , Ì *f* *f* *b* *f* *h*, ð *f* *T* *f* | [*f* *g*, · , é *B*

### **AddRef**

### **QueryInterface**

### **Release**

, <sup>3</sup> , ¢ , É **AIDirect3DRMVisualArray** *f* *C* *f* “ *f* ^ [*f* *t* *F* *f* *C* *f* *X*, Í *A* [*IDirect3DRMObject* *f* *C* *f* “ *f* ^ [*f* *t* *F* *f* *C* *f* *X*, © , ¢ *Ž* *Ÿ*, Ì *f* *f* *b* *f* *h*, ð *Ⓔ* *p* <sup>3</sup> , · , é *B*

### **AddDestroyCallback**

### **Clone**

### **DeleteDestroyCallback**

### **GetAppData**

### **GetClassName**

### **GetName**

### **SetAppData**

### **SetName**

**IDirect3DRMVisualArray** *f* *l* *u* *f* *W* *f* *F* *N* *f* *g*, Í **IDirect3DRMFrame::GetVisuals**  
method. *f* *f* *b* *f* *h*, Ì *Ⓔ* *Ä*, Ñ *o*, *μ*, É , æ , Ä , *Ž* æ “ <sup>3</sup> / <sub>4</sub> , <sup>3</sup> , ê , é *B*

**IDirect3DRMVisualArray::GetElement**

HRESULT GetElement(DWORD index, LPDIRECT3DRMVISUAL \* lpD3DRMVisual);

Direct3DRMVisualArrayIfufWfFfNfg,©,çŽw'è,<sup>3</sup>,ê,<sup>1</sup>/<sub>2</sub>—v‘f,ðŽæ“¾,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, fh,Ĵ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

index

”z—ñ—v‘f B

lpD3DRMVisual

**IDirect3DRMVisual** fCf“f^ [ftfFfCfX,ðŽó,¬Žæ,éf|fCf“f^ B

**IDirect3DRMVisualArray::GetSize**

DWORD GetSize ( ) ;

Direct3DRMVisualArray fIfufWfFfNfg,ÉŠŬ,Ŭ,ê,Ä,¢,é—v‘f ”,ðŽæ“¾,·,é B  
—v‘f ”,ð•Ô,· B



## IDirect3DRM

**IDirect3DRM** *fCf“f^ [ftfFfCfX,Í A*Direct3DRM*fIfufWfFfNfg,ð ì ¬,µ AfVfXfef€ Efœfxf<,l•l ”,ð•€ ì,·,é,½,ß,É—p,ç,ç,ê,é B,±,lfZfNfVf‡f“,Í A***IDirect3DRM***fCf“f^ [ftfFfCfX,l f fbfh,l fŠftf@fœf“fX,Å, ,é BŠT”O,É,Â,ç,Ä,ŠT—v,Í A u***IDirect3DRM***fCf“f^ [ftfFfCfX v,ðŽQ Æ,·,é,±,Æ B*

**IDirect3DRM** *fCf“f^ [ftfFfCfX Ef f\fbfh,Í A*È%°,lfOf< *[fv,É•a—D,·,é,±,Æ,ª,Å,«,é B*

**fAfjf [fVf‡f“** [CreateAnimation](#)  
[CreateAnimationSet](#)

**ffofCfX** [CreateDevice](#)  
[CreateDeviceFromClipper](#)  
[CreateDeviceFromD3D](#)  
[CreateDeviceFromSurface](#)  
[GetDevices](#)

**—ñ<“** [EnumerateObjects](#)

**–Ê iftfFfCfX j** [CreateFace](#)

**ftfœ [f€** [CreateFrame](#)

**œðœ¹** [CreateLight](#)  
[CreateLightRGB](#)

**f}fefŠfAf<** [CreateMaterial](#)

**f fbfVf...** [CreateMesh](#)  
[CreateMeshBuilder](#)

**,»,l¹¼** [CreateObject](#)  
[CreateUserVisual](#)  
[GetNamedObject](#)  
[Load](#)  
[Tick](#)

**fpfXœÿ õ** [AddSearchPath](#)  
[GetSearchPath](#)  
[SetSearchPath](#)

**%oA%oe** [CreateShadow](#)

**fefNfXf`ff** [CreateTexture](#)  
[CreateTextureFromSurface](#)  
[LoadTexture](#)  
[LoadTextureFromResource](#)  
[SetDefaultTextureColors](#)  
[SetDefaultTextureShades](#)

***f*r*f*... [*f*| [*f*g** **CreateViewport**

***f*%*f*b*f*v** **CreateWrap**

**IDirect3DRM***f*C*f*“*f*^ [*f*t*f*F*f*C*f*X,Í A,·,×,Ä,ÌCOM*f*C*f*“*f*^ [*f*t*f*F*f*C*f*X,Æ“—  
l A|**Unknown***f*C*f*“*f*^ [*f*t*f*F*f*C*f*X E*f* *f*\b*f*h,ðŒp<sup>3</sup>,·,é **BIUnknown***f*C*f*“*f*^ [*f*t*f*F*f*C*f*X,ÍŽŸ,Ì,R,Ä,Ì*f* *f*\b*f*h,ð*f*T*f*|  
[*f*g,·,é B

**AddRef**

**QueryInterface**

**Release**

**IDirect3DRM** COM*f*C*f*“*f*^ [*f*t*f*F*f*C*f*X,Í A**Direct3DRMCreate**,ÌŒÄ,Ñ o,μ,É,æ,Á,Ä ì ¬,<sup>3</sup>,ê,é B

**IDirect3DRM::AddSearchPath**

HRESULT AddSearchPath(LPCSTR lpPath);

Œ» Ý,ìftf@fCf<ŒŸ òfpfX,ì ÅŒã,ÉffBfŒfNfgfŠ,ìfŠfXfg,ð’Ç%Á,·,é B  
¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô’l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, fh,Ĵ•Ô’l v,ðŽQ Æ,·,é,±,Æ B

lpPath  
Œ» Ý,ìŒŸ òfpfX,É’Ç%Á,·,éfpfX,ðŽw’è,·,é ANULL,Å I,í,é•¶Žš—ñ,Ö,ìf|fCf“f^ B

Windows,Å,Í AfpfX,ÍfZf~fRf f“ i; j,Å<æ Ø,Á,½ffBfŒfNfgfŠ,ìfŠfXfg,Å,È,,Ä,Í,È,ç,È,¢ B  
ŽQ Æ @IDirect3DRM::SetSearchPath

**IDirect3DRM::CreateAnimation**

HRESULT CreateAnimation(LPDIRECT3DRMANIMATION \* lpD3DRMAnimation);

ó,ì Direct3DRMAnimationIfufWfFfNfg,ð ì ¬,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,î•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lpD3DRMAnimation  
ŒÄ,Ñ o,µ,<sup>a</sup> ¬Œ÷,µ,½,Æ,«,ÉIDirect3DRMAnimationfCf“f^ [ftfFfCfX,ðŽó, ¯Žæ,éf|fCf“f^,Ö,Ìf|fCf“f^ B

**IDirect3DRM::CreateAnimationSet**

HRESULT CreateAnimationSet (LPDIRECT3DRMANIMATIONSET \* lplpD3DRMAnimationSet);

⋄ó,̀̀Direct3DRMAnimationSetIfufWfFfNfg,đ ì ¬,·,é B

¬Ⓔ÷,·,é,ÆD3DRM\_OK AŽ, ”s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ĵ•Ô'l v,đŽQ Æ,·,é,±,Æ B

lplpD3DRMAnimationSet

ⒺÄ,Ň o,μ,<sup>a</sup> ¬Ⓔ÷,μ,½,Æ,«,É uIDirect3DRMAnimationSet vfCf“f^ [ftfFfCfX,đŽó,¬Žæ,éf|fCf“f^,Ö,̀̀f|  
fCf“f^ B

## **IDirect3DRM::CreateDevice**

```
HRESULT CreateDevice(DWORD dwWidth, DWORD dwHeight,  
    LPDIRECT3DRMDEVICE* lplpD3DRMDevice);
```

Windows 3.11, 3.11B

## IDirect3DRM::CreateDeviceFromClipper

```
HRESULT CreateDeviceFromClipper(LPDIRECTDRAWCLIPPER lpDDClipper,  
    LPGUID lpGUID, int width, int height,  
    LPDIRECT3DRMDEVICE * lpD3DRMDevice);
```

Žw'è,³,ê,½DirectDrawClipperIfufWfFfNfg,ðŽg,Á,ÄDirect3DRM WindowsffofCfX,ð ì ¬,·,é B

¬Ė÷,·,é,ÆD3DRM\_OK AŽ,"s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,îê——,É,Â,ĉ  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ĭ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lpDDClipper

DirectDrawClipper fIfufWfFfNfg,ĬfAfhfĖfX B

lpGUID

fOf [fof< Ef†fj [fNŽ¬•ÊŽq iGUID j,ĬfAfhfĖfX B,±,Ĭfpf%of [f^,É,íNULL,ðŽw'è,·,é,±,Æ,ª,Â,«,é B  
width, height  
ì ¬,³,ê,éffofCfX,Ĭ• ,Æ ,³ B

lpD3DRMDevice

ĖÄ,Ñ o,µ,ª ¬Ė÷,µ,½,Æ,«,ÉIDirect3DRMDevice fCf“f^ [ftfFfCfX,ðŽó,¬Žæ,éf|fCf“f^,Ö,Ĭf|fCf“f^ B

lpGUID fpf%of [f^,ÉNULL,ðŽw'è,·,é,Æ AfVfXfef€,ĬffofCfX,Ĭ «”\,ð²,×,é B,±  
,ê,Í Af† [fU,ª V,µ,ĉfn [fhfEfFfA,ðfCf“fXfg [f<,µ,½,Æ,«,É,à,Â,Ë,É“@ ì,·,é,½,ß A¼ Úf, [fh EffofCfX,Ĭ  
ì ¬•û-@,Æ,µ,Ä „ §,³,ê,Ä,ĉ,é B

fVfXfef€,Í A“à”\,ĬffofCfX—ñ<“,ĬĖÄ,Ñ o,µ,Ĭ†,Â AD3DPRIMCAPS \‘ĉ'Ĭ,©,çŽŸ,Ĭftf%ofO,ðŽg,µ,±  
,Æ,É,æ,Ä,ÄfftfHf<fg,Ĭ Ý'è,ð \ ¬,·,é B

D3DPCMPCAPS\_LESSEQUAL

D3DPMISCCAPS\_CULLCCW

D3DPRASTERCAPS\_FOGVERTEX

D3DPSHADECAPS\_ALPHAFLATSTIPPLED

D3DPTADDRESSCAPS\_WRAP

D3DPTBLENDCAPS\_COPY

D3DPTBLENDCAPS\_MODULATE

D3DPTTEXTURECAPS\_PERSPECTIVE

D3DPTTEXTURECAPS\_TRANSPARENCY

D3DPTFILTERCAPS\_NEAREST

fn [fhfEfFfA EffofCfX,ªĖ©,Â,©,ç,È,ĉ  
,Æ,«,Í Af,fmNf if%of“fv j,Ĭf\ftfgfEfFfA Efhf%ofCfo,ªf [fh,³,ê,é B,±,ĬfftfHf<fg Ý'è,ĬfŠfXfg,Éf}  
fbf^,µ,È,ĉ“Á•Ê,È—v< ,ðŽ ,ÂfAfvfŠfP [fVf‡f“,Í AlpGUID,ÉNULL,ðŽw'è,·,é,ª,í,è,ÉffofCfX,ð—ñ<“,·,é,×,«,Â, ,é  
B

## IDirect3DRM::CreateDeviceFromD3D

```
HRESULT CreateDeviceFromD3D(LPDIRECT3D lpD3D,  
    LPDIRECT3DDEVICE lpD3DDevice, LPDIRECT3DRMDEVICE * lplpD3DRMDevice);
```

Žw'è,³,ê,½Direct3DfIfufWfFfNfg,ðŽg,Á,Ä Direct3DRM WindowsfffofCfX,ð ì ¬,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ,"s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Î A uDirect3D•ŮŽ f, [fh,l•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lpD3D

Direct3DfCf“fXf^f“fX B

lpD3DDevice

Direct3DfffofCfX EfIfufWfFfNfg B

lpD3DRMDevice

ŒÄ,Ń o,μ,<sup>a</sup> ¬Œ÷,μ,½,Æ,«,ÉDirect3DRMDevicefCf“f^ [ftfFfCfX,Ö,Îf|fCf“f^,ðŽó,¬Žæ,éf|fCf“f^ B



## IDirect3DRM::CreateDeviceFromSurface

```
HRESULT CreateDeviceFromSurface(LPGUID lpGUID, LPDIRECTDRAW lpDD,  
    LPDIRECTDRAWSURFACE lpDDSBck,  
    LPDIRECT3DRMDEVICE * lplpD3DRMDevice);
```

Žw'è,<sup>3</sup>,ê,½ DirectDrawfT [ftfFfX,©,ç AfŒf“f\_Šf“fO,É—p,č,éWindowsffofCfX,đ ì ¬,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,Îê——,É,Â,č  
,Ă,Í A uDirect3D•ŮŽ f, [fh,Ĭ•Ô'l v,đŽQ Æ,·,é,±,Æ B

lpGUID

Žw'è,·,éfffofCfX Efhf%oCfo,ĬfOf [fof< Ef†fj [fNŽ~•ÊŽq iGUID j,ĬfAfhfŒfX B,±  
,Ĭfpf%of [f^,ÉNULL,<sup>a</sup>Žw'è,<sup>3</sup>,ê,é,Æ AffftHf<fg,ĬfffofCfX Efhf%oCfo,<sup>a</sup>Žg—p,<sup>3</sup>,ê,é B

lpDD

DirectDrawfT [ftfFfX,ĬŒ<sup>3</sup>,É,È,éDirectDrawfIfufWfFfNfg B

lpDDSBck

f ofbfN Ef ofbftf@,đ•\,·DirectDrawSurfacefIfufWfFfNfg B

lplpD3DRMDevice

ŒĂ,Ň o,μ,<sup>a</sup> ¬Œ÷,μ,½,Æ,«,ÉIDirect3DRMDevicefCf“f^ [ftfFfCfX,đŽó,¬Žæ,éf|fCf“f^,Ö,Ĭf|fCf“f^ B

**IDirect3DRM::CreateFace**

HRESULT CreateFace(LPDIRECT3DRMFACE \* lplpd3drmFace);

IDirect3DRMFace*fCf“f^ [ftfFfCfX,İfCf“fXf^f“fX,đ ì ¬,·,é B*

*¬Ǝ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ĵ•Ô'l v,đŽQ Æ,·,é,±,Æ B*

*lplpd3drmFace*

*ƎÄ,Ň o,μ,<sup>a</sup> ¬Ǝ÷,μ,½,Æ,«,ÉIDirect3DRMFace*fCf“f^ [ftfFfCfX,đŽó,¬Žæ,éf|fCf“f^,Ö,İf|fCf“f^ B**

## IDirect3DRM::CreateFrame

```
HRESULT CreateFrame(LPDIRECT3DRMFRAME lpD3DRMFrame,  
    LPDIRECT3DRMFRAME* lplpD3DRMFrame);
```

Žw'è,<sup>3</sup>,ê,<sup>1</sup>/<sub>2</sub> eftfŒ [f€,É V,μ,¢ŽqftfŒ [f€,ð ì ¬,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ,"s,·,é,ÆfGf%o [,<sup>ð</sup>•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Î A uDirect3D•ŮŽ f, [fh,l•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lpD3DRMFrame

V,μ,¢ftfŒ [f€,Î eftfŒ [f€ B

lplpD3DRMFrame

ŒÄ,Ñ o,μ,<sup>a</sup> ¬Œ÷,μ,<sup>1</sup>/<sub>2</sub>,Æ,«,ÉIDirect3DRMFramefCf“f^ [ftFfCfX,ðŽó,¬Žæ,éf|fCf“f^,Ö,Îf|fCf“f^ B

ŽqftfŒ [f€,Î eftfŒ [f€,ì“® ì‘® «,ðŒp <sup>3</sup>,·,é B,<sup>1</sup>/<sub>2</sub>,Æ,,Î eftfŒ [f€,“Žw'è,<sup>3</sup>,ê,<sup>1</sup>/<sub>2</sub>“¬“x,Ä“®,¢,Ä,¢  
,é ê ‡ AŽqftfŒ [f€,à“¬,¶“¬“x,Ä“®, B,Ů,<sup>1</sup>/<sub>2</sub> A eftfŒ [f€,“%oñ“],μ,Ä,¢,ê,Î AŽqftfŒ [f€,à eftfŒ [f€,ÎŒ  
“¬,ð'† S,Æ,μ,Ä%oñ“],·,é B eftfŒ [f€,ðŽ ,<sup>1</sup>/<sub>2</sub>,È,¢ftfŒ [f€

,ÎfV [f“,ÆŒÄ,Î,ê,é BfV [f“,ð ì ¬,·,é,É,Î A eftfŒ [f€,Æ,μ,ÄNULL

,ðŽw'è,·,ê,Î,æ,¢ BfAfvfŠfP [fVf‡f“,Î A e,ðŽ ,<sup>1</sup>/<sub>2</sub>,È,¢ftfŒ [f€,ð ì,Ä,<sup>1</sup>/<sub>2</sub>Œä,É AIDirect3DRMFrame::AddChild  
methodf f\fbfh,ð—p,¢,Ä,»,ÎftfŒ [f€,ð eftfŒ [f€,ÉŠÖ~A•t,¬,é,±,Æ,<sup>a</sup>,Ä,«,é B

ŽQ Æ @IDirect3DRMFrame::AddChild

**IDirect3DRM::CreateLight**

```
HRESULT CreateLight(D3DRMLIGHTTYPE d3drmltLightType,  
    D3DCOLOR cColor, LPDIRECT3DRMLIGHT* lplpD3DRMLight);
```

Žw'è,³,ê,½f^fCfv,Æ F,Â V,μ,¢ŒðŒ¹,ð ì ¬,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ,"s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Î A uDirect3D•ŮŽ f, [fh,l•Ô'l v,ðŽQ Æ,·,é,±,Æ B

d3drmltLightType

**D3DRMLIGHTTYPE**—ñ<“Œ^,Â——^,!,ç,ê,éŒðŒ¹,Îf^fCfv,Ì,Ð,Æ,Â B

cColor

Œð,Ì F B

lplpD3DRMLight

ŒÄ,Ñ o,μ,<sup>a</sup> ¬Œ÷,μ,½,Æ,«,ÉIDirect3DRMLightfCf“f^ [ftfFfCfX,ðŽó,¬Žæ,éf|fCf“f^,Ö,Îf|fCf“f^ B

**IDirect3DRM::CreateLightRGB**

```
HRESULT CreateLightRGB(D3DRMLIGHTTYPE ltLightType, D3DVALUE vRed,  
    D3DVALUE vGreen, D3DVALUE vBlue, LPDIRECT3DRMLIGHT* lplpD3DRMLight);
```

Žw'è,³,ê,½f^fCfv,Æ F,Â V,μ,¢ŒðŒ¹,ð ì ¬,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ,"s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Î A uDirect3D•ÛŽ f, [fh,l•Ô'l v,ðŽQ Æ,·,é,±,Æ B

*ltLightType*

**D3DRMLIGHTTYPE**—ñ<“Œ^,Â——^,!,ç,ê,éŒðŒ¹,Îf^fCfv,Ì,Ð,Æ,Â B

*vRed, vGreen, vBlue*

Œð,Ì F B

*lplpD3DRMLight*

ŒÄ,Ñ o,μ,<sup>a</sup> ¬Œ÷,μ,½,Æ,«,ÉIDirect3DRMLightfCf“f^ [ftfFfCfX,ðŽó,¬Žæ,éf|fCf“f^,Ö,Îf|fCf“f^ B

**IDirect3DRM::CreateMaterial**

```
HRESULT CreateMaterial(D3DVALUE vPower,  
    LPDIRECT3DRMMATERIAL * lpD3DRMMaterial);
```

Žw’è,<sup>3</sup>,ê,<sup>1</sup>/<sub>2</sub>”½ŽĚ“Á «,Âf}fefŠfAf<,ð ì ¬,·,é B

¬Ĉ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,<sup>ð</sup>•Ô,· B•Ô’l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Î•Ô’l v,ðŽQ Æ,·,é,±,Æ B

vPower

”½ŽĚ,ÎfnfCf%ofCf<sup>g</sup>•”•<sup>a</sup>,Î’N–¾“x B,±,Î’l,É5,ðŽw’è,·,é,Æ AfĈf“f\_fŠf“fO,<sup>3</sup>,ê,<sup>1</sup>/<sub>2</sub>•\–Ê,Íà‘®,Ì,æ,□  
,ĚŠOŠĪ,É,È,è A,»<sup>^</sup>È ã,Î’l,Â,Í,à,Á,Æ \_<sup>ç</sup>,©,¢ŠOŠĪ,Æ,È,é B

lpD3DRMMaterial

ĈĀ,Ñ o,μ,<sup>a</sup> ¬Ĉ÷,μ,<sup>1</sup>/<sub>2</sub>,Æ,«<sup>É</sup>IDirect3DRMMaterialfCf“f^ [ftfFfCfX,ðŽó,¬Žæ,éf|fCf“f^,Ö,Îf|fCf“f^ B

**IDirect3DRM::CreateMesh**

HRESULT CreateMesh(LPDIRECT3DRMMESH\* lpD3DRMMesh);

−Ê,ðŽ ,½,È,¢ V,µ,¢f fbfVf... EflfufWfFfNfg,ð ì ¬,·,é Bf fbfVf...,Íftf¢ [f€  
,É%oÁ,,ç,ê,é,Û,Â•Ž!,³,ê,È,¢ B

¬¢÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ÔŽ f, [fh,l•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lpD3DRMMesh

¢Ä,Ñ o,µ,<sup>a</sup> ¬¢÷,µ,½,Æ,«,ÉIDirect3DRMMeshfCf“f^ [ftfFfCfX,ðŽó,¬Žæ,éf|fCf“f^,Ö,Îf|fCf“f^ B

**IDirect3DRM::CreateMeshBuilder**

HRESULT CreateMeshBuilder(LPDIRECT3DRMMESHBUILDER\* lpD3DRMMeshBuilder);

V,μ,¢f fbfVf... ì ¬fIfufWfFfNfg,ð ì ¬,·,é B

¬Ɛ÷,·,é,ÆD3DRM\_OK AŽ,„s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ĵ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lpD3DRMMeshBuilder

ƐÄ,Ń o,μ,<sup>a</sup> ¬Ɛ÷,μ,½,Æ,«,ÉIDirect3DRMMeshBuilderfCf“f^ [ftfFfCfX,Ö,Ï|fCf“f^,ðŽó,¬Žæ,éfAfhfƐfX B



## IDirect3DRM::CreateObject

```
HRESULT CreateObject(REFCLSID rclsid, LPUNKNOWN pUnkOuter,  
    REFIID riid, LPVOID FAR* ppv);
```

%Šú%»<sup>3</sup>,ê,Ä,¢,È,¢ V,µ,¢fIfufWfFfNfg,ð ì ¬,·,é B

¬Ǝ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf% [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,l•Ô'l v,ðŽQ Æ,·,é,±,Æ B

*rclsid*

V,µ,¢fIfufWfFfNfg,ÎfNf%oXŽ<sup>−</sup>•ÊŽq B

*pUnkOuter*

COM W ¬%»«@”\,É‘Î%ž,·,é B

*riid*

ì ¬,<sup>3</sup>,ê,éIfufWfFfNfg,ÎfCf“f<sup>^</sup> [ftfFfCfXŽ<sup>−</sup>•ÊŽq B

*ppv*

f f\fbfh,<sup>a</sup> §Ǝä,ð−ß,µ,½,Æ,«,ÉfIfufWfFfNfg,ðŽó,<sup>−</sup>Žæ,éf|fCf“f<sup>^</sup>,Ö,Îf|fCf“f<sup>^</sup> B

,±,Îf f\fbfh,É,æ,è ì ¬,<sup>3</sup>,ê,½fIfufWfFfNfg,Í AfAfvfŠfP [fVf‡f“,É,æ,Á,Ä %Šú%»<sup>3</sup>,ê,È,-  
,Ä,Í,È,ç,È,¢ iDirect3DRMfCf“f<sup>^</sup> [ftfFfCfX,ì¼,Ì ì ¬f f\fbfh,Í AŽ©“@“l,ÉfIfufWfFfNfg,ð %Šú%»<sup>3</sup>,·,é j B  
V,µ,¢fIfufWfFfNfg,ð %Šú%»<sup>3</sup>,·,é,É,Í AInitf f\fbfh,ðŽg—  
p,·,é BInitf f\fbfh,ÎƎÄ,Ň o,µ,Í AfIfufWfFfNfg,É,Â,¢,Ä1%ñ,Ì,Ý s,□ B

fAfvfŠfP [fVf‡f“,Í A,±,Îf f\fbfh,ð—p,¢,ÄDirect3DRMfIfufWfFfNfg,Ì W ‡l,ðfCf“fvfŠf f“fg,Â,«,é B

**IDirect3DRM::CreateShadow**

```
HRESULT CreateShadow(LPDIRECT3DRMVISUAL lpVisual,
    LPDIRECT3DRMLIGHT lpLight, D3DVALUE px, D3DVALUE py, D3DVALUE pz,
    D3DVALUE nx, D3DVALUE ny, D3DVALUE nz,
    LPDIRECT3DRMVISUAL * lplpShadow);
```

Žw'è,<sup>3</sup>,ê,½fṛfWf...fAf<,ÆCEôCE¹,ð—p,¢ AŽw'è,<sup>3</sup>,ê,½•½–Ê,É“Š‰e,<sup>3</sup>,¹,Ä‰A‰e,ð ì ¬,·,é B‰A‰e,Í AfṛfWf...fAf<,ðŠÜ,ḐftfCE [f€,É'Ç‰Á,<sup>3</sup>,ê,éfṛfWf...fAf<,Ä, ,é B

¬CE÷,·,é,ÆD3DRM\_OK AŽ, ”s,·,é,ÆfGf‰ [ ,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŬŽ f, [fh,Î•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lpVisual  
‰A‰e,ÌCE³,É,È,é Direct3DRMVisual fIfufWfFfNfg B

lpLight  
CEôCE¹,Æ,È,éDirect3DRMLightfCf“f^ [ftfFfCfX B

px, py, pz  
‰A‰e, “Š‰e,<sup>3</sup>,ê,é•½–Ê B

nx, ny, nz  
‰A‰e, “Š‰e,<sup>3</sup>,ê,é•½–Ê,Ì–@ ü B

lplpShadow  
CEÄ,Ñ o,µ,<sup>a</sup> ¬CE÷,µ,½,Æ,« A‰A‰efṛfWf...fAf<,Ö—LCEø,Èf|fCf“f^,Å ‰Šú‰e»,<sup>3</sup>,ê,éf|fCf“f^,Ö,Ìf|fCf“f^ B

**IDirect3DRM::CreateTexture**

```
HRESULT CreateTexture(LPD3DRMIMAGE lpImage,
    LPDIRECT3DRMTEXTURE* lplpD3DRMTexture);

f f,fŠ à,İfCf [fW,©,çfefNfXf`ff,ð ì ¬,·,é B

    ¬Œ÷,·,é,ÆD3DRM_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,İê——,É,Â,¢
    ,Ä,Í A uDirect3D•ŨŽ f, [fh,l•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lpImage
    fefNfXf`ff,İf\ [fX,ð•\,·D3DRMIMAGE \‘¢‘İ B
lpD3DRMTexture
    ŒÄ,Ũ o,µ,a ¬Œ÷,µ,½,Æ,«,ÉIDirect3DRMTexturefCf“f^ [ftfFfCfX,ðŽó,¬Žæ,éf|fCf“f^,Ö,İf|fCf“f^ B

fefNfXf`ff,fŒf“f_Šf“fO,³,ê,é,½,Ũ ADirect3DRM,İfobftf@,ÉfRfs [,³,ê,½f f,fŠ,Â,Í,È,-
    AfCf [fW,ÉŠÖ~A•t,¬,ç,ê,½f f,fŠ,a—p,¢,ç,ê,é B,±
    ,l,½,ßfCf [fW,Í AfŒf“f_Šf“fO,İf^ [fQfbfg,Æ,µ,Ä,àfefNfXf`ff,Æ,µ,Ä,àŽg—p,·,é,±,Æ,a,Â,«,é B
```

## IDirect3DRM::CreateTextureFromSurface

```
HRESULT CreateTextureFromSurface(LPDIRECTDRAWSURFACE lpDDS,  
    LPDIRECT3DRMTEXTURE * lplpD3DRMTexture);
```

Žw'è,<sup>3</sup>,ê,½ DirectDrawfT [ftfFfX,©,çfefNfXf`ff,ð ì ¬,;é B

¬Ĉ÷,·,é,ÆD3DRM\_OK AŽ,"s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,l•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lpDDS

fefNfXf`ff,ðŠÜ,ᵀDirectDrawSurfaceIfufWfFfNfg B

lplpD3DRMTexture

ĈÄ,Ñ o,μ,<sup>a</sup> ¬Ĉ÷,μ,½,Æ,«,ÉIDirect3DRMTexturefCf“f^ [ftfFfCfX,Ö,Îf|fCf“f^,ðŽó,¬Žæ,éfAfhfĈfX B

**IDirect3DRM::CreateUserVisual**

```
HRESULT CreateUserVisual(D3DRMUSERVISUALCALLBACK fn,
    LPVOID lpArg, LPDIRECT3DRMUSERVISUAL * lpD3DRMUV);

fAfvfŠfP [fVf‡f“‘è^,łrfWf...fAf< EfIfufWfFfNfg,đ ì ¬,·,é B ì ¬Œă AfrfWf...
fAf< EfIfufWfFfNfg,đfV [f“,É’Ç%Á,μ AfAfvfŠfP [fVf‡f“‘è^,łfnf“fhf%,đ—p,¢,ĂfŒf“f_Šf“fO,Ă,«,é B
    ¬Œ÷,·,é,ŒD3DRM_OK AŽ,”s,·,é,ŒfGf%o [„đ•Ô,· B•Ô’l,Îê——,É,Â,¢
    ,Ă,Í A uDirect3D•ŮŽ f, [fh„Ĵ•Ô’l v,đŽQ Œ,·,é,±,Œ B

fn
    fAfvfŠfP [fVf‡f“‘è^,łD3DRMUSERVISUALCALLBACKfR [f<fofbfNŠÖ ” B
lpArg
    fR [f<fofbfNŠÖ ”,É“n,³,ê,é AfAfvfŠfP [fVf‡f“‘è^,łff [f^ B
lpD3DRMUV
    ŒĂ,Ň o,μ,ª ¬Œ÷,μ,½,Œ,«,ÉIDirect3DRMUserVisualfCf“f^ [ftfFfCfX,đŽó,¬Žæ,éf|fCf“f^,Ö,łf|fCf“f^ B
```

## IDirect3DRM::CreateViewport

```
HRESULT CreateViewport(LPDIRECT3DRMDEVICE lpDev,  
    LPDIRECT3DRMFRAME lpCamera, DWORD dwXPos,  
    DWORD dwYPos, DWORD dwWidth, DWORD dwHeight,  
    LPDIRECT3DRMVIEWPORT* lplpD3DRMViewport);
```

$f f f o f C f X \quad \tilde{a}, \tilde{l} (dwXPos, dwYPos), \odot, \zeta (dwXPos + dwWidth, dwYPos + dwHeight), \acute{E} f r f \dots [f]$   
 $[f g, \delta \quad \grave{\imath} \neg, \cdot, \acute{e} \quad B^{\hat{E}} u, \acute{I} f f o f C f X \quad \grave{A} \bullet W, \grave{A} \bullet \setminus, ^3, \hat{e}, \acute{e} \quad B$

$\neg \mathbb{E} \div, \cdot, \acute{e}, \mathbb{E} D3DRM\_OK \quad A \check{Z}, \text{”} s, \cdot, \acute{e}, \mathbb{E} f G f \% \quad [, \delta \bullet \hat{O}, \cdot \quad B \bullet \hat{O} \text{’} l, \grave{\imath} \hat{e} \text{——}, \acute{E}, \hat{A}, \mathfrak{C}$   
 $, \grave{A}, \acute{I} \quad A \quad u \underline{Direct3D \bullet \hat{U} \check{Z} \quad f, \quad [f h, \hat{I} \bullet \hat{O} \text{’} l} \quad v, \delta \check{Z} Q \quad \mathbb{E}, \cdot, \acute{e}, \pm, \mathbb{E} \quad B$

$lpDev$

$f r f \dots [f] [f g, ^a \quad \grave{\imath} \neg, ^3, \hat{e}, \acute{e} f f o f C f X \quad B$

$lpCamera$

$f r f \dots [, \grave{\imath}^{\hat{E}} u, \mathbb{E} \bullet \hat{u} \mathbb{E} \ddot{u}, \delta \lrcorner L \quad q, \cdot, \acute{e} f t f \mathbb{E} \quad [f \mathbb{E}, \hat{O}, \grave{\imath} f | f C f \text{“} f^{\wedge} \quad B$

$dwXPos, dwYPos, dwWidth, \quad , \text{”}, \mathfrak{a}, \tilde{N} \quad dwHeight$

$f r f \dots [, \grave{\imath}^{\hat{E}} u, \mathbb{E} f T f C f Y, \delta f f o f C f X \quad \grave{A} \bullet W, \grave{A} \check{Z} \text{’}, \cdot \quad B$

$lplpD3DRMViewport$

$\mathbb{E} \grave{A}, \tilde{N} \quad o, \mu, ^a \quad \neg \mathbb{E} \div, \mu, ^{1/2}, \mathbb{E}, \ll, \acute{E} \underline{IDirect3DRMViewport} f C f \text{“} f^{\wedge} \quad [f t f F f C f X, \delta \check{Z} \acute{o}, \neg \check{Z} \mathfrak{a}, \acute{e} f | f C f \text{“} f^{\wedge}, \hat{O}, \grave{\imath} f | f C f \text{“} f^{\wedge} \quad B$

$f r f \dots [f] [f g, \acute{I} \quad A f J f \quad f \% \circ, \delta \check{S} \ddot{U}, \mathfrak{P} f V \quad [f \text{“} \quad \tilde{a}, \acute{E} f l f u f W f F f N f g, \delta \text{”} z' u, \cdot, \acute{e} \quad B f r f \dots [, \grave{\imath} \bullet \hat{u} \mathbb{E} \ddot{u}, \mathbb{E} \quad \check{a} f x f N f g f \lrcorner, \acute{I} f J f \quad f \% \circ$   
 $, \odot, \zeta \check{Z} \mathfrak{a} \text{“} \% 4, ^3, \hat{e}, \acute{e} \quad B$

## IDirect3DRM::CreateWrap

```
HRESULT CreateWrap(D3DRMWRAPTYPE type, LPDIRECT3DRMFRAME lpRef,  
    D3DVALUE ox, D3DVALUE oy, D3DVALUE oz, D3DVALUE dx, D3DVALUE dy,  
    D3DVALUE dz, D3DVALUE ux, D3DVALUE uy, D3DVALUE uz, D3DVALUE ou,  
    D3DVALUE ov, D3DVALUE su, D3DVALUE sv,  
    LPDIRECT3DRMWRAP* lpD3DRMWrap);
```

–Ê,âf fbfVf...,ÉfefNfXf`ff À•W,ðŠ,,,è“–,Ä,é,½,ß,ÉŽg—p,·,éf%ofbfv<@”\,ð ì ¬,·,é Bf%ofbfv,ìƎ““\_,ÍxfNfgf<  
[ox oy oz] AzŽ²,Í [dx dy dz] AyŽ²,Í [ux uy uz] ,Ä—^,!,ç,ê,é B2DfxNfgf< [ou ov] ,Æ [su sv] ,Í Af%ofbfv,ìƎ“%oÊ,Ê“K  
—p,³,ê,éfefNfXf`ff,ìƎ““\_,Æ kŽÚƎEW ”,ðŽ!,· B

–Ǝ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,ƥ  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Î•Ô'l v,ðŽQ Æ,·,é,±,Æ B

type

**D3DRMWRAPTYPE**—ñ<“Ǝ^f f“fo,ì,Ð,Æ,Â B

lpRef

f%ofbfv,ì,½,ß,ìŽQ ÆftfƎ [f€,Ö,Ìf|fCf“f^ B

ox, oy, oz

f%ofbfv,ìƎ““\_ B

dx, dy, dz

f%ofbfv,ìzŽ² B

ux, uy, uz

f%ofbfv,ìyŽ² B

ou, ov

fefNfXf`ff,ìƎ““\_ B

su, sv

fefNfXf`ff,Ì kŽÚƎEW ” B

lpD3DRMWrap

ƎÄ,Ñ o,µ,<sup>a</sup> ¬Ǝ÷,µ,½,Æ,«,ÉIDirect3DRMWrapfCf“f^ [ftfFfCfX,ðŽó,¬Žæ,éf|fCf“f^,Ö,Ìf|fCf“f^ B

ŽQ Æ @IDirect3DRMWrap

## IDirect3DRM::EnumerateObjects

HRESULT EnumerateObjects(D3DRMOBJECTCALLBACK func, LPVOID lpArg);

*fAfNfefBfu*,ÈDirect3DRM*fIfufWfFfNfg*,Ì,»,ê,¼,ê,É,Â,¢  
,Ä *Afuncpf%**f* [f^,ĂŽ!,³,ê,é*fR* [f<fofbfNŠÖ ”,ðŒÄ,Ñ o,· B  
-Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,Æ*fGf%* [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A u*Direct3D•ŮŽ f, [fh,l•Ô'l* v,ðŽQ Æ,·,é,±,Æ B  
*func*  
Še*DIRECT3DRMOBJECTfIfufWfFfNfg*,É,Â,¢  
,Ä *AfAfvfŠfP* [fVf‡f“”èç,Îø ”,Æ,Æ,à,ÉŒÄ,Ñ o,³,ê,é *AfAfvfŠfP* [fVf‡f“”èç,ÌD3DRMOBJECTCALLBAC  
K*fR* [f<fofbfNŠÖ ” B  
*lpArg*  
*fR* [f<fofbfNŠÖ ”,É“n,³,ê,é *AfAfvfŠfP* [fVf‡f“”èç,Ìff [f^ B



**IDirect3DRM::GetDevices**

HRESULT GetDevices (LPDIRECT3DRMDEVICEARRAY\* lpDevArray);

$fVfXfef\epsilon,\hat{A} \ \hat{\imath} \ \neg,^3,\hat{e},\frac{1}{2},\cdot,\times,\ddot{A},\grave{\imath}$  Direct3DRM  $fffofCfX,\delta\bullet\hat{O},\cdot \ B$   
 $\neg\mathbb{E}\div,\cdot,\acute{e},\mathcal{E}D3DRM\_OK \ A\check{Z},\text{”}s,\cdot,\acute{e},\mathcal{E}fGf\%_0 \ [\cdot,\delta\bullet\hat{O},\cdot \ B\bullet\hat{O}'l,\grave{\imath}\hat{e}\text{---},\acute{E},\hat{A},\mathfrak{c}$   
 $,\ddot{A},\grave{\imath} \ \hat{\imath} \ A \ \underline{uDirect3D\bullet\grave{U}\check{Z} \ f, \ \underline{[fh,\grave{\imath}\bullet\hat{O}'l} \ \vee,\delta\check{Z}Q \ \mathcal{A}e,\cdot,\acute{e},\pm,\mathcal{A} \ B$   
 $lpDevArray$   
Direct3DRM $fffofCfX,\grave{\imath}\text{”}z\text{---}\grave{\imath},\delta\check{Z}\acute{o},\text{---}\check{Z}\mathfrak{a},\acute{e}f|fCf\text{“}f^\wedge \ BDirect3DRMDeviceArrayfIfufWfFfNfg,\acute{E},\hat{A},\mathfrak{c}$   
 $,\ddot{A},\grave{\imath} \ \hat{\imath}\bullet\grave{\imath},\hat{\imath} \ A \ \underline{uIDirect3DRMDeviceArrayfCf\text{“}f^\wedge \ [ftfFfCfX \ \vee,\delta\check{Z}Q \ \mathcal{A}e,\cdot,\acute{e},\pm,\mathcal{A} \ B$

**IDirect3DRM::GetNamedObject**

```
HRESULT GetNamedObject(const char * lpName,
    LPDIRECT3DRMOBJECT* lplpD3DRMObject);

-¼‘O,ðŽw’è,μ,Ä A^ê’v,·,éDirect3DRMObject,ðŽæ“¾,·,é B

    ¬Œ÷,·,é,ÆD3DRM_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô’l,Îê——,É,Â,¢
    ,Ä,Î A uDirect3D•ÛŽ f, [fh,Î•Ô’l v,ðŽQ Æ,·,é,±,Æ B

lpName
    ŒŸ ð,·,éfIfufWfFfNfg,Î-¼‘O B

lplpD3DRMObject
    ŒÄ,Ñ o,μ,a ¬Œ÷,μ,½,Æ,«,É A^ê’v,μ,½Direct3DRMObject,Îf|fCf“f^,Ö,Îf|fCf“f^ B
```

## IDirect3DRM::GetSearchPath

HRESULT GetSearchPath(DWORD \* lpdwSize, LPSTR lpszPath);

«» Ÿ, ìftf@fCf<«Ÿ òfpfX, ð•Ô, · B

¬«÷, ·, é, ÆD3DRM\_OK AŽ, ”s, ·, é, ÆfGf%o [ , ð•Ô, · B•Ô'l, Îê——, É, Â, ¢  
, Ä, Í A uDirect3D•ŮŽ f, [fh, Ĵ•Ô'l v, ðŽQ Æ, ·, é, ±, Æ B

lpdwSize

fpfX, Ì—v‘f ”, Ö, ìf|fCf“f^ B, ±, ìfpf%of [f^, ÉNULL, ðŽw'è, ·, é, ±, Æ, Í, Â, «, È, ¢ B

lpszPath

«Ÿ òfpfX, ðŽ', · ANULL, Â I, í, é•¶Žš—ñ B, ±  
, ìfpf%of [f^, ÉNULL, ðŽw'è, ·, é, Æ AlpdwSizefpf%of [f^, É, æ, Â, ÄŽ', ³, ê, é ê Š, É•K—v, È•¶Žš—  
ñ, ìfTfCfY, ð•Ô, · B

ŽQ Æ @IDirect3DRM::SetSearchPath

## IDirect3DRM::Load

```
HRESULT Load(LPVOID lpvObjSource, LPVOID lpvObjID,
    LPVOID * lpplpGUIDs, DWORD dwcGUIDs, D3DRMLOADOPTIONS d3drmLOFlags,
    D3DRMLOADCALLBACK d3drmLoadProc, LPVOID lpArgLP,
    D3DRMLOADTEXTURECALLBACK d3drmLoadTextureProc, LPVOID lpArgLTP,
    LPDIRECT3DRMFRAME lpParentFrame);
```

*fIfufWfFfNfg,ðf [fh,·,é B*

*¬œ÷,·,é,ÆD3DRM\_OK AŽ, ”s,·,é,ÆfGf% [,ð•Ö,· B•Ö'l,İê——,É,Â,¢  
„Ä,İ A uDirect3D•ÖŽ f, [fh,İ•Ö'l v,ðŽQ Æ,·,é,±,Æ B*

*lpvObjSource*

*f [fh,·,éIfufWfFfNfg,İf\ [fX,Ö,İf]  
fCf“f^ Bd3drmLOFlagsfpf%of [f^,ªŽ!,·f\ [fX Eftf%ofO,É,æ,Á,Ä Aftf@fCf< AfŠf\ [fX Af f,fŠ Efuf  
fbfN A,Ü,½,İfXfgfŠ [f€,ðŽw'è,·,é B*

*lpvObjID*

*f [fh,·,éIfufWfFfNfg,İ-¼‘O,Ü,½,İÊ‘u,Ö,İf|fCf“f^ B,±  
,İfpf%of [f^,İ Ad3drmLOFlagsfpf%of [f^,ªŽ!,·Ž-ÊŽqftf%ofO,É,æ,Á,Ä%ðŽB,³,è,é BD3DRMLOAD\_BYPOSI  
TIONftf%ofO,ðŽw'è,µ,½ ê ± A,±,İfpf%of [f^,İ Aftf@fCf<,İ†,İIfufWfFfNfg,İ ± ~,ðŽ!,·**DWORD**’l,Ö,İf|  
fCf“f^,Ä, é B,±,İfpf%of [f^,É,İNULL,ðŽw'è,·,é,±,Æ,à,Ä,«,é B*

*lpplpGUIDs*

*f [fh,·,éfCf“f^ [ftfFfCfXŽ-ÊŽq,İ”z—ñ,Ö,İf|fCf“f^ B,½,Æ,,İ A,±  
,İfpf%of [f^,ªIID\_IDirect3DRMMeshBuilder,ÆIID\_IDirect3DRMAnimationSet,ðŠÜ,Ð”z—  
ñ,İ,Æ,« A,·,×,Ä,İfAfjf [fVf‡f“ EfZfbfg,Æf fbfVf... Efıf<f\_ [ EfIfufWfFfNfg,ªf [fh,³,è,é B*

*dwcGUIDs*

*lpplpGUIDs fpf%of [f^,ÄŽw'è,³,è,½”z—ñ,İ—v‘f ” B*

*d3drmLOFlags*

*f [fh EfIfvfVf‡f“,ðŽ!,·**D3DRMLOADOPTIONS**œ^,İ'l B*

*d3drmLoadProc*

*Žw'è,³,è,½fIfufWfFfNfg,ðfVfXfef€,ª“Ç,Ý o,·,Æ,«œÄ,Ñ o,³,è,é **AD3DRMLOADCALLBACK**  
fR [f<fofbfNŠÖ ” B*

*lpArgLP*

***D3DRMLOADCALLBACK** fR [f<fofbfNŠÖ ”,É“n,³,è,é AfAfvfŠfP [fVf‡f““è<,İff [f^ B*

*d3drmLoadTextureProc*

***D3DRMLOADTEXTURECALLBACK**fR [f<fofbfNŠÖ ” B,±,è,İ A“Á•Ê,ÊftfH [f}fbfg,ð•K—  
v,Æ,·,éIfufWfFfNfg,ª—p,¢,éfefNfXf`ff,ð“Ç,Ý o,·,Æ,«,ÉœÄ,Ñ o,³,è,é B,±  
,İfpf%of [f^,É,İNULL,ðŽw'è,·,é,±,Æ,ª,Ä,«,é B*

*lpArgLTP*

***D3DRMLOADTEXTURECALLBACK**fR [f<fofbfNŠÖ ”,É“n,³,è,é AfAfvfŠfP [fVf‡f““è<,İff [f^,İfAfhfœf  
X B*

*lpParentFrame*

*eftfœ [f€ B,±  
,İfpf%of [f^,İ îñ,İ ADirect3DRMAnimationSet,âDirect3DRMFramefIfufWfFfNfg,ª İ ¬,³,è,é,Æ,«,İ e,ÉNULL,  
ªŽw'è,³,è,é,½,ß A,±,İfpf%of [f^,İ A,±,è,ç,İIfufWfFfNfg,ðf [fh,·,é Ü,É—L—p,Ä, é B,±  
,İfpf%of [f^,É,İNULL,ðŽw'è,·,é,±,Æ,ª,Ä,«,é B*

## IDirect3DRM::LoadTexture

```
HRESULT LoadTexture(const char * lpFileName,  
    LPDIRECT3DRMTEXTURE* lpD3DRMTexture);
```

Žw'è,³,ê,½ftf@fCf<,©,çfefNfXf`ff,ðf [fh,·,é B,±,ìfefNfXf`ff,Í AfsfNfZf<“–  
,½,è8 A24 A,Ü,½,Í32frfbfg,ìfrfbfg ”,ðŽ ,Â,±,Æ,<sup>a</sup>,Â,«,é B,Ü,½ AfefNfXf`ff,ÍWindowsfrfbfgf}  
fbfv i.bmp j,©f| [f^fuf< EfsfNfXf}fbfv i.ppm jP6Ĉ`Ž®,ì,¢,,ê,©,Â,È,,Ä,Í,È,ç,È,¢ B

¬Ĉ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŬŽ f, [fh,Î•Ô'l v,ðŽQ Æ,·,é,±,Æ B

*lpFileName*

.bmp,Ü,½,Í.ppmftf@fCf<,l–¼‘O,ðŽw'è,·,é B

*lpD3DRMTexture*

ĈÄ,Ń o,μ,<sup>a</sup> ¬Ĉ÷,μ,½,Æ,«,É A—LĈø,ÈDirect3DRMTexturef|fCf“f^,Ö,Ìf|fCf“f^ B

**IDirect3DRM::LoadTextureFromResource**

```
HRESULT LoadTextureFromResource(HRSRC rs,
    LPDIRECT3DRMTEXTURE * lplpD3DRMTexture);
```

Žw'è,<sup>3</sup>,ê,½fŠf\ [fX,©,çfefNfXf`ff,ðf [fh,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ,"s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,l•Ô'l v,ðŽQ Æ,·,é,±,Æ B

rs

fŠf\ [fX,îfnf“fhf< B

lplpD3DRMTexture

ŒÄ,Ń o,µ,<sup>a</sup> ¬Œ÷,µ,½,Æ,«,É A—LŒø,ÈDirect3DRMTexturef|fCf“f^,Ö,îf|fCf“f^ B

**IDirect3DRM::SetDefaultTextureColors**

HRESULT SetDefaultTextureColors(DWORD dwColors);

Direct3DRMTextureIfufWfFfNfg,ĂŽg—p,<sup>3</sup>,ê,éfftfHf<fg,Ì F,đ Ý'è,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ,"s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ă,Í A uDirect3D•ŮŽ f, [fh,Ĵ•Ô'l v,đŽQ Æ,·,é,±,Æ B

dwColors  
F,Ì " B

,±  
,Ĵf f\fbfh,Í A**IDirect3DRM::CreateTexture**f f\fbfh,İ‘O,ÉŒĂ,Ň o,<sup>3</sup>,ê,½,Æ,«,É,Ì,ÝfefNfXf`ff,Ì F,É”½%of,<sup>3</sup>,ê,é B  
,·,Ă,É ĩ ¬,<sup>3</sup>,ê,½fefNfXf`ff,É‘Î,μ,Ă,ÍŒø%oÊ,<sup>a</sup>,Ê,¢ B

**IDirect3DRM::SetDefaultTextureShades**

HRESULT SetDefaultTextureShades(DWORD dwShades);

Direct3DRMTextureIfufWfFfNfg,ĀŽg—p,<sup>3</sup>,ê,éfftfHf<fg,ì%A%œ,đ Ý'è,·,é B  
¬Ĉ÷,·,é,ÆD3DRM\_OK AŽ,"s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ă,Í A uDirect3D•ŮŽ f, [fh,Ĵ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

dwShades  
%oA%œ,ì " B

,±  
,Ĵf f\fbfh,Í A**IDirect3DRM::CreateTexture**f f\fbfh,ì‘O,ÉĈĂ,Ň o,<sup>3</sup>,ê,½,Æ,«,É,ì,ÝfefNfXf`ff,ì%A%œ,É”½%of,<sup>3</sup>,ê,  
é B,·,Ă,É ì ¬,<sup>3</sup>,ê,½fefNfXf`ff,ÉÎ,μ,Ă,íĈø%ŎÊ,<sup>a</sup>,È,¢ B



## IDirect3DRM::SetSearchPath

HRESULT SetSearchPath(LPCSTR lpPath);

ftf@fCf⌘EŸ òfpfX,ð Ý'è,·,é B

¬E÷,·,é,ÆD3DRM\_OK AŽ, ”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ĵ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lpPath

EŸ òfpfX,Æ,μ,Ä Ý'è,·,éfpfX,ðŽ|,· ANULL,Â L,í,é•¶Žš—ñ B

ffftfHf<fg,ìEŸ òfpfX,ÍŠÂ«•Ĭ ”D3DPATH,Ì'l,©,çŽæ,è o,³,ê,é B,±,ÌŠÂ«•Ĭ ”,ª Ý'è,³,ê,Ä,¢  
,È,¢ ê ‡ ACEŸ òfpfX,Íó,É,È,é Bftf@fCf<,ðfI [fvf“,·,é,Æ,« AfVfXfef€  
,Í,Ü,,fJfEf“fgffBfEfNfgfŠ,ð'T,μ AŽŸ,ÉEŸ òfpfX'†,Ì,·,×,Ä,ìffBfEfNfgfŠ,ðf`fFfbfN,·,é B

ŽQ Æ @IDirect3DRM::GetSearchPath

**IDirect3DRM::Tick**

HRESULT Tick(D3DVALUE d3dvalTick);

Direct3DRM fVfXfef€ Efn [fgfr [fg,ð s,□ B,±,İf f\fbfh,ªĖÄ,Ñ o,³,ê,é,Æ A,·,×,Ä,İ%oÂ“@ftfĖ [f€ ,İÊ’u,ÍĖ» Ý,İ“® ì‘® «,É,µ,½,ª,Ä,Ä X V,³,ê AfV [f“,ªĖ» Ý,İfffofCfX,ÉfĖf“f\_Šf“fO,³,ê,é B,Ü,½ AŠÖ~A, µ,½fR [f<fofbfNŠÖ ”,ª“K Ø,Ê,Æ,«,ÉĖÄ,Ñ o,³,ê,é B,±,İf f\fbfh,Í AfĖf“f\_Šf“fO EftfCfNf<,ªŠ®—<sup>1</sup>,µ,½,Æ,«,É §ĖÄ,ð•Ô,· B

¬Ė÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [ ,ð•Ô,· B•Ô’l,İê——,É,Â,¢ ,Ä,Í A uDirect3D•ŬŽ f, [fh,İ•Ô’l v,ðŽQ Æ,·,é,±,Æ B

d3dvalTick

**IDirect3DRMFrame::SetRotation**,Æ**IDirect3DRMFrame::SetVelocity**f f\fbfh,İ¬“x,“,æ,Ñ%oñ“]fXfefbfv B

fV [f“,İfĖf“f\_Šf“fO,É \_“î «,ðŽ ,½,¹,é,½,ß A¼ Úf, [fh,İ¼,İf f\fbfh,ð—p,¢,Ä,± ,İf f\fbfh,ðfCf“fvfŠf f“fg,·,é,±,Æ,à,Ä,«,é B

## IDirect3DRMAnimation

*fAfVfŠfP [fVf‡f“,ÍIDirect3DRMAnimationfCf“f^ [ftfFfCfX,lf f\fbfh,ð—~—p,µ,Ä A^Ê'u AÆü,« AfrfWf... fAf< EfIfufWfFfNfg,lfXfP [fŠf“fO AÆððÆ¹ Afrf... [f] [fg,lfAfjf [fVf‡f“,ð s,ϱ,±,Æ,ª,Ä,«é B,± ,lfZfNfVf‡f“,Í AIDirect3DRMAnimationfCf“f^ [ftfFfCfX Ef f\fbfh,lfŠftf@fÆf“fX,Ä, ,é BŠT”O,É,Ä,¢ ,Ä,İŠT—v,Í A uIDirect3DRMAnimation,ÆIDirect3DRMAnimationSetfCf“f^ [ftfFfCfX v,ðŽQ Æ,·,é,±,Æ B*

**IDirect3DRMAnimationfCf“f^ [ftfFfCfX,lf f\fbfh,ÍÊ%º,İfOf< [fv,É•ª—p,·,é,±,Æ,ª,Ä,«é B**

**fL [** [AddPositionKey](#)  
[AddRotateKey](#)  
[AddScaleKey](#)  
[DeleteKey](#)

**,»,İ¼** [SetFrame](#)  
[SetTime](#)

**fIfvfVf‡f“** [GetOptions](#)  
[SetOptions](#)

**IDirect3DRMAnimationfCf“f^ [ftfFfCfX,Í A,·,×,Ä,İCOMfCf“f^ [ftfFfCfX,Æ“—**  
**l A[UnknownfCf“f^ [ftfFfCfX Ef f\fbfh,ðÆp ³,·,é BIUnknownfCf“f^ [ftfFfCfX,íŽŸ,ì,R,Â,lf f\fbfh,ðfTf|**  
**[fg,·,é B**

[AddRef](#)  
[QueryInterface](#)  
[Release](#)

**,³,ç,ÉIDirect3DRMAnimationfCf“f^ [ftfFfCfX,Í AIDirect3DRMObjectfCf“f^ [ftfFfCfX,©,çŽŸ,lf f\fbfh,ðÆp ³,·,é B**

[AddDestroyCallback](#)  
[Clone](#)  
[DeleteDestroyCallback](#)  
[GetAppData](#)  
[GetClassName](#)  
[GetName](#)  
[SetAppData](#)  
[SetName](#)

**Direct3DRMAnimationfIfufWfFfNfg,Í AIDirect3DRM::CreateAnimationf f\fbfh,ìÆÄ,Ñ o,µ,É,æ,Á,ÄŽæ“¾,Ä,«é B**

## IDirect3DRMAnimation::AddPositionKey

```
HRESULT AddPositionKey(D3DVALUE rvTime, D3DVALUE rvX,  
    D3DVALUE rvY, D3DVALUE rvZ);
```

*fAfjf* [fVf‡f“,ÉÊ’ufL [,ð%Á,|,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô’l,îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,l•Ô’l v,ðŽQ Œ,·,é,±,Œ B

*rvTime*

*fAfjf* [fVf‡f“,î’†,ÂÊ’ufL [,ð Ý’è,·,é,Œ,«,lŽžŠÔ B0,ðŒ“\_,Œ,·,é”C^Ó,î’P^Ê,lŽžŠÔ,ðŽw’è,·,é,±  
,Œ,ª,Â,«,é B ÂŒâ,lfL [,lrvTime,î’l,ª99,l,Œ,« ArvTime,ª49,Â, ,éfL [,ªfAfjf [fVf‡f“,l,ç,â,ª,Ç’†ŠÔ,Â, ,é B

*rvX, rvY, rvZ*

^Ê’u B

,±,lf f\fbfh,É,æ,Â,Ä^Ú“®•İŠ:,ª s,í,ê,é,æ,ª,É,È,é B•İŠ·,ðŠŮ,p s—ñŒvŽZ,É,Â,¢,Ä,Í A u3D•İŠ: v,ðŽQ Œ,·,é,±  
,Œ B

ŽQ Œ @IDirect3DRMAnimation::DeleteKey

**IDirect3DRMAnimation::AddRotateKey**

HRESULT AddRotateKey(D3DVALUE rvTime, D3DRMQUATERNION \*rqQuat);

fAfjf [fVf‡f“,É%ñ“]fL [,ð'Ç%Á,·,é B  
-Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŨŽ f, [fh,İ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

rvTime  
fAfjf [fVf‡f“,ì'†,Â%ñ“]fL [,ð Ý'è,·,é,Æ,«,ìŽžŠÔ B0,ðŠî € ,Æ,·,é”C`Ó,ì'P`Ê,ìŽžŠÔ,ðŽw'è,·,é,±  
,Æ,ª,Â,«,é B ÄĖă,ìfL [,ìrvTime,ì'l,ª99,ì,Æ,« ArvTime,ª49,Â, ,éfL [,ªfAfjf [fVf‡f“,ì,ç,â,²,Ç'+ŠÔ,Â, ,é B  
rqQuat  
%ñ“,ð•\,·4ŽŸŒ³ s—ñ B

,±,ìf f\fbfh,É,æ,Á,Ä A%ñ“]•İŠ·,ª“K—p,³,ê,é B•İŠ·,ðŠÜ,þ s—ñŒvŽZ,É,Â,¢,Ä,Í A u3D•İŠ· v,ðŽQ Æ,·,é,±,Æ B  
ŽQ Æ @IDirect3DRMAnimation::DeleteKey

## IDirect3DAnimation::AddScaleKey

HRESULT AddScaleKey(D3DVALUE rvTime, D3DVALUE rvX, D3DVALUE rvY,  
D3DVALUE rvZ);

fAfjf [fVf‡f“,ÉfXfP [f< EfL [,ð'Ç%Á,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,l•Ô'l v,ðŽQ Æ,·,é,±,Æ B

rvTime

fAfjf [fVf‡f“,î'†,ÄfXfP [f< EfL [,ð<L%¬,·,é,Æ,«,îŽžŠÔ B0,ðŒ  
‘“\_,Æ,·,é”C^Ó,î'P^Ê,îŽžŠÔ,ðŽw'è,Ä,«,é B ÄŒã,îfL [,îrvTime,î'l,ª99,î,Æ,« ArvTime,ª49,Ä, ,éfL [,ªfAfjf [fV  
f‡f“,î,ç,â,¤,Ç'†ŠÔ,Ä, ,é B

rvX, rvY, rvZ

kŽÚŒW ” B.

,±,îf f\fbfh,É,æ,Ä,Ä A kŽÚ•İŠ,ª“K—p,³,ê,é B•İŠ,ðŠÜ,Ð s—ñŒvŽZ,É,Â,¢,Ä,Í A u3D•İŠ v,ðŽQ Æ,·,é,±  
,Æ B

ŽQ Æ @IDirect3DAnimation::DeleteKey

**IDirect3DRMAnimation::DeleteKey**

HRESULT DeleteKey(D3DVALUE rvTime);

fL [,ðfAfjf [fVf‡f“,©,ç í æ,·,é B  
¬Æ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ĵ•Ó'l v,ðŽQ Æ,·,é,±,Æ B  
rvTime  
fAfjf [fVf‡f“,©,ç í æ,³,ê,éfL [,ðŽ¯•Ê,·,éŽžŠÔ B

**IDirect3DRMAnimation::GetOptions**

D3DRMANIMATIONOPTIONS GetOptions();

fAfjf [fVf‡f“ EfIfvfVf‡f“,ǫŽæ“¾,·,é B  
fAfjf [fVf‡f“ EfIfvfVf‡f“,ǫŽ!,·D3DRMANIMATIONOPTIONSŒ^,İ'l,ǫ•Ô,· B

ŽQ Æ @IDirect3DRMAnimation::SetOptions



**IDirect3DRMAnimation::SetFrame**

HRESULT SetFrame(LPDIRECT3DRMFRAME lpD3DRMFrame);

fAfjf [fVf‡f“,ÉftfŒ [f€,ð Ý’è,·,é B  
¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô’l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,İ•Ô’l v,ðŽQ Æ,·,é,±,Æ B  
lpD3DRMFrame  
fAfjf [fVf‡f“,É Ý’è,·,éftfŒ [f€,ðŽw’è,·,é•İ ”,ÌfAfhfŒfX B

## IDirect3DRMAnimation::SetOptions

```
HRESULT SetOptions(D3DRMANIMATIONOPTIONS d3drmanimFlags);
```

*fAfjf* [fVf‡f“ EfIfvfVf‡f“,đ Ý’è,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,đ•Ô,· B•Ô’l,Îê——,É,Â,¢  
,Ä,Î A uDirect3D•ŮŽ f, [fh,Ĵ•Ô’l v,đŽQ Æ,·,é,±,Æ B

*d3drmanimFlags*

*fAfjf* [fVf‡f“ EfIfvfVf‡f“Žw’è,·,éD3DRMANIMATIONOPTIONSŒ^,Î’l,ÎfAfhfŒfX B

ŽQ Æ @IDirect3DRMAnimation::GetOptions

**IDirect3DRMAnimation::SetTime**

HRESULT SetTime(D3DVALUE rvTime);

fAfjf [fVf‡f“,ÉŒ» Ý,ìŽžŠŒ,ð Ý’è,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô’l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŨŽ f, [fh,Î•Ô’l v,ðŽQ Æ,·,é,±,Æ B

rvTime

fAfjf [fVf‡f“,É Ý’è,·,é V,µ,ŒŒ» Ý,ìŽžŠŒ B0,ðŒ“\_,Æ,·,é”C^Ó,Ì’P^Ê,ìŽžŠŒ,ðŽw’è,·,é,±  
,Æ,ª,Â,«,é B ÄŒã,ìfL [,ÌrvTime,Ì’l,ª99,ì,Æ,« ArvTime,ª49,Â, ,éfL [,ªfAfjf [fVf‡f“,Ì,ç,å,²,Ç’+ŠŒ,Â, ,é B

## IDirect3DRMAnimationSet

$fAfvf\check{S}fP\ [fvf\neq f^{\wedge},\acute{I}\ ADirect3DRMAnimationIfufWfFfNfg,\delta fOf<\ [fv\%o\rangle,\cdot,\acute{e},\frac{1}{2},\beta,\acute{E}IDirect3DRMAnimationSetfCf^{\wedge}\ [ftfFfCfX,\grave{I}f\ f\backslash bfh,\delta\check{Z}g\text{---}p,\cdot,\acute{e},\pm,\mathcal{A},^a,\grave{A},\langle,\acute{e}\ B,\pm,\grave{I}fCf^{\wedge}\ [ftfFfCfX,\acute{E},\ae,\grave{A},\grave{A}\cdot;\check{Z}G,\acute{E}fA\grave{f}j\grave{f}\ [fvf\neq f^{\wedge},\grave{I}\text{---}\neg,\acute{e},\delta\ \grave{A}\ \P,\cdot,\acute{e},\pm,\mathcal{A},^a\check{S}\acute{E}'P,\acute{E},\acute{E},\acute{e}\ B,\pm,\grave{I}fZfNfVf\neq f^{\wedge},\acute{I}\ AIDirect3DRMAnimationSetfCf^{\wedge}\ [ftfFfCfX\ Ef\ f\backslash bfh,\grave{I}f\check{S}ftf@f\mathbb{E}f^{\wedge}fX,\grave{A},\cdot,\acute{e}\ B\check{S}T^{\circ}O,\acute{E},\grave{A},\mathfrak{C},\grave{A},\grave{I}\check{S}T\text{---}v,\acute{I}\ A\ uIDirect3DRMAnimation,\mathcal{A}IDirect3DRMAnimationSetfCf^{\wedge}\ [ftfFfCfX\ v,\delta\check{Z}Q\ \mathcal{A},\cdot,\acute{e},\pm,\mathcal{A}\ B$

$IDirect3DRMAnimationSetfCf^{\wedge}\ [ftfFfCfX,\grave{I}f\ f\backslash bfh,\acute{I}\ A^{\wedge}\acute{E}\%o^{\circ},\grave{I}fOf<\ [fv,\acute{E}\cdot^a\text{---}p,\cdot,\acute{e},\pm,\mathcal{A},^a,\grave{A},\langle,\acute{e}\ B$

$\cdot\zeta\%o\acute{A}\ Af\ [fh\ A\ \underline{AddAnimation}$   
 $\acute{I}\ \mathfrak{e}$

DeleteAnimation

Load

$\check{Z}\check{z}\check{S}\acute{O}\ \underline{SetTime}$

$IDirect3DRMAnimationSetfCf^{\wedge}\ [ftfFfCfX,\acute{I}\ A,\cdot,\times,\grave{A},\grave{I}COMfCf^{\wedge}\ [ftfFfCfX,\mathcal{A}^{\wedge}\text{---}\l\ A\underline{Unknown}fCf^{\wedge}\ [ftfFfCfX\ Ef\ f\backslash bfh,\delta\mathbb{E}p\ ^3,\cdot,\acute{e}\ BIUnknownfCf^{\wedge}\ [ftfFfCfX,\acute{I}\check{Z}\check{Y},\grave{I},R,\grave{A},\grave{I}f\ f\backslash bfh,\delta fTf|\ [fg,\cdot,\acute{e}\ B$

AddRef

QueryInterface

Release

$,^3,\zeta,\acute{E}\ AIDirect3DRMAnimationSetfCf^{\wedge}\ [ftfFfCfX,\acute{I}\ A\underline{Direct3DRMObject}fCf^{\wedge}\ [ftfFfCfX,\odot,\zeta\check{Z}\check{Y},\grave{I}f\ f\backslash bfh,\delta\mathbb{E}p\ ^3,\cdot,\acute{e}\ B$

AddDestroyCallback

Clone

DeleteDestroyCallback

GetAppData

GetClassName

GetName

SetAppData

SetName

$Direct3DRMAnimationSetfIfufWfFfNfg,\acute{I}\ A\underline{IDirect3DRM::CreateAnimationSetf}\ f\backslash bfh,\grave{I}\mathbb{E}\grave{A},\check{N}\ o,\mu,\acute{E},\ae,\grave{A},\grave{A}\check{Z}\ae^{\circ}\frac{3}{4},\grave{A},\langle,\acute{e}\ B$

**IDirect3DRMAnimationSet::AddAnimation**

HRESULT AddAnimation(LPDIRECT3DRMANIMATION lpD3DRMAnimation);

fAfjf [fVf‡f“ ,ðfAfjf [fVf‡f“ EfZfbfg,É'Ç%Á,·,é B  
¬Œ÷,·,é,ÆD3DRM\_OK AŽ, ”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ĵ•Ô'l v,ðŽQ Æ,·,é,±,Æ B  
lpD3DRMAnimation  
fAfjf [fVf‡f“ EfZfbfg,É'Ç%Á,·,éDirect3DRMAnimationIfufWfFfNfg B

**IDirect3DRMAnimationSet::DeleteAnimation**

HRESULT DeleteAnimation(LPDIRECT3DRMANIMATION lpD3DRMAnimation);

fAfjf [fVf‡f“,đfAfjf [fVf‡f“ EfZfbfg,©,ç í œ,·,é B  
¬œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ĵ•Ô'l v,đŽQ Æ,·,é,±,Æ B  
lpD3DRMAnimation  
fAfjf [fVf‡f“ EfZfbfg,©,ç í œ,<sup>3</sup>,ê,éDirect3DRMAnimationIfufWfFfNfg B

## IDirect3DRMAnimationSet::Load

```
HRESULT Load(LPVOID lpvObjSource, LPVOID lpvObjID,
             D3DRMLOADOPTIONS d3drmLOFlags,
             D3DRMLOADTEXTURECALLBACK d3drmLoadTextureProc, LPVOID lpArgLTP,
             LPDIRECT3DRMFRAME lpParentFrame);
```

fAfjf [fVf‡f“ EfZfbfg,ðf [fh,·,é B  
¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf% [,ð•Ô,· B•Ô'l,Îê——,É,Â,Œ  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Î•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lpvObjSource  
fIfufWfFfNfg,ªf [fh,³,ê,éf\ [fX,Ö,Îf|  
fCf“f^ Bd3drmLOFlagsfpf%of [f^,ªŽ',·f\ [fX Eftf%ofO,É,æ,Á,Ä Aftf@fCf< AfŠf\ [fX Af f,fŠ Efuf  
fbfN A,Ü,½,ÎfXfgfŠ [f€,ðŽw'è,·,é B

lpvObjID  
f [fh,·,éIfufWfFfNfg,Î¼'O,Ü,½,ÎÊ'u,Ö,Îf|fCf“f^ B,±  
,Îpf%of [f^,Í Ad3drmLOFlagsfpf%of [f^,ªŽ',·Ž̄•ÊŽqftf%ofO,É,æ,Á,Ä%ðŽB,³,ê,é BD3DRMLOAD\_BYPOSI  
TIONftf%ofO,ðŽw'è,µ,½ ê ‡ A,±,Îpf%of [f^,Í Aftf@fCf<,Î†,ÎIfufWfFfNfg,Î ‡ ~,ðŽ',•DWORD'l,Ö,Îf|  
fCf“f^,Ä,·,é B,±,Îpf%of [f^,É,ÎNULL,ðŽw'è,·,é,±,Æ,à,Ä,«,é B

d3drmLOFlags  
f [fh EfIfvfVf‡f“,ðŽ',•D3DRMLOADOPTIONSŒ^,Î'l B

d3drmLoadTextureProc  
D3DRMLOADTEXTURECALLBACKfR [f<fofbfNŠÖ ” B,±,ê,Í A“Á•Ê,ÈftfH [f}fbfg,ð•K—  
v,Æ,·,éIfufWfFfNfg,ª—p,Œ,éfefNfXf`ff,ð“Ç,Ý o,·,Æ,«,ÉŒÄ,Ñ o,³,ê,é B,±  
,Îpf%of [f^,É,ÎNULL,ðŽw'è,·,é,±,Æ,ª,Ä,«,é B

lpArgLTP  
D3DRMLOADTEXTURECALLBACKfR [f<fofbfNŠÖ ”,É“n,³,ê,é AfAfvfŠfP [fVf‡f““è<,Îff [f^ B

lpParentFrame  
eftfŒ [f€,ÎfAfhfŒfX B,±,Îpf%of [f^,Í AfAfjf [fVf‡f“fZfbfg,ÎftfŒ [f€,ª A eftfŒ [f€,  
,ðNULL,Æ,µ,Ä ì ¬,³,ê,Ä,µ,Ü,ª,Ä,±,Æ,ð-hŽ~,·,é B

ffftfHf<fg,Ä,Í A,±,Îf f\fbfh,ÎlpvObjSourcefpf%of [f^,ÄŽw'è,³,ê,éftf@fCf<,Ì Ä %  
,ÎfAfjf [fVf‡f“ EfZfbfg,ðf [fh,·,é B

**IDirect3DRMAnimationSet::SetTime**

HRESULT SetTime(D3DVALUE rvTime);

fAfjf [fVf‡f“,ìŒ» Ý,ÌŽžŠÔ,ð Ý'è,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ,˝s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ĵ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

rvTime  
V,µ,¢ŽžŠÔ



## IDirect3DRMDevice

*fAfvfŠfP [fvf±f“,Æ o—ÍffofCfX,Ì‘ŠŒÝ’Ê M,Ì,½,B,ÉIDirect3DRMDevicefCf“f^ [ftFfCfX,Ìf f\fbfh,ðŽg—  
p,·,é B,±,İfZfNfVf±f“,Í AIDirect3DRMDevicefCf“f^ [ftFfCfX Ef f\fbfh,İfŠftf@fŒf“fX,Â, ,é BŠT”O,Ê,Â,¢  
,Â,İŠT—v,Í A uIDirect3DRMDevice,ÆIDirect3DRMDeviceArrayfCf“f^ [ftFfCfX v,ðŽQ Æ,·,é,±,Æ B*

*IDirect3DRMDevicefCf“f^ [ftFfCfX Ef f\fbfh,Í A^È%°,ÌfOf< [fv,É•ª—D,·,é,±,Æ,ª,Â,«,é B*

*fofbftf@ EfJfEf“fg* GetBufferCount  
SetBufferCount

*fJf%o [ Ef,ff<* GetColorModel

*ffBfUfŠf“fO* GetDither  
SetDither

*%oŠú%o»* Init  
InitFromClipper  
InitFromD3D

*,»,İ¼* GetDirect3DDevice  
GetHeight  
GetTrianglesDrawn  
GetViewports  
GetWidth  
GetWireframeOptions  
Update

*’Ê’m* AddUpdateCallback  
DeleteUpdateCallback

*fŒf“f\_fŠf“fO,İ•iŽ¿* GetQuality  
SetQuality

*%oA%oe* GetShades  
SetShades

*fefNfXf`ff,İ•iŽ¿* GetTextureQuality  
SetTextureQuality

*IDirect3DRMDevicefCf“f^ [ftFfCfX,Í A,·,×,Ä,ÌCOMfCf“f^ [ftFfCfX,Æ“—  
l AIDirect3DRMDevicefCf“f^ [ftFfCfX Ef f\fbfh,ðŒp ³,·,é BIUnknownfCf“f^ [ftFfCfX,ÍŽŸ,Ì,R,Â,Ìf f\fbfh,ðfTf|  
[fg,·,é B*

AddRef

QueryInterface

Release

*,³,ç,É AIDirect3DRMDevicefCf“f^ [ftFfCfX,Í AIDirect3DRMObjectfCf“f^ [ftFfCfX,©,çŽŸ,Ìf f\fbfh,ðŒp ³,·,  
é B*

AddDestroyCallback

Clone

DeleteDestroyCallback

GetAppData

GetClassName

GetName

SetAppData

SetName

Direct3DRMDeviceIfuFWfFNg,Í AIDirect3DRM::CreateDevicef f\bfh,ÌEÄ,Ñ o,μ,É,æ,Á,Žæ“¾,³,ê,é B

## IDirect3DRMDevice::AddUpdateCallback

HRESULT AddUpdateCallback(D3DRMUPDATECALLBACK d3drmUpdateProc, LPVOID arg);

fffofCfX,ªİ X,³,ê,½,Æ,«ÉfAfvfŠfP [fVf‡f“,É’Ê’m,·,éfR [f<fofbfNŠÖ ”,ð’Ç%oÁ,·,é BfAfvfŠfP [fVf‡f“,ª**IDirect3DRMDevice::Update**,ðŒÄ,Ñ o,·,Æ AfVfXfe€İ,±,İfR [f<fofbfNŠÖ ”,ðŒÄ,Ñ o,· B

–Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô’l,İê——,É,Â,¢  
,Ä,İ A uDirect3D•ŮŽ f, [fh,l•Ô’l v,ðŽQ Æ,·,é,±,Æ B

d3drmUpdateProc

fAfvfŠfP [fVf‡f““èˆ,İ**D3DRMUPDATECALLBACK**fR [f<fofbfNŠÖ ”,İfAfhfŒfX B

arg

X VfR [f<fofbfNŠÖ ”,É“n,³,ê,éfAfvfŠfP [fVf‡f““èˆ,İff [f^ B

ŽQ Æ @**IDirect3DRMDevice::DeleteUpdateCallback**, **IDirect3DRMDevice::Update**, **D3DRMUPDATECALLBACK**

## IDirect3DRMDevice::DeleteUpdateCallback

HRESULT DeleteUpdateCallback(D3DRMUPDATECALLBACK d3drmUpdateProc,  
LPVOID arg);

**IDirect3DRMDevice::AddUpdateCallback** f\fbfh,É,æ,Á,Ä'Ç%Á,<sup>3</sup>ê,½ X VfR [f<fofbfNŠÖ ",ð í æ,·,é B  
-Æ÷,·,é,ÆD3DRM\_OK AŽ,"s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,l•Ô'l v,ðŽQ Æ,·,é,±,Æ B

d3drmUpdateProc

fAfvfŠfP [fVf±f““è^,ìD3DRMUPDATECALLBACKfR [f<fofbfNŠÖ ",ìfAfhfÆfX B

arg

X VfR [f<fofbfNŠÖ ",É“n,<sup>3</sup>ê,éfvf%oCfx [fg,Èff [f^ B

ŽQ Æ @IDirect3DRMDevice::AddUpdateCallback, IDirect3DRMDevice::Update, D3DRMUPDATECALLBACK

**IDirect3DRMDevice::GetBufferCount**

DWORD GetBufferCount();

**IDirect3DRMDevice::SetBufferCount***f\fbfh,É,æ,Á,Ä Ý'è,<sup>3</sup>ê,½'l,ðŽæ“¾,·,é B*

*f ofbftf@,Ì ”,ð•Ô,· B1,ÍfVf“fOf< E f ofbftf@ A2,Í2 d f ofbftf@ A^È%º3 d A4 d,Æ,È,é B*

**IDirect3DRMDevice::GetColorModel**

D3DCOLORMODEL GetColorModel();

fffofCfX,lfJf%o [ Ef,fff< ,đŽæ“¾,·,é B

Direct3D fJf%o [ Ef,fff< iRGB , ,é,¢,Íf,fmfNf j,đŽ!,· **D3DCOLORMODEL**—ñ<“Œ^,©,ç'l,ð•Ô,· B

ŽQ Æ @fJf%o[ Ef,fff<

**IDirect3DRMDevice::GetDirect3DDevice**

HRESULT GetDirect3DDevice(LPDIRECT3DDEVICE \* lpD3DDevice);

¼ Úf, [fh,ÏffofCfX,Ö,Ï|fCf“f^,ðŽæ“¾,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŨŽ f, [fh,Î•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lpD3DDevice

¼ Úf, [fh,ÏffofCfX EflfufWfFfNfg,Ö,Ï|fCf“f^,Ä %Šú%o»,³,ê,éf|fCf“f^,ÏfAfhfŒfX B

**IDirect3DRMDevice::GetDither**

BOOL GetDither();

ffofCfX,łffBfU Eft%fO,đŽæ“¾,·,é B

ffBfU Eft%fO,ªfZfbfg,<sup>3</sup>,ê,Ä,¢,é ê ‡,ÍTRUE A,»,␣,Â,È,¢,Æ,«,ÍFALSE,ð•Ô,· B

ŽQ Æ @IDirect3DRMDevice::SetDither



**IDirect3DRMDevice::GetHeight**

DWORD GetHeight ( ) ;

*ffofCfX,ì ,,<sup>3</sup>,ðfsfNfZf<’P^Ê,ÃŽæ“¾,·,é B*  
*,,<sup>3</sup>,ð•Ô,· B*

**IDirect3DRMDevice::GetTrianglesDrawn**

DWORD GetTrianglesDrawn();

fffofCfX,ì ì -ŽŽ,©,çfffofCfX,É•`,©,ê,½f|fŠfSf“,ì ”,ðŽæ“¾,·,é B  
f|fŠfSf“,ì ”,ð•Ô,· B

f|fŠfSf“,ì ”,É,Í A%B-Ê Á<Ž,³,ê,½,à,ì,àŠÜ,Ü,ê,é Bfrf... [f| [fg,ìŠO‘ϣ,É”z’u,³,ê,½,½,ß,É-³Ž<,³,ê,½f|  
fŠfSf“,ì ”,íŠÜ,Ü,ê,Ä,¢,È,¢ B

**IDirect3DRMDevice::GetQuality**

D3DRMRENDERQUALITY GetQuality();

fffofCfX,lfŒf“f\_fŠf“fO•iŽč,đŽæ“¾,·,é B

D3DRMRENDERQUALITYŒ^,ĂŽ',³,ê,é—ñ<“Œ^f f“fo,ì,D,Æ,Â^È ã,đ•Ô,· B

ŽQ Æ @IDirect3DRMDevice::SetQuality

**IDirect3DRMDevice::GetShades**

DWORD GetShades ( ) ;

%oA%oe,ì ”,đŽæ“¾,·,é B,±,ì ”,Í AŽg—p,<sup>3</sup>,ê,Ä,¢,é F ”,Ä•\Œ»,<sup>3</sup>,ê,é B  
%oA%oe,ì ”,đ•Ô,· B

ŽQ Æ @IDirect3DRMDevice::SetShades

## **IDirect3DRMDevice::GetTextureQuality**

D3DRMTEXTUREQUALITY GetTextureQuality();

fffofCfX,ìŒ» Ý,ìfefNfXf`ff•iŽčfpf%of [f^,đŽæ“¾,·,é BfefNfXf`ff,ì•iŽč,í ARGBfffofCfX,É,ì,Ý“K—  
p,<sup>3</sup>,ê,é B

**D3DRMTEXTUREQUALITY**—ñ“Œ^f f“fo,ì,Đ,Æ,Â,đ•Ô,· B

ŽQ Æ @**IDirect3DRMDevice::SetTextureQuality**

**IDirect3DRMDevice::GetViewports**

HRESULT GetViewports(LPDIRECT3DRMVIEWPORTARRAY\* lplpViewports);

fffofCfX,̀lfrf... [f| [fg,đŽ|,· Direct3DRMViewportArrayIfufWfFfNfg,đ \`z,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ,˝s,·,é,ÆfGf%o [ ,đ•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŨŽ f, [fh,İ•Ô'l v,đŽQ Æ,·,é,±,Æ B

lplpViewports  
ŒÄ,Ñ o,µ,a ¬Œ÷,µ,½,Æ,«,É A—LŒø,ÈDirect3DRMViewportArrayIfufWfFfNfg,Ä,“ü,éf|fCf“f^,Ö,Ìf|  
fCf“f^ B

**IDirect3DRMDevice::GetWidth**

DWORD GetWidth();

fffofCfX,ì• ,ðfsfNfZfç,ÅŽæ“¾,·é B,±,lf f\fbfh,í•Ö—~,ÈŠÖ ”,Å, ,é B

- ,ð•Ô,· B

**IDirect3DRMDevice::GetWireframeOptions**

DWORD GetWireframeOptions();

Žw'è,<sup>3</sup>,ê,½fffoCfX,lf fCf,, [ftfŒ [f€ EfIfvfVf‡f“,ðŽæ“¾,·,é B

ˆÈ%°,İ'l,İfrfbfg**OR**,<sup>a</sup>•Ô,<sup>3</sup>,ê,é B

D3DRMWIREFRAME\_CULL  
—-Ê,İftfŒ [f€,Í•`%œ,<sup>3</sup>,ê,È,¢ B

**D3DRMWIREFRAME\_HIDDENLINE**  
f fCf,, [ftfŒ [f€  
,ÅfŒf“f\_fŠf“fO,<sup>3</sup>,ê,½ ü,<sup>a</sup> A‘O-  
Ê,İfIfufWfFfNfg,É,æ,Á,Ä%B,<sup>3</sup>,ê,é B



## IDirect3DRMDevice::Init

```
HRESULT Init(ULONG width, ULONG height);
```

Windows ã,É,ÍŽÀ‘•,³,ê,Ä,¢,È,¢ B

## IDirect3DRMDevice::InitFromClipper

```
HRESULT InitFromClipper(LPDIRECTDRAWCLIPPER lpDDClipper,  
    LPGUID lpGUID, int width, int height);
```

Žw'è,³,ê,½ DirectDrawClipperIfufWfFfNfg,©,çffofCfX,ð %Šú%»,,é B

¬Œ÷,,é,ÆD3DRM\_OK AŽ,"s,,é,ÆfGf% [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,l•Ô'l v,ðŽQ Æ,,é,±,Æ B

lpDDClipper

%Šú%»ff [f^,Æ,μ,Ä—p,¢,ç,ê,éDirectDrawClipperIfufWfFfNfg,ÌfAfhfŒfX B

lpGUID

fCf“f^ [ftfFfCfXŽ¯•ÊŽq,Æ,μ,ÄŽg—p,³,ê,éfOf [fof< Ef†fj [fNŽ¯•ÊŽq iGUID j B

width, height

fffofCfX,Ì• ,Æ ,,³ B

## IDirect3DRMDevice::InitFromD3D

```
HRESULT InitFromD3D(LPDIRECT3D lpD3D, LPDIRECT3DDEVICE lpD3DDevice);
```

Direct3D'¼ Úf, [fh EfIfufWfFfNfg,Æ'¼ Úf, [fh EfffofCfX,ðŽw'è,µ,Ä A'¼ Úf, [fh EfffofCfX,ð %Šú%»;,é B

¬Æ÷,·,é,ÆD3DRM\_OK AŽ,»s,·,é,ÆfGf% [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,l•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lpD3D

•ŮŽ f, [fh EfffofCfX,ð %Šú%»;,·,é,½,ß,ÉŽg,□Direct3'¼ Úf, [fh EfIfufWfFfNfg,Ö,Ìf|fCf“f^ B

lpD3DIMDev

•ŮŽ f, [fh EfffofCfX,ð %Šú%»;,·,é,½,ß,ÉŽg,□'¼ Úf, [fh EfffofCfX B

## IDirect3DRMDevice::SetBufferCount

HRESULT SetBufferCount(DWORD dwCount);

fAfvfŠfP [fVf‡f“,É,æ,Á,ÄŒ» ÝŽg—p,³,ê,Ä,¢,éfofbftf@,Ì ”,đ Ý’è,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ, ”s,·,é,ÆfGf%o [,đ•Ô,· B•Ô’l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ĵ•Ô’l v,đŽQ Œ,·,é,±,Œ B

dwCount

fofbftf@,Ì ”,đŽw’è,·,é B1,ÍfVf“fOf< Efofbftf@ A2,Í2 dfofbftf@ A^È%º3 d A4 d,Œ,È,é B BfftfHf<f  
g,Í1,Ä, ,è AfVf“fOf< Efofbftf@ EfEfBf“fhfE,Ì ^— ,đ s,▯ B

2 dfofbftf@,â3 dfofbftf@,đŽg—p,·,éfAfvfŠfP [fVf‡f“,Í AfVfXfef€,ªŽg—p’†,Ìfofbftf@,Ì ”,đ’Ê’m,·,é,½,ß,±  
,Ìf ffbfh,đŽg—p,µ,È,,Ä,Í,È,ç,È,¢ B,±,ê,É,æ,Ä,ÄfVfXfef€,Í AŠeftfŒ [f€,É,Â,¢  
,ÄfNfŠfA,“,æ,Ň X V,·,×,«fEfBf“fhfE,Ì ”,đŒvŽZ,·,é,±,Œ,ª,Ä,«,é B

ŽQ Œ @IDirect3DRMDevice::GetBufferCount

## IDirect3DRMDevice::SetDither

HRESULT SetDither(BOOL bDither);

fffofCfX,łffBfU Eftf%O,đ Ý'è,.,é B

¬Œ÷,.,é,ÆD3DRM\_OK AŽ,"s,.,é,ÆfGf% [,đ•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,İ•Ô'l v,đŽQ Æ,.,é,±,Æ B

bDither

fffofCfX,Ì V,µ,¢ffBfU Ef, [fh BfftfHf<fg,ÍTRUE,Ä,.,é B

ŽQ Æ @IDirect3DRMDevice::GetDither

**IDirect3DRMDevice::SetQuality**

HRESULT SetQuality (D3DRMRENDERQUALITY rqQuality);

fffofCfX,lfŒf“f\_fŠf“fO•iŽç,ð Ý’è,·,é B  
¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô’l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŨŽ f, [fh,İ•Ô’l v,ðŽQ Æ,·,é,±,Æ B

rqQuality  
D3DRMRENDERQUALITYŒ^,É,æ,Á,Ä•\,³,ê,é—ñ“Œ^f f“fo BffftfHf<fg,Ì Ý’è,ÍD3DRMRENDER\_FLAT,Â, ,é  
B

fŒf“f\_fŠf“fO•iŽç,Í AfffofCfX,lfŒf“f\_fŠf“fO EfT [ftfFfX ã,ÄŽÀ s,³,ê,éfŒf“f\_fŠf“fO,Ì•iŽç,Ì Ä’â’l,Â, ,é B  
Šef fbfVf...,Í“ÆŽ©,Ì•iŽç,ðŽ ,Ä,ª Af fbfVf...,É—LŒø,È Ä ,•iŽç,Æ,Í AfffofCfX,É—LŒø,È•iŽç,Æ“¬,Ä, ,é  
B^Ü,È,Ä,½fffofCfX,É,Í A^Ü,È,Ä,½•iŽç,ðŽw’è,·,é,±,Æ,ª,Ä,«é B,½,Æ,!,Í AfvfŒftrf...  
[Ì,½,B,lfffofCfX,Îê”Ê,É•iŽç,ªá,¢,ª A Ä I“I,È•Ž’,É—p,¢,ç,ê,éfffofCfX,Í A,à,Á,Æ ,,¢•iŽç,Ì,à,Ì,Ä, ,é B

ŽQ Æ @IDirect3DRMDevice::GetQuality

## IDirect3DRMDevice::SetShades

HRESULT SetShades(DWORD ulShades);

%oA%oe,ì“x Ꝥ,¢,ð Ý'è,·,é B,±,ì ”,Í AŽg—p,<sup>3</sup>,ê,Ä,¢,é F ”,Â•\Œ»,<sup>3</sup>,ê,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŨŽ f, [fh,î•Ô'l v,ðŽQ Æ,·,é,±,Æ B

ulShades

V,µ,¢%oA%oe,ì“x Ꝥ,¢ B,±,ìfpf%of [f^,Í2,ì—Ý æ,Ä,È,,Ä,Í,È,ç,È,¢ BffftfHf⟨fg,Í32,Ä, ,é B

ŽQ Æ @IDirect3DRMDevice::GetShades

**IDirect3DRMDevice::SetTextureQuality**

HRESULT SetTextureQuality(D3DRMTEXTUREQUALITY tqTextureQuality);

fffofCfX,lfefNfXf`ff•iŽč,đ Ý'è,•,é B

¬Œ÷,•,é,ÆD3DRM\_OK AŽ,„s,•,é,ÆfGf%o [,đ•Ô,• B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,İ•Ô'l v,đŽQ Æ,•,é,±,Æ B

tqTextureQuality  
D3DRMTEXTUREQUALITY—ñ“Œ^,İf f“fo,İ,Đ,Æ,Â BffftfHf<fg,ÍD3DRMTEXTURE\_NEAREST,Ä, ,é B

ŽQ Æ @IDirect3DRMDevice::GetTextureQuality



## IDirect3DRMDevice::Update

HRESULT Update();

ffBfXfvfC,ÉfCf“f\_Šf“fO,<sup>3</sup>,½fCf [fW,đ•i »,.é B,Ŭ,½ AfffofCfX Ehf%oCfo,Éfn [fgfr [fgŠÖ ”,đ  
'ñ<Ÿ,.é B

¬C÷,.é,ÆD3DRM\_OK AŽ,”s,.é,ÆfGf%o [ ,đ•Ô.· B•Ô'l,İê——,É,Â,¢  
,Ä,Í A uDirect3D•ŬŽ f, [fh,İ•Ô'l v,đŽQ Æ,.é,±,Æ B

,±,İf f\fbfh,ªCÄ,Ň o,<sup>3</sup>,ê,é,½,Ň,É AfVfXfef€  
,ÍAfvfŠfP [fVf‡f““è`,İD3DRMUPDATECALLBACKfR [f<fofbfNŠÖ ”,đCÄ,Ň o,· BfR [f<fofbfNŠÖ ”,đ’Ç  
%oÁ,.é,É,Í AIDirect3DRMDevice::AddUpdateCallbackf f\fbfh,đŽg—p,.é B

ŽQ Æ @IDirect3DRMDevice::AddUpdateCallback, D3DRMUPDATECALLBACK

## IDirect3DRMFace

fAfVfŠfP [fVf‡f“f Af fbfVf... ã, Ì, Ð, Æ, Â, Ìf|fŠfSf“, ÆŒÝ, ¢  
, É, â, èŽæ, è, ·, é, ½, ß, ÉIDirect3DRMFacefCf“f^ [ftfFfCfX, Ìf f\fbfh, ðŽg—p, ·, é B, ±  
, ÌfZfNfVf‡f“f, Í AIDirect3DRMFacefCf“f^ [ftfFfCfX Ef f\fbfh, ÌfŠftf@fŒf“fX, Â, , é BŠT”O, É, Â, ¢, Ä, ÌŠT—  
v, Í AIDirect3DRMFace, ÆIDirect3DRMFaceArrayfCf“f^ [ftfFfCfX, ðŽQ Æ, ·, é, ±, Æ B

IDirect3DRMFacefCf“f^ [ftfFfCfX Ef f\fbfh, Í A`È%°, ÌfOf< [fv, É•ª—p, ·, é, ±, Æ,ª, Â, «, é B

F                    GetColor  
                     SetColor  
                     SetColorRGB

f}fefŠfAf<        GetMaterial  
                     SetMaterial

fefNfXf`ff        GetTexture  
                     GetTextureCoordinateIndex  
                     GetTextureCoordinates  
                     GetTextureTopology  
                     SetTexture  
                     SetTextureCoordinates  
                     SetTextureTopology

, “, –, Æ–@ ü     AddVertex  
                     AddVertexAndNormalIndexed  
                     GetNormal  
                     GetVertex  
                     GetVertexCount  
                     GetVertexIndex  
                     GetVertices

IDirect3DRMFacefCf“f^ [ftfFfCfX, Í A, ·, ×, Ä, ÌCOMfCf“f^ [ftfFfCfX, Æ“—  
l A[UnknownfCf“f^ [ftfFfCfX Ef f\fbfh, ðŒp³, ·, é BIUnknownfCf“f^ [ftfFfCfX, ÍŽŸ, Ì, R, Â, Ìf f\fbfh, ðfTf|  
[fg, ·, é B

AddRef

QueryInterface

Release

,³, ç, É AIDirect3DRMFacefCf“f^ [ftfFfCfX, Í AIDirect3DRMObjectfCf“f^ [ftfFfCfX, ©, çŽŸ, Ìf f\fbfh, ðŒp³, ·, é  
B

AddDestroyCallback

Clone

DeleteDestroyCallback

GetAppData

GetClassName

GetName

SetAppData

SetName

Direct3DRMFaceIfufWfFfNfg,Í A**Direct3DRM::CreateFace** f\fbfh,ìĈĂ,Ñ o,μ,É,æ,Á,ĂŽæ“¾,³,ê,é B

**IDirect3DRMFace::AddVertex**

HRESULT AddVertex(D3DVALUE x, D3DVALUE y, D3DVALUE z);

Direct3DRMFaceIfufWfFfNfg,É’“\_‚ð’Ç%Á‚‚é B

¬Œ÷‚‚é‚ÆD3DRM\_OK AŽ‚”s‚‚é‚ÆfGf%o [‚ð•Ô‚‚ B•Ô’l‚Îê——‚É‚Â‚¢  
,Ä‚Í A uDirect3D•ŮŽ f‚ fh‚Ĵ•Ó’l v‚ðŽQ Æ‚‚é‚±‚Æ B

x, y, z  
V‚µ‚¢‚“\_ˆÊ’u‚Ïx Ay Az Å•W B

**IDirect3DRMFace::AddVertexAndNormalIndexed**

HRESULT AddVertexAndNormalIndexed(DWORD vertex, DWORD normal);

’,“\_,Æ-@ ü,ðDirect3DRMFaceIfufWfFfNfg,É’Ç%Á,·,é B,±,ì,Æ,« Af fbfVf...  
Efrf<f\_,ÉŠÜ,Ü,ê,é’,“\_,ÌfCf“fffbfNfX,Æ-@ ü,ÌfCf“fffbfNfX,ðŽg—p,·,é B-Ê A’,“\_ A-  
@ ü,Í ADirect3DRMMeshBuilderIfufWfFfNfg,Ì1•”,Ä,È,,Ä,Í,È,ç,È,¢ B  
-Æ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô’l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŨŽ f, fh,Î•Ô’l v,ðŽQ Æ,·,é,±,Æ B

vertex, normal  
’Ç%Á,·,é’,“\_,Æ-@ ü,ÌfCf“fffbfNfX B

**IDirect3DRMFace::GetColor**

D3DCOLOR GetColor();

Direct3DRMFaceIfufWfFfNfg,Ì F,ðŽæ“¾,·,é B  
F,ð•Ô,· B

ŽQ Æ @IDirect3DRMFace::SetColor

**IDirect3DRMFace::GetMaterial**

HRESULT GetMaterial(LPDIRECT3DRMMATERIAL\* lpMaterial);

Direct3DRMFaceIfuWfFfNfg,İf}fefŠfAf<,đŽæ“¾,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŬŽ f, [fh,İ•Ô'l v,đŽQ Æ,·,é,±,Æ B

lpMaterial  
-Ê,Ê“K—p,<sup>3</sup>,ê,Ä,¢,éDirect3DRMMaterialIfuWfFfNfg,Ö,İf|fCf“f^,đŽó,¬Žæ,é•İ ”,Ö,İf|fCf“f^ B

ŽQ Æ @IDirect3DRMFace::SetMaterial

**IDirect3DRMFace::GetNormal**

HRESULT GetNormal (D3DVECTOR \*lpNormal) ;

Direct3DRMFaceIfuWfFfNfg,Ì-@ ü,ðŽæ“¾,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŨŽ f, [fh,Ì•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lpNormal  
-Ê,Ì-@ üfxfNfgfç,ðŽó,¬Žæ,éD3DVECTOR \‘‘Ì B



**IDirect3DRMFace::GetTexture**

HRESULT GetTexture(LPDIRECT3DRMTEXTURE\* lpTexture);

Direct3DRMFaceIfuFWfFNfg,É“K—p,<sup>3</sup>,ê,½fEfNXf`ff,ðŽæ“¾,·,é B  
-Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, fh,j•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lpTexture  
-Ê,É“K—p,<sup>3</sup>,ê,½fEfNXf`ff,Ö,Ìf|fCf“f^,ðŽó,¬Žæ,é•İ ” B

ŽQ Æ @IDirect3DRMFace::SetTexture

**IDirect3DRMFace::GetTextureCoordinateIndex**

```
int GetTextureCoordinateIndex(DWORD dwIndex);
```

–Ê,Ïf fbfVf...,É, ,é’ ,“ \_,ÏfCf“fffbfNfX,ðfefNfXf`ff À•W,ĂŽæ“¾, ,é B,±  
,ÏfCf“fffbfNfX,Í AdwIndexpf%of [f^,ĂŽw’è,³ê,½fCf“fffbfNfX,É‘İ%ž, ,é B  
fCf“fffbfNfX,ð•Ô,· B

dwIndex  
–Ê,É, ,é’ ,“ \_,ÏfCf“fffbfNfX B

**IDirect3DRMFace::GetTextureCoordinates**

```
HRESULT GetTextureCoordinates(DWORD index, D3DVALUE *lpU,  
                               D3DVALUE *lpV);
```

```
Direct3DRMFaceIfufWfFfNfg'†,Ì'“„,ÌfefNfXf`ff À•W,ðŽæ“¾,·,é B  
    ¬Œ÷,·,é,ÆD3DRM_OK AŽ,„s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
    ,Ä,Í A uDirect3D•ŮŽ f, [fh,l•Ô'l v,ðŽQ Æ,·,é,±,Æ B
```

```
index  
'“„,ÌfCf“fffbfNfX B  
lpU, lpV  
'“„,ÌfefNfXf`ff À•W,ðŽó,¬Žæ,é•İ ” B
```

**IDirect3DRMFace::GetTextureTopology**

HRESULT GetTextureTopology(BOOL \*lpU, BOOL \*lpV);

Direct3DRMFaceIfufWfFfNfg,ÌfefNfXf`ff^Ê‘Š,ðŽæ“¼,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ,˝s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ĵ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lpU, lpV  
-Ê,Ì%o~'Œf%ofbfv Eftf%ofO,É,μ,½,<sup>a</sup>,Á,Ä A Ý'è,Û,½,ÍfNfŠfA,<sup>3</sup>,ê,é•Ĭ ”,ÌfAfhfŒfX B

ŽQ Æ @IDirect3DRMFace::SetTextureTopology

**IDirect3DRMFace::GetVertex**

```
HRESULT GetVertex(DWORD index, D3DVECTOR *lpPosition,  
                  D3DVECTOR *lpNormal);
```

```
Direct3DRMFaceIfuFWfFfNfg'†,Ì'“_„ÌÊ'u,Æ-@ ü,ðŽæ“¾,·,é B  
    -Œ÷,·,é,ÆD3DRM_OK AŽ,„s,·,é,ÆfGf%o [„ð•Ô,· B•Ô'l,Ìê——,É,Â,¢  
    ,Ä,Í A uDirect3D•ŮŽ f, [fh,Ì•Ô'l v,ðŽQ Æ,·,é,±,Æ B
```

```
index  
'“_„ÌfCf“fffbfNfX B
```

```
lpPosition, lpNormal  
'“_„ÌÊ'u,Æ-@ ü,ðŽó,Žæ,éD3DVECTOR \‘¢‘Ì B
```

**IDirect3DRMFace::GetVertexCount**

int GetVertexCount();

Direct3DRMFaceIfuWfFfNfg,ì'“\_ì” ,đŽæ“¾,·,é B  
’ ,“\_ì” ,đ•Ô,· B

**IDirect3DRMFace::GetVertexIndex**

```
int GetVertexIndex (DWORD dwIndex);
```

–Ê,Ïf fbfVf...,É, ,é’ ,“ \_,ÏfCf“fffbfNfX,ðŽæ“¾,·,é B,±  
,ÏfCf“fffbfNfX,ÍdwIndexpf%of [f^,ĂŽw’è,³,ê,½fCf“fffbfNfX,É‘Î%ž,·,é B  
fCf“fffbfNfX,ð•Ô,· B

dwIndex  
–Ê,É, ,é’ ,“ \_,ÏfCf“fffbfNfX B

## IDirect3DRMFace::GetVertices

```
HRESULT GetVertices(DWORD *lpdwVertexCount, D3DVECTOR *lpPosition,  
                    D3DVECTOR *lpNormal);
```

Direct3DRMFaceIfuFWfFfNfg'†,ì,»,ê,¼,ê,ì',“\_É,Â,¢,Ä AÊ'u,Æ-@ üfxfNfgf<,ðŽæ“¼,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ, ”s,·,é,ÆfGf% [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Î•Ô'l v,ðŽQ Æ,·,é,±,Æ B

*lpdwVertexCount*

',“\_,Ì ”,ðŽó,¬Žæ,é•İ ” B,±,İfp%of [f^,ÉNULL,ðŽw'è,·,é,±,Æ,Í,Ä,«,È,¢ B

*lpPosition, lpNormal*

',“\_„ÎÊ'u,Æ-@ üfxfNfgf<,ðŽó,¬Žæ,éD3DVECTOR \‘¢‘Î,ì”z—ñ,Ö,Ìf|fCf“f^ B—¼•û,Æ,àNULL,Ì ê ‡ A,±  
,İf f\fbfh,İlpdwVertexCountfpf%of [f^,É',“\_„Ì ”,ðŠi”[,·,é B



**IDirect3DRMFace::SetColor**

HRESULT SetColor(D3DCOLOR color);

Direct3DRMFaceIfuƒWƒFƒNfg,İ F,đ Ý’è,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ,˝s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,İê——,É,Â,¢  
,Ä,İ A uDirect3D•ŮŽ f, [fh,İ•Ô'l v,đŽQ Æ,·,é,±,Æ B

color

Ý’è,·,é F B

ŽQ Æ @IDirect3DRMFace::GetColor

**IDirect3DRMFace::SetColorRGB**

HRESULT SetColorRGB(D3DVALUE red, D3DVALUE green, D3DVALUE blue);

Direct3DRMFaceIfuƒWƒFƒNƒg,İ F,đR, G, B'l,Â Ý'è,·,é B

¬Ɛ÷,·,é,ÆD3DRM\_OK AŽ,"s,·,é,ÆƒGƒ%o [,đ•Ô,· B•Ô'l,İê——,É,Â,¢  
,Ä,Í A uDirect3D•ŨŽ f, [ƒh,İ•Ô'l v,đŽQ Æ,·,é,±,Æ B

red, green, blue  
Ô A—Î A Â,İ F—v'f B

**IDirect3DRMFace::SetMaterial**

HRESULT SetMaterial(LPDIRECT3DRMMATERIAL lpD3DRMMaterial);

Direct3DRMFaceIfuFWfFfNfg,Éf}fefŠfAf<,ðfZfbfg,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ, ”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Î A uDirect3D•ŮŽ f, [fh,Ĵ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lpD3DRMMaterial  
f}fefŠfAf<,ĴfAfhfŒfX B

ŽQ Æ @IDirect3DRMFace::GetMaterial

**IDirect3DRMFace::SetTexture**

HRESULT SetTexture(LPDIRECT3DRMTEXTURE lpD3DRMTexture);

Direct3DRMFaceIfuFWfFfNfg,ÉfefNfXf`ff,ðfZfbfg,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŨŽ f, [fh,İ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lpD3DRMTexture  
fefNfXf`ff B

ŽQ Æ @IDirect3DRMFace::GetTexture

## IDirect3DMMFace::SetTextureCoordinates

```
HRESULT SetTextureCoordinates(DWORD vertex, D3DVALUE u, D3DVALUE v);
```

Direct3DRMFacefIfufWfFfNfg'†,Ì',“\_ÌfefNfXf`ff À•W,ð Ý`è,:é B

[illegible]

*vertex*

Ý'è,·,é',„\_ìfCf“fffbfNfX B,½,Æ,!,î A-Ê,ŽŠpƎ',ì,Æ,« A',„\_Í0 A1 A2,Æ,È,é B

 $u, v$ 

Žw'è,<sup>3</sup>,ê,½',“\_ ,ÉŠ,,,è“- ,Ä,éfefNfXf`ff À•W B

**IDirect3DRMFace::SetTextureTopology**

HRESULT SetTextureTopology(BOOL cylU, BOOL cylV);

Direct3DRMFaceIfufWfFfNfg,ÉfefNfXf`ff^Ê‘Š,đ Ý’è,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ, ”s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, fh,Ĵ•Ô'l v,đŽQ Æ,·,é,±,Æ B

cylU, cylV  
fefNfXf`ff,ªu,Æv,ì,Ç,¿,ç,İŽŸŒ³,Å%~'Œ^Ê‘Š,đŽ ,Á,Ä,¢,é,©,đŽ',· B

ŽQ Æ @IDirect3DRMFace::GetTextureTopology

## IDirect3DRMFrame

*fAfvfŠfP [fVf‡f“Í AftfŒ [f€ ifIfufWfFfNfg,İftfŒ [f€,İŽQ Œ j,ŒŒÝ,¢  
,É,â,èŽæ,è,·,é,½,ß,ÉIDirect3DRMFramefCf“f^ [ftfFfCfX,İf f\fbfh,ðŽg—p,·,é B,±  
,İfZfNfVf‡f“Í AIDirect3DRMFramefCf“f^ [ftfFfCfX Ef f\fbfh,İfŠftf@fŒf“fX,Â, ,é BŠT”O,É,Â,¢,Ä,İŠT—  
v,Í A uIDirect3DRMFrame,ŒIDirect3DRMFrameArrayfCf“f^ [ftfFfCfX v,ðŽQ Œ,·,é,±,Œ B*

**IDirect3DRMFrame***fCf“f^ [ftfFfCfX Ef f\fbfh,Í A`È%º,İfOf< [fv,É•ª—b,·,é,±,Œ,ª,Â,«,é B*

**”wŒi**                    [GetSceneBackground](#)  
                          [GetSceneBackgroundDepth](#)  
                          [SetSceneBackground](#)  
                          [SetSceneBackgroundDepth](#)  
                          [SetSceneBackgroundImage](#)  
                          [SetSceneBackgroundRGB](#)

**F**                      [GetColor](#)  
                          [SetColor](#)  
                          [SetColorRGB](#)

**ftfHfO**                [GetSceneFogColor](#)  
                          [GetSceneFogEnable](#)  
                          [GetSceneFogMode](#)  
                          [GetSceneFogParams](#)  
                          [SetSceneFogColor](#)  
                          [SetSceneFogEnable](#)  
                          [SetSceneFogMode](#)  
                          [SetSceneFogParams](#)

**ŠK‘w**                [AddChild](#)  
                          [DeleteChild](#)  
                          [GetChildren](#)  
                          [GetParent](#)  
                          [GetScene](#)

**ŒðŒ¹**                [AddLight](#)  
                          [DeleteLight](#)  
                          [GetLights](#)

**f [fh**                [Load](#)

**f}fefŠfAf<f,ff<**    [GetMaterialMode](#)  
                          [SetMaterialMode](#)

**^Ê’u,Œ^Ú“®**        [AddMoveCallback](#)  
                          [AddRotation](#)  
                          [AddScale](#)  
                          [AddTranslation](#)  
                          [DeleteMoveCallback](#)

	<u>GetOrientation</u>
	<u>GetPosition</u>
	<u>GetRotation</u>
	<u>GetVelocity</u>
	<u>LookAt</u>
	<u>Move</u>
	<u>SetOrientation</u>
	<u>SetPosition</u>
	<u>SetRotation</u>
	<u>SetVelocity</u>
•³—p	<u>GetSortMode</u>
	<u>GetZbufferMode</u>
	<u>SetSortMode</u>
	<u>SetZbufferMode</u>
fefNfXf`ff	<u>GetTexture</u>
	<u>GetTextureTopology</u>
	<u>SetTexture</u>
	<u>SetTextureTopology</u>
•İŠ•	<u>AddTransform</u>
	<u>GetTransform</u>
	<u>InverseTransform</u>
	<u>Transform</u>
frfWf...	<u>AddVisual</u>
fAf< EfIfufWf	
FfNfg	<u>DeleteVisual</u>
	<u>GetVisuals</u>
IDirect3DRMFramefCf“f^ [ftfFfCfX,Í A,·,×,Ä,ÌCOMfCf“f^ [ftfFfCfX,Æ“— l A UnknownfCf“f^ [ftfFfCfX Ef f\fbfh,ðEp ³,;é BIUnknownfCf“f^ [ftfFfCfX,ÍŽŸ,Ì,R,Â,Ìf f\fbfh,ðfTf  [fg,·,é B	
	<u>AddRef</u>
	<u>QueryInterface</u>
	<u>Release</u>
³,ç,É AIDirect3DRMFramefCf“f^ [ftfFfCfX,Í A Direct3DRMObjectfCf“f^ [ftfFfCfX,©,çŽŸ,Ìf f\fbfh,ðEp ³,; é B	
	<u>AddDestroyCallback</u>
	<u>Clone</u>
	<u>DeleteDestroyCallback</u>
	<u>GetAppData</u>
	<u>GetClassName</u>
	<u>GetName</u>
	<u>SetAppData</u>



SetName

Direct3DRMFrameIfufWfFfNfg,Í AIDirect3DRM::CreateFramef f\fbfh,ìĈÄ,Ñ o,μ,É,æ,Á,ĂŽæ“¾,³,ê,é B

## IDirect3DRMFrame::AddChild

HRESULT AddChild(LPDIRECT3DRMFRAME lpD3DRMFrameChild);

ftfŒ [f€ŠK‘w,ÉŽqftfŒ [f€,ð’Ç%Á,·,é B  
¬Œ÷,·,é,ÆD3DRM\_OK AŽ, ”s,·,é,ÆfGf% [ ,ð•Ô,· B•Ô’l,Îê——,É,Â,¢  
,Ä,Î A uDirect3D•ŬŽ f, [fh,Ĵ•Ô’l v,ðŽQ Œ,·,é,±,Œ B

lpD3DRMFrameChild  
ŽqftfŒ [f€,Œ,μ,Ä’Ç%Á,·,éDirect3DRMFramefIfufWfFfNfg B

ŽqftfŒ [f€,Œ,μ,Ä’Ç%Á,·,éftfŒ [f€,ª,·,Ä,É e,ðŽ ,Á,Ä,¢,é ê ± A,±,łf f\fbfh,Î A V,μ,¢ eftfŒ [f€  
,É’Ç%Á,·,é‘O,É`È‘O,Î eftfŒ [f€,ðŽæ,è æ, B

fIfufWfFfNfg•İŠ·,ð`ŬŽ ,·,é,½,ß AAddChildf f\fbfh,ðŽg—  
p,·,é‘O,ÉIDirect3DRMFrame::GetTransform f\fbfh,ðŒÄ,Ŧ o,μ AfIfufWfFfNfg,Ĵ•İŠ· s—ñ,ðŽæ“¾,·,é,×,«,Ä, ,é  
B,»,ª,·,é,Î AftfŒ [f€,ð’Ç%Á,μ,½Œâ,à•İŠ·,ð•t,¯,ç,ê,é B

**IDirect3DRMFrame::AddLight**

HRESULT AddLight(LPDIRECT3DRMLIGHT lpD3DRMLight);

ftfŒ [f€,ÉŒðŒ¹,ð'Ç%ŒÁ,·,é B  
¬Œ÷,·,é,ÆD3DRM\_OK AŽ,"s,·,é,ÆfGf% [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŨŽ f, [fh,İ•Ô'l v,ðŽQ Æ,·,é,±,Æ B  
lpD3DRMLight  
ftfŒ [f€,É'Ç%ŒÁ,·,éDirect3DRMLightIfufWfFfNfg,ðŽ',·•İ ",İfAfhfŒfX B

**IDirect3DRMFrame::AddMoveCallback**

HRESULT AddMoveCallback(D3DRMFRAMEMOVECALLBACK d3drmFMC, VOID \* lpArg);

“Á•Ê,È˘Ú“® ^— ,ì,½,ß,ÉfR [f<fofbfNŠÖ ”,ð’Ç%Á,·,é B  
¬Æ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô’l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ĵ•Ô’l v,ðŽQ Æ,·,é,±,Æ B

d3drmFMC  
fAfvfŠfP [fVf‡f““è` ,ì **D3DRMFRAMEMOVECALLBACK** fR [f<fofbfNŠÖ ” B  
lpArg  
fR [f<fofbfNŠÖ ”,É“n,³,ê,éfAfvfŠfP [fVf‡f““è` ,Ĵf [f^ B

ŽQ Æ @**IDirect3DRMFrame::Move,**

**IDirect3DRMFrame::DeleteMoveCallback**

## IDirect3DRMFrame::AddRotation

HRESULT AddRotation(D3DRMCOMBINETYPE rctCombine, D3DVALUE rvX,  
D3DVALUE rvY, D3DVALUE rvZ, D3DVALUE rvTheta);

*rvTheta*,<sup>a</sup>Ž<sub>i</sub>,·f%ofWfAf“”PÊ,İŠp“x•<sup>a</sup> A(rvX,rvY,rvZ),É‘Î,μ,Ä%oñ“],<sup>3</sup>,<sup>1</sup>,é B

–Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Î A uDirect3D•ŮŽ f, [fh,Î•Ô'l v,ðŽQ Æ,·,é,±,Æ B

*rctCombine*

V,μ,¢%oñ“],ðŒ» Ý,ÌŒ» Ý,İftfŒ [f€•İŠ,Æ ‡ ¬,·,é•û–@,ðŽ<sub>i</sub>,· AD3DRMCOMBINETYPE—  
ñ“Œ^,İf f“fo B

*rvX,rvY,rvZ*

%oñ“]Ž<sup>2</sup> B

*rvTheta*

f%ofWfAf“”PÊ,ÄŽ<sub>i</sub>,μ,½%oñ“]Šp“x B

Žw'è,<sup>3</sup>,ê,½%oñ“],Î A,±,İDirect3DRMFramefCf“f^ [ftfFfCfX,É,æ,Á,ÄŽ<sup>–</sup>•Ê,<sup>3</sup>,ê,éftfŒ [f€,İ•İŠ· s—

ñ,<sup>¾</sup>,–,ð•İ X,·,é B,±,İf ffbfh,Î AfŒf“f\_Šf“fO,İf^fCf~f“fO,<sup>2</sup>,Æ,É s—

ñ,ð•İ X,·,éIDirect3DRMFrame::SetRotation,Æ,ÎÛ,È,è AftfŒ [f€ ã,İfIfufWfFfNfg,İ•İ X,Í1%oñ,Ì,Ý s,□ B

ŽQ Æ @3D•İŠ·, IDirect3DRMFrame::SetRotation

**IDirect3DRMFrame::AddScale**

HRESULT AddScale(D3DRMCOMBINETYPE rctCombine, D3DVALUE rvX,  
D3DVALUE rvY, D3DVALUE rvZ);

(rvX,rvY,rvZ),É,æ,Á,Äftf€ [f€,l̈f [fJf,•İŠ,ðfXfP [fŠf“fO,•,é B

¬€÷,•,é,ÆD3DRM\_OK AŽ,”s,•,é,ÆfGf% [,ð•Ô,• B•Ô'l,İê——,É,Â,¢  
,Ä,İ A uDirect3D•ŮŽ f, [fh,l•Ô'l v,ðŽQ Æ,•,é,±,Æ B

rctCombine  
V,µ,¢ kŽÚ,ð€» Ý,İftf€ [f€•İŠ,Æ ‡ ¬,•,é•û-@,ðŽ|,• AD3DRMCOMBINETYPE—ñ“€^,İf f“fo B  
rvX,rvY,rvZ  
x Ay Az•û€ü,İ kŽÚ€EW ”,ð'èç,•,é B

Žw'è,<sup>3</sup>,ê,<sup>½</sup>•İŠ,İ A,±,İIDirect3DRMFramefCf“f^ [ftfFfCfX,É,æ,Á,ÄŽ¯•Ê,<sup>3</sup>,ê,éftf€ [f€,l̈•İŠ s—ñ,¾,¯,ð•İ X,•,é B  
ŽQ Æ @3D•İŠ.

