

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—š, 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, ĩ, à, ĩ, Ē, μ, æ, □
, ĒDirectX, 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‘Œ ĩ, ·, é, ½, ß, Ē A, ±, ĹSDK, ĹŠJ”-
, ³, ě, ½, ĩ, Ā, , é B

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

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

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

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

DirectX,l'æ^ê,l-Ú“l,l A i“úMS-DOS,ÅŽg—p,³,ê,Ä,¢,é<@”\,Ö,ÌEÝŠ· «,l, ,éAfNfZfX,ð'ñ<Ÿ,µ AMS-DOSfRf“f\ [f<fx [fX,lAfvfŠfP [fVf‡f“•Ä,Ý, ,é,¢,l,»,ê^È ã,lfpftfH [f} f“fX,ð o,³,¹ 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,lAfvfŠfP [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,³,ðE,,ç,µ Afn [fhfEfFfA,l' Š,ð Ä'âEÀŠ^,©,µ,È,^a,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%o°,lfeNfmf fW [,ð—~—p,µ,Ä,¢,é B

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

fn [fhfEfFfAŠJ” ,İ,½,B,İfKfCfhf%oCf“ ,İ”ñ.Y

Microsoft,“DirectX,đŠJ”,μ,½,Æ,«,İ’æˆê,İ—Ú“İ,İ,Đ,Æ,Â,Í AWindowsfIfyfŒ [fefBf“fOŠÂ«„,Â,İfQ [f€ŠJ”-
 ,İ’£ i,¾,Â,½ BDirectX”È”O,Í Afp [f\fi<fRf“fsf... [f^—p,ÉŠJ”,¾,½fQ [f€,İŽâ—,ÍMS-
DOSfx [fX,¾,Â,½ B,»,ê,ç,İfQ [f€,İŠJ”ŽÖ,Í A,¾,Ü,‘,Ü,ÈfJ [fh,İ ”“½,çfn [fhfEfFfAŽÂ“•,É]
 ,ı,È,ˉ,ê,İ,È,ç,È,©,Â,½ B,μ,©,μDirectX,Â,Í AfQ [f€ŠJ”ŽÖ,Í Afn [fhfEfFfA,Ö,İf_CfŒfNfgfAfNfZfX,İ—
 “—,đŽ,¾,±,Æ,È, AfffofCfX”ñ”È”¶ «,Æ,ç,«—“—,“¾,ç,ê,é,İ,Â, ,é B

,à,Ϣ,Đ,Æ,Â,İ d—v,È—Ú“İ,Í Afn [fhfEfFfA%öİŽĐ,É’İ,μ AfnfCfpftfH [f}f“fX,ÈfAfvfŠfP [fVf‡f“,İŠJ”-
 ŽÖ,âfn [fhfEfFfAfxf“f_ [(IHV),©,ç,İftfB [fhfofbfN,ÉŠİ,Â,ç,½fKfCfhf%oCf“,đ”ñ.Y,·,é,±,Æ,Â, ,é BDirectX
 SDKfRf“f [fIf“fg,Í AŒ%œÈ,Æ,μ,Â,Ü,¾¶¶ Ý,μ,È,çfn [fhfEfFfAfNfZf%oŒ [f^<@” ,İŽd—İ,đ”ñ.Y,·,é,±
 ,Æ,È,È,é,©,à,μ,ê,È,ç B’½,İ ê ‡,Â,Í Af\ftfgfEfFfA,» ,ê,ç,İ<@”\,đfGf~f...
 fŒ [fg,·,é B,»,ê”ÈŠO,Â,Í Af\ftfgfEfFfA,Ífn [fhfEfFfA,É’İ,μ,»,İ” —İ,É,Â,ç,Ä—â,ç ‡,ı,¹ A,à,μfTf [fg,¾,ê,Â,ç
 ,È,ˉ,ê,İ—Ž<,·,é,Æ,ç,Ϣ,±,Æ,È,È,é B

«B XŽg—p%œ”\,É,È,é,Â, ,ë,ϣfBfXfvfŒfCfn [fhfEfFfA<@” ,Í A”È%°,đŠÜ,ñ,Â,ç,é B

fI [fo [fŒfC Bfy [fW EftfŠfbfsf“fO,đfOf%oftfBfbfNfffofCfXfCf“f^ [ftfFfCfX(GDI)fEfBf“fhfE“à,Â%œ
 Â”\,É,·,é,½,ß,ÉfTf [fg,¾,ê,é,¾,è,Ϣ Bfy [fW EftfŠfbfsf“fO,Í AfXfNfŠ [f““S’İ,É, ,éftfŒ [f€,đ•Žİ,·,é,½,ßŽg
 —p,¾,ê,é,fuf<fobftf@ EfXfL [f€,Â, ,é B

fXfvf%oCfGfGf“fWf“ BfXfvf%oCfG,đfI [fo [fŒfC,¾,¹,é,±,Æ,đ—e”Ö,É,·,é B

•ăŠÖ,É,æ,é L’ B ˉ¾,çftfŒ [f€,Â,àXfNfŠ [f““S’İ,ÉftfBfbfg,·,é,æ,Ϣ
 ,ÉŠg’ă,·,é,½,ß AfffBfXfvfŒfCf f,fŠ,đŒø—“İ,É B—ñ,·,é B

fAf<ftf@ EfufŒf“ffBf“fO Bfn [fhfEfFfAfsfNfZf<,İfŒfxf<,Â F,đ ˉ ‡,·,é B

fp [fX,·,³ Šm,ÈfefNfXf`ff,đŽ ,ÂŽŽYŒ³(3D)fAfNfZf%oŒ [f^ B3D,İ—
 È,ÉfefNfXf`ff,đ•Žİ,Â,«,é B,½,Æ,İ,İ A3Df\ftfgfEfFfA,Â ¶ ˉ,μ,½ é,İŒ°ŠÖ,É Afp [fX,đ ³Šm,É•Ü,Â,½,Ü,
 Ü—ùŠç•Çfrfbfgf}fbfv,İfefNfXf`ff,đ”\,é,±,Æ,·,³,Â,«,é B

Zfobftf@,đ İ—¶,É“ü,ê,½3DfOf%oftfBfbfN,İfuf fbfn“]— B

•W €2f fKfOfCfG(MB),İffBfXfvfŒfCf f,fŠ B”Ê”İ,É A3DfQ [f€,É Â’áŒÀ•K—v,Æ,¾,é,é B

˜¾ k<Z—@,İ•W € BffBfXfvfŒfCf f,fŠ,É,æ,è’½,,İff [f^,đŠİ”[,Â,«,é,æ,Ϣ,É,·,é B,±,İ•W €
 ,Í Af\ftfgfEfFfA Afn [fhfEfFfA’o•û,ÉŽÂ’•,¾,ê,ê,İ,½,ç,Ö,ñ ,‘—,É,È,é,¾,è,Ϣ BfefNfXf`ff,ÉŽg—
 p,¾,ê A“§%œß˜¾ k,đŠÜ,b B

«B XŽg—p%œ”\,É,È,é,Â, ,ë,ϣI [ffBfIfn [fhfEfFfA<@” ,Í A”È%°,đŠÜ,ñ,Â,ç,é B

˘Ü,È,é%œ¹,đ3D<óŠÖ,É”z’u,·,éfn [fhfEfFfA,ÆfGf“fnf“fT B

fI [ffBfIf { [fh,İIf“f { [fhf f,fŠ B

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

%œÁ,İ,Â A «—˘,İDirectXŒYŠ•fn [fhfEfFfAfAfNfZf%oŒ [f^,É,æ,è AfrffiI Ä ¶,à%œ¶Œb,đŽó,ˉ,é,¾,è,Ϣ B «—
 ˘fŠŠ [fX,¾,ê,éDirectX,İ”ê@”\,Æ,μ,Â AYUVftrffiI,İ”WŠJfn [fhfEfFfAfAfNfZf%oŒ [fVf‡f“•,³fTf [fg,¾,ê,é,¾,è,Ϣ 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|_ [fIf“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,¿,ë,ñ AfIfXfNfŠ [f“ffBfXfvfœfCf f,fŠ’†,lftrfbfgf}
fbfv,Ö,lf_CfœfNfgfAfNfZfX,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 ¶,%Â”,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%î,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%oftfBfbfNfVfXfœ€,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_Šf“fOfpfCfvf%œfCf“,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%œfCfo,ÖfXfP [f%œuf<,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%œfCfu,ÉfRf“fpfNfgffBfXfN,ð’“ü,·,é,ÆŽ@“®“l,ÉfCf“fXfg [f<fvf fOf%œf€
,âfQ [f€,ðŠŽñ,·,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— %ð,·,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%º,İ—á,Å,Í A **IDirectDraw2::CreateSurface** f\fbfh,ðŒÄ,Ô,½,ß**IDirectDraw2_CreateSurface**}fNf ,ðŽg—
p,µ,Ä,¢,é B Ä %º,İpf%of [f^,Í ADirectDrawIfufWfFfNfg,Ö,İŽQ Æ,Ä, ,é B

ret = IDirectDraw2_CreateSurface (lpDD, &ddsd, &lpDDS,
NULL);

f}fNf 'è` ,ªTf| [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<Ý,·,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%oÄ”\,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,Â,İf f\fbfh,ðŽ ,Â 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,Â,ĉ,Ä Æ%öi,·,é B

Release,Í AfIfufWfFfNfg,İŽQ ÆfJfEf“fg,ðffNfŠf f“fg,·,é BfJfEf“fg,³0,É,È,Á,½,Æ,« AfIfufWfFfNfg,Í%o
ð•ú,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,ĉ B,Ü,½AddRef,İŠeĖÄ,Ñ o,μ,É,ÍRelease,İĖÄ,Ñ o,μ,ð’İ%ž,³,¹,È,-
,Ä,Í,È,ç,È,ĉ 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,ĉ,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,ĉ
,é ê ‡ A**QueryInterface**,Í A,»,İfCf“f^ [ftfFfCfX,Ö,İf|
fCf“f^,ð•Ö,· B,·,é,ÆfIfufWfFfNfg,Æ’Ê M,·,é,½,ß,ÉfCf“f^ [ftfFfCfX,ðŽ ,Âf f\fbfh,³Žg—
p,Ä,«,é BfCf“f^ [ftfFfCfX,Ö,İf|
fCf“f^,ð•Ö,·,İ,É ¬Ė÷,·,é,Æ A**QueryInterface**,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,ĉ B

IUnknown::AddRef

ULONG AddRef();

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

V,µ,¢ŽQ ÆfJfEf“fg,ð•Ô,· B

fIfufWfFfNfg,^a ì ¬,³,ê,é,Æ AŽQ ÆfJfEf“fg,Í1,É Ý’è,³,ê,é BfAfvfŠfP [fVf‡f“,^afIfufWfFfNfg,Ö,İfCf“f^ [ft
fFfCfX,ðŽæ“¾,·,é,© A**AddRef** f\fbfh,ðÆÄ,Ñ o,·,½,Ñ,É AfIfufWfFfNfg,İŽQ ÆfJfEf“fg,İfCf“fNfŠf f“fg,³,
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 ^{3,3},ê,é**Unknown** fCf“f^ [ftfFfCfX,İ1•”,Å, ,é B

IUnknown::QueryInterface

HRESULT QueryInterface(REFIID riid, LPVOID* obp);

$fIfufWfFfNfg, {}^a\hat{A}'\grave{e}, \grave{I}COMfCf{}^f\wedge [ftFfCfX, \delta fTf] [fg, \mu, \tilde{A}, \mathbb{C}, \acute{e}, \odot, \zeta, \varpi, \odot \mathbb{E}^{\sim} \grave{e}, \cdot, \acute{e} BfTf] [fg, \mu, \tilde{A}, \mathbb{C}$
 $, \acute{e} \hat{e} \mp AfVfXf\epsilon f\epsilon$
 $, \grave{I}fIfufWfFfNfg, \grave{I}\check{Z}Q \mathcal{A}fJfEf{}^f\text{g}, \delta' \text{ , } \hat{a}, \mu AfAfvf\check{S}fP [fVf\mp f{}^{\cdot}, \acute{I}, \frac{1}{2}, \frac{3}{4}, \grave{z}, \acute{E}, \rangle, \grave{I}fCf{}^f\wedge [ftFfCfX, \delta \check{Z}g\text{---}p, \tilde{A}, \ll, \acute{e} B$

$\mathbb{E}\tilde{A}, \tilde{N} \text{ o}, \mu, {}^a \neg \mathbb{E} \div, \mu, \frac{1}{2} \hat{e} \mp AS_OK, \delta \bullet \hat{O}, \cdot B\mathbb{E}\tilde{A}, \tilde{N} \text{ o}, \mu, {}^a \check{Z}, \text{''s}, \mu, \frac{1}{2} \hat{e} \mp Af f\backslash fbfh, \acute{I} AE_NOINTERFACE, \ddot{U}, \frac{1}{2}$
 $, \acute{I} \grave{E} \% \circ, \grave{I}fCf{}^f\wedge [ftFfCfX\mathbb{E}\tilde{A}\text{---}L, \grave{I}fGf\% \text{ ['l, } \grave{I}, \mathcal{D}, \mathcal{A}, \hat{A}, \delta \bullet \hat{O}, \cdot BfCf{}^f\wedge [ftFfCfX\mathbb{E}\tilde{A}\text{---}L, \grave{I}fGf\% \text{ ['l, } \acute{I} AfRf{}^f|$
 $[flf{}^f\text{g}'P^{\sim} \hat{E}, \hat{A}f\check{S}fXfg, {}^3\hat{e}, \acute{e} B$

DirectDraw

DDERR_INVALIDOBJECT

DDERR_INVALIDPARAMS

DDERR_OUTOFMEMORY (IDirectDrawSurface2, \grave{I}, \acute{Y})

DirectSound

DSERR_GENERIC (IDirectSound, $\mathcal{A}IDirectSoundBuffer, \grave{I}, \acute{Y}$)

DSERR_INVALIDPARAM

DirectPlay

DPERR_INVALIDOBJECT

DPERR_INVALIDPARAMS

$Direct3D, \grave{I}f\check{S}f\epsilon fCf{}^fh Ef, [fh, \mathcal{A}fCf\sim f\check{f}BfG [fg Ef, [fh, \grave{I}fCf{}^f\wedge [ftFfCfX, \acute{E}, \hat{A}, \mathbb{C}$
 $, \tilde{A}, \acute{I} AQueryInterface f\backslash fbfh, \acute{I} A\textit{Direct3D}\bullet \grave{U}\check{Z} f, [fh, \grave{I}\bullet \hat{O}'l, \mathcal{A}Direct3D'\frac{1}{4} \acute{U}f, [fh, \grave{I}\bullet \hat{O}'l, \grave{I}, \zeta, \grave{z}, \zeta, \odot, \mathcal{D}, \mathcal{A}, \hat{A}, \delta \bullet \hat{O},$
 $\cdot B$

riid

$\text{---}v\lt, {}^3\hat{e}, \frac{1}{2}fCf{}^f\wedge [ftFfCfX, \grave{I}\check{Z}Q \mathcal{A}\check{Z}^{\sim} \bullet \hat{E}\check{Z}q B$

obp

$\mathcal{A}\% \circ \ddot{I}, {}^a \neg \mathbb{E} \div, \mu, \frac{1}{2} \hat{e} \mp AfCf{}^f\wedge [ftFfCfXf|fCf{}^f\wedge, {}^a \hat{O}, {}^3\hat{e}, \acute{e} f|fCf{}^f\wedge, \grave{I}fAfhf\mathbb{E}fX B$
 $, \pm, \grave{I}f f\backslash fbfh, \delta \mathbb{E}\tilde{A}, \hat{O}, \pm, \mathcal{A}, \hat{A}\check{Z}\mathfrak{a}{}^{\frac{3}{4}}, \mu, \frac{1}{2}fCf{}^f\wedge [ftFfCfX, {}^a s\text{---}$
 $v, \acute{E}, \hat{E}, \hat{A}, \frac{1}{2} \hat{e} \mp AfAfvf\check{S}fP [fVf\mp f{}^{\cdot}, \acute{I} AfCf{}^f\wedge [ftFfCfX, \delta \% \delta \bullet \acute{u}, \cdot, \acute{e}, \frac{1}{2}, B, \acute{E} \textit{Release} f\backslash fbfh, \delta \mathbb{E}\tilde{A}, \tilde{N} \text{ o}, \bullet \text{--}K\text{---}v, {}^a,$
 $, \acute{e} BQueryInterface f\backslash fbfh, \acute{E}, \mathfrak{a}, \grave{e} AMicrosoft, \mathcal{A}fT [fhfp [fefB, \acute{I} A\mathbb{E}\rangle{}^{\cdot} \P, \acute{e}, \mathbb{C}, \acute{I} \text{---}^{\wedge} \grave{I} \lt @ \text{''}\backslash, \mathcal{A}\check{S} \pm \hat{A}, \cdot, \acute{e}, \pm, \mathcal{A}, \hat{E}, -$
 $fIfufWfFfNfg, \delta \check{S}g'\mathcal{L}, \tilde{A}, \ll, \acute{e}, \mathfrak{a}, \varpi, \hat{E}, \acute{e} B$

$, \pm, \grave{I}f f\backslash fbfh, \acute{I} AfIfufWfFfNfg, \acute{E}, \mathfrak{a}, \hat{A}, \tilde{A}\mathbb{E}p {}^3, {}^3\hat{e}, \acute{e} \textit{Unknown}fCf{}^f\wedge [ftFfCfX, \grave{I}^{\wedge} \hat{e} \bullet \text{''}, \hat{A}, \acute{e} B$

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 [fhfEfFfAfpfCfbbfg,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 [fhfEfFfAfff 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,^a AŽÄ'•,İ'èç',¹, 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,·,éfR [fh,ðŽ ,½,È,¢,Æ,¢,ϣÖ—
i,Ä A f ~%¼'z,Æ,µ,Ä'èç',³,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,^aK—v,È ê ‡ A QueryInterface f\fbfh,ð—p,¢
,Ä AfIfufWfFfNfg,É,»,İfCf“f^ [ftfFfCfX,^a¶ Ý,·,é,©,Ç,ϣ,©Šm”F,µ A,»,İfCf“f^ [ftfFfCfX,Ö,İf|
fCf“f^,ð“¾,ê,±,Æ,^aÄ,«^a,é B

QueryInterface,ðÆÄ,×,é,İ,İfIfufWfFfNfg,^aŽÄ'•,·,éCf“f^ [ftfFfCfXf f\fbfh,¾,^a AŽÄ Ū,É,İ,±,İf f\fbfh,İ'—

MĖã AfAfvfŠfP [fVf‡f“,âfIfufWfFfNfg,Í AVfe [fuf<,Ö,İf|fCf“f^,ðfIfufWfFfNfg,©,çŽó,¯Žæ,é,±
,Æ,É,È,é B,±,İf fJjfYf€,Í AfIfufWfFfNfg,^aŽg—

p,·,éfvf%ofCfx [fgff [f^,ÆÆÄ,Ŋ o,µ'ϣNf%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 %
,İø ”,^a,»,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,³,³EyÆ,³,ê,é,İ,Ä, ,é B,½,
Æ,İ,İ AC++

,Ä^ø ”,İthis,Í A,·,Ä,É%oðŽß,³,ê,½fpf%of [f^,Æ,µ,Ä^µ,İ,ê,ÄfR [fh%o»,³,ê,, AVfe [fuf<,ð'Ê,µ,½*s ³,ÍC++
,Ä^Ä,É ^— ,³,ê,é B

C,Ä,ÏCOMfIfufWfFfNfg,Ö,ÏfAfNfZfX

,Ç,ñ,ÈCOMfCf“f^ [ftfFfCfXf f\fbfh,àCE¾CEê,©,çCEÄ,Ñ o,·,±
,Æ,ª,Ä,«,é BCCE¾CEê,©,çfCf“f^ [ftfFfCfXf f\fbfh,ðCEÄ,Ô,Æ,«,É AŠo,|,Ä,“,×,«Ž-•ç,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 CE¾CEê,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 î•ñ \‘ç‘Ï(&ddsd),ð Ý’è,µ A V,µ,çfT [ftfFfX,Ö,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,³,ê,Ä,¢,éCOMfCf“f^ [ftfFfCfXf f\fbfh,Í,·,×,Ä AC++fNf%ofX-¼,É,æ,Ä,Ä•\,³,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,³,ê,é B,±,ê,ÍC++,Ä,ì,Ý A,±
,ê,ç,ìf f\fbfh,ðŽg—p,Ä,«₁,é,Æ,¢,¤,±,Æ,Ä,Í,È,¢ B

,±,ê,É%oÁ,₁ Af f\fbfh,ì,½,ß,É’ñ<Ÿ,³,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,^a, ,é B^È%o°,ì—á,Ä AIDirectDraw2::GetCapsf f\fbfh,ìC++,Ä,ì•¶-
@,ðŽ₁,· B

HRESULT GetCaps(LPDDCAPS lpDDDriverCaps,
LPDDCAPS lpDDHELCaps);

“¯,¶—á,^a 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,Â,¢,é,ª ADirectX 2 SDK,âfIfšfWfif<,ÌDirectX 1 SDK,Â ‘,©,ê,½fAfvfšfP [fVf‡f“,Í,·,×,Â Af\ [fX,ð•Í X¹,,É ĀfRf“fpfCf<,μŽĀ s,Ā,«,é,Ā, ,ë,□ B,±,Ì Í,Ā,Ì–Ů“Í,Í ADirectX 2 SDK,ð,æ,’m,é 1,Ö A,±,ÌSDK,Ā‘â,«,˘Û,È,Ā,Ā,¢,é,¢,,Ā,©,Ì d—v,ÈŽ– € ,ð,·,Î,â,—%ð,·,é,½,ß,Ìžè •,–,È,È,é,±,Æ,Ā, ,é B,±,è,ç,Ì‘á,¢,ð AfRf“f| [flf“fg’P‘Ē,Ā‘ê——,É,·,é B

DirectDraw

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

DirectSound

DirectX 3,Í AfAfvfšfP [fVf‡f“,“%¹Ē¹,Ì•,±,!,Ā,,éÊ‘u,ð•Í X,Ā,«,é,æ,□,É,·,é DirectSound3D<@”\,ðšŮ,Ð BfAfvfšfP [fVf‡f“,Í AžwĒü «,Ì, ,é%¹Ē¹,Ì%¹%~ A˘Ů“@,·,é%¹,Ìfhfbfvf% [Ēø%Ē A,»,μ,Ā˘Û,È,éĒø%Ē,“”-¶,·,é<—£,ðŽw’è,Ā,«,é BDirectSound,Ì V<@”\,É,Ā,¢,Ì,Ì Ů × 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“,“ĒÝ,¢,É,Ê M,Ā,«,é,æ,□,É,·,é¾,–,Ā,È, Af} fbf`f [fLf“fOfT [fo,Ö,Ì”ñ‘Ē•¶ «,à’ñ<Ÿ,·,é<Z p,ÌèšĀ,Æ,È,Ā,½ B,±,Ì V,μ,¢<Z p,ðŽĀ‘•,·,é,½,ß AIDirectPlay2 A IDirectPlay2A AIDirectPlayLobby fCf“f^ [ftfFfCfX,“Ç%Á,³,è,½ BDirectPlay,Ì V<@”\,É,Ā,¢,Ā,Ì Ů × îñ,Í ADirectPlayfo [fWf‡f“3,Ā%¹½,ª V,μ,,È,Ā,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,Ā,Ā,¢,é B,±,Ìf`f... [fgfšfAf<,É,Ā,¢,Ā,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<‘†,ÉfĒfWfXfgfš,Ö ³,μ,-fGf“fgfš,ð“o^,Ā,«,é,æ,□•â •,·,é V<@”\,ðŽ ,Ā,½ B

AutoPlay

AutoPlay,É,Ā,¢,Ā,ÌfhfLf...f f“fg,Í A V,½,ÉWindows NT®,Ì îñ,àŽ ,Ā,½ B

•\L

^È%°,É-{\,Å,İ•\L,ð à-¾,·,é B

•\L

^Ó-ı

fCf^fŠfbfN^İ

fvfœ [fXfzf<f_ [,\,Û,½,Í•İ ”,ð•\,· BŽÀ Û,İ'1,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'1,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,ê^È%°,İˆÓ-ı,ð•\,· B

•\L

^Ó-ı

SMALL CAPITALS

fL [AfL [fV [fPf“fX AfL [fRf“fıfl [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‘¶,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 [f€ ,âWindowsfTfufVfXfef€,É‘Í,µ AftfOfCfX,É‘È‘¶,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”nRGBfJf‰ [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‘¶,µ,½fR [fh,ð•K—

v,Æ,.,éfAfVfŠfP [fVf‡f“,Â,µ,©,Â,«„È,©,Â,½È‰°,Ì,æ,±,È—~“,ð AftfOfCfX,É‘È‘¶,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‘¶,.,éfAfNfZfX,ð AftfOfCfX,É‘È‘¶,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‰ [Efth [f}

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

{“ÍftfOfCfX^È‘¶ «„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—¶,.,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‘¶,.,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 [f€ EfOf‰OfBfbfNfX,ð A

DirectDraw,Ì’ñ<Ÿ,.,é,Ì,Â, ,é B

DirectDrawA [fLfefNf`ff

DirectDraw,Í Af fBfXfvfœfC Ef f,fŠ,ÆffBfXfvfœfC 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‘œfCf [fW,ð•\,µ AfT [ftfFfX,ÆœÄ,Î,ê,é B
fAfvfŠfP [fVf‡f“,ÍDirectDraw,İfn [fhEfFfA EfAfufXfgf%ofNfVf‡f“ EfœfCf,, (HAL)
,ð'Ê,¶ A L'·,âfI [fo [fœfC AfefNfXf`ff Ef}
fbfsf“fO A%øñ“] Af~f%o [fŠf“fO,ðŠÜ,b“Æ“Á,ÈffBfXfvfœfC 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,«É,¢ B

DirectDraw,Í A Ddrawf_fCfif~fbfñ 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,½[NfNfŠfbfv EfŠfXfg,Æ,»,ì'¼,.,×,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,ìST”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“¼,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^,ðfZfbfg,.,é B,±,ì'€ ì,ì”ñ~Šú,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,Û,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 fbfN”]—,ð,Û, fVfXfefœ Ef f,fŠ ã,ÄŽÄ s,µ A,»,ìE%oÈ,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 Efpfœfbfg,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
IDirectDrawPalettefCf“f^ [ftfFfCfX,Í Afpfœfbfg,ðfn [fhfEfFfA ã,ÄŽÄ'•,.,é B,±
,è,ç,É,æ,èWindowsfpfœfbfg,ìfofCpfX,³,è AfQ [fœ
,ªffBfXfvfœfC Efn [fhfEfFfA,ð'r¼“L,ÉfAfNfZfX,.,é,Æ,«¼,~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 [fŒfC,àTf] [fg,µ,Ä,¢,é B

“\$%ßCE^fuf fbfN“]‘—’†,İ Afrfbfgf}fbfv,İfT [ftfFX,É“]‘—,³ê Afrfbfgf}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,ÄŽÀŒ»,³ê,é B“]‘—
Œ³fJf% [EfL [,İ A“]‘— ^— ’† Afrfbfgf}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,î,ê,é B“]‘— æfJf% [EfL [,İ A“]‘—Œ³fRfbfgf}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,î,ê,é B Ú ×,İ ufJf% [EfL [fCf“fQ v,ðŽQ Æ,·,é,±,Æ B

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

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

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

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

DirectDraw HAL

DirectDraw fn [fhfEfFfA EfAfufXfgf%NfVf‡f“ EfCfCf,, (HAL)
,Í Afn [fhfEfFfA,É`Ě‘¶,µ Afn [fhfEfFfAĖĀ—L,łfR [fh,¾,¯,©,ç,È,é B
HAL,Í A16frfbfg,Ā,à32frfbfg,Ā,à A,Ü,½ Windows 95 ā,Ā,Í‘o•û,ì‘g,Y ‡,í,¹,ĀŽĀ‘•,³,ê“¾,é BWindows
NT ā,Ā,Í,Ā,Ē,É32 frfbfg,ĀŽĀ‘•,³,ê,é B
HAL,Í AfBfBfXfvfCfC EfBf%oCfo,É“ ‡,³,ê,½`ê”„É,à A,Ü,½fhf%oCfo ì ¬ŽÒ,ª`èç,µ,½fvf%oCfx [fg EfC
f“f^ [ftfFfCfX,ð’Ē,µ,ĀffBfXfvfCfC EfBf%oCfo,Æ’Ē M,·,é“Æ—§,µ,½DLL,É,à,Ē,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,ÍfffoCfXĖĀ—
L,łfR [fh,¾,¯,©,çŽĀ‘•,³,ê AfGf~f...fC [fVf‡f“,Í s,í,, Afn [fhfEfFfA,É,Ē,¢‹@”\,Í’Ē’m,µ,Ē,¢ B
HAL,Í Afpf%o [f^,łŠm”F,ð s,í,Ē,, Afpf%o [f^ Ef`FfbfN,Í AHAL,ªĖĀ,Ń 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“,Ìfpf%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,^aÄ,«₁é 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

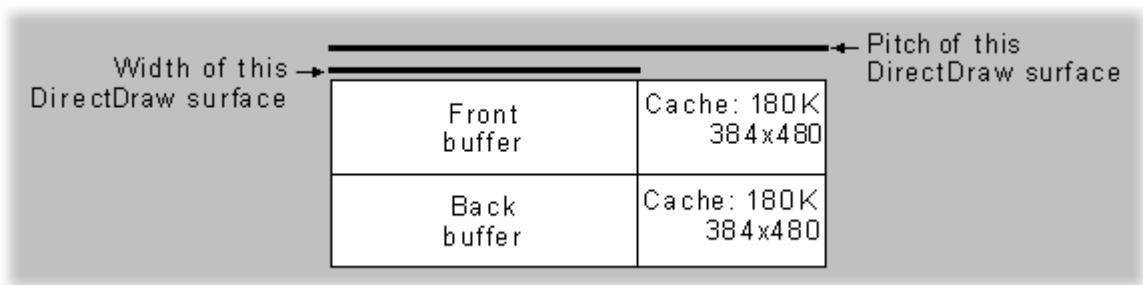
DirectDrawSurfaceIfufWfFfNfg,İ A’¼ ÚfAfNfZfX,μ,½,è‘€ ì,μ,½,è,Ä,«₁éffBfXfvfƎfC Ef f,fŠ,İ‘A‘±•”^a,ð\
,· B,±,ê,ç,İffBfXfvfƎfC Ef f,fŠ,İfAfhfƎfX,İ A%oÄŽ<ftfƎ [f€ Efofbftf@ Ef f,fŠ ifvf%ofCf}
fŠ EfT [ftfFfX j, ,é,ç,İ•s%oÄŽ<fofbftf@ ifIfftXfNfŠ [f“ EfT [ftfFfX,Ü,½,İfI [fo [fƎfC EfT [ftfFfX)
,ðŽw,· B•s%oÄŽ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

DirectDrawPalettefIfufWfFfNfg,İ A16 F,Æ256 F‘o•û,İfCf“fffbfNfX EfpfƎfbfg,ð\,· B fpfƎfbfg,İ A
fefNfXf`ff AfIfftXfNfŠ [f“ EfT [ftfFfX AfI [fo [fƎfC EfT [ftfFfX,É‘İ,μ’ñ<Ÿ,³ê,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,^a ì—
p,·,éDirectDrawSurface,ÉfAf^fbf¬,μ,È,¬,ê,İ,È,ç,È,ç BDirectDrawSurfaceIfufWfFfNfg,İ A
DirectDrawPalettefIfufWfFfNfg,ðfAf^fbf¬,·,é—v< ,ð<“”Ü,·,é%oÄ”\ «,^a,é B‘â•”^a,İfn [fhEfFfA,İ•i ”fpfƎfbfg,ðf
Tf| [fg,μ,Ä,ç,È,ç,½,ß,Ä A,μ,İ,μ,İ<N,«₁é,±,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”[³,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”[³,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”[³,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 [ftfFfX 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| lfg

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

fefNfXf`ff_Ef}fbfv

f~fbfvf}fbfv

Zfofbftf@

fefNfXf`ff Ef}fbfv

fefNfXf`ff Ef}fbfv,Í AHÉL,ðŽg,Á,ÄfVfXfef€ 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,ÍfV [fPf`fX,Ä, ,è A,»,è,¼,è,ÍfefNfXf`ff,Í%ð'æ"x,"QŽŸ'á,,È,é"¬,¶fCf [fW,Ä, ,é B
f~fbfvf}fbfv'†,ÍftfBf<f^,ð,©,¬,ç,è,½%æ'æfCf [fW,ðfEfxf<,ÆCEÄ,Ñ A,»,Í'ä,«,³ÍfEfxf<ŠÖ,Ä"ñ æ,İŠÖEW,É, ,
é B ,%ð'æ"x fEfxf<,Í AŠİ'ªŽÖ,Éð,¶fIfufWfFfNfg,Ä—p,¶ A
'á%ð'æ"x fEfxf<,Í AŠİ'ªŽÖ,©,ç,æ,è%¬,¶fIfufWfFfNfg,Ä—p,¶,é Bf~fbfvf}
fbfv,Í AfCEf`f_Šf`fO,³,è,½fefNfXf`ff,·,İŽç,ðCEü ä,µ AÆvŽZ—Ê,ð ß-ñ,·,é,½,ß,ÉŽg—p,·,é B

DirectDraw,Ä,Íf~fbfvf}fbfv,Í AfAf^fbf`³,è,½fT [ftFfX,Íf`fF [f“,Æ,µ,Ä·\,· B
Ä ,%ð'æ"x,ÍfefNfXf`ff,Íf`fF [f“,Í æ“,É'u,©,è AfAf^fbf`f f`fg,·,È,í,žŽŸfEfxf<,Íf~fbfvf}
fbfv,ðŽ ,Ä B,»,ÍfEfxf<,à,Ü,½,³,ç,ÉŽŸfEfxf<,ðfAf^fbf`f f`fg,Æ,µ,ÄŽ ,ç A,»,[□]
µ,Ä ‡,É Ä'á%ð'æ"x fEfxf<,Ü,Ä'±,ç,Ä,ç, B

f~fbfvf}fbfv,ÍPfEfxf<,ð·\
,·fT [ftFfX,ð Ì ¬,·,é,É,Í AIDirectDraw2::CreateSurface f\fbfh,É“n,·DDSURFACEDESC \‘ç'İ,İDDSCAPS_MIPMAPftf%oO,ðŽw'è,·,é Bf~fbfvf}fbfv,Í,·,×,ÄfefNfXf`ff,Ä,à, ,é,½,ß A DDSCAPS_TEXTURE
ftf%oO,àŽw'è,³,è,Ä,ç,È,¬,è,İ,È,ç,È,¶ B IDirectDrawSurface2::AddAttachedSurface f\fbfh
,ðŽg,¶ AŠefEfxf<,ðŽ©ª,Ä Ì ¬,µ,Äf`fF [f“,ð \ ¬,·,é,±
,Æ,ª,Ä,«,é B,µ,©,µIDirectDraw2::CreateSurface f\fbfh,ðŽg,µ,Í A‘Sf`fF [f“,ð^ê€ Ì,Ä \ ¬,Ä,«,é B

ŽŸ,Ì—á,Ä,Í A fTfCY,ª256'256 A128'128 A64'64 A32'32 A16'16,Ì,T,Ä,Íf~fbfvf}
fbfv Efefxf<,©,çf`fF [f“,ð \ ¬,·,é è ‡,ðŽ',· B

```
DDSURFACEDESC          ddsd;  
LPDIRECTDRAW_SURFACE2 lpDDMipMap;  
ZeroMemory(&ddsd, sizeof(ddsd));  
ddsd.dwSize = sizeof(ddsd);  
ddsd.dwFlags = DDSD_CAPS | DDSD_MIPMAPCOUNT;  
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—ª,·,é,±
,Æ,à,Ä,«,éª A,»,Ì è ‡IDirectDraw2::CreateSurface f\fbfh,ªfT [ftFfX,Íf`fF [f“,ð Ì ¬,·,é B,»,Ì,»,è,¼,è,ÍfT
[ftFfX,Í'OfT [ftFfX,Ì·½·üª,Ì'ä,«,³,Ä Ìç,è A%Ä”\,È,©,¬,è,Ì ¬,³,Ü,Ä'±, B• ,Æ ,,³,ð È—ª,·,é,±
,Æ,à,Ä,« A,»,Ì è ‡IDirectDraw2::CreateSurface,ª A Ä ¬fEfxf<,ÍfTfCY,ð1
'1,Æ,·,éŽw'è,µ,½ ”,ÍfEfxf<,ð Ì ¬,·,é B

f~fbfvf}fbfv EfT [ftFfX,Íf`fF [f“,Í AIDirectDrawSurface2::GetAttachedSurface f\fbfh,ð—
p,¶ ADDSCAPS \‘ç'İ,İDDSCAPS_MIPMAP,Æ DDSCAPS_TEXTUREftf%oO,ðŽw'è,·,é,±,Æ,É,æ,Ä,Ä s,□ B ŽŸ,Ì
—á,Í A Ä ,%ð'æ"x,©,ç Ä'á%ð'æ"x,Ü,Äf~fbfvf}fbfv Ef`fF [f“,ðfgfE [fX,µ,½,à,Ì,Ä, ,é B

```
LPDIRECTDRAW_SURFACE lpDDLevel, lpDDNextLevel;  
DDSCAPS ddsCaps;
```

```
lpDDLevel = lpDDMipMap;  
lpDDLevel->AddRef();  
ddsCaps.dwCaps = DDSCAPS_TEXTURE | DDSCAPS_MIPMAP;  
ddres = DD_OK;  
while (ddres == DD_OK)  
{  
    // ,±,ÍfEfxf<,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 EfŒfxf<,ª AŠÖ`A,·,éfofbfN Efofbftf@ EfefNfXf`fffT [ftfFfX,đŽ ,Ä BŠefofbfN Efofbftf@ EfefNf
Xf`fffT [ftfFfX,İ Af~fbfvf}fbfv,İ`êŒfxf<,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 EfŒfxf<,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“,İŽŸŒfxf<,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“,İfT [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,İŒÄ,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`êŒfxf<,É,İ,Ÿ“K—p,³,ê,é Bf~fbfvf}fbfv,İ`Sf`fF [f“,đfuf fbfN“]‘—,·,é,½,B,É,İ AŠefŒfxf<,đ•Ê X,Éfuf fbfN“]‘—,µ,È,¬,ê,İ,È,ç,È,¢ B

IDirectDrawSurface2::Flip f\fbfh,İ A—^,İ,ç,ê,½Œfxf<,©,çf~fbfvf}fbfv`t,İ Ä`áfŒfxf<,Ü,Ä A,·,×,Ä,İŒfxf<,đftfŠfbfsf“fO,·,é BftfŠfbfsf“fO æ,İfT [ftfFfX,à`ñ,Ÿ,³,ê,ª A,»,İ ê ±f~fbfvf}fbfv,İ`SfŒfxf<,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“,İfgfbfvfŒfxf<,É, é, R”Ö—Ü,İfofbfN Efofbftf@,ªfI [fof%oCfh,Æ,µ,Ä—^,İ,ç,ê,½ ê ± Af~fbfvf}fbfv,İ`SfŒfxf<,İ,»,İ,R”Ö—Ü,İfofbfN Efofbftf@,ÉftfŠfbfsf“fO,·,é B

f~fbfvf}fbfv Ef`fF [f“,İŒfxf< ”,İ A—¾Ž,“İ,ÉŠi”[³,ê,é B
fAfvfŠfP [fVf±f“,ª İIDirectDrawSurface2::Lock,Ü,½,İIDirectDrawSurface2::GetSurfaceDesc f\fbfh,đŒÄ,Ñ o,µ, Ä)f~fbfvf}fbfv,İfT [ftfFfX EftfXfNfŠfvf^,đŽæ“¾,·,é,Æ,« AfgfbfvfŒfxf<,đŠÜ,Đf~fbfvf}fbfv,İŒfxf< ”,İ **DDSURFACEDESC** \`¢İ,İ dwMipMapCountf f“fo,ªŽ ,Ä,Ä,¢,é Bf~fbfvf}fbfv,İfgfbfvfŒfxf<ÈŠÖ,İŒfxf<,É,Ä,¢,Ä,İ A dwMipMapCountf f“fo,İ A,»,İf~fbfvf}fbfv,©,çf`fF [f“,İ Ä ¬f~fbfvf}fbfv,Ü,Ä,İŒfxf< ”,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,,Å,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,Å,¢,é B,±,ìftf%ŒO,²Žw‘è,³,è,Å,¢,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,ÅfTf| [fg,·,é,æ,²,É ÝŒv,³,è,Å,¢,é è ‡ A **DDCAPS_BLTDEPTHFILL**ftf%ŒO,ðfGfNfXf| [fg,µ A **DDBLT_DEPTHFILL**fuf fbfN“]‘—,ðµ,²,Í,,Å, ,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`È‘¶,·,é B

DirectDraw,ÆDirect3D,ì“ ‡
,±,ì ß,Å,Í ADirectDraw,Æ Direct3D,ÌŠÖEW,É,Â,¢,Ä q,×,é B
Direct3Dfhf%ofCfo 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,¬,Â,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_ſf“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©,ìlufufWfFfNfgf^fCfv,Å,Í,È, A DirectDrawSurfaceIfufWfFfNfg,ì,à,□
,Đ,Æ,Â,ìfCf“f^ [ftfEfCfX,Å, ,é BŽŸ,ì—
á,Å,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<,Å,¢
,Å,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”,Å,
,é B

DirectDraw HEL,ÆDirect3D

DirectDraw HEL,Í A fefNfXf`ff Af~fbfvf}fbfv AZfofbftf@ EfT [ftfFfX,ì ì ¬,ðfTf| [fg,·,é B
,³,ç,É ADirectDraw,Æ Direct3D,Æ,ì-§,È“ þ,É,æ,è ADirectDraw,^a“® ì%oÂ”,ÈfVfXfef€,Í,Â,È,ÉDirect3D,ðfTf|
[fg,·,é i ,È,,Æ,àf\ftfgfEfFfAfGf~f...fœ [fVfþf“,É,æ,Á,ÄfTf| [fg,³,ê,é j B,µ,½,^a,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,³,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,^aÅ,«,(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,Á,«,(é Bf, [fhXf, [fh,Å,Ífvf%oCf}
fŠ EfT [ftfFfX,Ö,ì’¼ ÚfAfNfZfX,Í,Å,«,(È,¢ B.

f, [fhXf, [fh,ÍC» ÝWindows NT,Å,ÍfTf| [fg,³,ê,Ä,“,ç,, AfŠjJfA’á%ð’æ“xf, [fh,à L,fTf| [fg,Í,³,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,³,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,^a,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 ‡,^a,é B,»,[□]
,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

| fsfNfZf< EftfH [f} fbfg Eftf%ofO | frfbfg [“x | f}fXfN |
|--|-------------------|--|
| 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,Â%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,Ɖ
,ª AfffBfXfvfƎfC EfftofCfX,»,ê,¼,ê,ÉDirectDraw HAL,ð ‘,±,Æ,ª,Â,«,é B Windows
95,ÆGDI,ª”FŽˆ,·,éftfBfXfvfƎfC EfftofCfX,Í AffftfHf<fg,ÌDirectDrawIfufWfFfNfg,ªfCf“fXf^f“fX%»»,³,ê,é,Æ,
«—p,Ɖ,ç,ê,é,à,Ì,Â, ,è A,»,µ,Â,È,ƉfftofCfX,Í A‘æ“ñ,ÌftfBfXfvfƎfC EfftofCfX,ÌfOf [fof< Ef†fj [fNŽˆ•ÈŽq
(GUID) ,ðŽg,Â,Ä ì ¬,³,ê,½“Æ—§,µ,½,à,µ,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,Ê,Á,½,©?

DirectX,ªŽg—p,·,éCOMf,ffç,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,É,³,è,½ j B

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

IDirectDraw2::SetCooperativeLevel f f\fbfh,ÆIDirectDraw2::SetDisplayMode f f\fbfh,Æ,Ì’ŠŸÉ 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,Áf, [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::RestoreDisplayMode 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%œÊ,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%oCfo,ªfTf|
[fg,·,é,·,×,Ä,lfXfNfŠ [f“%øð‘œ“x,Æfrfbfg [“x,ðfTf| [fg,·,é B

DirectDraw,Ê,æ,è AfAfvfŠfP [fVf‡f“,Í AfRf“fsf... [f^,lffBfXfvfŒfC Efhf%oCfo,ªfTf|
[fg,·,é,Ç,Ïf, [fh,É,à•Ï X,Ä,«,é,æ,ð,É,È,é B,±,ê,É,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%oCfo,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^,lffBfXfvfŒfC §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

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

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,^a,ç,Å, ,é B fffBfXfvfœfC Ef, [fh,^aİ X,³,ê,é,Æ A fffBfXfvfœfC Ef f,fŠ,ÉŠi"[³,ê,½fT [ftfFfX,Í,·,×,ÄŽ,ⁱ,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 Efft of CfX,İ,½,ß,ÉCf“fXf^f“fX%»,³,ê,é,Æ,« A^Ä–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— ^,ⁱ,ç,ê,é BDirectDraw,Í A GDI,^a 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,Ä,È,ÉIDirectDraw2::GetGDISurface f f\fbfh,ðŽg,□,± ,Æ,É,æ,Ä,Ä“¾,ç,ê,é B

GDI,Í A DirectDraw,³Ç— ,·,éffBfXfvfœfC Ef f,fŠ ã,İtfHf“fg Afuf%ofV A fff of CfX^È‘¶ftrfbfgf} fbfv(DDB),ðfLfffbfVf...,Ä,«,È,ç B—~p,Ä,«,é f,fŠ,ð DirectDraw,İfq [fvf}fl [fWff,É'Ê'm,·,é'O A, ,é,ç ,ÍDirectDraw,İfq [fvf}fl [fWff,©,çfLfffbfVf...,³,ê,½ff [f^,İ,½,ß,ÉffBfXfvfœfC Ef hf%ofCfo,^af f,fŠ,ðŠ,,è“— ,Ä,Û,½,Í%ð•ú,Ä,«,é,æ,□,É,È,é'O,É AHAL,Í A DIBfGf“fWf“ Ef hf%ofCfo,^aK—v,Æ,·,éffBfXfvfœfC Ef f,fŠ,ð —\~ñ,μ,È, _ê,İ,È,ç,È,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,İfsfNfZf< [“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

CoCreateInstance, δ —p,¢,½**DirectDrawIfufWfFfNfg**,İ ì ¬

DirectDrawCreate ŠÖ ”,Ä,Í,È, A**CoCreateInstance** ŠÖ ”,Æ**IDirectDraw2::Initialize** f f\fbfh
, δ Žg,Ä,Ä**DirectDrawIfufWfFfNfg**, δ ì ¬,·,é,±,Æ,ª,Ä,«,é B ~È%º,ÉŽè ‡, δ Ž!,· B

```
1 fAfvfŠfP [fVf‡f“,İŽn,ß,Ä A NULL, $\delta$ Žw’è,µ,ÄCoInitialize, $\delta$ CEÄ,Ñ o,µ ACOM, $\delta$  %Šú%º»,·,é B
  if (FAILED(CoInitialize(NULL)))
    return FALSE;
```

```
2 CoCreateInstance,ÆIDirectDraw2::Initialize f f\fbfh, $\delta$ Žg,Ä,ÄDirectDrawIfufWfFfNfg, $\delta$  ì ¬,·,é B
  ddrval = CoCreateInstance(&CLSID_DirectDraw,
    NULL, CLSCTX_ALL, &IID_IDirectDraw2, &lpdd);
  if(!FAILED(ddrval))
    ddrval = IDirectDraw2_Initialize(lpdd, NULL);
```

,±,İ**CoCreateInstance**,İCEÄ,Ñ o,µ† A Ä %º,İfpf%of [f^CLSID_DirectDraw,Í A
DirectDrawfhf%ofCfo EfIfufWfFfNfg EfNf%ofX,İfNf%ofXŽ•ÉŽq,Ä, ,é B IID_IDirectDraw2
fpf%of [f^,Í A ì ¬,³,ê,é“Á’è,İDirectDraw fCf“f^ [ftfFfCfX, δ Ž•É,·,é B
lpddfppf%of [f^,Í AŽæ“¾,³,ê,éDirectDrawIfufWfFfNfg, δ Žw,· B CEÄ,Ñ o,µ,ª ¬CE÷,·,é,Æ A,±
,İŠÖ ”,Í %Šú%º»,³,ê,Ä,¢,È,¢fIfufWfFfNfg, δ •Ö,· B

```
3 DirectDrawIfufWfFfNfg, $\delta$ Žg,ª‘O,É AIDirectDraw2::Initialize, $\delta$ CEÄ,Ñ o,³,È,,Ä,Í,È,ç,È,¢ B,±,İf f\fbfh,Í A
DirectDrawCreate ŠÖ ”,ª“ê”É“İ,ÉŽg,ªfhf%ofCfo GUID fpf%of [f^ i,±,İ ê ‡NULL j, $\delta$ ˆø ”,ÉŽæ,é B
DirectDrawIfufWfFfNfg %Šú%º»CEä,Í ADirectDrawCreate ŠÖ ”, $\delta$ Žg,Ä,Ä ì ¬,µ,½,İ,Æ“—İ,ÉŽg—
p A% $\delta$ •ú,·,é,±,Æ,ª,Ä,«,é B DirectDrawIfufWfFfNfg,ÆŠÖ~A,Ä,¬,ç,ê,½f f\fbfh, $\delta$ Žg,ª‘O,É A
IDirectDraw2::Initialize f f\fbfh, $\delta$ CEÄ,Ñ o,³,È,¢,Æ A DDERR_NOTINITIALIZEDfGf% [,” ¶!,·,é B.
```

fAfvfŠfP [fVf‡f“, δ •Ä,¶,é‘O,É A **CoUninitialize** ŠÖ ”, δ Žg,Ä,ÄCOM, δ fVfffbfgf_fEf“,µ,È,,Ä,Í,È,ç,È,¢ B
CoUninitialize();

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•Ĭ X,³,ê,½— Ĭæ,¾,—fXfNfŠ [f“,ð X V,·,é,½,ß,É AfNfŠfbfv EfŠfXfg,ðŽg,¤,±,Æ,^a,Å,« ,é B*

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

fNfŠfbfv EfŠfXfg

DirectDrawClipperIfufWfFfNfg,Ĭ,␣—L

fhf%oCfo”ñˆË‘¶,İDirectDrawClipperIfufWfFfNfg

CoCreateInstance,ð—p,¢,½DirectDrawClipperIfufWfFfNfg,Ĭ ì Ñ

fNfŠfbfv EfŠfXfg

DirectDraw,Í ADirectDrawClipperIfufWfFfNfg,ðŽg,Á,ÄfNfŠfbfv EfŠfXfg,ðŠÇ— ,·,é B
fNfŠfbfv EfŠfXfg,Í AfT [ftfFfX,Ì%ŰŽ←Í`æ,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,éNfŠfbfv EfŠfXfg,É,æ,è
ADirectDrawClipperfNfŠfbfv EfŠfXfg,ð X V,·,é B

fNfŠfbfv EfŠfXfg,Í DirectDraw HAL,É,æ,Á,Ä%ŰŽ<%»,³,ê,é,^a A DirectDraw,ÍfNfŠfbfv EfŠfXfg,Ì—
v< ,ÉÇ© ±,²<éÇ,Ìfuf fbfN“]‘—
,É,¾, HAL,ðÇÄ,Ñ o,· B,½,Æ,!,ÌfT [ftfFfX,Ì%E ä,ÌŽlŠpÇ`,^afNfŠfbfsf“fO,³,ê A,»,ÌfT [ftfFfX,ðfvf%oCf}
fŠ EfT [ftfFfX,Éfuf fbfN“]‘—,·,é,æ,²fAfvfŠfP [fVf±f“,^a 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%Ű”¼^a,Ä, ,é B

fI [fo [fÇfC Efn [fhfEfFfA,^afNfŠfbfsf“fO,ðfTf] [fg,µ A,©,Ä“]‘—
æJf%o [EfL],^afAfNfefBfu,Ä,È,Ç ê ±,É,Ì,Y AHAL,ÍfI [fo [fÇfC,ÉfNfŠfbfv EfŠfXfg,ð—~p,·,é B
Ç» Ý,Ìfn [fhfEfFfA,Ì‘â”^a,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,^a A,±
Ì,Æ,«,à,µ•Ä Ç,Æ,È,é,ÆfI [fo [fÇfC,Í—³Çø%»,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,ı,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

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—^,ı,È,¢,İ,Â, ,é B

fhf%oCfo”ñ`Ě‘¶,İDirectDrawClipperfIfufWfFfNfg

, ,ç,ä,éDirectDrawfIfufWfFfNfg,É,à'¼ Ú Š—L,³,ê,È,¢DirectDrawClipperfIfufWfFfNfg,ð ì ¬,·,é,±,Æ,^aÀ,«₁,é B,±
,ê,ç,İDirectDrawClipperfIfufWfFfNfg,Í A•j ”,İDirectDrawfIfufWfFfNfg,^a␣—L,·,é,±,Æ,^a%oÂ”\,À, ,é Bfhf%oCfo”ñ`
Ě‘¶,İDirectDrawClipperfIfufWfFfNfg,Í A V,µ,¢**DirectDrawCreateClipper**
ŠÖ ”,ðŽg,Á,Ä ì ¬,·,é BfAfvfŠfP [fVf‡f“,Í ADirectDrawfIfufWfFfNfg,ð ì ¬,·,é‘O,À,à ADirectDawClipperfIf
ufWfFfNfg,ð ì ¬,·,é,±,Æ,^aÀ,«₁,é B

DirectDrawfIfufWfFfNfg,Í,±,ê,ç,İDirectDrawClipperfIfufWfFfNfg,ð Š—L,µ,È,¢
,½,ß AfAfvfŠfP [fVf‡f“,İfIfufWfFfNfg,^a%oð•ú,³,ê,Ä,àŽ©“®“I,É,Í%oð•ú,³,ê,È,¢ B,Û,½ AfAfvfŠfP [fVf‡f“,^a—
¼Ž‘I,É%oð•ú,µ,È,¢ ê ‡,İDirectDraw,^afAfvfŠfP [fVf‡f“ I—¹Žž,É%oð•ú,·,é B

IDirectDraw2::CreateClipper f f\fbfh,ðŽg,Á,Ä DirectDrawClipperfIfufWfFfNfg,ð ì ¬,·,é,±,Æ,à,À,«₁,é B,±
,ê,ç,İDirectDrawClipperfIfufWfFfNfg,Í A,à,Æ,İDirectDrawfIfufWfFfNfg,^a%oð•ú,³,ê,½,Æ,«Ž©“®“I,É%oð•ú,³,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,±,±
,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,¢
,éCf“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,±•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,»,±,·,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,B'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•İ X,·,é,±,Æ,à,Ä,«é B,±,Ìf f\fbfh,Í A ppfƎfbfg,Ö,İ•İ 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,İ•û—@,Í A"@%oæ,ÉŽg—
p,³,ê,é F,É'İ%oŽ,·,éfpfƎfbfg EfGf"fgfŠ,ð'¼ Ú'İ X,·,é,±,Æ,Ä, ,é B,±,ê,É,Í**DirectDrawPalette::SetEntries**
f f\fbfh,ð^ê%oñĚÄ,Ñ o,¹,İ,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%»»,³,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,ª,Ä,«,é,ª AfVfXfef€ EfpfŒfbfg,É%œç,ð—^,¡,é,ì,Í Afvf%ofCf}
fŠ EfT [ftfFfX,ÉfAf^fbf`,³,ê,½fpfŒfbfg,¾,—,Ä, ,é B’ ^Ó,·,×,« d—v,È“_,Í A DirectDraw fuf fbfN“]‘—
,ª F•İŠ,ðŽÄ s,µ,È,Œ,Æ,Œ,ª,±,Æ,Ä, ,é Bfuf fbfN“]‘—,ì“]‘—Œ³, ,é,Œ,Í“]‘—
æfT [ftfFfX,ÉfAf^fbf`,³,ê,½,·,×,Ä,ìpfŒfbfg,ªŽ<³,ê,é,ì,Ä, ,é B,³,Ç,ÉIDirectDrawSurface2::GetDC
f f\fbfh,Í AfT [ftfFfX,É‘Î,µ,Ä‘Î,ê,½, ,ç,ä,éDirectDrawPalettefIfufWfFfNfg,ð³Ž<,·,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

fpfŒfbfg,İ«—L

fpfŒfbfg,İ•i ”fT [ftFfXŠÔ,Â«—
L,·,é BftfŠfbfsf“fO Ef`fF [f“,ìftf f“fg Efofbftf@,ÆfofbfN Efofbftf@,Â““,¶fpfŒfbfg,³fZfbfg,³,ê A•i ”fe
fNfXf`ff EfT [ftFfXŠÔ,Â«—L,³,ê,é BfAfvfŠfP [fVf‡f“,ª ***IDirectDrawSurface2::SetPalette***
f f\bfh,ðŽg,Á,ÄfpfŒfbfg,ðfT [ftFfX,ÉfAf^fbf`,·,é,Æ AfT [ftFfX,Í,»»,ìfpfŒfbfg,ìŽQ *ÆfJfEf“fg,ðfCf“fNf*
Šf f“fg,·,é BfT [ftFfX,ìŽQ *ÆfJfEf“fg,*0,É,È,é,Æ AfT [ftFfX,ÍfAf^fbf`,³,ê,½fpfŒfbfg,ìŽQ *ÆfJfEf“fg,ðf**
ffNfŠf f“fg,·,é B,³,ç,É AfpfŒfbfg EfCf“f^ [ftFfCfX Ef|fCf“f^,ðNULL,É,µ,Ä
IDirectDrawSurface2::SetPalette,É,æ,èfT [ftFfX,©,çfpfŒfbfg,ðff^fbf`,µ,½ ê ‡ AfT [ftFfX EfpfŒfbfg,ìŽQ
ÆfJfEf“fg,ÍffNfŠf f“fg,³,ê,é B

Note

““,¶fpfŒfbfg A““,¶fT [ftFfX,É‘Î,µ A ***IDirectDrawSurface2::SetPalette***,ª½“x,©‘±
,·,ÄŒÄ,Ñ o,³,ê,½ ê ‡ AfpfŒfbfg,ìŽQ *ÆfJfEf“fg,Íê“x,µ,©fCf“fNfŠf f“fg,³,ê,È,ç B~A‘±*
,·,éŒÄ,Ñ o,µ,Í AfpfŒfbfg,ìŽQ *ÆfJfEf“fg,É%œç,ð—,!,È,ç,ì,Ä, ,é B*

fpfŒfbfg Ef^fCfv

DirectDraw,Í A 1frfbfg (2 fGf“fgfŠ) A2frfbfg (4 fGf“fgfŠ) A 4frfbfg (16 fGf“fgfŠ) A 8frfbfg (256fGf“fgfŠ)
fpfŒfbfg,ðfTf| [fg,·,é BfpfŒfbfg,Í AfsfNfZf< EftfH [f}fbfg,ªêv,·,éfT [ftfFfX,É,¾, ¯fAf^fbf`,³,ê,é,±
,Æ,ª,Â,«,é B,½,Æ,,Í A **DDPCAPS_1BIT** ftf%oO,ðŽw’è,µ,Ä ì ¬,³,ê,½2fGf“fgfŠfpfŒfbfg,Í A
DDPF_PALETTEINDEXED1 ftf%oO,ðŽw’è,µ,Ä ì ¬,³,ê,½1frfbfgfT [ftfFfX,É,¾, ¯fAf^fbf`,³,ê,é,±,Æ,ª,Â,«,é B.