## IDirect3DRMFrame::AddTransform

```
HRESULT AddTransform(D3DRMCOMBINETYPE rctCombine,  
    D3DRMMATRIX4D rmMatrix);
```

*rctCombine* *pf%* *f*<sup>^</sup>,*l*<sup>1</sup>,*É* ],*¢* *Aftf* *€* [*f**€*,*l**f* [*f**Jf* *À*•*W*,*ðfAftfBf*“•*İŠ*•,•,é *B*

¬*€*÷,•,é,*ED3DRM\_OK* *AŽ*,”*s*,•,é,*ÆfGf%* [,*ð*•*Ô*,• *B*•*Ô*<sup>1</sup>,*l*<sup>ê</sup>——,É,*Â*,*¢*  
,*Ä*,*Í* *A* *uDirect3D•ŮŽ* *f*, *[fh,l•Ô*<sup>1</sup> *v*,*ðŽQ* *Æ*,•,é,±,Æ *B*

*rctCombine*

*V*,*μ*,*¢*•*İŠ*•,ð*€*» *Ý*,*l*•*İŠ*•,Æ ‡ ¬,•,é•*û*—@,ð*Ž*<sup>1</sup>,• *AD3DRMCOMBINETYPE*—*ñ*“*€*<sup>^</sup>,*l**f* *f*“*f**o* *B*

*rmMatrix*

‡ ¬,<sup>3</sup>,é,é•*İŠ*• *s*—*ñ*,ð<sup>’</sup>*è*<sup>^</sup>,•,é*D3DRMMATRIX4D*”*z*—*ñ*,*l**f* *f*“*f**o* *B*

•*İŠ*•,É,*Í4* *s4*—*ñ*,*l* *s*—*ñ*,ð*Žw*<sup>’</sup>*è*,•,é,<sup>a</sup> *AfAftfBf*“•*İŠ*•,ð—~*p*,•,é,<sup>1</sup>/<sub>2</sub>,*ß* *A* *Â*€ã,*l*—*ñ*,*Í*[0 0 0 1],*l*“<sup>]</sup>*u* *s*—*ñ*,*Â*,*È*,<sup>-</sup>  
,*Ä*,*Í*,*È*,*ç*,*È*,*¢* *B*

*Žw*<sup>’</sup>*è*,<sup>3</sup>,é,<sup>1</sup>/<sub>2</sub>•*İŠ*•,*Í* *A*,±,*lIDirect3DRMFramef**Cf*“*f*<sup>^</sup> [*ftfFfCfX*,É,*æ*,*Á*,*ĂŽ*<sup>-</sup>•*Ê*,<sup>3</sup>,é,é*ftf* *€* [*f**€*,*l*•*İŠ*• *s*—*ñ*,<sup>3</sup>/<sub>4</sub>,<sup>-</sup>,ð•*İ* *X*,•,é *B*  
*ŽQ* *Æ* @*3D*•*İŠ*•

**IDirect3DRMFrame::AddTranslation**

HRESULT AddTranslation(D3DRMCOMBINETYPE rctCombine, D3DVALUE rvX,  
D3DVALUE rvY, D3DVALUE rvZ);

(rvX,rvY,rvZ),É,æ,é•İŠ·,ðftfŒ [f€,İf [fJf< À•WŒn,É'Ç%Á,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ,"s,·,é,ÆfGf% [,ð•Ô,· B•Ô'l,İê——,É,Â,¢  
,Ä,İ A uDirect3D•ŬŽ f, [fh,l•Ô'l v,ðŽQ Œ,·,é,±,Œ B

rctCombine  
V,µ,¢•İŠ·,ðŒ» Ý,İ•İŠ·,Œ ‡ ¬,·,é•û-@,ðŽ',· AD3DRMCOMBINETYPE—ñ<“Œ^,İf f“fo B  
rvX,rvY,rvZ  
x Ay Az•ûŒü,İêÊ'u•İ X,ð'è<,·,é B

Žw'è,<sup>3</sup>,ê,<sup>½</sup>•İŠ·,İ A,±,İIDirect3DRMFramefCf“f^ [ftfFfCfX,É,æ,Á,ÄŽ¯•Ê,<sup>3</sup>,ê,éftfŒ [f€,İ•İŠ· s—ñ,¾,¯,ð•İ X,·,é B  
ŽQ Œ @3D•İŠ·



**IDirect3DRMFrame::AddVisual**

HRESULT AddVisual(LPDIRECT3DRMVISUAL lpD3DRMVisual);

ftfŒ [f€,ÉfrfWf...fAf< EfIfufWfFfNfg,ð'Ç%ŒÁ,·,é B  
¬Œ÷,·,é,ŒD3DRM\_OK AŽ,»s,·,é,ŒfGf% [ ,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Î A uDirect3D•ŨŽ f, [fh,Î•Ô'l v,ðŽQ Œ,·,é,±,Œ B

lpD3DRMVisual  
ftfŒ [f€,É'Ç%ŒÁ,·,éDirect3DRMVisualfIfufWfFfNfg,ðŽ',·İ ” B

frfWf...fAf< EfIfufWfFfNfg,Î Af fbfVf...,ŒfefNfXf`ff,ðŠŨ,Ð BftfŒ [f€,ÉfrfWf...  
fAf< EfIfufWfFfNfg,ª'Ç%ŒÁ,<sup>3</sup>,ê,é,Œ AftfŒ [f€,ªfrf...  
[ ,É'¶ Ý,·,ê,ÎfIfufWfFfNfg,Î%ŒŽ< ó'Ô,Œ,È,é BfrfWf...fAf< EfIfufWfFfNfg,ÎftfŒ [f€,©,çŽQ Œ,<sup>3</sup>,ê,é B

**IDirect3DRMFrame::DeleteChild**

```
HRESULT DeleteChild(LPDIRECT3DRMFRAME lpChild);
```

ftfŒ [f€,đŠK‘w,©,ç í œ,·,é BftfŒ [f€,ªŽQ ŒE,³,ê,Ä,¢,È,¯,ê,Î A,·,×,Ä,ÌŽqftfŒ [f€ AŒöŒ¹ Af fbVf...  
,Œ,Œ,à,É”jŠü,³,ê,é B

¬Œ÷,·,é,ŒD3DRM\_OK AŽ,”s,·,é,ŒfGf%o [,đ•Ô,· B•Ô’l,Îê——,É,Â,¢  
,Ä,Î A uDirect3D•ŮŽ f, [fh,l•Ô’l v,đŽQ ŒE,·,é,±,Œ B

lpChild  
ŽqftfŒ [f€,Œ,µ,ÄŽg,í,ê,Ä,¢,éDirect3DRMFrameIfufWfFfNfg,đŽ!,•İ ” B

ŽQ Œ @ŠK‘w

**IDirect3DRMFrame::DeleteLight**

HRESULT DeleteLight(LPDIRECT3DRMLIGHT lpD3DRMLight);

ŒðŒ¹,ðftfŒ [f€,©,ç í œ,µ AŒðŒ¹,ažQ Œ,³,ê,Ä,¢,È,¯,ê,Î”jŠü,·,é BftfŒ [f€  
,©,çŒðŒ¹,ažæ,è œ,©,ê,é,Œ A,»,lŒðŒ¹,Í AftfŒ [f€,ª,Á,½fV [f“ ã,lŒ fbfVf...,ÉŒø‰Œ,ð—^,!,È,,È,é B  
¬Œ÷,·,é,ŒD3DRM\_OK Až,”s,·,é,ŒfGf‰ [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,l•Ô'l v,ðŽQ Œ,·,é,±,Œ B

lpD3DRMLight  
í œ,·,éDirect3DRMLightIfufWfFfNfg,ðŽ!,•İ ” B

**IDirect3DRMFrame::DeleteMoveCallback**

```
HRESULT DeleteMoveCallback(D3DRMFRAMEMOVECALLBACK d3drmFMC,
    VOID * lpArg);
```

“Á•Ê,È˘Ú“® ^— ,ðŽÀ s,µ,½fR [f<fofbfNŠÖ ”,ð í æ,·,é B

–Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢

,Ä,Í A uDirect3D•ŮŽ f, [fh,l•Ô'l v,ðŽQ Æ,·,é,±,Æ B

d3drmFMC

fAfvfŠfP [fVf‡f““è˘,ÌD3DRMFRAMEMOVECALLBACKfR [f<fofbfNŠÖ ” B

lpArg

fR [f<fofbfNŠÖ ”,É“n,³,ê,½fAfvfŠfP [fVf‡f““è˘,Ìff [f^,Ö,Ìf|fCf“f^ B

ŽQ Æ @IDirect3DRMFrame::AddMoveCallback, IDirect3DRMFrame::Move

**IDirect3DRMFrame::DeleteVisual**

```
HRESULT DeleteVisual(LPDIRECT3DRMVISUAL lpD3DRMVisual);
```

ftfŒ [f€,©,çfrfWf...fAf< EfIfufWfFfNfg,đ í œ,·,é BfrfWf...fAf< EfIfufWfFfNfg,aŽQ Œ,³,ê,Ä,¢  
,È,¯,ê,Î”jŠü,·,é B

¬Œ÷,·,é,ŒD3DRM\_OK AŽ,”s,·,é,ŒfGf%∞ [,đ•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,I•Ô'l v,đŽQ Œ,·,é,±,Œ B

lpD3DRMVisual

í œ,·,éDirect3DRMVisualfIfufWfFfNfg,đŽ',·İ ”,ÌfAfhfŒfX B

**IDirect3DRMFrame::GetChildren**

HRESULT GetChildren(LPDIRECT3DRMFRAMEARRAY\* lplpChildren);

Direct3DRMFrameArrayIfufWfFfNfg, ðŒŽ® , ÅžqftfŒ [f€ , ðŒŠfXfg, ðŽæ“¾ , · , é B  
¬Œ÷ , · , é , ÆD3DRM\_OK AŽ , ”s , · , é , ÆfGf%o [, ð•Ô , · B•Ô'l , ðê—— , É , Â , ¢  
, Ä , Í A uDirect3D•ŮŽ f , [fh, Ĵ•Ô'l v, ðŽQ Æ , · , é , ± , Æ B

lplpChildren  
ŒÄ , Ñ o , µ , <sup>a</sup> ¬Œ÷ , µ , ½ , Æ , « , É A—LŒø , ÈDirect3DRMFrameArray|fCf“f^ , “ü , éf|fCf“f^ , ðfAfhfŒfX B

ŽQ Æ @Direct3DRMFrameArray , ŠK‘w

**IDirect3DRMFrame::GetColor**

D3DCOLOR GetColor();

ftfŒ [f€,İ F,đŽæ“¾,·,é B

Direct3DRMFramefIfufWfFfNfg,İ F,đ•Ô,· B

ŽQ Æ @IDirect3DRMFrame::SetColor

**IDirect3DRMFrame::GetLights**

```
HRESULT GetLights(LPDIRECT3DRMLIGHTARRAY* lpLights);

Direct3DRMLightArrayIfufWfFfNfg,ìĈ`Ž®,ÅftfĈ [f€,ìĈôĈ!fŠfXfg,ðŽæ“¼,·,é B

¬Ĉ÷,·,é,ÆD3DRM_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,ç,Ä,Í A u
Direct3D•ŮŽ f, [[fh,İ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lpLights
ĈÄ,Ň o,μ,a ¬Ĉ÷,μ,½,Æ,«,É A—LĈø,ÈDirect3DRMLightArrayf|fCf“f^,“ü,éf|fCf“f^,İfAfhfĈfX B

ŽQ Æ @IDirect3DRMLightArray
```



## IDirect3DRMFrame::GetMaterialMode

D3DRMMATERIALMODE GetMaterialMode();

ftfⒺ [f€,\f}fefŠfAf<f, [fh,ðŽæ“¾,·,é B

Ⓔ» Ý,\f}fefŠfAf<f, [fh,ðŽ!,·D3DRMMATERIALMODE—ñ<“Ⓔ^f f“fo,Ì,Đ,Æ,Â,ð•Ô,· B

ŽQ Æ @IDirect3DRMFrame::SetMaterialMode

**IDirect3DRMFrame::GetOrientation**

HRESULT GetOrientation(LPDIRECT3DRMFRAME lpRef, LPD3DVECTOR lprvDir, LPD3DVECTOR lprvUp);

ftfŒ [f€,lŒü,«,ðŽæ“¾,·,é B,±,ì•ûŒü,Í AŽw’è,³,ê,½ŽQ ÆftfŒ [f€,©,ç‘Š‘Î“l,É•\,³,ê,é B  
-Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [„ð•Ô,· B•Ô’l,Îê——,É,Â,Œ  
,Ä,Í A uDirect3D•ŮŽ f, [fh,l•Ô’l v,ðŽQ Æ,·,é,±,Æ B

lpRef  
ŽQ Æ,Æ,µ,Ä—p,Œ,ç,ç,ê,éDirect3DRMFramefIfufWfFfNfg,ðŽ!,·•İ ” B  
lprvDir, lprvUp  
ftfŒ [f€,lžŽ²,ÆyŽ²,ì•ûŒü,ðŽó,¬Žæ,éD3DVECTOR \‘Œ‘İ B

ŽQ Æ @IDirect3DRMFrame::SetOrientation

**IDirect3DRMFrame::GetParent**

```
HRESULT GetParent(LPDIRECT3DRMFRAME* lpParent);
```

«» Ý, ðftf« [f€, ð e ftf« [f€, ðžæ“¼, ·, é B  
¬«÷, ·, é, ÆD3DRM\_OK AŽ, ”s, ·, é, ÆfGf%o [ , ð•Ô, · B•Ô'l, ðê——, É, Â, ¢  
, Ä, Í A uDirect3D•ÛŽ f, [fh, ð•Ô'l v, ðŽQ Æ, ·, é, ±, Æ B

lpParent  
ftf« [f€, ð e, ðŽl, ·Direct3DRMFrameIfufWfFfNfg, Ö, ðf|fCf“f^, ðŽó, ¬Žæ, éf|  
fCf“f^, ðfAfhf«fX B«» Ý, ðftf« [f€, <sup>a</sup> e ftf« [f€, ð ê ‡ A, ±, ðf|fCf“f^, É, ÍNULL, <sup>a</sup> Ý'è, <sup>3</sup>, ê, é B

## IDirect3DRMFrame::GetPosition

HRESULT GetPosition(LPDIRECT3DRMFRAME lpRef, LPD3DVECTOR lprvPos);

Žw'è,<sup>3</sup>,ê,½ŽQ ÆftfŒ [f€,©,ç,Ì AftfŒ [f€,ì'Š'Î'Ê'u,ðŽæ“¾,·,é i,½,Æ,!,Î A,±,Ìf f\bfbfh,ÍftfŒ [f€,ìŽQ Æ,©,ç,ì<————£,ðŽæ“¾,·,é j B<————£,Í A^êŽŸŒ<sup>3</sup>,ÌfTfCfY,Æ,µ,Ä,Ä,Í,È,- AfxfNfgf<,Æ,µ,ÄlprvPosfpf%of [f^,ÉŠi”[,<sup>3</sup>,ê,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê————,É,Â,Œ,Ä,Í A uDirect3D•ŮŽ f, [fh,Î•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lpRef  
ŽQ Æ,Æ,µ,Ä—p,ç,ç,ê,éDirect3DRMFrameIfufWfFfNfg,ðŽ!,·•İ ” B

lprvPos  
ftfŒ [f€,Î'Ê'u,ðŽó,¬Žæ,éD3DVECTOR \‘Œ'Ì B

ŽQ Æ @IDirect3DRMFrame::SetPosition

## IDirect3DRMFrame::GetRotation

```
HRESULT GetRotation(LPDIRECT3DRMFRAME lpRef, LPD3DVECTOR lprvAxis,  
                    LPD3DVALUE lprvTheta);
```

*ftf*€ [f€,l̂%ñ“],đŽæ“¾,·,é B%ñ“],Í AŽw`è,<sup>3</sup>,ê,½ŽQ Æftf€ [f€,©,ς‘Š‘Î“l,É•\,<sup>3</sup>,ê,é B

¬€÷,·,é,ÆD3DRM\_OK AŽ,˝s,·,é,ÆfGf% [,đ•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,l•Ô'l v,đŽQ Æ,·,é,±,Æ B

*lpRef*  
ŽQ Æ,Æ,μ,Ä—p,¢,ς,ê,éDirect3DRMFramefIfufWfFfNfg,đŽ!,·•İ ” B

*lprvAxis*  
*ftf*€ [f€,l̂%ñ“]Ž<sup>2</sup>,đŽó,¬Žæ,éD3DVECTOR \‘¢‘İ B

*lprvTheta*  
*ftf*€ [f€,l̂%ñ“],đf%o fWfAf“˝P^Ê,ÄŽó,¬Žæ,é•İ ” B

ŽQ Æ @IDirect3DRMFrame::SetRotation, •İŠ

**IDirect3DRMFrame::GetScene**

```
HRESULT GetScene (LPDIRECT3DRMFRAME* lpRoot);
```

Žw'è,<sup>3</sup>,ê,½ftfĚ [fĚ,ðŠŮ,ḐŠK'w,ìfĸ [fg EftfĚ [fĚ,ðŽæ“¾,·,é B  
¬Ĉ÷,·,é,ÆD3DRM\_OK AŽ,˝s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ĵ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lpRoot  
fV [f“,ì Å ãÊftfĚ [fĚ,ðŽ',·Direct3DRMFrameIfufWfFfNfg,ðŽó,¬Žæ,éf|fCf“f^,Ö,Ìf|fCf“f^ B

**IDirect3DRMFrame::GetSceneBackground**

D3DCOLOR GetSceneBackground() ;

*f*V [f“,l”wŒi F,đŽæ“¾,·,é B  
F,đ•Ô,· B

## IDirect3DRMFrame::GetSceneBackgroundDepth

```
HRESULT GetSceneBackgroundDepth(  
    LPDIRECTDRAWSURFACE * lpDDSsurface);
```

fV [f“,lŒ» Ý,l”wŒi [“xfobftf@,ðŽæ“¼,·,é B

–Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,l̂ê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,l•Ô'l v,ðŽQ Œ,·,é,±,Œ B

lpDDSsurface

Œ» Ý,l”wŒi [“xfobftf@,ðŽ!,·DirectDrawfT [ftfFfX,l̂AfhfŒfX,““ü,éf|fCf“f^,l̂AfhfŒfX B

ŽQ Œ @IDirect3DRMFrame::SetSceneBackgroundDepth



**IDirect3DRMFrame::GetSceneFogColor**

D3DCOLOR GetSceneFogColor();

*f*V [f“,lftfHfO,l F,đŽæ“¾,·,é B  
ftfHfO,l F,đ•Ô,· B

**IDirect3DRMFrame::GetSceneFogEnable**

BOOL GetSceneFogEnable();

,±,ìfV [f“,Å ACE» ÝftfHfO,ª—LCEø,Å, ,é,©,Ç,²,©,ð•Ô,· B  
ftfHfO,ª—LCEø,Å, ,ê,ÎTRUE A,»,²,Å,È,¯,ê,ÎFALSE,ð•Ô,· B

**IDirect3DRMFrame::GetSceneFogMode**

D3DRMFOGMODE GetSceneFogMode ( ) ;

,±,ìfV [f“,ìŒ» Ý,ìftfHfO Ef, [fh,ð•Ô,· B

Œ» Ý,ìftfHfO Ef, [fh,ðŽ',•**D3DRMFOGMODE**—ñ<“Œ^,ìf f“fo,ì,D,Æ,Â,ð•Ô,· B

**IDirect3DRMFrame::GetSceneFogParams**

HRESULT GetSceneFogParams(D3DVALUE \* lprvStart, D3DVALUE \* lprvEnd,  
D3DVALUE \* lprvDensity);

,±,ìfV [f“,ìŒ» Ý,ìtfHfO Efpf%of [f^,ðŽæ“¾,·,é B  
-Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,l•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lprvStart, lprvEnd, lprvDensity  
ftfHfO,ìŽn“\_ A I“\_ A-§“x,î'l,ðŽó,~Žæ,é•İ ” B

**IDirect3DRMFrame::GetSortMode**

D3DRMSORTMODE GetSortMode();

ŽqftfĒ [fĒ,đ ħ— ,;é,½,ß,ÉŽg,í,ê,é•ª—pf, [fh,đŽæ“¾,;é B  
•ª—pf, [fh,đŽ!,•D3DRMSORTMODE—ñ“Ē^,łf f“fo,đ•Ô,• B

ŽQ Æ @IDirect3DRMFrame::SetSortMode

**IDirect3DRMFrame::GetTexture**

HRESULT GetTexture(LPDIRECT3DRMTEXTURE\* lpTexture);

Žw'è,<sup>3</sup>,ê,½ftfĈ [f€,̀lfefNfXf`ff,ðŽæ“¾,·,é B

¬Ĉ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,İ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lpTexture  
ftfĈ [f€,̀lfefNfXf`ff,ðŽ!,·Direct3DRMTextureIfufWfFfNfg,ðŽó,¬Žæ,éf|fCf“f^,Ö,İf|fCf“f^ B

ŽQ Æ @IDirect3DRMFrame::SetTexture

**IDirect3DRMFrame::GetTextureTopology**

HRESULT GetTextureTopology(BOOL \* lpbWrap\_u, BOOL \* lpbWrap\_v);

Žw'è,<sup>3</sup>,ê,½ftfĈ [f€ ã,łflfufWfFfNfg,Éf}fbfv,<sup>3</sup>,ê,é,Æ,«,ł AfefNfXf`ff,łÊ‘Š“Á «,đŽæ“¾,·,é B

¬Ĉ÷,·,é,ÆD3DRM\_OK AŽ, ”s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,łÊ——,É,Â,ċ  
,Ă,Í A uDirect3D•ŨŽ f, [fh,Ĵ•Ô'l v,đŽQ Æ,·,é,±,Æ B

lpbWrap\_u, lpbWrap\_v  
Ĉ%oÊ,đŽó,¬Žæ,é•Í ” BfefNfXf`ff,<sup>a</sup>u•ûĈü,âv•ûĈü,Éf}fbfv,<sup>3</sup>,ê,é,Æ,« A,»,ê,¼,ê,ł•Í ”,ÉTRUE,<sup>a</sup> Ý'è,<sup>3</sup>,ê,é B

ŽQ Æ @IDirect3DRMFrame::SetTextureTopology

**IDirect3DRMFrame::GetTransform**

HRESULT GetTransform(D3DRMMATRIX4D rmMatrix);

4 s4—ñ, ÌfAftfBf“ s—ñ, Æ, µ, ÄftfÆ [f€ , Ìf [fJf•İŠ•, ðŽæ“¾, •, é B

¬Æ÷, •, é, ÆD3DRM\_OK AŽ, ”s, •, é, ÆfGf% [ , ð•Ô , • B•Ô'l, Îê——, É, Â, ¢

, Ä, Í A uDirect3D•ÛŽ f, [fh, İ•Ô'l v, ðŽQ Æ, •, é, ±, Æ B

rmMatrix

ftfÆ [f€•İŠ•, ðŽæ“¾, •, éD3DRMMATRIX4D”z—ñ B, ±, Ìfpf% [f^, Í”z—ñ, ðŽ!, •, İ, Å AŽÀ Û, É, ÍfAfhfÆfX, Å,

, é B

ŽQ Æ @3D•İŠ•



**IDirect3DRMFrame::GetVelocity**

HRESULT GetVelocity(LPDIRECT3DRMFRAME lpRef, LPD3DVECTOR lprvVel,  
          BOOL fRotVel);

Žw'è,³,ê,¼ŽQ ÆftfŒ [f€‚É'Î‚‚é AftfŒ [f€‚İ'Š'Î'¬“x‚ðŽæ“¾‚‚é B  
          ¬Œ÷‚‚é‚ÆD3DRM\_OK AŽ‚”s‚‚é‚ÆfGf% [‚ð•Ô‚‚ B•Ô'l‚Îê—‚É‚Â‚Œ  
‚Ä‚Î A uDirect3D•ŮŽ f‚ [fh‚İ•Ô'l v‚ðŽQ Æ‚‚é‚±‚Æ B

lpRef  
ŽQ Æ‚Æ‚µ‚Ä—p‚Œ‚ç‚é‚éDirect3DRMFramefIfufWfFfNfg‚ðŽ'‚•İ ” B

lprvVel  
ftfŒ [f€‚İ'¬“x‚ðŽó‚¬Žæ‚éD3DVECTOR \‘Œ'İ‚İfAfhfŒfX B

fRotVel  
êŽŸŒ³‚İ'¬“x‚ðŽæ“¾‚‚é ê ‡fIfufWfFfNfg‚İ%õñ“]‘¬“x‚ª l—¶‚É“ü‚ê‚ç‚ê‚é‚©‚Ç‚²‚©‚ðŽ'‚‚ftf%ofO B‚±  
‚İfpf%of [f^‚ÉTRUE‚ðŽw'è‚‚é‚ÆfIfufWfFfNfg‚İ%õñ“]‘¬“x‚ªEvŽZ‚ÉŠŮ‚ß‚ç‚ê‚é B

ŽQ Æ @IDirect3DRMFrame::SetVelocity

**IDirect3DRMFrame::GetVisuals**

HRESULT GetVisuals(LPDIRECT3DRMVISUALARRAY\* lpVisuals);

ftfϵ [fϵ ã,lfrrWf...fAfϵ,lfŠfXfg,ðŽæ“¾,·,é B

¬ϵ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŨŽ f, [fh,İ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lpVisuals

ϵÄ,Ũ o,μ,<sup>a</sup> ¬ϵ÷,μ,½,Æ,«,É A—Lϵø,ÈDirect3DRMVisualArray f|fCf“f^,Â %oŠú%o»,<sup>3</sup>,ê,éf|  
fCf“f^,lfAfhfϵfX B

**IDirect3DRMFrame::GetZbufferMode**

D3DRMZBUFFERMODE GetZbufferMode();

Zfofbftf@ Ef, [fh,đŽæ“%4,·,é B,·,È,í,¿ AZfofbftf@fŠf“fO,ª—LŒø,©³Œø,©,đŽ!,· B

D3DRMZBUFFERMODE—ñ“Œ^,Ìf f“fo,Ì,Đ,Æ,Â,đ•Ô,· B

ŽQ Æ @IDirect3DRMFrame::SetZbufferMode

**IDirect3DRMFrame::InverseTransform**

HRESULT InverseTransform(D3DVECTOR \*lprvDst, D3DVECTOR \*lprvSrc);

*lprvSrc*pf%of [f^,Ž',·fxfNfgf<,đf [f<fh À•W,©,çf,ff< À•W,É•İŠ·,µ AÆ<%oÊ,đ*lprvDst*pf%of [f^,É•Ô,· B  
¬Æ÷,·,é,ÆD3DRM\_OK AŽ,"s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,İ•Ô'l v,đŽQ Æ,·,é,±,Æ B

*lprvDst*  
•İŠ·Æ<%oÊ,đŽó,¬Žæ,éD3DVECTOR \‘¢‘İ B

*lprvSrc*  
•İŠ·,İf\ [fX,Æ,Ê,éD3DVECTOR \‘¢‘İ B

ŽQ Æ @IDirect3DRMFrame::Transform,3D•İŠ·

## IDirect3DRMFrame::Load

```
HRESULT Load(LPVOID lpvObjSource, LPVOID lpvObjID,  
             D3DRMLOADOPTIONS d3drmLOFlags,  
             D3DRMLOADTEXTURECALLBACK d3drmLoadTextureProc, LPVOID lpArgLTP);
```

Direct3DRMFrameIfufWfFfNfg,ðf [fh,·,é B

¬Æ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [ ,ð•Ô,· B•Ô'l,îê——,É,Â,¢  
,Ä,Í A uDirect3D•ÛŽ f, [fh,î•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lpvObjSource

fIfufWfFfNfg,ªf [fh,³,ê,éf\ [fX Bd3drmLOFlagsfpf%of [f^,ªŽ',·f\ [fX Eftf%ofO,É,æ,Á,Ä Aftf@fCf<  
AfŠf\ [fX Af f,fŠ Efuf fbFN A,Û,½,ÍfXfgfŠ [f€,ðŽw'è,·,é B

lpvObjID

f [fh,·,éIfufWfFfNfg,ì¼‘O,Û,½,ÍÊ'u B,±  
,ìfpf%of [f^,íd3drmLOFlagsfpf%of [f^,ªŽ',·Ž-•ÊŽqftf%ofO,É,æ,Á,Ä%ðŽB,³,ê,é BD3DRMLOAD\_BYPOSITIO  
Nftf%ofO,ðŽw'è,µ,½ ê ± A,±,ìfpf%of [f^,Íftf@fCf<,ì't,ìIfufWfFfNfg,ì ± ~,ðŽ',•DWORD'l,Ö,ìf|  
fCf“f^,Ä, ,é B,±,ìfpf%of [f^,Ê,ÍNULL,ðŽw'è,·,é,±,Æ,à,Ä,«,é B

d3drmLOFlags

f [fh EfIfvfVf±f“,ðŽ',•D3DRMLOADOPTIONS(É^,ì'l B

d3drmLoadTextureProc

**D3DRMLOADTEXTURECALLBACK** fR [f<fofbfNŠÖ ” B,±,ê,Í A“Á•Ê,ÈftfH [f}fbfg,ð•K—  
v,Æ,·,éIfufWfFfNfg,ª—p,¢,éfefNfXf`ff,ð“Ç,Ý o,·,Æ,«,ÉÆÄ,Ñ o,³,ê,é B,±  
,ìfpf%of [f^,Ê,ÍNULL,ðŽw'è,·,é,±,Æ,ª,Ä,«,é B

lpArgLTP

**D3DRMLOADTEXTURECALLBACK** fR [f<fofbfNŠÖ ”,É“n,³,ê,é AfAfvfŠfP [fVf±f““è<,ìff [f^ B

ffftfHf<fg,Ä,Í A,±,ìf f\fbfh,Í lpvObjSource fpf%of [f^,ÄŽw'è,³,ê,½ftf@fCf<,ì't,ì Ä %o  
,ìftfÆ [f€ŠK‘w,ðf [fh,·,é B,±,ìf f\fbfh,ðÆÄ,Ñ o,·ftfÆ [f€,Í A V,µ,¢ftfÆ [f€ŠK‘w,ì e,É,È,é B

**IDirect3DRMFrame::LookAt**

```
HRESULT LookAt(LPDIRECT3DRMFRAME lpTarget, LPDIRECT3DRMFRAME lpRef,
               D3DRMFRAMECONSTRAINT rfcConstraint);
```

Žw'è,³,ê,½ŽQ ÆftfŒ [f€,Æ”ăŠr,μ,Ă AftfŒ [f€,ð-Ú•WftfŒ [f€,ÉŒü, ¯ A—^,!,ç,ê,½ đŒ ,Ă%oñ“]  
,đf fbfn,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,Îê——,É,Â,Œ  
,Ă,Í A uDirect3D•ŨŽ f, fh,Ĭ•Ô'l v,đŽQ Æ,·,é,±,Æ B

lpTarget, lpRef  
-Ũ•W,“,æ,ŃŽQ Æ,Æ,μ,Ă—p,Œ,ç,ê,éDirect3DRMFramefIfufWfFfNfg,đŽ!,·İ ” B  
rfcConstraint  
%oñ“]Ž²,đŽw'è,·,éD3DRMFRAMECONSTRAINT—ñ“Œ^,Ĭf f“fo B

**IDirect3DRMFrame::Move**

HRESULT Move(D3DVALUE delta);

—^,!,ç,ê,½ŠK‘w’†,Ì,·,×,Ä,ÏftfŒ [f€‚É%oñ“],Æ‘¬“x,ð“K—p,·,·,é B  
¬Œ÷,·,·,é,ÆD3DRM\_OK AŽ, ”s,·,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Ïê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ï•Ô'l v,ðŽQ Æ,·,é,±,Æ B

delta  
•Ï X,·,·,é‘¬“x,Æ%oñ“],Ï—Ê B

## IDirect3DRMFrame::SetColor

```
HRESULT SetColor(D3DCOLOR rcColor);
```

*ftf*€ [f€,İ F,đ Ý'è,·,é **BD3DRMMATERIALMODE**—

ñ<“€^,ªD3DRMMATERIAL\_FROMFRAME,İ,Æ,« Aftf€ [f€ ä,İf fbfVf...,É,±,İ F,ªŽg—p,³ê,é B

–€÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,İê——,É,Â,¢  
,Ä,İ A uDirect3D•ŮŽ f, [fh,İ•Ô'l v,đŽQ Æ,·,é,±,Æ B

*rcColor*

*ftf*€ [f€,İ V,µ,¢ F B

ŽQ Æ @**IDirect3DRMFrame::GetColor**, **IDirect3DRMFrame::SetMaterialMode**



**IDirect3DRMFrame::SetColorRGB**

HRESULT SetColorRGB(D3DVALUE rvRed, D3DVALUE rvGreen,  
D3DVALUE rvBlue);

ftfŒ [f€,İ F,đ Ý'è,.,é BD3DRMMATERIALMODE—  
ñ<“Œ^,°D3DRMMATERIAL\_FROMFRAME,İ,Æ,« AftfŒ [f€ ã,İf fbVf...,É,±,İ F,ªŽg—p,³,ê,é B  
–Œ÷,.,é,ÆD3DRM\_OK AŽ,»s,.,é,ÆfGf%o [ ,đ•Ô,· B•Ô'l,İ^ê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,İ•Ô'l v,đŽQ Æ,.,é,±,Æ B

rvRed, rvGreen, rvBlue  
ftfŒ [f€,İ V,µ,¢ F BŠe F—v'f,Í0,©,ç1,İ”ÍÍ,É,È,,Ä,Í,È,ç,È,¢ B

ŽQ Æ @IDirect3DRMFrame::SetMaterialMode

**IDirect3DRMFrame::SetMaterialMode**

HRESULT SetMaterialMode(D3DRMMATERIALMODE rmmMode);

ftf€ {f€,łf}fefŠfAf<f, [fh,đ Ý'è,·,é Bf}fefŠfAf<f, [fh,Í Aftf€ {f€,Éf€f“f\_Ÿf“fO,<sup>3</sup>,ê,éfrfWf...fAf<,łf}fefŠfAf< î•ñ,łf\ [fX,đ€˘è,·,é B

¬€÷,·,é,ÆD3DRM\_OK AŽ,˘s,·,é,ÆfGf%∞ [,đ•Ô,· B•Ô'l,İê——,É,Â,¢,Ä,Í A uDirect3D•ŮŽ f, [fh,İ•Ô'l v,đŽQ Æ,·,é,±,Æ B

rmmMode

D3DRMMATERIALMODE—ñ<“€^f f“fo [,İ,Đ,Æ,Â B

ŽQ Æ @IDirect3DRMFrame::GetMaterialMode

## IDirect3DRMFrame::SetOrientation

```
HRESULT SetOrientation(LPDIRECT3DRMFRAME lpRef, D3DVALUE rvDx,  
    D3DVALUE rvDy, D3DVALUE rvDz, D3DVALUE rvUx, D3DVALUE rvUy,  
    D3DVALUE rvUz);
```

ftfĒ [fĒ,đ•À,×,é Bz•ûĒü,ª•ûĒüxfNfgfĸ[rvDx, rvDy, rvDz],É%ˆ,ĸ Ay•ûĒü,ªfxfNfgfĸ[rvUx, rvUy, rvUz],É•À,Ô,æ,▯  
,É,·,é B

¬Ē÷,·,é,ÆD3DRM\_OK AŽ, ”s,·,é,ÆfGf% [,đ•Ô,· B•Ô'l,Îê——,É,Â,ĸ  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Î•Ô'l v,đŽQ Æ,·,é,±,Æ B

lpRef  
ŽQ Æ,Æ,μ,Ä—p,ĸ,ç,ê,éDirect3DRMFrame fIfufWfFfNfg,đŽ|,·•İ ” B

rvDx, rvDy, rvDz  
ftfĒ [fĒ,Î V,μ,ĸzŽ² B

rvUx, rvUy, rvUz  
ftfĒ [fĒ,Î V,μ,ĸyŽ² B

ffftfHfĸfg,Ä,Í AftfĒ [fĒ,Í•ûĒüxfNfgfĸ[0, 0, 1],Æ ãfxfNfgfĸ[0, 1, 0],đŽ ,Á,Ä,ĸ,é B

[rvUx, rvUy, rvUz],ª[rvDx, rvDy, rvDz]  
,Æ•½ s,Ê ê ±,Í AD3DRMERR\_BADVALUEfGf% [l,ª•Ô,³,ê,é B,»,ê~ÈŠO,Î ê ±,Í A“n,³,ê,½[rvUx, rvUy,  
rvUz]fxfNfgfĸ,ª[rvDx, rvDy, rvDz],É ,'¼,È•½–Ê ã,É“Š%œ,³,ê,é B

ŽQ Æ @IDirect3DRMFrame::GetOrientation

## IDirect3DRMFrame::SetPosition

HRESULT SetPosition(LPDIRECT3DRMFRAME lpRef, D3DVALUE rvX, D3DVALUE rvY,  
D3DVALUE rvZ);

ŽQ ÆftfŒ [f€,©,ç,İftfŒ [f€,İŠ'İÊ'u,đ Ý'è,·é BftfŒ [f€,Í AŽQ ÆftfŒ [f€,©,ç,İ—£,[rvX,rvY,rvZ]  
,İ ê Š,É”z'u,³,ê,é B eftfŒ [f€,İ†,ÉŽqftfŒ [f€,ª ì ¬,³,ê,é,Æ,«,Í A eftfŒ [f€,İ[0, 0, 0],İÊ'u,É'u,©,ê,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ,»s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,İÊ—,É,Â,Œ  
,Ä,Í A uDirect3D•ŮŽ f, [fh,İ•Ô'l v,đŽQ Æ,·,é,±,Æ B

lpRef  
ŽQ Æ,Æ,μ,Ä—p,Œ,ç,ê,éDirect3DRMFrameIfufWfFfNfg,đŽ!,·İ ”,İfAfhfŒfX B  
rvX,rvY,rvZ  
ftfŒ [f€,İ V,μ,ŒÊ'u B

ŽQ Æ @IDirect3DRMFrame::GetPosition

**IDirect3DRMFrame::SetRotation**

HRESULT SetRotation(LPDIRECT3DRMFRAME lpRef, D3DVALUE rvX, D3DVALUE rvY, D3DVALUE rvZ, D3DVALUE rvTheta);

ftf€ [f€,\%õ“]Ž²,Æ%õ“]Šp“x,ð Ý’è,·,é B,±,Ì Ý’è,[IDirect3DRM::Tick,Û,½,Í  
IDirect3DRMFrame::Movef f\fbfh,ª€Ä,Ñ o,³,ê,é,½,Ñ,Ê“K—p,³,ê,é B•ü€üxfNfgf<[rvX, rvY, rvZ]  
,Í AŽQ Æftf€ [f€,Ä’è`³,ê,é B

¬€÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf% [,\ð•Ô,· B•Ô’l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ÛŽ f, [fh,Î•Ô’l v,ðŽQ Æ,·,é,±,Æ B

lpRef  
ŽQ Æ,Æ,µ,Ä—p,¢,ç,ê,éDirect3DRMFramefIfufWfFfNfg,ðŽ’,•İ ” B

rvX, rvY, rvZ  
%õ“]Ž²,Æ,È,éfxfNfgf< B

rvTheta  
f%oFWfAf““P^Ê,\%õ“]Šp“x B

ftf€ [f€ ã,\IfufWfFfNfg,ð1%õ,µ,©•İ X,µ,È,¢IDirect3DRMFrame::AddRotationf f\fbfh,Æ^Û,È,è A,±  
,Ìf f\fbfh,Í AŽw’è,³,ê,½%õ“],É,æ,Ä,Äf€f“f\_fŠf“fO,Ìf^fCf~f“fO,²,Æ,É•İŠ· s—ñ,ð•İ X,·,é B

ŽQ Æ @IDirect3DRMFrame::AddRotation, IDirect3DRMFrame::GetRotation

**IDirect3DRMFrame::SetSceneBackground**

HRESULT SetSceneBackground(D3DCOLOR rcColor);

fV [f“,l”wŒi F,ðfZfbfg,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,l̂ê——,É,Â,¢

,Ä,Í A uDirect3D•ŨŽ f, [fh,l̂•Ô'l v,ðŽQ Æ,·,é,±,Æ B

rcColor

”wŒi,l̂ V,µ,¢ F B

**IDirect3DRMFrame::SetSceneBackgroundDepth**

HRESULT SetSceneBackgroundDepth(LPDIRECTDRAWSURFACE lpImage);

fV [f“,l”wEi [“xfobftf@,đŽw’è,·,é B  
¬Æ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô’l,l̂ê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,l̂•Ô’l v,đŽQ Æ,·,é,±,Æ B

lpImage  
fV [f“,l̂ V,µ,¢”wEi [“x,đŠi”[,·,éDirectDrawfT [ftfFfX B

fCf [fW,l̂ [“x,í16,Ä,È,,Ä,Í,È,ç,È,¢ BfCf [fW,Æfxf... [f] [fg,l̂TfCfY,ªˆÙ,È,Á,Ä,¢  
,é ê ‡ A,Ů,, AfCf [fW,ªfXfP [fŠf“fO,³,ê,é B”wEi [“xfobftf@,l̂fAfjf [fVf‡f“,Ä Ä ,,l̂pfth [f}  
f“fX,đ“¾,é,½,ß,É,Í AfCf [fW,l̂TfCfY,ªfxf... [f] [fg,Æ“¯,¶,Ä,È,,Ä,Í,È,ç,È,¢ B,±,ê,É,æ,Ä,Ä A  
—]•ª,ÈfI [fo [fwfbfh,È,µ,É A [“xfobftf@,ðfCf [fW Ef f,fŠ,©,ç’¼ Ů X V,·,é,±,Æ,ª,Ä,«,é B

ŽQ Æ @IDirect3DRMFrame::GetSceneBackgroundDepth

**IDirect3DRMFrame::SetSceneBackgroundImage**

HRESULT SetSceneBackgroundImage(LPDIRECT3DRMTEXTURE lpTexture);

fV [f“,l”wŒifCf [fW,ðŽw’è,·,é B  
¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [ ,ð•Ô,· B•Ô’l,l̂ê——,É,Â,¢  
,Ä,Í A uDirect3D•ŨŽ f, [fh,l̂•Ô’l v,ðŽQ Æ,·,é,±,Æ B

lpTexture  
V,µ,¢”wŒifV [f“,ðŠŨ,bDirect3DRMTextureIfufWfFfNfg B

fCf [fW,l̂fTfCfY,â F ”,ªfrf... [f| [fg,Æ^Ũ,È,Á,Ä,¢,é,Æ A,Ũ,, AfCf [fW,ªfXfP [fŠf“fO,³,ê,é,© A“K“–  
,È F ”,É•İŠ·,³,ê,é B”wŒi,l̂fAfjff [fVf‡f“,Å Å ,,l̂pftfH [f}  
f“fX,ð“¾,é,½,ß,É,Í AfCf [fW,l̂fTfCfY,Æ F ”,ªfrf... [f| [fg,Æ“¯,¶,Ä,È,,Ä,Í,È,ç,È,¢ B,±,ê,É,æ,Á,Ä A  
—]•ª,ÈfI [fo [fwfbfh,È,µ,É A”wŒi,ðfCf [fW Ef f,fŠ,©,ç’¼ ÚŒf“f\_Œf“fO,·,é,±,Æ,ª,Ä,«,é B



**IDirect3DRMFrame::SetSceneBackgroundRGB**

HRESULT SetSceneBackgroundRGB(D3DVALUE rvRed, D3DVALUE rvGreen,  
D3DVALUE rvBlue);

*fV* [f“,l”wEi F,đ Ý’è,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,đ•Ô,· B•Ô’l,l̂ê——,É,Â,¢  
,Ä,Í A uDirect3D•ŨŽ f, [fh,l•Ô’l v,đŽQ Æ,·,é,±,Æ B

*rvRed, rvGreen, rvBlue*  
”wEi,l̂ V,μ,¢ F B

**IDirect3DRMFrame::SetSceneFogColor**

HRESULT SetSceneFogColor(D3DCOLOR rcColor);

fV [f“,lftfHfO,l F,đ Y’è,·,é B

¬Æ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,đ•Ô,· B•Ô’l,l̂ê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,l•Ó’l v,đŽQ Æ,·,é,±,Æ B

rcColor

ftfHfO,l V,µ,¢ F B

**IDirect3DRMFrame::SetSceneFogEnable**

HRESULT SetSceneFogEnable(BOOL bEnable);

ftfHfO,ð—LŒø,Û,½,Í–³Œø,É,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ,˝s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ĵ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

bEnable

ftfHfO,ĭ V,µ,¢ ó‘Ô B

**IDirect3DRMFrame::SetSceneFogMode**

HRESULT SetSceneFogMode(D3DRMFOGMODE rfMode);

ftfHfO Ef, [fh,đ Ý'è,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ, ”s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ĵ•Ô'l v,đŽQ Æ,·,é,±,Æ B

rfMode

V,µ,¢ftfHfO Ef, [fh,đŽ,·D3DRMFOGMODE—ñ<“Œ^,Ĭf f“fo,Ĭ,Đ,Æ,Â B

ŽQ Æ @IDirect3DRMFrame::SetSceneFogParams

## IDirect3DRMFrame::SetSceneFogParams

HRESULT SetSceneFogParams(D3DVALUE rvStart, D3DVALUE rvEnd,  
D3DVALUE rvDensity);

,±,ìfV [f“,ìŒ» Ý,ìftfHfO Efpf%of [f^,ð Ý’è,·,é B

¬Œ÷,·,é,ŒD3DRM\_OK AŽ,”s,·,é,ŒfGf%o [„ð•Ô’,· B•Ô’l,ìê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ì•Ô’l v,ðŽQ Œ,·,é,±,Œ B

rvStart, rvEnd

fŠfjfAftfHfO Ef, [fh,Â,Ì AftfHfO,ìŠJŽn,Œ I—¹Ê’u B,±,ê,ç,Ì Ý’è,Í A Â %o  
,ÉftfHfOŒø%oÊ,ªŒ»,ê,éfjf f%o,©,ç,Ì←—£,Œ AftfHfO,ª Â‘â–š“x,É’B,·,é←—£,ðŒ^è,·,é B

rvDensity

Žw ”ftfHfO Ef, [fh,Â,ìftfHfO,ì–š“x B,±,ìl,Í,O,©,ç,P,Ü,Â,ì”ÍÍ,Â,È,,Ä,Í,È,ç,È,¢ B

ŽQ Œ @D3DRMFOGMODE, IDirect3DRMFrame::SetSceneFogMode

**IDirect3DRMFrame::SetSortMode**

HRESULT SetSortMode (D3DRMSORTMODE d3drmsM) ;

ŽqftfŒ [f€,đ ^— ,·,é,½,ß,ÉŽg,í,ê,é•ª—pf, [fh,đfZfbfg,·,é B,±,lf f\fbfh,Í A%B—Ê œŽ,lfAf<fSfŠfYf€ ,đ•İ X,·,é,½,ß,É—p,¢,é,±,Æ,ª,Ä,«,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ,ªs,·,é,ÆfGf%∞ [ ,đ•Ô,· B•Ô'l,İê——,É,Â,¢ ,Ä,İ A uDirect3D•ŬŽ f, [fh,İ•Ô'l v,đŽQ Æ,·,é,±,Æ B

d3drmsM

•ª—pf, [fh,đŽw'è,·,éD3DRMSORTMODE— ñ<“Œ^,İf f“fo,İ,Đ,Æ,Â BftftfHf<fg'l,İD3DRMSORT\_FROMPARENT,Â, ,é B

ŽQ Æ **IDirect3DRMFrame::GetSortMode**

**IDirect3DRMFrame::SetTexture**

HRESULT SetTexture(LPDIRECT3DRMTEXTURE lpD3DRMTexture);

ftfœ [f€,\`f efNfXf`ff,ð Ý'è,·,é B  
¬œ÷,·,é,ÆD3DRM\_OK AŽ,"s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŨŽ f, [fh,İ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lpD3DRMTexture  
Žg—p,<sup>3</sup>,ê,éDirect3DRMTexturefIfufWfFfNfg,ðŽ',·İ " B

**D3DRMMATERIALMODE—**

ñ<“œ^,ªD3DRMMATERIAL\_FROMFRAME,Ì,Æ,« AfefNfXf`ff,Íftfœ [f€ ã,\`f fbfVf...,Ì,½,ß,ÉŽg—  
p,<sup>3</sup>,ê,é Bftfœ [f€,\`f efNfXf`ff,ð¬œø,É,·,é,É,Í AfefNfXf`ff,ÉNULL,ðŽw'è,·,é B

ŽQ Æ @IDirect3DRMFrame::GetTexture, IDirect3DRMFrame::SetMaterialMode

**IDirect3DRMFrame::SetTextureTopology**

HRESULT SetTextureTopology(BOOL bWrap\_u, BOOL bWrap\_v);

ftfЄ [fЄ ã,l̃fIfufWfFfNfg,l̃ AfeNfXf`ff À•W,îÊ‘Š“Á «,đ’è<’,,é B  
¬Є÷,.,é,ÆD3DRM\_OK AŽ,”s,.,é,ÆfGf%o [,đ•Ô,· B•Ô’l,îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŨŽ f, [fh,İ•Ô’l v,đŽQ Æ,.,é,±,Æ B  
bWrap\_u, bWrap\_v  
Ý’è,.,é’l,đŽ’,.ˆø ” B,••ûЄü,Ü,½,Í,—•ûЄü,ÉfeNfXf`ff,đf}fbfv,.,é,Æ,« A‘Í%ž,.,éˆø ”,ÉTRUE,đ Ý’è,.,é B

ŽQ Æ @IDirect3DRMFrame::GetTextureTopology



## IDirect3DRMFrame::SetVelocity

HRESULT SetVelocity(LPDIRECT3DRMFRAME lpRef, D3DVALUE rvX,  
D3DVALUE rvY, D3DVALUE rvZ, BOOL fRotVel);

Žw'è,<sup>3</sup>,ê,½ftfĈ [fĚ,ì AŽQ ÆftfĈ [fĚ  
,©,ç,ì'Š'î'¬“x,đ Ý'è,·,é B**IDirect3DRM::Tick**,Ü,½,Í**IDirect3DRMFrame::Move**f f\fbfh,ìĈÄ,Ñ o,μ,<sup>a</sup> ¬Ĉ÷,·,é,½,Ñ  
AftfĈ [fĚ,ÍfxfNfgf<[rvX, rvY, rvZ],É,æ,Á,Ä'Ú“<sup>@</sup>,<sup>3</sup>,ê,é B

¬Ĉ÷,·,é,ÆD3DRM\_OK AŽ,"s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,îê——,É,Â,ĉ  
,Ä,Í A u**Direct3D•ÜŽ f, [fh,î•Ô'l** v,đŽQ Æ,·,é,±,Æ B

lpRef  
ŽQ Æ,Æ,μ,Ä—p,ĉ,ç,ê,éDirect3DRMFramefIfufWfFfNfg,đŽ',·İ ” B

rvX, rvY, ,",æ,Ñ rvZ  
ftfĈ [fĚ,ì V,μ,ĉ'¬“x B

fRotVel  
^êŽŸĈ<sup>3</sup>,ì'¬“x,đ Ý'è,·,é ê ± AfIfufWfFfNfg,ì%oñ“]‘¬“x,đ l—¶,É“ü,ê,é,©,Ç,ϣ,©,đŽw'è,·,éftf%ofo B,±  
,ìfpf%of [f^,"TRUE,ì,Æ,« AfIfufWfFfNfg,ì%oñ“]‘¬“x,<sup>a</sup>ĈvŽZ,ÉŠÜ,ß,ç,ê,é B

ŽQ Æ @**IDirect3DRMFrame::GetVelocity**

**IDirect3DRMFrame::SetZbufferMode**

HRESULT SetZbufferMode(D3DRMZBUFFERMODE d3drmZBM);

Zfofbftf@ Ef, [fh,đ Ý'è,·,é B,·,È,í,ı AZfofbftf@fŠf“fO,đ—LŒø,Ŭ,½,Í—Œø,É,·,é B  
¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŬŽ f, [fh,İ•Ô'l v,đŽQ Œ,·,é,±,Œ B

d3drmZBM

Zfofbftf@ Ef, [fh,đŽw'è,·,éD3DRMZBUFFERMODE—  
ñ“Œ^,İf f“fo,İ,D,Œ,Â BfftfHf'fg'l,İD3DRMZBUFFER\_FROMPARENT,Â, ,é B

ŽQ Œ @IDirect3DRMFrame::GetZbufferMode

**IDirect3DRMFrame::Transform**

HRESULT Transform(D3DVECTOR \*lpd3dVDst, D3DVECTOR \*lpd3dVSrc);

lpd3dVSrcpf%of [f^,^Ž!,·fxfNfgf<,đL,fff< À•W,©,çf [f<fh À•W,É•İŠ·,µ AÆ<%oÊ,đlpd3dVDstf%of [f^,É•Ô  
,· B

¬Æ÷,·,é,ÆD3DRM\_OK AŽ, ”s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,İê——,É,Â,¢  
,Ä,İ A uDirect3D•ŮŽ f, [fh,İ•Ô'l v,đŽQ Æ,·,é,±,Æ B

lpd3dVDst  
•İŠ· ^— ,İÆ<%oÊ,đŽó,¬Žæ,éD3DVECTOR \‘¢‘İ B

lpd3dVSrc  
•İŠ· ^— ,³,ê,éD3DVECTOR \‘¢‘İ B

ŽQ Æ @IDirect3DRMFrame::InverseTransform, 3D•İŠ·

## IDirect3DRMLight

*fAfvfŠfP [fVf‡f“*,Í *AÆðÆ¹,ÆÆÝ,¢,É,â,èŽæ,è,·,é,½,ß,ÉIDirect3DRMLightfCf“f^ [ftFfCfX,lf f\fbfh,ðŽg—*  
*p,·,é B,±,lfZfNfVf‡f“*,Í *AIDirect3DRMLightfCf“f^ [ftFfCfX Ef f\fbfh,lfŠftf@fÆf“fX,Â, ,é BŠT”O,Ê,Â,¢*  
*,Â,ŠT—v,Í A uIDirect3DRMLight,ÆIDirect3DRMLightArrayfCf“f^ [ftFfCfX v,ðŽQ Æ,·,é,±,Æ B*

*IDirect3DRMLightfCf“f^ [ftFfCfX Ef f\fbfh,Í A`È%°,lfOf< [fv,É•—D,·,é,±,Æ,ª,Â,«,é B*

Æ, Š

GetConstantAttenuation

GetLinearAttenuation

GetQuadraticAttenuation

SetConstantAttenuation

SetLinearAttenuation

SetQuadraticAttenuation

F

GetColor

SetColor

SetColorRGB

—LÆø”Íí

GetEnableFrame

SetEnableFrame

ÆðÆ¹f^fCfv

GetType

SetType

—¾“x

GetRange

SetRange

fXf|

GetPenumbra

*fbfgÆðÆ¹ EfIfvfV*

*f‡f“*

GetUmbra

SetPenumbra

SetUmbra

*IDirect3DRMLightfCf“f^ [ftFfCfX,Í A,·,×,Ä,ÌCOMfCf“f^ [ftFfCfX,Æ“—*

*l A[UnknownfCf“f^ [ftFfCfX Ef f\fbfh,ðÆp ³,·,é BIUnknownfCf“f^ [ftFfCfX,ÍŽŸ,Ì,R,Â,lf f\fbfh,ðfTf|*  
*[fg,·,é B*

AddRef

QueryInterface

Release

*,³,ç,É AIDirect3DRMLightfCf“f^ [ftFfCfX,Í AIDirect3DRMObjectfCf“f^ [ftFfCfX,©,çŽŸ,lf f\fbfh,ðÆp ³,·,é*  
*B*

AddDestroyCallback

Clone

DeleteDestroyCallback

GetAppData

GetClassName

GetName

SetAppData

SetName

Direct3DRMLightfIfufWfFfNfg,Í AIDirect3DRM::CreateLight,¨,æ,ÑIDirect3DRM::CreateLightRGBf f\fbfh,ÌEÄ,  
Ñ o,μ,É,æ,Á,Žæ“¾,³,ê,é B

**IDirect3DRMLight::GetColor**

D3DCOLOR GetColor();

Œ» Ý,ìDirect3DRMLightIfufWfFfNfg,ì F,ðŽæ“¾,·,é B  
F,ð•Ô,· B

ŽQ Æ @IDirect3DRMLight::SetColor

**IDirect3DRMLight::GetConstantAttenuation**

D3DVALUE GetConstantAttenuation();

Direct3DRMLightIfuFWfNfg,Š'è ",đŽæ“¾,·,é B

Œ, Š'è ",đ•Ô,· B

Œ, Š'è ",ì'l,í”½”ä—á“I,ÉŒð“x,É%œ¿,đ—^,!,é B,½,Æ,,Î AŒ, Š'è ",²,ì,Æ,« AŒð,ì“x,í”¼•ª,É’á%°,·,é B

ŽQ Æ @IDirect3DRMLight::SetConstantAttenuation

**IDirect3DRMLight::GetEnableFrame**

```
HRESULT GetEnableFrame(LPDIRECT3DRMFRAME * lpEnableFrame);
```

ŒðŒ¹,ð Ý'è,·,é,Ì,É—LŒø,ÈftfŒ [f€‚ðŽæ“¾,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ, ”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢

,Ä,Í A uDirect3D•ŨŽ f, [fh,İ•Ô'l v,ðŽQ Œ,·,é,±,Œ B

lpEnableFrame

Œ» Ý,İDirect3DRMFrameIfufWfFfNfg,İ—LŒø,ÈftfŒ [f€‚ðŽó,¬Žæ,éf|fCf“f^,Ö,İf|fCf“f^ B

ŽQ Œ @IDirect3DRMLight::SetEnableFrame



### **IDirect3DRMLight::GetLinearAttenuation**

D3DVALUE GetLinearAttenuation();

ŒôŒ¹, Ì1ŽŸŒ, ŠŒW ”, ðŽæ“¾, ·, é B

1ŽŸŒ, ŠŒW ”, ð•Ô, · B

ŽQ Æ @**IDirect3DRMLight::SetLinearAttenuation**

**IDirect3DRMLight::GetPenumbra**

D3DVALUE GetPenumbra ( ) ;

*fXf|fbfgf%ofCfg,îÃ%œ•”,lŠp“x,ðŽæ“¾,·,é B*  
*^Ã%œ•”,l,ð•Ô,· B*

ŽQ Æ @IDirect3DRMLight::SetPenumbra

## **IDirect3DRMLight::GetQuadraticAttenuation**

D3DVALUE GetQuadraticAttenuation();

GetQuadraticAttenuation returns the quadratic attenuation value for the light.

The quadratic attenuation value is a value between 0.0 and 1.0.

For more information, see [IDirect3DRMLight::SetQuadraticAttenuation](#).

**IDirect3DRMLight::GetRange**

D3DVALUE GetRange ( ) ;

Œ» Ý,ìDirect3DRMLightIfufWfFfNfg,ì”íí,ðŽæ“¾,·,é B  
”íí,ðŽ!,·’l,ð•Ô,· B

ŽQ Æ @IDirect3DRMLight::SetRange

**IDirect3DRMLight::GetType**

D3DRMLIGHTTYPE GetType();

Žw'è,<sup>3</sup>,ê,½,ÌŒðŒ¹,Ìf^fCfv,ðŽæ“¾,·,é B

**D3DRMLIGHTTYPE**—ñ<“Œ^,Ìf f“fo,Ì,Đ,Æ,Â,ð•Ô,· B

ŽQ Æ @**IDirect3DRMLight::SetType**

**IDirect3DRMLight::GetUmbra**

D3DVALUE GetUmbra();

Direct3DRMLightIfufWfFfNfg,ł-¾•”,łŠp“x,đŽæ“¾,·,é B  
-¾•”,łŠp“x,đ•Ô,· B

ŽQ Æ @IDirect3DRMLight::SetUmbra

**IDirect3DRMLight::SetColor**

HRESULT SetColor(D3DCOLOR rcColor);

Žw'è,<sup>3</sup>,ê,½ŒðŒ¹,Ì F,ð Ý'è,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ,"s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŨŽ f, [fh,İ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

rcColor  
ŒðŒ¹,Ì V,µ,¢ F B

ŽQ Æ @IDirect3DRMLight::GetColor

**IDirect3DRMLight::SetColorRGB**

HRESULT SetColorRGB(D3DVALUE rvRed, D3DVALUE rvGreen,  
D3DVALUE rvBlue);

Žw'è,<sup>3</sup>,ê,¼ŒŒ¹,İ F,ðR, B, G,»,ê,¼,ê,İ'l,Â Ý'è,·,é B

–Œ÷,·,é,ÆD3DRM\_OK AŽ,"s,·,é,ÆfGf%<sub>0</sub> [,ð•Ô,· B•Ô'l,İê——,É,Â,¢  
,Ä,İ A uDirect3D•ŨŽ f, [fh,l•Ô'l v,ðŽQ Æ,·,é,±,Æ B

*rvRed, rvGreen, rvBlue*  
ŒŒŒ¹,İ V,µ,¢ F B



**IDirect3DRMLight::SetConstantAttenuation**

HRESULT SetConstantAttenuation(D3DVALUE rvAtt);

ŒðŒ¹,İŒ, ŠŒW ”,ð Ý’è,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô’l,İê——,É,Â,¢  
,Ä,İ A uDirect3D•ŬŽ f, fh,İ•Ô’l v,ðŽQ Æ,·,é,±,Æ B

rvAtt  
V,µ,¢Œ, ŠŒW ” B

Œ, Š’è ”,İ’l,İ”½”ä“l,ÉŒð“x,É%œç,ð—^,!,é B,½,Æ,,İ AŒ, Š’è ”,ª2,İ,Æ,« AŒð,İ“x,İ”¼•ª,É’á%º,·,é B  
ŽQ Æ @IDirect3DRMLight::GetConstantAttenuation

## IDirect3DRMLight::SetEnableFrame

```
HRESULT SetEnableFrame(LPDIRECT3DRMFRAME lpEnableFrame);
```

ŒðŒ¹, Ì—LŒøftfŒ [f€, ð Ý'è, ·, é B

¬Œ÷, ·, é, ŒD3DRM\_OK AŽ, ”s, ·, é, ŒfGf%o [, ð•Ô, · B•Ô'l, Ì^ê——, É, Â, ç  
, Ä, Í A uDirect3D•ÛŽ f, [fh, Ì•Ô'l v, ðŽQ Œ, ·, é, ±, Œ B

*lpEnableFrame*

ŒðŒ¹, Ì—LŒøftfŒ [f€, Ö, Ìf|fCf“f^ B, ±, ÌftfŒ [f€, É, Í eftfŒ [f€, Œ“—l, ÌŒðŒ¹, Œ, È, é B

ŽQ Œ @IDirect3DRMLight::GetEnableFrame

**IDirect3DRMLight::SetLinearAttenuation**

HRESULT SetLinearAttenuation (D3DVALUE rvAtt);

ŒðŒ¹,ì1ŽŸŒ, ŠŒW ”,ð Ý’è,:é B

¬Œ÷,:é,ÆD3DRM\_OK AŽ,”s,:é,ÆfGf%o [,ð•Ô,: B•Ô’l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ĵ•Ô’l v,ðŽQ Œ,:é,±,Œ B

rvAtt  
V,µ,¢Œ, ŠŒW ” B

ŽQ Œ @IDirect3DRMLight::GetLinearAttenuation

**IDirect3DRMLight::SetPenumbra**

HRESULT SetPenumbra(D3DVALUE rvAngle);

%o~ ,l~Å%oe•”,lŠp“x,ðfZfbfg,·,é B  
¬Æ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,l~ê——,É,Â,¢  
,Ä,Í A uDirect3D•ŨŽ f, [fh,l•Ô'l v,ðŽQ Æ,·,é,±,Æ B  
rvAngle  
V,µ,¢^Å%oe•”,lŠp“x B,±,lŠp“x,Í^Å•”,lŠp“x,æ,è‘â,«,¢,© A“™,µ,,È,,Ä,Í,¢,¬,È,¢ B^Å%oe•”,lŠp“x,ð–  
¾•”,lŠp“x,æ,è,à ¬,³, Ý'è,µ,½ ê ‡ A^Å%oe•”,Í–¾•”,Æ“¬,¶lŠp“x,É,È,é BffftfHf<fg'l,Í0.5f%ofWfAf“,Ä, ,é B

ŽQ Æ @IDirect3DRMLight::GetPenumbra

**IDirect3DRMLight::SetQuadraticAttenuation**

HRESULT SetQuadraticAttenuation(D3DVALUE rvAtt);

ŒðŒ¹,ì2ŽŸŒ, ŠŒW ”,ð Ý’è,:é B

¬Œ÷,:é,ÆD3DRM\_OK AŽ,”s,:é,ÆfGf%o [,ð•Ô,: B•Ô’l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,İ•Ô’l v,ðŽQ Æ,:é,±,Æ B

rvAtt  
V,µ,¢Œ, ŠŒW ” B

ŽQ Æ @IDirect3DRMLight::GetQuadraticAttenuation

**IDirect3DRMLight::SetRange**

HRESULT SetRange (D3DVALUE rvRange) ;

ŒðŒ¹,ì”íí,ðfZfbfg,·,é BŒðŒ¹,í A”íí,ì’†,É, ,éfIfufWfFfNfg,É,ì,ÝŒø%øÊ,ð—^,,é B  
¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô’l,îê——,É,Â,¢  
,Ä,í A uDirect3D•ŨŽ f, [fh,î•Ô’l v,ðŽQ Æ,·,é,±,Æ B

rvRange  
V,µ,¢”íí BfftfHf<fg’l,í256,Â, ,é B

ŽQ Æ @IDirect3DRMLight::GetRange

**IDirect3DRMLight::SetType**

HRESULT SetType(D3DRMLIGHTTYPE d3drmtType);

Ⓒ⓪Ⓒ¹, Ìf^fCfv, ḁ•İ X, ·, é B

¬Ⓒ÷, ·, é, ⒶD3DRM\_OK AŽ, ”s, ·, é, ⒶfGf%o [, ḁ•Ô, · B•Ô'l, İê——, É, Â, ¢  
, Ä, Í A uDirect3D•ŨŽ f, [fh, İ•Ô'l v, ḁŽQ Ⓐ, ·, é, ±, Ⓐ B

d3drmtType

V, μ, ¢Ⓒ⓪Ⓒ¹f^fCfv, ḁD3DRMLIGHTTYPE—ñ“Ⓒ^, Ìf f“fo, İ, Ð, Ⓐ, Â, ÅŽw'è, ·, é B

ŽQ Ⓐ @IDirect3DRMLight::GetType

**IDirect3DRMLight::SetUmbra**

HRESULT SetUmbra(D3DVALUE rvAngle);

%o~ ,l-¾•”,lŠp“x,đ Ý’è,·,é B  
¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,đ•Ô,· B•Ô’l,l̂ê——,É,Â,¢  
,Ä,Í A uDirect3D•ŨŽ f, [fh,l•Ô’l v,đŽQ Æ,·,é,±,Æ B

rvAngle  
V,µ,¢-¾•”,lŠp“x B,±,lŠp“x,Í A^Ä%oe•”,lŠp“x,æ,è,à ¬,³,¢,© A“™,µ,,È,,Ä,Í,¢,¬,È,¢ B-  
¾•”,lŠp“x,đ^Ä%oe•”,lŠp“x,æ,è‘â,«, Ý’è,µ,½ ê ‡ A-  
¾•”,l̂Ä%oe•”,Æ“¬,¶Šp“x,Æ,È,é BffftfHf<fg’l,Í0.4f%ofWfAf“,Ä, ,é B

ŽQ Æ @IDirect3DRMLight::GetUmbra



## IDirect3DRMMaterial

$fAfvf\check{S}fP\ [fVf\ddagger f^{\text{“},\acute{I}\ A}f\}fef\check{S}fAf\langle fIfufWfFfNfg,\mathcal{A}\mathcal{E}\acute{Y},\mathbb{C}$   
,É,â,èŽæ,è,·,é,½,ß,É**IDirect3DRMMaterial** $fCf^{\text{“}f^{\wedge}\ [ftfFfCfX,\grave{\imath}f\ f\backslash fbfh,\delta\check{Z}g\text{—}p,\cdot,\acute{e}\ B,\pm$   
, $\grave{\imath}fZfNfVf\ddagger f^{\text{“},\acute{I}\ A}$ **IDirect3DRMMaterial** $fCf^{\text{“}f^{\wedge}\ [ftfFfCfX\ Ef\ f\backslash fbfh,\grave{\imath}f\check{S}ftf@f\mathcal{E}f^{\text{“}fX,\mathring{A},\acute{e}\ B\check{S}T^{\text{”}}O,\acute{E},\mathring{A},\mathfrak{C},\mathring{A},\grave{\imath}\check{S}T$   
—v,Í A u**IDirect3DRMMaterial** $fCf^{\text{“}f^{\wedge}\ [ftfFfCfX\ v,\delta\check{Z}Q\ \mathcal{A},\cdot,\acute{e},\pm,\mathcal{A}\ B$

**IDirect3DRMMaterial** $fCf^{\text{“}f^{\wedge}\ [ftfFfCfX\ Ef\ f\backslash fbfh,\acute{I}\ A^{\text{`E}}\%^{\circ},\grave{\imath}fOf\langle\ [fv,\acute{E},\acute{a}\text{—}p,\cdot,\acute{e},\pm,\mathcal{A},^a,\mathring{A},\ll,\acute{e}\ B$

•úŽĚ

GetEmissive

SetEmissive

”½ŽĚŽw ”,İ<“x

GetPower

SetPower

”½ŽĚ

GetSpecular

SetSpecular

**IDirect3DRMMaterial** $fCf^{\text{“}f^{\wedge}\ [ftfFfCfX,\acute{I}\ A,\cdot,\times,\mathring{A},\grave{\imath}COMfCf^{\text{“}f^{\wedge}\ [ftfFfCfX,\mathcal{A}^{\text{“}}\text{—}$   
l A**Unknown** $fCf^{\text{“}f^{\wedge}\ [ftfFfCfX\ Ef\ f\backslash fbfh,\delta\mathcal{E}p^{\ 3},\cdot,\acute{e}\ B$ **Unknown** $fCf^{\text{“}f^{\wedge}\ [ftfFfCfX,\acute{\imath}\check{Z}\acute{Y},\grave{\imath},R,\mathring{A},\grave{\imath}f\ f\backslash fbfh,\delta fTf|$   
[fg,·,é B

AddRef

QueryInterface

Release

,<sup>3</sup>,ç,É **IDirect3DRMMaterial** $fCf^{\text{“}f^{\wedge}\ [ftfFfCfX,\acute{I}\ A$ **IDirect3DRMObject** $fCf^{\text{“}f^{\wedge}\ [ftfFfCfX,\mathring{C},\varsigma\check{Z}\acute{Y},\grave{\imath}f\ f\backslash fbfh,\delta\mathcal{E}p^{\ 3}$   
,·,é B

AddDestroyCallback

Clone

DeleteDestroyCallback

GetAppData

GetClassName

GetName

SetAppData

SetName

**Direct3DRMMaterial** $fIfufWfFfNfg,\acute{I}\ A$ **IDirect3DRM::CreateMaterial** $f\ f\backslash fbfh,\grave{\imath}\mathcal{E}\mathring{A},\tilde{N}\ o,\mu,\acute{E},\mathfrak{a},\mathring{A},\mathring{A}\check{Z}\mathfrak{a}^{\text{“}\frac{3}{4},^3,\acute{e},\acute{e}\ B$

**IDirect3DRMMaterial::GetEmissive**

HRESULT GetEmissive(D3DVALUE \*lpr, D3DVALUE \*lpg, D3DVALUE \*lpb);

f}fefŠfAf<,İ•úŽĚ“Á\_«,İ Ý’è,ðŽæ“¾,·,é B,±,İ“Á\_«,İ Ý’è,Í A F,ÆfIfufWfFfNfg,”ŽU,·,éĈö,İ<“x,ðŽ!,· B  
¬Ĉ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô’l,İê——,É,Â,¢  
,Ă,Í A uDirect3D•ŮŽ\_f, [fh,İ•Ô’l v,ðŽQ Æ,·,é,±,Æ B

lpr, lpg, lpb  
f f\fbfh,<sup>a</sup> §Ĉä,ð•Ô,·,Æ,« A•úŽĚ,İ Ô A—Î A Â,İ F—v‘f,ðŽó,¬Žæ,éfAfhfĈfX B

ŽQ Æ @IDirect3DRMMaterial::SetEmissive

**IDirect3DRMMaterial::GetPower**

D3DVALUE GetPower();

Žw'è,<sup>3</sup>,ê,½f}fefŠfAf<,Å,ì”½ŽĚŽw ”,ìfpf\_\_\_\_[,ðŽæ“¾,·,é B  
”½ŽĚŽw ”,ìfpf [ ,ðŽ!,·l,ð•Ô,· B

ŽQ Æ @IDirect3DRMMaterial::SetPower

**IDirect3DRMMaterial::GetSpecular**

HRESULT GetSpecular(D3DVALUE \*lpr, D3DVALUE \*lpg, D3DVALUE \*lpb);

f}fefŠfAf<,ì”½ŽĚfnfCf%ofCfg,ì F,ðŽæ“¾,·,é B

¬Ĉ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ĭ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lpr, lpg, lpb  
f f\fbfh,<sup>a</sup> §Ĉä,ð•Ô,·,Æ,« A”½ŽĚfnfCf%ofCfg,ì Ô A—Î A Â,Ì F—v‘f,ðŽó,¬Žæ,éfAfhfĈfX B

ŽQ Æ @IDirect3DRMMaterial::SetSpecular

**IDirect3DRMMaterial::SetEmissive**

HRESULT SetEmissive(D3DVALUE r, D3DVALUE g, D3DVALUE b);

f}fefŠfAf<,ì•úŽĚ“Á\_«,đ Ý'è,·,é B

¬Ĉ÷,·,é,ÆD3DRM\_OK AŽ, ”s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ă,Î A uDirect3D•ŮŽ f, [fh,Î•Ô'l v,đŽQ Æ,·,é,±,Æ B

r, g, b  
•úŽĚ,ì F,ì Ô A—Î A Â—v'f B

ŽQ Æ @IDirect3DRMMaterial::GetEmissive

**IDirect3DRMMaterial::SetPower**

HRESULT SetPower(D3DVALUE rvPower);

f}fefŠfAf<,ì”½ŽĚŽw ”,ð Ý’è,:é B

¬Œ÷,:é,ÆD3DRM\_OK AŽ,”s,:é,ÆfGf%o [,ð•Ô,: B•Ô’l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ĭ•Ô’l v,ðŽQ Æ,:é,±,Æ B

rvPower  
V,µ,¢”½ŽĚŽw ” B

ŽQ Æ @IDirect3DRMMaterial::GetPower

**IDirect3DRMMaterial::SetSpecular**

HRESULT SetSpecular(D3DVALUE r, D3DVALUE g, D3DVALUE b);

f}fefŠfAf<,ì”½ŽĚfnfCf%ofCfg,ì F,ð Ý’è,·,é B

¬Ĉ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô’l,Îê——,É,Â,¢  
,Ă,Î A uDirect3D•ŮŽ f, [fh,Î•Ô’l v,ðŽQ Æ,·,é,±,Æ B

r, g, b  
”½ŽĚfnfCf%ofCfg,ì F,ì Ô A—Î A Â,Ìše—v‘f B

ŽQ Æ @IDirect3DRMMaterial::GetSpecular

## IDirect3DRMMesh

*fAfvfŠfP [fVf‡f“ ,Í Af fbVfVf...,İfOf< [fv,ÆEÝ,¢  
,É,â,èŽæ,è,·,é,½,ß,ÉIDirect3DRMMeshfCf“f^ [ftfFfCfX,İf f\fbfh,ðŽg—p,·,é B,±  
,İfZfNfVf‡f“ ,ÍIDirect3DRMMeshfCf“f^ [ftfFfCfX Ef f\fbfh,İfŠftf@fÆf“fX,Â, ,é BŠT”O,É,Â,¢,Ä,İŠT—  
v,Í A uIDirect3DRMMesh,ÆIDirect3DRMMeshBuilderfCf“f^ [ftfFfCfX v,ð ŽQ Æ,·,é,±,Æ B*

**F** [GetGroupColor](#)  
[SetGroupColor](#)  
[SetGroupColorRGB](#)

**ì ¬,Æ îñ** [AddGroup](#)  
[GetBox](#)  
[GetGroup](#)  
[GetGroupCount](#)

**f}fefŠfAf<** [GetGroupMaterial](#)  
[SetGroupMaterial](#)

**,»,İ¼** [Scale](#)  
[Translate](#)

**fÆf“f\_Šf“fO•iŽ¿** [GetGroupQuality](#)  
[SetGroupQuality](#)

**fefNfXf`ff Ef}  
fbfsf“fO** [GetGroupMapping](#)  
[SetGroupMapping](#)

**fefNfXf`ff** [GetGroupTexture](#)  
[SetGroupTexture](#)

**,“\_,ìÊ’u** [GetVertices](#)  
[SetVertices](#)

**IDirect3DRMMeshfCf“f^ [ftfFfCfX,Í A,·,×,Ä,İCOMfCf“f^ [ftfFfCfX,Æ“—  
l AİUnknownfCf“f^ [ftfFfCfX Ef f\fbfh,ðÆp ³,·,é BIUnknownfCf“f^ [ftfFfCfX,ÍŽŸ,İ,R,Â,İf f\fbfh,ðfTf|  
[fg,·,é B**

**AddRef**

**QueryInterface**

**Release**

**,³,ç,É AIDirect3DRMMeshfCf“f^ [ftfFfCfX,ÍIDirect3DRMObjectfCf“f^ [ftfFfCfX,©,çŽŸ,İf f\fbfh,ðÆp ³,·,é B**

**AddDestroyCallback**

**Clone**

**DeleteDestroyCallback**

**GetAppData**

**GetClassName**

**GetName**

**SetAppData**



SetName

Direct3DRMFrameIfufWfFfNfg,Í AIDirect3DRM::CreateMeshf\fbfh,ìEÄ,Ñ o,μ,É,æ,Á,ĂŽæ“¾,³,ê,é B

## IDirect3DRMMesh::AddGroup

```
HRESULT AddGroup(unsigned vCount, unsigned fCount,  
    unsigned vPerFace, unsigned *fData, D3DRMGROUPINDEX *returnId);
```

–Ê,Ì W ‡,ðfOf< [fv%»»,µ A,»,ÌfOf< [fv,ÌŽ¯•ÊŽq,ðŽæ“¾,·,é B

–Æ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf% [,ð•Ô,· B•Ô’l,Ìê——,É,Â,¢  
,Ä,Í A uDirect3D•ÛŽ f, [fh,Ì•Ô’l v,ðŽQ Æ,·,é,±,Æ B

vCount, fCount

fOf< [fv,ÊŠÛ,Û,ê,é’,“\_,Æ–Ê,Ì ” B

vPerFace

,·,×,Ä,Ì–Ê,““–,¶ ”,Ì’ “\_,ðŽ ,Â ê ‡ A–Ê“–,½,è,Ì’,“\_,Ì ” BfOf< [fv’†,Ì–Ê,ªŽ ,Â’,“\_,Ì ”,ªê’è,Â,È,¢,Æ,«,Í A,±  
,Ìfpf%of [f^,É0,ðŽw’è,µ,È,,Ä,Í,È,ç,È,¢ B

fData

–Êff [f^,ÌfAfhfÆfX BvPerFacepf%of [f^,É’l,ª Ý’è,³,ê,Ä,¢,é ê ‡ A,±,Ìff [f^,Í’P,É AfOf< [fv,Ì’,“\_”z—  
ñ,Ô,ÌfCf“fffbfNfX EfŠfXfg,Â, ,é BvPerFace,ª0,Ì,Æ,«,Í A’,“\_fCf“fffbfNfX,æ,è,à A,»,Ì–  
Ê,Ì’ “\_,Ì ”,ðŽ,· ® ”’l,ð—D æ,µ,È,,Ä,Í,È,ç,È,¢ B,½,Æ,!,Í AvPerFace,ª0,Â AfOf< [fv,ð \ ¬,·,é–  
Ê,ªŽÖŠpE`,ÆŽlŠpE`,Â, ,é ê ‡ Aff [f^,ÍŽÝ,Ì,æ,¤,É,È,é B[ 3, fCf“fffbfNfX, fCf“fffbfNfX, fCf“fffbfNfX, 4,  
fCf“fffbfNfX, fCf“fffbfNfX, fCf“fffbfNfX, fCf“fffbfNfX, 3, fCf“fffbfNfX, fCf“fffbfNfX, fCf“fffbfNfX, ...]

returnId

f f\fbfh,ª §Æä,ð•Ô,·,Æ,« AfOf< [fv,ÌŽ¯•ÊŽq,ðŽó,¯Žæ,é,İ ”,Ö,Ìf|fCf“f^ B

V,µ,’Ç%»Ä,³,ê,½fOf< [fv,É,Í A`È%º,ÌfftftHf<fg,Ì“Á «,ª—^,!,ç,ê,é B

””

fefNfXf`ff,È,µ

”½ŽÈ,È,µ

,’ “\_”z—ñ,ÌŠe’,“\_,ÌÊ’u A–@ ü A F,Í0

,’ “\_,ÌÊ’u,ð Ý’è,·,é,É,Í AIDirect3DRMMesh::SetVertices f f\fbfh,ðŽg—p,·,é B

**IDirect3DRMMesh::GetBox**

HRESULT GetBox(D3DRMBOX \* lpD3DRMBox);

Direct3DRMMeshIfufWfFfNfg,đŠŮ,Đ•ŭŒ`”ÍÍ,đŽæ“¾,·,é B•ŭŒ`”ÍÍ,Í A,»,ê,¼,ê,İŽŸŒ³,İf,fff< Ä•W,İ Ä ¬’l,Æ Ä ‘â’l,đŽ!,· B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,đ•Ô,· B•Ô’l,İê——,É,Â,¢  
,Ä,Í A uDirect3D•ŬŽ f, [fh,l•Ô’l v,đŽQ Æ,·,é,±,Æ B

lpD3DRMBox  
•ŭŒ`”ÍÍ,İ Ä•W,đŽó,¬Žæ,éD3DRMBOX \‘Œ‘İ B

## IDirect3DRMMesh::GetGroup

```
HRESULT GetGroup(D3DRMGROUPINDEX id, unsigned *vCount,
    unsigned *fCount, unsigned *vPerFace, DWORD *fDataSize,
    unsigned *fData);
```

Žw'è,³,ê,½fOf< [fv,ÉŠÖ~A•t,¯,ç,ê,Ä,ç,éff [f^,ðŽæ“¾,·,é B

¬Æ±,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,ç  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Î•Ô'l v,ðŽQ Æ,·,é,±,Æ B

id

fOf< [fv,ìŽ¯•ÊŽq B,±,ìŽ¯•ÊŽq,ÍIDirect3DRMMesh::AddGroup,ðŽg—p,µ,Ä ¶ ¬,³,ê,½,à,ì,Â,È,,Ä,Í,È,ç,È,ç B

vCount, fCount

f f\fbfh,ª §Æä,ð•Ô,·,Æ,« AfOf< [fv,ì',“\_ì ”,Æ-Ê,ì ”,ðŽó,¯Žæ,é•İ ”,ìfAfhfÆfX B,±  
,ê,ç,ìfpf%of [f^,É,ÍNULL,ðŽw'è,·,é,±,Æ,ª,Â,«,é B

vPerFace

f f\fbfh,ª §Æä,ð•Ô,·,Æ,« A-Ê“-½,è,ì'“\_ì ”,ðŽó,¯Žæ,é•İ ”,ìfAfhfÆfX B,±  
,ê,ç,ìfpf%of [f^,É,ÍNULL,ðŽw'è,·,é,±,Æ,ª,Â,«,é B

fDataSize

fDatafpf%of [f^,ªŽw,·fofbftf@,ì'†,ì A•,,†,È,µ—v'f,ì ”,ðŽ!,·•İ ”,ìfAfhfÆfX B,±  
,ìfpf%of [f^,ÉNULL,ðŽw'è,·,é,±,Æ,Í,Â,«,È,ç B

fData

f f\fbfh,ª §Æä,ð•Ô,·,Æ,« AfOf< [fv,ì-Êff [f^,ðŠi”[,·,éfofbftf@,ìfAfhfÆfX B,±  
,ìff [f^,ìÆŽ®,Í AIDirect3DRMMesh::AddGroupf f\fbfh,ìÆÄ,Ñ o,µ,ÄŽw'è,µ,½,à,ì,Æ“¬,¶,Â, ,é B,±  
,ìfpf%of [f^,ªNULL,ì,Æ,« A•K—v,Èfofbftf@,ìfTfCfY,ªfDataSizefpf%of [f^,É•Ô,³,ê,é B

**IDirect3DRMMesh::GetGroupColor**

D3DCOLOR GetGroupColor(D3DRMGROUPINDEX id);

$fOf\langle [fv, \grave{\imath} F, \delta \check{Z} \mathfrak{a}^{\text{“}\frac{3}{4}\text{“}}, \cdot, \acute{e} B$   
 $\neg \mathfrak{E} \dot{+}, \mu, \frac{1}{2} \hat{e} \mp A F, \delta \check{Z} \iota, \cdot D3DCOLOR' l, \delta \bullet \hat{O}, \cdot B, \gg, \varpi, \hat{A}, \grave{E}, \mathfrak{C} \hat{e} \mp, \acute{\imath} 0, \delta \bullet \hat{O}, \cdot B$   
*id*  
 $fOf\langle [fv, \grave{\imath} \check{Z}^- \bullet \hat{E} \check{Z} q B, \pm, \grave{\imath} \check{Z}^- \bullet \hat{E} \check{Z} q, \acute{\imath} \underline{\underline{IDirect3DRMMesh::AddGroup}}, \delta \check{Z} g, \acute{A}, \check{A} \P \neg, ^3, \hat{e}, \frac{1}{2}, \grave{a}, \grave{\imath}, \hat{A}, \grave{E},, \check{A}, \acute{\imath}, \grave{E}, \mathfrak{C}, \grave{E}, \mathfrak{C} B$   
 $\check{Z} Q \mathcal{A} @ \underline{\underline{IDirect3DRMMesh::SetGroupColor}}, \underline{\underline{IDirect3DRMMesh::SetGroupColorRGB}}$

**IDirect3DRMMesh::GetGroupCount**

unsigned GetGroupCount();

Žw'è,<sup>3</sup>,ê,½Direct3DRMMeshIfufWfFNfg,ÌfOf< [fv,Ì ",ðŽæ“¾,·,é B  
¬Æ÷,µ,½ ê ‡,ÍfOf< [fv,Ì ",ð•Ô,· B,»,□,Å,È,¯,ê,Î0,ð•Ô,· B

**IDirect3DRMMesh::GetGroupMapping**

D3DRMMAPPING GetGroupMapping (D3DRMGROUPINDEX id) ;

Direct3DRMMeshIfufWfFfNfg'†,ìfOf< [fv,É'Î,μ,Ä A,Ç,Ì,æ,ϣ,ÉfefNfXf`ff,<sup>a</sup>f}fbfv,<sup>3</sup>,ê,é,©,ðŽæ“¾,·,é B  
¬Œ÷,·,é,Æ AfOf< [fv,Ö,ÌfefNfXf`ff,ìf}fbfv•û–  
@,ðŽ!,·D3DRMMAPPING'l,Ì,Ð,Æ,Â,ð•Ô,· BŽ,”s,·,é,Æ0,ð•Ô,· B

id  
fOf< [fv,ìŽ<sup>–</sup>•ÊŽq B,±,ìŽ<sup>–</sup>•ÊŽq,ÍIDirect3DRMMesh::AddGroup,ðŽg,Á,Ä ¶ ¬,<sup>3</sup>,ê,½,à,Ì,Â,È,,Ä,Í,È,Ç,È,¢ B

ŽQ Æ @IDirect3DRMMesh::SetGroupMapping

**IDirect3DRMMesh::GetGroupMaterial**

HRESULT GetGroupMaterial(D3DRMGROUPINDEX id,  
LPDIRECT3DRMMATERIAL \*returnPtr);

Direct3DRMMeshOf< [fv,ÉŠÖ~A•t,¯,ç,ê,½f}fefŠfAf<,Ö,İf|fCf“f^,ðŽæ“¾,·,é B

¬Æ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,İê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,l•Ô'l v,ðŽQ Æ,·,é,±,Æ B

id

fOf< [fv,İŽ¯•ÊŽq B,±,İŽ¯•ÊŽq,ÍIDirect3DRMMesh::AddGroup,ðŽg,Á,Ä ¶ ¬,³,ê,½,à,Ì,Â,È,,Ä,Í,È,ç,È,¢ B

returnPtr

f f\fbfh,<sup>a</sup> §Æä,ð-ß,·,Æ,« AfOf< [fv,İIDirect3DRMMaterialfCf“f^ [ftfFfCfX,ðŽó,¬Žæ,é•İ ”,Ö,İf|fCf“f^,Ö,İf|  
fCf“f^ B

ŽQ Æ @IDirect3DRMMesh::SetGroupMaterial



**IDirect3DRMMesh::GetGroupQuality**

D3DRMRENDERQUALITY GetGroupQuality(D3DRMGROUPINDEX id);

Žw'è,<sup>3</sup>,ê,½fOf< [fv,lfEf“f\_fŠf“fO•iŽĭ,ðŽæ“¾,·,é B

¬Œ÷,·,é,ÆD3DRMRENDERQUALITY,ĂŽ<sub>i</sub>,<sup>3</sup>,ê,é—ñ<“Œ^,ĭ'ĭ,ð•Ô,· BŽ,”s,·,é,Æ0,ð•Ô,· B,±

,ê,ç,ĭ'ĭ,É,Ĭ AfIfufWfFfNfg,İfVfF [ffBf“fO Ef, [fh,â Æ-¾f, [fh A“h,è,Â,Ô,µf, [fh,ªŠÜ,Ü,ê,Ă,¢,é B

id

fOf< [fv,İŽ<sup>-</sup>•ÊŽq B,±,İŽ<sup>-</sup>•ÊŽq,İIDirect3DRMMesh::AddGroup,ðŽg,Á,Ă ¶ ¬,<sup>3</sup>,ê,½,à,ĭ,Ă,È,,Ă,Ĭ,È,ç,È,¢ B

ŽQ Æ @IDirect3DRMMesh::SetGroupQuality

**IDirect3DRMMesh::GetGroupTexture**

```
HRESULT GetGroupTexture(D3DRMGROUPINDEX id,
    LPDIRECT3DRMTEXTURE *returnPtr);
```

*fOf< [fv,ÉŠÖ~A•t,¯,ç,ê,½fefNfXf`ff,Ö,Ìf|fCf“f^,ðŽæ“¾,·,é B*  
*¬Æ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢*  
*,Ä,Í A uDirect3D•ÛŽ f, [fh,l•Ô'l v,ðŽQ Æ,·,é,±,Æ B*

*id*  
*fOf< [fv,ìŽ¯•ÊŽq B,±,ìŽ¯•ÊŽq,ÍIDirect3DRMMesh::AddGroup,ðŽg,Á,Ä ¶ ¬,³,ê,½,à,Ì,Â,È,,Ä,Í,È,ç,È,¢ B*  
*returnPtr*  
*f f\fbfh,<sup>a</sup> §Æä,ð•Ô,·,Æ,« AfOf< [fv,ÌIDirect3DRMTexturefCf“f^ [ftfFfCfX,ðŽó,¯Žæ,é•İ ”,Ö,Ìf|fCf“f^,Ö,Ìf|*  
*fCf“f^ B*

ŽQ Æ @IDirect3DRMMesh::SetGroupTexture

## IDirect3DRMMesh::GetVertices

```
HRESULT GetVertices(D3DRMGROUPINDEX id, DWORD index,
    DWORD count, D3DRMVERTEX *returnPtr);
```

Žw'è,<sup>3</sup>,ê,½fOf< [fv,l',“\_Ê'u,ðŽæ“¾,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ, ”s,·,é,ÆfGf% [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,l•Ô'l v,ðŽQ Æ,·,é,±,Æ B

id

fOf< [fv,ÌŽ¯•ÊŽq B,±,ÌŽ¯•ÊŽq,ÍIDirect3DRMMesh::AddGroup,ðŽg,Á,Ä ¶ ¬,<sup>3</sup>,ê,½,à,Ì,Â,È,,Ä,Í,È,ç,È,¢ B

index

',“\_Ê'u,ðŽæ“¾,·,éŽn“\_,ðŽ!,·D3DRMVERTEX \‘¢‘Ì,Ì”z—ñ,ÌfCf“ffbfNfX B

count

indexfpf%of [f^,ªŽ!,·fCf“ffbfNfX,É‘±,¢,ÄŽæ“¾,·,é AD3DRMVERTEX \‘¢‘Ì i',“\_ j,Ì ” B,±  
,Ìfpf%of [f^,ÊNULL,ðŽw'è,·,é,±,Æ,Í,Â,«,È,¢ B

returnPtr

f f\fbfh,<sup>a</sup> §Œä,ð•Ô,·,Æ,«,É',“\_Ê'u,ðŽó,¯Žæ,éD3DRMVERTEX \‘¢‘Ì,Ì”z—ñ B,±  
,Ìfpf%of [f^,ÊNULL,ðŽw'è,·,é,Æ A•K—v,ÊD3DRMVERTEX \‘¢‘Ì,Ì ”,ðcountfpf%of [f^,ÉŠi”[,·,é B

ŽQ Æ @IDirect3DRMMesh::SetVertices

**IDirect3DRMMesh::Scale**

HRESULT Scale(D3DVALUE sx, D3DVALUE sy, D3DVALUE sz);

f,fffc À•W,ìxŽ² AyŽ² AzŽ²,É‘Î,µ A—  
^,!,ç,ê,½ kŽÚŒW ”,É,æ,Á,ÄDirect3DRMMeshIfufWfFfNfg,ðfXfP [fŠf“fO,·,é B  
¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Î A uDirect3D•ŮŽ f, [fh,I•Ô'l v,ðŽQ Æ,·,é,±,Æ B

sx, sy, sz  
xŽ² AyŽ² AzŽ²,É%o^,Á,Ä“K—p,³ê,é kŽÚŒW ” B

**IDirect3DRMMesh::SetGroupColor**

HRESULT SetGroupColor(D3DRMGROUPINDEX id, D3DCOLOR value);

Direct3DRMMeshIfufWfFfNfg't,ìfOf< [fv,Ì F,đ Ý'è,·,é B  
¬Æ÷,·,é,ÆD3DRM\_OK AŽ,"s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ĵ•Ô'l v,đŽQ Æ,·,é,±,Æ B

id  
fOf< [fv,ìŽ<sup>-</sup>•ÊŽq B,±,ìŽ<sup>-</sup>•ÊŽq,ÍIDirect3DRMMesh::AddGroup,đŽg,Á,Ä ¶ ¬,³,ê,½,à,Ì,Â,È,,Ä,Í,È,Ç,È,¢ B

value  
fOf< [fv,Ì F B

ŽQ Æ @IDirect3DRMMesh::GetGroupColor, IDirect3DRMMesh::SetGroupColorRGB

**IDirect3DRMMesh::SetGroupColorRGB**

HRESULT SetGroupColorRGB(D3DRMGROUPINDEX id, D3DVALUE red,  
D3DVALUE green, D3DVALUE blue);

RGB'l,ǒŽg—p,μ,Ä ADirect3DRMMeshIfufWfFfNfg’†,İfOf< [fv,İ F,ǒ Ý’è,·,é B

–Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [ ,ǒ•Ô,· B•Ô'l,İê——,É,Â,¢  
,Ä,İ A uDirect3D•ŬŽ f, [fh,l•Ô'l v,ǒŽQ Æ,·,é,±,Æ B

id  
fOf< [fv,İŽ<sup>−</sup>•ÊŽq B,±,İŽ<sup>−</sup>•ÊŽq,İIDirect3DRMMesh::AddGroup,ǒŽg,Á,Ä ¶ ¬,<sup>3</sup>,ê,½,à,İ,Â,È,,Ä,İ,È,ç,È,¢ B  
red, green, blue  
fOf< [fv,İ F,İ Ô A—Î A Â,İŠe—v‘f B

ŽQ Æ @IDirect3DRMMesh::GetGroupColor, IDirect3DRMMesh::SetGroupColor

**IDirect3DRMMesh::SetGroupMapping**

HRESULT SetGroupMapping(D3DRMGROUPINDEX id, D3DRMMAPPING value);

Direct3DRMMeshIfufWfFfNfg'†,‡fOf< [fv,Éf}fbfsf“fO,đ Ý'è,·,é Bf}fbfsf“fO,Í A,Ç,Ì,æ,ϱ,ÉfefNfXf`ff,a-Ê,Éf}fbfv,³,ê,é,©,đƐ^`è,·,é B

¬Ɛ÷,·,é,ÆD3DRM\_OK AŽ,˝s,·,é,ÆfGf%∞ [,đ•Ô,· B•Ô'l,İê——,É,Â,¢,Ä,Í A uDirect3D•ŮŽ f, [fh,l•Ô'l v,đŽQ Æ,·,é,±,Æ B

id  
fOf< [fv,İŽ⁻•ÊŽq B,±,İŽ⁻•ÊŽq,ÍIDirect3DRMMesh::AddGroup,đŽg,Á,Ä ¶ ¬,³,ê,½,à,Ì,Â,È,,Ä,Í,È,Ç,È,¢ B  
value  
fOf< [fv,İf}fbfsf“fO,đŽw'è,·,éD3DRMMAPPINGƐ^,İ'l B

ŽQ Æ @IDirect3DRMMesh::GetGroupMapping

**IDirect3DRMMesh::SetGroupMaterial**

HRESULT SetGroupMaterial(D3DRMGROUPINDEX id, LPDIRECT3DRMMATERIAL value);

Direct3DRMMeshIfufWfFfNfg't,ìfOf< [fv,Éf}fefŠfAf<,ðŠÖ~A•t,¯,é B

¬Æ÷,·,é,ÆD3DRM\_OK AŽ,„s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŨŽ f, [fh,İ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

id  
fOf< [fv,ìŽ¯•ÊŽq B,±,ìŽ¯•ÊŽq,ÍIDirect3DRMMesh::AddGroup,ðŽg,Á,Ä ¶ ¬,³,ê,½,à,Ì,Â,È,,Ä,Í,È,Ç,È,¢ B  
value

Direct3DRMMeshIfufWfFfNfg,ÉŠÖ~A•t,¯,éIDirect3DRMMaterialfCf“f^ [ftfFfCfX,ÌfAfhfÆfX B

ŽQ Æ @IDirect3DRMMesh::GetGroupMaterial



**IDirect3DRMMesh::SetGroupQuality**

HRESULT SetGroupQuality(D3DRMGROUPINDEX id, D3DRMRENDERQUALITY value);

Žw'è,<sup>3</sup>,ê,½fOf< [fv,lfœf“f\_fŠf“fO•iŽĭ,đ Ý'è,·,é B

¬œ÷,·,é,ÆD3DRM\_OK AŽ, ”s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ă,Í A uDirect3D•ŨŽ f, [fh,Ĭ•Ô'l v,đŽQ Æ,·,é,±,Æ B

id  
fOf< [fv,îŽ<sup>-</sup>•ÊŽq B,±,îŽ<sup>-</sup>•ÊŽq,ÍIDirect3DRMMesh::AddGroup,đŽg,Á,Ă ¶ ¬,<sup>3</sup>,ê,½,à,Ĭ,Ă,È,,Ă,Í,È,Ç,È,¢ B  
value

D3DRMRENDERQUALITYœ^,Ă•\,<sup>3</sup>,ê,é—ñ<“œ^,Ĭ'l B,±  
,ê,Ç,Ĭ'l,É,Í AfIfufWfFfNfg,ĬfVfF [ffBf“fO Ef, [fh,â Æ-¾f, [fh A“h,è,Â,Ô,µf, [fh,<sup>a</sup>ŠŨ,Ũ,ê,Ă,¢,é B

ŽQ Æ @IDirect3DRMMesh::GetGroupQuality

**IDirect3DRMMesh::SetGroupTexture**

HRESULT SetGroupTexture(D3DRMGROUPINDEX id, LPDIRECT3DTEXTURE value);

Direct3DRMMeshIfufWfFfNfg't,ìfOf< [fv,ÉfefNfXf`ff,ðŠÖ~A•t,¯,é B  
¬Æ÷,·,é,ÆD3DRM\_OK AŽ,„s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŨŽ f, [fh,İ•Ô'l v,ðŽQ Æ,·,é,±,Æ B  
id  
fOf< [fv,ìŽ¯•ÊŽq B,±,ìŽ¯•ÊŽq,ÍIDirect3DRMMesh::AddGroup,ðŽg,Á,Ä ¶ ¬,³,ê,½,à,Ì,Â,È,,Ä,Í,È,Ç,È,¢ B  
value  
Direct3DRMMeshIfufWfFfNfg,ÉŠÖ~A•t,¯,éIDirect3DRMTexturefCf“f^ [ftfFfCfX,ÌfAfhfÆfX B

ŽQ Æ @IDirect3DRMMesh::GetGroupTexture

## IDirect3DRMMesh::SetVertices

HRESULT SetVertices(D3DRMGROUPINDEX id, unsigned index,  
unsigned count, D3DRMVERTEX \*values);

Žw'è,³,ê,½fOf< [fv,l',“\_lÊ'u,ð Ý'è,·,é B

¬Æ÷,·,é,ÆD3DRM\_OK AŽ, ”s,·,é,ÆfGf%o [ ,ð•Ô,· B•Ô'l,lÊ——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,l•Ô'l v,ðŽQ Æ,·,é,±,Æ B

id

fOf< [fv,lŽ⁻•ÊŽq B,±,lŽ⁻•ÊŽq,ÍIDirect3DRMMesh::AddGroup,ðŽg,Á,Ä ¶ ¬,³,ê,½,à,l,Ä,È,,Ä,Í,È,ç,È,¢ B

index

',“\_Ê'u,ð Ý'è,·,éŽn“\_,ðŽl,· Avaluesfpf%of [f^,l”z—ñ,Ö,lfCf“ffbfNfX B

count

index fpf%of [f^,ªŽl,·fCf“ffbfNfX,É'±,¢,Ä Ý'è,·,é A',“\_l ” B

values

Ý'è,·,é',“\_Ê'u,ðŽl,·D3DRMVERTEX \‘¢‘l,l”z—ñ B

',“\_ îñ,ÍfOf< [fv,²,Æ,ÉŽ ,Â B,Ó,½,Â,l`Ù,È,Á,½fOf< [fvŠÔ,Â',“\_ð«—L,·,é•K—v,ª, ,é ê ‡ i,½,Æ,,l Af fbf  
Vf... ã,l—× Ú,µ,½—Ê,l F,ª`Ù,È,é,Æ,« j A—¼•û,lfOf< [fv,Â',“\_ðfRfs [ ,µ,È,,Ä,Í,È,ç,È,¢ B

ŽQ Æ @IDirect3DRMMesh::GetVertices

**IDirect3DRMMesh::Translate**

HRESULT Translate(D3DVALUE tx, D3DVALUE ty, D3DVALUE tz);

Direct3DRMMeshIfufWfFfNfg'†,ì'“\_„îÊ'u,É AŽw'è,<sup>3</sup>ê,½fIftfZfbfg,ð'Ç%oÁ,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ,„s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŨŽ f, [fh,î•Ô'l v,ðŽQ Æ,·,é,±,Æ B

tx, ty, tz  
Še',“\_Ê'u,ìx À•W Ay À•W Az À•W,É'Ç%oÁ,<sup>3</sup>ê,éfIftfZfbfg B

## IDirect3DRMMeshBuilder

*fAfvfŠfP [fVf±f“Í Af fbfVf...fIfufWfFfNfg,ÆŒÝ,¢  
,É,â,èŽæ,è,·,é,½,ß,ÉIDirect3DRMMeshBuilderfCf“f^ [ftfFfCfX,lf f\fbfh,ðŽg—p,·,é B,±  
,lfZfNfVf±f“Í AIDirect3DRMMeshBuilderfCf“f^ [ftfFfCfX Ef f\fbfh,lfŠftf@fŒf“fX,Å, ,é BŠT”O,É,Â,¢  
,Å,lfŠT—v,Í A uIDirect3DRMMesh,ÆIDirect3DRMMeshBuilderfCf“f^ [ftfFfCfX v,ðŽQ Æ,·,é,±,Æ B*

*IDirect3DRMMeshBuilderfCf“f^ [ftfFfCfX Ef f\fbfh,Í A`È%°,lfOf< [fv,É•—D,·,é,±,Æ,ª,Å,«,é B*

*F* [GetColorSource](#)  
[SetColor](#)  
[SetColorRGB](#)  
[SetColorSource](#)

*ì ¬,Æ îñ* [GetBox](#)

*–Ê* [AddFace](#)  
[AddFaces](#)  
[CreateFace](#)  
[GetFaceCount](#)  
[GetFaces](#)

*f [fh* [Load](#)

*f fbfVf...* [AddMesh](#)  
[CreateMesh](#)

*,»,lf¼* [AddFrame](#)  
[AddMeshBuilder](#)  
[ReserveSpace](#)  
[Save](#)  
[Scale](#)  
[SetMaterial](#)  
[Translate](#)

*–@ ü* [AddNormal](#)  
[GenerateNormals](#)  
[SetNormal](#)

*%“‘ß* [GetPerspective](#)  
[SetPerspective](#)

*fŒf“f\_fŠf“fO•iŽ¿* [GetQuality](#)  
[SetQuality](#)

*fefNfXf`ff* [GetTextureCoordinates](#)  
[SetTexture](#)  
[SetTextureCoordinates](#)

**SetTextureTopology**

, “

**AddVertex**

**GetVertexColor**

**GetVertexCount**

**GetVertices**

**SetVertex**

**SetVertexColor**

**SetVertexColorRGB**

**IDirect3DRMMeshBuilder***fCf“f^ [ftFfCfX,Í A,·,×,Ä,ÌCOMfCf“f^ [ftFfCfX,Æ“—*  
l *A[UnknownfCf“f^ [ftFfCfX Ef f\fbfh,ðEp ³,·,é BIUnknownfCf“f^ [ftFfCfX,ÍŽŸ,ì,R,Â,ìf f\fbfh,ðfTf|*  
*[fg,·,é B*

**AddRef**

**QueryInterface**

**Release**

,³,ç,É **AIDirect3DRMMeshBuilder***fCf“f^ [ftFfCfX,ÍIDirect3DRMObjectfCf“f^ [ftFfCfX,©,çŽŸ,ìf f\fbfh,ðEp*  
*³,·,é B*

**AddDestroyCallback**

**Clone**

**DeleteDestroyCallback**

**GetAppData**

**GetClassName**

**GetName**

**SetAppData**

**SetName**

**Direct3DRMMeshBuilder***fIfufWfFfNfg,Í AIDirect3DRM::CreateMeshBuilderf f\fbfh,ìĖÄ,Ñ o,μ,É,æ,Á,ÄŽæ“¾,³,ê*  
*,é B*

**IDirect3DRMMeshBuilder::AddFace**

HRESULT AddFace (LPDIRECT3DRMFACE lpD3DRMFace) ;

–Ê,ðDirect3DRMMeshBuilderIfufWfFfNfg,É’Ç%oÁ,·,é B

–Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô’l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, fh,j•Ô’l v,ðŽQ Æ,·,é,±,Æ B

lpD3DRMFace  
’Ç%oÁ,·,é–Ê,ÌfAfhfŒfX B

,Ð,Æ,Â,Ì–Ê,Í A1“x,É,Ð,Æ,Â,Ìf fbfVf...,É,µ,©‘¶ Ý,·,é,±,Æ,Í,Â,«,È,¢ B

## IDirect3DRMMeshBuilder::AddFaces

```
HRESULT AddFaces(DWORD dwVertexCount, D3DVECTOR * lpD3DVertices,  
    DWORD normalCount, D3DVECTOR *lpNormals, DWORD *lpFaceData,  
    LPDIRECT3DRMFACEARRAY* lplpD3DRMFaceArray);
```

•; ”,İ-Ê,ðDirect3DRMMeshBuilderIfufWfFfNfg,É’Ç%Á,·,é B

–Æ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô’l,İê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,İ•Ô’l v,ðŽQ Æ,·,é,±,Æ B

dwVertexCount  
,“\_„İ ” B

lpD3DVertices  
,“\_„İÊ’u,ðŠi”[,·,é **D3DVECTOR** \‘¢’İ,İ”z—ñ,İfx [fX EfAfhfÆfX,Ö,İf|fCf“f^ B

normalCount  
–@ ü,İ ” B

lpNormals  
–@ ü,İÊ’u,ðŠi”[,·,é **D3DVECTOR** \‘¢’İ,İ”z—ñ,İfx [fX EfAfhfÆfX,Ö,İf|fCf“f^ B

lpFaceData  
,»,ê,¼,ê,İ-Ê,É,Â,¢,Ä A’,“\_”z—ñ,Ö,İfCf“fffbfNfX,É’±,-  
,“\_„İ ”,ðŠŮ,Bfpf%of [f^ BnormalCount,°0,Ä,È,¢ ê ‡ A,±,İfpf%of [f^,É,Í’,“\_„İ ”,ð Ý’è,µ,È,-  
,Ä,Í,È,Ç,È,¢ B,»,µ,Ä’,“\_„İ ”,İÆã,É,Í A,»,İ ”,¾,¬fCf“fffbfNfX,İfyfA,“±, BfyfA,İ Ä %o,Í’,“\_”z—  
ñ,Ö,İfCf“fffbfNfX A2”Ö–Ú,Í–@ ü”z—  
ñ,Ö,İfCf“fffbfNfX,ðŽ!,· BfCf“fffbfNfX,İfŠfXfg,İ ÄÆã,É,Í0,ð Ý’è,µ,È,,Ä,Í,È,Ç,È,¢ B

lplpD3DRMFaceArray  
V,½,É ì ¬,³,ê,½–Ê,Ö,İf|fCf“f^,ðŠi”[,·,é AIDirect3DRMFaceArrayfCf“f^ [ftfFfCfX,Ö,İf|  
fCf“f^,İfAfhfÆfX B



**IDirect3DRMMeshBuilder::AddFrame**

HRESULT AddFrame (LPDIRECT3DRMFRAME lpD3DRMFrame) ;

ftfŒ [f€,l̈fRf“fef“fc,đDirect3DRMMeshBuilderIfufWfFfNfg,É’Ç%ŒÁ,·,é B  
¬Œ÷,·,é,ŒD3DRM\_OK AŽ,”s,·,é,ŒfGf% [,ð•Ô,· B•Ô’l,l̈ê——,É,Â,¢  
,Ä,Í A uDirect3D•ŬŽ f, [fh,l̈•Ô’l v,ðŽQ Œ,·,é,±,Œ B

lpD3DRMFrame  
ftfŒ [f€,l̈fAfhfŒfX B,±,l̈ftfŒ [f€,l̈fRf“fef“fc,”Ç%ŒÁ,<sup>3</sup>ê,é B  
,±,l̈ ^— ,ð s,Á,Ä,à AŒ<sup>3</sup>ftfŒ [f€,ª•İ X,Ŭ,½,ÍŽQ Œ,<sup>3</sup>ê,é,±,Œ,Í,È,¢ B

**IDirect3DRMMeshBuilder::AddMesh**

HRESULT AddMesh (LPDIRECT3DRMMESH lpD3DRMMesh) ;

f fbfVf...,ðDirect3DRMMeshBuilderIfufWfFfNfg,É'Ç%Á,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ,"s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, fh,Ĵ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lpD3DRMMesh

'Ç%Á,·,éf fbfVf...,İfAfhfŒfX B

**IDirect3DRMMeshBuilder::AddMeshBuilder**

HRESULT AddMeshBuilder(LPDIRECT3DRMMESHBUILDER lpD3DRMMeshBuild);

Direct3DRMMeshBuilderIfuFWfFfNfg,ÌfRf“fef“fc,ð A¼,ÌDirect3DRMMeshBuilderIfuFWfFfNfg,É’Ç%Á,·,é B  
¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô’l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, fh,Ĵ•Ô’l v,ðŽQ Æ,·,é,±,Æ B

lpD3DRMMeshBuild

Direct3DRMMeshBuilderIfuFWfFfNfg,ÌfAfhfŒfX B,±,ÌIfuFWfFfNfg,ÌfRf“fef“fc,ªÇ%Á,³,ê,é B

,±,Ì ^— ,ð s,Á,Ä,à A,à,Æ,ÌDirect3DRMMeshBuilderIfuFWfFfNfg,ªİ X,Ü,½,ÍŽQ Æ,³,ê,é,±,Æ,Í,È,¢ B

**IDirect3DRMMeshBuilder::AddNormal**

int AddNormal(D3DVALUE x, D3DVALUE y, D3DVALUE z);

-@ ü,ðDirect3DRMMeshBuilderIfufWfFfNfg,É’Ç%oÁ,·,é B  
-@ ü,ḷCf“ffbfNfX,ð•Ô,· B

x,y,z  
V,μ,¢-@ ü,ḷûĈEü,ðŽ’i,·x Ay Az,ḷše—v‘f B

**IDirect3DRMMeshBuilder::AddVertex**

int AddVertex(D3DVALUE x, D3DVALUE y, D3DVALUE z);

’, “\_ , δDirect3DRMMeshBuilderIfufWfFfNfg, É’Ç%Á, ·, é B  
’, “\_ , ÌfCf“fffbfNfX, ð•Ô, · B

x, y, z  
V, μ, €’, “\_ , ÌÊ’u, ðŽ!, ·x Ay Az, ÌŠe—v‘f B

**IDirect3DRMMeshBuilder::CreateFace**

HRESULT CreateFace(LPDIRECT3DRMFACE\* lpD3DRMFace);

’,“\_„ðŽ ,½,È,¢–Ê,ð V,µ, ì ¬,µ ADirect3DRMMeshBuilderIfufWfFfNfg,É’Ç%Á,·,é B  
¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô’l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, fh,Ĵ•Ô’l v,ðŽQ Æ,·,é,±,Æ B

lpD3DRMFace  
ì ¬,³,ê,½–Ê,Ö,Ïf|fCf“f^,ðŠi”[,·,éIDirect3DRMFacefCf“f^ [ftfFfCfX,Ö,Ïf|fCf“f^,ÏfAfhfŒfX B

**IDirect3DRMMeshBuilder::CreateMesh**

HRESULT CreateMesh (LPDIRECT3DRMMESH\* lpD3DRMMesh);

Direct3DRMMeshBuilderIfuWfFfNfg,©,ç V,µ,¢f fbfVf...,ð ì ¬,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, fh,Ĵ•Ó'l v,ðŽQ Æ,·,é,±,Æ B

lpD3DRMMesh

IDirect3DRMMeshfCf“f^ [ftfFfCfX,Ö,Ìf|fCf“f^,ðŽó,¬Žæ,éAfhfŒfX B

**IDirect3DRMMeshBuilder::GenerateNormals**

HRESULT GenerateNormals();

Direct3DRMMeshBuilderIfufWfFfNfg,đ ^— ,μ A’,“\_@ ü,đ ¶ ¬,·,é B’,“\_@ ü,Í AŠe’,“\_É Ú,·,éÊ—  
@ ü,ì½<İ,Ä, ,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,İê——,É,Â,¢  
,Ä,İ A uDirect3D•ŨŽ f, [fh,İ•Ô'l v,đŽQ Æ,·,é,±,Æ B

~A‘±,μ,½—Ê,İ—@ ü,đ•½<İ,·,é,Æ Af[f \_@ ü,ª ¶ ¬,³,ê,é B



**IDirect3DRMMeshBuilder::GetBox**

HRESULT GetBox(D3DRMBOX \*lpD3DRMBox);

Direct3DRMMeshBuilderIfufWfFfNfg,đŠŮ,Đ<éĈ`ÍÍ,đŽæ“¼,·,é B<éĈ`ÍÍ,Í A,»,ê,¼,ê,ìŽŸĈ³,ìf,fff< À•W,ì Á ¬’  
l,Æ Ä‘â’l,đŽ!,· B

¬Ĉ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,đ•Ô,· B•Ô’l,îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,l•Ô’l v,đŽQ Æ,·,é,±,Æ B

lpD3DRMBox  
<éĈ`ÍÍ,đŽó,¬Žæ,éD3DRMBOX \‘ĉ‘İ B

**IDirect3DRMMeshBuilder::GetColorSource**

D3DRMCOLORSOURCE GetColorSource();

Direct3DRMMeshBuilderIfufWfFfNfg,İfJf% [ Ef\ [fX,đŽæ“¾,·,é BfJf% [ Ef\ [fX,Í-Ê,Â,à',“\_,Â,à,æ,¢ B

**D3DRMCOLORSOURCE**—ñ““E^f f“fo,İ,Đ,Æ,Â,đ•Ô,· B

ŽQ Æ @**IDirect3DRMMeshBuilder::SetColorSource**

**IDirect3DRMMeshBuilder::GetFaceCount**

int GetFaceCount ( ) ;

Direct3DRMMeshBuilderIfuWfFfNfg’†,l-Ê,l ”,ðŽæ“¾,·,é B  
-Ê,l ”,ð•Ô,· B

**IDirect3DRMMeshBuilder::GetFaces**

HRESULT GetFaces (LPDIRECT3DRMFACEARRAY\* lpD3DRMFaceArray);

Direct3DRMMeshBuilderIfufWfFfNfg,Ì-Ê,ðŽæ“¾,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, fh,Ĵ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lpD3DRMFaceArray

-Ê,ÌfAfhfŒfX,ðŽó,¬Žæ,éIDirect3DRMFaceArrayfCf“f^ [ftfFfCfX,Ö,Ìf|fCf“f^,ÌfAfhfŒfX B

**IDirect3DRMMeshBuilder::GetPerspective**

BOOL GetPerspective();

Direct3DRMMeshBuilderIfufWfFfNfg,Å A%“‘Œ•â ³,a—LŒø,É,È,Á,Ä,¢,é,©,Ç,▯,©,ǒŽæ“¾,·,é B  
%“‘Œ•â ³,a—LŒø,Á, ,ê,ÎTRUE A,»,▯,Á,È,¯,ê,ÎFALSE,ð•Ô,· B

## **IDirect3DRMMeshBuilder::GetQuality**

D3DRMRENDERQUALITY GetQuality();

Direct3DRMMeshBuilderIfuWfFNfg,IfEf“f\_Šf“fO•iŽč,đŽæ“¾,·,é B

f fbfVf...,IfEf“f\_Šf“fO•iŽč,đŽ',·D3DRMRENDERQUALITY—ñ<“E^,If f“fo,Ì,Đ,Æ,Â,đ•Ô,· B

ŽQ Æ **IDirect3DRMMeshBuilder::SetQuality**

**IDirect3DRMMeshBuilder::GetTextureCoordinates**

```
HRESULT GetTextureCoordinates(DWORD index, D3DVALUE *lpU,  
                               D3DVALUE *lpV);
```

Direct3DRMMeshBuilderfIfufWfFfNfg'†,İŽw`è,<sup>3</sup>,ê,½ A',“\_,İfefNfXf`ff À•W,ðŽæ“¾,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ,"s,·,é,ÆfGf%∞ [,ð•Ô,· B•Ô'l,İê——,É,Â,¢  
,Ä,İ A uDirect3D•ŬŽ f, [fh,İ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

index  
,“\_,İfCf“ffbfNfX B

lpU, lpV  
f f\fbfh,<sup>a</sup> §Œä,ð•Ô,·,Æ,« A',“\_,İfefNfXf`ff À•W,ðŽó,¬Žæ,é•İ ” B

ŽQ Æ IDirect3DRMMeshBuilder::SetTextureCoordinates

**IDirect3DRMMeshBuilder::GetVertexColor**

D3DCOLOR GetVertexColor(DWORD index);

Direct3DRMMeshBuilderfIfufWfFfNfg’†,İŽw’è,<sup>3</sup>,ê,<sup>1/2</sup>,“\_ ,İ F,ðŽæ“¾,·,é B  
F,ð•Ô,· B

index  
,“\_ ,İfCf“ffbfNfX B

ŽQ Æ **IDirect3DRMMeshBuilder::SetVertexColor**



**IDirect3DRMMeshBuilder::GetVertexCount**

int GetVertexCount ( ) ;

Direct3DRMMeshBuilderIfufWfFfNfg’†,ì’ “\_ì ”,ðŽæ“¼,·,é B  
’, “\_ì ”,ð•Ô,· B

## IDirect3DRMMeshBuilder::GetVertices

```
HRESULT GetVertices(DWORD *vcount, D3DVECTOR *vertices,  
    DWORD *ncount, D3DVECTOR *normals, DWORD *face_data_size,  
    DWORD *face_data);
```

Direct3DRMMeshBuilder IfufWfFfNfg,l',"\_ A-@ ü A-Êff [f^,ðŽæ“¾,·,é B

¬Ç÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf% [,ð•Ô,· B•Ô'l,Îê——,É,Â,Ç  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Î•Ô'l v,ðŽQ Æ,·,é,±,Æ B

vcount

,“\_„l ”,ðŽó,¬Žæ,é•Î ”,ÎfAfhfÇfX B

vertices

Direct3DRMMeshBuilderIfufWfFfNfg,l',"\_„ðŽó,¬Žæ,éD3DVECTOR \‘Ç‘l,Î”z—ñ B

ncount

-@ ü„l ”,ðŽó,¬Žæ,é•Î ” B

normals

Direct3DRMMeshBuilderIfufWfFfNfg,l-@ ü„ðŽó,¬Žæ,éD3DVECTOR \‘Ç‘l,Î”z—ñ B

face\_data\_size

face\_datafpf%of [f^,ªŽl,·fofbftf@,ÎfTfCfY,ðŽw'è,·,é•Î ” B,±,ÎfTfCfY,ÍDWORD'l'P^Ê,Â—^,!,ç,ê,é B,±  
,Îfpf%of [f^,ÉNULL,ðŽw'è,·,é,±,Æ,Í,Â,«,É,Ç B

face\_data

Direct3DRMMeshBuilderIfufWfFfNfg,l-Êff [f^ B,±,Îff [f^,Í ANULL,Â I,í,é,Æ,Ç,±,±  
,Æ,ð æ,¬,Î AIDirect3DRMMeshBuilder::AddFaces f\fbfh,ÂŽw'è,·,é,à,Î,Æ“¬,¶Ç`Ž®,Â, ,é B,±  
,Îfpf%of [f^,ªNULL,Î,Æ,« A-Êfofbftf@,ªK—v,Æ,·,éTfCfY,ªface\_data\_sizefpf%of [f^,É•Ô,³,ê,é B

## IDirect3DRMMeshBuilder::Load

```
HRESULT Load(LPVOID lpvObjSource, LPVOID lpvObjID,  
             D3DRMLOADOPTIONS d3drmLOFlags,  
             D3DRMLOADTEXTURECALLBACK d3drmLoadTextureProc, LPVOID lpvArg);
```

Direct3DRMMeshBuilderIfuFWfFfNfg,ðf [fh,·,é B

–Æ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [ ,ð•Ô,· B•Ô'l,îê——,É,Â,¢  
 ,Ä,Í A uDirect3D•ŮŽ f, [fh,î•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lpvObjSource

f [fh,·,éIfuFWfFfNfg,îf\ [fX Bd3drmLOFlagsfpf%of [f^,ªŽ',·f\ [fX Eftf%ofo,É,æ,Á,Ä Aftf@fCf< Af  
 Šf\ [fX Af f,fŠ Efuf fbfn A,Ů,½,ÍfXfgfŠ [f€,ðŽw'è,·,é B

lpvObjID

f [fh,·,éIfuFWfFfNfg,î–¼'O,Ů,½,ÍÊ'u B,±  
 ,îfpf%of [f^,Íd3drmLOFlagsfpf%of [f^,ªŽ',·Ž–•ÊŽqftf%fofo,É,æ,Á,Ä%ðŽß,³,ê,é BD3DRMLOAD\_BYPOSITIO  
 Nftf%fofo,ðŽw'è,µ,½ ê ± A,±,îfpf%of [f^,Íftf@fCf<,î'†,îIfuFWfFfNfg,î ± ~,ðŽ',·**DWORD**'l,Ö,îf|  
 fCf“f^,Ä, ,é B,±,îfpf%of [f^,É,ÎNULL,ðŽw'è,·,é,±,Æ,à,Ä,«,é B

d3drmLOFlags

f [fh EfIfvfVf±f“,ðŽ',·**D3DRMLOADOPTIONS**(Æ^,î'l B

d3drmLoadTextureProc

**D3DRMLOADTEXTURECALLBACK**fR [f<fofbfNŠÖ ” B,±,ê,Í A“Á•Ê,ÈftfH [f}fbfg,ð•K—  
 v,Æ,·,éIfuFWfFfNfg,ª—p,¢,éefNfXf`ff,ð“Ç,Y o,·,Æ,«,ÉÆÄ,Ñ o,³,ê,é B,±  
 ,îfpf%of [f^,É,ÎNULL,ðŽw'è,·,é,±,Æ,ª,Ä,«,é B

lpvArg

**D3DRMLOADTEXTURECALLBACK**fR [f<fofbfNŠÖ ”,É“n,³,ê,é AfAfvfŠfP [fVf±f““è<,îff [f^ B

ffftfHf<fg,Ä,Í A,±,îf f\fbfh,ÍlpvObjSourcefpf%of [f^,ÄŽw'è,³,ê,½f\ [fX,©,ç Ä %o,îf fbVf...  
 ,ðf [fh,·,é B

**IDirect3DRMMeshBuilder::ReserveSpace**

HRESULT ReserveSpace(DWORD vertexCount, DWORD normalCount,  
                        DWORD faceCount);

’, “\_ A-@ ü A-Ê, Ì ”, ðŽw’è, µ, Ä ADirect3DRMMeshBuilderIfufWfFfNfg’†, É—Ìæ, ðŠm•Û, ·, é B, ±  
, ê, Ê, æ, Á, Ä AfVfXfef€,, æ, èŒø—!“I, Éf f, fŠ, ðŽg,, !, é, æ, ¢, É, È, é B

¬Œ÷, ·, é, ÆD3DRM\_OK AŽ,, s, ·, é, ÆfGf%o [, ð•Ô, · B•Ô’l, Îê——, É, Â, ¢  
, Ä, Í A uDirect3D•ÛŽ f, fh, Î•Ô’l v, ðŽQ Æ, ·, é, ±, Æ B

vertexCount, normalCount, faceCount  
, “\_ A-@ ü A-Ê, Ì, ½, ß, ÉŠ,,, è“-, Ä, é—Ìæ, Ì ” B

## IDirect3DRMMeshBuilder::Save

```
HRESULT Save(const char * lpFilename,  
             D3DRMXOFFFORMAT d3drmXOFFFormat, D3DRMSAVEOPTIONS d3drmSOContents);
```

Direct3DRMMeshBuilderIfufWfFfNfg,đ•Ů‘¶,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,l•Ô'l v,đŽQ Æ,·,é,±,Æ B

lpFilename

ì ¬,³,ê,éftf@fCf<¼‘O,Ö,îf|fCf“f^ Bftf@fCf<¼,îŠg’£Žq,Í.X,Â,È,,Ä,Í,È,ç,È,¢ B

d3drmXOFFFormat

**D3DRMXOFFFORMAT**—ñ,“Œ^,ìD3DRMXOF\_TEXT'l B

d3drmSOContents

•Ů‘¶lfvfVf‡f“,đ•\,·**D3DRMSAVEOPTIONS**Œ^,î'l B

**IDirect3DRMMeshBuilder::Scale**

HRESULT Scale(D3DVALUE sx, D3DVALUE sy, D3DVALUE sz);

*f,ff< À•W,̀xŽ² AyŽ² AzŽ²,É—*  
^,!,ç,ê,½ kŽÚŒW ”,É,æ,Á,Ä ADirect3DRMMeshBuilderIfufWfFfNfg,ðfXfP [fŠf“fO,·,é B  
¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,l•Ô'l v,ðŽQ Æ,·,é,±,Æ B

sx, sy, sz  
xŽ² AyŽ² AzŽ²,É%o^,Á,Ä“K—p,³ê,é kŽÚŒW ” B

**IDirect3DRMMeshBuilder::SetColor**

```
HRESULT SetColor(D3DCOLOR color);
```

Direct3DRMMeshBuilderIfufWfFfNfg,Ì,·,×,Ä,Ì-Ê,É AŽw'è,<sup>3</sup>,ê,½ F,đ Ý'è,·,é B  
-Œ÷,·,é,ÆD3DRM\_OK AŽ,"s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, fh,Ĵ•Ó'l v,đŽQ Æ,·,é,±,Æ B

color  
-Ê,Ì F B

**IDirect3DRMMeshBuilder::SetColorRGB**

HRESULT SetColorRGB(D3DVALUE red, D3DVALUE green, D3DVALUE blue);

Direct3DRMMeshBuilderIfufWfFfNfg,Ì,·,×,Ä,Ì-Ê,É AŽw'è,<sup>3</sup>,ê,½ F,đ Ý'è,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ,"s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Î A uDirect3D•ŮŽ f, fh,Ĵ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

red, green, blue  
Ý'è,·,é F,Ì Ô A—Î A Â,İŠe—v'f B



**IDirect3DRMMeshBuilder::SetColorSource**

HRESULT SetColorSource(D3DRMCOLORSOURCE source);

Direct3DRMMeshBuilderIfufWfFfNfg,İfJf% [ Ef\ [fX,đ Ý’è,·,é B  
¬Ĉ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf% [,đ•Ô,· B•Ô’l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ĵ•Ô’l v,đŽQ Æ,·,é,±,Æ B

source  
V,µ,Žg—p,·,éfJf% [ Ef\ [fX,đŽ!,·**D3DRMCOLORSOURCE**—ñċ“Ĉ^,İf f“fo B

ŽQ Æ @**IDirect3DRMMeshBuilder::GetColorSource**

**IDirect3DRMMeshBuilder::SetMaterial**

HRESULT SetMaterial(LPDIRECT3DRMMATERIAL lpIDirect3DRMmaterial);

Direct3DRMMeshBuilderIfufWfFfNfg,Ì,·,×,Ä,Ì-Ê,Éf}fefŠfAf<,ð Ý'è,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ, ”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŨŽ f, [fh,Ì•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lpIDirect3DRMmaterial

Direct3DRMMeshBuilderIfufWfFfNfg,ÌIDirect3DRMMaterialfCf“f^ [ftfFfCfX B

**IDirect3DRMMeshBuilder::SetNormal**

HRESULT SetNormal(DWORD index, D3DVALUE x, D3DVALUE y, D3DVALUE z);

Direct3DRMMeshBuilderIfufWfFfNfg,ÅŽw’è,<sup>3</sup>ê,½,’“\_ ,l-@ üfxfNfgfç,ð Ý’è,·,é B  
-Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô’l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, fh,Ĵ•Ô’l v,ðŽQ Æ,·,é,±,Æ B

index  
Ý’è,·,é-@ ü,lfCf“fffbfNfX B

x, y, z  
Žw’è,μ,½-@ ü,ÉŠ,,è“- ,Ä,éfxfNfgfç,Ĵx Ay Az,lŠe—v’f B

**IDirect3DRMMeshBuilder::SetPerspective**

HRESULT SetPerspective(BOOL perspective);

Direct3DRMMeshBuilderIfufWfFfNfg,Ì A%“«ß•â ³fefNfXf`ff Ef}fbfsf“fO,ð—LÆø,Û,½,Í¬³Æø,É,·,é B  
¬Æ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf% [ ,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ÛŽ f, fh,Ĵ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

*perspective*  
f fbfVf...,ĴfefNfXf`ff Ef}fbfsf“fO,É%“«ß•â ³,ð“K—p,·,é ê ‡,ÍTRUE A,»,□,Â,È,¯,ê,ÎFALSE,ðŽw'è,·,é B

**IDirect3DRMMeshBuilder::SetQuality**

HRESULT SetQuality(D3DRMRENDERQUALITY quality);

Direct3DRMMeshBuilderIfufWfFfNfg,İfƎf“f\_Šf“fO•iŽč,đ Ý’è,·,é B

¬Ǝ÷,·,é,ÆD3DRM\_OK AŽ, ”s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,İê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,İ•Ô'l v,đŽQ Æ,·,é,±,Æ B

quality  
V,µ,Žg—p,·,éfƎf“f\_Šf“fO•iŽč,đŽ',· AD3DRMRENDERQUALITY—ñ“Ǝ^,İf f“fo B

ŽQ Æ @IDirect3DRMMeshBuilder::GetQuality

**IDirect3DRMMeshBuilder::SetTexture**

HRESULT SetTexture(LPDIRECT3DRMTEXTURE lpD3DRMTexture);

Direct3DRMMeshBuilderIfuWfFfNfg,Ì,·,×,Ä,Ì-Ê,ìfeNfXf`ff,ð Ý'è,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ, ”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŨŽ f, [fh,Ì•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lpD3DRMTexture

•K—v,ÊDirect3DRMTextureIfuWfFfNfg B

**IDirect3DRMMeshBuilder::SetTextureCoordinates**

HRESULT SetTextureCoordinates(DWORD index, D3DVALUE u, D3DVALUE v);

Direct3DRMMeshBuilderIfufWfFfNfg,ìŽw'è,³,ê,½',“\_,ìfefNfXf`ff À•W,ð Ý'è,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ,„s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ĵ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

index  
Ý'è,·,é',“\_,ìfCf“fffbfNfX B

u, v  
Žw'è,³,ê,½f fbfVf...',“\_,ÉŠ,,è“–,Ä,éfefNfXf`ff À•W B

ŽQ Æ @IDirect3DRMMeshBuilder::GetTextureCoordinates

**IDirect3DRMMeshBuilder::SetTextureTopology**

HRESULT SetTextureTopology(BOOL cylU, BOOL cylV);

Direct3DRMMeshBuilderIfufWfFfNfg,ÌfefNfXf`ff^Ê‘Š,ð Ý’è,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ĭ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

cylU, cylV  
uŽŸŒ³,ÆvŽŸŒ³,Ĭ^Ê‘Šftf%ofo BuŽŸŒ³,Ů,½,ÍvŽŸŒ³,É%o~'Œ^Ê‘Š,ðŽ ,½,¹,é ê ‡,ÍTRUE A,»,□  
,Ä,È,¯,ê,ÎFALSE,ðŽw'è,·,é B



**IDirect3DRMMeshBuilder::SetVertex**

HRESULT SetVertex(DWORD index, D3DVALUE x, D3DVALUE y, D3DVALUE z);

Direct3DRMMeshBuilderIfufWfFfNfg,İŽw’è,<sup>3</sup>ê,½’ “\_ ,İ^Ê’u,đ Ý’è,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ, ”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô’l,İê——,É,Â,¢  
,Ă,Í A uDirect3D•ŮŽ f, fh,İ•Ô’l v,ðŽQ Æ,·,é,±,Æ B

index  
Ý’è,·,é’ “\_ ,İfCf“ffbfNfX B

x, y, z  
Žw’è,<sup>3</sup>ê,½’ “\_ ,ÉŠ,,,è“–,Ă,é^Ê’u,İx Ay Az,İŠe—v’f B

**IDirect3DRMMeshBuilder::SetVertexColor**

HRESULT SetVertexColor(DWORD index, D3DCOLOR color);

Direct3DRMMeshBuilderIfufWfFfNfg,Ì AŽw'è,<sup>3</sup>,ê,½',“\_ , Ì F,ð Ý'è,·,é B  
¬Œ÷,·,é,ÆD3DRM\_OK AŽ, ”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ĵ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

index  
Ý'è,·,é',“\_ , ÌfCf“fffbfNfX B

color  
Žw'è,<sup>3</sup>,ê,½',“\_ ,ÉŠ,,,è“–,Ä,é F B

ŽQ Æ @IDirect3DRMMeshBuilder::GetVertexColor

**IDirect3DRMMeshBuilder::SetVertexColorRGB**

HRESULT SetVertexColorRGB(DWORD index, D3DVALUE red,  
D3DVALUE green, D3DVALUE blue);

Direct3DRMMeshBuilderIfufWfFfNfg,Ì AŽw'è,<sup>3</sup>,ê,½',“\_Ì F,ð Ý'è,·,é B  
¬Œ÷,·,é,ÆD3DRM\_OK AŽ,"s,·,é,ÆfGf‰ [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Î A uDirect3D•ŮŽ f, [fh,l•Ô'l v,ðŽQ Æ,·,é,±,Æ B

index  
Ý'è,·,é',“\_ÌfCf“fffbfNfX B  
red, green, blue  
,“\_Ì,ÉŠ,,,è“–,Ä,é F,Î Ô A—Î A Â,ÎŠe—v'f B

**IDirect3DRMMeshBuilder::Translate**

HRESULT Translate(D3DVALUE tx, D3DVALUE ty, D3DVALUE tz);

Direct3DRMMeshBuilderIfufWfFfNfg,İ'“\_İÊ'u,É AŽw'è,³ê,½IftfZfbfg,đ'Ç%Á,·,é B  
¬Œ÷,·,é,ÆD3DRM\_OK AŽ,"s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,İê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, fh,İ•Ô'l v,đŽQ Æ,·,é,±,Æ B

tx, ty, tz  
Še',“\_Ê'u,İx Ay Az Ä•W,»,ê,¼,ê,É'Ç%Á,³ê,éIftfZfbfg B

## IDirect3DRMObject

*fAfvfŠfP [fVf±f“*,ÍDirect3DRMfIfufWfFfNfg,ÌfX [fp [ EfNf%ofX,Æ,â,èŽæ,è,·,é,½,ß AIDirect3DRMObjectfCf“f^ [ftfFfCfX,Ìf f\fbfh,ðŽg—p,·,é B,±,ÌfZfNfVf±f“*,ÍIDirect3DRMObjectfCf“f^ [ftfFfCfX Ef f\fbfh,ÌfŠftf@fÆf“fX,Å, ,é BŠT”O,É,Â,¢,Ä,ÌŠT—v,Í A uIDirect3DRMObjectfCf“f^ [ftfFfCfX v,ðŽQ Æ,·,é,±,Æ B*

IDirect3DRMObjectfCf“f^ [ftfFfCfX Ef f\fbfh,Í A^È%°,ÌfOf< [fv,É•<sup>a</sup>—b,·,é,±,Æ,<sup>a</sup>Ä,«,é B

*fAfvfŠfP [fVf±f“ÆÄ—* GetAppData

*L,Ìff [f^*

SetAppData

•i »

Clone

—¼‘O

GetClassName

GetName

SetName

’Ê’m

AddDestroyCallback

DeleteDestroyCallback

IDirect3DRMObjectfCf“f^ [ftfFfCfX,Í A,·,×,Ä,ÌCOMfCf“f^ [ftfFfCfX,Æ“—  
l A<sup>l</sup>UnknownfCf“f^ [ftfFfCfX Ef f\fbfh,ðÆp <sup>3</sup>,·,é B<sup>I</sup>UnknownfCf“f^ [ftfFfCfX,ÍŽŸ,Ì,R,Â,Ìf f\fbfh,ðfTf|  
[fg,·,é B

AddRef

QueryInterface

Release

Direct3DRMObjectfIfufWfFfNfg,Í A“K Ø,È<sup>È</sup>QueryInterface f\fbfh,ðÆÄ,Ñ o,·,±,  
Æ,É,æ,è A,Ç,ÌDirect3DRMfIfufWfFfNfg,©,ç,Ä,àŽæ“¾,·,é,±,  
Æ,<sup>a</sup>Ä,«,é B,·,×,Ä,ÌDirect3DRMfIfufWfFfNfg,Í AIDirect3DRMObjectfCf“f^ [ftfFfCfX Ef f\fbfh,ðÆp <sup>3</sup>,·,é  
B

**IDirect3DRMObject::AddDestroyCallback**

```
HRESULT AddDestroyCallback(D3DRMOBJECTCALLBACK lpCallback,
    LPVOID lpArg);
```

*fIfufWfFfNfg*,”jŠü,³,ê,é,Æ,«,ÉĈÄ,Ñ o,³,ê,éŠÖ ”,ð“o~^,·,é B

–Ĉ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,l•Ô'l v,ðŽQ Æ,·,é,±,Æ B

*lpCallback*

*fIfufWfFfNfg*,”jŠü,³,ê,é,Æ,«,ÉĈÄ,Ñ o,³,ê,é Af† [fU'èç,ÎfR [fçfofbfNŠÖ ” B

*lpArg*

fR [fçfofbfNŠÖ ”,É“n,³,ê,é AfAfvfŠfP [fVf‡f“èç,Îff [f^ B,±  
,İŠÖ ”,ÎfIfufWfFfNfg,”jŠü,³,ê,½Ĉä,ÉĈÄ,Ñ o,³,ê,é,½,ß A^ø ”,Æ,µ,ÄfIfufWfFfNfg,ð“n,µ,Ä,Í,È,ç,È,¢ B

**IDirect3DRMObject::Clone**

```
HRESULT Clone(LPUNKNOWN pUnkOuter, REFIID riid, LPVOID *ppvObj);
```

*fIfufWfFfNfg,İ•<sub>i</sub>* » ,đ ì ¬ ,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ, ”s,·,é,ÆfGf%<sub>o</sub> [,đ•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Î A uDirect3D•ŮŽ f, [fh,İ•Ô'l v,đŽQ Æ,·,é,±,Æ B

*pUnkOuter*

COM W ¬%o»«@”\,É‘Î%ož,·,é,½,ß,É‘¶ Ý,·,éfpf%<sub>o</sub>f [f^ B

*riid*

•<sub>i</sub> » ,·,éfIfufWfFfNfg,İŽ<sup>−</sup>•ÊŽq B

*ppvObj*

f f\fbfh,<sup>a</sup> §Œä,đ•Ô,·,Æ,« AfIfufWfFfNfg,İ•<sub>i</sub> » ,đŠi”[,·,éfAfhfŒfX B

## IDirect3DRMObject::DeleteDestroyCallback

```
HRESULT DeleteDestroyCallback(D3DRMOBJECTCALLBACK d3drmObjProc,  
    LPVOID lpArg);
```

**IDirect3DRMObject::AddDestroyCallback** *f\fbfh,É,æ,Á,Ä“o~^,³,ê,½ŠÖ ”,ð í æ,·,é B*

*¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [„ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,l•Ô'l v,ðŽQ Æ,·,é,±,Æ B*

*d3drmObjProc*

*fIfufWfFfNfg,””jŠü,³,ê,é,Æ,«,ÉŒÄ,Ň o,³,ê,é Af† [fU'èç,ÌD3DRMOBJECTCALLBACKfR [fçfofbfNŠÖ ”  
B*

*lpArg*

*fR [fçfofbfNŠÖ ”,É“n,³,ê,é AfAfvfŠfP [fVf‡f“‘èç,Ìff [f^,ÌfAfhfŒfX B*



## **IDirect3DRMObject::GetAppData**

DWORD GetAppData();

*fIfufWfFfNfg,©,ç AfAfvfŠfP [fVf‡f“ĈĀ—L,ì32frfbfg Eff [f^,đŽæ“¾,·,é BffftfHf<fg'l,Í0,Ā, ,é B*  
*fAfvfŠfP [fVf‡f“,É,æ,Ā,Ā'è`,³,ê,½ff [f^'l,đ•Ô,· B*

ŽQ Æ @**IDirect3DRMObject::SetAppData**

## IDirect3DRMObject::GetClassName

```
HRESULT GetClassName(LPDWORD lpdwSize, LPSTR lpName);
```

*fIfufWfFfNfg,İfNf%oX-¼,ðŽæ“¾,·,é B*

*¬Œ÷,·,é,ÆD3DRM\_OK AŽ, ”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,İê——,É,Â,¢  
,Ä,Í A uDirect3D•ŬŽ f, [fh,İ•Ô'l v,ðŽQ Æ,·,é,±,Æ B*

*lpdwSize*

*lpNamefpf%of [f^,ªŽ!,·fofbftf@,İfTfCfY,ªfofCf'P^Ê,Å“ü,é•İ ”,İfAfhfŒfX B*

*lpName*

*f f\fbfh,ª §Œä,ð•Ô,·,Æ,« AfNf%oX-¼,ðŽ!,·NULL,Å I,í,é•¶Žš—ñ,Ö,İf|fCf“f^ B,±  
,İfpf%of [f^,ªNULL,İ ê ‡ AlpdwSizefpf%of [f^,É,Í•¶Žš—ñ,É•K—v,ÈfTfCfY,ª Ý'è,³,ê,é B*

**IDirect3DRMObject::GetName**

HRESULT GetName(LPDWORD lpdwSize, LPSTR lpName);

fIfufWfFfNfg¼,ðŽæ“¾,·,é B

¬Æ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, fh,Ĵ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lpdwSize

lpNamefpf%of [f^,ªŽ|,·fofbftf@,ÏfTfCfY,ªfofCfP^Ê,Â“ü,é•Ĭ ” B

lpName

f f\fbfh,ª §Æä,ð•Ô,·,Æ,« AfIfufWfFfNfg,Ï¼‘O,ðŽ|,·NULL,Â I,í,é•¶Žš—ñ,Ö,Ïf|fCf“f^ B,±  
,Ïfpf%of [f^,ªNULL,Ï ê ‡ AlpdwSizefpf%of [f^,É,Í•¶Žš—ñ,É•K—v,ÈfTfCfY,ª Ý’è,³,ê,é B

ŽQ Æ @IDirect3DRMObject::SetName

## IDirect3DRMObject::SetAppData

HRESULT SetAppData(DWORD ulData);

If the application has set the IDirect3DRMObject::SetAppData method, the application must call the IDirect3DRMObject::SetAppData method before the application calls the IDirect3DRMObject::Render method.

The application must call the IDirect3DRMObject::SetAppData method before the application calls the IDirect3DRMObject::Render method. The application must call the IDirect3DRMObject::SetAppData method before the application calls the IDirect3DRMObject::Render method.

ulData

If the application has set the IDirect3DRMObject::SetAppData method, the application must call the IDirect3DRMObject::SetAppData method before the application calls the IDirect3DRMObject::Render method.

ŽQ AE @IDirect3DRMObject::GetAppData

## IDirect3DRMObject::SetName

HRESULT SetName(const char \* lpName);

*fIfufWfFfNfg, Ì¼‘O, đ Ý’è, ·, é B*

*¬Œ÷, ·, é, ÆD3DRM\_OK AŽ, ”s, ·, é, ÆfGf%o [, đ•Ô, · B•Ô’l, Îê——, É, Â, ¢  
, Ä, Í A uDirect3D•ŮŽ f, [fh, Ĩ•Ô’l v, đŽQ Æ, ·, é, ±, Æ B*

*lpName*

*fIfufWfFfNfg, Ì¼‘O, đŽl, ·f† [fU’è`, Ĩff [f^ B*

ŽQ Æ @IDirect3DRMObject::GetName

## **IDirect3DRMShadow**

*fAfvfŠfP [fVf‡f“,Í ADirect3DRMShadowfIfufWfFfNfg,đ %Šú%»,.é,½,ß,ÉIDirect3DRMShadowfCf“f^ [ftFfCfX,İf f\fbfh,đŽg—p,.é BfAfvfŠfP [fVf‡f“,“IDirect3DRM::CreateShadowf f\fbfh,đĖÄ,Ń o,.,Æ,«,Í A,±,İ %Šú%»»,Í•s—v,Ä, ,é B %Šú%»»,“K—*  
*v,È,İ,Í AIDirect3DRM::CreateObjectf f\fbfh,đĖÄ,Ń o,μ,Ä%A%œ,đ ¶ ¬,.,é ê ‡,¼,—,Ä, ,é B*

*,±,İfZfNfVf‡f“,ÍIDirect3DRMShadowfCf“f^ [ftFfCfX Ef f\fbfh,İfŠftf@fĖf“fX,Ä, ,é BŠT”O,É,Â,ĉ,Ä,İŠT—*  
*v,Í AIDirect3DRMShadowfCf“f^ [ftFfCfX,đŽQ Æ,.,é,±,Æ B*

**IDirect3DRMShadowfCf“f^ [ftFfCfX,Í AInitf f\fbfh,đfTf] [fg,.,é B**

**IDirect3DRMShadowfCf“f^ [ftFfCfX,Í A,.,×,Ä,İCOMfCf“f^ [ftFfCfX,Æ“—**  
**l AUnknownfCf“f^ [ftFfCfX Ef f\fbfh,đĖp ³,.,é BIUnknownfCf“f^ [ftFfCfX,ÍŽŸ,İ,R,Â,İf f\fbfh,đfTf]**  
**[fg,.,é B**

## **AddRef**

## **QueryInterface**

## **Release**

*,³,ĉ,É AIDirect3DRMShadowfCf“f^ [ftFfCfX,Í AIDirect3DRMObjectfCf“f^ [ftFfCfX,©,ĉŽŸ,İf f\fbfh,đĖp ³,*  
*,.,é B*

## **AddDestroyCallback**

## **Clone**

## **DeleteDestroyCallback**

## **GetAppData**

## **GetClassName**

## **GetName**

## **SetAppData**

## **SetName**

**Direct3DRMShadowfIfufWfFfNfg,Í AIDirect3DRM::CreateShadowf f\fbfh,İĖÄ,Ń o,μ,É,æ,Ä,ÄŽæ“¾,³,ê,é B**

## IDirect3DRMShadow::Init

```
HRESULT Init(LPDIRECT3DRMVISUAL lpD3DRMVisual,  
             LPDIRECT3DRMLIGHT lpD3DRMLight, D3DVALUE px, D3DVALUE py,  
             D3DVALUE pz, D3DVALUE nx, D3DVALUE ny, D3DVALUE nz);
```

Direct3DRMShadowIfufWfFfNfg,đ %Šú%»,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf% [,đ•Ô,· B•Ô'l,îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f. fh,İ•Ô'l v,đŽQ Æ,·,é,±,Æ B

*lpD3DRMVisual*

%A%œ•t,¯,éDirect3DRMVisualIfufWfFfNfg B

*lpD3DRMLight*

%A%œ,İŒ³,É,È,éŒðŒ¹,đ'ñ<Ÿ,·,éDirect3DRMLightIfufWfFfNfg B

*px, py, pz*

%A%œe,ª•t,¯,ç,ê,é•½–Ê ã,î“\_î À•W B

*nx, ny, nz*

%A%œe,ª•t,¯,ç,ê,é•½–Ê ã,î–@ üfxfNfgfç,î À•W B

## IDirect3DRMTexture

*fAfvfŠfP [fVf‡f“ ,Í AfefNfXf`ff,ÆŒÝ,¢  
,É,â,èŽæ,è,·,é,½,ß,ÉIDirect3DRMTexturefCf“f^ [ftfFfCfX,Ìf f\fbfh,ðŽg—p,·,é BfefNfXf`ff,Í«éŒ`,ÌfsfNfZf,“z  
—ñ,Â, ,é B,±,ÌfZfNfVf‡f“ ,Í AIDirect3DRMTexturefCf“f^ [ftfFfCfX Ef f\fbfh,ÌfŠftf@fŒf“fX,Â, ,é BŠT”O,  
É,Â,¢,Ä,ÌŠT—v,Í A uIDirect3DRMTexturefCf“f^ [ftfFfCfX v,ðŽQ Æ,·,é,±,Æ B*

*IDirect3DRMTexturefCf“f^ [ftfFfCfX Ef f\fbfh,Í A`È%°,ÌfOf< [fv,É•<sup>a</sup>—D,·,é,±,Æ,<sup>a</sup>,Â,« ,é B*

**F** **GetColors**

**SetColors**

*fffJ [f<*

**GetDecalOrigin**

**GetDecalScale**

**GetDecalSize**

**GetDecalTransparency**

**GetDecalTransparentColor**

**SetDecalOrigin**

**SetDecalScale**

**SetDecalSize**

**SetDecalTransparency**

**SetDecalTransparentColor**

*fCf [fW*

**GetImage**

*%oŠú%o»*

**InitFromFile**

**InitFromResource**

**InitFromSurface**

*fŒf“f\_f%o [’Ê’m*

**Changed**

*%oA%oe*

**GetShades**

**SetShades**

*IDirect3DRMTexturefCf“f^ [ftfFfCfX,Í A,·,×,Ä,ÌCOMfCf“f^ [ftfFfCfX,Æ“—  
l AIUnknownfCf“f^ [ftfFfCfX Ef f\fbfh,ðŒp <sup>3</sup>,·,é BIUnknownfCf“f^ [ftfFfCfX,ÍŽŸ,Ì,R,Â,Ìf f\fbfh,ðfTf|  
[fg,·,é B*

**AddRef**

**QueryInterface**

**Release**

*,<sup>3</sup>,ç,É AIDirect3DRMTexturefCf“f^ [ftfFfCfX,Í AIDirect3DRMObjectfCf“f^ [ftfFfCfX,©,çŽŸ,Ìf f\fbfh,ðŒp <sup>3</sup>,  
·,é B*

**AddDestroyCallback**

**Clone**

**DeleteDestroyCallback**

**GetAppData**

**GetClassName**

**GetName**

**SetAppData**



**SetName**

Direct3DRMTextureIfufWfFfNfg,í A**Direct3DRM::CreateTexture**f f\fbfh,ìEÄ,Ñ o,μ,É,æ,Á,Žæ“¾,Â,«,é B

**IDirect3DRMTexture::Changed**

HRESULT Changed(BOOL bPixels, BOOL bPalette);

fAfvfŠfP [fVf‡f“,afeNfXf`ff,İfsfNfZf<,âpfŒfbfg,ð•İ X,μ,½,±,Æ,ðfŒf“f\_f%o [É'Ê'm,·,é B  
¬Œ÷,·,é,ÆD3DRM\_OK AŽ, ”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,İê——,É,Â,¢  
,Ä,İ A uDirect3D•ŮŽ f, [fh,İ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

bPixels

fsfNfZf<,•İ X,<sup>3</sup>,ê,½,Æ,«,ÍTRUE,ð Ý'è,·,é B

bPalette

fpfŒfbfg,•İ X,<sup>3</sup>,ê,½,Æ,«,ÍTRUE,ð Ý'è,·,é B

## IDirect3DRMTexture::GetColors

DWORD GetColors();

fe fNfXf`ff, Ì fÇ f“ f\_ fŠ f“ fO, Å Ž g, í, ê, é Å ‘ å F ”, ð Ž æ “ ¾, ·, é B  
F ”, ð • Ô, · B

, ±, Ì f f\fbfh, Í A fe fNfXf`ff, Ì ì ¬, É Ž g, í, ê, ½ fCf [fW, Ì F ”, Å, Í, È, A, ±  
, ê, Ü, Å, É fe fNfXf`ff, É Ý ’ è, ³, ê, ½ F, Ì ”, ð • Ô, · B, µ, ½, <sup>a</sup>, Á, Ä A’ Ê í • Ô, ³, ê, é F, Ì ”, Í A IDirect3DRMTexture::SetColor  
rs f f\fbfh, Å –  
¾ Ž, “ I, É fe fNfXf`ff, Ì F, ð • Ĭ X, µ, È, Ç È À, è A IDirect3DRM::SetDefaultTextureColors f f\fbfh, ð Ç Ä, Ñ o, µ, Ä Ý ’ è, µ,  
½ F, Æ “, ¶, Å, , é B

Ž Q Æ @ IDirect3DRMTexture::SetColors

**IDirect3DRMTexture::GetDecalOrigin**

HRESULT GetDecalOrigin(LONG \* lpIX, LONG \* lpIY);

*fffj* [f<,l̈E» Ý,l̈E“\_„ðŽæ“¾,·,é B  
¬E±,·,é,ÆD3DRM\_OK AŽ„s,·,é,ÆfGf%o [„ð•Ô,· B•Ô'l,l̈e——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f. [fh,l̈•Ô'l v,ðŽQ Æ,·,é,±,Æ B

*lpIX, lpIY*  
*f f\fbfh,*<sup>a</sup> §Eä,ð•Ô,·,Æ,« AfffJ [f<,l̈E“\_„ðŽó,¬Žæ,é•İ ” B

ŽQ Æ @IDirect3DRMTexture::SetDecalOrigin

**IDirect3DRMTexture::GetDecalScale**

DWORD GetDecalScale();

Žw'è,<sup>3</sup>,ê,½fffJ\_lf<,lfXfP [fŠf“fO“Á «,ðŽæ“¾,·,é B  
¬Œ÷,·,é,ÆfXfP [fŠf“fO“Á «,ð•Ô,· BŽ,”s,·,é,Æ-,P,ð•Ô,· B

ŽQ Æ **IDirect3DRMTexture::SetDecalScale**

**IDirect3DRMTexture::GetDecalSize**

HRESULT GetDecalSize(D3DVALUE \*lprvWidth, D3DVALUE \*lprvHeight);

*fffJ [f<,l̈fTfCfY,đŽæ“¾,·,é B*

*¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [ ,đ•Ô,· B•Ô'l,l̈ê——,É,Â,¢  
,Ä,Í A uDirect3D•ŨŽ f, [fh,l̈•Ô'l v,đŽQ Æ,·,é,±,Æ B*

*lprvWidth, lprvHeight  
f f\fbfh,<sup>a</sup> §Œä,đ•Ô,·,Æ,«,ÉfffJ [f<,l̈• ,Æ ,,<sup>3</sup>,đŽó,¬Žæ,é•l̈ ” B*

*ŽQ Æ @IDirect3DRMTexture::SetDecalSize*

## **IDirect3DRMTexture::GetDecalTransparency**

BOOL GetDecalTransparency();

fffj [fç, ì“§-¾“x“Á «, ðŽæ“¾, ·, é B

fffj [fç, É“§-¾ F, <sup>a</sup>, , ê, îTRUE A, È, ¯, ê, îFALSE, ð•Ô, · B

ŽQ Æ @IDirect3DRMTexture::SetDecalTransparency

**IDirect3DRMTexture::GetDecalTransparentColor**

D3DCOLOR GetDecalTransparentColor();

fffJ [fç,ì“§–¾ F,ðŽæ“¾,·,é B

“§–¾ F,ì'l,ð•Ô,· B

ŽQ Æ @IDirect3DRMTexture::SetDecalTransparentColor



**IDirect3DRMTexture::GetImage**

D3DRMIMAGE \* GetImage();

feNfXf`ff,ì ì ¬,É—p,¢,ç,ê,½fCf [fW,ìfAfhf¢fX,ð•Ô,· B

¢» Ý,ìfeNfXf`ff,ì ì ¬,É—p,¢,ç,ê,½D3DRMIMAGE \“¢‘ì,Ö,ìf|fCf“f^,ð•Ô,· B

**IDirect3DRMTexture::GetShades**

DWORD GetShades ( ) ;

fe fNfXf`ff,đfƎf“f\_Šf“fO,·,é Ũ A,»,ê,¼,ê,Ì F,ĀŽg,í,ê,é%A%œ,Ì ”,đŽæ“¾,·,é B  
%oA%œ,Ì ”,đ•Ô,· B

ŽQ Æ @IDirect3DRMTexture::SetShades

**IDirect3DRMTexture::InitFromFile**

```
HRESULT InitFromFile(const char *filename);
```

Žw'è,<sup>3</sup>,ê,½ftf@fCf<,l̇ î•ñ,ðŽg,Á,ÄfefNfXf`ff,ð %Šú%»,,é B

¬Œ÷,,é,ÆD3DRM\_OK AŽ,"s,,é,ÆfGf% [ ,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŨŽ f, [fh,İ•Ô'l v,ðŽQ Æ,,é,±,Æ B

filename  
%Šú%» î•ñ,ðŽæ,è o,·ftf@fCf<,ðŽw'è,,é•¶Žš—ñ B

%Šú%»,,éfefNfXf`ff,Í AIDirect3DRM::CreateObject,ð—p,¢,Ä ì ¬,µ,Ä,¬,©,È,,Ä,Í,È,ç,È,¢ B

ŽQ Æ @IDirect3DRMTexture::InitFromResource, IDirect3DRMTexture::InitFromSurface

**IDirect3DRMTexture::InitFromResource**

HRESULT InitFromResource(HRSRC rs);

Žw'è,<sup>3</sup>,ê,½fŠf\ [fX,©,çDirect3DRMTextureIfufWfFfNfg,đ %Šú%»»,·,é B  
¬Œ÷,·,é,ÆD3DRM\_OK AŽ,"s,·,é,ÆfGf% [ ,đ•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŨŽ f, [fh,Ĭ•Ô'l v,đŽQ Æ,·,é,±,Æ B

<sup>rs</sup>  
fŠf\ [fX,Ĭfnf“fhf<,đŽw'è,·,é B

ŽQ Æ @IDirect3DRMTexture::InitFromFile, IDirect3DRMTexture::InitFromSurface

**IDirect3DRMTexture::InitFromSurface**

HRESULT InitFromSurface(LPDIRECTDRAWSURFACE lpDDS);

Žw'è,<sup>3</sup>,ê,½DirectDrawfT [ftFfX,Ìff [f^,ðŽg—p,μ,ÄfefNfXf`ff,ð %Šú%»»,·,é B  
¬Œ÷,·,é,ÆD3DRM\_OK AŽ,"s,·,é,ÆfGf% [ ,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŨŽ f, [fh,İ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lpDDS  
%Šú%»» î•ñ,ðŽæ,è o,·DirectDrawfT [ftFfX B

ŽQ Æ @IDirect3DRMTexture::InitFromFile, IDirect3DRMTexture::InitFromResource

**IDirect3DRMTexture::SetColors**

```
HRESULT SetColors(DWORD ulColors);

f efNfXf`ff, ìfƎf“f_Ÿf“fO,ÉŽg—p,·,é Å‘å F ”,đ Ý’è,·,é B,±, Ìf f\bfh,ª•K—
v,È, Ì, Í Af%of“fv EfJf%o [ Ef,ffƒ,¾,¯,Ä, ,é B

¬Ǝ÷,·,é,ÆD3DRM_OK AŽ, ”s,·,é,ÆfGf%o [,đ•Ô,· B•Ô’l, Ìê——,É,Â,¢
,Ä, Í A uDirect3D•ŮŽ f, [fh, Ĭ•Ô’l v,đŽQ Æ,·,é,±,Æ B

ulColors
F ” BffftfHfƒfg’l, Í8,Ä, ,é B
```

ŽQ Æ @IDirect3DRMTexture::GetColors

**IDirect3DRMTexture::SetDecalOrigin**

HRESULT SetDecalOrigin(LONG lX, LONG lY);

*ffff* [f<,l̈́Ě´“\_„đ Af ffJ [f<,l̈́ ¶ ã,©,ç,l̈́fIf tfZfbfg,Æ,μ,Ä Ý’è,·,é B  
¬Ě÷,·,é,ÆD3DRM\_OK AŽ, ”s,·,é,ÆfGf%o [„ð•Ô,· B•Ô’l,l̈́Ě——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,l̈́•Ó’l v,ðŽQ Æ,·,é,±,Æ B

*lX, lY*  
V,μ,¢Ě´“\_„đff fJ [f< Ä•W,ÄŽw’è,·,é BffftfHf<fg,l̈́Ě´“\_„Í[0, 0],Ä, ,é B

fĚf“f\_fŠf“fO,Æ,«„É,Í Af ffJ [f<,l̈́Ě´“\_„Í,» ,l̈́tfĚ [f€,l̈́Ê’u,Éf}fbfv,³,ê,é B,½,Æ,,l̈́ A \Žš,l̈́ff fJ [f<,l̈́Ě  
´“\_„Íff fJ [f<,l̈́†%o»,É A%o°Ěü,«„l̈́-ĩô,l̈́Ě´“\_„Í’ê•Ó,l̈́†%o»,ÉfZfbfg,³,ê,é B  
ŽQ Æ @IDirect3DRMTexture::GetDecalOrigin

**IDirect3DRMTexture::SetDecalScale**

HRESULT SetDecalScale(DWORD dwScale);

*fffJ [f<,İ kŽÚ“Á «,ðfZfbfg,·,é B*

*¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [ ,ð•Ô,· B•Ô'l,İê——,É,Â,¢  
,Ä,Í A uDirect3D•ŨŽ f, [fh,İ•Ô'l v,ðŽQ Æ,·,é,±,Æ B*

*dwScale*

*,±,İfpf%of [f^,ÉTRUE,ðŽw'è,·,é,Æ A [“x,ð l—  
¶,É“ü,ê,ÄfffJ [f<,ðfXfP [fŠf“fO,·,é BFALSE,ðŽw'è,·,é,Æ A [“x îñ,Í–3Ž<,³,ê,é BffftfHf<fg'l,ÍTRUE,Â, ,é  
B*

*ŽQ Æ @IDirect3DRMTexture::GetDecalScale*



**IDirect3DRMTexture::SetDecalSize**

HRESULT SetDecalSize(D3DVALUE rvWidth, D3DVALUE rvHeight);

fffJ [f<,ª [“x,É,æ,Á,ÄfXfP [fŠf“fO,³,ê,Ä,¢,é,Æ,« AŽg—p,³,ê,éfffJ [f<,l̐fTfCfY,ð Ý’è,·,é B  
¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô’l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,İ•Ô’l v,ðŽQ Æ,·,é,±,Æ B

rvWidth, rvHeight  
fffJ [f<,l̐ V,µ,¢• ,Æ ,,³,ðf,fff< Ä•W,ÄŽw’è,·,é BffftfHf<fg,l̐fTfCfY,Í[1, 1],Ä, ,é B

ŽQ Æ @IDirect3DRMTexture::GetDecalSize

**IDirect3DRMTexture::SetDecalTransparency**

HRESULT SetDecalTransparency(BOOL bTransp);

*fffJ* [*f*⌵,İ“§–¾“x“Â «,ðfZfbfg,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,İˆê——,É,Â,¢

,Ä,Í A u*Direct3D•ŨŽ f, [fh,İ•Ô'l* v,ðŽQ Æ,·,é,±,Æ B

*bTransp*

*fffJ* [*f*⌵,“§–¾ F,ðŽ ,Â,Æ,«,ÍTRUE A•s“§–¾ F,ðŽ ,Â,Æ,«,ÍFALSE,ðŽw'è,·,é BffftfHf⟨fg'l,ÍFALSE,Â, ,é B

ŽQ Æ @**IDirect3DRMTexture::GetDecalTransparency**

**IDirect3DRMTexture::SetDecalTransparentColor**

HRESULT SetDecalTransparentColor(D3DCOLOR rcTransp);

*fffJ* [*f*⌵,É“§–¾ F,ð Ý’è,·,é B  
¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô’l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŨŽ f, [fh,İ•Ô’l v,ðŽQ Æ,·,é,±,Æ B  
*rcTransp*  
V,µ,¢“§–¾ F BffftfHf<fg,Ì“§–¾ F,Í •,Â, ,é B

ŽQ Æ @IDirect3DRMTexture::GetDecalTransparentColor

## IDirect3DRMTexture::SetShades

HRESULT SetShades(DWORD ulShades);

fŒf“f\_fŠf“fOŽž,ÉfefNfXf`ff,ìŠe F,ÅŽg—p,<sup>3</sup>ê,é%oA%oe,ì Å‘â,ì ”,ð Ý’è,·,é B

fŒf“f\_fŠf“fO,ì,Æ,« AfefNfXf`ff,ì%oA%oe,ì Å‘â,ì ”,ð,»,ê,¼,ê,ì F,ì—p“r,ÉfZfbfg,·,é B,±,ìf f\fbfh,ð•K—  
v,Æ,·,é,ì,Í Af%of“fv EfJf%o [ Ef,fff<,¾,—,Å, ,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ, ”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,î•Ô'l v,ðŽQ Æ,·,é,±,Æ B

ulShades

%oA%oe,ì V,µ,¢ ” B,±,ì'l,Í2,ì—Ý æ,Å, ,é BffftfHf<fg'l,Í16,Å, ,é B

ŽQ Æ @IDirect3DRMTexture::GetShades

## IDirect3DRMUserVisual

*fAfvfŠfP [fVf‡f“*,Í A*Direct3DRMUserVisualIfufWfFfNfg*,đ %Šú%»»,·,é,½,ß,ÉI*Direct3DRMUserVisualfCf“f^ [f*  
*tfFfCfX,İf f\fbfh,đŽg—*  
*p,·,é BfAfvfŠfP [fVf‡f“*,<sup>a</sup>*IDirect3DRM::CreateUserVisual f\fbfh,đĈÄ,Ñ o,·,Æ,«*,Í A,<sup>±</sup>,İ %Šú%»»,Í•s—v,Ä, ,é  
B %Šú%»»,<sup>a</sup>•K—v,È,İ,Í A **IDirect3DRM::CreateObject** *f\fbfh,đĈÄ,Ñ o,μ,ÄfufWf...*  
*fAf· EfIfufWfFfNfg*,đ ¶ ¬,·,é ê ‡,¼, ,Ä, ,é B,<sup>±</sup>  
*,İfZfNfVf‡f“*,Í A*Direct3DRMUserVisualfCf“f^ [ftfFfCfX Ef f\fbfh,İfŠftf@fĈf“fX,Ä, ,é BŠT”O,É,Ä,¢*  
*,Ä,İŠT—v,Í A**Direct3DRMUserVisualfCf“f^ [ftfFfCfX,đŽQ* *Æ,·,é,±,Æ B*

*IDirect3DRMUserVisualfCf“f^ [ftfFfCfX,Í**Init**f f\fbfh,đfTf| [fg,·,é B*

*IDirect3DRMUserVisualfCf“f^ [ftfFfCfX,Í A,·,×,Ä,İCOMfCf“f^ [ftfFfCfX,Æ“—*

l A*UnknownfCf“f^ [ftfFfCfX Ef f\fbfh,đĈp* <sup>3</sup>,·,é B*UnknownfCf“f^ [ftfFfCfX,İŽŸ,İ,R,Ä,İf f\fbfh,đfTf|*  
*[fg,·,é B*

## AddRef

## QueryInterface

## Release

<sup>3</sup>,ç,É A*Direct3DRMUserVisualfCf“f^ [ftfFfCfX,Í A**Direct3DRMObjectfCf“f^ [ftfFfCfX,©,çŽŸ,İf f\fbfh,đĈp*  
<sup>3</sup>,·,é B

## AddDestroyCallback

## Clone

## DeleteDestroyCallback

## GetAppData

## GetClassName

## GetName

## SetAppData

## SetName

*Direct3DRMUserVisualIfufWfFfNfg,Í A***IDirect3DRM::CreateUserVisual** *f\fbfh,İĈÄ,Ñ o,μ,É,æ,Ä,ÄŽæ“¼,<sup>3</sup>,ê,é*  
B

**IDirect3DRMUserVisual::Init**

HRESULT Init(D3DRMUSERVISUALCALLBACK d3drmUVProc, void \* lpArg);

Direct3DRMUserVisualIfufWfFfNfg,đ %Šú%»,.é B

¬Œ÷,.é,ÆD3DRM\_OK AŽ,”s,.é,ÆfGf% [ ,đ•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ĵ•Ô'l v,đŽQ Æ,.é,±,Æ B

d3drmUVProc

fAfvfŠfP [fVf‡f““è` ,ID3DRMUSERVISUALCALLBACK fR [f<fofbfNŠÖ ” B

lpArg

fR [f<fofbfNŠÖ ”,É“n,³,ê,é fAfvfŠfP [fVf‡f““è` ,Ĭff [f^,Ö,Ĭf|fCf“f^ B

fAfvfŠfP [fVf‡f“,ĬIDirect3DRM::CreateUserVisualf f\fbfh,đŒÄ,Ň o,µ Af† [fU EfrfWf...  
fAf< EfIfufWfFfNfg,Ĭ ì ¬,Æ %Šú%»»,đ“Žž,É s,□,±,Æ,a,Å,«,é **BIDirect3DRMUserVisual::Init**,đŒÄ,Ň o,•K—  
v,a, ,é,Ĭ,Í AIDirect3DRM::CreateObjectf f\fbfh,É,æ,Á,Äf† [fU EfrfWf...  
fAf< EfIfufWfFfNfg,đ ì ¬,µ,½ ê ‡,¼,¬,Ä, ,é B

## IDirect3DRMViewport

*fAfvfŠfP [fVf‡f“‚Í Afrf... [f| [fg EfIfufWfFfNfg,ÆŒÝ,¢  
,É,â,èŽæ,è,·,é,½,ß,ÉIDirect3DRMViewportfCf“f^ [ftFfCfX,İf f\fbfh,ðŽg—p,·,é B,±  
,İfZfNfVf‡f“‚ÍIDirect3DRMViewportfCf“f^ [ftFfCfX Ef f\fbfh,İfŠftf@fŒf“fX,Â, ,é BŠT”O,É,Â,¢,Ä,İŠT—  
v,Í A uIDirect3DRMViewport,ÆIDirect3DRMViewportArrayfCf“f^ [ftFfCfX v,ðŽQ Æ,·,é,±,Æ B*

**IDirect3DRMViewportfCf“f^ [ftFfCfX Ef f\fbfh,Í A`È%°‚İfOf< [fv,É•ª—ð,·,é,±,Æ,ª,Â,«‚é B**

**fJf f%** **GetCamera**  
**SetCamera**

**fNfŠfbfsf“fO EfvfŒ [f“** **GetBack**  
**GetFront**  
**GetPlane**  
**SetBack**  
**SetFront**  
**SetPlane**

**fTfCfY** **GetHeight**  
**GetWidth**

**frf... [‚İftfB [f<fh** **GetField**  
**SetField**

**%oŠú%o»** **Init**

**,»,İ¼** **Clear**  
**Configure**  
**ForceUpdate**  
**GetDevice**  
**GetDirect3DViewport**  
**Pick**  
**Render**

**fIftfZfbfg** **GetX**  
**GetY**

**ŽÈ%œf^fCfv** **GetProjection**  
**SetProjection**

**fXfP [fŠf“fO** **GetUniformScaling**  
**SetUniformScaling**

**•İŠ.** **InverseTransform**  
**Transform**

**IDirect3DRMViewportfCf“f^ [ftFfCfX,Í A,·,×,Ä,İCOMfCf“f^ [ftFfCfX,Æ“—  
İIUnknownfCf“f^ [ftFfCfX Ef f\fbfh,ðŒp ³,·,é BIUnknownfCf“f^ [ftFfCfX,ÍŽŸ,İ,R,Â,İf f\fbfh,ðfTf|  
[fg,·,é B**

**AddRef**

**QueryInterface**

**Release**

,<sup>3</sup>,ç,É AIDirect3DRMViewportfCf“f^ [ftfFfCfX,ÍIDirect3DRMObjectfCf“f^ [ftfFfCfX,©,çŽŸ,Ìf f\fbfh,ðŒp<sup>3</sup>,·,  
é B

**AddDestroyCallback**

**Clone**

**DeleteDestroyCallback**

**GetAppData**

**GetClassName**

**GetName**

**SetAppData**

**SetName**

Direct3DRMViewportIfufWfFfNfg,Í AIDirect3DRM::CreateViewportf f\fbfh,ÌŒÄ,Ñ o,μ,É,æ,Á,ÄŽæ“¾,<sup>3</sup>ê,é B



**IDirect3DRMViewport::Clear**

HRESULT Clear();

«» Ý,ì”wŒi F,Â AŽw’è,<sup>3</sup>ê,½f<sub>r</sub>f... [f| [fg,ðfNfŠfA,·,é B  
¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%<sub>o</sub> [,ð•Ô,· B•Ô’l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ĵ•Ô’l v,ðŽQ Æ,·,é,±,Æ B

**IDirect3DRMViewport::Configure**

HRESULT Configure(LONG lX, LONG lY, DWORD dwWidth, DWORD dwHeight);

frf... [f| [fg,ìĖ“\_,ÆfTfCfY,ð Ä Ý’è,·,é B  
-Ė÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf% [,ð•Ô,· B•Ô’l,îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ĵ•Ô’l v,ðŽQ Æ,·,é,±,Æ B  
lX, lY  
frf... [f| [fg,ì V,µ,¢^Ê’u B  
dwWidth, dwHeight  
frf... [f| [fg,ì V,µ,¢• ,Æ ,,³ B  
lX + dwWidth,^fffofCfX,Ĵ• ,æ,è’â,«,¢ ê ð ‡ AlY + dwHeight,^fffofCfX,Ĵ ,,³,æ,è’â,«,¢ ê ð ‡ A, ,é,¢  
,ÍlX AlY AdwWidth AdwHeight,Ĵ,¢,,ê,©,^0Ê%°,Â, ,é ê ð ‡ A,±,Ĵ f\fbfh,ÍD3DRMERR\_BADVALUE,ð•Ô,· B

**IDirect3DRMViewport::ForceUpdate**

HRESULT ForceUpdate(DWORD dwX1, DWORD dwY1, DWORD dwX2,  
                  DWORD dwY2);

f r f... [f] [f g,l—l̂æ,ð< §“l,É X V,·,é BŽw’è,<sup>3</sup>,ê,<sup>1</sup>/<sub>2</sub>—  
l̂æ,Í AŽŸ%oñ,ìIDirect3DRMDevice::Updatef f\fbfh,ìĖÄ,Ñ o,μ,ÅfXfNfŠ [f“,ÉfRfs [,<sup>3</sup>,ê,é B

¬Ė÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [ ,ð•Ô,· B•Ô’l,l̂ê——,É,Â,ĉ  
,Ä,Í A uDirect3D•ŮŽ f, [fh,l̂•Ô’l v,ðŽQ Æ,·,é,±,Æ B

dwX1, dwY1  
X V—l̂æ,l̂ ¶ ã<÷,ì À•W B

dwX2, dwY2  
X V—l̂æ,l̂%oE%o°<÷,ì À•W B

fVfXfef€,Í AŽw’è,<sup>3</sup>,ê,<sup>1</sup>/<sub>2</sub><éĖ` ,æ,è,à‘â,«,ÈfŠ [fWf‡f“,ð X V,·,é,±,Æ,ª ,é B ê ‡,É,æ,Á,Ä,Í AfEfBf“fhfE‘S’l,ª  
X V,<sup>3</sup>,ê,é,±,Æ,à ,é B

**IDirect3DRMViewport::GetBack**

D3DVALUE GetBack();

*f*r... [*f*] [*f*g,ìĒă•ûfNfŠfbfv-Ê,îÊ'u,đŽæ“¾,·,é B  
^Ê'u,đŽ<sub>í</sub>,·<sup>1</sup>,đ•Ô,· B

ŽQ Æ @**IDirect3DRMViewport::SetBack**, Ž<sub>ı</sub>—ă

**IDirect3DRMViewport::GetCamera**

HRESULT GetCamera(LPDIRECT3DRMFRAME \*lpCamera);

frf... [f| [fg,lfJf f%,đŽæ“¾,·,é B  
¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŨŽ f, [fh,İ•Ô'l v,đŽQ Æ,·,é,±,Æ B

lpCamera  
fJf f%,đ•\,·Direct3DRMFrameIfufWfFfNfg,a“ü,é•İ ”,Ö,lf|fCf“f^ B

ŽQ Æ @IDirect3DRMViewport::SetCamera, fJf f%

**IDirect3DRMViewport::GetDevice**

HRESULT GetDevice(LPDIRECT3DRMDEVICE \*lpD3DRMDevice);

frf... [f| [fg,ÆŠÖ~A•t,¯,ç,ê,½fffofCfX,ðŽæ“¾,·,é  
¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŨŽ f, [fh,İ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lpD3DRMDevice  
Direct3DRMDeviceIfufWfFfNfg,““ü,é•İ ” B

**IDirect3DRMViewport::GetDirect3DViewport**

HRESULT GetDirect3DViewport(LPDIRECT3DVIEWPORT \* lplpD3DViewport);

«» Ý,ìDirect3DRMViewport,É‘Î%ž,·,éDirect3Dfıf... [f| [fg,ðŽæ“¾,·,é B  
¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ĵ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lplpD3DViewport  
Direct3DViewportIfufWfFfNfg,Ö,Ìf|fCf“f^,“ü,éf|fCf“f^ B

**IDirect3DRMViewport::GetField**

D3DVALUE GetField();

frf... [f| [fg,lfrrf... [ EftfB [f<fh,ðŽæ“¾,·,é B  
frf... [lftrfB [f<fh,ðŽ',·'l,ð•Ô,· B

ŽQ Æ @IDirect3DRMViewport::SetField, Ž<\_\_ä



**IDirect3DRMViewport::GetFront**

D3DVALUE GetFront();

*f*r... [*f*| [*f*g,l'Ō•ûfNfŠfbfv-Ê,l^Ê'u,ðŽæ“¾,·,é B  
^Ê'u,ðŽ',·'l,ð•Ô,· B

ŽQ Æ @IDirect3DRMViewport::SetFront, Ž<\_\_'ä

**IDirect3DRMViewport::GetHeight**

DWORD GetHeight ( ) ;

frf... [f| [fg,ì ,³,ðfsfNfZf<P^Ê,ÅŽæ“¾,·,é B  
         ,³,ðfsfNfZf<P^Ê,Å•Ô,· B

## IDirect3DRMViewport::GetPlane

```
HRESULT GetPlane(D3DVALUE *lpd3dvLeft, D3DVALUE *lpd3dvRight,  
D3DVALUE *lpd3dvBottom, D3DVALUE *lpd3dvTop);
```

‘O•ûfNfŠfbfv–Ê ã,İfıf... [f] [fg,İfTfCfY,ðŽæ“¾,·,é B

–Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,İê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,İ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

*lpd3dvLeft, lpd3dvRight, lpd3dvBottom, lpd3dvTop*

‘O•ûfNfŠfbfv–Ê ã,İfıf... [f] [fg,İfTfCfY,ðŽó,–Žæ,é•İ ”,İfAfhfŒfX B

ŽQ Æ @IDirect3DRMViewport::SetPlane

**IDirect3DRMViewport::GetProjection**

D3DRMPROJECTIONTYPE GetProjection();

*f*r*f*... [*f*] [*f*g, ìžĚ%œ*f*^*f*C*f*v, ðžæ“¼, ·, é B*f*r*f*... [*f*] [*f*g, É, Í A•½ s“Š%œ,Æ“§Ž,“Š%œ, ì, Ç, ĺ, Ç, Å, à—p, ċ, é, ±, Æ, ª, Å, «, é B

D3DRMPROJECTIONTYPE—ñ<“Ė^, ì*f* *f*“*f*o, ì, Ð, Æ, Â, ð•Ô, · B

ŽQ Æ @IDirect3DRMViewport::SetProjection

**IDirect3DRMViewport::GetUniformScaling**

BOOL GetUniformScaling();

fEfBf“fhfE,lfTfCfY,æ,è‘â,«È•Žlf{fŠf... [f€,đfXfP [fŠf“fO,·,é,½,B,É—p,¢,ç,ê,é A kŽÚ“Á «,đŽæ“¾,·,é B  
fzf... [f| [fg,“ê’è,l”ä—,ĀfXfP [fŠf“fO,³,ê,é ê ‡,ÍTRUE A,»,¤,Ā,È,¯,ê,ĤFALSE,đ•Ô,· B

ŽQ Æ @IDirect3DRMViewport::SetUniformScaling

**IDirect3DRMViewport::GetWidth**

DWORD GetWidth();

frf... [f| [fg,ì• ,ðfsfNfZfçP^Ê,ÅŽæ“¾,·,é B

- ,ðfsfNfZfçP^Ê,Å•Ô,· B

**IDirect3DRMViewport::GetX**

LONG GetX();

ffofCfX ā,łfrf... [f| [fgŽn“\_,łx Ā•WfIftfZfbfg,đŽæ“¾,·,é B  
xfIftfZfbfg,đ•Ô,· B

**IDirect3DRMViewport::GetY**

LONG GetY();

ffofCfX,ì ā,ìfrf... [f| [fgŽn“\_,ìy À•WfIftfZfbfg,đŽæ“¾,·,é B  
yfIftfZfbfg,đ•Ô,· B



## IDirect3DRMViewport::Init

```
HRESULT Init(LPDIRECT3DRMDEVICE lpD3DRMDevice,  
             LPDIRECT3DRMFRAME lpD3DRMFramefJf f%, DWORD xpos, DWORD ypos,  
             DWORD width, DWORD height);
```

Direct3DRMViewportIfufWfFfNfg,ð %Šú%»,,é B

¬Œ÷,,é,ÆD3DRM\_OK AŽ,”s,,é,ÆfGf%o [,ð•Ô,· B•Ô'l,îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,î•Ô'l v,ðŽQ Æ,,é,±,Æ B

lpD3DRMDevice

,±,îf rf... [f| [fg,ÉŠÖ~A•t,¯,ç,ê,½DirectD3DRMDeviceIfufWfFfNfg B

lpD3DRMFramefJf f%

,±,îf rf... [f| [fg,ÉŠÖ~A•t,¯,ç,ê,½fJf f%o EftfŒ [f€ B

xpos, ypos

f rf... [f| [fg,î ¶ ā÷,îx À•W,“,æ,Ŋy À•W B

width, height

f rf... [f| [fg,î• ,Æ ,,<sup>3</sup> B

**IDirect3DRMViewport::InverseTransform**

HRESULT InverseTransform(D3DVECTOR \* lprvDst, D3DRMVECTOR4D \* lprvSrc);

*lprvSrc*pf%of [f^,ªŽ',·fxNfgf<,ðf [f<fh À•W,©,çf,ff< À•W,É•İŠ·,µ AÆ<%oÊ,ð*lprvDst*pf%of [f^,É•Ô,· B  
¬Æ÷,·,é,ÆD3DRM\_OK AŽ,»s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Î A uDirect3D•ŮŽ f, [fh,Ĵ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

*lprvDst*  
f f\fbfh,<sup>a</sup> §Æä,ð•Ô,·,Æ,«,É ^— Æ<%oÊ,ðŽó,¬Žæ,éD3DVECTOR \‘¢‘Î B

*lprvSrc*  
•İŠ·,<sup>3</sup>,ê,éD3DRMVECTOR4D \‘¢‘Î B

**IDirect3DRMViewport::Pick**

```
HRESULT Pick(LONG lX, LONG lY,  
             LPDIRECT3DRMPICKEDARRAY* lplpVisuals);
```

[“x,É,æ,Á,Ä•ª—p,³,ê,½fIfufWfFfNfg iŠÖ`A,ª, ,ê,Î-Ê,à j,ìfŠfXfg,ðŒ©,Â,¯ o,· BŽæ“¾,µ,½”z—  
ñ,É,Í Af< [fg,©,çfIfufWfFfNfg,ðŠŮ,ᐅftfŒ [f€,É“Ž’B,·,é,Ů,Â,ÌŠK‘wfpfX,ªŠi”[.³,ê,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%∞ [,ð•Ô,· B•Ô’l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ĳ•Ô’l v,ðŽQ Æ,·,é,±,Æ B

*lX, lY*  
fsfbfLf“fO,ÉŽg,í,ê,é À•W B

*lpVisuals*  
ŒÄ,Ñ o,µ,ª ¬Œ÷,µ,½,Æ,« AIDirect3DRMPickedArrayfCf“f^ [ftfFfCfX,Ö,Ì—LŒø,Èf|fCf“f^,ª“ü,éf|  
fCf“f^,Ö,Ĳf|fCf“f^ B

**IDirect3DRMViewport::Render**

HRESULT Render(LPDIRECT3DRMFRAME lpD3DRMFrame);

ftfŒ [f€ŠK‘w,đ AŽw’è,<sup>3</sup>,ê,<sup>1</sup>/<sub>2</sub>frf... [f| [fg,ÉfŒf“f\_fŠf“fO,·,é BŽw’è,<sup>3</sup>,ê,<sup>1</sup>/<sub>2</sub>ftfŒ [f€ ã,ìfrfWf...  
fAf<,Æ A,»,ì%°,ìŠK‘w,ìftfŒ [f€,¾,¯,<sup>a</sup>fŒf“f\_fŠf“fO,<sup>3</sup>,ê,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ, ”s,·,é,ÆfGf%° [ ,đ•Ô,· B•Ô'l,îê——,É,Â,¢  
,Ä,Î A uDirect3D•ŮŽ f, [fh,l•Ô'l v,đŽQ Æ,·,é,±,Æ B

lpD3DRMFrame  
fŒf“f\_fŠf“fO,·,éftfŒ [f€ŠK‘w,đŽ!,·Direct3DRMFrameIfufWfFfNfg,đŽ!,·İ ”,Ö,ìf|fCf“f^ B

**IDirect3DRMViewport::SetBack**

HRESULT SetBack(D3DVALUE rvBack);

frf... [f| [fg,ìĈĕâ•ûfNfŠfbfv-Ê,ÎÊ'u,ð Ý'è,·,é B  
-Ĉ÷,·,é,ÆD3DRM\_OK AŽ,"s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Î A uDirect3D•ŮŽ f, [fh,Ĵ•Ô'l v,ðŽQ Æ,·,é,±,Æ B  
rvBack  
Ĉĕâ•ûfNfŠfbfv-Ê,Î V,µ,¢^Ê'u B  
ŽQ Æ @IDirect3DRMViewport::GetBack, IDirect3DRMViewport::SetFront, Ž< \_\_\_\_'ä

## IDirect3DRMViewport::SetCamera

HRESULT SetCamera(LPDIRECT3DRMFRAME lpCamera);

fJf f%ftfŒ [f€,ðfrf... [f| [fg,É Ý'è,·,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ,"s,·,é,ÆfGf% [ ,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŨŽ f, [fh,Î•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lpCamera

fJf f%,ðŽ',·Direct3DRMFramefIfufWfFfNfg,ðŽw,·•İ " B

,±,Ìf f\fbfh,Í Afrf... [f| [fg,ÎÊ'u A•ûŒü AŒü,«,ðŽw'è,³,ê,½fJf f% EftfŒ [f€,Æ“¬,¶,É Ý'è,·,é Bfrf...  
[,Í AfJf f% EftfŒ [f€,Ì ³,ÌzŽ²•ûŒü,É%ˆ,Á,Ä A ³,ÿŽ²,Ì ã•ûŒü,ÉŒü,¬,ç,ê,é B

ŽQ Æ @IDirect3DRMViewport::GetCamera, fJf f%

**IDirect3DRMViewport::SetField**

HRESULT SetField(D3DVALUE rvField);

frf... [f| [fg,Éfrf... [,lftfB [f<fh,ð Ý'è,·,é B  
¬Œ÷,·,é,ÆD3DRM\_OK AŽ, ”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,l̂ê——,É,Â,¢  
,Ä,Í A uDirect3D•ŨŽ f, [fh,l̂•Ô'l v,ðŽQ Æ,·,é,±,Æ B

rvField  
frf... [,l̂ V,µ,¢ftfB [f<fh BffftfHf<fg'l,Í0.5,Â, ,é B,±,l̂'l,É0`È%°,ðŽw'è,·,é,Æ A,±  
,l̂f f\fbfh,ÍD3DRMERR\_BADVALUEfGf%o [,ð•Ô,· B

ŽQ Æ @IDirect3DRMViewport::GetField, Ž<\_\_\_\_\_ä

**IDirect3DRMViewport::SetFront**

HRESULT SetFront(D3DVALUE rvFront);

frf... [f| [fg,l‘O•ûfNfŠfbfv–Ê,lˆÊ’u,ð Ý’è,·,é B  
–Æ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô’l,lˆê——,É,Â,¢  
,Ä,Í A uDirect3D•ŨŽ f, [fh,l•Ô’l v,ðŽQ Æ,·,é,±,Æ B

rvFront  
‘O•ûfNfŠfbfv–Ê,l V,µ,¢ˆÊ’u B

fftfHf<fg’l,Í1.0,Å, ,é B0`È%°,’l,a“n,³,ê,é,Æ A,±,Ìf f\bfh,ÍD3DRMERR\_BADVALUEfGf%o [,ð•Ô,· B  
ŽQ Æ @IDirect3DRMViewport::GetFront, Ž< ‘ă



## IDirect3DRMViewport::SetPlane

HRESULT SetPlane(D3DVALUE rvLeft, D3DVALUE rvRight, D3DVALUE rvBottom,  
D3DVALUE rvTop);

$fJf\ f\%,\grave{\text{z}}\acute{\text{z}}^2,\acute{\text{e}}'\acute{\text{i}},\acute{\text{e}}\text{f}\text{r}\text{f}\dots$  [f| [fg,lfTfCfY,ð'O•ûfNfŠfbfv-Ê,É Ý'è,;é B

¬Æ÷,;é,ÆD3DRM\_OK AŽ,"s,;é,ÆfGf% [;ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Î A uDirect3D•ŮŽ f, [fh,l•Ô'l v,ðŽQ Æ,;é,±,Æ B

rvLeft, rvRight, rvBottom, rvTop

f\text{r}\text{f}\dots [f| [fg,Î \grave{\text{A}} \neg,\grave{\text{I}}\text{x} \grave{\text{A}}\bullet\text{W} \text{A} \grave{\text{A}}'\grave{\text{a}},\grave{\text{I}}\text{x} \grave{\text{A}}\bullet\text{W} \text{A} \grave{\text{A}} \neg,\grave{\text{I}}\text{y} \grave{\text{A}}\bullet\text{W} \text{A} \grave{\text{A}}'\grave{\text{a}},\grave{\text{I}}\text{y} \grave{\text{A}}\bullet\text{W} \text{B}

'†%»,É'² ®,<sup>3</sup>,ê,½f\text{r}\text{f}\dots [f| [fg,ðŽw'è,;é**IDirect3DRMViewport::SetField**f f\fbfh,Æ^Û,Ê,è A,±  
,Îf f\fbfh,É,æ,Â,Ä A"ÇÓ,Î"ä—',Æ^Ê'u,Îf\text{r}\text{f}\dots [f| [fg,ðŽw'è,;é,±,Æ,<sup>a</sup>,Ä,«é B,½,Æ,!,Î A<sup>a</sup>—£  
,μ,½Ž<—'ä,ð \z,μ,Ä A%oE-Ů,â ¶-Ů,ÎfXfefÆfI Ef\text{r}\text{f}\dots [;ðfCf“fvfŠf f“fg,;é,±,Æ,<sup>a</sup>,Ä,«é B

ŽQ Æ @**IDirect3DRMViewport::GetPlane**, **IDirect3DRMViewport::SetField**

**IDirect3DRMViewport::SetProjection**

HRESULT SetProjection(D3DRMPROJECTIONTYPE rptType);

frf... [f| [fg,ÉŽĚ%œf^fCfv,đ Ý'è,·,é B  
¬Ĉ÷,·,é,ÆD3DRM\_OK AŽ,"s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,Îê——,É,Â,¢,Ä,Í A¢Direct3D•ŮŽ f. [fh,ĵ•Ô'lÉ  
,đŽQ Æ,·,é,±,Æ B

rptType  
D3DRMPROJECTIONTYPE—ñ<“Ĉ^,Îf f“fo,İ,Đ,Æ,Â B

ŽQ Æ @IDirect3DRMViewport::GetProjection

**IDirect3DRMViewport::SetUniformScaling**

HRESULT SetUniformScaling(BOOL bScale);

•Ž|f{fŠf... [f€,ðfEfBf“fhfE,İfTfCfY,æ,è,à‘â,«,fXfP [fŠf“fO,·,é,Æ,«,É—p,¢,ç,ê,é A kŽÚ“Á «,ð Ý’è,·,é B  
¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô’l,İê——,É,Â,¢,Ä,Í A¢Direct3D•ŮŽ f. [fh,İ•Ô’İf  
,ðŽQ Æ,·,é,±,Æ B

bScale

V,µ,¢ kŽÚ“Á « B,±,İfpf%of [f^,ÉTRUE,ðŽw’è,·,é,Æ A ...•½•ûŒü,Æ ,’¼•ûŒü,É“¬,¶ kŽÚŒEW ”,aŽg—  
p,<sup>3</sup>,ê,é B,»,¤,Ä,È,¬,ê,Î A•Ž|f{fŠf... [f€,ðfEfBf“fhfE,É^ê’v,<sup>3</sup>,<sup>1</sup>,é,½,ß A^Û,È,é kŽÚŒEW ”,a—p,¢  
,ç,ê,é BffftfHf<fg,İ Ý’è,ÍTRUE,Ä, ,é B

’Ê í,±,İf f\fbfh,Í Af of“ff fBf“fO,ðfTf| [fg,·,é,½,ß,É**IDirect3DRMViewport::SetPlane**f f\fbfh,Æ,Æ,à,ÉŽg—  
p,<sup>3</sup>,ê,é B

ŽQ Æ @**IDirect3DRMViewport::GetUniformScaling**

## IDirect3DViewport::Transform

```
HRESULT Transform(D3DRMVECTOR4D * lprvDst, D3DVECTOR * lprvSrc);
```

*lprvSrc* is a pointer to a D3DVECTOR structure. The function transforms the vector in the source space into the destination space. The destination space is defined by the viewport's transformation matrix.

The function returns S\_OK if successful, or an HRESULT error code if it fails. The error codes are defined in the D3DVIEWPORT.h header file.

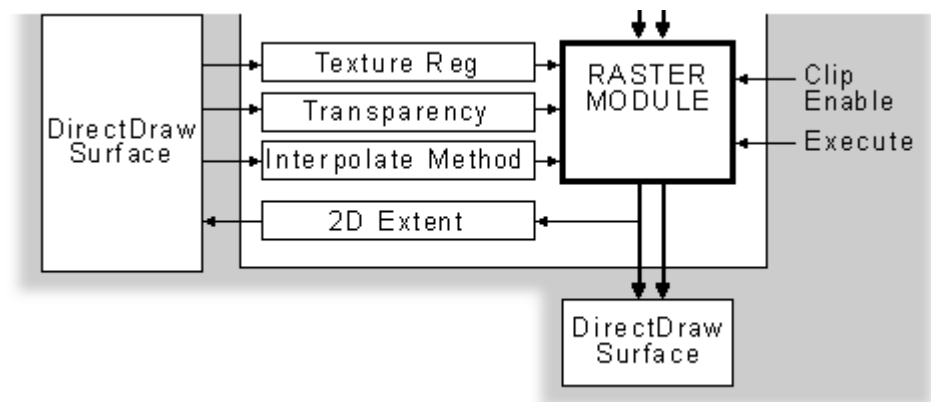
*lprvDst*

is a pointer to a D3DRMVECTOR4D structure. The function stores the transformed vector in this structure.

*lprvSrc*

is a pointer to a D3DVECTOR structure. The function reads the vector from this structure.

The function is used to transform a vector from the source space to the destination space. The source space is the space defined by the viewport's transformation matrix. The destination space is the space defined by the viewport's projection matrix.



fAfvfŠfP [fvf‡f“‚Í AfEfBf“fhfE Efvf fV [fwff‚ÁEfBf“fhfE Ef fbZ [fW‚É%ž“š‚‚‚é‚½‚ß‚ÉIDirect3DRM WinDeviceCf“^ [ftfFfCfX‚İf f\fbfh‚ðžg—p‚‚‚é B‚± ‚İfZfNfVf‡f“‚İIDirect3DRMWinDeviceCf“^ [ftfFfCfX Ef f\fbfh‚İšftf@fEf“fX‚Ä‚‚é BŠT”O‚É‚Â‚¢‚Ä‚İŠT—v‚Í A ufEfBf“fhfEŠÇ— v‚ðžQ Æ‚‚‚é‚±‚Æ B

```
Direct3DRMWinDeviceIfuWfFfNfg,Í AIID_IDirect3DRMWinDevice,ðŽw'ë,µ,ÄIDirect3DRM::QueryInterface f\fb
fhCEÄ,Ñ o,.,© AIDirect3DRM::CreateDeviceFromD3D,Ì,æ,ð,Ëf f\fbfh,ðŽg—
p,.,ê,ÎŽæ“4,Ä,«,æ BDirect3DRMWinDeviceIfuWfFfNfg,Ìf f\fbfh,Í AIDirect3DRMDevice,©,çEp 3,3,ê,é B
```

## IDirect3DRMWinDevice::HandleActivate

```
HRESULT HandleActivate(WORD wParam);
```

Windows, IWM\_ACTIVATE f bfZ [fW,É%ž“š,·,é B,±  
,ê,É,æ,è AfAfNfefBfu,ÈfŒf“f\_Šf“fO EfEfBf“fhfE,Ā F,ð ³,μ,•Ū,Ā,±,Æ,ª,Ā,«,é B  
¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf% [,ð•Ô,· B•Ô'l,Îê——,É,Ā,¢,Ā,Í A¢Direct3D•ŪŽ f, [fh,ĭ•Ô'lE  
,ðŽQ Ā,·,é,±,Æ B

wParam

f bfZ [fW ^— fvf fV [fWff,É“n,³,ê,é AWM\_ACTIVATE,Î**WPARAM**fpf%of [f^ B

**IDirect3DRMWinDevice::HandlePaint**

HRESULT HandlePaint(HDC hDC);

Windows,ÌWM\_PAINTf fbfZ [fW,É%ž“š,·,é BhDCfpf%of [f^,Í AWindows,ÌBeginPaintŠÖ ”,É“n,<sup>3</sup>,ê,éPAINTST  
**RUCT** \‘c‘ì,©,çŽæ“¾,<sup>3</sup>,ê,é B,±,ìf f\fbfh,Í AfffofCfX ä.É ì ¬,<sup>3</sup>,ê,½frf... [f] [fg,ÌŠO‘▯,ì—Îæ,ð Ä•·%æ,·,é,±  
,Æ,<sup>a</sup>, ,é,½,ß AfEfBf“fhfE“à,ÌfAfvfŠfP [fVf±f“—Îæ,ð Ä•·%æ,·,é‘O,É•K,,CEÄ,Ñ o,·•K—v,<sup>a</sup>, ,é B

¬Æ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô’l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Î•Ô’l v,ðŽQ Æ,·,é,±,Æ B

hDC  
fffofCfX EfRf“fefLfXfg iDC j,Ìfnf“fhf< B

## IDirect3DRMWrap

*f* *A* *f* *v* *f* *Š* *f* *P* [*f* *V* *f* *±* *f* “, *Í* *A* *f* % *f* *b* *f* *v* *E* *f* *I* *f* *u* *f* *W* *f* *F* *f* *N* *f* *g*, *Æ*, *â*, *ê* *Ž* *æ*, *è*, *·*, *é*, *½*, *ß*, *É* **IDirect3DRMWrap** *f* *C* *f* “ *f* ^ [*f* *t* *f* *F* *f* *C* *f* *X*, *Ì* *f* *f* *b* *f* *h*, *ð* *Ž* *g* — *p*, *·*, *é* *B*, *±*, *Ì* *Z* *f* *N* *f* *V* *f* *±* *f* “, *Í* **IDirect3DRMWrap** *f* *C* *f* “ *f* ^ [*f* *t* *f* *F* *f* *C* *f* *X* *E* *f* *f* *b* *f* *h*, *Ì* *Š* *f* *t* *f* @ *f* *Æ* *f* “ *f* *X*, *Â*, *·*, *é* *B* *Š* *T* ” *O*, *É*, *Â*, *ç*, *Â*, *Ì* *Š* *T* — *v*, *Í* *A* *u* *IDirect3DRMWrap* *f* *C* *f* “ *f* ^ [*f* *t* *f* *F* *f* *C* *f* *X* *v*, *ð* *Ž* *Q* *Æ*, *·*, *é*, *±*, *Æ* *B*

**IDirect3DRMWrap** *f* *C* *f* “ *f* ^ [*f* *t* *f* *F* *f* *C* *f* *X* *E* *f* *f* *b* *f* *h*, *Í* *A* *ˆ* *E* % *°*, *Ì* *f* *O* *f* < [*f* *v*, *É* *•* *—* *p*, *·*, *é*, *±*, *Æ*, *ª*, *Â*, «, *é* *B*

%*Š**ú*%*»*

**Init**

*f* % *f* *b* *f* *v*

**Apply**

**ApplyRelative**

**IDirect3DRMWrap** *f* *C* *f* “ *f* ^ [*f* *t* *f* *F* *f* *C* *f* *X*, *Í* *A*, *·*, *×*, *Ä*, *Ì* *C* *O* *M* *f* *C* *f* “ *f* ^ [*f* *t* *f* *F* *f* *C* *f* *X*, *Æ* “ — *l* *A* [*Unknown* *f* *C* *f* “ *f* ^ [*f* *t* *f* *F* *f* *C* *f* *X* *E* *f* *f* *b* *f* *h*, *ð* *Æ* *p* *³*, *·*, *é* *B* *I* *Unknown* *f* *C* *f* “ *f* ^ [*f* *t* *f* *F* *f* *C* *f* *X*, *Í* *Ž* *Ÿ*, *Ì*, *R*, *Â*, *Ì* *f* *f* *b* *f* *h*, *ð* *f* *T* *f* | [*f* *g*, *·*, *é* *B*

**AddRef**

**QueryInterface**

**Release**

, *³*, *ç*, *É* *A* **IDirect3DRMWrap** *f* *C* *f* “ *f* ^ [*f* *t* *f* *F* *f* *C* *f* *X*, *Í* *IDirect3DRMObject* *f* *C* *f* “ *f* ^ [*f* *t* *f* *F* *f* *C* *f* *X*, ©, *ç* *Ž* *Ÿ*, *Ì* *f* *f* *b* *f* *h*, *ð* *Æ* *p* *³*, *·*, *é* *B*

**AddDestroyCallback**

**Clone**

**DeleteDestroyCallback**

**GetAppData**

**GetClassName**

**GetName**

**SetAppData**

**SetName**

*D* *r* *e* *c* *t* *3* *D* *R* *M* *W* *r* *a* *p* *f* *I* *f* *u* *f* *W* *f* *F* *f* *N* *f* *g*, *Í* *A* **IDirect3DRM::CreateWrap** *f* *f* *b* *f* *h*, *Ì* *Æ* *Ä*, *Ň* *o*, *μ*, *É*, *æ*, *Á*, *Ä* *Ž* *æ* “ *¾*, *³*, *ê*, *é* *B*



**IDirect3DRMWrap::Apply**

HRESULT Apply(LPDIRECT3DRMOBJECT lpObject);

Direct3DRMWrapIfufWfFfNfg,đ,»," o—Í æIfufWfFfNfg,É“K—p,·,é B^ê”Ê,É o—Í æIfufWfFfNfg,Í A–Ê,Û,½,Íf fbfVf...,Ä, ,é B

¬Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,Îê——,É,Â,¢,Ä,Í A uDirect3D•ŮŽ f, [fh,l•Ô'l v,đŽQ Æ,·,é,±,Æ B

lpObject  
o—Í æIfufWfFfNfg,ÎfAfhfŒfX B

ŽQ Æ @IDirect3DRM::CreateWrap

**IDirect3DRMWrap::ApplyRelative**

```
HRESULT ApplyRelative(LPDIRECT3DRMFRAME frame,
    LPDIRECT3DRMOBJECT mesh);
```

*fIfufWfFfNfg*,*l*’ “*\_,Éf%fbfv,ð* *Ý’è,·,é* *B* *Å* *%o,ÉŠe’ “\_,ÉftfŒ* [*f€*  
*,l̈f* [*f<fh•İŠ·,ð* *s,¢* *AŽŸ,Éf%fbfv,l̈ŽQ* *ÆftfŒ* [*f€,l<tf* [*f<fh•İŠ·,ð* *Ý’è,·,é* *B*  
*–Œ÷,·,é,ÆD3DRM\_OK* *AŽ,*”*s,·,é,ÆfGf%o* [*,ð•Ô,·* *B•Ô’l,İ^ê——,É,Â,¢*  
*,Ä,İ* *A* *uDirect3D•ŮŽ* *f, [fh,İ•Ô’l* *v,ðŽQ* *Æ,·,é,±,Æ* *B*

*frame*  
*f%fbfsf*“*fO,·,é**fIfufWfFfNfg,ðŠÜ,ðDirect3DRMFramefIfufWfFfNfg* *B*  
*mesh*  
“*K—p,·,é**Direct3DRMWrapfIfufWfFfNfg* *B*

*ŽQ* *Æ* *@IDirect3DRM::CreateWrap*

## IDirect3DRMWrap::Init

```
HRESULT Init(D3DRMWRAPTYPE d3drmw, LPDIRECT3DRMFRAME lpd3drmfRef,  
    D3DVALUE ox, D3DVALUE oy, D3DVALUE oz,  
    D3DVALUE dx, D3DVALUE dy, D3DVALUE dz,  
    D3DVALUE ux, D3DVALUE uy, D3DVALUE uz,  
    D3DVALUE ou, D3DVALUE ov, D3DVALUE su, D3DVALUE sv);
```

Direct3DRMWrapIfufWfFfNfg,đ %Šú%»,·,é B

¬Ĉ÷,·,é,ĖD3DRM\_OK AŽ,”s,·,é,ĖfGf% [,đ•Ô,· B•Ô’l,îê——,É,Â,¢,Ă,Í A¢Direct3D•ŮŽ f. [fh,î•Ô’lÉ  
,đŽQ Ė,·,é,±,Ė B

d3drmw

**D3DRMWRAPTYPE**—ñĈ“Ĉ^,îf f“fo,î,Đ,Ė,Â B

lpd3drmfRef

,±,îDirect3DRMWrapIfufWfFfNfg,îŽQ ĖftfĈ [f€,đŽ!,·Direct3DRMFrameIfufWfFfNfg,îfAfhfĈfX B

ox, oy, oz

f%fbfv,îĈ“\_ B

dx, dy, dz

f%fbfv,îžŽ² B

ux, uy, uz

f%fbfv,îyŽ² B

ou, ov

fefNfXf`ff,îĈ“\_ B

su,·,æ,Ń sv

fefNfXf`ff,î kŽÚĈW ” B

ŽQ Ė @IDirect3DRM::CreateWrap

٧٤١

## D3DRMBOX

```
typedef struct _D3DRMBOX {  
    D3DVECTOR min, max;  
} D3DRMBOX;  
typedef D3DRMBOX *LPD3DRMBOX;
```

IDirect3DRMMesh::GetBox,âIDirect3DRMMeshBuilder::GetBox/ f\fbfh,ÅŽæ“¾,·,é«É”ÍÍ,ð’è`,·,é B  
min, #max  
«É”ÍÍ,ð’è`,·,é’l B,±,ê,ç,Ì’l,ÍD3DVECTOR \‘‘Ì,Å, ,é B

ŽQ Æ @D3DVECTOR, IDirect3DRMMesh::GetBox, IDirect3DRMMeshBuilder::GetBox

## D3DRMIMAGE

```
typedef struct _D3DRMIMAGE {
    int width, height;
    int aspectx, aspecty;
    int depth;
    int rgb;
    int bytes_per_line;
    void* buffer1;
    void* buffer2;
    unsigned long red_mask;
    unsigned long green_mask;
    unsigned long blue_mask;
    unsigned long alpha_mask;
    int palette_size;
    D3DRMPALETTEENTRY* palette;
} D3DRMIMAGE;
typedef D3DRMIMAGE, *LPD3DRMIMAGE;
```

**IDirect3DRM::CreateTexture** *f\fbfh,É,æ,Á,ÄfefNfXf`ff,ÉfAf^fbf`,³,ê,éfCf [fW,ð<L q,·,é B*  
**IDirect3DRMTexture::GetImage**,Í A,±,İfCf [fW,İfAfhfEfX,ð•Ö,· B

**width**,·,æ,Ñheight  
*fsfNfZf<P'Ê,Ä,İfCf [fW,İ• ,Æ ,·,³ B*

**aspectx**,·,æ,Ñaspecty  
*"ñ ³•ûE`fsfNfZf<,İfAfXfyfNfg"ä B*

**depth**  
*fsfNfZf<“-½,è,İrfbfg ” B*

**rgb**  
*,±,İf f“fo,“FALSE,İ ê ± AfsfNfZf<,İpfEfbbfg,İfCf“fffbfNfX,ðŽ',· B,±  
İf f“fo,“TRUE,İ,Æ,«,Í AfsfNfZf<,İfR [fh%»»,³,ê,½RGB'l,Ä, ,é B*

**bytes\_per\_line**  
*İf%ofCf““-½,è,İofCfg ” B,±,İ'l,Í4,İ”{ ”,Ä, ,é B*

**buffer1**  
*fEf“f\_İf“fO,“s,İ,ê,éf f,İf i Ä %,İfobftf@ j,İfAfhfEfX B*

**buffer2**  
*2 dfobftf@fİf“fO,İ2”Ö–  
Ú,İfEf“f\_İf“fO Efobftf@ BfVf“fOf< Efobftf@fİf“fO,İ,Æ,«,ÍNULL,ð Ý'è,·,é B*

**red\_mask, #green\_mask, #blue\_mask, #alpha\_mask**  
**rgb**,“TRUE,İ,Æ,« A,±,ê,ç,İf f“fo,İfsfNfZf<,İ Ö A—İ A Ä•“·,İf}fXfN,Ä, ,é  
**Brgb**,“FALSE,İ,Æ,«,Í AfpEfbbfg't,Ä d—v,Ë Ö A—İ A Ä,İŒe—v'ffrfbbfg,İf}fXfN,Ä, ,é B,½,Æ,,İ'½,,İ  
SVGAfİfBfXfvfEfC,Ä,Í AŽg—p,·,é Ö A—İ A Ä,İ“x ±,Í64,Ä, ,é,½,ß A,·,×,Ä,İf}  
fXfN,İ0xfc,ÉfZfbbfg,³,ê,é B

**palette\_size**  
*fpfEfbbfg EfGf“fgfŠ,İ ” B*

**palette**  
**rgb**,“FALSE,İ ê ± A,±,İf f“fo,İfpEfbbfg EfGf“fgfŠ,ðŽ',·**D3DRMPALETTEENTRY** \‘ç'İ,İfAfhfEfX,Ä, ,é  
B

ŽQ Ä @**IDirect3DRM::CreateTexture, IDirect3DRMTexture::GetImage**

## D3DRMLOADMEMORY

```
typedef struct _D3DRMLOADMEMORY {  
    LPVOID lpMemory;  
    DWORD  dSize;  
} D3DRMLOADMEMORY, *LPD3DRMLOADMEMORY;
```

*fAfvfŠfP [fVf‡f“, **D3DRMLOAD\_FROMMEMORY**, đŽw’è, μ, Ā**IDirect3DRM::Load**f f\fbfh i, Ů, ½, Í¼, Ì**Load**f f\fbfh j, đĚÄ, Ñ o, μ, ½, Æ, «, Ěf [fh,³,ê,éfŠf\ [fX, đŽ,· B*

### lpMemory

*f [fh,³,ê,éf f,fŠ Efuf fbfn B*

### dSize

*f [fh,³,ê,éf f,fŠ Efuf fbfn, ìfTfCfY, đfofCfg’P^Ê, ĀŽ!,· B*

ŽQ Æ @**IDirect3DRM::Load**, **IDirect3DRMAnimationSet::Load**, **IDirect3DRMFrame::Load**, **IDirect3DRMMeshBuilder::Load**, **D3DRMLOADOPTIONS**, **D3DRMLOADRESOURCE**

## D3DRMLOADRESOURCE

```
typedef struct _D3DRMLOADRESOURCE {  
    HMODULE hModule;  
    LPCTSTR lpName;  
    LPCTSTR lpType;  
} D3DRMLOADRESOURCE, *LPD3DRMLOADRESOURCE;
```

*fAfvfŠfP [fVf‡f“,”D3DRMLOAD\_FROMRESOURCE,đŽw’è,μ,ÄIDirect3DRM::Loadf f\fbfh i,Ü,½,Í¼,ÌLoadf f\fbfh,Ì,D,Æ,Â j,ðĲÄ,Ñ o,μ,½,Æ,«„Éf [fh,³,ê,éfŠf\ [fX,đŽ!,· B*

### hModule

*f [fh,³,ê,éfŠf\ [fX,đŠÜ,bf,fWf...  
[f<,İfnf“fhf< BfŠf\ [fX,“ĲÄ,Ñ o,μĲ³,İŽÄ s%Â”\tf@fCf<,ÉfAf^fbf`,³,ê,Ä,Ĳ,é,Æ,«„Í A,±  
„İf f“fo,ÉNULL,đŽw’è,·,é B*

### lpName

*f [fh,³,ê,éfŠf\ [fX,Ì¼‘O B,½,Æ,,İ AfŠf\ [fX,“f fbfVf...,Ä, ,ê,İ A,±,İf f“fo,Éf fbfVf...  
Eftf@fCf<,Ì¼‘O,đŽw’è,·,é B*

### lpType

*fŠf\ [fX,đŽˉ•Ê,·,éf† [fU’è<,İf^fCfv B*

*lpName,âlpTypef f“fo,Ì ãÊf [fh,“0,Ì ê ‡ A%“Êf [fh,Í A,»,Ì¼‘O,Ì ® ”Žˉ•ÊŽq,Ü,½,ÍŽw’è,³,ê,½fŠf\ [fX,İf^fCfv,đŽ!,· B,»,“„Ä,Ê,ˉ,ê,İ A,±  
,ê,ġ,İfpf%of [f^,İNULL,Ä I,İ,é•¶Žš—ñ,Ö,İf f“fO Ef|fCf“f^,Ä, ,é B•¶Žš—  
ñ,İ æ““•¶Žš,“fVff [fv<L † i# j,Ì,Æ,«„Í AŽc,è,İ•¶Žš,ÍfŠf\ [fX,Ì¼‘O,âf^fCfv,Ì ® ”Žˉ•ÊŽq,đŽ!,·10 i ”,đ\  
,· B,½,Æ,,İ A•¶Žš—ñ”#258”,Í ® ”Žˉ•ÊŽq258,đ\,· B¼‘O,İ‘ä,İ,è,É ® ”Žˉ•ÊŽq,đŽQ Ä,·,ê,İ AfŠf\ [fX,“K—  
v,Æ,·,éf f,fŠ,Ì—Ê,ðĲ,,ġ,·,±,Æ,“,Ä,«„é B*

*D3DRMLOAD\_FROMRESOURCE,đŽw’è,μ,ÄLoadf f\fbfh,ðĲÄ,Ñ o,İ,İ AfAfvfŠfP [fVf‡f“,ÄfŠf\ [fX,đ‘T,μ,½,è  
fAf“f fbfN,·,éK—v,Í,Ê,Ĳ B,±,Ì ê ‡ AfVfXfefĲ,“ŽĲ“®“I,É,»,İ ^— ,đ s,“ B*

*ŽQ Ä @IDirect3DRM::Load, IDirect3DRMAnimationSet::Load, IDirect3DRMFrame::Load,  
IDirect3DRMMeshBuilder::Load, D3DRMLOADMEMORY, D3DRMLOADOPTIONS*



## D3DRMPALETTEENTRY

```
typedef struct _D3DRMPALETTEENTRY {
    unsigned char red;
    unsigned char green;
    unsigned char blue;
    unsigned char flags;
} D3DRMPALETTEENTRY;
typedef D3DRMPALETTEENTRY, *LPD3DRMPALETTEENTRY;
```

**D3DRMIMAGE** \‘‘İ,ÅŽg—p,<sup>3</sup>,ê,éfJf% [ EfpfEfbfq,δ<L q,·,é B,±  
,İ \‘‘İ,İ AD3DRMIMAGE \‘‘İ,İrgbf f“fo,ÉFALSE,<sup>a</sup>Žw’è,<sup>3</sup>,ê,Ä,¢,é,Æ,«,İ,Ý—~—p,<sup>3</sup>,ê,é iTRUE,<sup>a</sup>Žw’è,<sup>3</sup>,ê,Ä,¢  
,é,Æ,«,İ ARGB’l,<sup>a</sup>—p,¢,ç,é,é j B

**red, #green, #blue**

fpfEfbfq,δ’è<’,·,éE’ F—v’f,δ’è<’,·,é’l B0,©,ç255,İ”Íİ,İ’l,δŽw’è,·,é,±,Æ,<sup>a</sup>,Ä,«,é B

**flags**

fEf“f\_fŠf“fOŽž,ÉfpfEfbfq,<sup>a</sup>,Ç,İ,æ,²,ÉŽg—p,<sup>3</sup>,ê,é,©,δ’è<’,·,é’l B,±,İ’l,İD3DRMPALETTEFLAGS—  
ñ<“E^,İf f“fo,İ,Đ,Æ,Ä,Ä, ,é B

ŽQ Æ @D3DRMIMAGE, D3DRMPALETTEFLAGS

## D3DRMPICKDESC

```
typedef struct _D3DRMPICKDESC {
    ULONG        ulFaceIdx;
    LONG         lGroupIdx;
    D3DVECTOR    vPosition;
} D3DRMPICKDESC, *LPD3DRMPICKDESC;
```

**IDirect3DRMPickedArray::GetPick** f\fbfh,É,æ,Á,ÄŽæ“¼,³,ê,½ AfsfbfN,ÎÊ’u A–Ê AfOf< [fvŽ•ÊŽq,δŠi”[,·,é B

### ulFaceIdx

Žæ“¼,³,ê,½fIfufWfFfNfg,Ì–Ê,̀fCf“fffbfNfX B

### lGroupIdx

Žæ“¼,³,ê,½fIfufWfFfNfg,̀fOf< [fvŽ–•ÊŽq B

### vPosition

Žæ“¼,³,ê,½fIfufWfFfNfg,ÎÊ’u,δŽ!,·l B,±,̀l,Í**D3DVECTOR** \‘ċ’î,Â, ,é B

ŽQ Æ @**D3DVECTOR**, **IDirect3DRMPickedArray::GetPick**

## D3DRMQUATERNION

```
typedef struct _D3DRMQUATERNION {  
    D3DVALUE    s;  
    D3DVECTOR    v;  
} D3DRMQUATERNION;  
typedef D3DRMQUATERNION, *LPD3DRMQUATERNION;
```

**IDirect3DRMAnimation::AddRotateKey** *f\bfbh,Å—p,¢,ç,ê,é%ñ“],ðL q,·,é B,Ü,½ ADirect3D,ì ”ŠwŠÖ ”,ì,¢,-,Å,©,Å,àŽg—p,<sup>3</sup>,ê,é B*

ŽQ Æ @**IDirect3DRMAnimation::AddRotateKey**, **D3DRMQuaternionFromRotation**, **D3DRMQuaternionMultiply**, **D3DRMQuaternionSlerp**, **D3DRMMatrixFromQuaternion**

## D3DRMVECTOR4D

```
typedef struct _D3DRMVECTOR4D {
    D3DVALUE x;
    D3DVALUE y;
    D3DVALUE z;
    D3DVALUE w;
} D3DRMVECTOR4D;
typedef D3DRMVECTOR4D, *LPD3DRMVECTOR4D;
```

$fXfNf\check{S}$  [f“ Å•W,ð«L q,·,é B,±,Ì \‘«Ì,Í A**IDirect3DRMViewport::Transform** f\fbfh,É,æ,é•İŠ·,Ì o—  
Í æ,Æ,µ,Ä A,“,æ,Ń**IDirect3DRMViewport::InverseTransform** f\fbfh,É,æ,é•İŠ·,İf\ [fX,Æ,µ,ÄŽg—p,<sup>3</sup>,ê,é B

x, #y, #z, #w

**D3DVALUE**«^,Ì¹ B•İŠ·«%«Ê,““ü,é B

ŽQ Æ @**IDirect3DRMViewport::Transform**, **IDirect3DRMViewport::InverseTransform**

## D3DRMVERTEX

```
typedef struct _D3DRMVERTEX{
    D3DVECTOR position;
    D3DVECTOR normal;
    D3DVALUE tu, tv;
    D3DCOLOR color;
} D3DRMVERTEX;
```

Direct3DRMMeshIfufWfFfNfg't,l',“\_,ðL q,·,é B

### position

,“\_,l~Ê'u B

### normal

,“\_,l-@ üfxfNfgf< B

### tu , ,æ,Ñ #tv

,“\_,l ...•½,“,æ,Ñ , '¼fefNfXf`ff À•W B

### color

,“\_,l F B

ŽQ Æ @ IDirect3DRMMesh::GetVertices, IDirect3DRMMesh::SetVertices

—ñ“E^

## D3DRMCOLORSOURCE

```
typedef enum _D3DRMCOLORSOURCE{
    D3DRMCOLOR_FROMFACE,
    D3DRMCOLOR_FROMVERTEX
} D3DRMCOLORSOURCE;
```

Direct3DRMMeshBuilderIfufWfFfNfg,lfJf% [ Ef\ [fX,ðL q,·,é BfJf% [ Ef\ [fX,ð Ý'è,·,é,É,Í **AIDirect3DRMMeshBuilder::SetColorSource**,ðŽg—  
p,·,é BfJf% [ Ef\ [fX,ðŽæ“¾,·,é,É,Í **AIDirect3DRMMeshBuilder::GetColorSource**f f\fbfh,ðŽg—p,·,é B

### D3DRMCOLOR\_FROMFACE

fIfufWfFfNfg,lfJf% [ Ef\ [fX,Í-Ê,Å, ,é B

### D3DRMCOLOR\_FROMVERTEX

fIfufWfFfNfg,lfJf% [ Ef\ [fX,Í',“\_,Å, ,é B

ŽQ Æ @**IDirect3DRMMeshBuilder::SetColorSource**, **IDirect3DRMMeshBuilder::GetColorSource**

## D3DRMCOMBINETYPE

```
typedef enum _D3DRMCOMBINETYPE{
    D3DRMCOMBINE_REPLACE,
    D3DRMCOMBINE_BEFORE,
    D3DRMCOMBINE_AFTER
} D3DRMCOMBINETYPE;
```

,Ó,½,Â,Ì s—ñ,Ì ‡ ¬•û—@,ðŽw’è,·,é B

## D3DRMCOMBINE\_REPLACE

—^,|,ç,ê,½ s—ñ,É,æ,è AftfŒ [f€,lŒ» Ý,Ì s—ñ,ð’u,«Š·,|,é B

## D3DRMCOMBINE\_BEFORE

—^,|,ç,ê,½ s—ñ,ÆftfŒ [f€,lŒ» Ý,Ì s—ñ,Ì Ĭ,ð< ,ß,é BŒvŽZ,É,¨,Œ,Ä,Í A—^,|,ç,ê,½ s—ñ,\*Œ» Ý,Ì s—ñ,æ,è,à æ,ÉŽw’è,³,ê,é B

## D3DRMCOMBINE\_AFTER

—^,|,ç,ê,½ s—ñ,ÆftfŒ [f€,lŒ» Ý,Ì s—ñ,Ì Ĭ,ð< ,ß,é BŒvŽZ,É,¨,Œ,Ä,Í A—^,|,ç,ê,½ s—ñ,\*Œ» Ý,Ì s—ñ,lŒã,ÉŽw’è,³,ê,é B

s—ñ,Ì æŽZ,Í%oÂŠ·,Â,Í,È,Œ,½,ß A—^,|,ç,ê,½ s—ñ,ÆŒ» Ý,Ì s—ñ,ðŠ|,¯ ‡,í,¹,é ‡ ~,Í d—v,Â, ,é B

ŽQ Æ @IDirect3DRMFrame::AddRotation, IDirect3DRMFrame::AddScale, IDirect3DRMFrame::AddTransform, IDirect3DRMFrame::AddTranslation



## D3DRMFILLMODE

```
typedef enum _D3DRMFILLMODE {
    D3DRMFILL_POINTS      = 0 * D3DRMLIGHT_MAX,
    D3DRMFILL_WIREFRAME   = 1 * D3DRMLIGHT_MAX,
    D3DRMFILL_SOLID       = 2 * D3DRMLIGHT_MAX,
    D3DRMFILL_MASK        = 7 * D3DRMLIGHT_MAX,
    D3DRMFILL_MAX         = 8 * D3DRMLIGHT_MAX
} D3DRMFILLMODE;
```

**D3DRMRENDERQUALITY**  $\mathbb{C}^{\wedge}, \mathbb{I}' \in \mathbb{C}, \mathbb{A} \check{Z} g, \mathbb{I}, \hat{e}, \acute{e} - \tilde{n} \mathbb{C}^{\wedge}, \mathbb{I}, \mathbb{D}, \mathbb{A}, \mathbb{A} \text{ B}$

## D3DRMFILL\_POINTS

$\text{“} \_ , \mathbb{I}, \acute{Y}, \delta \text{“} h, \grave{e}, \mathbb{A}, \hat{O}, \cdot \text{ B } \mathbb{A} \neg, \mathbb{I} \text{“} h, \grave{e}, \mathbb{A}, \hat{O}, \mu f, \text{ [} f h \text{ B}$

## D3DRMFILL\_WIREFRAME

$f \text{ } f C f, , \text{ [} f t f \mathbb{C} \text{ [} f \mathbb{C}, \delta \text{“} h, \acute{e} \text{ B}$

## D3DRMFILL\_SOLID

$\text{—} \S \text{“} \mathbb{I} f \mathbb{I} f u f W f F f N f g, \delta \text{“} h, \acute{e} \text{ B}$

## D3DRMFILL\_MASK

$f \} f X f N, \delta \check{Z} g \text{—} p, \mu, \mathbb{A} \text{“} h, \acute{e} \text{ B}$

## D3DRMFILL\_MAX

$\text{“} h, \grave{e}, \mathbb{A}, \hat{O}, \mu f, \text{ [} f h, \mathbb{I} \text{ } \mathbb{A} \text{“} \grave{a} \text{’ l B}$

$\check{Z} Q \mathbb{A} @ \text{D3DRMLIGHTMODE, D3DRMSHADEMODE, D3DRMRENDERQUALITY}$

## D3DRMFOGMODE

```
typedef enum _D3DRMFOGMODE{
    D3DRMFOG_LINEAR,
    D3DRMFOG_EXPONENTIAL,
    D3DRMFOG_EXPONENTIALSQUARED
} D3DRMFOGMODE;
```

$f = \frac{f_{end} - f_{start}}{end - start}$

## D3DRMFOG\_LINEAR

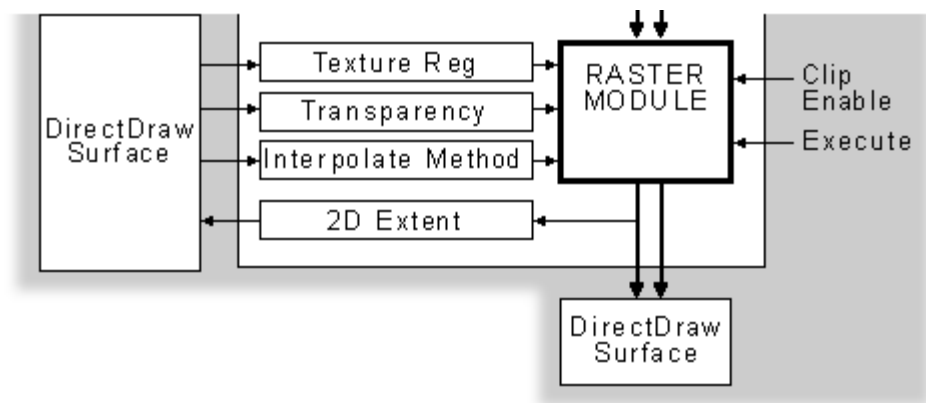
$f = \frac{end - z}{end - start}$

$$f = \frac{end - z}{end - start}$$

$f = \frac{end - z}{end - start}$

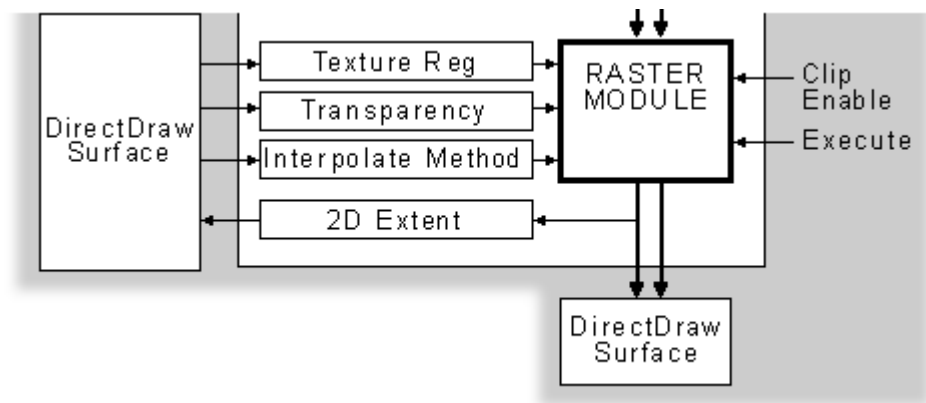
## D3DRMFOG\_EXPONENTIAL

$f = \frac{end - z}{end - start}$



## D3DRMFOG\_EXPONENTIALSQUARED

$f = \frac{end - z}{end - start}$



$f = \frac{end - z}{end - start}$

$f = \frac{end - z}{end - start}$

$f = \frac{end - z}{end - start}$

D3DRMFRAMECONSTRAINT

```
typedef enum _D3DRMFRAMECONSTRAINT {
    D3DRMCONSTRAIN_Z,
    D3DRMCONSTRAIN_Y,
    D3DRMCONSTRAIN_X
} D3DRMFRAMECONSTRAINT;
```

Direct3DRMFramefIfuFfWfFfNfg,đ•Ž!,·,é,Æ,«,É< §“I,É%œñ“,·,éŽ²,đ<L q,·,é B,±,Ì—  
ñ<“Œ^,İDirect3DRMFrame::LookAtf f\fbfh,É,æ,Á,ĂŽg—p,³,ê,é B

D3DRMCONSTRAIN\_Z  
x,“,æ,Ńy%œñ“,Ì,ÝŽg—p,·,é B

D3DRMCONSTRAIN\_Y  
x,“,æ,Ńz%œñ“,Ì,ÝŽg—p,·,é B

D3DRMCONSTRAIN\_X  
y,“,æ,Ńz%œñ“,Ì,ÝŽg—p,·,é B

ŽQ Æ @Direct3DRMFrame::LookAt

## D3DRMLIGHTMODE

```
typedef enum _D3DRMLIGHTMODE {  
    D3DRMLIGHT_OFF          = 0 * D3DRMSHADE_MAX,  
    D3DRMLIGHT_ON           = 1 * D3DRMSHADE_MAX,  
    D3DRMLIGHT_MASK         = 7 * D3DRMSHADE_MAX,  
    D3DRMLIGHT_MAX          = 8 * D3DRMSHADE_MAX  
} D3DRMLIGHTMODE;
```

**D3DRMRENDERQUALITY** Ć^, ĩ'è` , ÅŽg, í, ê, é—ñ, “Ć^, ĩ, Đ, Æ, Â B

### D3DRMLIGHT\_OFF

ĆôĆ^, ĩf ĩft, Å, , é B

### D3DRMLIGHT\_ON

ĆôĆ^, ĩf ĩf“, Å, , é B

### D3DRMLIGHT\_MASK

ĆôĆ^, ĩf}fXfN, ðŽg—p, ·, é B

### D3DRMLIGHT\_MAX

ĆôĆ^f, [fh, ĩ Å‘â'l B

ŽQ Æ @**D3DRMFillMode, D3DRMSHADEMODE, D3DRMRENDERQUALITY**

## D3DRMLIGHTTYPE

```
typedef enum _D3DRMLIGHTTYPE{
    D3DRMLIGHT_AMBIENT,
    D3DRMLIGHT_POINT,
    D3DRMLIGHT_SPOT,
    D3DRMLIGHT_DIRECTIONAL,
    D3DRMLIGHT_PARALLELPOINT
} D3DRMLIGHTTYPE;
```

**IDirect3DRM::CreateLight** *f\fbfh, ÌĖÄ, Ñ o, μ, Å AĖðĖ¹f^fCfv, ð'è<, ·, é B*

### D3DRMLIGHT\_AMBIENT

*fAf“frfGf“fgĖðĖ¹ B*

### D3DRMLIGHT\_POINT

*f|fCf“fg ĖðĖ¹ B*

### D3DRMLIGHT\_SPOT

*fXf|fbfgf%ofCf gĖðĖ¹ B*

### D3DRMLIGHT\_DIRECTIONAL

*—LĖüĖðĖ¹ B*

### D3DRMLIGHT\_PARALLELPOINT

*fpf%ofĖf< Ef|fCf“fgĖðĖ¹ B*

## D3DRMMATERIALMODE

```
typedef enum _D3DRMMATERIALMODE{
    D3DRMMATERIAL_FROMMESH,
    D3DRMMATERIAL_FROMPARENT,
    D3DRMMATERIAL_FROMFRAME
} D3DRMMATERIALMODE;
```

*f*}*fefŠfAf*<*f*, [*fh*,*đŽ*!,· *B*,±  
,*l*Ē<sup>^</sup>,*l* *AIDirect3DRMFrame::GetMaterialMode* *f*\fbfh,*É*,*æ*,*Á*,*ĂŽæ*“¾,<sup>3</sup>*ê* *AIDirect3DRMFrame::SetMaterialMode*  
*f* *f*\fbfh,*É*,*æ*,*Á*,*Ă* *Ý*’*è*,<sup>3</sup>*ê*,*é* *B*

## D3DRMMATERIAL\_FROMMESH

*f*}*fefŠfAf*< *î*•*ñ*,*l*f<sup>r</sup>*fWf*...*fAf*< *EfIfufWfFfNfg* if *fbfVf*... *j*,»,*l*,*à*,*l*,©,*çŽæ*“¾,<sup>3</sup>*ê*,*é* *B*,±,*ê*,*l*ffftfHf<*fg* *Ý*’*è*,*Ă*,  
,*é* *B*

## D3DRMMATERIAL\_FROMPARENT

*f*}*fefŠfAf*< *î*•*ñ*,*l* *A* *F*,*âfefNfXf`ff* *î*•*ñ*,*Æ*,*Æ*,*à*,*É* *eftf*Ē [*f*€,©,*ç*Ē<sup>p</sup> <sup>3</sup>,<sup>3</sup>*ê*,*é* *B*

## D3DRMMATERIAL\_FROMFRAME

*f*}*fefŠfAf*< *î*•*ñ*,*l*ftfĒ [*f*€,©,*çŽæ*“¾,<sup>3</sup>*ê* *Af<sup>r</sup>fWf*...*fAf*< *EfIfufWfFfNfg*,<sup>a</sup>•*ŬŽ* ,*μ*,*Ă*,*¢*  
,½<sup>^</sup>Ē<sup>‘</sup>*O*,*l* *î*•*ñ*,*đfi* [*f*o [*f*%*o*C*f*h,·*é* *B*

Ž<sup>Q</sup> *Æ* @*IDirect3DRMFrame::GetMaterialMode*,*IDirect3DRMFrame::SetMaterialMode*

## D3DRMPALETTEFLAGS

```
typedef enum _D3DRMPALETTEFLAGS {  
    D3DRMPALETTE_FREE,  
    D3DRMPALETTE_READONLY,  
    D3DRMPALETTE_RESERVED  
} D3DRMPALETTEFLAGS;
```

**D3DRMPALETTEENTRY** \‘ćì,Ā,Ī F,İŽg—p•û—@,đ’è‘,·,é B

### D3DRMPALETTE\_FREE

fĈf“f\_f%o [,Ī,±,ĭfGf“fgfŠ,đŽ©—R,ÉŽg—p,Ā,«,é B

### D3DRMPALETTE\_READONLY

ĈĀ’è,³,ê,Ā,Ĉ,é,<sup>a</sup> AfĈf“f\_f%o [,<sup>a</sup>Žg,▯,±,Æ,<sup>a</sup>,Ā,«,é B

### D3DRMPALETTE\_RESERVED

fĈf“f\_f%o [,<sup>a</sup>Žg,▯,±,Æ,Ī,Ā,«,È,Ĉ B

ŽQ Æ @**D3DRMPALETTEENTRY**

## D3DRMPROJECTIONTYPE

```
typedef enum _D3DRMPROJECTIONTYPE{
    D3DRMPROJECT_PERSPECTIVE,
    D3DRMPROJECT_ORTHOGRAPHIC
} D3DRMPROJECTIONTYPE;
```

Direct3DRMViewportIfufWfFfNfg,ÅŽg—p,<sup>3</sup>,ê,éŽĚ%œf^fCfv,ð'è`.,é B,±,ĭ—  
ñ<“Ĉ^,Í AIDirect3DRMViewport::GetProjection,ÆIDirect3DRMViewport::SetProjectionf f\fbfh,É,æ,Á,Ä—p,¢  
,ç,ê,é B

## D3DRMPROJECT\_PERSPECTIVE

“§Ž<“Š‰œ B

## D3DRMPROJECT\_ORTHOGRAPHIC

•½ s“Š‰œ B

ŽQ Æ @IDirect3DRMViewport::GetProjection,IDirect3DRMViewport::SetProjection



## D3DRMRENDERQUALITY

```
typedef enum _D3DRMSHADEMODE {
    D3DRMSHADE_FLAT          = 0,
    D3DRMSHADE_GOURAUD       = 1,
    D3DRMSHADE_PHONG         = 2,
    D3DRMSHADE_MASK          = 7,
    D3DRMSHADE_MAX           = 8
} D3DRMSHADEMODE;

typedef enum _D3DRMLIGHTMODE {
    D3DRMLIGHT_OFF           = 0 * D3DRMSHADE_MAX,
    D3DRMLIGHT_ON            = 1 * D3DRMSHADE_MAX,
    D3DRMLIGHT_MASK          = 7 * D3DRMSHADE_MAX,
    D3DRMLIGHT_MAX           = 8 * D3DRMSHADE_MAX
} D3DRMLIGHTMODE;

typedef enum _D3DRMFILLMODE {
    D3DRMFILL_POINTS         = 0 * D3DRMLIGHT_MAX,
    D3DRMFILL_WIREFRAME      = 1 * D3DRMLIGHT_MAX,
    D3DRMFILL_SOLID          = 2 * D3DRMLIGHT_MAX,
    D3DRMFILL_MASK           = 7 * D3DRMLIGHT_MAX,
    D3DRMFILL_MAX            = 8 * D3DRMLIGHT_MAX
} D3DRMFILLMODE;

typedef DWORD D3DRMRENDERQUALITY;

#define D3DRMRENDER_WIREFRAME (D3DRMSHADE_FLAT+D3DRMLIGHT_OFF+D3DRMFILL_WIREFRAME)
#define D3DRMRENDER_UNLITFLAT (D3DRMSHADE_FLAT+D3DRMLIGHT_OFF+D3DRMFILL_SOLID)
#define D3DRMRENDER_FLAT      (D3DRMSHADE_FLAT+D3DRMLIGHT_ON+D3DRMFILL_SOLID)
#define D3DRMRENDER_GOURAUD   (D3DRMSHADE_GOURAUD+D3DRMLIGHT_ON+D3DRMFILL_SOLID)
#define D3DRMRENDER_PHONG     (D3DRMSHADE_PHONG+D3DRMLIGHT_ON+D3DRMFILL_SOLID)
```

Direct3DRMMeshIfufWfFfNfg,lfVfF [ffBf“fO Ef, [fh AĖĖĖf, [fh A“h,è,Â,Ô,µf, [fh,ðĖ ħ,·,é B

### D3DRMSHADEMODE, D3DRMLIGHTMODE, D3DRMFILLMODE

fVfF [ffBf“fO AĖĖĖ A“h,è,Â,Ô,µf, [fh,ðŽ,· B

### D3DRMRENDER\_WIREFRAME

•Ó,ì,Ý,ð•Ž,·,é B

### D3DRMRENDER\_UNLITFLAT

ĖĖĖ,Ė,µ,ĭftf%ofbfg EfVfF [ffBf“fO B

### D3DRMRENDER\_FLAT

ftf%ofbfg EfVfF [ffBf“fO B

### D3DRMRENDER\_GOURAUD

fO [f [ EfVfF [ffBf“fO B

### D3DRMRENDER\_PHONG

ftfHf“ EfVfF [ffBf“fO B,±,ĭfVfF [ffBf“fO Ef, [fh,ÍĖ» Ý,ĭfTf| [fg,<sup>3</sup>,ê,Ä,ċ,È,ċ B

ŽQ Ą @IDirect3DRMMesh::GetGroupQuality, IDirect3DRMMesh::SetGroupQuality

## D3DRMSHADEMODE

```
typedef enum _D3DRMSHADEMODE {  
    D3DRMSHADE_FLAT      = 0,  
    D3DRMSHADE_GOURAUD   = 1,  
    D3DRMSHADE_PHONG     = 2,  
    D3DRMSHADE_MASK      = 7,  
    D3DRMSHADE_MAX       = 8  
} D3DRMSHADEMODE;
```

**D3DRMRENDERQUALITY** Ą, ĩ'è` , ĄŽg, í, ê, é—ñċ“ Ą^, ĩ, Đ, Ą, Ą B

ŽQ Ą @**D3DRMFILLMODE**, **D3DRMLIGHTMODE**, **D3DRMRENDERQUALITY**

## D3DRMSORTMODE

```
typedef enum _D3DRMSORTMODE {  
    D3DRMSORT_FROMPARENT,  
    D3DRMSORT_NONE,  
    D3DRMSORT_FRONTTOBACK,  
    D3DRMSORT_BACKTOFRONT  
} D3DRMSORTMODE;
```

*fV [f“ ã,É,Ç,Ì,æ,ϣ,ÉŽqftfŒ [f€,ªª—p,³,ê,é,©,ðŽ!,· B*

### D3DRMSORT\_FROMPARENT

*ŽqftfŒ [f€,Í eftfŒ [f€,Ìf\ [fg ‡ ~,ðŒp ³,·,é B,±,ê,ÍfftfHf<fg Ý'è,Å, ,é B*

### D3DRMSORT\_NONE

*ŽqftfŒ [f€,Íf\ [fg,³,ê,È,¢ B*

### D3DRMSORT\_FRONTTOBACK

*ŽqftfŒ [f€,Í‘O,©,çŒã,ë,Öf\ [fg,³,ê,é B*

### D3DRMSORT\_BACKTOFRONT

*ŽqftfŒ [f€,ÍŒã,ë,©,ç‘O,Öf\ [fg,³,ê,é B*

*ŽQ Æ @IDirect3DRMFrame::GetSortMode,*

*IDirect3DRMFrame::SetSortMode*

## D3DRMTEXTUREQUALITY

```
typedef enum _D3DRMTEXTUREQUALITY{
    D3DRMTEXTURE_NEAREST,
    D3DRMTEXTURE_LINEAR,
    D3DRMTEXTURE_MIPNEAREST,
    D3DRMTEXTURE_MIPLINEAR,
    D3DRMTEXTURE_LINEARMIPNEAREST,
    D3DRMTEXTURE_LINEARMIPLINEAR
} D3DRMTEXTUREQUALITY;
```

**IDirect3DRMDevice::SetTextureQuality**, **âIDirect3DRMDevice::GetTextureQuality** *f\fbfh, Å—p, ¢*  
*,ç,ê,éfefNfXf`ff•iŽč,ðŁ q,•,é B*

### D3DRMTEXTURE\_NEAREST

*fefNfXf`ff ã,Ĺ Å,àŁ,¢fsfNfZf<,ð‘I’ð,•,é B*

### D3DRMTEXTURE\_LINEAR

*Å,àŁ,¢4,Â,ĹfsfNfZf<,ð üĖ`É•ăŠ®,•,é B*

### D3DRMTEXTURE\_MIPNEAREST

*D3DRMTEXTURE\_NEAREST,ÉŽ—,Ä,¢,é,<sup>a</sup> AfefNfXf`ff,Ĺ’ă,i,è,É“K Ø,Èf~fbfvf}fbfv,ðŽg—p,•,é B*

### D3DRMTEXTURE\_MIPLINEAR

*D3DRMTEXTURE\_LINEAR,ÉŽ—,Ä,¢,é,<sup>a</sup> AfefNfXf`ff,Ĺ’ă,i,è,É“K Ø,Èf~fbfvf}fbfv,ðŽg—p,•,é B*

### D3DRMTEXTURE\_LINEARMIPNEAREST

*D3DRMTEXTURE\_MIPNEAREST,ÉŽ—,Ä,¢,é,<sup>a</sup> A Å,àŁ,¢,Ó,½,Â,Ĺf~fbfvf}fbfvŠÔ,ð•ăŠ®,•,é B*

### D3DRMTEXTURE\_LINEARMIPLINEAR

*D3DRMTEXTURE\_MIPLINEAR,ÉŽ—,Ä,¢,é,<sup>a</sup> A Å,àŁ,¢,Ó,½,Â,Ĺf~fbfvf}fbfvŠÔ,ð•ăŠ®,•,é B*

## D3DRMUSERVISUALREASON

```
typedef enum _D3DRMUSERVISUALREASON {  
    D3DRMUSERVISUAL_CANSEE,  
    D3DRMUSERVISUAL_RENDER  
} D3DRMUSERVISUALREASON;
```

*fVfXfef€,"D3DRMUSERVISUALCALLBACKfR [f<fofbfNŠÖ ",ðCEĂ,Ń o,μ,½— —R,ð'è<`,·,é B*

## D3DRMUSERVISUAL\_CANSEE

*f† [fU EfrfWf...fAf<fIfufWfFfNfg,ªfrf... [f| [fg ã,Â%oÂŽ< óˆÔ,Â, ,ê,Î AfR [f<fofbfNŠÖ ",ÍTRUE,ð•Ô,  
³,È,,Ă,Í,È,ç,È,¢ B*

## D3DRMUSERVISUAL\_RENDER

*fR [f<fofbfNŠÖ ",Íf† [fU EfrfWf...fAf< EfIfufWfFfNfg,ðfœf“f\_Šf“fO,μ,È,,Ă,Í,È,ç,È,¢ B*

ŽQ Æ @D3DRMUSERVISUALCALLBACK

## D3DRMWRAPTYPE

```
typedef enum _D3DRMWRAPTYPE{
    D3DRMWRAP_FLAT,
    D3DRMWRAP_CYLINDER,
    D3DRMWRAP_SPHERE,
    D3DRMWRAP_CHROME
} D3DRMWRAPTYPE;
```

**IDirect3DRM::CreateWrap** *f\fbfh,É,æ,Á,Ä ì ¬,³,ê,éDirect3DRMWrapfIfufWfFfNfg,Ìf^fCfv,ð'è`,·,é B,Ü,½IDirect3DRMWrap::Init*  
**ect3DRMWrap::Init** *f\fbfh,ìÆÄ,Ñ o,μ,ì†,Ä ADirect3DRMWrapfIfufWfFfNfg,ð %Šú%»,·,é,½,B,É,±,Ì—*  
*ñ<“Æ^,ðŽg—p,·,é,±,Æ,<sup>a</sup>,Ä,«,é B*

## D3DRMWRAP\_FLAT

*•½–Êf%fbfv B*

## D3DRMWRAP\_CYLINDER

*%o~'Æf%fbfv B*

## D3DRMWRAP\_SPHERE

*<...İf%fbfv B*

## D3DRMWRAP\_CHROME

*f%fbfv,Í AfefNfXf`ff,<sup>a</sup>fIfufWfFfNfg ã,Ä”½ŽË,³,ê,é,æ,ϣ,ÉfefNfXf`ff Ä•W,ðŠ,,,è“–,Ä,é B*

ŽQ Æ @**IDirect3DRM::CreateWrap**, **IDirect3DRMWrap::Init**, **IDirect3DRMWrapCf“f^ [ftfEfCfX**

## D3DRMXOFFORMAT

```
typedef enum _D3DRMXOFFORMAT{
    D3DRMXOF_BINARY,
    D3DRMXOF_COMPRESSED,
    D3DRMXOF_TEXT
} D3DRMXOFFORMAT;
```

**IDirect3DRMMeshBuilder::Save** *f\fbfh,ÅŽg—p,<sup>3</sup>,ê,étf@fCf< Ef^fCfv,ð'è`',,é B*

### D3DRMXOF\_BINARY

*ftf@fCf<,ÍfofCfifŠ EftfH [f}fbfg,Å, ,é B,±,ê,ÍfftfHf<fg Ý'è,Å, ,é B*

### D3DRMXOF\_COMPRESSED

*Œ» Ý,ÍfTf| [fg,<sup>3</sup>,ê,Å,¢,È,¢ B*

### D3DRMXOF\_TEXT

*ftf@fCf<,ÍfefLfXfg EftfH [f}fbfg,Å, ,é B*

D3DRMXOF\_BINARY,ÆD3DRMXOF\_TEXT Ý'è,ð“~Žž,ÉŽg—p,·,é,±,Æ,Í,Å,«,È,¢ B

ŽQ Æ @**IDirect3DRMMeshBuilder::Save**

## D3DRMZBUFFERMODE

```
typedef enum _D3DRMZBUFFERMODE {  
    D3DRMZBUFFER_FROMPARENT,  
    D3DRMZBUFFER_ENABLE,  
    D3DRMZBUFFER_DISABLE  
} D3DRMZBUFFERMODE;
```

Zfofbftf@,ª—LŒø,©,Ç,ª,©,đŽ|,· B

## D3DRMZBUFFER\_FROMPARENT

ftfŒ [f€,Í eftfŒ [f€,©,çZfofbftf@,l Ý'è,ðŒp ³,·,é B,±,ê,ÍfftfHf<fg Ý'è,Å, ,é B

## D3DRMZBUFFER\_ENABLE

Zfofbftf@,Í—LŒø,Å, ,é B

## D3DRMZBUFFER\_DISABLE

Zfofbftf@,Í¬Œø,Å, ,é B

ŽQ Æ @IDirect3DRMFrame::GetZbufferMode, IDirect3DRMFrame::SetZbufferMode



,»,i¼,iE^

## D3DRMANIMATIONOPTIONS

```
typedef DWORD D3DRMANIMATIONOPTIONS;  
#define D3DRMANIMATION_CLOSED          0x02L  
#define D3DRMANIMATION_LINEARPOSITION  0x04L  
#define D3DRMANIMATION_OPEN            0x01L  
#define D3DRMANIMATION_POSITION        0x00000020L  
#define D3DRMANIMATION_SCALEANDROTATION 0x00000010L  
#define D3DRMANIMATION_SPLINEPOSITION  0x08L
```

*fAfjf* [fVf‡f“, Ì Ä ¶•û–  
@,ð'è< ,·,é'l,ðŽw'è,·,é B  IDirect3DRMAnimation::GetOptions,âIDirect3DRMAnimation::SetOptions,Ä—p,¢,ç,ê,é B

## D3DRMANIMATION\_CLOSED

*fAfjf* [fVf‡f“, ÌCEJ,è•Ô,µ Ä ¶,³,ê A I“\_É'B,·,é,ÆŠJŽn“\_É–  
ß,Á,Äf< [fv,·,é B•Ä,¶,ç,ê,½*fAfjf* [fVf‡f“,Ä,Í AfAfjf [fVf‡f“, Ì Åæã, ÌfL [,Í Å %  
\_ ÌfL [, ÌCEJ,è•Ô,µ,Ä,È,,Ä,Í,È,ç,È,¢ B,±, ÌCEJ,è•Ô,µfL [,ð—  
p,µ,Ä Af< [fv,·,éAfjf [fVf‡f“,É,“,–,é ÅÆã,Æ Ä %\_, ÌfL [ŠÔ, ÌŽžŠÔ, Ì ·,ª\,³,ê,é B

## D3DRMANIMATION\_LINEARPOSITION

*fAfjf* [fVf‡f“, ÌÊ'ü,Í üÆ',É Ý'è,³,ê,é B

## D3DRMANIMATION\_OPEN

*fAfjf* [fVf‡f“, Ì1%õñ,¾,– Ä ¶,³,ê A'âŽ~,·,é B

## D3DRMANIMATION\_POSITION

*fAfjf* [fVf‡f“, ÌÊ'u s—ñ,É,æ,Ä,Ä A'¼, Ìf f\fbfh,ª Ý'è,·,é,Ç,ñ,È•İŠ· s—ñ,à ã '³,ê,é B

## D3DRMANIMATION\_SCALEANDROTATION

*fAfjf* [fVf‡f“, Ì kŽÚ,Æ%õñ“] s—ñ,É,æ,Ä,Ä A'¼, Ìf f\fbfh,ª Ý'è,·,é,Ç,ñ,È•İŠ· s—ñ,à ã '«³,ê,é B

## D3DRMANIMATION\_SPLINEPOSITION

*fAfjf* [fVf‡f“, ÌÊ'u,ÍfXfvf%\_fCf“,Ä Ý'è,³,ê,é B

D3DRMCOLORMODEL

typedef D3DCOLORMODEL D3DRMCOLORMODEL;

fffofCfX,"fCf"fvfŠf f"f g,·,é fJf% [ Ef,ff f<,đŽ!,· B Ú ×,É,Â,č,Ä,Í,D3DCOLORMODEL—ñ<“E^,đŽQ Æ,·,é,±,Æ B

ŽQ Æ @D3DCOLORMODEL

## D3DRMLOADOPTIONS

```
typedef DWORD D3DRMLOADOPTIONS;
#define D3DRMLOAD_FROMFILE 0x00L
#define D3DRMLOAD_FROMRESOURCE 0x01L
#define D3DRMLOAD_FROMMEMORY 0x02L
#define D3DRMLOAD_FROMSTREAM 0x03L
#define D3DRMLOAD_BYNAME 0x10L
#define D3DRMLOAD_BYPOSITION 0x20L
#define D3DRMLOAD_BYGUID 0x30L
#define D3DRMLOAD_FIRST 0x40L
#define D3DRMLOAD_INSTANCEBYREFERENCE 0x100L
#define D3DRMLOAD_INSTANCEBYCOPYING 0x200L
```

### IDirect3DRM::Load A

**IDirect3DRMAnimationSet::Load** **AIDirect3DRMFrame::Load** A,~,æ,Ñ**IDirect3DRMMeshBuilder::Load** f\fbfh,İfİ fVfVfİf“,đ’èç,·,é B,±,ê,ç,İfİfVfVfİfİf“,İ AfİfufWfFfNfg,“f [fh,³,ê,é•û-@,đ•İ X,·,é B

### f\ fX Eftf%ofO

#### D3DRMLOAD\_FROMFILE

fİf@fCf<,©,çf [fh,·,é B,±,ê,İffİfİfHf<fg Ý’è,Ä, ,é B

#### D3DRMLOAD\_FROMRESOURCE

fŠf\ [fX,©,çf [fh,·,é B,± ,İftf%ofO,đŽw’è,µ,½ ê ± A**Load** f\fbfh,İĖÄ,Ñ o,µ,İlpvObjSourcefİf%of [f^,İ **AD3DRMLOADRESOURCE** E \‘c’İ,đŽw,³,È,,Ä,İ,È,ç,È,ĸ B

#### D3DRMLOAD\_FROMMEMORY

f f,fŠ,©,çf [fh,·,é B,±,İftf%ofO,đŽw’è,µ,½ ê ± A**Load** f\fbfh,İĖÄ,Ñ o,µ,İlpvObjSource fİf%of [f^,İ **AD3DRMLOADMEMORY** \‘c’İ,đŽw,³,È,,Ä,İ,È,ç,È,ĸ B

#### D3DRMLOAD\_FROMSTREAM

fXfgfŠ [fĖ,©,çf [fh,·,é B

### Ž-•ÊŽqİf%ofO

#### D3DRMLOAD\_BYNAME

Žw’è,³,ê,½-¼‘O,đŽg—p,µ,ÄfİfufWfFfNfg,đf [fh,·,é B

#### D3DRMLOAD\_BYPOSITION

—  
^!,ç,ê,½ A0,©,çŽn,Ü,éÊ’u,É AfXf^f“fh EfAf f“,İfİfufWfFfNfg,đf [fh,·,é i,Ä,Ü,è Aİfİf@fCf<‘İ,İn”Ô— Ü,İfİfufWfFfNfg,đf [fh,·,é j BfXf^f“fh EfAf f“,İfİfufWfFfNfg,İ¼,İfİfufWfFfNfg,đŠÜ,İ,± ,Æ,ª,Ä,«,é,ª A¼,İfİfufWfFfNfg,ÉŠÜ,Ü,é,é,±,Æ,İ,È,ĸ B

#### D3DRMLOAD\_BYGUID

Žw’è,³,ê,½fOf [fof< Efİfj [fNŽ-•ÊŽq iGUID j,đŽg—p,µ,ÄfİfufWfFfNfg,đf [fh,·,é B

#### D3DRMLOAD\_FIRST

,±,ê,İffİfİfHf<fg Ý’è,Ä, ,é B—  
^!,ç,ê,½fAfCfV,İfXf^f“fh EfAf f“,İfİfufWfFfNfg,đf [fh,·,é i,½,Æ,İ,İ AfAfVfŠfP [fVfİf“,“**IDirect3DRMMeshBuilder::Load**,đĖÄ,Ñ o,· ê ±,İf fbİfVf...  
,đf [fh,·,é j BfXf^f“fh EfAf f“,İfİfufWfFfNfg,İ¼,İfİfufWfFfNfg,đŠÜ,İ,± ,Æ,ª,Ä,«,é,ª A¼,İfİfufWfFfNfg,ÉŠÜ,Ü,é,é,±,Æ,İ,È,ĸ B

### fCf“fXf^f“fX Eftf%ofO

#### D3DRMLOAD\_INSTANCEBYREFERENCE

Žw’è,³,ê,½-¼‘O,Æ“—,İ-¼‘O,İfİfufWfFfNfg,ª“Ÿ Ý,·,é,©,Ç,ª  
,©,đf`fFfbfN,·,é Bª“Ÿ Ý,·,é ê ± A V,µ,ĸfİfufWfFfNfg,đ İ ¬,·,éª,İ,è,É A,»,İfİfufWfFfNfg,İfCf“fXf^f“f X,đŽg—p,·,é B

#### D3DRMLOAD\_INSTANCEBYCOPYING

Žw’è,³,ê,½-¼‘O,Æ“—,İ-¼‘O,İfİfufWfFfNfg,ª“Ÿ Ý,·,é,©,Ç,ª  
,©,đf`fFfbfN,·,é Bª“Ÿ Ý,·,é ê ± A V,µ,ĸfİfufWfFfNfg,đ İ ¬,·,éª,İ,è,É A,»,İfİfufWfFfNfg,đfRfs [,·,é B

Še**Load** f\fbfh,İ AlpvObjSourcefİf%of [f^,đŽg—  
p,µ,ÄfİfufWfFfNfg,İf\ [fX,đŽw’è,µ AlpvObjİfİf%of [f^,É,æ,Ä,ÄfİfufWfFfNfg,đŽ-•Ê,·,é BfVfXfefĖ  
,İf\ [fX Eftf%ofO,İ‘İđ,ÉŠİ,Ä,ĸ,ÄlpvObjSourcefİf%of [f^,đ%đŽİ,·,é B,»,µ,Ä AŽ-•ÊŽqİf%ofO,İ‘İđ,ÉŠİ,Ä,ĸ  
,ÄlpvObjİfİf%of [f^,İ“à—e,đ%đŽİ,·,é B

fCf“fXf^f“fX Eftf%oO,Í Afpf%of [f^,ì%ođŽß•û–  
@,É,Í%o½,à•Ĭ X,ð%oÁ,,È,¢ BD3DRMLOAD\_INSTANCEBYREFERENCEftf%oO,đ—p,¢  
,é,Æ A V,μ,¢fIfufWfFfNfg,đ ì ¬,·,é,±,Æ,È,“¬,¶ftf@fCf<,đ2%oñf [fh,·,é,±,Æ,<sup>a</sup>,Å,«,é BfIfufWfFfNfg,<sup>a</sup>–  
¼‘O,đŽ ,Á,Ä,¢  
,È,¢ ê ‡ AD3DRMLOAD\_INSTANCEBYREFERENCEftf%oO,đfZfbfg,·,é,Æ AD3DRMLOAD\_INSTANCEBYCOPY  
INGftf%oO,đfZfbfg,μ,½,Æ,«,Æ“¬,¶Eø%oÊ,đ“¾,é,±,Æ,<sup>a</sup>,Å,«,é Bf [f\_,Í A“^ê,ìfIfufWfFfNfg,<sup>a</sup>¶ Ý,μ,Ä,à AŠe–  
¼‘O,È,μfIfufWfFfNfg,đ V,μ,¢fIfufWfFfNfg,Æ,μ,Ä ì ¬,·,é B

## D3DRMMAPPING

```
typedef DWORD D3DRMMAPPING, D3DRMMAPPINGFLAG;  
static const D3DRMMAPPINGFLAG D3DRMMAP_WRAPU = 1;  
static const D3DRMMAPPINGFLAG D3DRMMAP_WRAPV = 2;  
static const D3DRMMAPPINGFLAG D3DRMMAP_PERSPCORRECT = 4;
```

*fe*fNfXf`ff, ðfOf< [fv, Ö, ðf}fbfsf“fO•û–  
@, ð'è<, ·, é'l **IDirect3DRMMesh::GetGroupMapping, âIDirect3DRMMesh::SetGroupMapping** f\fbfh, É, æ, Á, Ä—  
p, Ç, ç, è, é B

## D3DRMMAPPINGFLAG

**D3DRMMAPPING**, ÆÆ^, æ<–, ¶ B

## D3DRMMAP\_WRAPU

u•ûÆü, ÉfeNfXf`ff, ðf%ofbfv, ·, é B

## D3DRMMAP\_WRAPV

v•ûÆü, ÉfeNfXf`ff, ðf%ofbfv, ·, é B

## D3DRMMAP\_PERSPCORRECT

*fe*fNfXf`ff Ef%ofbfsf“fO, Í%o“<ß•â ³,³, è, é B

D3DRMMAP\_WRAPU, ÆD3DRMMAP\_WRAPVftf%ofO, Í Af%ofXf^f%ofCfU, <sup>a</sup>feNfXf`ff À•W, ð%oðŽß, ·, é•û–  
@, ðÆ^è, ·, é Bf%ofXf^f%ofCfU, Í, Ä, È, É AfeNfXf`ff À•W, Ä Ä, à'Z, Ç<—£ A, Ä, Ü, è'¼ ü, ð•âŠ@, ·, é B, ±  
, ð'¼ ü, ðpfX, Æ Au, ", æ, Ñv Ä•W, ð—LÆø'l, Í Af%ofbfsf“fO Eftf%ofO, ðŽg, Ç•û, É, æ, Á, Ä^Ü, È, é B^ê•û, Ü, ½, Í—  
¼•û, ðftf%ofO, <sup>a</sup>fZfbfg, ³, è, é, Æ A'¼ ü, Íu, Ü, ½, Ív•ûÆü, ðfeNfXf`ff, ð•Ö, ðf%ofbfv EfAf%ofEf“fh, ·, é B, ±  
, ð ê ± AfeNfXf`ff, Í%o~'Æ ó, ©fh [fifc ã, ðÊ•Š, ðŽ , Ä, Ä, Ç, é, ©, ð, æ, ¢, ÉÆ©, , é B Ú ×, É, Ä, Ç  
, Ä, Í uIDirect3DRMWrapfCf“f^ [ftfEfCfX v, ðŽQ Æ, ·, é, ±, Æ B

ŽQ Æ @IDirect3DRMWrapfCf“f^ [ftfEfCfX, **IDirect3DRMMesh::GetGroupMapping,**  
**IDirect3DRMMesh::SetGroupMapping**

D3DRMMATRIX4D

typedef D3DVALUE D3DRMMATRIX4D[4][4];

•İŠ·,đ s—ñ,Æ,µ,Ä•\,· B s—ñfGf“fgfŠ,Í AD3DRMMATRIX4D[row][column],©,ç \ ¬,³,ê,é B

ŽQ Æ @IDirect3DRMFrame::AddTransform, IDirect3DRMFrame::GetTransform

## D3DRMSAVEOPTIONS

```
typedef DWORD D3DRMSAVEOPTIONS;  
#define D3DRMXOFSAVE_NORMALS 1  
#define D3DRMXOFSAVE_TEXTURECOORDINATES 2  
#define D3DRMXOFSAVE_MATERIALS 4  
#define D3DRMXOFSAVE_TEXTURENAMES 8  
#define D3DRMXOFSAVE_ALL 15  
#define D3DRMXOFSAVE_TEMPLATES 16
```

**IDirect3DRMMeshBuilder::Save** *f\bfbh,lIfIvfVf‡f“,ð’è<’,,é B*

### D3DRMXOFSAVE\_NORMALS

Šî-{"I,È-Ê,É%oÁ,| A-@ üfxfNfgf<,ð•Û‘¶,.,é B

### D3DRMXOFSAVE\_TEXTURECOORDINATES

Šî-{"I,È-Ê,É%oÁ,| AfefNfXf`ff À•W,ð•Û‘¶,.,é B

### D3DRMXOFSAVE\_MATERIALS

Šî-{"I,È-Ê,É%oÁ,| Af}fefŠfAf<,ð•Û‘¶,.,é B

### D3DRMXOFSAVE\_TEXTURENAMES

Šî-{"I,È-Ê,É%oÁ,| AfefNfXf`ff,l-¼‘O,ð•Û‘¶,.,é B

### D3DRMXOFSAVE\_ALL

Šî-{"I,È-Ê,É%oÁ,| A-@ üfxfNfgf< AfefNfXf`ff À•W Af}fefŠfAf< AfefNfXf`ff,l-¼‘O,ð•Û‘¶,.,é B

### D3DRMXOFSAVE\_TEMPLATES

ftf@fCf<,lIfef“fvfŒ [fg,ð•Û‘¶,.,é BffftfHf<fg,Å,lIfef“fvfŒ [fg,l•Û‘¶,³,è,È,¢ B



•Ô¹

Direct3D•ŮŽ f, [fh,İfRf“f] [flf“fg EfIfufWfFfNfg Ef,ffƒ< iCOM j  
fCf“f^ [ftfFfCfX Ef f\fbfh,İ AŽŸ,İ¹,ð•Ö,· B

D3DRM\_OK

¬Œ÷ B

D3DRMERR\_BADALLOC

f f,fŠ•s‘« B

D3DRMERR\_BADDEVICE

fffofCfX,İfŒf“f\_f%o [,ÆŒŸŠ· «,ª,È,Œ B

D3DRMERR\_BADFILE

ff [f^ftf@fCf<,ª•s ³ B

D3DRMERR\_BADMAJORVERSION

DLL,İf fWff [ Efo [fWf‡f“,ª•s ³ B

D3DRMERR\_BADMINORVERSION

DLL,İf}fCfi [ Efo [fWf‡f“,ª•s ³ B

D3DRMERR\_BADOBJECT

^ø ”,É,İfIfufWfFfNfg,ª•K—v B

D3DRMERR\_BADTYPE

•s ³,ÈŒ^,İ^ø ”,ª“n,³,ê,½ B

D3DRMERR\_BADVALUE

•s ³,È¹l,İ^ø ”,ª“n,³,ê,½ B

D3DRMERR\_FACEUSED

—Ê,İf fbfVf... ã,ÅŽg—p İ,Ÿ,Å, ,é B

D3DRMERR\_FILENOTFOUND

ftf@fCf<,ðŠJ,,±,Æ,ª,Å,«,È,Œ B

D3DRMERR\_NOTDONEYET

ŽÀ‘,³,ê,Å,Œ,È,Œ B

D3DRMERR\_NOTFOUND

Žw’è,³,ê,½•½—Ê,ÉfIfufWfFfNfg,ªŒ©,Å,©,ç,È,Œ B

D3DRMERR\_UNABLETOEXECUTE

fvf fV [fWff,ðŽÀ s,Å,«,È,Œ B

D3DDivide

D3DDivide(a, b) (float)((double) (a) / (double) (b))

œŽZ,đ s,▯ B

Š,,èŽZ,Ì ▯,đ•Ô,· B

a<sup>▯</sup>b

Ž®,ì••ê,Æ••Žq B

ŽQ Æ @D3DMultiply

D3DMultiply

D3DMultiply(a, b) ((a) \* (b))

æŽZ,ð s,▯ B

2'l,ì Ī,ð•Ô,· B

*a<sup>▯</sup>b* Š|,¯ ‡,í,<sup>3</sup>,ê,é'l B

ŽQ Æ @**D3DDivide**

D3DRGB

```
D3DRGB(r, g, b) \
    (0xff000000L | ( ((long)((r) * 255)) << 16) | \
    (((long)((g) * 255)) << 8) | (long)((b) * 255))
```

RGB →<sup>a</sup>l,đ F,l,É•řŠ·,·,é B

RGB →<sup>a</sup>l,đD3DCOLOR’l,É•řŠ·,·,é B

*r, g, b*  
F,l Ô(red) A—Î(green),,æ,Ň Â(blue),l—v‘f B,±,ê,ç,l’l,Í A0,©,ç1,ì”Í’Í,l•,“® ¬ ”“\_E^,Â, ,é B

ŽQ Æ @D3DRGBA

## D3DRGBA

```
D3DRGBA(r, g, b, a) \  
    (((long)((a) * 255)) << 24) | (((long)((r) * 255)) << 16) |  
    (((long)((g) * 255)) << 8) | (long)((b) * 255))
```

RGBA →<sup>a</sup>l,đ F,l,É•İŠ·,·,é B

RGBA →<sup>a</sup>l,đD3DCOLOR’l,É•İŠ·,·,é B

$r, g, b, a$   
F,İ Ö(red) A—İ(green) A Â(blue),,æ,ŃfAƒ<ftf@ (alpha),İ—v‘f B

ŽQ Æ @D3DRGB

## D3DSTATE\_OVERRIDE

D3DSTATE\_OVERRIDE(type) ((DWORD) (type) + D3DSTATE\_OVERRIDE\_BIAS)

f%ofXf^•İŠ· Af%ofCfefBf“fO A•İŠ·f,fWf...