,Ü,½ AfCf“fffbfNfX EfpfŒfbfg,ð ì ¬,·,é,±
,Æ,à,Â,«,é BfCf“fffbfNfX EfpfŒfbfg,ìfGf“fgfŠ,ÍRGBfJf% [,ðŽ ,½,, Af^ [fQfbfg,Æ,È,é‘¼,ìfpfŒfbfg,ì**PAL
ETTEENTRY** \‘ç‘ì,ì”z—
ñ,Ö,ì ® ”fCf“fffbfNfX,ðŽ ,Â BfCf“fffbfNfX EfpfŒfbfg,ìfJf% [Efe [fuf<,Í A2 A4 A16 A256fofCfg,ì
”z—ñ,Â, ,è A,»,ê,¼,ê,ìfofCfg,Í AfpfŒfbfg,ìfCf“fffbfNfX,ð•\,· B

fCf“fffbfNfX EfpfŒfbfg,ð ì ¬,·,é,É,Í A **IDirectDraw2::CreatePalette** f f\fbfh.,ðŒÄ,Ñ o,·,Æ,«,É A
DDPCAPS_8BITENTRIES ftf%oO,ðŽw’è,·,é B,½,Æ,,Í A,Sfrfbfg,ìfCf“fffbfNfX EfpfŒfbfg,ð ì ¬,·,é,Æ,«,Í
DDPCAPS_4BIT |

DDPCAPS_8BITENTRIES,ðŽw’è,·,é B,Ü,½ AfCf“fffbfNfX EfpfŒfbfg,ð ì ¬,·,é,Æ,«,Í **APALETTEENTRY**
 \‘ç‘ì,ì”z—ñf|fCf“f^,æ,è,à AfofCfg”z—ñf|fCf“f^,ð“n,·,·,Ü,ç,ª–],Ü,µ,ç B ,»,ì,Æ,«**IDirectDraw2::CreatePalette**
f f\fbfh,ðŽg,ª ê ‡,Í A **LPPALETTEENTRY**Œ^,ÖfofCfg”z—ñf|fCf“f^,ðfLffXfg,µ,È,¯,ê,î,È,ç,È,ç B

IDirectDrawPalette
fCf“f^ [ftfFfCfX Ef f\fbfh,Í AfffBfXfvfƎfC,“r“¼“I iftf<fXfNfŠ [f“ jf, [fh,Ì ê ± Afñ [fhEfFfA,É”¼
Ú ‘,«,±
Ý,ð s,µ B,µ,©,µfffbfXfvfƎfC Ef, [fh,ª A”ñ”r“¼“I ifEfBf“fhfE jf, [fh,Ì ê ± A”¼,ÌEfBf“fhfEfAfvfŠfP
[fVf±f“,Æ,“”²“® 1,·,é,½,J,É A **IDirectDrawPalette**
fCf“f^ [ftfFfCfXf,fbfbfh,ÍGDl,ÌfpfƎfbfg“€ iŠÖ ”,ðÆÄ,Ì,Ê,¯,é,Î,Ê,ç,È,¢ B,±,ê,É,æ,è A
DirectDraw,ÌEfBf“fhfE EfAfvfŠfP [fVf±f“,Ä,ÌfpfƎfbfg,ÌŽŸ,Ì,æ,µ,Ê-û-@,Äžg,i,é,é,±,Æ,É,È,é B

Windows,ĭ Ā~İpfpƎfbfg EfGf~fgfŠ i0,©,ç9 A246,©,ç255,ÉfCf~fffbfNfX,³,ê,Ä,¢,é),ðİ X,µ,æ,α
,Æ,u,Ä,İ,Ê,c,È,¢ B

```

EfBf“fhfE Ef, [fh,İfpfEfbfg EfGf“fgfŠ Ef^fCfv
EfBf“fhfE Ef, [fh,Å,İDirectDraw::CreatePalette,İEÄ,Ñ 0,µ
EfBf“fhfE Ef, [fh,İDirectDrawPalette::SetEntries,İEÄ,Ñ 0,µ

```

Windows Ā“IfGf“fgfŠ
 ě”Ē“I,É AWindows,Í A0,©,ç9 A246,©,ç255,Ü,Ä,İfGf“fgfŠ,ð—\n
 ñ ifVfXfef€fpfƐfbfg j,m,Ä,,è AfAfvfšFp [fvf‡f“,„»,è,çfGf“fgfŠ,İ F'l,ð•İ X.,é,±,Æ,ð.ÖŽ~,m,Ä,Ɖ,
 ,é B,»,è,ç,İ F,ðŠÜ,p256 FfGf“fgfŠ EfpfƐfbfg,ðGetSystemPaletteEntries Win32
 ŠÖ”,ðCEÄ,N o,m,Ä \ ¬,·,é,±,Æ,İ,Ä,«,é,a AfAfvfšFp [fvf‡f“,„¼ Ü,±,è,ç,İfGf“fgfŠ,ðŽQ Æ.,é•ü,*Æø—
 ‚I,A,,é B,»,è,È,İ,Ü, AfpfƐfbfg Efe [uf,ç,—^,ç,è,½fGf“fgfŠ,a,Ç,İ•—
 „I,ÈfpfƐfbfg EfCf“ffbfNfX,ðf}fbfv.,é,©Žw’,é BPC_EXPLICIT ftf%oF,ðPALETTEENTRY
 \‘c’l,İpeFlagsf f“fo ,ÉSì],m AfGf“fgfŠ,f}fbfv.,é•—
 fpfƐfbfg,İfCf“ffbfNfX,Æ,m,ÄpeRedf f“fo,ðfZfbfg,·,é B,±,²,m,ÄAfAfvfšFp [fvf‡f“,„©,ç’¼ ÚŽQ Æ.,é,±,
 ,Æ,a,Ä,«,é BfAfvfšFp [fvf‡f“,I,Ü,½ A< §“I,ÉWindows,ÉO,Æ255,İfGf“fgfŠ,¾,—ð—\ñ,·,é,æ,²,
 ,É,’³,ı,é,½,ß ASetsystempaletteUse Win32 ŠÖ”,ðCEÄ,N¾,·,±,Æ,à,Ä,« A,±,
 İ ē ±,IPC EXPLICIT.Éİ,·,éPALETTEENTRY \‘c’l,İO,Æ255,İfGf“fgfŠ,¾,—ðŽw’,é,é,x,«,Ä, é B

fAfvfŠfP [fVf‡f“^a AfpfƎfbfg EfAfjf [fVf‡f“Ǝ0%Ê,ð ì -,‘,é,½,ß,É.Í X,Â,«é B
fAfjf [fVf‡f“ EfGf“fgfŠ,Ì,½,ß,Ì PC_RESERVED ftf%oF,ðfAfvfŠfP [fVf‡f“,Žw‘è,µ,½ ê ‡ A
Windows,Í¼fAfvfŠfP [fVf‡f“,“— fpfƎfbfg,ð“— fpfƎfbfg,Éf}fbfv,‘,é,±,Æ,ð,ÖŽ~,‘,é B,±
,ê,É,æ,è AfAfvfŠfP [fVf‡f“,³fGf“fgfŠ,É˘Ü,É,è F,ð Y‘è,µ,½,Æ,«,É A¼,ÌfAfvfŠfP [fVf‡f“,ª,»Ì F,ð–
ß,µ,Ä,µ,Ü,±,±,Æ,ð˘,ç,è,é B
”ñfAfjf [fVf‡f“ EfGf“fgfŠ
fAfvfŠfP [fVf‡f“,ª.Í X,Â,«,È,ƎfGf“fgfŠ,Â,‘é B”ñfAfjf [fVf‡f“ EfGf“fgfŠ,Í A’P,ÉPC_NOCOLLAPSE
ftf%oF,Â–,,ß,ç,è,Â,“,è A,±,Ìftf%oF,Í A¼,ÌŠ,,,è–,Ä Í,Ý•— fpfƎfbfg EfGf“fgfŠ,ðWindows,ªu,«Š,,!,È,Ǝ
,æ,±,É,µ,Ä,Ǝ é B

| <i>fGf“fgfŠ Ef^fCfv</i> | peFlags’l | peRed, peGreen, peBlue’l |
|---|------------------|--|
| Windows 7 246- 255 A,Ü,½,Í0,Æ255,Ö,ìfCf“ff fbfNfX) | PC_EXPLICIT | peRed = index, peGreen = 0, peBlue = 0 |

```
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"É,ÉPALETTEENTRY \c'Ä,Ä"z—
ñ,ÄfAfvfŠfP [fVfzf"ŠJ"ŽÖŽ© g,a f"fefif"fX,·,é,½,ß A Ä \z,Äs—v,Æ Ä,Ç,é,é B•K—v,È,Ç,Ä"z—
ñ,ð•Ä X,µ AfpfÆfbfg X VŽž,É,Ä 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%ÄÄ,Ä—
```

```

\^a,Ä,«,È,¢ B ],Ä,Ä”ñ”r¼“I ifEfBf“fhfE jf, [fh,Ä,ìWindows Ä“lfGf“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 ,»,ê,ç,lfGf“fgfŠ,¾,¬,ð
IDirectDrawPalette::SetEntries,É“n,·,ì,Ä, ,é B,»,ì,æ,¼,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,lfGf“fgfŠ,ðfAfjf [fVf±f“,µ,æ,¼,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,ìfpfƎfbfgfAfjf [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,©,ìfGf“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,ìf|fCf“f^,Ä,Í,È, A
// •İ X,³,ê,½fGf“fgfŠ,¾,¬,Ö,ìf|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 %»,ìfGf“fgfŠ
    16, // fGf“fgfŠ ”
    & (pPaletteEntry[10])); // ff [f^,ª“¾,ç,ê,é,Æ,±,ë

```

IDirectDrawSurface2fCf“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•”^a,ð•\,· B,±,Ìff [f^,ÍffBfXfvfƎfC Efn [fhfEfFfA,^a—
%øð,Å,«,éƎ`Ô,Æ,È,Á,Ä,“,è A,Ü,½,»,Ìfn [fhfEfFfA,ÍDirectDrawSurfaceIfufWfFfNfg,ð Ì ¬,·,é
DirectDrawIfufWfFfNfg,É,æ,Á,Ä•\Ǝ»,³,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',³,è,È,Ǝ,©,¬,è A—
v< ,³,è,½<@”\,Ä Ä „,ÌfpftfH [f]f“fX,^a“¾,ç,è,é è Š,ÉDirectDrawSurfaceIfufWfFfNfg,ð'u, B

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

DirectDrawSurfaceIfufWfFfNfg,Í AWindows,ÌffBfXfvfƎfC EfVfXfef€,Ì¼,ÌfRf“f|
[flf“fg,ð”FŽ~,µ A,Ü,½,»,è,ç,Æ“ ±,³,è,Ä,Ǝ,é B
DirectDrawSurfaceIfufWfFfNfg,^a•\Ǝ»,·,éfT [ftfFfX Ef f,fŠ,ÉGDI ŠÖ ”,^a ‘,«,±,Ý,Ä,«,é,æ,¤,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,^a Afn [fhfEfFfA EfAfNfZf%øfƎ [f^,ÍÊ í Aff
fBfXfvfƎfC Ef f,fŠ ã,É, ,é è ±HDC,ÉÍ,µ,Ä—LƎø,Æ,È,é B

IDirectDrawSurface2,³ V,μ,È,Á,½,©?

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

LPDIRECTDRAW_SURFACE lpSurf;
LPDIRECTDRAW_SURFACE2 lpSurf2;

```
// fT [ftfFfX,ì ì ¬.
memset(&ddsd, 0, sizeof(ddsd));
ddsd.dwSize = sizeof(ddsd);
ddsd.dwFlags = DDSF_CAPS | DDSF_WIDTH | DDSF_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^ [ftfFfCfX,Í A,R,Ä,ì V,μ,¢f f\fbfh i **IDirectDrawSurface2::GetDDInterface** A
IDirectDrawSurface2::PageLock A**IDirectDrawSurface2::PageUnlock** j,ðŽn,ß A **IDirectDrawSurface**
fCf“f^ [ftfFfCfX,Ä'ñ<ÿ,³,ê,é,·,×,Ä,ìf f\fbfh,ðŠÜ,ñ,Ä,¢,é B

fT [ftfFX,ì ì ¬

DirectDrawSurfaceIfufWfFfNfg,Í AfT [ftfFX ifsfNfZf<f f,fŠ j,ð•\E»,·,é BfT [ftfFX,ÍÊ iftfBfXfvfƎfC Ef f,fŠ,É í““,μ,Ä,Ǝ,é,ª AfBfXfvfƎfC Ef f,fŠ,ª Á”i,³,ê,½ ê ‡,â–¾Ž,“L,ÉfŠfNfGfXfg,³,ê,½ ê ‡ AfVfXfefƎ Ef f,fŠ,É,à‘¶ Ý,·,é,±,Æ,ª%Ä”\,Ä, ,é Bfn [fhfEfFfA,ª—v< ,³,ê,½”\—Í,ðfTf [fg,Ä,«„È,Ǝ ê ‡,âfŠf\ [fX,ª¼,ìDirectDrawSurfaceIfufWfFfNfg,É, ,ç,©,¶,ßŠ,,è“—,Ä,ç,ê,Ä,Ǝ,½ ê ‡,Í A **IDirectDraw2::CreateSurface**,ì ^— ,ÍŽ,”s,·,é B

IDirectDraw2::CreateSurface f f\fbfh,ÍÊ í A,Ð,Æ,Ä,ìDirectDrawSurfaceIfufWfFfNfg,ð ì ¬,·,é B **DDSCAPS** \‘‘ì,ìdwCaps f f“fo,ìDDSCAPS_FLIP ftf%oO,ªfZfbfg,³,ê,Ä,Ǝ,é ê ‡ A **IDirectDraw2::CreateSurface** f f\fbfh,Í,Ǝ,Ä,©,ìDirectDrawSurfaceIfufWfFfNfg,ð ì ¬,·,é B,»,ê,ç,Í,Ü,Æ,ß,Ä•j ‡fT [ftfFX,ÆEÄ,Í,ê A,Ü,½’Ç%Á,μ,Ä ì ¬,³,ê,½fT [ftfFX,ÍÄŽ,“IfT [ftfFX,ÆEÄ,Í,ê,é BÄŽ,“IfT [ftfFX,Íff^fbf^,·,é,±,Æ,ª,Ä,«„È,Ǝ B **IDirectDrawSurface2::DeleteAttachedSurface**,ðŽQ Æ,·,é,±,Æ B

,Ü,½ Afvf%oCf}fŠ EfT [ftfFX,æ,è L,ffBfXfvfƎfC Ef f,fŠ EfT [ftfFX,ðŽæ,é,±,Æ,Í,Ä,«„È,Ǝ B
^È%°,Í A—LƎø,ÈfT [ftfFX ì ¬,ìfVfifŠfI—á,Ä, ,é B

fVfifŠfI1

fvf%oCf}fŠ EfT [ftfFX,Í AE» Ýf† [fU,ÉE©,ì,Ä,Ǝ,éfT [ftfFX,Ä, ,é Bfvf%oCf}
fŠ EfT [ftfFX,ð ì ¬,·,é,Æ,«„È,Í A GDI,ªŽ—p,μ,Ä,Ǝ
,éŠù‘¶,ìfT [ftfFX,ÉfAfNfZfX,·,é,½,ß ADirectDrawSurfaceIfufWfFfNfg,ð ì ¬,·,é B,μ,½,ª,Ä,Ä A
DDSURFACEDESC \‘‘ì,ìdwHeight f f“fo,âdwWidth f f“fo,ìl,ðfT [ftfFX,ì¼,ìf^fCfv,·,×,Ä,ª—v< ,μ,Ä,Ǝ
,éŠÔ,Í AE» Ý,ìfT [ftfFX,Æ—,¶ŽŸE³,Ä, ,é,Æ,í,©,Ä,Ä,Ǝ,½,Æ,μ,Ä,à Afvf%oCf}
fŠ EfT [ftfFX,Í,»,ìl,ðŽw^è,μ,Ä,Í,È,ç,È,Ǝ B

,»,²,μ,Äfvf%oCf}fŠ EfT [ftfFX ì ¬,ÉŠÖEW,·,é**DDSURFACEDESC** \‘‘ì(^È%°,ìddsd),ìf f“fo,ª ‘,«„±,Ü,ê,é B

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

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

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

fVfifŠfI2

fuf fbfn[“—fn [fhfEfFfA,ª \ ¬,·,éfrfbfgf}fbfv,ìfLfffbfVf...
,ÉŽg,í,ê,é’P f,ÈfIfXfNfŠ [f“ EfT [ftfFX,ð ì ¬,μ,Ä,Ý,é B fvf%oCf}
fŠ EfT [ftfFXEŠO,ì,·,×,Ä,ìfT [ftfFX,Ä,Í A ,³,Æ• ,ðE^,ß,é•K—
v,ª, ,é B,·,é,ÆfIfXfNfŠ [f“ EfT [ftfFX ì ¬,ÉŠÖEW,·,é **DDSURFACEDESC** \‘‘ì (ddsd below)
,ìf f“fo,ª ‘,«„±,Ü,ê,é B

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

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

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

DirectDraw,Í A,±

,ìfT [ftfFX,ðfBfXfvfƎfC Ef f,fŠ,É ì ¬,·,é B,μ,©,μfffBfXfvfƎfC Ef f,fŠ,É“ü,è,«„ç,È,Ǝ ê ‡,É,Í AfT [ftfFX,ìfVfXfefƎ Ef f,fŠ,É ì ¬,³,ê,é B,±,ì,Æ,«**DDSCAPS** \‘‘ì,ìdwCaps f f“fo
,É,Í AfT [ftfFX,ðfVfXfefƎ Ef f,fŠ,Ä ì ¬,μ,È,^,ê,Í,È,ç,È,Ǝ ê ‡,É,ìDDSCAPS_SYSTEMMEMORY ftf%oO,ð AfBfXfvfƎfC Ef f,fŠ,Ä ì ¬,μ,È,^,ê,Í,È,ç,È,Ǝ ê ‡,É,ìDDSCAPS_VIDEOMEMORY ftf%oO,ð A,»,ê,¼,êŽg—

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

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

fVfifŠfI3

Ä,à—L—p,È•î ‡fT [ftFfX,İ,Đ,Æ,Ä,Í Afvf%oCf}
fŠ EfT [ftFfX,ÆfT [ftFfX EfıfŠfbfsf“fOŠÄ«„ðĈE` ¬,·,é,Đ,Æ,ÄˆÈ ã,İfofbfN Efofbftf@,ðŽ ,Ä,à,İ,Ä, ,é B
•î ‡fT [ftFfX ì ¬,ÆŠÖĈEW,·,é**DDSURFACEDESC** \‘¢‘İ (È%°,İddsd)
,İf f“fo,Í AfofbfN Efofbftf@,ð,Đ,Æ,ÄŽ ,ÄftfŠfbfsf“fo EfT [ftFfX,ðL q,·,é,½,ß,É ‘,«„±,Ü,é,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 [ftFfX,ð—v< ,·,é  
//  
ddsd.ddsCaps.dwCaps = DDSCAPS_COMPLEX | DDSCAPS_FLIP |  
DDSCAPS_PRIMARYSURFACE;  
ddsd.dwBackBufferCount = 1;
```

,±,é,ç,Í Af_fuf<fofbftf@ EfıfŠfbfsf“fOŠÄ«„ð \z,·,é B **IDirectDrawSurface2::Flip**f f\fbfh,ðˆê“xĈÄ,Ñ o,·,±
,Æ,Ä Afvf%oCf}fŠ EfT [ftFfX,İfT [ftFfX Ef f,İfŠ,ÆfofbfN Efofbftf@,Æ,ðĈðŠ·,·,é,İ,Ä, ,é B
DDSURFACEDESC \‘¢‘İ,İ**BackBufferCount**f f“fo,ð2,ÉŽw'è,·,é,İ2ĈÄ,İfofbfN Efofbftf@,ª ì ¬,³,é A
IDirectDrawSurface2::Flip,ðĈÄ,Ñ o,·,²,Æ,ÉfgfŠfvf<fofbftf@ EfıfŠfbfsf“fOŠÄ«„ªñ×Ÿ,³,é,Ä3,Ä,İ%~Ĉ`pf^ [f“,İ
,æ,ª,É Ø,è'Ö,İ,ç,é,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}
 fbfq,ªÜ,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€,ªëŽŽ’âŽ~,ðN,±,•%Ä”\ «,ª, ,é B

ftfŠfbfsf“fO Eft [ftfFX,ÆGDIftfÆ [fE Eft ffg

DirectDraw,İ,·,×,Ä,İft [ftfFX,“ftfŠfbfsf“fO Eft [ftfFX,Æ,μ,Ä—~p,Ä,«é B
ftfŠfbfsf“fO Eft [ftfFX,İ Aftf f“fg Efofbftf@,ÆfofbfN Efofbftf@ŠÖ,ÄfXf fbfv,³,ê,éf f,š,İ”CÖ,İ·”·,
Ä,é B ftfŠfbfsf“fO Eft [ftfFX,Æ,μ,ÄDirectDrawft [ftfFX,ð \z,·,é,±,Æ,İ A]—
^,İÆÄ,ç,ê,½fy [fWftfŠfbfsf“fO,İ 1,·û,É”ä,×½,İ—“_,·,é B

fAfvfŠfP [fVf±f“,“ftfŠfbfsf“fO“É İ,İ—v· ,ÉIDirectDrawSurface2::Flip f\fbfh,ðŽg,μ
,Æ,« AftfŠfbfsf“fO,³,ê,éDirectDrawSurfacefIfufWfFfNfg,ÆŠÖ”A,Ä, ,ç,ê,½fT [ftfFX Ef f,š—
İæ,İ Ø,è,Ö,İ,ç,ê,é BftfŠfbfsf“fO,³,ê,éDirectDrawSurfacefIfufWfFfNfg,ÉfAf^fbf“,³,ê,½fT [ftfFX,É,İ%œç,μ,È,Ç
B,½,Æ,İ,İf_fuf<fobftf@,İ óÖ,Ä,İ AfobfN Efofbftf@,É·%œ,·,éfAfvfŠfP [fVf±f“,İ,Ä,È,É—“IDirectDrawSur
facefIfufWfFfNfg,ðŽg—p,·,é B
IDirectDrawSurface2::Flip,“fŠfNfGfXfg,³,ê,½,Æ,« AfIfufWfFfNfg%“,İft [ftfFX Ef f,š,İ A’P,Éftf f“fg E
fobftf@,Ö Ø,è,Ö,İ,ç,ê,é B

ftf f“fg Efofbftf@,“%ÄŽ,Ä, ,ê,İ A,»,ê,İvf%ofCf}fŠ Eft [ftfFX,Ä, ,é,©, ,é,Ç
,İÆ” Y%ÄŽ,İfİ [fo [fEfC,Ä, ,é,½,ß AfobfN Efofbftf@,ðİ Ü,Æ,·,éIDirectDrawSurface2::Lock,Ü,½,İIDirect
DrawSurface2::Bltf f\fbfh,ð”A±,μ,ÄÆÄ,Ñ o,·,Æ ÄŽY,İ ,’¼·ûEü,İfŠftfEfbfVf...,“N,±,é,Ü,Ä,İŠÖŽ,”s,μ A
DDERR_WASSTILLDRAWING,ðÖ,· B,±
,ê,İ Aftf f“fg Efofbftf@,İÈ”O,İf f,š,“ AfobfN Efofbftf@,É,à,μfAf^fbf“,³,ê,Ä,Ç,È,Ç
,É,à,©,©,İ,ç,·, A,È,“fn [fhEfFA,É,æ,è— fffBfXfvfEfC,É·%œ,³,ê,±,·,é,½,ß,ÉN,±,é B,±
,İ óÖ,İ ÄŽY,İ ,’¼·ûEü,İfŠftfEfbfVf...’t,É Ä—Ä,·,é B—
fffBfXfvfEfC,ð X V,·,éfn [fhEfFA,“ AfŠftfEfbfVf...
,²,Æ,ÉffBfXfvfEfC Ef f,š,İ”z’u,ð“Ç,Y ž,Ý’¼,μ,Ä,Ç,é,©,ç,Ä, ,é B

,±,İ,æ,μ,È— “İ,ÈÈ”ö,©,ç A%ÄŽ<ft [ftfFX ä,İDirectDrawSurface2::Flip f f\fbfhÆÄ,Ñ o,μ,İ”ñ—ŠúRf}
f“fh,Æ,È,é BfQ [fE,ð İ,é,Æ,«,İ Af f\fbfh,“ÆÄ,İ,ê,½Æä,ÄfQ [fE,İ,·,×,Ä,İ·s%ÄŽ<—v’f,ðŽÄ s,·,×,«Ä, ,é B,½,
Æ,İ,İ A“ü—İ,äfİ [ftfBfİ AfQ [fE,İfvfEfC A,»,μ,ÄfVfXfefE Ef f,š·%œæ“É İ,Š@—
¹,μ,Ä,©,ç A%ÄŽ<fobfN Efofbftf@,Ö,İfAfNfZfXŽæ“¼,ð—v,·,é·%œf^fXfN,ð,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 [fEfC Eft [ftfFX,İ İ Ñ,ðŽŽ,Ý,é Bfn [fhEfFA,“fl [fo [fEfC,ðftf]
[fg,μ,Ä,Ç,È,Ä Afy [fW,ðftfŠfbfsf“fO,·,éfvf%ofCf}fŠ Eft [ftfFX,ð İ Ñ,·,é,±,Æ,“Ä,«é B
fT [ftfFX,“fvf%ofCf}fŠ,É,È,è,æ,μ,Ä,Ç,é,Æ,«ÉGDI,“»,İft [ftfFX,É,Ä,Ç,Ä İñ,ðŽ ,Ä,Ä,Ç
,È,—,è,İ AGDI,“ ‘,«±,ñ,Ä,Ç,éfvf%ofCf}fŠ Eft [ftfFX,İ† g,ð%ÄŽ<,É,È,è,æ,μ,Ä,Ç
,éfofbftf@,Öfuf fbfN“]—,·,é,±,Æ,“Ä,«é Bfuf fbfN“]—,İ”ñ—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,İftfCYf,ÆfXfNfŠ [f“%ð’œ“x,ÉÈ”¶,·,éfuf fbfN“]—
,İfof“fh· ,Æ,ð,©,È,è Ä”İ,·,é BftfE [fEfE [fg,²0fps,ð%œñ,ç,È,Ç,©,—,è,İ AGDI,“ ³,μ,“® İ,μ,Ä,Ç,é,æ,μ
,ÉÈ©,İ,é,Ä, ,è,μ B

DirectDrawfIfufWfFfNfg,ðfCf“fXf^f“fX%“,·,éO,É AGDI,İ ÄŽ© g,İ·Ž’,ÉffBfXfvfEfC Ef f,š,ð,·,Ä,ÉŽg,Ä,
Ä,Ç,é Bfvf%ofCf}fŠ Eft [ftfFX,ðfCf“fXf^f“fX%“,·,é,½,ß,É
DirectDraw,ðÆÄ,Ñ o,·,Æ,« A,»,İft [ftfFX,İf f,šfAfhfEfX,İ AGDI,“Æ» ÝŽg,Ä,Ä,Ç,é,à,İ,Æ—,¶,Ä, ,é B

fobfN Efofbftf@,Ä·, ±fT [ftfFX,ð İ Ñ,·,é è ±,İ AGDI,İ A,Ü,·,fvf%ofCf}
fŠ Eft [ftfFX,İ,½,ß,İffBfXfvfEfC Ef f,š,ðŽv,· BGDI,İDirectDraw,æ,èÆÄ,Ç
,½,ß ADirectDraw,İ“® İ,ð’m,é,±
,Æ,“Ä,«É,Ç B,μ,½,“Ä,ÄGDI,İ A,½,Æ,İftfŠfbfsf“fO,³,ê·s%ÄŽ<fobfN Efofbftf@,É,È,Ä,½,Æ,μ,Ä,à A,±
,İft [ftfFX,ðÉ İ,μ±,—,é B

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

’¼,İfVfifšfİ,Ä,İ AGDI,İfİfšfWfifç,Èft [ftfFX,İ İñ,μ,©Ž ,½,·, AÆ» Ýfvf%ofCf}
fŠ Eft [ftfFX,È,İ,©fobfN Efofbftf@,È,İ,©,Æ,Ç,μ İñ,ðŽ ,½,È,Ç,±,Æ,ðŽv,Ç o,μ,Ä,Ü,μ,Ç 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 Efofbftf@,ð,Ö,½,ÄŽ ,Äfvf%ofCf}fŠ Eft [ftfFX,ð İ Ñ,·,é B
- 2 %Šúfvf%ofCf}fŠ Eft [ftfFX(GDIft [ftfFX),ð†ŠÖfobfN Efofbftf@,Éfuf fbfN“]—,·,é B
- 3 GDI,ð”O,İ è Š,É”u,Ç,Ä %ŠúRfs [,ð%ÄŽ<%œ“,·,é,½,ß AlpDDSurfaceTargetOverride
fpf%of [f^,ðNULL,ÉfZfbfg,μ,ÄfT [ftfFX,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,À, ,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::Restoref 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,Ä,Í
Afn [fhfEfFfA,İfuf fbfn“]‘—”\—İ,ð, ,ç,í,µ A ,à,ª,Đ,Æ,Ä,Í Afn [fhfEfFfA,İfI [fo [fÆfC”\—İ,ð, ,ç,í,· B

fJf% [EfL [fCf“fO

DirectDraw,Ā,Í Afuf fbfn“‘—,ÆfI [fo [fĖfC,ĭ,½,ß,É“]‘—Ė³ E“‘— æ ufJf% [EfL [fCf“fO v,³fTf|
[fg,³,ê,Ā,Ĉ,é B “]‘—Ė³ E“‘— æ,ĭ,Ĉ,ċ,ĉ,É,à A,±,ĭfJf% [EfL [A,Û,½,Í Fˆæ,ðŽw’è,·,é,±,Æ,ª,Ā,«,é B

“]‘—Ė³fJf% [EfL [fCf“fO,Í Afuf fbfn“]‘—ŽŽ,ÉfRfs [,³,ê,È,ĉ F,Û,½,Í Fˆæ AfI [fo [fĖfCŽŽ,É“‘—
æ,Ā*s%oĀŽĸ,ĭ F,Û,½,Í Fˆæ,ðŽw’è,·,é B “]‘— æfJf% [EfL [fCf“fO,Í Afuf fbfn“]‘—
ŽŽ,É’u,«Š·,ĭ,ĉ,ê,é F,Û,½,Í Fˆæ AfI [fo [fĖfCŽŽ,É“]‘— æ,ð•ĉ,▯ F,Û,½,Í Fˆæ,ðŽw’è,·,é B “]‘—
Ė³fJf% [EfL [,ĭfT [ftfFX,©,ĉ%½,““Ĉ,Ý,Æ,ê%½,““Ĉ,Ý,Æ,ê,È,ĉ,©Žw’è,·,é B “]‘—
æfJf% [EfL [,ĭ A“]‘— æfT [ftfFX,Ā ‘,ĉ,½,è•ĉ,Ā,½,è,Ā,«,é,à,ĭ,Æ,Ā,«,È,ĉ,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

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

fJf% [EfL [,ĭ AfT [ftfFX,ĭfsfNfZf< EftfH [f}fbfg,ĀŽw’è,³,ê,é BfT [ftfFX,ªpfĖfbfg%»»,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,ĉ,é ê ± AYUV fJf% [EfL [,ĭ A
DDCOLORKEY ‘ĉ’ĭ.

,ĭdwColorSpaceLowValue f“fo,ÆdwColorSpaceHighValue f“fo‘o‘û,ĭ%oˆÊ3fofCfg,ĀŽw’è,³,ê,é B Ā%oˆÊfofCfg,
ĭVff [f^ A,Q“Ö–Û,ĭff [f^ A Ā ãˆÊfofCfg,ĭYff [f^,Ā, ,é B **IDirectDrawSurface2::SetColorKey** f f\fbfh,ĭ
dwFlags fpf%of [f^,ĭ AfJf% [EfL [,ªfI [fo [fĖfC,Û,½,ĭfuf fbfn“]‘—,ĭ,Ĉ,ċ,ĉ,ĀŽg,ĭ,ê,é,© A“]‘—
Ė³,È,ĭ,©“]‘— æ,È,ĭ,©,ðŽw’è,·,é BˆÈ%o,ĭ—LĖø,ÈfJf% [EfL [,ĭ—á,Ā, ,é B

8frfbfgpfĖfbfg%»f, [fh

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

24frfbfgfgDf< [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,ĭŠÖ
// U,Û,½,Í v,ĭ50,Æ55,ĭŠÖ,Ā“§%oß,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,ł,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,ł—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,ł“—,¶—
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 AŠİ“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,ì,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%oCf}fŠ EfT [ftFfX,ÆfpfŒfbfg,ð<□—L,µ,È,Œ Bfvf%oCf}
fŠ EfT [ftFfX,ì,à,ì,Æ`Ü,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%oCf}
fŠ EfT [ftFfX,ª16frfbfg EfJf%o [f, [fh,ì,Æ,«fpfŒfbfg%o»fIf_tFfXfNfŠ [f“ EfT [ftFfX,ð ì ¬,·,é ê ± Af
uf fbfn“]—fn [fhfEfFfA,Í€ ì†,ÉfpfŒfbfg%o»fT [ftFfX,ðfgfDf< [fJf%o [,Ö•İŠ,·,é,±
,Æ,ª,Ä,«é,à,ì,Æ%o¼`è,·,é B

DirectDraw,Ä,Í A256 F,ð•Ž',Ä,«é•W €8frfbfg,ìfpfŒfbfg%o»fT [ftFfX,Æ A,»,ê,¼,ê16 F,ð•Ž',Ä,«é,QŽi—
p,ì4frfbfgfpfŒfbfg%o»fT [ftFfX,Æ,ð ì ¬,·,é,±
,Æ,ª,Ä,«é B4frfbfgfpfŒfbfg%o»fT [ftFfX,Ì`æ`è,ìf^Cfv,ÍfgfDf< [fJf%o [,ìfJf%o [Efe [fuf<,ÄfCf“fffbfNfX
,³,ê A`æ“ñ,ìf^Cfv,Ífvf%oCf}fŠ EfT [ftFfX,ìfCf“fffbfNfX EfJf%o [Efe [fuf<,ÉfCf“fffbfNfX,³,ê,é B,±
,Ì`æ“ñ,ìf^Cfv,Í A`æ`è,ìf^Cfv,Ì”¼•ª,ìff [f^—Ê,Ä İ,Y AfXfvf%oCf,ðŠi”[,·,é,½,ß,ÉŠÖ Ü“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%oÄ`
,Ä,È,¬,ê,Ì,È,ç,È,Œ B,µ,½,ª,Ä,Ä AfpfŒfbfg%o»fT [ftFfX,©,çfpfŒfbfg%o»fT [ftFfX,Öfuf fbfn“]—‘€ ì,ª s,í,
ê,é,Æ A,»,ìfpfŒfbfg,Í—
³Ž<,³,ê,é BfpfŒfbfg,ìffR [fh,Í AfgfDf< [fJf%o [EfT [ftFfX,ì ê ±,Æ A4frfbfgfpfŒfbfg,ª8frfbfgfpfŒfbf
g 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%o»fT [ftFfX,ìf%oXf^€ ì,Í—³Ž<,³,ê,é B,Ü,½fAf^fbf`,³,ê,½fpfŒfbfg,ì•İ X^€ ì,Í,«í,ß,Ä ,¬,Ä, ,é B,±
,ê,çfpfŒfbfg%o»,³,ê,½fT [ftFfX,ì,R,Ä,·,×,Ä,Í A3DfAfNfZf%oŒ [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 Ü,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<@”\,ð**DDCAPS**
‘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,©,çftfBfXfvfŒfC 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 **AdwCaps**f f“fo,É‘Î%ž,·,é B,½,¾,µ AfVfXfef€ Ef f,fŠ,©,çftfBfXfvfŒfCf f,fŠ,Ö,Ìfuf
fbfN“]‘—,ÉŠÖŒW,·,éftfBfXfvfŒfC Efhf%oCfo,Ì”\—Í,ð<L q,·,é ê ‡,ð æ, B “—
l,É **AdwSVBCKeyCaps**f f“fo,Í
dwCKeyCapsf f“fo,É‘Î%ž,µ **AdwSVBFXCaps**f f“fo,Í**dwFXCaps**f f“fo,É‘Î%ž,·,é B **dwSVBRops**f 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•ĭ 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,“ V,µ,,É,Ä,½,©?
v,Æ uIDirectDrawSurface2,Ä%o½,“ 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•ĭ X,.,é•K—v,“ ,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•ĭ X,µ,È,¯,ê,ĭ,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,“ ,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,^a, ,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,İ Cf“fXf^f“fX,đ ì ¬,·,é,É,Í A DDEX1fvf fOf%o€€,İdoInit ŠÖ ”“à,ÂŽ!,³,ê,é,æ,□
,É A DirectDrawCreate ŠÖ ”,đŽg,□ BDirectDrawCreate,Í3,Â,İpf%of [f^,đ•K—v,Æ,·,é B
‘æ~ê,İpf%of [f^,É,Í AfffBfXfvfƎfC EfffofCfX,đ•Ǝ»,·,éOf [fof< Eftfj [fNŽ~•ÊŽq (GUID)
,đ,Æ,é BGUID,Í,Û,Æ,ñ,Ç,İ ê ±NULL,ÉfZfbfg,³,ê,é,^a A,±,ê,İDirectDraw,^afVfXfef€
,İffftfHf<fg,İffBfXfvfƎfC EfffofCfX,đŽg,□,±,Æ,đ~Ó—i,μ,Ä,Ǝ,é B
‘æ~ñ,İpf%of [f^,Í A ì ¬,³,ê,^½DirectDrawIfufWfFfNfg,İf fP [fVf±f“,đŽ~•Ê,·,éf|
fCf“f^,İfAfhfƎfX,đŽ ,Â B‘æŽO,İpf%of [f^,Í,Â,Ê,ÉNULL,ÉfZfbfg,³,ê,Ä,Ǝ,é,^a 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 ^— ,^a ¬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,ðİ X,·,é‘O,É,Í A Ä‘áŒÄIDirectDraw2::SetCooperativeLevel
f f\fbfh,İfpf%of [f^dwFlags ,É, ,éDDSCL_EXCLUSIVE,Æ DDSCL_FULLSCREEN
ftf%ofO,ðŽw’è,µ,È,¯,ê,İ,È,ç,È,¢ B,±
,ê,È,æ,è AfAfvfŠfP [fVf‡f“,“ffBfXfvfŒfC EfffofCfX,ðŠ@‘S,ÉfRf“fgf [f<,Ä,«,é,æ,□
,É,È,è A¼AfAfvfŠfP [fVf‡f“,İffBfXfvfŒfC EfffofCfX,ð□—L,Ä,«,È,.,É,é B%Ä,İ,Ä DDSCL_FULLSCREEN
ftf%ofO,İ AfAfvfŠfP [fVf‡f“,ð”r¼“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 ‘,«,±,ð,±,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”r¼“If, [fh,Ä“@,-
fAfvfŠfP [fVf‡f“,É,¯,¢,ÄffXfNfgfbfv,ðŒ©,é,É,İ ADDEX1,ðfXf^ [fg,³,¹ A ALT + TAB,ð%Ÿ,¹,İ,æ,¢ j B
```

ŽŸ,İ—á,Ä,İ IDirectDraw2::SetCooperativeLevel ,İŽg,¢•û,ð à¾,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)
{
    // ”r¼“If, [fh,İ ¬Œ÷,µ,½.
}
else
{
    // ”r¼“If, [fh,İŽ,”s,µ,½
    // ,µ,©,µ AfAfvfŠfP [fVf‡f“,İ,Ü,¾“@,¢,Ä,¢,é
}
```

IDirectDraw2::SetCooperativeLevel,^a

DD_OK,ð•Ö,³,È,¢ ê ‡,Ä,à AfAfvfŠfP [fVf‡f“,İ‘± s,Ä,«,é B,µ,©,µ AfAfvfŠfP [fVf‡f“,”r¼“If, [fh,É,È,¯,ê
,İ A—v< ,³,ê,éfpftfH [f]f“fX,ðŽÄŒ»,Ä,«,È,¢%Ä”\ «,·,é B,±,İ ê ‡ A‘± s,·,é,©,Ç,□
,©f† [fU,ÉŒ~è,³,¹,éf fbfZ [fW,ð•Ž!,µ,½,Ü,□,ª—Ç,¢,¾,ë,□ B

IDirectDraw2::SetCooperativeLevel,ðŽg,□ ê ‡ AfAfvfŠfP [fVf‡f“,“Ÿ İ I—¹,µ,½,±
,Æ,ðWindows,É’m,ç,¹,é,æ,²fEfBf“fhfE Efnf“fhf<(HWNĐ),ð“n,³,È,¯,ê,İ,È,ç,È,¢ B,½,Æ,İ,İ A^ê”Ê•ŮŒè
(GP)^á”½,·,N,±,èGDI,“fofbfN Efofbftf@,ÉftfŠfbfsf“fO,³,ê,Ä,¢,é,Æ Af† [fU,İ Windows,İfXfNfŠ [f“,ðŽæ,è—ß,·,±
,Æ,ª,Ä,«,È,¢ B,±,ê,ð—h,®,½,ß DirectDraw,İ A,»,İfEfBf“fhfE,É‘—
,ç,ê,½f fbfZ [fW,ðfgf%ofbfv,·,éfofbfNfOf%ofEf“fh Efvf fZfX,ð’ñ<Ÿ,µ,Ä,¢
,é Bfgf%ofbfv,µ,½f fbfZ [fW,ðŽg,¢ A DirectDraw,İfAfvfŠfP [fVf‡f“,ª,¢,Ä I—¹,µ,½,©Œ~è,·,é B,±,İ<@”
,É,İ §ŒÄ,ª,¢,·,Ä,©, ,é B,Ü,·,fAfvfŠfP [fVf‡f“,İ,½,ß,İf fbfZ [fW,ðŽæ“¾,µ,Ä,¢
,éEfBf“fhfE Efnf“fhf<ðŽw’è,µ,È,¯,ê,İ,È,ç,È,¢ B ,Ä,Ü,è AfEfBf“fhfE,ð,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•,¢,ª ¶,¶,½,è A ALT+TAB,ð%Ÿ,µ,Ä,àfŒXf|f“fX,ª,È,©,Ä,½,è,æ,¢,Ä,½—â‘è,É~ ,□,±,Æ,ª, ,é B

Step 3: $\text{ffBfXfvf}\mathbb{C}fC$ Ef, [fh,İ•İ X

$fAfvf\check{S}fP$ [fVf‡f“, Ì U,é•,¢,ðfZfbfg,µ,½€ã,Å A $\text{IDirectDraw2::SetDisplayMode}$

f f\fbfh,ðŽg,¢ A $\text{ffBfXfvf}\mathbb{C}fC$,Ì%øð‘œ“x,ð•İ X,·,é,±,Æ,ª,Å,«,é BŽŸ,İ—á,Å,Í A $\text{ffBfXfvf}\mathbb{C}fC$ Ef, [fh,ð 640 ‘480’8 bpp,ÉfZfbfg,·,é•û—@,ðŽ,µ,Å,¢,é B

HRESULT ddrval;

LPDIRECTDRAW lpDD; // ·,·,Å,É ì ¬,³,ê,Å,¢,é

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

if(ddrval == DD_OK)

{

// $\text{ffBfXfvf}\mathbb{C}fC$ Ef, [fh,İ•İ X,Í ¬€÷,µ,½

}

else

{

// $\text{ffBfXfvf}\mathbb{C}fC$ Ef, [fh,İ•İ X,Å,«,È,©,Á,½

// f, [fh,ªfTf| [fg,³,ê,Å,¢,È,¢,© A‘¼,İfAfvfŠfP [fVf‡f“,ª

// ”r‘¼“If, [fh,É,È,Á,Å,¢,é

}

$\text{ffBfXfvf}\mathbb{C}fC$ Ef, [fh,ðfZfbfg,·,é,É,½,è Af† [fU,İfn [fhEfFfA,ª ,%øð‘œ“x,ðfTf| [fg,µ,Å,¢,È,¢,È,¢

,Æ,«,É,İ $\text{ffBfXfvf}\mathbb{C}fC$ EfAf_fvf^,İ‘ã‘½ ”,ªfTf| [fg,µ,Å,¢,é•W €f, [fh,ÉfAfvfŠfP [fVf‡f“,ªœ<A,Å,«,é,±

,Æ,ð•Û Ø,µ,Å,·,©,È,¬,ê,İ,È,ç,È,¢ B,½,Æ,!,İ A640‘480’8,Æ,¢,¤•W €,İfofbfNfAfbfv%øð‘œ“x,ðfTf| [fg,µ,Å,¢

,é,·,×,Å,İfVfXfef€,Å“@,,æ,¢fAfvfŠfP [fVf‡f“,ð Ÿ€v,·,é,×,«,Å, ,é (—

v< ·,·,é%øð‘œ“x,É $\text{ffBfXfvf}\mathbb{C}fC$ EfAf_fvf^,ðfZfbfg,Å,«,È,©,Á,½ ê ‡ A $\text{IDirectDraw::SetDisplayMode}$,ÍfGf%o [’

İDDERR_INVALIDMODE,ð•Û,· B,µ,½,ª,Å,Å A $\text{ffBfXfvf}\mathbb{C}fC$ Ef, [fh,ðfZfbfg,µ,æ,¤

,Æ,·,é‘O,É Af† [fU,İ $\text{ffBfXfvf}\mathbb{C}fC$ EfAf_fvf^,İ“Á‘è,Å,«,é $\text{IDirectDraw2::EnumDisplayModes}$ f\fbfh,ðŽg,¤

,×,«,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“,ĂŽg—
p,·,éT [ftfFX,đ ì ¬,μ,Ě,̄,ê,Ĭ,Ě,ç,Ě,¢ BDDEX1,Ĭ—
á,Ă,Ĭ A”r¼“I ift<fXfNfŠ [f“ jf, [fh,ÉfZfbfg,·,é,½,ßIDirectDraw2::SetCooperativeLevel f f\fbfh,đŽg,Ă,Ă,¢
,é,Ĭ,Ă AfT [ftfFXŠÖ,ĂftfŠfbfsf“fO,·,éT [ftfFX,đ ì ¬,·,é,±
,Æ,ª,Ă,«,é Bf, [fh,δDDSC_L_NORMAL,ÉfZfbfg,·,é,½,ßIDirectDraw2::SetCooperativeLevel,đŽg,Ă,½ ê ± A
fT [ftfFXŠÖ,Ăuf fbfN“]—
,·,éT [ftfFX,μ,© ì ¬,Ă,«,Ě,¢ BftfŠfbfsf“fO EfT [ftfFX,đ ì ¬,·,é,Ě,Ĭ AŽŸ,Ĭ,æ,µ,ÈfXfefbfv,Ă s,µ B
fT [ftfFX—v< ,Ĭ’è<
fT [ftfFX ì ¬
```

$\text{fT [ftfFX—v< ,Ĭ’è<}$

```
ftfŠfbfsf“fO EfT [ftfFX,đ ì ¬,·,é Ă %,ĬfXfefbfv,Ĭ A DDSURFACEDESC \‘c‘Ĭ,ĬfT [ftfFX—
v< ,đ’è<,·,é,±,Æ,Ă, ,é BŽŸ,Ĭ—á,Ă,Ĭ AfTfŠfbfsf“fO EfT [ftfFX,đ ì ¬,·,é,Ĭ,Ě•K—
v,Ě A \‘c‘Ĭ’è<,Æftf%oO,đŽ,μ,Ă,¢,é B
```

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

ddsd.dwBackBufferCount = 1;
```

```
,±,Ĭ—á,Ă,Ĭ A dwSizef f“fo,Ě DDSURFACEDESC \‘c‘Ĭ,ĬfTfCY,dfZfbfg,·,é B ,±,Ě,ĬDirectDraw
f f\fbfhĚĂ,Ň o,μ,Ă—LĚø,Ă,Ě,¢f f“foGf%o [,ª•Ö,Ă,Ă,±,Ě,¢,æ,µ,Ě,·,é,½,ß,Ă, ,é i dwSizef f“fo,Ĭ A
DDSURFACEDESC \‘c‘Ĭ,Ĭ «—^,ĬŠg’Ě,Ĭ,½,ß,Ě—p^Ó,³,ê,½,à,Ĭ,Ă, ,é j B
```

```
dwFlagsf f“fo,Ĭ A DDSURFACEDESC \‘c‘Ĭ,Ĭ,Ç,Ĭf f“fo,Ě—LĚø,Ě ĩ•ª•Ö,³,ê,é,©Ě’è,·,é BDDEX1,Ĭ—
á,Ă,Ĭ AdwFlags,dfZfbfg,·,é,±,Æ,Ă ADDSCAPS \‘c‘Ĭ,đŽg,¢(DDSD_CAPS)fofbfN Efofbftf@
,đ ì ¬,·,é(DDSD_BACKBUFFERCOUNT),±,Æ,đŽw’è,μ,Ă,¢,é B
```

```
dwCapsf f“fo,Ĭ A DDSCAPS \‘c‘Ĭ,ĂŽg,Ĭ,Ě,éftf%oO,đŽ,μ,Ă,¢,é B,±,Ĭ ê ±,Ĭ Afvf%oCf}
fŠ EfT [ftfFX(DDSCAPS_PRIMARYSURFACE),ÆftfŠfbfsf“fO EfT [ftfFX
(DDSCAPS_FLIP) A; Ĭ±T [ftfFX (DDSCAPS_COMPLEX),đŽw’è,μ,Ă,¢,é B
```

```
ĂĚă,Ě A,±,Ĭ—á,Ă,ĬfofbfN Efofbftf@,đ,Đ,Æ,ĂŽw’è,μ,Ă,¢
,é BfofbfN Efofbftf@,Ĭ A”wĚi,ÆfXfvf%oCf,ªŽĂ Ū,Ě ‘,«,±,Ū,Ě,é ê Š,Ă, ,é B,»,μ,ĂfofbfN Efofbftf@,Ĭ
Afvf%oCf}fŠ EfT [ftfFX,ÉftfŠfbfsf“fO,³,Ě,é B DDEX1,Ĭ—á,Ă,ĬfofbfN Efofbftf@,Ĭ ”,Ĭ1,ÉfZfbfg,³,Ě,Ă,¢
,é,ª A fffBfXfvfC Ef f,fŠ,ª<,·,©,¬,è,¢,,Ă,Ă,à ì ¬,·,é,±
,Æ,ª,Ă,«,é BfofbfN Efofbftf@,ĚŠÖ,·,é,³,ç,Ě Ū,μ,¢ ĩ•Ň,Ĭ A ufqfŠfv< Efofbftf@fŠf“fO v,đŽQ Ě,·,é,±
,Æ B.
```

```
fT [ftfFX Ef f,fŠ,ĬffBfXfvfC Ef f,fŠ,Ě,àfVfXfef€ Ef f,fŠ,Ě,à’u,,±,Æ,ª,Ă,«,é B
DirectDraw,Ĭ AfAvfŠfP [fVf±f“,ªftfBfXfvfC Ef f,fŠŠÖ,Ă“@,,Æ,«,ĬfVfXfef€ Ef f,fŠ,đŽg,µ
(½,Æ,,Ĭ A1MB,ĬRAMf f,fŠ,μ,©,Ě,¢ffBfXfvfC EfAf_fvf^ ā,Ă A,Đ,Æ,Ă’Ě ā,ĬfofbfN Efofbftf@,đŽw’è,
·,é,æ,µ,Ě ê ±,Ă, ,é) B DDSCAPS
\‘c‘Ĭ,ĬdwCapsf f“fo,đDDSCAPS_SYSTEMMEMORY,Ū,½,ĬDDSCAPS_VIDEOMEMORY,ĚŽw’è,·,é,±
,Æ,Ě,æ,Ă,Ă AfVfXfef€ Ef f,fŠ,¾,¬,đŽg,µ,©ffBfXfvfC Ef f,fŠ,¾,¬,đŽg,µ
,©,đŽw’è,Ă,«,é iDDSCAPS_VIDEOMEMORY,đŽw’è,μ,½,Ě,ăŠÖ,Ĭ,ç,,fT [ftfFX ì ¬,Ě [ª,Ěf f,fŠ,đ—~
p,Ă,«,Ě,¢ ê ±,Ĭ A IDirectDraw2::CreateSurface,ª DDERR_OUTOFVIDEOMEMORYfGf%o [,ª•Ö,é j B
```

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

```
DDSURFACEDESC \‘c‘Ĭ,Ĭf f“fo,đ—,,ß,½,ç A DirectDrawCreate ,ª ì ¬,μ,½DirectDrawIfufWfFfNfg,Ö,ĬfCf“f^
lpDD,ĂDDSURFACEDESC \‘c‘Ĭ,Ě,đŽg,Ă,Ă A IDirectDraw2::CreateSurface f f\fbfh,đĚĂ,Ň o,·,±
,Æ,ª,Ă,«,é BŽŸ,Ě—á,đŽ,· B
```

```
ddrval = lpDD->CreateSurface(&ddsd, &lpDDPrimary, NULL);
if(ddrval == DD_OK)
{
    // V,μ,¢fT [ftfFX,đŽw,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,·vf%ofCf}
fŠ EfT [ftFfX,Ö,ìf|fCf“f^,Æ,È,é B

vf%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,ìvf%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 ADDEX1fTf“fvf<,Ä,Í A•W €,İ Windows GDI ŠÖ ”,ðŽg,¢fvf%oCf}fŠ Eft [ftFfX,ÆfobfN Efofbftf@ Eft [ftFfX ä,Ä,¢,-,Ä,©,İfLfXfg,ðfÆf“f_Šf“fO,µ,Ä,¢,é BŽŸ,İ—á,ÄŽ,‚,É,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“fefLfXfg,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“fefLfXfg,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,‚,İê” 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 ‘,«,±,Ÿ‘†,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,½,Æã AfTf“fvf<,Ä,Í A”wEi F,ðfZfbfg,‚,é,½,ß,É•W €,İWindows GDI ŠÖ ”
SetBkColor,ðŽg,¢ A”wEi,É‘u,-
fefLfXfg,İ F,ð‘I,Ö,½,ß,ÉSetTextColor,ð AfT [ftFfX ä,ÉfefLfXfg,Æ”wEi F,ð ‘,‚,½,ß,ÉTextOut,ðŽg,Ä,Ä,¢
,é B`

`ftf“fvf<,Ä,Í Afobfbftf@,ÉfefLfXfg,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,Ÿ,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,ÄfŠfbsf“fO,Ä,«,È,¢ B`

`ê”Ê,É A ‘,« ž,Ÿ,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 ”“ä,Äfvf%oCf}fŠfobftf@,É ‘,«,±,Ÿ,ð,‚,é B,±,İfˆf...
[fgfŠfAf<,İŽŸ,İXfefbfv,ðÆ©,ê,İ,İ,©,é,æ,µ,É ADDEX1fTf“fvf<,Ä,Í
WM_TIMER,İŠÖ AfobfN Efofbftf@,É,¾,— ‘,«,±,Ÿ,ð s,µ Bfvf%oCf}fŠ Eft [ftFfX,É ‘,«,±,Ÿ,ªK—
v,È,İ,Í A %oŠú%o”ŠÖ ”,©f^Cfƒfƒfy [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 BfT [ftFfX Ef f,fŠ,Ö,İ—LÆø,Èf|
`fCf“f^,ð“¾,é,É,Í AIDirectDrawSurface2::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,Ñ 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,Ü,½,İfobfN Efofbftf@ Ef fbfZ [fW,İ,Ç,¿,Ş,a ‘,«,±

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

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

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

,Ü,è,é,Æ,Œ,Œ,±,Æ,É’ ^Ö,·,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 æ,³ê,½Ēă,Ā AfobfN Efobftf@,ðfvf% Cf}`
`fŠ EfT [ftfFX,ÉftfŠfbfsf“fO,·,éIDirectDrawSurface2::Flip f f\fbfh,ðŽg—p,Ā,«,é,æ,ᳵ,Ē,é BŽŸ,ĭ—`
`á,ĀŽ!,·Ē,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,Ī A `lpDDSPPrimary,Īfvf% Cf}` `fŠ EfT [ftfFX,Æ,» ,ê,ÉŠÖ~A,Ā,¯,ç,ê,½fobfN Efobftf@,Æ,ðŽ!,ᳵ,Ā,Ĉ,é B`
IDirectDrawSurface2::Flip,ªĒĀ,Ī,ê,é,Æ Aftf f“fg EfT [ftfFX,ÆfobfN EfT [ftfFX,ªĒŠ,³,ê,é ifT [ftfFX
,Ö,Īf|fCf“f^,ªĪ X,³,ê,é,¾,¯,Ā AŽĀ Ū,Éff [f^,ªŪ“@,·,é,Ī,¯,Ā,Ī,Ē,Ĉ j BftfŠfbfsf“fO,ª ¬Ē÷,ᳵ
DD_OK,ª•Ö,³,ê,é,Æ AfAfvfŠfP [fVf‡f“,Īwhilef< [fv,©,ç”²,¯,é B

`ftfŠfbfsf“fO,ª•ĪDDERR_SURFACELOST,ð•Ī,· ê ‡ AIDirectDrawSurface2::Restore`
`f f\fbfh,Ē,æ,Ā,ĀfT [ftfFX,ĪfŠfXfgfA,ªŽŽ,Ÿ,ç,ê,é BfŠfXfgfA,ª ¬Ē÷,·,é,Æ AfAfvfŠfP [fVf‡f“,Īf< [fv,Ē-`
`ß,è`
IDirectDrawSurface2::Flip,ĪĒĀ,Ũ o,ᳵ Ā,ŨŽŽ,Ÿ,é BfŠfXfgfA,ªŽ,”s,·,é,Æ AfAfvfŠfP [fVf‡f“,Īwhilef< [fv,ð”
²,¯,Ā AfGf%o [,ð•Ī,· B

Note

IDirectDrawSurface2::Flip,ðĒĀ,Ũ o,· ê ‡ AftfŠfbfsf“fO,Ī,·,®,Ē,ĪŠ®—
¹,¹,, AŽŸ,Ī ,’¼A ũŠúŠÖ,Ē s,Ī,ê,é B,½,Æ,!,Ī‘O,ĪftfŠfbfsf“fO,ª Ī,Ī,Ā,Ā,Ĉ,Ē,Ĉ,Æ,« A IDirectDrawSurface2::Flip,Ī
DDERR_WASSTILLDRAWING,ð•Ī,· B—á,Ā,Ī A IDirectDrawSurface2::Flip,ĪDD_OK,ð•Ī,·,Ū,Āf< [fv,ᳵ±,¯,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,±,lf fbfZ [fW,Í,.,×,Ä,İUnknown::ReleaseŠÖ ”,ðŠÜ,ðfiniObjects 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,.,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,.,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,¢,¾,³,©^Ü,E,Å,ÄŒ©,‘,é,^a A—{Žč“l,É,Í“¬,¶,Å, ,è AŽŸ,ìfZfNfVf‡f“,“Ü,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(lpDDSBack, szBackground);

if(ddrval != DD_OK)
goto error;

Step 1: *pfCEfbfg*.İ ì ¬

DDEX2Tf“fv<fCf<,Á,Í AŽŸ,İfR [fh,ðŽg,Á,Ä \‘İ,ÖfpfCEfbfg,ðf [fh,·,é B

lpDDPal = DDLoadPalette(lpDD, szBackground);

if (lpDDPal == NULL)
goto error;

DDLoadPalette,Í A<‘ÊDirectDraw ŠÖ ”,Á, ,è A\Sdk\Samples\Misc\Ddutil.cpp,É, ,é B
DirectDrawTf“fv<fCf<,İ‘â”•^a,±,İtf@fCf<,ðŽg,Á,Ä,¢,é B,±,ê,Í Aftf@fCf<,Ü,½,ÍŠf\ [fX,©,çfrfbfgf}
fbfv,ÆfpfCEfbfg,ðf [fh,·,é,½,ß,İŠÖ ”EQ,©,ç \ ¬,³,ê,é B,±,ê,ç,İŠÖ ”,Í A Ä—
p,Á,«,é,Ð,Æ,Ä,İtf@fCf<,É,Ü,Æ,ß,ç,ê,Ä,¢,é BŽc,è,İ DDEX samples,Æ,Æ,à,ÉRf“fpfCf<,·,étf@fCf<EQ,İfŠfXfg,É
Ddutil.cpp,³ŠÜ,Ü,ê,Ä,¢,é,±,Æ,ðŠm”F,·,é,±,Æ B

DDEX2,Ä ADDLoadPalette ŠÖ ”,Í

Back.bmpftf@fCf<,©,çDirectDrawPaletteIfufWfFfNfg,ð ì ¬,·,é **BDDLoadPalette**
ŠÖ ”,Í AfpfCEfbfg,ð ì ¬,·,é,½,ß,İtf@fCf<,Ü,½,ÍŠf\ [fX,“¶ Ý,·,é,©,Ç,²
,©,ð”»f,·,é B,à,µ‘¶ Ý,µ,È,¯,ê,İfftfHf<fg,İfpfCEfbfg,ð ì ¬,·,é B DDEX2,Ä,Í Afrfbfgf}
fbfvfpfCEfbfg,©,çfpfCEfbfg îñ,ð’Š o,µ Af|fCf“f^ape,³Žw,· \‘İ,ÉŠi”[,·,é B

,»,²,µ,ÄDDEX2,Í ŽŸ,İ—á,ÉŽ!,·,æ,²,ÉDirectDrawPaletteIfufWfFfNfg,ð ì ¬,·,é B

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

IDirectDraw2::CreatePalette f\fbfh,^a—

ß,é,Æ,« Addpalpf%of [f^,İDirectDrawPaletteIfufWfFfNfg,ðŽw,· **BDDLoadPalette**,İEÄ,Ñ o,µ,Ä•Ö,³,é,é,à,İ,Ä, ,
é B

ape fpf%of [f^,Í \‘İ,Ö,İ|fCf“f^,Ä A~A’±,µ,½2 A4 A16 A256fGf“fgfŠ,İ,¢,,è,©,ðŠÜ,ñ,Ä,¢,é B
fGf“fgfŠ,İ ”,Í **IDirectDraw2::CreatePalette** f\fbfh,İdwFlags fpf%of [f^,ÉÊ‘¶,·,é B ã,İ ê ± A dwFlags
fpf%of [f^,İDDPCAPS_8BIT,ÉfZfbfg,³,ê A,±,İ \‘İ,É256,İfGf“fgfŠ,^a, ,é,±,Æ,ðŽ!,µ,Ä,¢
,é BfGf“fgfŠ,İ,»,è,¼,è4fofCfg if`ffflf< Ô Af`ffflf<—Î Af`ffflf< Ä Aftf%ofO j,Ä \ ¬,³,ê,é B

Step 2: $f_p f \in f b f g$, $\bar{f} \in Y'$

$f p f \in f b f g, \delta \rightarrow \neg, \mu, \frac{1}{2} \in \tilde{A} \text{ A } \mathbf{IDirectDrawSurface2::SetPalette} \text{ } f \text{ } f \setminus f b f h, \delta \in \tilde{A}, \tilde{N} \text{ } o, \cdot, \pm$
 $, \mathcal{A}, \tilde{A} \text{ A } \mathbf{DirectDrawPalette} f \text{ I } u f W f F f N f g, \tilde{O}, \tilde{I} f \text{ } f C f \text{ } f \wedge \text{ } i d d p a l \text{ } j, \delta f v f \% f C f \text{ } f \tilde{S} \text{ } E f T \text{ } [f t f F f X, \acute{E} \text{ } n, \cdot \text{ } B \tilde{Z} \tilde{Y}, \tilde{I} -$
 $\acute{a}, \tilde{A} \tilde{Z}_i, \cdot \acute{E}, \grave{e}, \tilde{A}, \cdot \acute{e} \text{ } B$

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

```
if(ddsval != DD_OK)
    // SetPaletteŽ,s
```

IDirectDrawSurface2::SetPalette,ðĖÄ,Ñ 0,±,Æ,É,æ,Ä,Ä A DirectDrawPaletteIfufWfFfNfg,Í
 DirectDrawSurfaceIfufWfFfNfg,ÉŠÖ~Ä,Ä,¯,ç,é,é BfpfĖfbfg,ì·Ĭ X,·K~v,É,Æ,«,Í,Ė
 ,Ä,Ä,à V,m,ĖpfĖfbfg,ð ì ¬,mpfĖfbfg,ð Ä Ý`è,·,é,¾,¯,Ä,æ,Ė B i,±,ê,ÍfTf“fvfĖ,ÄŽg,í,ê,Ä,Ė,é·û~
 @,¾,ª AĖÄ,É à¾,·,é,Æ,¯,é¼,É,ä·û~@,ª,·,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,□,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,□,±,Æ,^aÄ,«₂,é B³,ç,É Ú,µ,ç î•ñ,İ A u f`f... [fgfŠfAf<5:fpfCEfbfg,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 ~,ðCEÄ,Ñ o,· B

DDCopyBitmap ŠÖ ~,İ Afrfbfgf}fbfv,ðf f,fŠ,ÉfRfs [µ Afrfbfgf}fbfv,İfTfCfY,ð’²,×,é,½,ß,ÉGetObject ŠÖ ~,ðŽg,□ B,»,µ,Äfrfbfgf}fbfv,^au,©,ê,éfofbfN Efofbftf@,İfTfCfY,ð’²,×,é,½,ß,ÉŽŸ,İ,æ,□,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,İCE» 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,İCEÄ,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,□ ,ÉfofbfN Efofbftf@,É, ,Ä,İ,Ü,é,æ,□ 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,^a ÁŽ,,μ,½ ê ‡ i
DDERR_SURFACELOST j,ð æ,¢,Ä DDEX1f`f... [fgfŠfAf<,Æ“[–],¶,Å, ,é i uf`f... [fgfŠfAf<1:
DirectDraw,İŠi`b v,ðŽQ Æ,·,é,±,Æ) B,»,İ ê ‡ AfT [ftFfX,^afŠXfgfA,³ê,½Ėă ADDReLoadBitmap
ŠÖ ”,ðŽg,Å,Äf_rbfbgf}fbfv,ðfofbfN Efofbftf@,Êf [fh,μ’¼,³È,[–],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“]‘—

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

```
// fIfxfXfNfŠ {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,Ð,Æ,Â,ÎfIf{XfNfŠ [f“frfbfgf}fbfv,ð ì ¬
ddrval = lpDD->CreateSurface(&ddsd, &lpDDSTwo, NULL);
if(ddrval != DD_OK)
{
    return initFail(hwnd);
}
```

dwFlags f"fo,Å AfAvfŠfP [fvf‡f,"**DDSCAPS** \‘ç'İ,ðŽg,±,±,Æ,ðŽw'ê,·,é B,,µ,Ä e DDSCAPS_OFFSCREENftf%oF,"**DDSCAPS** \‘ç'İ,ÉfZfbfg,³,ê,é,±,Æ,É,æ,Ä,ÄŽ,³,ê,é,æ,±,É Afofbftf@,İ ,,³,Æ%o j• ,ðfZfbfg,·,é B fT [ftfFfX,İfİftfXfNfŠ [f“ EfvfÆ [f“ Efofbftf@,É,È,é B ,,³,Æ• ,Í,,ê,¼,ê A480,Æ640,É **DDSURFACEDESC** \‘ç'İ"à,ÄfZfbfg,³,ê,é BfT [ftfFfX,İ= **IDirectDraw::CreateSurface** f\fbfh,ðŽg,Ä,Ä İ ¬,·,é B

f1ftfXfNfŠ [f[" EfvfE [f[" Efofbftf@,Í—¼•û,Æ,ã¯,¶fTfCY,Â, ,é,½,ß AfZfJf"fh Efofbftf@,ð ì ¬,•,é,½,ß,Ê ,Í A Ä,Ñ A~Ü,È,é|fCf" f^—¼,ÂIDirectDraw::CreateSurface,ðEÄ,Ñ o,¹,Î,æ,¢ B

“Á,É **DDSCAPS** \‘c‘İ,İDDSCAPS_SYSTEMMEMORY,Ü,½,İDDSCAPS_VIDEOMEMORY”\—Í,đfZfbfg,·,é,±
 ,Æ,É,æ,Á,Ä AfİftfXfNfŞ [f“ Efofbftf@,đfVfXfefE Ef f,f,Ş,Ü,½,İffBfXfvfCfCf f,f,Ş,É‘u,±,Æ,đŽw’è,·,é,±
 ,Æ,ª,Á,«,é B ffbfBfXfvfCfC Ef f,f,Ş,Éfrfbfgf}fbfv,đ•Ü‘¶,·,é,±
 ,Æ,É,æ,Á,Ä AfİftfXfNfŞ [f“ EfT [ftfFfX,ÆfofbfN Efofbftf@ŞÖ,İ“]—fXfs [fh,đ ä,·,é,±
 ,Æ,ª,Á,«,é Bfrfbfgf}fbfv EfAfjf [fVf‡f“ ,đŽg,ª,Æ,«,É,±,ê,İ,æ,é d—
 v,Æ,É,é B,µ,©,µfİftfXfNfŞ [f“ Efofbftf@,É DDSCAPS_VIDEOMEMORY,đŽw’è,µ,½ ê ‡ Afrfbfgf}
 fbvf‘S’,đ•ÜŽ ,·,é,İ,É,İ,Æf f,f,Ş,ª,É,ê ‡ AfT [ftfFfX,đ İ ¬,·,é É Ü,ÉŽ,‘s,µ ADDERR_OUTOFVEMEM
 ORYfGf% [·,ª,Ö,³,é,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,ªfofbfN 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,ª“]’—
,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::Blt** f f\fbfh,Æ**IDirectDrawSurface2::BlitFast**
f f\fbfh,İ,Ç,ç,àfIfxfNfŠ [f“ Efofbftf@,©,ç“]’—,·,é,½,ß,ÉŽg,ϱ,±,Æ,ª,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,ª“¾,ç,ê,È,ċ ê ‡ Afn [fhfEfFfA EfGf~f...fĖ [fVf±f“,ª“]’—
,đŽÄ s,·,é,Æ10fp [fZf“fg’öfpftfH [f}f“fX,ª—Ž,ç,é B,±
,İ,½,ß AftfBfXfvfĖfĖC Ef f,fŠ,©,çffBfXfvfĖfĖC Ef f,fŠ,Ö“]’—,³,¹,é,·,×,Ä,İffBfXfvfĖfĖC‘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::Blt**,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•”,ðfofbfN 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%œñ,é,»,İƐJ,è•Ô,µ,©,ç \ ¬,³,ê,éAll.bmp,Á, ,é B DDEX4,İfTf“fvf<,Í A%œñ“,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,©,çfofbfN 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 ”,ðŒ©,Â,¯,é,±,Æ,ª,Â,«,é B,μ,©,μ A
DDEX4,ÌfTf“fvf<,Í AfXfvf%oCfɡ,Ì,½,ß,ÌfJf% [EfL [,ðfZfbfg,·,éfR [fh,ðŠÜ,ñ,Ä,¢
,é BfJf% [EfL [,Í A“§-¾%»,ÄŽg,í,ê,é F’l,Ì Ý’è,ð,·,é BfVfXfef€,ªfn [fhfEfFA“]‘—”\—
Í,ðŽ ,Ä,Æ,« A«ÉŒ,ÌfsfNfZf<,Í AfJf% [EfL [,Æ,μ,ÄfZfbfg,³,ê,½’l,ð œ,¢
,Ä AfT [ftfFfX ä,Ì”ñ«ÉŒfXfvf%oCfɡ,ð ì ¬,μ,Ê,ª,ç“]—,³,ê,é B DDEX4,ÄfJf% [EfL [,ð Ý’è,μ,Ä,¢
,é•ª,ÍŽŸ,Ì’Ê,è,Ä, ,é B

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

```
return TRUE;
```

DDSetColorKey ŠÖ ”,ðŒÄ,Ñ o,·,Æ,«,É AŽw’è,μ,½,¢ F,ÌRGB’l,ð Ý’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 ”,ðŒÄ,Ñ,¾,· B i,Ç,·,ç,à ADdutil.cpp,É, ,é j **DDColorMatch**ŠÖ ”,Í A
*lpDDSTone*T [ftfFfX,É”z’u,³,ê,½frfbfgf}fbfv ä,Ì(0,0),ÌfsfNfZf<,ÌŒ» Ý,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 ÄŒä,É A—~p%Ä”,ÉfsfNfZf<-
^,Ìfrfbfg ”,Ä,»,ÌfJf% [,Ì’l,ðf}fXfN,·,é B,±,ê,ª I,í,é,Æ AŽn,ß,Ì F,Í(0,0)
,Ì’Ê’u,ÌŒä,ë,É’u,©,ê AŽÄ Ü,ÌfJf% [EfL [,Ì’l,Ä«¼,É A **DDSetColorKey**,Ö-ß,é B
DDColorMatch,ÌŒÄ,Ñ o,μ,ª I,í,Ä,½Œä AfJf% [EfL [’l,Í A **DDCOLORKEY**
\‘¢’l,ÌdwColorSpaceLowValuef f“fo,É’u,©,ê,é B,Ü,½ A dwColorSpaceHighValuef f“fo,É,àfRfs [,³,ê,é B
IDirectDrawSurface2::SetColorKey,Ö,ÌŒÄ,Ñ,¾,μ,É,æ,Ä,ÄfJf% [EfL [,ð Ý’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,ðŒÄ,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 AfOfŒ [,Ì%œ,Æ,Ê,é,±,Æ”Ö-ì,·,é,í,¯,Ä,Í,Ê,¢ 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•İ X,μ,Ä,Ý,é,±,Æ B
j,»,ê,Í AŽŸ,ÌDDEX4 **DDSetColorKey**,ðŒÄ,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,İ,¢,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,ÌfGf“fgfŠ,ð“@“I,É•İ X,·,é•û-@,ð%ø ò³,·,é B
DDEX5,Å%ø ò³,ê,é V,µ,¢<@”\,ð AŽŸ,ÌfXfefbfv,Å à-¾,·,é B

Step 1: fpfŒfbfg_EfGf“fgfŠ,İf____[fh

Step 2: fpfŒfbfg,İf____[fe [fg

Step 1: `fpfEfbbfg EfGf“fgfŠ,İf [fh`

```
DDEX5,İŽŸ,İfR [fh,Í AfpfEfbbfg EfGf“fgfŠ,É AAll.bmpftf@fCf<,İĖă”¼•”ª i Ô,ċ—  
Ö,İ,ðŠŮ,Đ•”ª j,l,ðf [fh,μ,Ā,ċ,é B
```

```
// ,İ,İ,Đ,É A,·,×,Ā,İ F,ð-ċŽg—p,ÉfZfbfg,·,é  
for(i=0; i<256; i++)  
{  
    torusColors[i] = 0;  
}
```

```
// fT [ftfFfX,ðf fbfn,μ ACEă”¼•”ª,ðfXfLfff“,·,é ifg [f%ofX EfGfŠfA j  
// Ė©,Ā,©,Ā,½fCf“fffbfnfX,İL~^,ð•ŮŽ ,·,é  
ddsd.dwSize = sizeof(ddsd);  
while (lpDDSDone->Lock(NULL, &ddsd, 0, NULL) == DDERR_WASSTILLDRAWING)  
    ;
```

```
// fg [f%ofX EftfĖ [fĖ,ðĖŸ 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;  
    }  
}
```

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

```
torusColors”z—ñ,Í A  
All.bmpftf@fCf<,İĖă”¼•”ª,ĀŽg,í,ê,éfJf% [ EfCf“fffbfnfX,İfCf“fWfP [f^,Æ,μ,ĀŽg,▫ B Ā %o,É A  
torusColors”z—  
ñ,İ,l,İ,·,×,Ā,ð0,ÉfŠfZfbfg,·,é BfİftfXfNfŠ [f“ Efofbftf@,Í AfJf% [ EfCf“fffbfnfX,l,Žg,í,ê,é ê ± A,»,ê,ç,  
İ F,ªŠm’è,³,ê,éO,Éf fbfn,³,ê,é B
```

```
torusColors”z—ñ,Í Afrfbfgf}fbfv,İ480—ñ,İ0Ė...,©,ç,İ,İ,Đ,é,æ,▫,ÉfZfbfg,·,é B”z—  
ñ,İJf% [ EfCf“fffbfnfX,l,Í Afrfbfgf}fbfv EfT [ftfFfX,“”z’u,³,ê,éf f,fŠ,İ”z’u ê Š,É,æ,èĖĖ”è,·,é B,±  
,İ”z’u ê Š,Í A DDSURFACEDESC \‘ċ’İ,İlpSurfacef f“fo,É,æ,Ā,ĀĖ”è,³,ê,é B,»,ê,İfrrfbfgf}fbfv,İ480—ñ0Ė...  
(y ‘lPitch + x),É’İ%ž,μ,½f f,fŠ,İ”z’u ê Š,Ö,İf|  
fCf“f^,Æ,É,é B“Ā”è,İfJf% [ EfCf“fffbfnfX,l,İ”z’u ê Š,Í1,ÉfZfbfg,·,é B’ly( srow),Í A lPitch’l i  
DDSURFACEDESC \‘ċ’İ,Ā, ,é jfŠfjAf f,fŠ,İfsfnfZf<,İŽĀ Ů,İ”z’u,ð“¾,é,±,Æ,ª,Ā,«,é B
```

```
torusColors,ÉfZfbfg,³,ê,½fJf% [ EfCf“fffbfnfX,l,Í A, ,Æ,ĀpfĖfbfg“à,İ,Ç,İ F,ðf [fe [fg,·,é,©Ė^,Đ,é,Æ,«,  
ÉŽg,▫ B ”wĖi,Æ Ō,ċ—Ō,É,İ<▫’Ė,·,é F,ª,Ė,ċ,½,Đ A Ō,ċ—Ō,ÆŠŌ~A,Ā,~ ,ç,é,½ F,¾,~ ,ªf [fe [fg,³,ê,é B,±  
,ê,ªtrue,©,Ç,▫,©,ðf`fFfbfn,·,é,½,Đ,É,Í A”z—ñ,©,ç”ddsd.lPitch”,ðŽæ,è æ,« Afvf fOf%ofĖ,ð ĀfRf“fpfCf<,μ,½, ,  
Æ“® ,©,·,Æ,«,É%½,ªN,±,é,©,ð— %òð,·,é,±,Æ B (y ‘lPitch,ĀŠ|,~ŽZ,ð,μ,Ė,ċ,Æ Ō,ċ—Ō,İŽæ“¾,³,ê,Ė,ċ  
,μ”wĖi,ĀĖ©,ç,é,é F,¾,~ ,ªCf“fffbfnfX,³,ê A, ,Æ,Āf [fe [fg,³,ê,é)  
,³,ç,É Ů,μ,ċ îñ,Í A u• ,Æfsfbf` v,ðŽQ Æ,·,é,±,Æ B
```

Step 2: `fpfEfBfg,İf lfe lfg`

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

```
// fpfEfBfg,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 Ä %o,İ s,Ä

```
DirectDrawPalette,©,ÇfpfEfBfg’l,đ“¾,é BfpfEfBfg EfGf“fgfŠ’l,İ A pe,đf|fCf“f^,Æ,·,é•İ ”,É“ü,è Af f\fbfh,İ  
DD_OK,đ•Ö,µ A ^— ,ª±,¬,Ç,ê,é B,»,İŠÖ AfJf%o [ EfCf“ffbfNfX,ª1,ÉfZfbfg,³,ê,Ä,Ç,é,©,Ç,ª  
,© A torusColors,đf`fFfbfN,µª±,¬,é BfZfbfg,³,ê,Ä,Ç,é ê ‡ AfpfEfBfg EfGf“fgfŠ,İ Ö A—  
İ A Ä,İ’l,İ Af [fe [fg i zŠÄ j,³,ê,é B
```

```
f} [fN,³,ê,½,·,×,Ä,İfpfEfBfg EfGf“fgfŠ,ªf [fe [fg,³,ê,½Eä A  
DirectDrawPalettefİfufWfFfNfg,İfGf“fgfŠ,đ•İ X,·,é,½,ß,ÉIDirectDrawPalette::SetEntriesf f\fbfh,đEÄ,Ñ o,· B,±  
,İ•İ X,İ Afvf%ofCf}fŠ EfT [ftfFfX,Ö,İfpfEfBfgfZfbfg,ª—LÆø,É,È,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,³,ê,½“]‘—
,Æ L’·,µfNfŠfbfsf“fO,³,ê,½“]‘—,l”\—Í,^a, ,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’²,×,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”ăŠr“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“¼

IDirectDrawSurface2::Flip*f 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,,İ‘O,İftfŠfbfsf“fO,ª I—¹,μ,Ä,¢ ,È,¢ ê ± A,Ü,½,İftfŠfbfsf“fO,ÉŽ,”s,μ,È,©,Ä,½ ê ± A,± ,İf f\fbfh,İDDERR_WASSTILLDRAWING,ð·Ô,· BSDK,İftf“fvf¢,Ä,Í A IDirectDrawSurface2::Flip,İCEÄ,Ñ o,μ,Í DD_OK,ª·Ô,³,ê,é,Ü,Äf¢ [fv,μ‘±, ¯,é B,Ü,½ IDirectDrawSurface2::Flip,İCEÄ,Ñ o,μ,à,·,®,ÉŠ®— ¹,μ,È,¢ BftfŠfbfsf“fO,İfvfXfef€,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‘ä,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,İftfŠfbfsf“fO,ª I,í,Ä,Ä, ¯,Ç,, ACEÄ,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,İ AŽŸ,İftfŠfbfsf“fO,ðŽÄ s,Ä,«é BŽŸ,Ì—á,Ä A,±,İŠT”O,ð à—¼,·,é B

while (lpDDSTBack->GetFlipStatus (DDGFS_ISFLIPDONE) == DDERR_WASSTILLDRAWING) ;

*// ‘O,İftfŠfbfsf“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 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,¢<œ’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<œ’Ê F,ª Â,İ ê ‡ A Â F,Â Â %œ,ÉfT [ftfFfX,đ-
,,ß,é,½,ß,ÉDDBLT_COLORFILL ftf%œfO,Æ<œ,É**DirectDrawSurface2::Blt**,đŽg,□ B,·,é,Æ A,»,İ ã,É%½,Â,à ‘,«,±
,p,±,Æ,ª,Â,«,é B<œ’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,    // “]‘—Ĉ³œĈ`
    DDBLT_COLORFILL, &ddbltfx);
```

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

ffBfXfvfC Efn [fhEfFA”—Í,İĖ~è

DirectDraw,Í Af† [fU,İfn [fhEfFA,ªfTf] [fg,µ,Ä,¢
,È,¢DirectDrawŠÖ ”,ðŽÀ s,·,é,½,ß,Éfn [fhEfFA EfGf~f...fĖ [fVf‡f“,ðŽg,□ B
DirectDrawAfvfŠfP [fVf‡f“,İpfth [f}“fX,ð ,‘¬»»,·,é,½,ß,É A
DirectDrawIfufWfFfNfg,ð ì ¬,µ,½ĖÄ,Ä Af† [fU,İffBfXfvfC Efn [fhEfFA,İ”—Í,ðĖ~è,·,×,«,Ä, ,é B
DirectDraw,Í Af† [fU,İfVfXfefĖ ä,ÄŽg—p%Ä”\,È,Ç,İffBfXfvfC ,‘¬»»fn [fhEfFA,àŽg,□,±
,Æ,ª,Ä,«,é BfAfvfŠfP [fVf‡f“,ª—
v< ,·,éffBfXfvfC ,‘¬»»fn [fhEfFA,ðf† [fU,İfVfXfefĖ ä,İffBfXfvfC EfAf_fvf^,É‘¶ Ý,µ,È,¢ ê ‡
AfAfvfŠfP [fVf‡f“,Í•K—v,Æ,·,éfn [fhEfFAfGf~f...fĖ [fVf‡f“,İfŠfXfg,ðDirectDraw,É’ñ<Ý,µ,È, ¯,ê,İ,È,ç,È,¢
,±,Æ,É’ ^Ó,·,é B

ffBfXfvfC Efn [fhEfFA,İ”—Í,ðŽæ“¾,·,é,½,ß,É A **IDirectDraw2::GetCaps**,ðŽg,□,±
,Æ,ª,Ä,«,é Bfn [fhEfFA,İ,½,ß,İDirectDrawffofCfX Efhf%ofCfo,Í A **DDCAPS** \‘Ĭ,İdwCapsf f“fo,İ’l,ð ‘,«\
,· B ,±,ê,ç,İ’l,Í AfVfXfefĖ,İffBfXfvfC ,‘¬»»fn [fhEfFA,İ”—Í,ðŽ’,· B **DDCAPS**
\‘Ĭ,Í AfAfvfŠfP [fVf‡f“,İ—v< ,Äfn [fhEfFA EfGf~f...fĖ [fVf‡f“,ð’ñ<Ý,·,é**DDSCAPS**
\‘Ĭ,İfAfhfCfX,ðŠÜ,ñ,Ä,¢,é B DirectDraw,İfn [fhEfFA §Ėä”—Í,ªffBfXfvfC EfAf_fvf^ ä,Ä—~
p,Ä,«,È,¢ ê ‡ Afn [fhEfFA EfGf~f...fĖ [fVf‡f“,ªŽg—p,³,ê,é B,±,İ ê ‡ AfAfvfŠfP [fVf‡f“,ª**DDSCAPS**
\‘Ĭ,Ä—v< ,³,ê,éfn [fhEfFA EfGf~f...fĖ [fVf‡f“’l,ð’ñ<Ý,µ,È, ¯,ê,İ,È,ç,È,¢ 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 [fhfEfFA,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 [fhfEfFA,ì”\—Í,ð“¾,é,½,ß,É_
IDirectDraw2::GetCapsf 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 Afvf%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,lfofbfN 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,lfofbfN 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,lfofbfN 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,lfofbfN 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,lfofbfN Efofbftf@,““]‘—,đ I—¹,µ,È,-
,Ä,à AfgfŠfvf< Efofbftf@fŠf“fO,É,æ,Á,ÄAfvfŠfP [fVf‡f“,lfofbfN 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,lfofbfN 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,^a ¬Ç÷,µ,½ ê ‡ A—LÇø,ÈDirectDrawIfufWfFfNfg,lf|fCf“f^,Â %oŠú%o»,³,ê,é|
fCf“f^,Ö,lfAfhfÇfX B

pUnkOuter

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

DirectDrawCreateClipper

```
HRESULT DirectDrawCreateClipper(DWORD dwFlags,  
    LPDIRECTDRAWCLIPPER FAR *lpDDClipper,  
    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%of [f^,Íœ» Ý–œŽg—p,Ä A0,ÉfZfbfg,µ,Ä,“,©,È,¯,ê,Î,È,ç,È,¢ B

lpDDClipper

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 AfAfvfŠfP [fVf‡f“,ÌfIfufWfFfNfg,ª%ð•ú,³,ê,Ä,àŽ©“®“I,É%ðð•ú,³,é,±,Æ,Í,È,¢ BfAfvfŠfP [fVf‡f“,ª–
¾Ž,“I,ÉDirectDrawClipperIfufWfFfNfg,ð%ðð•ú,µ,È,¢ ê ‡ A fAfvfŠfP [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,ª,±,Æ B

ŽQ Æ @**IDirectDraw2::CreateClipper**

DirectDrawEnumerate

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

fVfXfef€,ÉfCf“fXfg [f<,³,ê,½DirectDrawfIfufWfFfNfg,ð—ñ<“,;é B NULL,ìGUIDfGf“fgfŠ,Í AGDI,Æ<□—
L,³,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,³,ê,é CallbackŠÖ ”,ÌfAfhfÆfX B

lpContext

—ñ<“fR [f<fobfNŠÖ ”,ªÆÄ,Ñ o,³,ê,é,²,Æ,É“n,³,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,é²,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\bfh,ì,½,ß,ìfAfvfŠfP [fVf‡f“,Å’è“,·,éR [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,ì,½,ß,ÌfAvfŠfP [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,ÌfAfhfÆfX 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 \‘¢‘Ì,Ö,Ìf|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 () ;

Ⓖ» Ý A,±,ìf 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,ìfGf%o [,ð•Ô,· B

- DDERR_INVALIDOBJECT
- DDERR_INVALIDPARAMS
- DDERR_NOEXCLUSIVEMODE
- DDERR_SURFACEBUSY

,±,ìf f\fbfh,Í AfffBfXfvfⒼfC EfJ [fh,ìfT [ftfFfX Ef f,fŠ,ì'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,©,Ì ^— ,ª s,í,ê,Ä,¢,é,Æ,«,ÉⒼÄ,Ñ o,·,ÆŽ, ”s,·,é B
,±,ìf f\fbfh,ðⒼÄ,Ñ,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% [,đ•Ô,· B

DDERR_INVALIDOBJECT

DDERR_INVALIDPARAMS

DDERR_NOCOOPERATIVELEVELSET

DDERR_OUTOFMEMORY

dwFlags

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

lplpDDClipper

,±,İf f\fbfh,^a ¬Ė÷,μ,½ ê ‡•Ô,³,ê,é V,μ,ĉDirectDrawClipperIfufWfFfNfg,đŽ|,·f|fCf“f^,İfAfhfĖfX B

pUnkOuter

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

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

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

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

DirectDrawCreateClipperŠÖ ”,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,^a ¬Ė÷,μ,½ ê ±•Ô,³,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,^a ¬Ė÷,μ,½ ê ‡ A—LĖø,ÈDirectDrawSurface|fCf“f^,É,æ,Á,Ä %oŠú%o»,³,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,Ä,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,Í 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 [ftFfX,ÆÉÝŠ· «,^a, ,é,Æfn [fhEfFfA,ª”FŽ[−],μ,½ffBfXfvfÆfC
Ef, [fh,ð—ñ<“,·,é BfT [ftFfX,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,É“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,·,éT [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,·,éT [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,·,Â,É‘¶ Ý,μ,Ä,¢,éT [ftFfX,ð—ñ<“,·,é B

DDENUMSURFACES_MATCH

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

DDENUMSURFACES_NOMATCH

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

lpDDSD

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

lpContext

—ñ<“,³,ê,½f f“fo,É“n,³,ê,éAfvfŠfP [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,é**EnumSurfacesCallback**ŠÖ ”,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, ^a 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, ^a ‘,«,±,ñ,Ä,¢,éffBfXfvfŒfC Ef f,fŠ, ^a 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 [fhEfFA”\—í,ðŠÜ,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,Ü,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`ñ<Ÿ,·,é BffBfXfvfEfC Ef f,fŠ,ìó,«—e—Ê,İ AfT [ftfFX,ì ì ¬,Æ%ð•ú,ì ‡”Ô,È,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,İÜ,È,éf f,fŠf^fCfv,ð<æ•Ê,Å,«È,¢ B,½,Æ,İ,İ A Zfofbftf@,ÆfefNfXf`ff,ðŠi”[,·,é,İ,É AffBfXfvfEfC Ef f,fŠ,ì“¬,¶”•¾,ðfAf_fvf^,Žg—p,·,é%oÅ”\ «,¾, ,é B,æ,Å,Å AfT [ftfFX,İè,Å,İf^fCfv i,½,Æ,,İ AZfofbftf@ j,İ A,à,σ^è•û,ìfT [ftfFX i,½,Æ,,İ AfefNfXf`ff j,¾—~—p,Å,«éffBfXfvfEfC Ef f,fŠ,ì—e—Ê,É%œ<ç,ð—^,İ,é B,µ,½,¾,Å,Å A“@“İŽg—p ifefNfXf`ff Ef}fbfsf“fO,ì,æ,²,È j,È—~—p,Å,«éf f,fŠ,ì—e—Ê,ðE~`è,·,é•O,É AfAfvfŠfP [fVf‡f“,”EÅ`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,ìû—@,Å, ,é B

,±,ìf f\fbfh,Í A **IDirectDraw2**fCf“f^ [ftfCfX,ì V<@”\,Å, ,è A **IDirectDraw**fCf“f^ [ftfCfX,É,İŽÀ‘•,¾,ê,Å,¢,È,¢ B

IDirectDraw2::GetCaps

HRESULT GetCaps(LPDDCAPS lpDDDriverCaps, LPDDCAPS lpDDHELCaps);

fn [fhfEfFfA,ÆHEL ifn [fhfEfFfA 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 [fhfEfFfA,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“, ª, ±, ðf f\fbfh, Å•Ô, ³, 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, ª, Å, Ä Af}f`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,³,ê,Ä,¢,éFourCCfR [fh,ðŽæ“¾,·,é B,±,Ìf f\bfbh,Í AfTf| [fg,³,ê,Ä,¢,éfR [fh,Ì ”Žš,ð•Ô,·,½,ß,É,àŽg—p,³,ê,é B

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

DDERR_INVALIDOBJECT

DDERR_INVALIDPARAMS

lpNumCodes

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

lpCodes

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

```
HRESULT GetGDISurface(LPDIRECTDRAWSURFACE FAR * lpIDDSurface);
```

$$\neg \mathbb{E} \div, \cdot, \hat{e}, \hat{I} \text{ DD_OK} \quad A\check{Z}, "s, \cdot, \hat{e}, \hat{I}\check{Z}\check{Y}, \grave{I}fGf\%_{\infty} \quad [, \check{\delta} \cdot \hat{O}, \cdot \quad B$$

DDERR_INVALIDPARAMS

 $lplpGDIDDSSurface$

```

    GDI,İfıf%ofCf}fŞ EfT {ftfFfX,đfRf“fgf [f◁,µ,Ä,¢,éDirectDrawSurfacefİfufWfFfNfg,Ö,İf|fCf“f^ B
    ŽQ 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

¬Ǝ÷,·,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 ”,İfAfhfƎfX B

IDirectDraw2::GetScanLine

HRESULT GetScanLine(LPDWORD lpdwScanLine);

f, f j f ^, ^ E » Ý • % æ, µ, Ä, ¢, é f X f L f f f “ f % o f C f “, ð Ž æ “ ¾, ·, é B
¬ E ÷, ·, ê, Î DD_OK A Ž, ” s, ·, ê, Î Ž Ÿ, ì f G f % [, ð • Ô, · B

DDERR_INVALIDOBJECT

DDERR_INVALIDPARAMS

DDERR_UNSUPPORTED

DDERR_VERTICALBLANKINPROGRESS

lpdwScanLine

f f f B f X f v f E f C, ^ E » Ý • % æ, µ, Ä, ¢, é f X f L f f f “ f % o f C f “, ð Ž æ “ ¾, ·, é • Ĭ ”, ì f | f C f “ f ^ B

Ž Q Æ @ IDirectDraw2::GetVerticalBlankStatus A IDirectDraw2::WaitForVerticalBlank

IDirectDraw2::GetVerticalBlankStatus

HRESULT GetVerticalBlankStatus(LPBOOL lpbIsInVB);

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

,¼A ü,Æ“Šú,ðŽæ,é ê ÷,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,iffBfXfvfEfC EfffofCfX Efn [fhEfFfA,ð A

IDirectDraw2::SetDisplayMode,³ĈĈ,Ĥ,ê,éĚ‘O,Ê•æĚ³,·,é B”r¼“IfĈfxfç,Ĉ,ĤfAfNfZfX,μ,½Ĉã,É,Í•K—v,È ^— ,Ĉ, ,
é B

¬Ĉ÷,·,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<„ð Ý’è„,é B

–Œ÷„,ê,İ DD_OK AŽ„s„,ê,İŽŸ„İfGf% [„ð•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„ðŽæ„é B

DDSC_ALLOWMODEX

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

DDSC_ALLOWREBOOT

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

DDSC_EXCLUSIVE

”r“¼“İfŒfxf<„İ—v< B

DDSC_FULLSCREEN

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

DDSC_NORMAL

fAfvfŠfP [fVf‡f“,“ê İ„İWindowsfAfvfŠfP [fVf‡f“,Æ„ı„Ă<@”\
„,é„±„Æ„ðŽ„ı„. B

DDSC_NOWINDOWCHANGES

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

“¼„İfAfvfŠfP [fVf‡f“,æ„è„à„İ„é„©„É—D æ“İ„È<@”\„ð—L„,é„½„ß„É„İ ADDSC_EXCLUSIVEftf%ofO„ðfZfbfg„,é•K
—v„ª„,é B **IDirectDraw2::Compact** f f\fbfh„ðŒĂ„Ň AfffBfXf‡fŒfC Ef„ [fh„ð•İ X„ı Afvf%ofCf}
fŠ EfT [ftfFfX„İ“® İ i„½„Æ„ı„İftfŠfbfsf“fo j„ð•Œ İ„,é„É„İ AfAfvfŠfP [fVf‡f“,İ”r“¼“İfŒfxf<„ÉfZfbfg„ı„Ă„,“-
BfAfvfŠfP [fVf‡f“,ªDDSC_EXCLUSIVEftf%ofO„ÆDDSC_FULLSCREENftf%ofO„ðfZfbfg„ı„Ă**IDirectDraw2::SetCooperativeLevel**„ðŒĂ„Ö ê ‡EfBf“fhfE„İftf<fXfNfŠ [f“Ö„İfŠfTfCfY„ð s„,ı„
„Æ„,é BDDSC_EXCLUSIVEftf%ofO„Ü„½„İDDSC_NORMALftf%ofO„İ„Ç„ı„ç„©„Đ„Æ„Ă„ªfZfbfg„³„è„È„,è„İ„È„Ç„È„Œ
B„Ü„½ A DDSC_EXCLUSIVE„İ A DDSC_FULLSCREEN„İfZfbfg„à“ŽŽ„É•K—v„Æ„,é B

f„ [fhXf„ [fh„İ AfAfvfŠfP [fVf‡f“,ª DDSC_ALLOWMODEX„ÆDDSC_FULLSCREEN„Æ
DDSC_EXCLUSIVE„ðfZfbfg„ı„½ ê ‡„É„İ„Ÿ—~p„Ă„«„é B DDSC_ALLOWMODEX„İ A
DDSC_NORMAL„Æ^ê „ÉŽg„ı„±„Æ„İ„Ă„«„È„Œ B DDSC_ALLOWMODEX„ªŽw’è„³„è„Ă„Œ„È„Œ ê ‡ A
IDirectDraw2::EnumDisplayModes f f\fbfh„İf„ [fhXf„ [fh„ð—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„ðŽg„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„ðf 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„İ**IDirectDrawSurface2::GetDC** f f\fbfh„ðŽg„ı„±„Æ„à„Ă„«„È„Œ B„Ü„½ AfXfNfŠ [f“DC„Æ<ı
„ÉGDI„ðŽg„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•Ö³,ê,é,±*
,Æ,Ê,È,é BDDSURFACEDESC \‘ç‘İ,İˆê••^a,Ä, ,éDDSCAPS \‘ç‘İ,İDDSCAPS_MODEXftf%fo,ÄŽ³,ê,é B

IDirectDraw2::SetCooperativeLevel *İ AfAfvfŠfP [fVf‡f“,^a DirectDraw,ðf}fç`fvfç EfEfBf“fhfE,ÄŽg,±*
,Æ,^a,Ä,«,é,æ,±,É ADDSCL_NORMALf, [fh,ðŽw’è,µ,½ Ū,Ê,àEfBf“fhfE Efnf“fhfç,ð—
vç ,µ,Ê,ç BfEfBf“fhfE Efnf“fhfç,ÉNULL,ð“n,¹İ A,·,×,Ä,İfEfBf“fhfE,İ Afm [f}
fç,ÈWindowsf, [fh,Ä“Žž,ÉDirectDraw,ÄŽg,¹,é,æ,±,Ê,È,é B

IDirectDraw::SetDisplayMode *f\fbfh,Æ IDirectDraw::SetCooperativeLevelf f\fbfh,Æ,İ‘ŠŒÝ ì—p,İ A*
IDirectDraw2,É,“,“,é,»,ê,Æ,İˆŪ,Ê,Ä,Ä,ç,é B,Ä,Ū,èAfvfŠfP [fVf‡f“,^a §ŒăfŒfxç,ðfZfbfg,·,é,½,ß,É A,±
,ê,ç,İfCf“f^ [ftfFfCfX,İ IDirectDrawfo [fWf‡f“,ðŽg,± ê ‡,İ AŒ³,İffBfXfvfŒfCf, [fh,İ A
IDirectDraw::RestoreDisplayMode *f\fbfh,ðŽg,±,Æ,Ê,æ,Ä,ÄfŠfXfgfA,³,ê,é B*

- 1 ”r¼“If, [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 ”r¼“If, [fh,ð%ð æ,·,é,½,ß,ÉDDSCL_NORMALftf%fo,Æç±,ÉIDirectDraw::SetCooperativeLevel,ðŒÄ,Ñ o,· B

,µ,©,µ A IDirectDraw2fCf“f^ [ftfFfCfX,ðŽg,Ä,Ä““,¶,æ,±
,ÈŽè ‡,ð,Æ,é ê ‡ AŒ³,İffBfXfvfŒfC Ef, [fh,İ”r¼“If, [fh,%ð æ,³,ê,½,Æ,«,ÉŽ©“@“I,É•æŒ³,³,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

-C÷,·,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,Cf, [fh,Î• ,Æ ,·,³ B

dwBPP

V,µ,Cf, [fh,lfrrfbfg ^fsfNfZf<(bpp) B

dwRefreshRate

V,µ,Cf, [fh,lfŠftfCfbfVf...fC [fg B,±,lfpf%of [f^,ª,O,ÉfZfbfg,³,ê,é,Æ A,±,lf ffbfh,lfIDirectDraw
fC“f^ [ftfFfCfX Efo [fWf±f“,²Žg—p,³,ê,é B

dwFlags

,±,lfpf%of [f^,ÍC» Ý—CŽg—p B0,ÉfZfbfg,µ,Ä,“,·,±,Æ B

IDirectDraw2::SetCooperativeLevel ffbfh,Í Af, [fh,ªİ X,ª%Å”\

,É,É,é“O,É”r¼“IfCfxfAfNfZfX,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 ‘ŠCÝ ì—

p,ÍIDirectDraw2,Ä,İ,»»,ÆˆÜ,È,é B,Ä,Ü,èfAfvfŠfP [fVf±f“,ª A ŽŸ,İ,æ,□

,ÉŽè ±,ÄffBfXfvfCfC Ef, [fh,Æ §CäfCfxf<,ðfZfbfg,·,é,½,ß,É,±

,ê,ç,lfCf“f^ [ftfFfCfX,lfIDirectDrawfo [fWf±f“,ðŽg,□ ê ± AC³,lfBfXfvfCfC Ef, [fh,Í

IDirectDraw::RestoreDisplayMode ffbfh,ðŽg,Ä,Ä•æC³,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,ðCÄ,Ñ o,· B

2 ffBfXfvfCfC Ef, [fh,Îİ X,İ,½,ß,É IDirectDraw::SetDisplayMode,ðCÄ,Ñ o,· B

3 ”r¼“If, [fh,ð%ð æ,·,é,½,ß,ÉDDSCL_NORMALftf%ofO,ðfZfbfg,µ,ÄIDirectDraw::SetCooperativeLevel

,ðCÄ,Ñ o,· B

,µ,©,µ IDirectDraw2,ðŽg,Ä,Ä“¬,¶,æ,□,ÉŽè ±,ð“Ÿ

,b ê ±,É,Í AC³,lfBfXfvfCfC Ef, [fh,Î•C³,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);

ffvfŠfP [fVf±f“ ,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,ªŽn,Ü,é,Æ,«,İfCfxf“fg EfgfŠfK B,±,ê,Íœ» ŸfTf|
[fg,³,ê,Ä,¢,È,¢ B

DDWAITVB_BLOCKEND

,¼A üŠúŠÔ,ª I,í,è A•Ž!,ðŠJŽn,µ,½,Æ,«,É•Ô,³,ê,é B

hEvent

,¼A ü,ªŽn,Ü,Á,½,Æ,«,ÉfgfŠfK,Æ,È,éfCfxf“fg Efnf“fhf<

ŽQ Æ @IDirectDraw2::GetVerticalBlankStatus A IDirectDraw2::GetScanLine

IDirectDrawClipper

$fAfvf\check{S}fP\ [fVf\pm f^{\wedge},\acute{I}fNf\check{S}fbfv\ Ef\check{S}fXfg,\delta\check{S}\zeta\text{---}$
 $,\cdot,\acute{e},\frac{1}{2},\mathfrak{B},\acute{E}IDirectDrawClipperfCf^{\wedge}\ [ftfFfCfX,\grave{I}f\ f\backslash bfh,\delta\check{Z}g,\varpi\ B,\pm,\grave{I}fZfNfVf\pm f^{\wedge},\check{A},\acute{I}\ A,\pm$
 $,\grave{I}fCf^{\wedge}\ [ftfFfCfX,\grave{I}f\ f\backslash bfh,\acute{E},\check{A},\mathfrak{C},\check{A}\%o\delta\ \grave{a},\cdot,\acute{e}\ B\check{S}T\text{---}v,\acute{E},\check{A},\mathfrak{C},\check{A},\acute{I}\ A\ uIDirectDrawClipper$
 $fCf^{\wedge}\ [ftfFfCfX\ v,\delta\check{Z}Q\ \mathcal{A}e,\cdot,\acute{e},\pm,\mathcal{A}\ B$

IDirectDrawClipper $fCf^{\wedge}\ [ftfFfCfX,\grave{I}f\ f\backslash bfh,\acute{I}\ A\check{Z}\check{Y},\grave{I},\mathfrak{a},\varpi,\grave{E}fOf\leftarrow\ [fv,\acute{E}\bullet^a,\text{---},\mathfrak{C},\acute{e},\acute{e}\ B$

$f\ f,\check{f}\check{S}^{\circ}z'u$ **Initialize**

$fNf\check{S}fbfv\ Ef\check{S}fXfg$ **GetClipList**
IsClipListChanged
SetClipList
SetHWND

$fnf^{\wedge}fhf\leftarrow$ **GetHWND**

IDirectDrawClipper $fCf^{\wedge}\ [ftfFfCfX,\acute{I}\ A,\cdot,\times,\check{A},\grave{I}COMfCf^{\wedge}\ [ftfFfCfX,\grave{I},\mathfrak{a},\varpi,\acute{E}=$
 $IUnknownfCf^{\wedge}\ [ftfFfCfX\ Ef\ f\backslash bfh,\delta\mathfrak{C}ep\ ^3,\cdot,\acute{e}\ B$ $IunknownfCf^{\wedge}\ [ftfFfCfX,\acute{I}\check{Z}\check{Y},\grave{I},R,\check{A},\grave{I}f\ f\backslash bfh,\delta fTf|$
 $[fg,\cdot,\acute{e}\ B$

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,È,æ,Á,Ä AfNfŠfbfv EfŠfXfg,lfTfufZfbfg,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:‰oÊ,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 ”, đŽg, Á, Ä ì ¬,³,ê,½ ê ±, ì %Šú%» ,đ s, □ B

¬Œ÷, ·, ê, Î DD_OK AŽ, ”s, ·, ê, Î ŽŸ, ì fGf% [,đ•Ö, · B

DDERR_ALREADYINITIALIZED

DDERR_INVALIDPARAMS

lpDD

DirectDrawIfufWfFfNfg, ì DirectDraw \“Œ‘Î, ì f|fCf“f^ B, ±, ì pf%of [f^, aNULL, ÉfZfbfg,³,ê,é,Æ A“Æ—
š, μ, ½ DirectDrawClipperIfufWfFfNfg, a ì ¬,³,ê,é B(**DirectDrawCreateClipper**ŠÖ ”, đ Žg, □, ì, Æ“™, μ, Œ)

dwFlags

, ±, ì pf%of [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, đ ì ¬, ·, é, ½, š, ÉŽg, í, ê, ½ ê ±, É, Í A, ±, ì f ffbfh, ì fGf% [,Æ, È, è A DDERR_ALREADYINITIALIZED, đ•Ö, · B

IDirectDrawClipper::Initialize, ÆCoCreateInstance, ì Žg—p, É, Ä, Œ, Ä, ì Ú ×, Í A uCoCreateInstance, đ—p, Œ

½DirectDrawClipperIfufWfFfNfg, Ì ì ¬ v, đŽQ 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 AŽ,”s,·,ê,ĨŽŸ,ĨfGf%o [,ð•Ô,· 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¬ċŽg—p,Ä A0,ÉfZfbfg,µ,Ä,¬,©,È,¬,ê,Ĩ,È,ç,È,ċ B

,·,Ä,ÉEfBf“fhfE Efnf“fhf,ªDirectDrawClipperfIfufWfFfNfg,ÆŠÖ~A,Ä,¬,ç,ê,Ä,ċ ,é ê ‡,Ĩ AfNfŠfbfv EfŠfXfg,ðfZfbfg,·,é,±,Æ,Ĩ,Ä,«,È,ċ B_

IDirectDrawSurface2::BltFast f\fbfh,É,æ,é•%œ,Ĩ AfNfŠfbfsf“fO,³,ê,È,ċ,±,Æ,É’ ^Ó,·,é B

,±,Ĩf f\fbfh,ÄŽg,í,ê,éRGNDATA \‘ċ‘İ,Ĩ AŽŸ,Ĩ,æ,ð,È•Ÿ—@,ÄŽg,ð B

```
typedef struct _RGNDATA {
    RGNDATAHEADER rdh;
    char          Buffer[1];
} RGNDATA;
```

RGNDATA \‘ċ‘İ,Ĩrdhf f“fo,Ĩ AŽŸ,Ĩ,æ,ð,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,ċ,Ä,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,Â 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,đ ì ¬,μfVfXfef€ EfƎfxf◁ĭ ”,Å“® ì,³,¹,é,É,Í AIDirectDrawPalettefCf“f^ [ftfFfCfX,ĭf f\fbfh,đŽg,▫ B,±,ĭ B,Í A,±,ĭfCf“f^ [ftfFfCfX,ĭf f\fbfh,É,Â,¢,Ä,ĭfŠftf@fƎf“fX,Å, ,é BŠT—v,É,Â,¢ ,Ä,Í A uDirectDrawPaletteIfufWfFfNfg v,đŽQ Æ,·,é,±,Æ B

IDirectDrawPalette fCf“f^ [ftfFfCfX,ĭf f\fbfh,Í AŽŸ,ĭ,æ,▫,ÈfOf◁ [fv,É•ª,¬,ς,ê,é B

f f,fŠ”z’u Initialize

fpfƎfbfg,ĭ”—Í GetCaps

fpfƎfbfg EfGf“fgfŠ GetEntries
SetEntries

IDirectDrawPalette fCf“f^ [ftfFfCfX,Í A,·,×,Ä,ĭ COMfCf“f^ [ftfFfCfX,ĭ,æ,▫,ÉIUnknownf f\fbfh,đƎp ³,·,é B IunknownfCf“f^ [ftfFfCfX,ÍŽŸ,ĭ3,Ä,ĭf f\fbfh,đfTf| [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,PfofCf g–^,Ä, ,é B,»,ê~ÈŠO,Í4fo
fCf g–^,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,“,·,±,Œ B

dwStartingEntry

fZfbfg,³,ê,é ‰,ß,Ä,lfGf“fgfŠ B

dwCount

•Ī X,³,ê,½pfŒfbfg EfGf“fgfŠ ” B

lpEntries

fpfŒfbfg EfGf“fgfŠ,ĪAfhfŒfX B,±,ĪpfŒfbfg EfGf“fgfŠ,Ī A DDPCAPS_8BITENTRIES

ftf‰fO,^afZfbfg,³,ê,é,Œ AfpfŒfbfg EfGf“fgfŠ,Ī,PfofCfg,Ä A,»,▯,Ä,È,Œ ê ‡,Ī4fofCfg,Ä, ,é BŠeftfB [f<f

h,Ī FŽw’è,ĪL q,^a,³,ê,é B

IDirectDrawPalette::SetEntries,đŽg—p,·,·,é‘O,É**IDirectDrawSurface2::SetPalette**

f f\fbfh,đŽg,Ä,Ä AfpfŒfbfg,đfAf^fbf`,μ,Ä,“,©,È,,Ä,Ī,É,Œ,Œ,Œ B

ŽQ Œ @**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(  
    LPDIRECTDRAW_SURFACE2 lpDDSAttachedSurface);
```

fT [ftFfX,ð,à,ð,Ð,Æ,Â,ÌfT [ftFfX,ÉfAf^fbf^,·,é B
-Œ÷,·,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,ÑfobfbN 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,ÌfobfbN Efofbtf@,Ö,Ì,Ÿ,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...
fŒ [fg,³,ê,½fT [ftFfX,Í AfGf~f...fŒ [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,«* 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);
```

$$\neg \mathbb{E} \div, \cdot, \hat{e}, \hat{I} \text{ DD_OK} \quad \mathbb{A} \check{Z}, "s, \cdot, \hat{e}, \hat{I} \check{Z} \check{Y}, \grave{I} f G f \% \quad [, \delta \cdot \hat{O}, \cdot \quad B$$

DDERR_UNSUPPORTED

fsfNfZf< EftfH [f}fbfg,Å,ÏAf<ftf@ îñ,© A,±,Ïuf fbfN“]—
 ,ÏAf<ftf@ Ef`fflf<,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,ÌpDDSAlphaSrc
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,·,éƎø%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’èç³,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 €”ðª,Ä,«é,©, ,é,¢,Í¼,ÌfGf%o [,ª” ¶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 AfBfBfXfvfÆfC Ef f,fŠ,©,çffBfXfvfÆfC Ef f,fŠ,Ö AfBfBfXfvfÆfC 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“]‘—Æ³fJf% [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,É,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—B,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,©,ç,Đ,Æ,Â,ì“— æ,Ö A,Ü,Æ,ß,Ä **IDirectDrawSurface2::Bl** ^— ,đŽÀ s,,:é B,±
,ìf f\fbfh,ÍĒ» Ý’èç`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‰ [,ð•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^,ð’èç`,·,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“]’—,³fTfW [,Ì ê ‡ A
DDERR_WASSTILLDRAWING•Ô’l,đ, ,®,É,Í•Ô,³, ,É•Ô,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 Efñ [fhfEfFfA,³Žg—p,³,ê,À,ċ,é ê ‡,É,Í A—¼ŽÔ,ÌŠÔ,ÀfXfs [fh,Ì ·Û,Í,É,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’Ô<@,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,Í%ð•ú,³,ê,È,¢ B
-Œ÷,·,ê,Î DD_OK AŽ,”s,·,ê,ÎŽŸ,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^,^NULL,İ ê ‡ AfAf^fbf`,³,ê,Ä,¢
,é,·,×,Ä,İfT [ftFfX,^ff^fbf`,³,ê,é B

IDirectDrawSurface2::AddAttachedSurface f\fbfh,É,æ,è—¾Ž,“I,ÉfAf^fbf`,µ,½fT [ftFfX,ðff^fbf`,·,é B,½,¾,µ
DirectDraw,^Ä—Ü“I,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““†,İ“¼fT [ftFfX,Í• X,³,ê,é%Ä”\ «,^, ,é Bf_t
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,^,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,³,ê,½fT [ftFfX,ÉfAf^fbf`,³,ê,Ä,č,é,·,×,Ä,lfT [ftFfX,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,³,ê,é AfAfvfŠfP [fVf‡f“,”è<,μ,½ \‘Œ‘İ,Ö,lf|fCf“f^ B

lpEnumSurfacesCallback

fAf^fbf`,³,ê,Ä,č,éfT [ftFfX-^,ÉŒÄ,Ñ o,³,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–,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,lfGf%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,lf|fCf“f^ B ,±,lfpf%of [f^,lffftfHf<fg,ÍNULL,Ä, ,è A,±
,l,Æ,«IDirectDrawSurface2::Flip,Ífofbftf@’†,ÄÆŸ,¢,ÉfAf^fbf`,³,ê,Ä,¢,é ‡,ÉfTfCfNf<,·,é B,±
,lfpf%of [f^,ÍfI [fo [f%ofCfh,Æ,µ,Ä,¾,¯Žg—p,³,ê,é B

dwFlags

DDFLIP_WAIT

ˆê”Ê,É AftfBfXfvfÇfC Efn [fhfEfFfA,Ì ó•Ô,“K Ø,Ä,È,-
ftfŠfbfsf“fO,Ì €”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,±
,lftf%ofO,ðfZfbfg,·,é,Æ A HAL,©,çDDERR_WASSTILLDRAWING
fGf%o [,ðŽó, Žæ,Ä,Ä,àIDirectDrawSurface2::Flip,ÍftfŠfbfsf“fO,µ,æ,□
,Æ,µ’±,¯,é B,»,l ê ‡IDirectDrawSurface2::Flip,ÍftfŠfbfsf“fO ^—
,ª -Æ÷,·,é,© A DDERR_SURFACEBUSY,l,æ,□
,È•Ê,lfGf%o [,ª•Ô,³,ê,é,Ü,Ä-B,ç,È,¢ B

,±,lf f\fbfh,ðÇÄ,Ñ o,·,±,Æ,ª,Ä,«,é,Ì,Í A DDSCAPS_FLIP,¯,æ,Ñ
DDSCAPS_FRONTBUFFER,ªfZfbfg,³,ê,½fT [ftFfX,¾,¯,Ä, ,é B,±
,lf 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 ”,lfofbfN Efofbftf@,ª, ,é ê ‡,ÍfŠf“fO,ªÇ` ¬,³,ê Aft [ftFfX Ef f,fŠ Efofbftf@,Í
IDirectDrawSurface2::Flip,ªÇÄ,Ñ o,³,ê,é,½,Ñ,Ê,»,lfŠf“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,±,lfpf%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,³,ê,½"—Í,ǎŽ ,Â AfAf^fbf`³,ê,½fT [ftFfX,ǎŽæ“¾,·,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`³,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`^İ A•i ”,İDirectDrawSurface fİfufWfFfNfg,ð•i ‡ \‘Œ‘İ,É Ú‘±,·,é,½,ß,ÉŽg—
p,³,ê,é B•i ‡ \‘Œ‘İ,İ AZfofbftf@,É,æ,é,R,cfy [fW EftfŠfbfsf“fO,İfTf| [fg,É•K—v,È,à,İ,È,Ç,Â, ,é B—
v< ,³,ê,½”—Í,ÉŒ© ‡,²fT [ftFfX,³,Ð,Æ,Â^É âfAf^fbf`³,ê,Ä,Œ,é,Æ A,±,İf f\fbfh,İŽ,”s,·,é B,±
,İ ê ‡ AfAvfŠfP [fVf‡f“,ÍfAf^fbf`³,ê,Ä,Œ
,éfT [ftFfX,ð“¾,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 [fhEfFfA, Ì ó‘Ô, ðŽæ“¾, ·, é B

*fuf fbfN“]‘—fn [fhEfFfA, “¶ Ý, ·, é, È, Ç DD_OK, ð•Ô, · Afuf fbfN“]‘—fn [fhEfFfA, “frfW [, È, Ç
DDERR_WASSTILLDRAWING Afuf fbfN“]‘—fn [fhEfFfA, “¶ 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, ▯, 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, ▯
, ©, 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, ▯, ©, 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);

ft [ftFfX,ì”\—Í,ðŽæ“¾,·,é B ,±,ê,ç,ì”\—Í,ÍffBfXfvfÆfC EfffofCfX,ì”\—Í,Æ,Í–ŠÖEW,Å,à,æ,¢ B
¬Æ÷,·,ê,Î DD_OK AŽ,”s,·,ê,ÎŽŸ,ÌfGf%o [,ð•Ô,· B

DDERR_INVALIDOBJECT

DDERR_INVALIDPARAMS

lpDDSCaps

ft [ftFfX,Ìfn [fhfEfFfA”\—Í,“ü,é **DDSCAPS** \‘¢‘Ì,ÌfAfhfÆfX B

IDirectDrawSurface2::GetClipper

HRESULT GetClipper(LPDIRECTDRAWCLIPPER FAR * lplpDDClipper);

,±,lfT [ftFfX,ÆŠÖ~A,Ã,¯,ç,ê,½ DirectDrawClipper fIfufWfFfNfg,ðŽæ“¾,·,é B

¬Æ÷,·,ê,Î DD_OK AŽ,”s,·,ê,ÎŽŸ,lfGf%o [,ð•Ô,· B

DDERR_INVALIDOBJECT

DDERR_INVALIDPARAMS

DDERR_NOCLIPPERATTACHED

lplpDDClipper

fT [ftFfX,ÆŠÖ~A,Ã,¯,ç,ê,½ DirectDrawClipper fIfufWfFfNfg,Ö,lf|fCf“f^,lfAfhfÆfX 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

\‘Œ‘İ,İfJf% [EfL [, ,é,Œ,İfuf fbfN“]‘—,É,“,Œ,Ä“]‘—
æfJf% [EfL [,Æ,µ,ÄŽg,í,ê,é F«óŠÔ,ðŽw'è,·,é B

DDCKEY_DESTOVERLAY

\‘Œ‘İ,İfJf% [EfL [, ,é,Œ,İfI [fo [EfŒfC ^— ,É,“,Œ,Ä“]‘—
æfJf% [EfL [,Æ,µ,ÄŽg,í,ê,é F«óŠÔ,ðŽw'è,·,é B

DDCKEY_SRCBLT

\‘Œ‘İ,İfJf% [EfL [, ,é,Œ,İfuf fbfN“]‘—,É,“,Œ,Ä“]‘—
Œ³fJf% [EfL [,Æ,µ,ÄŽg,í,ê,é F«óŠÔ,ðŽw'è,·,é B

DDCKEY_SRCOVERLAY

\‘Œ‘İ,İfJf% [EfL [, ,é,Œ,İfI [fo [fŒfC ^— ,É,“,Œ,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 \‘Œ‘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,Î DD_OK AŽ,”s,·,ê,îŽŸ,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,³•Ô,³,ê,éfnf“fhf<,Ö,ĭf|fCf“f^ B

,±,ĭf f\fbfh,Í AfT [ftFfX,ĭf fbfN,É**IDirectDrawSurface2::Lock**f f\fbfh,ĭ“à”fo [fWf±f“,đŽg—p,·,é B
fT [ftFfX,Í A**IDirectDrawSurface2::ReleaseDC**f f\fbfh,ªŒÄ,Ň o,³,ê,È,ŒŒÄ,è Af fbfN,ªŰŽ ,³,ê,é B

ŽQ Æ @**IDirectDrawSurface2::Lock**

IDirectDrawSurface2::GetDDInterface

HRESULT GetDDInterface(LPVOID FAR *lplpDD);

fT [ftfFfX,ð ì ¬,·,é,½,ß,ÉŽg—p,³,ê,½ DirectDraw fIfufWfFfNfg,Ö,lfCf“f^ [ftfFfCfX,ðŽæ“%₄,·,é B
¬Œ÷,·,ê,Î DD_OK AŽ,”s,·,ê,ÎŽŸ,lfGf%₀ [,ð•Ô,· B

DDERR_INVALIDOBJECT

DDERR_INVALIDPARAMS

lpDD
DirectDraw f|fCf“f^,ª•Ô,³,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,Î**IDirectDraw2**fCf“f^ [ftfFfCfX,©,ç'Ç%₀Á,³,ê,½,à,Ì,Å A **IDirectDraw**
fCf“f^ [ftfFfCfX,É,ÍŽÀ‘•,³,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**

IIDirectDrawSurface2::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,·,é fT [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,©,Ãfvf%ofCf}fŠ EfT [ftFfX,ª8
bppf, [fh,Ã,·,é ê ÷ AfVfXfef€ EfpfÇfbfg,Ö,İf|fCf“f^,ðŽ ,Ã B

ŽQ Æ @IIDirectDrawSurface2::SetPalette

IDirectDrawSurface2::GetPixelFormat

HRESULT GetPixelFormat(LPDDPIXELFORMAT lpDDPixelFormat);

fT [*ftfFfX*,*lfJf%* [,*ÆfsfNfZf*< *EftfH* [*f*]*fbfg*,*ðŽæ*“¾,·,é B
¬*Æ÷*,·,ê,Î DD_OK AŽ,”s,·,ê,îŽŸ,*lfGf%* [,*ð•Ô*,· B

DDERR_INVALIDOBJECT

DDERR_INVALIDPARAMS

DDERR_INVALIDSURFACETYPE

lpDDPixelFormat

«» Ÿ*fsfNfZf*<,î Ú × î•ñ,Æ*fT* [*ftfFfX*,î_F<óŠÔ *EftfH* [*f*]*fbfg*,î Ú ×,È<L q,*ðŽæ*“¾,·,é
DDPIXELFORMAT \‘*ç*î,Ö,*lf|fCf*“*f*^ B

IDirectDrawSurface2::GetSurfaceDesc

HRESULT GetSurfaceDesc(LPDDSURFACEDESC lpDDSurfaceDesc);

fT [ftFfX,ì€» Ý,ì ó'Ô,ð Žw'è,µ,½DDSURFACEDESC \‘¢'ì,ÉŽæ“¾,·,é B
¬€÷,·,ê,Î DD_OK AŽ,”s,·,ê,îŽÝ,ìfGf%o [,ð•Ô,· B

DDERR_INVALIDOBJECT

DDERR_INVALIDPARAMS

lpDDSurfaceDesc

fT [ftFfX,ì ó'Ô,ðŽæ“¾,·,éDDSURFACEDESC \‘¢'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,İ|fCf“f^ B

lpDDSurfaceDesc

fT [ftfFfX,É,Â,ċ,Ä,İ Ú × î•ñ,^a Ý’è,³ê,½ **DDSURFACEDESC** \‘ċ‘İ,Ö,İ|fCf“f^ B

,±,İf f\fbfh,ÍfRf“f| [flf“fg EfIfufWfFfNfg Ef,ffƒ< iCOM jfvf fgfRf<,ÉŠİ,Ä,«’ñ<Ÿ,³ê,é B
DirectDrawSurface fIfufWfFfNfg,İ ì ¬,³ê,½,Æ,«É %Šú%»,³ê,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,î”r¼“I,ÈfAfNfZfX,ðŽó,¬Žæ,Á,ĂŒ» ÝffBfXfvfŒfC EfJ [fh ã,ÉŠ,,,è“–,Ă,ç,ê,Ă,¢,éT [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,^a—v< ,³,ê,½ft [ftfFfX Ef f,fŠ,lf|fCf“f^,ð•Ö,·,±,Æ,“%oÂ”\
,È,Æ,«,ÉfCfxf“fg,ðì“@,·,éftf%ofo BfCfxf“fg Efnf“fhf<,^a**IDirectDrawSurface2::Lock**
,É“n,³,ê,Ä,ç,é ê ‡ AfZfbfg,³,ê,é B,±
,lf^fCfv,lf fbfN,^aft [ftfFfX ä,É•i ”, ,é,Æ,« AfCfxf“fg,ÍFIFO ‡,Â^ø,«N,±,³,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,³,È,¯,ê,İ,È,ç,È,ç,±,Æ,ð•\,·ftf%ofo B
<éÇ,^aŽw’è,³,ê,È,ç ê ‡ A^ê”Ö ä,lfT [ftfFfX,Ö,lf|fCf“f^,•Ö,³,ê,é B ffftHf<fg,Â,İ,±
,lf%ofo,ðŽw’è,·,é B

DDLOCK_WAIT

’Ê í Afuf fbfN“]‘— ^—
,^afrfW [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,“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,^a,Â,«,½ uŠÖ,ðfgfŠfK,Æ,·,éfVfXfef€ EfCfxf“fg,Ö,lfnf“fhf< B

f|fCf“f^,ðŽæ“¾,µ,½Çä A’Î%öž,·,é

IDirectDrawSurface2::Unlockf f\fbfh,ðÇÄ,Ñ o,·,Ü,Â AfAvfŠfP [fVf‡f“,ÍfT [ftfFfX Ef f,fŠ,ÉfAfNfZfX,·,
é,±,Æ,^a,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,³,ê,½ft [ftfFfX,İ—Îæ,Âfuf fbfN“]‘—,·,é,±,Æ,Í,Â,«,È,ç B
f fbfN,³,ê,½ft [ftfFfX ä,Âfuf 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,Âf fbfN,ðŽæ“¾,Â,«,È,ç ê ‡ A