[f<,İ ó‘Ô,ðfI [fo [f%ofCfh,·,é BfAfvfŠfP [fVf‡f“,Í A ó‘Ô,İf fbfN,Æ%oð æ,ð,±,İf}fNf ,Å s,±,Æ,ª,Å,«,é B

•Ô’l,Í,È,¢ B

type

fI [fo [f%ofCfh,İ ó‘Ô B,±,İfpf%of [f^,İD3DTRANSFORMSTATETYPE AD3DLIGHTSTATETYPE A  
D3DRENDERSTATETYPE ¤^,İf f“fo,İ,Đ,Æ,Â,Â, ,é B

,½,Æ,İ,İ ASTATE\_DATAf}fNf (DirectX SDK,İfTf“fvf<fR [fh,İMisc/D3dmacs.hftf@fCf<,Â’è<’)

,ðŽg,¢ AD3DSTATE\_OVERRIDE,ÂD3DRENDERSTATE\_SHADEMODE,İf¤f“f\_Šf“fO,İ ó‘Ô,İf fbfN,Æ%oð æ,ð s  
,ª B

// -¾“xf, [fh,ðf fbfN

STATE\_DATA(D3DSTATE\_OVERRIDE(D3DRENDERSTATE\_SHADEMODE), TRUE, lpBuffer);

// fŠ [fhfIf“fŠ [,Å,È,¢,Æ,« A-¾“xf, [fh,ðŽÀ s,µf fbfN%oð æ,·,é

STATE\_DATA(D3DSTATE\_OVERRIDE(D3DRENDERSTATE\_SHADEMODE), FALSE, lpBuffer);

f¤f“f\_Šf“fO,İ ó‘Ô,İfI [fo [f%ofCfh,É,Â,¢

,Â,İ Ú ×,Í A ufXfe [fg,ÆfXfe [fg EfI [fo [f%ofCfh v,ðŽQ Æ,·,é,±,Æ B

**D3DVAL**

D3DVAL(val) ((float)val)

**D3DVALUE**( $\epsilon^{\wedge}$ ,l',É•İŠ·,·,é B

•İŠ· $\epsilon^{\wedge}$ ã,l',ð•Ô,· B

*val*

•İŠ·,<sup>3</sup>,ê,é'l B

ŽQ Æ @**D3DVALP**

D3DVALP

D3DVALP(val, prec) ((float)val)

,“x,ǒ•ĭŠ·,·,é B

•ĭŠ·Ĉĕã,ĭ'l,ǒ•Ô,· B

val

•ĭŠ·,<sup>3</sup>,ê,é'l B

prec

−<sup>3</sup>Ĉ∅ B

D3DVALf}fNf ,ĭ ,“x,ĭ A'l,ĭ ¬ ”•”•<sup>a</sup>,É‘Î,μ16frfbfg,Â, ,é B

ŽQ Æ @D3DVAL



**RGB\_GETBLUE**

RGB\_GETBLUE(rgb)      ((rgb) & 0xff)

**D3DCOLOR** 'l,©,ç    Â    Ñª,ðŽæ,è o,·    B

Â    Ñª,ð•Ô,·    B

*rgb*    Â    Ñª,ðŽæ,è o,·    F,ÌD3DCOLOR'l    B

**RGB\_GETGREEN**

```
RGB_GETGREEN(rgb)      (((rgb) >> 8) & 0xff)
```

**D3DCOLOR**'l,©,ç—Ĥ ¬•ª,ðŽæ,è o,· B

```
—Ĥ ¬•ª,ð•Ô,· B
```

*rgb*

```
—Ĥ ¬•ª,ðŽæ,è o,· F,ìD3DCOLOR'l B
```

**RGB\_GETRED**

```
RGB_GETRED(rgb)      (((rgb) >> 16) & 0xff)
```

**D3DCOLOR**'l,©,ç Ô ¬•ª,ðŽæ,è o,· B

Ô ¬•ª,ð•Ô,· B

*rgb*

Ô ¬•ª,ðŽæ,è o,· F,ÌD3DCOLOR'l B

**RGB\_MAKE**

RGB\_MAKE (r, g, b) ((D3DCOLOR) (((r) << 16) | ((g) << 8) | (b)))

¬•'l,©,çRGB F,ð ì ¬,·,é B

F,ì'l,ð•Ô,· B

r,g,b  
ì ¬,³,ê,é F,ì Ô A—Î A Â,ì—v'f B'l,ì"ÍÍ,Í0,©,ç255 B

**RGB\_TORGBA**

RGB\_TORGBA(rgb) ((D3DCOLOR) ((rgb) | 0xff000000))

RGB ǀ•'l,©,çRGBA F,đ ì ǀ,·,é B

RGBA F,đ•Ô,· B

*rgb*

RGBA F,É•İŠ·,·,éRGB F B

ŽQ Æ @**RGBA\_TORGB**

## RGBA\_GETALPHA

RGBA\_GETALPHA(rgb) ((rgb) >> 24)

RGBA, İD3DCOLOR'l,æ,èfAf<ftf@ ¬•ª,ðŽæ,è o,· B  
fAf<ftf@ ¬•ªl,ð•Ô,· B

*rgb*  
fAf<ftf@ ¬•ª,ðŽæ,è o,· F,İD3DCOLOR'l B

**RGBA\_GETBLUE**

RGB\_GETBLUE(rgb)      ((rgb) & 0xff)

RGBA, ID3DCOLOR'l,æ,è    Â    Ñª,ðŽæ,è o,· B  
Â    Ñª'l,ð•Ô,· B

*rgb*    Â    Ñª,ðŽæ,è o,· F, ID3DCOLOR'l B

## RGBA\_GETGREEN

```
RGB_GETGREEN(rgb)      (((rgb) >> 8) & 0xff)
```

RGBA, 3DCOLOR'l,æ,è—Î ¬•ª,ðŽæ,è o,· B

—Î ¬•ª'l,ð•Ô,· B

*rgb*

—Î ¬•ª,ðŽæ,è o,· F,Î3DCOLOR'l B



## RGBA\_GETRED

```
RGB_GETRED(rgb)      (((rgb) >> 16) & 0xff)
```

RGBA, 3DCOLOR'l,æ,è Ô ¬ª,ðŽæ,è o,· B

Ô ¬ª'l,ð•Ô,· B

*rgb*

Ô ¬ª,ðŽæ,è o,· F, 3DCOLOR'l B

**RGBA\_MAKE**

```
RGBA_MAKE(r, g, b, a) \
  ((D3DCOLOR) (((a) << 24) | ((r) << 16) | ((g) << 8) | (b)))
```

Ô A—Î A Â AfAf<ftf@ ¬•ª'l,æ,è ARGBA,ìD3DCOLOR'l,ð ì ¬,;é B  
F,ð•Ô,· B

r, g, b, a  
ì ¬,³,ê,éRGBA F,ì Ô A—Î A Â AfAf<ftf@ ¬•ª'l B

**RGBA\_SETALPHA**

RGBA\_SETALPHA(rgba, x) ((x) << 24) | ((rgba) & 0x00ffffff)

RGBA, **3DCOLOR**’l,ÉfAf<ftf@ ¬•ª,ð Ý’è,·,é B

fAf<ftf@ ¬•ª¹l,ª Ý’è,³,ê,½RGBA F,ð•Ô,· B

*rgba*

fAf<ftf@ ¬•ª¹l,ª Ý’è,³,ê,éRGBA F B

*x*

Ý’è,·,éfAf<ftf@ ¬•ª¹l B

**RGBA\_TORGB**

RGBA\_TORGB(rgba) ((D3DCOLOR) ((rgba) & 0xffffffff))

RGBA, **D3DCOLOR** 7•ª¹l,©,çfAf<ftf@ 7•ª,ð æ,¢,Ä ARGB, **D3DCOLOR** 'l,ð ì 7,·,é B

RGB F,ð•Ô,· B

*rgba*

RGB F,É•İŠ,·,éRGBA F B

ŽQ Æ @ **RGB\_TORGBA**

***f*R [f<fofbfNŠÖ ”**

## D3DENUMDEVICESCALLBACK

```
typedef HRESULT (FAR PASCAL * LPD3DENUMDEVICESCALLBACK)  
(LPGUID lpGuid, LPSTR lpDeviceDescription,  
 LPSTR lpDeviceName, LPD3DDEVICEDESC lpD3DHWDeviceDesc,  
 LPD3DDEVICEDESC lpD3DHELDeviceDesc, LPVOID lpUserArg);
```

```
fCf“fXfg [f<,3,ê,Ä,¢,éDirect3DffofCfX,ð—ñ<“,.,éfR [f<fofbfNŠÖ ”,ìfvf fgf^fCfv`è<` B  
 fAfvfŠfP [fVf‡f“,Í A^È%°,ì'l,ì,¢,,ê,©,ð•Ö,· B  
 D3DENUMRET_CANCEL  
 —ñ<“,ð'†Ž~,.,é B
```

```
 D3DENUMRET_OK  
 —ñ<“,ðŒp‘±,.,é B
```

```
lpGuid  
 fOf [fof< Ef†fj [fNŽ¯•ÊŽq(GUID),Ö,ìf|fCf“f^ B
```

```
lpDeviceDescription  
 fffofCfX,ì’ Žß,Ö,ìf|fCf“f^ B
```

```
lpDeviceName  
 fffofCfX→¼,Ö,ìf|fCf“f^ B
```

```
lpD3DHWDeviceDesc  
 Direct3DffofCfX Efn [fhfEfFfA î•ñ,ìD3DDEVICEDESC \‘¢‘ì,Ö,ìf|fCf“f^ B
```

```
lpD3DHELDeviceDesc  
 Direct3DffofCfX EfGf~f...fŒ [fVf‡f“ î•ñ,ìD3DDEVICEDESC \‘¢‘ì,Ö,ìf|fCf“f^ B
```

```
lpUserArg  
 ,±,ìfR [f<fofbfNŠÖ ”,É“n,3,ê,éAfvfŠfP [fVf‡f“`è<`f [f^,Ö,ìf|fCf“f^ B
```

```
fR [f<fofbfNŠÖ ”,ðŒÄ,Ñ o,· ‡ ~,ðŒ~`è,.,é,Æ,« AfVfXfef€,Í Ä %  
,É Ä,à ,,¢ŠK‘w,ìflfufWfFfNfg,ðŒŸ ò,μ,Ä AŽŸ,É,»,ê,ç,a ì ¬,3,ê,½ ‡ ~,ÄfR [f<fofbfNŠÖ ”,ðŒÄ,Ñ o,· B
```

### D3DENUMTEXTUREFORMATSCALLBACK

```
typedef HRESULT (WINAPI* LPD3DENUMTEXTUREFORMATSCALLBACK)  
(LPDDSURFACEDESC lpDdsd, LPVOID lpUserArg);
```

*fefNfXf`ff EftfH [f}fbfg,ð—ñ<“,;éfR [f<fofbfNŠÖ ”,lfvf fgf^fCfv’è<` B*

*lpDdsd*  
*fefNfXf`ff î•ñ,ðŠÜ,ðDirectDrawSurfaceIfufWfFfNfg,Ö,lf|fCf“f^ B*

*lpUserArg*  
*,±,lfR [f<fofbfNŠÖ ”,É“n,<sup>3</sup>,ê,éAfvfŠfP [fVf±f“’è<`f [f^,Ö,lf|fCf“f^ B*

*fR [f<fofbfNŠÖ ”,ðĖÄ,Ñ o,· ± ~,ðĖ~’è,.,é,Æ,« AfVfXfef€,Í Ä %<sub>o</sub>*  
*,É Ä,à ,,čŠK’w,lfIfufWfFfNfg,ðĖŸ ò,μ,Ä AŽŸ,É,»,ê,ç,<sup>a</sup> ì ¬,<sup>3</sup>,ê,½ ± ~,ÄfR [f<fofbfNŠÖ ”,ðĖÄ,Ñ o,· B*

## D3DVALIDATECALLBACK

```
typedef HRESULT (WINAPI* LPD3DVALIDATECALLBACK)  
(LPVOID lpUserArg, DWORD dwOffset);
```

*fAfvfŠfP [fVf‡f“<sup>a</sup> AIDirect3DExecuteBuffer::Validatef f\fbfh,ðĖÄ,Ñ o,·,Æ,«,É—  
^,!,ç,ê,éfAfvfŠfP [fVf‡f“”è`fR [f<fofbfNŠÖ ”,Ä, ,é B,±  
,İf f\fbfh,Æ,Í AfGf%o [,ðĖŸ o,μ,½,Æ,«,ÉŽÀ sfobftf@,İf`fFfbfN,âfobftf@,İfİftfZfbfg,ð•Ö,·fffofbfO Ef<  
[f`f“,Ä, ,é B*

*lpUserArg  
,±,İfR [f<fofbfNŠÖ ”,É“n,<sup>3</sup>,ê,éfAfvfŠfP [fVf‡f“”è`ff [f^,Ö,İf|fCf“f^ B*

*dwOffset  
fVfXfef€,ªGf%o [,ðĖŸ o,μ,½ŽÀ sfobftf@,İfİftfZfbfg B*

*fR [f<fofbfNŠÖ ”,ðĖÄ,Ñ o,· ‡ ~,ðĖ”è,·,é,Æ,« AfVfXfef€,Í Ä %o  
,É Ä,à ,,çŠK’w,İfİfufWfFfNfg,ðĖŸ ò,μ,Ä AŽŸ,É,»,ê,ç,<sup>a</sup> ì ¬,<sup>3</sup>,ê,½ ‡ ~,ÄfR [f<fofbfNŠÖ ”,ðĖÄ,Ñ o,· B*



## IDirect3D

**IDirect3D***fCf“f^ [ftfFfCfX,lf f\fbfh,ðŽg,▣,Æ A*Direct3D*fIfufWfFfNfg,ð ì ¬,μ,½,è AŠÂ<< Ý’è,μ,½,è,·,é,± ,E,<sup>a</sup>,Â,«,é B,±,ì ß,Â,Í A***IDirect3D***fCf“f^ [ftfFfCfX,lf f\fbfh,É,Â,¢,Â à–¾,·,é BŠT—<sup>a</sup>,É,Â,¢ ,Â,Í A u**Direct3DfCf“f^ [ftfFfCfX**v,ðŽQ Æ,·,é,±,Æ B*

**IDirect3D***fCf“f^ [ftfFfCfX,lf f\fbfh,Í AŽŸ,lfOf< [fv,©,ç,È,é B*

¶ ¬

**CreateLight**

**CreateMaterial**

**CreateViewport**

—ñ<“

**EnumDevices**

%oŠú%o»

**FindDevice**

**Initialize**

**IDirect3D***fCf“f^ [ftfFfCfX,Í A,·,×,Ä,ì COM fCf“f^ [ftfFfCfX,ì,æ,▣,É A**Unknown**fCf“f^ [ftfFfCfX Ef f\fbfh,ðŒp <sup>3</sup>,·,é B***IUnknown***fCf“f^ [ftfFfCfX,<sup>a</sup>fTf| [fg,·,éf f\fbfh,Í AŽŸ,ì’Ê,è B*

**AddRef**

**QueryInterface**

**Release**

## IDirect3D::CreateLight

```
HRESULT CreateLight(LPDIRECT3DLIGHT* lplpDirect3DLight,  
    IUnknown* pUnkOuter);
```

Direct3DLightIfufWfFfNfg,đŠ,,è“–,Ä,é B,±,ÌfIfufWfFfNfg,Í AIDirect3DViewport::AddLight f\fbfh,đŽg,□  
,Æftrf... [f] [fg,ÆÆ< ‡,·,é,±,Æ,a,Ä,«,é B

–Æ÷,·,ê,ÎD3D\_OK AŽ,”s,·,ê,Î AŽŸ,Ì'l,Ì,¢,,ê,©,đ•Ô,· B

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

lplpDirect3DLight

–Æ÷,·,ê,Î AIDirect3DLightfCf“f^ [ftfFfCfX,Ö,Ìf|fCf“f^,a Ý’è,³,ê,éf|fCf“f^ B

pUnkOuter

,±,Ìfpf%of [f^,ÍCOM W –%»«@”,Æ «—^ ACEÝŠ· «,đŽæ,é,½,ß,Ì,à,Ì,Ä, ,é

BIDirect3D::CreateLightf f\fbfh,Í,±,Ìfpf%of [f^,aNULL^ÈŠO,Ì,Æ,«fGf% [,đ•Ô,· B

**IDirect3D::CreateMaterial**

HRESULT CreateMaterial(LPDIRECT3DMATERIAL\* lplpDirect3DMaterial,  
IUnknown\* pUnkOuter);

Direct3DMaterialIfufWfFfNfg,đŠ,,è“–,Ä,é B

¬Œ÷,·,ê,Î AD3D\_OK,đ•Ô,· B•Ô'l,îê——,Í A uDirect3D'¼ Úf, [fh,İ•Ô'l v,đŽQ Æ,·,é,±,Æ B

lplpDirect3DMaterial

ŒÄ,Ñ o,µ,É ¬Œ÷,·,ê,Î ADirect3DMaterial fCf“f^ [ftfFfCfX,Ö,ìf|fCf“f^,ìfAfhfŒfX B

pUnkOuter

,±,ìfpf%of [f^,Í ACOM‘S‘İ,đ «—^ AŠg’£,·,é,½,ß,İ,à,İ,Ä, ,é B**IDirect3D::CreateMaterial** f\fbfh,Í A,±  
,ìfpf%of [f^,“NULL`ÈŠO,İ,Æ,«fGf%o [,đ•Ô,· B

## IDirect3D::CreateViewport

```
HRESULT CreateViewport(LPDIRECT3DVIEWPORT* lpD3DViewport,  
    IUnknown* pUnkOuter);
```

Direct3DViewportIfufWfFfNfg,đ ¶ ¬,·,é B,±,İrf... [f] [fg,İ AIDirect3DDevice::AddViewport f\fbfh,ÅŽg—  
p,<sup>3</sup>,ê,éDirect3DffofCfXfIfufWfFfNfg,ÆÆ< ‡,<sup>3</sup>,ê,é B

¬Æ÷,·,ê,İD3D\_OK AŽ,”s,·,ê,İ AŽŸ,İ'l,İ,¢,,ê,©,đ•Ô,· B

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

lpD3DViewport

ÆÄ,Ñ o,μ,É ¬Æ÷,·,ê,İ AIDirect3DViewport fCf“f^ [ftfFfCfX,Ö,İf|fCf“f^,İfAfhfÆfX B

pUnkOuter

,±,İfpf%of [f^,İ ACOM‘S‘İ,đ «—^ AŠg’£,·,é,½,ß,İ,à,İ,Å, ,é BIDirect3D::CreateViewport f\fbfh,İ A,±  
,İfpf%of [f^,“NULL^ÈŠO,İ,Æ,«fGf%o [,đ•Ô,· B

## IDirect3D::EnumDevices

```
HRESULT EnumDevices(LPD3DENUMDEVICESCALLBACK lpEnumDevicesCallback,  
    LPVOID lpUserArg);
```

*fVfXfef€*,É*fCf*“*fXfg* [*f*◁,<sup>3</sup>ê,Ä,¢,éDirect3DffofCfX Efhf%ofCfo,·,×,Ä,ð—ñ◁“,·,é B

¬Œ÷,·,ê,ÎD3D\_OK AŽ,”s,·,ê,Î AŽŸ,Ì'l,Ì,¢,,ê,©,ð•Ô,· B

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

*lpEnumDevicesCallback*

ŒŸ o,<sup>3</sup>ê,é,½,Ñ,ÉŒÄ,Ñ o,<sup>3</sup>ê,é—ñ◁“ ^— ,îD3DENUMDEVICESCALLBACK fR [*f*◁fofbfNŠÖ ”,Ö,Ìf|  
*fCf*“*f*^ B

*lpUserArg*

fR [*f*◁fofbfNŠÖ ”,É“n,·fAfvfŠfP [*fVf*‡*f*“è◁`ff [*f*^,Ö,Ìf|fCf“*f*^ B

## IDirect3D::FindDevice

```
HRESULT FindDevice(LPD3DFINDDEVICESEARCH lpD3DFDS,  
    LPD3DFINDDEVICERESULT lpD3DFDR);
```

Žw'è,³,ê,½ «ŽĹ,ĭfffofCfX,đĚŸ o,μ A,»,Ĭ ĩ•ñ,đŽæ“¾,·,é B

¬Ě÷,·,ê,ĬD3D\_OK,ª•Ô,³,ê,é B•Ô'l,É,Â,¢,Ă,Í A uDirect3D'¼ Úf, [fh,ĭ•Ô'] v,đŽQ Æ,·,é,±,Æ B

lpD3DFDS

Žæ“¾,·,éfffofCfX,đŽĭ,·**D3DFINDDEVICESEARCH** \‘¢‘Ĭ,ĭf|fCf“f^ B

lpD3DFDR

ĚŸ oŽž,ÉfffofCfX,đŽĭ,·**D3DFINDDEVICERESULT** \‘¢‘Ĭ,ĭf|fCf“f^ B

**IDirect3D::Initialize**

HRESULT Initialize (REFIID lpREFIID);

,±,ìf f\fbfh,Í ACOMfvf fgfRf<,ÌêŠÑ «,ð•Û,Â,½,ß,ì,à,ì,Â, ,é B

Direct3DfIfufWfFfNfg,<sup>a</sup> ¶ ¬,³,ê,é,Æ,«,É %oŠú%o»,³,ê,é,½,ß ADDERR\_ALREADYINITIALIZED,ð•Ô,· B

lpREFIID

f†fjfo [fTf< Ef†fj [fNŽ<sup>-</sup>•ÊŽq(UUID),Ö,ìf|fCf“f^,ð•Ô,· B

## IDirect3DDevice

**IDirect3DDevice** fCf“f^ [ftFfCfX,lf f\fbfh,ðŽg,□,Æ ADirect3DfIfufWfFfNfg,ì”\—  
Í,ð%ñ•æ,μ,½,è Ý’è,μ,½,è,·,é,±,Æ,ª,Ä,«,é B,±,İ ß,Ä,Í A**IDirect3DDevice** fCf“f^ [ftFfCfX,lf f\fbfh,É,Â,¢,Ä à–  
¼,·,é BŠT—ª,É,Â,¢,Ä,Í A u**IDirect3DDevice** fCf“f^ [ftFfCfX v,ðŽQ Æ,·,é,±,Æ B

**IDirect3DDevice** fCf“f^ [ftFfCfX,lf f\fbfh,Í AŽŸ,ìfOf< [fv,©,ç,È,é B

ŽÀ s **CreateExecuteBuffer**  
**Execute**

îñ **EnumTextureFormats**  
**GetCaps**  
**GetDirect3D**  
**GetPickRecords**  
**GetStats**

”z—ñ **CreateMatrix**  
**DeleteMatrix**  
**GetMatrix**  
**SetMatrix**

,»,ì¼ **Initialize**  
**Pick**  
**SwapTextureHandles**

fV [f“ **BeginScene**  
**EndScene**

frf... [f| [fg **AddViewport**  
**DeleteViewport**  
**NextViewport**

**IDirect3DDevice** fCf“f^ [ftFfCfX,Í A,·,×,Ä,ì COM fCf“f^ [ftFfCfX,Æ““, A Unknown  
fCf“f^ [ftFfCfX Ef f\fbfh,ðEp ³,·,é B **IUnknown** fCf“f^ [ftFfCfX,ªfTf| [fg,·,éf f\fbfh,Í AŽŸ,ì’È,è B

**AddRef**

**QueryInterface**

**Release**

Direct3DDevicefIfufWfFfNfg,Í A3D%æ–  
Ê,Æ,μ,Ä ¶ ¬,³,è,½DirectDrawSurfacefIfufWfFfNfg,©,ç**IDirect3DDevice::QueryInterface**  
f f\fbfh,ð“K Ø,ÉÆÄ,Ñ o,·,±,Æ,ÄŽæ“¼,³,è,é B



**IDirect3DDevice::AddViewport**

```
HRESULT AddViewport(LPDIRECT3DVIEWPORT lpDirect3DViewport);
```

Žw'è,<sup>3</sup>,ê,½fṛf... [f| [fg,đ AfffofCfX,É”z'u,<sup>3</sup>,ê,½fṛf... [f| [fg EfIfufWfFfNfg,İfŠfXfg,É’Ç%oÁ,·,é B  
¬Œ÷,·,ê,İD3D\_OK AŽ,”s,·,ê,Î AŽŸ,İ'l,İ,¢,,ê,©,đ•Ô,· B

**DDERR\_INVALIDOBJECT**  
**DDERR\_INVALIDPARAMS**

```
lpDirect3DViewport  
Direct3DdevicefIfufWfFfNfg,É”z'u,3,ê,½IDirect3DViewportfCf“f^ [ftfFfCfX,Ö,İf|fCf“f^ B
```

**IDirect3DDevice::BeginScene**

HRESULT BeginScene();

fV [f“,ǒŠJŽn,·,é B

¬Œ÷,·,é,ÆD3D\_OK,ǒ•Ô,· B

fAfvfŠfP [fVf‡f“,í•K,, AfŒf“f\_Šf“fO,ìŽÀ s‘O,É,±,ìf f\fbfh,ǒŒĂ,Ň o,·,±,Æ B,Û,½ AfŒf“f\_Šf“fO I—  
‘Žž,É,í A**IDirect3DDevice::EndScene**,ǒŒĂ,Ň o,·,±,Æ B

ŽQ Æ @**IDirect3DDevice::EndScene**

## IDirect3DDevice::CreateExecuteBuffer

```
HRESULT CreateExecuteBuffer(LPDIRECT3DEXECUTEBUFFERDESC lpDesc,  
    LPDIRECT3DEXECUTEBUFFER* lplpDirect3DExecuteBuffer,  
    IUnknown* pUnkOuter);
```

•Ž,ŠfXfg,ÉŽÀ sfofbftf@,đŠ,,è“-Ä,é B,±  
,İfŠfXfg,İ Afñ [fhfEfFA,İDMA,É,æ,èVRAM,É“Ç,Ý ž,Ü,ê,é B’,“\_İfCf“fffbfNfX,đŽ ,Äfobftf@“à,İ,·,×,Ä,İff  
fBfXfvfEfC EfvfŠf~fefBfu,İ A,»,,ê,ç,İ’“\_„đ“-¶fobftf@“à,ÉŽ ,½,È,\_,ê,İ,È,ç,È,¢ B  
-Æ÷,·,ê,İD3D\_OK AŽ,”s,·,ê,İ AŽŸ,İ’l,İ,¢,,ê,©,đ•Ô,· B

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

lpDesc

¶ ¬,³,ê,½Direct3DExecuteBufferIfufWfFfNfg,đŽ!,·D3DEXECUTEBUFFERDESC \‘¢‘İ,Ö,İf|fCf“f^ B,±  
,İfobftf@,İfTfCfY,‘«è,è,fIfufWfFfNfg,ª ¶ ¬,³,ê,È,¢,Æ,«„É,İ AÆÄ,Ñ o,µ,ÉŽ,”s,·,é B

lplpDirect3DExecuteBuffer

V,µ,¢Direct3DExecuteBufferIfufWfFfNfg,Ö,İf|fCf“f^,Ö,İf|fCf“f^ B

pUnkOuter

,±,İfpf%of [f^,İ ACOM‘S‘İ,đ «—^ AŠg’£,·,é,½,ß,İ,à,İ,Ä, ,é BIDirect3DDevice::CreateExecuteBuffer f\fbfh,İ  
A,±,İfpf%of [f^,ªNULL^ÈŠO,İ,Æ,«fGf%o [,đ•Ô,· B

**D3DEXECUTEBUFFERDESC** \‘¢‘İ,İ A ¶ ¬,³,ê,½ŽÀ sfofbftf@,đL q,·,é B ,È,,Æ,àfAfvfŠfP [fVf‡f“,İ A•K  
—v,Æ,³,ê,éTfCfY,đŽw’è,µ,È,\_,ê,İ,È,ç,È,¢ BfAfvfŠfP [fVf‡f“,ª”\—

İf f“fo,İDEBCAPS\_VIDEO\_MEMORY,đŽw’è,·,é,Æ ADirect3D,İ Afrfffi Ef f,fŠ,ÉŽÀ sfofbftf@,đ•ŮŽ ,µ,æ,ª  
,Æ,·,é B

fAfvfŠfP [fVf‡f“,İ**IDirect3DExecuteBuffer::Lock**f f\fbfh,đŽg,ª,Æ Af f,fŠ,İ^Ů“®—v< ,·,é,±,Æ,ª,Ä,«„é B,±  
,İf f\fbfh,ª-ß,Ä,½,Æ,« Af f [f^,ªfVfXfef€ Ef f,fŠ,Ü,½,İfrrfffi Ef f,fŠ,İ,Ç,¿,ç,©,É, ,é,©,đ\  
,·**D3DEXECUTEBUFFERDESC** \‘¢‘İ,İ \ ¬,É ‡,í,¹,ç,ê,é B

## IDirect3DDevice::CreateMatrix

HRESULT CreateMatrix(LPD3DMATRIXHANDLE lpD3DMatHandle);

s—ñ,ð ì ¬,·,é B

¬Æ÷,·,ê,ÎD3D\_OK AŽ,”s,·,ê,Î AŽŸ,Ì'l,ð•Ô,· B

### DDERR\_INVALIDPARAMS

lpD3DMatHandle

ì ¬,³,ê,½ s—ñ,Ìfnf“fhf<•İ ”,Ö,Ìf|fCf“f^ Bfofbftf@,ÌfTfCfY,ª“«,è,,É s—ñ,ð ¶ ¬,Ä,«,È,¢,Æ,«,«Í A,±  
,ìÆÄ,Ñ o,µ,ÉŽ,”s,·,é B

ŽQ Æ @IDirect3DDevice::DeleteMatrix A IDirect3DDevice::SetMatrix

## IDirect3DDevice::DeleteMatrix

```
HRESULT DeleteMatrix(D3DMATRIXHANDLE d3dMatHandle);
```

s—ñ,ĺfñf“fhfç,đ í æ,·,é B,±,ĺ s—  
ñ,ĺfñf“fhfç,ĺ AIDirect3DDevice::CreateMatrixf f\fbfh,Å ì ¬,³,ê,½,à,ĺ,Å,È,–,ê,ĺ,È,ç,È,¢ B  
¬Æ÷,·,ê,ÎD3D\_OK AŽ,”s,·,ê,Î AŽŸ,ĺ'l,đ•Ô,· B

**DDERR\_INVALIDPARAMS**

*d3dMatHandle*  
 í æ,³,ê,é s—ñ,Ìfnf“fhfç B

```

ŽQ  E  @IDirect3DDevice::CreateMatrix  A IDirect3DDevice::SetMatrix

```

**IDirect3DDevice::DeleteViewport**

HRESULT DeleteViewport(LPDIRECT3DVIEWPORT lpDirect3DViewport);

ffofCfX,ÉŠÖ~A,µ,½frf... [f| [fg EflfufWfFfNfg,ÌfŠfXfg,©,ç AŽw'è,³,ê,½frf... [f| [fg,đ í æ,·,é B  
¬Œ÷,·,ê,ÎD3D\_OK AŽ,ʹs,·,ê,Î AŽŸ,Ì'l,Ì,¢,,ê,©,đ•Ô,· B

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

lpDirect3DViewport

Direct3DDevicefIfufWfFfNfg,©,ç Ø,è—Ł,·Direct3DViewportfIfufWfFfNfg,Ö,Ìf|fCf“f^ B

**IDirect3DDevice::EndScene**

HRESULT EndScene ( ) ;

**IDirect3DDevice::BeginScene** f f\fbfh, ìĈĖÄ, Ñ o, μ, Ė, æ, èŠJŽn, ³, ê, ½fV [f“, ð I—¹, ·, é B  
¬Ĉ÷, ·, ê, ĤD3D\_OK, º•Ô, é B

ŽQ Æ @**IDirect3DDevice::BeginScene**

## IDirect3DDevice::EnumTextureFormats

```
HRESULT EnumTextureFormats(  
    LPD3DENUMTEXTUREFORMATSCALLBACK lpd3dEnumTextureProc,  
    LPVOID lpArg);
```

«» Ý, ðfhf%o fCfo, ÅfTf| [fg, 3, ê, Ä, ¢, éfefNfXf`ffÆ^, ðfŠfXfg, ð—ñ<“, ·, é B  
-Æ÷, ·, ê, ÎD3D\_OK AŽ,”s, ·, ê, Î AŽŸ, ð'l, ð, ¢,, ê, ©, ð•Ô, · B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

*lpd3dEnumTextureProc*

—ñ<“ ^—

,Æ,µ,ÄŠfefNfXf`ffÆ^, ÅÆÄ, Ñ o, 3, ê, é**D3DENUMTEXTUREFORMATSCALLBACK**fR [f<fofbfNŠÖ ”, Ö, ðf|  
fCf“f^ B

*lpArg*

fR [f<fofbfNŠÖ ”, É“n, 3, ê, éfAfvfŠfP [fVf‡f““è<`ff [f^, Ö, ðf|fCf“f^ B



## IDirect3DDevice::Execute

```
HRESULT Execute(LPDIRECT3DEXECUTEBUFFER lpDirect3DExecuteBuffer,  
                LPDIRECT3DVIEWPORT lpDirect3DViewport, DWORD dwFlags);
```

fofbftf@,ðŽÀ s,·,é B

–œ÷,·,ê,îD3D\_OK AŽ,”s,·,ê,î AŽŸ,ì'l,ð•Ô,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

lpDirect3DExecuteBuffer

ŽÀ s,<sup>3</sup>,ê,éŽÀ sfobftf@,Ö,îf|fCf“f^ B

lpDirect3DViewport

•Ž',<sup>3</sup>,ê,éŽÀ sfobftf@,î•İŠ·fRf“fefLfXfg,ðL q,·,éDirect3DViewportfIfufWfFfNfg,Ö,îf|fCf“f^ B

dwFlags

fofbftf@,îfIfufWfFfNfg,ðfNfŠfbfsf“fO,·,é,©,ðŽw'è,·,étf%ofo B,±,ìpf%of [f^,î AŽŸ,ì'l,ì,ç,,ê,©,Ä, ,é B

D3DEXECUTE\_CLIPPED

frf... [f| [fg,îŠO,É, ,évfŠf~fefBfu,ðfNfŠfbfsf“fO,·,é B

D3DEXECUTE\_UNCLIPPED

frf... [f|

[fg,î'†,É,·,×,Ä,îfvfŠf~fefBfu,ðŠŮ,ð(fNfŠfbfsf“fO,μ,È,ç) B

ŽQ æ @**D3DEXECUTEDATA** **AD3DINSTRUCTION** **AIDirect3DExecuteBuffer::Validate**

## IDirect3DDevice::GetCaps

```
HRESULT GetCaps(LPD3DDEVICEDESC lpD3DHWDevDesc,  
                LPD3DDEVICEDESC lpD3DHELDevDesc);
```

Direct3DDeviceIfuFWfFfNfg,Ì î•ñ,ðŽæ“¾,·,é B

¬Œ÷,·,ê,ÎD3D\_OK AŽ,”s,·,ê,Î AŽŸ,Ì'l,Ì,¢,,ê,©,ð•Ô,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

lpD3DHWDevDesc

fffofCfX,Ìfn [fhfEfFfA î•ñ,ðŠÜ,ðD3DDEVICEDESC \‘¢‘İ,Ö,Ìf|fCf“f^ B

lpD3DHELDevDesc

—^,!,ç,ê,Ä,¢,éf\ftfgfEfFfA,ÌfGf~f...fŒ [fVf‡f“ î•ñ,ðŠÜ,ðD3DDEVICEDESC \‘¢‘İ,Ö,Ìf|fCf“f^ B

,±,Ìf f\fbfh,Í AfffBfXfvfŒfC,ÌfffofCfX î•ñ,ÍŽæ“¾,µ,È,¢ B,±

,Ì î•ñ,ðŽæ“¾,·,é,É,Í AIDirectDraw2::GetCapsf f\fbfh,ðŽg—p,·,é B

**Direct3DDevice::GetDirect3D**

```
HRESULT GetDirect3D(LPDIRECT3D* lpD3D);
```

Œ» Ý,ìDirect3D fCf“f^ [ftfFfCfX,ðŽæ“¾,·,é B  
¬Œ÷,·,ê,îD3D\_OK,ð•Ô,µ A,»,ì¼,ì,Æ,«,ÍfGf%o [,Â, ,é B•Ô'l,É,Â,¢,Ä,Í A uDirect3D  
¼ Űf, [fh,î•Ô'l v,ðŽQ Æ,·,é,±,Æ B  
  
lpD3D  
f f\fbfh,ª•Ô,·fCf“f^ [ftfFfCfX,Ö,ìf|fCf“f^ B

## IDirect3DDevice::GetMatrix

```
HRESULT GetMatrix(D3DMATRIXHANDLE lpD3DMatHandle,  
                  LPD3DMATRIX lpD3DMatrix);
```

s—ñfnf“fhf<,©,ç s—ñ,ðŽæ“¾,·,é B,±,İ s—ñfnf“fhf<,Í AIDirect3DDevice::CreateMatrix  
f f\fbfh,É,æ,è ì ¬,³,ê,½,à,İ,Å,È,¯,ê,Î,È,ç,È,¢ B

¬Æ÷,·,ê,ÎD3D\_OK AŽ,”s,·,ê,Î AŽŸ,İ'l,ð•Ô,· B

### DDERR\_INVALIDPARAMS

lpD3DMatHandle

Žæ“¾,·,é s—ñ•İ ”,Ö,İf|fCf“f^ B

lpD3DMatrix

f f\fbfh,ª•Ô,· s—ñ,ðŠŮ,þD3DMATRIX \‘¢İ,Ö,İf|fCf“f^ B

ŽQ Æ @IDirect3DDevice::CreateMatrix AIDirect3DDevice::DeleteMatrix AIDirect3DDevice::SetMatrix

## IDirect3DDevice::GetPickRecords

```
HRESULT GetPickRecords(LPDWORD lpCount,  
    LPD3DPICKRECORD lpD3DPickRec);
```

*ffofCfXfÆfR [fh,ðŽæ“¾,·,é B*

*¬Æ÷,·,ê,ÎD3D\_OK,ð•Ô,· B*

*lpCount*

*Žæ“¾,·,éD3DPICKRECORD \‘ç‘İ,İ ”,“ü,é•İ ”,Ö,İf|fCf“f^ B*

*lpD3DPickRec*

*f f\fbfh,ª•Ô,•D3DPICKRECORD \‘ç‘İ,İ”z—ñ,Ö,İf|fCf“f^ B*

*ê”Ê“İ,ÈfAfvfŠfP [fVf‡f“,Í A,±,İf f\fbfh,ð,Q%ñÆÄ,Ñ o,· B Å %o,İÆÄ,Ñ o,µ,Å,Í A,Q”Ô–*

*Ú,İfpf%of [f^,É,ÎNULL,ð Ý’è,µ,P”Ô–*

*Ú,İfpf%of [f^,ÉD3DPICKRECORD \‘ç‘İ,İÆ ”,ðŽæ“¾,·,é BfAfvfŠfP [fVf‡f“,Í A,±,İ \‘ç‘İ—p,É•K—*

*v,Èf f,fŠ,ðŠm•Û,µ A,Q”Ô–Ú,İfpf%of [f^—p,É V,½,Éf f,fŠ,ðŠm•Û,µ,Ä A Ä“x,±,İf f\fbfh,ðÆÄ,Ñ o,· B*

**IDirect3DDevice::GetStats**

HRESULT GetStats(LPD3DSTATS lpD3DStats);

ffofCfX,Ì î•ñ,ðŽæ“¾,·,é B

¬Æ÷,·,ê,ÎD3D\_OK AŽ,”s,·,ê,Î AŽŸ,Ì¹,Ì,¢,,ê,©,ð•Ô,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

lpD3DStats

î•ñ,ðŽ¹,·**D3DSTATS** \‘¢‘Ì,Ö,Ìf|fCf“f^ B

## IDirect3DDevice::Initialize

```
HRESULT Initialize(LPDIRECT3D lpd3d, LPGUID lpGUID,  
    LPD3DDEVICEDESC lpddvdesc);
```

*ffofCfX,đ %Šú%»,·,é B*

*¬Ǝ÷,·,ê,ÎD3D\_OK,đ•Ô,μ A,»,Ì‘¼,Ì,Æ,«,ÍfGf%» [,Â, ,é B•Ô'l,É,Â,¢,Ä,Í A uDirect3D*  
*'¼ Úf, [fh,Ì•Ô'l v,đŽQ Æ,·,é,±,Æ B*

*lpd3d*

*%Šú%»,·,éDirect3D fffofCfX,Ö,Ìf|fCf“f^ B*

*lpGUID*

*fCf“f^ [ftfFfCfXŽ¯•ÊŽq,Â, ,éfOf [fof< Ef†fj [fNŽ¯•ÊŽq(GUID),Ö,Ìf|fCf“f^ B*

*lpddvdesc*

*%Šú%»,·,éDirect3DDevicefIfufWfFfNfg,đŽ!,·D3DDEVICEDESC \‘¢Ì,Ö,Ìf|fCf“f^ B*

## IDirect3DDevice::NextViewport

```
HRESULT NextViewport(LPDIRECT3DVIEWPORT lpDirect3DViewport,  
    LPDIRECT3DVIEWPORT* lplpDirect3DViewport, DWORD dwFlags);
```

*ffofCfX,ÉŠÖ~A,μ,½f rf... [f] [fg,ð—ñ<“,·,é B*

*–œ÷,·,ê,ÎD3D\_OK AŽ,”s,·,ê,Î AŽŸ,Ì'l,Ì,¢,,ê,©,ð•Ô,· B*

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

*lpDirect3DViewport*

*Direct3DDeviceIfufWfFfNfg,ÉŠÖ~A,μ,½f rf... [f] [fg,ÌfŠfXfg,Ì'†,Ìf rf... [f] [fg,Ö,Ìf|fCf“f^ B*

*lplpDirect3DViewport*

*Direct3DDeviceIfufWfFfNfg,ÉŠÖ~A,μ,½f rf... [f] [fg,ÌfŠfXfg,Ì'†,ÌŽŸ,Ìf rf... [f] [fg,Ö,Ìf|fCf“f^ B*

*dwFlags*

*f rf... [f] [fg,ÌfŠfXfg,æ,èŽæ“¾,·,éf rf... [f] [fg,ðŽw'è,·,éftf%ofo BfftfHf<fg,ÍD3DNEXT\_NEXT B*

**D3DNEXT\_HEAD** *fŠfXfg,Ì Å %o,Ì €–Ú,ðŽæ“¾ B*

**D3DNEXT\_NEXT** *fŠfXfg,ÌŽŸ,Ì €–Ú,ðŽæ“¾ B*

**D3DNEXT\_TAIL** *fŠfXfg,Ì Åœã,Ì €–Ú,ðŽæ“¾ B*



```
HRESULT Pick(LPDIRECT3DEXECUTEBUFFER lpDirect3DExecuteBuffer,
             LPDIRECT3DVIEWPORT lpDirect3DViewport, DWORD dwFlags,
             LPD3DRECT lpRect);
```

Direct3DExecuteBuffer fIfufWfFNfg,<sup>a</sup>f fbfN,<sup>3</sup>ê,Ä,¢,é,Æ,«,Í A,±,ìÆÄ,Ñ o,µ,ÍŽ,”s,·,é B  
¬Æ÷,·,ê,ÎD3D\_OK AŽ,”s,·,ê,Î AŽŸ,Ì¹,ì,¢,,ê,©,ð•Ô,· B

**DDERR\_INVALIDPARAMS**

ŽQ A @IDirect3DDevice::GetPickRecords

## IDirect3DDevice::SetMatrix

```
HRESULT SetMatrix(D3DMATRIXHANDLE d3dMatHandle,  
    LPD3DMATRIX lpD3DMatrix);
```

s—ñfnf“fhf<,Ö s—ñ,ð%Á,‘,é B,±,Ì s—ñfnf“fhf<,Í AIDirect3DDevice::CreateMatrix  
f f\fbfh,Á ì ¬,μ,½,à,ì,Á,È,¯,ê,Î,È,Ç,È,Ç B

¬Ç÷,·,ê,ÎD3D\_OK AŽ,”s,·,ê,Î AŽŸ,Ì'l,ð•Ô,· B

### DDERR\_INVALIDPARAMS

d3dMatHandle

Ÿ’è,<sup>3</sup>,ê,é s—ñfnf“fhf< B

lpD3DMatrix

Ÿ’è,<sup>3</sup>,ê,é s—ñ,ðŽ!,·D3DMATRIX \‘ç‘ì,Ö,Ìf|fCf“f^ B

s—

ñ,Ìfnf“fhf<,ðŠŮ,þŽÀ sfofbftf@“à,ð•İŠ·,·,é BIDirect3DDevice::SetMatrixf f\fbfh,ÍŽÀ sfofbftf@,ðf fbfN Af f  
bfN%øð æ,<sup>1</sup>,,É,±,Ì”z—ñ,ð•İ X,Á,«,é B

ŽQ Æ @IDirect3DDevice::CreateMatrix A IDirect3DDevice::GetMatrix A IDirect3DDevice::DeleteMatrix

**IDirect3DDevice::SwapTextureHandles**

```
HRESULT SwapTextureHandles(LPDIRECT3DTEXTURE lpD3DTex1,
                             LPDIRECT3DTEXTURE lpD3DTex2);
```

,Ó,½,Â,îf efNfXf`ffnf“fhf<,ðŒðŠ·,·,é B

¬Œ÷,·,ê,îD3D\_OK,ð•Ô,· B

```
lpD3DTex1,“,æ,Ñ lpD3DTex2
f f\fbfh,ª–ß,Â,½,Æ,« AŒðŠ·,³,ê,é efNfXf`ff,înf“fhf<,Ö,î|fCf“f^ B
```

,±  
,îf f\fbfh,Í A’Ê ífAfvfŠfP [fVf‡f“,ªfIfufWfFfNfg,ì W ‡‘ì,ì’†,Å,·,×,Ä,îf efNfXf`ff,ð•İ X,·,é,Æ,«Žg,í,ê,é B

## IDirect3DExecuteBuffer

**IDirect3DExecuteBuffer** fCf“f^ [ftfFfCfX, ìf f\fbfh, ðŽg, □  
, Æ A Direct3DŽÀ sfofbftf@, ìfZfbfgfAfbfv, â §Œä, ð s, □, ±, Æ, ª, Å, «, é B, ±, ì ß, Í A, ±  
, ìfCf“f^ [ftfFfCfX, ìf f\fbfh, É, Å, ¢, Ä à–¾, ·, é BŠT—ª, É, Å, ¢  
, Å, Í A u IDirect3DExecuteBuffer fCf“f^ [ftfFfCfX v, ðŽQ Æ, ·, é, ±, Æ B

**IDirect3DExecuteBuffer** fCf“f^ [ftfFfCfX, ìf f\fbfh, Í AŽŸ, ìfOfç [fv, ©, ç, È, é B

f f^, ìŽÀ s **GetExecuteData**  
**SetExecuteData**

f fbfN, Æ%ð œ **Lock**  
**Unlock**

,», ì¼ **Initialize**  
**Optimize**  
**Validate**

**IDirect3DExecuteBuffer** fCf“f^ [ftfFfCfX, Í A, ·, ×, Ä, ì COM fCf“f^ [ftfFfCfX, Æ“¯, ¶, A **Unknown**  
fCf“f^ [ftfFfCfX Ef f\fbfh, ðŒp ³, ·, é B **Unknown** fCf“f^ [ftfFfCfX, ªfTf| [fg, ·, éf f\fbfh, Í AŽŸ, ìÊ, è B

**AddRef**

**QueryInterface**

**Release**

## **IDirect3DExecuteBuffer::GetExecuteData**

HRESULT GetExecuteData(LPD3DEXECUTEDATA lpData);

Direct3DExecuteBufferIfufWfFfNfg,ìŽÀ sff [f^,ì ó‘Ô,ðŽæ“¾,·,é BŽÀ sff [f^,Í ADirect3DExecuteBufferIfufWfFfNfg,ìL q,ÉŽg—p,³,ê,é B

–Œ÷,·,ê,îD3D\_OK AŽ,”s,·,ê,î AŽŸ,ì¹,ì,¢,,ê,©,ð•Ô,· B

**D3DERR\_EXECUTE\_LOCKED**

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

lpData

Direct3DExecuteBufferIfufWfFfNfg,ìŒ» Ý,ìŽÀ sff [f^,ì ó‘Ô,<sup>a</sup> Ý’è,<sup>3</sup>,ê,½**D3DEXECUTEDATA** \‘Œ‘Ì,Ö,ìf|fCf“f^ B

Direct3DExecuteBufferIfufWfFfNfg,<sup>a</sup>f fbfN,<sup>3</sup>,ê,Ä,¢,é,Æ,«,<sup>Í</sup> A,<sup>±</sup>,ìŒÄ,Ñ o,μ,íŽ,”s,·,é B

ŽQ Æ @**IDirect3DExecuteBuffer::SetExecuteData**

## IDirect3DExecuteBuffer::Initialize

```
HRESULT Initialize(LPDIRECT3DDEVICE lpDirect3DDevice,  
    LPD3DEXECUTEBUFFERDESC lpDesc);
```

,±,ìf f\fbfh,Í ACOMfvf fgfRf<,Ö,Ì €<—p,É'ñ<Ÿ,³,ê,é B

Direct3DExecuteBufferfobftf@,ª ¶ ¬ŽŽ,É %oŠú%o»,³,ê,é,½,ßDDERR\_ALREADYINITIALIZED,ð•Ô,· B

*lpDirect3DDevice*

Direct3D fIfufWfFfNfg,ðŽ',·ffofCfX,Ö,ìf|fCf“f^ B

*lpDesc*

¶ ¬,³,ê,½Direct3DExecuteBufferfIfufWfFfNfg,ðL q,·,éD3DEXECUTEBUFFERDESC \‘¢‘Ì,Ö,ìf|fCf“f^ Bfofbftf@,ìfTfCfY,ª««è,È,¢,Æ,«,Í AÆÄ,Ñ o,µ,ÍŽ,”s,·,é B

## IDirect3DExecuteBuffer::Lock

HRESULT Lock(LPD3DEXECUTEBUFFERDESC lpDesc);

ŽÀ sfofbftf@,lfrf}f“fh,Ö,lf|fCf“f^,ðŽæ“¾,·,é B

¬Æ÷,·,ê,ÎD3D\_OK AŽ,”s,·,ê,Î AŽŸ,Îl,Î,¢,,ê,©,ð•Ö,· B

**D3DERR\_EXECUTE\_LOCKED**

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

**DDERR\_WASSTILLDRAWING**

lpDesc

**D3DEXECUTEBUFFERDESC** \‘ı,Ö,lf|

fCf“f^ Bf f\fbfh,•Ö,Á,½,Æ,«lpDataf f“fo,É,Í AfAvfŠfP [fVf‡f“,afAfNfZfX,·,éŽž“\_,lff [f^,Ö,lf|

fCf“f^,ª Ÿ’è,³,ê,é B,±,lff [f^,Í AfVfXfef€

,âfrffl Ef f,fŠ,É“Ÿ Ÿ,µ AdwCapsf f“fo,É,æ,èŽ!,³,ê,é BfAvfŠfP [fVf‡f“,Í AIDirect3DExecuteBuffer::Lo  
ckf f\fbfh,ðŽg,ª,ÆDirect3D,afVfXfef€,âfrffl Ef f,fŠŠÖ,Á,lff [f^“]‘—,ð—v< ,Á,«,é B

Direct3DExecuteBufferIfufWfFfNfg,af fbfN,³,ê,Ä,¢,é,Æ A,±

,lÆÄ,Ñ o,µ,İŽ,”s,·,é B,½,Æ,,Î A’¼,lfXfÆfbfh,afobftf@,ðfAfNfZfX’t,¾,Á,½,è A,±,lfofbftf@,É”-

Ÿ,µ,½**IDirect3DDevice::Executef** f\fbfh,ª,Ü,¾Š@—¹,µ,Ä,¢,È,¢,Æ,«,É<N,±,é B

ŽQ Æ @**IDirect3DExecuteBuffer::Unlock**

**IDirect3DExecuteBuffer::Optimize**

HRESULT Optimize();

Ⓔ» ÝfTf| [fg,µ,Ä,¢,È,¢ B



## **IDirect3DExecuteBuffer::SetExecuteData**

HRESULT SetExecuteData(LPD3DEXECUTEDATA lpData);

Direct3DExecuteBufferIfUFWFFNfg,žžÀ sff [f^,ì ó‘Ô,đ Ý’è,·,é BžžÀ sff [f^,Í ADirect3DExecuteBufferIfUFWFFNfg,İ“ă—e,đŽ!,·,½,ß,ÉŽg—p,<sup>3</sup>,ê,é B

–Œ÷,·,ê,ÎD3D\_OK AŽ,”s,·,ê,Î AŽŸ,İ’l,Ì,¢,,ê,©,đ•Ô,· B

**D3DERR\_EXECUTE\_LOCKED**

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

lpData

žžÀ sfofbftf@,ìfŒfCfAfEfG,đŽ!,·**D3DEXECUTEDATA** \‘¢‘ì,Ö,ìf|fCf“f^ B

Direct3DExecuteBufferIfUFWFFNfg,<sup>a</sup>f fbfN,<sup>3</sup>,ê,Ă,¢,é,Æ,«,Í A,±,ÌŒĂ,Ň o,μ,ÍŽ,”s,·,é B

žQ Æ @**IDirect3DExecuteBuffer::GetExecuteData**

**IDirect3DExecuteBuffer::Unlock**

HRESULT Unlock();

ŽÀ sfobftf@,ìfRf}f“fh,Ö,Ïf|fCf“f^,ð%ð•ú,·,é B,½,¾,μ,±,ìf|  
fCf“f^,Í Afobftf@,ð**IDirect3DDevice::Execute**f f\fbfh,Åf fbfN,μ,½,à,ì,À,È,¯,ê,Î,È,ç,È,¢ B  
-Œ÷,·,ê,ÎD3D\_OK AŽ,”s,·,ê,Î AŽŸ,ì'l,Ì,¢,,ê,©,ð•Ô,· B

**D3DERR\_EXECUTE\_NOT\_LOCKED**

**DDERR\_INVALIDOBJECT**

ŽQ Æ @**IDirect3DExecuteBuffer::Lock**

### **IDirect3DExecuteBuffer::Validate**

```
HRESULT Validate(LPDWORD lpdwOffset, LPD3DVALIDATECALLBACK lpFunc,  
    LPVOID lpUserArg, DWORD dwReserved);
```

«» Ý AŽÀ•,³,ê,Ä,¢,È,¢ B

## IDirect3DLight

**IDirect3DLight***fCf“f^ [ftfFfCfX,lf f\fbfh,ðŽg,□,Æ ACEõŒ¹ î•ñ,ìŽæ“¾,â Ý’è,ð s,□,±,Æ,ª,Â,«„é B,± ,ì ß,Â,Í AIDirect3DlightfCf“f^ [ftfFfCfX,lf f\fbfh,É,Â,¢,Ä à¾,·,é BŠT—ª,É,Â,¢ ,Ä,Í A uIDirect3DLightfCf“f^ [ftfFfCfX v,ðŽQ Æ,·,é,±,Æ B*

**IDirect3DLight***fCf“f^ [ftfFfCfX,lf f\fbfh,Í AŽŸ,lfOf< [fv,©,ç,È,é B*

**Žæ“¾,Æ Ý’è**

**GetLight**

**SetLight**

**%oŠú%o»**

**Initialize**

**IDirect3DLight***fCf“f^ [ftfFfCfX,Í A,·,×,Ä,ì COM fCf“f^ [ftfFfCfX,ì,æ,□,É A IUnknown fCf“f^ [ftfFfCfX Ef f\fbfh,ðŒp ³,·,é B IUnknown fCf“f^ [ftfFfCfX,ªTf| [fg,·,éf f\fbfh,Í AŽŸ,ìÊ,è B*

**AddRef**

**QueryInterface**

**Release**

**IDirect3DLight::GetLight**

HRESULT GetLight(LPD3DLIGHT lpLight);

Direct3DLightIfuFWfFNfg, ĨĖōĖ¹ ħ•ñ,đŽæ“¾,·,é B  
¬Ė÷,·,ê,ĤD3D\_OK AŽ,”s,·,ê,Ĥ AŽŸ,Ĭ¹,Ĭ,ċ,,ê,©,đ•Ô,· B

DDERR\_INVALIDOBJECT  
DDERR\_INVALIDPARAMS

lpLight  
Ė» Ÿ, ĨĖōĖ¹ff [f^,ª Ÿ’è,³,ê,½D3DLIGHT \‘ċ‘Ĭ,Ö,Ĭf|fCf“f^ B

ŽQ Æ @IDirect3DLight::SetLight

**IDirect3DLight::Initialize**

HRESULT Initialize(LPDIRECT3D lpDirect3D);

,±,ìf f\fbfh,Í ACOMfvf fgfRf€,Ì^êŠÑ «,ð•Û,Â,½,ß,ì,à,ì,Â, ,é B

Direct3DLightfIfufWfFfNfg,ð ¶ ¬Žž,É %oŠú%o»,·,é,½,ß ADDERR\_ALREADYINITIALIZED,ª•Ô,é B

lpDirect3D

Direct3DfIfufWfFfNfg,ðŽ',·Direct3D \‘¢‘Ì,Ö,ìf|fCf“f^ B

## IDirect3DLight::SetLight

HRESULT SetLight(LPD3DLIGHT lpLight);

Direct3DLightIfufWfFfNfg, ĩĖōĖ¹ î•ñ,đ Ý'è,·,é B

¬Ė÷,·,ê,îD3D\_OK AŽ,„s,·,ê,î AŽŸ,İ'l,İ,ċ,,ê,©,đ•Ô,· B

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

*lpLight*

Ė» Ý, ĩĖōĖ¹ff [f^,đ Ý'è,·,é,½,ß,ÉŽg—p,³,ê,éD3DLIGHT \‘ċ‘İ,Ö,İf|fCf“f^ B

ŽQ Æ @IDirect3DLight::GetLight

## IDirect3DMaterial

**IDirect3DMaterial** fCf“f^ [ftfFfCfX Ef f\fbfh,ðŽg,□,Æ Af}fefŠfAf<,ðŽæ“¾,μ,½,è“Á «,ð Ý’è,μ,½,è,·,é,±,Æ,ª,Á,«,é B,±,ì ß,Á,Í AIDirect3DmaterialfCf“f^ [ftfFfCfX,É,Á,¢,Ä à¾,·,é BŠT—ª,É,Á,¢,Ä,Í A uIDirect3DMaterialfCf“f^ [ftfFfCfX v,ðŽQ Æ,·,é,±,Æ B

**IDirect3DMaterial** fCf“f^ [ftfFfCfX,ìf f\fbfh,Í AŽŸ,ìfOf< [fv,©,ç,È,é B

F,ì—\ñ Reserve  
Unreserve

f}fefŠfAf< GetMaterial  
SetMaterial

,»,ì¼ GetHandle  
Initialize

**IDirect3DMaterial** fCf“f^ [ftfFfCfX,Í A,·,×,Ä,ì COM fCf“f^ [ftfFfCfX,ì,æ,□,É A IUnknown  
fCf“f^ [ftfFfCfX Ef f\fbfh,ðEp ³,·,é B IUnknown fCf“f^ [ftfFfCfX,ªfTf| [fg,·,éf f\fbfh,Í AŽŸ,ìÊ,è B

AddRef

QueryInterface

Release



## IDirect3DMaterial::GetHandle

```
HRESULT GetHandle(LPDIRECT3DDEVICE lpDirect3DDevice,  
                  LPD3DMATERIALHANDLE lpHandle);
```

Direct3DMaterialIfufWfFfNfg,lf}fefŠfAf<,lfnf“fhf<,đŽæ“¾,·,é B,±,lfnf“fhf<,Í A,·,×,Ä,lDirect3D  
APIEÄ,Ñ o,µ,Å Af}fefŠfAf<,lŽQ Æ,l,½,B,ÉŽg—p,³,ê,é Bf}fefŠfAf<,Í A1“x,É,Đ,Æ,Ä,lffofCfX,ÅŽg—  
p,Å,«,é B

fffofCfX,“”jŠü,³,ê,½,Æ,« Af}fefŠfAf<,ÍfffofCfX,©,ç Ø,è—£,³,ê,é B

¬E÷,·,ê,ÎD3D\_OK,đ•Ô,µ A,»,l‘¼,l,Æ,«,Í ADDERR\_INVALIDOBJECT•Ô,· B

lpDirect3DDevice

Žg—p,³,ê,Ä,¢,éf}fefŠfAf<,lDirect3DDeviceIfufWfFfNfg,Ö,l|fCf“f^ B

lpHandle

Direct3DMaterialIfufWfFfNfg,É‘Î%ž,·,éf}fefŠfAf<,lfnf“fhf<,<sup>a</sup> Ý’è,³,ê,é•İ ”,Ö,l|fCf“f^ B

**IDirect3DMaterial::GetMaterial**

HRESULT GetMaterial(LPD3DMATERIAL lpMat);

Direct3DMaterialIfuFWfFNfg,lf}fefŠfAf< Eff [f^,ðŽæ“¾,·,é B  
¬Œ÷,·,ê,ÎD3D\_OK AŽ,”s,·,ê,Î AŽŸ,Ì¹,Ì,¢,,ê,©,ð•Ô,· B

**DDERR\_INVALIDOBJECT**  
**DDERR\_INVALIDPARAMS**

lpMat  
Œ» Ÿ,lf}fefŠfAf<,Ì“Á «,ª Ÿ’è,³,ê,é**D3DMATERIAL** \‘Œ¹,Ö,Ìf|fCf“f^ B

ŽQ Æ @**IDirect3DMaterial::SetMaterial**

**IDirect3DMaterial::Initialize**

HRESULT Initialize(LPDIRECT3D lpDirect3D);

,±,ìf f\fbfh,Í ACOMfvf fgfRf€,ÌêŠÑ «,ð•Û,Â,½,ß,ì,à,ì,Â, ,é B

Direct3DMaterialfIfufWfFfNfg,ð ¶ -Žž,É %Šú%»,·,é,½,ß ADDERR\_ALREADYINITIALIZED,ª•Ô,é B

lpDirect3D

Direct3DfIfufWfFfNfg,ðŽ,ì,·Direct3D \‘¢‘Ì,Ö,ìf|fCf“f^ B

**IDirect3DMaterial::Reserve**

HRESULT Reserve ( ) ;

Œ» Ý AŽÄ‘•,³,ê,Ä,¢,È,¢ B

**IDirect3DMaterial::SetMaterial**

HRESULT SetMaterial(LPD3DMATERIAL lpMat);

Direct3DMaterialIfuFWfFNfg,lf}fefŠfAf< Eff [f^,ð Ý’è,·,é B  
¬Œ÷,·,ê,îD3D\_OK AŽ,”s,·,ê,î AŽŸ,Ì’l,Ì,¢,,ê,©,ð•Ô,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

lpMat  
f}fefŠfAf<“Á «,ª Ý’è,³,ê,é**D3DMATERIAL** \‘¢‘ì,Ö,Ìf|fCf“f^ B

ŽQ Æ @**IDirect3DMaterial::GetMaterial**

**IDirect3DMaterial::Unreserve**

HRESULT Unreserve();

Œ» Ý AŽÄ‘•,³,ê,Ä,¢,È,¢ B

## IDirect3DTexture

**IDirect3DTexture***fCf“f^ [ftFfCfX,lf f\fbfh,ðŽg,ϱ,Æ AfefNfXf`ff,ÌŽæ“¾,â“Á «,Ì Ý'è,ð s,ϱ,±,Æ,ª,Â,«,é B,± ,Ì ß,Â,Í A*IDirect3Dtexture*fCf“f^ [ftFfCfX,lf f\fbfh,É,Â,¢,Ä à¾,·,é BŠT—ª,É,Â,¢ ,Ä,Í A u**IDirect3DTexturefCf“f^ [ftFfCfX**v,ðŽQ Æ,·,é,±,Æ B*

**IDirect3DTexture***fCf“f^ [ftFfCfX,lf f\fbfh,Í AŽŸ,lfOf< [fv,©,ç,È,é B*

**f***n*“**f***h*⋄ **GetHandle**

**%**Šú%» **Initialize**

**f** [f**h** **Load**  
**Unload**

**f***p*Œ**f***b***f***g* îñ **PaletteChanged**

**IDirect3DTexture***fCf“f^ [ftFfCfX,Í A,·,×,Ä,Ì COM fCf“f^ [ftFfCfX,Ì,æ,ϱ,É A**Unknown**fCf“f^ [ftFfCfX Ef f\fbfh,ðŒp ³,·,é B***IUnknown***fCf“f^ [ftFfCfX,ªfTf| [fg,·,éf f\fbfh,Í AŽŸ,Ì'Ê,è B*

**AddRef**

**QueryInterface**

**Release**

**Direct3DTexture***fIfufWfFfNfg,ðŽæ“¾,·,é,É,Í AfefNfXf`fff}*  
*fbfv,Æ,µ,Ä ¶ ¬,³,ê,½***DirectDrawSurface***fIfufWfFfNfg,©,ç***IDirect3D::QueryInterface***f f\fbfh,ðŒÄ,Ñ o,· B*

## IDirect3DTexture::GetHandle

```
HRESULT GetHandle(LPDIRECT3DDEVICE lpDirect3DDevice,  
    LPD3DTEXTUREHANDLE lpHandle);
```

Direct3DTextureIfufWfFfNfg,lfefNfXf`ff,lfnf“fhf<,đŽæ“¾,·,é B,±,lfnf“fhf<,Í A,·,×,Ä,ÌDirect3D  
APIEÄ,Ñ o,μ,Å AfefNfXf`ff,İŽQ Æ,ÉŽg—p,³,ê,é B

¬Œ÷,·,ê,ÎD3D\_OK AŽ,”s,·,ê,Î AŽŸ,Ì'l,Ì,¢,,ê,©,đ•Ô,· B

## D3DERR\_BADOBJECT

## DDERR\_INVALIDPARAMS

lpDirect3DDevice

f [fh,³,ê,Ä,¢,éfefNfXf`ff,ÌDirect3DDeviceIfufWfFfNfg,Ö,İf|fCf“f^ B

lpHandle

Direct3DTextureIfufWfFfNfg,É‘Î%oož,·,éfefNfXf`ff,lfnf“fhf<,<sup>a</sup> Ý’è,³,ê,é•İ ”,Ö,İf|fCf“f^ B



## IDirect3DTexture::Initialize

```
HRESULT Initialize(LPDIRECT3DDEVICE lpD3DDevice,  
    LPDIRECTDRAWSURFACE lpDDSurface);
```

,±,ìf f\fbfh,Í ACOMfvf fgfRf<,ÎêŠŃ «,ð•Û,Â,½,ß,ì,à,Ì,Â, ,é B

Direct3DTextureIfufWfFfNfg,ð ¶ -Žž,É %oŠú%o»,·,é,½,ß ADDERR\_ALREADYINITIALIZED,°•Ô,é B

*lpDirect3D*

Direct3DfIfufWfFfNfg,ðŽ',·Direct3D \‘ċ‘Î,Ö,ìf|fCf“f^ B

*lpDDSurface*

,±,ìfIfufWfFfNfg ã,ìDirectDraw,Ö,ìf|fCf“f^ B

**IDirect3DTexture::Load**

HRESULT Load(LPDIRECT3DTEXTURE lpD3DTexture);

DDSCAPS\_ALLOCONLOADftf%oÉ,æ,è ¶ ¬,³,ê,½fefNfXf`ff,ðf [fh,·,é BfT [ftfFfX,ª,±  
,İf f\fbfh,ðŽg,Á,Äf [fh,³,ê,é,Ü,Ä Af f,fŠ,ÍŠ,,,è“–,Ä,ç,ê,È,¢ B

–Œ÷,·,ê,Î AD3D\_OK,ð•Ô,µ A,»,ì¼,Ì,Æ,«,ÍfGf%o [,Ä, ,é B•Ô'l,É,Â,¢,Ä,Í A uDirect3D  
¼ Űf, [fh,İ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lpD3DTexture  
f [fh,³,ê,éfefNfXf`ff,Ö,İf|fCf“f^ B

ŽQ Æ @IDirect3DTexture::Unload

**IDirect3DTexture::PaletteChanged**

HRESULT PaletteChanged(DWORD dwStart, DWORD dwCount);

fT [ftfFfX ã,ÌfpfŒfbfg,ªİ X,³,ê,½,±,Æ,ðfhf%ofCfo,É'Ê'm,·,é B  
¬Œ÷,·,ê,Î AD3D\_OK,ð•Ô,µ A,»,ì¼,Ì,Æ,«,ÍfGf% [,Â, ,é B•Ô'l,É,Â,¢,Ä,Í A uDirect3D  
¼ Űf, [fh,İ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

dwStart  
•İ X,³,ê,½ æª,ÌfpfŒfbfg,ÌfCf“fffbfNfX B  
dwCount  
•İ X,³,ê,½fpfŒfbfg,ÌŒÂ ” B

,±,Ìf f\fbfh,Í AfAfvfŠfP [fVf‡f“,ªfrfflIfNfŠfbfv,Ì Ä ¶,âfpfŒfbfg,Ì•İ X,ð—v< ,·,é,Ì,É“Á,É•Ö—,Å, ,é B

**IDirect3DTexture::Unload**

HRESULT Unload();

Œ» Ý,ìfefNfXf`ff,ðfAf“f [fh,·,é B  
¬Œ÷,·,ê,îD3D\_OK,ð•Ô,µ A,»,ì¼,ì,Æ,«,ÍfGf%o [,Â, ,é B•Ô'l,É,Â,¢,Ä,Í A uDirect3D  
¼ Úf, [fh,î•Ô'l v,ðŽQ Æ,·,é,±,Æ B  
ŽQ Æ @IDirect3DTexture::Load

## IDirect3DViewport

**IDirect3DViewport***fCf“f^ [ftfFfCfX,lf f\fbfh,ðŽg,□,Æ Afrf... [f| [fg,ÌŽæ“¾,âfvf fpfefB,Ì Ý’è,ð s,□,± ,Æ,ª,Ä,«,«é B,±,Ì ß,Ä,Í AIDirect3DViewportfCf“f^ [ftfFfCfX,lf f\fbfh,É,Â,¢,Ä à¾,·,é BŠT—ª,É,Â,¢ ,Ä,Í A uIDirect3DViewportfCf“f^ [ftfFfCfX v,ðŽQ Æ,·,é,±,Æ B*

**IDirect3DViewport***fCf“f^ [ftfFfCfX,lf f\fbfh,Í AŽŸ,ÌOf< [fv,©,ç,È,é B*

”wŒi **GetBackground**  
**GetBackgroundDepth**  
**SetBackground**  
**SetBackgroundDepth**

%Šú%» **Initialize**

ŒôŒ¹ **AddLight**  
**DeleteLight**  
**LightElements**  
**NextLight**

f} **Clear**  
*fefŠfAf‘,Æfrf... [f| [fg*  
**GetViewport**  
**SetViewport**

•İŠ· **TransformVertices**

**IDirect3DViewport***fCf“f^ [ftfFfCfX,Í A,·,×,Ä,Ì COM fCf“f^ [ftfFfCfX,Ì,æ,□,É A Unknown fCf“f^ [ftfFfCfX Ef f\fbfh,ðŒp ³,·,é B IUnknown fCf“f^ [ftfFfCfX,ªfTf| [fg,·,éf f\fbfh,Í AŽŸ,Ì’Ê,è B*

**AddRef**  
**QueryInterface**  
**Release**

**IDirect3DViewport::AddLight**

HRESULT AddLight(LPDIRECT3DLIGHT lpDirect3DLight);

frf... [f] [fg,ÉŠÖ~A,µ,½Direct3DLightIfufWfFfNfg,ÌfŠfXfg,É AŽw'è,³,ê,½CEôCE¹,ð'Ç%oÁ,·,é B  
¬Œ÷,·,ê,ÎD3D\_OK AŽ,ʹs,·,ê,Î AŽŸ,Ì¹,Ì,Œ,,ê,©,ð•Ô,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

lpDirect3DLight  
Direct3DDeviceIfufWfFfNfg,ÉŠÖ~A,µ,½Direct3DLightIfufWfFfNfg,Ö,Ìf|fCf“f^ B

## IDirect3DViewport::Clear

HRESULT Clear(DWORD dwCount, LPD3DRECT lpRects, DWORD dwFlags);

«» Ý,ì”w«Eif}fefŠfAf<,ìfrf... [f| [fg,âfrf... [f| [fg ã,ì«é«”ÍÍ,ð Á<Ž,·,é B  
-«÷,·,ê,ÎD3D\_OK AŽ,”s,·,ê,Î AŽŸ,Ì’l,Ì,«,„ê,©,ð•Ô,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

*dwCount*

lpRectsfpf%of [f^,ÉŽw’è,<sup>3</sup>,ê,é«é«`ì ” B

*lpRects*

**D3DRECT** \‘«‘Ì,ì”z—ñ,Ö,ìf|fCf“f^ B

*dwFlags*

Á<Ž,Ì’Î Û,ðŽ!,·ftf%ofO Bf«f“f\_Šf“fO‘Î Û AZfobftf@,Û,½,Í,»,Ì—¼•û B

**D3DCLEAR\_TARGET** ”w«Eif}fefŠfAf<( Ý’è,<sup>3</sup>,ê,Ä,«,é,Æ,«)  
,ìf«f“f\_Šf“fO‘Î Û B

**D3DCLEAR\_ZBUFFER** Zfobftf@,© A,»,±,É Ý’è,<sup>3</sup>,ê,Ä,«,é«» Ý,ì”w«Ei [“x( Ý’è,<sup>3</sup>,ê,Ä,«,é,Æ,«) B

**IDirect3DViewport::DeleteLight**

HRESULT DeleteLight (LPDIRECT3DLIGHT lpDirect3DLight);

frf... [f] [fg,ÉŠÖ^A,μ,½Direct3DLightIfufWfFfNfg,ÌfŠfXfg,©,ç AŽw'è,<sup>3</sup>,ê,½ŒðŒ¹,ð í æ,·,é B  
¬Œ÷,·,ê,ÎD3D\_OK AŽ,ʹs,·,ê,Î AŽŸ,Ì¹,Ì,¢,,ê,©,ð•Ô,· B

**DDERR\_INVALIDOBJECT**  
**DDERR\_INVALIDPARAMS**

lpDirect3DLight  
Direct3DDeviceIfufWfFfNfg,©,ç Ø,è—Ł,· ADirect3DLightIfufWfFfNfg,Ö,Ìf|fCf“f^ B



## IDirect3DViewport::GetBackground

HRESULT GetBackground(LPD3DMATERIALHANDLE lphMat, LPBOOL lpValid);

*lphMat*... [f] [fg,ÉŠÖ~A,μ,½Æ» Ý,ì”wÆi,©,çf}fefŠfAf<,ìfnf“fhf<,ðŽæ“¾,·,é B  
¬Æ÷,·,ê,ÎD3D\_OK AŽ,”s,·,ê,Î AŽŸ,Ì¹,Ì,¢,,ê,©,ð•Ö,· B

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

*lphMat*

”wÆi,Æ,μ,ÄŽg—p,³,ê,Ä,¢,éf}fefŠfAf<,ìfnf“fhf<,Ö,ìf|fCf“f^ B

*lpValid*

”wÆi,ªf rf... [f] [fg,ÉŠÖ~A,μ,Ä,¢,é,±,Æ,ðŽ¹,·,½,ß,É Ý’è,³,ê,é•Ĭ ”,Ö,ìf|fCf“f^ B,±  
,ìfpf%of [f^,ªFALSE,Ì,Æ,« Af rf... [f] [fg,ÉŠÖ~A,·,é”wÆi,Í,È,¢ B

ŽQ Æ @IDirect3DViewport::SetBackground

## IDirect3DViewport::GetBackgroundDepth

```
HRESULT GetBackgroundDepth(LPDIRECTDRAWSURFACE* lpDDSsurface,  
    LPBOOL lpValid);
```

frf... [f| [fg,ÉŠÖ~A,μ,½Œ» Ý,ì”wŒi [“x,ð•\,·DirectDrawfT [ftfFfX EfIfufWfFfNfg,ðŽæ“%4,·,é B  
-Œ÷,·,ê,ÎD3D\_OK AŽ,”s,·,ê,Î AŽŸ,ì'l,Ì,Œ,,ê,©,ð•Ô,· B

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

lpDDSsurface

”wŒi [“x,ð•\,·DirectDrawSurfaceIfufWfFfNfg,Ö,Ìf|fCf“f^,Ö,Ìf|fCf“f^ B

lpValid

frf... [f| [fg,ÉŠÖ~A•t,¯,ç,ê,½”wŒi [“x,ª,È,Œ,Æ,«FALSE,ª Ý’è,³,ê,é•İ ”,Ö,Ìf|fCf“f^ B

ŽQ Æ @IDirect3DViewport::SetBackgroundDepth

**IDirect3DViewport::GetViewport**

HRESULT GetViewport(LPD3DVIEWPORT lpData);

frf... [f| [fg,lfrrf... [f| [fg EfŒfWfXf^,ðŽæ“¾,·,é B  
¬Œ÷,·,ê,îD3D\_OK AŽ,”s,·,ê,î AŽŸ,Ìl,Ì,¢,,ê,©,ð•Ô,· B

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

lpData  
frf... [f| [fg,ðŽæ“¾,·,éD3DVIEWPORT \‘¢‘Ì,Ö,lf|fCf“f^ B

ŽQ Æ @IDirect3DViewport::SetViewport

**IDirect3DViewport::Initialize**

HRESULT Initialize(LPDIRECT3D lpDirect3D);

,±,ìf f\fbfh,Í ACOMfvf fgfRf€,Ì^ëŠÑ «,ð•Û,Â,½,ß,ì,à,ì,Â, ,é B

Direct3DViewportIfufWfFfNfg,ð ¶ -Žž,É %oŠú%o»,·,é,½,ß ADDERR\_ALREADYINITIALIZED,ª•Ô,é B

lpDirect3D

Direct3DfIfufWfFfNfg,ðŽ',·Direct3D \‘¢‘Ì,Ö,ìf|fCf“f^ B

## **IDirect3DViewport::LightElements**

```
HRESULT LightElements(DWORD dwElementCount, LPD3DLIGHTDATA lpData);
```

«» Ý AŽÄ‘,³,ê,Ä,¢,È,¢ B

## IDirect3DViewport::NextLight

```
HRESULT NextLight(LPDIRECT3DLIGHT lpDirect3DLight,  
    LPDIRECT3DLIGHT* lplpDirect3DLight, DWORD dwFlags);
```

*frf...* [f] [fg,ÉŠÖ~A,μ,½Direct3DLightIfufWfFfNfg,ð—ñ<“,·,é B

–Œ÷,·,ê,ÎD3D\_OK AŽ,”s,·,ê,Î AŽŸ,Ì'l,Ì,¢,,ê,©,ð•Ô,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

*lpDirect3DLight*

Direct3DDeviceIfufWfFfNfg,ÉŠÖ~A,μ,½ŒðŒ¹fŠfXfg,Ì'†,ÌŒðŒ¹,Ö,Ìf|fCf“f^ B

*lplpDirect3DLight*

Direct3DDeviceIfufWfFfNfg,ÉŠÖ~A,μ,½ŒðŒ¹fŠfXfg,Ì'†,©,ç—v< ,³,ê,½ŒðŒ¹,ðŠÛ,Þf|fCf“f^,Ö,Ìf|fCf“f^ B—  
v< ,³,ê,éŒðŒ¹,Î AdwFlagsfp%of [f^,ÄŽw'è,³,ê,é B

*dwFlags*

ŒðŒ¹fŠfXfg,©,çŽæ“¾,·,éŒðŒ¹,ðŽw'è,·,éftf%ofO BfftfHf<fg,Æ,μ,Ä AD3DNEXT\_NEXT,ª Ý'è,³,ê,é B

**D3DNEXT\_HEAD**

*fŠfXfg,Ì Å %o,Ì €–Ú B*

**D3DNEXT\_NEXT**

*fŠfXfg,ÌŽŸ,Ì €–Ú B*

**D3DNEXT\_TAIL**

*fŠfXfg,Ì ÅŒã,Ì €–Ú B*

**IDirect3DViewport::SetBackground**

HRESULT SetBackground(D3DMATERIALHANDLE hMat) ;

f{f... [f| [fg,ÉŠÖ~A,µ,½”wŒi,ð Ý’è,·,é B  
¬Œ÷,·,ê,ÎD3D\_OK AŽ,”s,·,ê,Î AŽŸ,Ì’l,Ì,Œ,,ê,©,ð•Ô,· B

**DDERR\_INVALIDOBJECT**  
**DDERR\_INVALIDPARAMS**

hMat  
”wŒi,Æ,µ,ĂŽg—p,³,ê,éf}fefŠfAf<,̀lfnf“fhf< B

ŽQ Æ @**IDirect3DViewport::GetBackground**

## **IDirect3DViewport::SetBackgroundDepth**

HRESULT SetBackgroundDepth (LPDIRECTDRAWSURFACE lpDDSurface);

frf... [f] [fg,ì”wŒi [“x,ð Ý’è,·,é B

¬Œ÷,·,ê,îD3D\_OK AŽ,”s,·,ê,î AŽŸ,Ì’l,Ì,Œ,,ê,©,ð•Ô,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

lpDDSurface

”wŒi [“x,ð•\,·DirectDrawSurfaceIfufWfFfNfg,Ö,Ìf|fCf“f^ B

**IDirect3DViewport::Clear** f\fbfh,ªŒÄ,î,ê AD3DCLEAR\_ZBUFFERftf%fo,ªŽw’è,³,ê,Ä,Œ  
,é,Æ,« AŽw’è,³,ê,½ [“x,ªZfofbftf@,É Ý’è,³,ê,é B [“x,Í16frfbfg,Å,È,¬,ê,î,È,Ç,È,Œ B

ŽQ Æ @**IDirect3DViewport::GetBackgroundDepth**



## IDirect3DViewport::SetViewport

```
HRESULT SetViewport(LPD3DVIEWPORT lpData);
```

[illegible]

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

lpData  
V\Kfrf... [f] [fg,đŽ',**D3DVIEWPORT** \`c`ì,Ö,ìf|fCf“f^ B

ŽQ Æ @IDirect3DViewport::GetViewport

## IDirect3DViewport::TransformVertices

```
HRESULT TransformVertices(DWORD dwVertexCount,  
    LPD3DTRANSFORMDATA lpData, DWORD dwFlags, LPDWORD lpOffscreen);
```

•İŠ· s—ñ,É,æ,è',“\_Zfbfg,ð•İŠ·,·,é B  
¬Æ÷,·,ê,İD3D\_OK AŽ,”s,·,ê,Î AŽŸ,İ'l,İ,¢,,ê,©,ð•Ô,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

*dwVertexCount*

*itfpf%of* [f^,İ'†,İ•İŠ·,³,ê,é',“\_ ” B

*lpData*

•İŠ·,³,ê,é',“\_,ðŠŮ,ð**D3DTRANSFORMDATA** \‘¢‘İ,Ö,İf|fCf“f^ B

*dwFlags*

ˆÈ%°,İftf%ofO,İ“à,Đ,Æ,Â B,±,ê,ç,İftf%ofO,İŽg,¢•û,É,Â,¢,Ä,Í ACEã q,İ à¾,ðŽQ Æ,·,é,±,Æ B

**D3DTRANSFORM\_CLIPPED**

**D3DTRANSFORM\_UNCLIPPED**

*lpOffscreen*

•İŠ·Æã A',“\_,ªfXfNfŠ [f“ŠO,İ,Æ,« A0ˆÈŠO,İ'l,ª Ý'è,³,ê,é•İ ”,Ö,İf|fCf“f^ B

*itfpf%of* [f^,ªD3DTRANSFORM\_CLIPPED,İ,Æ,« A,±,İf f\fbfh,Í A•İŠ·,³,ê,½',“\_,ªŽ<\_“ã,İ'†,É, ,ê,Î A',“\_,İ•İŠ·,É  
Æ» Ý,İ•İŠ· s—

ñ,ðŽg,□ B',“\_,ªfNfŠfbfsf“fO,³,ê,é,Æ,«,Í Ait,İ'†,İ**D3DLVERTEX** \‘¢‘İ,É‘İ%ž,·,é”ª,ª“ü,é B,»,İ'¼,İ,Æ,«,Í AfXfNf  
Š [f“ Ä•W,ª Ý'è,³,ê,é B•İŠ·,³,ê,½ Ä•W,İfNfŠfbfsf“fOÆð“\_,Í Ait,É•Ô,é B,à,µit,ª0ˆÈŠO,İ,Æ,«,Í A',“\_,ªfXfNfŠ  
[f“ŠO,Äfrf... [f|

[fg,É,©,©,ç,È,¢ B**D3DTRANSFORMDATA** \‘¢‘İ,İdrExtentf f“fo,à A•İŠ·Æã,İ',“\_,İ2D<éÆ”ÍÍ,É Ý'è,³,ê,é B

*itfpf%of* [f^,ªD3DTRANSFORM\_UNCLIPPED,İ,Æ,« A,±,İf f\fbfh,Í',“\_,İ•İŠ·,ÉÆ» Ý,İ•İŠ· s—ñ,ðŽg,□ B,±  
,İ ê ‡ AfVfXfef€,İŽ<\_ “ã,İ'†,É•İŠ·Æã,İ Ä•W,ª, ,é,Æ%¼'è,·,é

**BD3DTRANSFORMDATA** \‘¢‘İ,İdrExtentf f“fo•İŠ·Æã,İ Ä•W,İ<éÆ”ÍÍ,É Ý'è,³,ê,é B

**D3DTRANSFORMDATA** \‘¢‘İ,İdwClipf f“fo,Í A•İŠ·f,fWf... [f<,ªfrf... [,İ'ã,«,³,ð l—¶,µfNfŠfbfsf“fO,ªK—  
v,©,Ç,□,©Æˆè,·,é,±,Æ,ð •,¯,é B•İŠ·‘O,É ,“x,Èf\ftgfEfFA,Ä A<éÆ`â<...,İ”ÍÍ,ªfrf... [,İ'ã,«,³,Ä \ª,Ä, ,é,©%½“  
x,àfefXfg,·,é,±,Æ,ª,Ä,«<é BfNfŠfbfsf“fO,İfefXfg,Ä,Í AfXfLfbfv,³,ê,½,è Afrf... [,İ'ã,«,³,İŠO‘ª,ª \ª,Ä, ,é,© A'  
S'İ,ðfXfLfbfv,³,¹,½,è,·,é B

٧٤١

## D3DBRANCH

```
typedef struct _D3DBRANCH {
    DWORD dwMask;
    DWORD dwValue;
    BOOL bNegate;
    DWORD dwOffset;
} D3DBRANCH, *LPD3DBRANCH;
```

ŽÀ sfobftf@,l'†,É, ,é ðŒ •t,«,l-½—ß,ðŽÀ s,·,é B,±,l \‘Œ‘l,Í A•Šò \‘Œ‘l,Å, ,é B

### dwMask

•Šò,l,½,ß,lfrfbfgf}fXfN B,±,lf}fXfN,Í A~— l-½—ß,É,æ,èfhf%oCfo ó‘Ôf}  
fXfN,ÆŒ< ‡,Å,«,é BŒ<%oÊ,ªdwValuef f“fo,ÅŽw’è,³,ê,½‘l,É“™,µ,-  
AbNegatef f“fo,“FALSE,l ê ‡ A•Šò,·,é B

Žg—p%oÂ”\,Èfhf%oCfo ó‘Ôf}fXfN,lŒŠfXfg,Í AD3DSTATUS \‘Œ‘l,ldwStatusf f“fo,ðŽQ Œ,·,é,±,Æ B

### dwValue

dwMaskf f“fo,ÅŽ‘,³,ê,½-½—ß,Æ”äŠr,·,éAfvfŠfP [fVf‡f““è<,l‘l B

### bNegate

TRUE,Å A”äŠrŒ<%oÊ,l”½“] B

### dwOffset

•Šò æ,Ö,lIfIfZfbfg B I—¹,l,Æ,«,Í A0,ðŽw’è,·,é B

## D3DCOLORVALUE

```
typedef struct _D3DCOLORVALUE {
    union {
        D3DVALUE r;
        D3DVALUE dvR;
    };
    union {
        D3DVALUE g;
        D3DVALUE dvG;
    };
    union {
        D3DVALUE b;
        D3DVALUE dvB;
    };
    union {
        D3DVALUE a;
        D3DVALUE dvA;
    };
} D3DCOLORVALUE;
```

D3DLIGHT, D3DMATERIAL \‘ċ‘İ,ĂŽg,ƣfJf%o [‘l,đ’è‘,·,é B

**dvR, dvG, dvB, dvA**

F,l—v‘f,Ă, ,é Ô A—Î A Â AfAf<ftf@,đŽw’è,·,éD3DVALUEĈ^,İ‘l B

## D3DDEVICEDESC

```
typedef struct _D3DDeviceDesc {
    DWORD          dwSize;
    DWORD          dwFlags;
    D3DCOLORMODEL  dcmColorModel;
    DWORD          dwDevCaps;
    D3DTRANSFORMCAPS dtcTransformCaps;
    BOOL           bClipping;
    D3DLIGHTINGCAPS dlcLightingCaps;
    D3DPRIMCAPS    dpcLineCaps;
    D3DPRIMCAPS    dpcTriCaps;
    DWORD          dwDeviceRenderBitDepth;
    DWORD          dwDeviceZBufferBitDepth;
    DWORD          dwMaxBufferSize;
    DWORD          dwMaxVertexCount;
} D3DDEVICEDESC, *LPD3DDEVICEDESC;
```

«» Ý, ðffofCfX, É, Â, Ç, Ä, Ì ðñ,ª Ý'è,³,ê,é B,±  
, Ì \Ç'Ì, Í AIDirect3DDevice::GetCaps™, ðf f\bfh, Å«» Ý, ðffofCfX, ð-â, Ç ±, í,¹,é,½,B,ÉŽg,í,ê,é B

### dwSize

,±, Ì \Ç'Ì, ðf ofCf g'P^Ê, ðTfCfY B

### dwFlags

,±, Ì \Ç'Ì, Ì—LÊØ, Èff [f^,ª Ý'è,³,ê,Ä, Ç, éf f“fo, ðŽ-•Ê, ·, éftf%ofo B

#### D3DDD\_BCLIPPING

**bClipping** f“fo,ª—LÊØ B

#### D3DDD\_COLORMODEL

**dcmColorModel** f“fo,ª—LÊØ B

#### D3DDD\_DEVCAPS

**dwDevCaps** f“fo,ª—LÊØ B

#### D3DDD\_LIGHTINGCAPS

**dlcLightingCaps** f“fo,ª—LÊØ B

#### D3DDD\_LINECAPS

**dpcLineCaps** f“fo,ª—LÊØ B

#### D3DDD\_MAXBUFFERSIZE

**dwMaxBufferSize** f“fo,ª—LÊØ B

#### D3DDD\_MAXVERTEXCOUNT

**dwMaxVertexCount** f“fo,ª—LÊØ B

#### D3DDD\_TRANSFORMCAPS

**dtcTransformCaps** f“fo,ª—LÊØ B

#### D3DDD\_TRICAPS

**dpcTriCaps** f“fo,ª—LÊØ B

### dcmColorModel

ffofCfX, ðfJf% [ Ef, fffç, ðŽw'è, µ, Ä, Ç, é D3DCOLORMODEL—ñ<“Ç^f f“fo, Ì, Ð, Æ, Â B

### dwDevCaps

ffofCfX, ð”—Ì, ðŽ-•Ê, ·, éftf%ofo B

#### D3DDEVCAPS\_EXECUTESYSTEMMEM

#### ORY

fVfXfef€ Ef f, fŠ, ðŽÀ sf ofbftf@, ÉŽg—p%oÂ”\ B

#### D3DDEVCAPS\_EXECUTEVIDEOMEMORY

frfffl Ef f, fŠ, ðŽÀ sf ofbftf@, ÉŽg—p%oÂ”\ B

#### D3DDEVCAPS\_FLOATTVERTEX

ĨŠ·Ĉĕă,ĭ'“\_ff [f^,đ•,“@ ¬ ”“\_„ĂŽæ“¾ B  
**3DDEVCAPS\_SORTDECREASINGZ**  
 [“x,ĭĈ, •ûĈü,Éf\ [fg,<sup>3</sup>,ê,½ff [f^,<sup>3</sup>•K—v B  
**D3DDEVCAPS\_SORTEXACT**  
 ,\_ș,Éf\ [fg,<sup>3</sup>,ê,½ff [f^,<sup>3</sup>•K—v B  
**D3DDEVCAPS\_SORTINCREASINGZ**  
 Z‘ %oÁ•ûĈü,Éf\ [fg,<sup>3</sup>,ê,½ff [f^,<sup>3</sup>•K—v B  
**D3DDEVCAPS\_TEXTURESYSTEMMEMORY**  
 fVfXfefĈ Ef f,fŠ,©,çfefNfXf`ff,đŽæ“¾%oÁ”\ B  
**D3DDEVCAPS\_TEXTUREVIDEOMEMORY**  
 fffofCfXf f,fŠ,©,çfefNfXf`ff,đŽæ“¾%oÁ”\ B  
**D3DDEVCAPS\_TLVERTEXSYSTEMMEMORY**  
 ’,“\_„đ•ĬŠ·,μ,½,è—¾,é,,·,é,½,ß AfVfXfefĈ Ef f,fŠ,đfofbftf@,ÉŽg—  
 p%oÁ”\ B  
**D3DDEVCAPS\_TLVERTEXVIDEOMEMORY**  
 ’,“\_„đ•ĬŠ·,μ,½,è—¾,é,,·,é,½,ß AfrfffI Ef f,fŠ,đfofbftf@,ÉŽg—  
 p%oÁ”\ B  
**dtcTransformCaps**  
 fffofCfX,ĭ•ĬŠ·”—Ĭ,đŽw’è,,é**D3DTRANSFORMCAPS** \‘Ĉ‘Ĭ,ĭf f“fo,Ĭ,Đ,Æ,Â B  
**bClipping**  
 fffofCfX,<sup>3</sup>DfNfŠfbsf“fo,đŽÀ s%oÁ”\,Â, ,ê,Ĭ ATRUE,Æ,È,é B  
**dlcLightingCaps**  
 fffofCfX,ĬĈĕĈE1”—Ĭ,đŽw’è,,é**D3DLIGHTINGCAPS** \‘Ĉ‘Ĭ,ĭf f“fo,Ĭ,Đ,Æ,Â B  
**dpcLineCaps=dpcTriCaps**  
 ü,ăŽŎŠpĈ,đ•%oæ,,·,é,½,ß AfffofCfX,ĭfTf| [fg ĭ•ñ,đ’èĈ’,·,é**D3DPRIMCAPS** \‘Ĉ‘Ĭ B  
**dwDeviceRenderBitDepth**  
 fffofCfX,ĭfĈf“f\_Šf“fo Efrfbfg [“x BŽŸ,ĬDirectDrawfrfbfg [“x’è ”DDBD\_8 ADDBD\_16 ADDBD\_24 AD  
 DBD\_32,ĭ“à,Đ,Æ,ÂĖ ĩă,đ Ý’è,Â,«,é B  
**dwDeviceZBufferBitDepth**  
 fffofCfX,ĬZfofbftf@,ĭfrfbfg [“x BŽŸ,ĬDirectDrawfrfbfg [“x’è ”DDBD\_8 ADDBD\_16 ADDBD\_24 ADDBD  
 \_32,ĭ“à,Đ,Æ,ÂĖ ĩă,đ Ý’è,Â,«,é B  
**dwMaxBufferSize**  
 ,±,ĭfffofCfX,ĬŽÀ sfofbftf@,Ĭ ÂăfTfCfY B,±,ĭf f“fo,<sup>3</sup>0,Ĭ,Æ,«,Ĭ AfAfvfŠfP [fVf‡f“,Ĭ,Ç,Ĭ,æ,□  
 ,ÈfTfCfY,Â,ăŽg—p%oÁ”\,Â, ,é B  
**dwMaxVertexCount**  
 ,±,ĭfffofCfX,Ĭ Âă’,“\_ ” B  
 ŽQ Æ @**D3DCOLORMODEL** **AD3DFINDDEVICERESULT** **AD3DLIGHTINGCAPS** **AD3DPRIMCAPS** **AD3DTRANSFORMCAPS**

## D3DEXECUTEBUFFERDESC

```
typedef struct _D3DExecuteBufferDesc {
    DWORD    dwSize;
    DWORD    dwFlags;
    DWORD    dwCaps;
    DWORD    dwBufferSize;
    LPVOID    lpData;
} D3DEXECUTEBUFFERDESC;
typedef D3DEXECUTEBUFFERDESC *LPD3DEXECUTEBUFFERDESC;
```

**IDirect3DDevice::CreateExecuteBuffer,âIDirect3DExecuteBuffer::Lock**,l,æ,□  
,Ëf f\fbfh,Ì,½,ßŽÀ sfobftf@ î•ñ,ðŽ!,· B

### dwSize

,±,Ì \‘c‘Ì,ÌfofCfg’PˆÊ,ÌfTfCfY B

### dwFlags

,±,Ì \‘c‘Ì,Ì—LÆø,Èff [f^,ª Ý’è,³,ê,Ä,¢,éf f“fo,ðŽˉ•Ê,·,éftf%ofo B

**D3DDEB\_BUFSIZE**

**dwBufferSize** f“fo,ª—LÆø B

**D3DDEB\_CAPS**

**dwCaps** f“fo,ª—LÆø B

**D3DDEB\_LPDATA**

**lpData** f“fo,ª—LÆø B

### dwCaps

ŽÀ sfobftf@,Ìf f,fŠ’†,ÌÊ’u B

3DDEBCAPS\_MEM

D3DDEBCAPS\_SYSTEMMEMORY,Æ

D3DDEBCAPS\_VIDEOMEMORY,Ìˆ— ~a(OR) B

**D3DDEBCAPS\_SYSTEMMEMORY**

ŽÀ sfobftf@,Ìff [f^,ÍfVfXfef€ Ef f,fŠ,É“¶ Ý,·,é B

**D3DDEBCAPS\_VIDEOMEMORY**

ŽÀ sfobftf@,Ìff [f^,ÍfffofCfXf f,fŠ,É“¶ Ý,·,é B

### dwBufferSize

ŽÀ sfobftf@,ÌfofCfg’PˆÊ,ÌfTfCfY B

### lpData

fobftf@ Eff [f^,Ö,Ìf|fCf“f^ B



## D3DEXECUTEDATA

```
typedef struct _D3DEXECUTEDATA {
    DWORD      dwSize;
    DWORD      dwVertexOffset;
    DWORD      dwVertexCount;
    DWORD      dwInstructionOffset;
    DWORD      dwInstructionLength;
    DWORD      dwHVertexOffset;
    D3DSTATUS  dsStatus;
} D3DEXECUTEDATA, *LPD3DEXECUTEDATA;
```

**IDirect3DDevice::Execute** *f f\fbfh, l, 1/2, B Aff [f^, dŽw'è, , é B, ±, l f f\fbfh, aĖÄ, î, ê•İŠ·, a I—  
1, ·, é, Ė, « AdwInstructionOffset f “fo, ĀŽw'è, 3, ê, 1/2'l, ĀŽn, Ū, é—1/2—BfŠfXfg, %ođ Í, 3, ê, Ā•Ž, 3, ê, é B*

**dwSize**  
*, ±, l \“‘l, lfofCfg’P^Ê, lTfCfY B*

**dwVertexOffset**  
*, “\_fŠfXfg, lIfIfZfbfg B*

**dwVertexCount**  
*ŽÀ s, ·, é, “\_ ” B*

**dwInstructionOffset**  
*ŽÀ s—1/2—BfŠfXfg, lIfIfZfbfg B*

**dwInstructionLength**  
*ŽÀ s—1/2—B, l', 3 B*

**dwHVertexOffset**  
*fAfvfŠfP [fVf±f“, \*fNfŠfbfsf“fO, đ•K—v, Ė, ·, éfXfNfŠ [f“ Ā•Wff [f^, Ā—^, |, ç, ê, é, Ė, «, ÉŽg—  
p, 3, ê, é“—Žĭ, l', “\_lIfIfZfbfg B*

**dsStatus**  
*•İŠ· I—1ĖăŽg—p, 3, ê, éfXfNfŠ [f““ÍÍ, đŠi”[·, ·, é'l B, ±, l'l, Í AD3DSTATUS \“‘l, Ā, , é B*

ŽQ Ė @D3DSTATUS

## D3DFINDDEVICERESULT

```
typedef struct _D3DFINDDEVICERESULT {
    DWORD          dwSize;
    GUID           guid;
    D3DDEVICEDESC  ddHwDesc;
    D3DDEVICEDESC  ddSwDesc;
} D3DFINDDEVICERESULT, *LPD3DFINDDEVICERESULT;
```

*fAfvfŠfP [fVf±f“;“IDirect3D::FindDevicef f\fbfh,ðĖÄ,Ñ o,μ AŽæ“¾,·,éffofCfX,ðŽ~•Ė,·,é B*

### dwSize

*,±,ĭ \‘ċ‘ĭ,ĭf ofCf g’P~Ė,ĭfTfCfY B*

### guid

*ĖŸ o,³,ê,½ffofCfX,ĭfOf [f of< Ef+fj [fNŽ~•ĖŽq(GUID) B*

### ddHwDescddSwDesc

*ĖŸ o,³,ê,½fn [fhfEfFfA,Æf\ftfgfEfFfA,ĭftf ofCfX,ðŽ!,·D3DDEVICEDESC \‘ċ‘ĭ B*

*ŽQ Æ @D3DFINDDEVICESEARCH*

## D3DFINDDEVICESEARCH

```
typedef struct _D3DFINDDEVICESEARCH {
    DWORD          dwSize;
    DWORD          dwFlags;
    BOOL           bHardware;
    D3DCOLORMODEL  dcmColorModel;
    GUID           guid;
    DWORD          dwCaps;
    D3DPRIMCAPS    dpcPrimCaps;
} D3DFINDDEVICESEARCH, *LPD3DFINDDEVICESEARCH;
```

*fAfvfŠfP [fVf‡f“,”ŒŸ o,μ,½,ƒfffofCfX,İ“Á «,đŽ|,· B,±*  
*,İ \‘ċ’İ,İ AIDirect3D::FindDevice f\bfh,đŒĂ,Ň o,·,½,ß,ÉŽg,í,ê,é B*

### dwSize

*,±,İ \‘ċ’İ,İfofCfɡ’PˆÊ,İfTfCfY B*

### dwFlags

*fAfvfŠfP [fVf‡f“,”ŒŸ o,μ,½,ƒfffofCfXŒ^,đ’èċ,·,éftf%ofo B,±*  
*,İf f“fo,É,İ AŽŸ,İ’l,İ“à,Đ,Œ,ĂˆÊ ā,ª Ý’è,Ă,«,é B*

### D3DFDS\_ALPHACMPCAPS

*,±*  
*,İ \‘ċ’İ,İdpcPrimCapsf f“fo,Œ,μ,ĂŽw’è,³,ê,½D3DPRIMCAPS \‘ċ’*  
*İ,İdwAlphaCmpCapsf f“fo,Œˆê’v,·,é B*

### D3DFDS\_COLORMODEL

*,±*  
*,İ \‘ċ’İ,İdcmColorModelf f“fo,ĂŽw’è,³,ê,½fJf%o [ Ef,ffċ,Œˆê’v*  
*,·,é B*

### D3DFDS\_DSTBLENDCAPS

*,±*  
*,İ \‘ċ’İ,İdpcPrimCapsf f“fo,Œ,μ,ĂŽw’è,³,ê,½D3DPRIMCAPS \‘ċ’*  
*İ,İdwDestBlendCapsf f“fo,Œˆê’v,·,é B*

### D3DFDS\_GUID

*,±*  
*,İ \‘ċ’İ,İguidf f“fo,ĂŽw’è,³,ê,½fof [fofċ Ef†fj [fNŽˆ•ÊŽq(G*  
*UID),Œˆê’v,·,é B*

### D3DFDS\_HARDWARE

*,±,İ \‘ċ’İ,İbHardwaref f“fo,É—^,!,ç,ê,Ă,ƒ*  
*,éfn [fhfEfFfA,©f\ftfgfEfFfA,İŽæ“¾“à—e,Œˆê’v,·,é B*

### D3DFDS\_LINES

*D3DDEVICEDESC \‘ċ’İ,İdpcLineCapsf f“fo,ĂŽw’è,³,ê,½*  
*D3DPRIMCAPS \‘ċ’İ,Œˆê’v,·,é B*

### D3DFDS\_MISCCAPS

*,±*  
*,İ \‘ċ’İ,İdpcPrimCapsf f“fo,Œ,μ,ĂŽw’è,³,ê,½D3DPRIMCAPS \‘ċ’*  
*İ,İdwMiscCapsf f“fo,Œˆê’v,·,é B*

### D3DFDS\_RASTERCAPS

*,±*  
*,İ \‘ċ’İ,İdpcPrimCapsf f“fo,Œ,μ,ĂŽw’è,³,ê,½D3DPRIMCAPS \‘ċ’*  
*İ,İdwRasterCapsf f“fo,Œˆê’v,·,é B*

### D3DFDS\_SHADECAPS

*,±,İ \‘ċ’İ,İdpcPrimCaps*  
*f f“fo,Œ,μ,ĂŽw’è,³,ê,½D3DPRIMCAPS \‘ċ’İ,İdwShadeCapsf f“f*  
*o,Œˆê’v,·,é B*

### D3DFDS\_SRCBLENDCAPS

*,±*

ŽQ Æ @D3DFINDDEVICERESULT

## D3DHVERTEX

```
typedef struct _D3DHVERTEX {
    DWORD          dwFlags;
    union {
        D3DVALUE  hx;
        D3DVALUE  dvHX;
    };
    union {
        D3DVALUE  hy;
        D3DVALUE  dvHY;
    };
    union {
        D3DVALUE  hz;
        D3DVALUE  dvHZ;
    };
} D3DHVERTEX, *LPD3DHVERTEX;
```

*fAfVfŠfP [fVf±f“ ,ÉfNfŠfbfsf“fO, : ,é,½,ß,É•K—v,ÈfXfNfŠ [f“ À•W,ª—^!,ç,ê,é,Æ,« AŽg—  
p,³,ê,é“ŽŸ,“\_,ð’è‘,·,é B,±,İ \‘‘İ,İ AD3DTRANSFORMDATA \‘‘İ,İê•”,Ä, ,é B*

### dwFlags

*“ŽŸ,“\_,İfNfŠfbfsf“fO ó‘Ô,ð’è‘,·,éftf%ofo B,±  
,İf f“fo,İ AD3DTRANSFORMDATA \‘‘İ,İdwClipf f“fo,İftf%ofo,ð,Đ,Æ,Â^È ã Ý’è,Ä,«,é B*

### dvHX A dvHY A dvHZ

*“ŽŸ Ä•W,Ö,İİŠ·,ðŽw’è,·,éD3DVALUEĈ^,İl B,±,ê,ç,İ Ä•W,Í A’,“\_,ðŽl,· B*

## D3DINSTRUCTION

```
typedef struct _D3DINSTRUCTION {  
    BYTE bOpcode;  
    BYTE bSize;  
    WORD wCount;  
} D3DINSTRUCTION, *LPD3DINSTRUCTION;
```

ŽÀ sfofbftf@'†,ì-½—ß,ð'è<,:é BffBfXfvfƎfC EfŠfXfg,Í A%oÂ•İ'·-½—ß,ìfŠfXfg,æ,è ì ¬,³,ê,é B,»,ê,¼,ê,ì-½—ß,Í A<▯'Ê,È-½—ßfwfbf\_,ĂŽn,Ů,è A,»,ì-½—ß,ìfp%of [f^,ª±, B

### bOpcode

D3DOPCODE —ñ<“Ǝ^,ìf f“fo,Æ,µ,ĂŽw'è,³,ê,éƎf“f\_Šf“fO-½—ß B

### bSize

-½—ßff [f^††fjfbfg,ìfTfCfY B,±,ìf f“fo,Í A ‡ŽŸ,ÉŽŸ,ì-½—ß,É”ð,Ô,½,ß,ÉŽg,í,ê,é B

### wCount

Ý'è,·,é-½—ßff [f^ ” B,±,ìf f“fo,Í AŽOŠpƎ`,ìf fbfVf...,Ă,Ă,«,Ă,¢,éŽOŠpƎ`,ì,æ,▯,È AŽ—,½-½—ß,ð,Ů,Æ,ß,éŽž,ÉŽg,í,ê,é B

## D3DLIGHT

```
typedef struct _D3DLIGHT {
    DWORD          dwSize;
    D3DLIGHTTYPE   dltType;
    D3DCOLORVALUE   dcColor;
    D3DVECTOR       dvPosition;
    D3DVECTOR       dvDirection;
    D3DVALUE        dvRange;
    D3DVALUE        dvFalloff;
    D3DVALUE        dvAttenuation0;
    D3DVALUE        dvAttenuation1;
    D3DVALUE        dvAttenuation2;
    D3DVALUE        dvTheta;
    D3DVALUE        dvPhi;
} D3DLIGHT, *LPD3DLIGHT;
```

**IDirect3DLight::SetLight, IDirect3DLight::GetLight**,  $\lambda, \alpha, \varphi, \vec{f} = f \backslash f b f h, \delta \mathbb{E} \tilde{\mathbb{A}}, \tilde{\mathbb{O}}, \frac{1}{2}, \beta, \tilde{\mathbb{I}} \quad \mathbb{A} \mathbb{E} \delta \mathbb{E}^1 \mathbb{E}^{\wedge}, \delta \mathbb{E}^{\sim} \hat{\cdot}, \cdot, \acute{e} \quad \mathbb{B}$

**dwSize**

$, \pm, \tilde{\mathbb{I}} \quad \backslash \mathbb{C}^{\cdot} \tilde{\mathbb{I}}, \tilde{\mathbb{I}} f o f C f g^{\circ} \mathbb{P}^{\circ} \hat{\mathbb{E}}, \tilde{\mathbb{I}} f T f C f Y \quad \mathbb{B}$

**dltType**

$\mathbb{E} \delta \mathbb{E}^1, \tilde{\mathbb{I}} \mathbb{E}^{\wedge} \quad \mathbb{B}, \pm, \tilde{\mathbb{I}}^1, \tilde{\mathbb{I}} \quad \mathbb{A} \mathbb{D} \mathbb{3} \mathbb{D} \mathbb{L} \mathbb{I} \mathbb{G} \mathbb{H} \mathbb{T} \mathbb{T} \mathbb{Y} \mathbb{P} \mathbb{E} \text{---} \tilde{\mathbb{n}} \mathbb{C}^{\wedge}, \tilde{\mathbb{I}} f \quad f^{\circ} f o, \tilde{\mathbb{I}}, \mathbb{D}, \mathbb{A}, \hat{\mathbb{A}}, \acute{e} \quad \mathbb{B}$

**dcColor**

$\mathbb{E} \delta \mathbb{E}^1, \tilde{\mathbb{I}} \quad \mathbb{F} \quad \mathbb{B}, \pm, \tilde{\mathbb{I}} f \quad f^{\circ} f o, \tilde{\mathbb{I}} \quad \mathbb{A} \mathbb{D} \mathbb{3} \mathbb{D} \mathbb{C} \mathbb{O} \mathbb{L} \mathbb{O} \mathbb{R} \mathbb{V} \mathbb{A} \mathbb{L} \mathbb{U} \mathbb{E} \quad \backslash \mathbb{C}^{\cdot} \tilde{\mathbb{I}}, \hat{\mathbb{A}}, \acute{e} \quad \mathbb{B}$

**dvPosition= dvDirection**

$f \quad [f \langle f h \circ \acute{o} \tilde{\mathbb{S}} \tilde{\mathbb{O}}, \hat{\mathbb{A}}, \tilde{\mathbb{I}} \mathbb{E} \delta \mathbb{E}^1, \tilde{\mathbb{I}}^{\circ} \hat{\mathbb{E}}^{\circ} u, \hat{\mathbb{a}}^{\circ} \acute{\mathbb{I}}^{\circ} \quad \mathbb{B}$

**dvRange**

$\mathbb{E} \delta \mathbb{E}^1, \tilde{\mathbb{I}} \text{---} \mathbb{L} \mathbb{E} \emptyset^{\circ} \acute{\mathbb{I}}^{\circ} \quad \mathbb{B}$

**dvFalloff**

$\frac{-34 \cdot}{\tilde{\mathbb{I}} \tilde{\mathbb{S}} \tilde{\mathbb{O}}, \hat{\mathbb{A}}, \mathbb{P}^{\circ} \mathbb{X},^{\circ} \mathbb{E}, \quad \tilde{\mathbb{S}}, \cdot, \acute{e} \quad \mathbb{B}^{\circ} \frac{1}{4} \% \mathbb{O} \mathbb{E}^{\circ} \hat{\mathbb{a}}, \tilde{\mathbb{I}} \text{---} \hat{\mathbb{A}}, \tilde{\mathbb{I}} \mathbb{C}^{\circ} \mathbb{P}^{\circ} \mathbb{X}, \tilde{\mathbb{I}} \quad \mathbb{A} \tilde{\mathbb{Z}} \tilde{\mathbb{Y}}, \tilde{\mathbb{I}}^{\circ} \hat{\mathbb{u}}^{\circ} \delta \tilde{\mathbb{Z}} @, \hat{\mathbb{A}} \tilde{\mathbb{Z}}_{\tilde{\mathbb{I}}},^3, \acute{e}, \acute{e} \quad \mathbb{B}$

$$Light \times \cos^{\text{falloff}} \left| \frac{\pi}{2} \frac{2 \rho \theta - dvTheta}{dvPhi - dvTheta} \right|$$

$, \pm, \tilde{\mathbb{I}}^{\circ} \hat{\mathbb{u}}^{\circ} \delta \tilde{\mathbb{Z}} @, \hat{\mathbb{A}}, \tilde{\mathbb{I}} \quad \mathbb{A} \quad \mathbb{A} \tilde{\mathbb{E}} \tilde{\mathbb{E}} \tilde{\mathbb{Z}}^2, \mathbb{A} f X f | f b f g f \% o f C f g^{\circ} n^{\circ} \text{---} \mathbb{A}, \tilde{\mathbb{I}} \tilde{\mathbb{S}} p^{\circ} \mathbb{X}, \delta^{\circ} \backslash, \cdot \quad \mathbb{B}$

**dvAttenuation0**

$\hat{\mathbb{e}}^{\circ} \hat{\mathbb{e}}, \tilde{\mathbb{I}} \mathbb{C}^{\circ} \mathbb{X} \quad \mathbb{B} \mathbb{E} \delta \mathbb{E}^1, \mathbb{A} \mathbb{D} \mathbb{V} \mathbb{R} \mathbb{A} \mathbb{N} \mathbb{G} \mathbb{E} f \quad f^{\circ} f o, \acute{\mathbb{E}}, \mathbb{A}, \mathbb{E} \text{---} \wedge_{\tilde{\mathbb{I}}}, \mathbb{C}, \hat{\mathbb{e}}, \frac{1}{2}^{\circ} \hat{\mathbb{a}} \tilde{\mathbb{Z}} \sim \text{---} \tilde{\mathbb{I}} \tilde{\mathbb{S}} \tilde{\mathbb{O}}, \hat{\mathbb{A}} \mathbb{E}, \quad \tilde{\mathbb{S}}, \mu, \mathbb{E}, \mathbb{C} \mathbb{E} \delta \mathbb{E}^1 f \mathbb{E} f x f \langle, \delta \tilde{\mathbb{Z}} w^{\circ} \hat{\mathbb{e}}, \cdot, \acute{e} \quad \mathbb{B}$

**dvAttenuation1**

$f \tilde{\mathbb{S}} f j f \mathbb{A}, \acute{\mathbb{E}} \mathbb{E}, \quad \tilde{\mathbb{S}}, \cdot, \acute{e} \mathbb{C}^{\circ} \mathbb{X} \quad \mathbb{B} \mathbb{C}^{\circ} \mathbb{X}, \tilde{\mathbb{I}} \quad \mathbb{A} \mathbb{D} \mathbb{V} \mathbb{R} \mathbb{A} \mathbb{N} \mathbb{G} \mathbb{E} f \quad f^{\circ} f o, \acute{\mathbb{E}}, \mathbb{A}, \mathbb{E} \text{---} \wedge_{\tilde{\mathbb{I}}}, \mathbb{C}, \hat{\mathbb{e}}, \frac{1}{2}^{\circ} \hat{\mathbb{a}} \tilde{\mathbb{Z}} \sim \text{---} \tilde{\mathbb{I}} \tilde{\mathbb{S}} \tilde{\mathbb{O}}, \tilde{\mathbb{I}}^{\circ} \hat{\mathbb{t}}^{\circ} \tilde{\mathbb{S}} \tilde{\mathbb{O}}, \hat{\mathbb{A}} \quad \mathbb{A}, \pm, \tilde{\mathbb{I}}^1, \tilde{\mathbb{I}} 50 f p \quad [f Z f^{\circ} f g, \hat{\mathbb{A}}, \acute{e} \quad \mathbb{B}$

**dvAttenuation2**

$2 \tilde{\mathbb{Z}} \tilde{\mathbb{Y}} \mathbb{E}, \quad \tilde{\mathbb{S}} \text{---} \acute{\mathbb{I}}, \acute{\mathbb{E}} \quad \mathbb{I}, \hat{\mathbb{A}}, \hat{\mathbb{A}} \mathbb{E}, \quad \tilde{\mathbb{S}}, \cdot, \acute{e} \mathbb{C}^{\circ} \mathbb{X} \quad \mathbb{B}$

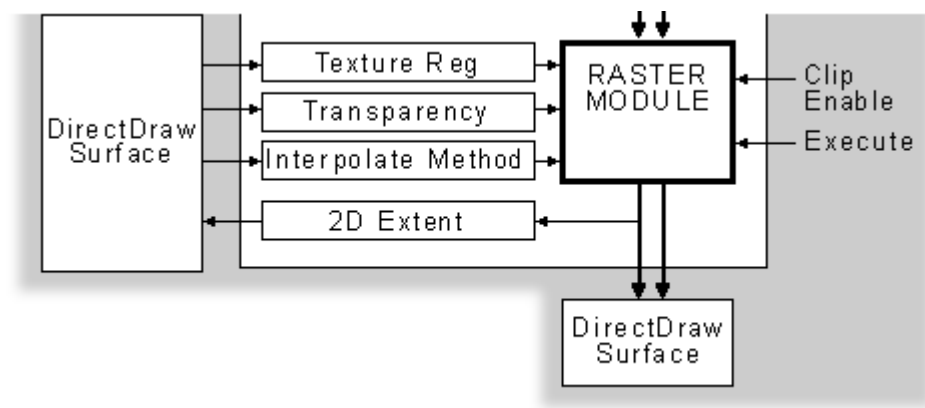
**dvTheta**

$f X f | f b f g f \% o f C f g, \tilde{\mathbb{I}}^{\circ} \hat{\mathbb{a}} \tilde{\mathbb{S}} p (f \% o f W f \mathbb{A} f^{\circ}) \quad \mathbb{B} \quad \mathbb{A}, \mathbb{C},^3, \hat{\mathbb{e}}, \frac{1}{2} f X f | f b f g f \% o f C f g, \tilde{\mathbb{I}} \tilde{\mathbb{Z}} \langle \quad \hat{\mathbb{a}}, \hat{\mathbb{A}}, \acute{e} \quad \mathbb{B}$

**dvPhi**

$f X f | f b f g f \% o f C f g, \tilde{\mathbb{I}} \tilde{\mathbb{S}} \tilde{\mathbb{O}} \tilde{\mathbb{S}} p (f \% o f W f \mathbb{A} f^{\circ}) \quad \mathbb{B}, \pm, \tilde{\mathbb{I}} \tilde{\mathbb{Z}} \langle \quad \hat{\mathbb{a}}, \tilde{\mathbb{I}} \tilde{\mathbb{S}} \tilde{\mathbb{O}}^{\circ} \mathbb{u}, \tilde{\mathbb{I}} \text{---} \hat{\mathbb{I}} \quad \mathbb{A} f X f | f b f g f \% o f C f g, \acute{\mathbb{E}} \quad \mathbb{A}, \mathbb{C},^3, \hat{\mathbb{e}}, \mathbb{E}, \mathbb{C} \quad \mathbb{B}$

$f V f X f e f \mathbb{E}, \tilde{\mathbb{I}} \quad \mathbb{A} \text{---} \mathbb{E}, \acute{\mathbb{E}}, \mathbb{A}, \acute{e} \mathbb{E} \delta \mathbb{E}^1, \tilde{\mathbb{I}} \mathbb{E}, \quad \tilde{\mathbb{S}}, \delta \mathbb{E} v \tilde{\mathbb{Z}} \tilde{\mathbb{Z}}, \cdot, \acute{e}, \frac{1}{2}, \beta \mathbb{E}, \quad \tilde{\mathbb{S}}, \delta 3 \tilde{\mathbb{Z}} \acute{\mathbb{I}}, \mathbb{A}, \hat{\mathbb{a}} \tilde{\mathbb{Z}} g \text{---} p, \cdot, \acute{e} \quad \mathbb{B} \tilde{\mathbb{Z}} \tilde{\mathbb{Y}}, \tilde{\mathbb{I}}^{\circ} \hat{\mathbb{u}}^{\circ} \delta \tilde{\mathbb{Z}} @, \tilde{\mathbb{I}} \quad \mathbb{A} \mathbb{E}, \quad \tilde{\mathbb{S}}, \tilde{\mathbb{I}} \quad \acute{\mathbb{Y}}^{\circ} \hat{\mathbb{e}}^{\circ} \hat{\mathbb{u}} \text{---} @, \delta \tilde{\mathbb{Z}}_{\tilde{\mathbb{I}}}, \cdot \quad \mathbb{B}, \pm, \tilde{\mathbb{I}}, \mathbb{A}, \mathbb{C}^{\circ} \mathbb{I} d, \tilde{\mathbb{I}} \quad \mathbb{A} \quad \mathbb{A} \tilde{\mathbb{E}} \tilde{\mathbb{E}},^3, \hat{\mathbb{e}}, \hat{\mathbb{A}}, \mathbb{C}, \acute{e}^{\circ}, \text{---} \mathbb{A} \mathbb{E} \delta \mathbb{E}^1, \tilde{\mathbb{I}} \tilde{\mathbb{S}} \tilde{\mathbb{O}}, \tilde{\mathbb{I}} \text{---} \mathbb{E}, \delta^{\circ} \backslash, \cdot \quad \mathbb{B}$



ŒöŒ¹,É,Â,ç,Ä,Ì Ú ×,Í A u Æ-¾f,fWf... [fç v,ðŽQ Æ,·,é,±,Æ B  
 ŽQ Æ @D3DLIGHTTYPE



## D3DLIGHTDATA

```
typedef struct _D3DLIGHTDATA {
    DWORD          dwSize;
    LPD3DLIGHTINGELEMENT lpIn;
    DWORD          dwInSize;
    LPD3DTLVERTEX  lpOut;
    DWORD          dwOutSize;
} D3DLIGHTDATA, *LPD3DLIGHTDATA;
```

**IDirect3DViewport::LightElements** *f\bfbfh,Ö,ìĖÄ,Ñ o,μ,É,,̄,éĖðĖ¹'n“\_,Æ F,ðŽ',· B*

**dwSize**  
*,±,Ì \‘ċ‘Ì,Ìf ofCf g’PˆÊ,ÌfTfCfY B*

**lpIn**  
*“ü—Í’n“\_,Æ—@ üfxfNfgfç,ðŽw’è,·,éD3DLIGHTINGELEMENT \‘ċ‘Ì,Ö,Ìf|fCf“f^ B*

**dwInSize**  
*ŽŸ,ì“ü—Í—v‘f,Ö,ÌˆÚ“@—Ê B,±,ê,Í AfAfvfŠfP [fVf‡f“,ª—v‘f,ðfCf“f%ofCf“ ^— ,μ A—  
áŠOff [f^,ðŠi”[,·,é,½,ß,Ê’ñçŸ,³,ê,é B*

**lpOut**  
*o—Í F,ðŽw’è,·,éD3DTLVERTEX \‘ċ‘Ì,Ö,Ìf|fCf“f^ B*

**dwOutSize**  
*ŽŸ,ì o—Í F,Ü,Ä,ÌˆÚ“@—Ê B,±,ê,Í AfAfvfŠfP [fVf‡f“,ª F,ðfCf“f%ofCf“ ^— ,μ A—  
áŠOff [f^,ðŠi”[,·,é,½,ß,Ê’ñçŸ,³,ê,é B*

## D3DLIGHTINGCAPS

```
typedef struct _D3DLIGHTINGCAPS {  
    DWORD dwSize;  
    DWORD dwCaps;  
    DWORD dwLightingModel;  
    DWORD dwNumLights;  
} D3DLIGHTINGCAPS, *LPD3DLIGHTINGCAPS;
```

fffofCfX, ðœœ¹” — Í, ðŽ‘, · B, ±, Ì \‘‘Ì, Í AD3DDEVICEDESC \‘‘Ì, Ìf f“fo, Å, , é B

### dwSize

, ±, Ì \‘‘Ì, ÌfofCf g’PˆÊ, ÌfTfCfY B

### dwCaps

œœœ¹f, fWf... [f<, Ì” — Í, ðŽ‘, ·ftf%ofo BŽŸ, Ìftf%ofo, ”è<³, ê, Å, ¢, é B

### D3DLIGHTCAPS\_DIRECTIONAL

—LŒÛœö, ðfTf| [fg, ·, é B

### D3DLIGHTCAPS\_GLSPOT

Open-GLfXf^fCf<, ÌfXf|fbfgf%ofoCf g, ðfTf| [fg, ·, é B

### D3DLIGHTCAPS\_PARALLELPOINT

fpf%ofoEf< Ef|fCf“fgœö, ðfTf| [fg, ·, é B

### D3DLIGHTCAPS\_POINT

f|fCf“fgœöœ¹, ðfTf| [fg, ·, é B

### D3DLIGHTCAPS\_SPOT

fXf|fbfgf%ofoCf g, ðfTf| [fg, ·, é B

### dwLightingModel

œœœ¹f, fff<,ª ARGB, ©f, fmfNf , Å, , é, ©, ð’è<, ·, éftf%ofo BŽŸ, Ìftf%ofo, ”è<³, ê, é B

### D3DLIGHTINGMODEL\_MONO

f, fmfNf œœœ¹f, fff< B

### D3DLIGHTINGMODEL\_RGB

RGBœöœ¹f, fff< B

### dwNumLights

Žg—p, Å, «, éœöœ¹ ” B

## D3DLIGHTINGELEMENT

```
typedef struct _D3DLIGHTINGELEMENT {  
    D3DVECTOR dvPosition;  
    D3DVECTOR dvNormal;  
} D3DLIGHTINGELEMENT, *LPD3DLIGHTINGELEMENT;
```

*f,fff«óŠÔ“à,ì Æ-¾^Ê'u,ðŽ',· B,±,ì \‘ċ'İ,Í AD3DLIGHTDATA \‘ċ'İ,İ^ê•”,Å, ,é B*

### dvPosition

*f,fff«óŠÔ,Å,ì Æ-¾^Ê'u,ðŽw'è,·,é'l B,±,İ'l,Í AD3DVECTOR \‘ċ'İ,Å, ,é B*

### dvNormal

*-@ üfxfNfgf<,ðŽw'è,·,é'l B,±,İ'l,Í AD3DVECTOR \‘ċ'İ,Å, ,é B*

*ŽQ Æ @D3DLIGHTDATA AIDirect3DViewport::LightElements*

D3DLINE

```
typedef struct _D3DLINE {
    union {
        WORD v1;
        WORD wV1;
    };
    union {
        WORD v2;
        WORD wV2;
    };
} D3DLINE, *LPD3DLINE;
```

D3DOPCODE—ñ“Œ^,Ä,ìD3DOP\_LINEfIfyfR [fh,ì,½,ß,ì¼ ü,ðŽ|,· B

wV1wV2  
,“\_,ìfCf“ffbfNfX B

•`%œ,³,ê,é ü ”,æ,è1,Â ,È,¢ A~A‘±,µ,½’,“\_,ìfŠfXfg,ðŽg,Á,Ä ü,Í•`%œ,³,ê,é B

## D3DLINEPATTERN

```
typedef struct _D3DLINEPATTERN {  
    WORD wRepeatFactor;  
    WORD wLinePattern;  
} D3DLINEPATTERN;
```

'¼ üfpf^ [f“,ðŽ,· B,±,ê,ç,ì'l,Í AD3DRENDERSTATETYPE—  
ñ‘“Œ^,Ä,ìD3DRENDERSTATE\_LINEPATTERNfŒf“f\_Œf“fO ó‘Ô,É,æ,èŽg—p,<sup>3</sup>,ê,é B

### wRepeatFactor

fpf^ [f“ŠJŽn,ì €”õ,Æ,μ,Ä AŠJŽn‘O,ÉŽg—p,<sup>3</sup>,ê,éwLinePatternf f“fo,ÅŽw’è,<sup>3</sup>,ê,½fpf^ [f“,ìfrfbfg ” B

### wLinePattern

f%oCf“ Efpf^ [f“,ðŽw’è,·,éfrfbfg B,½,Æ,,Î A'l1100110011001100,Í Afhfbfg Ef%oCf“,ð ¶ ¬,·,é B

## D3DLVERTEX

```
typedef struct _D3DLVERTEX {
    union {
        D3DVALUE x;
        D3DVALUE dvX;
    };
    union {
        D3DVALUE y;
        D3DVALUE dvY;
    };
    union {
        D3DVALUE z;
        D3DVALUE dvZ;
    };
    DWORD          dwReserved;
    union {
        D3DCOLOR color;
        D3DCOLOR dcColor;
    };
    union {
        D3DCOLOR specular;
        D3DCOLOR dcSpecular;
    };
    union {
        D3DVALUE tu;
        D3DVALUE dvTU;
    };
    union {
        D3DVALUE tv;
        D3DVALUE dvTV;
    };
};
} D3DLVERTEX, *LPD3DLVERTEX;
```

•İŠ·,³,ê,Ä,¢,È,¢ AE¼,³,ê,½’,“\_,ð’èç,·,é( F,Æ“™,İf,fffç Ä•W) Bfn [fhfEfFfA,ª•İŠ·,µ,½’,“\_,ðŽg—  
p,·,é,Æ,« AfAfvfŠfP [fVf‡f“,Í A,±,İ \‘¢‘İ,ðŽg, B,±  
,İ \‘¢‘İ,É,Í Af\ftfgfEfFfA,İĖĖĖ¹,É,æ,è Ý’è,³,ê,½ff [f^,Æ F,ªŠÜ,Ü,ê,é B

**dvX, dvY, dvZ**

’,“\_,İ“ŽŸ Ä•W,ðŽw’è,·,éD3DVALUEĖ^,İ¹ B

**dwReserved**

—\—ñ İ,Ý B0,Ä,È,¯,ê,İ,È,ç,È,¢ B

**dcColor=dcSpecular**

’,“\_,İ F,Æ“Š‰œ,ðŽw’è,·,éD3DCOLORĖ^,İ¹ B

**dvTU= dvTV**

’,“\_,İfefNfXf`ff Ä•W,ðŽw’è,·,éD3DVALUEĖ^,İ¹ B

## D3DMATERIAL

```
typedef struct _D3DMATERIAL {
    DWORD          dwSize;
    union {
        D3DCOLORVALUE diffuse;
        D3DCOLORVALUE dcvDiffuse;
    };
    union {
        D3DCOLORVALUE ambient;
        D3DCOLORVALUE dcvAmbient;
    };
    union {
        D3DCOLORVALUE specular;
        D3DCOLORVALUE dcvSpecular;
    };
    union {
        D3DCOLORVALUE emissive;
        D3DCOLORVALUE dcvEmissive;
    };
    union {
        D3DVALUE      power;
        D3DVALUE      dvPower;
    };
    D3DTEXTUREHANDLE  hTexture;
    DWORD             dwRampSize;
} D3DMATERIAL, *LPD3DMATERIAL;
```

**IDirect3DMaterial::GetMaterial**, **âIDirect3DMaterial::SetMaterial** f fbfh, ĩĖÄ, Ñ o, µ, ĩf}  
fefŠfAf<, ĩ“Á «, đŽw’è, ., é B

**dwSize**  
, ±, ĩ \‘ċ’ĩ, ĩfofCfġP’Ė, ĩfTfCfY B

**dcvDiffuse A dcvAmbient A dcvSpecular A dcvEmissive**  
, », ě, ¼, ě Af}fefŠfAf<, ĩŠgŽU F A•řÍ F A“Š‰ F A•úŽĚ F, đŽw’è, ., é’l B, ±  
, ě, ġ, ĩ’l, ĩ **AD3DCOLORVALUE** \‘ċ’ĩ, Á, , é B

**dvPower**  
“Š‰, ĩfnfCf‰ofCfġ, ĩ<, đŽw’è, ., é**D3DVALUE**Ė^, ĩ’l B

**hTexture**  
fefNfXf`ff Ef}fbfv, ĩfnf“fhf< B

**dwRampSize**  
F, ĩĖXŽĪ, ĩ’ă, «, <sup>3</sup> B’P F, ĩ(ĖXŽĪ)fhf‰ofCfo, Á, ĩ A”wĖi, ĖŽw’è, <sup>3</sup>, ě, ½f}fefŠfAf<, ĩ, ½, Ė, Ė A, ±  
, ĩ’l, ĩ1^Ė‰°, Á, Ė, ĩ, ě, ĩ, Ė, ġ, Ė, Ė B, », ĩ’¼, ĩ, Ė, « A”wĖi, ĩ•Ž, <sup>3</sup>, ě, Ė, Ė B, ±  
, ĩ“®, «, ĩ A”wĖi, ĖŽw’è, <sup>3</sup>, ě, ½fefNfXf`ff, <sup>a</sup>**dwRampSize** f“fo, <sup>a</sup>1^Ė ā, Ėf}fefŠfAf<, đĖ< ±, µ, Á, Ė, ě, Ė, «, Ė, à•  
, ě, é B

fefNfXf`ff, ĩfnf“fhf<, đŽă“¾, ., é, Ė, ĩ Afhf‰ofCfo, ĩfefNfXf`ff, đf [fh, ., é B, ±  
, ě, ĩ AfffofCfX, Ėf [fh, <sup>3</sup>, ě, ě, Ė, «, Ė, ĩ, ÝŽġ, ĩ, ě, é B

ŽQ Ė @**IDirect3DMaterial::GetMaterial** **AIDirect3DMaterial::SetMaterial**

## D3DMATRIX

```
typedef struct _D3DMATRIX {  
    D3DVALUE _11, _12, _13, _14;  
    D3DVALUE _21, _22, _23, _24;  
    D3DVALUE _31, _32, _33, _34;  
    D3DVALUE _41, _42, _43, _44;  
} D3DMATRIX, *LPD3DMATRIX;
```

**IDirect3DDevice::GetMatrix**,**âIDirect3DDevice::SetMatrix**, $\grave{\text{I}},\text{æ},\text{ϩ},\grave{\text{E}}f\ f\backslash fb\text{f}h,\grave{\text{I}},\frac{1}{2},\text{ß},\grave{\text{I}}\ s\text{---}\grave{\text{n}},\grave{\text{d}}\grave{\text{Z}}|,\cdot\ \text{B}$

Direct3D,Å A“Š‰œ s—ñ,ì\_44—v‘f,Í•‰o ”,đ Ý’è,Å,«,È,¢ BfAfvfŠfP [fVf‡f“,Å,±,ìˆÊ’u,É•‰o ”,đŽg,ϩ•K—v,<sup>a</sup>,,é  
ê ‡ A,»,ì‘ă,í,è,É-1,Å“Š‰œ s—ñ‘S‘Ì,đ kŽÚ,·,é B

ŽQ Æ @**IDirect3DDevice::GetMatrix** **AIDirect3DDevice::SetMatrix**



## D3DMATRIXLOAD

```
typedef struct _D3DMATRIXLOAD {  
    D3DMATRIXHANDLE hDestMatrix;  
    D3DMATRIXHANDLE hSrcMatrix;  
} D3DMATRIXLOAD, *LPD3DMATRIXLOAD;
```

**D3DOPCODE**— $\tilde{n}$ “ $\langle \mathbb{E}^\wedge, \tilde{\imath} \underline{\mathbf{D3DOP\_MATRIXLOAD}} f l f y f R \quad [f h, \tilde{\imath}, \frac{1}{2}, \mathbb{B}, \tilde{\imath} f l f y f \% o f “ f h \quad E f f \quad [f^\wedge, \delta \tilde{Z}_i, \cdot \quad B$

**hDestMatrix**  $\sqcap$  **hSrcMatrix**

“ $\tilde{\imath}$ “ $\text{---} \quad \mathfrak{a}, \mathbb{A} “ \tilde{\imath} \text{---} \mathbb{E}^3, \tilde{\imath} \quad s \text{---} \tilde{n}, \tilde{\imath} f n f “ f h f \langle \quad B$

$\tilde{Z} Q \quad \mathbb{A} \quad @ \underline{\underline{\mathbf{D3DOPCODE}}}$

## D3DMATRIXMULTIPLY

```
typedef struct _D3DMATRIXMULTIPLY {  
    D3DMATRIXHANDLE hDestMatrix;  
    D3DMATRIXHANDLE hSrcMatrix1;  
    D3DMATRIXHANDLE hSrcMatrix2;  
} D3DMATRIXMULTIPLY, *LPD3DMATRIXMULTIPLY;
```

**D3DOPCODE**— $\tilde{n}$ “ $\mathbb{C}\mathbb{E}^\wedge$ , $\hat{\imath}$ **D3DOP\_MATRIXMULTIPLY** $fIfyfR$   $[fh,\hat{\imath},\frac{1}{2},\beta,\hat{\imath}fIfyf\%of$ “ $fh$   $Eff$   $[f^\wedge,\delta\check{Z}'_{\imath},\cdot$   $B$

### hDestMatrix

$\mathbb{C}\mathbb{E}\check{Z}\mathbb{Z}\mathbb{C}\langle\%o\hat{E},\delta\check{S}\mathbb{i}$ ” $[\cdot,\acute{e}$   $s\text{---}\tilde{n},\hat{\imath}fnf$ “ $fhf\langle$   $B$

### hSrcMatrix1 $\square$ hSrcMatrix2

$1^\circ\hat{O}\text{---}\acute{U},\mathbb{A}2^\circ\hat{O}\text{---}\acute{U},\hat{\imath}\mathbb{C}\mathbb{E}\mathbb{V}\check{Z}\mathbb{Z}^\circ\hat{\imath}$   $\hat{U},\hat{\imath}$   $s\text{---}\tilde{n},\hat{\imath}fnf$ “ $fhf\langle$   $B$

$\check{Z}Q$   $\mathbb{A}$   $@$ **D3DOPCODE**

## D3DPICKRECORD

```
typedef struct _D3DPICKRECORD {  
    BYTE      bOpcode;  
    BYTE      bPad;  
    DWORD     dwOffset;  
    D3DVALUE  dvZ;  
} D3DPICKRECORD, *LPD3DPICKRECORD;
```

**IDirect3DDevice::GetPickRecords** *f\bfbh—p,É AŽÀ sfofbftf@,l‘I‘ðfvfŠf~fefBfu,É,Â,¢,Ä,Ì î•ñ,ð•Ô,· B*

### bOpcode

*‘I‘ðfvfŠf~fefBfu,lfIfyfR [fh B*

### bPad

*PadfofCfg B*

### dwOffset

*ŒŸ o,<sup>3</sup>,ê,½‘I‘ðfvfŠf~fefBfu,ÌŽÀ sfofbftf@,l æ“<sup>a</sup>,©,ç,lfIftfZfbfg B*

### dvZ

*‘I‘ðfvfŠf~fefBfu,Ì [“x B*

*‘I‘ðfvfŠf~fefBfu,Ìx Ay Â•W,Í A‘I‘ðfŒfR [fh,Â ¶ ¬,<sup>3</sup>,ê,é**IDirect3DDevice::Pick**f\bfbh,É,æ,èŽw’è,<sup>3</sup>,ê,é B*

*ŽQ Æ @**IDirect3DDevice::GetPickRecords** A**IDirect3DDevice::Pick***

## D3DPOINT

```
typedef struct _D3DPOINT {  
    WORD wCount;  
    WORD wFirst;  
} D3DPOINT, *LPD3DPOINT;
```

**D3DOPCODE**—ñ<“E^,ìD3DOP\_POINTfIfyfR [fh,ìIfyf%of“fh Eff [f^,ðŽ!,· B

**wCount**  
,“\_,ì ” B

**wFirst**  
Å %o,ì’,“\_,ìfCf“ffbfNfX B

,“\_,í A’,“\_fŠfXfg,É,æ,è•%oæ,³,ê,é B

ŽQ Æ @**D3DOPCODE**

## D3DPRIMCAPS

```
typedef struct _D3DPrimCaps {
    DWORD dwSize;
    DWORD dwMiscCaps;
    DWORD dwRasterCaps;
    DWORD dwZCmpCaps;
    DWORD dwSrcBlendCaps;
    DWORD dwDestBlendCaps;
    DWORD dwAlphaCmpCaps;
    DWORD dwShadeCaps;
    DWORD dwTextureCaps;
    DWORD dwTextureFilterCaps;
    DWORD dwTextureBlendCaps;
    DWORD dwTextureAddressCaps;
    DWORD dwStippleWidth;
    DWORD dwStippleHeight;
} D3DPRIMCAPS, *LPD3DPRIMCAPS;
```

,»,ê,¼,ê,ìfvfŠf~fefBfuĈ^,ì”—Í,ð’èĉ,·,é BfffofCfX,ì ¶ ÑŽž,âfffofCfX,ì”—Í,ðŽæ“¾,·,é,Æ,«,ÉŽg—p,³,é,é B,±  
,ì \‘ĉì,í AD3DDEVICEDESC \‘ĉì,ì†,ì,ĉ,,Ā,©,ìf f“fo,ð’èĉ,·,é B

### dwSize

,±,ì \‘ĉì,ìfofCfY’P’Ê,ìfTfCfY B

### dwMiscCaps

,±,ìfvfŠf~fefBfu,ì‘ ‘ì,È”—Í B,±,ìf f“fo,É,Í AŽŸ,ìl,ì,Ð,Æ,Ā^È ã,ð Ý’è,Ā,«,é B

### D3DPMISCCAPS\_CONFORMANT

fffofCfX,Í AOpenGL•W €É €¶,Ā,ĉ,é B

### D3DPMISCCAPS\_CULLCCW

fffofCfX,Í AD3DRENDERSTATE\_CULLMODE ó‘Ô,Ā‘ìð,μ,½ ¶%oñ,è  
,ðfTf| [fg,·,éŽŒŠpĈ^,ìfvfŠf~fefBfu,ì ê ±,ì,Ý) BD3DCULL—  
ñĉ“Ĉ^,ìD3DCULL\_CCWf f“fo,É‘î%ož,·,é B

### D3DPMISCCAPS\_CULLCW

fffofCfX,Í AD3DRENDERSTATE\_CULLMODE ó‘Ô,Ā‘ìð,μ,½%oE%oñ,  
è,ìŽŒŠpĈ^,ðfTf|  
[fg,·,éŽŒŠpĈ^,ìfvfŠf~fefBfu,ì ê ±,ì,Ý) BD3DCULL—  
ñĉ“Ĉ^,ìD3DCULL\_CCWf f“fo,É‘î%ož,·,é B

### D3DPMISCCAPS\_CULLNONE

fffofCfX,Í A‘ìð,μ,Ā,ĉ,éŽŒŠpĈ^,ðŽÀ s,Ā,«,È,ĉ BD3DCULL—  
ñĉ“Ĉ^,ìD3DCULL\_NONEf f“fo,É‘î%ož,·,é B

### D3DPMISCCAPS\_LINEPATTERNREP

fffofCfX,Í AD3DLINEPATTERN \‘ĉì,ìwRepeatFactorf f“fo,É1^È  
ã,ìl,ðŽg—p,Ā,«,é(‘¼ ü•%oæ,ìfvfŠf~fefBfu,ì ê ±,ì,Ý) B

### D3DPMISCCAPS\_MASKPLANES

fffofCfX,Í A F,ìftrfbfgf}fXfN,ðŽÀ s,Ā,«,é B

### D3DPMISCCAPS\_MASKZ

fffofCfX,Í AfsfNfZfĉ ^— ,ĀZfofbftf@,ì C ³,ð%oĀ”\  
,Æ,μ,½,è•s%oĀ”\,Æ,μ,½,è,·,é B

### dwRasterCaps

f%ofXf^•%oæ,ì”—Í îñ B,±,ìf f“fo,É,Í AŽŸ,ìl,ð,Ð,Æ,Ā^È ã Ý’è,Ā,«,é B

### D3DPRASTERCAPS\_DITHER

fffofCfX,Í A F,ì ĀĈ»—Í,ð—Ĉ,,·,é,½,B,ÉfffbfU^Žì,Ā,«,é B

### D3DPRASTERCAPS\_FOGTABLE

fffofCfX,Í AfsfNfZfĉ,ì [³,ðŽw,·ftfHfO’l,ð•İŠ,·,éŽæ“¾fe [fufĉ,Æ  
Æ ±,μ,Ā AftfHfO’l,ðŽŽ o,·,é B

### D3DPRASTERCAPS\_FOGVERTEX

fffofCfX,Í A Æ¾ˆ—  
,İŠÖ† AD3DTLVERTEX \‘c‘İ,İspecularf f“fo,Ä—  
^,İ,ç,ê,½D3DCOLOR‘l,İfAf<ftf@ ¬ˆ†,İ‘l,ðEvŽZ,‘,é B,»,µ,Ä Af%of  
Xf^,İŠÖ† AftfHfO‘l,ð ‘,«Š,İ,é B