IDirectDrawSurface2::Lock,ÍfGf%o [,ð•Ö,µ,Ä-ß,é B f fbfN,^aŽæ“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,ÉffBfXfvfCfC Ef f,fŠ,ªŽ,í,ê,é,İ,ð-h,®,½,ß A DirectDraw ,İ
IDirectDrawSurface2::Lock,,æ,Ñ **IDirectDrawSurface2::Unlock**‘€ ì,İŠÔ,É A Win16 f fbfN,ð•ÛŽ ,μ,Ä,¢,é B
Win16f fbfN,Í GDI ,ÆUSER,İfAfNfZfXŽÄ s,É,©,©,í,é d‘â,È•”ª,Ä, ,è A,±
,İfefNfjfbfN,É,æ,èffBfXfvfCfC 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**,©,ç
IDirectDrawSurface2::GetDC/**IDirectDrawSurface2::ReleaseDC**,İŠúŠÔ,Í,Ä,«,éCÄ,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

,±,ìfp‰of [f^,íE» Ý—¢Žg—p B0,ÉfZfbfg,μ,Ä,“,±,Æ B

f fbfN,ÍIfyf€ [fefBf“fO EfVfXfef€,ìpftfH [f}f“fX,É^«‰œ¿,ð—^,!,é B

*f fbfN EfJfEf“fg,Í,»,ê,¼,ê,ìfT [ftFfX,ì,½,ß,É•ÛŽ ,³,ê AIDirectDrawSurface2::PageLock€Ä,Ñ o,μ,ð,·,é,½,Ñ,
ÉfCf“fNfŠf f“fg,³,ê AIDirectDrawSurface2::PageUnlock,³€Ä,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,ðflfyf€ [fefBf“fO E
fVfXfef€,³fy [fWf“fO’î Û,Æ,Ä,«,é,æ,²,É,È,é B*

*,±,ìf f\fbfh,ÍfVfXfef€ Ef f,fŠ EfT [ftFfX ã,Ä,ì,Ÿ“® ì,·,é BffBfXfvf€fC Ef f,fŠ EfT [ftFfX, ,é,¢
,ÍfGf~f...f€ [fg,³,ê,½fvf‰ofCf}fŠ EfT [ftFfX,ðfy [fW Ef fbfN,·,é,±
,Æ,Í,Ä,«,È,¢ B,à,μffBfXfvf€fC Ef f,fŠ EfT [ftFfX ã,Ä,±,ìf f\fbfh,ð€Ä,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,Ä,«é,æ,µ,É,·,é B

¬€÷,·,ê,Î DD_OK ÄŽ,”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**(Ä,Ŧ o,µ,É,æ,Ä,ÄCf“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,lf 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,lfVfXfef€ 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,·,¾,¬,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,ÎŽÄ‘•,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

–Æ÷,·,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,ðÆÄ,Ñ o,μ,½ŽŽ,lfT [ftFfX,lf fbfN,%ð æ,³,ê,é B*

*ŽQ Æ @***IDirectDrawSurface2::GetDC**

IDirectDrawSurface2::Restore

HRESULT Restore();

Ž,Á,½fT [ftfFfX,ðfŠfXfgfA,·,é B ,±,ê,Í DirectDrawSurface
fIfufWfFfNfg,ÆŠÖ~A,Ä,¯,ç,ê,½fT [ftfFfX Ef f,fŠ,ª%ð•ú,³,ê,½,Æ,«” ¶,·,é B
¬Æ÷,·,ê,Î DD_OK AŽ,”s,·,ê,ÎŽŸ,ÌfGf% [,ð•Ö,· B

DDERR_GENERIC

DDERR_IMPLICITLYCREATED

DDERR_INCOMPATIBLEPRIMARY

DDERR_INVALIDOBJECT

DDERR_INVALIDPARAMS

DDERR_NOEXCLUSIVEMODE

DDERR_OUTOFMEMORY

DDERR_UNSUPPORTED

DDERR_WRONGMODE

ffBfXfvfÆfC EfJ [fh,Ìf, [fh•İ XŽž,â AfAfvfŠfP [fVf‡f“,ªffBfXfvfÆfC EfJ [fh,Ö,Ì”r¼AfNfZfX,ðŽó,¯
Žæ,Á,ÄÆ» ÝfJ [fh ã,ÉŠ,,,è“¬,Ä,ç,ê,Ä,¢
,éfT [ftfFfX Ef f,fŠ,Ì,·,×,Ä,ð%ð•ú,·,éŽž,É,Í AfT [ftfFfX,ªŽ,í,ê,é%Ä”\ «,ª, ,é B DirectDrawSurface
fIfufWfFfNfg,ª,»,ÌfT [ftfFfX Ef f,fŠ,ðŽ,·,Á,½,Æ,« A¼,·,Ìf f\fbfh,Í DDERR_SURFACELOST
,ð•Ö,µ A¼,Ì, ,ç,ä,é<@”\,ÌŽÄ s,ªs%Ä”\,É,È,é B
IDirectDrawSurface2::Restoref f\fbfh,ÍfT [ftfFfX Ef f,fŠ,ð ÄŠ,,,è“¬,Ä,µ A DirectDrawSurface
fIfufWfFfNfg,É,»,ê,ð ÄfAf^fbf`,·,·,é B

,±,Ìf f\fbfh,ÌÆÄ,Ń o,µ,ð s,²,Æ A DirectDrawSurface fIfufWfFfNfg,ÉŠÖ~A,Ä,¯,ç,ê,½^Ä–
Ü,ÌfT [ftfFfX ifofbfN Efofbftf@,È,Ç j,ªfŠfXfgfA,³,ê,é B ^Ä–
Ü~I,É ì,ç,ê,½fT [ftfFfX,ðfŠfXfgfA,·,éŽž,Ÿ,ÍfGf% [,Æ,È,é B
IDirectDrawSurface2::Restore,ÍDirectDrawSurface2::AddAttachedSurfacef f\fbfh,ðŽg—p,µ,Ä ì ¬,³,ê,½–
¾Ž,“I,ÈfAf^fbf`,Ü,Ä,ÍŽ©“®~I,ÉfŠfXfgfA,µ,È,¢ ì ,±,ê,ç,ÌfT [ftfFfX,Í,»,ê,¼,ê,ªÆÄ X,ÉfŠfXfgfA,³,¹,ç,ê,È,-
,Ä,Í,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*•*À*, *μ*, *Ä*, *¢*, *é* DirectDrawClipper
`*¢*•*Ì*, *Ìf|fCf“f^* B *à*, *μ*, *±*, *Ìfpf%of* [*f^*, *^f[f* , *È*, *¢*, *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, *·*, *¢*, *ã*, *éft* [*ftfFfX* *ã*, *ÄŽg*—*p*, *Ä*, *«*, *é* B DirectDrawClipper
fIfufWfFfNfg, *^fAf^fbf`*, *³*, *ê* A, *»*, *μ*, *ÄfNfŠfbfv* *EfŠfXfg*, *^*, *»*, *ê*, *ÆŒŒ*, *Ñ*•*t*, *—*, *¢*, *ê*, *½Œã* A DirectDrawClipper
fIfufWfFfNfg, *ÌIDirectDrawSurface2::Blt* A *IDirectDrawSurface2::BltBatch* A, *”*, *æ*, *Ñ*
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* ”%*ñŒã*, *Ñ* *o*, *³*, *½* *ê* *‡*, *Ä*, *à* A*fIfufWfFfNfg*, *ÌŽQ* *ÆfJfEf“fg*, *Í*, *P*, *μ*, *©*• %*o*Ä, *μ*, *È*, *¢* B
d•*j*], *·*, *éŒã*, *Ñ* *o*, *μ*, *Í* A*fIfufWfFfNfg*, *ÌŽQ* *ÆfJfEf“fg*, *É*%*oe*•*¿*, *đ*—*^*, *Ì*, *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,³,ê,½ DirectDrawPalette fIfuFWfFfNfg,đfT [ftfFfX,ÉfAf^fbf`,·,é B fT [ftfFfX,ÍÈ ~,ì ^— ,Ă,Í,±
,İfpfŒfbfg,đŽg—p,·,é B fpfŒfbfg•İ X,İfŠftfŒfbfVf... Ef^fCf~f“fO,ÉŠÖŒW,È,‘ Ě,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,Ă~A‘±

,μ,Ă ”‰ñŒĂ,Ň o,³,ê,½ ê ‡,Ă,à AfpfŒfbfg,İŽQ ŒfJfEf“fg,Í,P,Â‘ ‰Ă,·,é,¾,–,Ă, ,é B d•i,·,éŒĂ,Ň o,μ,İfp
fŒfbfg,İŽQ ŒfJfEf“fg,É‰œç,đ—^,‘,È,Œ B

ŽQ Œ @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%oÂ”,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*_o [*f*Ɛ*f*C *E**f*T [*f**t**f**F**f*X, ĹŽŠo‘@ «,đ’uŠ·,Ü,½,Í C ³,·,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

“]’—Ɛ³*f*T [*f**t**f**F**f*X,ª*f*I [*f*_o [*f*Ɛ*f*C,ĂŽg,□,~ A,™• ,~,æ,Ñ—Ĺæ,Ĺ ,,³,đ’èç,·,é **RECT** \‘ç’Ĺ,Ĺ*f*C*f*“*f*^ B

lpDDDestSurface

*f*I [*f*_o [*f*Ɛ*f*C,³,ê,Ă,ç,é DirectDraw *f*T [*f**t**f**F**f*X,Ĺ*f*|*f*C*f*“*f*^ B

lpDestRect

*f*I [*f*_o [*f*Ɛ*f*C,ª s,í,ê,é“]’— æ*f*T [*f**t**f**F**f*X,Ĺ ä,É,~ A,™• ,~,æ,Ñ—Ĺæ,Ĺ ,,³,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*_o [*f*Ɛ*f*C,³,ê,½*f*T [*f**t**f**F**f*X,É A X V,μ,È,¯,ê,Ĺ,È,ç,È,ç—
Ĺæ,đ%Ă,Ĺ,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*̀f*f*f*f*l*f*ç *E**f*T [*f**t**f**F**f*X,đ A,±
,Ĺ*f*I [*f*_o [*f*Ɛ*f*C,Ĺ“]’— æ*f*A*f*ç*f**t**f*@ *E**f*̀f*f*f*f*l*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*_o [*f*Ɛ*f*C,Ĺ“]’— æ*f*A*f*ç*f**t**f*@ *E**f*̀f*f*f*f*l*f*ç,Æ,μ,Ă**DDOVERLAYFX** \‘ç’Ĺ,Ĺ
dwAlphaDestConst *f* “*f*o,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*_o [*f*Ɛ*f*C,Ĺ“]’— æ*f*A*f*ç*f**t**f*@ *E**f*̀f*f*f*f*l*f*ç,Æ,μ,Ă**DDOVERLAYFX** \‘ç’Ĺ,Ĺ
lpDDAlphaDest *f* “*f*o,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*̀f*f*f*f*l*f*ç,Æ,μ,Ă**DDOVERLAYFX**
\‘ç’Ĺ,Ĺ **dwAlphaEdgeBlend** *f* “*f*o,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*̀f*f*f*f*l*f*ç *E**f*T [*f**t**f**F**f*X,đ A,±
,Ĺ*f*I [*f*_o [*f*Ɛ*f*C,Ĺ“]’—Ɛ³*f*A*f*ç*f**t**f*@ *E**f*̀f*f*f*f*l*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

,±,İfI [fo [fCfC,İ“]—C³fAf<ftf@ Ef`ffflf<,Æ,μ,Ä **DDOVERLAYFX**
 \‘C‘İ,İdwAlphaSrcConst f f“fo,ðŽg—p,·,é B

DDOVER_ALPHASRCNEG

fAf<ftf@‘l,İ‘ %oÁ,É,Â,ê“]—C³fT [ftfFfX,“§—¾%o»,·,é,±,Æ,ð·\,· i0,Í•s“§—¾ j B

DDOVER_ALPHASRCSURFACEOVERRIDE

,±,İfI [fo [fCfC,İfAf<ftf@ Ef`ffflf<C¹,Æ,μ,Ä **DDOVERLAYFX** \‘C‘İ,İlpDDSAlphaSrc
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

,±,İfI [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,İfJf%o [EfL [,Æ,μ,Ä **DDOVERLAYFX** \‘C‘İ,İdckDestColorkey
f f“fo,ðŽg—p,·,é B

DDOVER_KEYSRC

]“—C³fT [ftfFfX,ÆC<,Ñ•t,¯,ç,ê,½fJf%o [EfL [,ðŽg—p,·,é B

DDOVER_KEYSRCOVERRIDE

]“—C³fT [ftfFfX,İfJf%o [EfL [,Æ,μ,Ä **DDOVERLAYFX** \‘C‘İ,İdckSrcColorkey
f f“fo,ðŽg—p,·,é B

DDOVER_SHOW

,±,İfI [fo [fCfC,ðfIf“,É,·,é B

DDOVER_ZORDER

,±,İfI [fo [fCfC,İZfI [f_ [,Æ,μ,Ä **DDOVERLAYFX** \‘C‘İ,İdwZOrderFlags 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‘İ,ðŽQ Æ,·,é,±,Æ B

IDirectDrawSurface2::UpdateOverlayDisplay

HRESULT UpdateOverlayDisplay(DWORD dwFlags);

—LÆø,È,·,×,Ä,İfI [fo [fÆfC,İ,ı,ç A X V,μ,È,—,ê,İ,È,ç,È,¢«éÆ`,İfŠfXfg,Ä«éÆ`,ð Ä•`%øæ,·,é B,Û,½ A ^—
,ª İ,í,é,Æ,»,İ«éÆ`fŠfXfg,ðfNfŠfA,·,é B,±,İf f\fbfh,İf\ftfgfEfFfA EfGf~f...fÆ [fVf‡f“Žž,İ,Y—
LÆø,Ä Afñ [fhfEfFfA,ÄfI [fo [fÆfC,ªfTf| [fg,³,ê,Ä,¢,é ê ‡ A%½,à,μ,È,¢ B

—Æ÷,·,ê,İ DD_OK AŽ,”s,·,ê,İŽŸ,İfGf%ø [,ð•Ô,· B

DDERR_INVALIDOBJECT

DDERR_INVALIDPARAMS

DDERR_INVALIDSURFACETYPE

DDERR_UNSUPPORTED

dwFlags

^— ,·,×,« X Vf^fCfv B^È%º,İftf%øfO,İ,ı,ç,Đ,Æ,Ä,İ'l,ðŽæ,é B

DDOVER_REFRESHDIRTYRECTS

,±,İ“]‘— æ,İ,½,ß,É‘O,à,Ä,Ä—p^Ó,μ,½ X V,·,×,««éÆ`,İfŠfXfg,ðŽg—
p,μ,Ä AftfBfXfvfÆfC,ð X V,·,é B,Û,½ A,»,İ«éÆ`fŠfXfg,ðfNfŠfA,·,é B

DDOVER_REFRESHALL

X V,·,×,««éÆ`,İfŠfXfg,ð—³Ž<,μ,Ä AfI [fo [fÆfC EfftBfXfvfÆfC,ðŠ@‘S,É X V,·,é B
,Û,½ A,»,İ«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%O,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_SENDTOFRONT

,±,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,³,ê,éDirectDraw fT [*ftfFX*,İf|fCf“f^ B,±
,İfpf%of [*f*^,Í DDOVERZ_INSERTINBACKOF,“,æ,Ń DDOVERZ_INSERTINFRONTOF ,¼,¬,İ,½,ß,É•K—
v,Æ,³,ê,é B

ŽQ Æ @**IDirectDrawSurface2::EnumOverlayZOrders**

١٤٩

DDBLTBATCH

```
typedef struct _DDBLTBATCH{
    LPRECT          lprDest;
    LPDIRECTDRAW SURFACE lpDDSrc;
    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

lpDDSrc

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@ îñ, ,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@ îñ, ,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

$fuf\ fbfN["']\text{---}\ \text{æfT}\ [ftfFfX\ \tilde{a},\tilde{l}fuf\ fbfN["']\text{---}\ \text{æ}^{\acute{e}}\mathbb{E}\text{'},\delta\text{--}\tilde{z},\frac{1}{2},\cdot\ RGB\ F,\mathbb{A},\mu,\tilde{A}\ A\ \underline{\text{DDBLTFX}}\ \backslash^{\text{'}}\mathfrak{C}'\tilde{l},\tilde{l}\ \underline{\text{dwFillColor}}\ f\ f^{\text{'}}fo,\delta\tilde{Z}g\text{---}p,\cdot,\acute{e}\ B$

DDBLT_DDFX

$,\pm,\tilde{l}fuf\ fbfN["']\text{---},\tilde{A}\tilde{Z}g\text{---}p,\cdot,\acute{e}\mathbb{E}\theta\%{\hat{E}},\delta\tilde{Z}w'\text{'},\cdot,\acute{e}\ \underline{\text{DDBLTFX}}\ \backslash^{\text{'}}\mathfrak{C}'\tilde{l},\tilde{l}\ \underline{\text{dwDDFX}}\ f\ f^{\text{'}}fo,\delta\tilde{Z}g\text{---}p,\cdot,\acute{e}\ B$

DDBLT_DDROPS

$\text{Win32 API},\tilde{l}^{\text{'}}\hat{e}\bullet,\tilde{A},\mathbb{E},\mathbb{C}f\%ofXf^{\wedge}\ \hat{\text{---}}\ i\ \text{ROPs}\ j,\delta\tilde{Z}w'\text{'},\cdot,\acute{e},\frac{1}{2},\mathbb{B},\acute{E}\underline{\text{DDBLTFX}}\ \backslash^{\text{'}}\mathfrak{C}'\tilde{l},\tilde{l}\ \underline{\text{dwDDROPS}}\ f\ f^{\text{'}}fo,\delta\tilde{Z}g\text{---}p,\cdot,\acute{e}\ B$

DDBLT_KEYDEST

$fuf\ fbfN["']\text{---}\ \text{æfT}\ [ftfFfX,\mathbb{A}\mathbb{E}\mathbb{C},\tilde{N}\bullet t,\text{---},\mathfrak{C},\hat{e},\frac{1}{2}fJf\% [E fL\ [\delta\tilde{Z}g\text{---}p,\cdot,\acute{e}\ B$

DDBLT_KEYDESTOVERRIDE

$fuf\ fbfN["']\text{---}\ \text{æfT}\ [ftfFfX,\tilde{l}fJf\% [E fL\ [\mathbb{A},\mu,\tilde{A}\ \text{ADDBLTFX}\ \backslash^{\text{'}}\mathfrak{C}'\tilde{l},\tilde{l}\ \underline{\text{dckDestColorkey}}\ f\ f^{\text{'}}fo,\delta\tilde{Z}g\text{---}p,\cdot,\acute{e}\ B$

DDBLT_KEYSRC

$fuf\ fbfN["']\text{---}\mathbb{E}^3fT\ [ftfFfX,\mathbb{A}\mathbb{E}\mathbb{C},\tilde{N}\bullet t,\text{---},\mathfrak{C},\hat{e},\frac{1}{2}fJf\% [E fL\ [\delta\tilde{Z}g\text{---}p,\cdot,\acute{e}\ B$

DDBLT_KEYSRCOVERRIDE

$\hat{i}\hat{n}\mathbb{E}^3fT\ [ftfFfX,\tilde{l}fJf\% [E fL\ [\mathbb{A},\mu,\tilde{A}\ \text{ADDBLTFX}\ \backslash^{\text{'}}\mathfrak{C}'\tilde{l},\tilde{l}\ \underline{\text{dckSrcColorkey}}\ f\ f^{\text{'}}fo,\delta\tilde{Z}g\text{---}p,\cdot,\acute{e}\ B$

DDBLT_ROP

$,\pm,\tilde{l}fuf\ fbfN["']\text{---},\tilde{l}\ \text{ROP},\tilde{l},\frac{1}{2},\mathbb{B},\acute{E}\ \underline{\text{DDBLTFX}}\ \backslash^{\text{'}}\mathfrak{C}'\tilde{l},\tilde{l}\ \underline{\text{dwROP}}\ f\ f^{\text{'}}fo,\delta\tilde{Z}g\text{---}p,\cdot,\acute{e}\ B\ \text{ROP},\acute{I}\ \text{Win32 API},\tilde{A}'\text{'},\hat{e}\text{'},\cdot,\acute{e},\hat{a},\tilde{l},\mathbb{A}\text{---},\P,\tilde{A},\cdot,\acute{e}\ B$

DDBLT_ROTATIONANGLE

$fT\ [ftfFfX,\tilde{l}\%{\hat{n}}["']\tilde{S}p\ i1/100\text{'x'P}^{\hat{E}},\tilde{A}\tilde{Z}w'\text{'},\cdot,\acute{e},\hat{e}\ j,\mathbb{A},\mu,\tilde{A}\ \text{ADDBLTFX}\ \backslash^{\text{'}}\mathfrak{C}'\tilde{l},\tilde{l}\ \underline{\text{dwRotationAngle}}\ f\ f^{\text{'}}fo,\delta\tilde{Z}g\text{---}p,\cdot,\acute{e}\ B$

DDBLT_ZBUFFER

$fuf\ fbfN["']\text{---}\mathbb{E}^3,\text{---},\mathfrak{a},\tilde{N}fuf\ fbfN["']\text{---}\ \text{æfT}\ [ftfFfX,\acute{E}fAf^{\wedge}fbf^{\text{'}},\cdot,\hat{e},\frac{1}{2}Zfofbftf@,\delta\tilde{Z}g\text{---}p,\mu,\tilde{A}\ Zfofbftf@E fuf\ fbfN["']\text{---},\delta\tilde{Z}\tilde{A}\ s,\cdot,\acute{e}\ B\ \underline{\text{DDBLTFX}}\ \backslash^{\text{'}}\mathfrak{C}'\tilde{l},\tilde{l}\ \underline{\text{dwZBufferOpCode}}\ f\ f^{\text{'}}fo,\delta\ Zfofbftf@E fIfyfR\ [fh,\mathbb{A},\cdot,\acute{e}\ B$

DDBLT_ZBUFFERDESTCONSTOVERRIDE

$\underline{\text{DDBLTFX}}\ \backslash^{\text{'}}\mathfrak{C}'\tilde{l},\tilde{l}\ \underline{\text{dwZDestConst}},\delta["']\text{---}\ \text{æ}\ Zfofbftf@,\acute{E}\tilde{Z}g\text{---}p,\mu,\tilde{A}\ AZfofbftf@E fuf\ fbfN["']\text{---},\delta\tilde{Z}\tilde{A}\ s,\cdot,\acute{e}\ B\text{---}\ \backslash^{\text{'}}\mathfrak{C}'\tilde{l},\tilde{l}\ \underline{\text{dwZBufferOpCode}}\ f\ f^{\text{'}}fo,\delta["']\text{---}\ \text{æ}\ Zfofbftf@E fIfyfR\ [fh,\mathbb{A},\cdot,\acute{e}\ B$

DDBLT_ZBUFFERDESTOVERRIDE

$\underline{\text{DDBLTFX}}\ \backslash^{\text{'}}\mathfrak{C}'\tilde{l},\tilde{l}\ \underline{\text{lpDDSZBufferDest}},\delta["']\text{---}\ \text{æ}\ Zfofbftf@,\acute{E}\tilde{Z}g\text{---}p,\mu,\tilde{A}\ AZfofbftf@E fuf\ fbfN["']\text{---},\delta\tilde{Z}\tilde{A}\ s,\cdot,\acute{e}\ B\text{---}\ \backslash^{\text{'}}\mathfrak{C}'\tilde{l},\tilde{l}\ \underline{\text{dwZBufferOpCode}}\ f\ f^{\text{'}}fo,\delta["']\text{---}\ \text{æ}\ Zfofbftf@E fIfyfR\ [fh,\mathbb{A},\cdot,\acute{e}\ B$

DDBLT_ZBUFFERSRCCONSTOVERRIDE

$\underline{\text{DDBLTFX}}\ \backslash^{\text{'}}\mathfrak{C}'\tilde{l},\tilde{l}\ \underline{\text{dwZSrcConst}},\delta["']\text{---}\mathbb{E}^3Zfofbftf@,\acute{E}\tilde{Z}g\text{---}p,\mu,\tilde{A}\ AZfofbftf@E fuf\ fbfN["']\text{---},\delta\tilde{Z}\tilde{A}\ s,\cdot,\acute{e}\ B\text{---}\ \backslash^{\text{'}}\mathfrak{C}'\tilde{l},\tilde{l}\ \underline{\text{dwZBufferOpCode}}\ f\ f^{\text{'}}fo,\delta["']\text{---}\ \mathbb{E}^3Zfofbftf@E fIfyfR\ [fh,\mathbb{A},\cdot,\acute{e}\ B$

DDBLT_ZBUFFERSRCOVERRIDE

$\underline{\text{DDBLTFX}}\ \backslash^{\text{'}}\mathfrak{C}'\tilde{l},\tilde{l}\ \underline{\text{lpDDSZBufferSrc}},\delta["']\text{---}\mathbb{E}^3Zfofbftf@,\acute{E}\tilde{Z}g\text{---}p,\mu,\tilde{A}\ AZfofbftf@E fuf\ fbfN["']\text{---},\delta\tilde{Z}\tilde{A}\ s,\cdot,\acute{e}\ B\text{---}\ \backslash^{\text{'}}\mathfrak{C}'\tilde{l},\tilde{l}\ \underline{\text{dwZBufferOpCode}}\ f\ f^{\text{'}}fo,\delta["']\text{---}\ \mathbb{E}^3Zfofbftf@E fIfyfR\ [fh,\mathbb{A},\cdot,\acute{e}\ B$

lpDDBltFx

$'\mathfrak{C}'\%{\hat{A}},\cdot,\hat{e},\frac{1}{2}fuf\ fbfN["']\text{---}\mathbb{E}\theta\%{\hat{E}},\delta\tilde{Z}w'\text{'},\cdot,\acute{e}\ \underline{\text{DDBLTFX}}\ \backslash^{\text{'}}\mathfrak{C}'\tilde{l},\tilde{l}f|Cf^{\text{'}}f^{\wedge}\ B$

```
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;
    LPDIRECTDRAW SURFACE lpDDSZBufferDest;
};
    DWORD dwZSrcConstBitDepth;
union
{
    DWORD dwZSrcConst;
    LPDIRECTDRAW SURFACE lpDDSZBufferSrc;
};
    DWORD dwAlphaEdgeBlendBitDepth;
    DWORD dwAlphaEdgeBlend;
    DWORD dwReserved;
    DWORD dwAlphaDestConstBitDepth;
union
{
    DWORD dwAlphaDestConst;
    LPDIRECTDRAW SURFACE lpDDSAAlphaDest;
};
    DWORD dwAlphaSrcConstBitDepth;
union
{
    DWORD dwAlphaSrcConst;
    LPDIRECTDRAW SURFACE lpDDSAAlphaSrc;
};
union
{
    DWORD dwFillColor;
    DWORD dwFillDepth;
    LPDIRECTDRAW SURFACE lpDDSPattern;
};
DDCOLORKEY ddckDestColorkey;
DDCOLORKEY ddckSrcColorkey;
} DDBLTFX, FAR* LPDDBLTFX;
```

$$\begin{array}{l} \textbf{dwSize} \\ \backslash\!\!{\rm C}\,\grave{\rm I},\grave{\rm I}\acute{\rm a},\ll^3\ B,\pm,\grave{\rm l}\!f\ f\!{}^{\circ}\!{\rm o},\acute{\rm I}\ \backslash\!\!{\rm C}\,\grave{\rm I},^{\rm a}\check{\rm Z}\!g,\acute{\rm i},\acute{\rm e},\acute{\rm e}'\!{\rm O},\acute{\rm E}\ \acute{\rm Y}\grave{\rm e},^3,\hat{\rm e},\check{\rm A},\P,\acute{\rm E},,\check{\rm A},\acute{\rm I},\acute{\rm E},_{\rm c},\acute{\rm E},\P\ B \\ \textbf{dwDDFX} \\ \mathfrak{E}\emptyset\%{\acute{\rm E}}\ ^{-}\ ,\grave{\rm l}\!f\wedge\!f\!c\!f\!v,\delta\check{\rm Z}\!w'\acute{\rm e},\cdot,\acute{\rm e}\!f\!t\!f\%\!o\ {\rm B} \\ \textbf{DDBLTFX_ARITHSTRETCHY} \\ \ ,\pm,\grave{\rm l}\!f\!u\!f\ f\!b\!f\!N\!{}^{\circ}\![\!-\!,\acute{\rm E},\ddot{\cdot},\P,\check{\rm A},^{\rm TM}\check{\rm Z}^2,\acute{\rm E}\%{\wedge},\check{\rm A},\check{\rm A}\%\%\check{\rm Z}\check{\rm Z}\ L'\cdot,\delta\check{\rm Z}\!g\!-\!\!p,\cdot,\acute{\rm e}\ B \\ \textbf{DDBLTFX_MIRRORLEFTRIGHT} \\ \ ,^{\rm TM}\check{\rm Z}^2\ \tilde{\alpha},\check{\rm A}\!f\!T\ [f\!t\!f\!F\!f\!X,\delta\%{\rm o}\tilde{\rm n}\!{}^{\circ}\!],\cdot,\acute{\rm e}\ B,\pm,\grave{\rm l}\!f\!u\!f\ f\!b\!f\!N\!{}^{\circ}\![\!-\!,\acute{\rm I}\!f\!T\ [f\!t\!f\!F\!f\!X]]\end{array}$$

DDBLTFX_MIRRORUPDOWN

,Ž² 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“],^{3,1},é B

DDBLTFX_ROTATE270

,±,ìfuf fbfN“]‘—,ìŠÔ,ÉfT [ftFfX,ðŽžĈv%õñ,è,Å270“x%õñ“],^{3,1},é B

DDBLTFX_ROTATE90

,±,ìfuf fbfN“]‘—,ìŠÔ,ÉfT [ftFfX,ðŽžĈv%õñ,è,Å90“x%õñ“],^{3,1},é B

DDBLTFX_ZBUFFERBASEDEST

,±,ìfuf fbfN“]‘—,ìŠÔ,É A”ăŠr,·,é‘O,ìfuf fbfN“]‘—Ĉ³,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“]‘—
Ĉ³fT [ftFfX,©,ç·i » ,μ,½frfbfg,ìĈÀŠE,ðŽw’è,·,é”ÍÍ‘l,Æ,μ,ĀdwZBufferLow,“,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@”ăŠr 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 ”,ìfrfbfg [“x B

dwZDestConst

fuf fbfN“]‘— æZfofbftf@,Æ,μ,ĀŽg—p,³,ê,é’è ” B

lpDDSZBufferDest

fuf fbfN“]‘— æZfofbftf@,Æ,μ,ĀŽg—p,³,ê,éT [ftFfX B

dwZSrcConstBitDepth

fuf fbfN“]‘—Ĉ³,š’è ”,ìfrfbfg [“x B

dwZSrcConst

fuf fbfN“]‘—Ĉ³Zfofbftf@,Æ,μ,ĀŽg—p,³,ê,é’è ” B

DDSZBufferSrc

fuf fbfN“]‘—Ĉ³Zfofbftf@,Æ,μ,ĀŽg—p,³,ê,éT [ftFfX B

dwAlphaEdgeBlendBitDepth

fAf<ftf@ EfGfbfW EfufĈf“fh,ì,½,ß,ìfrfbfg [“x’è ” B

dwAlphaEdgeBlend

fGfbfW ¬ ‡,ì,½,ß,ÉŽg,í,ê,½fAf<ftf@’è ” B

dwReserved

«—,ì,½,ß,É—\—ñ,³,ê,Ā,ç,é B

dwAlphaDestConstBitDepth

fuf fbfN“]‘— æfAf<ftf@’è ”,ìfrfbfg [“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,³,ê,éT [ftfFfX B

dwAlphaSrcConstBitDepth

fuf fbfN“]‘—Æ³fAf<ftf@’è ”,ìfrfbfg [“x B

dwAlphaSrcConst

fuf fbfN“]‘—Æ³fAf<ftf@ Ef`ffflf<,Ì,½,ß,ÉŽg,í,ê,é’è ” B

lpDDSAAlphaSrc

fuf fbfN“]‘—Æ³fAf<ftf@ Ef`ffflf<,Æ,μ,ÄŽg—p,³,ê,éT [ftfFfX B

dwFillColor

DDBLT_COLORFILL,“Žw’è,³,ê,éŽŽ AfT [ftfFfX,ð•â [,·,é,½,ß,ÉŽg—p,³,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“]‘—Æ³,Æfuf fbfN“]‘—
æ,ðfAf^fbf`,·,é“Á’è,Ìfuf fbfN“]‘—‘€ ì,ÉŽg—p,³,ê,é B

ddckDestColorkey

—D æ,·,éfuf fbfN“]‘— æfJf%o [EfL [B

ddckSrcColorkey

—D æ,·,éfuf fbfN“]‘—Æ³fJf%o [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 ,±,İ \‘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,¾,ê,½fT [ftfFfX,İ,·,×,Ä,ð ì,é,±,Æ,Í•s%Ä”\,È%Ä”\ «,à, ,é B ,±,İ \‘ç‘İ,İ

IDirectDraw2::GetCaps, ,æ,Ñ **IDirectDrawPalette::GetCaps** f\fbfh,ÄŽg—p,³,é,é B

dwSize

\`Ç`İ,İ`â,«,³ B ,±,İf f“fo,Í \`Ç`İ,`aŽg,í,ê,é`O,É Ý`è,³,ê,È,,Ä,Í,È,ç,È,Ç B

dwCaps

fhf%oCfo“Á`è”—Í,ð, ,ç,í,·ftf%oO B

DDCAPS_3D

ffBfXfvfÇfC Efn [fhEfFfA,^aR,cfAfNfZf%oÇ [fVf±f“,ðŽ ,Á,Ä,Ç,é,±,Æ,ð•\,· B

DDCAPS_ALIGNBOUNDARYDEST

DirectDraw,İfuf fbfN“]‘—Ç³éÇ`İ Ä•W,Í A **dwAlignBoundaryDest**
,İ”{ ”,Ä, ,é ê ±,İ,Ý,ðfTf| [fg,·,é,±,Æ,ð•\,· B

DDCAPS_ALIGNBOUNDARYSRC

DirectDraw,İfuf fbfN“]‘—Ç³éÇ`İ Ä•W,Í A **dwAlignBoundarySrc**,İ”{ ”,Ä, ,é ê ±,İ,Ý,ðfTf|
[fg,·,é,±,Æ,ð•\,· B

DDCAPS_ALIGNSIZEDEST

DirectDraw ,^afofCfçP`Ê,Ä,İ,~Ž•ûÇü,İ`â,«,³,^a**dwAlignSizeDest**,İ”{ ”,Ä, ,é ê ±,İfuf fbfN“]‘—
Ç³éÇ`İ,¾,_,ðfTf| [fg,·,é,±,Æ,ð•\,· B

DDCAPS_ALIGNSIZESRC

DirectDraw ,^afofCfçP`Ê,Ä,İ,~ûÇü,İ`â,«,³,^a**dwAlignSizeSrc**,İ”{ ”,Ä, ,é ê ±,İfuf fbfN“]‘—
Ç³éÇ`İ,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 [ftfFfX,ð ì ¬,·,é,±,Æ,ð•\,· B

DDCAPS_ALPHA

fuf fbfN“]‘—‘€ ì,İŠÔ AffBfXfvfÇfC Efn [fhEfFfA,^aAf<ftf@ Ef`fff|f<,ðfTf|
[fg,·,é,±,Æ,ð•\,· B

DDCAPS_BANKSWITCHED

ffBfXfvfÇfC Efn [fhEfFfA,^aof“fN Ø,è`Ö,İ,Ä, ,è AffBfXfvfÇfC Ef f,fŠ,İf%of“f_fÇ
EfAfNfZfX,„ñ í,É`x,Ç%oÂ”\ «,^a, ,é,±,Æ,ð•\,· B

DDCAPS_BLT

ffBfXfvfÇfC Efn [fhEfFfA,İfuf fbfN“]‘—‘€ ì,^a,Ä,«,^a,é,±,Æ,ð•\,· B

DDCAPS_BLTCOLORFILL

ffBfXfvfÇfC Efn [fhEfFfA,^afuf fbfN“]‘—,ÄJf%o [EftfBf<,^a,Ä,«,^a,é,±,Æ,ð•\,· B

DDCAPS_BLTDEPTHFILL

ffBfXfvfÇfC Efn [fhEfFfA,^afuf fbfN“]‘—,ÄZfobftf@ [“x•â [,^a,Ä,«,^a,é,±,Æ,ð•\,· B

DDCAPS_BLTFOURCC

ffBfXfvfÇfC Efn [fhEfFfA,^afuf fbfN“]‘—,Ä_FóŠÔ•İŠ<,^a,Ä,«,^a,é,±,Æ,ð•\,· B

DDCAPS_BLTQUEUE

ffBfXfvfÇfC Efn [fhEfFfA,„ñ“~Šúfuf fbfN“]‘—,^a,Ä,«,^a,é,±,Æ,ð•\,· B

DDCAPS_BLTSTRETCH

fuf fbfN“]‘—‘€ ì,Ä AffBfXfvfÇfC Efn [fhEfFfA,^aL`·,Ä,«,^a,é,±,Æ,ð•\,· B

DDCAPS_CANBLTSYSMEM

ffBfXfvfÇfC Efn [fhEfFfA,^aVfXfefÇ Ef f,fŠ,É, ,é,Ç
,İfVfXfefÇ Ef f,fŠ,©,çfuf fbfN“]‘—,Ä,«,^a,é,±,Æ,ð•\,· B

DDCAPS_CANCLIP

ffBfXfvfÇfC Efn [fhEfFfA,^afuf fbfN“]‘—,ÄNfŠfbfsf“fO,Ä,«,^a,é,±,Æ,ð•\,· B

DDCAPS_CANCLIPSTRETCHED

ffBfXfvfÇfC Efn [fhEfFfA,^aA L`·fuf fbfN“]‘—’†,ÉfNfŠfbfsf“fO,Ä,«,^a,é,±,Æ,ð•\,· B

DDCAPS_COLORKEY

fI [fo [fÇfC,Û,½,İfuf fbfN“]‘—‘€ ì,İ,Ç,,è,©,ÄJf%o [EfL [İ,Ç,,Ä,©,İÇ`Ž®,ðfTf|
[fg,·,é B`Ä`è,İJf%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_DESTBLTCLRSPACE

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_DESTBLTCLRSPACEYUV

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_DESTOVERLAYCLRSPEACE

RGB F,lfuf fbfN“]‘— æfJf%o [EfL [,Æ,µ,Ä F<óŠÔ,ðfTf| [fg,.,é B

DDCKEYCAPS_DESTOVERLAYCLRSPEACEYUV

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_NOCOSTOVERLAY

fi [fo [fŒfC,ÄfJf%o [EfL [,ðŽg—p,.,é,±,Æ,É‘î,µ,Ä ^— ‘¬“x,É%œ<ç,ª,È,¢,±,Æ,ð•\,· B

DDCKEYCAPS_SRCBLT

RGB FfT [ftfFfX,lfuf fbfN“]‘—Œ³fJf%o [EfL [,É,æ,é“\$%ßŒ^fuf fbfN“]‘—,ðfTf|
[fg,.,é B

DDCKEYCAPS_SRCBLTCLRSPEACE

RGB FfT [ftfFfX,lfuf fbfN“]‘—Œ³ F<óŠÔ,É,æ,é“\$%ßŒ^fuf fbfN“]‘—,ðfTf| [fg,.,é B

DDCKEYCAPS_SRCBLTCLRSPEACEYUV

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_SRCOVERLAYCLRSPEACE

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_SRCOVERLAYCLRSPEACEYUV

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,±
,è,Í A,™Z² i ,¼,É j,É%o^,Ä,Ä s,í,è,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,™Ž² i ,¼,É j,É%ˆ,Ä,Ä s,í,ê A ® ””{ i’1, ’2, İ,æ,ϱ,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

,Ž² i ...¼ j,É%ˆ,Ä,ÄfT [ftfFfX,ð”CˆÓ,É k ¬,·,é,±,Æ,ðfTf| [fg,·,é B,±
,İftf%oO,İfuf fbfN“]‘—‘€ ì,İ,Ý,É—LÆø,Ä, ,é B

DDFXCAPS_BLTSHRINKXN

,Ž² i ...¼ j,É%ˆ,Ä,ÄfT [ftfFfX,ð ® ”ª,İˆ i’1/2 A’1/3,İ,æ,ϱ,É j,Ä k ¬,·,é,±,Æ,ðfTf|
[fg,·,é B,±,İftf%oO,İfuf fbfN“]‘—‘€ ì,İ,Ý,É—LÆø,Ä, ,é B

DDFXCAPS_BLTSHRINKY

,™Ž² i ,¼ j,É%ˆ,Ä,ÄfT [ftfFfX,ð”CˆÓ,É k ¬,·,é,±,Æ,ðfTf| [fg,·,é B,±
,İftf%oO,İfuf fbfN“]‘—‘€ ì,İ,Ý,É—LÆø,Ä, ,é B

DDFXCAPS_BLTSHRINKYN

,™Ž² i ,¼ j,É%ˆ,Ä,ÄfT [ftfFfX,ð ® ”ª,İˆ i’1/2 A’1/3,İ,æ,ϱ,É j,Ä k ¬,·,é,±,Æ,ðfTf|
[fg,·,é B,±,İftf%oO,İfuf fbfN“]‘—‘€ ì,İ,Ý,É—LÆø,Ä, ,é B

DDFXCAPS_BLTSTRETCHX

,Ž² i ...¼ j,É%ˆ,Ä,ÄfT [ftfFfX,ð”CˆÓ,ÉŠg‘â,·,é,±,Æ,ðfTf| [fg,·,é B,±
,İftf%oO,İfuf fbfN“]‘—‘€ ì,İ,Ý,É—LÆø,Ä, ,é B

DDFXCAPS_BLTSTRETCHXN

,Ž² i ...¼ j,É%ˆ,Ä,ÄfT [ftfFfX,ð ® ””{ i’1, ’2, İ,æ,ϱ,É j,ÄŠg‘â,·,é,±,Æ,ðfTf|
[fg,·,é B,±,İftf%oO,İfuf fbfN“]‘—‘€ ì,İ,Ý,É—LÆø,Ä, ,é B

DDFXCAPS_BLTSTRETCHY

,™Ž² i ,¼ j,É%ˆ,Ä,ÄfT [ftfFfX,ð”CˆÓ,ÉŠg‘â,·,é,±,Æ,ðfTf| [fg,·,é B,±
,İftf%oO,İfuf fbfN“]‘—‘€ ì,İ,Ý,É—LÆø,Ä, ,é B

DDFXCAPS_BLTSTRETCHYN

,™Ž² i ,¼ j,É%ˆ,Ä,ÄfT [ftfFfX,İ ® ””{ i’1, ’2, İ,æ,ϱ,É j,ÄŠg‘â,·,é,±,Æ,ðfTf|
[fg,·,é B,±,İftf%oO,İfuf 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,™Ž² 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,™Ž² i ,¼ j,É%ˆ,Ä,Ä s,í,ê A ® ””{ i’1, ’2, İ,æ,ϱ,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

,Ž² i ...¼ j,É%ˆ,Ä,ÄfT [ftfFfX,ð”CˆÓ,É k ¬,·,é,±,Æ,ðfTf| [fg,·,é B,±,İftf%oO,İ
DDSCAPS_OVERLAY fT [ftfFfX,İ,Ý,É—LÆø,Ä, ,é B,±,İftf%oO,İfT [ftfFfX,İ”
İ,¾,¬,ðŽ,µ A k ¬,%Ä”\,Ä, ,é,±,Æ,ðª,³,È,¢ B

DDFXCAPS_OVERLAYSHRINKXN

,TMZ² i ...½ j,É%[^],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",Ä, ,é,±,Æ,ð·\,³,È,¢ B

DDFXCAPS_OVERLAYSHRINKY

,TMZ² i ,¼ j,É%[^],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",Ä, ,é,±,Æ,ð·\,³,È,¢ B

DDFXCAPS_OVERLAYSHRINKYN

,TMZ² i ,¼ j,É%[^],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",Ä, ,é,±,Æ,ð·\,³,È,¢ B

DDFXCAPS_OVERLAYSTRETCHX

,TMZ² i ...½ j,É%[^],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",Ä, ,é,±,Æ,ð·\,³,È,¢ B

DDFXCAPS_OVERLAYSTRETCHXN

,TMZ² i ...½ j,É%[^],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",Ä, ,é,±,Æ,ð·\,³,È,¢ B

DDFXCAPS_OVERLAYSTRETCHY

,TMZ² i ,¼ j,É%[^],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",Ä, ,é,±,Æ,ð·\,³,È,¢ B

DDFXCAPS_OVERLAYSTRETCHYN

,TMZ² i ,¼ j,É%[^],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",Ä, ,é,±,Æ,ð·\,³,È,¢ B

dwFXAlphaCaps

fhf%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@ îñ,ðfTf| [fg,·,é B fsfNfZf< EftfH [f]
fbfg,Ä,ÌfAf<ftf@ îñ,Ìfxfbfg ["x,Í,P A,Q A,S A, ,é,¢,Í,W,Ä, ,é B
fAf<ftf@'l,Í' %Ä,·,é,É,Ä,è,Ä·s"§—¾,É,È,é B
fAf<ftf@ îñ,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@ îñ,ðfTf| [fg,·,é B fsfNfZf< EftfH [f]
fbfg,Ä,ÌfAf<ftf@ îñ,Ìfxfbfg ["x,Í,P A,Q A,S A, ,é,¢,Í,W,Ä, ,é B
fAf<ftf@'l,Í' %Ä,·,é,É,Ä,è,Ä·s"§—¾,É,È,é B
fAf<ftf@ îñ,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,±,±,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,Ìfxfbfg ["x,Í,P A,Q A,S A, ,é,¢,Í,W,Ä, ,è"¾,é B
fAf<ftf@'l,Í' %Ä,·,é,É,Ä,è,Ä·s"§—¾,É,È,é B
fAf<ftf@ îñ,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<,^a AfAf<ftf@'l,ì' %oÁ,É,Â,ê,Ä“§-¾,É,È,é,±,Æ,ð\,· B
fAf<ftf@ Ef^ffflf< Eft [f^,Ì [“x,Í,P A,Q A,S A, ,é,¢,Í,W,Ä, ,é B
fAf<ftf@ î•ñ,Ì [“x,É,©,©,í,ç,, A,O,^a,Ä,Ë,ÉŠ@‘S,É•s“§-¾,È'l,Ä, ,é B,±,Ìftf%ofo,ÍDDCAPS_
ALPHASURFACES,^afZfbfg,³,ê,½ ê ‡,ÉCEÄ,èfZfbfg,·,é,±,Æ,^a,Ä,«,é B
fuf fbfN“]‘—€ ì,Ì,½,ß,ÉŽg—p,³,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,³,ê,é B

DDFXALPHACAPS_OVERLAYALPHAIXELS

fsfNfZf< EftfH [f}fbfg,ÄfAf<ftf@ î•ñ,ðfTf| [fg,·,é B fsfNfZf< EftfH [f}
fbfg,Ä,ÌfAf<ftf@ î•ñ,ÌfRfbfg [“x,Í,P A,Q A,S A, ,é,¢,Í,W,Ä, ,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,^a,Ä,Ë,ÉŠ@‘S,É“§-¾,È'l,Ä, ,é B fI [fo [f€fC,Ì,½,ß,ÉŽg—
—p,³,ê,é B

DDFXALPHACAPS_OVERLAYALPHAIXELSNEG

fsfNfZf< EftfH [f}fbfg,ÄfAf<ftf@ î•ñ,ðfTf| [fg,·,é B fsfNfZf< EftfH [f}
fbfg,Ä,ÌfAf<ftf@ î•ñ,ÌfRfbfg [“x,Í,P A,Q A,S A, ,é,¢,Í,W,Ä, ,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,^a,Ä,Ë,ÉŠ@‘S,É•s“§-¾,È'l,Ä, ,é B,±,Ìftf%ofo,ÍDDCAPS_
ALPHAIXELS,^afZfbfg,³,ê,½ ê ‡,ÉCEÄ,èŽg,±,±,Æ,^a,Ä,«,é B fI [fo [f€fC,Ì,½,ß,ÉŽg—
p,³,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,Ä, ,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,^a,Ä,Ë,ÉŠ@‘S,É“§-¾,È'l,Ä, ,é B fI [fo [f€fC,Ì,½,ß,ÉŽg—
—p,³,ê,é B

DDFXALPHACAPS_OVERLAYALPHASURFACESNEG

fAf<ftf@ Ef^ffflf<,^a AfAf<ftf@'l,ì' %oÁ,É,Â,ê,Ä“§-¾,É,È,é,±,Æ,ð\,· B
fAf<ftf@ Ef^ffflf< Eft [f^,Ì [“x,Í,P A,Q A,S A, ,é,¢,Í,W,Ä, ,é B
fAf<ftf@ î•ñ,Ì [“x,É,©,©,í,ç,, A,O,^a,Ä,Ë,ÉŠ@‘S,É•s“§-¾,È'l,Ä, ,é B,±,Ìftf%ofo,ÍDDCAPS_
ALPHASURFACES,^afZfbfg,³,ê,½ ê ‡,ÉCEÄ,èfZfbfg,·,é,±,Æ,^a,Ä,«,é B
fI [fo [f€fC,Ì,½,ß,ÉŽg—p,³,ê,é B

dwPalCaps

fpf€fbfg”—Í,ð\,·ftf%ofo B

DDPCAPS_1BIT

fCf“fffbfNfX,^aPfRfbfg,Ä, ,é,±,Æ,ð\,· B fJf%o [Efe [fuf<,É2,Ä,Ì €—Ú,^a, ,é B

DDPCAPS_2BIT

fCf“fffbfNfX,^aQfRfbfg,Ä, ,é,±,Æ,ð\,· B fJf%o [Efe [fuf<,É4,Ä,Ì €—Ú,^a, ,é B

DDPCAPS_4BIT

fCf“fffbfNfX,^aSfRfbfg,Ä, ,é,±,Æ,ð\,· B fJf%o [Efe [fuf<,É16,Ì €—Ú,^a, ,é B

DDPCAPS_8BIT

fCf“fffbfNfX,^aWfRfbfg,Ä, ,é,±,Æ,ð\,· B fJf%o [Efe [fuf<,É256,Ì €—Ú,^a, ,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,^afsfNfZf< i bpp j—,É,WfRfbfg,Ä, ,é ê ‡,É—
L€ø,Ä, ,é B,»,è,¼,è,Ì F €—Ú,“,³,PfofCfG,Ä, ,è Afuf fbfN“]‘— æfT [ftfFfX ä,Ì,W bpp
fpf€fbfg,ÌfCf“fffbfNfX,Ä, ,é B

DDPCAPS_ALLOW256

,±,Ìfpf€fbfg,^a256,Ì €—Ú,·,×,Ä,ð'è<,Ä,«,é,±,Æ,ðŽ',· B

DDPCAPS_PRIMARYSURFACE

fpf€fbfg,^afvf%oCf}fŠ Eft [ftfFfX,ÉfAf^fbf`³,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%æ‘æ(,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,fŠ |ffBfXfvfĖfC Ef f,fŠfuf fbfN“]‘—,ìfhf%oCfo”\—Í B
dwSVBCKeyCaps
 fVfXfefĖ Ef f,fŠ |ffBfXfvfĖfC Ef f,fŠfuf fbfN“]‘—,ìfhf%oCfofJf%o [EfL [ĖÝŠ· « B
dwSVBFXCaps
 fVfXfefĖ Ef f,fŠ |ffBfXfvfĖfC Ef f,fŠfuf fbfN“]‘—,ìfhf%oCfoFXĖÝŠ· « B
dwSVBRops[DD_ROP_SPACE]
 fVfXfefĖ Ef f,fŠ |ffBfXfvfĖfC Ef f,fŠfuf fbfN“]‘—,ìf%oXf^ ^— fTf| [fg B
dwVSBCaps
 fffBfXfvfĖfC Ef f,fŠ |fVfXfefĖ Ef f,fŠfuf fbfN“]‘—,ìfhf%oCfo”\—Í B
dwVSBCKeyCaps
 fffBfXfvfĖfC Ef f,fŠ |fVfXfefĖ Ef f,fŠfuf fbfN“]‘—,ìfhf%oCfofJf%o [EfL [ĖÝŠ· « B
dwSVBFXCaps
 fffBfXfvfĖfC Ef f,fŠ |fVfXfefĖ Ef f,fŠfuf fbfN“]‘—,ìfhf%oCfoFXĖÝŠ· « B
dwVSBRops[DD_ROP_SPACE]
 fffBfXfvfĖfC Ef f,fŠ |fVfXfefĖ Ef f,fŠfuf fbfN“]‘—,ìf%oXf^ ^— fTf| [fg B
dwSSBCaps
 fVfXfefĖ Ef f,fŠ |fVfXfefĖ Ef f,fŠfuf fbfN“]‘—,ìfhf%oCfo”\—Í B
dwSSBCKeyCaps
 fVfXfefĖ Ef f,fŠ |fVfXfefĖ Ef f,fŠfuf fbfN“]‘—,ìfhf%oCfofJf%o [EfL [ĖÝŠ· « B
wSSBCFXCaps
 fVfXfefĖ Ef f,fŠ |fVfXfefĖ Ef f,fŠfuf fbfN“]‘—,ìfhf%oCfoFXĖÝŠ· « B
dwSSBRops[DD_ROP_SPACE]
 fVfXfefĖ Ef f,fŠ |fVfXfefĖ Ef f,fŠfuf 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“]‘—Ė³fJf%o [EfL [,à,μ,,Ífuf fbfN“]‘— æfJf%o [EfL [,Æ,È,é F<óŠÔ,ðŽw’è,.,é B
,à,μ ãĖÀ,Æ%o°ĖÀ,Ì”ÍÍl,“““,¶,Ä, ,é,È,ç AfJf%o [EfL [,Æ,μ,ÄŽw’è,³,ê,é B ,±,Ì \‘ċ‘İ,Í
IDirectDrawSurface2::GetColorKey,“,æ,Ń IDirectDrawSurface2::SetColorKey f\fbfh,ÄŽg,í,ê,é B*

dwColorSpaceLowValue

fJf%o [EfL [,Æ,μ,Ä—p,ç,ç,ê,é F”ÍÍ,Ì%o°ĖÀ’l B

dwColorSpaceHighValue

fJf%o [EfL [,Æ,μ,Ä—p,ç,ç,ê,é F”ÍÍ,Ì ãĖÀ’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\bfbh,É“n,³,ê,éI [fofŒfC î•ñ 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 EfufŒf“fhŒW ”,ðŽw’è,·,é,½,ß,ÉŽg—p,³,ê,érfbfg [“x B

dwAlphaEdgeBlend

fAf<ftf@ EfGfbfW EfufŒf“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,ìfAfhfŒfX B

dwAlphaSrcConstBitDepth

fuf fbfN“]‘—Œ³,ìfAf<ftf@’è ”,ðŽw’è,·,é,ì,ÉŽg—p,³,ê,érfbfg [“x B

dwAlphaSrcConst

fuf fbfN“]‘—Œ³,ìfAf<ftf@ Ef`ffflf<,Æ,µ,ÄŽg,í,ê,é’è ” B

lpDDSAAlphaSrc

fuf fbfN“]‘—Œ³,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“]‘—Œ³fJf%o [EfL [B

dwDDFX

fI [fo [fŒfC FXftf%oO 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,İ½,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,Prfbfg A,Qrfbfg A,Srfbfg, ,é,¢,İ,Wfrfbfg,ÄfCf“fffbfNfX,³,ê,Ä,¢,é B

DDPF_PALETTEINDEXEDTO8

$fT \left[ftfFX, \hat{I}, Pf_{rfbf}g \ A, Q_{frfbf}g, , \acute{e}, \text{¢}, \hat{I} \right. \\ \left. , S_{frfbf}g, \hat{I} \ F, \delta, W_{frfbf}g \ E_{pf\text{¢}fbf}g, \acute{E}fCf \text{“} ffbfNfX, \mu, \ddot{A}, \text{¢}, \acute{e} \ B \right.$

DDPF_RGB

$fsNfZf< \ EftfH \ [f]fbf g \ \backslash \text{¢} \hat{I}, \ddot{A}, \hat{I}RGB \ ff \ [f^{\wedge}, \acute{I} \text{—} L\text{¢}\emptyset, \ddot{A}, , \acute{e} \ B$

DDPF_RGBTOYUV

$fT \left[ftfFX, \hat{I}RGB \ ff \ [f^{\wedge}, \delta \acute{Z} \acute{o}, \text{“} \ddot{u}, \hat{e}, \ddot{A} \ A, \rangle, \mu, \ddot{A} \ \text{‘}, \langle, \pm, \acute{Y} \ \hat{\text{—}} \ , \hat{I}\acute{S}\hat{O}, \acute{E}YUV \right. \\ \left. ff \ [f^{\wedge}, \acute{E} \cdot \hat{I}\acute{S} \cdot, \cdot, \acute{e} \ B \ \text{‘}, \langle, \pm, \acute{Y}, \hat{I}ff \ [f^{\wedge}, \hat{I}ftfH \ [f]fbf g, \hat{I}fsfNfZf< \ EftfH \ [f] \right. \\ \left. fbfg \ \backslash \text{¢} \hat{I}, \acute{E}\acute{S}\ddot{U}, \ddot{U}, \hat{e}, \acute{e} \ B \ DDPF_RGB \ ftf\%fO, \text{¢}, \grave{a}, \acute{E}fZfbfg, ^3, \hat{e}, \grave{E}, \text{“}, \hat{e}, \hat{I}, \grave{E}, \text{¢}, \grave{E}, \text{¢} \ B \right.$

DDPF_YUV

$fsNfZf< \ EftfH \ [f]fbf g \ \backslash \text{¢} \hat{I}, \ddot{A}, \hat{I}YUV \ ff \ [f^{\wedge}, \acute{I} \text{—} L\text{¢}\emptyset, \ddot{A}, , \acute{e} \ B$

DDPF_ZBUFFER

$Zfofbftf@ \ \hat{e} \text{—} pfT \left[ftfFX, \hat{I}fsfNfZf< \ EftfH \ [f]fbf g, \acute{A} \text{<} L \ q, ^3, \hat{e}, \acute{e} \ B \right.$

dwFourCC

$FourCC \ fR \ [fh \ B$

wRGBBitCount

$fsNfZf<\text{“}, \hat{I}RGB \ frfbfg \ i4, 8, 16, 24, , \acute{e}, \text{¢}, \hat{I}32 \ j \ B$

dwYUVBitCount

$fsNfZf<\text{“}, \hat{I}YUV \ frfbfg \ iDDBD_4 \ A \ DDBD_8 \ A \ DDBD_16 \ A \ DDBD_24 \ A, , \acute{e}, \text{¢}, \hat{I}DDBD_32 \ j \ B$

dwZBufferBitDepth

$Zfofbftf@ \ Efrfbfg \ [\text{“}x \ i8, 16, 24, , , \acute{e}, \text{¢}, \hat{I}32 \ j \ B$

dwAlphaBitDepth

$fAf<ftf@ \ Ef^ffflf< \ Efrfbfg \ [\text{“}x \ iDDBD_1 \ A \ DDBD_2 \ A \ DDBD_4 \ A, , \acute{e}, \text{¢}, \hat{I}DDBD_8 \ j \ B$

dwRBitMask

$\hat{O}frfbfg, \hat{I}f\}fXfN \ B$

dwYBitMask

$,xf_{rfbf}g, \hat{I}f\}fXfN \ B$

dwGBitMask

$\text{—}\hat{I}frfbfg, \hat{I}f\}fXfN \ B$

dwUBitMask

$,tf_{rfbf}g, \hat{I}f\}fXfN \ B$

dwBBitMask

$\hat{A}frfbfg, \hat{I}f\}fXfN \ B$

dwVBitMask

$,uf_{rfbf}g, \hat{I}f\}fXfN \ B$

dwRGBAlphaBitMask

$fAf<ftf@ \ Ef^ffflf<, \hat{I}f\}fXfN \ B$

dwYUVAAlphaBitMask

$fAf<ftf@ \ Ef^ffflf<, \hat{I}f\}fXfN \ B$

DDSCAPS

```
typedef struct _DDSCAPS{
    DWORD dwCaps;
} DDSCAPS, FAR* LPDDSCAPS;
```

DirectDrawSurface fIfufWfFfNfg, l" — Í, ð'è<, ·, é B , ±, l \ 'ç'ì, l DirectDraw fIfufWfFfNfg, l" — Í, ð<L q, ·, é, ½, ß, ÉŽg, í, è, é DDCAPS \ 'ç'ì, l'ê•", Å, , é B

dwCaps

fT [ftfFfX, l" — Í, ð<, · B `È%° , lftf%oO, l, ð, ç, Ð, Æ, Å, Û, 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, ^ AfAfvfŠfP [fVf±f" , Í'ã, í, è, É A
DDSCAPS_3DDEVICE ftf%oO, ðŽg, ð, ×, «, Å, , é B

DDSCAPS_3DDEVICE

, ±, l'fT [ftfFfX, ^, R, c\«» — p, É — ~ — p%Å" , È, ±, Æ, ð<, · B
fAfvfŠfP [fVf±f" , lftfofCfX, ^"K Ø, Èfq [fv, ©, çŠ„, è“—
 , Å, ç, è, ½fIfTfXfNfŠ [f" EfT [ftfFfX, ðŽ , Å, Å, ç, é A“Å'è, l'fq [fv, l, Ý, ð\«» , ·, é, ±
 , Æ, ^, Å, «, é, ±, Æ, ð•Û Ø, ·, é, ½, ß, È A, ±, lftf%oO, ðŽg — p, ·, é, ±, Æ, ^, Å, «, é B , à, µ, ±
 , lftf%oO, ^fq [fv, l, ½, ß, ÉfZfbfg, ³, è, Å, ç, é, È, ç AfT [ftfFfX, l, » , l'fq [fv, ©, çŠ„, è“— , Å, ç, è, È, ç B

DDSCAPS_ALLOCONLOAD

fT [ftfFfX, ^IDirect3DTexture::Loadf f\fbfh, É, æ, Å, Äf [fh, ³, è, é, Û, Å AfT [ftfFfX, Éf f, f
Š, ðŠ„, è“— , Å, È, ç, Æ, ç, ðŽw'è B

DDSCAPS_ALPHA

, ±, l'fT [ftfFfX, ^fAf<ftf@ îñ, ðŠÛ, ñ, Å, ç, é, ±, Æ, ð<, · B fsfNfZf< EftfH [f]fbfg, l, ±
 , l'fT [ftfFfX, ^, ½, ¾fAf<ftf@ îñ, , é, ç, l'fsfNfZf< Fff [f^ iRGBA , , é, ç, l'YUVA, l, æ, ð
 , È j, Æ ¬ ±, ³, è, ½fAf<ftf@ îñ, ¾, ^ , ðŠÛ, 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, ^fT [ftfFfX EftfŠfbfsf"fo \ 'ç'ì, l'fofbfN Efofbftf@, Å, , é, ±, Æ, ð<, · B
 ^è"È, É, ±, lftf%oO, l DDSCAPS_FLIPftf%oO, ^Žg—
 p, ³, è, ½IDirectDraw2::CreateSurface f\fbfh, É, æ, Å, Ä Ý'è, ³, è, é BDDSCAPS_FRONTBUFFERf
 T [ftfFfX, æ, è'¼ Û æ s, ·, éfT [ftfFfX, ¾, ^ , ±, 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, l'Ê±" @, É, æ, èfofbfN Efofbftf@, Æ, µ, Ä" F'm, ³, è, é B , ±, l" — Í, ^
 IDirectDraw2::CreateSurface f\fbfh, É' — , ç, è, é, Æ A“Æ—
 §«^, l'fofbfN Efofbftf@, ^ î ¬, ³, è, é B , ±, l'f f\fbfh, ^«È, Ñ o, ³, è, ½«È A, ±
 , l'fT [ftfFfX, l AfT [ftfFfX EftfŠfbfsf"fo \ 'ç'ì, 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, ÉfA^fbf` , ·, é, ±, Æ, ^, Å, «, é B Û ×, l
 IDirectDrawSurface2::AddAttachedSurface, ðŽQ Æ, ·, é, ±, Æ B DirectDraw
 , lftfŠfbfsf"fo \ 'ç'ì, Å" C^Ö, l " , l'fT [ftfFfX, ðfTf| [fg, ·, é B

DDSCAPS_COMPLEX

·i ±fT [ftfFfX, ^<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 EfT [ftfFfX, ÉfAf^fbf` , ³, è, é B ·i ± \ 'ç'ì, l, ½, ¾f< [fg, ð"jŠü, ·, é, ±
 , Æ, È, æ, Å, Ä"jŠü, ·, é, ±, Æ, ^, Å, «, é B

DDSCAPS_FLIP

, ±, l'fT [ftfFfX, ^fT [ftfFfXftfŠfbfsf"fo \ 'ç'ì, l'ê•", Å, , é, ±, Æ, ð<, · B , ±, l" — Í, ^
 IDirectDraw2::CreateSurface f\fbfh, É"n, ³, è, é, Æ, « A, Ð, Æ, Å, l'ftf f"fg Efofbftf@, ^, æ, Ñ, Ð,
 Æ, Å È ã, l'fofbfN Efofbftf@, ^ î ¬, ³, è, é B DirectDraw
 , l'ftf f"fg Efofbftf@, lDDSCAPS_FRONTBUFFERf\fbfg, ^, æ, Ñftf f"fg Efofbftf@, É—
 × Û, µ, Å, ç, éfT [ftfFfX, l DDSCAPS_BACKBUFFERf\fbfg, ðfZfbfg, ·, é B , ±
 , lftf%oO, ðŽw'è , ·, é è ± ADDSURFACEDESC \ 'ç'ì, l dwBackBufferCountf f"fo, l , È, -
 , Æ, à, P, ÉfZfbfg, µ, È, ^ , è, l, ç, ^ , È, ç B IDirectDraw2::CreateSurface f\fbfh, ðŽg — p, µ, Å
 '½ " , l'fT [ftfFfX, ð î, èŽŽ A í, ÈDDSCAPS_COMPLEXftf%oO, ðfZfbfg, µ, È, ^, Å, l, È, ç, È, ç B

DDSCAPS_FRONTBUFFER

, ±, l'fT [ftfFfX, ^fT [ftfFfX EftfŠfbfsf"fo \ 'ç'ì, l'ftf f"fg Efofbftf@, Å, , é, ±, Æ, ð<, · B , ±
 , lftf%oO, l'è"È, É DDSCAPS_FLIP" — Í, ^fZfbfg, ³, è, ½, Æ, «

IDirectDraw2::CreateSurface f\fbfh,É,æ,Á,ÄfZfbfg,³,é,é B
IDirectDraw2::CreateSurface f\fbfh,ðŽg—p,μ,½ ê ‡,Í“Æ—
§E^ftf f“fg Efofbftf@,^a 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,Ä¼,ìfobfN Efofbftf@,ÉfAf^fbf` ,Ä,« ,é B

DDSCAPS_HWCODEC

,±,ìfT [ftfFfX,^afn [fhEfFfA,É,æ,Á,Ä³ k%ð æ,³,é,½fXfgfŠ [f€,ðŽ ,Ä,±,Æ,^a,Ä,« ,é,±
,Æ,ð·,· B

DDSCAPS_LIVEVIDEO

,±,ìfT [ftfFfX,^af%oCfu Efrffl,ÌŽó,¬Žæ,è,%Ä”\,Ä ,é,±,Æ,ð·,· B

DDSCAPS_MIPMAP

,±,ìfT [ftfFfX,^aPfCefxf<,ìf~fbfvf}fbfv,Ä ,é,±,Æ,ð·,· B ,±,ìfT [ftfFfX,Íf~fbfvf}
fbfv,ðE` ¬,·,é,½,ß,É¼,ÌDDSCAPS_MIPMAP fT [ftfFfX,ÉfAf^fbf`³,é,é B,±
,é,Í A¼ ”,ìfT [ftfFfX,ð i,èIDirectDrawSurface2::AddAttachedSurface f\fbfh,ðŽg—p,·,é,±
,Æ,Ä¾Ž,“Í,É s,í,ê,é,© A ,é,¢,Í IDirectDraw2::CreateSurface f\fbfh,ðŽg—p,·,é,±,Æ,ÄÄ—
Ü“Í,É s,í,ê,é B ,à,μ,±,ìftf%o,ðfZfbfg,·,é,È,¢ A DDSCAPS_TEXTURE,àfZfbfg,μ,È,-
,Ä,Í,É,ç,È,¢ B

DDSCAPS_MODEX

,±,ìfT [ftfFfX,^a320’200 ,é,¢,Í 320’240,ìf, [fhX10 (f, [fhX) fT [ftfFfX,Ä ,é,±,Æ,ð·,· B

DDSCAPS_OFFSCREENPLAIN

,±
,ìfT [ftfFfX,^afI [fo [fCfC AfefNfXf`ff AZfobftf@ Af tf f“fg Efofbftf@ AfobfN
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,^afI [fo [fCfC,Ä ,é,±,Æ,ð·,· B E» Ý Ä %
,ìfT [ftfFfX,ÉfI [fo [fCfC,³,é,Ä,¢,é,©,Ç,©,É,æ,Ä,Ä A%ÄŽ<,Ä ,é,© A,»,□,Ä,È,¢
,©,“E^Ü,é B DDSCAPS_VISIBLE ,Í AfT [ftfFfX,“E» ÝfI [fo [fCfC,³,é,Ä,¢,é,©,Ç,□
,©”»f,·,é,½,ß,ÉŽg,□,±,Æ,^a,Ä,« ,é B

DDSCAPS_OWNDC

,±,ìfT [ftfFfX,^a·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,èè“Ó“Í,ÈDirectDrawPalette flufWfFfNfg,ð ì ¬,μ,Ä,±
,ìfT [ftfFfX,ÉfAf^fbf` ,Ä,« ,é,±,Æ,ð·,· B

DDSCAPS_PRIMARYSURFACE

,±,ìfT [ftfFfX,^afv%oCf}fŠ EfT [ftfFfX,Ä ,é,±,Æ,ð·,· B ,±,ìfT [ftfFfX,%ÄŽ<,Ä ,é,±
,Æ,ðÖ—i,·,é B

DDSCAPS_PRIMARYSURFACELEFT

,±,ìfT [ftfFfX,^a ¶—p,ìfv%oCf}fŠ EfT [ftfFfX,Ä ,é,±,Æ,ð·,· B ,±
,ìfT [ftfFfX,Í† [fU,ì ¶—Ü,ÉE©,·,é,à,ì,ì“à—e,ð·,· B ,±,ìfT [ftfFfX,^a i,ç,ê,éŽž A
DDSCAPS_PRIMARYSURFACEftf%o,ðŽ ,Ä,Ä,¢,éfT [ftfFfX,Í AÄÜ,ì,□,ç,É%E—Ü—
p,ìfv%oCf}fŠ EfT [ftfFfX,Æ%ðŽß,³,é,é B

DDSCAPS_SYSTEMMEMORY

,±,ìfT [ftfFfX Ef f, fŠ,^afvfXfef€ 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,^a,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,^affBfXfvfCfC Ef f, fŠ,É¶ Ý,·,é,±,Æ,ð·,· B

DDSCAPS_VISIBLE

,±,ìfT [ftfFfX,É·Í,μ,Ä s,í,ê,é·Í X,^a“ Ä,É%æ—È,É”½%o,³,é,é,±,Æ,ð·,· B,Ä,È,Éfvf%oCf}
fŠ EfT [ftfFfX,ÉfZfbfg,³,é,é B

DDSCAPS_WRITEONLY

*f*T [ftfFfX,^a ‘,«,[±],Ý ê—p,Æ,È,é,[±],Æ,ð•\,· B
*f*T [ftfFfX,©,ç,Ì“Ç,Ý o,μfAfNfZfX,^a~ê”Ê•ÛŒì i,f,o j—áŠO,ð ¶ ¬,·,é%oÂ”\ «,à, ,é B,[±]
,ÌfT [ftfFfX,©,ç,Ì“Ç,Ý o,μŒç%oÊ,Ì“à—e,Í•Û Ø,³,ê,È,¢ B

DDSCAPS_ZBUFFER

,[±],ÌfT [ftfFfX,^aZfofbftf@,Â, ,é,[±],Æ,ð•\,· B Zfofbftf@,Í•Ž',Â,«È,¢ î•ñ,ðŠÛ,ñ,Â,¢
,é BfsfNfZfç,Ì%oA—Ê ÁçŽ“™,É—~—p,³,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 \‘ç‘ì,íIDirectDraw2::CreateSurfacef f\fbfh,É“n,³,ê,é B
“K Ø,Èf f“fo,Í,»,ê,¼,ê,ìf^fCfv,ìfT [ftFfX,É,æ,è“Ü,È,é 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,,Ä,Í,È,ç,È,ç B

dwFlags

*fIfvfVf±f“ §Çäftf%o B ^È%°,ìftf%oO,Ì,□,¿,Đ,Æ,Â,Ü,½,Í•i ”,ì‘® «,ðŽ ,Â B \‘ç‘ì,ì,Ç,ìf f“fo,ª—
LÇø,È,ì,©Žw’è,·,é B*

DDSD_ALL

“ü—Í,³,ê,½,·,×,Ä,ìf f“fo,ª—LÇø,Â, ,é,±,Æ,ð•\,· B

DDSD_ALPHABITDEPTH

dwAlphaBitDepth f f“fo,ª—LÇø,Â, ,é,±,Æ,ð•\,· B

DDSD_BACKBUFFERCOUNT

dwBackBufferCount f f“fo,ª—LÇø,Â, ,é,±,Æ,ð•\,· B

DDSD_CAPS

ddsCaps f f“fo,ª—LÇø,Â, ,é,±,Æ,ð•\,· B

DDSD_CKDESTBLT

ddckCKDestBlt f f“fo,ª—LÇø,Â, ,é,±,Æ,ð•\,· B

DDSD_CKDESTOVERLAY

ddckCKDestOverlay f f“fo,ª—LÇø,Â, ,é,±,Æ,ð•\,· B

DDSD_CKSRCLBLT

ddckCKSrcBlt f f“fo,ª—LÇø,Â, ,é,±,Æ,ð•\,· B

DDSD_CKSRCOVERLAY

ddckCKSrcOverlay f f“fo,ª—LÇø,Â, ,é,±,Æ,ð•\,· B

DDSD_HEIGHT

dwHeight f f“fo,ª—LÇø,Â, ,é,±,Æ,ð•\,· B

DDSD_MIPMAPCOUNT

dwMipMapCount f f“fo,ª—LÇø,Â, ,é,±,Æ,ð•\,· B

DDSD_PITCH

IPitch $f \text{ “} f_0, \text{ }^a\text{—L}\mathbb{E}\emptyset, \mathbb{A}, \text{ }, \acute{e}, \pm, \mathbb{E}, \delta^\bullet \backslash, \cdot \text{ ” } B$

DDSD_PIXELFORMAT

ddpfPixelFormat $f \text{ “} f_0, \text{ }^a\text{—L}\mathbb{E}\emptyset, \mathbb{A}, \text{ }, \acute{e}, \pm, \mathbb{E}, \delta^\bullet \backslash, \cdot \text{ ” } B$

DDSD_REFRESHRATE

dwRefreshRate $f \text{ “} f_0, \text{ }^a\text{—L}\mathbb{E}\emptyset, \mathbb{A}, \text{ }, \acute{e}, \pm, \mathbb{E}, \delta^\bullet \backslash, \cdot \text{ ” } B$

DDSD_WIDTH

dwWidth $f \text{ “} f_0, \text{ }^a\text{—L}\mathbb{E}\emptyset, \mathbb{A}, \text{ }, \acute{e}, \pm, \mathbb{E}, \delta^\bullet \backslash, \cdot \text{ ” } B$

DDSD_ZBUFFERBITDEPTH

dwZBufferBitDepth $f \text{ “} f_0, \text{ }^a\text{—L}\mathbb{E}\emptyset, \mathbb{A}, \text{ }, \acute{e}, \pm, \mathbb{E}, \delta^\bullet \backslash, \cdot \text{ ” } B$

dwHeight

$fT \text{ [} ftfFfX, \grave{\text{I}} \text{ , }^3 B$

dwWidth

$\text{“}\ddot{u}\text{—}\acute{\text{I}}fT \text{ [} ftfFfX, \grave{\text{I}} \text{ ” } B$

IPitch

$\check{Z}\check{Y}, \grave{\text{I}}f\%fCf\text{“}\check{S}J\check{Z}n, \ddot{U}, \mathbb{A}, \grave{\text{I}}\text{—}\mathbb{E} \text{ i}\hat{\text{O}}'l, \grave{\text{I}}, \acute{Y} \text{ j ifsfbf` j } B$

dwBackBufferCount

$\underline{fofbfN \text{ E}fofbftf@, \grave{\text{I}} \text{ ” } B}$

dwMipMapCount

$\underline{f\sim fbfvf}\}\underline{fbfvf}\mathbb{E}fxf\langle, \grave{\text{I}} \text{ ” } B$

dwZBufferBitDepth

$Zfofbftf@, \grave{\text{I}} \text{ [“} x \text{ ” } B$

dwRefreshRate

$f\check{S}ftf\mathbb{E}fbfVf\ldots\text{“}\neg x \text{ ifffBfXfvf}\mathbb{E}fC \text{ Ef, [} fh, \text{ }^aL \text{ q, }^3\hat{e}, \acute{e}\check{Z}\check{Z}g\text{—}p, \text{ }^3\hat{e}, \acute{e} \text{ j } B$

dwAlphaBitDepth

$fAf\langle ftf@ \text{ E}fofbftf@, \grave{\text{I}} \text{ [“} x \text{ ” } B$

dwReserved

$\text{—}\neg\grave{\text{I}}, \text{ }^3\hat{e}, \mathbb{A}, \mathbb{C}, \acute{e} \text{ ” } B$

lpSurface

$\check{S}\check{O}\sim A, \mathbb{A}, \neg, \varsigma, \hat{e}, \text{ }^{\text{1}}_2fT \text{ [} ftfFfX \text{ Ef } f, f\check{S}, \grave{\text{I}}fAfhf}\mathbb{E}fX \text{ ” } B$

ddckCKDestOverlay

$fI \text{ [} fo \text{ [} f\mathbb{E}fC \text{ æ, É}\check{Z}g\text{—}p, \cdot, \acute{e}fJf\% \text{ [EfL [} B$

ddckCKDestBlit

$fuf \text{ fbfN“} \text{’}\text{—} \text{ æ, É}\check{Z}g\text{—}p, \cdot, \acute{e}fJf\% \text{ [EfL [} B$

ddckCKSrcOverlay

$fI \text{ [} fo \text{ [} f\mathbb{E}fC\mathbb{E}^3, \acute{E}\check{Z}g\text{—}p, \cdot, \acute{e}fJf\% \text{ [EfL [} B$

ddckCKSrcBlit

$fuf \text{ fbfN“} \text{’}\text{—}\mathbb{E}^3, \acute{E}\check{Z}g\text{—}p, \cdot, \acute{e}fJf\% \text{ [EfL [} B$

ddpfPixelFormat

$fT \text{ [} ftfFfX, \grave{\text{I}}fsfNfZf\langle \text{ E}ftfH \text{ [} f\}\text{fbfg}\langle L \text{ q } B$

ddsCaps

$\text{DirectDraw } fT \text{ [} ftfFfX\text{”}\neg\acute{\text{I}} \text{ ” } B$

•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 œ,ªŽ,”s,µ,½ B
fy [fW Ef fbfn%ð œ,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
êfT [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_NOCOLORKEY

fT [ftfFfX,ÍĖ» ÝfJf% [EfL [,ðŽ ,Á,Ä,ċ,È,ċ B

DDERR_NOCOLORKEYHW

“]’— æfJf% [EfL [,É‘Î,·,éfn [fhfEfFfAfTf| [fg,^a,È,ċ,½,ß A ^— ,^aŽÀ s,Á,«,È,ċ B

DDERR_NOCOOPERATIVELEVELSET

IDirectDraw2::SetCooperativeLevel f f\fbfh,ðĖÄ,Ñ o,·,±,Æ,È, ì -ŠÖ ”,^aĖÄ,Ñ o,³,ê,½ B

DDERR_NODC

,c,b,Í A,±,ê,Ü,Ä,É,±,ÌfT [ftfFfX—p,É ì,ç,ê,Ä,ċ,È,©,Á,½ B

DDERR_NODDROPSHW

DirectDraw f%oXf^ ^— ìROP jfn [fhfEfFfA,^a—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“,^a—p,Á,«,È,ċ B

DDERR_NOEXCLUSIVEMODE

fAfvfŠfP [fVf‡f“,É‘Î,μ”r‘¼“If, [fh,^a—
v< ,³,ê,½,^a 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,^a“Œ Ý,μ,È,ċ B

DDERR_NOHWN

fNfŠfbfsf“fO’Ê’m,^afEfBf“fhfE Efnf“fhf<,ð•K—v,Æ,·,é A, ,é,ċ
,ÍfEfBf“fhfE Efnf“fhf<,^a‘’²fĖfxf< EfEfBf“fhfE Efnf“fhf<,Æ,μ,Ä, ,ç,©,Œ,ßfZfbfg,³,ê,Ä,ċ
,È,ċ B

DDERR_NOMIPMAPHW

f~fbfvf}fbfv EfefNfXf`ff Ef}fbfsf“fO,Ìfn [fhfEfFfA,^a“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,^a“Œ Ý,μ,È,ċ,©, ,é,ċ,Í—~p,Á,«,È,ċ,½,ß A ^—
,^aŽÀ s,Á,«,È,ċ B

DDERR_NOOVERLAYDEST

“]’— æŠm—š,½,ß,ÌIDirectDrawSurface2::UpdateOverlayf f\fbfhĖÄ,Ñ o,μ,ð,μ,Á,ċ
,È,ċfI [fo [fĖfC,É‘Î,μ AIDirectDrawSurface2::GetOverlayPositionf f\fbfh,^aĖÄ,Ñ o,³,ê,½
B

DDERR_NOOVERLAYHW

fI [fo [fĖfC Efn [fhfEfFfA,^a“Œ Ý,μ,Á,ċ,È,ċ,©, ,é,ċ,Í—~p,Á,«,È,ċ,½,ß A ^—
,^aŽÀ s,Á,«,È,ċ B

DDERR_NOPALETTEATTACHED

fpfĖfbfg EfIfuWfFfNfg,^a,±,ÌfT [ftfFfX,ÉfAf^fbf³,ê,Ä,ċ,È,ċ B

DDERR_NOPALETTEHW

16 F, ,é,ċ,Í256 F,ÌpfĖfbfg,É‘Î,·,éfn [fhfEfFfA EfTf| [fg,^a,È,ċ B

DDERR_NORASTEROPHW

“K Ø,Èf%oXf^ ^— fn [fhfEfFfA,^a“Œ Ý,μ,È,ċ,©, ,é,ċ,Í—~p,Á,«,È,ċ,½,ß A ^—
,^aŽÀ s,Á,«,È,ċ B

DDERR_NOROTATIONHW

%oñ“]fn [fhfEfFfA,^a“Œ Ý,μ,Á,ċ,È,ċ,© A, ,é,ċ,Í—~p,Á,«,È,ċ,½,ß ^— ,^aŽÀ s,Á,«,È,ċ B

DDERR_NOSTRETCHHW

Šg‘âfn [fhEfFfA,“Ŧ Ÿ,µ,Ä,¢,È,¢,©, ,é,¢,Í—~p,Ä,«,È,¢,½,ß A ^— ,ŽÄ s,Ä,«,È,¢ B

DDERR_NOT4BITCOLOR

DirectDrawSurface flfufWfFfNfg,Í A—v< ,³,ê,½,Sfrfbfg FfpfƎfbfg,ðŽg,Ä,Ä,¢,È,¢ B

DDERR_NOT4BITCOLORINDEX

DirectDrawSurface flfufWfFfNfg,Í A—
v< ,³,ê,½,Sfrfbfg,İfJf%o [EfCf“fffbfNfX EfpfƎfbfg,ðŽg,Ä,Ä,¢,È,¢ B

DDERR_NOT8BITCOLOR

DirectDrawSurface flfufWfFfNfg,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 [fhEfFfA,“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

flfufWfFfNfg,“ %Šú%»,³,ê,é‘O,É A CoCreateInstance,Ä ì ¬,³,ê,½ DirectDraw
flfufWfFfNfg,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_NOVSYNCH

,¼‘A ü“Šú ^— ,É‘Î,·,éfn [fhEfFfAfTf| [fg,“È,¢,½,ß A ^— ,ðŽÄ s,Ä,«,È,¢ B

DDERR_NOZBUFFERHW

Zfofbftf@,É‘Î,·,éfn [fhEfFfA EfTf| [fg,“È,¢
,½,ß AfBfXfvfƎfC 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 [fhEfFfA,“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 [fhEfFfA,“,·,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 [fhEfFfA,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

$, \pm, \hat{\mathbb{I}} \quad \text{---} \quad , \hat{\mathbb{I}}, \cdot, \hat{A}, \acute{E} f v f \% o f \check{S} f \} f \check{S} \quad E f T \quad [f t f F f X, \delta \quad \grave{\mathbb{I}} \quad \neg, \mu, \check{A}, \mathbb{C}, \acute{e} \quad B$

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

$, \cdot, \hat{A}, \acute{E} f A f^{\wedge} f b f^{\neg}, \mu, \check{A}, \mathbb{C}, \acute{e}, \grave{\alpha}, \varpi, \mathbb{D}, \mathbb{A}, \hat{\mathbb{I}} f T \quad [f t f F f X, \acute{E} f T \quad [f t f F f X, \delta f A f^{\wedge} f b f^{\neg}, \mu, \mathfrak{a}, \varpi, \mathbb{A}, \mu, \frac{1}{2} \quad B$

DDERR_SURFACEALREADYDEPENDENT

$, \cdot, \hat{A}, \acute{E} \text{''}\frac{1}{4}, \grave{\mathbb{I}} f T \quad [f t f F f X, \acute{E}^{\neg} \mathbb{C}, \mu, \check{A}, \mathbb{C}, \acute{e} f T \quad [f t f F f X, \delta^{\neg} \mathbb{C},^3,^1, \mathfrak{a}, \varpi, \mathbb{A}, \mu, \frac{1}{2} \quad B$

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

$\text{---} v \ll \quad ,^3, \hat{e}, \frac{1}{2} f T \quad [f t f F f X, \hat{\mathbb{I}} f A f^{\wedge} f b f^{\neg}, \hat{A}, \ll, \grave{E}, \mathbb{C} \quad B$

DDERR_TOOBIGHEIGHT

$\text{DirectDraw} \quad , \acute{E}, \mathfrak{a}, \acute{A}, \check{A} \text{---} v \ll \quad ,^3, \hat{e}, \frac{1}{2} \quad , ,^3,^a, \hat{a}, \ll, \cdot, \neg, \acute{e} \quad B$

DDERR_TOOBIGSIZE

$\text{DirectDraw} \quad , \acute{E}, \mathfrak{a}, \acute{A}, \check{A} \text{---} v \ll \quad ,^3, \hat{e}, \frac{1}{2} \text{''}\hat{a}, \ll,^3,^a, \hat{a}, \ll, \cdot, \neg, \acute{e} \quad B, \mu, \odot, \mu \quad A \mathbb{C} \hat{A} \cdot \hat{E}, \hat{\mathbb{I}} \quad , ,^3, \mathbb{A} \cdot \quad , \hat{\mathbb{I}} \text{---} \hat{a}^{\neg} \hat{e},^a, \grave{E}, \mathbb{C} \quad B$

DDERR_TOOBIGWIDTH

$\text{DirectDraw} \quad , \acute{E}, \mathfrak{a}, \acute{A}, \check{A} \text{---} v \ll \quad ,^3, \hat{e}, \frac{1}{2} \cdot \quad ,^a, \hat{a}, \ll, \cdot, \neg, \acute{e} \quad B$

DDERR_UNSUPPORTED

$f T f | \quad [f g,^3, \hat{e}, \check{A}, \mathbb{C}, \grave{E}, \mathbb{C} \quad \text{---} \quad , \hat{A}, \quad , \hat{A}, \frac{1}{2} \quad B$

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

$\text{---} v \ll \quad ,^3, \hat{e}, \frac{1}{2} f s f N f Z f \ll \quad E f t f H \quad [f \} f b f g, \hat{A}, \hat{\mathbb{I}} \quad f r f b f g f \} f X f N, \hat{\mathbb{I}} \text{DirectDraw} \quad , \acute{E}, \mathfrak{a}, \acute{A}, \check{A} f T f | \quad [f g,^3, \hat{e}, \check{A}, \mathbb{C}$
 $, \grave{E}, \mathbb{C} \quad B$

DDERR_UNSUPPORTEDMODE

$f f B f X f v f \mathbb{C} f C, \hat{\mathbb{I}} \mathbb{C} \gg \quad \acute{Y} f T f | \quad [f g,^3, \hat{e}, \check{A}, \mathbb{C}, \grave{E}, \mathbb{C} f, \quad [f h, \hat{A}, \quad , \acute{e} \quad B$

DDERR_VERTICALBLANKINPROGRESS

$, \text{''}\frac{1}{4} \ll A \quad \ddot{u} \check{S} \acute{u} \check{S} \hat{O}, \hat{A}, \quad , \acute{e} \quad B$

DDERR_WASSTILLDRAWING

$, \pm, \hat{\mathbb{I}} f T \quad [f t f F f X, \odot, \zeta \quad A, \ddot{U}, \frac{1}{2}, \hat{\mathbb{I}} f T \quad [f t f F f X, \check{O}, \hat{\mathbb{I}}^{\neg} O \% \hat{n}, \hat{\mathbb{I}} f u f \quad f b f N \text{''}]^{\neg} \text{---} \text{''}\mathbb{C} \quad \hat{\mathbb{I}},^a \check{S} \text{---} \text{---}^1, \mu, \check{A}, \mathbb{C}, \grave{E}, \mathbb{C} \quad B$

DDERR_WRONGMODE

$\text{---} \hat{U}, \grave{E}, \hat{A}, \frac{1}{2} f, \quad [f h, \hat{A} \quad \hat{\mathbb{I}}, \zeta, \hat{e}, \frac{1}{2}, \frac{1}{2}, \beta \quad A, \pm, \hat{\mathbb{I}} f T \quad [f t f F f X, \hat{\mathbb{I}} f \check{S} f X f g f A, \cdot, \acute{e}, \pm, \mathbb{A},^a, \hat{A}, \ll, \grave{E}, \mathbb{C} \quad B$

DDERR_XALIGN

$\text{---} \text{---}^{\neg},^1, \zeta, \hat{e}, \frac{1}{2} \ll \acute{e} \mathbb{C}^{\neg}, \delta^{\neg} K \text{---} v, \mathbb{A},^3, \hat{e}, \acute{e} \text{''}\acute{\mathbb{I}} \acute{\mathbb{I}}, \acute{E} \quad \dots \cdot \frac{1}{2} \hat{\text{---}} \text{---} \hat{n}, \acute{E} \cdot \check{A}, \times, \acute{e}, \pm, \mathbb{A},^a, \hat{A}, \ll, \grave{E}, \odot, \hat{A}, \frac{1}{2} \quad B$

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,Ä, ,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

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¾,·,é B

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DirectSound,ÍIDirectSound,ÆIDirectSoundBuffer,Æ,ç
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,• BfAfvfŠfP [fVf‡f“,ÍDirectSoundIfufWfFfNfg,ìIDirectSound::CreateSoundBuffer f\fbfh,ðŽg—
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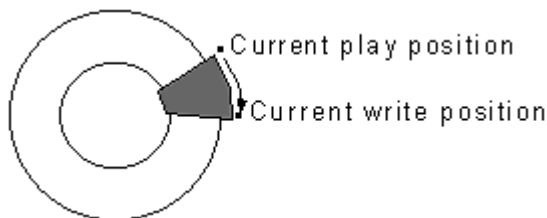
[fIf“fg EfIfufWfFfNfg Ef,fIf“(COM)fCf“f^ [ftfFfCfX,Å, ,é B,± ,îfCf“f^ [ftfFfCfX,îf f\fbfh,É,æ,è AfAvfŠfP [fVf‡f“,©,çJ [fh,î“Å «,ð•I X,.,é,±,Æ,ª,«,é B

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fvf%ofCf}fŠ Efobftf@,Í A o—ÍEŽ® Afg [f^f Ef{fŠf... [fE ,È,Ç AfTfEf“fh,î“Å «,ð §Eä,.,é B,Ü,½ A ì ¬,µ,½AfAvfŠfP [fVf‡f“,©,ç¼ Úfvf%ofCf} fŠ Efobftf@,Ö,î ‘,«,± ,Ý,ð s,¹,é B,½,¾,µ,»,î ê ±,Í ADirectSoundf~fLfVf“fO,Æfn [fhfEfFfA EfAfNfZf%ofE [fVf‡f“,î<@“\,Í—³Eø,É,È,é B,³,ç,É Afvf%ofCf}fŠ Efobftf@,Ö,î¼ Ú“I,È ‘,«,± ,Ý,Í A¹¼,ÍDirectSoundfAvfŠfP [fVf‡f“,î““ ì,ð—W,°,é,±,Æ,É,à,È,é B,µ,½,ª,ÄAfAvfŠfP [fVf‡f“,©,ç,î ‘,«,± ,Ý,Í Afvf%ofCf}fŠ Efobftf@,É,Å,Í,È,fZfJf“f_fŠ Efobftf@,Ö s,µ•ü,ª,¢ BfZfJf“f_fŠ Efobftf@,Å, ,è,Í A fhfEfFfA,³E ŽŽ ,Å,Å,¢,È,¢<@“”,ðfGf~f...fE [fg,.,é,± ,Æ,ª,Å,« A,³,ç,ÉfTfEf“fh EfJ [fh,ðfVfXfefE“à,¼¼,îfAvfŠfP [fVf‡f“,Æ,«—L,.,é,±,Æ,à,Å,«,é,©,ç,Å, ,é B

fZfJf“f_fŠ Efobftf@,Æ,ÍAfAvfŠfP [fVf‡f“,Žg—p,.,éEÄ X,î‰¹E¹,î,±,Æ,Å, ,é B,Ð,Æ,Å,îfAvfŠfP [fVf‡f“,©,ç A,»,é,¼,ê,îfobftf@,ðEÄ X,É Å ¶ E¹ž~.,,é,± ,Æ,ª,Å,«,é BDirectSound,Í Å ¶†,îfobftf@,ð,.,×,Äfvf%ofCf}fŠ Efobftf@ ä,Äf~fLfVf“fO,µ A,»,îfvf%ofCf} fŠ Efobftf@,ðfTfEf“fh EfffofCfX,Ö o—Í,Å,«,é BfZfJf“f_fŠ Efobftf@,Ífn [fhfEfFfA A,à,µ,-,ÍfVfXfefE Efobftf@,Ö i““,³,¹,é,± ,Æ,ª,Å,«,é Bfn [fhfEfFfA Efobftf@,ÍfTfEf“fh EfffofCfX ä,Äf~fLfVf“fO,³,è,é,î,Å AfVfXfefE ä,î ^— ,È•‰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@,î,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,îê•,¾, -,ðŽû—e,.,éofobftf@,Å, ,è A,»,î, ½,B,É Å ¶†,ÍfAvfŠfP [fVf‡f“,©,ç â,¹, V,µ,¢ff [f^,ðfobftf@,Ö ‘,«,±,B•K—v,ª, ,é BfTfEf“fh<@Ší ä,îfTfE f“fh Ef f,fŠ,ª—LÆø,Å, ,è,î A DirectSound,Í,»,é,ð—~p,µ,ÄfXf^fefBfbfN Efobftf@,ðŠm•Ü,µ,æ,µ ,Æ,.,é BfTfEf“fh<@Ší ä,ÉŠm•Ü,³,è,½fobftf@,Í Afn [fhfEfFfA ä,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,î,- ,èÖ,µŽg,î,è,éTfEf“fh,É,Í AfXf^fefBfbfN Efobftf@,îŽg—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,î d—v,Èf| fWfVf‡f“,Å“® ì,.,é BfJfEef“fg EfVfEfc Ef| fWfVf‡f“,Í Afobftf@,î†,îfTfEf“fh,î Å ¶,³JŽn,³,è,éÊ‘u,ðŽ¹,µ,Ä,¢,é BfJfEef“fg Ef%ofCfE Ef| fWfVf‡f“,Í Afobftf@,î†,Å‘À‘S,Éff [f^,ð•I X,Å,«,éÊ‘u,ðŽ¹,µ,Ä,¢,é BŽŸ,î },î,±,î,Ó,½,Å,îf| fWfVf‡f“,îŠÖEW,ðŽ¹,µ,Ä,¢,é B



DirectSoundfobftf@,ÍŠT“O“I,É,ÍfŠf“fO ó,É,È,Å,Å,¢,é,ª AŽÀ Û,É,Í‘A¹,µ,½fŠfjA,Èf f,fŠ,Å ì ¬,³,è,Å,¢ ,é ifŠf“fO Efobftf@ j BfJfEef“fg EfVfEfc Ef|fWfVf‡f“,îfobftf@,î ÅEä,Ü,Å,.,é,ÆŠJŽnÊ‘u,Ü,Å—B,é B ,±,î Í,Å,Í ADirectSound A,.,æ,Ñ DirectSoundBufferfIfufWfFfNfg,É,Å,¢,Ä,Æ AfAvfŠfP [fVf‡f“,É,.,-,é,± ,é,çfIfufWfFfNfg,î—~p•û—@,ð‰ð à,.,é B

DirectSoundfIfufWfFfNfg

DirectSoundBuffer fIfufWfFfNfg

DirectSoundfIfufWfFfNfg

fVfXfef€‚ÉfCf“fXfƒ [f<‚³‚é‚Ä‚¢‚é‚¼‚é‚İfTfEf“fh EfffofCfX‚İDirectSoundfİfufWfFfNfƒ‚Ä‚‚è A
İDirectSoundfCf“f^ [ftfFfCfX‚ð‚Ê‚µ‚ÄfAfNfZfX‚ª s‚İ‚é‚è BDirectSoundfİfufWfFfNfƒ‚İ ĩ ĩ‚İ
DirectSoundCreateŠÖ ”‚ðÉÄ‚Ñ o‚µ‚Ä s‚ª B‚±
 ‚İŠÖ ”‚İ‚Ö‚İ‚Æ‚µ‚Ä A‚Ð‚Æ‚Ä‚İİDirectSoundfCf“f^ [ftfFfCfX‚ð‚Ö‚· B
DirectSoundEnumerateŠÖ ”‚ðÉÄ‚Ñ o‚‚Æ AfVfXfef€‚ÉfCf“fXfƒ [f<‚³‚é‚Ä‚¢‚éDirectSoundfİfufWfFfNfƒ‚ð—
 ñ<‚‚‚é B

Windows,Íf}{f{f^fXfXfN EfIÍfYfœ [fefBf“fO EfVfXfef€,Ä,é Bf† [fU,“ê“x,É⋅”],ìfvf fOf%œ€,ð‘–
,ç,¹ A,»,ê,ç,⋅,×,Ä,ÉŠf\ [fX,ðœ–L,³,1,½,ç,Æ 1,],é,ì,Í–“R,Ä,é BDirectSoundfIfufWfFfNfg,Í“ü–
ÍftfH [fJfX,Ì’Ç Ö,ð s,Ä,ÄTfEf“fh EfffofCfX,ðœ–L,‘é BDirectSoundfIfufWfFfNfg,Í A,»,ê,¼,ê,“S“–
,‘.éfAfvfŠfP [fVf†f“,“ü–ÍftfH [fJfX,ðœ¾,¼žž,É,¾,“%œ,ð–Ä,ç,⋅ B,éfAfvfŠfP [fVf†f“,“ü–
ÍftfH [fJfX,ðž,œ,Æ A,»,ìfIfufWfFfNfg,©,ç,ìfI [fffBfI EfXfgfŠ [f€,Íf~f...
[fg,ž,ê,é B⋅”],ìfAfvfŠfP [fVf†f“,“ü–¶TfEf“fhffofCfX,É.Í,‘,é,»,¼,ê,ìDirectSoundfIfufWfFfNfg,ð ì ¬,‘,é,
±,Æ,ä%œÄ“Ä,Ä,é BfAfvfŠfP [fVf†f“ŠÖ,Ä“ü–ÍftfH [fJfX,“Í,í,é,Æ AfI [fffBfI o–
Í,Íž©“®“Í,É,»,ìfAfvfŠfP [fVf†f“,ìfXfgŠ [f€,©,çžž,ìfAfvfŠfP [fVf†f“,ìfXfgfŠ [f€,
Ö Ø,èÖ,í,é Bœ%œÉ“Í,É AfAfvfŠfP [fVf†f“,Í“ü–
ÍftfH [fJfX,“Í,í,é,½,Ñ,Éfobf†f@.ì Ä ¶ E’ăž~,ðœJ,èÖ,⋅K–v,“È,È,é B

Note

DirectSound,Ifwfbf_ftf@fCfC,ĪIDirectSound,Īf f\fbfh,ÆIDirectSoundBufferfCf“f^ [ftfFfCfX,Å`è`,3,ê,½ ACÆ¾CēE,Īf}fNf `è`,ðŠÜ,n,Ā,č,é B

DirectSoundBufferIfufWfFfNfg

,D,Æ,Â,D,Æ,Â,lfTfEf“fh,“,æ,ÑfI [ffBfI EfXfgfŠ [f€,ÍDirectSoundBuffer,Â, ,è AfAvfŠfP [fVf±f“,
ÍIDirectSoundBufferCf“f^ [ftFfCfX,ð'Ê,µ,Ä,±
,è,ç,Ö,lfAfNfZfX,ð s,□ BIDirectSound::CreateSoundBuffer f\fbfh,ðÆÄ,Ñ o,.,Æ ADirectSoundBufferIfufWfFfNfg,ð ì ¬,.,é,±,Æ,ª,Ä,«é B,±,l•Ö'l,ÍIDirectSoundBufferCf“f^ [ftFfCfX,Â, ,é B

,Ü,½ AfAvfŠfP [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,lfv%ofCf}fŠ Efofbftf@,µ,©Ž ,Â,±,Æ,ª,Ä,«é,¢ B

fAvfŠfP [fVf±f“,É,æ,éTfEf“fh Efofbftf@,Ö,lf [f^,l' ,«±,Ý,Í A,Ü,,fofbftf@,ðf fbfN,µ,Ä,©,ç ' ,«±
,Ý,ð s,¢ A,»,lÆä,Éfofbftf@,lf fbfN,ð%ð æ,.,é Bfofbftf@,ðf fbfN,.,é,É,ÍIDirectSoundBuffer::Lock f\fbfh,
ðÆÄ,Ñ o,· B,±,lf f\fbfh,lf fbfN,³,è,½fofbftf@,lf
fC“f^,ð•Ö,· Bfofbftf@,af fbfN,³,è,é,Æ AfAvfŠfP [fVf±f“,É,æ,éI [ffBfI Eff [f^,lfobftf@,Ö,lfRfs [,ª
%oÄ”,É,É,é Bfofbftf@,Ö,lf [f^ ' ,«±,Ý I—Æä Afofbftf@,lf fbfN,ð%ð æ,µ,Ä ' ,«±,Ý'€ ì,ðŠ®—
¹,.,é Bfofbftf@,lf fbfN,ð%ð æ,.,é,É,ÍIDirectSoundBuffer::Unlock f\fbfh,ðÆÄ,Ñ o,· B

fVf%ofCf}fŠ EfTfEf“fh Efofbftf@,É,ÍŽÄ Ü,É•,«Žæ,è%Ä”,Èff [f^,ªSi”[,³,é B_
IDirectSoundBuffer::Play f\fbfh,ðŽg—p,.,é,±
,Æ,É,æ,è AfZfJf“f_fŠ EfTfEf“fh Efofbftf@,©,ç,lfI [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 ÄÆä,Ä'âŽ~,.,é B,±,lf f\fbfh“à,É
DSBPLAY_LOOPINGftf%ofO,ðŽw'è,.,é,Æ A'A'±f< [fv,ì't,ÄÆJ,è•Ö,µfTfEf“fh,ð Ä ¶,Ä,«é B Ä ¶'†,lfobftf@
,ð'âŽ~,.,é,É,ÍIDirectSoundBuffer::Stop f\fbfh,ðŽg—p,.,é B

fTfEf“fh Efofbftf@,²,Æ,lfAvfŠfP [fVf±f“,É,æ,éŽg,¢ª,¬,Í AfTfEf“fh,ì Ä ¶ŽžŠÖ,ÄÆ~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,Ê,¬,è,Í AfXfgfŠ [f€ Efofbftf@,ª ì ¬,³,è,é) B DirectSound,Í AfTfEf“fh<@Ši,ª—
LÆø,Ä, ,è,Í A,»,l<@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
FFA 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^“]—,lfI [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”\,Â, ,é B

ffofCfX Ehf%oCfo

DirectSound,Í AfI [ffBfI EfffofCfX Ehf%oCfo,ªŽÀ‘•,·,éCf“f^ [ftFfCfX A DirectSound HAL,ð—p,¢
,ÄfTfEf“fh<@Ší,ÖfAfNfZfX,·,é B,±,ê,ÍWindows,ÌfI [ffBfI EfffofCfX Ehf%oCfo ,Ä, ,è AHAL,ðfTf|
[fg,·,é,½,ß,É•Ĭ X,ð%Á,!,ç,ê,Ä,¢,é B ,±
,Ìhf%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 Ehf%oCfo,Íf\ftfgfEfFfA EfGf~f...fÆ [fVf‡f“,ð^ê Ø s,í,È,¢ Bfn [fhfEfFfA,Ì «”\
,ðDirectSound,Ö’Ê’m,µ A DirectSound,©,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 ‡ A DirectSound,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 Ehf%oCfo,ðŽg—p,·,é B,±,Ì ê ‡ A DirectSound,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

‘¹’²fƎfxf<

DirectSound,Í AfTfEf“fh EfffofCfX,É‘Î,μ,Ä•W € A—D æ A”r¼ A ‘,«±,Ý—
D æ,Î4,Ä,Î¹’²fƎfxf<,ð’èç’,,é BfAfvfŠfP [fVf‡f“,Í **IDirectSound::SetCooperativeLevel** f\fbfh,ðŽg—
p,μ,ÄfTfEf“fh EfffofCfX,Î¹’²fƎfxf<,ð Ý’èç’,,é B,Û,½ A ‘,«±,Ý—D æ,ð æ,-
,:×,Ä,Î¹’²fƎfxf<“à,ÉfOf [fof< EfTfEf“fh Efofbftf@ A,à,μ,-
,ÎfXfefBfbfL [EfTfEf“fh Efofbftf@,ð ì ¬,·,é,±,Æ,ª,Ä,«é B

u•W € v¹’²fƎfxf<,Í,à,Ä,Æ,à‰°Ê,ÎfƎfxf<,Ä, ,é B•W €fƎfxf<,Ä,Í A
IDirectSoundBuffer::SetFormat A,“,æ,Ñ**IDirectSound::Compact**f f\fbfh,ÎĖÄ,Ñ o,μ,Î•s‰Ä”,Ä, ,é B
,³,ç,É AfAfvfŠfP [fVf‡f“,Ä,Îfvf‰ofCf}fŠ Efofbftf@,Ö,Î ‘,«±,Ý,ª,Ä,«É,ç B,±
,Î¹’²fƎfxf<,ÄfAfvfŠfP [fVf‡f“,ðŽg—p,μ,Ä,ç,éŽŽ,ÉfXf€ [fY,Èf^fXfN Ø,è‘Ö,!,ð s,□,É,Í A22 kHz,Îfvf‰ofCf}
fŠ Efofbftf@ AfXfefƎfIfTfEf“fh A,»,μ,Ä8ftrfbfgfTf“fvfŠf“fO,ÎftfH [f}fbfg,ðŽg—p,·,é B

DirectSoundIfufWfFfNfg,ð u—D æ v¹’²fƎfxf<,ÄŽg—
p,·,é,Æ AfAfvfŠfP [fVf‡f“,Í Afn [fhEfFfA Ef~LfVf“fO,È,Ç,Îfn [fhEfFfA EfŠf\ [fX,É‘Î,μ,Ä‘æ^èç‰,Ì—
D æ“x,ðŽ ,Ä,±,Æ,ª,Ä,« A**IDirectSoundBuffer::SetFormat** ,Æ **IDirectSound::Compact**,ðĖÄ,Ñ o,·,±,Æ,ª,Ä,«é B

DirectSoundIfufWfFfNfg,ð u”r¼ v¹’²fƎfxf<,ÄŽg—p,·,é,Æ AfAfvfŠfP [fVf‡f“,Í—
D æfƎfxf<,É,“,é,·,×,Ä,Î“ÁĖ,ðŽ ,Ä,±,Æ,ª,Ä,«é B,μ,©,μ A,»,ÎfAfvfŠfP [fVf‡f“,“ü—
ÎftfH [fJfX,ðŽ ,Ä è ‡ A,»,Îfobftf@,Î,Ý,©,ç,μ,©‰!,ª,±,!,É,ç B“ü—
ÎftfH [fJfX,ÎŠl“¾ĖÄ ADirectSound,ÎfAfvfŠfP [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**,ÎĖÄ,Ñ o,μ,Ä,à,Ä,Æ,à Äç,É’èç’,³,è,½,à,Î,±
,Æ,Ä, ,é (DirectSound,Í—D æfƎfxf<,ÉŠÖEW,È,wave,ðfŠfXfgfA,·,é) B

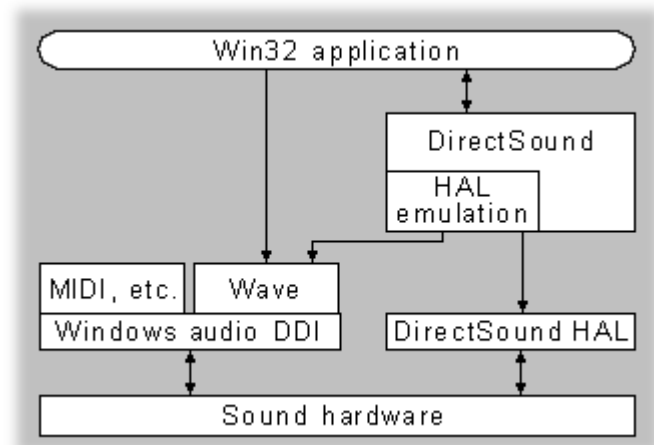
Ä,à ãÊ,Î¹’²fƎfxf<,Í u ‘,«±,Ý—D æ v,Ä, ,é B DirectSoundIfufWfFfNfg,ð ‘,«±,Ý—D æ¹’²fƎfxf<,ÄŽg—
p,·,é,Æ AfTfEf“fh Efofbftf@,Öf_fCfƎfNfg,ÉfAfNfZfX,Ä,«é B,±
,Îf, [fh,Ä,Í AfAfvfŠfP [fVf‡f“,ª**IDirectSoundBuffer::Lock**f f\fbfh,ð—p,ç,Äfobftf@,ðf fbfN,μ Afvf‰ofCf}
fŠ Efofbftf@,É’¼ Ũ ‘,« ž,b,±,Æ,É,È,é B,±,Î Ũ AfZfJf“f_fŠ Efofbftf@,Î Ä ¶,Í,Ä,«É,ç B

‘,«±,Ý—D æ¹’²fƎfxf<,É Ý’èç³,è,Ä,ç,éfAfvfŠfP [fVf‡f“,“ü—
ÎftfH [fJfX,ðŽæ“¾,·,é,Æ A’¼,ÎfAfvfŠfP [fVf‡f“,ÎfZfJf“f_fŠ Efofbftf@,Í,·,×,Ä’ãŽ~³,è Aff [f^,ÎŽ,·,í,è,é(±
,è,ç,Îfobftf@,ð Ä,Ñ Ä ¶,³,¹,é,É,Í A**IDirectSoundBuffer::Restore**f f\fbfh,ÄfŠfXfgfA,ð s,□•K—v,ª, ,é) B,±
,ÎfAfvfŠfP [fVf‡f“,“ü—ÎftfH [fJfX,ðŽ,!,Î Afvf‰ofCf}
fŠ Efofbftf@,Îff [f^,ÎŽ,·,í,è,é,ª AfAfvfŠfP [fVf‡f“,“ü—ÎftfH [fJfX,ð ÄŽæ“¾,·,è,ÎfŠfXfgfA,à‰Ä”,Ä, ,é B

‘,«±,Ý—D æfƎfxf<,Í Afvf‰ofCf}fŠ Efofbftf@,ð ì ¬,·,é,½,B,Î•K—
v â^Î ðĖ ,Ä,Í,È,ç B,μ,©,μ Afvf‰ofCf}
fŠ Efofbftf@“à,ÎTf“fvfŠf“fO EfI [ffBfL,ÖfAfNfZfX,·,é,½,B,É,Í AfAfvfŠfP [fVf‡f“,ª ‘,« ž,Ý—
D æfƎfxf<,É Ý’èç³,è,Ä,ç,é•K—v,ª, ,é B,±,ÎfƎfxf<,ÉfZfbfg,³,è,Ä,ç,È,ç
,Æ A,½,Æ,**IDirectSoundBuffer::GetFormat**, **IDirectSoundBuffer::SetFormat**,
IDirectSoundBuffer::GetVolume,È,Ç,Îf f\fbfh,ÎĖÄ,Ñ o,μ,É ¬Ė÷,μ,½,Æ,μ,Ä,à A **IDirectSoundBuffer::Lock**
A,“,æ,Ñ **IDirectSoundBuffer::Play**,ÎĖÄ,Ñ o,μ,É,ÎŽ,“,s,·,é B

ffVfXfef€Œ,İ“ ‡

ŽŸ,İ },İDirectSound,Æ,»,İ¼,İfVfXfef€ŒfI [ffBfI EfRf“f| [flf“fg,Æ,İŠÖEW,ðŽ,İ,µ,Ä,€,é B



DirectSound HAL—p,É İ,ç,ê,½fTfEf“fh EfffofCfX Efhf%oCfo,İ AfI [ffBfI Ä ¶Žž,É Ä „İ”—İ,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”—
 İ,ðDirectSound,Ö,Æ’m,ç,¹ ADirectSound,©,ç,İ—v< ,ðfn [fhEfFfA,Ö,Æ“„İ,é B,à,µfn [fhEfFfA,ª—v< ,É%ž,İ,é”\
 —İ,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”è“x,ÉfAfNfZfX,ð”ñ<Ÿ,.,éfpfX,İ,Đ,Æ,Ä,Ä, ,é BfEfF [fuftfH [f€ EfI [ffBfI Efhf%
 fCfo,ª,Đ,Æ,Ä,İfffofCfX,ðŠ,,è“—,Ä,é ê ‡ ADirectSound,Ä,İ“fffofCfX,Ö,İŠ,,è“—,Ä,İŽ,”s,.,é B“—
 İ,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,İ A,»,è,¼,è,İŠÖ ”,ð€ð€Ÿ,Éžg—
 p,.,é,İ,æ,€ B,Ä,Ü,è A **DirectSoundCreateŠÖ** ”,ÄfTfEf“fh Efn [fhEfFfA,ðfI [fvf“,µ A
 IDirectSound,,æ,ÑIDirectSoundBufferCf“f^ [ftfFfCfX,ÄfTfEf“fh,ð Ä ¶,µ A
IDirectSound::Releasef fVbfh,Ä“fn [fhEfFfA,ðfNf [fY,.,é,Æ,€,Ä,½,±,Æ,ª%Ä”\,Ä, ,é BfTfEf“fh Efn [fhf
 EfFfA,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“—
 İ,É ADirectSoundŠÖ ”,ÆfEfF [fuftfH [f€ EfI [ffBfIŠÖ ”,İ,Ç,ı,ç,ð—p,€
 ,Ä,à AfAfvfŠfP [fVf‡f“,İ,»,è,¼,è,İfffofCfX,É“Æ—ş,µ,½fAfNfZfX,ª%Ä”\,Ä, ,é B

, ,éŽİ,İAfvfŠfP [fVf‡f“,É,“„éfEfF [fuftfH [f€ EfI [ffBfIŠÖ ”,İžg—p,İ A”ñ İ,É—L€ø,È%ø€—
 @,Æ,É,é,±,Æ,ª,µ,İ,µ,İ, ,é B,½,Æ,İ A **PlaySound**,ª,ÑWaveOutŠÖ ”,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 Efghf%oBfN,ð o—
 İ,.,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 Efghf%oBfN,İ Ä ¶,Ä,«,É,€ B“—
 İ,É Aaviftf@fCf<,ð Ä ¶,µ,Ä,©,çDirectSoundfIfufWfFfNfg,ð İ ¬,µ,æ,ª
 ,Æ,µ,Ä,à A İ ¬Žž,İŠÖ ”,İfGf%o [İ,ð•Ö,· B

€» Ý,İ,Æ,±

,è,Ä,İ AfAfvfŠfP [fVf‡f“,ªDirectSoundfIfufWfFfNfg,ð%øð“ú,.,é,½,ß,É,İ Aaviftf@fCf<,İ Ä ¶“O,ÉIDirectSound::

Release, ÌĈÄ,Ñ o,μ,ð s,▯ BfAfvfŠfP [fVf‡f“,Ífrrffl,Ì Ä ¶ I—
'Ĉä,ÉDirectSoundIfufWfFfNfg,Æ,»,ìDirectSoundBufferIfufWfFfNfg,Ì Ä ì ¬,Æ Ä Ý'è,ð s,,é B

DirectSoundŠT—v

,±,ì ß,Å,ÍDirectSoundfRf“f| [flf“fg,ìê”Ê“l,È î•ñ,É,Â,¢,Ä%ø ò,·,é B

DirectSound,ì“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,ƒ,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,ƒ,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,^aà,Ä,Æ,à ,,¢,ì,Í A,í,,©,ÈfCefCfef“fV,ÄfI [ffBfI Ef~fLfVf“fO,ð s,¤@”\,Ä, ,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,»,ê`È 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~fLf Vf“fO,·,é B,»,µ,Ä Af~fLfVf“fO,µ,½E%oÊ,ð AfTfEf“fh<@Ší,Ö,ìfI [ffBfI Eff [f^,ìY<<,ð,µ,Ä,¢,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 §CÄ,ðŽó,¬,é B

fCefCfef“fV,^a20f~fŠ•b`È%o°,Ì ê ± Af† [fU,^afofbftf@,ì ì ¬,©,çfXfs [fJ,ì Ä ¶,Ü,Ä,Ì’x%o,,,ðŠ’,¶,é,± ,Æ,Í,È,¢ BDirectSoundf~fLfT [,ÌfCefCfef“fV,Í20f~fŠ•b,È,Ì,Ä A Ä ¶,Žn,Ü,é,Ü,Ä,Ì’x%o,,,Í’mŠo,³,ê,È,¢,ì,Ä, ,é B, ± ,Ì ðE %o°,¾,Æ Afobftf@,ð Ä ¶,·,é,Æ“Žž,ÉfXfNfŠ [f“ EfAfjf [fVf‡f“,ðŠJŽn,·,ê,Î AfI [ffBfI,ÆfrrffI, Í“Žž,ÉfXf^ [fg,·,é B,µ,©,µ ADirectSound,“HEL,ðŽg—p,µ,È,,Ä,Í,È,ç,È,¢ ê ‡(fTfEf“fh<@Ší— p,ÌDirectSoundfhf%ofCfo,^a,È,¢ ê ‡) Afñ [fhfEfFfA,É`¶,·,é’x%o,,(‘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“™,lfTfEf“fh@Ší,ðŽ©“
®“I,É ,‘¬%»,·,é BfAfvfŠfP [fVf‡f“,©,ç,Í A“Á,Éfn [fhfEfFfA EfAfNfZf%ofŒ [fVf‡f“,l Ý’u—v< ,ð s,□•K
—v,Í,È,Œ B

,½,¾,µ AŒ» Ý,lf [fhfEfFfA,lŸŠf\ [fX,ð Å‘âŒÀ,É—~p,µ,½,Œ,Æ l,|,é,È,ç A
DirectSound,É‘Î,µ,ÄfTfEf“fh EfffofCfX,lf [fhfEfFfA «”\ î•ñ,î•Ž!,ð—v< ,·,é•û—@,ª, ,é B,±
,l î•ñ,©,ç Af [fhfEfFfA EfAfNfZf%ofŒ [fVf‡f“,ð s,□ Ū,lî Ū,Æ,È,éfTfEf“fh Efofbftf@,lŽw’è,ª,Å,«,é,æ,
□,É,È,é B

,±,ê,Í A,»,ê,¼,ê,ìŒø%êŽg—p,âfTfEf“fh Efofbftf@ Ä ¶,lf^fCf~f“fO Afofbftf@Žæ“¾,l—
D æ“x,È,Ç,ðfAfvfŠfP [fVf‡f““□,ÅŒ^è,·,é,±,Æ,ª,Å,« A•K—
v,Èfn [fhfEfFfA,lŸŠf\ [fX,lŠ,,,è U,è,ª,Å,«,é,©,ç,Å, ,é B

f v f % o 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 % o f C f } f Š E f T f E f “ f h E f o f b f t f @ , İ f T f 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 , ð o —

*İ , · , é B D i r e c t S o u n d , Ä , İ f v f % o 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 , ª , Ä , « , é B , ± , İ < @ ” *

, İ A ” ñ í , É Ą È , ç , ê , ½ Ž í —

b , İ A f v f Š f P [f V f ‡ f “ A , Ä , Ü , è “ Á % » , º , 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 I [f g , µ , Ä , ¢

, È , ¢ < @ ” \ , t , « f A f v f Š f P [f V f ‡ f “ , Ä , İ , Ý — L — p , Ä , , é B f A f v f Š f P [f V f ‡ f “ , © , ç f v f % o f C f } f Š E f o f b f t f @ , Ö ‘ ¼ Ú ‘ , « , ±

, Ý , ð s , º , Ä A , Ç , º , µ , Ä , à T f E f “ f h , “ r Ø , ê , â , · , , È , é B f v f % o f C f }

f Š E f o f b f t f @ , Ö ‘ ¼ Ú f A f N f Z f X , ð s , º f A f v f Š f P [f V f ‡ f “ , İ A f p f t f H [f } f “ f X ð Ą , º Ą µ , µ , È , é , İ , Ä , , é B

f v f % o f C f } f Š E f o f b f t f @ , İ ‘ È í , Ä , Ä , à ¬ , º , ¢ B , » , İ , ½ , ß A , ± , İ Ž í , İ f o f b f t f @ , Ö ‘ ¼ Ú ‘ , « , ±

, Ý , ð s , º ê ± , İ A , · , Ä , È f o f b f t f @ “ à , È , , é u f f b f N , º Ą J , è • Ö , µ Ä ¶ , º , ê , È , ¢ , æ , º A f f [f ^ E f u f f b f N , Ö , İ ‘ , « , ±

, Ý , ð ‘ Z , ¢ Š Ō Š u , Ä s , í , È , ¯ , ê , İ , È , ç , È , ¢ B f o f b f t f @ ì ¬ ‘ † , İ f o f b f t f @ , İ f T f C f Y , İ Ž w ‘ è , Ä , « , È , ¢ , ½ , ß A ì ¬ ì < Ä İ —

º Ą Ą , È , Ä , « , , º , Ä , ½ T f C f Y , ð Ž ó , “ ü , ê , é , ± , Ä , È , È , é B

f v f % o f C f } f Š E f T f E f “ f h E f o f b f t f @ , É ‘ İ , · , é ‘ , « , ± , Ý f A f N f Z f X , ð Š İ “ ¼ , · , é , Ä A ‘ ¼ , İ D i r e c t S o u n d , İ < @ ” \ , İ —

º Ą Ą , 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 , º , ê , È , ¢

, ½ , ß A f n [f h f E f F f A E f A f N f Z f % o f Ą [f V f ‡ f “ E f ~ f L f V f “ f O , İ ¬  Ą , È , é

(D i r e c t S o u n d , º 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 , ð s , º , Ä A f ~ f L f V f “ f O , º , ê , ½ f I [f f f B f I E f f [f ^ , İ f v f % o f C f }

f Š E f o f b f t f @ , É ‘ u , © , ê , é) B

f A f v f Š f P [f V f ‡ f “ , İ ‘ ½ , , İ A f v f % o f C f } f Š E f o f b f t f @ , Ö ‘ ¼ Ú f A f N f Z f X , º , , È f Z f J f “ f _ f Š E f o f b f t f @ , ð Ž g —

p , · , é B f Z f J f “ f _ f Š E f o f b f t f @ , Ö , İ ‘ , « , ± , Ý , İ Ž © — R , È s , , , é B ‘ ä , « , È f o f b f t f @ , º Ž Ÿ , İ f f [f ^ E f u f f b f N , Ö , İ ‘ , « , ±

, Ý , Ü , Ä , İ Ž ž Š Ō , ð % Ō , ¬ A , » , ê , È , æ , Ä , Ä f I [f f f B f I , Ä % º º , “ r Ø , ê , é Š è Ą , ð Ä ¬ Ą Ä , È , Ä , Ç , ß , é , İ , Ä , , é B , ½ , Ä , , İ 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 < , º A f ~ f L f V f “ f O , ð • K — v , Ä , µ , È , ¢ f I [f f f B f I E f X f g f Š [f € , İ , æ , º

, 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 ¶ , È f Z f J f “ f _ f Š E f o f b f t f @ , ð Ž g — p , · , é , ±

, Ä , Ä , , ¢ p f t f H [f } f “ f X , ð Ž Ä Ą , · , é , ± , Ä , , º , Ä , « , é B

3DfTfEf“fh

DirectSound,É,æ,è AfAvfŸfP [fVf‡f“,Í%¹CE¹,aŽ-•Ê,³ê,é^Ê'u i'è^Ê j,ð•İ X,·,é,±,Æ,a,Â,«,é B,± ,ê,É,Í AIDirectSound3DBuffer A,“,æ,ŸIDirectSound3DListenerfCf“f^ [ftfFfCfX,ðŽg— p,·,é B,ç,È,Ý,É%¹CE¹,Æ,Í A%¹,a“S•ûCEü,Ö L,a,é,Æ,«,İ'† S^Ê'u A,à,µ,,Í%¹,a%~ ó,É ¬,³,,È,Á,Ä,¢,- ,Æ,«,İ',“_İ,±,Æ,Â, ,é B,Û,½ Afhfbfvf% [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,İ••,«Žæ,è%øÂ”\,¾,a Afwfbfhfzf“,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'è^Ê,İ”FŽ-

fŠfXfi_l

fTfEf“fh EfR [f“

Ä'Z<—£,Æ Ä'·<—£

^Ê'u,Æ'¬“x

Direct3D,Ö,İ“ ±

“a”è'P^Ê,Æ<—£—v'f

f,fmf%øf<%¹CE¹,ÆfXfefCEfI%¹CE¹

%o'œ'è'Ê,ì"ŦŽ̄

Œ»ŽÀ ¢ŠE,Â,Í AóŠÔ,É,̄,̄,é%o'œ'è'Ê,ì"ŦŽ̄,Í A'½ " ,Ì—v'f,É%œç,³,ê,é BŽŸ,ÉŽ',,Ì,Í,»,Ì'ê•",Â, ,é B

f{fŠf... [f€ B%o¹,ð o,••"Ì,ªfŠfXfi [,©,ç—£,ê,é,Ù,Ç A,»,Ì%o¹,Í ¬,³,,È,Á,Ä,¢, B,± ,ÌŒ» Û,Íf [f<fIf t,ÆŒÄ,Î,ê,Ä,¢,é B

“Ž'B,Ì,,ê BfŠfXfi [,Ì%OE•ûŒü,©,ç",¹,ç,ê,½%o¹,Í,ªfŠfXfi [,Ì%OEŽ̄,É“Ž'B,·,é,Ì,Í A ¶Ž̄,æ,è,à,Ù,ñ,Ì ,µ æ,Â, ,é (,±,Ì,,ê,ÌŽ̄ '±ŽžŠÔ,Í A-ñ1f~fŠ•b,Â, ,é) B

Á%o¹ BfŠfXfi [,ÌŒã,ê,©,ç,,é%o¹,Í A'O,©,ç,«,½%o¹,É"ä,×,Ä,©,·,©,É Á%o¹,³,ê,Ä,¢,é B,± ,ê,É,æ,è 1,ÌŽ̄,Ì•ûŒüŠm"F,ÍŠmŽÀ,É,È,é B,³,ç,É AfŠfXfi [,Ì%OE,©,ç%o¹,ª,«,½ ê ±,à A ¶Ž̄,É“Í,- %o¹,Íª,Đ,Æ,Â,Ô,ñ Á%o¹,³,ê,é B

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[fg,·,éfn [fhfEfFfA,ª^ê"Ê“Í,É,È,ê,Î A,±,ê"ÊŠO,Ìf|fWfVf±fjf“fO—v'f,ªfVfXfef€,É'g,Ý ž,Û,ê,é,± ,Æ,¾,ë,□ B,½,Æ,,¹,¹ AfŠfXfi [,Ìª,ÌŽ̄— Ê,Û,½,ÍŒ̄,ãŠOŽ̄,Ô,Ì"½ŽÊ,É,æ,é Á%o¹,Í A ,Žü"g,Æ'áŽü"g,Æ,Â,Í"Ù,È,Á,Ä,,é B

,µ,©,µ A Â,à d—v,È%o¹,Ì'Ê'uŽ̄•Ê—v'f,Í A%o¹Œ¹,ÌŽ̄Šo“Í,È"Ê'u,Â, ,é B,½,Æ,,¹,¹ A%o“,,É, ,é A ¬,³,È“_,Æ,µ,ÄŒ ©,,¹,Ä,¢,½"ŽÊ'Ì,ª AŒ©,Ä,¢,é 1,Ìª ä,ð%oZ,,¹,é'O,É'ä—□ŠÔ'e“1f~fTfCfç,Ì'ä,«,³,É,É,È,Á,Ä,¢,é,Í A,± ,Û,²,Û,Æ,µ,½Žè,ª,©,è,è,Ç,ª,È,,Ä,à A%o¹,ÍŠmŽÀ,É,»,ÌfŠfXfi [,ÉçB,Ä,« AŽ̄,Á,Ä,Ä,Ä,¢,,¾,ë,□ B

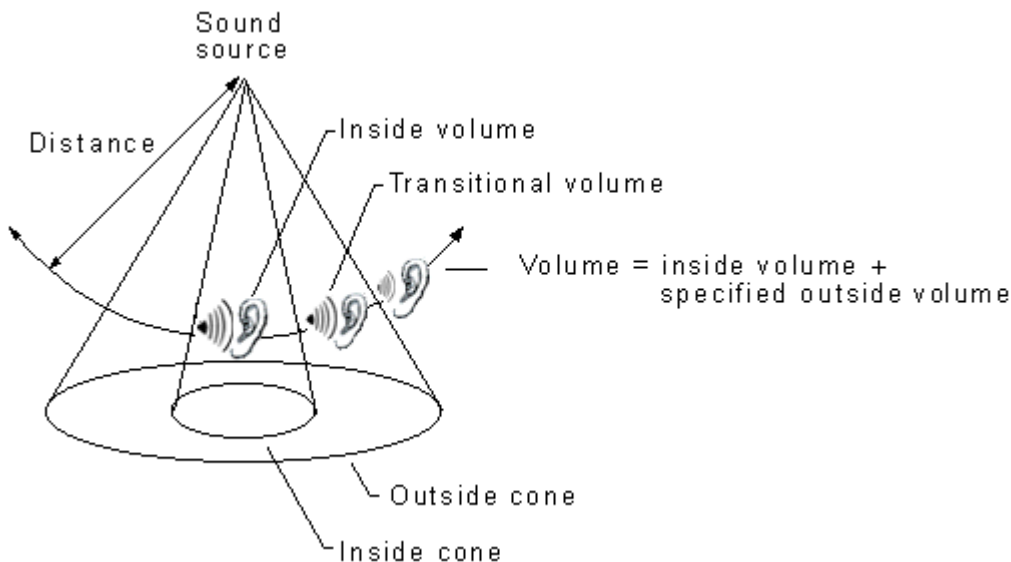
fŠfXfi [

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,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“

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 ,È,é BˆÊ'u,Ā•ûĈÛ,Ì, ,é%o¹,ðfTfEf“fh EfR [f“,Ā,Ĉ,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‘âfĈfxfĈ,Ā,È,é(DirectSound,Ā,Í‘ • ,ðfTf| [fg,µ,Ā,˘,ç, , A Ā‘âf{fŠf... [fĈ EfĈfxfĈ,Í0,Ā, ,é B,»
 ,Í¼,Ì,˘,×,Ā,Ìf{fŠf... [fĈ EfĈfxfĈ,Í A Ā‘âf{fŠf... [fĈ,©,çĈ, Š,µ,Ā,Ĉ, ,Ā,Ĉ,ĉÔ-ĵ,Ā A‰¹
 ,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
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 ,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“,ÌŠÔ,Ā,Í Af{fŠf
 ... [fĈ,Í, ,éĈfxfĈ,©,Ĉ•Ê,ÌfĈfxfĈ,É ™ X,É•Ĭ‰¹,˘,é BfTfEf“fh EfR [f“,ÌŠT”O,ðŽŸ,Ì },ÉŽ,˘ B



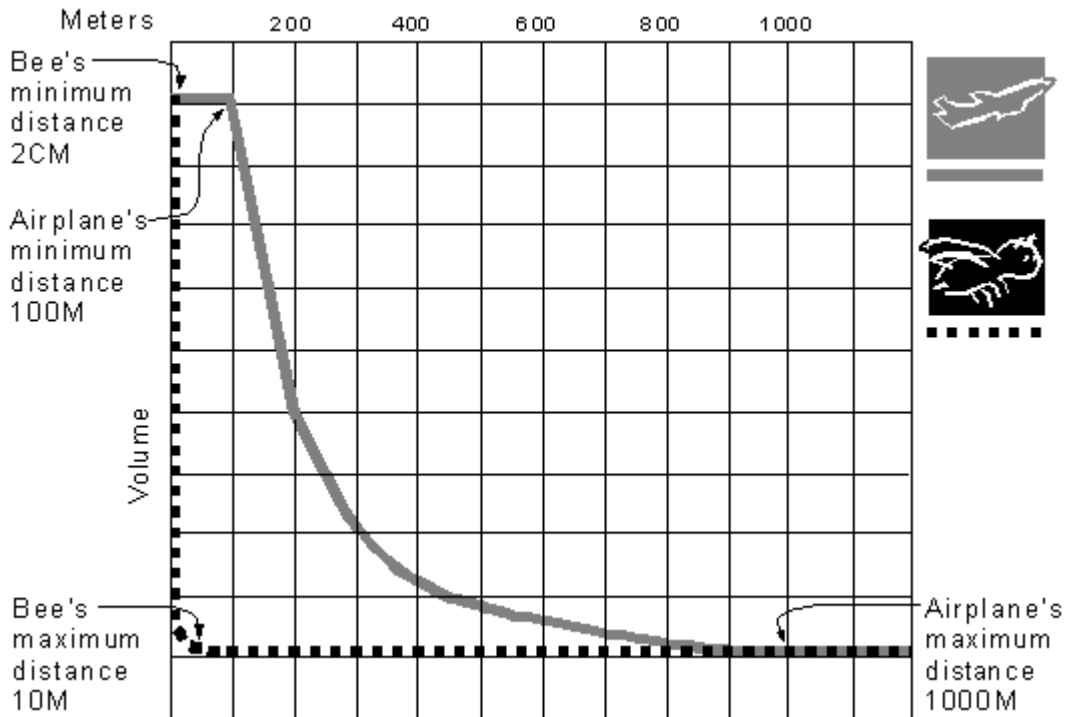
<Z p“¹,É,Í A_

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•Ĭ,Ā,à Af{fŠf... [fĈ
 ,ÍfR [f“,Ì“à•”,Ā,àŠO•”,Ā,à˘,¶,Ā A‰¹,Í-
 ¾Šm,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'·<—£

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 “I,ÈCEÀŠE,ÉŽŠ,Á,½ ê ±,È,Ç A^è'è,Ìf|fCf“fg,ð'È%œß,µ,½Žž^ÈCEä,Í Af{fŠf... [f€,Í'â,«,.,È,è'±,¯,È,¢ B,±
 ,è,ð%œ¹CE¹,Ì À'Z<—£,Æ,¢,µ B“—l,É A%œ¹CE¹,Ì À'·<—£,Æ,Í A,±,è^È ä%œ¹,a ¬,³,,È,Ç,È,¢,Æ,¢
 ,µ^È'u,ð'·,½ ê ±,Ì<—£,ðCE¾,µ B

•Ê X,Ì%œ¹,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%œ¹,Í,Ý,Ä,Ì,¿,Ì%œH%œ¹,æ,è,â'â,«,.,È,¯,è,Î,È,Ç,È,¢,a A, ,é— —R,©,Ç,±,è,Ç,Ì%œ¹,Í'¯,¶ ä'Îf{fŠf...
 [f€ EfCEfxf<,Ä^%œ¹,³,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 [,%200f [fgf<—£,è,½,Æ,«,Éf{fŠf... [f€
 ,a”¼•,É,È,é,a A,Ý,Ä,Ì,¿,ÍfŠfXfi [,%4fZf“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,^a, ,é BfOf%oftfBfbfN,ÆfAfjf [fVf‡f“,ÌE©' n,©,ç,Í A,±,ê,ç,Ì“Á «,Í,Û,Á,½,-

“¬,¶,É,Y,_{||},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,«^a,é B,μ,©,μ Afofbftf@,âfŠfXfi [,^a,»,Ì¬“Ì,^a<óŠÔ,ð~Ú“@,μ,Ä,ç,é¬³,ð¬“x,Ä•\,·,± ,Æ,Í,Ä,«^a,É,ç Bfofbftf@,âfŠfXfi [,Ì¬“x,Í A DirectSound,Ä,Ífhfbfvf% [Eø%Ê,ÌEvŽŽ,ÉŽg—p,³,ê,é B

“¬“x’² B,Í A¬“Ì,Ìfhfbfvf% [Eø%Ê,ð<’²,μ,½,ç ê ‡,É—L—p,Ä, ,é B,½,Æ,_{||},Î A,□,È,è,ð, ,°,Ä¬,Á,Ä,- ,éfE [fVf“fOfJ [,^afŠfXfi [,Ì%_o],ð’Ê,è%ß,¬,é,Æ,«,Ì%¹,^a—~,μ,ç ,Æ,μ,æ,□ B,à,μfŠfXfi [,É,Î,μ,Äfhfbfvf% [Eø%Ê,ð<’²,³,¹,½,Æ,·,é,Æ A,»,Ì<’²,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,³/₄,¬,±,ÌEø%Ê,ð<- ’²,³,¹,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 Ì“Í,É~μ,□ BfAfvfŠfP [fVf‡f“,ÌfŠfXfi [,Æ%¹E¹,^a¬“x,ðŽ ,Á,Ä,ç ,ê,Í AfVfXfef€,ÍŽ©“@“Í,É,»,Ì¬“xŠÔ,ÌŠÖEW,ðEvŽŽ,μ Afhfbfvf% [Eø%Ê,ð¬,â,©,É’² 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
D3DRMFRAMEMOVECALLBACKfR [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

‘‘è’P^Ê,Æ<—£—v‘f

3DfTfEf“fhŒø%ôÊ,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%ôÊ,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%ôÊ,ð<’²,μ,½,è A<—£
,É,æ,é%¹,ÌŒ, Š,ð<’²,³,¹,é B

DirectSound,Ì3DŒø%ôÊ,Å,Í A<—£,Ì‘‘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‘‘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,Ä,¢,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%oð à,ð,·,é B
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DirectSoundCreateŠÖ ”,ðĈÄ,Ñ o,μ,ÄDirectSoundIfufWfFfNfg,ð ì ¬,μ,½ĈË,Í AIDirectSound::GetCapsf f\fbf
h,ðŽg—p,·,·,é,±,Æ,ÄfTfEf“fh EfffofCfX,ì «”\,ðŽæ“¾,Ä,«,é B Ä“K,ÈfpftfH [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,ìfpf%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’² „µ,½Œã,Í AfAfvfŠfP [fVf‡f“,Í AfI [ffBfI Eff [f^,ðŠÜ,ðfTfEf“fh Efofbftf@,ð ì ¬ E—ñ<“,·,é,±
,Æ,^aÄ,«,é **BIDirectSound::CreateSoundBuffer** f\fbfh,ÍfTfEf“fh Efofbftf@,ð ì ¬,·,é **BIDirectSound::Duplicate**
SoundBuffer 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”İ,·,é,±,Æ,È,—¼•û,İfobftf@,ð•Ê X,É Ä ¶,·,é,±,Æ,^aÄ,«,é B

fTfEf“fh EfffofCfX,É’İ,µ,Ä<’²fŒfxf<,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,^a ,é B,Û,Æ,ñ,Ç,İfAfvfŠfP [fVf‡f“,Í•W €,İ<’²fŒfxf<,Ä, ,é
DSSCL_NORMAL,ðŽg—p,·,é B,±,İfŒfxf<,Í A’¼,İfAfvfŠfP [fVf‡f“,Æ<£ ‡,·,é,±,Æ,ÍŒ^,µ,Ä,È,¢ B

fXfs [fJ,İŠÂ«» Ý’è

*IDirectSoundfCf“f^ [ftfFfCfX,É,Í AfVfXfef€“à,İfXfs [fJ,İ’² , 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^%¹ Ä ¶ AfTf%oEf“fh EfTfEf“fh,^a,
,é B*

fn [fhfEfEfAf *f*,fŠŠÇ—

IDirectSound::Compact*f* f\fbfh,ðŽg—

p,·,é,Æ Af1f“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,^a,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@,ÅfTf [fg,³,ê,Ä,¢,é,í,¯,Å,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 fWfFfNfVf‡f“ EfR [f“

IDirectSound3DBuffer*f*“*f*^ [f*t*F*f*C*f*X E*f*|*f*C*f*“*f*^,İŽæ“¾

IDirectSound3DBuffer,İ*f*|*f*C*f*“*f*^,ðŽæ“¾,·,é,É,Í A,Ü,,*f*Z*f*J*f*“*f*_fŠ3D*f*T*f*E*f*“*f*h E*f*o*f*b*f*t*f*@,ð Ì ¬,·,é•K—*v*,^a,,é B Ì
¬•û—@,Í A **IDirectSound::CreateSoundBuffer**,ðŽg—
p,µ,Ä ADSBUFFERDESC \‘İ,É•t ,·,é*dwFlags* *f*“*f*o,İ†,ÉDSBCAPS_CTRL3D,ðŽw’è,·,é B,»,µ,Ä A Ì ¬,³,ê,½
*f*o*f*b*f*t*f*@ ä,Ä**IDirectSoundBuffer::QueryInterface** *f*\f*b*f*h*,ðŽg—
p,µ,Ä A,»,İ*f*o*f*b*f*t*f*@,İ*IDirectSound3DListener**f*C*f*“*f*^ [f*t*F*f*C*f*X,Ö,İ*f*|*f*C*f*“*f*^,ðŽæ“¾,·,é B

// DSBCAPS_CTRL3D,ðŽg—p,µ,ÄlpDsbSecondary,ð Ì ¬,·,é
hr = lpDsbSecondary->QueryInterface(IID_IDirectSound3DBuffer,
 &lpDs3dBuffer);
if (SUCCEEDED(hr)) {
 // ,±,İ*f*T*f*E*f*“*f*h,İ3D*f*p*f*%*f* [f^,ð Ý’è,·,é
 .
 .
 .
}

DirectSound,İ3D*f*T*f*E*f*“*f*h E*f*o*f*b*f*t*f*@,Æ,µ,Ä A*f*,*f*m*f*%*f*◁ A*f*X*f*e*f*Œ*f*I—¼•û,İ”gŒ`ð*f*T*f*| [f*g*,µ,Ä,Œ
,é,^a A3D*f*T*f*E*f*“*f*h,İ ^%ö,ð”Šö,·,é,É,İ*f*,*f*m*f*%*f*◁ E*f*T*f*E*f*“*f*h,ðŽg—p,µ,½•û,^a,æ,Œ B,±,ê,İ3D ^—
,^a*f*,*f*m*f*%*f*◁ E*f*T*f*E*f*“*f*h,©,ç*f*X*f*e*f*Œ*f*I o—İ,ð Ì ¬,·,é,½,ß,Ä, ,é B,à,µ*f*X*f*e*f*Œ*f*I E*f*T*f*E*f*“*f*h E*f*o*f*b*f*t*f*@,ðŽg—
p,µ,½ ê ‡ A3D ^—
,^aŽ{,³,ê,é‘O,É ¶%öE,İ*f*T*f*“*f*v*f*◁,İ‘l,İ•½◁İ%ö»,³,ê,é B,Ó,½,Ä,İ*f*X*f*e*f*Œ*f*I E*f*^f*f*f“*f*l*f*◁,ð•Ê X,É”z’u,·,é,É,Í A*f*X*f*e*f*Œ*f*I
E*f*X*f*g*f*Š [f€,ð,Ó,½,Ä,İ*f*,*f*m*f*%*f*◁ E*f*X*f*g*f*Š [f€,É•Š,,,µ A,±
,İ*f*f [f^,ð,Ó,½,Ä,İ*f*,*f*m*f*%*f*◁ E*f*T*f*E*f*“*f*h E*f*o*f*b*f*t*f*@,É ‘,«,±,b•K—*v*,^a,,é B

Note

*f*p*f*“ §Œä,İ3D ^— ,Æ◁Œ ‡,·,é B,»,İ,½,ß A DSBCAPS_CTRL3D,ÆDSBCAPS_CTRLPAN,İ—¼•û,^aŽw’è,³,ê,Ä,Œ
,é,ÆDirectSound,Í—*v*◁ ,İ 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, ^a, , 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,^aÅ,«,é B Å'Z<—£,Æ,Í A%^ol,^a,±,ê^È ã'â,«,È,ç,È,¢<—£,Å, ,é B'¹/₂'Î,É A Å'·<—£,Æ,Í%^ol,^a,±,ê^È ã ¬,³,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¬³E∅,ì,R,Â,ì ^— f, [fh,đŽ ,Â B•W € ^—
f, [fh,ÍffftfHf<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%fO,ð,à,Æ,É‘€ ìf, [fh,ð Ý’è,·, ,é B,±,Ìftf%fO,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\bfh,ðŽg—p,·,é B

DirectSound,^afŠfXfi [,É'Î,·,éfhfbfvf%o [Eø%oÊ,ÛEvŽZ,ÉŽg—
p,·,é'¬“x'l,ð Ý'è EŽæ“¼,·,é,É,Í A**IDirectSound3DBuffer::SetVelocity** A,,æ,Ñ
IDirectSound3DBuffer::GetVelocity f f\bfh,ðŽg—
p,·,é Bfofbftf@,ÎÊ'u,Î A,»,Î'¬“x,l%oeç,ðŽó,¯,È,¢ BÊ'u,Æ'¬“x,İŠÖEW,É,Â,¢
,Ä,Ì Ú ×,Î AÊ'u,Æ'¬“x,ðŽQ Æ,·,é,±,Æ B

fTfEf“fh Efvf fWfFfNfVf‡f“ EfR [f“

3DfTfEf“fh Efofbftf@,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◀—
£ Afofbftf@,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’Ÿ,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• ,É ‡,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 [,ªfobftf@,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<,Èfobftf@ 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@ EfIfufWfFfNfg,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
fobf` Efpf‰of [f^‘€ ì
˜,‘u,« Ý’è
←—£—v’f
fhfbfvf‰ [—v’f
fŠfXfi [,ìÊ’u,Æ‘ˆ“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^,đŽæ“¾,·,é,É,Í A,Ü,,fvf%ofCf}

fŠ3DfTfEf“fh Efofbftf@,đ Ì ¬,·,é•K—v,^a,,é B,±

,ê,đ Ì ¬,·,é,É,Í A**IDirectSound::CreateSoundBuffer** f\fbfh,đŽg—p,µ A

DSBUFFERDESC \‘İ,İdwFlagsf f“fo’†,ÉDSBCAPS_CTRL3Dftf%ofO,đŽw’è,·,é B,»,µ,Ä Ì ¬,³,ê,½fofbftf@ ã,Ä

IDirectSoundBuffer::QueryInterface f\fbfh,đŽg—

p,µ,Ä A,»,İfofbftf@,İ**IDirectSound3DListener** fCf“f^ [ftfFfCfX,Ö,İf|fCf“f^,đŽæ“¾,·,é B`È%°,İ—á,đŽQ Æ,·,é,±,Æ B

// DSBCAPS_CTRL3D,đŽg—p,µ,ÄlpDsbPrimary,đ Ì ¬,·,é

hr = lpDsbPrimary->QueryInterface(IID_IDirectSound3DListener,
 &lpDs3dListener);