#### D3DPRASTERCAPS\_PAT

fhf%ofCfo,Í Afpf^ [f“ˆ%œ,ð ˆ—  
,Ä,«é B(D3DRENDERSTATE\_LINEPATTERN,â  
D3DRENDERSTATE\_STIPPLEPATTERNfœf“f\_Šf“fO ó‘Ö,İ,Ð,Æ,Ä,Ä,  
İ üˆ,â“h,è,Ä,Ö,µ)fvfŠf~fefBfu—p,Ê Æ%öİ,³,ê,é B

#### D3DPRASTERCAPS\_ROP2

fffofCfX,Í AR2\_COPYPENˆÈŠÖ,İf%ofXf^ ˆ— ,ðfTf| [fg,Ä,«é B

#### D3DPRASTERCAPS\_STIPPLE

fffofCfX,Í A”¼“§¾,ðfVf~f...fœ [fg,ˆ,éf|fŠfSf“,ðˆˆ,Ä,«é B

#### D3DPRASTERCAPS\_SUBPIXEL

fffofCfX,Í Aˆê”Ö,œ,œ ® ”œ^,İfsfNfZf< Ä•W,Ä,È,-  
AZ A F AfefNfXf`ff,İff [f^,İfTfufsfNfZf<”z’u,Ä ˆ— ,ˆ,é B,±  
,ê,İ AZ,İfufŠ [fh ü,ð”ð,ˆ,é,İ,ð •,ˆ,é( F,İfWfbf^,ÆfsfNfZf<,İfefNf  
Xf`ff’l,à) B,±,ê,ç,İ A—Lœø,Æ,µ,½,è³œø,Æ,µ,½,è,Ä,«È,œ,œ  
(fffofCfX,Í AfTfufsfNfZf<”z’u,ðŽÄ s,µ,½,è A,µ,È,©,Ä,½,è,ˆ,é) B,  
±,İfrfbf,İ Afœf“f\_Šf“fO,İŽç,ðœˆˆ,ˆ,é,±  
,Æ,İ,Ä,«éDirect3DfNf%ofCfAf“fg,É’ñ<Ÿ,³,ê,é B

#### D3DPRASTERCAPS\_SUBPIXELX

fffofCfX,Í AXŽ²,È%œ^,Ä,½fTfufsfNfZf<”z’u,Ä ,è A ® ”œ^,İYŽ²,İˆ  
— ü,ð İ,Ý ä,°,½,à,İ,Ä ,é BfTfufsfNfZf<”z’u,É,Ä,œ  
,Ä,İ Ú ×,İ AD3DPRASTERCAPS\_SUBPIXEL,ðŽQ Æ,ˆ,é,±,Æ B

#### D3DPRASTERCAPS\_XOR

fffofCfX,Ír”¼“T— ˆa ˆ— (XOR),ðfTf| [fg,ˆ,é B,±  
,İftf%ofo,ª Y’è,³,ê, AD3DPRIM\_RASTER\_ROP2,ª Y’è,³,ê,Ä,œ,œ  
,é ê ‡,İ A”r”¼“T— ˆa ˆ— ,ªfTf| [fg,³,è,Ä,œ,œ,ˆ,è,İ,È,ç,È,œ,œ B

#### D3DPRASTERCAPS\_ZTEST

fffofCfX,İZfefXfg ˆ— ,ðŽÄ s,Ä,«é B,±  
,ê,İ Aœø%œÈ“I,ÉfvfŠf~fefBfu,ðfœf“f\_Šf“fO,µ Afœf“f\_Šf“fO,³,è  
,½,ç,İ,æ,œ,ÈZfsfNfZf<,Ä,à•Ž‘,ˆ,é B

#### dwZCmpCaps

fhf%ofCfo,ªŽÄ s%œÄ”\,ÈŠÖ ”,ð”äŠr,ˆ,éZfofbftf@ B,±,İf f“fo,İ AŽŸ,İ‘l,ð,Ð,Æ,ÄˆÈ ä Y’è,Ä,«é B

#### D3DPCMPCAPS\_ALWAYS

,Ä,È,ÉZfefXfg,ð’Ê,ˆ B

#### D3DPCMPCAPS\_EQUAL

V<K,İZ,ªœ» Ý,İZ,Æ“™,µ,œ ê ‡ AZfefXfg,ð’Ê,ˆ B

#### D3DPCMPCAPS\_GREATER

V<K,İZ,ªœ» Ý,İZ,æ,è‘ä,«œ ê ‡ AZfefXfg,ð’Ê,ˆ B

#### D3DPCMPCAPS\_GREATEREQUAL

V<K,İZ,ªœ» Ý,İZ,æ,è‘ä,«œ,©“™,µ,œ ê ‡ AZfefXfg,ð’Ê,ˆ B

#### D3DPCMPCAPS\_LESS

V<K,İZ,ªœ» Ý,İZ,æ,è ¬,³,œ ê ‡ AZfefXfg,ð’Ê,ˆ B

#### D3DPCMPCAPS\_LESSEQUAL

V<K,İZ,ªœ» Ý,İZ,æ,è ¬,³,œ,©“™,µ,œ ê ‡ AZfefXfg,ð’Ê,ˆ B

#### D3DPCMPCAPS\_NEVER

,Ä,È,ÉZfefXfg,ðŽ,”s,ˆ,é B

#### D3DPCMPCAPS\_NOTEQUAL

V<K,İZ,ªœ» Ý,İZ,Æ“™,µ,,È,œ ê ‡ AZfefXfg,ð’Ê,ˆ B

## dwSrcBlendCaps

$f \setminus [fX, \text{ifuf}\mathbb{C}f\text{“}ffBf\text{“}fO \hat{\imath}\tilde{n} B, \pm$   
 $, \text{if} f\text{“}fo, \hat{I} \text{ } \mathbb{A}\tilde{Z}\tilde{Y}, \hat{I}, \delta, \mathbb{D}, \mathbb{E}, \hat{A}\tilde{E} \hat{a} \text{ } \hat{Y}'\hat{e}, \hat{A}, \ll, \acute{e}(\text{RGBA}'l, \hat{l}) \setminus [fX, \mathbb{A}ffXfefBf \mid [fVf\pm f\text{“}, \hat{I} \text{ } A, \gg, \hat{e}, \tfrac{1}{4}, \hat{e}s, \mathbb{E}d, \hat{A}\bullet\backslash, \cdot) \text{ } B$   
D3DPBLENDCAPS\_BOTHINVSRCALPHA

$f \setminus [fX, \text{ifuf}\mathbb{C}f\text{“}ffBf\text{“}fO\mathbb{C}EW \text{”}(1\text{-}A_s, 1\text{-}A_s, 1\text{-}A_s, 1\text{-}A_s)$   
 $, \mathbb{A}ffXfefBf \mid [fVf\pm f\text{“}, \text{ifuf}\mathbb{C}f\text{“}ffBf\text{“}fO\mathbb{C}EW \text{”}(A_s, A_s, A_s,$   
 $A_s) \text{ } BffXfefBf \mid [fVf\pm f\text{“}, \text{ifuf}\mathbb{C}f\text{“}ffBf\text{“}fO, \hat{I}'\delta, \hat{I} \text{ } A\text{--}\mathbb{C}\emptyset, \mathbb{E}, \hat{E}, \acute{e} \text{ } B$

## D3DPBLENDCAPS\_BOTHSRCALPHA

$f \setminus [fX, \text{ifuf}\mathbb{C}f\text{“}ffBf\text{“}fO\mathbb{C}EW \text{”}(A_s, A_s, A_s, A_s)$   
 $, \mathbb{A}ffXfefBf \mid [fVf\pm f\text{“}, \text{ifuf}\mathbb{C}f\text{“}ffBf\text{“}fO\mathbb{C}EW \text{”}(1\text{-}A_s, 1\text{-}A_s, 1\text{-}A_s, 1\text{-}$   
 $A_s) \text{ } BffXfefBf \mid [fVf\pm f\text{“}, \text{ifuf}\mathbb{C}f\text{“}ffBf\text{“}fO, \hat{I}'\delta, \hat{I} \text{ } A\text{--}\mathbb{C}\emptyset, \mathbb{E}, \hat{E}, \acute{e} \text{ } B$

## D3DPBLENDCAPS\_DESTALPHA

$\text{fuf}\mathbb{C}f\text{“}ffBf\text{“}fO\mathbb{C}EW \text{”}(Ad, Ad, Ad, Ad) \text{ } B$

## D3DPBLENDCAPS\_DESTCOLOR

$\text{fuf}\mathbb{C}f\text{“}ffBf\text{“}fO\mathbb{C}EW \text{”}(Rd, Gd, Bd, Ad) \text{ } B$

## D3DPBLENDCAPS\_INVDESTALPHA

$\text{fuf}\mathbb{C}f\text{“}ffBf\text{“}fO\mathbb{C}EW \text{”}(1\text{-}Ad, 1\text{-}Ad, 1\text{-}Ad, 1\text{-}Ad) \text{ } B$

## D3DPBLENDCAPS\_INVDESTCOLOR

$\text{fuf}\mathbb{C}f\text{“}ffBf\text{“}fO\mathbb{C}EW \text{”}(1\text{-}Rd, 1\text{-}Gd, 1\text{-}Bd, 1\text{-}Ad) \text{ } B$

## D3DPBLENDCAPS\_INVSRCALPHA

$\text{fuf}\mathbb{C}f\text{“}ffBf\text{“}fO\mathbb{C}EW \text{”}(1\text{-}A_s, 1\text{-}A_s, 1\text{-}A_s, 1\text{-}A_s) \text{ } B$

## D3DPBLENDCAPS\_INVSRCCOLOR

$\text{fuf}\mathbb{C}f\text{“}ffBf\text{“}fO\mathbb{C}EW \text{”}(1\text{-}Rd, 1\text{-}Gd, 1\text{-}Bd, 1\text{-}Ad) \text{ } B$

## D3DPBLENDCAPS\_ONE

$\text{fuf}\mathbb{C}f\text{“}ffBf\text{“}fO\mathbb{C}EW \text{”}(1, 1, 1, 1) \text{ } B$

## D3DPBLENDCAPS\_SRCALPHA

$\text{fuf}\mathbb{C}f\text{“}ffBf\text{“}fO\mathbb{C}EW \text{”}(A_s, A_s, A_s, A_s) \text{ } B$

## D3DPBLENDCAPS\_SRCALPHASAT

$\text{fuf}\mathbb{C}f\text{“}ffBf\text{“}fO\mathbb{C}EW \text{”}(f, f, f, 1) \text{ } Af = \min(A_s, 1\text{-}Ad) \text{ } B$

## D3DPBLENDCAPS\_SRCCOLOR

$\text{fuf}\mathbb{C}f\text{“}ffBf\text{“}fO\mathbb{C}EW \text{”}(R_s, G_s, B_s, A_s) \text{ } B$

## D3DPBLENDCAPS\_ZERO

$\text{fuf}\mathbb{C}f\text{“}ffBf\text{“}fO\mathbb{C}EW \text{”}(0, 0, 0, 0) \text{ } B$

## dwDestBlendCaps

$\text{ffXfefBf} \mid [fVf\pm f\text{“} \neg \pm \hat{\imath}\tilde{n} B, \pm, \text{if} f\text{“}fo, \hat{I} \text{ } AdwSrcBlendCaps f \text{“}fo, \hat{A}'\hat{e}\hat{c}', \hat{3}, \hat{e}, \tfrac{1}{2}\text{”}\neg\hat{I} \hat{\imath}\tilde{n}, \mathbb{E}\text{“}\neg, \mathbb{I}, \hat{A}, \text{ } , \acute{e} \text{ } B$

## dwAlphaCmpCaps

$\text{fhf}\%ofCfo, \hat{a}\tilde{Z}\hat{A} \text{ } s\% \hat{A}\text{”}, \mathbb{E}\tilde{S}\tilde{O} \text{”}, \delta\text{”}\hat{a}\hat{S}r, \cdot, \acute{e}fAf\langle ftf@ \text{ } EfefXfg \text{ } B, \pm, \text{if} f\text{“}fo, \hat{I} \text{ } AdwZCmpCaps f \text{“}fo, \hat{A}'\hat{e}\hat{c}', \hat{3}, \hat{e}, \tfrac{1}{2}\text{”}\neg\hat{I} \hat{\imath}\tilde{n}, \mathbb{E}\text{“}\neg, \mathbb{I}, \hat{A}, \text{ } , \acute{e} \text{ } B$

## dwShadeCaps

$\text{ffofCfX}, \hat{a}\tilde{Z}\hat{A} \text{ } s, \hat{A}, \ll, \acute{e}fVfF \mid [ffBf\text{“}fO \text{ } \neg\text{—} \text{ } B\hat{e}\text{”}\hat{E}\text{”}I, \acute{E} \text{ } AfffofCfX, \hat{a}\text{—}\wedge, \text{ } , \text{ } , \text{ } \hat{c}, \hat{e}, \tfrac{1}{2}fRf\}$   
 $f\text{“}fh(\text{D3DOP\_TRIANGLE}, \hat{l}, \hat{a}, \text{ } , \text{ } \hat{E}), \delta\tilde{Z}\hat{A} \text{ } s, \hat{A}, \ll, \acute{e} \text{ } \hat{e} \text{ } \pm, \hat{I} \text{ } AD3DSHADE\_FLATf, \mid [fh(\text{D3DSHADEMODE}\text{—}$   
 $\hat{n}\text{“}\mathbb{C}\wedge, \hat{A}\tilde{Z}w'\hat{e}, \hat{3}, \hat{e}, \hat{e}, \hat{a}, \text{ } , \text{ } \hat{E}), \delta fTf \mid [fg, \cdot, \acute{e} \text{ } B, \pm$   
 $, \text{iftf}\%ofo, \hat{I} \text{ } AfOf \text{ } \mid EfVfF \mid [ffBf\text{“}fO, \mathbb{A}ftfHf\text{“} \text{ } EfVfF \mid [ffBf\text{“}fO, \delta fTf \mid$   
 $\mid [fg, \cdot, \acute{e}fhf\%ofCfo, \hat{a} \text{ } A, R, \hat{A}, \text{ifJf}\% \mid [ \text{ } \mathbb{I} \text{ } \neg f, \mid [fh, \hat{E}, \gg, \hat{e}, \tfrac{1}{4}, \hat{e}fTf \mid [fg, \hat{3}, \hat{e}, \acute{e}fAf\langle ftf@ \text{ } EfJf\% \mid [EfRf\text{“}f \mid$   
 $\text{ } \mid [lf\text{“}fg, \delta\tilde{Z}w'\hat{e}, \cdot, \acute{e} \text{ } BfAf\langle ftf@ \text{—}v'f, \hat{a}\text{—}\wedge, \text{ } , \text{ } , \text{ } \hat{c}, \hat{e}, \tfrac{1}{2}f, \mid [fh, \hat{A}fTf \mid$   
 $\mid [fg, \hat{3}, \hat{e}, \hat{E}, \text{ } \text{ } \hat{c} \text{ } \hat{e} \text{ } \pm \text{ } A, \gg, \text{if}, \mid [fh, \hat{A} \text{ } \mathbb{I} \text{ } \neg, \hat{3}, \hat{e}, \tfrac{1}{2} \text{ } F, \text{ifAf}\langle ftf@ \text{ } , \text{ } \hat{l}, \hat{I}\bullet K, \text{ } , 255, \hat{E}, \hat{E}, \acute{e} \text{ } B, \pm$   
 $, \text{if} \text{”}l, \hat{a} \text{ } AfAf\langle ftf@, \text{if} \text{”}\hat{A}'\hat{e}\hat{c}'l(fAf\langle ftf@, \hat{a} \text{ } \hat{A}\rangle), \hat{A}, \text{ } , \acute{e} \text{ } B$

$\hat{Z}\hat{O}\hat{S}p\mathbb{C}\hat{E}, \text{if} \text{ } F \text{ } AfnfCf\%ofCfg\text{“}\hat{S}\%oe \text{ } AftfHfO \text{ } AfAf\langle ftf@ \text{ } \neg\hat{a}, \hat{E}, \hat{I}, \gg, \hat{e}, \tfrac{1}{4}, \hat{e} \text{ } AfffofCfX \text{ } Efhf\%ofCfo, \text{ } fAfvf\hat{S}fP$   
 $\mid [fVf\pm f\text{“}, \hat{E}'\hat{E}'m, \cdot, \acute{e}\text{”}\neg\text{—iftf}\%fo, \hat{a}, \text{ } , \acute{e} \text{ } B$

$, \pm$   
 $, \text{iftf}\%ofo, \hat{I} \text{ } AfVfF \mid [ffBf\text{“}fO \text{ } Ef, \mid [fh \text{ } AfJf\% \mid [Ef, fff\langle \text{ } A, \gg, \mu, \hat{A} \text{ } \neg \pm, \hat{a}\text{“}\neg, \hat{3}, \hat{e}, \acute{e} \text{ } F, \text{ifAf}\langle ftf@ \text{ } \neg\hat{a}, \hat{A} \text{ } X$   
 $V, \hat{3}, \hat{e}, \acute{e} \text{ } B \text{ } \hat{U} \times, \hat{I} \text{ } A \text{ } uf\mid f\hat{S}fSf\text{“} \text{ } v, \delta\tilde{Z}Q \text{ } \mathbb{E}, \cdot, \acute{e}, \pm, \mathbb{E} \text{ } B$

,±,İf f“fo,Í AŽŸ,Ì'l,ð,Đ,Æ,Â^È ã Ý'è,Â,«,é B

D3DPSHADECAPS\_ALPHAFLATBLEND

D3DPSHADECAPS\_ALPHAFLATSTIPPLE

D

fffofCfX,Í A“§%ß“l,É,»,ê,¼,ê ¬ ‡,â“\_•³,ê,½•½—  
Ê(D3DSHADEMODE—ñ““Ĉ^,İD3DSHADE\_FLAT),İfAf<ftf@ ¬•ª,ðfTf|  
[fg,Â,«,é B,±,ê,ç,İf, [fh,Â A,Đ,Æ,Â,İ—  
v'f,İ,½,ß,İfAf<ftf@ F ¬•ª,Í A—v'f,İ Â %o,İ',“\_İ F,İ1•”ª,Æ,µ,Ä—  
^,!,ç,ê,é B

D3DPSHADECAPS\_ALPHAGOURAUDBLEND

D3DPSHADECAPS\_ALPHAGOURAUDSTIPPLED

fffofCfX,Í A“§%ß“l,É,»,ê,¼,ê ¬ ‡,â“\_•³,ê,½fOf [(D3DSHADE  
MODE—ñ““Ĉ^,İD3DSHADE\_GOURAUD),İfAf<ftf@ ¬•ª,ðfTf|  
[fg,Â,«,é B,±,ê,ç,İf, [fh,Â,Í AfAf<ftf@ F ¬•ª,Í',“\_É,½,!,ç,ê A  
'¼,İ F ¬•ª,Æ,Æ,à,Ê '«,« ž,Ü,ê,é B

D3DPSHADECAPS\_ALPHAPHONGBLEND

D3DPSHADECAPS\_ALPHAPHONGSTIPPLED

fffofCfX,Í A“§%ß“l,É,»,ê,¼,ê ¬ ‡,â“\_•³,ê,½ftfHf“(D3DSHADEM  
ODE—ñ““Ĉ^,İD3DSHADE\_PHONG),İfAf<ftf@ ¬•ª,ðfTf|  
[fg,Â,«,é B,±,ê,ç,İf, [fh,Â A',“\_fpf%of [f^,Í Ô A—  
Î A Â,İ F ¬•ª,İ“K%ž,·,éĈōĈ¹Ĉø%ĈÊ,³fsfNfZf<'P^Ê,É Ä•]%)  
¿,³,ê,é B

D3DPSHADECAPS\_COLORFLATMONO

D3DPSHADECAPS\_COLORFLATRGB

fffofCfX,Í AD3DCOLOR\_MONO,ÆD3DCOLOR\_RGBfJf%o [f, [fh  
,İ½—ÊfVfF [ffBf“fO,İ F•t,¬,ªfTf| [fg,Â,«,é B,±  
,ê,ç,İf, [fh,Â,Í A,Đ,Æ,Â,İ—v'f,İ F ¬•ª,Í A—v'f,İ Â %o  
,İ',“\_İ F,Æ,µ,Ä—  
^,!,ç,ê,é Bf,fmfNf ĈōĈ¹f, [fh,Â A F,İ Â ¬•ª,¾,¬,ª ‘,«Š,!,ç,ê,é  
BRGBĈōĈ¹f, [fh,Â,Í A Ô A—Î A Â ¬•ª,ª ‘,«Š,!,ç,ê,é B

D3DPSHADECAPS\_COLORGOURAUDMONO

D3DPSHADECAPS\_COLORGOURAUDRGB

fffofCfX,Í AD3DCOLOR\_MONO,ÆD3DCOLOR\_RGBfJf%o [f, [fh  
,İfOf [ EfVfF [ffBf“fO,İ F•t,¬,ªfTf| [fg,Â,«,é B,±  
,ê,ç,İf, [fh,Â A,Đ,Æ,Â,İ—v'f,İ,½,ß,İfAf<ftf@ F ¬•ª,Í',“\_É,½,!,ç,ê  
A'¼,İ F ¬•ª,Æ,Æ,à,Ê½—  
Ê,ð“n,Â,Â ‘,« ž,Ü,ê,é Bf,fmfNf ĈōĈ¹f, [fh,Â A F,İ Â ¬•ª,¾,¬  
,Í A ‘,«Š,!,ç,ê,é BRGBĈōĈ¹f, [fh,Â,Í A Ô A—  
Î A Â ¬•ª,Í ‘,«Š,!,ç,ê,é B

D3DPSHADECAPS\_COLORPHONGMONO

D3DPSHADECAPS\_COLORPHONGRGB

fffofCfX,Í AD3DCOLOR\_MONO,ÆD3DCOLOR\_RGBfJf%o [f, [fh  
,İftfHf“ EfVfF [ffBf“fO,İ F•t,¬,ªfTf| [fg,Â,«,é B,±  
,ê,ç,İf, [fh,Â A',“\_fpf%of [f^,ÍfsfNfZf<'P^Ê,É Ä•]%)  
¿,³,ê,é BĈōĈ¹Ĉø%ĈÊ,Í ARGBf, [fh,İ Ô A—  
Î A Â,İ F ¬•ª,Â“K%ž,³,ê,é BftfHf“ EfVfF [ffBf“fO,ÍĈÊ» ÝfTf  
| [fg,³,ê,Ä,ç,È,ç B

D3DPSHADECAPS\_FOGFLAT

D3DPSHADECAPS\_FOGGOURAUD

D3DPSHADECAPS\_FOGPHONG

fffofCfX,Í A½—Ê AfOf [ AftfHf“f, [fh,ÂftfHfO,ðfTf|  
[fg,Â,«,é BftfHf“ EfVfF [ffBf“fO,Í AĈÊ» ÝfTf| [fg,³,ê,Ä,ç  
,È,ç B

D3DPSHADECAPS\_SPECULARFLATMONO

D3DPSHADECAPS\_SPECULARFLATRGB



fffofCfX,Í AD3DCOLOR\_MONO,ÆD3DCOLOR\_RGBfJf%o [f, [fh  
,İ½-ÊfVfF [ffBf“fO,İfnfCf%ofCf g“Š%oe,ðfTf| [fg,Â,«,é B

#### D3DPSHADECAPS\_SPECULARGOURAUDMONO

#### D3DPSHADECAPS\_SPECULARGOURAUDRGB

fffofCfX,Í AD3DCOLOR\_MONO,ÆD3DCOLOR\_RGBfJf%o [f, [fh  
,İfOf [ EfVfF [ffBf“fO,İfnfCf%ofCf g“Š%oe,ðfTf| [fg,Â,«,é B

#### D3DPSHADECAPS\_SPECULARPHONGMONO

#### D3DPSHADECAPS\_SPECULARPHONGRGB

fffofCfX,Í AD3DCOLOR\_MONO,ÆD3DCOLOR\_RGBfJf%o [f, [fh  
,İftfHf“ EfVfF [ffBf“fO,İfnfCf%ofCf g“Š%oe,ðfTf| [fg,Â,«,é B

### dwTextureCaps

¬ ‡fefNfXf`ff Ef}fbfsf“fO îñ B,±,İf f“fo,Í AŽŸ,İ'l,ð,Đ,Æ,ÂÈ ã Ý'è,Â,«,é B

#### D3DPTTEXTURECAPS\_ALPHA

D3DTEX\_DECAL,ÆD3DTEX\_MODULATEfefNfXf`ffftfBf<f^ [f, [f  
h,İRGBAfefNfXf`ff,ðfTf| [fg,·,é B,±,İ<@”\,ª Ý'è,³,è,Â,¢  
,È,¢ ê ‡ ARGBfefNfXf`ff,İ,Ý,ª A,±,è,ç,İf, [fh,ÂfTf|  
[fg,³,è,é B,±,İftf%ofo,İ Ý'è,ð-³Ž<,·,é,Æ AfAf<ftf@,İŽg—p%oÂ”\  
,ÈD3DTEX\_DECAL\_MASK AD3DTEX\_DECAL\_ALPHA AD3DTEX\_  
MODULATE\_ALPHAftfBf<f^f, [fh,ÂfTf| [fg,³,è,é B

#### D3DPTTEXTURECAPS\_BORDER

«ŠE ü,È%o^,Â,ÂfefNfXf`ff Ef}fbfsf“fO,ðfTf| [fg,·,é B

#### D3DPTTEXTURECAPS\_PERSPECTIVE

“ŠŽ<“Š%oe,ªfTf| [fg,³,è,é B

#### D3DPTTEXTURECAPS\_POW2

,±,İftf%ofo,ª Ý'è,³,è,½ ê ‡ Af~fbfvf}  
fbfv,Â,È,¢fefNfXf`ff,Í A2 æ,ÂŽw'è,³,è,½• ,Æ ,³,ðŽ ,½,È,-,è,Î,È,  
ç,È,¢(f~fbfvf}  
fbfv EfefNfXf`ff,Í A•K,2 æŽŸƐ³,Â,È,-,è,Î,È,ç,È,¢) B

#### D3DPTTEXTURECAPS\_SQUAREONLY

fefNfXf`ff,Í A,·,×,Ä<éƐ',Â,È,-,è,Î,È,ç,È,¢ B

#### D3DPTTEXTURECAPS\_TRANSPARENCY

“Š%oßfefNfXf`ff,ªfTf| [fg,³,è,é(Ɛ» Ý,İ“Š%oß F,Â,È,¢,±  
,è,ç,İfefNfXf`ffs,İ,Ý•%oæ,³,è,é) B

### dwTextureFilterCaps

fefNfXf`ff,İf}fbfsf“fO îñ B,±,İf f“fo,Í AŽŸ,İ'l,ð,Đ,Æ,ÂÈ ã Ý'è,Â,«,é B

#### D3DPTFILTERCAPS\_LINEAR

fsfNfZf<,ðŽæ,èŠª,fefNfZf<,İ2 ~2—İ'æ,É d,Ý•t,-³,è,½•½<İ'l B,±  
,è,Í AŠg'â,Æ k ¬,İ—¼•û,ÂŽg—p,³,è,é BŠg'â,© k ¬,ªfTf|  
[fg,³,è,Â,¢,é,Æ,«,Í A—¼•û,ªfTf| [fg,³,è,Â,¢,È,-,è,Î,È,ç,È,¢ B

#### D3DPTFILTERCAPS\_LINEARMIPLINEAR

D3DPRIM\_TEX\_MIP\_LINEAR,Æ“—l,¾,ª A,Ó,½,Â,İ<ßŽ—f~fbfvf}  
fbfv,ð ',«Š•,İ,é B

#### D3DPTFILTERCAPS\_LINEARMIPNEAREST

D3DPRIM\_TEX\_MIP\_NEAREST,Æ“—l,¾,ª A,Ó,½,Â,İ<ßŽ—f~fbfvf}  
fbfv,ð ',«Š•,İ,é B

#### D3DPTFILTERCAPS\_MIPLINEAR

D3DPRIM\_TEX\_LINEAR,Æ“—l,¾,ª A'I'ðfefNfZf<,É'İ%ož,·,éf~fbfvf}  
fbfv,ðŽg—p,·,é B

#### D3DPTFILTERCAPS\_MIPNEAREST

D3DPRIM\_TEX\_NEAREST,Æ“—  
l,¾,ª A'I'ðfefNfZf<,É'İ%ož,·,éf~fbfvf}fbfv,ðŽg—p,·,é B

#### D3DPTFILTERCAPS\_NEAREST

fsfNfZf<1,ì<ßŽ— À•W,ìfefNfZf<,Žg—p,<sup>3</sup>,ê,é B,±  
,ê,Í AŠg‘â,Æ k ¬,ì—¼•û,ĂŽg—p,<sup>3</sup>,ê,é BŠg‘â,© k ¬,<sup>a</sup>fTf|  
[f g,<sup>3</sup>,ê,Ă,¢,é,Æ,«,Í A—¼•û,<sup>a</sup>fTf| [f g,<sup>3</sup>,ê,Ă,¢,È,—,ê,Î,È,ç,È,¢ B

#### dwTextureBlendCaps

fefNfXf`ff ¬ ‡ îñ BfefNfXf`ff ¬ ‡f, [fh,ðŽw`è,·,é,½,ßD3DTEXTUREBLEND—ñ<“Ĉ^,ð Æ%oi,·,é B,±  
,ìf f“fo,Í AŽŸ,ì'1,ð,Đ,Æ,Â^È ã Ý'è,Ă,«,é B

#### D3DPTBLENDCAPS\_COPY

fefNfXf`ff ¬ ‡f, [fh,ìfRfs [(D3DTEXTUREBLEND—  
ñ<“Ĉ^,æ,èD3DPTBLEND\_COPY),ðfTf| [f g,·,é B

#### D3DPTBLENDCAPS\_DECAL

fffJ [f< EfefNfXf`ff ¬ ‡f, [fh(D3DTEXTUREBLEND—  
ñ<“Ĉ^,æ,èD3DPTBLEND\_DECAL),ðfTf| [f g,·,é B

#### D3DPTBLENDCAPS\_DECALALPHA

fffJ [f< EfAf<ftf@ EfefNfXf`ff ¬ ‡f, [fh(D3DTEXTUREBLEND—  
ñ<“Ĉ^,æ,èD3DPTBLEND\_DECALALPHA),ðfTf| [f g,·,é B

#### D3DPTBLENDCAPS\_DECALMASK

fffJ [f< Ef{fXfN EfefNfXf`ff ¬ ‡f, [fh(D3DTEXTUREBLEND—  
ñ<“Ĉ^,æ,èD3DPTBLEND\_DECALMASK),ðfTf| [f g,·,é B

#### D3DPTBLENDCAPS\_MODULATE

•İ'²fefNfXf`ff ¬ ‡f, [fh(D3DTEXTUREBLEND—  
ñ<“Ĉ^,æ,èD3DPTBLEND\_MODULATE),ðfTf| [f g,·,é B

#### D3DPTBLENDCAPS\_MODULATEALPHA

•İ'²fAf<ftf@ EfefNfXf`ff ¬ ‡f, [fh(D3DTEXTUREBLEND—  
ñ<“Ĉ^,æ,èD3DPTBLEND\_MODULATEALPHA),ðfTf| [f g,·,é B

#### D3DPTBLENDCAPS\_MODULATEMASK

•İ'²f{fXfN EfefNfXf`ff ¬ ‡f, [fh(D3DTEXTUREBLEND—  
ñ<“Ĉ^,æ,èD3DPTBLEND\_MODULATEMASK),ðfTf| [f g,·,é B

#### dwTextureAddressCaps

fefNfXf`ff,ìfAfhfĈfX îñ B,±,ìf f“fo,Í AŽŸ,ì'1,ð,Đ,Æ,Â^È ã Ý'è,Ă,«,é B

#### D3DPTADDRESSCAPS\_CLAMP

fffofCfX,Í AfefNfXf`ff,ìĈĂ'è,“%Ă”\,Ă, ,é B

#### D3DPTADDRESSCAPS\_MIRROR

fffofCfX,Í AfefNfXf`ff,ì”½“,“%Ă”\,Ă, ,é B

#### D3DPTADDRESSCAPS\_WRAP

fffofCfX,Í AfefNfXf`ff,ì'£,è•t,—,“%Ă”\,Ă, ,é B

#### dwStippleWidth □ dwStippleHeight

fTf| [f g,<sup>3</sup>,ê,½“\_•,ì Ă• ,Æ ,,(32 ~32^È ã) B

## D3DPROCESSVERTICES

```
typedef struct _D3DPROCESSVERTICES {
    DWORD dwFlags;
    WORD wStart;
    WORD wDest;
    DWORD dwCount;
    DWORD dwReserved;
} D3DPROCESSVERTICES, *LPD3DPROCESSVERTICES;
```

’, “\_ î•ñ, ìfhf%oCfo, É, æ, é ^ — •û-@, ðŽ‘, · B, ±, ê, Í AD3DOPCODE—  
ñ“Æ^, Ì‘†, ÌD3DOP\_PROCESSVERTICESfIfyfR [fh, ÄŽg—p, ³, ê, é B

### dwFlags

fhf%oCfo, É, æ, é’, “\_Ì ^ — •û-@, ðŽw’è, ·, éŽŸ, Ìftf%ofo, ð A, Ð, Æ, Â^È ã Ý’è, ·, é B

### D3DPROCESSVERTICES\_COPY

’, “\_ î•ñ, Í Afhf%oCfo, É Ä—~—  
p, ³, ê, é BŽÄ sfobftf@, Ì‘†, Ì’, “\_ î•ñ,ª Ä—~—  
p, ³, ê, é, Æ Afhf%oCfo, Í’, “\_ð ^ — ·, é•K—v,ª, È, -  
È, è A, » ÌÆç%oÊ A ^ — ‘¬“x, %oü‘P, ³, ê, é B

### D3DPROCESSVERTICES\_NOCOLOR

’, “\_Ì F•t, ^, ³, ê, È, Ç B

### D3DPROCESSVERTICES\_OPMASK

D3DPROCESSVERTICES\_NOCOLOR, â

D3DPROCESSVERTICES\_UPDATEEXTENTS, ÌŽÄ s, ÄdwFlagsf f“f  
o, Ì‘¼, Ìftf%ofo, Ìrfbfgf}fXfN, ðŽw’è, ·, é B

### D3DPROCESSVERTICES\_TRANSFORM

’, “\_Ì•İŠ·, ³, ê, é B

### D3DPROCESSVERTICES\_TRANSFORMLIGHT

’, “\_Ì•İŠ·, ³, ê Æ-¾Æø%oÊ, à—^, , ç, ê, é B

### D3DPROCESSVERTICES\_UPDATEEXTENTS

X V, ³, ê, ½•İŠ·Æâ, Ì’, “\_Ì”ÍÍ B, ±  
Ì î•ñ, ÌD3DSTATUS \‘ç‘Ì, ÌdrExtentf f“fo, É•Ô, é B

### wStart

f\ [fX, Ì Ä %o, Ì’, “\_ÌfCf“fffbfNfX B

### wDest

f [fJfç Efobftf@, Ì Ä %o, Ì’, “\_ÌfCf“fffbfNfX B

### dwCount

^ — , ³, ê, é’, “\_ ” B

### dwReserved

—\—ñ İ, Ý B0, Ä, È, ^, ê, İ, È, ç, È, Ç B

ŽQ Æ @D3DOPCODE

## D3DRECT

```
typedef struct _D3DRECT {
    union {
        LONG x1;
        LONG lX1;
    };
    union {
        LONG y1;
        LONG lY1;
    };
    union {
        LONG x2;
        LONG lX2;
    };
    union {
        LONG y2;
        LONG lY2;
    };
} D3DRECT, *LPD3DRECT;
```

«éĒ,ì'è«` B

**IX1** ⇨ **IY1**

«éĒ,ì ¶ ã<÷,ì À•W B

**IX2** ⇨ **IY2**

«éĒ,ì‰E‰°÷,ì À•W B

ŽQ Æ @**D3DRMUPDATECALLBACK** A **IDirect3DDevice::Pick** A**IDirect3DViewport::Clear**

D3DSPAN

```
typedef struct _D3DSPAN {
    WORD wCount;
    WORD wFirst;
} D3DSPAN, *LPD3DSPAN;
```

D3DOPCODE—ñ“Œ^,Â,ìD3DOP\_SPANfIfyfR [fh—  
p,É A’,“\_,ìfXfpf“,ð’è‘,,:é BfXfpf“,Í A“™,μ,¢y’l,ðŽ ,Â’,“\_,ðŒ‘,ñ,Â’£,ç,ê,é–Ê,Â, ,é By’l,ª•İ,í,é,Æ A V,μ,¢fXfp  
f“,ª i,ç,ê,é B

wCount  
fXfpf“,ì ” B

wFirst  
Â %o,ì’,“\_,ìfCf“fffbfNfX B

ŽQ Æ @D3DOPCODE

## D3DSTATE

```
typedef struct _D3DSTATE {
    union {
        D3DTRANSFORMSTATETYPE dtstTransformStateType;
        D3DLIGHTSTATETYPE      dlstLightStateType;
        D3DRENDERSTATETYPE      drstRenderStateType;
    };
    union {
        DWORD                    dwArg[1];
        D3DVALUE                 dvArg[1];
    };
} D3DSTATE, *LPD3DSTATE;
```

## D3DOPCODE —

Ń“Œ^,İ†,İD3DOP\_STATETRANSFORM AD3DOP\_STATELIGHT,ÆD3DOP\_STATE RENDER/IfyfR [fh—  
p,İfŒf“f\_fŠf“fO ó‘Ô,ÄŽw’è,·,é B,±,İ \‘Œ‘İ,İ Å %o,İf f“fo,İ AŠÖ`A,μ,½—Ń“Œ^,Å, ,é B2”Ô—  
Ú,İf f“fo,İ A,»,İŒ^,İ,½,ß,İ’l,Å, ,é B

dtstTransformStateType A dlstLightStateType A drstRenderStateType

fŒf“f\_fŠf“fO ó‘Ô,ÄŽw’è,³,ê,éD3DTRANSFORMSTATETYPE AD3DLIGHTSTATETYPE AD3DRENDERSTA  
TETYPE—Ń“Œ^,İf f“fo,İ,Đ,Æ,Å B

dvArg

,±,İ \‘Œ‘İ,İ Å %o,İf f“fo,ÄŽw’è,³,ê,½Œ^,İ’l B

ŽQ Æ @D3DLIGHTSTATETYPE A D3DOPCODE A D3DRENDERSTATETYPE A\_  
D3DTRANSFORMSTATETYPE A D3DVALUE

## D3DSTATS

```
typedef struct _D3DSTATS {
    DWORD dwSize;
    DWORD dwTrianglesDrawn;
    DWORD dwLinesDrawn;
    DWORD dwPointsDrawn;
    DWORD dwSpansDrawn;
    DWORD dwVerticesProcessed;
} D3DSTATS, *LPD3DSTATS;
```

**IDirect3DDevice::GetStats** *f f\bfh,É,æ,èŽg—p,<sup>3</sup>,ê,é“ ĆEv î•ñ,ðŠŮ,Đ B*

**dwSize**

*,±,İ \‘ċ‘î,îf ofCf g’PˆÊ,îfTfCfY B*

**dwTrianglesDrawn, dwLinesDrawn, dwPointsDrawn, dwSpansDrawn**

*ff ofCfX,İ ¶ ¬ˆÈĈã•`%oæ,<sup>3</sup>,ê,½ŽOŠpĈ` A ü A“ \_ AfXfpf“,İ ” B*

**dwVerticesProcessed**

*ff ofCfX,İ ¶ ¬ˆÈĈã ^— ,<sup>3</sup>,ê,½’,“\_ ,İ ” B*

ŽQ Æ @**IDirect3DDevice::GetStats**

## D3DSTATUS

```
typedef struct _D3DSTATUS {  
    DWORD    dwFlags;  
    DWORD    dwStatus;  
    D3DRECT  drExtent;  
} D3DSTATUS, *LPD3DSTATUS;
```

ŽÀ sfobftf@,lĚ» Ý,ì ó‘Ô,ðŽw’è,·,é B,±,ì \‘ċ‘ĭ,ĭ ADD3DEXECUTEDATA \‘ċ‘ĭ,ĭĉê•”,âD3DOPCODE —  
ñċ“ĈĖ^,ĭ’†,ĭD3DOP\_SETSTATUSfIfyfR [fh,ĀŽg—p,³,ê,é B

### dwFlags

fXfe [f^fX A”ÍÍ A,Û,½,ĭ,»,ĭ—¼•û,Ā, ,é,±,Ė,ðŽw’è,·,éŽÝ,ĭftf%fo,ĭ,Đ,Ė,Ā,ð Ý’è,·,é B

### D3DSETSTATUS\_STATUS

fXfe [f^fX,ð Ý’è B

### D3DSETSTATUS\_EXTENTS

drExtentf f“fo,ĀŽw’è,³,ê,½”Íĭ,ð Ý’è B

### D3DSETSTATUS\_ALL

fXfe [f^fX,Ė”Íĭ,ĭ—¼•û,ð Ý’è B

### dwStatus

fNfŠfbfsf“fO Eftf%fo B,±,ĭf f“fo,ĭ AŽÝ,ĭftf%fo,ĭ,Đ,Ė,Ā^È ã,ð Ý’è,·,é B

‘g,Ý ‡,ĭ,¹,Ėĉ”Êftf%fo

### D3DSTATUS\_CLIPINTERSECTION

,·,×,Ā,ĭCLIPINTERSECTIONftf%fo,ĭ’g,Ý ‡,ĭ,¹ B

### D3DSTATUS\_CLIPUNIONALL

,·,×,Ā,ĭCLIPUNIONftf%fo,ĭ’g,Ý ‡,ĭ,¹ B

### D3DSTATUS\_DEFAULT

D3DSTATUS\_CLIPINTERSECTION,Ė

D3DSTATUS\_ZNOTVISIBLEftf%fo,ĭ’g,Ý ‡,ĭ,¹ B,±

,ĭl,ª AffftHf<fg,Ā, ,é B

### D3DSTATUS\_ZNOTVISIBLE

fNfŠfbfvĈð ·ftf%fo

### D3DSTATUS\_CLIPINTERSECTIONBACK

Ž< ‘ä,ĭĈĀ•ûfNfŠfbfv–Ê,ĭ’ “\_,ĭfNfŠfbfsf“fO Eftf%fo,ĭ~—  
ĭ,ð,Ė,é B

### D3DSTATUS\_CLIPINTERSECTIONBOTTOM

Ž< ‘ä,ĭ%°,ĭ’ “\_,ĭfNfŠfbfsf“fO Eftf%fo,ĭ~— ĭ,ð,Ė,é B

### D3DSTATUS\_CLIPINTERSECTIONFRONT

Ž< ‘ä,ĭ’O•ûfNfŠfbfv–Ê,ĭ’ “\_,ĭfNfŠfbfsf“fO Eftf%fo,ĭ~—  
ĭ,ð,Ė,é B

### D3DSTATUS\_CLIPINTERSECTIONGEN0 `D3DSTATUS\_CLIPINTERSECTIONGEN5

fAfvfŠfP [fVf‡f““è<,ĭfNfŠfbfv–Ê,ĭ~— ĭ,ð,Ė,é B

### D3DSTATUS\_CLIPINTERSECTIONLEFT

Ž< ‘ä,ĭ ¶‘²,ĭ’ “\_,ĭfNfŠfbfsf“fO Eftf%fo,ĭ~— ĭ,ð,Ė,é B

### D3DSTATUS\_CLIPINTERSECTIONRIGHT

Ž< ‘ä,ĭ%°E‘²,ĭ’ “\_,ĭfNfŠfbfsf“fO Eftf%fo,ĭ~— ĭ,ð,Ė,é B

### D3DSTATUS\_CLIPINTERSECTIONTOP

Ž< ‘ä,ĭ ã,ĭ’ “\_,ĭfNfŠfbfsf“fO Eftf%fo,ĭ~— ĭ,ð,Ė,é B

fNfŠfbfvĈ< ‡ftf%fo

### D3DSTATUS\_CLIPUNIONBACK



D3DCLIP\_BACK,Æ““,¶ B  
D3DSTATUS\_CLIPUNIONBOTTOM  
D3DCLIP\_BOTTOM,Æ““,¶ B  
D3DSTATUS\_CLIPUNIONFRONT  
D3DCLIP\_FRONT,Æ““,¶ B  
D3DSTATUS\_CLIPUNIONGEN0 `D3DSTATUS\_CLIPUNIONGEN5  
D3DCLIP\_GEN0 `D3DCLIP\_GEN5,Æ““,¶ B  
D3DSTATUS\_CLIPUNIONLEFT  
D3DCLIP\_LEFT,Æ““,¶ B  
D3DSTATUS\_CLIPUNIONRIGHT  
D3DCLIP\_RIGHT,Æ““,¶ B  
D3DSTATUS\_CLIPUNIONTOP  
D3DCLIP\_TOP,Æ““,¶ B

Šî-*{fNfŠfbfsf“fO Eftf%ofo*

D3DCLIP\_BACK  
Ž< ‘ä,ì”w-Ê,É,æ,èfNfŠfbfsf“fO,<sup>3</sup>,ê,é B  
D3DCLIP\_BOTTOM  
Ž< ‘ä,ì’ê-Ê,É,æ,èfNfŠfbfsf“fO,<sup>3</sup>,ê,é B  
D3DCLIP\_FRONT  
Ž< ‘ä,ì‘O-Ê,É,æ,èfNfŠfbfsf“fO,<sup>3</sup>,ê,é B  
D3DCLIP\_LEFT  
Ž< ‘ä,ì ¶“□-Ê,É,æ,èfNfŠfbfsf“fO,<sup>3</sup>,ê,é B  
D3DCLIP\_RIGHT  
Ž< ‘ä,ì%oE‘□-Ê,É,æ,èfNfŠfbfsf“fO,<sup>3</sup>,ê,é B  
D3DCLIP\_TOP  
Ž< ‘ä,ì ã’ê-Ê,É,æ,èfNfŠfbfsf“fO,<sup>3</sup>,ê,é B  
D3DCLIP\_GEN0 `D3DCLIP\_GEN5  
*fAfvfŠfP [fVf‡f““è<,ìfNfŠfbfv-Ê B*

drExtent

,·,×,Ä,ì’,“\_,ð,»,ì“à,ÉŠÜ,Ð<éŒ`,ð’è<,·,éD3DRECT \‘¢‘Ì B,½,Æ,,Î AD3DPROCESSVERTICES  
\\‘¢‘ì,ì’†,Ä Ý’è,<sup>3</sup>,ê,éD3DPROCESSVERTICES\_UPDATEEXTENTS*ftf%ofo,ðŽæ“¾,·,é*D3DOP\_PROCESSVERTIC  
ESfIfyfR [fh,ì o—Í,ðŠÜ,Ð—Ìæ,ð’è<,·,é B

ó‘Ô,íŽÀ s ó‘Ô,Ä,·,è AŠeŽÀ s,ìŠÔ,É X V,<sup>3</sup>,ê,é B<éŒ`,ì‘ä,«,<sup>3</sup>,Í AŠeŽÀ s,Ä‘ ‘ä,·,é,<sup>a</sup>Žû k,μ,È,¢ BD3DOP\_SE  
TSTATUS*fIfyfR [fh,É,æ,èfŠfZfbfg,Ä,«,é B*

ŽQ Æ @D3DEXECUTEDATA AD3DOPCODE AD3DRECT

## D3DTEXTURELOAD

```
typedef struct _D3DTEXTURELOAD {  
    D3DTEXTUREHANDLE hDestTexture;  
    D3DTEXTUREHANDLE hSrcTexture;  
} D3DTEXTURELOAD, *LPD3DTEXTURELOAD;
```

**D3DOPCODE**—ñ““Ĉ^,ì’†,ì**D3DOP\_TEXTURELOAD**fIfyfR [fh,ìfIfyf%of“fh E f [f^,ðŽw’è,·,é B

### hDestTexture

“]‘— æfefNfXf`ff,ìfnf“fhf< B

### hSrcTexture

“]‘—Ĉ³fefNfXf`ff,ìfnf“fhf< B

fefNfXf`ff,Í AhDestTexture,ÆhSrcTexturef f“fo,““¯,¶‘å,«,³,©’²,×,é B

## D3DTLVERTEX

```
typedef struct _D3DTLVERTEX {
    union {
        D3DVALUE sx;
        D3DVALUE dvSX;
    };
    union {
        D3DVALUE sy;
        D3DVALUE dvSY;
    };
    union {
        D3DVALUE sz;
        D3DVALUE dvSZ;
    };
    union {
        D3DVALUE rhw;
        D3DVALUE dvRHW;
    };
    union {
        D3DCOLOR color;
        D3DCOLOR dcColor;
    };
    union {
        D3DCOLOR specular;
        D3DCOLOR dcSpecular;
    };
    union {
        D3DVALUE tu;
        D3DVALUE dvTU;
    };
    union {
        D3DVALUE tv;
        D3DVALUE dvTV;
    };
};
} D3DTLVERTEX, *LPD3DTLVERTEX;
```

**D3DLIGHTDATA** \‘ç‘l,ì•İŠ·,â Æ-¾,l’,“\_(fJf%o [,İfXfNfŠ [f“ Å•W),ð’èç`,·,é B

**dvSX, dvSY, dvSZ**

fXfNfŠ [f“ Å•W,Å’,“\_,ðŽw’è,·,é**D3DVALUE**Ĉ^,İ’l B

**dvRHW**

**D3DVALUE**Ĉ^,İ’l B,±,İ’l,Í A,P,ðZŽ²,É%ˆ,Á,½Ĉ“\_,©,çfIfufWfFfNfg,Ö,İ<—Ł,ĂŠ,,,Á,½’l,Ă, ,é B

**dcColor □ dcSpecular**

,“\_,İ F,Æ“Š‰œ,ðŽw’è,·,é**D3DCOLOR**Ĉ^,İ’l B

**dvTU □ dvTV**

,“\_,İfefNfXf`ffŽw’è,·,é**D3DVALUE**Ĉ^,İ’l B

ŽQ Æ @**D3DLIGHTDATA**

## D3DTRANSFORMCAPS

```
typedef struct _D3DTransformCaps {  
    DWORD dwSize;  
    DWORD dwCaps;  
} D3DTRANSFORMCAPS, *LPD3DTRANSFORMCAPS;
```

*fffofCfX,İ•İŠ•”\—Í,đŽw’è,·,é B,±,İ \‘Ŧ‘İ,Í AD3DDEVICEDESC \‘Ŧ‘İ,İ^ê•”,Å, ,é B*

### dwSize

*,±,İ \‘Ŧ‘İ,İffoCfg’P^Ê,İfTfCfY B*

### dwCaps

*•İŠ•’†,İfVfXfef€,<sup>a</sup>fNfŠfbfsf“fO,·,é,©,Ç,¤,©,đŽw’è,·,éftf%ofo B,±  
 ,İf f“fo,İ A0,Û,½,İŽŸ,İftf%ofo,<sup>a</sup> Ý’è,Å,«,é B*

**D3DTRANSFORMCAPS\_CLIP** *fVfXfef€  
 ,İ•İŠ•’†,ÉfNfŠfbfsf“fO,·,é B*

## D3DTRANSFORMDATA

```
typedef struct _D3DTRANSFORMDATA {
    DWORD          dwSize;
    LPVOID          lpIn;
    DWORD          dwInSize;
    LPVOID          lpOut;
    DWORD          dwOutSize;
    LPD3DHVERTEX    lpHOut;
    DWORD          dwClip;
    DWORD          dwClipIntersection;
    DWORD          dwClipUnion;
    D3DRECT         drExtent;
} D3DTRANSFORMDATA, *LPD3DTRANSFORMDATA;
```

**IDirect3DViewport::TransformVertices** *f\fbfh—p, ĩ•İŠ• î•ñ,đŽ ,Â B*

**dwSize**

*,±,İ \‘ċ‘İ,İf ofCf g’P’Ê,İfTfCfY B*

**lpIn**

*•İŠ•,³,ê,é’,“\_,Ö,İf|fCf“f^ B,±,ê,Í AD3DLVERTEX \‘ċ‘İ,Â, ,é B*

**dwInSize**

*•İŠ•,³,ê,é’,“\_,İŠÔŠu B*

**lpOut**

*•İŠ•,³,ê,½’,“\_,Ö,İf|fCf“f^ B*

**dwOutSize**

*o—Í’,“\_,İŠÔŠu B*

**lpHOut**

*ĽŽž;•İŠ•,³,ê,½’,“\_,đŠÜ,Đ’l,Ö,İf|fCf“f^ B,±,İ’l,Í AD3DHVERTEX \‘ċ‘İ,Â, ,é B*

**wClip**

*,“\_,³,Ç,İ,æ,¼,ÊfNfŠfbfsf“fO,³,ê,é,©,đŽw’è,·,éftf%ofO B,±,İf f“fo,É,Í AŽŸ,İ’l,đ,Đ,Æ,Â^È ã Ý’è,·,é B*

**D3DCLIP\_BACK**

*Ž< ‘ä,İ”w—Ê,É,æ,èfNfŠfbfsf“fO,³,ê,é B*

**D3DCLIP\_BOTTOM**

*Ž< ‘ä,İ’ê—Ê,É,æ,èfNfŠfbfsf“fO,³,ê,é B*

**D3DCLIP\_FRONT**

*Ž< ‘ä,İ’O—Ê,É,æ,èfNfŠfbfsf“fO,³,ê,é B*

**D3DCLIP\_GEN0 through D3DCLIP\_GEN5**

*fAf v fŠšP [fVf‡f““è<,İfNfŠfbfv—Ê B*

**D3DCLIP\_LEFT**

*Ž< ‘ä,İ ¶“—Ê,É,æ,èfNfŠfbfsf“fO,³,ê,é B*

**D3DCLIP\_RIGHT**

*Ž< ‘ä,İ‰E“—Ê,É,æ,èfNfŠfbfsf“fO,³,ê,é B*

**D3DCLIP\_TOP**

*Ž< ‘ä,İ ã’ê—Ê,É,æ,èfNfŠfbfsf“fO,³,ê,é B*

**dwClipIntersection**

*fNfŠfbfsf“fO Eftf%ofO,İĈĐ ·,đŽ!,·ftf%ofO B,±,İf f“fo,É,Í AŽŸ,İ’l,đ,Đ,Æ,Â^È ã Ý’è,·,é B*

**D3DSTATUS\_CLIPINTERSECTIONBACK**

*Ž< ‘ä,İĈĈ•ûfNfŠfbfv—Ê,İ’,“\_,İfNfŠfbfsf“fO Eftf%ofO,İ’—  
İ,đ,Æ,é B*

**D3DSTATUS\_CLIPINTERSECTIONBOTTOM**

*Ž< ‘ä,İ‰°,İ’,“\_,İfNfŠfbfsf“fO Eftf%ofO,İ’— İ,đ,Æ,é B*

**D3DSTATUS\_CLIPINTERSECTIONFRONT**

Ž< ‘ä,ì‘O•ûfNfŠfbfv–Ê,ì’ “\_ ,ìfNfŠfbfsf“fO Eftf%ofo,ì~—  
İ,ð,Æ,é B

**D3DSTATUS\_CLIPINTERSECTIONGEN0 `D3DSTATUS\_CLIPINTERSECTIONGEN5**

fAfvfŠfP [fVf‡f““è< ,ìfNfŠfbfv–Ê,ì~— İ,ð,Æ,é B

**D3DSTATUS\_CLIPINTERSECTIONLEFT**

Ž< ‘ä,ì ¶‘□,ì’ “\_ ,ìfNfŠfbfsf“fO Eftf%ofo,ì~— İ,ð,Æ,é B

**D3DSTATUS\_CLIPINTERSECTIONRIGHT**

Ž< ‘ä,ì%OE‘□,ì’ “\_ ,ìfNfŠfbfsf“fO Eftf%ofo,ì~— İ,ð,Æ,é B

**D3DSTATUS\_CLIPINTERSECTIONTOP**

Ž< ‘ä,ì ä,ì’ “\_ ,ìfNfŠfbfsf“fO Eftf%ofo,ì~— İ,ð,Æ,é B

**dwClipUnion**

fNfŠfbfsf“fO Eftf%ofo,ìE< ‡,ðŽ!,·ftf%ofo B,±,ìf f“fo,É,Í AŽŸ,ì'l,ð,Ð,Æ,Â^È ä Ý'è,·,é B

**D3DSTATUS\_CLIPUNIONBACK**

D3DCLIP\_BACK,Æ“^,¶ B

**D3DSTATUS\_CLIPUNIONBOTTOM**

D3DCLIP\_BOTTOM,Æ“^,¶ B

**D3DSTATUS\_CLIPUNIONFRONT**

D3DCLIP\_FRONT,Æ“^,¶ B

**D3DSTATUS\_CLIPUNIONGEN0 `D3DSTATUS\_CLIPUNIONGEN5**

D3DCLIP\_GEN0 `D3DCLIP\_GEN5,Æ“^,¶ B

**D3DSTATUS\_CLIPUNIONLEFT**

D3DCLIP\_LEFT,Æ“^,¶ B

**D3DSTATUS\_CLIPUNIONRIGHT**

D3DCLIP\_RIGHT,Æ“^,¶ B

**D3DSTATUS\_CLIPUNIONTOP**

D3DCLIP\_TOP,Æ“^,¶ B

**drExtent**

•İŠ·Ĉëä,ì’ “\_ ,ì”ÍÍ,ðĈE^è,·,é'l B,±,ì \‘ĉ‘İ,Í AfWfIf fgfŠ·İŠ·Ĉëä,ìfXfNfŠ [f““ÍÍ,ì·İŠ·f,fWf...  
[f<,É,æ,èfZfbfg,<sup>3</sup>,é,é BfNfŠfbfsf“fO,<sup>3</sup>,é,é,½,ß A,±,ì”ÍÍ,ÍŽ< “ä“ä•”,ì’ “\_ ,¾,¯,ðŠÜ,Ð B,±  
,ì'l,Í**D3DRECT** \‘ĉ‘İ,Ä, ,é B

Še“ü—Í’ “\_ ,Í AfWfIf fgfŠ Ef,fffc<óŠÔ,Ä,ì[x y z] Ä•W,Ä—

^,!,ç,ê,½,R,Ä,ìfxfNfgf<’ “\_ ,Ä, ,é BdwInSizef f“fo,Í AŠe’,“\_ ,<sup>a</sup> A—

ášOf f [f^,ðfCf“f%oCf“,ÄŠi”[·,·,é,½,ß,ìfAfvfŠfP [fVf‡f“,ð<~%oÄ,·,é’,“\_ ŠÔ,ð~Ú“®,·,é—Ê,ð—^,!,é B

•İŠ·f,fWf... [f<,É,æ,è ¶ ¬,<sup>3</sup>,é,½’,“\_ ,Í A16frfbfg ,“x'l,Æ,µ,ÄŠi”[<sup>3</sup>,é,é BfNfŠfbfsf“fO,Í A—  
^,!,ç,ê,½•İŠ·Ĉëä,ì’ “\_ ,ðfNfŠfbfsf“fO,·,éŽ< “äfvfĈ [f“,ì·iŠÜ“T—  
~a,Ä Ý'è,<sup>3</sup>,é,½ ® ”frfbfg EftfB [f<fh,Æ,µ,Ä^µ,í,ê,é B

ŽQ Æ @**IDirect3DViewport::TransformVertices**

## D3DTRIANGLE

```
typedef struct _D3DTRIANGLE {
    union {
        WORD v1;
        WORD wV1;
    };
    union {
        WORD v2;
        WORD wV2;
    };
    union {
        WORD v3;
        WORD wV3;
    };
    WORD wFlags;
} D3DTRIANGLE, *LPD3DTRIANGLE;
```

,,×,Ä,İŽOŠpĚ,İŠİ-{\Ě^,ðŽw'è,·,é BŽOŠpĚ,Í AŠİ-{"I,ÈfĚf"f\_Šf"fO—v'f,Ä,·,é B

ŠÖ~A îñ,Í AD3DOPCODE—ñĚ^,İD3DOP\_TRIANGLEf f"fo,ðŽQ Æ,·,é,±,Æ B

**wV1 A wV2 A wV3**

ŽOŠpĚ,ðŽw'è,·,é',\_ B

**wFlags**

Žg—p%oÄ",ÈŽOŠpĚ,İfGfbfW,ð'èĚ,·,éftf%oO(±,İ îñ,Í Af fCf,,ftfĚ [fĚ Ef, [fh,Ä,İ,Ý—LĚø) B,±  
İf f"fo,È,Í AŽŸ,İ'l,ð,Đ,Æ,Ä^È ã Ý'è,·,é B

**fGfbfW Eftf%oO**

**D3DTRIFLAG\_EDGEENABLE1**

fGfbfWv1—v2,ð'èĚ,·,é B

**D3DTRIFLAG\_EDGEENABLE2**

fGfbfWv2—v3,ð'èĚ,·,é B

**D3DTRIFLAG\_EDGEENABLE3**

fGfbfWv3—v1,ð'èĚ,·,é B

**D3DTRIFLAG\_EDGEENABLETRIANGLE**

,,×,Ä,İfGfbfW,ð'èĚ,·,é B

**"WŠJ },Æ îĚ`ftf%oO**

D3DTRIFLAG\_EVEN

Ě» Ý,İŽOŠpĚ,İv1—v2fGfbfW,Í A'¼'O,İŽOŠpĚ,İv3—  
v1fGfbfW,É ‡,í,¹,ç,è,é Bv1,Í'¼'O,İv1,É Av2,Í'¼'O,İv3,Æ,È,é B

**D3DTRIFLAG\_ODD**

Ě» Ý,İŽOŠpĚ,İv1—v2fGfbfW,Í A'¼'O,İŽOŠpĚ,İv2—  
v3fGfbfW,É ‡,í,¹,ç,è,é Bv1,Í'¼'O,İv3,É Av2,Í'¼'O,İv2,Æ,È,é B

**D3DTRIFLAG\_START**

"WŠJ },â îĚ,ðŠJŽn,µ,Ä A,R,Ä,İ',"\_,ðf [fh,·,é B

**D3DTRIFLAG\_STARTFLAT(len)**

,±  
İŽOŠpĚ,ª Ø,è"²,©,è,½,Æ,« A,»,İĚä,İŽOŠpĚ,İŽw'è,³,è,½ ",ð Ø,è  
"², B,±,İ',³,Í A0,æ,è'ä,«30,æ,è ¬,³,Ě B

,±,İ \Ě'İ,Í A,·,×,Ä,İŽOŠpĚ,ð'h,è,Ä,Ô,·,½,ß,É'¼ ÚŽg—p,Ä,«,é B•½—

ÊfVfF [fffbf"fO,Ä A F,Æ"Š%oe ¬•ª,Í Ä %o

,İ',"\_,©,çŽæ"¾,·,é B,R,Ä,İ',"\_fCf"fffbfNfX,İv1 Av2 Av3,Í AŽÀ sfofbftf@,İŠJŽn,İ',"\_fŠfXfg,İ't,İ',"\_fCf"fffb  
fNfX,Ä,·,é B

Žg—p%oÄ",ÈfGfbfW,Í Af fCf,,ftfĚ [fĚ Ef, [fh,Ä%oÄŽ< óÔ,Ä,·,é BfAfvfŠfP [fVf‡f",ªf fCf,,ftfĚ [fĚ  
,İŽOŠpĚ,ð~Žİ,·,é,Æ,« A2%ñfGfbfW,ð•,·,İ,ð"ð,¯,é,½,ß A—×,è ‡,ı,Ç,ı,ç,©,İfGfbfW,ªŽg—p%oÄ",Æ,È,é B

The D3DTRIFLAG\_ODD,ÆD3DTRIFLAG\_EVENftf%oO,Í A’Ê í,ìŽOŠpĚ`,ì“WŠJ }  
,© îĚ`,ì†,ìŽOŠpĚ`,ìÊ’u,ðŽQ Æ,.,é BŽOŠpĚ`,ì“WŠJ },°5,Â,ìŽOŠpĚ`,ì ê ‡ AŽŸ,ìftf%oO,Â“WŠJ }  
,ðĚ`è,Â,«,é B

D3DTRIFLAG\_START  
D3DTRIFLAG\_ODD  
D3DTRIFLAG\_EVEN  
D3DTRIFLAG\_ODD  
D3DTRIFLAG\_EVEN

“—l,É AŽŸ,ìftf%oO,Â5,Â,ìŽOŠpĚ`,ì îĚ`,ðĚ`è,Â,«,é B

D3DTRIFLAG\_START  
D3DTRIFLAG\_EVEN  
D3DTRIFLAG\_EVEN  
D3DTRIFLAG\_EVEN  
D3DTRIFLAG\_EVEN

ŽŸ,ìftf%oO,Â A5,Â,ìŽOŠpĚ`,ì•½–ÊŽOŠpĚ`,ì îĚ`,ðĚ`è,Â,«,é B

D3DTRIFLAG\_STARTFLAT(4)  
D3DTRIFLAG\_EVEN  
D3DTRIFLAG\_EVEN  
D3DTRIFLAG\_EVEN  
D3DTRIFLAG\_EVEN

ŽQ Æ @ŽOŠpĚ`,ì“WŠJ },Æ îĚ`



## D3DVECTOR

```
typedef struct _D3DVECTOR {
    union {
        D3DVALUE x;
        D3DVALUE dvX;
    };
    union {
        D3DVALUE y;
        D3DVALUE dvY;
    };
    union {
        D3DVALUE z;
        D3DVALUE dvZ;
    };
} D3DVECTOR, *LPD3DVECTOR;
```

‘½,,lDirect3D,ÆDirect3DRMf f“fo,Æ \‘¢‘l,lfxfNfgf<,ð’è<’,,é B

**dvX A dvY A dvZ**

fxfNfgf<,ðŽw’è,:éD3DVALUEŒ^,l’l B

ŽQ Æ @D3DLIGHT A D3DLIGHTINGELEMENT A D3DRMBOX A D3DRMQUATERNION A D3DRMVERTEX

## D3DVERTEX

```
typedef struct _D3DVERTEX {
    union {
        D3DVALUE x;
        D3DVALUE dvX;
    };
    union {
        D3DVALUE y;
        D3DVALUE dvY;
    };
    union {
        D3DVALUE z;
        D3DVALUE dvZ;
    };
    union {
        D3DVALUE nx;
        D3DVALUE dvNX;
    };
    union {
        D3DVALUE ny;
        D3DVALUE dvNY;
    };
    union {
        D3DVALUE nz;
        D3DVALUE dvNZ;
    };
    union {
        D3DVALUE tu;
        D3DVALUE dvTU;
    };
    union {
        D3DVALUE tv;
        D3DVALUE dvTV;
    };
};
} D3DVERTEX, *LPD3DVERTEX;
```

•İŠ·,Æ“Š‰œ,ð,µ,È,¢’,“\_,ð’è<’,·,é( ³K•ûĈüxfNfgf<,Ă,İf,fff<\_Ă•W) B

ŠÖ~A î•ñ,É,Ă,¢,Ă,Í AD3DOPCODE—ñ<“ĈE^,İ’†,İD3DOP\_TRIANGLEf f“fo,ðŽQ Æ,·,é,±,Æ B

dvX A dvY A dvZ

⟨İŽĊ,È Ă•W,Ă’,“\_,ðŽw’è,·,éD3DVALUEĈE^,İ’l B

dvNX A dvNY A ,“,æ,Ń dvNZ

³K Ă•W,Ă’,“\_,ðŽw’è,·,éD3DVALUE ĈE^,İ’l B

dvTU □ dvTV

,“\_,İfefNfXf`ff,ðŽw’è,·,éD3DVALUEĈE^,İ’l B

ŽQ Æ @D3DVALUE

## D3DVIEWPORT

```
typedef struct _D3DVIEWPORT {
    DWORD    dwSize;
    DWORD    dwX;
    DWORD    dwY;
    DWORD    dwWidth;
    DWORD    dwHeight;
    D3DVALUE dvScaleX;
    D3DVALUE dvScaleY;
    D3DVALUE dvMaxX;
    D3DVALUE dvMaxY;
    D3DVALUE dvMinZ;
    D3DVALUE dvMaxZ;
} D3DVIEWPORT, *LPD3DVIEWPORT;
```

–Ú,É€©,,é3Df{fŠf... [f€,Æ2DfXfNfŠ [f“—İæ,ð’è<’,.é B3Df{fŠf... [f€  
,Í AIDirect3DViewport::GetViewport,ÆIDirect3DViewport::SetViewport f f\fbfh,Å“ŠŽĚ,³,ê,é B  
frf... [f| [fg,ªİ X,³,ê,é,Æ Afhf%oCfo,Í V,µ,¢•İŠ· s—ñ,ð \z,.,é B  
frf... [f| [fg,İ Å•W,Æ”z—ñ,Í AfffoCfX,İ ¶ ã,©,ç,İ‘Š‘İ’l,Å, ,é B

**dwSize**  
,±,İ \‘İ,İfoCf’PˆÊ,İfTfCfY B

**dwX** □ **dwY**  
frf... [f| [fg,İ ¶ ã<÷,İ Å•W B

**dwWidth** □ **dwHeight**  
frf... [f| [fg,İ”z—ñ B

**dvScaleX** □ **dvScaleY**  
fXfNfŠ [f“ ,É<İŽĭ,ÈfXfP [f<”ä,ðŽw’è,.,éD3DVALUEĈ^,İ’l B

**dvMaxX** A **dvMaxY** A **dvMinZ** A **dvMaxZ**  
x Ay Az,İ<İŽĭ Å•W,İ Å‘ä’l,Æ Å ¬’l,ðŽw’è,.,éD3DVALUEĈ^,İ’l B

ŽQ Æ @D3DVALUE A IDirect3DViewport::GetViewport A IDirect3DViewport::SetViewport

—ñ“E^

```
typedef enum _D3DBLEND {
    D3DBLEND_ZERO           = 1,
    D3DBLEND_ONE            = 2,
    D3DBLEND_SRCCOLOR       = 3,
    D3DBLEND_INVSRCCOLOR    = 4,
    D3DBLEND_SRCALPHA        = 5,
    D3DBLEND_INVSRCALPHA    = 6,
    D3DBLEND_DESTALPHA      = 7,
    D3DBLEND_INVDESTALPHA   = 8,
    D3DBLEND_DESTCOLOR      = 9,
    D3DBLEND_INVDESTCOLOR   = 10,
    D3DBLEND_SRCALPHASAT    = 11,
    D3DBLEND_BOTHSRCALPHA   = 12,
    D3DBLEND_BOTHINVSRCALPHA = 13,
} D3DBLEND;
```

**D3DBLEND\_ZERO****D3DBLEND\_ONE****D3DBLEND\_SRCOLOR****D3DBLEND\_INVSRCCOLOR****D3DBLEND\_SRCALPHA****D3DBLEND\_INVSRCALPHA****D3DBLEND\_DESTALPHA****D3DBLEND\_INVDESTALPHA****D3DBLEND\_DESTCOLOR**

## D3DBLEND\_INVDESTCOLOR

**D3DBLEND\_SRCALPHASAT****D3DBLEND\_BOTHSRCALPHA****D3DBLEND\_BOTHINVSRCALPHA**
$$\begin{array}{l} f \wedge [fX, \lambda f u f C f f f B f f f O E W \text{ "}, \lambda A (1-A, 1-A, 1-A, 1-A) \\ B f f f X f e f B f \lambda [f V f f f, \lambda f u f C f f f B f f f O E W \text{ "}, \lambda A (A, A, A, A) \\ B f f f X f e f B f \lambda [f V f f f, \lambda f u f C f f f B f f f O \lambda A^{-3} E \emptyset, E, E, E] B \end{array}$$

## D3DCMPFUNC

```
typedef enum _D3DCMPFUNC {
    D3DCMP_NEVER          = 1,
    D3DCMP_LESS           = 2,
    D3DCMP_EQUAL          = 3,
    D3DCMP_LESSEQUAL      = 4,
    D3DCMP_GREATER        = 5,
    D3DCMP_NOTEQUAL       = 6,
    D3DCMP_GREATEREQUAL   = 7,
    D3DCMP_ALWAYS         = 8,
} D3DCMPFUNC;
```

**D3DRENDERSTATETYPE**—Ń“Œ^,ì’†,ìD3DRENDERSTATE\_ZFUNC,ÆD3DRENDERSTATE\_ALPHAFUNC  
'l,ì,¼,ß,ÉfTf| [fg,<sup>3</sup>,ê,½”ăŠrŠÖ ”,đ’è‘,·,é B

### D3DCMP\_NEVER

,Â,Ë,ÉfefXfg,ÍŽ,”s,·,é B

### D3DCMP\_LESS

V,μ,ƆfsfNfZf<’l,<sup>a</sup> AŒ» Ý,ÌfsfNfZf<’l,æ,è ¬,<sup>3</sup>,Ɔ,Æ,«,É%ž,¶,é B

### D3DCMP\_EQUAL

V,μ,ƆfsfNfZf<’l,<sup>a</sup> AŒ» Ý,ÌfsfNfZf<’l,Æ“™,μ,Ɔ,Æ,«,É%ž,¶,é B

### D3DCMP\_LESSEQUAL

V,μ,ƆfsfNfZf<’l,<sup>a</sup> AŒ» Ý,ÌfsfNfZf<’l`È%°,ì,Æ,«,É%ž,¶,é B

### D3DCMP\_GREATER

V,μ,ƆfsfNfZf<’l,<sup>a</sup> AŒ» Ý,ÌfsfNfZf<’l,æ,è‘ă,«,Ɔ,Æ,«,É%ž,¶,é B

### D3DCMP\_NOTEQUAL

V,μ,ƆfsfNfZf<’l,<sup>a</sup> AŒ» Ý,ÌfsfNfZf<’l,Æ“™,μ,,È,Ɔ,Æ,«,É%ž,¶,é B

### D3DCMP\_GREATEREQUAL

V,μ,ƆfsfNfZf<’l,<sup>a</sup> AŒ» Ý,ÌfsfNfZf<’l`È ã,ì,Æ,«,É%ž,¶,é B

### D3DCMP\_ALWAYS

,Â,Ë,ÉfefXfg,đŽÀ s,·,é B

## D3DCOLORMODEL

```
typedef enum _D3DCOLORMODEL {  
    D3DCOLOR_MONO = 1,  
    D3DCOLOR_RGB  = 2,  
} D3DCOLORMODEL;
```

,»,\fVfXfef€,\fJf% [ Ef,fff<,ð'è<`,`é B

## D3DCOLOR\_MONO

f,fmfNf f,fff<(,Ü,½,Í Af%of“fvf,fff<),ðŽg—p`,`é B,±  
,\f,fff<,Â A`,`\_ F,\ Â,\l,Í A`,`\_,\P“x,ð'è<`,`é,½,ß,ÉŽg—p,<sup>3</sup>,ê,é B

## D3DCOLOR\_RGB

Š®‘S,ÈRGBf,fff<,ðŽg—p`,`é B

ŽQ Æ @D3DDEVICEDESC A D3DFINDDEVICESEARCH A D3DLIGHTSTATETYPE A  
IDirect3DRMDevice::GetColorModel

D3DCULL

```
typedef enum _D3DCULL {
    D3DCULL_NONE = 1,
    D3DCULL_CW   = 2,
    D3DCULL_CCW   = 3,
} D3DCULL;
```

fTf| [fg,·,é Ø,è”2,«f, [fh,ð’èc`,·,é BfWfIf fgfŠ,ÉfŒf“f\_fŠf“fO,·,é,Æ,«,ì-Ê,Ì Ø,è”2,«•û-@,ð’èc`,·,é B

D3DCULL\_NONE

Ø,è”2,«,Í,μ,È,¢ B

D3DCULL\_CW

%oE%oñ,è,É Ø,è”2, B

D3DCULL\_CCW

¶%oñ,è,É Ø,è”2, B

ŽQ Æ @D3DPRIMCAPS AD3DRENDERSTATETYPE



## D3DFILLMODE

```
typedef enum _D3DFILLMODE {
    D3DFILL_POINT      = 1,
    D3DFILL_WIREFRAME  = 2,
    D3DFILL_SOLID       = 3
} D3DFILLMODE;
```

“h,è,Â,Ô,μf, [fh,ǒŽw'è,·,é'è ”,ǒ Ý'è,·,é B,±,ê,ç,Ì'l,Í AD3DRENDERSTATETYPE—  
ñ<“Œ^,Ì'†,ID3DRENDERSTATE\_FILLMODEfŒf“f\_Šf“fO ó'Ô,ì,½,ℓ,ÉŽg—p,<sup>3</sup>,ê,é B

## D3DFILL\_POINT

“\_„Â“h,è,Â,Ô,· B

## D3DFILL\_WIREFRAME

f fCf„ [ftfŒ [f€„Â“h,è,Â,Ô,· B

## D3DFILL\_SOLID

–Ê„Â“h,è,Â,Ô,· B

## D3DFOGMODE

```
typedef enum _D3DFOGMODE {
    D3DFOG_NONE      = 0,
    D3DFOG_EXP        = 1,
    D3DFOG_EXP2       = 2,
    D3DFOG_LINEAR     = 3
} D3DFOGMODE;
```

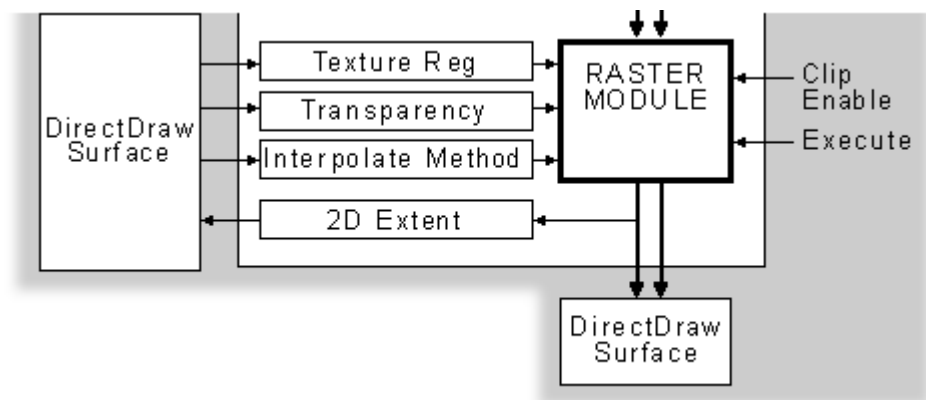
ftfHfO Ef, [fh,ðŽw'è,·,é'è ",ð Ý'è,·,é B,±,ê,ç,ì'l,Í AD3DRENDERSTATETYPE—  
ñ<“Æ^,ì†,ìD3DRENDERSTATE\_FOGTABLEMODEfÆf“f\_Šf“fO ó‘Ô,ì,½,ß,ÉŽg—p,³,é,é B

### D3DFOG\_NONE

ftfHfOÆø%Ê,Í,È,¢ B

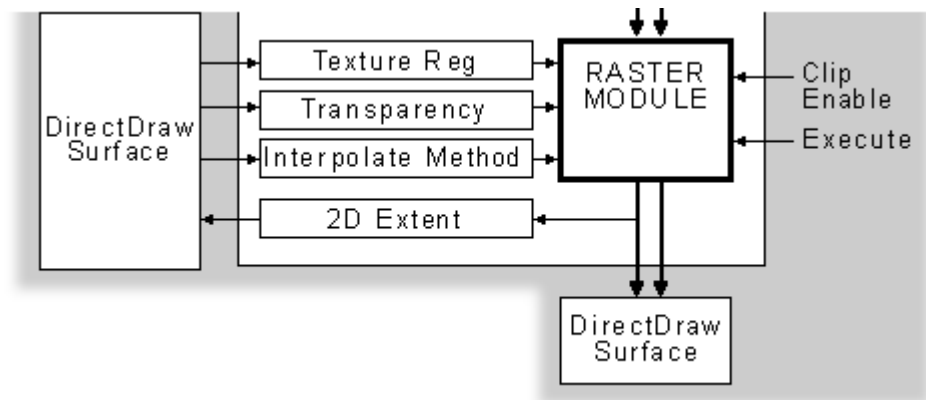
### D3DFOG\_EXP

ŽŸ,ì•û'öŽ@,ì'í ",Å AftfHfOÆø%Ê,“ ,· B



### D3DFOG\_EXP2

ŽŸ,ì•û'öŽ@,ì'í "2 æ,Å AftfHfOÆø%Ê,“ ,· B



### D3DFOG\_LINEAR

ŽŸ,ì•û'öŽ@,ìŽn“\_,Æ I“\_,ìŠÔ,Å üÆ',É AftfHfOÆø%Ê,“ ,· B

$$f = \frac{\text{end} - z}{\text{end} - \text{start}}$$

,±,ê,Í AÆ» ÝfTf| [fg,³,ê,Ä,¢,é—B^è,ìftfHfO Ef, [fh,Å, ,é B  
ftfHfO,Í A“Š—¾“x,ð•,·Šì € ,Å, ,é B,±,ì ê ± AftfHfO,ì'l,“ ¬,³,¢,Ù,Ç AfIfufWfFfNfg,“Æ©,!,È,,È,é B

## D3DLIGHTSTATETYPE

```
typedef enum _D3DLIGHTSTATETYPE {
    D3DLIGHTSTATE_MATERIAL      = 1,
    D3DLIGHTSTATE_AMBIENT       = 2,
    D3DLIGHTSTATE_COLORMODEL    = 3,
    D3DLIGHTSTATE_FOGMODE       = 4,
    D3DLIGHTSTATE_FOGSTART      = 5,
    D3DLIGHTSTATE_FOGEND        = 6,
    D3DLIGHTSTATE_FOGDENSITY    = 7,
} D3DLIGHTSTATETYPE;
```

**D3DOP\_STATELIGHT** If yfR [fh—p, ìĖōĖ¹ ó‘Ô, ð’èĸ, ·, é B, ±, ê, Í **AD3DSTATE** \‘ĸ‘Ĭ, ĬĥĖ•”, Ā, , éĖ^, ð—ñĸ“, ·, é B

## D3DLIGHTSTATE\_MATERIAL

ĀĖã, Ĭ F, Ąf%ofXf^%o», ĬšÔ, Ĭ¹, Ĭ“x ‡, ĸ, ðžž o, ·, é, ½, 8žg—p, μ, Ā A ĄĖ¼, “—, Ā, ç, ê, éf}  
fefšfAfĸ, ð’èĸ, ·, é BfftfHfĸfg¹, ĬNULL, Ā, , é B

## D3DLIGHTSTATE\_AMBIENT

F, ĄĖĖ» Ý, ìĖōĖ¹, Ĭ“x ‡, ĸ, ð Ý’è, ·, é BfAfvfšfP [fVf‡f“, ª, ±  
, Ĭ¹, ðžw’è, μ, ½, Ą, «, Í Afpf%of [f^, Ą, μ, ĀĖōĖ¹, ðžw’è, μ, Ē, ĸ BfftfHfĸfg¹, Ĭ0, Ā, , é B

## D3DLIGHTSTATE\_COLORMODEL

**D3DCOLORMODEL**—ñĸ“Ė^, Ĭf f“fo, Ĭ, Đ, Ą, Ā BfftfHfĸfg¹, ĬD3DCOLOR\_RGB, Ā, , é B

## D3DLIGHTSTATE\_FOGMODE

**D3DFOGMODE**—ñĸ“Ė^, Ĭf f“fo, Ĭ, Đ, Ą, Ā BfftfHfĸfg¹, ĬD3DFOG\_NONE, Ā, , é B

## D3DLIGHTSTATE\_FOGSTART

ftfHfO, ĬšJžn¹, ð’èĸ, ·, é BfftfHfĸfg¹, Ĭ1.0, Ā, , é B

## D3DLIGHTSTATE\_FOGEND

ftfHfO, Ĭ I—¹¹, ð’èĸ, ·, é BfftfHfĸfg¹, Ĭ100.0, Ā, , é B

## D3DLIGHTSTATE\_FOGDENSITY

ftfHfO, Ē Ý’è, ·, é [“x, ð’èĸ, ·, é BfftfHfĸfg¹, Ĭ1.0, Ā, , é B

žQ Ą @**D3DOPCODE** □ **D3DSTATE**

## D3DLIGHTTYPE

```
typedef enum _D3DLIGHTTYPE {
    D3DLIGHT_POINT          = 1,
    D3DLIGHT_SPOT           = 2,
    D3DLIGHT_DIRECTIONAL    = 3,
    D3DLIGHT_PARALLELPOINT  = 4,
    D3DLIGHT_GLSPT         = 5,
} D3DLIGHTTYPE;
```

ŒõŒ¹Œ^,ð'è\,·,é B,±,ì—ñ<“Œ^,íD3DLIGHT \‘c‘ì,ìˆê•”,Å, ,é B

## D3DLIGHT\_POINT

ŒõŒ¹,í|f|Cf“fg,Å, ,é B

## D3DLIGHT\_SPOT

ŒõŒ¹,ífXf|fbfgf%ofCf g,Å, ,é B

## D3DLIGHT\_DIRECTIONAL

ŒõŒ¹,í—LŒüŒõ,Å, ,é B

## D3DLIGHT\_PARALLELPOINT

ŒõŒ¹,ífp%ofŒf< Ef|fCf“fg,Å, ,é B

## D3DLIGHT\_GLSPT

ŒõŒ¹,íGLŒ^,ìfXf|fbfgf%ofCf g,Å, ,é B

ŽQ Æ @IDirect3DRMLight,ÆIDirect3DRMLightArrayfCf“f^ [ftfFfCfX

## D3DOPCODE

```
typedef enum _D3DOPCODE {
    D3DOP_POINT          = 1,
    D3DOP_LINE           = 2,
    D3DOP_TRIANGLE       = 3,
    D3DOP_MATRIXLOAD     = 4,
    D3DOP_MATRIXMULTIPLY = 5,
    D3DOP_STATETRANSFORM = 6,
    D3DOP_STATELIGHT     = 7,
    D3DOP_STATERENDER    = 8,
    D3DOP_PROCESSVERTICES = 9,
    D3DOP_TEXTURELOAD    = 10,
    D3DOP_EXIT            = 11,
    D3DOP_BRANCHFORWARD  = 12,
    D3DOP_SPAN            = 13,
    D3DOP_SETSTATUS      = 14,
} D3DOPCODE;
```

ŽÄ sfobftf@,lfIfyfR [fh,ðŠÜ,D B

### D3DOP\_POINT

fŒf“f\_f% [„É“„ð“—,é BfIfyf%of“fh Eff [f^,Í AD3DPOINT \‘c‘İ,ÄŽw’è,³,ê,é B

### D3DOP\_LINE

fŒf“f\_f% [„É ü,ð“—,é BfIfyf%of“fh Eff [f^,Í AD3DLINE \‘c‘İ,ÄŽw’è,³,ê,é B

### D3DOP\_TRIANGLE

fŒf“f\_f% [„ÉŽOŠpŒ“,ð“—,é BfIfyf%of“fh Eff [f^,ÍAD3DTRIANGLE \‘c‘İ,ÄŽw’è,³,ê,é B

### D3DOP\_MATRIXLOAD

fŒf“f\_fŠf“fO EfGf“fWf“,Éff [f^“]‘—  
,,éfgfŠfK [„Æ,È,é BfIfyf%of“fh Eff [f^,ÍAD3DMATRIXLOAD \‘c‘İ,ÄŽw’è,³,ê,é B

### D3DOP\_MATRIXMULTIPLY

fŒf“f\_fŠf“fO EfGf“fWf“,Éff [f^“]‘—  
,,éfgfŠfK [„Æ,È,é BfIfyf%of“fh Eff [f^,ÍAD3DMATRIXMULTIPLY \‘c‘İ,ÄŽw’è,³,ê,é B

### D3DOP\_STATETRANSFORM

•İŠ·f,fWf... [f←—  
p,İfŒf“f\_fŠf“fO EfGf“fWf“,É A“à•” ó‘Ô•İ ”,İl,ð Ý’è,·,é BfIfyf%of“fh Eff [f^,Í A•İ ”,Ä,éfg [fNf“,Æ  
V,µ,Œ¹,Ä, ,é Bfg [fNf“,Í A“à•” ó‘Ô•İ ”,ðŽ,· B,±,İ•İ ”l,É,Í A V,µ,Œ¹,a Ý’è,³,ê,é B,±,ê,ç,İ•İ ”,É,Ä,Œ  
,Ä,İ Ú ×,İ AD3DSTATE \‘c‘İ,ÆAD3DTRANSFORMSTATETYPE—ñŒ“Œ^,ðŽQ Œ,·,é,±,Æ B

### D3DOP\_STATELIGHT

ŒðŒ¹f,fWf... [f←—  
p,İfŒf“f\_fŠf“fO EfGf“fWf“,É“à•” ó‘Ô•İ ”,İl,ð Ý’è,·,é BfIfyf%of“fh Eff [f^,Í A•İ ”,Ä,éfg [fNf“,Æ  
V,µ,Œ¹,Ä, ,é Bfg [fNf“,Í A“à•” ó‘Ô•İ ”,ðŽ,· B,±,İ•İ ”l,É,Í A V,µ,Œ¹,a Ý’è,³,ê,é B,±,ê,ç,İ•İ ”,É,Ä,Œ  
,Ä,İ Ú ×,İ AD3DSTATE \‘c‘İ,ÆAD3DLIGHTSTATETYPE—ñŒ“Œ^,ðŽQ Œ,·,é,±,Æ B

### D3DOP\_STATERENDER

fŒf“f\_fŠf“fOf,fWf... [f←—  
p,İfŒf“f\_fŠf“fO EfGf“fWf“,É“à•” ó‘Ô•İ ”,İl,ð Ý’è,·,é BfIfyf%of“fh Eff [f^,Í A•İ ”,Ä,éfg [fNf“,Æ  
V,µ,Œ¹,Ä, ,é Bfg [fNf“,Í A“à•” ó‘Ô•İ ”,ðŽ,· B,±,İ•İ ”l,É,Í A V,µ,Œ¹,a Ý’è,³,ê,é B,±,ê,ç,İ•İ ”,É,Ä,Œ  
,Ä,İ Ú ×,İ AD3DSTATE \‘c‘İ,ÆAD3DRENDERSTATETYPE—ñŒ“Œ^,ðŽQ Œ,·,é,±,Æ B

### D3DOP\_PROCESSVERTICES

’,„,İŒðŒ¹,Æ•İŠ·,ð Ý’è,·,é BfIfyf%of“fh Eff [f^,Í AD3DPROCESSVERTICES \‘c‘İ,ÄŽw’è,³,ê,é B

### D3DOP\_TEXTURELOAD

fŒf“f\_fŠf“fO EfGf“fWf“,Éff [f^,ð“]‘—  
,,éfgfŠfK [„Æ,È,é BfIfyf%of“fh Eff [f^,Í AD3DTEXTURELOAD \‘c‘İ,ÄŽw’è,³,ê,é B

### D3DOP\_EXIT

“Ž‘B,µ,½fŠfXfg,İ I—¹,É“Ž‘B,µ,½Ž—,ðŽ,· B

### D3DOP\_BRANCHFORWARD

ŽÄ sfobftf@,İ•Šð,ð%Ä”,Æ,·,é B Ú ×,İ AD3DBRANCH \‘c‘İ,ðŽQ Œ,·,é,±,Æ B

### D3DOP\_SPAN

“¬,¶Y'l,ì“\_ìfŠfXfg,©,çfXfpf“,ð'£,é B Ú ×,Í AD3DSPAN \‘¢‘İ,ðŽQ Æ,·,é,±,Æ B  
**D3DOP\_SETSTATUS**  
ŽÀ sfobftf@,ì ó‘Ô,ðfŠfZfbfg,·,é B Ú ×,Í AD3DSTATUS \‘¢‘İ,ðŽQ Æ,·,é,±,Æ B

ŽÀ sfobftf@,Í,Ó,½,Â,ì”•“,“\_”z—ñ(Ê’u A=@\_üfxfNfgfç AfefNfXf`ff À•W),ÆfIfyfR [fh/  
fIfyf%of“fh,ìfOfç [fv,ì”z—ñ,ðŽ ,Â B,Ð,Æ,Â,ìfIfyfR [fh,Í A,»,ìŒã,É‘±,¬,Ä,¢,,Â,©,ìfIfyf%of“fh,ðŽ ,Â,±  
,Æ,ª,Â,«,é BfVfXfef€,Í AŠefIfyf%of“fh,ÂŠÖ~A,·,éIfyfR [fh,ðŠÈ’P,ÉŽÀ s,·,é B

ŽQ Æ @D3DINSTRUCTION

## D3DRENDERSTATETYPE

```
typedef enum _D3DRENDERSTATETYPE {
    D3DRENDERSTATE_TEXTUREHANDLE = 1,
    D3DRENDERSTATE_ANTIALIAS = 2,
    D3DRENDERSTATE_TEXTUREADDRESS = 3,
    D3DRENDERSTATE_TEXTUREPERSPECTIVE = 4,
    D3DRENDERSTATE_WRAPU = 5,
    D3DRENDERSTATE_WRAPV = 6,
    D3DRENDERSTATE_ZENABLE = 7,
    D3DRENDERSTATE_FILLMODE = 8,
    D3DRENDERSTATE_SHADEMODE = 9,
    D3DRENDERSTATE_LINEPATTERN = 10,
    D3DRENDERSTATE_MONOENABLE = 11,
    D3DRENDERSTATE_ROP2 = 12,
    D3DRENDERSTATE_PLANEMASK = 13,
    D3DRENDERSTATE_ZWRITEENABLE = 14,
    D3DRENDERSTATE_ALPHATESTENABLE = 15,
    D3DRENDERSTATE_LASTPIXEL = 16,
    D3DRENDERSTATE_TEXTUREMAG = 17,
    D3DRENDERSTATE_TEXTUREMIN = 18,
    D3DRENDERSTATE_SRCBLEND = 19,
    D3DRENDERSTATE_DESTBLEND = 20,
    D3DRENDERSTATE_TEXTUREMAPBLEND = 21,
    D3DRENDERSTATE_CULLMODE = 22,
    D3DRENDERSTATE_ZFUNC = 23,
    D3DRENDERSTATE_ALPHAREF = 24,
    D3DRENDERSTATE_ALPHAFUNC = 25,
    D3DRENDERSTATE_DITHERENABLE = 26,
    D3DRENDERSTATE_BLENDENABLE = 27,
    D3DRENDERSTATE_FOGENABLE = 28,
    D3DRENDERSTATE_SPECULARENABLE = 29,
    D3DRENDERSTATE_ZVISIBLE = 30,
    D3DRENDERSTATE_SUBPIXEL = 31,
    D3DRENDERSTATE_SUBPIXELX = 32,
    D3DRENDERSTATE_STIPPLEDALPHA = 33,
    D3DRENDERSTATE_FOGCOLOR = 34,
    D3DRENDERSTATE_FOGTABLEMODE = 35,
    D3DRENDERSTATE_FOGTABLESTART = 36,
    D3DRENDERSTATE_FOGTABLEEND = 37,
    D3DRENDERSTATE_FOGTABLEDENSITY = 38,
    D3DRENDERSTATE_STIPPLEENABLE = 39,
    D3DRENDERSTATE_STIPPLEPATTERN00 = 64,
    // “_•`f p f ^ [ f “ , ì 0 1 , © , ç 3 0 , ð È — ” ^
    D3DRENDERSTATE_STIPPLEPATTERN31 = 95,
} D3DRENDERSTATETYPE;
```

**D3DOP\_STATE\_RENDERER** f l f y f R [ f h — p , ì f C e f “ f \_ f Š f “ f O ó ‘ Ô , ð Ý ’ è , , é B , ± , ì — ñ “ C E ^ , Í **AD3DSTATE** \ ‘ C ‘ ì , ì ‘ è • ” , Å ,  
, é B Ž Ÿ , ì L q , È ‘ L Ú , ³ , è , ½ ’ l , Í A , ± , ì \ ‘ C ‘ ì , ì 2 ” Ô — Ú , ì f f “ f o , È Ý ’ è , ³ , è , é B

## D3DRENDERSTATE\_TEXTUREHANDLE

f e f N f X f ` f f , ì f n f “ f h f < B f f f t f H f < f g ’ l , Í NULL , Å , , é B

## D3DRENDERSTATE\_ANTIALIAS

f A f “ f ` G f C f Š f A f V f “ f O — v ‘ f , ì [ B f f f t f H f < f g ’ l , Í FALSE , Å , , é B

## D3DRENDERSTATE\_TEXTUREADDRESS

**D3DTEXTUREADDRESS** — ñ “ C E ^ , ì f f “ f o , ì , ð , Å , Å B f f f t f H f < f g ’ l , Í D3DTEXTUREADDRESS\_WRAP , Å , , é B

## D3DRENDERSTATE\_TEXTUREPERSPECTIVE

TRUE , ì , Å , « A “ § Ž < C ³ B f f f t f H f < f g ’ l , Í FALSE , Å , , é B

## D3DRENDERSTATE\_WRAPU

TRUE , ì , Å , « A u • û C ü , È ’ £ , è • t , \_ , é B f f f t f H f < f g ’ l , Í FALSE , Å , , é B

## D3DRENDERSTATE\_WRAPV

TRUE,Ì,Æ,« Av•ûĈëü,É'Ě,è•t,¯,é BffftfHf<fg'l,ÍFALSE,Â, ,é B

### D3DRENDERSTATE\_ZENABLE

TRUE,Ì,Æ,« AZfofbftf@,Ì"ăŠrfefXfg,ð%Â",É,·,é BffftfHf<fg'l,ÍFALSE,Â, ,é B

### D3DRENDERSTATE\_FILLMODE

D3DFILLMODE—ñ<“Ĉ^,Ìf f“fo,Ì,Đ,Æ,Â BffftfHf<fg'l,ÍD3DFILL\_SOLID,Â, ,é B

### D3DRENDERSTATE\_SHADEMODE

D3DSHADEMODE—ñ<“Ĉ^,Ìf f“fo,Ì,Đ,Æ,Â BffftfHf<fg'l,ÍD3DSHADE\_GOURAUD,Â, ,é B

### D3DRENDERSTATE\_LINEPATTERN

D3DLINEPATTERN \‘ĉ'Ì,Â, ,é BffftfHf<fg'l,ÍwRepeatPattern—p,É0,Â AwLinePattern—p,É0,Â, ,é B

### D3DRENDERSTATE\_MONOENABLE

TRUE,Ì,Æ,« Af,fmfNf EfĈf“f\_Šf“fO,ð%Â",Æ,·,é BffftfHf<fg'l,ÍFALSE,Â, ,é BfffofCfX,ªRGBfĈf“f\_Šf“fO,ðfTf| [fg,µ,Â,Ĉ,É,Ĉ,Æ,« ATRUE,Â, ,é BfAfvfŠfP [fVf‡f“,Í AfĥfofCfX,ªRGBfĈf“f\_Šf“fO,ðfTf| [fg,µ,Â,Ĉ,É,Ĉ,ðD3DDEVICEDESC \‘ĉ'Ì,ÌdcmColorModelf f“fo,ðŽg—p,µ,Â'²,×,é,±,Æ,ª,Â,«,é

### D3DRENDERSTATE\_ROP2

TRUE,Ì,Æ,« f,fmfNf EfĈf“f\_Šf“fO,ð%Â",Æ,·,é BffftfHf<fg'l,ÍFALSE,Â, ,é BfffofCfX,ªRGBfĈf“f\_Šf“fO,ðfTf| [fg,µ,Â,Ĉ,É,Ĉ,Æ,« ATRUE,Â, ,é BfAfvfŠfP [fVf‡f“,Í AfĥfofCfX,ªRGBfĈf“f\_Šf“fO,ðfTf| [fg,µ,Â,Ĉ,É,Ĉ,ðD3DDEVICEDESC \‘ĉ'Ì,ÌdcmColorModelf f“fo,ðŽg—p,µ,Â'²,×,é,±,Æ,ª,Â,«,é B  
—,!,Ĉ,è,½fsfNfZf<,ð•Ž,ÌT [fĥFfX,ÌsfNfZf<,É ‘,« ž,Ĭ•û—@,ðŽw'è,·,é A16 ROP2fofCfifŠf%oXf^ ^—  
Ì,Đ,Æ,Â BffftfHf<fg'l,Í AR2\_COPYPEN,Â, ,é BfAfvfŠfP [fVf‡f“,Í AfTf| [fg,³,è,é'Ĉ%oÁf%oXf^ ^—  
,ðĈ'è,·,éD3DPRIMCAPS \‘ĉ'Ì,ÌdwRasterCapsf f“fo,ÌD3DPRASTERCAPS\_ROP2ftf%oF,Žg—p,Â,«,é B

### D3DRENDERSTATE\_PLANEMASK

ULONGĈ^,Ì•— fvfĈ [f“f}fXfN BffftfHf<fg'l,Í A0,Â, ,é B

### D3DRENDERSTATE\_ZWRITEENABLE

TRUE,Ì,Æ,« AZ ‘,« ž,Ý,ð%Â",Æ,·,é BffftfHf<fg'l,Í ATRUE,Â, ,é B,±  
Ìf f“fo,Í AfAfvfŠfP [fVf‡f“,ÉfVfXfē€,ª V,µ,ĈZ'Ì,ÂZfofbftf@,ð X V,·,é,Ì,ð—h,®Ž—,ð<—%oÂ,·,é B

### D3DRENDERSTATE\_ALPHATESTENABLE

fAf<ftf@ EfēfXfg,ð%Â",Æ,·,é,½,ŠTRUE BffftfHf<fg'l,Í AFALSE,Â, ,é B,±  
Ìf f“fo,Í AfAfvfŠfP [fVf‡f“,ÉfAf<ftf@'Ì,ŠÌ €,Æ,È,éfsfNfZf<,ÌŽó,~Žæ,è,âŽó,~Žæ,è,“Ū,Ì'âŽ~,ð<—%oÂ,·,é B

### D3DRENDERSTATE\_LASTPIXEL

TRUE,Ì,Æ,« A ü,Ì ÂĈă,ÌsfNfZf<,ð•%oæ,·,é,Ì,ðŽ~,ß,é BffftfHf<fg'l,Í ATRUE,Â, ,é B

### D3DRENDERSTATE\_TEXTUREMAG

D3DTEXTUREFILTER—ñ<“Ĉ^,Ìf f“fo,Ì,Đ,Æ,Â BffftfHf<fg'l,Í AD3DFILTER\_NEAREST,Â, ,é B

### D3DRENDERSTATE\_TEXTUREMIN

D3DTEXTUREFILTER—ñ<“Ĉ^,Ìf f“fo,Ì,Đ,Æ,Â BffftfHf<fg'l,Í AD3DFILTER\_NEAREST,Â, ,é B

### D3DRENDERSTATE\_SRCBLEND

D3DBLEND—ñ<“Ĉ^,Ìf f“fo,Ì,Đ,Æ,Â BffftfHf<fg'l,ÍD3DBLEND\_ONE,Â, ,é B

### D3DRENDERSTATE\_DESTBLEND

D3DBLEND—ñ<“Ĉ^,Ìf f“fo,Ì,Đ,Æ,Â BffftfHf<fg'l,ÍD3DBLEND\_ZERO,Â, ,é B

### D3DRENDERSTATE\_TEXTUREMAPBLEND

D3DTEXTUREBLEND—ñ<“Ĉ^,Ìf f“fo,Ì,Đ,Æ,Â BffftfHf<fg'l,ÍD3DTBLEND\_MODULATE,Â, ,é B

### D3DRENDERSTATE\_CULLMODE

D3DCULL—ñ<“Ĉ^,Ìf f“fo,Ì,Đ,Æ,Â BffftfHf<fg'l,ÍD3DCULL\_CCW,Â, ,é Bf\ftfgfEfFfA,ÌĈf“f\_Šf“fO,Í A ĈĈ'è,Ì Ø,è"²,« ‡ ~,ðŽ ,ĉ A Ø,è"²,«f, [fh,Ì•Ì X,ÍfTf| [fg,µ,È,Ĉ B

### D3DRENDERSTATE\_ZFUNC

D3DCMPFUNC—ñ<“Ĉ^,Ìf f“fo,Ì,Đ,Æ,Â BffftfHf<fg'l,ÍD3DCMP\_LESSEQUAL,Â, ,é B,±  
Ìf f“fo,Í AfAfvfŠfP [fVf‡f“,ÉfJf f%o,Ĉ,Ĉ,Ì<—Ł,ðŠÌ €,Æ,·,éfsfNfZf<,ÌŽó,~Žæ,è,âŽó,~Žæ,è,“Ū,ð<—  
%oÂ,·,é B

### D3DRENDERSTATE\_ALPHAREF

fAf<ftf@ EfēfXfg,%oÂ",É,Æ,« AfēfXfg,³,è,éfsfNfZf<,É'Ĭ,·,éŽQ æfAf<ftf@'Ì,ðŽw'è,·,é'Ì B,±  
Ì'Ì,ÌĈ^,ÍD3DFIXED,Â, ,é BffftfHf<fg'l,Í0,Â, ,é B

### D3DRENDERSTATE\_ALPHAFUNC

D3DCMPFUNC—ñ<“Ĉ^,Ìf f“fo,Ì,Đ,Æ,Â BffftfHf<fg'l,Í AD3DCMP\_ALWAYS,Â, ,é B,±  
Ìf f“fo,Í AfAfvfŠfP [fVf‡f“,ÉfAf<ftf@'Ì,ðŠÌ €,Æ,·,éfsfNfZf<,ÌŽó,~Žæ,è,âŽó,~Žæ,è,“Ū,ð<—%oÂ,·,é B

### D3DRENDERSTATE\_DITHERENABLE

TRUE,Ì,Æ,« ffbfUfŠf“fO,ð%Â",Æ,·,é BffftfHf<fg'l,ÍFALSE,Â, ,é B



### D3DRENDERSTATE\_BLENDENABLE

TRUE,Ì,Æ,«fAf<ftf@,Ì ¬ ‡,ð%Å”\,Æ,·,é BfftfHf<fg’l,ÍFALSE,Å, ,é B

### D3DRENDERSTATE\_FOGENABLE

TRUE,Ì,Æ,«ftfHfO,ð%Å”\,Æ,·,é BfftfHf<fg’l,ÍFALSE,Å, ,é B

### D3DRENDERSTATE\_SPECULARENABLE

TRUE,Ì,Æ,«“§%ß,ð%Å”\,Æ,·,é BfftfHf<fg’l,ÍTRUE,Å, ,é B

### D3DRENDERSTATE\_ZVISIBLE

TRUE,Ì,Æ,«ZŒŸ ,ð%Å”\,Æ,·,é BfftfHf<fg’l,ÍFALSE,Å, ,é BZŒŸ ,Æ,Í A•`%œ,·,é|fŠfSf“,ðŒ©,Å, -,é,½,ßZfofbftf@,Ê‘Í,μ,ÄfefXfg,<sup>3</sup>,ê,é A,·,×,Ä,Ì|fŠfSf“,ÌfOf< [fv,ÌfXfNfŠ [f“<óŠÔ,Ê•,©,ê,éf|fŠfSf“,Å,Ì Ø,è”<sup>2</sup>,«<Z,Ì,±,Æ,Å, ,é B

### D3DRENDERSTATE\_SUBPIXEL

TRUE,Ì,Æ,«fTfu fsfNfZf<,Ì`<sup>3</sup>,ð%Å”\,Æ,·,é BfftfHf<fg’l,ÍFALSE,Å, ,é B

### D3DRENDERSTATE\_SUBPIXELX

TRUE,Ì,Æ,«X,¾, -,Ì`<sup>3</sup>,ð%Å”\,Æ,·,é BfftfHf<fg’l,ÍFALSE,Å, ,é B

### D3DRENDERSTATE\_STIPPLEDALPHA

TRUE,Ì,Æ,«“-•,<sup>3</sup>,ê,½fAf<ftf@,ð%Å”\,Æ,·,é BfftfHf<fg’l,ÍFALSE,Å, ,é B

### D3DRENDERSTATE\_FOGCOLOR

D3DCOLORŒ^,Ì`l BfftfHf<fg’l,Í0,Å, ,é B

### D3DRENDERSTATE\_FOGTABLEMODE

D3DFOGMODE—ñ“Œ^,Ìf f“fo,Ì,Ð,Æ,Å BfftfHf<fg’l,ÍD3DFOG\_NONE,Å, ,é B

### D3DRENDERSTATE\_FOGTABLESTART

ftfHfO Efe [fuf<,ÌŠJŽn B,±,ê,Í üŒ`ftfHfO Ef, [fh,Ì,½,ßŠJŽn,<sup>3</sup>,ê,½ftfHfOŒø%Ê,ÌÊ`u,Å, ,é B

### D3DRENDERSTATE\_FOGTABLEEND

ftfHfO Efe [fuf<,Ì I—<sup>1</sup> B,±,ê,Í A üŒ`ftfHfO Ef, [fh,Ì Å‘â—§“x,É“ž’B,μ,½ftfHfOŒø%Ê,ÌÊ`u,Å, ,é B

### D3DRENDERSTATE\_FOGTABLEDENSITY

üŒ`ftfHfO Ef, [fh,Ì Å‘âftfHfO—§“x,ð Ý’è,·,é B,±,Ì`l,Ì”ÍÍ,Í A0,©,ç1,Å, ,é B

### D3DRENDERSTATE\_STIPPLEENABLE

ffofCfX Efhf%ofCfo,Ö,Ì“-•,ð%Å”\,Æ,·,é B“-•,<sup>3</sup>,ê,½fAf<ftf@,“%Å”\,È,Æ,« AŒ» Ý,Ì“-•`fpf^ [f“,ð—<sup>3</sup>Œø,Æ,μ,È, -,ê,Ì,È,ç,È,Œ B

### D3DRENDERSTATE\_STIPPLEPATTERN00 `D3DRENDERSTATE\_STIPPLEPATTERN31

“-•`fpf^ [f“ B,»,ê,¼,ê,ÌŒEf“f\_fŠf“fO ó‘Ô,Í A“-•`fpf^ [f“,Ì“—£ ü,Ê“K%ž,<sup>3</sup>,ê,é B

ŽQ Æ @D3DOPCODE AD3DSTATE

## D3DSHADEMODE

```
typedef enum _D3DSHADEMODE {  
    D3DSHADE_FLAT      = 1,  
    D3DSHADE_GOURAUD   = 2,  
    D3DSHADE_PHONG     = 3,  
} D3DSHADEMODE;
```

**D3DRENDERSTATETYPE**— $\tilde{n}^{\circ}\mathbb{C}^{\wedge}, \underline{\text{D3DRENDERSTATE\_SHADEMODE}}$   $f\mathbb{C}f^{\circ}f_{\check{S}}f^{\circ}f\mathcal{O}$   $\acute{o}^{\circ}\hat{\mathcal{O}}\text{---}p, \acute{E}fTf|$   
 $[fg,^3,\acute{e},\acute{e}fVfF$   $[fffBf^{\circ}f\mathcal{O}$   $Ef,$   $[fh,\delta\check{Z}w^{\circ}\grave{e},^{\circ},\acute{e}$   $B$

## D3DSHADE\_FLAT

$\bullet\frac{1}{2}\text{---}\hat{E}fVfF$   $[fffBf^{\circ}f\mathcal{O}$   $Ef,$   $[fh$   $B\check{Z}\mathcal{O}\check{S}p\mathbb{C}^{\circ},\grave{\text{I}}$   $\mathring{A}$   $\%_o,\grave{\text{I}}^{\circ},\text{---},\grave{\text{I}}$   $F,\acute{\text{I}}$   $A\bullet\text{---}\hat{E},\grave{\text{I}}$   $F,\delta\mathbb{C}^{\circ}\grave{e},^{\circ},\acute{e},\frac{1}{2},\mathcal{B},\acute{E}\check{Z}g\text{---}p,^3,\acute{e},\acute{e}$   $B$

## D3DSHADE\_GOURAUD

$f\mathcal{O}f$   $[$   $EfVfF$   $[fffBf^{\circ}f\mathcal{O}$   $Ef,$   $[fh$   $B\bullet\text{---}$   
 $\hat{E},\grave{\text{I}}$   $F,\acute{\text{I}}$   $A\check{Z}\mathcal{O}\check{S}p\mathbb{C}^{\circ},\grave{\text{I}},R,\mathring{A},\grave{\text{I}}^{\circ},\text{---},\check{S}\hat{\mathcal{O}},\mathring{A}$   $^{\circ},\ll$   $\check{Z},\ddot{U},\acute{e},\frac{1}{2}$   $\ddot{u}\mathbb{C}^{\circ},\acute{E},\mathfrak{a},\grave{e}\mathbb{C}^{\circ}\grave{e},^3,\acute{e},\acute{e}$   $B$

## D3DSHADE\_PHONG

$ftfHf^{\circ}$   $EfVfF$   $[fffBf^{\circ}f\mathcal{O}$   $Ef,$   $[fh$   $B,_{\pm},\grave{\text{I}}f,$   $[fh,\acute{\text{I}}$   $A\mathbb{C}^{\circ}\gg$   $\acute{Y}fTf|$   $[fg,^3,\acute{e},\mathring{A},\mathfrak{C},\grave{E},\mathfrak{C}$   $B$

$\check{Z}Q$   $\mathcal{A}E$   $@\underline{\text{D3DRENDERSTATETYPE}}$

## D3DTEXTUREADDRESS

```
typedef enum _D3DTEXTUREADDRESS {  
    D3DTEXTUREADDRESS_WRAP = 1,  
    D3DTEXTUREADDRESS_MIRROR = 2,  
    D3DTEXTUREADDRESS_CLAMP = 3,  
} D3DTEXTUREADDRESS;
```

**D3DRENDERSTATETYPE**— $\tilde{n}^{\leftarrow} \langle \mathbb{C}^{\wedge}, \mathbb{I} \rangle$  **D3DRENDERSTATE\_TEXTUREADDRESS**  $f \in f^{\leftarrow} f_{\check{S}} f^{\leftarrow} f_{\mathcal{O}}$   $\acute{o}^{\circ} \hat{\mathcal{O}}, \mathbb{I}, \frac{1}{2}, \mathbb{B} f T f |$   
 $[f g, {}^3, \acute{e}, \acute{e} f e f N f X f^{\leftarrow} f f^{\leftarrow} E f A f h f \in f X, \acute{o} \check{Z} w^{\circ} \acute{e}, \cdot, \acute{e} \text{ } B$

## D3DTEXTUREADDRESS\_WRAP

**D3DRENDERSTATETYPE**— $\tilde{n}^{\leftarrow} \langle \mathbb{C}^{\wedge}, \mathbb{I} \rangle$

**D3DRENDERSTATE\_WRAPU**,  $\mathbb{A} \mathbb{D} \mathbb{3} \mathbb{D} \mathbb{R} \mathbb{E} \mathbb{N} \mathbb{D} \mathbb{E} \mathbb{R} \mathbb{S} \mathbb{T} \mathbb{A} \mathbb{T} \mathbb{E} \mathbb{T} \mathbb{Y} \mathbb{P} \mathbb{E}$   $f \in f^{\leftarrow} f_{\check{S}} f^{\leftarrow} f_{\mathcal{O}}$   $\acute{o}^{\circ} \hat{\mathcal{O}}, {}^a \check{Z} g \text{---} p, {}^3, \acute{e}, \acute{e} \text{ } B, \pm$   
 $, \acute{e}, {}^a \text{ } A f f f t f H f \langle f g, \mathbb{A} \text{ } \acute{Y}^{\circ} \acute{e}, {}^3, \acute{e}, \acute{e} \text{ } B$

## D3DTEXTUREADDRESS\_MIRROR

$f^{\wedge} f C f_{\check{S}} f^{\leftarrow} f_{\mathcal{O}} E f e f N f X f^{\leftarrow} f f^{\leftarrow}, \mathbb{I} f A f h f \in f X, \mathbb{A}^{\text{TM}}, \mu, \mathbb{C} \text{ } B (D3DRENDERSTATE_WRAPU, \mathbb{A}, \acute{a} D3DRENDERSTATE\_WRA$   
 $PV, \mathbb{A}, \acute{a}, \acute{e}, \mathbb{C}, \mathbb{A}, \langle \rangle, \rangle, \rangle, \acute{e}, \mathbb{I} \text{ } A, \cdot, \times, \mathbb{A}, \mathbb{I} \text{ } \mathbb{R} \text{ } \text{ } \acute{U} \text{ } \ddot{z} f t f_{\check{S}} f b f s f^{\leftarrow} f_{\mathcal{O}}, {}^3, \acute{e}, \frac{1}{2} f e f N f X f^{\leftarrow} f f^{\leftarrow}, \acute{o} \text{ } \mathbb{A}, -$   
 $B, \frac{1}{2}, \mathbb{A}, \mathbb{I}, \mathbb{I} f e f N f X f^{\leftarrow} f f^{\leftarrow}, \mathbb{I} \text{ } A0, \mathbb{A}1, \mathbb{I} \check{S} \hat{\mathcal{O}}, \mathbb{I} u^{\circ} l, \mathbb{A} \text{ } A \text{ } {}^3 \langle K f A f h f \in f X, \mathbb{A}, \acute{e} \text{ } B1, \mathbb{A}2, \mathbb{I} \check{S} \hat{\mathcal{O}}, \mathbb{A}, \mathbb{I} \text{ } A f t f_{\check{S}} f b f v ({}^{\circ} \frac{1}{2} \text{ } )$   
 $, {}^3, \acute{e}, \acute{e} \text{ } B, \check{U}, \frac{1}{2}, \mathbb{A}3, \mathbb{I} \check{S} \hat{\mathcal{O}}, \mathbb{A}, \mathbb{I} \text{ } A \text{ } \mathbb{A}, \check{N} \text{ } {}^3 \langle K, \acute{E} - \mathbb{B}, \acute{e} \text{ } B$

## D3DTEXTUREADDRESS\_CLAMP

$f e f N f X f^{\leftarrow} f f^{\leftarrow} \mathbb{A} \bullet W, {}^a 1.0, \mathbb{A}, \acute{e}^{\circ} \acute{a}, \langle \rangle, \rangle, \acute{e}, \mathbb{I} \text{ } A1.0, {}^a \acute{Y}^{\circ} \acute{e}, {}^3, \acute{e}, \acute{e} \text{ } B0.0, \mathbb{A}, \acute{e} \text{ } \neg, {}^3, \neg, \acute{e}, \mathbb{I} \text{ } A0.0, {}^a \acute{Y}^{\circ} \acute{e}, {}^3, \acute{e}, \acute{e} \text{ } B$

$D3DRENDERSTATE\_WRAPU, \mathbb{A} \mathbb{D} \mathbb{3} \mathbb{D} \mathbb{R} \mathbb{E} \mathbb{N} \mathbb{D} \mathbb{E} \mathbb{R} \mathbb{S} \mathbb{T} \mathbb{A} \mathbb{T} \mathbb{E} \mathbb{T} \mathbb{Y} \mathbb{P} \mathbb{E}$   $f \in f^{\leftarrow} f_{\check{S}} f^{\leftarrow} f_{\mathcal{O}}$   $\acute{o}^{\circ} \hat{\mathcal{O}}, \acute{o} \check{Z} g \text{---}$   
 $p, \cdot, \acute{e}, \frac{1}{2}, \mathbb{B}, \mathbb{I} \text{ } \acute{U} \text{ } \times, \mathbb{I} \text{ } A \text{ } u \underline{IDirect3DTextureCf}^{\leftarrow} f^{\wedge} \text{ } [\underline{f t f E f C f X} \text{ } v, \acute{o} \check{Z} Q \text{ } \mathbb{A}, \cdot, \acute{e}, \pm, \mathbb{A} \text{ } B$

$\check{Z} Q \text{ } \mathbb{A} \text{ } @ \underline{D3DRENDERSTATETYPE}$

## D3DTEXTUREBLEND

```
typedef enum _D3DTEXTUREBLEND {
    D3DTBLEND_DECAL          = 1,
    D3DTBLEND_MODULATE        = 2,
    D3DTBLEND_DECALALPHA      = 3,
    D3DTBLEND_MODULATEALPHA   = 4,
    D3DTBLEND_DECALMASK       = 5,
    D3DTBLEND_MODULATEMASK    = 6,
    D3DTBLEND_COPY             = 7,
} D3DTEXTUREBLEND;
```

*fTf* [*fg*,<sup>3</sup>,*ê*,*é**fefNfXf`ff*  $\neg$  *‡f*, [*fh*,*ð*'*è*' $\cdot$ ,*é* *B*, $\pm$ ,*ì*—*ñ*“*Œ*^,*í* **AD3DRENDERSTATETYPE**—*ñ*“*Œ*^,*í***D3DRENDERSTATE\_TEXTUREMAPBLEND***fŒf“fŠf“fO* *ó*’*Ô*,*É*,*æ*,*è*Ž*g*—*p*,<sup>3</sup>,*ê*,*é* *B*

### D3DTBLEND\_DECAL

*ffJ* [*f* < *BfefNfXf`ff*  $\neg$  *‡f*, [*fh*,*ªfTf*] [*fg*,<sup>3</sup>,*ê*,*é* *B*, $\pm$   
,*ìf*, [*fh*,*Á*,*í* *AfefNfXf`ff*,*ìRGB*,*ÆfAf<ftf@’l*,*í* *AfefNfXf`ff*,*ĂŽg*—*p*,<sup>3</sup>,*ê*,*Ă*,*Œ*,*Œ* *F*,*ð*’*uŠ*’ $\cdot$ ,*é* *B*

### D3DTBLEND\_MODULATE

•*İ*<sup>2</sup> *BfefNfXf`ff*  $\neg$  *‡f*, [*fh*,*ªfTf*] [*fg*,<sup>3</sup>,*ê*,*é* *B*, $\pm$ ,*ìf*, [*fh*,*Á*,*í* *AfefNfXf`ff*,*ìRGB*’*l*,*í* *AfefNfXf`ff*,*ĂŽg*—*p*,<sup>3</sup>,*ê*,*Ă*,*Œ*,*Œ* *F*,*ð*’*uŠ*’ $\cdot$ ,*é* *B*  
*p*,<sup>3</sup>,*ê*,*Ă*,*Œ*,*Œ* *RGB*’*l*,*ðŒJ*,*è*•*Ô*, $\cdot$  *BfefNfXf`ff*,*ìfAf<ftf@’l*,*í* *AfefNfXf`ff*,*ĂŽg*—*p*,<sup>3</sup>,*ê*,*Ă*,*Œ*  
,*É*,*Œ* *F*,*ìfAf<ftf@’l*,*ð*’*uŠ*’ $\cdot$ ,*é* *B*

### D3DTBLEND\_DECALALPHA

*ffJ* [*f* < *EfAf<ftf@ BfefNfXf`ff*  $\neg$  *‡f*, [*fh*,*ªfTf*] [*fg*,<sup>3</sup>,*ê*,*é* *B*, $\pm$   
,*ìf*, [*fh*,*Á*,*í* *AfefNfXf`ff*,*ìRGB*,*ÆfAf<ftf@’l*,*í* *AŽŸ*,*ì*•*û*’*öŽ*@,*ĂfefNfXf`ff*,*ĂŽg*—*p*,<sup>3</sup>,*ê*,*Ă*,*Œ*  
,*É*,*Œ* *F*,*Ă*  $\neg$  *‡*,<sup>3</sup>,*ê*,*é* *B*  
$$C = (1 - A_t) C_o + A_t C_t$$

, $\pm$ ,*ì*•*û*’*öŽ*@,*Ă* *AC*,*í* *F* *AA*,*ífAf<ftf@* *At*,*ífefNfXf`ff* *Ao*,*íŒ*<sup>3</sup>,*ìfIfufWfFfNfg*(  $\neg$  *‡*’*O*,*ì*),*ð*• $\cdot$ , $\cdot$  *B*  
D3DTBLEND\_DECALALPHA*f*, [*fh*,*Á* *AfefNfXf`ff*,*ìfAf<ftf@’l*,*í* *AfefNfXf`ff*,*ĂŽg*—*p*,<sup>3</sup>,*ê*,*Ă*,*Œ*  
,*É*,*Œ* *F*,*ìfAf<ftf@’l*,*ð*’*uŠ*’ $\cdot$ ,*é* *B*

### D3DTBLEND\_MODULATEALPHA

•*İ*<sup>2</sup>*fAf<ftf@,ìfefNfXf`ff*  $\neg$  *‡f*, [*fh*,*ªfTf*] [*fg*,<sup>3</sup>,*ê*,*é* *B*, $\pm$   
,*ìf*, [*fh*,*Á* *AfefNfXf`ff*,*ìRGB*’*l*,*í* *ARGB*’*l*,*ð*’ $\cdot$ ,*â*, $\mu$  *AfefNfXf`ff*,*ìfAf<ftf@’l*,*à*’ $\cdot$ ,*â*, $\cdot$  *B*

### D3DTBLEND\_DECALMASK

*ffJ* [*f* < *Ef*}{*fXfN*,*ìfefNfXf`ff*  $\neg$  *‡f*, [*fh*,*ªfTf*] [*fg*,<sup>3</sup>,*ê*,*é* *B*

### D3DTBLEND\_MODULATEMASK

•*İ*<sup>2</sup>*f*}{*fXfN*,*ìfefNfXf`ff*  $\neg$  *‡f*, [*fh*,*ªfTf*] [*fg*,<sup>3</sup>,*ê*,*é* *B*

### D3DTBLEND\_COPY

•*ĩ*Ž*fefNfXf`ff*  $\neg$  *‡f*, [*fh*,*ªfTf*] [*fg*,<sup>3</sup>,*ê*,*é* *B*

•*İ*<sup>2</sup>,*í* *AŒðŒ*<sup>1</sup>,*ÆfefNfXf`ff*,*ì*  $\neg$ —  
*p*,*Æ*’*Š* *æ*, $\cdot$ ,*é* *B* *F*,*í* *A0*^*È* *ã1*^*È*%*°*,*ì*’*l*,*ĂŽw*’*è*,<sup>3</sup>,*ê*,*é* *B*, $\gg$ , $\mu$ ,*Ă* *AfefNfXf`ff*,*âf*\ [*fX*,*æ*,*è*’*x*,*ì*’*á*,*Œ* *F*,*É* *‡*,*í*,<sup>1</sup>,*Ă* *A*^*ê*  
,*É* ¶  $\neg$ ,<sup>3</sup>,*ê*, $\frac{1}{2}$ *Œ* *X*,*ì* *F*,*ð*•*İ*<sup>2</sup>, $\cdot$ ,*é* *B*, $\gg$ ,*ì*  $\neg$ •<sup>ª</sup>,*ìf*\ [*fX*,*ì*,*Đ*,*Æ*,*Ă*,<sup>ªª</sup>”(1),*ì*,*Æ*,« *A*’*P*“*x*,*ì*’*á*,*Œ* *F*  $\neg$ •<sup>ª</sup>,*íŒ*, $\cdot$ , $\mu$ ,*É*,*Œ* *B*“—  
*l*,*É* *AfIfufWfFfNfg*,*É*’%*ž*, $\cdot$ ,*é**fefNfXf`ff*,<sup>ª</sup> *A*”(1 *A1* *A1*)  
,*ì*,*Æ*,« *AfefNfXf`ff*,*ì* *F*,*í* *A*^*Ÿ* <sup>3</sup>,*ê* *A*•*İ* *X*,<sup>3</sup>,*ê*,*É*,*Œ* *B*

## D3DTEXTUREFILTER

```
typedef enum _D3DTEXTUREFILTER {
    D3DFILTER_NEAREST          = 1,
    D3DFILTER_LINEAR           = 2,
    D3DFILTER_MIPNEAREST       = 3,
    D3DFILTER_MIPLINEAR        = 4,
    D3DFILTER_LINEAR_MIPNEAREST = 5,
    D3DFILTER_LINEAR_MIPLINEAR = 6,
} D3DTEXTUREFILTER;
```

**D3DRENDERSTATETYPE**—Ń“Œ^,İD3DRENDERSTATE\_TEXTUREMAGfŒf“f\_fŠf“fO ó‘Ô,ðŽg—p,·,é AfTf|  
[fg,<sup>3</sup>,ê,½fefNfXf`ff EftfBf<f^ Ef, [fh,ð’è<^,·,é B

## D3DFILTER\_NEAREST

—v< ,<sup>3</sup>,ê,½fsfNfZf<’l,É Ā,à&Œ,Œ Ā•W,İfefNfZf<,aŽg—p,<sup>3</sup>,ê,é B,±,ê,Í AŠg‘â,Æ k ¬,İ—¼•û,Ā—p,Œ  
,ç,ê,é BŠg‘â,© k ¬,afTf| [fg,<sup>3</sup>,ê,Ā,Œ,é,Æ,«,Í A—¼•û,afTf| [fg,<sup>3</sup>,ê,Ā,Œ,È,¬,ê,Î,È,ç,È,Œ B

## D3DFILTER\_LINEAR

2 ~2,İ—İ^æ,İ d,<sup>3</sup>,İ•½İ BfefNfZf<ŠĀ<«,İ—v< ,<sup>3</sup>,ê,½fsfNfZf<,aŽg—p,<sup>3</sup>,ê,é B,±,ê,ÍŠg‘â,Æ k ¬,İ—¼•û,Ā—p,Œ  
,ç,ê,é BŠg‘â,© k ¬,afTf| [fg,<sup>3</sup>,ê,Ā,Œ,é,Æ,«,Í A—¼•û,afTf| [fg,<sup>3</sup>,ê,Ā,Œ,È,¬,ê,Î,È,ç,È,Œ B

## D3DFILTER\_MIPNEAREST

D3DFILTER\_NEAREST,Æ“—l,¾,<sup>a</sup> A‘I’ðfefNfZf<ŒĀ—L,İf~fbfvf}fbfv,ðŽg—p,·,é B

## D3DFILTER\_MIPLINEAR

D3DFILTER\_LINEAR,Æ“—l,¾,<sup>a</sup> A‘I’ðfefNfZf<ŒĀ—L,İf~fbfvf}fbfv,ðŽg—p,·,é B

## D3DFILTER\_LINEAR\_MIPNEAREST

D3DFILTER\_MIPNEAREST,Æ“—l,¾,<sup>a</sup> A,Ó,½,Ā,İ&Ž—f~fbfvf}fbfv,Ā İ,è‘Ö,İ,é B

## D3DFILTER\_LINEAR\_MIPLINEAR

D3DFILTER\_MIPLINEAR,Æ“—l,¾,<sup>a</sup> A,Ó,½,Ā,İ&Ž—f~fbfvf}fbfv,Ā İ,è‘Ö,İ,é B

## D3DTRANSFORMSTATETYPE

```
typedef enum _D3DTRANSFORMSTATETYPE {  
    D3DTRANSFORMSTATE_WORLD      = 1,  
    D3DTRANSFORMSTATE_VIEW       = 2,  
    D3DTRANSFORMSTATE_PROJECTION = 3,  
} D3DTRANSFORMSTATETYPE;
```

**D3DOPCODE**— $\tilde{n}$ “ $\mathcal{C}^\wedge$ , $\tilde{\mathbf{I}}$ **D3DOP\_STATE\_TRANSFORM** $fIfyfR$  [f $h$ —p,É• $\tilde{\mathbf{I}}$ Š• ó‘Ô,ðŽw’è,·,é B,±,İ—  
 $\tilde{n}$ “ $\mathcal{C}^\wedge$ , $\tilde{\mathbf{I}}$  **AD3DSTATE** \‘ $\mathfrak{c}$ ‘ $\tilde{\mathbf{I}}$ , $\tilde{\mathbf{I}}$ ê”,Ä, ,é B

**D3DTRANSFORMSTATE\_WORLD**

**D3DTRANSFORMSTATE\_VIEW**

**D3DTRANSFORMSTATE\_PROJECTION**

• $\tilde{\mathbf{I}}$ Š•,·,éf [f<f $h$  A $f$ r $f$ ... [ A“Š%oe, $\tilde{\mathbf{I}}$ ”z— $\tilde{n}$ ,ð’è<’,·,é B $f$ f $f$ t $f$ H $f$ <f $g$ ’l, $\tilde{\mathbf{I}}$  ANULL,Ä, ,é(“ $\sim$ ^ê, $\tilde{\mathbf{I}}$ ”z— $\tilde{n}$ ) B

ŽQ Æ @**D3DOPCODE** A **D3DRENDERSTATETYPE**

,»,i¼,iE^

## D3DCOLOR

```
typedef DWORD D3DCOLOR, D3DCOLOR, *LPD3DCOLOR;
```

,±,ìŒ^,í AŠî-{"I,È Direct3D,ì FŒ^,Å, ,é B

ŽQ Æ @**D3DRGB** A **D3DRGBA**



**D3DVALUE**

typedef float D3DVALUE, \*LPD3DVALUE;

,±,̀̀E^,Í AŠî-{"I,ÈDirect3D,̀̀•ª "ff [f^E^,Â, ,é B

•Ô'l

fGf%o [,Í•%o ""l,Â•,³,ê A'g,Ý ‡,í,³,ê,é,±,Æ,Í,È,¢ BŽŸ,É A,·,×,Ä,̀Direct3Df f\fbfh,É,æ,è•Ô,³,ê,é'l,Îê——  
,ðŽ',· BEÂ X,lf f\fbfh,Î•Ô'l,É,Â,¢,Ä,Í AŠef f\fbfh,ÎL q,ðŽQ Æ,·,é,±,Æ B

**D3D\_OK**

**D3DERR\_BADMAJORVERSION**

**D3DERR\_BADMINORVERSION**

**D3DERR\_EXECUTE\_CLIPPED\_FAILED**

**D3DERR\_EXECUTE\_CREATE\_FAILED**

**D3DERR\_EXECUTE\_DESTROY\_FAILED**

**D3DERR\_EXECUTE\_FAILED**

**D3DERR\_EXECUTE\_LOCK\_FAILED**

**D3DERR\_EXECUTE\_LOCKED**

**D3DERR\_EXECUTE\_NOT\_LOCKED**

**D3DERR\_EXECUTE\_UNLOCK\_FAILED**

**D3DERR\_LIGHT\_SET\_FAILED**

**D3DERR\_MATERIAL\_CREATE\_FAILED**

**D3DERR\_MATERIAL\_DESTROY\_FAILED**

**D3DERR\_MATERIAL\_GETDATA\_FAILED**

**D3DERR\_MATERIAL\_SETDATA\_FAILED**

**D3DERR\_MATRIX\_CREATE\_FAILED**

**D3DERR\_MATRIX\_DESTROY\_FAILED**

**D3DERR\_MATRIX\_GETDATA\_FAILED**

**D3DERR\_MATRIX\_SETDATA\_FAILED**

**D3DERR\_SCENE\_BEGIN\_FAILED**

**D3DERR\_SCENE\_END\_FAILED**

**D3DERR\_SCENE\_IN\_SCENE**

**D3DERR\_SCENE\_NOT\_IN\_SCENE**

**D3DERR\_SETVIEWPORTDATA\_FAILED**

**D3DERR\_TEXTURE\_CREATE\_FAILED**

**D3DERR\_TEXTURE\_DESTROY\_FAILED**

**D3DERR\_TEXTURE\_GETSURF\_FAILED**

**D3DERR\_TEXTURE\_LOAD\_FAILED**

**D3DERR\_TEXTURE\_LOCK\_FAILED**

**D3DERR\_TEXTURE\_LOCKED**

**D3DERR\_TEXTURE\_NO\_SUPPORT**

**D3DERR\_TEXTURE\_NOT\_LOCKED**

**D3DERR\_TEXTURE\_SWAP\_FAILED**

**D3DERR\_TEXTURE\_UNLOCK\_FAILED**

### DirectX 3,ÉŠÖ,·,é V,μ,¢ îñ

«» Ý,ìMicrosoft® DirectInput™,Í AfWf‡fCfXfefBfbfN,Î,©,è,Ä,È,f}fEfX,¨,æ,ÑfL [f{ [fh“ü—ÍfftofCfX,àfTf| [fg,μ,Ä,¢,é Bf}fEfX,¨,æ,ÑfL [f{ [fh,É‘Î,·,éAPI,Í ACOM,ìIfufWfFfNfg,¨,æ,ÑfCf“f^ [ftfF [fX,ð—p,¢,é B DirectInput,Í Af}fEfX,¨,æ,ÑfL [f{ [fh Eff [f^,É‘Î,μ,Ä•W €Win32 API,æ,è,à ,‘¬,ÉfAfNfZfX,Ä,«,é B

Windows 95,É‘g,Ý ž,Û,ê,½DirectInput

1.0,É,æ,Ä,Ä AfffWf^f< EfWf‡fCfXfefBfbfN EfftofCfX,Ö,ìfAfNfZfX,“%Ä”,É,È,Ä,½ B,± ,ê,ìJoyGetPosEx,È,Ç,ì,¢,,Ä,©,ìAPI AfLffŒfuf¢ [fVf‡f“— pfAfvf¢fbfg(joy.cpl) A,¨,æ,ÑffWf^f< EfWf‡fCfXfefBfbfN EfftofCfX,ìfTf| [fg,ð%Ä”\ ,Æ,μ,½VJOYD.VXD,ðŠì—{,Æ,·,éfhf%oCfo Ef,ff<,©,Ç \ ¬,³,ê,Ä,¢,é B

fo [fWf‡f“ 1.0,ìfŠŒ [fX^È—^ ADirectX SDK,ÉŠÖ,μ,Ä Ä,à%ü—Ç,ì—v< ,“½,©,Ä,½“\_,ì,D,Æ,Ä,Í Af} fEfX,¨,æ,ÑfL [f{ [fh Eff [f^,Ö,ìfAfNfZfX,ð,±,ê,Û,Ä,ìWindows,æ,è,à,³,Ç,É ,‘¬%»,·,é,Æ,¢,±,±,Æ,Ä, ,Ä,½ B,»,ê ,“{fo [fWf‡f“,ìDirectInput,“Ü•W,Æ,μ,½,±,Æ,Ä, ,é BDiectInput 3.0,É,æ,è Af} fEfX,¨,æ,ÑfL [f{ [fh Eff [f^,É‘Î,μ,Ä,³,Ç,É ,‘¬,ÈfAfNfZfX,“%Ä”,É,È,é BDirectInput 1.0 ,Æ,Í^Û,È,è ADirectInput 3.0,ìf} fEfX,¨,æ,ÑfL [f{ [fh,É‘Î,·,éAPI,Í ACOMfIfufWfFfNfg,¨,æ,ÑfCf“f^ [ftfFfCfX,ðŽg—p,μ,Ä,¢,é B

DirectInput,ì «—,ìfo [fWf‡f“,Ä,Í AfWf‡fCfXfefBfbfN EfftofCfX,É‘Î,μ,ÄCOM,“•t%Ä,³,ê,é,± ,Æ,É,È,é BftfH [fX ftfB [fhfofbfN,ðfTf| [fg,·,éfWf‡fCfXfefBfbfN EfftofCfX,É‘Î,μ,Ä,Í A DirectInput,Ä,à,»,ìfTf| [fg,“•t%Ä,³,ê,é B”Ä—p“ü—ÍfftofCfX(“Á’è,ìDirectInputCf“f^ [ftfFfCfX,É,æ,è’¼ ÚfTf| [fg,³,ê,Ä,¢,È,¢fffofCfX),ðfTf| [fg,·,é<@”,à•t%Ä,³,ê,é B

**DirectInputŠT—v**

Windows DirectX SDK ,É,æ,è A ,“x,ÈfRf“fsf... [f^fQ [f€,ð ì ¬,·,é,±,Æ,ª,Â,«,é BDirectInput,Í A“ü—  
ÍfffofCfX Eff [f^,Ö,Ì ,‘¬,Å•Ö—~,ÈfAfNfZfX,ð%oÂ”\,Æ,·,éDirectX SDKfRf“f| [flf“fg,Â, ,é B

—{ Í,Ì–Ú“I,Í Afo [fWf‡f“3.0,ÌDirectInput  
fAfvfŠfP [fVf‡f“ Efvf fOf%of~f“fO EfCf“f^ [ftfFfCfX,“,æ,ÑCOMfCf“f^ [ftfFfCfX,É,Â,¢,Ä à–¾,·,é,±  
,Æ,Â, ,é B,±,±,Ä,Íf}fEfX,“,æ,ÑfL [f{ [fh“ü—Í,ÌfTf| [fg,É•K—v,ÈAPI,ÆCOMfCf“f^ [ftfFfCfX,É,Â,¢  
,Ä,Ì,Ý à–¾,µ ADirectInput 1.0,É,Â,¢,Ä,Í G,ê,È,¢ B

## DirectInput,É,æ,éfWf‡fCfXfefBfbfN,İfTf| lfg

DirectInput

API,Í AfAfif fO,“,æ,ÑffWf^f< EfWf‡fCfXfefBfbfN,É‘İ,µ,Ä ,‘¬,©,Â ® ‡ «,İ, ,éfAfNfZfX,ð’ñ<Ÿ,·,é B,± ,İAPI,Í A Microsoft Win32® f\ftfgfEFAŠJ”fLfbfg (SDK),İfWf‡fCfXfefBfbfNAPI,Æ,İ ® ‡ «,ð‘ŰŽ ,µ,Ä,¢ ,é,ª AfffofCfX Efhf%ofCfo Ef,ff<,İ‘İ X,É,æ,è%ž“š «,“,æ,Ñ M—Š «,%ü‘P,³,ê,Ä,¢ ,é BDirectInputffofCfX Efhf%ofCfo,Í A•W € ,“,æ,ÑOEM<Ÿ<“,İfWf‡fCfXfefBfbfN,İ Ÿ’è,âÈ‘O Ÿ’è,³,ê,½fWf‡fCfXfefBfbfN,İLfffŠfufŒ [fVf‡f“ îñ,ðfŒf WfXfgfŠ,ÉŠi”[,·,é B

—{ B,Ä,Í AfWf‡fCfXfefBfbfN,ðfTf| [fg,·,éDirectInputŠÖ ”,Æf fbfZ [fW,“,æ,Ñ \‘İ,É,Ä,¢,Ä à—¾,µ A Win32fWf‡fCfXfefBfbfNAPI,©,ç,İ‘İ X“\_,ð—¾,ç,©,É,·,é BDirectInput API,Í Af^fbf^fXfNfŠ [f“,âf^fufŒfbfg Af%ofCfgfyf“,Æ,¢,Ä,½ â‘İ À•WŒn“à,Ä^Ê‘u,ð’Ç Ő,·,é‘¼,İ•â •“ü— İfffofCfX,É,à“K—p,³,ê,é B<@”Šg’Œ ,É,æ,è Af%of\_ [ Efyf\_f< Aftf%ofCfg Ef^ [fN Afo [f`ff< EfŠfAfŠfefB EfwbfbhfMfA,È,Ç‘¼,İfffofCfX,É ‘İ,·,éfTf| [fg,à’ñ<Ÿ,³,ê,é BŠeffofCfX,İ Äâ6—{,İ%o^“®Ž² AŽ<“\_fnfbfg,“,æ,Ñ32ŒÄ,İf{f^f“,ð—p,¢,é,± ,Æ,ª,Ä,«,é B

DirectInputŠÖ ”,ð—p,¢,Ä AfWf‡fCfXfefBfbfN,“,æ,ÑfWf‡fCfXfefBfbfN Efhf%ofCfo,İ”—— İ,ðŠ^,©,µ,½fAfvfŠfP [fVf‡f“,ðffUfCf“,·,é,± ,Æ,ª,Ä,«,é B,Ű,½ AÊ‘u,“,æ,Ñf{f^f“ îñ,ðfWf‡fCfXfefBfbfN,©,çŽæ“¾,·,é,±,Æ,ª,Ä,«,é B

,±,İ B,Ä,İDirectInputRf“f| [flf“fg,ªñ<Ÿ,·,éfWf‡fCfXfefBfbfN EfTf| [fg,É,Ä,¢,Ä,İ îñ,ð^µ,□ B

fWf‡fCfXfefBfbfN,İ<@”

fWf‡fCfXfefBfbfN,İLfffŠfufŒ [fVf‡f“,·,æ,ÑfefXfg

fWf‡fCfXfefBfbfN,İÊ‘u

fWf‡fCfXfefBfbfN,İ<@”\

DirectInputfT [frfX,Í AfIfyfœ [fefBf“fO EfVfXfef€<N“@Žž,Éf [fh,<sup>3</sup>,ê,é BDirectInput,ÍfAfif fO,“,æ,ŃffWf  
^f<,İfWf‡fCfXfefBfbfN,đfTf| [fg,·,é BfAfif fO EfWf‡fCfXfefBfbfN,Í A,æ,èfŠfAf<f^fCf€,È%ž“š,đ•K—  
v,Æ,µ AfffWf^f< EfWf‡fCfXfefBfbfN,æ,è,à‘â,«,È•%×,đfVfXfef€,É—  
^,!,é BDirectInputfT [frfX,Í A^Û,È,é \ ¬,İfAfif fO EfWf‡fCfXfefBfbfN,đ•j ”“~Žž,Éf,fjf^,·,é,±  
,Æ,<sup>a</sup>,Â,«,é B,»,İ \ ¬,Í A Â‘â4-{,İ%““@Žž,đ‘Ç Ö,µ Â‘â4,Â,İf{f^f“,đ—p,¢  
,éfAfif fO EfWf‡fCfXfefBfbfN2Šî,©,ç A2-{,İ%““@Žž,đ‘Ç Ö,µ Â‘â4,Â,İf{f^f“,đ—p,¢  
,éfAfif fO EfWf‡fCfXfefBfbfN4Šî,Û,Â,İ”ÍÍ,É“n,é B,Û,½ffWf^f< EfWf‡fCfXfefBfbfN,É,Â,¢  
,Â,Í“~Žž,É Â‘â16Šîf,fjf^,Â,«,é B1Šî, ,½,è A%““@Žž,Í Â‘â6-{ Af{f^f“,Í Â‘â32ÊÂ,Û,Â,Â, ,é B  
fWf‡fCfXfefBfbfN,<sup>a</sup>Ç Ö,·,éŠe%““@Žž,É,Í i“@”ÍÍ,<sup>a</sup>, ,é B i“@”ÍÍ,Æ,Í AfWf‡fCfXfefBfbfN,İfnf“fhf<,đjfjf...  
[fgf%of<,Û,½,Í ÂŽ~ ó‘Ô,İÊ‘u,©,ç“@,©,1,é“ê”Ô—£,ê,½“\_,Û,Â,İ<—£,Â, ,é B

fWf‡fCfXfefBfbfN Efhhf%ofCfo,Í Â‘â16,İf~fjfhf%ofCfo,đfTf|  
[fg,µ AŠef~fjfhf%ofCfo,Í,Đ,Æ,Â,İfWf‡fCfXfefBfbfN,đfTf| [fg,·,é BjoyGetNumDevsŠÖ ”,đ—p,¢,é,±  
,Æ,È,æ,è AfWf‡fCfXfefBfbfN Efhhf%ofCfo,<sup>a</sup>fTf| [fg,·,éfWf‡fCfXfefBfbfN ”,đ‘2,×,é,±,Æ,<sup>a</sup>,Â,«,é B,±  
,İŠÖ ”,İfhf%ofCfo,<sup>a</sup>fTf| [fg%Â”\  
,ÈfWf‡fCfXfefBfbfN ”,đŽw‘è,·,é•, †,È,µ @ ”,đ•Ô,· BfWf‡fCfXfefBfbfN,<sup>a</sup>fTf| [fg,<sup>3</sup>,ê,Â,¢  
,È,¢ è ±,İ0,đ•Ô,· B

fAfvfŠfP [fVf‡f“,Í AjoyGetPosExŠÖ ”,đ—p,¢,é,±,Æ,É,æ,è AfRf“fsf... [f^,ÉfWf‡fCfXfefBfbfN,<sup>a</sup> Ú‘±  
,<sup>3</sup>,ê,Â,¢,é,©,Ç,©,²,×,é,±,Æ,<sup>a</sup>,Â,«,é B,±,İŠÖ ”,Í AŽw‘è,<sup>3</sup>,ê,½ffofCfX,<sup>a</sup> Ú‘±,<sup>3</sup>,ê,Â,¢  
,ê,İJOYERR\_NOERROR A,»,²,Â,È,\_,ê,İJOYERR\_UNPLUGGED,đ•Ô,· B

ŠefWf‡fCfXfefBfbfN,É,Í AfAfvfŠfP [fVf‡f“,©,ç—~—p%Â”,È<@”\,<sup>a</sup>,¢,,Â,©‘¶ Ý,·,é B,»,İ<@”\  
,Í AjoyGetDevCapsŠÖ ”,đ—p,¢,Â‘2,×,é,±,Æ,<sup>a</sup>,Â,«,é B,±,İŠÖ ”,Í AfWf‡fCfXfefBfbfN,İ—  
Lœø,È%““@Žž,â Â•Wœn,İ Â ¬‘1,“,æ,Ń Â‘â‘1 AfWf‡fCfXfefBfbfN â,İf{f^f“ ”,Æ,¢  
,Â,½fWf‡fCfXfefBfbfN,İ<@”\,đJOYCAPS \‘¢‘İ,É‘â“ü,·,é B

’ °

joyGetNumDevs,İ•Ô‘1,Í AfVfXfef€,É Ú‘±,<sup>3</sup>,ê,½fWf‡fCfXfefBfbfN ”,Â,Í,È, AfVfXfef€,<sup>a</sup>fTf|  
[fg,·,éfWf‡fCfXfefBfbfN ”,đŽ!,· B

fWf‡fCfXfefBfbfN,lfLfffŠfufŒ [fVf‡f“,“,æ,ÑfefXfg

ì“®”ÍĬ,âf{f^f“,È,Ç AfWf‡fCfXfefBfbfN,lfLfffŠfufŒ [fVf‡f“,“,æ,ÑfefXfg,ð,·,é,½,ß,É AMicrosoft Windows®  
95,lfRf“fgf [f<pf|f<,É,lfWf‡fCfXfefBfbfN EfAfvfŠfP [fVf‡f“,ª, ,é Bf† [fU,Í A,±  
,lfAfvfŠfP [fVf‡f“,©,çÈ‰°,lfWf‡fCfXfefBfbfN,ð‘Tð,Ä,«,é B

ˆê”Ê“l,ÈfWf‡fCfXfefBfbfN

OEMfWf‡fCfXfefBfbfN

fJfXf^f€ EfWf‡fCfXfefBfbfN

,±,lfAfvfŠfP [fVf‡f“,É,æ,è AŠefWf‡fCfXfefBfbfN,É‘Ĭ,µ,Ä A Ä‘â6–  
{,İ‰^“®Ž² A32,lf{f^f“,“,æ,ÑŽ<“\_fnfbfg,lfLfffŠfufŒ [fVf‡f“,‰‰Ä”\  
,Æ,È,é BfLfffŠfufŒ [fVf‡f“ î•ñ,lfŒfWfXfgfŠ,ÉŠi”[,³,è,é,Ĭ,Ä A ÄfLfffŠfufŒ [fVf‡f“,·,é,±,Æ,È,-  
fWf‡fCfXfefBfbfN,ð•Ê,Ĭ,à,Ĭ,ÉŽæ,è‘Ö,Ĭ,é,±  
,Æ,ª,Ä,«,é Bf† [fU,ª V,½,ÈfWf‡fCfXfefBfbfN,ðfLfffŠfufŒ [fVf‡f“,µ,½,èfŠfXfg,©,ç‘Tð,µ,½,è,·,é,Æ AfLff  
fŠfufŒ [fVf‡f“—pfAfvfŠfP [fVf‡f“,Í‘Tð,³,è,½fWf‡fCfXfefBfbfN,“,æ,ÑfLfffŠfufŒ [fVf‡f“ î•ñ,É,Ä,¢  
,ÄfŒfWfXfgfŠ,ð X V,µ A,»,è,ðfWf‡fCfXfefBfbfN Efhf‰ofCfo,Ê’Ê’m,·,é B

,³,ç,É,±,lfAfvfŠfP [fVf‡f“,Í AjoyConfigChangedŠÖ ”,ð—p,¢,é,±  
,Æ,É,æ,è A“Á’è,lfWf‡fCfXfefBfbfN,É‘Ĭ,µ A‰œ‘Ĭ,Ĭ, ,éŒfWfXfgfŠ•Ĭ X î•ñ,ð’Ê’m,·,é,±,Æ,ª,Ä,«,é B



*fWf‡fCfXfefBfbfN,İÊ’u*

*joyGetPosExŠÖ ”,ð—p,¢,é,±,Æ,É,æ,è AÊ’u,“,æ,Ñf{f^f“ îñ,ðfWf‡fCfXfefBfbfN,©,çŽæ“¾,·,é,±,Æ,ª,Â,«,é B,±,İŠÖ ”,Í AÊ’u,İx Ay Az À•W,ðŠÜ,ß,ÄWin32 API,İĲfWf‡fCfXfefBfbfNŠÖ ”,©,ç•Ö,³,è,éÊ’u îñ,ðŽæ“¾,·,é,±,Æ,ª,Â,«,é B Àª4,Â,İf{f^f“,ÉÍ,·,é óÔ îñ,ðŽæ“¾,·,é,±,Æ,à%Â”,Â, ,é B,Ü,½*joyGetPosExŠÖ ”,É,æ,è AÊ%°,İ îñ,ÖfAfNfZfX,Â,«,é B**

*4 A5 A6”Ô–Ú,İŽ² ir Au,“,æ,Ñv j,İ óÔ*

*f%of\_ [ îñ*

*Ž<“\_fnfbfg*

*Âª32ĲÂ,İf{f^f“,İ óÔ îñ*

*fLfffŠfufĲ [fVf‡f“,³,è,Ä,¢,È,Ĳ(“¾,ç,è,½,Ü,Ü,İ)fWf‡fCfXfefBfbfN,İff [f^*

*’è<,³,è,Ä,¢,é¹,Ì”ÍÍ,Â•]‰,³,è,½ff [f^*

*’† S,É, ,é•]‰ff [f^*

*fWf‡fCfXfefBfbfN,İfjf... [fgf‰f<Ê’uŽüÍ,İfffbfhf] [f“,ðŠÜ,B,½•]‰ff [f^*

**DirectInput,É,æ,é****L** [f{ [fh,¨,æ,Ñf}fEfX,ÌfTf| [fg

,±,Ì ß,Ä,ÍDirectInputfRf“f| [flf“fg,ªñ<Ÿ,·,éL [f{ [fh,¨,æ,Ñf}fEfX,ÌfTf| [fg,É,Â,¢,Ä à¾,·,é B

DirectInput flfufWfFfNfg

DirectInputDevice flfufWfFfNfg

f}fEfX\_EfffofCfX,©,ç,Ìff [f^Žæ“¾

fL [f{ [fh\_EfffofCfX,©,ç,Ìff [f^Žæ“¾

fL [f{ [fh\_EfXfLfff“fR [fh

“ú–{ŒêfL [f{ [fh

**DirectInput** *fIfufWfFfNfg*

**DirectInput***fIfufWfFfNfg*,**ÍDirectInput***fTfufVfXfef€*,*ð\*,*· BfAfvfŠfP [fVf‡f“*,**ÍDirectInputCreate**  
API,*ð*€*Ä*,*Œ* *o*,*μ*,*ÄDirectInputfIfufWfFfNfg*,*ð* *ì* *¬*,*·*,*é* **B DirectInputCreate**  
API,*Í* **AIDirectInput***fCf“f^ [ftfFfCfX*,*ð*•*Ô*,*·* **B**

**IDirectInput***fCf“f^ [ftfFfCfX*,*Ö*,*ìf|fCf“f^*,*““¾*,*ç*,*ê*,*é*,*Æ* **ADirectInput**,*““®* *ì%oÂ”\*,*È*“*ü—ÍffofCfX*,*ð—ñ*“*·*,*é*,*±*  
*,Æ*,*ª*,*Â*,*«*,*é* **B**“*ü—ÍffofCfX*,**ÍIDirectInput::EnumDevices***f f\bfh*,*É*,*æ*,*è—ñ*“*³*,*ê*,*é* **B**

## DirectInputDevice fIfufWfFfNfg

**DirectInputDevice**fIfufWfFfNfg,Í Af}fEfX,âfL {f{ [fh,»,l'¼,l"ü—ÍffofCfX,ð•\ ,· BfAfvfŠfP [fVf‡f“,Í**IDirectInput::CreateDevice**f f\bfh,ðĖĂ,Ń o,μ,Ă**DirectInputDevice**fIfufWfFfNfg,ð ì ¬, ·,é B **IDirectInput::CreateDevice**f f\bfh,Í A**IDirectInputDevice**fCf“f^ [ftfFfCfX,ð•Ô,· B

IDirectInput::CreateDevice,l'æ^ê,lfpf%of [f^,ÍfCf“fXf^f“fXGUID,Ă A,± ,ê,ÍfCf“f^ [ftfFfCfX,ª ì ¬,³,ê,éffofCfX,ÌfCf“fXf^f“fX,ðŽ•Ê,·,é BDirectInput,É,Í, ,ç,©,¶,ß'è`,³,ê,Ă,¢ ,é,Ó,½,Ă,ÌfCf“fXf^f“fXGUID,ª ,é BGUID\_SysMouse,·,æ,ŃGUID\_SysKeyboard,Ă, ,è A,»,ê,¼,êf† [fU,lŽâf} fEfX AŽâfL {f{ [fh,ð•\,· B

f}fEfX EfffofCfX,©,ç,İff [f^Žæ“¼

f}fEfX EfffofCfX,©,ç,İff [f^,ðŽæ“¼,.,é,É,İ Ac\_dfdIMouseff [f^ EftfH {f}  
fbfg,ÄIDirectInputDevice::SetDataFormat,ðĖÄ,Ñ o,. Bf}  
fEfX EfffofCfX,©,ç,Ö,³,é,éff [f^,İ AfXfNfŠ [f“ Ä•W,Ä,İ,È,f}fEfX,“Ü“@,µ,½f†fjfbfg ”,ðŠİ,É,µ,Ä,ç,é B,±  
,é,ç,İf}fEfX Eft†fjfbfg,İf}fEfX Efn [fhEfFfA(f~fbfL [,Æ,àĖÄ,İ,é,é),©,ç,Ö,³,é,éŽÄ Ü,İ,İ,ðŠİ,É,µ,Ä,ç  
,é BDirectInput,İ,»,İff [f^,ð C ³ A%Ä H,.,é,±,Æ,İ,È,ç Bf}fEfX Eff [f^,ð,»,İ,Ü,Ü•Ö,.,¼,\_,Ä, ,é B

f}fEfX,©,ç,Ö,³,é,éff [f^,İ•Šİff [f^ A âİff [f^,İ,ç,.,é,Ä,à,æ,ç Bf}  
fEfX,İ•Šİff,İ,ÈfffofCfX,È,İ,Ä AfftfHf<fg,Ä,İ•Šİff [f^,•Ö,³,é,é Bf}  
fEfX EfffofCfX,İŽ²f, [fh,İ A•Ö,³,é,éff [f^,“Šİ,Ä, ,é,© âİ,Ä, ,é,©,ðŽwè,.,é B,±  
,é,İIDirectInputDevice::SetProperty f\fbfh,ð%î,µ,Ä•İ X%Ä”,ÈfffofCfX Efvf fpfefB,Ä, ,é BŽ²f, [fh,ð âİ,É  
fZfbfg,.,é,É,İ AREFGUIDpf%of [f^,ðDIPROP\_AXISMODE,É,µ,ÄIDirectInputDevice::SetProperty,ðĖÄ,Ñ o,.  
B,»,µ,Ä A DIPROPDWORD \‘çİ,İdwDataftB [f<fh,ðDIPROPAXISMODE\_ABS,ÉfZfbfg,.,é B

f}fEfX EfffofCfX,Éİ,.,éŽ²f, [fh,“Šİ,ÉfZfbfg,³,é,Ä,ç,é,Æ,« AŽ² Ä•W,İ“Ä,İŽ²,É,»,Ä,ÄfffofCfX,“Ü“@,µ,½f}  
fEfX†fjfbfg ”,ð•, B•%o,İ,İ,İ Af}fEfX,“xŽ²,É,»,Ä,Ä ¶ü,Ö AyŽ²,É,»,Ä,Ä ãü,Ö A, ,é,ç  
,İzŽ²,É,»,Ä,ÄĖâü,ÖÜ“@,µ,½,±,Æ,ðŽİ, B ³,İ,İ Af}fEfX,“xŽ²,É,»,Ä,Ä%Ėü,Ö AyŽ²,É,»,Ä,Ä%°ü,Ö A, ,é,ç  
,İzŽ²,É,»,Ä,ÄÖ•ü,ÖÜ“@,µ,½,±,Æ,ðŽİ, B

’ Ŏ,.,ç,«È,İ,İ Af}fEfX,Éİ âİÊ’u,Æ,ç,µ l,.,ü,“¶ Ý,µ,È,ç,Æ,ç,µ“,Ä, ,é B,»,İĖ%Ê A âİ Ä•W,  
İDirectInput,©,ç“¼,ç,é,½,.,ç,Ä,İ•Šİff“@,ð’P,É ‡Ėv,µ,½,à,İ,Æ,È,é B,±,é,İ âİ Ä•W,İ ”l,É,İÖİ,.,é,ç,±  
,Æ,ðŽİ,µ,Ä,.,è Af}fEfX Ef\|Cf“f^,İfXfNfŠ [f“ Ä•W,Æ,İ•ŠÖĖW,Ä, ,é BfAfvfŠfP [fVf†f“,İ A âİ Ä•W,ð-  
çm,İĖ“\_,Éİ,.,é,Šİ Ä•W,Ä, ,é,Æ,µ,Äµ,µ B  
,½,Æ,İ AfAfvfŠfP [fVf†f“,İfffofCfX,İ”FŽ“¼ĖÄ,É,»,İ,Æ,ç,İ âİÊ’u,ðL~µ A,»,é,ð u%¼‘zĖ  
“\_ v,Æ,µ,Ä•ÜŽ ,.,é,±,Æ,Ä,«é B,»,µ,ÄÈ ~,İ,»,±,©,çf}fEfX,“Ü“@,µ,½,Šİ—f  
,ðĖvŽZ,.,é,½,ß,É AIDirectInputDevice::GetDeviceState, ,é,ç  
,İDirectInputDevice::GetDeviceData,ð%î,µ,ÄfffofCfX,©,çŽæ“¼,³,é,é âİ Ä•W,©,ç%¼‘zĖ“\_,Æ,İ .,ð,Æ,é,(±  
,é,ðŽY,İIDirectInputDevice::Unacquire,Ü,Ä±,.,é) B f ^,È•ŠİfffofCfX(f)fEfX,È,Ç)  
,É,.,,é âİ Ä•W,İ AÈÖ,ÉL~³,é,½Ê’u,Æ,İ”äŠr,ð s,µ,Æ,«É,¼,~Öİ,.,é B

f}fEfX,İĖ“ Ý,İ óÖ,ðŽæ“¼,.,é,½,ß,É,İ Af|  
fCf“f^,ðDIMOUSESTATE \‘çİ,ÖfZfbfg,µ,ÄIDirectInputDevice::GetDeviceState,ðĖÄ,Ñ o,. Bf}fEfX,İ óÖ,É,İf}  
fEfX,İÊ’u,äŠef{f^f“,İ óÖ,Æ,ç,Ä,½ îñ,.,é B

f}fEfX,©,çfobftf@ Eff [f^,ðŽæ“¼,.,é,É,İ ADIDEVICEOBJECTDATA \‘çİ,İ”z—ñ,ð ì ¬,µ Af\|Cf“f^,.,æ,Ñ”z  
—ñ,İfTfCfY,ðŠÜ,ðİ ”,ðIDirectInputDevice::GetDeviceData,Ö“n,³,È,\_,é,İ,È,ç,È,ç B“ü—İÖ,ç s—ñ,Éff [f^,.,È,-  
,È,é,©, ,é,ç,İ”z—ñ,.,,Ü,Ä,Ä,µ,Ü,µ,Ü,Ä ADirectInput,İ Ä,àĖÄ,çf}fEfX Eff [f^,©,ç”z—ñ,È,Ä,ç, B  
IDirectInputDevice::GetDeviceData,©,ç,Ö,³,é,éffTfCfYİ ”,İŽÄ Ü,ÉŽg—p,³,é,Ä,ç,é”z—ñ—vf ”,Ä, ,é Bf}  
fEfX,©,çfobftf@ Eff [f^,ðŽæ“¼,.,é Ü A’Pê,İDIDEVICEOBJECTDATA \‘çİ,É—^,ç,é,éff [f^,İf}  
fEfX ä,İ’PêİfufWfFfNfg,İ óÖ,ÉŠÖ,.,éİ X\_,Ä, ,é B,½,Æ,İ,İ A“TĖ^“İ,Èf}  
fEfX,É,İÄ,İfİfufWfFfNfg A,.,É,İ,ç“ü—İf [fX,“¶ Ý,.,é BxŽ² AyŽ² Af{f^f“0 Af{f^f“1,Ä, ,é Bf† [fU,“f{f  
^f“0,ð%Y,µf}fEfX,ðŽİ,ß•üĖü,ÉÜ“@,.,é,Æ A  
IDirectInputDevice::GetDeviceData,É“n,³,é,ÉDIDEVICEOBJECTDATA \‘çİ,İ”z—ñ,É,İ,Ä,İ—vf,“ä“ü,³,é,Ä,ç  
,é Bf{f^f“0,“%Y,³,é,½,±,Æ,ðŽİ,—vf AxŽ²•üĖü,İ•İ%o”, Ä,½,±,Æ,ðŽİ,—vf A,.,æ,ÑyŽ²•üĖü,İ•İ%o”, Ä,½,±  
,Æ,ðŽİ,—vf,Ä, ,é B

IDirectInputDevice::GetDeviceData,İĖÄ,Ñ o,µ,İĖÄ AfAfvfŠfP [fVf†f“,İ A, ,ç,©,¶,ß’è³,é,Ä,ç  
,éè ”,ÆDIDEVICEOBJECTDATA \‘çİ,İdwOfsftB [f<fh,Æ,ð”äŠr,.,é,±,Æ,É,æ,è“z—ñ†,İ—  
vf,ç,İfİfufWfFfNfg,ðŽQ Ä,µ,Ä,ç,é,©,ð’m,é,±,Æ,Ä,«é B”äŠr,É—p,ç,éè ”,İ ADIMOFBS\_BUTTON0 A  
DIMOFBS\_BUTTON1 ADIMOFBS\_BUTTON2 A  
DIMOFBS\_BUTTON3 ADIMOFBS\_X ADIMOFBS\_Y A,.,æ,ÑDIMOFBS\_Z,Ä, ,é B,±,é,ç,İè ”,İ A  
DIMOUSESTATE \‘çİ,Ä,İ,İfİfZfbfg,ðŽQ Ä,.,é B,±,é,ç,İè ”,ð—p,ç  
,Ä ADIDEVICEOBJECTDATA \‘çİ,İff [f^,“f}fEfX ä,İ,Ç,İfİfufWfFfNfg,ðŽQ Ä,µ,Ä,ç,é,©,ð ³Sm,É’m,é,±  
,Æ,Ä,Ä,«é B,»,İfİfufWfFfNfg,Éİ,.,éŽÄff [f^,İ \‘çİ,İdwDataftB [f<fh,É¶ Ý,.,é Bf{f^f“ EfİfufWfFfNfg,É,  
Ä,ç,Ä,İdwData,İ%°ÊfofCfG,¼,\_,—LÖ,Ä, ,é B,±,İfofCfG,İ äÊfufbfg,İ A,»,İf{f^f“,“%Y,³,é,é,ÆfZfbfg,³,é A—f  
,³,é,é,ÆfNfŠfA,³,é,é B

ScrawlTf“fvf< EfAfvfŠfP [fVf†f“,İ Afobftf@ Eff [f^,ðŽü W,µIDirectInputDevice::GetDeviceData,©,çŽæ“¼,  
µ,½ îñ,ð ^— ,.,éü—@,İ,ð,Æ,Ä,ðŽİ,µ,½,à,İ,Ä, ,éİ

ff [f^,İIDirectInputDevice::GetDeviceData,©,çŽæ“¼,³,é,Ä,ç,é è ‡,İ,Ý AŽŽ •t,«,İf}fEfX Eff [f^,“~—p%Ä”\  
,Æ,È,é B

fAfvfŠfP [fVf†f“,İ AfffofCfX,ð”FŽ“,µ,Äff [f^,ðŽæ“¼,.,éÖ,É Af}  
fEfX EfffofCfX,İ,²fĖfxf<,ðfZfbfg,µ,È,\_,é,İ,È,ç,È,ç,İ,½,ß,É,İ A•K—

v,È'²fƎfxf<,ðŽ',·ftf%oF,ðfZfbfg,μ,ÄIDirectInputDevice::SetCooperativeLevel,ðƎÄ,Ñ o,· BWindows  
95\$Ä<«%o°,Ä,Í Af}fEfX EfffofCfX,É'Í,μ,Ä`Ê%o°,Í'²fƎfxf<,ªfTf| [fg,³,ê,Ä,¢,é BDISCL\_BACKGROUND |  
DISCL\_NONEXCLUSIVE ADISCL\_FOREGROUND | DISCL\_NONEXCLUSIVE A,¨,æ,ÑDISCL\_FOREGROUND |  
DISCL\_EXCLUSIVE,Ä, ,é BDirectInput 3.0,Ä,ÍDISCL\_BACKGROUND | DISCL\_EXCLUSIVE'²fƎfxf<,Íf}  
fEfX EfffofCfX,É'Í,μ,ÄfTf| [fg,³,ê,Ä,¢,É,¢ B\$e'²fƎfxf<,ÌÖ—j,ÉŠÖ,·,é Ú ×,È îñ,ê,Ä,¢,Ä,Í A,±  
,ê,ç,ì'²Ǝ^è ”,È,Ä,¢,Ä,ÌL q,ðŽQ Æ,·,é,±,Æ B

DirectX,Ì «—fo [fWf±f“,Ä,Í AWindows NT ã,ÄDirectInput,ªfTf| [fg,³,ê,é,æ,µ,É,È,é B,¾,ª AWindows NT,Ä,Íf}  
fEfX EfffofCfX,É'Í,μ,ÄDISCL\_FOREGROUND | DISCL\_EXCLUSIVE,μ,©fTf| [fg,³,ê,È,¢ Bf}  
fEfX Efhhf%oCfo,ÌfTf| [fgfƎfxf<,É,æ,Ä,Ä,Í AWindows 95 ã,ÌDirectInput,Ä,àDISCL\_FOREGROUND |  
DISCL\_EXCLUSIVE,¾,—,ÌfTf| [fg,ÉƎÄ'è,³,ê,é%oÄ”\ «,ª, ,é B,μ,½,ª,Ä A , ,é,¾,—,·,×,Ä,Ìfvf%obfgfth [f€  
,¨,æ,Ñf}fEfX Efhhf%oCfo ã,ÄAfvfŠfP [fVf±f“,ðŽÄ s,·,é·K—v,ª, ,é è ±,É,Í,±,ì'²fƎfxf<,ð—p,¢,é,×,«Ä, ,è A  
,Ü,½Windows NT'í%ož,ÌINPUT.DLLfvfƎfŠfŠ [fX Efo [fWf±f“(DirectX 3.0 SDK,ÌExtrasffBfƎfNfgfŠ,É, ,é),ð—  
p,¢,½fefXfg,ªK—v,Ä, ,é BWindows NTfo [fWf±f“,ÌDirectInput(¨,æ,Ñf}fEfX Efhhf%oCfo,ªfTf| [fg,³,ê,Ä,¢  
,È,¢Windows 95fo [fWf±f“,ÌDirectInput),ÍWindows  
95fo [fWf±f“,æ,è,à·p”É,ÉDIERR\_INPUTLOST,ð'È'm,·,é,ì,Ä A,±,ê,ç,ÌfP [fX,ð ~u,·,é,æ,µ  
,ÉfAfvfŠfP [fVf±f“,ð ‘,©,È,—,ê,Í,È,ç,È,¢ B

IDirectInputDevice::GetDeviceData,Ü,½,ÍIDirectInputDevice::GetDeviceState,É,æ,èf}  
fEfX EfffofCfX,©,çff [f^,ðŽæ“¾,·,é‘O,É AIDirectInputDevice::Acquire,ðƎÄ,Ñ o,μ,ÄfffofCfX,ð”FŽ—,μ,Ä,¨,©,È  
,·,è,Í,È,ç,È,¢ BfAfvfŠfP [fVf±f“,ª”f,³,ê,½,è“ü—  
ÍftfH [fJfX,ðŽ,Ä,½,è,—,é,Æ,«„É,Í AIDirectInputDevice::Unacquire,ðƎÄ,Ñ o,μ,ÄAfvfŠfP [fVf±f“,©,çf}  
fEfX EfffofCfX,ð%oð•ú,·,é,±,Æ,ª „ §,³,ê,é BfAfvfŠfP [fVf±f“ Ef fjf... [, ,é,¢,ÍfvfXfef€ Ef fjf...  
[,ª‘I’ð,³,ê,é,© A,Ü,½,ÌfEfBf“fhfE,ªfŠfTfCfY, ,é,¢  
,ÍÚ“@,³,ê,é è ±,à AfffofCfX,ð%oð•ú,μ,È,—,ê,Í,È,ç,È,¢ BfAfvfŠfP [fVf±f“,ì”f,ª%ð æ,³,ê,½,èfAfvfŠfP [fVf±  
f“,ª“ü—  
ÍftfH [fJfX,ð Ä“xŠl“¾,μ,½,è,—,é,Æ,«„É,Í AfAfvfŠfP [fVf±f“,ÍDirectInputDevice::Acquire,ðƎÄ,Ñ o,μ,Äf}  
fEfX EfffofCfX,ð”FŽ—,μ’¼,·K—v,ª, ,é B

fAfvfŠfP [fVf±f“,ªDISCL\_FOREGROUNDf, [fh,Äf}fEfX,ðŽg—p,μ,Ä,¢  
,é è ± AIDirectInputDevice::GetDeviceData,Ü,½,Í  
IDirectInputDevice::GetDeviceState,©,ç,ÌDIERR\_INPUTLOST·Ö'l,ðf`FFfbfN,·,é,±  
,Æ,ª „ §,³,ê,é BfAfvfŠfP [fVf±f“,ªftfH [fJfX,ðŽ,µ Ü ADirectInput,ÍŽ“@“l,Éf}  
fEfX,ð%oð•ú,·,é,½,ß ADIERR\_INPUTLOST·Ö'l,ðŽó,—Žæ,Ä,½ è ±fAfvfŠfP [fVf±f“,Íf}  
fEfX EfffofCfX,Ì”FŽ—,ð Ä“x s,µ,×,«Ä, ,é B,μ,©,μ A,Ç,Ì,æ,µ,Èf^fCfv,ÌfGf%o [,ª” ¶,μ,½ Ü,Ä,à—  
³ ðƎ ,ÉDirectInputfffofCfX,ð”FŽ—,μ’¼,³,¹,é,æ,µ,ÈfAfvfŠfP [fVf±f“,ð ‘,¢  
,Ä,Í,È,ç,È,¢ B”FŽ—,Ä,«„È,¢fffofCfX,ð”FŽ—,μ,æ,µ,Æ,μ,Ä—³ƎÄf< [fv,ÉŠ×,é%oÄ”\ «,ª, ,é,©,ç,Ä, ,é B

fAfvfŠfP [fVf±f“,ªDISCL\_NONEXCLUSIVEf, [fh,Äf}fEfX,ÉfAfNfZfX,μ,Ä,¢,é è ± Af}  
fEfX Eff [f^,ÍDirectInput(Eo—R,ÆWindowsf}fEfX Ef fbZ [fWƎo—R,Ì—  
¼•û,©,çŽæ“¾,³,ê,é BfAfvfŠfP [fVf±f“,ªDISCL\_EXCLUSIVEf, [fh,Äf}fEfX,ÉfAfNfZfX,μ,Ä,¢,é è ± Af}  
fEfX Eff [f^,ÍDirectInput,ð%oì,μ,Ä,Ì,YŽæ“¾%oÄ”\,Æ,È,é BWindowsf}fEfX Ef fbZ [fW,É,ÍŽg—  
p,Ä,«„éff [f^,ªŠÜ,Ü,è,È,¢ B

ScrawlTf“fvf<fAfvfŠfP [fVf±f“,Í Af}fEfX EfffofCfX,ð”FŽ—,¨,æ,Ñ%oð•ú,·,é“K Ø,È•û—@,Ì—á,Ä, ,é B

fL [f{ [fh EfffofCfX,©,ç,İff [f^Žæ“¾

fL [f{ [fh EfffofCfX,©,çff [f^,ðŽæ“¾,.,é,É,Í A\_ **IDirectInputDevice::SetDataFormat**,ðc\_dfdIKeyboardff [f^ EftfH [f{ fbf,ÁEÄ,Ñ o,³,È,\_,é,İ,È,ç,È,ç BDirectInput,Í AfCf“f^ [fifVf‡fif< EfL [f{ [fh ä,É“¶ Ý,.,é“Ç%ÁfL [,İ,©,è, Ä,È,Šg“EfL [f{ [fh ä,İSefL [,É“İ,µ,Ä,à“è “,ð“è<µ,Ä,ç,é B,Ü,Æ,ñ,Ç,İ ê ‡ A,± ,é,ç,İ“è “,İŽÄ Ü,É,İPCŠg“EfXfLfff“fR [fh,Ä,.,é B,±,è,ç,İfL [“è “,İDIK\_,ÄŽn,Ü,è Adinput.h,Ä“è<³,è,Ä,ç ,é BNECfL [f{ [fh,İPCŠg“EfL [f{ [fh,Æ,İ“Ü,È,éfXfLfff“fR [fh,ðfTf] [fg,µ,Ä,ç ,é,İ,Ä ADirectInput,İNECfL [fXfLfff“fR [fh,ð%Ä““,È,©,\_,èPCŠg“EfXfLfff“fR [fh,É•İŠ,.,µ,Ä,ç ,é B,æ,è Ü ×,È îñ,È,Ä,ç,Ä,Í AfL [ff [fh EfXfLfff“fR [fh,ðŽQ Ä,İ,±,Æ B

fL [f{ [fh,İE» Ý,İ ó“Ö,ðŽæ“¾,.,é,½,ß,É,Í A256fofCf,İ \“ç“İ,ð éE¾,µ A,»,İf| fCf“f^,ð**IDirectInputDevice::GetDeviceState** f f\fbfh,Ö“n,³,È,\_,é,İ,È,ç,È,ç B **IDirectInputDevice::GetDeviceState** f f\fbfh,İWindows,İGetKeyboardStateŠÖ “,Æ“—İ,İ<@“\ ,ð%Ö,½,· BfffofCfX,İ ó“Ö,İ,±,İ256fofCf,İ”z— ñ,ÉŠİ”[,³,è ASefofCf,İ,Đ,Æ,Ä,İfL [,İ ó“Ö,É“İ%ž,.,é B,½,Æ,İ,İ ADIK\_ENTER“Ö— Ü,İfofCf,İ ä“Èftrfbf,³fZfbf,³,è,Ä,ç,é ê ‡ AEnterfL [,“%Ÿ,³,è,Ä,ç ,é B,µ,©,µGetKeyboardState,Æ,İ“Ü,È,è ADirectInput,İfofCf,İ ä“Èftrfbf,µ,©Žg— p,µ,È,ç B ä“Èftrfbf,³fZfbf,³,è,Ä,ç,é ê ‡ A,»,İfL [,“%Ÿ,³,è,Ä,ç,é,±,Æ,ðŽİ,· B,»,µ ,Ä,È,\_,é,İ AfL [,İ%Ÿ,³,è,Ä,ç,È,ç B

fL [f{ [fh,©,çfofbftf@ Eff [f^,ðŽæ“¾,.,é,É,Í **ADIDeviceObjectData** \“ç“İ,İ”z—ñ,ð ì -,µ Af| fCf“f^,.,æ,Ñ,±,İ”z—ñ,İfTfCfY,ðŠÜ,b•İ “,ð**IDirectInputDevice::GetDeviceData**,É“n,³,È,\_,é,İ,È,ç,È,ç B“ü—İ“Ö,ç s— ñ,Éff [f^,³,è,È,è,©,.,é,ç,İ”z—ñ,.,Ü,Ä,Ä,µ,Ü,µ,Ü,Ä ADirectInput,Í Ä,àEÄ,çfL [f{ [fh Eff [f^,©,ç”z— ñ,É“ü,è,Ä,ç, B **IDirectInputDevice::GetDeviceData**,©,ç“Ö,³,è,éfTfCfY•İ “,İŽÄ Ü,ÉŽg—p,³,è,Ä,ç,é”z—ñ— v“f “,Ä,.,é BfL [f{ [fh,©,çfofbftf@ Eff [f^,ðŽæ“¾,.,é Ü A“P“è,İ**IDIDeviceObjectData** \“ç“İ,É— ^,İ,ç,é,éf [f^,İfL [f{ [fh ä,İ“P“èfIfufWfFfNfg,İ ó“Ö,ÉŠÖ,.,é•İ X“\_,Ä,.,é BfL [f{ [fh ä,İSefL [,Ü,½,İf{f^f ^,İfIfufWfFfNfg,ð\,· Bft [fU,“ÖA”fL [,ð%Ÿ,µ,Ä—£,µ A“±,ç,ÄÖR”fL [,ð%Ÿ,·,Æ A **IDirectInputDevice::GetDeviceData**,Ö“n,³,è,½**IDIDeviceObjectData** \“ç“İ,İ”z—ñ,É,İ3,Ä,İ— v“f,“ä“ü,³,è,è B“A”fL [,“%Ÿ,³,è,½,±,Æ,ðŽİ,·—v“f A“ÖA”fL [,“—£,³,è,½,±,Æ,ðŽİ,·—v“f A,.,æ,Ñ ÖR”fL [,“%Ÿ,³,è,½,±,Æ,ðŽİ,·—v“f,Ä,.,é B **IDirectInputDevice::GetDeviceData**,İEÄ,Ñ o,µ,İEä AfAfvfŠfP [fVf‡f“,Í A,.,ç,©,¶,ß“è<³,è,Ä,ç ,éDIK\_\*“è “,Æ**IDIDeviceObjectData** \“ç“İ,İdwOfstfB [f<fh,ð“äŠr,µ,Ä A”z—ñ“†,İ— v“f,³,ç,İfIfufWfFfNfg(Ü,½,İfL [),ðŽQ Ä,µ,Ä,ç,é,©,ð“m,é,±,Æ,³,Ä,ç,é B,Ü,½**DIK\_\***“è “,ð—p,ç ,Ä **ADIDeviceObjectData** \“ç“İ,İff [f^,³fL [f{ [fh ä,İ,ç,İfIfufWfFfNfg,ðŽQ Ä,µ,Ä,ç,é,©,ð ³Šm,É“m,é,± ,Æ,³,Ä,ç,é BfIfufWfFfNfg,İŽÄff [f^,İ \“ç“İ,İdwDataftfB [f<fh,É“¶ Ý,.,é BfL [f{ [fh ä,İfL [,İ,æ,µ ,Éf{f^f“fIfufWfFfNfg,É,Ä,ç,Ä,İdwData,İ%““EfofCf,¾,\_,“—L“Ó,Ä,.,é B,± ,İfofCf,İ ä“Èftrfbf,İ AfL [,“%Ÿ,³,è,è,ÆfZfbf,³,è AfL [,“—£,³,è,è,ÆfNfŠfA,³,è,é B

ff [f^,³**IDirectInputDevice::GetDeviceData**,.,æ,èŽæ“¾,³,è,Ä,ç,é ê ‡,İ,Ý AŽž •t,«,İfL [f{ [fh Eff [f^,³—p%öÄ““,Æ,È,é B

fAfvfŠfP [fVf‡f“,Í AftfofCfX,ð“FŽ“,µ,Äff [f^,ðŽæ“¾,.,é“O,É AfL [f{ [fh EfffofCfX,İç“²fCefxf<,ðfZfbf,µ ,È,\_,é,İ,È,ç,È,ç,İ,»,İ,½,ß,É,Í A•K— v,Éç“²fCefxf<,ðŽİ,·ftf%o“O,ðfZfbf,µ,Ä**IDirectInputDevice::SetCooperativeLevel**,ðEÄ,Ñ o,· BWindows 95ŠÄ<“%“,Ä,Í AfL [f{ [fh EfffofCfX,É“İ,µ,Ä“È%“,İç“²fCefxf<,³fTf] [fg,³,è,Ä,ç,é B **DISCL\_BACKGROUND | DISCL\_NONEXCLUSIVE ADISCL\_FOREGROUND | DISCL\_NONEXCLUSIVE**,Ä,.,é BDirectInput 3.0,Ä,İ**DISCL\_BACKGROUND | DISCL\_EXCLUSIVE ADISCL\_FOREGROUND | DISCL\_EXCLUSIVE**ç“²fCefxf<,İfL [f{ [fh EfffofCfX,É“İ,µ,ÄfTf] [fg,³,è,Ä,ç,È,ç B,± ,é,İ AfL [f{ [fh Eff [f^,³,Ä,È,ÉDirectInput,ÆWindowsf fbfZ [fW,Æ,ð“È,µ,ÄŽó M,³,è,é,±,Æ,ð“Ó— j,·,é BŠeç“²fCefxf<,İ“Ó—j,ÉŠÖ,.,é Ü ×,È îñ,È,Ä,ç,Ä,Í A,±,è,ç,İç“²E“è “,É,Ä,ç,Ä,İ<L q,ðŽQ Ä,.,é,±,Æ B DirectX,İ «—~fo [fWf‡f“,Ä,Í AWindows NT ä,ÄDirectInput,³fTf] [fg,³,è,é,æ,µ,É,È,é B,¾,³, AWindows NT,Ä,İfL [f{ [fh EfffofCfX,É“İ,µ,Ä**DISCL\_FOREGROUND | DISCL\_NONEXCLUSIVE**,µ,©fTf] [fg,³,è,È,ç BfAfvfŠfP [fVf‡f“,ðWindows NT,ÄŽÄ s,.,éK—v,³,é ê ‡ AfL [f{ [fh,Ö,İfAfNfZfX,É,İ,± ,İç“²fCefxf<,ðŽİ,µ,±,Æ,È,È,é BfL [f{ [fhfh%oCfo,İfTf] [fgfCefxf<,É,æ,Ä,Ä,Í AWindows 95 ä,İDirectInput,Ä,Ä**DISCL\_FOREGROUND | DISCL\_NONEXCLUSIVE**,¾,\_,İfTf] [fg,ÉEÄ“è,³,è,è%öÄ““ «,³,.,é B,µ,½,³,Ä,Ä A,.,é¾,\_,·,×,Ä,İfvf%o“fbfgftfH [fç ,.,æ,ÑfL [f{ [fhfh%oCfo ä,ÄfAfvfŠfP [fVf‡f“,ðŽÄ s,.,éK—v,³,é ê ‡ A,±,İç“²fCefxf<,ð—p,ç,é,×,«,Ä,.,é B

**IDirectInputDevice::GetDeviceData**,Ü,½,İ**IDirectInputDevice::GetDeviceState**,.,æ,éfL [f{ [fh EfffofCfX,©,çff [f^,ðŽæ“¾,.,é“O,É A**IDirectInputDevice::Acquire**,ðEÄ,Ñ o,µ,ÄfffofCfX,ð“F Ž“,µ,Ä,.,ç,È,\_,é,İ,È,ç,È,ç BfAfvfŠfP [fVf‡f“,“†f,³,è,½,è“ü—

ÍftfH [fJfX,ðŽ,,Á,½,è,·,é,Æ,«,É,Í AIDirectInputDevice::Unacquire,ðŒÄ,Ñ o,µ,ÄfAfvfŠfP [fVf‡f“,©,çfL [f{ [fh EfffofCfX,ð%ð•ú,·,é,±,Æ,<sup>a</sup> „ §,<sup>3</sup>,ê,é BfAfvfŠfP [fVf‡f“ Ef fjf... [, ,é,¢,ÍfVfXfef€ Ef fjf...  
[,<sup>a</sup>‘I’ð,<sup>3</sup>,ê,é,© A,Û,½,ÍfEfBf“fhfE,<sup>a</sup>fŠfTfCfY, ,é,¢  
,Í‘Ú“®,<sup>3</sup>,ê,é ê ‡,à AfffofCfX,ð%ð•ú,µ,È,¯,ê,Î,È,ç,È,¢ BfAfvfŠfP [fVf‡f“,Ì‘†’f,<sup>a</sup>%ð æ,<sup>3</sup>,ê,½,èfAfvfŠfP [fVf‡f“,<sup>a</sup>“ü—  
ÍftfH [fJfX,ð Ä“xŠl“¾,µ,½,è,·,é,Æ,«,É,Í AfAfvfŠfP [fVf‡f“,ÍIDirectInputDevice::Acquire,ðŒÄ,Ñ o,µ,ÄfL [f{ [fh EfffofCfX,ð”FŽ¯,µ’¼,•K—v,<sup>a</sup> , ,é B  
fAfvfŠfP [fVf‡f“,<sup>a</sup>DISCL\_FOREGROUNDf, [fh,ÄfL [f{ [fh,ðŽg—p,µ,Ä,¢  
,é ê ‡ AIDirectInputDevice::GetDeviceData,Û,½,Í IDirectInputDevice::GetDeviceState.  
,©,ç,ÌDIERR\_INPUTLOST•Ô’l,ðf`fFbfN,·,é,±  
,Æ,<sup>a</sup> „ §,<sup>3</sup>,ê,é BfAfvfŠfP [fVf‡f“,<sup>a</sup>ftfH [fJfX,ðŽ,µ Û ADirectInput,ÍŽ©“®“I,ÉfL [f{ [fh,ð%ð•ú,·,é,½,ß AD  
IERR\_INPUTLOST•Ô’l,ðŽó,¯Žæ,Á,½ ê ‡fAfvfŠfP [fVf‡f“,ÍfL [f{ [fh EfffofCfX,Ì”FŽ¯,ð Ä“x s,µ,x,«,Á, ,é  
B,µ,©,µ A,Ç,Ì,æ,µ,Èf^fCfv,ÌfGf%o [,<sup>a</sup> ¶,µ,½ Û,Ä,à<sup>−3</sup> ðŒ ,ÉDirectInputfffofCfX,ð”FŽ¯,µ’¼,<sup>3</sup>,<sup>1</sup>,é,æ,µ  
,ÈfAfvfŠfP [fVf‡f“,ð ‘,¢,Ä,Î,È,ç,È,¢ B”FŽ¯,Ä,«,È,¢fffofCfX,ð”FŽ¯,µ,æ,µ,Æ,µ,Ä<sup>−3</sup>ŒÄf< [fv,ÉŠx,é%Ä”\ «,<sup>a</sup> , ,é  
,©,ç,Ä, ,é B



**fL [f{ [fh EfXfLffff“fR [fh**

fL [f{ [fh,É,Í AfAvfŠfP [fVf‡f““□,Ā' ^Ó,μ,Ā,“,©,È,¯,ê,Î,È,ç,È,¢“\_„ª,¢,,Ā,©, ,é B•¯—  
“I,ÈfL [f{ [fh EfŒfCfAfEfƒg,É ‡,í,¹,Āf† [fU,ªfL [,ÌŠ„,è“—,Ā,ð Ā Ý'è,Ā,«„é,æ,□  
,ÈfAvfŠfP [fVf‡f“„ð ì ¬,·,é,±,Æ,ª „ §,³,ê,é,Ì,Ā, ,é B

,±,Ì,±,Æ,ð à~¾,·,é,½,ß AfL [f{ [fh,ÌŠî~{fŒfCfAfEfƒg,ðUS PCSŠg'£fL [f{ [fh,Æ,·,é B, ,éfL [,ª“¶ Ý,μ,È,¢,Æ,¢  
,□,Æ,«„Ā A,»„,ÌfL [,ÍUS PCSŠg'£fL [f{ [fh,É,Í“¶ Ý,·,é,ª à~¾,μ,Ā,¢,éfL [f{ [fh,É,Í“¶ Ý,μ,È,¢,±,Æ,ð^Ó—  
j,·,é B, ,éfL [,ª“Ç%Ā,³,ê,½,ÆŽ,³,ê,é,Æ,« A,»„,ÌfL [,ÍUS PCSŠg'£fL [f{ [fh,É,Í“¶ Ý,μ,È,¢,ª à~¾,μ,Ā,¢  
,éfL [f{ [fh,É,Í“¶ Ý,·,é,±,Æ,ð^Ó—j,·,é B

,·,×,Ā,ÌPCSŠg'£fL [f{ [fh,ª V,½,ÈWindowsfL [(DIK\_LWIN ADIK\_RWIN A,“,æ,ÑDIK\_APPS j,ðfTf| [fƒ,μ,Ā,¢  
,é,í,¯,Ā,Í,È,¢ B,±,ê,ç,ÌfL [,ª•¯— “I,É—~—p%Ā”\,©,Ç,□,©,ð'm,é•û—@,Í,È,¢ B

DIK\_PAUSEfL [fR [fh,Í“¶ Ý,μ,È,¢,Æ,¢,□,±,Æ,É' ^Ó,ð—v,·,é BPCSŠg'£fL [f{ [fh,ÍDIK\_PAUSE,Æ,¢  
,ªfXfLffff“fR [fh,ð ¶ ¬,·,é,Ì,Ā,Í,È,-

ADIK\_LCONTROL,“,æ,ÑDIK\_NUMLOCKfXfLffff“fR [fh,Ì'g,Ý ‡,í,¹,ĀÒPause”,ð ¶ ¬,μ,Ā,¢,é B

f%ofbvfvgfbfv, ,é,¢,Í,»,Ì'¼,Ì ¬Œ^fRf“fsf... [f^,Í Aftf<fZfbfg,ÌfL [f{ [fh,ðŽĀ'•,μ,Ā,¢,È,¢,±,Æ,ª,æ,, ,é B,©,í,è,  
É,¢,,Ā,©,ÌfL [ i“TŒ^“I,É,Ífef“fL [ j,Í'¼,ÌfL [,Æ<ª'Ê,É,È,Ā,Ā,“,è A•â •“I,Èf, [fh EfL [,É,æ,è'I'ð,³,ê,é B,±  
,Ìf, [fh EfL [Ž©'Ì,ÍfXfLffff“fR [fh,ð ¶ ¬,μ,È,¢ B

fL [f{ [fh,ÌfTfuf^fCfv,ªPC XT, ,é,¢,ÍPC ATfL [f{ [fh,Ì ê ‡ AŽŸ,ÌfL [,Í—~—  
p,Ā,«„È,¢ BDIK\_F11 ADIK\_F12,“,æ,Ñ,·,×,Ā,ÌŠg'£fL [(DIK\_\*'l,ª0x80^È ã) B,»,Ì ã APC  
XTfL [f{ [fh,É,ÍDIK\_SYSRQ,ª“¶ Ý,μ,È,¢ B

“ú—{ŒêfL [f{ [fh A“Á,ÉNEC  
PC-98fL [f{ [fh,É,Í AUSfL [f{ [fh,Æ,ÍŽĀŽç“I,É^Ù,È,éfL [fZfbfg,ªŠÜ,Ü,ê,é B Ú ×,É,Ā,¢,Ā,Í“ú—  
{ŒêfL [ff [fh,ðŽQ Æ,·,é,±,Æ B

“ú–{ŒêfL [f{ [fh

“ú–{ŒêfL [f{ [fh,ÆUSfL [f{ [fh,Æ,îŠÔ,É,ÍŽÀŽč“I,È˙Š^á,“Ų Ų,˙,é B^È%°,î•,Å,Í AŠef^fCfv,î“ú–  
{ŒêfL [f{ [fh,Å—~—p%oÂ”\,È•t%oÁfL [,ðfŠfXfgfAfbfv,µ,Ä,č,é B,Û,½USfL [f{ [fh,Å—~—p%oÂ”\,Å,Í, ,é,ª,č,-  
,Å,©,î“ú–{ŒêfL [f{ [fh,É,Í“Ų Ų,µ,È,čfL [,àfŠfXfgfAfbfv,˙,é B

,Û,½ ANEC PC-98fL [f{ [fh,Å,ÍDIK\_CAPSLOCK,˙,æ,ÑDIK\_KANAF [,ªfvfbfVf... Ef{f^f“,Å,Í,È,-  
fgfOf< Ef{f^f“,É,È,Å,Ä,č,é,à,î,ª, ,é,±,Æ,É’ ^Ô,˙,é,±,Æ B,±,ê,ç,Í A Å %o,É%oŲ,³,ê,é,Æ%oŲ,³,ê,½,Æ,č  
,²fCfxf“fg,ð Ų ¬,µ AŽŲ,É%oŲ,³,ê,é,Æ—£,³,ê,½,Æ,č,²fCfxf“fg,ð Ų ¬,˙,é B

fL [f{ [fh	•t%oÁfL [	‘Ų Ų,µ,È,čfL [
DOS/V 106fL [f{ [fh, NEC PC-98 106fL [f{ [fh	DIK_AT DIK_CIRCUMFLEX DIK_COLON DIK_CONVERT DIK_KANA DIK_KANJI DIK_NOCONVERT DIK_YEN	DIK_APOSTROPHE DIK_EQUALS DIK_GRAVE
NEC PC-98fXf^f“f_ [fhfL [f{ [fh	DIK_AT DIK_CIRCUMFLEX DIK_COLON	DIK_APOSTROPHE DIK_BACKSLASH DIK_EQUALS
NEC PC-98f%ofbfbfvfgfbfvfL [f{ [fh	DIK_F13, F14, F15 DIK_KANA DIK_KANJI DIK_NOCONVERT DIK_NUMPADCOMMA DIK_NUMPADEQUALS DIK_STOP DIK_UNDERLINE DIK_YEN	DIK_GRAVE DIK_NUMLOCK DIK_NUMPADENTER DIK_RCONTROL DIK_RMENU DIK_RSHIFT DIK_SCROLL
AXfL [f{ [fh	DIK_AX DIK_CONVERT DIK_KANJI DIK_NOCONVERT DIK_YEN	DIK_RCONTROL DIK_RMENU
J-3100fL [f{ [fh	DIK_KANA DIK_KANJI DIK_NOLABEL	DIK_RCONTROL DIK_RMENU

DIK\_YEN

DirectInputŠftf@fŒf“fX

*ffNf*

## DIDFT\_GETINSTANCE

```
BYTE DIDFT_GETINSTANCE(  
    DWORD dwType)
```

```
fIfufWfFfNfg EfCf“fXf^f“fX”Ô †fR [fh,ðff [f^ EftfH [f}  
fbfg Ef^fCfv,©,ç’Š o,·,é B Ú ×,¡DirectInputff [f^ EftfH [f}fbfg Ef^fCfv,ðŽQ Æ,·,é,±,Æ B
```

```
dwType  
    DirectInputff [f^ EftfH [f}fbfg Ef^fCfv B
```

**DIDFT\_GETTYPE**

```
BYTE DIDFT_GETTYPE(  
    DWORD dwType)
```

```
flfuWfFfNfgf^fCfv EfR [fh,ðff [f^ EftfH [f}fbfg,©,ç'Š o,.,é B Ú ×,ÍDirectInputff [f^ EftfH [f}  
fbfg Ef^fCfv,ðŽQ Æ,.,é,±,Æ B
```

```
dwType  
    DirectInputff [f^ EftfH [f}fbfg Ef^fCfv B
```

DISEQUENCE\_COMPARE

```
BOOL DISEQUENCE_COMPARE(  
    DWORD dwSequence1, cmp,  
    DWORD dwSequence2)
```

,Ó,½,Â,ÌDirectInput ‡ ~”Ô †,ð%ñ,è ž,Ý,ð l—¶,μ,Ä”äŠr,·,é B

dwSequence1  
”äŠr,·,é Å %o,ì ‡ ~”Ô † B

cmp  
ŽŸ,ì”äŠr%%ŽŽŽq,Ì,Ð,Æ,Â B "==" A "!=" A "<" A ">" A "<=" A ">=" B

dwSequence2  
”äŠr,·,é“ñ”Ô–Ú,ì ‡ ~”Ô † B

•Ô¹

‘æ^êfpf%of [f^,Æ‘æ“ñfpf%of [f^,Æ,Ì ‡ ~ŠÖEW,<sup>a</sup> A‘æ“ñfpf%of [f^,ÅŽw’è,μ,½”äŠr%  
%ŽŽŽq,Æ^ê˘v,μ,½ ê ‡ A0,Â,È,¢¹l,ð•Ô,· B

—á

ŽŸ,ì—á,ÍdwSequence1,<sup>a</sup>dwSequence2,æ,èŽŽŒn—ñ“I,É æ s,·,é,©,ðf`fFfbfN,·,é B

```
if (DISEQUENCE_COMPARE(dwSequence1, <, dwSequence2)) {  
    ...  
}
```

ŽŸ,ì—á,ÍdwSequence1,<sup>a</sup>dwSequence2,æ,èŽŽŒn—ñ“I,ÉŒâ‘±,Û,½,Í“~Žž,Â, ,é,©,ðf`fFfbfN,·,é B

```
if (DISEQUENCE_COMPARE(dwSequence1, >=, dwSequence2)) {  
    ...  
}
```



## GET\_DIDEVICE\_SUBTYPE

```
BYTE GET_DIDEVICE_SUBTYPE(  
    DWORD dwDevType)
```

*ffofCfX,lfTfu<sup>f</sup>^fCfv EfR [fh,δfffofCfX Ef^fCfv<L qfR [fh,©,ç'Š o,·,é BfTfu<sup>f</sup>^fCfv EfR [fh,l%δŽŒ,Íff  
ofCfX,l<sup>f</sup>v<sup>f</sup>%ofCf}fŠ Ef^fCfv,É<sup>ˆ</sup>È<sup>•</sup>¶,·,é B Ú ×,ÍDirectInputfffofCfX Ef^fCfv<L qfR [fh,δŽQ Æ,·,é,±,Æ B*

*dwDevType*

*DirectInputfffofCfX Ef^fCfv<L qfR [fh B*

## GET\_DIDEVICE\_TYPE

```
BYTE GET_DIDEVICE_TYPE(  
    DWORD dwDevType)
```

*ffofCfX Ef^fCfvfR [fh,ðffofCfX Ef^fCfv<L qfR [fh,©,ç'S o,;é B Ú ×,íDirectInputfffofCfX Ef^fCfv<L  
qfR [fh,ðŽQ Æ,·,é,±,Æ B*

*dwDevType*

*DirectInputfffofCfX Ef^fCfv<L qfR [fh B*

**MAKEDIPROP**

® ”fvf fpfefB,ð ì ¬,·,éfwf⟨fpf⟩fNf B

® ”fvf fpfefB,ÍMicrosoft,É,æ,è'è`³,ê,Ä,¢,é BfJfXf^f€ Efvf fpfefB,ðŽÀ‘,µ,½,¢fxf“f\_ [,Í AGUID,ð—p,¢  
,é,±,Æ B

šö ”

## DirectInputCreate

```
HRESULT DirectInputCreate(  
    HINSTANCE hinst,  
    DWORD dwVersion,  
    LPDIRECTINPUT * lplpDirectInput,  
    LPUNKNOWN punkOuter);
```

**IDirectInput** COMfCf“f^ [ftfFfCfX,ðfTf|  
[fg,·,éDirectInputfIfufWfFfNfg,ð ì ¬,·,é,½,ß,ÉÆÄ,Ñ o,³,ê,é B ³ í,ÉÆÄ,Ñ o,³,ê,é,Æ AŠÖ ”,Í\*lpplDirectInput,É,·,¬,é V,½,ÈfIfufWfFfNfg,Öf|fCf“f^,ð•Ö,· B

,±,İŠÖ ”,ðpunkOuter = NULL,ÄÆÄ,Ñ o,·,±,Æ,Í A CoCreateInstance(&CLSID\_DirectInput, punkOuter, CLSCTX\_INPROC\_SERVER, &IID\_IDirectInput, lpplDirectInput)  
,ð%î,µ,ÄfIfufWfFfNfg,ð ì ¬,µInitialize,Ä %oŠú%o»,·,é,±,Æ,Æ““™,Ä, ,é B

,±,İŠÖ ”,ðpunkOuter != NULL,ÄÆÄ,Ñ o,·,±,Æ,Í A CoCreateInstance(&CLSID\_DirectInput, punkOuter, CLSCTX\_INPROC\_SERVER, &IID\_IUnknown, lpplDirectInput),ð%î,µ,ÄfIfufWfFfNfg,ð ì ¬,·,é,±,Æ,Æ““™,Ä, ,é B W ¬%o»,³,ê,½fIfufWfFfNfg,ÍŽè ìÆ,Ä %oŠú%o»,µ,È,¬,ê,Î,È,Ç,È,Ç B

,±  
,İfT [frfX,É,ÍANSIfö [fWf±f“,·,æ,ÑUNICODEfö [fWf±f“,ªÊ,É¶ Ý,·,é BANSIfö [fWf±f“,ÍIDirectInputAfCf“ f^ [ftfFfCfX,ðfTf|  
[fg,·,éIfufWfFfNfg,ð ì ¬,µ AUNICODEfö [fWf±f“,ÍIDirectInputWfCf“f^ [ftfFfCfX,ðfTf|  
[fg,·,éIfufWfFfNfg,ð ì ¬,·,é B¶ŽšfZfbfg,ª-â-è,Æ,È,é¼,İfVfXfef€ EfT [frfX,É,Ä,Ç ,Ä,Í Afwfbf\_ftf@fCf<,İf}fNf ,ÍDirectInputCreate,ð“K Ø,È•¶ŽšfZfbfg,Èf}fbfsf“fO,·,é B

hinst

DirectInputfIfufWfFfNfg,ð ì ¬,µ,Ä,Ç,éAfAvfŠfP [fVf±f“,Ü,½,ÍDLL,İfCf“fXf^f“fX Efnf“fhf< B

dwVersion

Žg—p,³,ê,½dinput.hfwfbf\_ftf@fCf<,İfo [fWf±f“”Ô † B,±,İ¹,ÍDIRECTINPUT\_VERSION,Ä,È,¬,ê,Î,È,Ç,È,Ç B

DirectInput,Í,±,İ¹,ð—p,Ç

,Ä A,Ç,İfo [fWf±f“,İDirectInput,É‘Î,µ,ÄfAvfŠfP [fVf±f“,Ü,½,ÍDLL,ª ÝÆv,³,ê,½,İ,©,ðŽw,µŽ!,· B

lpplDirectInput

³ íŽÄ s,³,ê,é ê † AIDirectInputfCf“f^ [ftfFfCfX,Ö,İf|fCf“f^,ð,Ç,±,É•Ö,·,©,ðŽw,µŽ!,· B

punkOuter

OLE W ¬%o»<@”\,ª-Ç’m,İ §Æä,Ö,İf|fCf“f^ BfCf“f^ [ftfFfCfX,ª W ¬%o»,³,ê,Ä,Ç ,È,Ç ê †,İÖ B,Ü,Æ,ñ,Ç,İÆÄ,Ñ o,µ‘æ,İÖ,ð“n,· B

W ¬%o»,ª—v< ,³,ê,½ ê † A\*lpplDirectInput,É•Ö,³,ê,éIfufWfFfNfg,ÍIUnknown,Ö,İf|fCf“f^,Ä, ,é B  
OLE W ¬‘İ,ª—v< ,·,éIDirectInput,Ö,İf|fCf“f^,Ä,Í,È,Ç,±,Æ,É’ ^Ö B

•Ö¹

COMfGf%o [fh,ð•Ö,· B^È%o,İfGf%o [fh,Í•Ö,³,ê,éfR [fh,İ,·,×,Ä,Æ,ÍÆÄ,Ç,È,Ç B

DI\_OK = S\_OK: ‘€ ì,ª ³ í I—¹,µ,½ B

DIERR\_INVALIDPARAM = E\_INVALIDARG: lpplDirectInputpf%of [f^,ª—LÆø,Èf|fCf“f^,Ä,Í,È,Ç B

DIERR\_OUTOFMEMORY = E\_OUTOFMEMORY: f f, fŠ,ªs‘«,µ,Ä,Ç,é B

DIERR\_OLDDIRECTINPUTVERSION: DirectInput,İfo [fWf±f“,ªÆÄ,Ç B

DIERR\_BETADIRECTINPUTVERSION: fTf|

[fgŠO,Ä, ,éDirectInputfx [f^ Efo [fWf±f“,É‘Î,µ,ÄfAvfŠfP [fVf±f“,ª ‘,©,ê,Ä,Ç,½ B

## joyConfigChanged

```
MMRESULT joyConfigChanged(  
    DWORD dwFlags);
```

fŒfWfXfgfŠ,É V,½,ÈfWf‡fCfXfefBfbfN,Ì Ý'è,ª, ,é,±,Æ,ðfWf‡fCfXfefBfbfN Efhf%oCfo,É'Ê'm,·,é B  
,±,İŠÖ ",Í Af† [fU,ªfWf‡fCfXfefBfbfN,İfLfffŠfufŒ [fVf‡f“, ,é,¢,Í ÄfLfffŠfufŒ [fVf‡f“,ð s,□  
,Æ,« A,Û,½,Í•Ê,İfWf‡fCfXfefBfbfN EftfofCfX,ªI'ð,³,ê,é,Æ,«,Ê AfRf“fgf [f<fpflf<,É, ,éfWf‡fCfXfefBfbfN  
EfLfffŠfufŒ [fVf‡f“,İfvf fpfefB,©,çŒÄ,Ñ o,³,ê,é B

OEM,İfWf‡fCfXfefBfbfN EfLfffŠfufŒ [fVf‡f“ EfAfvfŠfP [fVf‡f“,İ,æ,□  
,É AfAfvfŠfP [fVf‡f“,ªfWf‡fCfXfefBfbfN,İfpftfH [f}f“fX,ðfJfXf^f}fCfY,·,é,æ,□,É ÝŒv,³,ê,Ä,¢  
,é ê ‡ AŒ» Ý'I'ð,³,ê,Ä,¢,éfWf‡fCfXfefBfbfN,É'İ,·,éfŒfWfXfgfŠ,İJOYSTICK USER'l,ªİ X,³,ê,½,±,Æ,ð A,±  
,İŠÖ ",ð—p,¢,ÄfWf‡fCfXfefBfbfNfhf%oCfo,É'Ê'm,·,é,±,Æ,ª,Ä,«,é BJOYSTICK  
USER'l,İfŒfWfXfgfŠ,İHKEY\_LOCAL\_MACHINE”ª,É, ,é B

dwFlags

—\-ñ,³,ê,Ä,“,è A0,ÉfZfbfg,µ,Ä,“,©,È,¯,ê,Î,È,ç,È,¢ B

•Ô'l

-Œ÷,·,ê,Î JOYERR\_NOERROR AŽ,”s,·,ê,ÎŽŸ,İfGf%o [,ð•Ô,· B

JOYERR\_NOCANDO

JOYERR\_REGISTRYNOTVALID

## joyGetDevCaps

```
MMRESULT joyGetDevCaps(  
    UINT uJoyID,  
    LPJOYCAPS pjc,  
    UINT cbjc);
```

fffofCfX,İŽ ,Â<@”\,ðfWf‡fCfXfefBfbfN,É Æ%öİ,·,é B

,±,İŠÖ ”,ð—p,¢,Ä Afhf%ofo,ªfTf| [fg,·,éfWf‡fCfXfefBfbfN EfffofCfX ”,ð’m,é,±,Æ,ª,Ä,«,é B

uJoyID

Æ%öİ,³,ê,éfWf‡fCfXfefBfbfN,İŽ¯•ÊŽq BJOYSTICKID1,Ü,½,ÍJOYSTICKID2,Ä, ,é B

pjc

fWf‡fCfXfefBfbfN<@”\,ðŠÜ,bJOYCAPS \‘¢‘İ,İfAfhfÆfX B

cbjc

**JOYCAPS** \‘¢‘İ,İfTfCfY,ðfofCfg ”,ÄŽ!,· B

•Ô¹

¬Æ÷,·,ê,Î JOYERR\_NOERROR AŽ,”s,·,ê,İŽŸ,İfGf%o [,ð•Ô,· B

**MMSYSERR\_INVALIDPARAM**

**MMSYSERR\_NODRIVER**

**JOYERR\_REGISTRYNOTVALID**

ŽQ Æ @**JOYCAPS**, **joyGetNumDevs**

joyGetNumDevs

UINT joyGetNumDevs (VOID) ;

$fWf\ddag CfXfefBfbfN$   $Efhf\%Cfo,^fTf|$   $[fg,\mu,\ddot{A},\text{¢},\acute{e}fWf\ddag CfXfefBfbfN$  ”, $\delta fhf\%Cfo,\text{©},\zeta\check{Z}\mathfrak{a}^{\text{“}\frac{3}{4},\cdot,\acute{e}}$  B  
Žw’è,<sup>3</sup>,ê,<sup>½</sup> $fWf\ddag CfXfefBfbfN$ ,<sup>a</sup>fRf“ $f sf\ldots$   $[f^{\wedge},\acute{E},\ddot{\cdot}$ — “I,É Ú‘±,<sup>3</sup>,ê,Ä,¢,é,©,Ç,ϣ,©, $\delta$ ’<sup>2</sup>,×,é,É,Í A joyGetPosExŠÖ ”, $\delta$   
—p,¢,é B

•Ô’l

$fhf\%Cfo,^fTf|$   $[fg,\cdot,\acute{e}fWf\ddag CfXfefBfbfN$  ”, $\delta\bullet\hat{O},\cdot$  B  $fhf\%Cfo,^{\text{“}\P}$  Ý, $\mu,\grave{E},\bar{\cdot},\hat{e},\hat{0},\delta\bullet\hat{O},\cdot$  B  
ŽQ Æ @joyGetDevCaps



## joyGetPosEx

MMRESULT joyGetPosEx(UINT uJoyID, LPJOYINFOEX pji);

^Ê'u,“,æ,Ñf{f^f“ ó‘Ô,ðfWf‡fCfXfefBfbfN,©,çŽæ“¾,·,é B

,±,İŠÖ ”,ðĖÄ,Ñ o,·‘O,É AJOYINFOEX \‘ċ‘İ,İdwFlags—  
v‘f,Ê,Đ,Æ,Â^Ê ã,İftf%oO,ðfZfbfg,μ,Ä AfAfvfŠfP [fVf‡f“,<sup>a</sup> Æ%öİ,·,é €–Ú,ðŽw’è,μ,È,–,ê,Î,È,ç,È,ċ B

,±,İŠÖ ”,É,æ,è Af%of\_ [fyf\_fċ AŽċ“\_fnfbfg A‘½ ”,İf{f^f“,ðŽ ,ÂfffofCfX,Æ,ċ  
,Ä,½Šg‘ĒfffofCfX,“,æ,Ñ Ä‘â6Ž<sup>2</sup>,ð—p,ċ,½ Ä•WĖn,Ö,İfAfNfZfX,“%oÂ”\,Æ,È,é B

uJoyID  
Æ%öİ,<sup>3</sup>,ê,éfWf‡fCfXfefBfbfN,İŽ–•ÊŽq B

pji  
fWf‡fCfXfefBfbfN,İŠg‘Ē^Ê‘u î•ñ,“,æ,Ñf{f^f“ ó‘Ô,ðŠÛ,þJOYINFOEX \‘ċ‘İ,İfAfhfĖfX B

## •Ô¹

–Ė÷,·,ê,Î JOYERR\_NOERROR AŽ,”s,·,ê,ÎŽŸ,İfGf%o [,ð•Ô,· B  
JOYERR\_UNPLUGGED  
MMSYSERR\_BADDEVICEID  
MMSYSERR\_INVALPARAM  
MMSYSERR\_NODRIVER

ŽQ Æ @JOYINFOEX

$f_R = [f_{\langle f o f b f N \check{O} } ]$  ”

## DIEnumDeviceObjectsProc

```
BOOL CALLBACK DIEnumDeviceObjectsProc(  
    LPCDIDEVICEOBJECTINSTANCE lpddoi,  
    LPVOID pvRef);
```

IDirectInputDevice::EnumObjects *f\fbfh, Å—p, ¢, ç, ê, éfR [f<fofbfNŠÖ ” B*

*lpddoi*

*—ñ<“,³,ê,Ä,¢,éIfufWfFfNfg,ð<L q,·,é***DIDEVICEOBJECTINSTANCE** *\‘¢ì,ìfAfhf¢fX B*

*pvRef*

**IDirectInputDevice::EnumObjects**ŠÖ ”,É,“,¢,Ä—^,!,ç,ê,Ä,¢,é AfAfvfŠfP [fVf±f“,É,æ,è’è<³,ê,½’l,ðŽw’è,·,é B

## •Ô’l

**DIENUM\_CONTINUE**

*—ñ<“,ð¢p’±,·,é*

**DIENUM\_STOP**

*—ñ<“,ð’†Ž~,·,é*

## DIEnumDevicesProc

```
BOOL CALLBACK DIEnumDevicesProc(  
    LPDIDEVICEINSTANCE lpddi,  
    LPVOID pvRef  
);
```

IDirectInput::EnumDevices f\bfh,Å—p,¢,ç,ê,é fR [f<fofbfNŠÖ ” B

lpddi

—ñ<“,³,ê,Ä,¢,é f f of CfX,ð<L q,·,é DIDEVICEINSTANCE \‘¢‘İ,İ f AfhfÆ fX B

pvRef

IDirectInput::EnumDevicesŠÖ ”,Ä—^,!,ç,ê,½ AfAfvfŠ fP [fVf‡f“”è<,İ f f [f^,İ f AfhfÆ fX B

## •Ö¹

DIENUM\_CONTINUE

—ñ<“,ðÆp‘±,·,é

DIENUM\_STOP

—ñ<“,ð’†Z~,·,é

**IClassFactory**

**IClassFactory***fCf“f^ [ftfFfCfX,ÍOLEfTf| [fg,É•K—v,Æ,³,ê,é B Ú ×,È î•ñ,É,Â,¢,Ä,íOLEf}ffj...*  
*fAf<,ðŽQ Æ,·,é,±,Æ BDirectInput,ð—p,¢*  
*,éfAfvfŠfP [fVf‡f“,ì,Û,Æ,ñ,Ç,Í AOLEfNf%fXftf@fNfgfŠ,Æ’¼ Ú’Ê M,·,é•K—v,Í,È,¢ B*

**IClassFactory::AddRef**

```
HRESULT AddRef(  
    LPCLASSFACTORY lpClassFactory);  
  
fCf“f^ [ftfFfCfX,É‘Î,·,éŽQ ÆfJfEf“fg,ðfCf“fNfŠf f“fg,·,é BOLEf}fjf...  
fAf<,İIUnknown::AddRef,ðŽQ Æ,·,é,±,Æ B
```

**•Ô’l**

```
fIfufWfFfNfgŽQ ÆfJfEf“fg,ð•Ô,· B
```

## IClassFactory::CreateInstance

```
HRESULT CreateInstance(  
    LPCLASSFACTORY lpClassFactory,  
    LPUNKNOWN punkOuter,  
    REFIID riid,  
    LPVOID * ppvOut);
```

V,½,ÈDirectInputIfufWfFfNfg,ðŽw'è,³,ê,½fCf“f^ [ftFfCfX,Ä ì ¬,·,é BOLEf}fjf...  
fAf<,Ì**IClassFactory::CreateInstance**,ðŽQ Æ,·,é,±,Æ B V,½,È ì ¬,³,ê,½fIfufWfFfNfg,Î,Û,¾ %Šú%»,³,ê,Ä,¢,È,¢  
,±,Æ,É' ^Ó B

*punkOuter*

OLE W ¬%»«<@”\,ª-¢’m,Ì §Æä,Ö,Ìf|fCf“f^ A,Û,½,ÍfCf“f^ [ftFfCfX,ª W ¬%»»,³,ê,Ä,¢  
,È,¢ ê ‡,Í0 B,Û,Æ,ñ,Ç,ÌÆÄ,Ñ o,µ‘²,Í0,ð“n,· B

*riid*

•K—v,ÈfCf“f^ [ftFfCfX B,±,Ìfpf%of [f^,Í—LÆø,ÈfCf“f^ [ftFfCfXŽ~•ÊŽq,ðŽw,µŽ!,·•K—v,ª, ,é B

*ppvOut*

³ íŽÄ s,³,ê,é ê ‡ A ì ¬,³,ê,½fCf“f^ [ftFfCfX,Ö,Ìf|fCf“f^,ð,Ç,±,É•Ö,·,©,ðŽw,µŽ!,· B

•Ö¹

COMfGf% [fR [fh,ð•Ö,· B^È%°,ÌfGf% [fR [fh,Í•Ö,³,ê,éfR [fh,Ì,·,×,Ä,Æ,ÍÆÄ,Ç,È,¢ B  
**S\_OK**: ‘€ ì,Í ³ í I—¹,µ,½ B  
**E\_INVALIDARG**: ppvOutpf%of [f^,Í—LÆø,Èf|fCf“f^,Ä,È,¢ B  
**CLASS\_E\_NOAGGREGATION**: W ¬%»«<@”\,ªfTf| [fg,³,ê,Ä,¢,È,¢ B  
**E\_OUTOFMEMORY**: f f,fŠ,ªs‘«,µ,Ä,¢,é B  
**E\_NOINTERFACE**: Žw'è,³,ê,½fCf“f^ [ftFfCfX,ÍfTf| [fg,³,ê,Ä,¢,È,¢ B

**IClassFactory::LockServer**

```
HRESULT LockServer(  
    LPCLASSFACTORY lpClassFactory,  
    BOOL fLock);
```

DLL f bfN EfJfEf“fg,ðfCf“fNfŠf f“fg,Ü,½,ÍffNfŠf f“fg,·,é BDLL f bfN EfJfEf“fg,³0,Å,È,¢ ê ±,Í Af  
f,fŠ,©,ç í æ,³,ê,È,¢ BOLEf}fjf...fAf<,l**IClassFactory::LockServer**,ðŽQ Æ,·,é,±,Æ B

fLock  
TRUE,Å, ,é ê ± Af bfN EfJfEf“fg,ðfCf“fNfŠf f“fg,·,é B  
FALSE,Å, ,é ê ± Af bfN EfJfEf“fg,ðffNfŠf f“fg,·,é B

**•Ô'l**

COMfGf%o [fR [fh,ð•Ô,· B`È%o,lfGf%o [fR [fh,Í•Ô,³,ê,éfR [fh,ì,·,×,Ä,Æ,ÍŒÀ,ç,È,¢ B  
S\_OK: ‘€ ì,Í ³ í I—¹,µ,½ B  
E\_OUTOFMEMORY: f f,fŠ,ªs‘«,µ,Ä,¢,é B



**IClassFactory::QueryInterface**

```
HRESULT QueryInterface(  
    LPCLASSFACTORY lpClassFactory,  
    REFIID riid,  
    LPVOID * ppvObj);
```

*f*l*f*u*f*W*f*F*f*N*f*g ã,Ì‘¼,Ì*f*C*f*“*f*^ [f*t*fF*f*C*f*X,É*f*N*f*%*f*C*f*A*f*“*f*g E*f*A*f*N*f*Z*f*X,ð—^,‘,é BOLE*f*}*f*j*f*...  
*f*A*f*ç,Ì*IUnknown::QueryInterface*,ðŽQ Æ,·,é,±,Æ B

*riid*  
•K—v,È*f*C*f*“*f*^ [f*t*fF*f*C*f*XIID B

*ppvObj*  
“¾,ç,ê,é*f*C*f*“*f*^ [f*t*fF*f*C*f*X,Ö,Ì*f*|*f*C*f*“*f*^,ðŽó,¬Žæ,é B

•Ô‘l  
COM*f*G*f*% [f*R* [f*h*,ð•Ô,· B

**IClassFactory::Release**

```
HRESULT Release(LPCLASSFACTORY lpClassFactory);
```

*fCf“f^ [ftfFfCfX,É‘Î,·,éŽQ ÆfJfEf“fg,ðffNfŠf f“fg,·,é BfIfufWfFfNfg,ìŽQ ÆfJfEf“fg,°0,É,È,é ê ‡ A,»,Ì  
fIfufWfFfNfg,Íf f,fŠ,©,ç%øð•ú,³,ê,é BOLEf}fjf...fAf«,ìIUnknown::Release,ðŽQ Æ,·,é,±,Æ B*

**•Ô’l**

*fIfufWfFfNfgŽQ ÆfJfEf“fg,ð•Ô,· B*

**IDirectInput**

**DirectInput***fIfufWfFfNfg,ÍDirectInputTfuVfXfef€„ð•\„µ A’P^ê“ü—ÍfffofCfX„ð•\*  
**„DirectInputDevice***fIfufWfFfNfg„ð ì ¬„•„é B*

**IDirectInput::AddRef**

```
DWORD AddRef(  
    LPDIRECTINPUT lpDirectInput);
```

**IDirectInput**,<sup>a</sup>Ĉp<sup>3</sup>,;éIUnknownfCf“f^ [ftfFfCfX,î`ê•” BŠÖ`A,ì, ,éCOMfIfufWfFfNfg,ÌŽQ ÆfJfEf“fg,ð‘ ,â,·,½,ß,É—p,Ĉ,ç,ê,é BfIfufWfFfNfg,<sup>a</sup> Å %  
,É ì ¬,<sup>3</sup>,ê,é Ŭ,É AŽQ ÆfJfEf“fg,Í1,ÉfZfbfg,<sup>3</sup>,ê,é B**AddRef**,<sup>a</sup>ĈÄ,Ñ o,<sup>3</sup>,ê,é,½,Ñ,ÉŽQ ÆfJfEf“fg,ÍfCf“fNfŠf f“fg,<sup>3</sup>,ê A**Release**,<sup>a</sup>ĈÄ,Ñ o,<sup>3</sup>,ê,é,½,Ñ,ÉŽQ ÆfJfEf“fg,ÍftfNfŠf f“fg,<sup>3</sup>,ê,é BŽQ ÆfJfEf“fg,<sup>a</sup>0,É,È,é,Æ A,»,ÌfIfufWfFfNfg,Í%øð•ú,<sup>3</sup>,ê,é B

*lpDirectInput*  
,±,Ìf f“fo,<sup>a</sup>ĈÄ,Ñ o,<sup>3</sup>,ê,½DirectInputfIfufWfFfNfg,ðŽw,µŽ!,· B

•Ô¹

V,½,ÈŽQ ÆfJfEf“fg,ðŽ ,ÂDWORD B

## IDirectInput::CreateDevice

```
HRESULT CreateDevice(  
    LPDIRECTINPUT lpDirectInput,  
    REFGUID rguid,  
    LPDIRECTINPUTDEVICE *lplpDirectInputDevice,  
    LPUNKNOWN * pUnkOuter);
```

GUID, <sup>a</sup>Žw'è, ·, é f f f o f C f X, Ì f C f " f X f ^ f " f X, ð Ì ¬, µ %oŠú%o», ·, é B

, ±, ÌŠÖ ", ðpunkOuter = NULL, ÅÆÄ, Ñ o, ·, ±, Æ, Í A **CoCreateInstance**(&CLSID\_DirectInputDevice, NULL, CLSCTX\_INPROC\_SERVER, riid, lplpDirectInputDevice), ð%oi, µ, Ä f l f u f W f F f N f g, ð Ì ¬, µ **Initialize**, Ä %oŠú%o», ·, é, ±, Æ, Æ " "™, Ä, , é B

, ±, ÌŠÖ ", ðpunkOuter != NULL, ÅÆÄ, Ñ o, ·, ±, Æ, Í A **CoCreateInstance**(&CLSID\_DirectInputDevice, punkOuter, CLSCTX\_INPROC\_SERVER, &IID\_IDirectInput, lplpDirectInput), ð%oi, µ, Ä f l f u f W f F f N f g, ð Ì ¬, ·, é, ±, Æ, Æ " "™, Ä, , é B W ¬%o», <sup>3</sup>, è, ½ f l f u f W f F f N f g, ÍŽ è Ì Æ, Ä %oŠú%o», <sup>3</sup>, è, È, ¬, è, Í, È, ç, È, ¢ B

lpDirectInput  
, ±, Ì f f " f o, °ÆÄ, Ñ o, <sup>3</sup>, è, ½ DirectInput f l f u f W f F f N f g, ðŽw, µŽ', · B

rguid  
•K—v, È " ü — Í f f f o f C f X, ð·\, ·GUID, Ö, ÌŽQ Æ B, ±, ÌGUID, ÍEnumDevices f f\ f b f h, ð'Ê, µ, ÄŽæ " ¾, <sup>3</sup>, è, é, © A, , é, ¢, Í, , ç, ©, ¶, ß'è', <sup>3</sup>, è, Ä, ¢, éGUID, Ì, Ð, Æ, Ä, Ä, , é B

lplpDirectInputDevice  
<sup>3</sup> í, ÉŽÀ s, <sup>3</sup>, è, é è ‡ A **IDirectInputDevice** f C f " f ^ [ f t f F f C f X E f | f C f " f ^, ðŽw, µŽ', · B

punkOuter  
OLE W ¬%o» <@", °—¢'m, Ì §Æä, Ö, Ì f | f C f " f ^ A, Ü, ½, Í f C f " f ^ [ f t f F f C f X, ° W ¬%o», <sup>3</sup>, è, Ä, ¢, È, ¢ è ‡, Í0 B, Ü, Æ, ñ, Ç, ÌÆÄ, Ñ o, µ'¤, Í0, ð"n, · B

## •Ô'1

COM f G f %o [ f R [ f h, ð·Ô, · B ~È%o°, Ì f G f %o [ f R [ f h, Í·Ô, <sup>3</sup>, è, é f R [ f h, Ì, ·, ×, Ä, Æ, ÍÆÄ, ç, È, ¢ B

**DI\_OK = S\_OK**: '€ Ì, Í <sup>3</sup> í I—, µ, ½ B

**DIERR\_INVALIDPARAM = E\_INVALIDARG**: p p v O u t p p f %o f [ f ^, Í—LÆø, È f | f C f " f ^, Ä, È, ¢ B

**DIERR\_OUTOFMEMORY = E\_OUTOFMEMORY**: f f, f Š, °s'«, µ, Ä, ¢, é B

**DIERR\_NOINTERFACE = E\_NOINTERFACE**: Žw'è, <sup>3</sup>, è, ½ f C f " f ^ [ f t f F f C f X, Í, ±, Ì f l f u f W f F f N f g, É, æ, è f T f | [ f g, <sup>3</sup>, è, Ä, ¢, È, ¢ B

**DIERR\_DEVICENOTREG**: f f f o f C f X E f C f " f X f ^ f " f X, ° A DirectInput, Ä " o ^, <sup>3</sup>, è, Ä, ¢, é f f f o f C f X, É 'Š " —, µ, È, ¢ B

## IDirectInput::EnumDevices

```
HRESULT EnumDevices(  
    LPDIRECTINPUT lpDirectInput,  
    DWORD dwDevType,  
    LPDIENUMCALLBACK lpCallback,  
    LPVOID pvRef,  
    DWORD dwFlags);
```

*fRf“fsf... [f^,ÉÆ» Ý Ú‘±,³,ê,Ä,Ç,é,© A, ,é,Ç,Í Ú‘±%Â”\,ÈfffofCfX,ð—  
ñ<“,·,é B,½,Æ,!,Îftf%oCfG EfXfefBfbfN,ðfVfXfef€,ÉfCf“fXfg [f<,μ,½,ªÆ»Žž“\_,Ä,ÍfRf“fsf... [f^,É Ú‘±,μ,Ä,Ç  
,È,Ç,Æ,Ç,Ä,½ ê ±,ª, ,é,½,ß A Ú‘±,³,ê,Ä,Ç,éfffofCfX,¾,¯,ð—ñ<“,·,é,©fCf“fXfg [f<,³,ê,Ä,Ç,éfffofCfX,·,×,Ä,ð—  
ñ<“,·,é,©,ðŽ[,·ftf%ofo,ðdwFlagsfpf%of [f^,ÉfZfbfg,·,é Bftf%ofo **DIEDFL\_ATTACHEDONLY**,ªfZfbfg,³,ê,Ä,Ç,É,Ç  
,Æ AfCf“fXfg [f<,³,ê,Ä,Ç,éfffofCfX,·,×,Ä,ª—ñ<“,³,ê,é B—ñ<“,·,éfffofCfX,Ìf^fCfv,ðftfBf<f^,Æ,μ,Ä“n,·,±  
,Æ,à,Ä,ª,«é B*

*fAfvfŠfP [fVf±f“““è<“,·,éfR [f<fofbfNŠÖ ”,Í AlpCallbackfpf%of [f^,ÌIDirectInput::EnumDevices,Ö“n,³,ê,é B,  
±,ÌŠÖ ”,Í A—  
ñ<“,³,ê,½fffofCfX,·,×,Ä,É,Î,μ,ÄÆÄ,Ñ o,³,ê,é BfR [f<fofbfN,Ä,Í AfffofCfX Ef^fCfv,Æ,»,ÌfjfbfNf| [f€ A,·,æ  
,Ñ »•iGUID,Æ,»,ÌfjfbfNf| [f€,ª AŠefffofCfX,É—^,!,Ç,ê,é B’P^ê,Ì“ü—  
ÍfffofCfX,É•i ”,ÌDirectInputfffofCfX Ef^fCfv,Ì<@”\,ª, ,é ê ±,Í AfTf|  
[fg,·,éŠefffofCfX Ef^fCfv,É,Î,μ,Ä’l,ª•Ö,³,ê,é i,½,Æ,!,Î A“à‘ f}fEfX,ð,à,ÂfL [f{ [fh,Í AfL [f{ [fh,·,æ,Ñf}  
fEfX,Æ,μ,Ä—ñ<“,³,ê,é B,μ,©,μ A »•iGUID,ÍŠefffofCfX,É,Î,μ,Ä“~ê,Ä, ,é j B*

*,±,ÌfŠfŠ [fX,ÌDirectInput,Ä,Í Af}fEfX,·,æ,ÑfL [f{ [fh EfffofCfX,Ì,Ý,ª—ñ<“,³,ê,Ä,Ç,é B*

*lpDirectInput  
,±,Ìf f“fo,ªÆÄ,Ñ o,³,ê,½DirectInputIfufWfFfNfg,ðŽw,μŽ!,· B*

*dwDevType  
fffofCfX Ef^fCfv EftfBf<f^ B0,Ä, ,é ê ±,Í A,·,×,Ä,ÌfffofCfX Ef^fCfv,ª—ñ<“,³,ê,é B,»,ª  
,Ä,È,Ç ê ±,ÍDIDEVTYPE\_\*’l,Æ,È,è A—ñ<“,³,ê,éfffofCfX Ef^fCfv,ðŽ!,· B,±,ÌfŠfŠ [fX,ÌDirectInput,Ä,Í Af}  
fEfX EfffofCfX,·,æ,ÑfL [f{ [fh,¾,¯,ª—ñ<“,³,ê,é B*

*lpCallback  
ŠeDirectInputfffofCfX,Ì<L q,Æ,Æ,à,ÉÆÄ,Ñ o,³,ê,é AfAfvfŠfP [fVf±f“““è<“,·,éfR [f<fofbfNŠÖ ”,ðŽw,μŽ!,· B*

**BOOL CALLBACK DIEnumDevicesProc(LPDIDEVICEINSTANCE lpddi,  
LPVOID pvRef)**

*lpddi  
,±,ÌfffofCfX EfCf“fXf^f“fX,ð<L q,·,é \‘ç’l,ðŽw,μŽ!,· B*

*pvRef  
**EnumDevices**,É—^,!,Ç,ê,é AfAfvfŠfP [fVf±f“““è<“ff [f^,ðŽw,μŽ!,· B*

*pvRef  
ÆÄ,Ñ o,³,ê,é,½,Ñ,É—ñ<“fR [f<fofbfN,Ö“n,³,ê,é AÆÄ,Ñ o,μ‘  
,É,æ,è“è<“,³,ê,½32ftrfbfg EfRf“fefLfXfg,ðŽw,μŽ!,· B*

*dwFlags  
Æ» Ý‘è<“,³,ê,Ä,Ç,éftf%ofo,ÍŽŸ,Ì,Ð,Æ,Ä,¾,¯,Ä, ,é B  
**DIEDFL\_ATTACHEDONLY**-Æ» Ý Ú‘±,³,ê,Ä,Ç,éfffofCfX,Ì,Ý,ð—ñ<“,·,é B*

## •Ö’l

*COMfGf%o [fR [fh,ð•Ö,· BÈ%°,ÌfGf%o [fR [fh,Í•Ö,³,ê,éfR [fh,Ì,·,×,Ä,Æ,ÍÆÄ,Ç,È,Ç B  
**DI\_OK** = **S\_OK**: ‘€ ì,Í ³ í I—,μ,½ BfR [f<fofbfN,ª“r’†,Ä—ñ<“,ð†Ž~,μ,½ ê ± A—ñ<“,Í ³ í I—  
¹,μ,½,ÆÆ©,È,³,ê,é,±,Æ,É’ ^Ö B  
**DIERR\_INVALIDPARAM** = **E\_INVALIDARG**: flfpf%of [f^,É—³Æø,Èftf%ofo,ª, ,Ä,½,© A, ,é,Ç  
,ÍfR [f<fofbfN,ª—³Æø,ÈfXfe [f^fX EfR [fh,ð•Ö,μ,½ B*

## IDirectInput::GetDeviceStatus

```
HRESULT GetDeviceStatus(  
    LPDIRECTINPUT lpDirectInput,  
    REFGUID rguidInstance);
```

,±,Ïf f“fo,Í AŽw’è,<sup>3</sup>ê,½ffofCfX,ªE» ÝDirectInput,É Ú‘±,<sup>3</sup>ê,Ä,¢,é,©,ðf`fFfbfN,·,é BffofCfX,ª Ú‘±,<sup>3</sup>ê,Ä,¢  
,é ê ‡,É,ÍOK,ð A,<sup>3</sup>ê,Ä,¢,È,¢ ê ‡,É,ÍfGf%o [,ð•Ô,· B

lpDirectInput  
,±,Ïf f“fo,ªEÄ,Ñ o,<sup>3</sup>ê,½DirectInputfIfufWfFfNfg,ðŽw,µŽ!,· B

rguidInstance  
fXfe [f^fX,ðf`fFfbfN,·,éffofCfX,ÏfCf“fXf^f“fX,ðŽ~•Ê,·,é B

## •Ô¹

COMfGf%o [fR [fh,ð•Ô,· B^È%°,ÏfGf%o [fR [fh,Í•Ô,<sup>3</sup>ê,éfR [fh,Ï,·,×,Ä,Æ,ÍEÀ,ç,È,¢ B

**DI\_OK** = **S\_OK**: fffofCfX,Í Ú‘±,<sup>3</sup>ê,Ä,¢,é B

**DI\_NOTATTACHED** = **S\_FALSE**: fffofCfX,Í Ú‘±,<sup>3</sup>ê,Ä,¢,È,¢ B

**DIERR\_GENERIC** = **E\_FAIL**: fffofCfX,ª Ú‘±,<sup>3</sup>ê,Ä,¢,é,©,ðDirectInput,ÍŠm’è,Å,«,È,©,Á,½ B

**DIERR\_INVALIDPARAM** = **E\_INVALIDARG**: fffofCfX,Í“¶ Ý,µ,È,¢ B

## IDirectInput::Initialize

```
HRESULT Initialize(  
    LPDIRECTINPUT lpDirectInput,  
    HINSTANCE hinst,  
    DWORD dwVersion);
```

DirectInputIfuFwFfNfg,đ %Šú%»,·,é BDirectInputIfuFwFfNfg EfffofCfX,<sup>a</sup> ì ¬,<sup>3</sup>,ê,é,ÆDirectInputCreatef f\fbfh,<sup>a</sup>Ž©“@“I,É %Šú%»,đ s,□,½,ß A’Ê í,ÍfAfvfŠfP [fVf‡f“,©,ç,±,ÌŠÖ ”,đÆĀ,Ñ o,•K—v,Í,È,¢ B

*hinst*

DirectInputIfuFwFfNfg,đ ì ¬,μ,Ā,¢,éfAfvfŠfP [fVf‡f“,Ü,½,ÍDLL,ÌfCf“fXf^f“fX Efnf“fhf< B

*dwVersion*

Žg—p,<sup>3</sup>,ê,½dinput.hfwfbf\_ftf@fCf<,Ìfo [fWf‡f“”Ô † B,±,Ì¹,ÍDIRECTINPUT\_VERSION,Ā,È,¬,ê,Î,È,ç,È,¢ B

DirectInput,Í,±,Ì¹,đ—p,¢

,Ā A,Ç,Ìfo [fWf‡f“,ÌDirectInput,É‘Î,μ,ĀfAfvfŠfP [fVf‡f“,Ü,½,ÍDLL,<sup>a</sup> ÝÆv,<sup>3</sup>,ê,½,Ì,©,đŠm’è,·,é B

•Ô¹

COMfGf% [fR [fh,đ•Ô,· B^È%°,ÌfGf% [fR [fh,Í•Ô,<sup>3</sup>,ê,é,·,×,Ā,ÌfR [fh,Æ,ÍÆĀ,ç,È,¢ B

**DI\_OK = S\_OK:** fffofCfX,Í Ú‘±,<sup>3</sup>,ê,Ā,¢,é B

**DIERR\_OLDDIRECTINPUTVERSION:** DirectInput,Ìfo [fWf‡f“,ªÆĀ,¢ B

**DIERR\_BETADIRECTINPUTVERSION:** fTf|

[fgŠO,Ā, ,éDirectInputfx [f^ Efo [fWf‡f“,É‘Î,μ,ĀfAfvfŠfP [fVf‡f“,ª ‘,©,ê,Ā,¢,½ B



## IDirectInput::QueryInterface

```
HRESULT QueryInterface(  
    LPDIRECTINPUT lpDirectInput,  
    REFIID riid,  
    LPVOID FAR* ppvObj);
```

**IDirectInput**,<sup>a</sup>Ɖp<sup>3</sup>,·,éIUnknownfCf“f^ [ftfFfCfX,îrê•” BfAfvfŠfP [fVf‡f“,žg—p,μ,æ,ϣ,Æ,μ,Ä,¢  
,éfCf“f^ [ftfFfCfX,ð,»»,îIfufWfFfNfg,<sup>a</sup>fTf| [fg,μ,Ä,¢,é,©,Ç,ϣ,©—â,¢ ‡,í,¹,é,½,ß,É—p,¢,é B—  
â,¢ ‡,í,¹,½,“Á’è,ìCOMfCf“f^ [ftfFfCfX,ðfIfufWfFfNfg,<sup>a</sup>fTf| [fg,μ,Ä,¢  
,é ê ‡ AfAfvfŠfP [fVf‡f“,Í,»,îfCf“f^ [ftfFfCfX,ð’¼,¿,ÉŽg—p,μŽn,ß,é,±,Æ,<sup>a</sup>,Ä,«,é B•K—  
v,ÈfCf“f^ [ftfFfCfX,<sup>a</sup>fTf| [fg,<sup>3</sup>,ê,Ä,¢,é ê ‡ AfAfvfŠfP [fVf‡f“,ìppvObjpf%of [f^,Éf|  
fCf“f^,<sup>a</sup>Ô,<sup>3</sup>,ê,é BfAfvfŠfP [fVf‡f“,»,»,îfCf“f^ [ftfFfCfX,ðŽg—p,μ,È,¢,© A, ,é,¢,ÍŽg—p,ð I—  
¹,μ,½ ê ‡,Í ARelease,ðĈÄ,Ñ o,μ,ÄfCf“f^ [ftfFfCfX,ð%ð•ú,μ,È, ,ê,î,È,ç,È,¢ B,±,îf f“fo,É,æ,è AŠù“¶], ,é,¢  
,Í «—,î<@”\,Æ Ö“Ĉ AŠ± Ä,·,é,±,Æ,È,**DirectInput**IfufWfFfNfg,ðŠg’£,Ä,«,é B Ú ×,É,Ä,¢,Ä,Í AOLEf}fjf...  
fAf<,ìIUnknown::QueryInterface,ðŽQ Ä,·,é,±,Æ B

lpDirectInput  
·,±,îf f“fo,<sup>a</sup>ĈÄ,Ñ o,<sup>3</sup>,ê,½DirectInputfIfufWfFfNfg,ðŽw,μŽ!,· B

riid  
•K—v,ÈfCf“f^ [ftfFfCfX,ðŽ~•Ê,·,éfCf“f^ [ftfFfCfXŽ~•ÊŽq(IID),ðŽw,μŽ!,· B

ppvObj  
—â,¢ ‡,í,¹,<sup>a</sup> ³ í,ÉŽÀ s,<sup>3</sup>,ê,é ê ‡•Ô,<sup>3</sup>,ê,éfCf“f^ [ftfFfCfX Ef|fCf“f^,“ă“ü,<sup>3</sup>,ê,é~Ê’u,ðŽw,μŽ!,· B

•Ô¹

DI\_OK  
DIERR\_INVALIDPARAM  
DIERR\_NOINTERFACE

## IDirectInput::Release

```
DWORD Release(  
    LPDIRECTINPUT lpDirectInput);
```

**IDirectInput**,<sup>a</sup>Ep<sup>3</sup>,,éIUnknownfCf“f^ [ftfFfCfX,îê” BŠÖ^A,î,,éCOMfIfufWfFfNfNg,îŽQ AƒJfEf“fg,đE,,ç,,½,ß,Ê—p,ç,ç,é,é BfIfufWfFfNfNg,<sup>a</sup> A %  
“É ì ¬,é,é,éA,« AZQ AƒJfEf“fg,î,ÉZfbfg,<sup>3</sup>,é,é BAddRef,“EÄ,Ñ o,<sup>3</sup>,é,é,½,Ñ,ÉŽQ AƒJfEf“fg,îfCf“fNfŠf f  
“fg,<sup>3</sup>,é,é ARelease,“EÄ,Ñ o,<sup>3</sup>,é,é,½,Ñ,ÉŽQ AƒJfEf“fg,îfNfNŠf f“fg,<sup>3</sup>,é,é BŽQ AƒJfEf“fg,<sup>0</sup>,E,É,é,É A,»,îfIfu  
fWfFfNfNg,î%đó·ú,<sup>3</sup>,é,é B Ú ×,É,Ä,ç,Ä,î AOlef}fjf...fAfç,î IUnknown::QueryInterface,đŽQ A,,é,±,Æ B

$$lpDirectInput_{,\pm,\tilde{f}}\,f^{\prime\prime}fo,^a\mathbb{E}\tilde{A},\tilde{N}\,o,^3,\hat{e},\frac{1}{2}DirectInputfIfufWfFfNfg,\delta\check{Z}w,\mu\check{Z}',\cdot\,B$$

•Ô'1

V,½,ÈŽQ ÆfJfEf“fg,đŠÜ,ĐDWORD B,±,ì•’l,ÍfffofbfO—p“r,É,¾,¬Žg—p,<sup>3</sup>,ê,é,±,Æ,É’ ^Ó B

## IDirectInput::RunControlPanel

```
HRESULT RunControlPanel(  
    LPDIRECTINPUT lpDirectInput,  
    HWND hwndOwner,  
    DWORD dwFlags);
```

$f^{\dagger}$  [fU,<sup>a</sup> V,<sup>1</sup>/<sub>2</sub>,È“ü—  
ÍfffofCfX,ðfCf“fXfg [f<,μ,<sup>1</sup>/<sub>2</sub>,èfZfbfgfAfbfv,ð C<sup>3</sup>,μ,<sup>1</sup>/<sub>2</sub>,è,Ä,«,é,æ,□ AWindows,ÌDirectInputRf“fgf [f<fpflf<,ð  
ŽÀ s,.,é,<sup>1</sup>/<sub>2</sub>,ß,É—p,¢,ç,ê,é BfT [fhfp [fefB,ìfRf“fgf [f<fpflf<,ÌŽÀ s,μ,È,¢ B

*lpDirectInput*  
 ,±,ìf f“fo,<sup>a</sup>ÆÄ,Ñ o,<sup>3</sup>,ê,<sup>1</sup>/<sub>2</sub>DirectInputIfufWfFfNfg,ðŽw,μŽ',. B

*hwndOwner*  
 Æä‘±,ÌUI,É‘Î,.,é efEfBf“fhfE,Æ,μ,Ä—p,¢  
 ,ç,ê,éEfBf“fhfE Efnf“fhf<,ðŽ<sup>−</sup>•Ê,.,é BNULL,Í efEfBf“fhfE,<sup>a</sup>¶ Ý,μ,È,¢,±,Æ,ðŽ',. B

*dwFlags*  
 Æ»Žž“\_,Ä,Íftf%fo,Í'è`<sup>3</sup>,ê,Ä,¢,È,¢ B,±,ìfpf%of [f^,Í0,Ä,È,<sup>−</sup>,ê,Î,È,ç,È,¢ B

## •Ô'I

COMGf%o [fR [fh,ð•Ô,· B`È%o°,ÌfGf%o [fR [fh,Í•Ô,<sup>3</sup>,ê,éfR [fh,Ì,.,×,Ä,Æ,ÍÆÀ,ç,È,¢ B  
**DI\_OK** = **S\_OK**: fffofCfX,Í Ú‘±,<sup>3</sup>,ê,Ä,¢,é B

**IDirectInputDevice**

IDirectInputDevicefCf“f^ [ftfFfCfX,Í A“ü—ÍfffofCfX,lfCf“fXf^f“fX,©,çff [f^,đŽæ“¾,·,é,½,ß,É—p,č,é B

## IDirectInputDevice::Acquire

```
HRESULT Acquire(  
    LPDIRECTINPUTDEVICE lpDirectInputDevice);
```

“ü—

ÍffofCfX,Ö,ÌfAfNfZfX,ðŽæ“¾,·,é BGetDeviceState,Ü,½,ÍGetDeviceData,ðŒÄ,Ñ o,·‘O,É AffofCfX,ð”FŽ̄,μ,Ä,·  
,©,È,̄,ê,Î,È,ç,È,¢ BffofCfX”FŽ̄,É,ÍŽQ ÆfJfEf“fg,“¶ Ý¹, AffofCfX,“ñ“x”FŽ̄³,ê,Äê“x%ð•ú³,ê,½ ê ‡ A  
ffofCfX,Í%ð•ú³,ê,½ ó‘Ô,É,È,é B

lpDirectInputDevice

,±,Ìf f“fo,³ŒÄ,Ñ o,³,ê,½DirectInputffofCfX EfIfufWfFfNfg,ðŽw,μŽ!,· B

•Ô¹

COMfGf%o [fh,ð•Ô,· B`È%°,ÌfGf%o [fh,Í A•Ô³,ê,éfR [fh,Ì,·,×,Ä,Æ,ÍŒÄ,ç,È,¢ B

DI\_OK = S\_OK: ‘€ ì,Í³ í I—¹,μ,½ B

S\_FALSE: fffofCfX,Í,·,Ä,É”FŽ̄³,ê,Ä,¢,é B,±,Ì¹,Í³ ífR [fh,Ä, ,é,±,Æ,É’ ^Ó,·,é,±,Æ B

DIERR\_INPUTLOST: fffofCfX,Ö,ÌfAfNfZfX,³—^,|,ç,ê,Ä,¢,È,¢ B

DIERR\_INVALIDPARAM = E\_INVALIDARG: fffofCfX,Í¹‘ð³,ê,½ff [f^ EftfH [f}fbfgŒ`Ž®,Ä,Í,È,¢ B

## IDirectInputDevice::AddRef

```
DWORD AddRef(LPDIRECTINPUTDEVICE lpDirectInputDevice);
```

**IDirectInputDevice**,<sup>a</sup>Ep<sup>3</sup>,·,éIUnknownfCf“f^[ftfFfCfX,îê•” BŠÖ~A,Ì, ,éCOMfIfufWfFfNfg,ìŽQ ÆfJfEf“fg,ð‘  
 ,â,·,½,ℓ,É—p,¢,ç,ê,é BfIfufWfFfNfg,<sup>a</sup> Ä %  
 ,É ì ¬,<sup>3</sup>,ê,é Ů,É AŽQ ÆfJfEf“fg,Í1,ÉfZfbfg,<sup>3</sup>,ê,é B**AddRef**,<sup>a</sup>ĈÄ,Ñ o,<sup>3</sup>,ê,é,½,Ñ,ÉŽQ ÆfJfEf“fg,ÍfCf“fNfŠf  
 f“fg,<sup>3</sup>,ê A**Release**,<sup>a</sup>ĈÄ,Ñ o,<sup>3</sup>,ê,é,½,Ñ,ÉŽQ ÆfJfEf“fg,ÍffNfŠf f“fg,<sup>3</sup>,ê,é BŽQ ÆfJfEf“fg,<sup>0</sup>É,È,é,Æ A,»,ìfIf  
 ufWfFfNfg,Í%øð•ú,<sup>3</sup>,ê,é B Ů ×,É,Â,¢,Ä,Í AOLEf}fjf...fAf<,ì **IUnknown::AddRef**,ðŽQ Æ,·,é,±,Æ B

*lpDirectInputDevice*

,±,Ìf f“fo,<sup>a</sup>ĈÄ,Ñ o,<sup>3</sup>,ê,½DirectInputffofCfX EfIfufWfFfNfg,ðŽw,μŽ!,· B

•Ö¹

V,½,ÈŽQ ÆfJfEf“fg,ðŠŮ,ÐDWORD B

**IDirectInputDevice::GetCapabilities**

```
HRESULT GetCapabilities(  
    LPDIRECTINPUTDEVICE lpDirectInputDevice,  
    LPDIDEVCAPS lpDIDevCaps);
```

“ü—ÍffofCfX,Ì îñ,ðŽæ“¾,·,é B

*lpDirectInputDevice*  
 ,±,Ìf f“fo,ªĖÄ,Ñ o,³,ê,½DirectInputffofCfX EfIfufWfFfNfg,ðŽw,μŽ!,· B

*lpDIDevCaps*  
 ,±,ÌŠÖ ”,ª îñ,ð•Ô,·**DIDEVCAPS** \‘ċ‘Ì,ðŽw,μŽ!,· B,±  
 ,Ìf f\fbfh,ðĖÄ,Ñ o,·‘O,É A \‘ċ‘Ì,ÌfTfCfY,ðdwSizeftfB [f<fh,ÄŽw’è,μ,Ä,¨,©,È,¯,ê,Î,È,Ç,È,ċ B

ŽQ Æ @DIDEVCAPS

**•Ô¹**

COMfGf%o [fR [fh,ð•Ô,· B^È%°,ÌfGf%o [fR [fh,Í•Ô,³,ê,éfR [fh,Ì,·,×,Ä,Æ,ÍĖÄ,Ç,È,ċ B  
**DI\_OK = S\_OK**: ‘Ė ì,Í ³ í I—¹,μ,½ B  
**DIERR\_INVALIDPARAM = E\_INVALIDARG**: lpDIDevCapsfpf%of [f^,ª—LĖø,Èf|fCf“f^,Ä,Í,È,ċ B

## IDirectInputDevice::GetDeviceData

```
HRESULT GetDeviceData(  
    LPDIRECTINPUTDEVICE lpDirectInputDevice,  
    DWORD cbObjectData,  
    LPDIDEVICEOBJECTDATA rgdod,  
    LPDWORD pdwInOut,  
    DWORD fl);
```

DirectInputffofCfX,©,çfobftf@ Eff [f^,ðŽæ“¾,·,é B

ffofCfX Eff [f^Žæ“¾,ì‘O,É ASetCooperativeLevel,É‘?’2fÇfxf<,ð ASetDataFormat,Éff [f^ EftfH [f}  
fbfg,ð,»,ê,¼,êfZfbfg,µ AAquire,ÄffofCfX,ð”FŽ~,µ,Ä,“,©,È,\_,ê,Î,È,ç,È,Ç B

lpDirectInputDevice  
\_,±,İf f“fo,“ÆÄ,Ñ o,³,ê,½DirectInputffofCfX EfIfufWfFfNfg,ðŽw,µŽ!,· B

cbObjectData

**DIDEVICEOBJECTDATA** \‘Ç‘İ,İfTfCfY,ðfofCfG,ÄŽ!,µ,½,à,İ B

rgdod

fobftf@ Eff [f^,ðŽó,~Žæ,é,½,ß,İDIDEVICEOBJECTDATA \‘Ç‘İ,İ”z—ñ B\*pdwInOut—v‘f,Ä \ ¬,³,ê,Ä,Ç  
\_,È,\_,ê,Î,È,ç,È,Ç B

\_,±,İpf%of [f^,“NULL,İ ê ± Afofobftf@ Eff [f^,Í,Ç,±,É,àŠi”[,³,ê,È,Ç,“ A,»,ê^ÈŠO,İ“@ İ,Í s,İ,é,é B

pdwInOut

Ä %o,İrgdod,É,æ,èŽw,µŽ!,³,ê,é”z—ñ,İ—v‘f ” BÇÄ,Ñ o,µÇÄ,ÍŽÄ Û,É“¾,Ç,ê,½—v‘f ” B

fl

ff [f^Žæ“¾,İ•û—@,ð §ÇÄ,·,éftf%ofO B0, ,é,Ç,ÍÈ%°,İftf%ofO,Ä, ,é B

**DIGDD\_PEEK:** fobftf@,©,ç €—Ú,ð í æ,µ,È,Ç BÇÄ‘±

,İGetDeviceData,İ“¬,¶ff [f^,ð“Ç,ÝŽæ,é B’È í,Í Aff [f^,Í“Ç,ÝŽæ,ç,ê,½ÇÄfobftf@,©,ç í æ,³,ê,é B

•Ö’l

**DI\_OK = S\_OK:** ·,×,Ä,İff [f^,Í ³ İ,ÉŽæ“¾,³,ê,½ Bff [f^,“Žæ“¾,³,ê,½,© A,Û,½,Ç,ê,®,ç,Ç,İ—  
È,İff [f^,“Žæ“¾,³,ê,½,©,ð^m,é,½,ß,È AfAfvfŠfP [fVf±f“,“\*pdwInOut,İ o—İ’l,ðf`fFfbfN,·,é•K—v,“ ,é,±  
,Æ,É’ ^Ö B,±,İ’l,“0,İ,Æ,«,Í Afofobftf@,“ó,Ä, ,é,±,Æ,ðŽ!,· B

**DI\_BUFFEROVERFLOW = S\_FALSE:**

ff [f^,Í ³ İ,ÉŽæ“¾,³,ê,½,“ AfffofCfX,İfobftf@ EftfCfY,“ \““Ä,È,©,Ä,½,½,ßff [f^,“Ç,Ä,©Ž,İ,ê,½ B,±  
\_,İ ê ± Afofobftf@ Eff [f^,İŽæ“¾%ñ ”,ð‘ ,â,·,© AfffofCfX Efobftf@,İfTfCfY,ð‘â,«,·,  
\_,µ,È,\_,ê,Î,È,ç,È,Ç B,±,İ•Ö’l,İfobftf@,“fl [fo [ftf [\_,µ,½ÇÄİDirectInputDevice::GetDeviceData,ð Ä %o  
\_,ÉÇÄ,Ñ o,·,Æ,«,¾,~•Ö,³,ê,é B,±,İfR [fh,Í ³ İfXfe [f^fX EfR [fh,Ä, ,é,±,Æ,É’ ^Ó B

**DIERR\_NOTACQUIRED:** fffofCfX,“FŽ~,³,ê,Ä,Ç,È,Ç B

**DIERR\_INPUTLOST:**

fffofCfX,Ö,İfAfNfZfX,“+‘f,³,ê,½ BfAfvfŠfP [fVf±f“,İfffofCfX,ð Ä”FŽ~,µ,È,\_,ê,Î,È,ç,È,Ç B

**DIERR\_INVALIDPARAM = E\_INVALIDARG:** ¬Çø,Èfpf%of [f^,“¶ Ý,µ,½ B

—á

ŽŸ,İ—á,Ä,Í A10ÇÄ,İfobftf@ Eff [f^—  
v‘f,ð“Ç,ÝŽæ,è A“Ç,ÝŽæ,èÇÄffofCfX Efobftf@,©,ç,»,ê,ç,ð í æ,·,é B

DIDEVICEOBJECTDATA rgdod[10];

DWORD dwItems = 10;

hres = IDirectInputDevice\_GetDeviceData(  
 pdid,  
 sizeof(DIDEVICEOBJECTDATA),  
 rgdod,  
 &dwItems,  
 0);

```
if (SUCCEEDED(hres)) {  
    // fobftf@,Í ³ İ,Éftf%ofbVf...,³,ê,½  
    // dwItems = ftf%ofbVf...,³,ê,½—v‘f ”
```



```

    if (hres == DI_BUFFEROVERFLOW) {
        // fofbftf@,^fI [fo [ftf [μ,½
    }
}

rgdod,ÉNULL,δ“n,μ €-Ú ”,Æ,μ,Ä-³CEÀ‘â,ðŽw’è,·,é,Æ Afobftf@,Íftf%fbfVf...,³ê Aftf%fbfVf...,³ê,½ €-
Ú ”,ª•Ö,³ê,é B

dwItems = INFINITE;
hres = IDirectInputDevice_GetDeviceData(
    pdid,
    sizeof(DIDeviceObjectData),
    NULL,
    &dwItems,
    0);
if (SUCCEEDED(hres)) {
    // fofbftf@,Í ³ í,Éftf%fbfVf...,³ê,½ D
    // dwItems = ftf%fbfVf...,³ê,½-v‘f ”
    if (hres == DI_BUFFEROVERFLOW) {
        // fofbftf@,^fI [fo [ftf [μ,½ B
    }
}

rgdod,ÉNULL,δ“n,μ,Ä €-Ú ”,Æ,μ,Ä-³CEÀ‘â,ðŽw’è,μ AffofCfX Efofbftf@,©,çff [f^,ð í œ,μ,È,¢,æ,□
,É,·,é,Æ AffofCfX Efofbftf@,Ì-v‘f ”,ð-â,¢ ‡,í,¹,é,Ì,Æ“-„,±,Æ,É,È,é B

dwItems = INFINITE;
hres = IDirectInputDevice_GetDeviceData(
    pdid,
    sizeof(DIDeviceObjectData),
    NULL,
    &dwItems,
    DIGDD_PEEK);
if (SUCCEEDED(hres)) {
    // dwItems = fofbftf@,Ì-v‘f ”
    if (hres == DI_BUFFEROVERFLOW) {
        // fofbftf@,ÌfI [fo [ftf [ªN,±,Á,½
        // ,·,×,Ä,Ìff [f^,ª ³ í,ÉfLfffvff`ff,³ê,½,í,-,Á,Í,È,¢
    }
}

rgdod,ÉNULL,δ“n,μ €-Ú,δ‘S,-v< ,μ,È,¢,Æ Afobftf@,ÌfI [fo [ftf [ªN,±,Á,½,©,Ç,□,©-
â,¢ ‡,í,¹,é,Ì,Æ“-„,±,Æ,É,È,é B

dwItems = 0;
hres = IDirectInputDevice_GetDeviceData(
    pdid,
    sizeof(DIDeviceObjectData),
    NULL,
    &dwItems,
    0);
if (hres == DI_BUFFEROVERFLOW) {
    // fofbftf@,ÌfI [fo [ftf [ªN,±,Á,½
}

```

**IDirectInputDevice::GetDeviceInfo**

```
HRESULT GetDeviceInfo(  
    LPDIRECTINPUTDEVICE    lpDirectInputDevice,  
    LPDIDEVICEINSTANCE     pdidi)
```

fffofCfX,ìŽ̄•Ê î•ñ,ðŽæ“¾,.,é B

**fpf%of** [f^

lpDirectInputDevice  
,±,ìf f“fo,ªŒÄ,Ñ o,³,ê,½DirectInputfffofCfX EfIfufWfFfNfg,ðŽw,μŽ!,· B

pdidi  
fffofCfX,ìŽ̄•Ê î•ñ,ðŽó,̄Žæ,é B,±,ìf f\fbfh,ðŒÄ,Ñ o,·‘O,É AŒÄ,Ñ o,μ‘□  
,**ÍDIDEVICEINSTANCE** \‘¢‘ì,ìdwSizeftfB [f<fh,ð %oŠú%o»,μ,È,̄,ê,î,È,Ç,È,¢ B

•Ô¹

COMfGf%o [fR [fh,ð•Ô,· B^È%o°,ìfGf%o [fR [fh,Í•Ô,³,ê,éfR [fh,ì,·,×,Ä,Æ,ÍŒÀ,Ç,È,¢ B  
**DI\_OK** = **S\_OK**: ‘€ ì,Í ³ í,É I—¹,μ,½ B  
**DIERR\_INVALIDPARAM** = **E\_INVALIDARG**: ,Ð,Æ,Â^È ã,ìfpf%of [f^,ª-³Œø,Â, ,Á,½ B

## IDirectInputDevice::GetDeviceState

```
HRESULT GetDeviceState(  
    LPDIRECTINPUTDEVICE lpDirectInputDevice,  
    DWORD cbData,  
    LPVOID lpvData);
```

DirectInputffofCfX,©,ç‘Žžff [f^,ðŽæ“¾,·,é B

ffofCfX Eff [f^Žæ“¾,ì‘O,É ASetCooperativeLevel,Éç‘²fÇfxfç,ð ASetDataFormat,Éff [f^ EftfH [f}  
fbfg,ð,»,ê,¼,êfZfbfg,µ AAcquire,ÄffofCfX,ð”FŽ¯,µ,Ä,“,©,È,¯,ê,Î,È,ç,È,¢ B

lpDirectInputDevice  
 ,±,İf f“fo,“ÇÄ,Ñ o,³,ê,½DirectInputffofCfX EfIfufWfFfNfg,ðŽw,µŽ‘,· B

cbData  
 lpvData,É,æ,èŽw,µŽ‘,³,ê,éofbftf@,İTfCfY,ðf ofCf g,ÄŽ‘,µ,½,à,İ B

lpvData  
 fffofCfX,İÇ» Ý,İ ó‘Ô,ðŽó,¯Žæ,é \‘ç‘İ,ðŽw,µŽ‘,· Bff [f^,İftfH [f}fbfg,Í A, ,ç,©,¶,  
İIDirectInputDevice::SetDataFormat,ðÇÄ,Ñ o,·,±,Æ,ÄÇ¯,ß,ç,ê,é B

## •Ô’I

COMfGf%o [fR [fh,ð•Ô,· B^È%°,İfGf%o [fR [fh,Í•Ô,³,ê,éfR [fh,İ,·,×,Ä,Æ,ÍÇÄ,ç,È,¢ B  
DI\_OK=S\_OK: ‘€ İ,İ ³ İ,É I—¹,µ,½ B

### E\_PENDING:

ffofCfX,É,Í,Û,¾ff [f^,“¶ Ý,µ,È,¢ BffofCfX,İ‘†,É,Í(,½,Æ,,İUSBfWf†fCfXfefBfbfN) AffofCfX,“fIf“,É,  
È,éŽž ,ÆffofCfX,“ff [f^,ð‘— M,µŽn,ß,éŽž ,İŠÔ,É‘Ô,çŽžŠÔ,ð—v,·,é,à,İ,“ ,é B,±  
,İfEfH [fÇfAfbfvŽžŠÔ† AGetDeviceState,İE\_PENDING,ð•Ô,· Bff [f^,“—~—p%oÄ”\  
,É,È,é,Æ AfCxf“fg’Ê”mfnf“fhfç,ÉfVfOfifç,“—,ç,ê,é B

DIERR\_NOTACQUIRED: fffofCfX,“”FŽ¯,³,ê,Ä,¢,È,¢ B

### DIERR\_INPUTLOST:

ffofCfX,Ö,İfAfNfZfX,“†‘f,³,ê,½ BfAfvfŠfP [fVf†f“,İffofCfX,ð Ä”FŽ¯,µ,È,¯,ê,Î,È,ç,È,¢ B

DIERR\_INVALIDPARAM= E\_INVALIDARG: lpvDatapf%of [f^,“—LÇø,Èf|fCf“f^,Ä,È,¢

,© A‘O%oñ,İSetDataFormat(ÇÄ,Ñ o,µ,ÄfZfbfg,³,ê,½ff [f^fTfCfY,ÆcbDatapf%of [f^,Æ,“ê’v,µ,È,¢ B

## IDirectInputDevice::GetObjectInfo

```
HRESULT GetObjectInfo(  
    LPDIRECTINPUTDEVICE lpDirectInputDevice,  
    LPDIDEVICEOBJECTINSTANCE pdidoi,  
    DWORD dwObj,  
    DWORD dwHow)
```

*fIfufWfFfNfg,ÉŠÖ,·,é î•ñ,ð“¾,é B*

*lpDirectInputDevice  
 ,±,İf f“fo,“ĖÄ,Ñ o,³,ê,½DirectInputffofCfX EfIfufWfFfNfg,ðŽw,μŽ',· B*

*pdidoi  
 fIfufWfFfNfg,ÉŠÖ,·,é î•ñ,ðŽó,⁀Žæ,é B,±,İf f\fbfh,ðĖÄ,Ñ o,·‘O,É AĖÄ,Ñ o,μ‘▯  
 ,**IDIDEVICEOBJECTINSTANCE** \‘ċ‘İ,İdwSizeftfB [f<fh,ð %Šú%»»,μ,È,⁀,ê,İ,È,Ç,È,ċ B*

*dwObj  
 fvf fpfefB,³fAfNfZfX,³,ê,éIfufWfFfNfg,ðŽ⁀•Ê,·,é B*

*dwHow  
 dwObj,İ%ððŽß•û-@,ðŽ⁀•Ê,·,é B*

ŽQ Æ @DIPROPHEADER

•Ô'İ

*COMfGf% [fR [fh,ð•Ô,· BˆÈ%°,İfGf% [fR [fh,Í—á Ø“İ,Ä, ,é,ÆˆÓ }  
 ,³,ê,Ä,⁀,è A•Ô,³,ê,éfR [fh,İ,·,×,Ä,Æ,ÍĖÄ,Ç,È,ċ B*