```
if(SUCCEEDED(hr)) {  
    // 3D`€ İ,đŽÄ s,·,é  
    .  
    .  
    .  
}
```

f of b f` E f p f % o f [f ^ ' € ì

f A f v f Š f P [f V f ‡ f “, Å, ì 3 D f T f E f “ f h f p f % o f [f ^, ì Ž æ “ ¼ E Ý ’ è, Í A Ć Â X, ì Ž Å s, Å, à A f o f b f ` , ð Ž g —
p, μ, ½ Ž Å s, Å, à % Å ” \, Å, , é B Ć Â X, ì ’ l, ð Ý ’ è, ., é, ½, ß, É A “ K — p % Å ” \
, È IDirectSound3DListener f C f “ f ^ [f t f F f C f X E f f \ f b f h, ð Ž g — p, ., é, ±
, Æ, ª, Å, «, é B, μ, ©, μ A f o f b f t f @, ð • \ Ć », ., é, ., ×, Å, ì ’ l, ð ê “ x, É Ž æ “ ¼ E Ý ’ è, ., é • K — v, ª, , é ê ‡, à, , é B, » , ì Ů, É, Í A _
 IDirectSound3DListener :: GetAllParameters A, ., æ, Ñ IDirectSound3DListener :: SetAllParameters f 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 % ñ, ì Ć Å, Ñ o, μ, Å Ž Å s, Å, «, 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,Ç,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,ðŒÄ,Ñ o,·,±,Æ,ª,Ä,«,éj

Note

,Ç,İ ~, 'u, « Ý'è,à AIDirectSound3DListener::CommitDeferredSettings,ðŒÄ,Ñ o,·,Ü,Ä,Í A“¬,¶ Ý'è,ðDS3D_IMME
DIATEftf%ofO,ðŽg—p,μ,ÄŒÄ,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,Í(4,5,6)
,Æ,È,é B,»,İŒä DirectSound3DListener::CommitDeferredSettingsf f\fbfh,ðŒÄ,Ñ o,·,Æ A‘¬“x,Í(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 A**IDirectSound3DListener::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, ,é,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,ð**IDirectSound3DListener::GetDistanceFactor**f 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,Ü,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”{,Ü,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',· B'¼,Ì¹,Í,·,×,Ä ACE»ŽÀ ċŠE,Â'ìCE±,Ä,«,éfhfbfvf%o [Cø%oÊ,Ì”{ ”,ð•\,· B,Ä,Ü,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

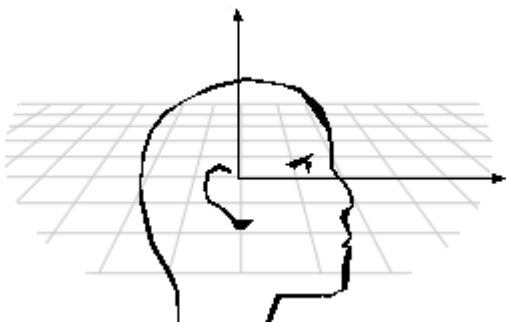
IDirectSound3DListener::SetPosition A,“,æ,Ń **IDirectSound3DListener::GetPosition***f f\fbfh,ðŽg—*
p,μ,Ä A3D«óŠÔ,É,“,̄,éfŠfXfi [,İÊ'u,ð Ý'è EŽæ“¾,Â,«,é B

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,Í3DCEø%Ê,l ^— ,É,“,ç,Ä—Í,È–ðŠ,,ð%Ê,½,· B<óŠÔ“à,ìê’è,ìÊ’u,Â%l,“” ¶,µ,½,æ,□
,È òŠo,ð ì,è o,·,½,ß,É ADirectSound,ÍfTfEf“fh EfLf... [,ðŠTŽZ,·,é BfLf... [,É,Ä,ç
,Ä,ì Ú ×,Í A%l‘æ’èÊ,ì”FŽ_,ðŽQ Æ,·,é,±,Æ B

fŠfXfi [,l•uEü,Í A ã•ûfxfNfgf<,Æ‘O•ûfxfNfgf<,Æ,ç,□ ACE’“_,ð<□—
L,·,é,Ó,½,Ä,ìfxfNfgf<,ìŠÖEW,É,æ,Ä,Ä’è<³,ê,é B ã•ûfxfNfgf<,ÍfŠfXfi [,l“a,ì’† S,©,çŽn,Ü,è A“a,ìÊ”Ô ã,ÉEü,
©,Ä,Ä^ê’¼ ü,É’Ê%ß,·,é B‘O•ûfxfNfgf<,à,Ü,½fŠfXfi [,l“a,ì’† S,©,çŽn,Ü,é,a A ã•ûfxfNfgf<,©,çE©,é,Æ%E,ÖE
ü,©,ç AfŠfXfi [,lŠç,ì‘O–Ê,ð’Ê%ß,·,é BŽŸ,ì },Í,±,ê,ç,ìfxfNfgf<,ìŠÖEW,ðŽ,µ,Ä,ç,é B



fŠfXfi [,l•uEü,ð Ý’è EŽæ“¾,·,é,É,ÍIDirectSound3DListener::SetOrientation A,“,æ,Ñ
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,È,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€ ,ì,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 ”,ÌfI [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,ÌfI [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“I,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,±,Ìfofbftf@,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,»,ÌfIfufWfFfNfg,ª ì ¬,µ,½fofbftf@,à,·,×,Ä%ð•ú,³,è AŽQÆ,³,è,é,±,Æ,Í,È,¢ B

,±,ì B,Ä,Í AfTfEf“fh Efofbftf@,Ìˆ%¹ E Ä ¶,ìŠÇ— •û–@ Af{fŠf... [f€ ,Ìfgf%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~^%o¹ E Ä ¶,ð §Œä,·,é,½,ß,É,Í A IDirectSoundBuffer::Play,Æ= IDirectSoundBuffer::Stopf f\fbfh,ðŽg—p,·,é BfTfEf“fh,İ Ä ¶,É,İIDirectSoundBuffer::Play,ðŽg— p B ÄŒä,Û,Ä,,é,Æfobftf@,İŽ©“@“I,É’âŽ~,·,é B,½,¾,µ Af< [fv,ðŽw’è,·,é,Æ A IDirectSoundBuffer::Stop,ðŒÄ,Ñ o,·,Û,Äfobftf@,İ,,è•Ö,µ Ä ¶,³,ê,é B

IDirectSoundBuffer::Lockf f\fbfh,ÍŒ» Ý,İfTfEf“fh Efobftf@,İ ‘,«,±,Ýf| fCf“f^,ðŽæ“¾,·,é Bfobftf@,ÖfI [ffBfI Eft [f^,ð ‘,«,±,ñ,¾Œä,Í A IDirectSoundBuffer::Unlockf f\fbfh,ðŽg —p,µ,Äfobftf@,İf fbfN,ð‰ð æ,·,é•K—v,^a, ,é B’•ŠúŠÖ,É,í,½,Á,Äfobftf@,ðf fbfN,µ,Ä,“,×,«,Ä,Í,È,ç B

fTfEf“fh Efobftf@,İfJfŒf“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,Ń **IDirectSoundBuffer::SetVolume***f f\fbfh,ðŽg—*

p,·,é,Æ A Ä ¶’†,l̄fofbftf@,l̄f{fšf... [f€,,l̄žæ“¾ E Ý’è,“ s,!,é Bfvf%oCf}fš EfTfEf“fh Efofbftf@,l̄f{fšf... [f€,ð Ý’è,·,é,±,Æ,Ā AfTfEf“fh EfJ [fh,l̄fEfF [fuftfH [f€ EfI [ffBfI Ef{fšf... [f€,“İ X,³,ê,é B

“—l,É A **IDirectSoundBuffer::GetFrequency** A,“,æ,Ń **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@,l̄žü”g ”,ð•İ X,·,é,±,Æ,Í,Ā,«È,¢ B

fpf“,l̄žæ“¾ E Ý’è,É,Í A **IDirectSoundBuffer::GetPan** A,“,æ,Ń

IDirectSoundBuffer::SetPan*f f\fbfh,ðĖÄ,Ń o,· Bfvf%oCf}fš Efofbftf@,l̄fpf“,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,³,ê,½DirectSoundBufferIfufWfFfNfg,lfTfEf“fh Efofbftf@f f,fŠ,ðfŠfXfgfA,·,é,±,Æ,^a,Ä,«,é B,±,ê,Ífofbftf@,^aŽ,,í,ê,½ ê ‡,É—L—p,^¾,^a A

IDirectSoundBuffer::Restore,^a*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,^afŠfXfgfA,³,ê,½Œă,Í A,»,±,Ö—LŒø,ÈfTfEf“fhf [f^,ð ‘,«,±,b•K—v,^a, ,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::SetCooperativeLevelf f\fbfh, ðÄÄ, Ñ o, µ, Ä¶'²fÇfxf<, ðŽw'è, ·, é B, Û, Æ, ñ, Ç, ĨfAfvfŠfP [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 Efobftf@, ð ì ¬, ·, é **BDSBUFFERDESC** \‘ç'İ, Ĩ†, Ä, Í A, », Ĩfobftf@, ªfZfJf“f fŠ Efobftf@, Ä, , é, ±, Æ, ðŽw'è, ·, é•K—v, Í, È, Ç BfftfHf<fg, ÄfZfJf“f fŠ Efobftf@, ª ì ¬, º, é, æ, ▢, É, È, Ä, Ä, Ç, é B

4 fZfJf“f fŠ Efobftf@, 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 Efobftf@, ð Ä ¶, ·, é B

6 fAfvfŠfP [fVf±f“, ªfTfEf“fh, Ĩ Ä ¶, ð I—¹, µ, ½, Ç ADirectSoundBufferfobftf@, Ĩ**IDirectSoundBuffer::Stop**f f\fbfh, ðŽg—p, µ, Ä, ·, ×, Ä, Ĩfobftf@, ð'âŽ~, º, ¹, é B

7 fZfJf“f fŠ Efobftf@, ð%ð•ú, ·, é B

8 DirectSoundfIfufWfFfNfg, ð%ð•ú, ·, é B

, Û, ½ A^È%°, ĨfIfvfVf±f“, ðŽÄ s, ·, é, ±, Æ, à, Ä, «, , é B

fvf%ofCf}fŠ Efobftf@, ð ì ¬, µ, Ä**IDirectSoundBuffer::SetFormat**f f\fbfh, ðÄÄ, Ñ o, µ Afvf%ofCf}fŠ EfTfEf“fh Efobftf@, Ĩ o—ÍÇ`Ž®, ð Ý'è, ·, é B, ±, Ĩ Ý'è, Ĩ'O, É AfAfvfŠfP [fVf±f“, Ĩ¶'²fÇfxf<, ªDSSCL_PRIORITY, É Ý'è, º, é, Ä, Ç, é•K—v, ª, , é B

fvf%ofCf}fŠ EfTfEf“fh Efobftf@, ð ì ¬, µ A**IDirectSoundBuffer::Play**f f\fbfh, ðŽg—p, µ, Ä, », Ĩfobftf@, ð Ä ¶, ·, é B, ±, é, Í A, ½, Æ, |fZfJf“f fŠ Efobftf@, ª Ä ¶, º, é, Ä, Ç, È, , Ä, à Afvf%ofCf}fŠ Efobftf@, ª, Ä, È, É Ä ¶, º, é, Ä, Ç, é, ±, Æ, ð•Û Ø, ·, é B, ±, Ĩ“® ì, ĨCPUfpf [, ð, Ç, -, Ç, © Á”i, ·, é, ª AfZfJf“f fŠ Efobftf@, ª Ä ¶, º, é, é, Æ, «, ĨŠJŽnŽžŠÖ, ð'Z k, ·, é B

, ±, Ĩ ß, É, Í ADirectSoundRf“f| [fLf“fg, ÉŠÖ~A, µ, ½È%°, Ĩ`è”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 Efobftf@, Ĩ ì ¬

fTfEf“fh Efobftf@, 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 ",đĀÄ,Ń 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,²,Æ,·,é B,»,İ, ,
Æ**DirectSound::SetCooperativeLevel**f\fbfh,đĀÄ,Ń o,·K—v,ª, ,é B,±
,İf f\fbfh,İĀÄ,Ń o,µ,ª s,İ,è,è,Ü,Ä,İfTfEf"fh Efofbtf@,Í à ¬,³,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 è ±  
    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 è ±  
    // .  
    // .  
    // .  
    // .  
}
```

DirectSoundEnumerateŠÖ ",đŽg—p,·,é,Æ A"Á'è,İfTfEf"fhffofCfX,İ à ¬,đŽw'è,·,é,±,Æ,ª,Ä,«,é B,±,İŠÖ ",đŽg
—p,·,é,É,Í **ADSEnumCallback**ŠÖ ",Æ A,Ü,Æ,ñ,Ç,İ è ±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  
}
```

,³,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,Ä,«,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 [fuftfH [f€ EfI [ffBflŠÖ ”,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*, δ $\dot{\iota}$ \neg , \cdot , \acute{e} , \acute{E} , \acute{I} $\hat{E}\%^\circ$, $\check{I}\check{Z}\grave{e}$ \ddot{z} , δ s, \square B

1 $\check{S}\check{O}$ ", \acute{E} NULL, $\delta\check{Z}w'\grave{e},\mu,\check{A}$ ACOM, δ $\%_o\check{S}\acute{u}\%_o$ », \cdot , \acute{e} B

```
if (FAILED(CoInitialize(NULL)))  
    return FALSE;
```

2 **DirectSoundCreate** $\check{S}\check{O}$ ", $\delta\check{Z}g-p,\cdot$, \acute{e} , \mathfrak{a} , \grave{e} A**CoCreateInstance**, \cdot , \mathfrak{a} , \check{N} **IDirectSound::Initialize***f\fbfh*, $\delta\check{Z}g-p,\mu,\check{A}$ **DirectSound***fIfufWfFfNfg*, δ $\dot{\iota}$ \neg , \cdot , \acute{e} B

```
dsrval = CoCreateInstance(&CLSID_DirectSound,  
    NULL, &IID_IDirectSound, &lpds);  
if (!FAILED(dsrval))  
    dsrval = IDirectSound_Initialize(lpds, NULL);
```

CLSID_DirectSound, \acute{I} **DirectSound***fhf%oCfo EfIfufWfFfNfg EfNf%oX,\check{I}fNf%oX\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**, $\mathfrak{a}\cdot\hat{O},-\mathfrak{C}$ $\%_o\check{S}\acute{u}\%_o$ »*fIfufWfFfNfg,\check{A}, \acute{e} B****

DirectSound*fIfufWfFfNfg*, $\delta\check{Z}g-p,\cdot$, \acute{e} \acute{O} , \acute{E} **IDirectSound::Initialize**, $\delta\mathfrak{C}\check{E}\check{A},\check{N}$ o, $\overset{3}{E},,\check{A},\acute{I},\grave{E},\zeta,\grave{E},\mathfrak{C}$ B, \pm , $\grave{I}f$ *f\fbfh,\acute{I} A
DirectSoundCreate, $\mathfrak{a}\mathfrak{V}\hat{E}$ $\dot{\iota}\check{Z}g-p,\cdot$, \acute{e} *fhf%oCfo,\grave{I}GUID*fpf%of [f^(\pm,\check{I} \hat{e} \ddot{z} , \acute{I} NULL), δ $\grave{I}-$
 p,\cdot , \acute{e} B**DirectSound**, \mathfrak{a} $\%_o\check{S}\acute{u}\%_o$ », $\overset{3}{E},\acute{e}$, \mathfrak{A} A**DirectSoundCreate**, \check{A} $\dot{\iota}$ \neg , $\overset{3}{E},\hat{e},\frac{1}{2},\mathfrak{A},\langle\mathfrak{A}$ “ \neg , \P , \mathfrak{a} , \square
, \acute{E} **DirectSound***fIfufWfFfNfg*, $\delta\check{Z}g-p,\mu,\frac{1}{2},\grave{e}\%_o\delta\cdot\acute{u},\mu,\frac{1}{2},\grave{e},\cdot$, \acute{e} , \pm , $\mathfrak{A},\mathfrak{a},\check{A},\langle\mathfrak{e},\mathfrak{a}$, \square , $\acute{E},\grave{E},\acute{e}$ B***

fAfvfŠfP [fVf \ddot{z} f“, δ $I-\mathfrak{I},\cdot$, \acute{e} \acute{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, $\grave{I}fVfffbfgf_fEf“$, δ s, \square B

CoUninitialize();

fn [fhfEfFfA «”\ì Æ%öĩ

DirectSound,Â,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) {
        // ¬¢÷,µ,½,çDSCAPS \‘¢‘ì,ðª%öð,·,é
        // .
        // .
        // .
    }
    // .
    // .
    // .
}
```

DSCAPS \‘¢‘ì,É,Í A,»ê,¼,ê,ìf^fCfv,ì Ä‘âfŠf\ [fX,â¢» Ÿ—

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 «”\ ,ðª»è,·,é ê ‡ Afobftf@,ìŠ,,è“—,Ä,ÆŠ,,è“— ,Ä,ìŠÖ,ÉIDirectSound::GetCaps,ð¢Ä,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 ā A «—¬ñ<Ÿ,³,ê,éfffofCfX,ª A¢»‘¶,·,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,ÈfIfyf¢ [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 §ŒäflfvfVf‡f“,É,Â,¢,Ä,à à-
¾,.,é B,³,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

§ŒäflfvfVf‡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,ðŒÄ,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,ìfobftf@,ð ì ¬,µ,Ä,©,ç A,»,Ì'¼,ìfobftf@,ð d—
v"x,ì ,ç ‡,É ì ¬,·,é BDirectSound,Ífn [fhfEfFfA,ÌfŠf\ [fX,ð A—~p%oÄ",Èê"Ô Ä %o,ìfobftf@,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,ìfobftf@  
    dsbdesc.dwBufferBytes = 3 * pcmwf.wf.nAvgBytesPerSec;  
    dsbdesc.lpwfxFormat = (LPWAVEFORMATEX)&pcmwf;  
    // fobftf@,ð ì ¬,·,é  
    hr = lpDirectSound->lpVtbl->CreateSoundBuffer(lpDirectSound,  
        &dsbdesc, lplpDsb, NULL);  
    if(DS_OK == hr) {  
        // ¬Œ÷ B—LŒø,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,^a, ,é B,± ,ê,É,ÍDSBUFFERDESC \‘ĉ‘İ,İdwFlagsf f“fo,ðŽg—

p,·,é BfTfEf“fh Efofbftf@,Éfn [fhfEfFfA EfŠf\ [fX,^aŠ,,è“—,Ä,ç,ê,Ä,¢

,é,Æ ADirectSound,ÍAfvfŠfP [fVf‡f“,^aŽw’è,μ,½fIfvfVf‡f“,ðŽg—

p,·,é B,½,Æ,İ,İ AfffoCfX,^afn [fhfEfFfA Efofbftf@,ðfTf| [fg,μ,Ä,¢

,Ä,à A,»,İfobftf@,É‘İ,·,éfpf“ §Ĉä,Í’ñ<Ÿ,μ,Ä,¢,È,¢ ê ‡,^a, ,é B,±

,İ ê ‡DirectSound,Í ADSBCAPS_CTRLPANftf%oO,^aŽw’è,³,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“,^aŽ©•^a,ÄŽg—

p,·,éIfvfVf‡f“,İ,Ÿ,ðŽw’è,·,é B

fobftf@,^aŽ ,Ä,Ä,¢,È,¢f f\fbfh,ðĈÄ,Ñ o,μ,Ä,àŽ,”s,É I,í,é B,½,Æ,İ,İ A₂

IDirectSoundBuffer::SetVolumef 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,^aŽw’è,³,ê,Ä,¢

,ê,İf f\fbfh,İ ¬Ĉ÷,·,é Bftf%oO,^aŽw’è,³,ê,Ä,¢,È,¬,ê,İf f\fbfh,İŽ,”s,É I,í,è A

DSERR_CONTROLUNAVAILfGf% [fR [fh,^a•Ö,³,ê,é Bfofbftf@,İ §Ĉä,É,æ,è AĈ»‘¶,àšŮ,ñ,Ä «—

ˆ’ñ<Ÿ,³,ê,éfffoCfX ä,Ä,İfAfvfŠfP [fVf‡f“,İ“® ì•Ů Ø,^a,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,îê•”,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,± ,î ê ± AfAfvfŠfP [fVf±f“,îèŠú“î,É V,µ,çff [f^,ðfTfEf“fh Efofbftf@,Ö ‘,«,± ,Ü,È,¯,ê,î,È,ç,È,¢ B,µ,©,µ AfXfgfŠ [f€ Efofbftf@,ÍfXf^fefBfbfN Efofbftf@,æ,è,àf f,fŠ,ì Á”i,ª ,È,- ,Ä,·,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,ìTfEf“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 [fhfEfFfA Ef~fLfVf“fo,ð—~—p,·,é,± ,Æ,ª,Å,« AfVfXfef€,í,±,ê,ç,ìTfEf“fh Ef~fLfVf“fOŽž,ìfI [fo [fwfbfh,ð Å ¬ÆÀ,É%Ÿ,³,,é,± ,Æ,ª,Å,«,é BfTfEf“fh Eff [f^,ªfn [fhfEfFfA Ef f,fŠ,É~ê“xf [fh,³,ê,é,¾,¯ ,Å Ì,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 [fhfEfFfA Ef~fLfVf“fo,ð—~— p,Å,«,é ê ±,Å,à A,æ,èÆø—!“î,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,ìTfEf“fh,È,ç AfXfgfŠ [f€ Efofbftf@,ðŽg— p,µ,½•û,ª Afn [fhfEfFfA Ef f,fŠ,Éf [fh,·,é•K—v,ª,È,¢,½,ßÆø—!“î,Å, ,é B

Note

fofbftf@,ðfXf^fefBfbfN,É,·,é,©fXfgfŠ [f€É,É,·,é,©,ðŽw’è,·,é,ì,ÍfpftfH [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

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,^aŽÀ s,³,ê,é Bf\ftfgfEfFfA EfTfEf“fh Efofbftf@,ÍCPU,É,æ,Á,Äf~fLfVf“fO,^aŽÀ s,³,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,^afn [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,^aŽw’è,³,ê,Ä,¢ ,Ä Afn [fhEfFfA Ef f,fŠ,âf~fLfVf“fO”—Í,^as \‘^a,È,Æ,«„Í Afobftf@,Ì ì ¬— v< ,ÍŽ,”s,·,é B,Û,½ AÆ» Ý,ÌfTfEf“fh EfffofCfX,Í,Û,Æ,ñ,Ç,^afn [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,ÄSBCAPS_LOCHARDWARE,à,µ,,Í DSBCAPS_LOCSOFTWAREftf%oF,ðŠm”F,·,é,Î,æ,¢ B,Ä,È,È,Ç,·,é,©,ÉŽw’è,³,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,İTfEf“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,İTfEf“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,² ~— ,Í Afñ [fhfEfFA,İfŠ\ [fXŠ,,è—,Ä,â A Ä ¶†,İ,·,×,Ä,İfofbftf@,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,²,½,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 Afñ [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,²f 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,ðñÇY,·,é B,±,İfofbftf@,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‘Oññ,İff [f^,ðĖJ,è•Ö,µ A%¹ °,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;
    // fofbftf@fTfCfY,İTfEf“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÷ Bfofbftf@,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 **IDirectSoundBuffer::Lock**f f\fbfh,ðŽg—
p,·,é Bfofbftf@,Ö,İff [f^ ‘,«±,Ý AfRfs [,İ AfTfEf“fh Efofbftf@(f f,fŠ),^af fbfN,³,é,½,Æ,É%Å”\
,É,È,é Bfofbftf@ Ef f,fŠ,İf fbfN,İ,»),İÆ **IDirectSoundBuffer::Unlock**f f\fbfh,Å%ð æ,·,é±,Æ B

·Ê í AfXfgfŠ [f€ EfTfEf“fh Efofbftf@,İ^A±
,µ,Ä Ä ¶,³,é,é,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,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@,İIftfZfbfg,Æ’·,³,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,³,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’¹²fÆfxf<,İfAfvfŠfP [fVf±f“,“ü—İftfH [fJfX,ð“¾,½ ê ±,É,à<N,±,è,â,·,ç B±
,İftf%ofo,” Ý’è,³,è,Ä,ç,é,Æ Afth [fJfX,ðŽ ,ÄfAfvfŠfP [fVf±f“,^afvf%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,^a<N,«½ ê ± ADirectSound,İ **IDirectSoundBuffer::Lock**,·,æ,Ñ
IDirectSoundBuffer::Playf f\fbfh,É’İ,µ,ÄDSERR_BUFFERLOSTfGf%o [fR [fh,ð•Ö,· B,»,İfAfvfŠfP [fVf±f“,^a ‘
,« Ž,Ý—D æ’¹²fÆfxf<,©,ç’¼,İfÆfxf<,É%o°,^a,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,ðŠfXfgfA,·,é B,µ,©,µ AfŠfXfgfA,³,è,½fofbftf@,İTfEf“fh Eff [f^,İ”]
%oó,³,è,Ä,ç,é B efAfvfŠfP [fVf±f“,İfŠfXfgfA,³,è,½fofbftf@,Öff [f^,ð Ä ‘,«±,Ý,·,é•K—v,^a, ,é B

ŽÝ,İ—á,Ä,İ**IDirectSoundBuffer::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,Ä; ”,İfXfgš [f€,đf~fLfVf“fO,·,é,İ,İŠÈ’P,Ä, ,é B’P,
ÉfZJf“f fŠ EFTfEf“fh Efofbftf@,đ ì ¬,µ A,»,é,¼,é,İfofbftf@,ÉIDirectSoundBufferfCf“f^ [ftfFfCfX,đŽó,¬Žæ
,ç,¹,é,¾,¬,Ä,æ,ç B,±,é,ç,İfCf“f^ [ftfFfCfX,đŽg—p,µ,Ä A IDirectSoundBuffer::Lock,¬,æ,Ñ
IDirectSoundBuffer::Unlockf f\fbfh,Äfofbftf@,Éff [f^,đ ‘,«,±,Ý A
IDirectSoundBuffer::Play,Äfofbftf@,đ Ä ¶,·,é,±,æ,ª,Ä,«,é B,Ü,½ A IDirectSoundBuffer::Stopf f\fbfh,đŽg—
p,µ,Ä A Ä ¶†,İfofbftf@,đ,ç,Ä,Ä,à’âŽ~,·,é,±,æ,ª,Ä,«,é B

IDirectSoundBuffer::Playf f\fbfh,İ,Ä,É,Éfofbftf@,İfJfEf“fg EflfWfVf±f“,©,ç Ä ¶,đŽn,ß,é BfJfEf“fg Efl
fWfVf±f“,İ Afobftf@“à,İfİftfZfbfg,ÄfofCf’P`Ê,ÄŽw`è,³,é,é B V<K ì ¬,³,é,½fofbftf@,İfJfEf“fg Efl
fWfVf±f“,İO,Ä, ,é Bfofbftf@,“âŽ~,·,é,æ AfJfEf“fg EflfWfVf±f“,İ,Žž,ÉŽÝ,É Ä ¶,³,é,éftf“fvf<,Ö`Ü“®,·,é B
IDirectSoundBuffer::SetCurrentPositionf f\fbfh,đĖÄ,Ñ o,¹,İfJfEf“fg EflfWfVf±f“,đ—¾šm,É Ý’è,·,é,±
,æ,ª,Ä,« A IDirectSoundBuffer::GetCurrentPositionf f\fbfh,đĖÄ,Ñ o,¹,İfJfEf“fg EflfWfVf±f“,đŽæ“¾,Ä,«,é B

ffftfHf<fg,Ä,İIDirectSoundBuffer::Play,İfofbftf@,İ I,İ,è,É“Ž’B,µ,½,æ,«,É Ä ¶,đ I—¹,·,é B,±
,è,İf< [fv,É,µ,İfXf^fefBfbfN Efofbftf@,İ“K ØÈ® ì,Ä, ,é(fJfEf“fg EflfWfVf±f“,İ,±
,İŽŽ“_Äfofbftf@,İŠJŽn`Ê`u,Ü,ÄfŠfZfbfg,³,é,é) B
fXfgš [f€ Efofbftf@,¬,æ,ÑfXf^fefBfbfN Efofbftf@,đ`A`±“I,É Ä ¶,·,é ê ±,İ A
IDirectSoundBuffer::Play,đĖÄ,Ñ o,µ,Ä AdwFlagsfpf%of [f^“à,ÉDSBPLAY_LOOPINGftf%ofO,đŽw`è,·,é B,±
,è,É,æ,è Afobftf@,¹ I,İ,è,Ü,Ä“Ž’B,·,é,æ,Ü,½šJŽn`Ê`u,Ü,Ä—ß,é,æ,µ,É,É,é B

fXfgš [f€ EFTfEf“fh Efofbftf@,Ä,İ A Ä ¶fJ [f<“,šJŽn`Ê`u,Ü,ÄŠª,«—
ß,é“O,É AŽÝ,İfuf fbfN,İff [f^,ª ‘,«,±,Ü,è,Ä,ç,é•K—v,ª, ,é B,±,İ,½,ß,É,İWin32ŠÖ ”,İSetTimer,à,µ,,İ
SetEvent,đŽg—p,µ,Ä A`èŠú“I,Éf fbfZ [fW,âfR [f<fofbfNŠÖ ”,ªŽÄ s,³,é,é,æ,µ,É,·,é,İ,æ,ç B,³,ç,É A`½,-
,İDirectSoundfAfvššP [fVf±f“,İ AfšfAf<f^fCfĖDirectDrawfRf“f]
[flf“fg,đŽ ,Ä,Ä,¬,è AfffBfXfvfEfC,É`İ,µ,Ä`èŠú“I,ÉfT [frfX,đ s,µ,à,İ,Ä, ,é B,±,İfRf“f]
[flf“fg,İDirectSoundfofbftf@,É,à“—l,ÉfT [frfX,đ`Ý<“,·,é,±,æ,ª,Ä,«,é BEØ—
,İĖü ã,đ I,¹ A Ä ¶†,İfI [ffBfI o—
İ,İ,,è,đ Ä ¬ĖÄ,É,¬,³,¹,é,½,ß,É,İ AfAfvššP [fVf±f“,İfJfEf“fg,İ Ä ¶fJ [f<,æ,è ,É,,æ,à¹b,İ æ,É ‘,«,±
,Ý,đ s,µ•K—v,ª, ,é B

,à,µfXf^fefBfbfN Efofbftf@,É`İ,µ,ÄDSBCAPS_STATICftf%ofO,đŽw`è,µ,Ä,ç
,è,İ AdirectSoundf~fLFT [,İfn [fhfEfFfA EfAfNfZf%ofĖ [fVf±f“,İĖØ—p,đ Ä`âĖÄ,ÉŽó,¬,é,±,æ,ª,Ä,«,é B,±
,İftf%ofO,İ Ä—~p,³,é,éXf^fefBfbfN Efofbftf@,Ä,İ•K,Žw`è,µ,½,Ü,µ,ª,æ,ç BDirectSound,İ,±,é,ç,İfofbftf@,đ—
LĖØ,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 Efofbftf@,İ Afn [fhfEfFfA EfAfNfZf%ofĖ [fVf±f“,đ—D æ“I,ÉŽó,¬,ç,è,é,æ,µ
,É`è“Ö Ä %ø,É ì ¬,·,é,Ü,µ,ª,æ,ç B

fAfvššP [fVf±f““à,İfTfEf“fh,ª,·,×,Ä“¬,¶wave,đŽg—p,µ Afn [fhfEfFfA,Ö,İ o—
İĖ`Ž®,ª,»,è,ç,İfTfEf“fh,æ ±,Ä,Ä,ç,è,İ AdirectSoundf~fLFT [,İ Ä ,<%ø•iŽç,İfTfEf“fh,đ ì,è o,· B,±
,İ đĖ %ø,Ä,İ Af~fLFT [,İĖ`Ž®•İŠ·,đ,·,é•K—v,ª,É,ç,½,ß,Ä, ,é B

fn [fhfEfFfA,Ö,İ o—İĖ`Ž®,đ•İ X,·,é,É,İ Afvf%ofCf]
fŠ EFTfEf“fh Efofbftf@,đ ì ¬,µ,ÄIDirectSoundBuffer::SetFormatf f\fbfh,đĖÄ,Ñ o,· B,½,¾,µ A,±
,İvf%ofCf}fš Efofbftf@,İ §Ėä,İ—Ü“I,Ä,µ,©Žg—p,Ä,«, , A,±
,İŠÖ ”,đĖÄ,Ñ o,¹,éAfvššP [fVf±f“,İ ADSSCL_PRIORITY,à,µ,,İ,»,è`È ã,İç’²fĖfxf<,É Ý’è,³,é,æ,ç,é,à,İ,Ý,Ä,
,é B,»,µ,ÄDirectSound,İ AfAfvššP [fVf±f“,“ü—
İftfH [fJfX,đ“¾,é,½,Ñ,É Afn [fhfEfFfA,İĖ`Ž®,đ•O%ñ,İIDirectSoundBuffer::SetFormatf f\fbfh,İĖÄ,Ñ o,µ,Ä
Ý’è,µ,½Ė`Ž®,É•Ö,· B

fJfXf^f€ Ef~fLFT [,lžg—p

,Û,Æ,ñ,ç,lfAfVfŠfP [fVf‡f“,Ä,ÍDirectSoundf~fLFT [,ðŽg—p,·,é,ª A,±,ê,Í A,Û,Ú,·,×,Ä,lf~fLfVf“fO,ì—v, ,ð—ž,½,µ A,Û,½ AŽ@“@“I,Éfn [fhEfFfA EfAfNfZf%of€ [fVf‡f“,ð—~—
p,·,é B,µ,©,µ ADirectSound,“ñŸ,µ,È,¢<@“\,ðfAfVfŠfP [fVf‡f“,ªK—v,Æ,·,é ê ‡ Afvf%ofCf}
fŠ EfTfEf“fh Efofbftf@,Ö,ì ‘,«,±,ŸfAfNfZfX,ðŠl“¾,µ A,»,±,Ä’¼ ÚfXfgfŠ [f€,ðf~fLfVf“fO,·,é,±
,Æ,ª,Ä,«,é B,±,ì<@“\,fRf“f| [f|f“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<@“\,ð—~—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, ,ªEµ,µ,È,é B

fJfXf^f€ Ef~fLFT [,ð ì ¬,·,é,É,Í A,Û,,DSSCL_WRITEPRIMARY<’²f€fxf<,ðŽæ“¾,µ Afvf%ofCf}
fŠ EfTfEf“fh Efofbftf@,ð ì ¬,·,é BŽŸ,É**IDirectSoundBuffer::Lock**f f\fbfh,ðÆÄ,Ñ o,µ A•Ö,³,ê,½f|
fCf“f^,Öff [f^,ð ‘,«,±
,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@,ð Ä ¶,µ Aff [f^,ðfXfs [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—@,ðŽŸ,ÉŽ!,µ,Ä,¢,é B—á,l’†,É, ,éAppMixIntoPrimaryBufferŠÖ ”,Í AfTfEf“fh Efff ofCfX,ªff [f^ Efuf fbfN,ì Ä ¶,ðEJ,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,l’†,ÄŽw’è,³,ê,½,Æ,«,É•i ”,lfXfgfŠ [f€
,ðf~fLfVf“fO,µ AÆ•%Ê,ðŽw’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^,ðŽæ“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^,ðf~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 æ,lž,“s  
    return FALSE;  
}
```

³ kwave,İŽg—p

Œ» Ý,İDirectSound,Í A³ kwave,ðfTf| [fg,µ,Ä,Œ
,È,Œ B³ k,³,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,Œ,éfI [ffBfI³ kf}fI [fWff(ACM) ŠÖ ”,ðŽg—p,·,é•K
—v,^a,,é BŽÀ Û,É,Í Af|fCf“f^,ðfTfEf“fh Efofbftf@ Ef f,fŠ,İf|fCf“f^,ðf fbfN,µ,Ä ACM,É“n,¹,İ A Ä,àŒø
—¹,æ,ff [f^,ð’¼ ÚTfEf“fh Efofbftf@,ÖffR [fh,Ä,«,é B

DirectSoundfŠftf@fÆf“fX

šö ”

DirectSoundCreate

```
HRESULT DirectSoundCreate(GUID FAR * lpGuid,  
    LPDIRECTSOUND * ppDS, IUknown FAR * pUnkOuter);
```

IDirectSoundfCf“f^ [ftFFfCfX,Ì ì ¬,Æ %Šú%»»,ð s,□ B

¬Æ÷,·,ê,ÎDS_OK AŽ,”s,·,ê,ÎŽŸ,ÌfGf% [fR [fh,ð•Ô,· B

DSERR_ALLOCATED

DSERR_INVALIDPARAM

DSERR_NOAGGREGATION

DSERR_NODRIVER

DSERR_OUTOFMEMORY

lpGuid

fTfEf“fhffofCfX,ðŽ¬•Ê,·,éGUID,Ö,Ìf|fCf“f^ B,±
·,Ìfpf%of [f^,Ì'l,ÍDirectSoundEnumerate,É,æ,è•Ô,³,ê,éGUIDs,Ì,Ð,Æ,Â A,à,µ,,ÍfftfHf<fg,ÌffofCfX,ð—
v< ,·,é,½,ß,ÉNULL,Æ,Ê,é B

ppDS

,±,ÌŠÖ ”,É%ž“š,µ,Â ì ¬,³,ê,éDirectSoundIfufWfFfNfg,Ö,Ìf|fCf“f^ B

pUnkOuter

¬¢'è<,Ìø ” B,±,Ì'l,ÍNULL,Â,Ê,¬,ê,Î,È,ç,È,¢ B

DirectSoundIfufWfFfNfg,Ì ì ¬Æã,Í A,·,Ý,â,©,ÉIDirectSound::SetCooperativeLevelf f\fbfh,ðÆÄ,Ñ o,³,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<,³,ê,Ä,¢,éDirectSoundfhf%ofCfo,ð—ñ<“,·,é B

¬€÷,·,ê,Î,c,r_,n,j AŽ,”s,·,ê,Î**DSERR_INVALIDPARAM**,İfGf%o [fR [fh,ð•Ô,· B

lpDSEnumCallback

DSEnumCallbackŠÖ ”,Ö,İf|fCf“f^ B,±,ê,İfVfXfef€,\acute{E}fCf\text{“}fXfg [f<,³,ê,Ä,¢
,é,»,ê,¼,ê,İDirectSoundIfufWfFfNfg,©,ç€Ä,Ñ o,³,ê,é B

lpContext

f† [fU’è`fRf“fefLfXfg,Ö,İf|fCf“f^ B,±,İfRf“fefLfXfg,Í A—
ñ<“fR [f<fofbfNŠÖ ”,ª€Ä,Ñ o,³,ê,é,½,Ñ,É A,»,İŠÖ ”,Ö“n,³,ê,é B

ŽQ Æ @**DSEnumCallback**

***f*R [f<fofbfNŠÖ ”**

DSEnumCallback