**DI\_OK = S\_OK**: ‘ċ İ,İ ³ İ,È İ—¹,μ,½ B

**DIERR\_INVALIDPARAM = E\_INVALIDARG**: ⁀Ėø,Èfpf%of [f^,“¶ Ý,·,é B

**DIERR\_OBJECTNOTFOUND**: Žw’è,³,ê,½fIfufWfFfNfg,“¶ Ý,μ,È,ċ B

## IDirectInputDevice::GetProperty

```
HRESULT GetProperty(  
    LPDIRECTINPUTDEVICE lpDirectInputDevice,  
    REFGUID rguidProp,  
    LPDIPROPHEADER pdiph);
```

“ü—ÍfffofCfX,ÉŠÖ,·,é îñ,ðŽæ“¾,·,é B,¢,-  
,Ä,©,ìfvf fpfefB,ÍDirectInputDevice::SetPropertyf f\fbfh,ìÆÄ,Ñ o,µ,ÄfZfbfg,³,ê,é B,»êÈŠÖ,Í“Ç,Ý o,µ ê—  
p,Ä, ,é BÍDirectInputDevice::SetPropertyf f\fbfh,ìfZfbfg%Ä”\,Èfvf fpfefB,ìfŠfXfg,ðŽQ Æ,·,é,±,Æ B

lpDirectInputDevice

,±,ìf f“fo,ªÆÄ,Ñ o,³,ê,½DirectInputfffofCfX EfIfufWfFfNfg,ðŽw,µŽ!,· B

rguidProp

Žæ“¾,³,ê,éfvf fpfefB,ìŽ·ÊŽq B, ,ç,©,¶,ß’èç’,³,ê,Ä,¢  
,éDIPROP\_\*¹¹,Ð,Æ,Ä,© Afvf fpfefB,ðŽ·Ê,·,éGUID,Ö,ìf|fCf“(C++,ðŽg—p,·,é ê ±,ÍŽQ Æ) B  
È%°,ìfvf fpfefB,ª“ü—ÍfffofCfX,É‘Î,µ,Ä, ,ç,©,¶,ß’èç’,³,ê,Ä,¢,é B

DIPROP\_AXISMODE

DIPROP\_BUFFERSIZE

DIPROP\_GRANULARITY

DIPROP\_RANGE

,±,ê,ç,ìfvf fpfefB,»ê,¼,ê,ì Ú ×,É,Ä,¢,Ä,Í A \‘‘ì,“,æ,Ñ’è ”,ì B,ÄÆÄ X,ìfvf fpfefB,ìL q,ðŽQ Æ,·,é,±  
,Æ B

pdiph

fvf fpfefB,ÉÈ‘¶,·,é \‘‘ì,ìDIPROPHEADER·”,ðŽw,µŽ!,· B

## •Ö¹

COMfGf% [fR [fh,ð·Ö,· BÈ%°,ìfGf% [fR [fh,Í·Ö,³,ê,éfR [fh,ì,·,×,Ä,Æ,ÍÆÄ,ç,È,¢ B

DI\_OK = S\_OK: ‘€ ì,Í ³ í,É I—¹,µ,½ B

DIERR\_INVALIDPARAM = E\_INVALIDARG: pdiphfpf%of [f^,ª—LÆø,Èf|fCf“f^,Ä,È,¢

,© AdwHowftfB [f<fh,ª³Æø,© A, ,é,¢,ÍdwHow,ªDIPH\_DEVICE,ÉfZfbfg,³,ê,Ä,¢

,È,ª,çdwObjftfB [f<fh,ª0,Ä,È,¢ B

DIERR\_OBJECTNOTFOUND: Žw’è,³,ê,½fIfufWfFfNfg,ª¶ Ý,µ,È,¢ B

DIERR\_UNSUPPORTED = E\_NOTIMPL:fffofCfX,Ü,½,ÍfIfufWfFfNfg,ªfvf fpfefB,ðfTf| [fg,µ,Ä,¢,È,¢ B

—á

È%°,ìÇ¾¾ÆêfR [fh,ìê·”,Í ADIPROP\_BUFFERSIZEfvf fpfefB,ì¹,ìŽæ“¾·ü—@,ðŽ!,µ,Ä,¢,é B

DIPROPDWORD dipdw;

HRESULT hres;

dipdw.diph.dwSize = sizeof(DIPROPDWORD);

dipdw.diph.dwHeaderSize = sizeof(DIPROPHEADER);

dipdw.diph.dwObj = 0; // fffofCfX,ìfvf fpfefB

dipdw.diph.dwHow = DIPH\_DEVICE;

hres = IDirectInputDevice\_GetProperty(pdid, DIPROP\_BUFFERSIZE, &dipdw.diph);

if (SUCCEEDED(hres)) {

// dipdw.dwData,Éfvf fpfefB,ì¹,ª“ü,é

}

## IDirectInputDevice::EnumObjects

```
HRESULT EnumObjects(  
    LPDIRECTINPUTDEVICE lpDirectInputDevice,  
    LPDIENUMDEVICEOBJECTSCALLBACK lpCallback,  
    LPVOID pvRef,  
    DWORD fl);
```

“ü—ÍffofCfX,É,“,Ä—~—p%oÂ”,È“ü—Íf\ [fX(Ž<sup>2</sup> Af{f^f“,È,Ç),ð—ñ<“,·,é B

*lpDirectInputDevice*

,±,İf f“fo,“EÄ,Ñ o,<sup>3</sup>,ê,½DirectInputffofCfX EfIfufWfFfNfg,ðŽw,μŽ!,· B

*lpCallback*

DirectInputDeviceIfufWfFfNfg,ðŽó, Žæ,éfAfvfŠfP [fVf‡f“,É,æ,è’è’,<sup>3</sup>,ê,½fR [f<fofbfNŠÖ ”,ðŽw,μŽ!,· B

**BOOL CALLBACK DIEnumDeviceObjectsProc(  
 LPCDIDEVICEOBJECTINSTANCE lpddoi,  
 LPVOID pvRef);**

*pvRef*

fR [f<fofbfN,É‘İ,·,éŽQ Æff [f^(fRf“fefLfXfg) B

*fl*

—ñ<“,<sup>3</sup>,ê,éfIfufWfFfNfg,İf^fCfv,ðŽw’è,·,éftf%ofo Bff [f^ EftfH [f}fbfg Ef^fCfv,İ‘g,Ý ‡,í,<sup>1</sup>,Ä, ,é,±,Æ,à, ,  
é BDirectInputff [f^ EftfH [f}fbfg Ef^fCfv,ðŽQ Æ,·,é,±,Æ B

•Ö¹

COMfGf%o [fR [fh,ð•Ö,· B`È%°,İfGf%o [fR [fh,Í•Ö,<sup>3</sup>,ê,éfR [fh,İ,·,×,Ä,Æ,ÍEÄ,ç,È,ç B  
**DI\_OK = S\_OK:** ‘€ ì,İ<sup>3</sup> í,É I—<sup>1</sup>,μ,½ BfR [f<fofbfN,“r’†,Ä—ñ<“,ð’†Ž~,μ,½ ê ‡ A—ñ<“,İ<sup>3</sup> í I—  
<sup>1</sup>,μ,½,ÆE©,È,<sup>3</sup>,ê,é,±,Æ,É’ ^Ó B  
**DIERR\_INVALIDPARAM = E\_INVALIDARG:** flfpf%of [f^,É—<sup>3</sup>Eø,Èftf%ofoO,<sup>a</sup>, ,Ä,½,© A, ,é,ç  
,İfR [f<fofbfN,<sup>a</sup>—<sup>3</sup>Eø,ÈfXfe [f^fX EfR [fh,ð•Ö,μ,½ B

## IDirectInputDevice::Initialize

```
HRESULT Initialize(  
    LPDIRECTINPUTDEVICE lpDirectInputDevice,  
    HINSTANCE hinst,  
    DWORD dwVersion,  
    REFGUID rguid);
```

DirectInputDeviceIfufWfFfNfg,đ %Šú%»,·,é B

,±,lf f\fbfh,<sup>a</sup> 3 í,ÉŽÀ s,<sup>3</sup>ê,È,©,Á,½ ê ± AfIfufWfFfNfg,Í ó‘Ô,<sup>a</sup>s’è,Á, ,é,ÆÆ©,È,<sup>3</sup>é,é B‘±  
, ,Á,»,lfIfufWfFfNfg,đŽg—p,·,é,É,Í Ä“x %Šú%»,l•K—v,<sup>a</sup> ,é,±,Æ,É’ ^Ô B

**IDirectInput::CreateDevice**f f\fbfh,ÍfffofCfX,đ ì ¬,·,é,ÆŽ©“@“I,É,»,ê,đ %Šú%»,·,é,½,ß A^Ê í,ÍAfvfŠfP [fV  
f±f“,©,ç,±,İŠÖ ”,ðÆÄ,Ñ o,•K—v,Í,È,¢ B

lpDirectInputDevice

,±,lf f“fo,<sup>a</sup>ÆÄ,Ñ o,<sup>3</sup>ê,½DirectInputfffofCfX EfIfufWfFfNfg,đŽw,μŽl,· B

hinst

DirectInputDeviceIfufWfFfNfg,đ ì ¬,μ,Ä,¢  
,éAfvfŠfP [fVf±f“,Ü,½,ÍDLL,lfCf“fXf^f“fX Efnf“fhf< BDirectInput,Í A,±,l’l,đ—p,¢,ÄAfvfŠfP [fVf±f“,  
,é,¢,ÍDLL,“F Ø,<sup>3</sup>ê,Ä,¢,é,©,Ç,²,©,ð’m,é B

dwVersion

Žg—p,<sup>3</sup>ê,½dinput.hfwfbf\_ftf@fCf<,lfo [fWf±f“”Ô † B,±,l’l,ÍDIRECTINPUT\_VERSION,Á,È,¬,ê,Î,È,ç,È,¢ B  
DirectInput,Í,±,l’l,đ—p,¢  
,Ä A,Ç,lfo [fWf±f“,lDirectInput,É‘Î,μ,ÄAfvfŠfP [fVf±f“,Ü,½,ÍDLL,<sup>a</sup> ÝÆv,<sup>3</sup>ê,½,Î,©,ðŠm’è,·,é B

rguid

fCf“f^ [ftfFfCfX,ÉŠÖ~A,Ì ,éfffofCfX,lfCf“fXf^f“fX,ðŽ~•Ê,·,é B**IDirectInput::EnumDevices**f f\fbfh,đ—p,¢  
,Ä AfVfXfef€,^,Ç,lfCf“fXf^f“fXGUID,ðfTf| [fg,μ,Ä,¢,é,©,ð’m,é,±,Æ,<sup>a</sup>Ä,«,é B

•Ô’l

COMfGf%o [fR [fh,ð•Ô,· B^È%°,lfGf%o [fR [fh,Í•Ô,<sup>3</sup>ê,éfR [fh,Ì,·,×,Ä,Æ,ÍÆÄ,ç,È,¢ B

**DI\_OK = S\_OK:** fffofCfX,Í Ú‘±,<sup>3</sup>ê,Ä,¢,é B

**DIERR\_OLDDIRECTINPUTVERSION:** DirectInput,lfo [fWf±f“,^ÆÄ,¢ B

**DIERR\_BETADIRECTINPUTVERSION:** fTf|

[fgŠÖ,Ä, ,éDirectInputfx [f^ Efo [fWf±f“,É‘Î,μ,ÄAfvfŠfP [fVf±f“,^ ,‘,©,ê,Ä,¢,½ B

**S\_FALSE:** fffofCfX,Írguid,É“n,<sup>3</sup>ê,½Cf“fXf^f“fXGUID,Ä,·,Ä,É %Šú%»,<sup>3</sup>ê,Ä,¢,½ B

**DIERR\_ACQUIRED:** fffofCfX,Í”FŽ~<sup>3</sup>ê,Ä,¢,é,<sup>a</sup> %Šú%»,Ä,«,È,©,Á,½ B

## IDirectInputDevice::QueryInterface

```
HRESULT QueryInterface(  
    LPDIRECTINPUTDEVICE lpDirectInputDevice,  
    REFIID riid,  
    LPVOID FAR* ppvObj);
```

**IDirectInputDevice**,<sup>a</sup>Ep<sup>3</sup>,·,éIUnknownfCf“f^ [ftfFfCfX,îê•” BfAfvfŠfP [fVf‡f“,<sup>a</sup>Žg—p,μ,æ,ϱ,Æ,μ,Ä,¢ ,éfCf“f^ [ftfFfCfX,ð,»,îIfufWfFfNfg,<sup>a</sup>fTf| [fg,μ,Ä,¢,é,©,Ç,ϱ,©—â,¢ ‡,í,¹,é,½,ß,É—p,¢,é B—â,¢ ‡,í,¹,½,“Á’è,ìCOMfCf“f^ [ftfFfCfX,ðfIfufWfFfNfg,<sup>a</sup>fTf| [fg,μ,Ä,¢ ,é ê ‡ AfAfvfŠfP [fVf‡f“,Í,»,îfCf“f^ [ftfFfCfX,ð’¼,¿,ÉŽg—p,μŽn,ß,é,±,Æ,<sup>a</sup>Ä,«,é B•K—v,ÈfCf“f^ [ftfFfCfX,<sup>a</sup>fTf| [fg,<sup>3</sup>ê,Ä,¢,é ê ‡ AfAfvfŠfP [fVf‡f“,ìppvObjpf%of [f^,Éf| fCf“f^,<sup>a</sup>Ô,<sup>3</sup>,ê,é BfAfvfŠfP [fVf‡f“,<sup>a</sup>,»,îfCf“f^ [ftfFfCfX,ðŽg—p,μ,È,¢,© A, ,é,¢,ÍŽg—p,ð I—¹,μ,½ ê ‡,Í ARelease,ðĀ,Ñ o,μ,ÄfCf“f^ [ftfFfCfX,ð%ð•ú,μ,È, ,ê,î,È,ç,È,¢ B,±,îf f“fo,É,æ,è AŠù“¶], ,é,¢ ,Í «—,î<@”\,Æ Œ“Ē AŠ± Ä,·,é,±,Æ,È,**DirectInput**IfufWfFfNfg,ðŠg’£,Ä,«,é B Ú ×,É,Ä,¢,Ä,Í AOLEf}fjf... fAf<,ìIUnknown::QueryInterface,ðŽQ Ä,·,é,±,Æ B

lpDirectInputDevice

,±,îf f“fo,<sup>a</sup>Ā,Ñ o,<sup>3</sup>,ê,½DirectInputffofCfX EfIfufWfFfNfg,ðŽw,μŽ!,· B

riid

•K—v,ÈfCf“f^ [ftfFfCfX,ðŽ•Ê,·,éfCf“f^ [ftfFfCfXID(IID),ðŽw,μŽ!,· B

ppvObj

—â,¢ ‡,í,¹,<sup>a</sup> <sup>3</sup> í,ÉŽÀ s,<sup>3</sup>,ê,½ ê ‡•Ô,<sup>3</sup>,ê,éfCf“f^ [ftfFfCfX Ef|fCf“f^,<sup>a</sup>ã“ü,<sup>3</sup>,ê,éÊ’u,ðŽw,μŽ!,· B

•Ô¹

DI\_OK

DIERR\_INVALIDPARAM

DIERR\_NOINTERFACE



## IDirectInputDevice::Release

```
DWORD Release(LPDIRECTINPUTDEVICE lpDirectInputDevice);
```

**IDirectInputDevice**,<sup>a</sup>Ep<sup>3</sup>,·,éIUnknownfCf“f^[ftfFfCfX,î~ê•” BŠÖ~A,Ì, ,éCOMfIfufWfFfNfg,ìŽQ ÆfJfEf“fg,ðE<sub>·,ç,·,½,ß,É—p,ç,ç,ê,é BfIfufWfFfNfg,<sup>a</sup> Ä %<sub>o</sub></sub>  
,É ì ¬,<sup>3</sup>,ê,é,Æ,« ÄŽQ ÆfJfEf“fg,Í1,ÊfZfbfg,<sup>3</sup>,ê,é BAddRef,<sup>a</sup>ĖÄ,Ñ o,<sup>3</sup>,ê,é,½,Ñ,ÉŽQ ÆfJfEf“fg,ÍfCf“fNfŠf f  
“fg,<sup>3</sup>,ê ARelease,<sup>a</sup>ĖÄ,Ñ o,<sup>3</sup>,ê,é,½,Ñ,ÉŽQ ÆfJfEf“fg,ÍffNfŠf f“fg,<sup>3</sup>,ê,é BŽQ ÆfJfEf“fg,<sup>0</sup>,É,È,é,Æ A,»,ìfIfu  
fWfFfNfg,Í%øð•ú,<sup>3</sup>,ê,é B Ú ×,É,Â,ç,Ä,Í AOLEf}fjf...fAf<,ì IUnknown::QueryInterface,ðŽQ Æ,·,é,±,Æ B

lpDirectInputDevice

,±,Ìf f“fo,<sup>a</sup>ĖÄ,Ñ o,<sup>3</sup>,ê,½DirectInputffofCfX EfIfufWfFfNfg,ðŽw,μŽ!,· B

## •Ô'l

V,½,ÈŽQ ÆfJfEf“fg,ðšÜ,ÐDWORD B,±,ì•Ô'l,ÍfffbfO—p“r,É,<sup>¾</sup>,¬Žg—p,<sup>3</sup>,ê,é,±,Æ,É’ ^Ó B

**IDirectInputDevice::RunControlPanel**

```
HRESULT RunControlPanel(  
    LPDIRECTINPUTDEVICE lpDirectInputDevice,  
    HWND hwndOwner,  
    DWORD dwFlags);
```

fffofCfX,ÉŠÖ~A,Ä,¯,ç,ê,½fRf“fgf [f<fpflf<,ðŽÄ s,·,é BfffofCfX,ÉŠÖ~A,Ä,¯,ç,ê,½fRf“fgf [f<fpflf<,”¶ Ý,µ  
,È,¢ ê ‡ AffftfHf<fg,İfffofCfX EfRf“fgf [f<fpflf<,”N“®,³,ê,é B

lpDirectInputDevice  
 ,±,İf f“fo,”ÆÄ,Ñ o,³,ê,½DirectInputfffofCfX EfIfufWfFfNfg,ðŽw,µŽ‘,· B

hwndOwner  
 Ąä‘±,İUI,É‘Î,·,é efEfBf“fhfE,Æ,µ,Ä—p,¢  
 ,ç,ê,éEfEfBf“fhfE Efnf“fhf<,ðŽ¯•Ê,·,é BNULL,Í efEfBf“fhfE,”¶ Ý,µ,È,¢,±,Æ,ðŽ‘,· B

dwFlags  
 Ą»Žž“\_,Ä,İftf%oO,Í’è<³,ê,Ä,¢,È,¢ B,±,İfpf%o [f^,Í0,Ä,È,¯,ê,Î,È,ç,È,¢ B

**•Ö’l**

COMfGf%o [fR [fh,ð•Ö,· B^È%°,İfGf%o [fR [fh,Í•Ö,³,ê,éfR [fh,İ,·,×,Ä,Æ,ÍĄÄ,ç,È,¢ B  
**DI\_OK = S\_OK:** ‘€ ì,Í ³ í,É I—¹,µ,½ B

```
HRESULT SetCooperativeLevel(
    LPDIRECTINPUTDEVICE lpDirectInputDevice,
    HWND hwnd,
    DWORD dwFlags);
```

$$\begin{array}{l} f\vee fXf\text{ef}\in \text{Ef}\rangle f\text{EfX},{}^{\text{a}}\text{r}^{\text{1}}\text{4f},\text{ [fh,}\mathring{\text{A}}^{\text{F}}\text{Z}^{\text{-3},\hat{\text{e}},\mathring{\text{A}},\text{C},\text{e}}\hat{\text{e}}\neq \text{AfffofCfX},{}^{\text{\%}}\text{o}\hat{\text{o}}\cdot\acute{\text{u}},{}^3,\hat{\text{e}},\hat{\text{e}},\ddot{\text{U}},\mathring{\text{A}}\text{f} \\ f\text{EfX}\text{EfJ}\text{ [f}\langle\text{f},{}^{\text{a}}\text{fXfNf}\mathring{\text{S}}\text{ [f}^{\text{-}},\text{\textcircled{C}},\text{\textcircled{C}}\text{\textcircled{C}},\text{\textcircled{!}},\ddot{\text{E}},\ddot{\text{E}},\hat{\text{e}},\pm,\mathring{\text{A}},\acute{\text{E}}'\text{ }\text{^}\acute{\text{O}}\text{ B} \end{array}$$

## hwnd

*dwFlags*

•Ô'1

COMFGf%00 [fR [fh,ð,Ô,· B`È%00,ÌfGf%00 [fR [fh,Í,Ô,³,ê,é fR [fh,Ì,·,×,Ä,Æ,ÍEÀ,ç,È,¢ B  
**DI\_OK = S\_OK:** ‘€ ,ì,Í ³ ,í,É Í—,µ,½ B  
**DIERR\_INVALIDPARAM = E\_INVALIDARG:** hwn d p f % o f [f^,É—³EØ,È f E f B f “ f h f E E f n f “ f h f < , , é , ¢ , Í—³EØ,È f t f % o f O , Ü , ½ , Í f t f % o f O , Ì g , Ý ± , í , 1 , a c n , ³ , ê , ½ B

## IDirectInputDevice::SetDataFormat

```
HRESULT SetDataFormat(  
    LPDIRECTINPUTDEVICE lpDirectInputDevice,  
    LPCDIDATAFORMAT lpdf);
```

DirectInputffofCfX,É'Î,·,éff [f^ EftfH [f]fbfg,ðfZfbfg,·,é Bff [f^ EftfH [f]  
fbfg,ÍfffofCfX,"FŽ~³,ê,é'O,ÉfZfbfg,·,é•K—v,ª, ,é Bff [f^ EftfH [f]  
fbfg,İfZfbfg,İ,½,¾^ê"x,¾,¯,Ä,È,¯,ê,İ,È,ç,È,¢ Bff [f^ EftfH [f]fbfg,ÍfffofCfX,"FŽ~³,ê,Ä,¢,éŠÔ,İ•İ X,·,é,±  
,Æ,ª,Ä,«,È,¢ Bff [f^ EftfH [f]fbfg,İfZfbfg,ÉŽ,"s,·,é,Æ Aff [f^ EftfH [f]  
fbfg îñ,İ,·,×,ÄŽ,·,İ,ê,é B»,»l,½,ßfffofCfX,"FŽ~³,ê,é'O,É—LÆø,Èff [f^ EftfH [f]  
fbfg,ðfZfbfg,µ,Ä,"©,È,¯,ê,İ,È,ç,È,¢ BfAfvfŠfP [fVf‡f“,İ'Ê í A, ,ç,©,¶,ß'è`³,ê,Ä,¢,éff [f^ EftfH [f]fbfg,Ä,  
,éc\_dfDIMouse,Û,½,İ c\_dfDIKeyboard,İ,¢,,ê,©,ð—p,¢,é B

lpDirectInputDevice

,±,İf f“fo,"ÆÄ,Ñ o,³,ê,½DirectInputffofCfX EfIfufWfFfNfg,ðŽw,µŽ',· B

lpdf

DirectInputDevice,ª•Ô,·ff [f^ EftfH [f]fbfg,ðL q,·,é \`¢'İ,ðŽw,µŽ',· B

•Ô'İ

COMfGf%o [fR [fh,ð•Ô,· B`È%°,İfGf%o [fR [fh,ÍŽÄ—á,ðŽ',·,±,Æ,ð`Ó }

,µ,Ä,"è A•Ô,³,ê,éfR [fh,İ,·,×,Ä,Æ,İÆÄ,ç,È,¢ B

DI\_OK = S\_OK: '€ ì,İ ³ í,È I—¹,µ,½ B

DIERR\_INVALIDPARAM = E\_INVALIDARG: lpdfp%of [f^,İ—LÆø,Èff|fCf“f^,Ä,İ,È,¢ B

DIERR\_ACQUIRED: fffofCfX,"FŽ~³,ê,Ä,¢,éŠÔ,Íff [f^ EftfH [f]fbfg,ð•İ X,·,é,±,Æ,ª,Ä,«,È,¢ B

## IDirectInputDevice::SetEventNotification

```
HRESULT SetEventNotification(
    LPDIRECTINPUTDEVICE lpDirectInputDevice,
    HANDLE Event);
```

fffofCfX ó'Ô,îĬ XŽž,ÉfZfbfg,³,ê,éfCxf“fg,ðŽw'è,·,é BfCxf“fg'Ê'm,ðfIf,É,·,é,½,ß,É,à—p,ç,ç,é,é B

IDirectInputDeviceIfufWFFfNfg,ª,·,Ä,É'I'ð,µ,Ä,ç  
,éfCxf“fg,É'Ĭ,µCloseHandle,ðCEÄ,Ñ o,·,ÆfGf%o [,É,È,é B,»,Ĭ,½,ß AfCxf“fg Efnf“fhf<,ð•Ä,¶,é'O,É AhEventf  
pf%of [f^,ðNULL,ÉfZfbfg,µ,ÄIDirectInputDevice::SetEventNotification,ðCEÄ,Ñ o,³,È,—,ê,Ĭ,È,ç,É,ç B

fffofCfX,“FŽ—,³,ê,Ä,ç,éŠÖ,ÍfCxf“fg'Ê'mfnf“fhf<,ð•Ĭ X,·,é,±,Æ,Ĭ,Ä,«,È,ç B

ŠÖ ”,ª ³ í,ÉŽÀ s,³,ê,½ ê ± AfAvfŠfP [fVf±f“,Ĭ A'¼,İWin32fCxf“fg Efnf“fhf<,Æ“—Ĭ,Ĭ•û—  
@,ÄfCxf“fg Efnf“fhf<,ð—p,ç,é,±,Æ,ª,Ä,«,é BŽg—p@,Ĭ—á,ð`È%o°,ÉŽ',· BWin32fEfCfCfCgŠÖ ”,ð—p,ç  
,é Ŭ,Ĭ îñ,É,Ä,ç,Ä,Ĭ AWin32 SDK,“,æ,ÑŠÖ`A,Ĭf}fj...fAf<,ðŽQ Æ,·,é,±,Æ B

lpDirectInputDevice

,±,Ĭf f“fo,ªCEÄ,Ñ o,³,ê,½DirectInputfffofCfX EfIfufWFFfNfg,ðŽw,µŽ,Ĭ,· B

hEvent

fffofCfX ó'Ô,îĬ XŽž,ÉfZfbfg,³,ê,éfCxf“fg,Ö,Ĭfnf“fhf< BDirectInput,ÍfffofCfX,Ĭ ó'Ô,ª'İ%o»,·,é,Æ,«,Éfnf“fh  
f<,ðSetEvent,·,é B

Žè“@fŠfZfbfg EfCxf“fg,Ĭfnf“fhf<,ð Ĭ ¬,·,é,É,Ĭ A CreateEventŠÖ ”,ð—p,ç  
,é BfCxf“fg,ðŽ“@fŠfZfbfg EfCxf“fg,Æ,µ,Ä Ĭ ¬,µ,½ ê ± AfEfFfCfCgŽžŠÖ,ð%oß,¬,é,ÆOS,ªŽ“@“Ĭ,ÉfC  
xf“fg,ðfŠfZfbfg,·,é BfCxf“fg,ðŽè“@fŠfZfbfg EfCxf“fg,Æ,µ,Ä Ĭ ¬,µ,½ ê ± AResetEvent,ðCEÄ,Ñ o,µ,  
ÄfŠfZfbfg,·,é,Ĭ,ĬfAvfŠfP [fVf±f“,Ĭ—  
ðŠ,,Æ,È,é BDirectInput,ÍfCxf“fg'Ê'mfnf“fhf<,ð¾,é,½,ß,ÉResetEvent,ðCEÄ,Ñ o,·,±  
,Æ,Ĭ,µ,È,ç B,Ŭ,Æ,ñ,Ç,ĬfAvfŠfP [fVf±f“,Ä,ÍfCxf“fg,ðŽ“@fŠfZfbfg EfCxf“fg,Æ,µ,Ä Ĭ ¬,·,é B

hEvent,ªNULL,Ĭ ê ± A'Ê'm,Ĭ•s%oÄ”\,Æ,È,é B

## •Ô'Ĭ

COMfGf%o [fR [fh,ð•Ô,· B`È%o°,ĬfGf%o [fR [fh,Ĭ•Ô,³,ê,éfR [fh,Ĭ,·,×,Ä,Æ,ĬCEÄ,ç,È,ç B  
DI\_OK = S\_OK: € Ĭ,Ĭ ³ í,É Ĭ—¹,µ,½ B

DIERR\_ACQUIRED: IDirectInputDeviceIfufWFFfNfg,Ĭ'FŽ—,³,ê,Ä,ç

,é BIDirectInputDevice::Unacquire,ðCEÄ,Ñ o,µ,Ä A'Ê'm ó'Ô,îĬ X'O,ÉfffofCfX,ð%oð•ú,µ,È,—,ê,Ĭ,È,ç,È,ç B

DIERR\_HANDLEEXISTS:

IDirectInputDeviceIfufWFFfNfg,É,Ĭ AfCxf“fg'Ê'mfnf“fhf<,ª,·,Ä,É'¶ Ý,·,é BDirectInput,Ä,Ĭ A,ð,Æ,Ä,İDire  
ctInputDeviceIfufWFFfNfg,É'Ĭ,µfTf [fg,³,ê,éfCxf“fg'Ê'mfnf“fhf<,Ĭ,ð,Æ,Ä,¾,—,Ä, ,é B

E\_INVALIDARG: fCxf“fg Efnf“fhf<,Ä,Ĭ,È,ç B

—á

fnf“fhf<,ªE”Žž“—,ÄfZfbfg,³,ê,Ä,ç,é,ç,ç,ç Afuf fbfLf“fO,¹,,Éf`fFfbfN,·,é B

```
dwResult = WaitForSingleObject(hEvent, 0);
if (dwResult == WAIT_OBJECT_0) {
    // fCxf“fg,ªfZfbfg,³,ê,½
    // fCxf“fg,ªŽ“@fŠfZfbfg,Æ,µ,Ä Ĭ ¬,³,ê,½ ê ± A
    // ,»,ê,à,Ŭ,½fŠfZfbfg,³,ê,é
}
```

ŽŸ,Ĭ—á,Ä,Ĭ AfCxf“fg,ªfZfbfg,³,ê,é,Ŭ,Ä—³ §CEÄ,Éfuf fbfLf“fO,µ,Ä,ç,é B,±,ĬŽè—  
@,ĬCE~,µ,Ä „ §,Ä,«,È,ç BfEfFfCfCgŽžŠÖ,‰oß,¬,é,Ŭ,Ä AfXfÆfbfh,ªfVfXfef€(“Ä,ÉWindowsf fbfZ [fW)  
,É'Ĭ,µ,Ä%ž“š,µ,È,ç,ç,Ä, ,é B

```
dwResult = WaitForSingleObject(hEvent, INFINITE);
if (dwResult == WAIT_OBJECT_0) {
    // fCxf“fg,ªfZfbfg,³,ê,½
```

```

        // fCxf"fg,"Ž@“®fŠfZfbfg,Æ,μ,Ä ì ¬,³,ê,½ ê ‡ A
        // „,ê,à,Ü,½fŠfZfbfg,³,ê,é
    }

f fbfZ [fW Efx [fX,ÄfCxf"fg,ð,Ó,½,Ä—p,¢,Ä,¢,éAfvfŠfP [fVf‡f“,l“TÆ^“l,Èf fbfZ [fW Efx [fv,"ŽŸ,l
—á,Ä, ,é B

HANDLE ah[2] = { hEvent1, hEvent2 };

while (TRUE) {

    dwResult = MsgWaitForMultipleObjects(2, ah, FALSE,
        INFINITE, QS_ALLINPUT);
    switch (dwResult) {
    case WAIT_OBJECT_0:
        // fCxf"fg1,"fZfbfg,³,ê,½
        // fCxf"fg,"Ž@“®fŠfZfbfg,Æ,μ,Ä ì ¬,³,ê,½ ê ‡ A
        // „,ê,à,Ü,½fŠfZfbfg,³,ê,é
        ProcessInputEvent1();
        break;

    case WAIT_OBJECT_0 + 1:
        // fCxf"fg2,"fZfbfg,³,ê,½
        // fCxf"fg,"Ž@“®fŠfZfbfg,Æ,μ,Ä ì ¬,³,ê,½ ê ‡ A
        // „,ê,à,Ü,½fŠfZfbfg,³,ê,é
        ProcessInputEvent2();
        break;

    case WAIT_OBJECT_0 + 2:
        // Windowsf fbfZ [fW,ðŽó,¬žæ,Á,½
        // f fbfZ [fW,"È,È,é,Ü,Ä ^— ,ð s,¤
        while(PeekMessage(&msg, NULL, 0, 0, PM_REMOVE)){
            if (msg.message == WM_QUIT) {
                goto exitapp;
            }
            TranslateMessage(&msg);
            DispatchMessage(&msg);
        }
        break;

    default:
        // —Šú,μ,È,¢fGf% [
        Panic();
        break;
    }
}

f fbfZ [fW Efx [fX,Ä,È,¢AfvfŠfP [fVf‡f“,ÄfCxf"fg,ð,Ó,½,Ä—p,¢,Ä,¢
,é ê ‡,l“TÆ^“l,ÈfAfvfŠfP [fVf‡f“ Efx [fv,"ŽŸ,l—á,Ä, ,é B

HANDLE ah[2] = { hEvent1, hEvent2 };
DWORD dwWait = 0;

while (TRUE) {

    dwResult = MsgWaitForMultipleObjects(2, ah, FALSE,
dwWait, QS_ALLINPUT);
    dwWait = 0;

    switch (dwResult) {
    case WAIT_OBJECT_0:
        // fCxf"fg1,"fZfbfg,³,ê,½
        // fCxf"fg,"Ž@“®fŠfZfbfg,Æ,μ,Ä ì ¬,³,ê,½ ê ‡ A

```

```

// „,ê,à,Û,½fŠfZfbfg,³,ê,é
ProcessInputEvent1();
break;

case WAIT_OBJECT_0 + 1:
// fCxf“fg2,³fZfbfg,³,ê,½
// fCxf“fg,Ž“@fŠfZfbfg,Æ,µ,Ä ì ¬,³,ê,½ ê ‡ A
// „,ê,à,Û,½fŠfZfbfg,³,ê,é
ProcessInputEvent2();
break;

case WAIT_OBJECT_0 + 2:
// Windowsf fbfZ [fW,ðŽó,¬Žæ,Á,½
// f fbfZ [fW,³,Ê,,Ê,é,Û,Ä ^— ,ð s,²
while(PeekMessage(&msg, NULL, 0, 0, PM_REMOVE)){
    if (msg.message == WM_QUIT) {
        goto exitapp;
    }
    TranslateMessage(&msg);
    DispatchMessage(&msg);
}
break;

default:
// ‘Ò,Á,Ä,¢,é“ü—Í,âf fbfZ [fW,Í‘¶ Ý,µ,È,¢
// fQ [f€,ìfƒÆ [f€,ðÆ^,ß,é
// fQ [f€,³fAfCfhƒ‘ ó‘Ô,ì ê ‡ AŽŸ,ìfEfFfCfƒ,É‘Î,µ,Ä
// “ü—Í,âf fbfZ [fW,ð³ §ÆÄ,É‘Ô,ç‘±,¬,é,æ,²ŽwŽ|,·,é
if (!DoGame()) {
    dwWait = INFINITE;
}
break;
}
}

```

## IDirectInputDevice::SetProperty

```
HRESULT SetProperty(
    LPDIRECTINPUTDEVICE lpDirectInputDevice,
    REFGUID rguid,
    LPCDIPROPHEADER pdiph);
```

fffofCfX,ł““@,đ'è<`.,éfvf fpfefB,đfZfbfg,.,é BfZfbfg%Ō”\,Èfvf fpfefB,É,Í“ü—  
Ífofbftf@ EfTfCfY,âŽ²f, [fh,È,Ç,ª, ,é B,±  
,ê,ç,İfvf fpfefB,İŒ» Ý¹,Í AIDirectInputDevice::GetProperty f\fbfh,İŒÄ,Ŧ o,µ,ÄŽæ“¾,Ä,«,é B

lpDirectInputDevice

,±,İf f“fo,ªŒÄ,Ŧ o,³,ê,½DirectInputffofCfX EfIfufWfFfNfg,đŽw,µŽ¹,· B

rguidProp

fZfbfg,³,ê,éfvf fpfefB,İŽ`•ÈŽq B, ,ç,©,¶,ß'è<`³,ê,Ä,Œ,éDIPROP\_\*¹,İ,Œ,,ê,© A, ,é,Œ

,İfvf fpfefB,đŽ`•È,.,éGUID,Ö,İf|fCf“f^(C++,İ ê ±,İŽQ Œ) B

ˆÈ%°,İfvf fpfefB,ª“ü—ÍffofCfX,É¹,µ,Ä, ,ç,©,¶,ß'è<`³,ê,Ä,Œ,é B

**DIPROP\_AXISMODE**

**DIPROP\_BUFFERSIZE**

,±,ê,ç,İfvf fpfefB,»,ê,¼,ê,İ Ú ×,É,Ä,Œ,ª,Í A \Œ'İ,“,æ,Ŧ'è ”,İ B,ÄŒÄ X,İfvf fpfefB<L q,đŽQ Œ,.,é,±  
,Œ B

pdiph

fvf fpfefB,ÉˆÈ‘¶,.,é \Œ'İ,İDIPROPHEADER•”,đŽw,µŽ¹,· B

•Ō¹

COMfGf% [fR [fh,đ•Ō,· BˆÈ%°,İfGf% [fR [fh,Í•Ō,³,ê,éfR [fh,İ,·,×,Ä,Œ,ÍŒÄ,ç,È,Œ B

**DI\_OK = S\_OK:** ‘Œ İ,Í ³ í,É I—¹,µ,½ B

**DI\_PROPNOEFFECT = S\_FALSE:** ‘Œ İ,Í ³ í,É I—¹,µ,½,ª—

³Œø,Ä, ,é B,½,Œ,İ,İ AŽ²,ª“¶ Ý,µ,È,ŒffofCfX,ÄŽ²f, [fh,đ•İ X,.,é,Œ,±,İ¹,đ•Ō,· B

**DIERR\_INVALIDPARAM = E\_INVALIDARG:** pdiphpf%of [f^,ª—LŒø,Èf|fCf“f^,Ä,È,Œ

,© AdwHowftfB [f<fh,ª—³Œø,© A, ,é,Œ,ÍdwHow,ªDIPH\_DEVICE,ÉfZfbfg,³,ê,Ä,Œ

,È,ª,çdwObjftfB [f<fh,ª0,Ä,È,Œ B

**DIERR\_OBJECTNOTFOUND:** Žw'è,³,ê,½IfufWfFfNfg,ª“¶ Ý,µ,È,Œ B

**DIERR\_UNSUPPORTED = E\_NOTIMPL:**ffofCfX,Ü,½,İIfufWfFfNfg,ªfvf fpfefB,đfTf| [fg,µ,Ä,Œ,Œ,Œ B



**IDirectInputDevice::Unacquire**

```
HRESULT Unacquire(  
LPDIRECTINPUTDEVICE lpDirectInputDevice);
```

*ffofCfX,Ö,İfAfNfZfX,ð%ð•ú,·,é B*

*lpDirectInputDevice*  
*,±,İf f“fo,\*ĖÄ,Ñ o,<sup>3</sup>,ê,½DirectInputffofCfX EfIfufWfFfNfg,ðŽw,μŽ<sub>i</sub>,· B*

**•Ô'l**

*COMfGf%o [fR [fh,ð•Ô,· B`È%°,İfGf%o [fR [fh,Í•Ô,<sup>3</sup>,ê,éfR [fh,İ,·,×,Ä,Æ,ÍĖÄ,ç,È,¢ B*  
*DI\_OK = S\_OK: ‘€ ì,İ<sup>3</sup> í,É I—<sup>1</sup>,μ,½ B*  
*S\_FALSE: fIfufWfFfNfg,ÍĖ» Ý”FŽ<sup>-</sup>,<sup>3</sup>,ê,Ä,¢,È,¢ B`È‘O,É“ü—Í,ðŽ,,Á,½,½,ß,Ä, ,é%oÂ”\ «,<sup>a</sup>, ,é B,±*  
*,ê,İ<sup>3</sup> ífR [fh,Ä, ,é,±,Æ,É’ ^Ó B*

١٤٩

## DIDATAFORMAT

```
typedef struct {
    DWORD dwSize;
    DWORD dwObjSize;
    DWORD dwFlags;
    DWORD dwDataSize;
    DWORD dwNumObjs;
    LPDIOBJECTDATAFORMAT rgodf;
} DIDATAFORMAT;
```

**IDirectInputDevice::SetDataFormat** *f\fbfh,^ AfffofCfX,Ìff [f^ EftfH [f]fbfg,ðfZfbfg,·,é,Ì,É—p,¢  
,é B'Ê í,ÍfAfvfŠfP [fVf‡f“;”DIDATAFORMAT \‘¢‘ì,ð ì ¬,·,é•K—v,Í,È, A, ,ç,©,¶,ßfOf [fof<,Æ,μ,Ä'è^,³,ê,  
Ä,¢,éff [f^ A\_c\_dfiDlMouse, ,é,¢,Íc\_dfiDlKeyboard,Ì,¢,,ê,©,ð—p,¢,é,±,Æ,ª,Ä,«,é B*

### dwSize

**DIOBJECTDATAFORMAT** \‘¢‘ì,ÌfTfCfY B

### dwObjSize

**DIDATAOBJECTFORMAT** \‘¢‘ì,ÌfTfCfY B

### dwFlags

*ff [f^ EftfH [f]fbfg,Ì‘¼,Ì‘® «,ðL q,·,éftf%oO B*

*^È%°,Ìftf%oO,ª^è^,³,ê,Ä,¢,é B*

**DIDF\_RELAXIS:** *Ž²,ð â‘İf, [fh,ÉfZfbfg,·,é B,±,Ìftf%oO,ðff [f^ EftfH [f]fbfg,ÄfZfbfg,·,é,±,Æ,Í A*  
**IDirectInputDevice::SetProperty**,*ð%î,μ,ÄŽè ìÆ,ÄŽ²f, [fhfvf fpfefB,ðfZfbfg,·,é,±,Æ,Æ“™,Ä, ,é B,±*  
*,Ìftf%oO,ðDIDF\_ABSAXIS,Æ‘g,Ý ‡,í,¹,é,±,Æ,Í,Ä,«,È,¢ B*

**DIDF\_ABSAXIS:** *Ž²,ð â‘İf, [fh,ÉfZfbfg,·,é B,±,Ìftf%oO,ðff [f^ EftfH [f]fbfg,ÄfZfbfg,·,é,±,Æ,Í A*  
**IDirectInputDevice::SetProperty**,*ð%î,μ,ÄŽè ìÆ,ÄŽ²f, [fhfvf fpfefB,ðfZfbfg,·,é,±,Æ,Æ“™,Ä, ,é B,±*  
*,Ìftf%oO,ðDIDF\_RELAXIS,Æ‘g,Ý ‡,í,¹,é,±,Æ,Í,Ä,«,È,¢ B*

### dwDataSize

*fffofCfX,ª•Ô,·fffofCfX Eff [f^,ÌfTfCfY B,±*  
*,Ì¹,Ì,Ì”{ ”,Ä,È,¯,é,Ì,È,ç,, AfIfufWfFfNfgfŠfXfg,ÄŽw’è,³,ê,Ä,¢,éIfufWfFfNfg,·,×,Ä,É,Ä,¢*  
*,ÄdwOfs’l,ð%oz,¹,Ä,¢,È,¯,é,Ì,È,ç,È,¢ B*

### dwNumObjs

**rgodf**”z—ñ,É,¯,·,éIfufWfFfNfg ” B

### rgodf

**DIOBJECTDATAFORMAT** \‘¢‘ì,Ì”z—ñ,Ö,Ìf|fCf“f^,Ä A,»,é,¼,è,Ì \‘¢‘ì,Í, ,éIfufWfFfNfg Eff [f^,ªfffofCfX  
Eff [f^,É,¯,¢,Ä,Ç,Ì,æ,ª,É’Ê’m,³,é,é,×,«,©,ðL q,μ,Ä,¢,é B“¶ ê Š,É,Ó,½,Ä,Ì’Ü,È,é îñ,ªu,©,é,Ä,¢  
,é,© A,Ü,½,Ì“è,Ì îñ,ª2f— Š,É’u,©,é,Ä,¢,é,Æ Argodf,ÍfGf%o [,Æ,È,é B

### —á

*^È%°,Ì éÆ¼,Ä,Í A2Ž² i â‘İ Ä•W,Ä’Ê’m,³,é,é j,·,æ,Ñ,Ó,½,Ä,Ìf{f^f“,ð—~p,·,éfAfvfŠfP [fVf‡f“,Ä—p,¢  
,ç,é,éff [f^ EftfH [f]fbfg,ðfZfbfg,μ,Ä,¢,é B*

*// fAfvfŠfP [fVf‡f“,Ì^È%°,Ì \‘¢‘ì,ð—p,¢,ÄfffofCfX Eff [f^,ð“Ç,Ý ž,b,Æ%¼’è,·,é*

```
typedef struct MYDATA {
    LONG lX; // xŽ²
    LONG lY; // yŽ²
    BYTE bButtonA; // f{f^f“
    BYTE bButtonB; // •Ê,Ìf{f^f“
    BYTE bPadding[2]; // fTfCfY,ªdword,Ì”{ ”,Ä,È,¯,é,Ì,È,ç,È,¢
} MYDATA;
```

*// ,»,μ,Ä^È%°,Ìff [f^ EftfH [f]fbfg,ð—p,¢,é,±,Æ,ª,Ä,«,é*

```
DIOBJECTDATAFORMAT rgodf[] = {
    { &GUID_XAxis, FIELD_OFFSET(MYDATA, lX), 0, DIDFT_AXIS |
DIDFT_ANYINSTANCE, },
    { &GUID_YAxis, FIELD_OFFSET(MYDATA, lY), 0, DIDFT_AXIS |
DIDFT_ANYINSTANCE, },
```

```

    { &GUID_Button,    FIELD_OFFSET(MYDATA, bButtonA), 0, DIDFT_BUTTON |
DIDFT_ANYINSTANCE, },
    { &GUID_Button,    FIELD_OFFSET(MYDATA, bButtonB), 0, DIDFT_BUTTON |
DIDFT_ANYINSTANCE, },
};
#define numObjects (sizeof(rgodf) / sizeof(rgodf[0]))

DIDATAFORMAT df = {
    sizeof(DIDATAFORMAT),          // ,±,ì \‘çì
    sizeof(DIOBJECTDATAFORMAT), // fIfufWfFfNfg Eff [f^ EftfH [f}fbfg,ìfTfCfY
    DIDE_ABSAXIS,                  // â‘İŽ² Å•W
    sizeof(MYDATA),                // fffofCfX Eff [f^fTfCfY
    numObjects,                   // fIfufWfFfNfg ”
    rgodf,                        // ,±,ê,Å I,í,è
};

```

## DIDEVCAPS

```
typedef struct {
    DWORD dwSize;
    DWORD dwDevType;
    DWORD dwFlags;
    DWORD dwAxes;
    DWORD dwButtons;
    DWORD dwPOVs;
} DIDEVCAPS;
```

**IDirectInputDevice::GetCapabilities** *f\fbfh,É,æ,è—p,¢,ç,ê AfffofCfX,lfvf fpfefB,ð•Ô,· B*

### dwSize

*\‘¢‘İ,İfTfCfY,ðfofCfg,ÅŽw’è,·,é B* IDirectInputDevice::GetCapabilities,ðĖÄ,Ń o,·‘O,É %Šú%»»,μ,È,¯,ê,Î,È,ç,È,¢ B

### dwDevType

*fffofCfX Ef^fCfvŽw’èŽq B,±,İftfB [f<fh,İ<L q,É,Â,¢,Ä,Í ADirectInputfffofCfX Ef^fCfv<L qfR [fh,ðŽQ Æ,·,é,±,Æ B*

### dwFlags

*fffofCfX,ÉŠÖ~A,·,éftf%ofo B^È%°,İftf%ofo,ª’è<³,ê,Ä,¢,é B*

**DIDC\_ATTACHED:** *fffofCfX,Í•— “I,É Ú‘±³,ê,Ä,¢,é B*

**DIDC\_POLLEDDEVICE:** *fffofCfX,ÍŠ,,,è ž,Ýà“@Ė^,Â,Í,È,f| [fŠf“foĖ^,Â,·,é Bff [f^,ð“¾,é,½,B,É,ÍfAfvfŠfP [fVf‡f“,ª—¾Ž,“I,É*

**IDirectInputDevice::GetDeviceState**,ðĖÄ,Ń o,³,È,¯,ê,Î,È,ç,È,¢ Bfofbftf@fŠf“fo,“,æ,ŃfCfxf“fg’Ê’m,ÍĖø%oÊ,ª,È,¢ B

### dwAxes

*fffofCfX ã,Â—~—p%oÂ”\,ÈŽ²,İ ”,ðŽw’è,·,é B*

### dwButtons

*fffofCfX ã,Â—~—p%oÂ”\,Èf{f^f“ ,İ ”,ðŽw’è,·,é B*

### dwPOVs

*fffofCfX ã,Â—~—p%oÂ”\,ÈŽ<“\_fRf“fgf [f%o,İ ”,ðŽw’è,·,é B* IDirectInputfo [fWf‡f“3.0,Â,Í—~—p,³,ê,È,¢ B

## DIDEVICEINSTANCE

```
typedef struct {
    DWORD dwSize;
    GUID guidInstance;
    GUID guidProduct;
    DWORD dwDevType;
    TCHAR tszInstanceName[MAX_PATH];
    TCHAR tszProductName[MAX_PATH];
} DIDEVICEINSTANCE;
```

**IDirectInput::EnumDevices**, ,æ, Ñ **IDirectInputDevice::GetDeviceInfo** f\fbfh,É,æ,è—p,¢  
,ç,ê A“Á’è,ÌffofCfX EfCf“fXf^f“fX,ÉŠÖ,·,é î•ñ,ð•Ô,· B

### dwSize

\‘¢‘İ,İfTfCfY,ðf ofCf g ”,ĂŽ!,· B

### guidInstance

ˆêˆÓ“I,ÈŽˆ•ÊŽq,Ă Aftf ofCfX,İfCf“fXf^f“fX,ðŽˆ•Ê,·,é BfAfvfŠfP [fVf‡f“,Í,±  
,İfCf“fXf^f“fXGUID,ð Ý’èftf@fCf<,É•Ů‘ł,µ AĖã,É—~—p,Ă,«,é BfCf“fXf^f“fXGUID,Íf}fVf“ĖĂ—L,Ă, ,è  
A, ,éf}fVf“,©,ç“¾,ç,ê,½fCf“fXf^f“fXGUID,Í•Ê,İf}fVf“,İfCf“fXf^f“fXGUID,Æ,Í–ŠÖĖW,Ă, ,é B

### guidProduct

»•i,ðŽˆ•Ê,·,éêˆÓ“I,ÈŽˆ•ÊŽq B,±,İŽˆ•ÊŽq,İff ofCfX,İ »‘¢%oiŽĐ,“è,ß,é B

### dwDevType

ff ofCfX Ef^fCfvŽw’èŽq B,±,İftfB [f<fh,İkL q,É,Ă,¢  
,Ă,Í A**DirectInputff ofCfX Ef^fCfv<L qfR [fh,ðŽQ** Æ,·,é,±,Æ B

### tszProductName[MAX\_PATH]

»•i,İfjfbfNfl [fĖ B,½,Æ,,İ A” Frobozz Industries SuperStick 5X" B

### tszInstanceName[MAX\_PATH]

fCf“fXf^f“fX,İfjfbfNfl [fĖ B,½,Æ,,İ A” Joystick 1" B

## DIDEVICEOBJECTDATA

```
typedef struct {
    DWORD dwOfs;
    DWORD dwData;
    DWORD dwTimeStamp;
    DWORD dwSequence;
} DIDEVICEOBJECTDATA;
```

**IDirectInputDevice::GetDeviceData** *f\fbfh,É,æ,è—p,¢,ç,ê Afobftf@ EfffofCfX îñ,»,ì,à,ì,ð•Ô,· B*

### dwOfs

*ff [f^,ªÊ'm,³,ê,éIfufWfFfNfg,Ì€» Ý,ìff [f^ EftfH [f]  
fbfg,Ô,ìfIfzfZfbfg B€¾,¢Š,·,é,ª A**IDirectInputDevice::GetDeviceState**  
,ð%oi,µ,Äff [f^,ª¾,ç,ê,½,Æ,«**dwData**,ªŠi"[³,ê,½ ê Š,Â, ,é B  
, ,ç,©,¶,B'è',³,ê,Ä,¢,éff [f^ EftfH [f]fbfg,ÉÎ,µ AdwOfsftfB [f<fh,ÍŽŸ,ì,æ,µ,É,È,é B  
fffofCfX,ªf}fEfX,Æ,µ,ÄfAfNfZfX,³,ê,Ä,¢,é ê ± **ADIMOFs** \*'l,ì,Ð,Æ,Â B  
fffofCfX,ªFL [f [fh,Æ,µ,ÄfAfNfZfX,³,ê,Ä,¢,é ê ± **ADIK** \*'l,ì,Ð,Æ,Â B  
fJfXf^f€ff [f^ EftfH [f]fbfg,ªfZfbfg,³,ê,Ä,¢,é ê ± AfJfXf^f€ff [f^ EftfH [f]  
fbfg,ÉÎ,·,éŠîfIfzfZfbfg B*

### dwData

*fffofCfX,©,ç“¾,ç,ê,½ff [f^ B,±,ìff [f^,ìftfH [f]  
fbfg,ÍfffofCfX,ìf^fCfv,ÉÊ“¶,·,é,ª A,Ç,ñ,È ê ±,É,àff [f^,Í,»,ì,Ü,Ü,Ì€`Ž@,Â'Ê'm,³,ê,é B*

#### DIDFT\_AXIS:

*fffofCfX,ªŠîŽ²f, [fh,Â, ,é ê ± A'ŠîŽ²%o^“®,ªÊ'm,³,ê,é BfffofCfX,ª âîŽ²f, [fh,Â, ,é ê ± A âîŽ² Â·  
W,ªÊ'm,³,ê,é B*

#### DIDFT\_BUTTON: dwData,ì%o°ÊfofCfg,ì,Ý,ªÓ—

*ì,ðŽ ,Â Bf{f^f“,ª%Ÿ,³,ê,é,Æ%o°ÊfofCfg,ì ãÊfrfbfg,ªfZfbfg,³,ê Af{f^f“,ª—£,³,ê,é,ÆfNfŠfA,³,ê,é B*

### dwTimeStamp

*f~fŠ·b'PÊ,Â“®,fefBfbfN EfJfEf“f^,Â A,±,ê,É ±,ì,¹,ÄfCxf“fg,ª ¶ ¬,³,ê,é B€» Ý,ìfVfXfef€  
,ìfefBfbfN EfJfEf“f^,Í A **GetTickCount**fVfXfef€ŠÖ ”,ð€Ä,Ñ o,µ,Â“¾,é B,±,ì¹,Í,·,æ,»50“ú,Âê „,·,é,±  
,Æ,É' °Ö B*

### dwSequence

*,±,ìfCxf“fg,ìDirectInput ± ~Ô † B,·,×,Ä,ìDirectInputfCxf“fg,É,Í' %oÁ,·,é ± ~Ô †,ªŠ,,,è“—,Ä,ç,ê,Ä,¢  
,é B,±,ê,É,æ,è AÜ,È,éfffofCfX,©,ç,ìfCxf“fg,ðŽŽ€n—ñ“I,Éf\ [fg,Â,«é B,±,ì¹,Íê „,·,é,Æ€³,É—  
ß,é,ì,Â A,Ó,½,Â,ì ± ~Ô †,ð”äŠr,·,é Ü,É,Í' °Ó,ð—v,·,é B **DISEQUENCE\_COMPARE**f}fNf ,ð—p,¢,Ä,±  
,ì”äŠr,ð^À'S,ÉŽÄ s,·,é,±,Æ,ª,Â,«é B*

## DIDEVICEOBJECTINSTANCE

```
typedef struct {
    DWORD dwSize;
    GUID guidType;
    DWORD dwOfs;
    DWORD dwType;
    DWORD dwFlags;
    TCHAR tszName[MAX_PATH];
} DIDEVICEOBJECTINSTANCE;
```

**IDirectInputDevice::EnumObjects** *f\fbfh,É,æ,è—p,¢,ç,ê AfffofCfX ã,ì“Á’è,ìIfufWfFfNfg(Ž² Af{f^f“,È,Ç)*  
*,ÉŠÖ,·,é îñ,ðfR [f<fofbfNSÖ ”,É•Ô,· B*

### dwSize

*‘¢‘ì,ìfTfCfY,ðfofCfg ”,ĂŽ!,· B,±,ì ‘¢‘ì,É,“,¢,Ă‘Ă—,ÈftfB [f<fh ”,ð’m,é,½,ß,É AfAfvfŠfP [fVf‡f“,ª,±*  
*,ì¹,ð^fFfbfN,·,é,±,Æ,ª, ,é BDirectInput 3.0,É,Ă,¢,Ă,Ĭ A,±,ì¹,Ĭsizeof(DIDEVICEOBJECTINSTANCE)*  
*,Æ,È,é B «—^fo [fWf‡f“,ĬDirectInput,Ă,Ĭ,æ,è‘ă,«,È¹,ð•Ô,·%ŎÂ” «,à, ,é B*

### guidType

*fIfufWfFfNfg,Ĭf^fCfv,ðŽ!,·Žˉ•ÊŽq B,±,ĬftfB [f<fh,ĬfIfvfVf‡f“,Ă, ,é B‘¶ Ý,·,é ê ±,ĬÈ%°,ì¹,Ĭ,□*  
*,Ĭ,Ĭ,Đ,Æ,Ă,Ă, ,é B*

**GUID\_XAxis:** *fRf“fgf [f%Ŏ,Ĭ ...•½Ž² B,½,Æ,,Ĭf}fEfX,Ĭ ...•½˘Ú“@,ðŽ!,·,±,Æ,à, ,é B*

**GUID\_YAxis:** *fRf“fgf [f%Ŏ,Ĭ ,¹⁄₄Ž² B,½,Æ,,Ĭf}fEfX,Ĭ ,¹⁄₄˘Ú“@,ðŽ!,·,±,Æ,à, ,é B*

**GUID\_ZAxis:** *fRf“fgf [f%Ŏ,Ĭ‘OEă,ĬŽ² B,½,Æ,,Ĭf}fEfX,ĬZ—Ö,Ĭ%ŏñ“,ðŽ!,·,±,Æ,à, ,é B*

**GUID\_Button:** *f}fEfX,Ĭf{f^f“ B*

**GUID\_Key:** *fL [f{ [fh,ĬfL [ B*

*‘¼,ĬfIfufWfFfNfg Ef^fCfv,à ;ĬĚă’è<³,ê,é%ŎÂ” «,ª, ,é(,½,Æ,,Ĭ AGUID\_Fire AGUID\_Throttle AGUID\_SteeringWheel j B*

### dwOfs

*,±,ĬfIfufWfFfNfg,ªÈ’m,·,éff [f^,ð Ă,àĬø—!,æ,“¾,ç,ê,é Aff [f^ EftfH [f}*  
*fbfg“à,Ă,ĬfIftfZfbfg BfJfXf^f€ff [f^ EftfH [f}fbfg,ð ‘z,·,éfAfvfŠfP [fVf‡f“,É‘Ĭ,µ,Ă,¾,—L^Ó,Ă, ,é B,*  
*Ù,Æ,ñ,Ç,ĬfAfvfŠfP [fVf‡f“,Ă,Ĭ,±,ì¹,ĬŽg—p,³,ê,È,¢ B*

### dwType

*fIfufWfFfNfg,ð<L q,·,éfffofCfX Ef^fCfvŽw’èŽq BfIfufWfFfNfg Ef^fCfv(Ž² Af{f^f“,È,Ç)*  
*,ð<L q,·,éDIDFT\_\*ftf%ofO,Ĭg,Ý ‡,Ĭ,¹,Ă A âÊfofCfg,É,ĬfIfufWfFfNfg EfCf“f^f“fX”Ô †,“ü,é BfIfufWfFfNfg*  
*fNfg EfCf“fXf^f“fX”Ô †,ðŠ o,·,é,É,ĬDIDFT\_GETINSTANCEf}fNf ,ð—p,¢,é B*

### dwFlags

*Ĭ»ŽŽ“\_,Ă,Ĭftf%ofO,Ĭ%Ŏ½,à’è<³,ê,Ă,¢,È,¢ B*

### tszName[MAX\_PATH]

*fIfufWfFfNfg,Ĭ—¼ Ĭ B,½,Æ,,Ĭ”X-Axis" ,ă “Right Shift" B*



```
typedef struct {
    LONG lX;
    LONG lY;
    LONG lZ;
    BYTE rgbButtons[4];
} DIMOUSESTATE;
```

IX

IV

12

**rgbButtons[4]**
$$f\{f^{\wedge}f^{\wedge},\grave{\text{ı}}\acute{\text{o}}\hat{\text{O}},\grave{\text{ı}}\text{z}\text{--}\tilde{\text{n}}\text{B}^{\text{Š}}\text{--},\cdot,\acute{\text{e}}f\{f^{\wedge}f^{\wedge},^{\text{a}}\% \ddot{\text{Y}},^3,\hat{\text{e}},\ddot{\text{A}},\text{¢},\acute{\text{e}}\hat{\text{e}}\nmid \text{A}\tilde{\text{a}}\hat{\text{E}}\text{rfrfbfg},^{\text{a}}\text{fZfbfg},^3,\hat{\text{e}},\acute{\text{e}}\text{B}$$

## DIOBJECTDATAFORMAT

```
typedef struct {
    const GUID * pguid;
    DWORD dwOfs;
    DWORD dwType;
    DWORD dwFlags;
} DIOBJECTDATAFORMAT;
```

**IDirectInputDevice::SetDataFormat**  $f\backslash fb\text{fh},^a\text{ AfffofCfX}^{\text{à},\text{ì}^{\text{P}}\text{êfIfufWfFfNfg},\text{É}^{\text{í},\mu},\text{Äff}\{f^{\wedge}\text{ EftfH}\{f\}$   
 $fbfg,\delta fZfbfg,\cdot,\text{é},\text{ì},\text{È}\text{—p},\text{Ç},\text{é}\text{ Bff}\{f^{\wedge}\text{ EftfH}\{f\}$   
 $fbfg,\text{Í}\cdot\text{ }^{\text{”}}\text{,}\text{ìDIOBJECTDATAFORMAT}\backslash^{\text{Ç}^{\text{í}},\text{©},\text{Ç}\backslash\neg,\text{^3},\text{ê}\text{ AŠefIfufWfFfNfg}(\text{Ž}^2\text{ Af}\{f^{\wedge}\text{f}^{\text{”}},\text{È},\text{Ç}\}$   
 $,\text{É}^{\text{í},\mu},\text{Ä},\text{D},\text{Æ},\text{Ä},\text{ì}\backslash^{\text{Ç}^{\text{í}},\text{a}^{\text{”}},\text{Ä},\text{Ç},\text{é}\text{ B},\pm,\text{ê},\text{Ç},\text{ì}\backslash^{\text{Ç}^{\text{í}},\text{ì}^{\text{”}}}\text{z—}$   
 $\text{ñ},\text{Í}\text{ AIDirectInputDevice::SetDataFormat},\text{É}^{\text{n},\text{^3},\text{ê},\text{éDIDATAFORMAT}\backslash^{\text{Ç}^{\text{í}},\text{a}^{\text{”}}},\text{Ä}\text{ B}^{\text{’}}\text{È}\text{ í},\text{ÍfAfvfŠfP}\{fVf\pm f^{\text{”}},^{\text{a}}\text{DIOB}$   
 $\text{JECTDATAFORMAT}\backslash^{\text{Ç}^{\text{í}},\text{ì}^{\text{”}}}\text{z—ñ},\text{ð}\text{ ì}\neg,\cdot,\text{é}\text{•K—v},\text{Í},\text{È},\text{ A},\pm,\text{ì}\backslash^{\text{Ç}^{\text{í}},\text{É}^{\text{í},\mu}\text{ Ý}^{\text{’}}\text{è},^{\text{a}},\text{,Ç},\text{©},\text{¶},\text{ß}^{\text{’}}\text{è}^{\text{’}},\text{^3},\text{ê},\text{Ä},\text{Ç}$   
 $,\text{éc\_dfDIMouse},\text{Ü},\text{½},\text{Í}\text{ c\_dfDIKeyboard},\text{ì},\text{Ç},\cdot,\text{é},\text{©},\text{ð—p},\text{Ç},\text{é}\text{ B}$

### pguid

$\text{Ž}^2\text{ Af}\{f^{\wedge}\text{f}^{\text{”}},\cdot,\text{é},\text{Ç},\text{í}^{\text{’}},\text{ì}^{\text{”}}\text{ü—Íf}\{fX,\text{É}^{\text{í}},\cdot,\text{é}\text{Ž}^{\text{’}}\text{•ÉŽq}\text{ Bff}\{f^{\wedge}\text{ EftfH}\{f\}fbfg,\text{ð—v}^{\text{’}},\cdot,\text{é}\text{ Ü},\text{È},\pm$   
 $,\text{ìftfB}\{f^{\text{’}}\text{fh},\text{ðNULL},\text{ÉfZfbfg},\cdot,\text{é},\text{Æ}\text{ A},\text{Ç},\text{ì},\text{æ},\text{ð},\text{Éf}^{\text{’}}\text{fCfv},\text{ìfIfufWfFfNfg},\text{Ä},\text{à},\text{Ç},\text{Ç},\text{Æ},\text{Ç},\text{ð}^{\text{’}}\text{Ö—j},\text{È},\text{È},\text{é}\text{ B}$

### dwOfs

$\text{“ü—Íf}\{fX,\text{É}^{\text{í}},\cdot,\text{éff}\{f^{\wedge},\text{“Ši}^{\text{”}}[\text{^3},\text{ê},\text{éff}\{f^{\wedge}\text{ EfpfPfbfg}^{\text{”}},\text{Ä},\text{ìfIftfZfbfg},\text{Ä}\text{ AŽ}^2,\text{ì},\text{æ},\text{ð}$   
 $,\text{ÉDWORDfTfCfY},\text{ìff}\{f^{\wedge},\text{É},\text{Ä},\text{Ç},\text{Ä},\text{Í4},\text{ì}^{\text{”}}\{^{\text{”}},\text{Ä},\text{È},\text{—},\text{ê},\text{ì},\text{È},\text{Ç},\text{È},\text{Ç}\text{ B},\text{à},\text{µ},\text{—}$   
 $,\text{Í}\text{ Af}\{f^{\wedge}\text{f}^{\text{”}},\text{É}^{\text{í}},\mu,\text{Ä}\text{•Ä},\text{x},\text{Ç},\text{é},\text{½fofCfG}\text{ EfAf\%ofCf}^{\text{”}}f^{\text{”}}f\text{G},\text{ì}^{\text{’}}\text{ B}$

### dwType

$f\text{IfufWfFfNfg},\text{ð}^{\text{’}}\text{L}\text{ q},\cdot,\text{éfffofCfX}\text{ Ef}^{\text{’}}\text{fCfvŽw}^{\text{’}}\text{èŽq}\text{ B},\pm,\text{ê},\text{Í}\text{ AfIfufWfFfNfgf}^{\text{’}}\text{fCfv}(\text{Ž}^2\text{ Af}\{f^{\wedge}\text{f}^{\text{”}},\text{È},\text{Ç}\}$   
 $,\text{ð}^{\text{’}}\text{L}\text{ q},\cdot,\text{éDIDFT\_*ftf\%o},\text{ì}^{\text{’}}\text{g},\text{Ý}\text{ }^{\text{’}},\text{í},\text{1},\text{Ä}\text{ A}\text{ ã}^{\text{’}}\text{ÈfofCfG},\text{É},\text{ìfIfufWfFfNfg}\text{ EfCf}^{\text{’}}\text{f}^{\text{’}}\text{f}^{\text{’}}\text{fX}^{\text{’}}\text{Ö}\text{ }^{\text{’}},\text{a}^{\text{’}}\text{ü},\text{é}\text{ Bff}\{f^{\wedge}\text{ E}$   
 $\text{ftfH}\{f\}fbfg,\text{ð—v}^{\text{’}},\cdot,\text{é}\text{ Ü},\text{È}\text{ A}^{\text{’}}\text{C}^{\text{’}}\text{Ö},\text{ìfCf}^{\text{’}}\text{fXf}^{\text{’}}\text{f}^{\text{’}}\text{fX},\text{a}^{\text{’}}\text{—e},\text{^3},\text{ê},\text{é},\pm$   
 $,\text{Æ},\text{ðŽ}^{\text{’}},\cdot,\text{½},\text{B},\text{È}\text{ AfCf}^{\text{’}}\text{fXf}^{\text{’}}\text{f}^{\text{’}}\text{fX}^{\text{’}}\text{•}^{\text{a}},\text{ðDIDFT\_ANYINSTANCE},\text{ÉfZfbfg},\cdot,\text{é},\pm,\text{Æ},\text{a},\text{Ä},\text{«},\text{é}\text{ B}$

### dwFlags

$\text{Æ}^{\text{’}}\text{ŽŽ}^{\text{’}}\text{—},\text{Ä},\text{ìftf\%o},\text{ì}^{\text{’}}\text{½},\text{à}^{\text{’}}\text{è}^{\text{’}},\text{^3},\text{ê},\text{Ä},\text{Ç},\text{È},\text{Ç}\text{ B},\pm,\text{ìftfB}\{f^{\text{’}}\text{fh},\text{Í0},\text{Ä},\text{È},\text{—},\text{ê},\text{ì},\text{È},\text{Ç},\text{È},\text{Ç}\text{ B}$

### —á

$\text{Ž}^{\text{’}}\text{Ý},\text{ìfIfufWfFfNfg}\text{ Eff}\{f^{\wedge}\text{ EftfH}\{f\}fbfg\text{Žw}^{\text{’}},\text{Ä},\text{Í}\text{ ADirectInput},^{\text{a}}\text{ Ä}\text{ }\text{‰},\text{ì}^{\text{’}}\text{—p}^{\text{’}}\text{‰Ä}^{\text{’}}\text{”}$   
 $,\text{ÈŽ}^2,\text{ð}^{\text{’}}\text{t}^{\text{’}}\text{ð},\mu\text{ A}^{\text{’}}\text{ì},\text{ðfffofCfX}\text{ Eff}\{f^{\wedge},\text{Æ},\mu,\text{ÄfIftfZfbfg4},\text{ÉDWORD},\text{Ä}^{\text{’}}\text{È}^{\text{’}}\text{m},\cdot,\text{é}\text{ B}$   
 $\text{DIOBJECTDATAFORMAT dfAnyAxis} = \{$   
 $\text{0},\text{ // f fCf}^{\text{’}}\text{fhfJ}\{f\text{h}$   
 $\text{4},\text{ // fIftfZfbfg}$   
 $\text{DIDFT\_AXIS} \mid \text{DIDFT\_ANYINSTANCE},\text{ // },\text{Ç},\text{ìŽ}^2,\text{Ä},\text{à},\text{©},\text{Ü},\text{í},\text{È},\text{Ç}$   
 $\text{0},\text{ // 0},\text{Ä},\text{È},\text{—},\text{ê},\text{ì},\text{È},\text{Ç},\text{È},\text{Ç}$   
 $\};$   
  
 $\text{Ž}^{\text{’}}\text{Ý},\text{ìfIfufWfFfNfg}\text{ Eff}\{f^{\wedge}\text{ EftfH}\{f\}$   
 $\text{fbfg}\text{Žw}^{\text{’}},\text{Ä},\text{Í}\text{ AfffofCfX},\text{ìXŽ}^2,\text{ðfffofCfX}\text{ Eff}\{f^{\wedge},\text{Æ},\mu,\text{ÄfIftfZfbfg12},\text{ÉDWORD},\text{Ä}^{\text{’}}\text{Ši}^{\text{’}}[\cdot,\cdot,\text{é}\text{ BfffofCfX},\text{É}\cdot\text{ }^{\text{’}},\text{ì}$   
 $\text{XŽ}^2,\text{a}^{\text{’}}\text{¶}\text{ Ý},\cdot,\text{é}\text{ ê}\text{ }^{\text{’}}\text{A}\text{ Ä}\text{ }\text{‰},\text{È}\text{—p}^{\text{’}}\text{‰Ä}^{\text{’}}\text{”},\text{È},\text{à},\text{ì},\text{a}^{\text{’}}\text{t}^{\text{’}}\text{ð},\text{^3},\text{é},\text{é}\text{ B}$   
 $\text{DIOBJECTDATAFORMAT dfAnyXAxis} = \{$   
 $\text{&GUID\_XAxis},\text{ // xŽ}^2,\text{Ä},\text{È},\text{—},\text{ê},\text{ì},\text{È},\text{Ç},\text{È},\text{Ç}$   
 $\text{12},\text{ // fIftfZfbfg}$   
 $\text{DIDFT\_AXIS} \mid \text{DIDFT\_ANYINSTANCE},\text{ // },\text{Ç},\text{ìxŽ}^2,\text{Ä},\text{à},\text{©},\text{Ü},\text{í},\text{È},\text{Ç}$   
 $\text{0},\text{ // 0},\text{Ä},\text{È},\text{—},\text{ê},\text{ì},\text{È},\text{Ç},\text{È},\text{Ç}$   
 $\};$   
  
 $\text{Ž}^{\text{’}}\text{Ý},\text{ìfIfufWfFfNfg}\text{ Eff}\{f^{\wedge}\text{ EftfH}\{f\}fbfg\text{Žw}^{\text{’}},\text{Ä},\text{Í}\text{ ADirectInput},^{\text{a}}\text{ Ä}\text{ }\text{‰},\text{ì}^{\text{’}}\text{—p}^{\text{’}}\text{‰Ä}^{\text{’}}\text{”}$   
 $,\text{Èf}\{f^{\wedge}\text{f}^{\text{’}},\text{ð}^{\text{’}}\text{t}^{\text{’}}\text{ð},\mu\text{ A},\text{»},\text{ì}^{\text{’}},\text{ìBYTE},\text{ì}\text{ ã}^{\text{’}}\text{Èfrfbfg},\text{ðfffofCfX}\text{ Eff}\{f^{\wedge},\text{Æ},\mu,\text{ÄfIftfZfbfg16},\text{É}^{\text{’}}\text{È}^{\text{’}}\text{m},\cdot,\text{é}\text{ B}$   
 $\text{DIOBJECTDATAFORMAT dfAnyButton} = \{$   
 $\text{0},\text{ // f fCf}^{\text{’}}\text{fhfJ}\{f\text{h}$   
 $\text{16},\text{ // fIftfZfbfg}$   
 $\text{DIDFT\_BUTTON} \mid \text{DIDFT\_ANYINSTANCE},\text{ // },\text{Ç},\text{ìf}\{f^{\wedge}\text{f}^{\text{’}},\text{Ä},\text{à},\text{©},\text{Ü},\text{í},\text{È},\text{Ç}$   
 $\text{0},\text{ // 0},\text{Ä},\text{È},\text{—},\text{ê},\text{ì},\text{È},\text{Ç},\text{È},\text{Ç}$   
 $\};$

```

ŽŸ,İfİfufWfFfNfg Eff [f^ EftfH [f}fbfgŽw'è,Ä,Í A DirectInput,ª Ä %o,İ—~p%oÄ"\
,ÈÖFire”f{f^f“,đ·İ'ð,µ A,»,İ'l,İBYTE,İ ãÊfrfbfg,ðffofCfX Eff [f^,Æ,µ,ÄfİftfZfbfg17,É'Ê'm,·,é B
fffofCfX,ÈÖFire”f{f^f“,ª¶ Ý,µ,È,¢ ê ‡ A,±,İff [f^ EftfH [f}fbfg,İfZfbfg•s%oÄ"\,Ä, ,é B
DIOBJECTDATAFORMAT dfAnyButton = {
    &GUID_FireButton,          // fİfufWfFfNfgf^fCfv
    17,                          // fİftfZfbfg
    DIDFT_BUTTON | DIDFT_ANYINSTANCE, // ,Ç,İf{f^f“,Ä,à,©,Ü,İ,È,¢
    0,                          // 0,Ä,È,¯,ê,İ,È,Ç,È,¢
};

ŽŸ,İfİfufWfFfNfg Eff [f^ EftfH [f}fbfgŽw'è,Ä,Í A
fffofCfX,İf{f^f“0,ðfffofCfX Eff [f^,Æ,µ,ÄfİftfZfbfg18,ÉŠi”[³,ê,éBYTE,İ ãÊfrfbfg,Æ,µ,Ä'Ê'm,·,é B
fffofCfX,Èf{f^f“0,ª¶ Ý,µ,È,¢ ê ‡ A,±,İff [f^ EftfH [f}fbfg,İfZfbfg•s%oÄ"\,Ä, ,é B
DIOBJECTDATAFORMAT dfButton0 = {
    0,                          // f fCf◁fhfJ [fh
    18,                          // fİftfZfbfg
    DIDFT_BUTTON | DIDFT_MAKEINSTANCE(0), // f{f^f“0
    0,                          // 0,Ä,È,¯,ê,İ,È,Ç,È,¢
};

```

## DIPROPDWORD

```
typedef struct {
    DIPROPHEADER diph;
    DWORD dwData;
} DIPROPDWORD;
```

DWORD *vf* *fpfefB*,Ö,İfAfNfZfX,É—p,¢,ç,ê,é”Ä—p \‘İ B

### diph

^È%°,İ,æ,ϣ,É %Šú%»»,μ,Ä,~,©,È,¯,ê,Î,È,ç,È,¢ B

**dwSize** = (DIPROPDWORD),İfTfCfY B

**dwHeaderSize** = (DIPROPHEADER),İfTfCfY B

**dwObj** = fIfufWfFfNfgŽ¯•ÊŽq B

**dwHow** = **dwObj**,İ%øŽß•û—@ B

### dwData

SetProperty,Ä,Í A,±,İ \‘İ,É,Í,±,İvf *fpfefB*,ÉfZfbfg,<sup>3</sup>,ê,é'l,<sup>a</sup>ŠÜ,Ü,ê,é BGetProperty,Ä,Í A,±,İ \‘İ,İvf *fpfefB*,İ'l,øŽó,¯Žæ,é B

## DIPROPHEADER

```
typedef struct {  
    DWORD dwSize;  
    DWORD dwHeaderSize;  
    DWORD dwObj;  
    DWORD dwHow;  
} DIPROPHEADER;
```

,·,×,Ä,Ïfvf fpfefB \‘İ,İ æ“a,É’u,©,ê,é”Ä—p \‘İ B

### dwSize

ŠÜ,ñ,Ä,¢,é \‘İ,ÏTfCfY B

### dwHeaderSize

DIPROPHEADER \‘İ,ÏTfCfY B

### dwObj

fvf fpfefB,ªfAfNfZfX,³,ê,éIfufWfFfNfg,ðŽ⁻•Ê,·,é B

dwHowtfB [f<fh,ªDIPH\_DEVICE,Ä, ,é ê ‡,Í0 B

dwHowtfB [f<fh,ªDIPH\_BYOFFSET,Ä, ,é ê ‡ Afvf fpfefB,ªfAfNfZfX,³,ê,æ,□,Æ,μ,Ä,¢  
,éIfufWfFfNfg,Ï« Ý,Ïff [f^ EftfH [f}fbfg,Ö,ÏIftfZfbfg B

dwHowtfB [f<fh,ªDIPH\_BYID,Ä, ,é ê ‡ A‘O%ñ,ÏIDirectInputDevice::EnumObjects,Ï«Ä,Ń o,μ,©,¢•Ô,³,ê,½D  
IDeviceObjectInstance,ÏdwTypetfB [f<fh,É•Ô,³,ê,éIfufWfFfNfg Ef^fCfv,Ü,½,ÍfCf“fXf^f“fXŽ⁻•ÊŽq  
B

### dwHow

dwObj,Ï%ðŽŽ•û—@,ðŽw’è,·,é B

## DIPROP RANGE

```
typedef struct {  
    DIPROPHEADER diph;  
    LONG lMin;  
    LONG lMax;  
} DIPROP RANGE;
```

**DIPROP RANGE** *f v f f p f e f B, <sup>a</sup> A Ž<sup>2</sup>, È, Ç, ð f I f u f W f F f N f g, ð" Í Í, ð f Z f b f g, â Ž æ " ¾, É — p, Ç, é B f f f o f C f X, ð" Í Í, <sup>a</sup> —  
<sup>3</sup> § Ç È, Å, , é ê ± A' Ê' m, <sup>3</sup> ê, é" Í Í, ð l **Min** = DIPROP RANGE\_ NOMIN, ", æ, Ñ l **Max** =  
DIPROP RANGE\_ NOMAX, Æ, È, é B" Í Í, <sup>a</sup> —<sup>3</sup> § Ç È, Å, , é f f f o f C f X, Å, Í % ñ, è ž, Ý, <sup>a</sup> s, í, ê, é, ±, Æ, É' ~ Ó B*

## diph

*^ È % °, Ì, æ, µ, É % Š ú % » , µ, Ä, ", ©, È, ¯, ê, Î, È, ç, È, Ç B*

**dwSize** = (DIPROP RANGE), ð f T f C f Y B

**dwHeaderSize** = (DIPROP HEADER), ð f T f C f Y B

**dwObj** = f I f u f W f F f N f g Ž ¯ • Ê Ž q B

**dwHow** = dwObj, ð % ð Ž Ž • û — @ B

## lMin

*" Í Í, ð % ° Ç È B*

## lMax

*" Í Í, ð ã Ç È B*

## JOYCAPS

```
typedef struct {
    WORD wMid;
    WORD wPid;
    CHAR szPname[MAXPNAMELEN];
    UINT wXmin;
    UINT wXmax;
    UINT wYmin;
    UINT wYmax;
    UINT wZmin;
    UINT wZmax;
    UINT wNumButtons;
    UINT wPeriodMin;
    UINT wPeriodMax;
    \\ ^È%°,Ìf f“fo,ÍÊ‘O,Ìfo [fWf‡f“,ÌWindows,Â,Í‘¶ Ý,μ,È,©,Á,½
    UINT wRmin;
    UINT wRmax;
    UINT wUmin;
    UINT wUmax;
    UINT wVmin;
    UINT wVmax;
    UINT wCaps;
    UINT wMaxAxes;
    UINT wNumAxes;
    UINT wMaxButtons;
    CHAR szRegKey[MAXPNAMELEN];
    CHAR szOEMVxD[MAXOEMVXD];
} JOYCAPS;
```

Žw’è,<sup>3</sup>,ê,½fWf‡fCfXfefBfbfN,Ì<@”\,ÉŠÖ,·,é îñ B

**wMid**  
»•¢ŽÒŽ¯•ÊŽq B

**wPid**  
»•iŽ¯•ÊŽq B

**szPname**  
fWf‡fCfXfefBfbfN,Ì »•i-¼,ªŠÜ,Ü,ê,é ANULL,Â I,í,é•¶Žš—ñ B

**wXmin AwXmax**  
x Â•W’l,Ì Â ¬’l,“,æ,Ñ Â‘â’l B

**wYmin AwYmax**  
y Â•W’l,Ì Â ¬’l,“,æ,Ñ Â‘â’l B

**wZmin AwZmax**  
z Â•W’l,Ì Â ¬’l,“,æ,Ñ Â‘â’l B

**wNumButtons**  
fWf‡fCfXfefBfbfN,Ìf{f^f“ ” B

**wPeriodMin AwPeriodMax**  
fAfvfŠfP [fVf‡f“,ªfWf‡fCfXfefBfbfN,ð•ß“,μ,½,Æ,«,ÉfTf| [fg,<sup>3</sup>,ê,éf| [fŠf“fOŽüŠú,Ì Â ¬’l,“,æ,Ñ Â‘â’l B

**wRmin AwRmax**  
f%of\_ [’l,Ì Â ¬’l,“,æ,Ñ Â‘â’l Bf%of\_ [,Í4”Ô-Ú,Ì%o^“@Ž²,Â ,é B

**wUmin AwUmax**  
u Â•W(5”Ô-Ú,ÌŽ²)’l,Ì Â ¬’l,“,æ,Ñ Â‘â’l B

**wVmin AwVmax**  
v Â•W(6”Ô-Ú,ÌŽ²)’l,Ì Â ¬’l,“,æ,Ñ Â‘â’l B

**wCaps**  
fWf‡fCfXfefBfbfN,Ì<@”\ B^È%°,Ìftf%ofo,Í AfWf‡fCfXfefBfbfN,ªŽ ,¿“¾,éEÂ X,Ì<@”\,ð’è`,·,é B  
JOYCAPS\_HASPOV  
fWf‡fCfXfefBfbfN,ÍŽ<“\_ îñ,ðŽ ,Â B

**JOYCAPS\_HASR**

*fWf‡fCfXfefBfbfN,Íf%of\_ [(4”Ô–Ú,ÌŽ²) î•ñ,ðŽ ,Â B*

**JOYCAPS\_HASU**

*fWf‡fCfXfefBfbfN,Íu À•W(5”Ô–Ú,ÌŽ²) î•ñ,ðŽ ,Â B*

**JOYCAPS\_HASV**

*fWf‡fCfXfefBfbfN,Ív À•W(6”Ô–Ú,ÌŽ²) î•ñ,ðŽ ,Â B*

**JOYCAPS\_HASZ**

*fWf‡fCfXfefBfbfN,Íz À•W î•ñ,ðŽ ,Â B*

**JOYCAPS\_POV4DIR**

*fWf‡fCfXfefBfbfN,ÌŽ<“\_,Í—£ŽU’l,ðfTf|  
[fg,·,é i’†%» A‘O ACEã A ¶,“,æ,N%»E j B*

**JOYCAPS\_POVCTS**

*fWf‡fCfXfefBfbfN,ÌŽ<“\_,ÍˆA‘±“I,È•ûˆÊŠp,ðfTf| [fg,·,é B*

**wMaxAxes**

*fWf‡fCfXfefBfbfN,ªfTf| [fg,·,éŽ²,Ì Â‘â ” B*

**wNumAxes**

*fWf‡fCfXfefBfbfN,É,æ,è£» ÝŽg—p,³,ê,Ä,¢,éŽ² ” B*

**wMaxButtons**

*fWf‡fCfXfefBfbfN,ªfTf| [fg,·,éf{f^f“,Ì Â‘â ” B*

**szRegKey**

*fWf‡fCfXfefBfbfN,É‘Î,·,éf£fWfXfgfŠ EfL [,ðŠÜ,Ð ANULL,Â I,í,é•¶Žš—ñ B*

**szOEMVxD**

*fWf‡fCfXfefBfbfNfhf%»fCfoOEM,ðŽ¯•Ê,·,é ANULL,Â I,í,é•¶Žš—ñ B*

ŽQ Æ @joyGetDevCaps



## JOYINFOEX

```
typedef struct joyinfoex_tag {
    DWORD dwSize;
    DWORD dwFlags;
    DWORD dwXpos;
    DWORD dwYpos;
    DWORD dwZpos;
    DWORD dwRpos;
    DWORD dwUpos;
    DWORD dwVpos;
    DWORD dwButtons;
    DWORD dwButtonNumber;
    DWORD dwPOV;
    DWORD dwReserved1;
    DWORD dwReserved2;
} JOYINFOEX;
```

*fWf‡fCfXfefBfbfN,İÊ'u AŽ<“\_,İÊ'u,“,æ,Ñf{f^f“,İ ó'Ô,ÉŠÖ,·,éŠg'£ îñ B*

### dwSize

*,±,İ \‘ç'İ,İfTfCfY,ðfofCfg ”,ĂŽ',· B*

### dwFlags

*,±,İ \‘ç'İ,ÉŠi”[,<sup>3</sup>,ê,½ îñ,<sup>a</sup>—LÆø,Ă, ,é,©,ðŽ',·ftf%ofOı—LÆø,È îñ,ðŠÜ,Ü,È,ç—  
v'f,İ0,ÉfZfbfg,<sup>3</sup>,ê,é;^È%°,İftf%ofO,“è^,<sup>3</sup>,ê,Ă,ç,é B*

### JOY\_RETURNALL

*JOY\_RETURNRAWDATA,ð æ,,·,×,Ă,İJOY\_RETURN'l,ðfZfbfg,·,é,±  
,Æ,Æ““™,Ă, ,é;*

### JOY\_RETURNBUTTONS

**dwButtons**—  
*v'f,É,İ AŞefWf‡fCfXfefBfbfN,İf{f^f“,İ ó'Ô,ÉŠÖ,·,é—  
LÆø,È îñ,“ŠÜ,Ü,ê,é B*

### JOY\_RETURNCENTERED

*ŠeŽ<sup>2</sup>,İ·İÊ,İ'†%o',l,ÉfWf‡fCfXfefBfbfN,İfjf... [fgf%of^Ê'u,ð'u, B*

### JOY\_RETURNPOV

**dwPOV**—*v'f,É,İ A—£ŽU“İ,È'P^Ê,ð—p,ç  
,ĂŽ',<sup>3</sup>,ê,éŽ<“\_fRf“fgf [f<,ÉŠÖ,·,é—LÆø,È îñ,“ŠÜ,Ü,ê,é B*

### JOY\_RETURNPOVCTS

The **dwPOV**—  
*v'f,É,İ A“A‘±“İ,Ă100•<sup>a</sup>,İ1“x,ð'P^Ê,Æ,µ,ĂŽ',<sup>3</sup>,ê,éŽ<“\_fRf“fgf [f<,  
ÉŠÖ,·,é—LÆø,È îñ,“ŠÜ,Ü,ê,é B*

### JOY\_RETURNR

The **dwRpos**—*v'f,É,İ A—LÆø,Èf%of\_ [fyf\_f< îñ,“ŠÜ,Ü,ê,é B,±  
,ê,İ4”Ô—Ü,İŽ<sup>2</sup>,“¶ Ý,·,é,±,Æ,ðŽ',·;*

### JOY\_RETURNRAWDATA

*fLfffŠfu fÆ [fVf‡f“,<sup>3</sup>,ê,Ă,ç,È,çfWf‡fCfXfefBfbfN,İŽwŽ',<sup>a</sup>,±  
,İ \‘ç'İ,ÉŠi”[,<sup>3</sup>,ê,Ă,ç,é,±,Æ,ðŽ',·;*

### JOY\_RETURNU

**dwUpos**—*v'f,É,İ AfWf‡fCfXfefBfbfN,İ5”Ô—Ü,İŽ<sup>2</sup>,“Žg—p%oÂ”\,Ă, ,ê,  
İ A,±,İŽ<sup>2</sup>,ÉŠÖ,·,é—LÆø,Èff [f^,“ŠÜ,Ü,ê,é B,»,□  
,Ă,È,ç ê ‡,İ0,“Ô,<sup>3</sup>,ê,é B*

### JOY\_RETURNV

**dwVpos**—*v'f,É,İ AfWf‡fCfXfefBfbfN,İ6”Ô—Ü,İŽ<sup>2</sup>,“Žg—p%oÂ”\,Ă, ,ê,  
İ A,±,İŽ<sup>2</sup>,ÉŠÖ,·,é—LÆø,Èff [f^,“ŠÜ,Ü,ê,é B,»,□  
,Ă,È,ç ê ‡,İ0,“Ô,<sup>3</sup>,ê,é B*

### JOY\_RETURNX

**dwXpos**—v'f,É,Í AfWf‡fCfXfefBfbfN,Ìx À•W,ÉŠÖ,·,é—  
LÆø,Èff [f^,ªŠÜ,Ü,ê,é B

#### JOY\_RETURNY

**dwYpos**—v'f,É,Í AfWf‡fCfXfefBfbfN,Ìy À•W,ÉŠÖ,·,é—  
LÆø,Èff [f^,ªŠÜ,Ü,ê,é B

#### JOY\_RETURNZ

**dwZpos**—v'f,É,Í AfWf‡fCfXfefBfbfN,Ìz À•W,ÉŠÖ,·,é—  
LÆø,Èff [f^,ªŠÜ,Ü,ê,é B

#### JOY\_USEDEADZONE

fWf‡fCfXfefBfbfN,Ìfjf... [fgf%of^Ê'u,Ì"Í,ðŠg'£,µ A,±  
,Ì"Í,ðfffbfhf] [f^,ÆÆÄ,Ô BfWf‡fCfXfefBfbfNfhf%ofCfo,Ífffbfh  
f] [f^"à,Ì,·,×,Ä,ÌÊ'u,É'Í,µ,Ä'è "'l,ð•Ö,· B

È%°,Ìftf%ofO,Í AfWf‡fCfXfefBfbfN,ðfLfffŠfuÆ [fVf‡f^,·,é,½,ß,Ìff [f^,ð'n<Ÿ,µ AfJfXf^f€ EfLfffŠfu  
fÆ [fVf‡f^ EfAfvfŠfP [fVf‡f^,ð'Í Ü,Æ,·,é,à,Ì,Ä,·,é B

#### JOY\_CAL\_READ3

x Ay Az À•W,ð"Ç,Ý ž,Ý A,»,Ì,Ü,Ü,Ì'l,ðdwXpos AdwYpos AdwZ  
pos—v'f,É,»,ê,¼,êŠi"[·,·,é B

#### JOY\_CAL\_READ4

f%of\_ [ î•ñ,·,æ,Ñx Ay Az À•W,ð"Ç,Ý ž,Ý A,»,Ì,Ü,Ü,Ì'l,ðdwRpo  
s AdwXpos AdwYpos AdwZpos—v'f,É,»,ê,¼,êŠi"[·,·,é B

#### JOY\_CAL\_READ5

f%of\_ [ î•ñ,·,æ,Ñx Ay Az Au À•W,ð"Ç,Ý ž,Ý A,»,Ì,Ü,Ü,Ì'l,ðdw  
Rpos AdwXpos AdwYpos AdwZpos AdwUpos—  
v'f,É,»,ê,¼,êŠi"[·,·,é B

#### JOY\_CAL\_READ6

fWf‡fCfXfefBfbfNf~fjfhf%ofCfo,ª¶ Ý,µ î•ñ,ð'n<Ÿ,µ,Ä,¢  
,é ê ±,Ì AvŽ²ff [f^,ð,»,Ì,Ü,Ü"Ç,Ý ž,Ð B,»,ª,Ä,È,·,ê,Î0,ð•Ö,· B

#### JOY\_CAL\_READALWAYS

fhf%ofCfo,ªfffofCfX,ðÆŸ'm,µ,È,¢ ê ±,Ä,·,Ä,Ä,à AfWf‡fCfXfefBf  
bfN,Ìf| [fg,ð"Ç,Ý ž,Ð B

#### JOY\_CAL\_READONLY

fWf‡fCfXfefBfbfNf~fjfhf%ofCfo,ª¶ Ý,µff [f^,ð'n<Ÿ,·,é ê ±,Íf%of  
\_ [ î•ñ,ð"Ç,Ý ž,Ý A,»,Ì,Ü,Ü,Ì'l,ðdwRpos—v'f,ÉŠi"[·,·,é B,»,ª  
,Ä,È,·,ê,Î0,ð•Ö,· B

#### JOY\_CAL\_READUONLY

fWf‡fCfXfefBfbfNf~fjfhf%ofCfo,ª¶ Ý,µff [f^,ð'n<Ÿ,·,é ê ±,Íu Ä  
•W,ð"Ç,Ý ž,Ý A,»,Ì,Ü,Ü,Ì'l,ðdwUpos—v'f,ÉŠi"[·,·,é B,»,ª  
,Ä,È,·,ê,Î0,ð•Ö,· B

#### JOY\_CAL\_READVONLY

fWf‡fCfXfefBfbfNf~fjfhf%ofCfo,ª¶ Ý,µff [f^,ð'n<Ÿ,·,é ê ±,Ív Ä  
•W,ð"Ç,Ý ž,Ý A,»,Ì,Ü,Ü,Ì'l,ðdwVpos—v'f,ÉŠi"[·,·,é B,»,ª  
,Ä,È,·,ê,Î0,ð•Ö,· B

#### JOY\_CAL\_READXONLY

x À•W,ð"Ç,Ý ž,Ý A,»,Ì,Ü,Ü,Ì'l,ðdwXpos—v'f,ÉŠi"[·,·,é B

#### JOY\_CAL\_READXYONLY

x Ay À•W,ð"Ç,Ý ž,Ý A,»,Ì,Ü,Ü,Ì'l,ðdwXpos AdwYpos—  
v'f,É,»,ê,¼,êŠi"[·,·,é B

#### JOY\_CAL\_READYONLY

y À•W,ð"Ç,Ý ž,Ý A,»,Ì,Ü,Ü,Ì'l,ðdwYpos—v'f,ÉŠi"[·,·,é B

#### JOY\_CAL\_READZONLY

z À•W,ð"Ç,Ý ž,Ý A,»,Ì,Ü,Ü,Ì'l,ðdwZpos—v'f,ÉŠi"[·,·,é B

**dwXpos AdwYpos AdwZpos**

,»,ê,¼,ê AĖ» Ý,ĭx Â•W Ay Â•W Az Â•W B

**dwRpos**

fWf‡fCfXfefBfbfN,ĭ4”Ô–Ú,ĭŽ²,Â, ,éf%of\_ [,ĭĖ» Ý,ĭĖ’u B

**dwUpos AdwVpos**

,»,ê,¼,ê A5”Ô–Ú A6”Ô–Ú,ĭŽ²,ĭĖ’u B

**dwButtons**

32,ĭfWf‡fCfXfefBfbfNf{f^f“,ĭĖ» Ý,ĭ óÔ B,±,ĭ—  
v’f,ĭ’l,ĭJOY\_BUTTONNnflags,ĭ”CÔ,ĭ’g,Ý ‡,í,¹,ĖfZfbfg,³,ê,é B,±,±,Ân,Í1,©,ç32,Ü,Â,ĭ’l,Â, ,éj,»,ê,¼,ê,ĭ’l,ĭ%Ÿ,³,ê,  
Â,ĉ,éf{f^f“,Ė’Š–,.,é B

**dwButtonNumber**

Ė» Ý%Ÿ,³,ê,Â,ĉ,éf{f^f“—v’f B

**dwPOV**

Ė» Ý,ĭŽ<“\_fRf“fgf [f<,ĭĖ’u B,±,ĭ—v’f,Ė’ĭ,.,é’l,Í0,©,ç35,900,Ü,Â,ĭ”Í’â,Ė, ,é B,±  
,ê,ç,ĭ’l,ĭ AŠeŽ<Šp,ð“x’PĖ,Â•\,μ100”{,μ,½,à,ĭ,Â, ,é B

**dwReserved1 AdwReserved2**

—\–ñ,³,ê,Â,ĉ,é,½,ßŽg—p,μ,Ė,ĉ B

**dwSize**—v’f,ĭ’l,ĭ A **joyGetPosEx**ŠÖ ”,Ė“n,³,ê,é Ũ,Ė,ĭ A,±,ĭ—v’f,ĭ \“ĉ’ĭ,Ė’ĭ,.,éfo [fWf‡f“”Ô †,ðŽ–•Ė,.,é,½,ß,Ė,à  
—p,ĉ,ç,ê,é B

Ž<“\_fRf“fgf [f<,ðŽ ,ÂfffofCfX,ĭ,Ũ,Æ,ñ,Ç,ĭ A5,Â,ĭĖ’u,μ,©Ž ,½,Ė,ĉ B  
JOY\_RETURNPOVftf%fo,ªfZfbfg,³,ê,Â,ĉ,é,Æ,« A,±,ê,ç,ĭĖ’u,ĭĖ%º,ĭJOY\_POV’è ”,ð—p,ĉ,Â’Ė’m,³,ê,éj

**Ž<“\_ĖŠÖ,.,éĖ’u**

**, Žß**

**JOY\_POVBACKWARD**

Ž<“\_fnfbfg,ªĖă,ë‘□,Ė, ,é B’l18,000,ĭ180.00“x,ĭ•ûĖü,ð•\  
,’i

**JOY\_POVCENTERED**

Ž<“\_fnfbfg,ĭfjf... [fgf%of^Ė’u,Ė, ,é B’l-1,ĭ AŽ<“\_fn  
fbfg,ªŠp“x,ð’Ė’m,μ,Â,ĉ,Ė,ĉ,±,Æ,ð”Ô–i,.,é B

**JOY\_POVFORWARD**

Ž<“\_fnfbfg,ĭ’O‘□,Ė, ,é B’l0,ĭ0.00“x,ĭ•ûĖü,ð•\, B

**JOY\_POVLEFT**

Ž<“\_fnfbfg,ĭ ¶‘□,Ė, ,é B’l27,000,ĭ270.00“x,ĭ•ûĖü,ð•\  
,. B

**JOY\_POVRIGHT**

Ž<“\_fnfbfg,ĭ%Ė‘□,Ė, ,é B’l9,000,ĭ90.00“x,ĭ•ûĖü,ð•\  
,. B

Windows 95,ĭffftfHf<fg,ĭfWf‡fCfXfefBfbfNfhf%foCfo,Â,ĭ AĖ»ŽŽ“\_,Â,ĭ,±,ê,ç,ĭ5,Â,ĭ—ĖŽU“ĭ,Ė•ûĖü,ªfTf|  
[fg,³,ê,Â,ĉ,é B’è<’,³,ê,½Ž<“\_,ĭ’l,μ,©fAfvfŠfP [fVf‡f“,Â—p,ĉ,é,±,Æ,ª,Â,«,Ė,ĉ ê ‡ªJOY\_RETURNPOVftf%fo,ð  
—p,ĉ,Ė, ,é,ĭ,Ė,ç,Ė,ĉj¼,ĭ’l,ĭŠp“x,ðfAfvfŠfP [fVf‡f“,Â—p,ĉ,é,±,Æ,ª,Â,«,Ė ê ‡ª—~p%Ė”\  
,Â, ,ê,ĭA“±“ĭ,Ėff [f^,ðJOY\_RETURNPOVCTStf%fo,ð—p,ĉ,ÂŽæ“¾,μ,Ė, ,é,ĭ,Ė,ç,Ė,ĉ  
j,Ü,½JOY\_RETURNPOVCTStf%fo,ĭ AJOY\_RETURNPOVftf%fo,Æ,Æ,à,Ė—p,ĉ,ç,ê,éJOY\_POV’è ”,àfTf|  
[fg,μ,Â,ĉ,é B

ŽQ Æ @**joyGetPosEx**

*fOf* [fɒf•i ”

## c\_dfDIKeyboard

, ,ç,©,¶,ß'è<',³,ê,Ä,č,éDIDATAFORMAT \‘č'İ,Å AfL [f{ [fh EfffofCfX,ð<L q,·,é B,±  
,İfIfufWfFfNfg,ÍDINPUT.LIBf%ofCfuf%fŠftf@fCf<,Å—^,|,ç,ê,Ä,č,é B

,±,İ \‘č'İ,Ö,İf|

fCf“f^,ÍIDirectInputDevice::SetDataFormat,Ö“n,³,ê A,»,İfffofCfX,afL [f{ [fhĚ`Ž®,ÅfAfNfZfX,³,ê,é,±  
,Æ,ðŽ',· B

**c\_dfDI**Mouse

, ,ç,©,¶,ß'è<`³,ê,Ä,ç,é**DIDATAFORMAT** \`ç'İ,Å Af}}fEfX EfffofCfX,ð<L q,·,é B,±  
,İfIfufWfFfNfg,ÍDINPUT.LIBf%ofCfuf%fŠftf@fCfç,Å—^,|,ç,ê,Ä,ç,é B

,±,İ \`ç'İ,Ö,İf|fCf“f^,Í**DirectInputDevice::SetDataFormat**,Ö“n,³,ê A,»,İfffofCfX,ªf}}fEfXE`Ž@,ÅAfNfZfX,³,ê,é,±  
,Æ,ðŽ',· B

## GUID\_SysKeyboard

, ,ç,©,¶,ß'è<',³,ê,Ä,¢,éDirectInput,ìfCf“fXf^f“fXGUID,Å AffftfHf<fg,ìfVfXfef€fL [f{ [fh,ð,Â,Ë,ÉŽQ Æ,·,é B,± ,ì'l,Í AfVfXfef€fL [f{ [fh,É'Í,·,éfCf“f^ [ftfFfCfX,ð ì ¬,·,é,½,ß,ÉIDirectInput::CreateDevice,Ö“n,³,ê,é,±,Æ,à, , é B

**GUID\_SysMouse**

, ,ç,©,¶,ß'è<',³,ê,Ä,¢,éDirectInput,ìfCf“fXf^f“fXGUID,Å AfftfHf<fg,ìfVfXfef€f}fEfX,ð,Â,Ë,ÉŽQ Æ,·,é B,±  
,ì'l,Í AfVfXfef€f}fEfX,É'Î,·,éfCf“f^ [ftfFfCfX,ð ì ¬,·,é,½,ß,ÉIDirectInput::CreateDevice,Ö“n,³,ê,é,±,Æ,à, ,é B



'è ”

## DIPROP\_AXISMODE

,,ç,©,¶,ß'è<³,ê,Ä,¢,éfvf fpfefB,Â AŽ²ff [f^f, [fh,lfZfbfg, ,é,¢,ÍŽæ“¾,É—p,¢,ç,ê,é B,±  
,l Y'è,Í A“Á'è,lfIfufWfFfNfg,É'İ,µ,Ä,Æ,¢,²,æ,è,ÍfffofCfX'S'İ,É“K—  
p,³,ê,é,l,Â AdwHowftfB [f<fh,ÍDIPH\_DEVICE,Â,È,¯,ê,İ,È,ç,È,¢ B

,±,lfvf fpfefB,ÍDIPROPDWORD \‘¢'İ,ð—p,¢  
,é BDIPROPDWORD \‘¢'İ,İpdiphftfB [f<fh,ÍDIPROPHEADER \‘¢'İ,Ö,İf|  
fCf“f^,Â,È,¯,ê,İ,È,ç,È,¢ BdwDataftfB [f<fh,ÍŽ²f, [fh,ðŠÜ,ð,© A, ,é,¢,ÍŽó,¯Žæ,é,±,Æ,É,È,é B

DIPROPHEADER \‘¢'İ,İdwObjftfB [f<fh,Í0,Â,È,¯,ê,İ,È,ç,, A,±,ê,Í,±  
,İfvf fpfefB Y'è,““Á'è,İfIfufWfFfNfg,Â,Í,È,fffofCfX'S'İ,É“K—p,³,ê,é,±  
,Æ,ðŽ',· BdwSizeftfB [f<fh,É,ÍDIPROPDWORD \‘¢'İ,İfTfCfY,ðfZfbfg,µ,È,¯,ê,İ,È,ç,È,¢ B

DIPROPDWORD \‘¢'İ,İdwDataftfB [f<fh,Í^È%°,İ'l,İ,Đ,Æ,Â B

DIPROPAXISMODE\_ABS: â'İ À•W,ÂŽ²Ê'u,ð'Ê'm,·,é BŽ²Ú“®,ÍŽžŠÔ,É,Â,¢,Ä—Ýœv,³,ê,é B

DIPROPAXISMODE\_REL: Ž²Ê'u,ð'S'İ À•W,Â'Ê'm,·,é BŽ²Ú“®,Í A'O%ñŽ²Ê'u,ð—  
v< ,µ,½,Æ,«,Æ,İ ,Æ,µ,Ä'Ê'm,³,ê,é B

## DIPROP\_BUFFERSIZE

, ,ç,©,¶,ß'èç',³,ê,Ä,¢,éfvf fpfefB,Ä AfffofCfX“ü—Ífofbftf@fTfCfY,ìfZfbfg,âŽæ“¾,É—p,¢,ç,ê,é B

,±,ì Ý'è,Í A“Á'è,ìfIfufWfFfNfg,É'î,µ,Ä,Æ,¢,²,æ,è,ÍffofCfX'S'î,É“K—  
p,³,ê,é,ì,Ä AdwHowftfB [f<fh,ÍDIPH\_DEVICE,Ä,È,¯,ê,î,È,ç,È,¢ B

,±,ìfvf fpfefB,ÍDIPROPDWORD \‘¢'î,ð—p,¢  
,é BDIPROPDWORD \‘¢'î,ìpdiphftfB [f<fh,ÍDIPROPHEADER \‘¢'î,Ö,ìf|  
fCf“f^,Ä,È,¯,ê,î,È,ç,È,¢ BdwDataftfB [f<fh,Ífofbftf@fTfCfY,ðŠÜ,p,© A, ,é,¢,ÍŽó,¯Žæ,é,±,Æ,É,È,é B

**DIPROPHEADER** \‘¢'î,ìdwObjftfB [f<fh,Í0,Ä,È,¯,ê,î,È,ç,, A,±,ê,Í,±  
,ìfvf fpfefB Ý'è,““Á'è,ìfIfufWfFfNfg,Ä,Í,È,ffofCfX'S'î,É“K—p,³,ê,é,±  
,Æ,ðŽ',· BdwSizeftfB [f<fh,É,ÍDIPROPDWORD \‘¢'î,ìfTfCfY,ðfZfbfg,µ,È,¯,ê,î,È,ç,È,¢ B

fAfvfŠfP [fVf±f“,^ffofCfX,©,çfofbftf@ Eff [f^,ð“Ç,Ý,Æ,ç,È,¢ ê ±,É,Í ADIPROPDWORD \‘¢'î,ìdwDataftf  
B [f<fh,°0,ÉfZfbfg,³,ê,é B,Ü,½,Í A—p,¢,éfofbftf@,ìfTfCfY,ðŽ',·,½,ß,É0^ÈŠO,ì'l,à,Æ,è,²,é B

fofbftf@fTfCfY,ðfZfbfg,·,é Û,É AdwData,°Ž',·fofbftf@fTfCfY,°ffofCfX,ÄfTf|  
[fg,·,é,É,Í'â,«,·,¬,é ê ± A,Æ,è,²,é Á'â,ìfofbftf@fTfCfY,ÉfZfbfg,³,ê,é B•K—  
v,Èfofbftf@fTfCfY,°fZfbfg,³,ê,½,©,ð'm,é,É,Í Afofbftf@fTfCfYfvf fpfefB,ðŽæ“¾,µ A,»,ìĚ%oÊ,ðfZfbfg,µ,æ  
,²,Æ,µ,½'l,Æ”äŠr,µ,È,¯,ê,î,È,ç,È,¢ B

DIPROP\_GRANULARITY

,,ç,©,¶,ß'èç',³,ê,½fvf fpfefB,Å AfIfufWfFfNfg,Ì Å ¬'P^Ê,ðŽæ“¾,·,é B

,±,lfvf fpfefB,ÍDIPROPDWORD \‘ç'Ì,ð—p,ç  
,é BDIPROPDWORD \‘ç'Ì,ÌpdiphftfB [f<fh,ÍDIPROPHEADER \‘ç'Ì,Ö,Ìf|  
fCf“f^,Å,È,¬,ê,Î,È,ç,È,ç BdwDataftfB [f<fh,Í Å ¬'P^Ê,ðŽó,¬Žæ,é,±,Æ,È,È,é B

DIPROPHEADER \‘ç'Ì,ÌdwObjftfB [f<fh,Í A Å ¬'P^Ê,ªŽæ“¾,³,ê,éIfufWfFfNfg,É'Î,·,éŽ¬•ÊŽq,Å,È,¬,ê,Î,È,ç,È,ç  
BdwSizeftfB [f<fh,É,ÍDIPROPDWORD \‘ç'Ì,ÌfTfCfY,ðfZfbfg,μ,È,¬,ê,Î,È,ç,È,ç B

Å ¬'P^Ê,Ì'l,Í AfIfufWfFfNfg,ªÚ“@,ð'Ê'm,Å,«,é Å ¬,Ì<—£,Å, ,é B,Û,Æ,ñ,Ç,ÌŽ²IfufWfFfNfg,Ì Å ¬'P^Ê,Í  
1,Å, ,è A”C^Ó,Ì'l,ð,Æ,è,□,é,±,Æ,ð^Ó—j,·,é B,±,ê,æ,è,à'â,«,ç Å ¬'P^Ê,ðŽ ,ÂŽ²,à, ,é B,½,Æ,',Î Af}fEfX ã,ÌZ-  
%oñ“]—ÖŽ²,Ì Å ¬'P^Ê,Í20,Å A'Ê'm,³,ê,éÊ'u•İ%o»,Í,·,×,Ä20,İ”{ ”,Å, ,é,±,Æ,ð^Ó—  
j,·,é BÆ¾,çŠ',!,é,Æ Af† [fU,ªZ-%oñ“]—Ö,ð,ä,Á,,è%oñ“,·,é,Æ AfffofCfX,ÎÊ'u0 A20,»,μ,Ä40,Æ,ç,□,æ,□  
,É'Ê'm,·,é B

,±,ê,Í“Ç,Ý o,μ ê—p,lfvf fpfefB,Å, ,é B

## DIPROP\_RANGE

, ,ç,©,¶,ß'è< ,³,ê,Ä,¢,éfvf fpfefB,Å AfIfufWfFfNfg,©,ç'Ê'm,³,ê,é'l,Ì"ÍÍ,ðŽæ“¾,.,é B

,±,lfvf fpfefB,DIPROP\_RANGE \‘¢ì,ð—p,¢

,é BDIPROP\_RANGE \‘¢ì,ìpdiphftfB [f<fh,ÍDIPROPHEADER \‘¢ì,Ö,ìf|fCf“f^,Å,È,¯,ê,Î,È,ç,È,¢ B

**DIPROPHEADER** \‘¢ì,ìdwObjftfB [f<fh,Í"ÍÍ,ªŽæ“¾,³,ê,éIfufWfFfNfg,É‘Î,·,éŽ¯•ÊŽq,Å,È,¯,ê,Î,È,ç,È,¢ BdwSize  
ftfB [f<fh,É,ÍDIPROP\_RANGE \‘¢ì,ìTfCfY,ðfZfbfg,μ,È,¯,ê,Î,È,ç,È,¢ B

,±,ê,Í“Ç,Ý o,μ ê—p,lfvf fpfefB,Å, ,é B

DISCL\_BACKGROUND

SetCooperativeLevel,Ö,lfpf%of [f^,Å AfobfNfOf%ofEf“fh EfAfNfZfX,ªK—v,Å, ,é,±  
,Æ,ðŽ|,· BfobfNfOf%ofEf“fh EfAfNfZfX,ª—^,|,ç,ê,é,Æ AŠÖ~A,ì, ,éEfBf“fhfE,ªfAfNfefBfu EfEfBf“fhfE,Å,  
È,ç,Æ,«,àŠÛ,BfffofCfX,Í,ç,Â,Â,à”FŽ~%oÂ”\,Å, ,é B

DISCL\_FOREGROUND,ÆDISCL\_BACKGROUND,ì,□,ç,ç  
,,ê,©,ªIDirectInputDevice::SetCooperativeLevel,É“n,³,ê,È,¯,ê,Î,È,ç,È,ç B—¼•û,ð“n,µ,½,è,ç  
,,ê,à“n,³,È,ç ê ±,ÍfGf%o [,Æ,È,é BCE»fo [fWf±f“,ÌDirectInput,Â,Í”r¼“I,ÈfobfNfOf%ofEf“fh EfAfNfZfX,ª←  
,³,ê,Ä,ç,È,ç,±,Æ,É’ ^Ó B

## DISCL\_EXCLUSIVE

**SetCooperativeLevel**,Ö,İfpf%of [f^,Å A”r¼“IfAfNfZfX,ª•K—v,Å, ,é,±,Æ,ðŽ!,· B”r¼“IfAfNfZfX,ª—  
^,!,ç,ê,é,Æ Afff of CfX,İ¼,İfCf“fXf^f“fX,Í A”FŽ<sup>—</sup>,³,ê,Ä,¢  
,éff of CfX,Ö,İ”r¼“IfAfNfZfX,Í“¾,ç,ê,È,¢ B,µ,©,µ A¼,İfAvfŠfP [fVf‡f“,”r¼“IfAfNfZfX,ð“¾,Ä,¢  
,é ê ‡,Ä, ,Ä,Ä,à Afff of CfX,Ö,İ”ñ”r¼“I,ÈfAfNfZfX,Í,Ä,È,É<-,³,ê,Ä,¢,é,±,Æ,É’ ^Ó,·,é,±,Æ( u”r¼“I v,Æ,¢  
,␣Eê,Í,±,±,Ä,ÍEê,Ä,½E¾,¢%ñ,µ,Ä, ,é,ª ADirectDraw,É,“,—é—bŽ—,İŠT”O,Æ”äŠr,·,é,½,ß,ÉŽæ,è ã,°,ç,ê,Ä,¢,é) B

**WM\_ENTERSIZEMOVE**,“,æ,Ñ **WM\_ENTERMENULOOP**f fbfZ [fW,ðŽó,¯Žæ,Ä,½ Ū,É Af}fEfX, ,é,¢  
,ÍfL [f{ [fh Efff of CfX,ð”r¼f, [fh,Å”FŽ<sup>—</sup>,·,éfAvfŠfP [fVf‡f“,Íff of CfX,ð%ð•ú,·,é,±,Æ,ð<,-  
„ §,·,é B,³,à,È,¢,Æ Af† [fU,Íf fjf... [‘€ ì,âfEfBf“fhfE,İ^Ú“® EfŠfTfCfY,ª,Ä,«,È,,È,é B

**DISCL\_EXCLUSIVE**,Æ**DISCL\_NONEXCLUSIVE**,ì,␣,¿,Ì,¢,,ê,©,ð**SetCooperativeLevel**,É“n,³,ê,È,¯,ê,Î,È,ç,È,¢ B—  
¼•û,ð“n,µ,½,è,¢  
,,ê,à“n,³,È,¢ ê ‡,ÍfGf%o [,Æ,È,é BCE»fo [fWf‡f“,İDirectInput,Å,Í”r¼“IfAfNfZfX,É,ÍftfHfAfOf%ofEf“fh EfAf  
NfZfX,ª•K—v,Æ,È,é B

DISCL\_FOREGROUND

SetCooperativeLevel,Ö,lfpf%of [f^,Å AftfHfAfOf%ofEf“fh EfAfNfZfX,ªK—v,Å, ,é,±  
,Æ,ðŽ|,· BftfHfAfOf%ofEf“fh EfAfNfZfX,ª—^,|,ç,ê,é,Æ AŠÖ~A,ì, ,éfEfBf“fhfE,ªftfHfAfOf%ofEf“fh,ÅfAfNfe  
fBfu,Å,È,,È,é,ÆfffofCfX,ÍŽ©“®“L,É%ð•ú,³,ê,é B

DISCL\_FOREGROUND,ÆDISCL\_BACKGROUND,ì,□,ç,¢  
,,ê,©,ªIDirectInputDevice::SetCooperativeLevel,É“n,³,ê,È,¯,ê,Î,È,ç,È,¢ B—¼•û,ð“n,µ,½,è,¢  
,,ê,à“n,³,È,¢ ê ±,ÍfGf%o [,Æ,È,é B



DISCL\_NONEXCLUSIVE

SetCooperativeLevel,Ö,Ïpf%of [f^,Å A”ñ”r‘¼“IfAfNfZfX,ª•K—v,Å, ,é,±  
,Æ,ðŽ|,· BfffofCfX,Ö,ÏfAfNfZfX,Í A“^ê,ÏfffofCfX,ÉfAfNfZfX,µ,Ä,¢,é‘¼,ÏfAfvfŠfP [fVf‡f“,ÉŠ± Â,µ,È,¢ B

DISCL\_EXCLUSIVE,ÆDISCL\_NONEXCLUSIVE,Ï,²,¿,¢  
,,,ê,©,ªIDirectInputDevice::SetCooperativeLevel,É“n,³,ê,È, ¯,ê,Î,È,Ç,È,¢ B—¼•û,ð“n,µ,½,è,¢  
,,,ê,à“n,³,È,¢ ê ‡,ÍfGf%o [,Æ,È,é B

JOYINFOEXfL [f{ [fh EfffofCfX'è ”

fL [f{ [fh EfffofCfX'è ”,Ídinput.h,É'è`³,ê,Ä,“,è AfL [f{ [fh EfffofCfX,Ìff [f^fpfPfbfg(256fofCfg,Ì”z—  
ñ)“à,Ä,ÌfIfZfbfg,ð\,µ,Ä,¢,é BŞefIfZfbfg,Ì¹,Í AŽw'è,³,ê,½ff [f^,“Ši”[³,ê,Ä,¢,é”z—ñ—  
v'f,Ì˙Š˙İ˙È˙u,ðŽ˙•È˙,˙,é B,»,ÌfIfZfbfg,Ì˙È˙u,É, ,éff [f^,Í AfL [f{ [fh,ÌfL [,É˙İ%ž,µ,Ä,¢,é B˙È˙È,É A,±  
,ê,ç,Ì¹,Í,ÍDIDEVICEOBJECTDATA ADIOBJECTDATAFORMAT A, ,é,¢  
,ÍDIDEVICEOBJECTINSTANCE \˙¢˙Ì,ÌdwOfsf f“fo,ÄŽg—p,³,ê,é B,Û,½ A—v'f,ðŽw'è,µ,Ä”z—  
ñ,ÉfAfNfZfX,˙,é Û,Ì“YŽš,Æ,µ,Ä,à—p,¢,ç,ê,é B

˙È˙È“İ,ÈfL [f{ [fh EfffofCfX'è ”,ð˙È%°,ÉŽ,˙ i , ‡ j B

DIK_ESCAPE	EscfL [
DIK_1	1 fL [
DIK_2	2 fL [
DIK_3	3 fL [
DIK_4	4 fL [
DIK_5	5 fL [
DIK_6	6 fL [
DIK_7	7 fL [
DIK_8	8 fL [
DIK_9	9 fL [
DIK_0	0 fL [
DIK_MINUS	f fCf“fL [f{ [fh,Ì - fL [
DIK_EQUALS	= fL [
DIK_BACK	BackspacefL [
DIK_TAB	TabfL [
DIK_Q	Q fL [
DIK_W	W fL [
DIK_E	E fL [
DIK_R	R fL [
DIK_T	T fL [
DIK_Y	Y fL [
DIK_U	U fL [
DIK_I	I fL [
DIK_O	O fL [
DIK_P	P fL [
DIK_LBRACKET	[ fL [
DIK_RBRACKET	] fL [
DIK_RETURN	f fCf“fL [f{ [fh,Ì Enter fL [
DIK_LCONTROL	¶CtrlfL [
DIK_A	AfL [
DIK_S	S fL [
DIK_D	D fL [
DIK_F	F fL [
DIK_G	G fL [
DIK_H	H fL [
DIK_J	J fL [
DIK_K	K fL [
DIK_L	L fL [
DIK_SEMICOLON	; fL [
DIK_APOSTROPHE	fAf fXfgf ftfB [ (') fL [
DIK_GRAVE	accent grave (') fL [
DIK_LSHIFT	¶ShiftfL [
DIK_BACKSLASH	\ fL [
DIK_Z	Z fL [
DIK_X	X fL [
DIK_C	C fL [
DIK_V	V fL [
DIK_B	B fL [
DIK_N	N fL [
DIK_M	M fL [
DIK_COMMA	, fL [

DIK_PERIOD	<i>f fCf“fL [f{ [fh,î . fL [</i>
DIK_SLASH	<i>f fCf“fL [f{ [fh,î / fL [</i>
DIK_RSHIFT	<i>%oEShiftfL [</i>
DIK_MULTIPLY	<i>fef“fL [,î * fL [</i>
DIK_LMENU	<i>¶Alt fL [</i>
DIK_SPACE	<i>fXfy [fXfo [</i>
DIK_CAPITAL	<i>Caps LockfL [</i>
DIK_F1	<i>F1 fL [</i>
DIK_F2	<i>F2 fL [</i>
DIK_F3	<i>F3 fL [</i>
DIK_F4	<i>F4 fL [</i>
DIK_F5	<i>F5 fL [</i>
DIK_F6	<i>F6 fL [</i>
DIK_F7	<i>F7 fL [</i>
DIK_F8	<i>F8 fL [</i>
DIK_F9	<i>F9 fL [</i>
DIK_F10	<i>F10fL [</i>
DIK_NUMLOCK	<i>Num LockfL [</i>
DIK_SCROLL	<i>Scroll LockfL [</i>
DIK_NUMPAD7	<i>fef“fL [,î7fL [</i>
DIK_NUMPAD8	<i>fef“fL [,î8 fL [</i>
DIK_NUMPAD9	<i>fef“fL [,î9 fL [</i>
DIK_SUBTRACT	<i>fef“fL [,î - fL [</i>
DIK_NUMPAD4	<i>fef“fL [,î4 fL [</i>
DIK_NUMPAD5	<i>fef“fL [,î5 fL [</i>
DIK_NUMPAD6	<i>fef“fL [,î6 fL [</i>
DIK_ADD	<i>fef“fL [,î + fL [</i>
DIK_NUMPAD1	<i>fef“fL [,î1 fL [</i>
DIK_NUMPAD2	<i>fef“fL [,î2 fL [</i>
DIK_NUMPAD3	<i>fef“fL [,î3 fL [</i>
DIK_NUMPAD0	<i>fef“fL [,î0 fL [</i>
DIK_DECIMAL	<i>fef“fL [,î . fL [</i>
DIK_F11	<i>F11fL [</i>
DIK_F12	<i>F12fL [</i>
DIK_NUMPADENTER	<i>fef“fL [,îEnterfL [</i>
DIK_RCONTROL	<i>%oECtrlfL [</i>
DIK_DIVIDE	<i>fef“fL [,î / fL [</i>
DIK_SYSRQ	<i>SysRqfL [</i>
DIK_RMENU	<i>%oEAlt fL [</i>
DIK_HOME	<i>HomefL [</i>
DIK_UP	<i>ã-î^ófL [</i>
DIK_PRIOR	<i>PgUpfL [</i>
DIK_LEFT	<i>¶-î^ófL [</i>
DIK_RIGHT	<i>%oE-î^ófL [</i>
DIK_END	<i>EndfL [</i>
DIK_DOWN	<i>%o^o-î^ófL [</i>
DIK_NEXT	<i>PgDnfL [</i>
DIK_INSERT	<i>InsertfL [</i>
DIK_DELETE	<i>DeletfL [</i>
DIK_LWIN	<i>¶WindowsfL [</i>
DIK_RWIN	<i>%oEWindowsfL [</i>
DIK_APPS	<i>AppMenufL [</i>

*fEfX EftfCfX'è "*

#### **DIMOF5\_BUTTON0**

**DIMOUSESTATE** \‘ç‘İ,İ æ“a,É‘İ,·,éf}fEfXf{f^f“0,İ ó‘Ô,İIfIfZfbfg B,±  
,İ‘l,Í **ADIDEVICEOBJECTDATA** \‘ç‘İ,İdwOfsftfB [f<fh,Æ,µ,Ä•Ô,<sup>3</sup>,ê Aff [f^,^f}fEfXf{f^f“0,É“K—p,<sup>3</sup>,ê,é,±  
,Æ,ðŽ‘,· B

#### **DIMOF5\_BUTTON1**

**DIMOUSESTATE** \‘ç‘İ,İ æ“a,É‘İ,·,éf}fEfXf{f^f“1,İ ó‘Ô,İIfIfZfbfg B,±  
,İ‘l,Í **ADIDEVICEOBJECTDATA** \‘ç‘İ,İdwOfsftfB [f<fh,Æ,µ,Ä•Ô,<sup>3</sup>,ê Aff [f^,^f}fEfXf{f^f“1,É“K—p,<sup>3</sup>,ê,é,±  
,Æ,ðŽ‘,· B

#### **DIMOF5\_BUTTON2**

**DIMOUSESTATE** \‘ç‘İ,İ æ“a,É‘İ,·,éf}fEfXf{f^f“2,İ ó‘Ô,İIfIfZfbfg B,±  
,İ‘l,Í **ADIDEVICEOBJECTDATA** \‘ç‘İ,İdwOfsftfB [f<fh,Æ,µ,Ä•Ô,<sup>3</sup>,ê Aff [f^,^f}fEfXf{f^f“2,É“K—p,<sup>3</sup>,ê,é,±  
,Æ,ðŽ‘,· B

#### **DIMOF5\_BUTTON3**

**DIMOUSESTATE** \‘ç‘İ,İ æ“a,É‘İ,·,éf}fEfXf{f^f“3,İ ó‘Ô,İIfIfZfbfg B,±  
,İ‘l,Í **ADIDEVICEOBJECTDATA** \‘ç‘İ,İdwOfsftfB [f<fh,Æ,µ,Ä•Ô,<sup>3</sup>,ê Aff [f^,^f}fEfXf{f^f“3,É“K—p,<sup>3</sup>,ê,é,±  
,Æ,ðŽ‘,· B

#### **DIMOF5\_X**

**DIMOUSESTATE** \‘ç‘İ,İ æ“a,É‘İ,·,éf}fEfX,İx•ûĖü,İ^Ê’u,İIfIfZfbfg B,±  
,İ‘l,Í **ADIDEVICEOBJECTDATA** \‘ç‘İ,İdwOfsftfB [f<fh,Æ,µ,Ä•Ô,<sup>3</sup>,ê Aff [f^,^f}fEfX,İx•ûĖü,İ^Ê’u,É“K—  
p,<sup>3</sup>,ê,é,±,Æ,ðŽ‘,· B

#### **DIMOF5\_Y**

**DIMOUSESTATE** \‘ç‘İ,İ æ“a,É‘İ,·,éf}fEfX,İy•ûĖü,İ^Ê’u,İIfIfZfbfg B,±  
,İ‘l,Í **ADIDEVICEOBJECTDATA** \‘ç‘İ,İdwOfsftfB [f<fh,Æ,µ,Ä•Ô,<sup>3</sup>,ê Aff [f^,^f}fEfX,İy•ûĖü,İ^Ê’u,É“K—  
p,<sup>3</sup>,ê,é,±,Æ,ðŽ‘,· B

#### **DIMOF5\_Z**

**DIMOUSESTATE** \‘ç‘İ,İ æ“a,É‘İ,·,éf}fEfX,İz•ûĖü,İ^Ê’u,İIfIfZfbfg B,±  
,İ‘l,Í **ADIDEVICEOBJECTDATA** \‘ç‘İ,İdwOfsftfB [f<fh,Æ,µ,Ä•Ô,<sup>3</sup>,ê Aff [f^,^f}fEfX,İz•ûĖü,İ^Ê’u,É“K—  
p,<sup>3</sup>,ê,é,±,Æ,ðŽ‘,· B

**DirectInputfffofCfX Ef^fCfv<L qfR [fh**

DirectInputfffofCfX Ef^fCfv<L qfR [fh,ÍDIDEVICEINSTANCE \‘c`ì,Ā—p,¢  
,ç,ê,é BfffofCfX Ef^fCfv<L qfR [fh,Ī Ā%“ÊfofCfG,ÍfffofCfX Ef^fCfv,ǎŽw’è,·,é B

**DIDEVTYPE\_MOUSE:** f}fEfX, ,é,¢,Íf}fEfX,É—bŽ—,µ,½fffofCfX(fgf%ofbfNf{ [f<,È,Ç) B  
**DIDEVTYPE\_KEYBOARD:** fL [f{ [fh, ,é,¢,ÍfL [f{ [fh,É—bŽ—,µ,½fffofCfX B

%“Ê,©,ç2”Ô—Ū,ĪfofCfG,ÍfffofCfX,ĪfTfuf^fCfv,ǎŽw’è,·,é B

f}fEfXf^fCfv,ĪfffofCfX,É,Ā,¢,Ā,Ī AŽŸ,ĪfTfuf^fCfv,“è<`,³,ê,Ā,¢,é:

**DIDEVTYPE\_MOUSE\_UNKNOWN:** fTfuf^fCfv,ǎŠm’è,Ā,«,È,¢ B

**DIDEVTYPE\_MOUSE\_TRADITIONAL:** ““ “Ī,Èf}fEfX B

**DIDEVTYPE\_MOUSE\_FINGERSTICK:** ftfBf“fK [fXfefBfbfN B

**DIDEVTYPE\_MOUSE\_TOUCHPAD:** ffffofCfX,Íf^fbf`fpfbfh,Ā, ,é B

**DIDEVTYPE\_MOUSE\_TRACKBALL:** ffffofCfX,Ífgf%ofbfNf{ [f<,Ā, ,é B

fL [f{ [fhf^fCfv,ĪfffofCfX,É,Ā,¢,Ā,Ī AŽŸ,ĪfTfuf^fCfv,“è<`,³,ê,Ā,¢,é:

**DIDEVTYPE\_KEYBOARD\_PCXT:** IBM PC/XT 83fL [fL [f{ [fh B

**DIDEVTYPE\_KEYBOARD\_OLIVETTI:** fIfŠfxfbfefB102fL [fL [f{ [fh B

**DIDEVTYPE\_KEYBOARD\_PCAT:** IBM PC/AT 84fL [fL [f{ [fh B

**DIDEVTYPE\_KEYBOARD\_PCENH:** IBM PCŠg’£101/102fL [,Ū,½,ĪMicrosoftfif`f...f%of<fL [f{ [fh B

**DIDEVTYPE\_KEYBOARD\_NOKIA1050:** Nokia 1050fL [f{ [fh B

**DIDEVTYPE\_KEYBOARD\_NOKIA9140:** Nokia 9140fL [f{ [fh B

**DIDEVTYPE\_KEYBOARD\_NEC98:** “ú—{ĖĖNEC PC98fL [f{ [fh B

**DIDEVTYPE\_KEYBOARD\_NEC98LAPTOP:** “ú—{ĖĖNEC PC98f%ofbfvfgfbfvfL [f{ [fh B

**DIDEVTYPE\_KEYBOARD\_NEC98106:** “ú—{ĖĖNEC PC98 106fL [fL [f{ [fh B

**DIDEVTYPE\_KEYBOARD\_JAPAN106:** “ú—{ĖĖ106fL [fL [f{ [fh B

**DIDEVTYPE\_KEYBOARD\_JAPANAX:** “ú—{ĖĖAXfL [f{ [fh B

**DIDEVTYPE\_KEYBOARD\_J3100:** “ú—{ĖĖJ3100fL [f{ [fh B

**DirectInputff** [f^ EftfH [f]fbfg Ef^fCfv

DirectInputff [f^ EftfH [f]

fbfg Ef^fCfv,ÍfffofCfX,É,¯,é'P^êIfufWfFfNfg,ì® «,ðL q,·,é BfffofCfX,É,¯,éIfufWfFfNfg,ÍŽ² Af{f^f“  
,,é,¢,í¼,ì“—Í\ [fX,Æ,È,è,ð,é B