```
BOOL DSEnumCallback(GUID FAR * lpGuid,  
    LPSTR lpstrDescription, LPSTR lpstrModule,  
    LPVOID lpContext);
```

DirectSoundfhf%ofCfo,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%ofCfo,ì—ñ<“,ª±, ê ±,É,ÍTRUE A I—¹,·,é ê ±,É,ÍFALSE,ð•Ö,· B

lpGuid

—ñ<“”†,ìfhf%ofCfo,ðŽ•Ê,·,éGUID,Ö,ìf|fCf“f^ B,±
,ì¹,Í Afhf%ofCfo,ìDirectSoundfIfufWfFfNfg,ð ì ¬,·,é,½,ß,ÉDirectSoundCreateŠÖ ”,Ö“n,³,ê,é B

lpstrDescription

DirectSoundfffofCfX,ìfefLXfg<L q,ð—^,ì,é A NULL,Ä I,í,é•¶Žš—ñ,Ö,ìf|fCf“f^ B

lpstrModule

,±,ìfffofCfX,É•Š“—,·,éDirectSoundfhf%ofCfo,ìf,fWf... [f<¼,ðŽw’è,·,é A NULL,Ä I,í,é•¶Žš—ñ,Ö,ìf|fCf“f^ B

lpContext

fAfvfŠfP [fVf‡f“”è`ff [f^,Ö,ìf|fCf“f^ B,»,é,¼,ê,ìfR [f<fofbfNŠÖ ”,Ö“n,³,ê,é B

lpstrDescription,“,æ,Ñ lpstrModulefpf%of [f^,É“n,³,ê,½•¶Žš—ñ,Í Afq [fv,©,çŠ,,,è“—
,Ä,ç,ê,½f f,fŠ,ÖfRfs [,μ,Ä•¶,·,é,±,Æ,ª,Ä,«é B•¶Žš—ñ,ð,±,ìfR [f<fofbfNŠÖ ”,Ö“n,·,ì,ÉŽg—
p,³,ê,½f f,fŠ,Í A,±,ìfR [f<fofbfNŠÖ ”,ªŽÄ s†,ì,Æ,«,É,ì,Ý—LÆø,Æ,È,é 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 Å‘â,ÏftfŠ [f f,fŠ—Ïæ,ðŽg—p‰Â”\ ,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†,ÅDSSCL_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
¬œ÷,·,ê,İDS_OK AŽ,”s,·,ê,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,¢,éDSBUFFERDESC \‘¢‘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¬ø ” B,±,ì¹,İNULL,Ä,È,,Ä,Í,È,ç,È,¢ B

fTfEf“fh Efofbftf@,đ Ä ¶%oÂ”\,É,·,é,½,ß,É AŽ–‘O,ÉIDirectSound::SetCooperativeLevelf f\fbfh,đŽg—
p,µ,ÄDirectSoundfIfufWfFfNfg,İç’²fœfxfç,đŽw’è,µ,Ä,¬,©,È,,Ä,Í,È,ç,È,¢ B

lpDSBufferDescfpf%of [f^,Í Aœ`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,Í–³œø,É,È,é B,½,Æ,,İDirectSoundfIfufWfFfNfg,đ ì ¬,·,é,Æ,«,É

DSBCAPS_CTRLFREQUENCYftf%ofO,đŽw’è,µ,Ä,¬,©,È,¢,Æ A

IDirectSoundBuffer::SetFrequency,İœÄ,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,ìIfufWfFfNfg,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 »³,ê,½DirectSoundBufferIfufWfFfNfg,Ö,ìf|fCf“f^ B

lplpDsbDuplicate

V<K,ìDirectSoundIfufWfFfNfg,Ö,ìf|fCf“f^ B

V<K,ìIfufWfFfNfg,ÍIfIfŠfWfiƒ,Æ“¬,¶,æ,µ,ÉŽg—p,Ä,«,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,Ä A‘ŠŽè,É%œç,ðçy,Ú,·,±,Æ,È, A Ä ¶,¬,æ,Ñ’âŽ~,ð s,µ,±,Æ,^a,Ä,«,é B

f ofbftf@“à,ìff [f^,^a,Ç,ç,ç,©,ìIfufWfFfNfg,É,æ,Á,Ä•İ X,³,ê,é,Æ Af f,fŠ,^aç—L,³,ê,Ä,ç
,é,½,ß,É A,»,ì•İ X,Í,à,ç“ê•û,ìIfufWfFfNfg,É,à”½%of,³,ê,é B

ÅÆä,ìIfufWfFfNfgŽQ Æ,^a%ð•ú,³,ê,é,Æ Af ofbftf@ Ef f,fŠ,Í%ð•ú,³,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,ðpfpfH [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,³,ê,½fXfs [fJ Ý'è,ðŽæ“¾,·,é B
¬Œ÷,·,ê,ÎDS_OK AŽ,”s,·,ê,ÎŽŸ,ÌfGf% [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,³,ê,é B

DSSPEAKER_HEADPHONE

fI [ffBfI,Ífwbfbfhzf“,©,ç o—Í,·,é B

DSSPEAKER_MONO

fI [ffBfI,Íf,fmf%of< EfXfs [fJ,©,ç o—Í,·,é B

DSSPEAKER_QUAD

fI [ffBfI,Í4f`fff“flf< EfXfs [fJ,©,ç o—Í,·,é B

DSSPEAKER_STEREO

fI [ffBfI,ÍfXfefŒfI EfXfs [fJ,©,ç o—Í,³,ê,é(fftfHf<fg'l) B

DSSPEAKER_SURROUND

fI [ffBfI,ÍfTf%ofEf“fh EfXfs [fJ,©,ç o—Í,³,ê,é B

ŽQ Æ @*IDirectSound*, **IDirectSound::SetSpeakerConfig**

IDirectSound::Initialize

HRESULT Initialize(GUID FAR * lpGuid);

CoCreateInstanceŠÖ ”,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,Ň o,³,ê,È,¢
,Æ A,»,ÌŒã,ÉŒÄ,Ň 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);
```

fTfEf“fh EfftfoCfX,Éî,éAfvfŠfP [fVf±f“,î²fĈfxf,ð Ý`è,é B
 ñĈ÷,·ê,îDS_OK AŽ,”s,·ê,îŽŸ,îGf%o [fR [fh,ð·Ô,· B

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< ,³,ê,^{1/2}<₁'²f⊆fxf< B ŽŸ,ì'l,^aŽw'è,Å,«,é B

DSSCL_EXCLUSIVE

fAfvfŠfP [fVf‡f“,ð”¼fƒfxf,É Ý’è,·é B“ü—
 ÍftfH [fJfX,ð”¼é,Æ A,»,ÌfAfvfŠfP [fVf‡f“,¾,—,ª—B“è—
 Â,ç,¹,é,æ,²,É,È,é
 (DSBCAPS_GLOBALFOCUSftf%oF Ý’è,ÌfAfvfŠfP [fVf‡f“,©,ç,Ìf
 TfeF“fh,Íf~f... [fg,³,è,ê) B,±,Ìfƒfxf,É,—,é
 fAfvfŠfP [fVf‡f“,Í ADSSCL_PRIORITYfƒfxf,Ì,·,×,Ä,Ì“Áƒ,ð—
 L,· B Ä V,ÌDirectSoundBuffer::SetFormat f\fbfh,ÌƒÄ,Ñ o,µ,Ä
 Žw’è,³,è,Æ ADirectSound,Ífn [fhEfFfAƒŽŽ,ðfŠfXfgfA,·,é
 (,¾,¾,µ ADirectSound,Í Ý’è,³,è,½—
 D æfƒfxf,ÉŠÖ,í,ç, A,Ä,Ë,Éwave,ðfŠfXfgfA,·,é) B

DSSCL_NORMAL

fAfvfŠfP [fvfʃf“„É ʷ„Èçʰ2 ó Ô„ð Ýè„„é B Å„àfXf€ [fY„Èf}
f<f^f^XfLf“fO„ÆfŠf\ [fXç—L„ð s„ç
„İ„Å A„Ü„È„ñ„Ç„İfAfvfŠfP [fvfʃf“„İ„ı„İf€fxfç„É Ýèè„„„ç„ B

DSSCL_PRIORITY

fAfvfŠfP [fVf‡f“,đ—D æfEfxf,É Ý`è,`é B,±
 ĩfEfxf,İfAfvfŠfP [fVf‡f“,İ**ndirectSoundBuffer::SetFormat**,,æ,Ñİ
DirectSound::Compactf fvfbfh,đEÄ,Ñ o,.,±,Æ,^aÄ,«,é B

DSSCL_WRITEPRIMARY
$$\begin{aligned} & \pm, \hat{e}, \hat{1} \quad \hat{A} \quad \hat{a} \hat{e} \hat{1}, \hat{l} f(E f x f, \hat{A}, \hat{e} \quad B f A f v f \hat{S} \hat{P} \quad [f V f \pm f, \hat{1} f v f \hat{o} f C f] \\ & \hat{f} \hat{S} \quad E f T f E f " f h \quad E f o f b f t f @, \hat{O} \hat{1} \quad ', \pm, \hat{Y} f A f N f Z f X, \hat{O} - L, \mu, \hat{A}, \hat{c} \\ & \hat{e} \quad B f Z f J f " f \hat{f} \hat{S} \quad E f T f E f " f h \quad E f o f b f t f @, \hat{1} \quad \hat{A} \quad \P, \hat{1} \hat{e} \quad \emptyset, \hat{A}, \hat{c}, \hat{E}, \hat{c} \quad B \end{aligned}$$

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 , · , ± , E , Ä , Í · K { , Ä , , é B , , § , l , ' , ' 2 f C f x f , ð , Í D S S C L _ N O R M A L , Ä , , é B ' ¼ , l — D 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 E , ·, é , ± , E B

ŽQ Ą @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,É,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
*IDirectSound3DBuffer*fCf“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
*IUnknown*fCf“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

¬Ɖ÷,·,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,ǫŽæ“¾,·,é B
¬Ė÷,·,ê,İDS_OK AŽ,”s,·,ê,İ**DSERR_INVALIDPARAM**fGf%o [fR [fh,ǫ•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,ǫŽ',μ,Ä,ċ
,é BfxfNfgf< îñ,İfTfEf“fh EfR [f“,İ'† S,ǫ•\,· 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,^aÈ,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%₀ [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(−¾%₀!),Ü,Â,Â, ,é B‘ • ,ÍŒ» Ý,ÎDirectSoun
d,Â,ÍfTf| [fg,³,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);
```

$\neg \mathbb{E} \vdash \cdot, \hat{e}, \hat{\text{IDS_OK}} \quad \text{AŽ}, \text{"s}, \cdot, \hat{e}, \hat{\text{DSERR_INVALIDPARAM}} \quad fGf\%_0 \quad [fR \quad [fh, \partial \cdot \hat{O}, \cdot \quad B$

« \mathbb{E} » $\dot{\text{Y}}, \dot{\text{I}}$ $\ddot{\text{A}}' \cdot \leftarrow - \text{£}$ $\dot{\text{Y}}' \dot{\text{e}}, \check{\text{đ}} \check{\text{Z}}_{\text{,}}^{\text{!}}, \bullet \ddot{\text{I}}$ ", $\ddot{\text{O}}, \dot{\text{I}} f | f C f " f ^ B$

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,ÎDSERR_INVALIDPARAMfGf%o [fR [fh,ð•Ô,· B

lpflMinDistance

Œ» Ý,l Å’Z<—£ Ý’è,ðŽ|,·İ ”,Ö,l|f|fCf“f^ B

ffftfHf<fg,Ä,Í Å’Z<—£’l,Í1.0,É,È,Ä,¢,é B,±,ê,ÍffftfHf<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,ì 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,Ü,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,ĂŽæ“¾,·,é BfftfHf<fg,Ă,Í<——
Ě’P^Ê,Íf [fgf<,¾,ª A’P^Ê,ìĪ X,ÍIDirectSound3DListener::SetDistanceFactorf f\fbfh,ðŽg—p,µ,Ă 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,Ă,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,Éfofbftf@,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@,l̇, é ušŌ,İ ó‘Ô,İ,·,×,Ä,đŽ!,μ,Ä,¢,éDS3DBUFFER \‘¢‘İ,©,ç—
^,!,ç,ê,½ A,·,×,Ä,İ3DfTfEf“fh Efofbftf@ Efpf%of [f^,đ Ý’è,·,é B*

¬œ÷,·,ê,İDS_OK AŽ,”s,·,ê,İDSERR_INVALIDPARAMfGf%o [fR [fh,đ•Ô,· B

lpDs3dBuffer

DS3DBUFFER \‘¢‘İ,Ö,İf|fCf“f^ B,±,İ \‘¢‘İ,İfTfEf“fh Efofbftf@,İ3D“Á «,đŽ!,μ,Ä,¢,é B

dwApply

Ý’è,İf^fCf~f“fO,đŽ!,·! BŽŸ,İ!l,ÄŽ!,³,ê,é B

DS3D_DEFERRED *fAfvfŠfP [fVf‡f“,“IDirectSound3DListener::CommitD
eferredSettingsf f\fbfh,đœÄ,Ň o,·,Ü,Ä Ý’è,İ s,í,ê,È
,¢ B•i ”,İ Ý’è,đ•İ X,μ,½,è A’P“Æ,İ ÄœvŽZ,đŽÄ s
,·,é,±,Æ,“%oÂ”\ B*

DS3D_IMMEDIATE *Ý’è,İ‘ŽŽ,É s,í,ê AfVfXfef€
,İ,·,×,Ä,İ3DfTfEf“fh Efofbftf@,É‘İ,·,é3D À•W,İ Ä
œvŽZ,đ s,□ B*

IDirectSound3DBuffer::SetConeAngles

```
HRESULT SetConeAngles(  
    DWORD dwInsideConeAngle,  
    DWORD dwOutsideConeAngle, DWORD dwApply);
```

fTfEf“fh Efofbftf@,l̂fTfEf“fh Efvf fWfFfNfVf‡f“ EfR [f“,l̂“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“,l̂“à•”Šp,ÆŠO•”Šp B

dwApply
Ý’è,^a s,í,ê,éf^fCf~f“fO,đŽ!,·! BŽŸ,ì!,ĂŽ!,³,ê,é B

DS3D_DEFERRED *fAfvfŠfP* [fVf‡f“,^aIDirectSound3DListener::Comm
*tDeferredSettings**f* f\fbfh,đÆĂ,Ñ o,·,Û,Ă Ý’è,Í s,í
,ê,È,¢ B•i ”,Ì Ý’è,đ•İ X,μ,½,è A’P“Æ,Ì ĂÆvŽZ,đ
ŽĂ s,·,é,±,Æ,^a%oĂ”\ B

DS3D_IMMEDIATE Ý’è,Í‘Žž,É s,í,ê AfVfXfef€
,Í,·,×,Ă,İ3DfTfEf“fh Efofbftf@,É‘Î,·,é3D À•W,İ
ĂÆvŽZ,đ s,□ B

Šp“x,l̂”ÍÍ,Í0“x(fR [f“,È,μ),©,ç360“x(‘S”ÍÍ),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! ,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 ,^a s,í,ê,éf^fCf~f“fO,đŽ!,·¹ B^È%o°,İ¹,ĂŽ!,³,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@,ÉÍ ,·,é3D Ă•W,İ Ă
ŒvŽŽ,đ s,▯ B

f{fŠf... [f€ EfŒfxf<,İŒ, Š,đ•\,· B’ • ,İDirectSound,Ă,İŒ» ÝfTf| [fg,³,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,^a s,í,ê,éf^fCf~f“fO,ðŽ',·'l B^È%°,İ'l,ÄŽ',³,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«vŽŽ,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
«vŽŽ,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,^a s,í,ê,éf^fCf~f“fO,ðŽ!,·'l B^È%o°,ì'l,ÄŽ!,³,ê,é B

DS3D_DEFERRED fAfvfŠfP [fVf‡f“,^aIDirectSound3DListener::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,î3DfTfEf“fh Efofbftf@,É'î,·,é3D Ä•W,ì Ä
«vŽŽ,ð s,² B

ffftfHf<fg,Ä,Í Á'Z<—£'l,í1.0(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  
    -œ÷,·,ê,ÎDS_OK AŽ,”s,·,ê,ÎDSERR_INVALIDPARAMfGf%o [fR [fh,ð•Ô,· B  
  
dwMode  
    3DfTfEf“fh ^— f, [fh,ð Ý’è,·,é BŽŸ,ì‘l,ÄŽ‘,³,ê,é B  
    DS3DMODE_DISABLE  
        3DfTfEf“fh ^— ,Í-³œø BfTfEf“fh,ÍfŠfXfi [,ì“a,ì‘† S,©,ç•,±  
        ,!,é,æ,¤,ÉŠ’,¶,é B  
  
    DS3DMODE_HEADRELATIVE  
        fTfEf“fh Efpf%of [f^(^Ê‘u A‘-“x A•ûœü)  
        ,ÍfŠfXfi [,ìfpf%of [f^,Æ‘Š‘ÎŠÖœW,É, ,é B,±  
        ,ìf, [fh,Ä,Í AfTfEf“fh,Ì â‘Îfpf%of [f^,ÍfŠfXfi [ Efpf%of [f  
        f^,ª‘Î X,³,ê,½,Æ,«„ÉŽ©“®“l,É X V,³,ê,é,ì,Ä A‘Š‘Îfpf%of [f^,Í‘Î  
        ,í,ç,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,ðŽ‘,·‘l B^È%oo,ì‘l,ÄŽ‘,³,ê,é B  
  
    DS3D_DEFERRED fAfvfŠfP [fVf‡f“,ªIDirectSound3DListener::CommitDef  
erredSettingsf f\fbfh,ðœÄ,Ñ o,·,Û,Ä Ý’è,Í s,í,ê,È,¢  
B•¡ ”,Ì Ý’è,ð•Î X,µ,½,è A’P“Æ,Ì ÄœvŽŽ,ðŽÄ s,·,é,±  
,Æ,ª%oÄ”\ B  
  
    DS3D_IMMEDIATE Ý’è,Í‘ŽŽ,É s,í,ê AfVfXfef€  
,Í,·,×,Ä,ì3DfTfEf“fh Efobftf@,É‘Î,·,é3D Ä•W,ì Äœ  
vŽŽ,ð s,¤ B
```


IDirectSound3DBuffer::SetPosition

```
HRESULT SetPosition(D3DVALUE x,  
    D3DVALUE y, D3DVALUE z, DWORD dwApply);
```

*fTfEf“fh Efofbtft@,lE» Ý,îÊ‘u,ð<——£’PˆÊ,Â Ý’è,·,é BfftfHf<fg,l<——
£’PˆÊ,Íf [fgf<,¾,a AIDirectSound3DListener::SetDistanceFactor methodf f\fbfh,ðŽg—p,µ,Ä’PˆÊ,î•İ X,à s,!,é B
¬Æ÷,·,ê,İDS_OK AŽ,”s,·,ê,İDSERR_INVALIDPARAMfGf%o [fR [fh,ð•Ô,· B*

*x, y, , ,æ,Ñ z
D3DVALUE,İf^fCfv,ðŽ!,·l B,±,ê,Í V,µ,¢ˆÊ‘ufxfNfgf<,İ Ä•W,ð•\,· B*

*dwApply
Ý’è,ª s,í,ê,éf^fCf~f“fO,ðŽ!,·l BˆÈ%o°,İl,ÄŽ!,¾,ê,é B*

DS3D_DEFERRED *fAfvfŠfP [fVf‡f“,ªIDirectSound3DListener::CommitD
eferredSettings
f f\fbfh,ðÆÄ,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 ÄÆvŽZ,ðŽÄ s,·,é,±
,Æ,ª%oÄ”\ B*

DS3D_IMMEDIATE *Ý’è,Í‘Žž,É s,í,ê AfVfXfef€
,Í,·,×,Ä,İ3DfTfEf“fh Efofbtft@,É‘Î,·,é3D Ä•W,İ Ä
ÆvŽZ,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,lf^fCfv,ðŽ!,·l B,±,ê,Í V,μ,¢‘¬“xfxfNfgf<,l À•W,ð•\,· B

dwApply

Ý’è,^a s,í,ê,éf^fCf~f“fO,ðŽ!,·l B^È%o°,l,ÁŽ!,³,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,‘lŽž,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,³,ê,é BŽÄ Û,Éfofbftf@,ð~Ú“®,·,é,±
,Æ,Í,È,¢ B Û ×,Í^Ê’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*

f ofbf`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 BIUnknownfCf“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,ìĒĀ,Ñ o,μ^ÈĒã,É ì ¬,³,ê,½ ~,|’u,« Ý’è,ðfRf~fbfg,·,é B
¬Ē÷,·,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,ċ,Ă,Ì Ú ×,í ~,|’u,« Ý’è,ðŽQ Æ,·,é,±,Æ B

IDirectSound3DListener::GetAllParameters

```
HRESULT GetAllParameters(LPDS3DLISTENER lpListener);
```

3Df [f<fh,“,æ,Ń3DfŠfXfi [,lŒ» Ý,l ó‘Ô,ð•\,· î•ñ,ðŽæ“¾,·,é B

¬Œ÷,·,ê,ŦDS_OK AŽ,”s,·,ê,ŦDSERR_INVALIDPARAMfGf%o [fR [fh,ð•Ô,· B

lpListener

DS3DLISTENER \‘Œ‘İ,Ö,l|f|fCf“f^ B,±,İ \‘Œ‘İ,Í3Df [f<fh,“,æ,Ń3DfŠfXfi [,lŒ» Ý,l 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,Î**DSERR_INVALIDPARAM**fGf%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• Ĩ ”,Ö, ìf|fCf“f^ B,±,ê,ÍE» Ýfhfbfvf% [¬v‘f, ì’l,ªŽ,³,ê,é B

fhfbfvf% [¬v‘f, ì”ÍÍ,Í0(fhfbfvf% [¬v‘f,È,µ),©,ç10.0(ŽÀ Û, ì ¢ŠE, ì10”{, ìfhfbfvf% [¬v‘f),Ä, ,é

BffftfHf<fg’l,ÎDS3D_DEFAULTDOPPLERFACTOR(1.0),Ä, ,é Bfhfbfvf% [¬v‘f,É,Ä,¢
,Ä, Ì Ú ×, Í 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,ÎDS_OK AŽ,”s,•,ê,ÎDSERR_INVALIDPARAM fGf%o [fR [fh,ð•Ô,• B

lpvOrientFront

D3DVECTOR \‘ç‘ì,Ö,l̂f|fCf“f^ BfŠfXfi [,l‘O•ûfxfNfgf<,ðŽ‘,μ,Ă,ç,é B

lpvOrientTop

D3DVECTOR \‘ç‘ì,Ö,l̂f|fCf“f^ BfŠfXfi [,l ã•ûfxfNfgf<,ðŽ‘,μ,Ă,ç,é B

‘O•ûfxfNfgf<,l̂fŠfXfi [,l•@,É^Ê’u,μ A ã•ûfxfNfgf<,l̂fŠfXfi [,l““ ã,©,ç^Ê’u,•,é BfftfHf<fg,Ă,l‘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,î«—
£'P^Ê,Íf [fgf<,¾,^a 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 \“î,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, Î**DSERR_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,³,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 BfftfHf<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);
```

$$\neg \mathbb{E}^{\div, \cdot, \hat{e}, \hat{I}DS_OK} \text{ A\text{Z}, "s, \cdot, \hat{e}, \hat{I}DSERR_INVALIDPARAM} fGf\%_0 \ [fR \ [fh, \partial \cdot \hat{O}, \cdot \ B$$

dwApply
 Ý'è,^a s,í,ê,éf^fCf~f“fO,đŽ_l,'l B^È%_o,Ì'l,ÅŽ_l,³,ê,é B

DS3D_IMMEDIATE Ÿë,Í,ŽŽ,É s,í,é AfVfXfef€
,Í,·,×,Ä,İ3DfTfEf“fh Efofbftf@,É,Î,·,é3D Ä•W,İ Ä
EçŽŽ,ð s,□ B

ŽQ A @IDirectSound3DListener::GetDistanceFactor

IDirectSound3DListener::SetDopplerFactor

```
HRESULT SetDopplerFactor(  
    D3DVALUE flDopplerFactor, DWORD dwApply);
```

«» Ý, ðfhfbfvf%o [—v‘f, ð—v‘f, ð Ý’è, ·, é B

—«÷, ·, è, ÎDS_OK AŽ, ”s, ·, è, ÎDSERR_INVALIDPARAM fGf%o [fR [fh, ð•Ô, · B

flDopplerFactor

V, µ, ¢fhfbfvf%o [—v‘f, ð’l B

dwApply

Ý’è, ^a s, í, è, éf^fCf~f“fO, ðŽ, ‘, ‘l B^È%o, ð’l, ÅŽ, ³, è, é B

DS3D_DEFERRED fAfvfŠfP [fVf‡f“, **IDirectSound3DListener::CommitD
eferredSettings**f f\fbfh, ðCEÄ, Ñ o, ·, Ü, Ä Ý’è, ð’l s, í, è, È
, ¢ B•_i ”, ð Ý’è, ð•Ï X, µ, ½, è A’P“Æ, ð Ä«vŽZ, ðŽÄ s
, ·, é, ±, Æ, ^a%oÄ”\, Ä, , é B

DS3D_IMMEDIATE Ý’è, ð’l ŽŽ, É s, í, è AfVfXfef€
, ð, ·, ×, Ä, ð3DfTfEf“fh Efofbftf@, ÉÏ, ·, é3D Ä•W, ð Ä
«vŽZ, ð s, [□] 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 Æ, ·, é, ±, Æ B

ŽQ Æ @IDirectSound3DListener::GetDopplerFactor

IDirectSound3DListener::SetOrientation