DIDFT\_ALL

,±,Ìftf%oO,ÍIDirectInputDevice::EnumObjects,É'Î,μ,Ä,Ì,Ý—

LÆø,Æ,È,é B,·,×,Ä,ÌIfufWfFfNfg,Íf^fCfv,ÉŠÖ,í,ç,—ñ<“,³,ê,é B,±,Ìftf%oO,ð¼,Ìftf%oO,Æ'g,Ý ±,í,¹,é,±  
,Æ,ª,Ä,«,È,¢ B

DIDFT\_RELAXIS

fIfufWfFfNfg,Í'Š'ÎŽ²,Ä, ,é B'Š'ÎŽ²,Æ,Í A'O%ññ'Ê'm,³,ê,½^Ê'u,©,ç,Ì' •ª—Ê,Æ,μ,Äff [f^,ð'Ê'm,·,é,à,Ì,Ä, ,é B'Š'ÎŽ²,Í'è“I,É,Í³ sÆÄ,ì”ÍÍ,ðfTf| [fg,μ,Ä,¢,é BŽ²,Í'A±“I,È ”l,ð'Ê'm,·,é•K—

v,ª,È,¢ B,½,Æ,ì,Í AŽ²,Í,»,Ì'Ê'u,ð20,ì”{ ”,Ä'Ê'm,·,é,±,Æ,à, ,é,ª A,±,è,ÍŽ²,Ì Ä ¬'P^Ê,ª20,Ä, ,é,±  
,Æ,ðŽ',· BŽ²,ÌIDIPROP\_GRANULARITYfvf fpfefB,Í,Í,»,ÌŽ²,Ì Ä ¬'P^Ê,ð'Ê'm,·,é B

‘Š'ÎŽ²fffofCfX,É,Í â'Î Ä•W,ª¶ Ý,μ,È,¢ B,P,μ,è A'Ê'm,³,ê,é â'Î Ä•W,Í'P,É AfffofCfX,ª”FŽ²,³,è,Ä,¢  
,éŠÖ,É,»,ÌfffofCfX,É,æ,è'Ê'm,³,ê,é'Š'Í Ä•W,Ì ±Æv,Ä, ,é BÆ%œÊ,Æ,μ,Ä A'Š'ÎŽ²fIfufWfFfNfg,©,ç“¾,ç,è,½  
â'Î Ä•W,Í A'¼,Ì â'Î Ä•W,Æ”äŠr,³,ê,é ê ±,Ì,YÓ—i,ðŽ ,Ä B,½,Æ,ì,Í Af{f^f“,ª%Ý,³,è,Ä,¢  
,é,Æ,«ÉfAvfŠfP [fVf±f“,ª â'Î'Tl,ðL^,μ Af{f^f“,ª—£,³,è,é,Æ,»,è,ðŽæ“¾,·,é,Æ%¼'è',·é B,±  
,Ì,Ó,½,Ä,Ì'l,Ì ,ð,Æ,é,±,Æ,È,æ,è AfAvfŠfP [fVf±f“,Í Af{f^f“,ª%Ý,³,è,½^Ê'u,Æ—£,³,è,½^Ê'u,Æ,ÌŠÖ,Ì<—£  
,ðEvŽZ,·,é,±,Æ,ª,Ä,«,é B

‘Š'ÎŽ² ä,Ä â'Î'Tl,ÌÆ“—,ðfZfbfg,μ,½,èŽæ“¾,μ,½,è,·,é,±,Æ,Ís%œÄ”\  
,È,Ì,Ä AfAvfŠfP [fVf±f“,ÍfffofCfX,ð”FŽ² ,μ,½'¼Æä,É â'Î'Ê'u,ðL^,·,é,×,«Ä, ,é B,±,Ì'l,Í%¼'zÆ  
‘—,Æ,È,é B,»,èÊ ~,ÌÆÄ,N o,μ,É,Ä,¢,Ä,Ì,·,×,Ä A,±,ÌÆ“—,ðŠi,É â'Î'Ê'u,ª l—¶,³,è,é B

DIDFT\_ABSAXIS

fIfufWfFfNfg,Í â'ÎŽ²,Ä, ,é B â'ÎŽ²,Æ,Í A â'Î'Ê'u,Æ,μ,Äff [f^,ð'Ê'm,·,é,à,Ì,Ä, ,é B

â'ÎŽ²,Í'è“I,É,Í—LÆÄ,ì”ÍÍ,ðfTf| [fg,μ,Ä,¢,é B

Ž²,Í'A±“I,È ”l,ð'Ê'm,·,é•K—v,ª,È,¢ B,½,Æ,ì,Í AŽ²,Í,»,Ì'Ê'u,ð20,ì”{ ”,Ä'Ê'm,·,é,±,Æ,à, ,é,ª A,±  
,è,ÍŽ²,Ì Ä ¬'P^Ê,ª20,Ä, ,é,±  
,Æ,ðŽ',· BŽ²,ÌIDIPROP\_GRANULARITYfvf fpfefB,Í,Í,»,ÌŽ²,Ì Ä ¬'P^Ê,ð'Ê'm,·,é B

DIDFT\_AXIS

,±,Ìftf%oO,ÍIDirectInputDevice::EnumObjects,É'Î,μ,Ä,Ì,Ý—LÆø,Æ,È,é B,·,×,Ä,ÌŽ²,Í A â'Î'I E'Š'Î'I,ÉŠÖ,í,ç,,  
—ñ<“,³,ê,é B

DIDFT\_PSHBUTTON

fIfufWfFfNfg,ÍfvfbfVf...f{f^f“,Ä, ,é BfvfbfVf...f{f^f“,Í Af† [fU,ª%Ý,μ,Ä,¢,é,Æ,«Í%°,ª,Ä,Ä,¢  
,é,Æ'Ê'm,³,è Af† [fU,ª—£,·,Æ ä,ª,Ä,Ä,¢,é,Æ'Ê'm,³,è,é B

DIDFT\_TGLBUTTON

fIfufWfFfNfg,ÍfgfOf<f{f^f“,Ä, ,é BfgfOf<f{f^f“,Íf† [fU,ª%Ý,μ,Ä,¢,é,Æ,«É,Í%°,ª,Ä,Ä,¢  
,é,Æ'Ê'm,³,è AŽY,Éf† [fU,ªf{f^f“,ð%Ý,·,Ü,Ä,Í A%Ý,³,è,Ä,¢,é,Æ'Ê'm,³,è±,·,é B

DIDFT\_BUTTON

fIfufWfFfNfg,ÍfvfbfVf...f{f^f“,©fgfOf<f{f^f“,Ä, ,é B

•Ô'l

fGf%o [ ,Í•%o,ì'l,Â•\,³,ê A'g,Ý ±,í,l,é,±,Æ,Í,È,¢ B,±,ì•\,Â,Í A,·,×,Ä,ìDirectInputŠÖ ",É,æ,è•Ô,³,ê,²,éfGf%o [ ,ð—  
ñ<“,μ,Ä, ,é BŠeŠÖ ”,ª•Ô,μ,²,éfGf%o [fR [fh,ìfŠfXfg,É,Â,¢,Ä,Í ACEÂ X,ìŠÖ ”,ì' Žß,ðŽQ Æ,·,é,±,Æ B

JOYERR\_NOCANDO

fWf±fCfXfefBfbfNfhf%oCfo,ÍfŒfWfXfgfŠ,©,ç,ìfffofCfX îñ,ð X V  
,Ä,«,È,¢ B

JOYERR\_NOERROR

—v< ,Í ³ í I—¹,μ,½ B

JOYERR\_REGISTRYNOTVALID

fŒfWfXfgfŠ,ì,Ð,Æ,Â^È ã,ìfWf±fCfXfefBfbfNfGf“fgfŠ,É—  
³Œø,Èff [f^,ªŠÜ,Ü,ê,é B

JOYERR\_UNPLUGGED

Žw'è,³,ê,½fWf±fCfXfefBfbfN,ÍfRf“fsf... [f^,É Ú'±,³,ê,Ä,¢,È,¢ B

MMSYSERR\_BADDEVICEID

Žw'è,³,ê,½fWf±fCfXfefBfbfN,ìŽ¯•ÊŽq,ª—³Œø,Â, ,éi

MMSYSERR\_INVALIDPARAM

—³Œø,Èfpf%of [f^,ª“n,³,ê,½ B

MMSYSERR\_NODRIVER

fWf±fCfXfefBfbfNfhf%oCfo,ª“¶ Ý,μ,È,¢ B

## DirectSetup ,É,Â,¢,Ä

DirectSetup,Í A ŠÈ’P,ÈfAfvfŠfP [fVf‡f“ Efvf fOf%of~f“fO EfCf“f^ [ftfF [fX(API  
,Ä A,P“xCEÄ,Ñ o,·,¾,¯,ÄDirectX™ 3,İfRf“f [flf“fg,ðfCf“fXfg [f<,Ä,«,é BDirectX  
3,Í•ŽG,Èfvf f\_fNfg,È,İ,Ä AfCf“fXfg [f<,à•İŽG,È ì<Æ,ð—v,·,é B,µ,½,<sup>a</sup>,Ä,ÄDirectX  
3,ðŽè ì<Æ,ÄfCf“fXfg [f<,·,é,×,«,Ä,Í,È,¢ B

,<sup>3</sup>,ç,É ADirectSetup,ðŽg—p,·,é,±,Æ,Ä ADirectPlayLobbyIfufWfFfNfg,ð—p,¢,éfAfvfŠfP [fVf‡f“,É•K—  
v,ÈfEfWfXfgfŠ î•ñ,ðŽ©“®“I,ÈfCf“fXfg [f<,Ä,«,é B,±  
,İfEfWfXfgfŠ î•ñ,Í ADirectPlayLobbyIfufWfFfNfg,<sup>a</sup>fAfvfŠfP [fVf‡f“,ð<N“®,·,é Û,É•K—v,Æ,È,é B

DirectSetup,Í,R,Â,İAPIŠÖ ”,ð”ö,‘,Ä,¢,é,<sup>a</sup> A,»,ì,□,¿fAfvfŠfP [fVf‡f“ŠJ”ŽÒ,É,Æ,Ä,Ä—L%ov,È,İ,Í,Ó,½,Â,¾,¯,Ä,·,é  
B,»,êÈŠO,İ,Ð,Æ,Ä A**DirectXDeviceDriverSetup**,Í ADirectXfffofCfX Efhh%ofCfo,ðfCf“fXfg [f<,µ,æ,□  
,Æ,·,é 1,İ,½,B,İ,à,İ,Ä A,±,İf}fjf...fAf<,Ä,ÍÆ¾y,µ,È,¢ B



**DirectSetup,İŠT—v**

,±,İfZfNfVf‡f“,Å,Í ADirectSetup,İfRf“f| [flf“fg,ÉŠÖ,·,é^ê”Ê“l,È î•ñ,ð q,×,é B

EDirectXSetupŠÖ ”,İŽq—p

EDirectXfAfvfŠfP [fVf‡f“,İfCf“fXfg [f< €”õ

EAutoPlay,İ‰oÒ“®

## DirectXSetupŠÖ ”,İŽg—p

DirectX,ÉˆË•¶,·,é fAfvfŠfP [fVf‡f“,·,æ,ŃfQ [f€,Í A,»,ìfVfXfef€ EfRf“f|  
[flf“fg,ð A'Ê í,ìfAfvfŠfP [fVf‡f“,ìfCf“fXfg [f<,É%Á,|,ÄfCf“fXfg [f<,·,é B,±  
,ìfCf“fXfg [f<,É,Í**DirectXSetup**APIŠÖ ”,ð—p,¢,é B,±  
,İŠÖ ”,Í ADirectX,ìfCf“fXfg [f<'†,ÉffBfXfvfƎfC,·,æ,ŃfI [ffBfI Efhf%ofCfo,ð(•K—  
v,É%ž,¶,Ä) X V,µ ADirectX,ðfTf|  
[fg,·,é **BDirectXSetup**,Í Afvf f\_fNfg,É“Y•t,<sup>3</sup>,ê,éDsetup.dll,ÅŠefAfvfŠfP [fVf‡f“,É'ñ<Ÿ,<sup>3</sup>,ê,Ä,¢  
,é BDirectSetup,Ì éƎ¼•¶,ÍDsetup.h,É, ,é B

**DirectXSetup**,ðŽg—p,·,é fAfvfŠfP [fVf‡f“,Í A\Redist\Directx\ffBfƎfNfgfŠ,ì“à—e,Ì,Ÿ,Ä,È,-  
ARedist\ffBfƎfNfgfŠ,Ì'S“à—e,ð”z•z,µ,Ê,̄,ê,Ì,È,ç,È,¢ **BDirectXSetup**,É,æ,èDirectDraw®,Æ,¢  
,Á,½'Pˆê,ÌDirectXfRf“f| [flf“fg,ðfCf“fXfg [f<,Ä,«„é,<sup>a</sup> A,±,ê,Í „ Š,Ä,«„È,¢ B,È,<sup>o</sup>,È,çDirectXfRf“f|  
[flf“fg,ÍŠƎŸˆË•¶ «„Ì, ,é ŸƎv,É,È,Ä,Ä,¢,é,Ì,Ä AffBfXfNfXfy [fX,Ì ß–ñ,É,Í,È,ç,È,¢,©,ç,Ä, ,é BDirectXfRf“  
f| [flf“fg,ð,P,Ä,¾,̄—p,¢,é ê ‡,Ä,à AfAfvfŠfP [fVf‡f“,ÍDirectX'S'ì,ì<@”\,ð”z•z,µ,Ê,̄,ê,Ì,È,ç,È,¢ B

**DirectX fAfvfŠfP [fVf‡f“,İfCf“fXfg [f< €”ö**

fAfvfŠfP [fVf‡f“,ÆDirectXftf@fCf<,ðf† [fU,İfVfXfef€,ÉfCf“fXfg [f<,.é €”ö,ð,µ,½,ç A‘±  
,-,ÄfZfbfgfAfbfv Efvf fOf%of€,ð ì Ñ,.é•K—v,³, ,é BfZfbfgfAfbfv Efvf fOf%of€  
,Í AfAfvfŠfP [fVf‡f“,É•K—v,Èftf@fCf<,İfŠfXfgfAfbfv A•K—v,ÈffBfXfN—e—  
Ê,İŒ~è A“K Ø,ÈDirectX,İfCf“fXfg [f<,İ3,Â,İ ì<Æ,ð s,□ B,»,µ,Ä”z•z”}‘İ,ÉffBfŒfNfgfŠ,ð ì Ñ,µ AfAfvfŠfP  
[fVf‡f“,İ‘Sftf@fCf<,,æ,Ñ•Œ%Á,³,ê,½DirectXfRf“f| [flf“fg,ð,±,İffBfŒfNfgfŠ,É’u, BŽŸ,É,±  
,ê,ç,İfXfefbfbv,ð à~¾,.é B

fZfbfgfAfbfv Efvf fOf%of€,İ ì Ñ

fAfvfŠfP [fVf‡f“ EffBfŒfNfgfŠ,İfZfbfgfAfbfv

fZfbfgfAfbfv Efvf fOf%of€,ì ì ñ

,±,ìSDK,É“Y•t,³,ê,Ä,ç,é,ì,Í Af† [fU—p,ìfZfbfgfAfbfv Efvf fOf%of€,ì—á,Ä, ,é B\Dxsdk\Sdk\Samples\SetupfffBf  
ŒfNfgfŠ,É, ,éDinstall,Æ,ç,¼—¼,ìfZfbfgfAfbfv Efvf fOf%of€,É,Í ARockem,Æ,ç,¼Tf“fvf< Efvf fOf%of€  
,ð¹ð,³,ê,½ffBfŒfNfgfŠ,ÉfCf“fXfg [f<.,é•û—@,ì à—¾,ª, ,é B,Û,½DirectXSetupŠÖ ”,ðŽg—p,.,é•í“l,È•û—@,ì à—  
¾,à, ,é B

È%º,ìfXfefbfv,Ä,Í Af† [fU,ìfRf“fsf... [f^,Ä“® ì,.,é,æ,¼,ÉDinstall.cfvf fOf%of€,ð C ³,.,é•û—@,ðŽ!,. B

1 fGffBf^,ÄDinstall.c,ðŠJ, B

2 f† [fU,ìfVfXfef€ ä,ÉfCf“fXfg [f<,µ,½,çfAfvfŠfP [fVf‡f“,ìftf@fCf< EfŠfXfg,ð'ñ<Ÿ,.,é,±,Æ Bf† [fU,ì  
—p“r,É, ,¼,æ,¼,ÉDinstall.cftf@fCf<,É, ,éŠfXfg,ð C ³,.,é,É,Í AÖcopy\_listÖ,ðŒŸ ò,µ A,±  
,ì \ç“l,È•“Ÿ,.,éftf@fCf< EfŠfXfg,ðf† [fU—p,ìftf@fCf< EfŠfXfg,É•l X,.,é B

Dinstall,ìffftHf<fg EfffBfŒfNfgfŠ,Éftf@fCf<,ðfCf“fXfg [f<.,é BfAfvfŠfP [fVf‡f“,ìftf@fCf<,ðfTfuuffB  
fŒfNfgfŠ,ÉfCf“fXfg [f<,µ,½,ç é ±,Í ADinstall.c,ð C ³,.,é B

3 Dinstall.cfvf fOf%of€,Í AfAfvfŠfP [fVf‡f“,ð ³ í,ÉfCf“fXfg [f<.,é,ì,É \ª,Èfn [fhffBfXfN,ì<ó,«—e—Ê,ª,  
,é,©,Ç,¼,©,ð”»è,Ä,«„È,ç B,½,¾,µ Af† [fU,ì,à,ÄfR [fh,ð“ü—l,.,é,ì,±,ì<@”\,ð•t%ªÄ,.,é,±,Æ,ª,Ä,«„é B,±  
,ìfR [fh,ð“ü—l,.,é è Š,ÍDinstall.cftf@fCf<,É2%º Š , ,éª A,»,±,ÍÖIND\_DISK\_MSGÖ,ðŒŸ ò,.,é,îT,.,±  
,Æ,ª,Ä,«„é B

4 DirectXSetup,ìlpszRootPath

fpf%of [f^,Í A”z•z”“ì ä,ìDsetup\*.dllftf@fCf<(Dsetup.dll ADsetup6e.dll ADsetup6j.dll ADsetupe.dll,.,æ,ÑDset  
upj.dll),.,æ,ÑDirectXffBfŒfNfgfŠ,Ö,ìpfX,ðŽw”è,.,é B“Ä,É— —R,ª,È,çŒÄ,è A,±  
,è,ç,ìf\_cCif~fbfNfŠf“fNf%ofCuf%ofŠ A,.,æ,Ñ,±,ìffBfŒfNfgfŠ,ÍŽÄ s—  
p(fRf“fpfCf<Œä)Dinstall,Æ““““ffBfŒfNfgfŠ,É,È,.,é,ì,È,ç,È,ç B,±  
,è,ç,ì,.,x,Ä,ìftf@fCf<.,æ,ÑffBfŒfNfgfŠ,““““ffBfŒfNfgfŠ,É“Ÿ,.,é è ± AlpszRootPathfpf%of [f^,ìl,Í  
NULL,Ä,æ,ç B,±,è,è,æ,è AfAfvfŠfP [fVf‡f“,ìf< [fg,©,çRf“fpfNfgffBfXfN, ,é,ç  
,ìftf fbfs [ffBfXfN ä,Öftf@fCf<“Ü“®,.,é Ü,ÉfpfX,ª•l,í,Ä,Ä,à ADirectXSetup,Í ³ í,É<@”\,.,é,±  
,Æ,ª,Ä,«„é B

,½,Æ,.,l ADinstall.exe ADsetup\*.dll,.,æ,ÑDirectxffBfŒfNfgfŠ,ª AfefXfg“iŠK,ìŠÖ,ÍD:\Funstuff,Æ,ç  
,AfAfvfŠfP [fVf‡f“ EfffBfŒfNfgfŠ,É, ,é,Æ%¼“è,.,é B,»,µ,Ä Aftf@fCf<,ðfRf“fpfNfgffBfXfN ä,É Ä,«  
t,.,é Ü,É A,»,è,ç,ìftf@fCf<,ðf< [fg,É’u,.,Æ%¼“è,.,é B lpszRootPath  
fpf%of [f^,ªÖFUNSTUFFÖ,ÉfZfbfg,³,è,Ä,ç,é,Æ AfRf“fpfNfgffBfXfN,É, ,éfZfbfgfAfbfv Efvf fOf%of€  
(Dinstall.exe),Í ³ í,É<@”\,µ,È,ç B,µ,©,µlpszRootPath fpf%of [f^,ªNULL,ÉfZfbfg,³,è,Ä,ç,é,Í A—  
¼•û,ìfZfbfgfAfbfv Efvf fOf%of€,ª<@”\  
,.,é B,È,º,È,ç,Í ADsetup\*.dll,.,æ,ÑDirectxffBfŒfNfgfŠ,Ö,ìpfX,ìfJfŒf“fg EfffBfŒfNfgfŠ,É“Ÿ,.,é,ç,Ä,  
,é B

Dinstall.exe,ª, ,éffBfŒfNfgfŠ“ÈŠÖ,ì è Š,ÉDsetup\*.dllftf@fCf<.,æ,ÑDirectxffBfŒfNfgfŠ,ð,.,-  
è ± ADirectXSetup,É ³,µ,çfpf%of [f^,ð“n,µ ADsetup.dll,ð ³,µ,fCf“fXfg [f<.,é•K—v,ª, ,é

BDirectXSetup,ìlpszRootPath

fpf%of [f^,É,ÍDsetup.dll,Ö,ìftf<fpfX,ªŠÜ,Ü,è,È,.,é,ì,È,ç,È,ç B,³,ç,É ALoadLibrary,.,æ,ÑGetProcAddress,Æ,ç  
,ªWin32Ö,ìŠÖ ”,ðfZfbfgfAfbfv Efvf fOf%of€,Ä—p,ç,é,Æ ADsetup.dll,ìÈ’u,ð’m,é,±,Æ,ª,Ä,«„é B

fZfbfgfAfbfv Ef\_cCfAf fOf{fbfNfX,ì“—e,Í ADinstall.rcfŠf\ [fX Eftf@fCf<,Ä—  
^,!,ç,è,éff [f^,É,æ,Ä,ÄŒ“è,³,è,é BfAfvfŠfP [fVf‡f“,ì¼ ì,.,æ,ÑfOf%oftfBfbfNfX,ð•Ž!,.,é,É,Í A,±  
,ìŠf\ [fX Eftf@fCf<,É•l,µ,ÄÈ%º,ì•l X,ð s,¼ B

1 fGffBf^,ÄDinstall.rc,ðŠJ, B

2 ftf@fCf<,ÉŠÜ,Ü,è,é,.,x,Ä,ìÖRockemÖ,ðŒŸ ò,µ AŒÄ 1,ìfAfvfŠfP [fVf‡f“¼,É•l X,.,é B

3

fZfbfgfAfbfv,.,æ,Ñfšfu [fg Ef\_cCfAf fOf{fbfNfX,Ä•Ž!,³,è,éOf%oftfBfbfNfX,Í AfŠf\ [fX Eftf@fCf<,  
É,.,ç,Ä,ÍSignon.bmp,.,æ,ÑReboot.bmp,Ä, ,é BŒÄ 1,ìfRfbfgf}fbfv Eftf@fCf<,É,±,è,ç,ì¼ ì,ð,Ä,.,é,© A, ,é,ç  
,ìŒÄ 1,ìfRfbfgf}fbfv,ì¼ ì,É ±,¼,æ,¼,ÉŠf\ [fX Eftf@fCf<,Ä,ì¼ ì,ð•l X,.,é,±,Æ,ª,Ä,«„é B

4 ŽÄ s—pDinstall,É•l,.,éAfCfRf“,ìfŠf\ [fX Eftf@fCf<,É,.,ç

,Ä,ÍSetup.ico,ÆŒÄ,Í,è ASETUP ICON,ÄŽw”è,³,è,é BŒÄ 1,ìfAfCfRf“ Eftf@fCf<,ì-  
¼ ì,ðSetup.ico,Æ,.,é,© A, ,é,ç,ìŒÄ 1,ìfAfCfRf“ Eftf@fCf<,ì¼ ì,É, ,¼,æ,¼,ÉŠf\ [fX Eftf@fCf<,É,.,-  
¼ ì,ð•l X,.,é,±,Æ,ª,Ä,«„é B

5 fIfvfVf‡f“,Æ,µ,Ä AŒÄ 1,ìfAfvfŠfP [fVf‡f“,ðfCf“fXfg [f<.,éffftHf<fgffBfŒfNfgfŠ,ð•l X,.,é,±  
,Æ,ª,Ä,«„é B,±,è,ð s,¼,É,Í AÖIDS\_DEFAULT\_GAME\_DIRÖ(fŠf\ [fX Eftf@fCf<,Ä,Í2%º Š“Ÿ,.,é)

,ðŒŸ ð,µ AfftfHf<fg EfffBfŒfNfgfŠ,İfpfX,ð•İ X,·,é B

ŒÂ 1,İfAfvfŠfP [fVf‡f“,İ—p“r,É, ,ϱ,æ,ϱ,É ADinstall.c,“,æ,ŃDinstall.rcftf@fCf<,ð C <sup>3</sup>,µ,½Œã A,»,ê,ç,ðŽÀ s—  
pDinstall.exe,ÖfRf“fpfCf<,·,é,±,Æ,<sup>a</sup>,Å,«é B,±,İŽÀ sftf@fCf<,İ-¼ İ,ð•İ X,·,é,±,Æ,à,Å,«é(½,Æ,İSetup.exe) B

fAfvfŠfP [fVf‡f“ EfffBfŒfNfgfŠ,İfZfbfgfAfbfv

ŒÂ 1,İfAfvfŠfP [fVf‡f“ ,ðfRf“fpfNfgffBfXfN, ,é,Œ  
,İftf fbfS [ffBfXfN,É“Ů,‘O,É AfZfbfgfAfbfv Efvf fOf%œ  
,İfefXfg,İ,½,ß,İfAfvfŠfP [fVf‡f“ EfffBfŒfNfgfŠ,ð ì ¬,µ,Ä,“-  
BfAfvfŠfP [fVf‡f“ EfffBfŒfNfgfŠ,É,İ,·,×,Ä,İfAfvfŠfP [fVf‡f“ Eftf@fCf< AfZfbfgfAfbfv Efvf fOf%œ  
œ ADirectXftf@fCf<,“,æ,Ñfhf%œCfo,ªŠŮ,Ů,ê,é,±,Æ,É,È,é B

fAfvfŠfP [fVf‡f“ EfffBfŒfNfgfŠ,ðfZfbfgfAfbfv,·,é,½,ß,É AŽŸ,İfXfefbfv,ðŽÀ s,·,é,±,Æ B

- 1 ŒÂ 1,İfAfvfŠfP [fVf‡f“ Eftf@fCf<,·,×,Ä,ðŠŮ,ðffBfŒfNfgfŠ,ð ì ¬,·,é B•K—v,Ä, ,ê,İfTfuffBfŒfNfgfŠ  
,ð ì ¬,µ A“K Ø,ÈfAfvfŠfP [fVf‡f“ Eftf@fCf<,ðfTfuffBfŒfNfgfŠ,É’u,,æ,µ,É,·,é B
- 2 ì ¬,µ,½ŽÀ s—pfZfbfgfAfbfv Eftf@fCf<,ðfAfvfŠfP [fVf‡f“ EfffBfŒfNfgfŠ,İf< [fg,ÖfRfs [,·,é B
- 3 MS-DOSfvf f“fvfg,Ä AxcopyfRf}f“fh,ð—p,Œ,Ä ADirectX 3  
fRf“fpfNfgffBfXfN ä,İRedistffBfŒfNfgfŠ,ð AfAfvfŠfP [fVf‡f“ EfffBfŒfNfgfŠ,İf< [fg,ÖfRfs [,·,é  
B,½,Æ,İ,İ AfAfvfŠfP [fVf‡f“,İf< [fgffBfŒfNfgfŠ,ŠD:Fungame,ÆE:fhf%œCfu,ªCD-ROMfhf%œCfu,Ä, ,é ê  
‡ AŽŸ,İ,æ,µ,Éf^fCfv,·,é B

xcopy /s e:\redist\\*. \* d:\fungame

---

’ ^Ó @ @DirectXSetupŠÖ ”,“,æ,ÑDxsetup.exeftf@fCf<,ª ³ í,É“® ì,·,é,½,ß,É,İ ADirectX 3  
SDK ä,É”z’u,³,ê,½RedistffBfŒfNfgfŠ,İ“S—a—  
e,ªfAfvfŠfP [fVf‡f“ EfffBfŒfNfgfŠ,İf< [fg,É,È,¬,ê,İ,È,ç,Œ,Œ B

---

“K Ø,Èftf@fCf<,·,×,Ä,ðf< [fgfAfvfŠfP [fVf‡f“ EfffBfŒfNfgfŠ,ÖfRfs [,·,é,Æ A`È%œ,İ,æ,µ,É,È,é B

fhf%œCfu D: ,İf{fŠf... [fœf%œxf<,İ SYSTEM  
ffBfŒfNfgfŠ,İ D:\FUNGAME

```
.          <DIR>          96-07-26  6:43 .
..         <DIR>          96-07-26  6:43 ..
DIRECTX    <DIR>          96-07-26  6:43 directx
DSETUP  DLL      22,016  96-07-26  4:38 dsetup.dll
DSETUP6E DLL     36,224  96-07-26  4:38 dsetup6e.dll
DSETUP6J DLL     36,224  96-07-26  4:38 dsetup6j.dll
DSETUPE  DLL     42,496  96-07-26  4:38 dsetupe.dll
DSETUPJ  DLL     42,496  96-07-26  4:38 dsetupj.dll
DINSTALL DLL    168,960  96-07-26  4:38 dinstall.dll
YOURFILE EXE     96,442  96-07-26  4:39 yourfile.exe
YOURFILE DAT    1,508,228 96-07-26  4:39 yourfile.dat
...
```

## AutoPlay,İ%Ö“®

AutoPlayRf“fpfNfgffBfXfN Ef^fCfgef<,đ ì ¬,·,é,É,Í A DirectX 3  
SDKfRf“fpfNfgffBfXfN,İf< [fg EfffBfĖfNfgfŠ,É, ,éAutorun.infft@fCf<,đĖÂ l,İfAfvfŠfP [fVf‡f“ EfffBf  
ĖfNfgfŠ,İf< [fg,ÖfRfs [,·,é B,±,İfefLfXfgtf@fCf<,É,Í^È%°,İ,æ,ϣ,È î•ñ,ªŠÜ,Ü,ê,é B

[autorun]  
OPEN=SETUP.EXE

fAfvfŠfP [fVf‡f“,İfZfbfgfAfbfv Efvf fOf%ofĖ–¼,ªSetup.exe,Â, ,ê,Î A,±,İftf@fCf<,đ•İ X,·,é•K—  
v,Í,È,¢ B,»„ê^ÈŠÖ,İ ê ‡,Í A,±,İftf@fCf<,đ•Ö W,μ AĖÂ l,İfZfbfgfAfbfv Efvf fOf%ofĖ–  
¼,đ“ü,ê,È,¬,ê,Î,È,ç,È,¢ BAutorun.infft@fCf<,ÉŠÖ,·,é Ú ×,È î•ñ,É,Â,¢,Ă,Í AAutorun.infft@fCf<.,đŽQ Æ,·,é,±  
,Æ B

DirectSetup fŠftf@fÆf“fX



šö ”

## DirectXRegisterApplication

```
int WINAPI DirectXRegisterApplication(HWND hWnd,  
    LPDIRECTXREGISTERAPP lpDXRegApp);
```

ISVfQ [f€,ðDirectPlayLobby,ð—p,¢,Ä“® ì,·,éfAfvfŠfP [fVf‡f“,Æ,μ,Ä“o~^,·,é B

<sup>3</sup> í,ÉŽÀ s,<sup>3</sup>,ê,ê,ÎTRUE ,ð A,»,¤,Ä,È,¯,ê,ÎFALSE,ð•Ô,· BFALSE,ð•Ô,·,Æ,«GetLastError,Æ,¢  
,¤Win32,ìŠÖ ”,ðŽg—p,·,é,ÆŠg’£fGf%o [ î•ñ,ð“¾,é,±,Æ,<sup>a</sup>,Ä,«,é B

*hWnd*

efEfBf“fhfE,ìfnf“fhf< B,±,ìfpf%of [f^,^NULL,É,È,Á,Ä,¢,é,Æ AfffXfNfgfbfv,<sup>a</sup> efEfBf“fhfE,Æ,È,é B

*lpDXRegApp*

fÆfWfXfgfŠ EfGf“fgfŠ,ðŠÜ,ð**DIRECTXREGISTERAPP** \‘¢‘Ì,ÌfAfhfÆfX B

## DirectXSetup

int WINAPI DirectXSetup(HWND hWnd, LPSTR lpszRootPath,  
DWORD dwFlags);

,D,Æ,Â,Û,½,Í,»,êÊ ã,ÌDirectXfRf“f [flf“fg,ðfCf“fXfg [f<.,é B

<sup>3</sup> í,ÉŽÀ s,<sup>3</sup>,ê,ê,ÎSUCCESS,ð•Ô,µ A,»,ϣ,Â,È,¯,ê,ÎfGf%o [ ,ð•Ô,· B•Ô'lfR [fh,ÎfŠfXfg,É,Â,¢  
,Ä,Í A•Ô'lf,ðŽQ Æ,·,é,±,Æ B

hWnd

fZfbfgfAfbfvf\_fCfAf fOf{fbfNfX,Ì efEfBf“fhfE,Ìfnf“fhf< B

lpszRootPath

DirectXfRf“f [flf“fgftf@fCf<,Ìf< [fgfpfX,ðŠÛ,Ð•¶Žš—ñ,ÌfAfhfÆfX B,±,Ì•¶Žš—  
ñ,Í ADsetup.dllftf@fCf<,ðŠÛ,ÐffBfÆfNfgfŠ,Ö,Ìftf<fpfX,ðŽw'è,µ,È,¯,ê,Î,È,ç,È,¢  
(‘Ê í,ÍRedist) BfJfÆf“fg EfffBfÆfNfgfŠ,ÉDsetup.dll,“,æ,ÑDirectxfffBfÆfNfgfŠ,“ŠÛ,Û,ê,Ä,¢,é,Ì,“Šm,©,Ä, ,ê,Î  
A,±,Ìfpf%of [f^,ÍNULL,Ä, ,é B

dwFlags

,Ç,ÌDirectXfRf“f  
[flf“fg,“fCf“fXfg [f<,<sup>3</sup>,ê,é,©,ðŽ',· A,D,Æ,Â,Û,½,Í,»,êÊ ã,Ìftf%oO B‘S'Ì,ðfCf“fXfg [f<.,é(DSETUP\_DIRE  
CTX),±,Æ,ð „ §,·,é B

**DSETUP\_D3D**

Direct3D™,ðfCf“fXfg [f<.,é B

**DSETUP\_DDRAW**

DirectDraw,ðfCf“fXfg [f<.,é B

**DSETUP\_DDRAWDRV**

DirectDrawfffofCfX Efhf%ofCfo,ðfCf“fXfg [f<.,é  
B

**DSETUP\_DINPUT**

DirectInput™,ðfCf“fXfg [f<.,é B

**DSETUP\_DIRECTX**

,·,×,Ä,ÌDirectX fRf“f [flf“fg,ðfCf“fXfg [f<.,é B

**DSETUP\_DIRECTXSETUP**

**DirectXSetup** DLL,ðfCf“fXfg [f<.,é B

**DSETUP\_DPLAY**

DirectPlay®,ðfCf“fXfg [f<.,é B

**DSETUP\_DPLAYSP**

DirectPlayfT [frfX Efvf fofCf\_,ðfCf“fXfg [f<.,  
é B

**DSETUP\_DSOUND**

DirectSound®,ðfCf“fXfg [f<.,é B

**DSETUP\_DSOUNDDRV**

DirectSoundfffofCfX Efhf%ofCfo,ðfCf“fXfg [f<.,é  
B

**DSETUP\_DVIDEO**

DirectVideo,ðfCf“fXfg [f<.,é B

**DSETUP\_PROMPTFORDRIVERS**

fffBfXfvfÆfC,“,æ,ÑfI [fffBfI EfffofCfX Efhf%  
fCfo,ð'u,«Š,‘,é‘O,ÉŠm”F,ð s,ϣ B

**DSETUP\_RESTOREDRIVERS**

fffBfXfvfÆfC,“,æ,ÑfI [fffBfI Efhf%ofCfo,ð•æE<sup>3</sup>,  
,é B

fZfbfgfAfbfv Efvf fOf%of€,Ä**DirectXSetup**,ðŽg—p,·,é‘O,É Af† [fU,ÌfVfXfef€,É Ä’á5 MB,Ì<ó,«fffBfXfN—e  
—Ê,“ ,é,±,Æ,ðŠm”F,·,é,±,Æ B,±,ê,Í“K Ø,Èftf@fCf<,ðfZfbfgfAfbfv,·,é,½,ß,ÉDirectX,“•K—v,Æ,·,é Ä’â,Ì—e—Ê,Ä,  
,é(,½,¾,µf† [fU,ÌfVfXfef€,ÉDirectXftf@fCf<,<sup>a</sup>,·,Ä,É¶ Ý,·,é ê ±,Ís—v) B

٧٤١

## DIRECTXREGISTERAPP

```
typedef struct _DIRECTXREGISTERAPP {
```

```
    DWORD dwSize;
```

```
    DWORD dwFlags;
```

```
    LPSTR lpszApplicationName;
```

```
    LPGUID lpGUID;
```

```
    LPSTR lpszFilename;
```

```
    LPSTR lpszCommandLine;
```

```
    LPSTR lpszPath;
```

```
    LPSTR lpszCurrentDirectory;
```

```
} DIRECTXREGISTERAPP, *PDIRECTXREGISTERAPP, *LPDIRECTXREGISTERAPP;
```

DirectPlayLobby,Å“® ì,·,é fAfvfŠfP [fVf‡f“,É•K—v,ÈfŒfWfXfgfŠ EfGf“fgfŠ,ðŽ ,Â B

**dwSize**

‖‘ċİ,İfTfCfY B

**dwFlags**

«—^,İŽg—p,İ,½,ß,É—\—ñ,³,ê,Ä,ċ,é B

**lpszApplicationName**

fAfvfŠfP [fVf‡f“,İ—¼ ì B

**lpGUID**

fAfvfŠfP [fVf‡f“,İfOf [fof< Ef†fj [fNŽ¯•ÊŽq(GUID) B

**lpszFilename**

ŒÄ,Ñ o,³,ê,éŽÄ sftf@fCf<,İ—¼ ì B

**lpszCommandLine**

ŽÄ sftf@fCf<,É‘Î,·,éfRf}f“fhf%ofCf“,Ä,İˆø ” B

**lpszPath**

ŽÄ sftf@fCf<,İpfX B

**lpszCurrentDirectory**

fJfŒf“fg EfffBfŒfNfgfŠ,ðŽ!,· B’Ê í,İlpszPath ,Æ““,¶ B

•Ô¹

**DirectXSetup**ŠÖ ”,íÊ%°,ì¹,ð•Ô,· B

**DSETUPERR\_BADSOURCESIZE**

$f\text{tf}@fCf<fTfCfY,\delta\mathbb{E}\ddot{Y} \quad \emptyset,\mathbb{A},\ll,\mathbb{E},\odot,\mathbb{A},\frac{1}{2},\odot \quad A\mathbb{E}\ddot{e},\mathfrak{e},\mathbb{A},\text{,}\mathbb{A},\frac{1}{2} \quad B$

**DSETUPERR\_BADSOURCETIME**

$f\text{tf}@fCf<,\grave{\text{I}}\text{“}\acute{\text{u}}\text{t},\text{,}\mathfrak{a},\mathring{N}\check{Z}\check{Z} \quad ,\delta\mathbb{E}\ddot{Y} \quad \emptyset,\mathbb{A},\ll,\mathbb{E},\odot,\mathbb{A},\frac{1}{2},\odot \quad A\mathbb{E}\ddot{e},\mathfrak{e},\mathbb{A},\text{,}\mathbb{A},\frac{1}{2} \quad B$

**DSETUPERR\_BADWINDOWSVERSION**

$\text{DirectX},\grave{\text{I}},\pm,\grave{\text{I}}f\text{o} \quad [fWf\sharp f\text{“},\grave{\text{I}}\text{Windows},\delta fTf| \quad [fg,\mu,\mathbb{A},\mathfrak{e},\mathbb{E},\mathfrak{e} \quad B$

**DSETUPERR\_CANTFINDDIR**

$fZfbfgfAfbfv \quad Efvf \quad fOf\%f\mathbb{E} \quad ,^a \quad \grave{\text{I}}\text{ÆffBf}\mathbb{E}fNfgf\check{S},\delta^{\text{,}}T,\mu \quad \text{o},^1,\mathbb{E},\odot,\mathbb{A},\frac{1}{2} \quad B$

**DSETUPERR\_CANTFINDINF**

$\bullet K\text{—}v,\mathbb{E} \quad .inf \quad f\text{tf}@fCf<,\delta^{\text{,}}T,\mu \quad \text{o},^1,\mathbb{E},\odot,\mathbb{A},\frac{1}{2} \quad B$

**DSETUPERR\_INTERNAL**

$\text{“}\grave{\text{a}}\text{”}fGf\% \quad [,^a,N,\pm,\mathbb{A},\frac{1}{2} \quad B$

**DSETUPERR\_NOCOPY**

$f\text{tf}@fCf<,\grave{\text{I}}f\text{o} \quad [fWf\sharp f\text{“},\delta\mathbb{E}\ddot{Y} \quad \emptyset,\mathbb{A},\ll,\mathbb{E},\odot,\mathbb{A},\frac{1}{2},\odot \quad A\mathbb{E}\ddot{e},\mathfrak{e},\mathbb{A},\text{,}\mathbb{A},\frac{1}{2} \quad B$

**DSETUPERR\_NOTPREINSTALLEDONNT**

$fVfXfef\mathbb{E},\grave{\text{I}}\text{Windows NT},\grave{\text{I}}f\text{o} \quad [fWf\sharp f\text{“},\acute{\mathbb{E}},\acute{\text{I}}\text{DirectX }3fRf\text{“}f| \quad [flf\text{“}fg,\text{”}\grave{\text{e}} \quad \emptyset fCf\text{“}fXfg \quad [f<,\textsuperscript{3},\mathfrak{e},\mathbb{A},\mathfrak{e},\mathbb{E},\mathfrak{e} \quad B$

**DSETUPERR\_OUTOFDISKSPACE**

$fCf\text{“}fXfg \quad [f<\text{’}\dagger,\acute{\mathbb{E}}fZfbfgfAfbfv \quad Efvf \quad fOf\%f\mathbb{E},^a\text{ffBf}XfN \quad \text{—}e\text{—}\mathbb{E},\delta\check{Z}g,\mathfrak{e}\% \mathbb{E},\frac{1}{2},\mu,\frac{1}{2} \quad B$

**DSETUPERR\_SOURCEFILENOTFOUND**

$\bullet K\text{—}v,\mathbb{E}f\backslash \quad [fXf\text{tf}@fCf<,\grave{\text{I}},\mathfrak{c},\grave{\text{I}},\mathfrak{D},\mathbb{A},\mathbb{A},\delta^{\text{,}}T,\mu \quad \text{o},^1,\mathbb{E},\odot,\mathbb{A},\frac{1}{2} \quad B$

**DSETUPERR\_UNKNOWNOS**

$fTf| \quad [fg,\textsuperscript{3},\mathfrak{e},\mathbb{A},\mathfrak{e},\mathbb{E},\mathfrak{e}f\text{o} \quad [fWf\sharp f\text{“},\grave{\text{I}}\text{OS},\mathbb{A},\text{,}\acute{\mathfrak{e}} \quad B$

**DSETUPERR\_USERHITCANCEL**

$fAfvf\check{S}fP \quad [fVf\sharp f\text{“},^a\check{S}\textcircled{\text{’}}S,\acute{\mathbb{E}}fCf\text{“}fXfg \quad [f<,\textsuperscript{3},\mathfrak{e},\acute{\mathfrak{e}}\text{’}O,\acute{\mathbb{E}} \quad A\text{Cancel} \quad f\{f^{\wedge}f\text{“},^a\% \check{Y},\textsuperscript{3},\mathfrak{e},\frac{1}{2} \quad B$

**SUCCESS**

$fZfbfgfAfbfv,\grave{\text{I}} \quad \textsuperscript{3} \quad \acute{\text{I}} \quad \text{I—} \quad B \quad \mathbb{A}\text{N}\text{“}\textcircled{\text{’}},\grave{\text{I}}\bullet K\text{—} \quad v,\textsuperscript{a},\mathbb{E},\text{,}\mathfrak{e},\acute{\text{I}} \quad A0,\textsuperscript{a}\bullet\mathbb{O},\textsuperscript{3},\mathfrak{e},\acute{\mathfrak{e}} \quad B$

$fZfbfgfAfbfv,\grave{\text{I}} \quad \textsuperscript{3} \quad \acute{\text{I}} \quad \text{I—} \quad B \quad \mathbb{A}\text{N}\text{“}\textcircled{\text{’}},\grave{\text{I}}\bullet K\text{—}v,\textsuperscript{a},\text{,}\mathfrak{e},\acute{\text{I}} \quad A1,\textsuperscript{a}\bullet\mathbb{O},\textsuperscript{3},\mathfrak{e},\acute{\mathfrak{e}} \quad B$

## AutoPlay,É,Â,¢,Ä

Microsoft® AutoPlay,ÍMicrosoft Windows® fIfyf€ [fefBf“fO EfVfXfef€,Îê<@”\  
,Ä, ,é BAutoPlay,Í AWindowsfvf%fbfgftfH [f€—p,É ÝEv,³,ê,½ »•i,ðfCf“fXfg [f< A \ ¬,·,é,Ì,É•K—v,ÈŽè‘±  
,«„ðŽ©“®%o»,·,é,à,Ì,Ä AfRf“fpfNfg EfffBfXfN(CD),Ä”z•z,³,ê,Ä,¢,é BAutoPlay,Î“ü,Ä,Ä,¢  
,éffBfXfN,ðWindows,“® ì,µ,Ä,¢,éRf“fsf... [f^,ÌCD-  
ROMfhf%ofCfu,É’}“ü,·,é,Æ AAutoPlay,ÍffBfXfN ä,ÌfAfvfŠfP [fVf±f“,ðŽ©“®“L,É<N“®,µ A‘T’ð,³,ê,½ »•i,ðfCf“  
fXfg [f< A \ ¬,·,æ,ÑŽÀ s,·,é B

Autoplay,ð—p,¢,Ä AMS-DOS® fIfyf€ [fefBf“fO EfVfXfef€ AWindows 3.0 AWindows 3.1 AWindows  
95,Ü,½,ÍWindows NT®,Ì,¢,,ê,©,ðfx [fX,É,µ,Ä“® ì,·,éCD-  
ROMfAfvfŠfP [fVf±f“,ð AWindows ä,ÄfCf“fXfg [f<,·,æ,ÑŽÀ s,·,é,±,Æ,ª,Ä,«„é B,»,ÌCD-ROM »•i,ÉMicrosoft  
Windows 95,Ìf fS,ð•Ž,³,¹,½,¢ ê ±,É,Í AAutoPlay,ð—p,¢,é,±,Æ,ª•K—v,É,È,é B

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## ’ °

MS-DOS AWindows 95ˆÈ‘O,Ìfo [fWf±f“,ÌWindows A,“,æ,ÑWindows NT  
fo [fWf±f“3.51,“,æ,Ñ,»,êˆÈ‘O,Ì,à,Ì,ÍAutoPlay,ðfTf| [fg,µ,Ä,¢,È,¢ B,µ,©,µAutoPlay,ðCD,É%Á,!,Ä,à A,±  
,ê,ç,ÌfIfyf€ [fefBf“fO EfVfXfef€,“® ì,µ,Ä,¢,éRf“fsf... [f^,Ì“® ì,Í—W,°,ç,ê,½,è%oe<ç,ðŽó,¯,½,è,µ,È,¢ B

## AutoPlay,İ“® ì,É,Â,ç,Ä

AutoPlay,İ“® ì,İŽŸ,É, ,°,é,R,Â,İ ðŒ ,ð•K—v,Æ,·,é B

Windows 95,“,æ,ÑWindows NT,İ32frfbfgCD-ROMfffofCfX Efhh%ofoCfo,İfZfbfg B,±  
,ê,ç,İfffofCfX Efhh%ofoCfo,İ Af† [fU,°CD,ðCD-ROMfhf%ofoCfu,É‘}“ü,µ,½,±,Æ,ðŒŸ’m,·,é i,½,¾,µMS-DOS, ,  
é,ç,İÈ·O,İfo [fWf‡f“,İWindows,İfffofCfX Efhh%ofoCfo,İŒŸ’m,ð s,í,È,ç j B

CD ä,İAutorun.infftf@fCf< B Windows 95, ,é,ç,İWindows NT,““® ì,·,éRf“fsf... [f^,İCD-  
ROMfhf%ofoCfu,ÉffBfXfN,ð‘}“ü,·,é,Æ AfVfXfef€,Í’¼,ı,ÉffBfXfN,ÉPC,İftf@fCf<fVfXfef€,“¶ Ÿ,·,é,©,Ç,□  
,©,ðf`fFfbfN,·,é B¶ Ÿ,·,é ê ‡,É,İ AfVfXfef€,İAutorun.inf,Æ,ç,□—¼ İ,İftf@fCf<,ð’T,· B,±  
,İftf@fCf<,İAutoPlay,“ŽÀ s,·,éAfvfŠfP [fVf‡f“,ðŽw’è,µ A,³,ç,É’¼,İ î•ñ,ð,à•Ū—L,·,é,±,Æ,ª,Ä,«é B,±  
,İftf@fCf<,İ Ū ×,É,Â,ç,Ä,İ AAutorun.infftf@fCf<,ðŽQ Æ,·,é,±,Æ B

CD ä,İXf^ [fgAfbfv EfAfvfŠfP [fVf‡f“ BAutorun.infftf@fCf<,ÄŽw’è,·,ê,İffBfXfN ä,İ”CˆÓ,İfAfvfŠfP  
[fVf‡f“,ðN“®,Ä,«é,ª Aˆê”Ê“İ,É,İN“®,Ū,½,İfCf“fXfg [f<<@”\  
,ðŽÀ s,·,é B V,½,É ì,Ä,½fXf^ [fgAfbfv EfAfvfŠfP [fVf‡f“,ðŽg,□  
,Æ A »•i,İfCf“fXfg [f< AfAf“fCf“fXfg [f<,“,æ,ÑŽÀ sfvf fZfX,ð §Œä,·,é,±,Æ,ª,Ä,«é B



## Autorun.inf

Autorun.inf [fg EffBfEfNfgfŠ,É, ,éfefLfXfgftf@fCf<,Ä, ,é B,± ,lftf@fCf<,É,Í AffBfXfN,Ä,lfx^ [fgfAfbfv EfAfvfŠfP [fVf±f“ iftfBfXfN,ðCD-ROMfhf%ofCfu,É’}“ü, ,é,ÆŽ@“®“L,É“® i, ,éfAfvfŠfP [fVf±f“ j,l-¼ l,â AWindowsf† [fU EfCf“f^ [ftfFfCfX,É, ,ç,ÄAutoPlay“® i%Ä”,ÈCD,Ä, ,é,± ,Æ,ðŽ’, ,fAfcRf“, ,šÜ,Ü,ê,é B,Ü,½Autorun.inf [fgfJfbfg Ef fjf... [ ,É%Ä, ,½,çfIfvfVf±f“, ,lf fjf... [fRf}f“fh,àšÜ,Ü,ê,Ä,ç,é B,±,lfVf± [fgfJfbfg Ef fjf... [ ,Í ACD-ROMfAfcRf“, ,ðf}fEfX,Ä%EfNfŠfbfN, , ,é,Æ•Ž’, ,³,ê,é B

Autorun.inf [fgfAfbfv EfAfvfŠfP [fVf±f“, , ,æ,ÑfAfcRf“, ,ðŽ-•É, , ,é B`É%°,É—á,ðŽ’, , B

```
[autorun]
open=filename.exe
icon=filename.ico
```

[autorun] fZfNfVf±f“, ,Í A, ,», ,é,É’±, s,ðAutoPlayfRf}f“fh,Æ,µ,ÄŽ-•É, , ,é B [autorun] fZfNfVf±f“, ,Í, , ,x, ,Ä,lAutorun.inf [fgfAfbfv EfAfvfŠfP [fVf±f“, ,lfpfX, , ,æ,Ñftf@fCf<-¼,ðŽw’è,µ A iconfRf} f“fh,ÍfAfcRf“ î•ñ,ðšÜ,ðftf@fCf<,ðŽw’è, , ,é B

Autorun.inf [fLfefNf`ff“Ä— L,lfZfNfVf±f“, ,ðšÜ,ß,é,±,Æ,à,Ä,« ,é B, ,», ,l,½,ß,É,Í A, ,», ,é,¼,ê, ,lf^fCfv,lfvf fZfbfT EfA [fLfefNf`ff,É, ,í,¹,Ä A, ,», ,lfA [fLfefNf`ff,ÄŽÄ s,µ,½,çfXf^ [fgfAfbfv EfAfvfŠfP [fVf±f“, ,lftf@fCf<-¼,ðšÜ,ðAutorun.inf [fgfAfbfv EfAfvfŠfP [fVf±f“, ,ð%Ä, , ,é Bx86fA [fLfefNf`ff,É,Í A•W € [autorun] s,ð—p,ç ,é BMIPsfA [fLfefNf`ff ä,ÄfAfvfŠfP [fVf±f“, ,ðŽÄ s, , ,é ê ±,É,Í [autorun.mips] AAlphafA [fLfefNf`ff ä,lfAfvfŠfP [fVf±f“, ,É,Í [autorun.alpha] APowerPCfA [fLfefNf`ff,É,Í [autorun.ppc] ,ð—p,ç,é BfRf“fsf... [f^ EfA [fLfefNf`ff,É,æ,è`Ü,È,éfXf^ [fgfAfbfv EfAfvfŠfP [fVf±f“, ,ðŽÄ s, , ,éAutorun.inf [fgfAfbfv EfAfvfŠfP [fVf±f“, ,ðŽÄ s, , ,éA`É%°,ÉŽ’, , B

```
[autorun]
open=filename.exe
icon=filename.ico
```

```
[autorun.mips]
open=filenam2.exe
icon=filename.ico
```

```
[autorun.alpha]
open=filenam3.exe
icon=filename.ico
```

```
[autorun.ppc]
open=filenam4.exe
icon=filename.ico
```

fVfFf<,Í Ä %°,ÉfA [fLfefNf`ffÄ— L,lfZfNfVf±f“, ,ðf`fFfbfN, , ,é BfZfNfVf±f“, ,ðœ@,Ä, ,ç,è,È,©,Ä,½ ê ±,Í A [autorun] fZfNfVf±f“, ,l î•ñ,ð—~— p, , ,é BfZfNfVf±f“, ,ðœ@,Ä, , ,é,ÆfVfFf<,Í¼,lfZfNfVf±f“, ,ð, , ,x, ,Ä-³Ž’, ,µ,Ä,µ,Ü,² ,l,Ä A, ,», ,é,¼,ê, ,lfZfNfVf±f“, ,fA [fLfefNf`ff, ,l, , ,x, ,Ä, ,l î•ñ,ðŽ ,Ä,Ä,ç,é,±,Æ,ðŠm”F, , ,éK—v, , ,é B

**AutoPlayfAfvfŠfP [fVf‡f“,ð ‘, ã,Â,İfAfhfofCfX**

,±,İfZfNfVf‡f“,Â,ÍAutoPlayfAfvfŠfP [fVf‡f“,ð ‘, ã,Â•K—v,È^È%°,İfAfhfofCfX,É,Â,¢,Ä à–¼,.,é B

fXf^ [fgfAfbfv EfAfvfŠfP [fVf‡f“,İfL [fvf“

fobfNfOf%ofEf“fh,Â,İf [fh

fn [fhfffBfXfN<óŠÔ,İ B–ñ

fEfWfXfgfŠ,İŽg—p

NoDriveTypeAutoRun’l,İfZfbfg

*fXf*<sup>^</sup> [fgfAfbfv EfAfvfŠfP [fVf‡f“,ìfI [fvf“

AutoPlayCD,ðfhf%oCfu,É‘}“ü,·,é,Æ,·,®,É AfXf<sup>^</sup> [fgfAfbfv EfAfvfŠfP [fVf‡f“,ª—§,¿ ã,ª,é B,±  
,ê,É,Í AAutorun.infftf@fCf<,l**open**fRf}

f“fh,É A ‘,¬,Éf [fh,Ä,«,é ¬Œ^,ìfXf<sup>^</sup> [fgfAfbfv EfAfvfŠfP [fVf‡f“,ðŽw’è,·,é B,»,ìfAfvfŠfP [fVf‡f“,É,Í  
AŽÀ s,·,éf^fCf<sub>g</sub>f<,l•Ž,âfLfff“fZf< Ef{f^f“,È,Ç,ð”ö,!„Ä,“, B

**f**o**f**b**f**N**f**O**f%**f**E**f**“f**h**,**Ä**,**İ**f    [f**h****

fXf^ [fgfAfbfv EfAfvfŠfP [fVf‡f“,ª A ^— ,ð‘±,¯,Ä,¢,©,Ç,◻,©,ðf\_fCfAf fO Ef{fbfNfX,Å•,-  
,Æ Af† [fU,ÍÊ íOK,ðfNfŠfbfN,·,é B,±,Ì,Æ,« Af† [fU,ªf{f^f“,ð%Ÿ,·,Û,Å,İŽžŠÔ,ð—  
p,µ,Ä Af**o**f**b**f**N**f**O**f%**f**E**f**“f**h**,ÅfXf^ [fgfAfbfv EfAfvfŠfP [fVf‡f“,İf [fh,ðŽn,ß,é•ÊfXfƎfbfh,ðN“@,³,¹,Ä,“, -  
,Æ AŽžŠÔ,ð—LƎø,É—~p,Å,«,é B,±,ê,É,æ,è AfAfvfŠfP [fVf‡f“,İf [fhŽžŠÔ,ª,©,Ê,è’Z k,³,ê,é B

**fn [fhfffBfXfN◁óŠŎ,ĭ Ɓ-ñ**

fn [fhfffBfXfN—ĭæ,É,ÍÆÀ,è,<sup>a</sup>,,é B,±,±,Â,Ífn [fhfffBfXfN,ð Ɓ-ñ,·,é,½,ℓ,ĭAfhfofCfX,ð,¢,,Â,©◁“,°,é B

fCf“fXfg [f◁—pAfvfŠfP [fVf‡f“,ðŽÀ s,<sup>1</sup>,, ACD,©,ç’¼ ÚfAfvfŠfP [fVf‡f“,ðŽÀ s,·,é B

fAfvfŠfP [fVf‡f“,<sup>a</sup>fn [fhfffBfXfNfhf%oCfu,ð•K—v,Æ,·,é ê ‡,Í AŽÀ s,É•K—v,È◁@”\fRf“f|

[flf“fg,ĭ,Ý,ðCf“fXfg [f◁,·,é B,<sup>3</sup>,ç,É A,±,ê,ç,ĭfRf“f|

[flf“fg,ðfn [fhfffBfXfN,©,çfAf“fCf“fXfg [f◁,·,é•û—@,à €”ð,μ,Ä,“, -

BfAfvfŠfP [fVf‡f“,ĭfAf“fCf“fXfg [f◁,ÉŠŎ,·,é Ú ×,È îñ,É,Â,¢,Ä,Í Af}fCfNf f\ftfg Win32

f\ftfgfEfFfAŠJ”fLfbfg (SDK),É“Y•t,<sup>3</sup>,ê,Ä,¢,éf}fjf...fAf◁,ðŽQ Æ,·,é,±,Æ B

fAfvfŠfP [fVf‡f“,<sup>a</sup>fn [fhfffBfXfNfhf%oCfu,ðff [f^fLfffbfVf...,Æ,μ,Ä—~—p,·,é•K—v,<sup>a</sup>,,é ê ‡ Af^fCfg

f◁,Ü,½,ÍfQ [f€,ĭ I—

<sup>1</sup>Žž,ÉfLfffbfVf...“à,ĭff [f^,ð Á◁Ž,·,éIfvfVf‡f“,ĭf\ftfg,ðfXf^ [fgfAfbfv EfAfvfŠfP [fVf‡f““à,É—

p^Ŏ,μ,Ä,“, B

## fŒfWfXfgfŠ,İžg—p

fŒfWfXfgfŠ,İ A %Šú%» î•ñ(.ini),,æ,ÑfRf“ftfBfMf...fŒ [fVf‡f“ Eftf@fCf<,É‘Ö,i,éWindows,İ<@”\,Ä, ,é BfŒfWfXfgfŠ,đ€ İ,.,éAPI,ÉŠÖ,.,é î•ñ,É,Ä,¢,Ä,Í AWin32 SDK,É“Y•t,<sup>3</sup>,é,Ä,¢,éf}fj...fAf<,đŽQ Œ,.,é,±,Œ B

»i,<sup>a</sup> %Šú%» î•ñ,đ“o^,µ,Ä,¢,é,Œ A,»,İ î•ñ,İfŒfWfXfgfŠ,ÉŠi”[,<sup>3</sup>,é AŒă,©,çŽæ,è o,.,±,Œ,%Ä”\ ,É,È,é BfAfvfŠfP [fVf‡f“,İfŒfWfXfgfŠ’†,İ î•ñ,đŒŒ,Ä A »i,đfCf“fXfg [f<,.,é•K—v,<sup>a</sup> ,é,©,Ç,□,©,đŒ^,ß,é,± ,Œ,<sup>a</sup>,Ä,«,é B »i,İfŒfWfXfgfŠfGf“fgfŠ,“¶ Ý,µ,È,¢ ê ‡,Í i,Ä,Ü,è »i,<sup>a</sup>Žg,í,é,é Ä % ,İ,Œ,« j AfZfbfgfAfbfv,İfİfvfVf‡f“,đ^è—— ,.,éf\_fCfAf fOf{fbfNfX,đ•Ž,<sup>3</sup>,<sup>1</sup>,é B »i,<sup>a</sup>fŒfWfXfgfŠ,É“o^ İ,Ý,İ ê ‡ A »i,Í,.,Ä,ÉfCf“fXfg [f<,<sup>3</sup>,é,Ä,¢ ,é,<sup>1</sup>/<sub>2</sub>,ß AfZfbfgfAfbfvİfvfVf‡f“,đ È—<sup>a</sup>,Ä,«,é B

fVfXfefŒfŒfWfXfgfŠ,đ•İ X,.,é,Œ Aftf fbfs [ffBfXfN,©,çAutorun.inf@fCf<,đ“Ç,Ý ž,Ü,<sup>1</sup>,é,±,Œ,%Ä”\ ,Œ,È,é Bftf fbfs [ffBfXfN,ÄAutoPlay,đ“® İ,<sup>3</sup>,<sup>1</sup>,Ä,àÖ—i,İ,È,¢ ,<sup>a</sup> AAutorun.inf@fCf<,đCD,É Ä,«t,^,é‘O,İfffofbfO,É,Í—đ—§,Ä BAutoPlay,ÍCD,Ä,<sup>3</sup>/<sub>4</sub>,^“ê”Ê”z•z,.,é—\’è,Ä, ,é BA utoPlay,đftf fbfs [ffBfXfN,Ä“® İ,.,é,æ,□,É,.,é,É,Í AŽŸ,İŽè‘±,«,đŽÄ s,.,é,±,Œ B

- 1 fŒfWfXfgfŠfGffBf^ (Regedit.exe) ,É,^,¢ ,Ä u•Ö W(E) v,đfNfŠfbfN,µ A,»,İŒă,Ä uŒŸ ò(F) v,đfNfŠfbfN,.,é B
- 2 ŒŸ òf\_fCfAf fO,Ä^È%°,ÉŽİ,^Œê,đf^fCfv,µ uŽŸ,đŒŸ ò(F) v,đfNfŠfbfN,.,é B

### NoDriveTypeAutoRun

- 3 u•Ö W(E) v,đfNfŠfbfN,µ A,»,İŒă u•İ X(M) v,đfNfŠfbfN,.,é B
- 4 NoDriveTypeAutoRun ‘l,İff [f^,đ0000 95 00 00 00 ,©,ç 0000 91 00 00 00,É•İ X,µ AOK,đfNfŠfbfN,.,é B  
^È ä,Ä A”C^Ó,İfhf%oCfu ä,ÄAutoPlay,%Ö“®,.,é B,µ,©,µ Aftf fbfs [ffBfXfN ä,ÉfCf“fXfg [f<,<sup>3</sup>,é,Ä,¢ ,é,Œ,«,Í AAutoPlay,đŽè İŒ,Ä^N“®,µ,È,^,ê,İ,È,ç,È,¢ B,±,ê,đ s,□ ,É,Í Aftf fbfs [ffBfXfNfAfCfRf“,đf\_fuf<fNfŠfbfN, ,é,¢,Íf} fEfX,Ä%EfNfŠfbfN,µ A,»,İŒăAutoPlay,đfNfŠfbfN,.,é B
- 5 Autorun.inf,İfefXfg,<sup>a</sup>Š®—<sup>1</sup>,µ,<sup>1</sup>/<sub>2</sub>Œă ANoDriveTypeAutoRun,İ‘l,đ0000 95 00 00 00,ÉfŠfZfbfg,.,é B

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## d—vž– €

ftf fbfs [ffBfXfN,ÄAutoPlay,đ“® İ,<sup>3</sup>,<sup>1</sup>,é,Œ AfRf“fsf... [f^fEfBf<fX,đŠÈ’P,É– %,,,<sup>3</sup>,<sup>1</sup>,é,± ,Œ,<sup>a</sup>,Ä,«,Ä,µ,Ü,□ B^”Ê”z•z,<sup>3</sup>,é,Ä,¢,éftf fbfs [ffBfXfN,ÉAutorun.inf@fCf<,<sup>a</sup>“ü,Ä,Ä,¢ ,<sup>1</sup>/<sub>2</sub>,ç AfEfBf<fX,İ“¶ Ý,đ^,□•K—v,<sup>a</sup> ,é B

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NoDriveTypeAutoRun‘l,ÉŠÖ,.,é Ú ×,È î•ñ,É,Ä,¢,Ä,Í ANoDriveTypeAutoRun‘l,İfZfbfg,đŽQ Œ,.,é,±,Œ B

## NoDriveTypeAutoRun'l,İfZfbfg

fCefWfXfgfŠ,É, ,éNoDriveTypeAutoRun'l,İ Af^fCfvREG\_BINARY,İ4fofCfg'.İfofCfifŠff [f^,İ'l,Ä, ,é B,± ,İ'l,İ Ä %o,İfofCfg,İ AAutoPlay İÆ,©,ç æŠO,<sup>3</sup>,ê,éŽí X,İfhf%ofCfu,ð•\,· B,±,İfofCfg,İ %Šú Ý'è,İ0x95,Ä A,± ,ê,İ" FŽ<sup>-3</sup>,ê,È,Çf^fCfv,İfhf%ofCfu,Ä, ,éDRIVE\_UNKNOWN ADRIVE\_REMOVEABLE,“,æ,ŃDRIVE\_FIXED,İf fffB fAf^fCfv,ðAutoPlay“K—p'İ Ü,©,ç æŠO,·,é B,Ü,½AutoPlay,İ“@ İ,Éftf fbfs [ffBfXfNfhf%ofCfu,ð—~ p,·,é,É,İ Afrfbfg2,ð0,ÉfŠfZfbfg,·,é,© A,Ü,½,İŽc,è,İ %Šú Ý'è,ð,»,İ,Ü,É,µ,Ä,~, - ,æ,ı'10x91,ðŽw'è,·,é,©,İ,Ç,ı,ç,©,ð s,•K—v,<sup>a</sup>, ,é BfCefWfXfgfŠ'l,İ•İ X-@,ÉŠÖ,·,é î•ñ,É,Ä,Ç ,Ä,İ AfCefWfXfgfŠ,İŽq—p,ðŽQ Æ,·,é,±,Æ Bfrfbfg Afrfbfgf}fXfN'è ”,“,æ,Ńfhf%ofCfu,ÉŠÖ,·,éŠÈ'P,È' Žß,İ• ,İŽŸ,İ'È,è,Ä, ,é B

frfbfg”Ö †	frfbfgf}fXfN'è ”	’ Žß
0 ( Ä%o°Êfrfbfg)	DRIVE_UNKNOWN	”FŽ <sup>-3</sup> ,ê,È,Çfhf%ofCfu^fC fv B
1	DRIVE_NO_ROOT_DIR	f< [fgffBfCefNfgfŠ, <sup>a</sup> ¶ Ÿ,µ,È,Ç B
2	DRIVE_REMOVEABLE	ffBfXfN,ðfhf%ofCfu(ftf fbfs [ffBfXfN) ,©,çŽæ,èŠO, <sup>1</sup> ,é B
3	DRIVE_FIXED	ffBfXfN,ðfhf%ofCfu(fn [fhffBfXfN) ,©,çŽæ,èŠO, <sup>1</sup> ,È,Ç B
4	DRIVE_REMOTE	flfbfgf [fNfhf%ofCfu B
5	DRIVE_CDROM	CD-ROMfhf%ofCfu B
6	DRIVE_RAMDISK	RAMffBfXfN B
7 ( Ä ãÊfrfbfg)		«—^,İ—~—p,İ,½,ß,É— \~ñ, <sup>3</sup> ,ê,Ä,Ç,é B

’ ~Ö

Windows NT,É,Ä,Ç,Ä,İ A•İ X,ð—LÆø,É,·,é‘O,ÉWindows Explorer,ð ÄN“@,µ,È,—,ê,İ,È,ç,È,Ç B

## AutoPlay,İ—} §

CD,ð‘}“ü,.,é Û,ÉSHIFTfL [,ð%Ÿ,³,!,é,Æ AfffBfXfN ã,İAutorun.inf,tf@fCf<,%ð Í EŽÀ s,³,ê,é,İ,ðŽè ì<Æ,Ä—}  
§,Ä,«,é BWindows NTfo [fWf‡f“4.0,“,æ,ÑWindows 95,ÄInternet Explorerfo [fWf‡f“4.0,ð—p,¢,Ä,¢  
,éf† [fU,İ AŽ©“®“I,ÉAutoPlay,ð—} §,.,é,±,Æ,ª,Ä,«,é B,±,İ<@”\  
,İ AfXf^ [fgfAfbfv EfAfvfŠfP [fVf‡f“,İ†,Äf† [fU,ÉAutorun.inf,tf@fCf<,İ“ü,Ä,Ä,¢,éffBfXfN,ð‘}“ü,³,¹,é•K—  
v,ª,.,é,Æ,«,È,Ç,ÉŽg,□ B,±  
,İ ê ‡ AfXf^ [fgfAfbfv EfAfvfŠfP [fVf‡f“ŽÀ s’†,É•ÊfAfvfŠfP [fVf‡f“,ðŽÀ s,³,¹,éAutoplay<@”\,İ•s—v,Ä, ,  
é BfXf^ [fgfAfbfv EfAfvfŠfP [fVf‡f“,ªftfHfAfOf%ofEf“fh,É, ,é,Æ,«AutoPlay,ð—}  
§,.,é,É,İ A`È%°,İfR [fh,ðfZfbfgfAfbfv %oŠú%o»fR [fh,É%oÄ,!,é B

uMessage - RegisterWindowMessage(TEXT("QueryCancelAutoPlay"));

,»,µ,Ä`È%°,İfR [fh,ðfZfbfgfAfbfv EfEfBf“fhfE Efvf fV [fWff,É%oÄ,!,é B

if(msg == uMessage)

```
{  
    // return 1 to cancel AutoPlay  
    // return 0 to allow AutoPlay  
    return 1L;  
}
```



## MS-DOS AfvfŠfP [fVf‡f“,lAutoPlay

,Ü,½ AAAutoPlay,ð—p,¢,Ä AMS-DOSfx [fX,lAfvfŠfP [fVf‡f“,ðWindows MS-DOSfZfbfVf‡f“,ÄfCf“fXfg [f< A \ ¬,“,æ,ÑŽÄ s,Ä,«,é BMS-DOSfx [fX,lŠefAfvfŠfP [fVf‡f“,É‘l,µ“ÆŽ©,lAfCfRf“ AConfig.sysftf@fCf<“,æ,ÑAutoexec.batftf@fCf<,ð Ý’è,·,é,±,Æ,ª,Ä,«,é B

Windows,IMS-

DOSfAfvfŠfP [fVf‡f“,l,½,ß,l³,µ,¢ Ý’èftf@fCf<,ð ì ¬,·,é B,Ü,½fXf^ [fgfAfbfv EfAfvfŠfP [fVf‡f“,IMS-DOSfAfvfŠfP [fVf‡f“,ðfEfBf“fhfE“à,ÄN“@,Ä,«,é,æ,²,É,·,é BfXf^ [fgfAfbfv EfAfvfŠfP [fVf‡f“,Í•K—v,É%ž,¶,Ä,»,lMS-DOSfAfvfŠfP [fVf‡f“,l ÄN“@,ðWindows,ÉŽwŽl,Ä,« AfAfvfŠfP [fVf‡f“,ª•Ä,¶,é,Æ’¼,¿,ÉWindows,Ö §Æä,ð•Ô,·,±,Æ,ª,Ä,«,é B

*fŠftf@fÆf“fX*

***fRf)f“fh***

## defaulticon

defaulticon=path\iconname.ico

fAfCfRf“ î•ñ,ðŽ ,Âftf@fCf<,Ö,ìCD ã,ì â‘îfpfX,ðŽw’è,·,é B,±  
,îfAfCfRf“,ÍWindowsf† [fU EfCf“f^ [ftfFfCfX,É,“,¢,ÄAutoPlay“® ì%oÂ”\,ÈCD,ð•\,· B

path\iconname.ico

fAfCfRf“ î•ñ,ì, ,éftf@fCf<,ì â‘îfpfX,“,æ,Ñftf@fCf<-¼ Bbmp Aexe, ,é,¢,Ídllftf@fCf<,ðŽw’è,·,é,±  
,Æ,à,Â,«,é Bftf@fCf<,É•¡ ”,îfAfCfRf“,ªŠÜ,Ü,ê,é ê ‡ AŽg—pftf@fCf<‘□  
,ÂfAfCfRf“,îfŠf\ [fX”Ô †(fCf“fffbfNfX),ðŽw’è,·,é B

icon ,“,æ,Ñ defaulticon fRf}f“fh,ªAutorun.infftf@fCf<,É, ,é ê ‡ AAutoPlay,ÍdefaulticonfRf}  
f“fh,ÂŽw’è,³,ê,½fAfCfRf“,ðŽg—p,·,é B

fhf%oCfu,ÉAutoPlay“® ì%oÂ”\,ÈCD,ª,È,¢ ê ‡ AfVfXfef€,Ífhf%oCfu,ì•Ž!,ÉffftfHf<fg,îfAfCfRf“,ð—p,¢,é B

ŽQ Æ @icon

icon

icon=filename.ico

Windowsf† [fU EfCf“f^ [ftfFfCfX,É,“,¢,ÄAutoPlay“® i‰Ä”\,ÈCD,ð•\  
,·fAfCfRf“,İ î•ñ,ðŽ ,Äftf@fCf<,ðŽw’è,·,é B,±,İfRf}f“fh,ÄŽw’è,<sup>3</sup>,ê,éftf@fCf<¼,Í Aopen fRf}  
f“fh,ÄŽw’è,<sup>3</sup>,ê,éftf@fCf<¼,Æ““,¶ffBfÆfNfgfŠ,É,È,¯,ê,Î,È,ç,È,¢ B

filename.ico

fAfCfRf“ î•ñ,ðŠÜ,bftf@fCf<,İ¼ İ B,Ü,½.bmp A.exe, ,é,¢,Í.dllftf@fCf<,ðŽw’è,·,é,±  
,Æ,à,Ä,«,é Bftf@fCf<,É•i“,İfAfCfRf“,ªŠÜ,Ü,ê,é ê ‡ A—p,¢  
,éftf@fCf<,ÄfAfCfRf“,İfŠf\ [fX”Ô †(fCf“fffbfNfX),ðŽw’è,·,é,±,Æ B  
fhf‰Cfu,ªAutoPlay“® i‰Ä”\,ÈCD,ðŠÜ,Ü,È,¢ ê ‡ AfVfXfef€,Ífhf‰Cfu,İ•Ž',ÉfftfHf<fg,İfAfCfRf“,ð—p,¢  
,é B

ŽŸ,İ—á,Ä,Í ACD,ð•\,·,Q”Ô—Ú,İfAfCfRf“,ªftf@fCf<,ÄŽw’è,<sup>3</sup>,ê,Ä,¢,é B Ä ‰  
,İfAfCfRf“,İfCf“fffbfNfX,Í0,ÉfZfbfg,<sup>3</sup>,ê,Ä,¢,é B

icon=filename.exe 1

ŽQ Æ @defaulticon

**open**

open=dir\filename.exe

CD-ROMfhf%oCfu,ÉCD,ð'{"ü,µ,½,Æ,« AAutoPlay,ªŽÀ s,·,éAfvfŠfP [fVf‡f“,łpfX,Æftf@fCf<-¼,ðŽw'è,·,é B

dir\filename.exe

CD,ì'{"üŽŽ AŽÀ s%oÂ"}\ftf@fCf<,ðŽÀ s,µ,½,èfhfLf...f f“fg,ðŠJ,¢,½,è,·,épfX,“,æ,Ńftf@fCf<-  
¼ Bftf@fCf<,"fhfLf...f f“fg,ł ê ‡ AWindows,ÍŽw'è,³,ê,½fhfLf...  
f f“fg,ÉŠÖ`A,Ä,¯,ç,ê,½fAfvfŠfP [fVf‡f“,ðN“®,·,é BpfX,ªŽw'è,³,ê,Ä,¢  
,È,¢ ê ‡ AWindows,ÍCD ä,łf< [fgffBfŒfNfgfŠ,Äftf@fCf<,ðŒY ò,·,é B‘Š‘İpfX,ðŽw'è,µ,Ä A,»,łftf@fCf  
<,ðfTfuffBfŒfNfgfŠ,É'u,,±,Æ,à,Ä,«,é B

fAfvfŠfP [fVf‡f“ŽÀ sŽŽ,ÉAutoPlay,““n,·fRf}f“fhf%oCf“fpf%of [f^,ð•t%oÁ,·,é,±,Æ,à,Ä,«,é B

,±,łfRf}f“fh,ðŽg—p,µ,ÄfXf^ [fgfAfbfv EfAfvfŠfP [fVf‡f“,ðŠJ,,±  
,Æ,Ä Af† [fU,©,ç,ì%oŽ“š,ð,»,ì ê,ÄŽó,¯Žæ,ê,é BfXf^ [fgfAfbfv EfAfvfŠfP [fVf‡f“,ì Ú ×,É,Â,¢  
,Ä,Í AfXf^ [fgfAfbfv EfAfvfŠfP [fVf‡f“,łfI [fvf“,ðŽQ Æ,·,é,±,Æ B

**shell**

shell=verb

fVf‡ [fgfJfbfg Ef fjf... [,lfftfHf<fgfGf“fgfŠ,ð AŽw’è,<sup>3</sup>,ê,½fJfXf^f€fRf}f“fh,É•Ĭ X,·,é B

verb

fJfXf^f€fRf}f“fh,Ĭ È—ªE` BfJfXf^f€fRf}f“fh,ÍAutorun.inf tf@fCf<,Å’è<,<sup>3</sup>,ê,Ä,¢,È,¬,ê,Î,È,ç,È,¢ B  
AutoPlay,ÍAutoPlay““® ì%oÂ”,ÈffBfXfN,lfftfHf<fgf fjf... [ €–Ú,Ä, ,é B

f† [fU,ªCD,ð•\,·fAfCfRf“,ðf\_fuf<fNfŠfbfN,·,é,Æ Averb,ÅŽ!,<sup>3</sup>,ê,éRf}f“fh,ªŽÀ s,<sup>3</sup>,ê,é B

ŽQ Æ **shell\verb**

## shell\verb

shell\verb\command=filename.exe  
shell\verb=Menu Item Name

fAfCfRf“,lVf‡ [fgfJfbfg Ef fjf... [ÉŽl,³,ê,Ä,¢,éfJfXf^f€fRf}f“fh,ðŽw’è,·,é B,Ü,,1 s-Ú,Ä AfRf}  
f“fh,ðŽÄ s,·,éŽÄ s‰Ä”\ftf@fCf<,ðŽw’è,·,é B2”Ô-Ú,l s,ÄVf‡ [fgfJfbfg Ef fjf...  
[,lJfXf^f€fGf“fgfŠ,ðŽw’è,·,é B

## verb

fRf}f“fh,l È—“E` B,±,lpf%of [f^,lŽÄ s‰Ä”\ftf@fCf<-¼,Æf fjf... [ €-Ú,ðfRf}f“fh,ÉŠÖ~A,Ä,¯,é B,±  
lpf%of [f^,É,luf%of“fN,ðŠÜ,Ð,±,Æ,l,Ä,«,É,¢ B Autorun.inf\ftf@fCf<,ÄMenu Item Name,ð È—  
ª,µ,È,¢EÄ,è Averb,lVf‡ [fgfJfbfg Ef fjf... [É•Žl,³,ê,È,¢ B

## filename.exe

fJfXf^f€fRf}f“fh,ðŽÄ s,·,éAfvfŠfP [fVf‡f“,lftf@fCf<-¼ B

## Menu Item Name

‘â ¬•¶Žš,~,æ,ÑfXfy [fX,ðŠÜ,Ðf fjf... [ €-ÚfefLfXfg Bf fjf... [ €-Ú’†,l1•¶Žš,l’O,ÉfAf“fpfTf“fh•¶Žš(&  
,ð,Ä,¯,é,±,Æ,É,æ,è A,»,lf fjf... [ €-Ú,lVf‡ [fgfJfbfgfL [,àfZfbfg,Ä,«,é B

Windows† [fU EfCf“f^ [ftfFfCfX,Ä,l AfAfCfRf“,ðf}fEfX,Ä‰EfNfŠfbfN,·,é,ÆfVf‡ [fgfJfbfg Ef fjf...  
[,ª,ç,í,è,é BAutorun.inf\ftf@fCf<,ªCD ã,É•¶ Ý,·,é ê ‡ AWindows,l,»,lftfBfXfN,lAfCfRf“,lVf‡ [fgfJfbfg  
Ef fjf... [É AAutoPlay,ðŽ©“@“l,É•t‰Ä,·,é B  
,Ü,½AutoPlay,ªfftfHf<fg,Ä<N“®,³,ê,é,æ,µfZfbfg,·,é BfAfCfRf“,ðf\_fuf<fNfŠfbfN,·,é,Æ Aopen fRf}  
f“fh,ÄŽw’è,³,ê,Ä,¢,é,à,l,ª,·,×,Ä<N“®,³,ê,é B

fRf}f“fhReadMe,ð »i,lVf‡ [fgfJfbfg Ef fjf...

[É•t‰Ä,µ A•¶Žš gMÓ,ðfVf‡ [fgfJfbfgfL [,É,·,é ê ‡,É,l A^È‰°,ðAutorun.inf\ftf@fCf<,É‰Ä,!,Ä,¯,±,Æ B

shell\readit\command=notepad abc\readme.txt  
shell\readit=Read &Me

ŽQ Æ shell, A open



%p ”

**HAL**

$f_n$  [fhEfFFA EfAfuXfgf% $\infty$ NfVf‡f“ EfŒEfCf,, BfffofCfXŒÅ—  
L,İŽÀ‘•,©,çfAvfŠfP [fVf‡f“,đ•ŬŒì,·,é Afn [fhEfFFA,âfffofCfX Efhf% $\infty$ Cfo,İf fJjfYf€  
,É,æ,è \  $\neg$ ,<sup>3</sup>,ê,é BfAvfŠfP [fVf‡f“,©,ç—v< <sup>3</sup>,ê,½<@”\,đŒ» Ý,İfn [fhEfFFA,<sup>a</sup>ŽÀ‘•,μ,Ä,¢  
,È,¢ ê ‡ A,»,İ<@”\,İf\ftfgEfFFA,<sup>a</sup>fGf~f...fŒ [fg,·,é B

**HEL**

$f_n$  [fhEfFFA EfGf~f...fŒ [fVf‡f“ EfŒEfCf,, Bfn [fhEfFFA,<sup>a</sup>fTf| [fg,μ,È,¢<@”\  
,İf\ftfgEfFFA Efx [fX,É,æ,éfGf~f...fŒ [fVf‡f“,đ'ñ<Ÿ,·,é B

**Zfofbftf@ iz-buffer j**

fV [f“ ã,İšfsfNfZf<,İ [“x,đŠi”[,μ,½fofbftf@ BZ'l,İ  $\neg$ ,<sup>3</sup>,¢fsfNfZf<,ÍZ'l,İ‘â,«,¢fsfNfZf<,đ ã ‘,«,·,é B

,  
**fAf^fbf` iattach j**

•<sub>i</sub> ",IDirectDrawSurfaceIfufWfFfNfg,ð AZfofbftf@,É,æ,é3Dfy [fW EftfŠfbfsf"fo,Â•K—v,Æ,³,ê,é,æ,□  
,Ê•<sub>i</sub> ‡ '¢'Í,Ê Ú±,·,é±,Æ BfAf^fbf',Í'o•ûEü"Í,Â,Í,Ê, A,Ü,½fT [ftfFfX,ð,»,êŽ© g,ÉfAf^fbf',·,é,±  
,Æ,Í,Â,«,Ê,¢ B ifVfXfef€ Ef f,fŠ,Â jfGf~f...f€ [fg,³,ê,½fT [ftfFfX,Í AfGf~f...  
f€ [fVf‡f",Â,Ê,¢fT [ftfFfX,É,ÍfAf^fbf',Â,«,Ê,¢ B•D•û,İfT [ftfFfX,³fefNfXf`ff Ef}  
fbfv,Â,Ê,¢EÄ,è A,Ó,½,Â,İfT [ftfFfX,Í"~,¶fTfCfY,Â,Ê,·,Â,Í,Ê,ç,Ê,¢ B

**fAf<ftf@ EfGfbfW Efuf€f"fh ialpha edge blend j**

fAf<ftf@ Efuf€f"fffBf"fo i,"æ,NfAf<ftf@ Ef`ffflf< î•ñ j,İ—p—@,İ,D,Æ,Â BfsfNfZf<,İ"K—  
p"ÍÍ,ÊŠİ,Â,¢,ÄfGfbfW,ð ¬ F,·,é,±,Æ,É,æ,è AfGfCfŠfAfVf"fo,ðE, ,³,¹,é•û—@,Â, ,é B

**fAf<ftf@ EfJf%o [ EfRf"f [lf"fg ialpha color component j**

•s"§—¾"x,ðŽ',·¹,ðŠÜ,ð32fFbfg,İ F \ ¬—v'f B,±,İ ê ‡ AfsfNfZf<,²,Æ,İ F—  
v'f i,½,Æ,¹,İARGB j,É,»,ê,¼,ê,İfAf<ftf@ i•s"§—¾"x j¹,ª•t%oÁ,³,ê,Â,¢,é B"ê"E"Í,Â,Í,Ê,¢,ª A"Á•Ê,É—  
p"Ó,³,ê,½fAf<ftf@ EfT [ftfFfX,ÉfsfNfZf<,²,Æ,İfAf<ftf@¹,ð,Ü,Æ,ß,Â•ÜŽ ,µ,Â,¢,é ê ‡,à, ,é B

**fAf<ftf@ Effffff< ialpha channel j**

fsfNfZf<,²,Æ,É F—v'f i,½,Æ,¹,İARGB j,İ¹,Æ,Æ,à,É—p"Ó,³,ê,½

fCf [fW,İ•s"§—¾"x,ð'è<,·,é¹ B,Ü,½,Í"Æ—§,µ,½fAf<ftf@ EfT [ftfFfX,ÊŠİ"[³,ê,½ AfsfNfZf<—,½,è,İ•s"§—  
¾"x¹ B,Ü,½,Í AfT [ftfFfX'S'İ,İ•s"§—¾"x¹ B

**fAf<ftf@'è " ialpha constant j**

fT [ftfFfX'S'İ,É"K—p,³,ê,é•s"§—¾"x ifAf<ftf@¹ j B

**^Ä%oe" ipenumbra j**

fXf|fbfgf%ofCfgeð%o~ Žü"Í,İ"—^Ä,¢•"ª B—¾•",ðŽæ,è'Í,Ý AŽü•Ó,İ"Ä,¢%oe,ðf} [fW,·,é B

ŽQ Ä @—¾•" AfXf|fbfgf%ofCfge

**fAf"frfGf"fg iambient j**

fV [f" ä,İfIfufWfFfNfg,İEü,« A"Ê'u AfT [ftfFfX,İ"Á «,ÊŠÖ,í,ç,, AfV [f""S'İ,ð Ä,ç,·EðE¹ BfV [f",İ  
,·,×,Ä,İ ê Š,ð"~,¶Eð"x,Ä Ä,ç,·,½,ß AfAf^fbf',³,ê,½fTf€ [f€,İ"Ê'u,âEü,«,Í d—  
v,Ä,Ê,¢ B,D,Ä,Æ,Ä,İfV [f",Ä,Í A•<sub>i</sub> ",İfAf"frfGf"fgEðE¹,ªE< ‡,³,ê,Ä,¢,é B

**F•óŠÔ icolor space j**

F,ðfGf"FR [fh,µ,½,è•Ž,µ,½,è,·,é A,¢,,Â,©,İ"Ü,Ê,éf f\fbfh,İ,¢  
,,ê,©,ðŽw,· B Ä,à"ê"E"Í,ÉfJf%o [ EfXfy [fX,İf^fCfv,Í ARGB,ÆYUV,İ,Ó,½,Ä,Ä, ,é B

**F•óŠÔ•İŠ icolor-space conversion j**

,D,Æ,Ä,İfJf%o [ EfXfy [fX,©,ç¼,İfJf%o [ EfXfy [fX,É F,ð•İŠ,·,é<Z p BfrrfFI E\ [fX,İYUVfJf%o [,  
©,çffBfXfvfEfC,İRGBfJf%o [,Ó,İ•İŠ,ª"TE^"Í,Ä, ,é B

**fI [ffBfI EfXfgfŠ [f€ iaudio stream j**

gf~fLfVf"fo,³,ê,½ A,Ü,½,Íf~fLfVf"fo,³,ê,é%oÄ"» «,İ, ,é hfTfEf"fh Eff [f^ BDirectSound,Í A Ä ¶"†,İŠ  
efZJf"f\_fŠ EfTfEf"fh Efobftf@,©,çfI [ffBfI EfXfgfŠ [f€,ðf~fLfVf"fo,µ AÆç%oÊ,ðfvf%ofCf}  
fŠ EfTfEf"fh Efobftf@,É o—Í,·,é Bfvf%ofCf}  
fŠ EfTfEf"fh Efobftf@,Í AfTfEf"fh Efn [fhEfFfA,ÉfI [ffBfI Eff [f^,ð"Ÿ<<,·,é B

**fI [fo [fhf [ ioverdraw j**

fXfNfŠ [f" EfsfNfZf<,ª•%oæ,³,ê,é•½<İ%oñ " B

**fI [fo [f€fC EfT [ftfFfX ioverlay surface j**

f f,fŠ ä,İŠT"O"Í,ÊçE—İ"æ B"ê"E"Í,Ê A•Ž'Í'O,ÉfobfNfobftf@,Öfuf fbfN"']—,³,ê,éfrfbfgf}  
fŠ EfT [ftfFfX,İfCf [fW î•ñ,ðfJfo [,·,é BfI [fo [f€fC,Í A¼,İ,·,×,Ä,İfXfNfŠ [f"—v'f,İfgfbfv,É, ,é,  
Æ'z'è,³,ê,Ä,¢,é B

**fI [fo [f€fCZfI [f\_ [ ioverlay z-order j**

fI [fo [f€fC,ªfNfŠfbfsf"fo,³,ê,é ‡"Ö,ðE"è,·,é B,±,ê,É,æ,è Afn [fhEfFfA EfXfvf%ofCfge EfVfXfef€  
,ªDirectDraw,İ,à,Æ,ÄŽÄ'•,³,ê,é B

**fİftfXfNfŠ [f" EfT [ftfFfX ioff-screen surface j**

f f,fŠ ä,İŠT"O"Í,ÊçE—İ"æ B"ê"E"Í,Ê A•Ž'Í'O,ÉfobfNfobftf@,Öfuf fbfN"']—,³,ê,éfrfbfgf}  
fbfv,ðŠİ"[·,é,½,ß,É—p,¢,ç,ê,é B'Ê í AfXfvf%ofCfge,ðŠİ"[·,é,İ,É—~p,³,ê,é B

**fİfyfR [fh iopcode j**

ŽÄ sfofbftf@,İ',·,·,İ%oð Í•û—@,âfVfXfef€ ó"Ö,İ"İ X•û—@,ð'è<,µ,½—½—ßfR [fh B

,©

**fJf f% icamera j**

•Ž'Ê'u,Æ•ûĖü,ð'è',,é,½,ß Afrf... [f] [fg,<sup>a</sup>—p,¢,éDirect3DRMFramefIfufWfFfNfg Bfrf... [f]  
[fg,Í AfJf f% EftfĖ [f€,İ <sup>3</sup>,ìzŽ<sup>2</sup> ã,Ê, ,é%oÂŽ<fIfufWfFfNfg,¾,¯,ð AyŽ<sup>2</sup> ã,İ <sup>3</sup>•ûĖü,ÉfĖf“f\_Šf“fO,.,é  
B

**fJf% [ EfL [ icolor key j**

“š–¾Ėø%oÊ,â”¼“š–¾Ėø%oÊ,İ,½,ß,É—p,¢,ç,ê,é F,ðŽ',μ,½'l B,½,Æ,,',Îfn [fhfEfFfA,İfufŠfbfg<@”\,ðŽg—  
p,.,é ê ± AfJf% [ EfL [,Æ,μ,Ä Ý'è,<sup>3</sup>,ê,½ F,ð œ,<éĖ—ÎæfsfNfZf<.,×,Ä,<sup>a</sup>fuf fbfN“]‘—,<sup>3</sup>,ê,é B,±  
,ê,Ê,æ,Á,Ä A<éĖ',Ä,Ê,¢fXfvf%oCf g,<sup>a</sup>fT [ftfFfX ã,Ê ì ¬,<sup>3</sup>,ê,é B

**fJf% [ Efe [fuf< icolor table j**

n F,İfJf% [ 'l,İ”z—ñ i'Ê í,ÍRGBŽOĖ' F j B

**fJfĖf“fg Ef v fĖfC Ef|fWfVf‡f“ icurrent play position j**

DirectSoundfofbftf@“à,İ AfTfEf“fh,<sup>a</sup> Ä ¶,<sup>3</sup>,ê,éÊ'u B

**fJfĖf“fg Ef%oCf g Ef|fWfVf‡f“ icurrent write position j**

DirectSoundfofbftf@,İ'†,Ä A^Ä'S,Éff [f^,ð•İ X,.,é,±,Æ,<sup>a</sup>Ä,«,éÊ'u B

**fNfH [f^fjIfI“ iquaternion j**

fxnfNfgf<,ð'è',,é A[x, y, z]'l,İ4”Ô–Ú,İ—v'f BfNfH [f^fjIfI“ ,Í A3D%oñ“],Ä^è”Ê“l,É—~—p,<sup>3</sup>,ê,Ä,¢,½ s—  
ñf f\fbfh,ÊŽæ,Ä,Ä'ã,í,é,à,İ,Ä, ,é B

**fNfŠfbfp iclipper j**

DirectDrawClipperfIfufWfFfNfg B

**fNfŠfbfv EfŠfXfg iclip list j**

fT [ftfFfX,İ%oÂŽ<—  
Îæ,ðŽ',.<éĖ',İfŠfXfg B,.,Ä,ÉfEfBf“fhfE Efnf“fhf<,<sup>a</sup>DirectDrawClipperfIfufWfFfNfg,ÉĖ<,Ñ,Ä,¯,ç,ê,Ä,¢  
,é,Æ,«,Í AfNfŠfbfv EfŠfXfg,ð Ý'è,.,é,±,Æ,Í,Ä,«,Ê,¢ B

**fOf< [fv igroup j**

DirectPlayfZfbfVf‡f“ ,É,“,¢,Ä A,Đ,Æ,Ä,İfZfbfg,Æ,μ,Ä,Ü,Æ,ß,ç,ê,éfvfĖ [f,, ,l W ± B

**Ėâ•ûfNfŠfbfv–Ê iback clipping plane j**

Ž< 'ã,İ%oœ s,«,İĖÄŠE B,±,İ æ,É, ,éfIfufWfFfNfg,İfĖf“f\_Šf“fO,<sup>3</sup>,ê,È,¢ B

ŽQ Æ @'O•ûfNfŠfbfv–Ê

,<sup>3</sup>

**fT [frfX Efvf fofCf\_ iservice provider j**

DirectPlay,<sup>a</sup>—

p,.,é Af**l**bfgf [fN'Ê M,ð s,ꝛf\_Cfif~fbfN EfŠf“fN Ef%oCfuf%oŠ BfT [frfX Ef**v**f fofCf\_,Í Af f  
bfZ [fW,ì—Žó M,É•K—v,È**f**lfbfgf [fNĖĀ—L,ĭfR [fh,ð”ö,ĭ,Ā,č,é Bf**I**f“f%oCf“ EfT [frfX,àŠŮ,ß,½, ,ç,  
ä,é'g D,Í A“Ā%o”,<sup>3</sup>,é,½fn [fhEfFfA,â'Ê M”]‘ĭ,ĭ,½,ß,ĭfT [frfX Ef**v**f fofCf\_,ð<Ÿ<.,,é,±,Æ,<sup>a</sup>Ā,Ā,«<sup>a</sup>,é B

**fT [ftfFfX isurface j**

Ž<ŠofCf [fW,ð•ŮŽ ,.,éf f,fŠ B,μ,ĭ,μ,ĭffBfXfvfĖfC Ef f,fŠ,ðŽw,.,<sup>a</sup> AfVfXfefĖ Ef f,fŠ,Ā, ,Ā,Ā,à,æ  
,č B

ŽQ Æ @.; ‡fT [ftfFfX Af**I**ftfXfNfŠ [f“ EfT [ftfFfX Af**I** [fo [fĖfC EfT [ftfFfX Af**v**f%oCf}  
fŠ EfT [ftfFfX

**fTfEf“fh Efofbftf@ isound buffer j**

DirectSound**I** [ffBf**I** Ef**f** [f^,ðŠi”[.,,éf f,fŠ BfTfEf“fh Efofbftf@,ĭfvf%oCf}fŠ,Ā,àZfJf“f\_fŠ,Ā,à,æ,-  
A,Ů,½ AfXf^fefBfbfN,Ā,àXfgfŠ [fĖ,Ā,à,æ,č B

**ŽQ ÆfJfEf“fg ireference count j**

fRf“f]

[f**I**f“fg Ef**I**fufWfFfNfg Ef,ff< iCOM j**I**fufWfFfNfg,ðRf“fgf [f<.,,é,½,ß,ĭfJfEf“f^ Bf**I**fufWfFfNfg,<sup>a</sup>  
ì -<sup>3</sup>,é,é,Æ AŽQ ÆfJfEf“fg,ĭ1,É Ÿ’è,<sup>3</sup>,é,é BfCf“f^ [ftfFfCfX,<sup>a</sup>f**I**fufWfFfNfg,ĖĖ<,Ť,Ā, -,ç,é,é,½,Ť,ÉŽQ  
ÆfJfEf“fg,ĭfCf“fNfŠf f“fg,<sup>3</sup>,é A,»,ĭ Ů’±  
,<sup>a</sup> Ø’f,<sup>3</sup>,é,é,Æ AŽQ ÆfJfEf“fg,ĭf**I**fNfŠf f“fg,<sup>3</sup>,é,é BŽQ ÆfJfEf“fg,<sup>a</sup>0,É,Ė,Ā,½,Æ,« Af**I**fufWfFfNfg,ĭ”jšü,  
<sup>3</sup>,é A,»,ĭ**I**fufWfFfNfg,Ů,ĭ,.,x,Ā,ĭfCf“f^ [ftfFfCfX,ĭ—Ėø,Æ,Ė,é B

**fV [f“ iscene j**

%¼’zŠĀ<<,ð \ -<sup>3</sup>,.,éf**I**fufWfFfNfg‘S’ĭ,ĭZfbfg B%ĀŽ<f**I**fufWfFfNfg AfTfEf“fh AĖð AftfĖ [fĖ  
,ðŠŮ,ð BDirect3D,Ā,ĭ Af< [fg EftfĖ [fĖ,ÉŠŮ,Ů,é,éf**I**fufWfFfNfg,ĭZfbfg,ðŽw,· B

ŽQ Æ @f< [fg EftfĖ [fĖ

**Ž< ‘ä iviewing frustrum j**

frf... [f] [fg,ĭfJf f%o,Ė·ĭ,μ,Ā·Š’ĭ“ĭ,É”z’u,<sup>3</sup>,é,½fV [f“,ĭ—š’ĭ BŽ< ‘ä,ĭ’†,É, ,éf**I**fufWfFfNfg,ĭ%ĀŽ< ó’Ů,Ā, ,  
é B“Ž<“Š%o,Ā,ĭ A’O·ûfNfŠfbfv—Ė,ÆĖä·ûfNfŠfbfv—  
Ė,ĭŠŮ,ĭ%¼’z“ĭ,Ėfsf%o~fbfhĖ^,ðŽw,· B·½ s“Š%o,Ė,“,č,Ā,ĭ—š·û’ĭ,É,Ė,é B

**ŽĀ sfobftf@ iexecute buffer j**

3DfV [f“,ð<L q,.,é AŠ@‘S,ÉŽ<ĖĖ“à·iĖ^,ĭ A“Æ—š,μ,½ ĭñfpfPfbfg BŽĀ sfobftf@,É,ĭ AĖä,É—½—  
ßfXfgfŠ [fĖ,“±,’,“\_,ĭfŠfXfg,“ŠŮ,Ů,é,Ā,č,é B—½—ßfXfgfŠ [fĖ  
,ĭ Af**I**fyĖ [fVf‡f“fR [fh **i**f**I**fyR [fh j,Æ A,±,ĭ**I**fyR [fh,<sup>a</sup>Ė ĭ,.,éff [f^,©,ç \ -<sup>3</sup>,é,Ā,č,é B

**L’· istretching j**

~Ů,Ė,éfTfCY,ĭ”—— æ,ĖfCf [fW,ðfufŠfbfg,.,é,±,Æ B,±,ĭ‘Ė ĭ,ð’¼ ŮfTf [fg,.,éfn [fhEfFfA,à, ,é B

**fXf^fefBfbfN EfTfEf“fh Efofbftf@ istatic sound buffer j**

Š@‘S,ĖfTfEf“fh,ðŠi”[μ,Ā,č,éf f,fŠ BfTfEf“fh‘S’ĭ,ð~“x,Ėfobftf@,É ‘,«,±,ß,é,½,ß A·Ů—,Ā, ,é B

**fXfefBfbfL [ EftfH [fJfX isticky focus j**

DirectSound,Ė,“,č,Ā Af**I** [f**i** [ EfAf**v**fŠfP [fVf‡f“,“ü—ĭftfH [fJfX,ðŽ ,Ā,Ā,č,Ė,č  
,Æ,«,Ā,àTfEf“fh,ð Ā ¶,Ā,«,é”——

ĭ B,½,Æ,ĭ,ĭ ADirectSoundAf**v**fŠfP [fVf‡f“,ĭ Af† [fU [,“¼,ĭfAf**v**fŠfP [fVf‡f“,ð“@,©,μ,Ā,č  
,é,Æ,«,Ā,à AfTfEf“fh Efofbftf@,ð Ā ¶,μ’±, -,é,±,Æ,<sup>a</sup>Ā,«,é B

**fXfgf%oCfh EfAf%oCf“f f“fg istride alignment j**

DirectX,Ā,ĭ AfXfgf%oCfh,Æ,ĭ A, ,éf%oXf^ Ef%oCf“,ÆŽŸ,ĭf%oXf^ Ef%oCf“,Æ,ĭŠŮ,ĭ**I**ftfZfbfg,ðŽw,·  
BfXfgf%oCfh EfAf%oCf“f f“fg,ĭ Af**I**fBfXfvfĖfC Ef f,fŠ EfT [ftfFfX,ðfZfbfgfAfbfv,.,é Ů,ĭ d—  
v,Ė ŸĖv—v’f,Æ,Ė,é Ė ‡,<sup>a</sup>, ,é B

**fXfgfŠ [fĖ EfTfEf“fh Efofbftf@ istreaming sound buffer j**

’,,čTfEf“fh,ð Ā ¶,.,é,±

,Æ,<sup>a</sup>Ā,«,é A -<sup>3</sup>,ĖfTfEf“fh Efofbftf@ BfAf**v**fŠfP [fVf‡f“,ĭ Af**I** [ffBf**I** Ef**f** [f^,ð Ā ¶,μ,Ė,<sup>a</sup>ç“@‘ĭ,Ėf  
ofbftf@,Ėf [fh,.,é B,½,Æ,ĭ,ĭfAf**v**fŠfP [fVf‡f“,ĭ A3·b,ĭ**I** [ffBf**I** Ef**f** [f^,ð•ŮŽ ,Ā,«,éfobftf@,ð2·<sup>a</sup>,ĭfT  
fEf“fh,ð Ā ¶,.,é,½,ß,ÉŽg—p,.,é,±

,Æ,<sup>a</sup>Ā,«,é BfXfgfŠ [fĖ Efofbftf@,ĭ AfXf^fefBfbfN Efofbftf@,æ,è,à,ĭ,é,©,Ė ,Ė,čf f,fŠ,μ,©·K—  
v,Æ,μ,Ė,č B

**fXf**I**fbfgf%oCfg ispotlight j**

%o~ ó,ĭĖð,ð•Ů,ĀĖðĖ1 B%o~ ,ĭ’†,É, ,éf**I**fufWfFfNfg,¾, -,<sup>a</sup> Æ,ç,<sup>3</sup>,é,é B%o~ ,ĭ,Ů,½,Ā,ĭ·P“x,ð ¶ -<sup>3</sup>,.,é  
B’†%o,ĭ—¾,é,č,“·<sup>a</sup> ĭ—¾·” j,ĭ**I**fCf“fgĖðĖ1,Æ—,¶,«,ð,μ AŽü~ĭ,ĭ—Ā,č·<sup>a</sup> ĭ—Ā%o,“ j,ĭ AŽü·Ů,ĭ~Ā,č%o,Æf}

[fW,<sup>3</sup>,ê,é B

**fZfJf“f\_fŠ EfTfEf“fh Efofbftf@ isecundary sound buffer j**

fI [ffBfI Ef f,fŠ,É,“,¢

,Ä AfAfvfŠfP [fVf‡f“,ð’Ê,µ,Ä Ä ¶,<sup>3</sup>,ê,éĈÂ X,İfTfEf“fh,ðŠi”[µ,½•”<sup>a</sup> BfTfEf“fh,Í A1%õñ,İfCfxf“fg,Æ,µ

,Ä Ä ¶,.,é,±,Æ,à Af< [fv EfTfEf“fh,Æ,µ,ÄĈJ,è•Ô,µ Ä ¶,.,é,±

,Æ,à,Ä,«,é B,Ü,½ AfZfJf“f\_fŠ Efofbftf@,Í A—

LĈø,ÈfTfEf“fh Efofbftf@ Ef f,fŠ,æ,è’•,¢fTfEf“fh,ð Ä ¶,.,é,±,Æ,à%Â”\,Ä, ,é B,±

,İfobftf@,Í A Ä ¶,µ,æ,□,Æ,µ,Ä,¢,éfTfEf“fh,İ^ê•”<sup>a</sup>,ðŠi”[.,éfLf... [,Æ,µ,Ä,İ-ðŠ,,ðŽ ,Á,Ä,¢,é B

**fZfbfVf‡f“ isession j**

DirectPlay,Ä ACEÝ,¢,É’Ê M,µ,Ä,¢,éfŠf, [fg Ef}fVf“ ä,İfAfvfŠfP [fVf‡f“,İfCf“fXf^f“fX B

**‘O•ûfNfŠfbfv-Ê ifront clipping plane j**

Ž< ‘ä,İ‘O-Ê,İĈÄŠE B‘O•ûfNfŠfbfv-Ê,æ,è,àfJf f%o,É<ð,Ĉ^Ê’u,É, ,éfIfufWfFfNfg,İfĈf“f\_fŠf“fO,<sup>3</sup>,ê,È,¢ B‘

O•ûfNfŠfbfv-Ê,İ ,,<sup>3</sup>,Í Afrf... [,İftfB [f<fh,ð’è<’,.,é B

ŽQ Æ @Ĉä•ûfNfŠfbfv-Ê

,½

’,“\_ ivertex j  
3D<óŠŌ,ì“\_ B

**fefBfAfŠf“fO itearing j**  
fXfNfŠ [f“,ìfŠftfœfbfVf... Efœ [fg,³fAfvfŠfP [fVf‡f“,ìftfœ [fœ Efœ [fg,Æ“Šú,µ,Ä,ç,È,ç,Æ,«,É<N,±  
,é A^Ž,³,²,É,è,æ,²,Éœ©,¹,éœ» Ũ B,Đ,Æ,Ä,ìftfœ [fœ,ì ä”,³•Ê,ìftfœ [fœ  
,ì%º””,Æ“Žž,É^Ž,³,è A,Ó,½,Â,ìfCf [fW,ìŠŌ,É—ô,¯—Ú,³ ¶,¶,é B

**fefNfXf`ff itexture j**  
Direct3D,É,“,ç,Ä AfrfWf...fAf< EfIfufWfFfNfg,É“K—p,³,è,é AfsfNfZf<,³éœ`,É•Ä,ñ,¾”z—ñ B

**fefNfXf`ff Ä•W itexture coordinates j**  
ŠefefNfXf`ff,ìfefNfZf<,É AfIfufWfFfNfg ä,ìŠe’,“\_³,ç,²ŠŌ~A,Ä,¯,ç,è,é,©œ”è,³,é Ä•W B

**fefNfXf`ff Efufœf“ffBf“fO itexture blending j**  
fefNfXf`ff,ì F,ðf}fbfv æ,ìfT [ftfFfX,ì F,Æ’g,Ý ‡,í,¹,é<Z p B

**fefNfXf`ff Ef}fbfsf“fO itexture mapping j**  
fefNfXf`ff,ðfIfufWfFfNfg,É“\,è,Ä,¯,é,±,Æ BfefNfXf`ff,Í•½—ÊfCf [fW,¾,³fIfufWfFfNfg,Í,»,²  
,Ä,È,ç ê ‡,³½,ç,ì,Ä AfefNfXf`ff Ä•W,Æf%fbfsf“fO Eftf%oF,ð—p,ç  
,ÄfefNfXf`ff,ðfIfufWfFfNfg,ìfT [ftfFfX,Éf}fbfv,µ,È,,Ä,Í,È,ç,È,ç B  
ŽQ Æ @fefNfXf`ff Ä•W Af%fbfv

**fefNfZf< itexel j**  
fefNfXf`ff,ìP^è,ì—v^f BfefNfXf`ff,³fIfufWfFfNfg,É“K—  
p,³,è,½,Æ,« AfefNfZf<,³fXfNfŠ [f“,ìfsfNfZf<,É‘î%ž,³,é,±  
,Æ,Í,ß,Ä,½,É,È,ç BfAfvfŠfP [fVf‡f“,Í AfefNfZf<,³,ç,²fsfNfZf<ŠŌ,ð•äŠŌ,³,é,© §œä,³,é,½,ß,É AfefNfXf`f  
f EftfBf<f^fŠf“fO,ðŽg—p,³,é,±,Æ,³,Ä,«,é B

**ffJ [f< idecal j**  
frfWf...fAf< EfIfufWfFfNfg,Æ,µ,Ä’¼ Úfœf“f\_Šf“fO,³,è,éfefNfXf`ff Bfrf... [f]  
[fg,Æ^è^v,µ,½,éœ`,Éfœf“f\_Šf“fO,³,è,é B

**“]—œ³Jf% [ EfL [ isource color key j**  
fuf fbfN“]—,É,“,ç,ÄRfs [³,è,È,ç F A,Ü,½,Í AfI [fo [fœfC,É,“,ç,Ä o—Í æ,É•Ž,³,è,È,ç F B

**“]— æfJf% [ EfL [ idestination color key j**  
fuf fbfN“]—,É,“,ç,Ä,Í A^u,«Š•,¹,ç,è,é F BfI [fo [fœfC,É,“,ç,Ä,Í A“]— æ,ìfT [ftfFfX ä,ì•ç,ç  
%B,³,è,é F B

,í

”z—ñfIfufWfFfNfg iarray object j  
 ,D,Æ,Â,Ì”z—ñ,Ë,Û,Æ,ß,ç,ê,½fIfufWfFfNfg,ÌfOf< [fv B”z—  
 ñfIfufWfFfNfg,Ë,æ,èfOf< [fv’S’Ì,ð,æ,èŠÈ”P,É’€ ì,Â,«,é B”z—ñfIfufWfFfNfg,ð—~—  
 p,Â,«,éCOM,ÌfCf“f^ [ftfFfCfX,É,Í AGetElementf f\fbfh,ÆGetSizef f\fbfh,a—p^Ó,<sup>3</sup>,ê,Â,¢,é B,±  
 ,ê,ç,Ìf f\fbfh,Ì,»,ê,¼,ê A”z—ñ—v’f,Ö,Ìf|fCf“f^ A”z—ñ,ÌfTfCfY,ðŽæ“¾,·,é B

fofbfN Efofbftf@ iback buffer j  
 fv%ofCf}fŠ EfT [ftfFfX,ªCE» Ý,ì%ÂŽ<fCf [fW,ð•Žì,µ,Â,¢,éŠÔ,É Afrfbfgf}  
 fbv,»,ì¼,ÌfCf [fW,ð•,«,±,ñ,Â,“,é A•s%ÂŽ<fT [ftfFfX B

• iwidth j  
 f f,fŠ,ËŠì”[<sup>3</sup>,ê,½frfbfgf}fbfv“à,Â A ,éf%ofCf“,ìŽn“\_,Æ,»,Ìf%ofCf“,Ì I“\_,Æ,ðŽì,·,Ó,½,Â,Ì<——£ B,±,Ì<——£  
 ,Ìf f,fŠ à,Ìfrfbfgf}fbfv,Ì• ,µ,©•,<sup>3</sup>, A<éCE`f f,fŠ,Ë,Ç,Æ`á,Â,Äfrfbfgf}fbfv,ÌŽÝ,Ì ù,ÌŽn“\_,Ü,Â’B,·,é,Ì,É•K  
 —v,Ë•â<«f f,fŠ,ðŠÜ,Ü,Ë,¢ B

fpf%ofCEf< EflfCf“fg iparallel point j  
 fpf%ofCEf< Ef%ofCf,ÄIfufWfFfNfg,ð Æ,ç,·CEðCE¹,¾,a ACEð,ÌCEü,«,Ípf%ofCEf< Efl  
 fCf“fgCEðCE¹,ÌÈ’u,©,çCE”è,<sup>3</sup>,ê,é B,½,Æ,ì,Î Afpf%ofCEf< EflfCf“fgCEðCE¹,Ì—¼‘¤,Éf fbvVf...,·,é ê ± ACEð  
 CE¹,Ë—Ë,µ,Â,¢,é,Ü,¤,Ìf fbvVf...,·,¾,é,é,Ë,é B

fpfCEfbfg ipalette j  
 fIfufWfFfNfg,âfAfvfŠfP [fvf±f“,ªŽg—  
 p,·,é F,ÌfZfbfg BDirectX,Â,Í ADirectDrawPalettefIfufWfFfNfg,ðŽw,· B

fpfCEfbfg Efcf“fffbfNfX ipalette index j  
 F,ð’Ìð,·,é,½,ß,Ë—p,¢,ç,ê,é AfpfCEfbfg Efe [fuf<”z—ñ,Ö,Ì ® ”fcf“fffbfNfX B

fpf [ ipower j  
 ‘f p,Ì”½ŽË“Á «,Â AfXfyfLf...f%o [ EfnfCf%ofCf,Ì’N—¾“x,ðCE”è,·,é’l B,±  
 ,Ì’l,“5,Ì,Æ,«,Ìà’@“I,ÈŠOŠÌ,Ë,Ë,è A,»,èÈ ã,Ì,Æ,«,Ì,à,Â,Æ \_ç,©,»,¤,ÈŠOŠÌ,Ë,Ë,é B

”½ŽË“Á « ispecular property j  
 CEðCE¹,Ì”½ŽË,Ë’ì%oZ,µ,½CEð,éfIfufWfFfNfg ã,ÌCEð“,·,ª,Ç,Ì,æ,¤  
 ,Ë•Žì,<sup>3</sup>,é,©,ðCE”è,·,é A’f p,Ì“Á « B”½ŽË“Á «,Ì A’f p,ª,Ç,¤CEð,ð”½ŽË,·,é,©CE”è,·,é,Ó,½,Â,Ì“Á «,Ì,¤  
 ,ç,Ì,ð,Æ,Â,Â,·,é B  
 ŽQ Æ @•úŽË“Á «

fpf“l ipan value j  
 ¶%oE,ÌfI [ffBfI Ef’ffflf<,Ì’Š’ì%o’—Ê B100•,ÌlffVfxf<P^Ê,Â•\,<sup>3</sup>,ê,é B

frf... [f| lfg iviewport j  
 3DfV [f“,ª,Ç,Ì,æ,¤  
 ,É2DfEfBf“fhfE,ÉfCEf“f\_Šf“fO,<sup>3</sup>,ê,é,©,ð’è<,µ,½<éCE` B,Ü,½fIfufWfFfNfg,ªfCEf“f\_Šf“fO,<sup>3</sup>,ê,é AfffofCfX  
 ã,Ì—Ì’æ,à’è<,·,é B

fsfbfLf“fO ipick j  
 frf... [f| [fg,Â,Ì2D Â•W,ÌfV [f“,ÄfrfWf...fAf< EfIfufWfFfNfg,ð’T ò,·,é,±,Æ B

fsfbf` ipitch j  
 f f,fŠ,ËŠì”[<sup>3</sup>,ê,½frfbfgf}fbfv“à,Â A ,é ü,ÌŽn“\_,ÆŽÝ,Ì ü,ÌŽn“\_,Æ,ðŽì,·,Ó,½,Â,Ì<——  
 £ BDirectDraw,Â,Í A,·,×,Â,ÌffBfXfvfCEfC Ef f,fŠ,ª,ð,Æ,Â,Ì üCE`fuf fbfn,Æ,µ,Ä”z’u,<sup>3</sup>,ê,é,Æ,ÍCEÀ,ç,Ë,¢  
 ,Ì,Â Af f,fŠ Efsfbf,Æf f,fŠ• ,Ìá,¢,Í d—v,Â,·,é B,½,Æ,ì,ÌéCE,Ìf f,fŠ,Â,Í AffBfXfvfCEfC Ef f,fŠ,Ì  
 fsfbf,Ë,Í Afrfbfgf}fbfv• ,É%oÄ,|fLfffbfVf...,Ì’è•”,ªŠÜ,Ü,Ë,é ê ±,ª,·,é B  
 ŽQ Æ @\_—

•i ±fT [ftfFfX icomplex surface j  
 DirectDrawSurfacefIfufWfFfNfg,Â Af< [fg EfT [ftfFfX,ÉfAf^fbf`<sup>3</sup>,ê,é,à,Ì,ð,Ü,Æ,ß,ÄŽw,·CEê B•i ±fT [ftf  
 FfX `¢è’Ì,Í Af< [fg,ª”jŠü,<sup>3</sup>,ê,é,Æ,«,É,Ì,Ý”jŠü,·,é,±,Æ,ª,Â,«,é B

ftfŠfbfsf“fO Eft [ftfFfX iflipping surface j  
 ftfŠfbfsf“fO%oÂ”,Ëf f,fŠ B  
 ŽQ Æ @ftfŠfbfv

ftfŠfbfv iflip j  
 fofbfN Efofbftf@,Æftf f“fg Efofbftf@,ÌfAfhfCEfX,ðCEðŠ,·,évf fZX BŽÀ Û,É,ÍfobfN Efofbftf@,Ìf  
 Cf [fW,ªftf f“fg Efofbftf@,ÉCEðŠ,<sup>3</sup>,ê A,»,è,Ë,æ,Â,ÄfCf [fW,ª•Žì,<sup>3</sup>,ê,é B

ftfCE [f€ iframe j  
 fV [f“ ã,Â,ÌfIfufWfFfNfg,Ì”z’u,ÌCE<sup>3</sup>,Ë,Ë,é A”ñ•Žì,Ì`g BfIfufWfFfNfg,Í AŠÖ`A,µ,½ŽQ ÆftfCE [f€

,É'Î,·,éóŠÔ“ISÖEW,ðŽw'è,·,é,±,Æ,É,æ,Á,Ä AfV [f“ ã,É”z'u,³,ê,é BfrfWf...  
fAf< EfIfufWfFfNfg,Í A,»,ÌÊ'u,âCEü,«,ðftfCE [f€  
,©,çŽæ“¾,·,é B,Ü,½ A“®%æ,âfAfjf [fVf‡f““†,Ì,Ð,Æ,Â,ÌfCf [fW,àftfCE [f€,©,çŽæ“¾,³,ê,é B

**ftf f“fg Efofbftf@ ifront buffer j**

ftfŠfbfsf“fO Ef`fF [f“,Ì Å %o,Ìfofbftf@ B'½,,Ì ê ‡ A%oÂŽ< ó'Ô,Ìfvf%oCf}  
fŠ EfT [ftfFfX,ðŽw,· B,»,□,Ä,È,¢,Æ,«,Í AfefNfXf`ff,ÌftfŠfbfsf“fO Ef`fF [f“,Ì,æ,□  
,É A3DfGf“fWf“,“fefNfXf`ff,ðŽæ“¾,·,éT [ftfFfX,Ì,±,Æ,Â, ,é B,±,Ì ê ‡,Ìfvf%oCf}  
fŠ EfT [ftfFfX,Ä,Í,È,-  
A•Ž!,à,³,ê,È,¢ BftfŠfbfsf“fO EfI [fo [fCEfC EfT [ftfFfX,Ä,Íftf f“fg Efofbftf@,Í•Ž!,³,ê,é,ª A,±  
,ê,ÍP,Éfvf%oCf}fŠ EfT [ftfFfX,ÉfI [fo [fCEfC,³,ê,½fT [ftfFfX,É,·,¬,È,¢ B  
ŽQ Æ @fvf%oCf}fŠ EfT [ftfFfX

**fufŠfbfg iblit j**

frfbfgfuf fbfN“]‘— B

**fufCEf“ffBf“fOEW ” iblend factor j**

fefNfXf`ff EfufCEf“ffBf“fO,É,·,¢,Ä AŠe F—v'f,ª,Ç,Ì,æ,□,É ¬ F,³,ê,é,©,ðŽ!,·CEW ” B

**fufCEf“ffBf“fO Ef, [fh iblend mode j**

fefNfXf`ff,ª,Ç,Ì,æ,□,Éf}fbfv æ,ÌfT [ftfFfX,Ì F,Æ ¬ F,³,ê,é,©,ðCE”è,·,éAf<fSfŠfYf€ B

**fvf%oCf}fŠ EfT [ftfFfX iprimary surface j**

f,fjf^ [ ã,É•Ž!,³,ê,éCf [fW,ðŠÜ,ñ,¾f f,fŠ—Ìæ BDirectX,Ä,Í Afvf%oCf}fŠ EfT [ftfFfX,Ífvf%oCf}  
fŠDirectDrawSurfaceIfufWfFfNfg,É,æ,Ä,Ä•\,³,ê,é B

**fvf%oCf}fŠ EfTfEf“fh Efofbftf@ iprimary sound buffer j**

fQ [f€†,Äf† [fU [,ÌŽ·,É•,±  
,!,é%o¹,ðŽ ,Äfofbftf@ B”è”É,É,ÍfZfJf“fh Efofbftf@,©,ç,ÌfTfEf“fh,ðf~fLfVf“fO,·,é,Ì,É—p,¢  
,é,ª AfJfXf^f€ Ef~fLfVf“fO,â,»,Ì¼,Ì“Ä•Ê,È“® ì,ð s,□,½,ß Af\_fCfCEfNfg,ÉfAfNfZfX,·,é,±,Æ,à,Ä,«,é B

**fvfCEfCf,, iplayer j**

DirectPlayZfbfVf‡f“,ÌŠeŽQ%oÁŽÒ BŠefvfCEfCf,,Í AfvfCEfCf,,ŠÖ,Ìf fbfZ [fWCEðŠ·,ð%oÄ”\  
,É,·,éfvfCEfCf,,ID,ÉŠÖ~A,Ä,¬,ç,ê,é B

**fvfCEfCf,,ID iplayer ID j**

DirectPlayZfbfVf‡f“,ÌŠeŽQ%oÁŽÒ,ÉŠÖ~A,Ä,¬,ç,ê,é†fj [fN,ÈŽ·•ÊŽq BfvfCEfCf,,Ì ì -Žž,ÉŠ,,è—  
,Ä,ç,ê,é BfAfvfŠfP [fVf‡f“,ÍfvfCEfCf,,ID,ðŽg—p,µ,Ä AfvfCEfCf,,ŠÖ,Äf fbfZ [fW,ðCEðŠ·,·,é,±  
,Æ,ª,Ä,«,é BfzfXfg,É,Í,Ä,È,ÉDPID\_SYSMMSGfvfCEfCf,,ID,ªŠ,,è—,Ä,ç,ê,é B

**fy [fW EftfŠfbfsf“fO ipage flipping j**

ŽQ Æ @ftfŠfbfv

**fzfXfg ihost j**

DirectPlay,É,·,¢,Ä AID,ªDPID\_SYSMMSG,Ä, ,é%o¼‘zfvfCEfCf,, [ BfvfXfef€ Ef fbfZ [fW,â AfZfbfVf‡f““†,  
Ì,·,×,Ä,ÌfvfCEfCf,, [,É’Ê’m,³,ê,é fbfZ [fW,Í AfzfXfg,É,æ,Ä,Ä ^— ,³,ê,é B

**f|fCf“fg ipoint j**

CE““,©,ç‘S•ûCEü,İ™,ÉCEð,ð•ú,ÄCEðCE¹ B

**•úŽÈ Ý’è iemissive setting j**

ŽQ Æ @•úŽÈ“Á «

**•úŽÈ“Á « iemissive property j**

‘f Þ,Ì“Á «,Ì,Ð,Æ,Ä B‘f Þ,ªCEð,ð•úŽÈ,·,é,©,Ç,□  
,©,ðŽ!,· B•úŽÈ“Á «,Í A‘f Þ,ÌCEð,Ì”½ŽÈ,Ì,µ,©,½,ðCE”è,·,é,Ó,½,Ä,Ì“Á «,Ì,□,ç,Ì,Ð,Æ,Ä,Ä, ,é B  
ŽQ Æ @”½ŽÈ“Á «

**—@ üfxfNfgf< inormal vector j**

—É,ÌCEü,«,ð’è<·,·,é AfT [ftfFfX,©,ç ,¼,É,Ì,Ñ,é%oË<ó,ÌCEð ü B



,Ü

**f}fefŠfAf< imaterial j**

-Ê,ª,Ç,Ì,æ,ð,ÊĖð,ð”½ŽĖ,·,é,©,ðĖ^è,·,é“Á « B‘f Þ,É,Í A•úŽĖ“Á « iĖð,ð•úŽĖ,·,é,©,Ç,ð  
,© j,Æ”½ŽĖ“Á «,Ì,Ó,½,Â,Ì \ ¬—v‘f,ª, ,é B”½ŽĖ,Ì¬¼,é,³,Í A<“x,Ì Ý’è,É,æ,Á,ĂĖ^è,³,é,é B

**f~fLfVf“fO imixing j**

DirectSound,É,·,¢,Ă A Ā ¶|†,ÌfTfEf“fh Efofbftf@,ð ‡ ¬,µ AĖ<%ĖÊ,ðfvf%oCf}  
fŠ EfTfEf“fh Efofbftf@,É ‘,«„±,Þfvf fZfX BfTfEf“fh Efn [fhfEfFfA,ÉfI [fffBfI Eff [f^,ð o—  
Í,·,é B ^— ŽžŠŌ,ªŽĀ—p,É‘İ,|,é,©,ð 1,,Ê,¬,ê,Î Af~fLfVf“fO,³,è“¼,éfofbftf@,Ì ”,É §ĖĀ,Í,Ê,¢ B

**f~fbfvf}fbfv imipmap j**

~A‘±,µ,½fefNfXf`ff BŠefefNfXf`ff,Í A“¬,¶fCf [fW,ÉftfBf<f^,ð,©,¬,Ă ™ X,É’á%ðð‘æ“x,É,µ,½,à,Ì,Ā, ,é  
B%ĖĀŽ<fIfufWfFfNfg,ªŠi“ŽŌ,Ì<ß,,É, ,é,Æ,«„É,Í ,%ðð‘æ“xfCf [fW,ª—p,¢  
,ç,è AfIfufWfFfNfg,ª%“„,‘,©,é i,»,µ,Ă ¬,³,,Ê,é j,É,µ,½,ª,Ā,Ă A,æ,è’á%ðð‘æ“x,ÌfCf [fW,ª—p,¢,ç,è,é B

**-¼•” iumbra j**

fXf|fbfgf%oCf,Ì%~ ó,ÌĖð,Ā A‘†%„,Ì¬¼,é,¢•”ª Bf|fCf“fgĖðĖ¹,Æ“¬,¶“® i,ð,·,é,±,Æ,à, ,é B  
ŽQ Ą @^Ā%œ•” AfXf|fbfgf%oCf,Ì%~

**f fbVf... imesh j**

’P f,Èf|fŠfSf“,Ā•Ė»,³,è,é-Ê,ÌfZfbfg B

**-Ê iface j**

f fbVf...’†,Ì,Ð,Æ,Ā,Ìf|fŠfSf“ B

**f, [fhX iMode X j**

fXf^f“f\_ [fhVGaf, [fh13,ªñ<Ÿ,·,éfnCfufŠfbfh,ÈffBfXfvfĖfC Ef, [fh B,±  
,Ìf, [fh,Ā,Í AVGAfAf\_vf^,ÌEGAf}f<f`fvf< Efıffı Efıvıf [f“ EfVfXfef€,É,æ,Ā,Ā iMode 13,ĀŽg—  
p,Ā,«„é64K,Ì,©,i,è,É j256K,Ü,Ā,ÌffBfXfvfĖfC Ef f,fŠ,ðŽg,ð,±,Æ,ª,Ā,«„é B

**f,ff< Ā•W imodel coordinates j**

ŽqftfĖ [f€,É‘İ,·,é‘Š‘İ Ā•W B

ŽQ Ą @f\_\_ [f<fh Ā•W

,â

—LĈü idirectional j  
ftfĈ [fĈ,ĖfAf^fbf^,³,ê,éĈĉĈ¹,¼,ª A,·,×,Ä,łIfufWfFfNfg,đ“¬,¶,P“x,Å Æ,ç,µ AĈĉĈ¹,ªfIfufWfFfNfg,©,ç-  
³ĈÀ%“,łĖ’u,Ė, ,é,æ,□,ĖĈø%ĖĖ,đ—^,|,é B—LĈüĈĉĈ¹,ÍĈü,«,đŽ ,Ĥ,ªĖ’u,đŽ ,½,, A^ê”Ė,Ė A‘¼—z,ł,æ,□  
,Ė%“,—Ł,ê,½ĈĉĈ¹,đfVf~f...fĈ [fg,·,é,½,ß,Ė—p,ĉ,ç,ê,é B

—LĈøftfĈ [fĈ ienable frame j  
ĈĉĈ¹,đ“K—p,·,é,±,Æ,ª,Å,«,éftfĈ [fĈ B

,ç

**f%ofbfv iwrap j**

-Ê,âf fbfVf...,îfefNfXf`ff Ä•W,îEvŽZ,É—p,ç,éfvf fV [fWff BŠî-  
{“I,Êf%ofbfsf“fO Ef^fCfv,É,Í Aftf%ofbfg A%~’Œ A<...‘İ AfNf f€,ª, ,é B

**f< [fg EftfŒ [f€ iroot frame j**

Direct3D,É,¬,ç,Ä A eftfŒ [f€,ðŽ ,½,È,çftfŒ [f€ BftfŒ [f€ŠK‘w,îfgfbfv,É, ,étfŒ [f€ Bf< [fg EftfŒ  
[f€,Í AfV [f“,ð \ ¬,·,éIfufWfFfNfg‘S‘İ,İfZfbfg,ðŠÜ,ñ,Ä,ç,é B  
ŽQ Æ @fV ff“

**fŒfCfef“fV ilatency j**

fTfEf“fh Efobftf@,ª Ä ¶,³,ê,Ä,©,ç AfXfs [fJ,ªŽÀ Ū,ÉfTfEf“fh,ð-Â,ç,·,Ü,Ä,İ’x%  
„ŽžŠÔ BDirectSoundf~fLft,İfŒfCfef“fV,Í A^ê”Ê,É20f~fŠ•b,Ä, ,é B

**f fr [ EfNf%ofCfAf“fg ilobby client j**

f† [fU,İfRf“fsf... [f^,ÉŠÖ~A,Ä,¬,ç,ê,½f fr [ŠÇ—  
f< [f`f“ BfAfvfŠfP [fVf‡f“,İf%ofEf“f` Af† [fU [ EfCf“f^ [ftfFfCfX,İfAfbfvff [fg Af fr [ EfT  
[fo,Æ,İ’Ê M,ðŠÜ,ð B

**f fr [ EfT [fo ilobby server j**

fŠf, [fg EfT [fo,ÉŠÖ~A,Ä,¬,ç,ê,½f fr [ŠÇ—  
f< [f`f“ Bf fr [ EfT [fo,Í A“Á’è,İfAfvfŠfP [fVf‡f“,É Ú‘±  
,µ,½f† [fU [,ÉŠÖ,·,é,·,×,Ä,İ î•ñ,ð’² @,·,é B

,**i**

**f** [f<fh À•W iworld coordinates j  
f< [fg Eftfœ [f€,É•Î,•,é•Š•Î À•W B  
ŽQ Æ @f,fff< À•W