```
HRESULT SetOrientation(D3DVALUE xFront,  
    D3DVALUE yFront, D3DVALUE zFront,  
    D3DVALUE xTop, D3DVALUE yTop,  
    D3DVALUE zTop, DWORD dwApply);
```

fŠfXfi [,lŒ» Ý,ŀ•ûĚü,ð‘O•ûfxfNfgf<,Æ ã•ûfxfNfgf<,l,Ó,½,Â,l̂fxfNfgf<,ĂŽæ“¾,·,é B
-Œ÷,·,ê,ŀDS_OK AŽ,”s,·,ê,ŀDSERR_INVALIDPARAMfGf%o [fh,ð•Ô,· B

xFront, yFront, ,̣,æ,Ń zFront

D3DVALUEf^fCfv,l̂l B‘O•ûfxfNfgf<,l À•W,ðŽl,μ,Ă,Œ,é B

xTop, yTop, ,̣,æ,Ń zTop

D3DVALUEf^fCfv,l̂l B ã•ûfxfNfgf<,l À•W,ðŽl,μ,Ă,Œ,é B

dwApply

Ý’è,^a s,í,ê,éf^fCf~f“fO,ðŽl,·l B^È%°,l̂l,ĂŽl,³,ê,é B

DS3D_DEFERRED fAfvfŠfP [fVf‡f“,^a**IDirectSound3DListener::CommitDeferredSettings**

f f\fbfh,ðĚĂ,Ń o,·,Ü,Â Ý’è,Í s,í,ê,È,Œ B•j ”,l Ý
’è,ð•l̂ X,μ,½,è A’P“Æ,l̂ ĂĚvŽZ,ðŽĂ s,·,é,±
,Æ,%oÂ”\,Ă, ,é B

DS3D_IMMEDIATE Ý’è,Í‘l̂Žž,É s,í,ê AfVfXfef€
,Í,·,×,Ă,l̂3DfTfEf“fh Efofbftf@,Él̂,·,é3D À•W,l̂ Ă
ĚvŽZ,ð s,▯ B

‘O•ûfxfNfgf<,ÍfŠfXfi [,l̂•@,É^Ê’u,μ A ã•ûfxfNfgf<,ÍfŠfXfi [,l̂““ 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,Œ,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
D3DVALUEf^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%o,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,^a s,i,ê,éf^fCf~f“fO,đŽ',·'l B^È%o°,l'l,ÄŽ',³,ê,é B

DS3D_DEFERRED *fAfvfŠfP* [fVf‡f“,“IDirectSound3DListener::CommitD
eferredSettings

*f f\fbfh,đŒÄ,Ñ o,·,Ü,Ä Ý'è,Í s,i,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,i,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,³,ê,é BŽÀ 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

¬Œ÷,·,ê,ÎDS_OK AŽ,”s,·,ê,ÎDSERR_INVALIDPARAMfGf%o [fR [fh,ð•Ô,· B

lpDSBufferCaps

DSBCAPS \‘ċ‘İ,Ö,İf|fCf“f^ BfTfEf“fh Efofbftf@,İ «”\,ðŽ!,μ,Ä,ċ,é B

DSBCAPS \‘ċ‘İ,É,ÎIDirectSound::CreateSoundBufferf f\fbfh,Ö“n,³,ê,éDSBUFFERDESC \‘ċ‘İ,Æ“™,İ î•ñ,É%Á,İ, Ä X,È,é‘Ç%Á î•ñ,^a,ċ,,Â,©ŠÜ,Ü,ê,Ä,ċ,é B,±,İ‘Ç%Á î•ñ,Æ,İ Afn [fhfEfFA Af\ftfgfEfFA— ¼•û,İfofbftf@,İ ê Š,Æ AfRfXfg,Ä, ,é BfRfXfg,É,İ Afn [fhfEfFA 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,ċ,Ä,½,à,İ,^a, ,é B

DSBCAPS \‘ċ‘İ,İdwFlagsf f“fo“à,ÄŽw’è,³,ê,½ftf%oO,İDSBUFFERDESC \‘ċ‘İ,ÄŽg—p,³,ê,éftf%oO,Æ““,à,İ,Ä, ,é B,μ,©,μ A DSBCAPS \‘ċ‘İ,ÄŽg—p,·,éftf%oO,İ•û,İDSBCAPS_LOCHARDWARE,à,μ,,İ DSBCAPS_LOC SOFTWARE,İ,Ç,¿,ç,©,^afofbftf@—pf f,fŠ,İ ê Š,É,æ,Ä,ÄŽw’è,³,ê,é“_,—B^ê,İá,ċ,Ä, ,é BDSBUFFERDESC \‘ċ‘İ,Ä,İ,±,ê,ç,İftf%oO,İ‘İ’ð%Á”\,Ä, ,è AŽw’è,³,ê,Ä,ċ ,éftf%oO,É,æ,Ä,Äfofbftf@,İ”z’u,ðfn [fhfEfFA,Æf\ftfgfEfFA,İ,Ç,¿,ç,©,É,·,é±,Æ,^a,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,îGf% [fR [fh,ð•Ô,· B

DSERR_INVALIDPARAM

DSERR_PRIOLEVELNEEDED

lpdwCurrentPlayCursor

DirectSoundBufferIfufWfFfNfg“à,îJfĚf“fg EfvfĚfC Ef|fWfVf±f“,ðŽ|,·İ ”,Ö,îf|fCf“f^ B,±
,lŔÊ’u,îfTfEf“fh Efofbftf@“à,îlftfZfbfg,Ā,,è AfofCfg,ĀŽw’è,³,ê,é B

lpdwCurrentWriteCursor

DirectSoundBufferIfufWfFfNfg“à,îJfĚf“fg Ef%ofCfg Ef|fWfVf±f“,ðŽ|,·İ ”,Ö,îf|fCf“f^ B,±
,lŔÊ’u,îfTfEf“fh Efofbftf@“à,îlftfZfbfg,Ā,,è AfofCfg,ĀŽw’è,³,ê,é B

‘,,«,±,ÝfJ [f\f<,Í Afofbftf@,Ö,îff [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“- ,îfI [ffBfI Eff [f^•³,¾, ¯ æ,É, ,é B

lpdwCurrentPlayCursorpf%of [f^,ĀŽ|,³,ê,½^Ê’u,æ,è,àĖă,ë,îff [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%o [fR [fh,ð•Ô,· B

lpwfxFormat

fofbftf@“à,İfTfEf“fh Eff [f^,É,Â,ĉ,Ä,İ î•ñ,ðŠÛ,ðWAVEFORMATEX \‘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,İfofCfG’PˆÊ,İfTfCfY BDirectSound,İf|fCf“f^,Ö ‘,«±,ð,İ,İ,¹,ĉ
,°,ĉdwSizeAllocated,İfofCfG ”,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,½fofCfG ”,ðŽ!,·İ ”,Ö,İf|fCf“f^ B,±,İfpf%of [f^,İNULL,Ä,à,æ,ĉ B

WAVEFORMATEX \‘ĉ‘İ,İ%oÂ•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%oi,·,é•K—v,ª, ,é B \‘ĉ‘İ,İfTfCfY,
İlpdwSizeWrittenfpf%of [f^,Ö•Ô,³,ê,é B,»,İĈãfAfvfŠfP [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,·•Ī ”,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•Ô,• 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”ÍÍ,Å10,000,ð100dB‘Š“¬,Æ,µ,Ä‘a’è,³,ê,é B-10,000,İ‘l,İ%œ,İf`fff“flf<‚¹100dBŽă,,È,Ä,Ä,¢,é,±,Æ,ðˆÓ–İ,•,é B10,000,İ‘l,İ ¶,İf`fff“flf<‚¹100dBŽă,,È,Ä,Ä,¢,é,±,Æ,ðˆÓ–İ,•,é BfftfHf<fg,İ‘l,İ0,Ä, ,é B
lplPanfpf%of [f^,Ä,İ0,İ—¼•û,İf`fff“flf<‚¹ftf<f{fŠf... [f€‚Ä, ,é,±,Æ,ðˆÓ–İ,•,é(Ç,ç,ç,à0dBŽă,,È,Ä,Ä,¢,é) B0ˆÈŠÖ,İ Ý’è,İ,Ç,ê,à A•Ð•û,¹ftf<f{fŠf... [f€‚Ä A,à,¤•Ð•û,¹Žă,,È,Ä,Ä,¢,é B

-2173,İfpf“,Í A ¶f`fff“flf<‚¹ftf<f{fŠf... [f€‚Ä A%œEf`fff“flf<‚²21.73 dBŽă,,È,Ä,Ä,¢,é,±,Æ,ðˆÓ–İ,•,é B“—
l,É870,İfpf“,Í A ¶f`fff“flf<‚²8.7 dBŽă,,È,Ä,Ä,“,è A%œEf`fff“flf<‚¹ftf<f{fŠf... [f€‚Ä, ,é,±,Æ,ðˆÓ–
İ,•,é B-10,000,İfpf“,Í A%œEf`fff“flf<‚³%œ¹,Ä AfTfEf“fh,ª u ¶‘¤,İ,Ý v,Ä, ,é,±,Æ,ðˆÓ–
İ,•,é Bˆê•û A10,000,İfpf“,Í A ¶f`fff“flf<‚³%œ¹,Ä AfTfEf“fh,ª u%œE‘¤,İ,Ý v,Ä, ,é,±,Æ,ðˆÓ–İ,•,é B

fpf“ §Ɛă,İf{fŠf... [f€ EfRf“fgf [f<,É—Ý 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,Ńf 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%o [fR [fh,đ•Ô,· B

DSERR_CONTROLUNAVAIL

DSERR_INVALIDPARAM

DSERR_PRIOLEVELNEEDED

lplVolume

Žw’è,³,ê,½DirectSoundfofbftf@,ìf{fŠf... [f€,đŽ!,·! ”,Ö,ìf|fCf“f^ B

f{fŠf... [f€,í100dB,ì”íí,đ0,©,ç-10,000,ì”íí,Å AŽw’è,³,ê,é B0,í Å %o,ì AfXfgfŠ [f€,l-ċ! X,ìf{fŠf... [f€,đ•\ ,· B-10,000,ífl [ffBfIf{fŠf... [f€,ª 100 dBŽã,,È,Á,Ä,ċ,é,±,Æ,đ•\,· B‘ • ,íĚ» Ý,ìDirectSound,Á,ífTf|
[fg,³,ê,Ä,ċ,È,ċ B

ffVfxfċ,ìŽÚ“x,í’®—í,é‘í,μ,Ä‘í ”,Ä‘î%ož,μ,Ä,ċ
,é B,½,Æ,,í 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‰»³,ê,Ä,¢,È,¢DirectSoundBufferIfufWfFfNfg,ð ‰Šú‰»³,·,é B

DSERR_ALREADYINITIALIZEDfGf‰ [fR [fh,ð•Ô,· B

lpDirectSound

DirectSoundBufferIfufWfFfNfg,ÆÆ< ‡,µ,½DirectSoundIfufWfFfNfg,Ö,ìf|fCf“f^ B

lpDSBufferDesc

fTfEf“fh Efofbftf@,ì ‰Šú‰»³,ÉŽg—p,·,é'l,ðŽ',µ,Ä,¢,é**DSBUFFERDESC** \‘¢‘ì,Ö,ìf|fCf“f^ B

IDirectSound::CreateSoundBufferf 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^Ó³,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@,İŠJŽn^Ê'u,©,çf fbfN,ðŠJŽn,·,éÊ'u,Ü,Ä,İ AfofCf'P^Ê,İfIfZfbfg B
dwFlagsfpf%o [f^,ÄDSBLOCK_FROMWRITECURSORftf%oO,^Žw'è,³,ê,Ä,ç,é ê ±,İ A,±,İfpf%o [f^,İ-
³Ž<,³,ê,é B

dwWriteBytes

f fbfN,·,éfofbftf@—İæ,İ AfofCf'P^Ê,İfTfCfY BfTfEf“fh Efofbftf@,İŠT”O“İ,É,İ%o~,É,È,Ä,Ä,ç
,é ifŠf“fOfofbftf@ j,±,Æ,É' ^Ö,·,é,±,Æ B

lpvpvAudioPtr1

f fbfN,³,ê,éfofbftf@,İ Ä %o,İfuf fbfN,Ö,İf|fCf“f^ B

lpdwAudioBytes1

lpvpvAudioPtr1fpf%o [f^,ÄŽ!,³,ê,½fofCf'g ”,ðŽ!,·İ ”,Ö,İf|fCf“f^ B,±
,İ¹,dwWriteBytesfpf%o [f^,æ,è ¬,³,ç ê ± A lpvpvAudioPtr2,^fTfEf“fhff [f^,İŽŸ,İfuf fbfN,ðŽ!,· B

lpvpvAudioPtr2

f fbfN,³,ê,éTfEf“fh Efofbftf@,İ2”Ô—Ú,İ—İæ,Ö,İf|fCf“f^ B,±,İfpf%o [f^,İ¹,^NULL,İ ê ± A
lpvpvAudioPtr1fpf%o [f^,İfTfEf“fh Efofbftf@,İf fbfN,³,ê,½—İæ'S'İ,ðŽ!,· B

lpdwAudioBytes2

lpvpvAudioPtr2 fpf%o [f^,Äf|fCf“fg,³,ê,½fofCf'g ”,ðŽ!,·İ ”,İfAhfÇfX B lpvpvAudioPtr2,^NULL,İ ê ± A,±
,İ¹,İ0,Æ,È,é B

dwFlags

f fbfN,İfCfxf“fg,ð C ³,·,éftf%oO B^È%o,İ¹,ÄŽ!,³,ê,é B

DSBLOCK_FROMWRITECURSOR

Æ» Ý,İ '«,±,ÝfJ [f\ç,©,çf fbfN,ð s,ç A,±
,é,É,æ,èIDirectSoundBuffer::GetCurrentPosition,İÆÄ,Ñ o,μ,^s•K—
v,É,È,é B,±,İftf%oO,^Žw'è,³,ê,é,ÆdwWriteCursorfpf%o [f^,İ-
³Ž<,³,ê,é B,±,İftf%oO,İ”C^Ö,ÉŽw'è,Ä,«,é B

,±,İf f\fbfh,İfIfZfbfg,Æ—İæfJfEf“fg,ðŽó,~Žæ,è A,Ó,½,Ä,İ '«,±,Ýf|fCf“f^,Æ,±

,é,ð ±,İ¹,½fTfCfY,ð•Ö,· B,Ó,½,Ä,İf|fCf“f^,ð•K—

v,Æ,·,é,İ,İfTfEf“fh Efofbftf@,^ŠÄ ó ifŠf“fO Efofbftf@ j,İ,½,B,Ä, ,é Bf fbfN,³,ê,½fofbftf@,^ I—

ıÊ'u,Ä zŠÄ,μ,È,ç ê ± A,Ó,½,Ä,B,İf|fCf“f^,Ä, ,

élvpvAudioBytes2,İNULL,É,È,é B,½,¾,μ zŠÄ,·,é ê ±,İ A,Ó,½,Ä,B,İf|fCf“f^,İfofbftf@,İŠJŽn^Ê'u,ðŽ!,· B

lpvpvAudioPtr2,·,æ,Ñ

lpdwAudioBytes2fpf%o [f^,É'Î,μ,ÄNULL,ð“n,·,Æ ADirectSound,İfofbftf@,İ%ofbfvAf%oEf“fh—
İæ,ðf fbfN,μ,È,ç B

fAfvfŠfP [fVf±f“,İIDirectSoundBuffer::Lockf f\fbfh,É,æ,è•Ö,³,ê,½f|fCf“f^,Öff [f^,ð '«,±
,Ý ADirectSound,Öfofbftf@,ð•Ö,·,½,B,ÉIDirectSoundBuffer::Unlockf f\fbfh,ðÆÄ,Ñ o,·K—v,^ ,é BfTfEf“fh E
fofbftf@,Ö,İf fbfN,İ·ŽžŠÖ,·,×,«,Ä,İ,È,ç B·ŽžŠÖf fbfN,³,ê,é,Æ A Ä ¶fJ [f\ç,^f fbfN,³,ê,½—
İæ,Ö“ž”B,μ,Ä,μ,Ü,ç Af%of“f_fÇmfCfY,Æ,ç,Ä,½ A^@Ší \ ¬Ê“¶,İfi [ffBfi-â“è,^” ¶,·,é B

Warning

,±,İf f\fbfh,İ '«,±,Ýf|fCf“f^,İ,Ý,ð•Ö,· B,±,İf|

fCf“f^,©,çfTfEf“fhff [f^,İ“Ç,Ý ž,Ý,Í s,í,È,¢ B,½,Æ,|DirectSoundBufferfIfufWfFfNfg,ª—
LÆø,ÈfTfEf“fh Eff [f^,ðŠŮ,ñ,À,¢,À,à A,»,İff [f^,İ³Æø,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@,İfAfhfÆfX,Æ,È,é B**IDirectSoundBuffer::Unlock**,ªÆÄ,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 ¶,^{3,1}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,ÄŽì,³,ê,é B

DSBPLAY_LOOPING

fI [ffBfI Efofbftf@,ì I—

¹Ê'u,Ü,Ä“ž'B,·,é,Æ Afofbftf@,îŠJŽnÊ'u,©,ç Ä,Ñ Ä ¶,ð s,Œ

A'âŽ~,ð—¾Žì,·,é,Ü,ÄŒJ,è•Ô,· B,±,îftf%ofo,Í[vf%ofoCf}

fŠ EfTfEf“fh Efofbftf@,ì Ä ¶'†,É Ý'è,·,é•K—v,^a, ,é B

,±,îf f\fbfh,É,æ,è AfZfJf“f fŠ EfTfEf“fh Efofbftf@,Í[vf%ofoCf}

fŠ Efofbftf@“à,Äf~fLfVf“fo,³,ê,Ä,©,çfTfEf“fh EfffofCfX,Ö—,ç,ê,é B,±,ê,^a Ä %o,É Ä ¶,³,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,³,ê,½fofbftf@,^a,·,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 ¶«@”,^aè<,³,ê,½ftf%ofo,ÍÊ'Ö Ä•B,É'è<,³,ê,½ftf%ofo,ÉŽæ,Ä,Ä'ã,í,ç,ê,é B

fvf%ofoCf}fŠ Efofbftf@,îDSBPLAY_LOOPINGftf%ofo,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“,^a ‘,« ž,Ý—

D æ<¹²fŒfxf<,É Ý'è,³,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“,^a¼,ì<¹²fŒfxf<,É Ý'è,³,ê,Ä,Œ,é ê ±,Í A,±

,îf f\fbfh,É,æ,éfZfJf“f_fŠ Efofbftf@,ì Ä ¶,^a,D,Æ,Ä,à s,í,ê,Ä,Œ,È,,Ä,àfvf%ofoCf}

fŠ Efofbftf@,^a Ä ¶,³,ê,é B,±,ì ê ±,ì—¾%o¹,Æ,É,é B,±,ì ê ± AfTfEf“fh,^a ‡ŽŸ,É Ä ¶ E'âŽ~,·,é,Æ,«,ì ^—

fI [fo [fwfbfh,ð Ä ¬ŒÄ,É,·,é,±,Æ,^a,Ä,«^a,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@,^a Ä ¶,³,ê,é,½,ß,Ä, ,é B

Note

,Ç,îTfEf“fh Efofbftf@,É,¬,Œ,à AfAfvfŠfP [fVf‡f“,Í,±

,îf f\fbfh,^aŒÄ,Ñ o,³,ê,é•O,ÉIDirectSound::SetCooperativeLevel f f\fbfh,ðŒÄ,Ñ o,µ A<¹²fŒfxf<,ðŽw'è,·,é•K—

v,^a, ,é B'Ê í,îSSCL_NORMAL,ðŽw'è,·,é B,à,µIDirectSound::SetCooperativeLevel f f\fbfh,^aŒÄ,Ñ o,³,ê,Ä,Œ,È,Œ,Œ

,Æ A IDirectSoundBuffer::Play f\fbfh,îDSERR_PRIOLEVELNEEDEDfGf%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@,ÌfŠXfgfA,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,³, ê, é of Cf g’PÊ, ÌlftfZfbfg’l B

, ±, Ìf f\fbfh, Ífvf% of Cf }fŠ EfTfEf“fh Efofbftf@ ã, Å, ÍÆÄ, Ñ o,¹, È, ¢ B

f of bftf@, ^a Ä ¶’†, Ì ê ‡, Í A‘| Ä, É V<K, ÌÊ’u, ÖÚ“@, µ, ÄÆp’±,³, ê, é B’âŽ~’†, Ì ê ‡, Í A
IDirectSoundBuffer::Play f f\fbfh, ^aÆÄ, Ñ o, µ,³, ê, ¹/₂, , 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<KDirectSoundBufferIfufWfFfNfg,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<,^aftf<f{fŠf... [f€„Å, ,é,±,Æ,đŽ',·(0dBŽă,,È,Á,Ä,¢,é) B,±
,êˆÈŠO,İ Ý'è,Í,Ç,ê,à A•Đ•û,^aftf<f{fŠf... [f€„Å A,à,▯•Đ•û,^aŽă,,È,Á,Ä,¢
,é B,½,Æ,!,İ A-2173,İpf“,Í A ¶f`fff“flf<,^aftf<f{fŠf... [f€„Å A%oEf`fff“flf<,^a21.73 dBŽă,,È,Á,Ä,¢,é,±,Æ,đˆÓ–
j,·,é B“—l,É870,İpf“,Í A ¶f`fff“flf<,^a8.7 dBŽă,,È,Á,Ä,“,è A%oEf`fff“flf<,^aftf<f{fŠf... [f€„Å, ,é,±,Æ,đˆÓ–
j,·,é B

-10,000,İpf“,Í A%oEf`fff“flf<,^{a-3%o¹},Å AfTfEf“fh,^a u ¶‘▯,İ,Ý v,Å, ,é,±,Æ,đˆÓ–
j,·,é Bˆê•û A10,000,İpf“,Í A ¶f`fff“flf<,^{a-3%o¹},Å AfTfEf“fh,^a u%oE‘▯,İ,Ý v,Å, ,é,±,Æ,đˆÓ–
j,·,é Bpf“ §Œă,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%o [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%¹ j,Ů,À,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,İffŦŦŦŦf<,Í' • ,đ•\,μ A•%o,İ'l,ÍŦ, Š,đ•\,μ,Ä,Ŧ,é BŦŦŦŦŦŦŦ<,İŽŮ“x,İ'®—Í,É'İ,μ,Ä'İ ”,Ä'İ%ož,μ,Ä,Ŧ
,é B10dBŦ, Š,•,é,Æ,İfofbŦŦf@,İŦŦŦEŦ“fh,İ”¼^a,É,È,è A20dBŦ, Š,•,é,Æ4^a,İ1,É,È,é BŦ» Ý,İDirectSound,Í' • ,
đŦŦf| [fg,μ,Ä,Ŧ,È,Ŧ B

fŦŦ“ §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,Ê,·,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,□,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 lpvAudioPtr1 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 lpvAudioPtr2 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
fpf%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

١٤٩

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•ûĖü,“,æ,Ñ“® i,l ACEÂ•ÊĽ q,É•K—v,È,·,×,Ä,l î•ñ,ðŠÜ,ñ,Â,ċ,é B,±,l \‘ċ‘l,Í
IDirectSound3DBuffer::GetAllParameters,“,æ,Ñ IDirectSound3DBuffer::SetAllParametersf f\fbfh,Æ,Æ,à,ÉŽg—
p,³,ê,é B

dwSize

,±,l \‘ċ‘l,lfofCfƒg’PˆÊ,lIfTfCfY B

vPosition

,R,cfTfEf“fh Efofbftf@,lĖ» Ý,lˆÊ’u,ðĽ q,·,é D3DVECTOR \‘ċ‘l B

vVelocity

,R,cfTfEf“fh Efofbftf@,lĖ» Ý,lˆ—“x,ðĽ q,·,é D3DVECTOR \‘ċ‘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“,lĖ» Ý,l•ûĖü,ðĽ q,·,é D3DVECTOR \‘ċ‘l B

lConeOutsideVolume

ŠO“”f{fŠf... [fĖ,lfR [f“ B

flMinDistance

Ä ¬Ľ—Ė B

flMaxDistance

Ä‘âĽ—Ė B

dwMode

,R,cfTfEf“fh ^— f, [fh BŽŸ,l’l,ÄŽ’,³,ê,é B

DS3DMODE_DISABLE

3DfTfEf“fh ^— ,l—

³Ėø,É,È,é BfTfEf“fh,ÍfŠfXfi [l,““l’† S,©,ġ•,±,‘,é,æ,ƒ,ÉŠ’,¶,é B

DS3DMODE_HEADRELATIVE

fTfEf“fhfpf%of [f^(ˆÊ’u A‘¬“x A•ûĖü)

,ÍfŠfXfi [,lfpf%of [f^,Æ‘Š‘İŠÖĖW,É, ,é B,±

,lf, [fh,Ä,Í AfTfEf“fh,l âˆİfpf%of [f^,ÍfŠfXfi [Efpf%of [

f^,³•İ X,³,ê,½,Æ,«,ÉŽ©“®“l,É X V,³,ê,é,l,Ä A‘Š‘İfpf%of [f^,Í•İ

,í,ġ,È,ċ,Ü,Ü,Ä, ,é B

DS3DMODE_NORMAL

•W Ė,l ^— B,±,ê,³fftfHfĽfgf, [fh,É,È,Ä,Ä,ċ,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,Ì 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

,±,l \‘‘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’P˘Ê,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,ç B

DSBCAPS_CTRLPAN

fofbftf@,İf’p’ §Œä”—Í,ðŽ ,½,È,,Ä,İ,È,ç,È,ç B

DSBCAPS_CTRLVOLUME

fofbftf@,İf{fŠf... [f€ §Œä”—Í,ðŽ ,½,È,,Ä,İ,È,ç,È,ç B

DSBCAPS_GETCURRENTPOSITION2

IDirectSoundBuffer::GetCurrentPosition

,ª Ä ¶fJ [f\‘,İ V,µ,Œ“® 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,ç
,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,ç óŒ,Ä, ,è,İ%ß,Ž,İ“® ì,ªŒÝŠ· «,İ,½,ß,É˘ŪŽ ,
³,è,Ä,ç,é B,±,İftf%o,ª%œç,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,çfAfvfŠfP [fVf‡f“,ªDirectSound,ðŽg,ª è ‡ A
DirectSound,ðŽg,Ä,Ä,ç,éAfvfŠfP [fVf‡f“,İ,»,İfofbftf@,ð Ä ¶,µ‘±
,—,é,±,Æ,ª,Ä,«é B,µ,©,µ AftfH [fJfX,ð DSSCL_EXCLUSIVE , ,é,ç,İ
DSSCL_WRITEPRIMARYftf%o,İç¹²fŒfxfç,ðŽg,ªDirectSound
fAfvfŠfP [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@,İç-
§“İ,Éfn [fhfEfFA Ef~LfVf“fO,ðŽg—p,·,é B
,à,µfffoCfX,ªfn [fhfEfFA Ef~LfVf“fO,ðfTf] [fg,µ,Ä,ç,È,ç
,© A, ,é,ç,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
fAfvfŠfP [fVf‡f“,İf~LfVf“fO Ef`ffflfç,ª,±,İfofbftf@,İ,½,ß,È—
—p%Ä”,Ä, ,é,±,Æ,ð˘Ū Ø,·,é•K—v,ª, ,é B

DSBCAPS_LOCSOFTWARE

DSBCAPS_STATIC ,^aŽw'è,³ēfn [fhfEfFfA EfŠf\ [fX,^a—p%Ű"\\
,Ā, ,Ā,Ā,à Afobftf@,Ī,-
§"Ī,Ēf\ftfgfEfFfA Ef f,fŠ,ÉŠi"[³,ē Af\ftfgfEfFfA Ef~fLfVf"f
O,ðŽg—p,·,é B

DSBCAPS_PRIMARYBUFFER

fobftf@,^afvf%ofCf}\fŠ EfTfEf"fh Efofbftf@,Ā, ,é,±,Æ,ð\,· B
,à,μ,±,Ī'Ī,^aŽw'è,³ē,Ē,¢
,Ē,ç AfZfJf"f fŠ EfTfEf"fh Efofbftf@,^a ĩ,ç,ē,é B

DSBCAPS_STATIC

fobftf@,^afXf^fefBfbfN EfTfEf"fh Eff [f^,Ī,½,ß,ÉŽg,Ī,ē,é,±,Æ,ð\
,· B"ē"Ē,Ē,±
,ē,ç,Īfobftf@,Ī,P"x [fh,³,ē,Ā A,»,μ,Ā%½"x,à Ā ¶,³,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,±
,Æ,^a,Ā,«^a,é B,±
,Īftf%ofO,^afZfbfg,³,ē,é,Æ A,à,μf† [fU,^a¼,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,±,Æ,^a,Ā,«^a,é B,±
,Ī ó'Ö,ĀfAfvfŠfP [fVf‡f",Ī·W €fobftf@,Ī Ā%¹,³,ē,é,^a AfXfefBf
bfL [EftfH [fJfX Efofbftf@,Ī-Ā,è±
,·,é B,½,Æ,Ī,Īf† [fU,^af [fh , ,é,¢
,ĪGfNfZf<,Āf^fCfv,·,éŠÖ,ĒfTfEf"fhfgf%ofbfN,ð·,·,æ,□
,ĒŽŽ AfQ [f€"ÈŠÖ,ĪfAfvfŠfP [fVf‡f" A,½,Æ,Ī,Ī%of%æ Ā ¶
(ActiveMovie™),Ē,Ç,Ā-ð—§,Ā B,μ,©,μ Af† [fU,^a,μ'¼,Ī
DirectSound fAfvfŠfP [fVf‡f",Ē Ø,è'Ö,Ī,é,Ē,ç A·W €
,ÆfXfefBfbfL [EftfH [fJfX—
¼·û,ĪfTfEf"fh Efofbftf@,^a,·,x,Ā Ā%¹,³,ē,é B

dwBufferBytes

,±,Īfobftf@,ĪfofCf'P^Ē,ĪTfCY B

dwUnlockTransferRate

ĪDirectSoundBuffer::Unlock,^aĒĀ,Ñ o,³,ē,½,Æ,«^a,Éfobftf@ Ef f,fŠ,Éff [f^,^a"]'—,³,ē,éfĒ [fg,ð A,P·b—
^,ĪkofCf'g,ĀŽw'è,·,é BfnfCfpftfH [f}f"X,ĒfAfvfŠfP [fVf‡f",^a ĪDirectSoundBuffer::Unlock,ðŽĀ s,·,é,½,ß,Ē
—v,·,éŽžŠÖ,ðĒ"è,·,é,Ī,Ē A,±,Ī'Ī,ðŽg,μ,±,Æ,^a,Ā,«^a,é B fVfXfef€f f,fŠ,Ē"z'u,³,ē,Ā,¢
,éf\ftfgfEfFfA Efofbftf@,Ī,½,ß,ĪĒ [fg,Ī A ^— ,^as—v,Ē,Ī,Ā"ñ Ī,Ē ,·,¢ B
fn [fhfEfFfA Efofbftf@,Ī,½,ß,ĪĒ [fg,Ī Afobftf@,^afTfEf"fh EfJ [fh,Ēf [fh,³,ē,é%Ű"\\ «,^a ,é,½,ß A,
æ,è'x,,Ē,é%Ű"\\ «,^a ,é B,»,μ,Ā"]'—'—x,^aĒ'è,³,ē,é ê ‡,^a,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,^afTfEf"fh EftfofCfX,Ē,æ,Ā,Ā s,Ī,ē,é,Ī,Ā A,O,Ā, ,é B f\ftfgfEfFfA Efofbftf@,Ē,·,¢
,Ā,Ī A,±,Īf f"fo,Īfobftf@ EftfH [f}fbfg,ÆfVfXfef€ Efvf fZfbfT,Ī'—x,Ē'Ē·¶,³,ē,é B

DSBCAPS \^c'Ī,Ī ĪDirectSound::CreateSoundBuffer f f\fbfh,Ē"n,³,ē,é DSBUFFERDESC \^c'Ī,Ē—pŽ—

,μ,ĀĒ©,ç,ē,é ĩ·ñ,ðŠÜ,ñ,Ā,¢,Ā A'Ç%ŰĀ,Ī ĩ·ñ,ð,¢,,Ā,©Ž ,Ā,Ā,¢,é B
'Ç%ŰĀ ĩ·ñ,Ē,Ī Afobftf@ ifn [fhfEfFfA, ,é,¢,Īf\ftfgfEfFfA j,ĪĒ'u,Æ,¢,-
,Ā,©,ĪfRfXfg'P^Ē ifn [fhfEfFfA,Ē'Ē'u,μ,Ā,¢
,é,Ē,çfobftf@,ðf [fh,·,éŽžŠÖ Af\ftfgfEfFfA,Āfobftf@,^af~fLfVf"fO,³,ē,é,Ē,ç Ā ¶,·,é,Æ,«^a,Ī ^—
,ĪfI [fo [fwfbfh,Ī,æ,Ē,Ē ĩ·ñ j,^aŠÜ,Ü,é,é B

DSBCAPS \^c'Ī,Ī dwFlags f f"fo,^a DSBUFFERDESC \^c'Ī,Ē,æ,Ā,ĀŽg,Ī,ē,½"—,¶ftf%ofO,ðŠÜ,ñ,Ā,¢,é,±

,Æ,Ē' ^Ö,·,é,±,Æ B—B'ē,ĪŠ^á,Ī **DSBCAPS** \^c'Ī,Ē,·,¢,Ā ADSBCAPS_LOCHARDWARE , ,é,¢,Ī
DSBCAPS_LOCSOFTWARE ftf%ofO,^afobftf@f f,fŠ,Ī ē Š,Ē,æ,Ā,ĀŽw'è,³,ē,é,Æ,¢,μ,±,Æ,Ā, ,é B
DSBUFFERDESC \^c'Ī,Ā A,±,ē,ç,Īftf%ofO,Ī"ĈÖ,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 v f% 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@,İf ftfHf<f g,İfRf"fgf [f< EfIfvfVf±f",ðŽ ,Ä,×,«,Ä, ,é
B ,±,ê,İDSBCAPS_CTRLPAN A
DSBCAPS_CTRLVOLUME," ,æ,ÑDSBCAPS_CTRLFREQUENCYf tf% 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@,İf pf" §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%°,İ AŽÄ Ū,İ%°,æ,è,à Ū—§,Ä,Ä i,ñ,Ä,¢
,½ BŒ» Ý,Ä,İ
DSBCAPS_GETCURRENTPOSITION2f tf% 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 ,±
,İf tf% ofO,ªŽw'è,³,ê,¢ óÔ,Ä, ,ê,İ%ß<Ž,İ"® İ,ªŒÝŠ· «,İ,½,ß,É^ŪŽ ,
³,ê,Ä,¢,é B ,±,İf tf% 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, ,ê,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<,ÈfTfEf"fh E f ofbftf@,Ä, ,é B ,±
,İf tf% ofO,ðfZfbfg,·,é,±
,Æ,È,æ,è A,à,µf† [fU,ª¼,İAfvfŠfP [fVf±f",Éf tfH [fJfX,ð Ø,è'Ö,İ,½,è A
V,µ,¢ AfvfŠfP [fVf±f",ªDirectSound ,ðŽg,² ê ± A DirectSound ,ðŽg,Ä,Ä,¢
,é f AfvfŠfP [fVf±f",İ,» ,İf ofbftf@,ð Ä ¶,µ'±, ,é,±,Æ,ª,Ä,«,é B
,µ,©,µ Af tfH [fJfX,ð DSSCL_EXCLUSIVE , ,é,¢,İ
DSSCL_WRITEPRIMARYf tf% 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~fLfVf“fO,ðŽg—p,·,é B
à,µfffofCfX,ªfn [fhfEfFA Ef~fLfVf“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~fLfVf“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~fLfVf“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,Íf† [fU,ªf [fh , ,é,¢
,ÌfGfNfZf,Äf^Cfv,·,éŠÖ,ÉfTfEf“fhfgf‰ofbfn,ð•,·,æ,□
,ÉŽŽ Afq [fĖÈŠÖ,ÌfAfvfŠfP [fVf‡f“ A,½,Æ,,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,³,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±,³,ê•Û Ø,³,é,Ä,‘,é B

DSCAPS_CONTINUOUSRATE

ffofCfX,ÍdwMinSecondarySampleRate

,ÆdwMaxSecondarySampleRate

f f“fo’l,ÌŠÔ,Â,·,×,Ä,ìTf“fvfŠf“fOfŒf| [fg,ðfTf| [fg,·,é B
ˆè’Ê,É,±,ê,ÍŽÀ Û,ì o—ÍfŒ [fg,^a—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<,³,é,½DirectSound

fhf%ofCfo,Í,È,‘ B,»,ê,ÍfEfF [fuftfH [f€ EfI [ffBfI<@”

,ð’Ê,µ,ÄGf~f...fŒ [fg,³,é,Ä,‘,é B ŽÀ s”—Í,ì’á%°,^a—\z,³,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%^afvf%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 Efofbftf@,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%¹fZfJf“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 Efofbftf@,ÅfTf|
[fg,³,è,é Å’á E Å ,,ìfTf“fvfŠf“fOfEf [fg,ðŽw’è B

dwPrimaryBuffers

fTf| [fg,³,è,éfvf%ofCf}fŠ Efofbftf@,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^t,μ,ì,μ,Î” ¶,·,é B

dwMaxHwMixingStaticBuffers

fXf^fefBfbfN EfTfEf“fh Efofbftf@,ì Å’á ”,ðŽw’è,·,é B

dwMaxHwMixingStreamingBuffers

fXfgfŠ [fEf EfTfEf“fh Efofbftf@,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,^afZfJf“f_fŠ EfTfEf“fh Efofbftf@,ìŠ,,,è“–,Å,ì,½,ß,É~—
p%Å”\,Å, ,é,©,Ç,²,©”»’f,·,é,½,ß,É A,±,è,ç,ì’l,ðŽg,²,±,Æ,^aÅ,«,é B “–,¶,±,è,ç,ì’l,ð Å’á,ìf~fLfVf“fO”–
Í,ðŽw’è,·,é f f“fo,Æ”àŠr,·,é,Î A,·,Å,ÉŠ,,,è“–,Å,ç,è,Å,¢,éŠf\ [fX,ð“Á’è,·,é,±,Æ,^aÅ,«,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 Efofbftf@,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’±fuf fbfN,ìfofCfg’P^Ê,ìfTfCfY B

dwUnlockTransferRateHwBuffers

fn [fhEfFfAfXf^fefBfbfN EfTfEf“fh Efofbftf@ iflf“f{ [fhfTfEf“fh 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,±,ìfEf [fg,ÆfofCfg,Å,ì”]’——Ê,Í

IDirectSoundBuffer::Unlock f fbfhEÄ,Ñ o,μ,ìEp’±ŽžŠÔ,ðE”è,·,é B

dwPlayCpuOverheadSwBuffers

f\ftgfEfFfA Efofbftf@ 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,ì’l 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 Efofbftf@,ì”]’—fEf [fg,Í Aff [f^,ð,Ç,±,É,à”]’—,·,é•K—v,^aÈ,¢,½,ß,O,Å, ,é
B “—l,Éfn [fhEfFfAfobftf@,ì Å ¶fI [fo [fwfbfh,Í Af~fLfVf“fO,^afTfEf“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•%o ”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

fIfufWfFfNfg,Í,·,Ä,É %oŠú%o»,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%oÄ“,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%of [f^,ªŠÖ ”,É“n,³,ê,½ B

DSERR_NOAGGREGATION

fIfufWfFfNfg,ÍCOM W ¬%o»,ðfTf| [fg,μ,È,¢ B

DSERR_NODRIVER

Žg—p,·,éTfEf“fh Efhf%ofCfo,ª—~—p,Ä,«,È,¢ B

DSERR_OTHERAPPHASPRIO

,±,ì'l,Í%oß<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®

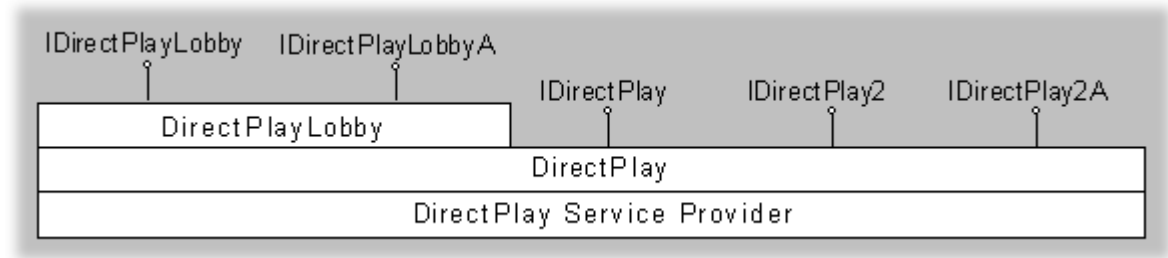
DirectPlay®fAfvfŠfP [fVf‡f“ Efvf fOf%of~f“fO EfCf“f^ [ftfFfCfX (API)

,Í AfAfvfŠfP [fVf‡f“,©,ç,ÌÊ MfT [frfX,Ö,ÌfAfNfZfX,ð’P f%o»,·,éf\ftfgfEfFfA EfCf“f^ [ftfFfCfX,Â, ,é
BDirectPlay,Í Afgf%of“fXf [fg,âfvf fgfRf< A, ,é,¢,ÍfIf“f%ofCf“ EfT [frfX,ÉÊµ,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,¤,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%oß<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%o»,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•jŽG,³,ðC,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,ff<,ðŽg—p,µ,Ä Af}f<f`fvfEfCf,, E fAfvfŠfP [fVf‡f“,ì—
v< ,É'Î‰ž,µ,½ Ú'±API,ðfCf“fvfŠf f“fg,µ,Ä,¢
,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,¢,é B



,±,ìfZfNfVf‡f“,Ä,Í A,±,ê,ç,ìfRf“f| [flf“fg,É,Ä,¢,Ä,îê”Ê“l,È î•ñ,ð à–¾,·,é B

DirectPlayfRf“f| [flf“fg

DirectPlayLobbyfRf“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^ [ftfFfCfX,ðŒöŠJ,·,é B
DirectPlayfCf“f^ [ftfFfCfX,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—¶,·,é,Ì,æ, A,»,Ì”}’Ì,ð’ñ<ÿ,·,é,f,ff€
,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,½fT [frfX Efvf fofCf_,Í Afgf%of“fXf| [fg,âfvf fgfRf<,Æ,â,êŽæ,è,ð,·,é B

DirectPlay API,Í ACOMfCf“f^ [ftfFfCfX,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^ [ftfFfCfX,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^ [ftfFfCfX,Í ADirectPlayfo [fWf‡f“1,Æ2,Á ,·,©,ê,½fAvfŠfP [fVf‡f“,Æ,Ì%°ÊŒÝŠ· «,Ì,½,ß
,ÉffftfHf<fg,ÌfCf“f^ [ftfFfCfX,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,ff<,ÁfQ [f€,ð ÝŒv,·,é,±
,Æ,ª,Ä,«,é BfNf%ofCfAf“fg ^fT [fo Ef,ff<,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 [fVfžf“,Æ’Ê M,·,é,½,ß,Ì A`ê”Ê“I,ÈJfXf^f€ Ef fr [Ef\šf...
[fVfžf“,Ä, ,é B’Ê í AfJfXf^f€ Ef fr [Ef\šf... [fVfžf“,Í A%½Ži—

p,©,ìf fr [EfNf%oCfAf“fg Ef\ftfgEfFfA,ðŠÛ,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,ªŽÄ‘,µ,Ä,¢

,éf† [fU EfCf“f^ [ftfFfCfX,É,æ,Ä,Ä A’¼,ÌfvfœfCf,,ðœ©,Ä,¬,ÄfQ [f€ EfZfbfVfžf“,ÈŽQ%Ä,·,é,±

,Æ,ª,Ä,«„é BfvfœfCf,, EfOf< [fv,ªfZfbfVfžf“,ðŠJŽn,·,é,±

,Æ,ðœ^,ß,é,Æ Af fr [EfNf%oCfAf“fg,Í,»,é,¼,è,ÌfRf“fsf...

[f^ ã,ÄfAfvfŠfP [fVfžf“,ðŠJŽn,µ AfT [frfX Efvf fofCf_,Ì‘ð,âfZfbfVfžf“,Æ,Ì Ú±,ì,½,ß,É•K—

v,È îñ,ð’ñ·ÿ,·,é B DirectPlayLobby APIŠÖ ”,ð’Ê,µ,Ä Ú±,³,è AŠJŽn%Ä”\

,Æ,È,Ä,½DirectPlayfAfvfŠfP [fVfžf“,Í Af fr [%Ä”\

,ÆEÄ,Ì,é,é B,Û,½ ADirectPlayLobby,Í AfZfbfVfžf“,Ì i s’†,ÉfAfvfŠfP [fVfžf“,ªf fr [EfNf%oCfAf“fg,Æ’

Ê M,µ,½,è AfAfvfŠfP [fVfžf“,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,ªŽ ,Ä,Ä,¢

,éDirectPlayfAfvfŠfP [fVfžf“,ð”»è,·,é,±,Æ,ª,Ä,«„é B,Û,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,ªfZfbfVfžf“,È%Ä,í,é,±

,Æ,ðœ^,ß A•K—

v,ÈfAfvfŠfP [fVfžf“,ÆfT [frfX Efvf fofCf_,Ì¶ Ý,ðŠm”F,µ,½Eä AIDirectPlayLobby::RunApplicationf ffb

fh,ð—p,¢,ÄfAfvfŠfP [fVfžf“,ÌŠJŽn,ÆfZfbfVfžf“,Ö,Ì Ú±,ðŽÄ s,Ä,«„é B,±

,ÌEÄ,Ñ o,µ,É,æ,Ä,Ä Af fr [EfNf%oCfAf“fg,Í AŽÄ s,·,éfAfvfŠfP [fVfžf“ AŽg—

p,·,éDirectPlayfT [frfX Efvf fofCf_ AfT [frfX Efvf fofCf_,ªfZfbfVfžf“,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 [fVfžf“,Ì è Š,ð‘Á’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 [fVfžf“,Í AIDirectPlayLobby::SendLobbyMessage,ÆIDirectPlayLobby::Rec

eiveLobbyMessagef ffbfh,ð—p,¢,Ä’Ê M,·,é,±,Æ,ª,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 [fVfžf“,©,çCfxf“fg,ðfZfbfgfAfbfv,·,é,É,Í AIDirectPlayLobby::

SetLobbyMessageEventf ffbfh,ðŽg—p,·,é B,±,Ìf ffbfh,ðŽg,µ,±,Æ,É,æ,è Af fr [,ÌfCfxf“fg,ð·Ì X,·,é,±

,Æ,à,Ä,«„é B

fAfvfŠfP [fVfžf“,ªf fr [%Ä”\,Ä, ,é,½,ß,É,Í AIDirectPlayLobbyfCf“f^ [ftfFfCfX,ð ì ¬,·,éK—v,ª, ,é BfAfvfŠ

fP [fVfžf“,Í AIDirectPlayLobby::GetConnectionSettingsf ffbfh,É,æ,Ä,Äf fr [EfNf%oCfAf“fg,ª

’ñ·ÿ,µ,½ Ú±fpf%o [f^,ð²,×,é,±,Æ,ª,Ä,«„é B,±

,è,ð·Ì X,·,é,É,Í AIDirectPlayLobby::SetConnectionSettingsf ffbfh,ðŽg—p,·,é B Ú±

,Ì Ý’è,ðŽg,Ä,ÄfZfbfVfžf“,Æ Ú±,·,é,Æ,«„Í AfAfvfŠfP [fVfžf“,©,çIDirectPlayLobby::Connect,ðEÄ,Ñ o,·, B,±

,ÌŠôf fr [EfNf%oCfAf“fg,Í AfAfvfŠfP [fVfžf“ŠJŽnfvf fZfX,ðŽ,·fVfXfef€ Ef fbfZ [fW,ðŽó M,·,é B

fvfœfCf,,ª ì ¬,³,è,é,Æ,« AfAfvfŠfP [fVfžf“,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 [,ªfZfbfVfžf“ îñ,ðŽw’è,·,é,½,ß Af† [fU,ª,»,Ì,µ,ç,Ì,Ð,Æ,Ä,ð‘I,Ô•K—
v,Ì,È,¢ j

4 IDirectPlay2::Open ifZfbfVfžf“,ÍŽ©“@“I,ÉŠJŽn,³,è,é)

IDirectPlayLobby::GetConnectionSettings,²DPERR_NOTLOBBIEDfGf%o [,ð·Ô,·,Æ,«„Í Af fr [EfNf%oCfAf“fg,ª

fAfvfŠfP [fVfžf“ŠJŽnŽŽ,Ì %Šú%» ^— ,ð s,í,È,©,Ä,½,±,Æ,ðŽ,µ,Ä,¢,é B,±

,Ì è ‡ AfAfvfŠfP [fVfžf“,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%öž,¶ A”}·İ,É^È“¶,μ,½’Ê MfT [frfX,ð’ñ<ÿ,·,·,é B
flf“f%ofCf“ EfT [frfX,ðŠŮ,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_,ªŠŮ,Ů,ê,Ä,¢,é B*

DirectPlay,İŠT—v

,±,İfZfNfVf‡f“,É,Í ADirectPlayfRf“f| [flf“fg,É,Â,¢,Ă,î^ê”Ê“l,È î•ñ,ªŠÜ,Ü,ê,Ă,¢,é BŽŸ,İfgfsfbfN,É,Â,¢,Ă 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,©?

fZfbfVf+f“ŠÇ—

DirectPlayfZfbfVf+f“,Í A,“CEÝ,¢,É’Ê M,µ,Ä,¢,éfŠf, [fg EfRf“fsf... [f^ ã,ì,¢,-
,Ä,©,ìfAfvfŠfP [fVf+f“,ìfCf“fXf^f“fX,Ä, ,é B
fAfvfŠfP [fVf+f“,Í A’Ê Mf`ffflf<,ìfI [fvf“,ÆfNf [fY,ì,½,ß,É A DirectPlay ,ìfZfbfVf+f“ŠÇ— <@”\,ðŽg—
p,·,é BfAfvfŠfP [fVf+f“,Í A V,µ,¢fZfbfVf+f“,ð ì ¬,·,é,©Šù“¶,ìfZfbfVf+f“,ð—
ñ<“,µ,Ä A Ú± æ,ìfZfbfVf+f“,ðCE`è,·,é BfZfbfVf+f“,ð ì ¬,·,éfAfvfŠfP [fVf+f“,Í AfzfXfg,Æ,µ,ÄŽQ Æ,³,è,
é B fzfXfg,Ífvf¢fCf,,ID,ÆfOf< [fvID,ðŠ,,,è—
,Ä AfZfbfVf+f“,ÉŽQ%oÁ,·,é V,µ,¢fAfvfŠfP [fVf+f“,ð’² ®,·,é B

fAfvfŠfP [fVf+f“,Í AIDirectPlay2::EnumSessionsf f\fbfh,ð—
p,¢ Af\fbfgf [fN ã,Ä i s’†,ì,·,×,Ä,ìŠù“¶,ìfZfbfVf+f“,ðŽæ“¾,·,é,±
,Æ,ª,Ä,«,é B V,µ,¢fZfbfVf+f“,ð ì ¬,µ,½,è AŠù“¶,ìfZfbfVf+f“,É Ú±,·,é,É,Í A
IDirectPlay2::Openf f\fbfh,ðŽg—p,·,é BfZfbfVf+f“,Í’í%ž,·,éDPSESSIONDESC2 \‘¢‘ì,É,æ,Ä,Ä•\,³,è,é B,±
,ì \‘¢‘ì,É,Í AfAfvfŠfP [fVf+f“CEÄ—L,ì’l,Æ AfZfbfVf+f“,ì—¼‘O,âf\fvfVf+f“,ìfpfXf [fh AŽQ%oÁ%oÄ”\
,Èfvf¢fCf,,,ì ”,Æ,¢,Ä,½ AfZfbfVf+f“,ì“Ä «,ªŠÜ,Ü,è,Ä,¢
,é BfZfbfVf+f“,ðfI [fvf“,µ,½CEã,Í AfAfvfŠfP [fVf+f“,©,¢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

fZfbfVf+f“,ìCE» Ý,ì“Ä «,ðŽæ“¾,·,é,É,Í AIDirectPlay2::GetSessionDescf f\fbfh,ðŽg—p,·,é B

fZfbfVf+f“,©,ç”²,¬,È,,Ä,Í,È,ç,È,¢,Æ,«,Í AIDirectPlay2::Closef f\fbfh,ð—p,¢,é,±
,Æ,ª,Ä,«,é BfZfbfVf+f“ EfzfXfg,ªfZfbfVf+f“,©,ç”²,¬,é ê ‡ A,»,ìfZfbfVf+f“,ªDPSESSIONDESC2 \‘¢‘ì,ÉDPSE
SSION_MIGRATEHOSTftf%ofO,ðŽw’è,µ,ÄŠJŽn,³,è,½,à,ì,Ä, ,è,ì AfZfbfVf+f“”†,ì’¼,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,^a,Ä,«,é BfvfŒfCf,,^a İ ¬,³,ê,Æ AfAfvfŠfP [fVf‡f“,İfvfŒfCf,,İ[□] İ,Æ ³Ž®—¼ İ A,“,æ,Ñ,Œ,-,Ä,©,İ %ŠúfŠf, [fg Eff [f^,ðŽw’è,·,é,±,Æ,^a,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,^a□ İ,â ³Ž®—¼ İ,ðŽg,□,±,Æ,İ,È,Œ,^a AfAfvfŠfP [fVf‡f“,İ A,»,ê,ç,ð—~—p,µ,ÄfvfŒfCf,,ðŽ~•Ê,·,é,±,Æ,^a,Ä,«,é B

IDirectPlay2::CreatePlayer,“,æ,Ñ**IDirectPlay2::DestroyPlayer**f f\fbfh,İ AfZfbfVf‡f““†,İfvfŒfCf,,İ İ ¬,“,æ,Ñ í œ,ð s,□ BfvfŒfCf,,^a İ ¬,³,ê,Æ AfAfvfŠfP [fVf‡f“,İfvfŒfCf,,İ[□] İ,Æ ³Ž®—¼ İ A,“,æ,Ñ,Œ,Œ,©,İ %ŠúfŠf, [fg Eff [f^,ðŽw’è,·,é,±,Æ,^a,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,^a□ İ,â ³Ž®—¼ İ,ðŽg,□,±,Æ,İ,È,Œ,Œ,^a AfAfvfŠfP [fVf‡f“,İ A,»,ê,ç,ð—~—p,µ,ÄfvfŒfCf,,ðŽ~•Ê,·,é,±,Æ,^a,Ä,«,é B

fAfvfŠfP [fVf‡f“,Í A**IDirectPlay2::EnumPlayers**f f\fbfh,ðŽg—p,µ,Ä AŒ» Ý,İfZfbfVf‡f“,É,Œ,éfvfŒfCf,,â A,»,İ[□] İ,Æ ³Ž®—¼ İ,ð”»’è,·,é,±,Æ,^a,Ä,«,é B’Ê íAfvfŠfP [fVf‡f“,Í A**IDirectPlay2::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**IDirectPlay2::EnumPlayers**f f\fbfh,ð—~—p,·,é BfZfbfVf‡f“,Ö,İfvfŒfCf,,İ Ú‘±¬“x,É,Ä,Œ,Ä,İ î•ñ,^a•K— v,ÈfAfvfŠfP [fVf‡f“,Ä,Í A**IDirectPlay2::GetPlayerCaps**f f\fbfh,ð—p,Œ,é,±,Æ,^a,Ä,«,é B

fvfŒfCf,,ÉŠÖ~A•t,¬,ç,ê,½—¼‘O,ð•İ X,·,é,É,Í**IDirectPlay2::SetPlayerName**f f\fbfh,ðŽg—p,·,é B,±,İf f\fbfh,İ AfvfŒfCf,,İ—¼‘O,^a•İ X,³,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,©**IDirectPlay2::GetPlayerName**,É,æ,è V,µ,Œ—¼‘O,ðŽæ“¼,·,é,±,Æ,^a,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 l,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%Ä”\,Ä, ,é B

IDirectPlay2::CreateGroup,Æ**IDirectPlay2::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,â**IDirectPlay2::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,,ÉfVfXfef€ 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 [fWŠ—

f fbZ [fWŠ— <@”\

,Í AfAfVfŠP [fVfzf“,É,æ,fvfEfCf,,ŠÖ,lf fbZ [fW,lf [fefBf“fO,ðŽx%±,·,é BfAfVfŠP [fVfzf“,Í AfVfXfef€,·,Ä,É’è’,µ,Ä,¢,é ”,lf fbZ [fW,ð æ,« A•K—v,É%ž,¶,Ä”C^Ó,lf fbZ [fW,ð’è’,·,é,±,Æ,·,Ä,«é BfAfVfŠP [fVfzf“,Í**DirectPlay2::Send**f f\fbfh,ðŽg—

p,µ,Ä AfvfEfCf,,âfOf [fv A,Ü,½,ÍfZfbfVfzf““†,ì,·,×,Ä,lfvfEfCf,,Éf fbZ [fW,ð’—,é,±,Æ,·,Ä,«é B’—
M æ,É,Í A,»,é,¼,é AfvfEfCf,,ID AfOf [fvID A,Ü,½,ÍDPID_ALLPLAYERS,ðŽw’è’,·,é BDirectPlay,“—

M,Ä,«é fbZ [fW,ì’â,«³,É,Í §EÄ,·,È,¢ BfAfVfŠP [fVfzf“,Í**DirectPlay2::GetCaps**,ðEÄ,Ñ o,µ,Ä A,Ð,Æ,Ä,lfpPfbbg,Ä’— M,·,é,±,Æ,·,Ä,«é Ä’âfOfCf ”,ðŽæ“¾,·,é,±,Æ,·,Ä,«é B,»,é,æ,ð,à’â,«é fbZ [fW,Í A·i ”,lfpPfbbg,É•Š,,,µ,Ä’— M,³,é,é B

fvfEfCf,,âfOf [fv,lfOf [fof ó’Ô,·,İ X,³,é AfZfbfVfzf““†,ì¼,ì,·,×,Ä,lfvfEfCf,,É,»,·,İ X,ð’Ê’m,µ,È,-,Ä,Í,È,ç,È,¢ é ±,Í A V,µ,¢ff [f^,É,Ä,¢,Ä,lf fbZ [fW,ðfvfEfCf,,É’—,é,æ,è,à Aff [f^Š— ŠÖ ”,ð—~
p,µ,½,Ü,²,·,Ö—,Ä, é B Ú ×,É,Ä,¢,Ä,Íff [f^Š—,ðŽQ Æ B

f fbZ [fW EfLf... [,©,çf fbZ [fW,ðŽó,~Žæ,é,É,Í A**DirectPlay2::Receive**f f\fbfh,ðŽg—

p,·,é Bf fbZ [fW,“Ä’è,lfvfEfCf,,É’—,ç,è,½,à,ì A, é,¢,İ“Ä’è,lfvfEfCf,,©,ç’Ê’m,³,è,½,à,ì,Ä, é é ± AfAfVfŠP [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, éfvfEfCf,,É’İ,µ,ÄfLf... [,É’u,©,è,Ä,¢,é fbZ [fW,ì ”,ðŽæ“¾,·,é,É,Í A**DirectPlay2::GetMessageCount**f f\fbfh,ðŽg—p,·,é B

DirectPlay,Í AfZfbfVfzf““†,ÄN,«¼,·,İ X,ðfvfEfCf,,É’Ê’m,·,éVfXfef€ Ef fbZ [fW,ð ¶ ¬,·,é B,·,×,Ä,lfVfXfef€ Ef fbZ [fW,Í ADPID_SYMSG,É,æ,Ä,Ä’è’³,è,é%¼’zfvfEfCf,,©,ç’—

M,³,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,·,é fbZ [fW \‘¢ì,ðŠÜ,ñ,Ä,¢,é B,±

,ì \‘¢ì,lf fbZ [fW,ð%ð“Ç,·,é,½,ß,É•K—v,Ä, é BfAfVfŠP [fVfzf“,Í

ADPSESSIONDESC2 \‘¢ì,lf%fofO,ðŽw’è,µ,Ä A ¶ ¬,³,è,éVfXfef€ Ef fbZ [fW,ð §Eä,·,é,±,Æ,·,Ä,«é B

•Ê,lfXfEfbbh,ðŽg—

p,µ,Äf fbZ [fW,ðŽó,~Žæ,é é ± AfAfVfŠP [fVfzf“,Í Af fbZ [fW,ìŽó MŽž,ÉfZfbfg,³,é“~ŠúCfxf“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%œÊ AfŠf, [fg Eff [f^,Í,·,×,Ä,ìfŠf, [fg EfRf“fsf... [f^ŠÖ,ì<□—Lf f,fŠ,Æ,È,é B,Ü,è•İ 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%œfO,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,İ AfVfXfef€ Ef fbfZ [fW,Â, ,é B,·,×,Ä,İfVfXfef€ Ef fbfZ [fW,İ 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@,İ 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“,İ AfVfXfef€ Ef fbfZ [fW,ðŽ~•Ê,µ,½,ç Aff [f^,ð“Ç,Ý o,·,½,ß,É iDPMSG_f vfƎftfBfNfX,ÄŽn,Ü,é j“K Ø,È \¢'İ,Éfofbftf@,ðfLfffXfg,·,é,×,« ,Ä, ,é B*

fAfvfŠfP [fVf±f“,İ A`È%º,İfVfXfef€ Ef fbfZ [fW,İ ^— ,ð—p^Ó,µ,È,,Ä,İ,È,ç,È,¢ B

dwType,İ'l

f fbfZ [fW \¢'İ

DPSYS_ADDPLAYERTOGROUP

DPMSG_ADDPLAYERTOGROUP

DPSYS_CREATEPLAYERORGROUP

DPMSG_CREATEPLAYERORGROUP
P

DPSYS_DELETEPLAYERFROMGROUP

DPMSG_DELETEPLAYERFROMGROUP
UP

DPSYS_DESTROYPLAYERORGROUP

DPMSG_DESTROYPLAYERORGROUP
UP

DPSYS_HOST

DPMSG_HOST

DPSYS_SESSIONLOST

DPMSG_SESSIONLOST

DPSYS_SETPLAYERORGROUPDATA

DPMSG_SETPLAYERORGROUPDATA
TA

DPSYS_SETPLAYERORGROUPNAME

DPMSG_SETPLAYERORGROUPNAME
ME

IDirectPlayLobby::ReceiveLobbyMessage *f\fbfh,ª•Ô,· fbfZ [fW,İ,□*

*,ç AdwFlagsfpf%of [f^,ÉDPLAD_SYSTEM,ª Y'è,³,ê,Ä,¢,é,à,İ,İ AfVfXfef€ Ef fbfZ [fW,Â, ,é B,·,×,Ä,İfVfXfef€ Ef fbfZ [fW,İdwType,É,æ,Ä,ÄŽ!,³,ê,éf_fuf<f [fh'l,ÄŽn,Ü,Ä,Ä,¢ ,é BIDirectPlayLobby::ReceiveLobbyMessage,ª•Ô,·fofbftf@,İ 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,¢,Ă,íê”Ê“l,È•û—@,ð’ñ<Ÿ,µ,Ă,¢
,È,¢ B’ñ<Ÿ,µ,½ ê ‡,Í AfAfvfŠfP [fVf‡f“”Ê Mfpf%of_fCf€,É §ŒÀ,ð—^,!,Ă,µ,Û,¤,É^á,¢
,È,¢ B,µ,©,µ AfVfXfef€,É,Í A,±,ê,¢,lf^fXfN,ðŽx%o‡,·,é,½,ß,É ÝŒv,³,ê,½,¢,,Ă,©,lfT [frfX,^aŠÛ,Û,ê,Ă,¢
,é B,½,Æ,,!,Í AfAfvfŠfP [fVf‡f“,^afvfŒfCf,,ð ì ¬,µ,½,Æ,«,Í A’Ê’mfCfxf“fg,ðŽw’è,·,é,±
,Æ,^a,Ă,«,é B,»,ê,©,çWin32®,lWaitForSingleObjectŠÖ ”,ðŽg—p,µ,Ă Af fbfZ [fW,^a ^— ’†,Ă, ,é,©,Ç,¤
,©,ð’m,é,±,Æ,^a,Ă,«,é B

DirectPlayfAfhfŒfX

,±,lfZfNfVf‡f“,l î•ñ,Í ADirectPlayLobbyfNf%oCfAf“fg,ìŠJ”ŽÒ,ì,½,B,ì,à,ì,À, ,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—l,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 \‘¢`ì 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 †,ì ,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,©,lÜ,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,Í16fofCfg,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,“ñ<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,é,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 A<, „ §,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“,Ì‘ð A,»,ì¼,Ì îñ i“d`b”Ô †,âf lfbfgf [fN EfAfhfŒfX,È,Ç j,Ìñ<Ÿ,Ì,½,ß,É Af† [fU,É-â,Ç ‡,í,¹,ð,·,é•K—v,ª,È,Ç B

DirectPlay,É,Í A,±,Ì,Ü,©,Ì V,µ,Ç<@““,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

‘n`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“n,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 M<@““ 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

fŠf, [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,µ,È<@““,DirectPlay 3,É‘Ç%Ä,ª,È,Ä,Ç,é B

fAfvfŠfP [fVfzf“ŒÄ—L,Ìff [f^,ðDirectPlayfOfç [fvID,âfvfŒfCfç,,ID,ÆŠÖ`A•t,—é<@““ B,±,è,È,æ,Ä,ÄfAfvfŠfP [fVfzf“,Í ADirectPlay,Ì1•“,Ä, ,éfvfŒfCfç,,âfOfç [fv,ÌfŠfXfgŠÇ— fR [fh,ðŠg`Œ,·,é,±,Æ,ª,Ä,«,é Bf [fJfç Eff [f^,Æ,Í AfvfŒfCfç,,ð•,·frfbfgf}fbfv,Ì,æ,µ,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,è,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,µ,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,—é<@““ B,±,è,Íf` [fŒçZ,É-ð—§,Ä B

DirectPlay 3,Ì V<@““,Ì,µ,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,µ,È,·,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,Ì<@““,ÈfAfNfZfX,·,éü-@,É,Ä,Ç,Ä ä-¼,·,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,^aĀ,«,«,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,^aĀ,«,«,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,^,.,é B

- 1 fAfvfŠfP [fVf‡f“,^f fr [EfNf%ofCfAf“fg,©,ç,N“@,^3,ê,½,©,Ç,□,©,đ^2,×,é B Ú ×,É,Â,ç ,Ä,İ ADirectPlayf^... [fgfŠfAfç,İ uStep 2: Ú“+ŠÄ«„İŽæ“¾ v,đŽQ Æ,^3,ê,½,ç B
- 2 fAfvfŠfP [fVf‡f“,^fT [frfX Efvf fofCf_,đ—ñ“,µ,Ä,ç ,é ê ‡,İ A**DirectPlayEnumerate**fR [fçfobfNŠÖ ”,đ—p,ç,Ä AfT [frfX Efvf fofCf_,^Žg—p%Ä”\,©,Ç,□ ,©,đ”»”è,.,é BŽg—p%Ä”\,Ä,.,ê,İ A,»,İfT [frfX Efvf fofCf_,É,Ä,ç ,Ä**DirectPlayCreate**ŠÖ ”,đÆÄ,Ň o,· B**DirectPlayEnumerate**fR [fçfobfNŠÖ ”,^fGf% [,đ•Ö,µ,½,Æ,«„İ A,»,İ fT [frfX Efvf fofCf_,đfVfXfef€ ä,ÄŽÀ s,.,é,±,Æ,İ,Ä,«„É,ç,İ,Ä Af† [fU,É•Ž!,.,éfŠfXfg,É’Ç%Ä,µ,É,ç ,æ,□,É,.,é BÆÄ,Ň o,µ,^ ÑÆ÷,.,é,İ A**Release**f f\bfh,đŽg— p,µ,ÄDirectPlayfIfufWfFfNfg,đ%đ•ú,µ A,»,İfT [frfX Efvf fofCf_,đfŠfXfg,É’Ç%Ä,.,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,İ’ä,ç,İ A \ç‘İ,É,“,“é•Žš— ñ,İ“Ç,Ÿ ‘,«„İû—@,Ä,.,é BUnicodefCf“f^ [ftFfCfX,Ä,İ ALPWSTRÆ^,İ \ç‘İf f“fo,ÉUnicode•Žš— ñ,“Ç,Ÿ ‘,«„^3,ê,é BANSIfCf“f^ [ftFfCfX,Ä,İ ALPSTRÆ^,İ \ç‘İf f“fo,ÉANSI•Žš—ñ,“Ç,Ÿ ‘,«„^3,ê,é B

- 4 Šù“Ÿ,İAPI,Ä V,µ,ç \ç‘İ,đŽg,□,½,ß,É•K—v,È A,.,×,Ä,İ•İ X,đ s,□ B,½,Æ,!,İ AŽŸ,İfR [fh,İ’ä,İ,é,É A lpDP->SetPlayerName(pidPlayer, lpzFriendlyName, lpzFormalName)

lpDP,^**IDirectPlay**fCf“f^ [ftFfCfX,Ä,.,é,È,ç A^È%°,İ,æ,□,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“,^Unicode•Žš—ñ,đŽg— p,.,é i,µ,½,^,Ä,Ä**IDirectPlay2fCf**“f^ [ftFfCfX,İfCf“fXf^f“fX,đ i ¬,.,é j ê ‡,İ AŽŸ,İ,æ,□,É,.,é B

lpPayerName->lpzShortName = lpwszFriendlyName;
lpPlayerName->lpzLongName = lpwszFormalName;
lpDP2->SetPlayerName(pidPlayer, lpPlayerName, 0)

lpDP2,İ**IDirectPlay2fCf**“f^ [ftFfCfX,Ä,.,é B

- 5 ŽŸ,İfVfXfef€ 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,^•İ X,^3,ê,½,Æ,« ADPSYS_SETPLAYERORGROUPNAMEf fbfZ [fW,đ” s,.,é,æ,□ ,ÉfAfvfŠfP [fVf‡f“,đ X V,.,é B,Ü,½ AfvfÆfCf,,âfOfç [fv Eff [f^,^•İ X,^3,ê,½,Æ,«„É,İ ADPSYS_SETPLAYERORGROUPDATAf fbfZ [fW,đ Ÿ ¬,.,é,æ,□,É,.,é B

- 7 DPSESSIONDESC \ç‘İ,đ**DPSESSIONDESC2** \ç‘İ,É X V,µ ADPCAPS \ç‘İ,É V,µ,çf f“fo,đ’Ç%Ä,.,é B

8

IDirectPlay2::EnumSessions A**IDirectPlay2::EnumGroups** A**IDirectPlay2::EnumGroupPlayers** A,“,æ,Ň**IDirectPlay2::EnumPlayers**,İfR [fçfobfNŠÖ ”,đ X V,.,é B

9

IDirectPlay2::CreatePlayerf 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,ç B,»,İ’ä,İ,è AfAfvfŠfP [fVf‡f“,^fCfxf“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,ÉŠî,Ã,¢
,½fIfufWfFfNfg,ÆfCf“f^ [ftfFfCfX,Å \ ¬,³,ê,Ã,¢,é BCOM,Í AfCf“f^ [ftfFfCfX,İ Ä—~—p,É Ä“_,ð“—
,Ä,½fIfufWfFfNfgfx [fX EfVfXfef€,İŠî“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,Í,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,İ”ê”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,³,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,ç,ÌDirectPlayfCf“f^ [ftFfCfX,“T‘ð,³ê,é,© iUnicode,ÌIDi
rectPlay2,© AANSI,ÌIDirectPlay2A j,É,æ,Á,Ä A \‘c‘Ì,©,ç“K Ø,È•¶Žš—ñ,ð“Ç,Ý ‘,«,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,İfŒfWfXfgfŠ,É,Œ
,,Â,©,İ i•ñ,đ'Ç%0Á,µ,È,,Ä,Í,È,Ç,È,Œ B,±,İ,½,B,É A`È%°,İfŒfWfXfgfŠ EfL [,“è<³,ê,Ä,Œ,é B"Application
Name",Í ADirectPlayLobby,³AfvfŠfP [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,·,éftfBfŒfNfgfŠ,İfpfX

DirectPlayf`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“,ðL 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

$f^f \dots [fgf\check{S}fAf\langle 1:f\text{ fr }[\delta\check{Z}g-p,\mu,\frac{1}{2}\text{ }\acute{U}'\pm$

IDirectPlayLobbyfCf“f^ [ftfFfCfX,δŽg—

p,μ,Ä ‘,©,ê,½fAfvfŠfP [fVf‡f“,Í Af† [fU,ªŽè ì<Æ,Ä Ú‘± î•ñ,đf_fCfAf fO Ef{fbfNfX,É“ü—Í,·,é,±,Æ,È,-
Ú‘±,Ä,«,é BLOBBYfTf“fvf<,Í AŽŸ,İfXfefbfv,Äf fr [,³,ê,½fAfvfŠfP [fVf‡f“,đ ì ¬,·,é•û-@,đ à-¾,·,é B

Step 1: DirectPlayLobbyfIfufWfEfNfg,İ ì ¬

Step 2: Ú‘±ŠÂ<<,İŽæ“¾

Step 3: fZfbfVf‡f“<L_q,İ Ý’è

Step 4: fZfbfVf‡f“,Ö,İ Ú‘±

Step 5: fvfŒfCf„,İ ì ¬

Step 1: DirectPlayLobbyIfufWfFfNfg,İ ì Ñ

DirectPlayf fr [;<@”\,đŽg,ϣ,½,ß A,Ü,,
DirectPlayLobbyCreateŠÖ ”,đĖĂ,Ň o,μ,ÄDirectPlayLobbyIfufWfFfNfg,İfCf“fXf^f“fX,đ ì Ñ,·,é B,±
,İŠÖ ”,İ5,Ā,İfpf%of [f^,đŠÜ,ñ,Ā,¢,é B‘æ1 A‘æ3 A‘æ4pf%of [f^,Í A «—^,İŠg’E,İ,½,ß,É—\—
ñ,³,ê,Ā,“,è A,Ā,Ē,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,¢
,ĀfIfufWfFfNfg,İĒ’u,đŽ•Ē,·,é,±,Æ,ª,Ā,«,é B‘æ5pf%of [f^,à «—^,İŠg’E,İ,½,ß,É—\—
ñ,³,ê,Ā,“,è A,Ā,Ē,É0,É Ý`è,·,é B

ŽŸ,İ—á,Í ADirectPlayLobbyIfufWfFfNfg,İ ì Ñ•û—@,İ,Đ,Æ,Ā,Ā, ,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,^a 3,μ, Ý'è,³ê,é,Æ AfAfvfŠfP [fVf‡f“,Í fZfbfVf‡f“,Æ Ú±
,·,é,½,ß,É**IDirectPlayLobby::Connect**f f\fbfh,ðŽg—p,·,é,±,Æ,^aÄ,«,é B,±,İf f\fbfh,^aDP_OK,ð•Ö,¹Î A,Đ,Æ,Ä, ,é,¢
,Í·j ”,İfvfƎfCf,,,ð ì ¬,·,é,±,Æ,^aÄ,«,é B,±
,İf f\fbfh,^aDPERR_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<,³ê,Ä,¢,éfT [frfX Efvf fofCf_,ðŽ¯•Ê,·,é,É,Í A**IDirectPlayEnumerate**ŠÖ ”,ð—~—p,·,é,±
,Æ,^aÄ,«,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;
```

IDirectPlayLobby::Connect

f f\fbfh,É,æ,Ä,Ä³ i,ÉfAfvfŠfP [fVfþf“,ªŠŽn,ª,é,é,Æ A,Ð,Æ,Ä,Ü,½,Í,¡; ”,ÌfvfÆfCf,,ð ì ¬,Ä,«,é,æ,ª,É,É,é BfAfvfŠfP [fVfþf“,ÍIDirectPlay2::CreatePlayer f f\fbfh,ðŽg—p,µ,Ä ADPNAME \‘c‘ì iIDirectPlayLobby::GetConnectionSettings f f\fbfh,É,æ,Ä,Ä Ý’è,ª,é,½,à,Ì j,ªŽw’è,·,é—¼‘O,ÌfvfÆfCf,,ð ì ¬,·,é,±,Æ,ª,Ä,«,é B

$$\hat{E}^0, \mathcal{E}f \vee f \mathcal{E}f C f, \text{, } \hat{I} \text{ } \hat{I} \text{ } \neg \bullet \hat{u} - @, \hat{I} - \acute{a}, \check{\delta} \check{Z}_!, \cdot \text{ } B$$

// Ú± Ý'è,É•Ô,³,ê,½–¼‘O,ÅfvfƎfCf,,,ð ì ¬,·,é B

```
hr = lpDirectPlay2A->CreatePlayer(&dpidPlayer,
```

lpConnectionSettings->lpPlayerName,

```
lpDPInfo->hPlayerEvent, NULL, 0, 0);
```

if FAILED(hr)

goto FAILURE;

$$, \pm, \hat{e}, \mathbb{A} f A f v f \check{S} f P \quad [f V f \nmid f " , \acute{I} \quad \acute{U}^{\pm, 3}, \hat{e} \quad A f v f \mathbb{E} f C \quad \epsilon " \check{o}, {}^a \check{S}^{\textcircled{R}} - 1, \mu, \frac{1}{2} \quad B$$

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%º°,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%ºÁ

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);

DirectPlayEnumerateŠÖ ”,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,
(WPARAM) iIndex, (LPARAM) lpGuid);

FAILURE:
return (TRUE);
}

Step 2: IDirectPlay1IfuFWfFNfg, Ĩ ì Ñ

f† [fU,žg—p,·,éT [frfX Efvf fofCf_,đ'I'đ,·,é,Æ A'I'đ,ÉŠi,Ä,¢
,ÄDirectPlay1IfuFWfFNfg,đ ì Ñ,µ A“K Ø,ÈT [frfX Efvf fofCf_,lOf [fof< Ef†fj [fNŽ~·ÊŽq iGUID j,
đŽw'è,·,é,±,Æ,ª,Ä,«é BDirectPlay1IfuFWfFNfg,Ĩ ì 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**
rectPlayCf“f^ [ftfFfCfX,đ•Ô,· B

IDirectPlayCf“f^ [ftfFfCfX,Í V,µ,¢fQ [f€,İ ì Ñ,É—p,¢,é,±,Æ,ª,Ä,«é,ª A,æ,è,æ,¢•û—
@,Í 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,Í A'Ç%Ä,³,ê,½DirectPlay,İ'S<@”\,ªŠÜ,Ü,ê,Ä,¢
,é B**DirectPlay2**,ä**IDirectPlay2A**Cf“f^ [ftfFfCfX,đŽæ“¾,·,é,É,Í A**DirectPlayCreate**ŠÖ ”,ª•Ô,·**IDirectPlay**Cf“f^ [ftfFfCfX,İ**QueryInterface** f\fbfh,ðEÄ,Ñ o,· B

ŽŸ,İ—á,Ä,İ**IDirectPlay**Cf“f^ [ftfFfCfX,İ ì Ñ•û—@,đŽ|,µ A**QueryInterface**,đŽg—
p,µ,Ä**IDirectPlay2A**Cf“f^ [ftfFfCfX,đ ì 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;
```

```
// ì 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,ðˆñˆŸ,·,é B,»,µ,Ä ADPOPEN_JOINftf%ofo,ðŽw’è,µ,ÄIDirectPlay2::Openf f\fbfh,ðŒÄ,Ŧ
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—@,ðŽŸ,ÉŽ!,· B
```

```
// ,±,İŽİ—Đ,İfZfbfVfzf“,ðŒŸ 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 BŽŸ,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€fAfeFg,ð”»’è,·,é B
if (dwFlags & DPESC_TIMEDOUT)
return (FALSE); // ÄŽŽ s,µ,È,¢ B
```

```
// fZfbfVfzf“—¼,ðfŠfXfg,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^,ðfŠfXfg,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 AfAvfŠfP [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: fZfbfVf‡f“,İ ì ¬

f† [fU,ª V,µ,¢fZfbfVf‡f“,ð ì ¬,·,é,É,Í ADPOPEN_CREATEftf%ofo,ðŽw'è,µ,ÄIDirectPlay2::Open f\fbfh,ðCEÄ
,Ñ o,· B,±,±
,Ä,àfT [frfX Efvf fofCf_,Í AfZfbfVf‡f“,ª ì ¬,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,¢fZfbfVf‡f“,İ ì ¬•û—@,ðŽŸ,ÉŽ',· B

```
// V,µ,¢fZfbfVf‡f“,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: *f v f C f , , Ì ì ñ*

f Z f b f V f ‡ f “ , ð ì ñ A , , é , ¢
, Í f Z f b f V f ‡ f “ , É Ž Q % Á , µ , ½ Ć ã A f A f v f Š f P [f V f ‡ f “ , Í A I D i r e c t P l a y 2 :: C r e a t e P l a y e r f f \ f b f h , É , æ , Á , Ä , Ð , Æ , Â ^ È ã , Ì
f v f C f C f , , ð ì ñ , · , é , ± , Æ , ª , Å , « , é B Ž Ÿ , Ì — á , Å , Í A f v f C f C f , , ð ì ñ , · , é • û — @ , Ì , Ð , Æ , Â , ð Ž , µ , Å , ¢ , é B

// —¼‘O \ ‘ Ć ‘ Ì , ð Ÿ ‘ è , · , é B
ZeroMemory(&dpName, sizeof(DPNAME));
dpName.dwSize = sizeof(DPNAME);
dpName.lpszShortNameA = lpszPlayerName;
dpName.lpszLongNameA = NULL;

// , ± , Ì —¼‘O , Å f v f C f C f , , ð ì ñ , · , é B
hr = lpDirectPlay2A->CreatePlayer(&dpidPlayer, &dpName,
lpDPInfo->hPlayerEvent, NULL, 0, 0);
if FAILED(hr)
goto CREATEPLAYER_FAILURE;

*f A f v f Š f P [f V f ‡ f “ , Í A I D i r e c t P l a y 2 :: G e t C a p s , â I D i r e c t P l a y 2 :: G e t P l a y e r C a p s f f \ f b f h , ð Ž g — p , µ , Å f v f C f C f , , Ì ‘ È M ” *
— Í , ð ” » ‘ è , · , é , ± , Æ , ª , Å , « , é B , Ü , ½ A ‘ ¼ , Ì f v f C f C f , , ð Ć © , Å , , é , É , Í A I D i r e c t P l a y 2 :: E n u m P l a y e r s f f \ f b f h , ð Ž g —
p , · , é B

, ± , ê , Å f A f v f Š f P [f V f ‡ f “ , Í Ú ± , ³ , ê A f v f C f C , · , é , ½ , ß , Ì € ” ð , ª Š ® — ¹ , µ , ½ B

DirectPlayfŠftf@fÆf“fX

šö ”

DirectPlayCreate

HRESULT WINAPI DirectPlayCreate(LPGUID lpGUID,
LPDIRECTPLAY *lpDP, IUnknown *pUnkOuter);

DirectPlayIfufWfFfNfg,lfCf“fXf^“fX,đ ì ¬,·,é B

¬Ĉ÷,·,ê,ÎDD_OK AŽ,”s,·,ê,ÎŽŸ,lfGf%o [’l,ì,Ĉ,,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

—LĈø,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,ÌĈYŠ· «,ì,½,ß,É’ñ<Ÿ,³,ê,é BĈ» Ý,ÌDirectPlayCreateŠÖ ”,Í A,±
,lfpf%of [f^,ÉNULL^ÈŠO,ì’l,ªŽw’è,³,ê,Ā,Ĉ,é,ÆfGf%o [,đ•Ô,· B
,±,ìŠÖ ”,ÍDirectPlayIfufWfFfNfg,ì %Šú%o»,đ s,Ĉ 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,ÉDirectPlayEnumerateŠÖ ”,đĈĀ,Ñ o,·,×,«,Ā, ,é iDirectPlayEnu
merateŠÖ ”,Í ADirectPlayCreate,ìlpGUIDfpf%of [f^,đ Y’è,·,é j B
,±,ìŠÖ ”,Í AIDirectPlayfCf“f^ [ftfFfCfX,Ö,lf|fCf“f^,đ•Ô,· BĈ» Ý,ÌDirectX
3fCf“f^ [ftfFfCfX,ÍIDirectPlay2,~,æ,ÑIDirectPlay2A,Ā, ,é B,±
,ê,Ĉ,lfCf“f^ [ftfFfCfX,đŽæ“¾,·,é,É,Í ADirectPlayCreate,É,æ,Ā,Ā•Ô,³,ê,½IDirectPlayfCf“f^ [ftfFfCfX,ì*QueryInte
rface* f\fbfh,đĈĀ,Ñ o,·•K—v,ª, ,é B

ŽQ Æ @DirectPlayEnumerate

DirectPlayEnumerate

HRESULT WINAPI DirectPlayEnumerate(
LPDPENUMDPCALLBACK lpEnumDPCallback, LPVOID lpContext);

fVfXfef€,É*fCf“fXfg* [*f<*,³,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<*,³,ê,Ä,¢
,é*DirectPlayfT* [*ftrfX* *Efvf* *fofCf_* *EfCf“f^* [*ftfFfCfX*,²,Æ,É€Ä,Ñ o,³,ê,é A*EnumDPCallback*ŠÖ ”,Ö,Ì*f*
fCf“f^ B

lpContext

ŠÖ ”,ª€Ä,Ñ o,³,ê,é,½,Ñ,É*fR* [*f<fofbfNŠÖ* ”,É“n,³,ê,é A*fAfvfŠfP* [*fVf‡f““è<*,Ì \‘¢‘ì,Ö,Ì*f*|*fCf“f^* B

,±,ìŠÖ ”,Í A*fVfXfef€*,É*fCf“fXfg* [*f<*,³,ê,Ä,¢,é*T* [*ftrfX* *Efvf* *fofCf_*,È,§ A*fVfXfef€*,ª—p,·,é,±,Æ,^a,Ä,«,È,¢
,à,ì,Ä,à—ñ<“,·,é B,½,Æ,,Ì A*fVfXfef€*,É*f*,*ftf€*,ª*fCf“fXfg* [*f<*,³,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,đ ì ¬,·,é B,±
,İŠÖ ”,İDirectPlayLobbyIfufWfFfNfg,ì %Šú%»,đ s,¢ Af|fCf“f^,đfZfbfg,·,é B
-Œ÷,·,ê,İDD_OK AŽ,”s,·,ê,İŽŸ,İfGf% [’l,ì,¢,,ê,©,đ•Ô,· B

CLASS E_NOAGGREGATION

DPERR_INVALIDPARAMS

DPERR_OUTOFMEMORY

lpguidSP

«—^,ì,½,ß,É—\¬ñ,³,ê,Ä,¢,é BNULL,ÉfZfbfg,μ,Ä,“,©,È,¬,ê,Î,È,ç,È,¢ B

lpDPL

—LŒø,ÈİDirectPlayLobbyfCf“f^ [ftfFfCfX,Ä %Šú%»,³,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· «,ì,½,ß,É’ñ<Ÿ,³,ê,Ä,¢,é BŒ» Ÿ,İDirectPlayLobbyCreateŠÖ ”,Ä,Í A,±
,İpf%of [f^,ÉNULL^ÈŠÖ,İ’l,^aŽw’è,³,ê,é,ÆfGf% [,đ•Ô,· B

lpData

DirectPlayLobbyIfufWfFfNfg,đ ì ¬,·,é,½,ß,É’Ç%Äff [f^,đ•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**fAfvfŠfP* [*fVf‡f*““*è*`,*l**fR* [*f<fofbfNŠÖ* ” *B*

—*ñ*“,*ð*‘*±*,*¯*,*é* *ê* *‡*,*Í*TRUE *A* *I*—*·*,*·*,*é* *ê* *‡*,*Í*FALSE,*ð*•*Ö*,*·* *B*

guidDataType

ff [*f*^ *Ef`fff*“*fN*,*l*CE^,*ð*•\,*·**fOf* [*fof< Ef‡fj* [*fNŽ*¯•ÊŽ*q* *iGUID* *j* *B*

dwDataSize

ff [*f*^*f`fff*“*fN*,*l**fTfCfY*,*ðfofCfg*’*P*^Ê,*ÅŽw*’*è*,*·*,*é* *B*

lpData

’*è* ”*ff* [*f*^,*Ö*,*l**f|fCf*“*f*^ *B*

lpContext

fR [*f<fofbfNŠÖ* ”,*É*“*n*,³*ê*,*é**fRf*“*fefLfXfg* *B*

fT [*f**r**fX* *Efvf* *fofCf*_,*Í* *AguidDataType**f**p**f*%*o**f* [*f*^,*l*GUID,*ð*’²,*×*,*Ä* *AlpData*,*ÅŽ*’³,*é*,*é*’*l*,*ð* ^— ,*Ü*,^½,*Í*◁*L%*◊, *μ*,*È*,*-*,*Ä*,*Í*,*È*,*ç*,*È*,*¢* *B*”*FŽ*¯, *Ä*,*«*,*È*,*¢guidDataType*,*l*’*l*,*Í*—³*Ž*<,*·*,*é*,*±*,*Æ*,^a,*Ä*,*«*,*é* *B*

fR [*f<fofbfNŠÖ* ”,*É*•*Ö*,³*é*,*é*,*·*,*×*,*Ä*,*l**f|fCf*“*f*^,*Í*êŽŽ“*I*,*È*,*à*,*l*,*Ä*,*·**è* *AfR* [*f<fofbfNŠÖ* ”“*à*,*Ä*,*l*,*Ý*—*L*Æø,*Ä*,*·**é* *Bf|fCf*“*f*^ *î*•*ñ*,*ð*•*Ü*“*¶*,*·*,*é*•*K*—*v*,^a,*·*,*é**fAfvfŠfP* [*fVf‡f*“,*Í* *Aff* [*f*^,*ð*•*ÜŽ* ,*·*,*é**f* *f*,*fŠ*,*ðŠm*•*Ü*,*μ* *Aff* [*f*^,*ðfRfs* [*μ* *A* *V*,*μ*,*¢ff* [*f*^,*l**f|fCf*“*f*^,*ð*•*Ü*“*¶*,*μ*,*È*,*¯*,*ê*,*l*,*È*,*ç*,*È*,*¢* *B*,*±*,*lŠÖ* ”“*à*,*l**lpData*,*Í*êŽŽ“*I*,*È**f|fCf*“*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);

DirectPlayEnumerateŠÖ ”,ÄŽg—p,·,éAfvfŠfP [fVf‡f““èè,èR [f<fofbfNŠÖ ” BUNICODE,“èè,³,è,é,©,Ç,□
,©,É,æ,Ä,Ä AfR [f<fofbfNŠÖ ”,èfvf fgf^fCfv,èlpSPName,Í ALPWSTR iUnicode,è è ‡ j, ,é,¢
,ÍLPSTR iANSI,è è ‡ j,Æ,µ,Ä’èè,³,è,é B

—ñ“,ð‘±,¬,é è ‡,ÍTRUE A I—,·,é è ‡,ÍFALSE,ð•Ö,· B

lpguidSP

DirectPlayfT [frfX Efvf fofCf_,èf†fj [fNŽ~•ÊŽq,èfAfhfÆfX B

lpSPName

fhf%ofCfo,ðŽ!,•¶Žš—ñ,èfAfhfÆfX BUNICODEfVf“f{f<,“èè,³,è,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,èf fWff [,¬,æ,Ñf}fCfi [Efo [fWf‡f““Ô † B

lpContext

fAfvfŠfP [fVf‡f““èè,èRf“fefLfXfg,Ö,èf|fCf“f^ B

fR [f<fofbfNŠÖ ”,É•Ö,³,è,é,·,×,Ä,è|fCf“f^,ÍêŽž“L,È,à,è,Ä, ,è AfR [f<fofbfNŠÖ ”“à,Ä,è,Ý—LÆø,Ä, ,é B|
fCf“f^ îñ,ð•Ů•¶,·,é•K—v,ª, ,éAfvfŠfP [fVf‡f“,Í Aft [f^,ð•ŮŽ ,·,éf f,fŠ,ðŠm•Ů,µ Aft [f^,ðfRfs [,µ A V
,µ,¢ff [f^,è|fCf“f^,ð•Ů•¶,µ,È,¬,è,è,È,Ç,È,¢ B,±,èŠÖ ”“à,èlpguidSP AlpSPName AlpData,ÍêŽž“L,Èè|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,İfR [f<fofbfNŠÖ ” B

—ñ<“,ð‘±,¬,é ê ‡,İTRUE A I—,·,é ê ‡,İFALSE,ð•Ô,· B

lpAppInfo

—ñ<“,³,ê,½fAfvfŠfP [fVf‡f“,İ î•ñ,ðŠÜ,Đ A“Ç,Ý o,μ ê—p,İDPLAPPINFO \‘ç‘İ,Ö,İf|fCf“f^ B

lpContext

IDirectPlayLobby::EnumLocalApplications ĆÄ,Ñ o,μ,©,ç“n,³,ê,éRf“fefLfXfg,Ö,İf|fCf“f^ B

dwFlags

—\—ñ,³,ê,Ä,ç,é BŽg—p,μ,Ä,Í,ç,¬,È,ç B

fR [f<fofbfNŠÖ ”,É•Ô,³,ê,é,·,×,Ä,İf|fCf“f^,ÍêŽŽ“İ,È,à,İ,Ä, ,è AfR [f<fofbfNŠÖ ”“à,Ä,İ,Ý—LĖø,Ä, ,é B|
fCf“f^ î•ñ,ð•Ů‘¶,·,é•K—v,ª, ,é fAfvfŠfP [fVf‡f“,Í Aff [f^,ð•ŮŽ ,·,é f,fŠ,ðŠm•Ů,μ Aff [f^,ðfRfs [,μ A V
,μ,çff [f^,İf|fCf“f^,ð•Ů‘¶,μ,È,¬,ê,İ,È,ç,È,ç B,±,İŠÖ ”“à,İlpAppInfo,ÍêŽŽ“İ,Èf|fCf“f^,Ä, ,é B,Ů,½
AlpAppInfopf%of [f^,ÄŽ¹,³,ê,é \‘ç‘İ,İ’†,İf|fCf“f^ AlpszAppNameA,“,æ,ÑlpszAppName,âêŽŽ“İ,È,à,İ,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,éfAfvfŠfP [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, ,éfAfvfŠfP [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,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,·,é fAfvfŠfP [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€ EfAfEf g,µ,½ ê ‡ A,±
,ìfpf%of [f^,É,íNULL,ªfZfbfg,³,ê,é B

lpdwTimeOut

Œ» Ý,ìf^fCf€ EfAfEf g’l,ðŠÜ,b•İ ”,Ö,ìf|fCf“f^ B%ž“š,ì,½,B,ÉfZfbfVf‡f“,ìf^fCf€ EfAfEf g’l,ð’,-
,µ,½,ç ê ‡,í ADPESC_TIMEDOUTftf%ofO,ª•Ô,³,ê,½,Æ,«É,±,ìfpf%of [f^,ðfŠfZfbfg,·,é,±,Æ,ª,Å,«é B

dwFlags

’Ê í,ì,±,ìftf%ofO,É,Í0,ªfZfbfg,³,ê,é B

DPESC_TIMEDOUT

—ñ<“,ªf^fCf€ EfAfEf g,µ,½,±,Æ,ðŽ’,· BlpdwTimeOut
,ðfŠfZfbfg,µ A—ñ<“,ð‘±,¯,é ê ‡,íTRUE A I—
1,·,é ê ‡,íFALSE,ð•Ô,· B

lpContext

fAfvfŠfP [fVf‡f““èç,ìfRf“fefLfXfg,ìfAfhfŒfX B

fR [f<fofbfNŠÖ ”,É•Ô,³,ê,é,·,×,Ä,ìf|fCf“f^,íêŽž“I,È,à,ì,Å, ,è AfR [f<fofbfNŠÖ ”“à,Å,ì,Ý—LŒø,Å, ,é Bf|
fCf“f^ îñ,ð•Ü•¶,·,é•K—v,ª, ,é fAfvfŠfP [fVf‡f“,í Aff [f^,ð•ÜŽ ,·,éf f,fŠ,ðŠm•Ü,µ Aff [f^,ðfRfs [,µ A V
,µ,çff [f^,ìf|fCf“f^,ð•Ü•¶,µ,È,¯,ê,ì,È,ç,È,ç B,±,ìŠÖ ”“à,ìlpThisSD,íêŽž“I,È,ìf|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“I,È,à,ì,Å, ,é,±,Æ,É’ ^Ó,³,ê,½,ç 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,^a AfvfŒfCf,,,Í•i ”,ÏfOf< [fv,Ïf f“fo [,É,È,é,±
,Æ,^a,Â,«,é BfvfŒfCf,,,^a’Ç%Á,³,ê,é,Æ ADPSYS_ADDPLAYERTOGROUPfVfXfef€ Ef fbfZ [fW,^a ¶ ¬,³,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,³,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,Ñ 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**

```
HRESULT CreateGroup(LPDPID lpidGroup,
    LPDPNAME lpGroupName, LPVOID lpData,
    DWORD dwDataSize, DWORD dwFlags);
```

DPERR_OUTOFMEMORY

ŽQ Æ @DPNAME, DPMMSG_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 [’l, 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 ±, ð’l, ÍDirectPlay, É, æ, Ä, Ä’è<³, ê, é B

lpPlayerName

fvfÆfCf,,, ð¼’O, ðŽ , ÄDPNAME \‘‘İ, Ö, ðf|fCf“f^ B NULL, ÍfvfÆfCf,,,ª %Šú¼¼ îñ, ðŽ , Ä, Ä, Ç, È, Ç, ±, Æ, ð•\ , · B

hEvent

, ±
ÍfvfÆfCf,,, ¶, Ä, ð fbfZ [fWŽó M, µ, ½, Æ, «, ÉDirectPlay, É, æ, Ä, ÄN“®, ³, ê, é AfAfvfŠfP [fVfþf“,ª ¶ ¬, µ, ½f
Cxf“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, ÍfvfÆfCf,,,ª %Šúff [f^, ðŽ , Ä, Ä, Ç, È, Ç, ±, Æ, ð•\, · B, ±, ±
, ÄŽw’è, ³, ê, ½ff [f^, Í AIDirectPlay2::SetPlayerData,ªÆÄ, Ñ o, ³, ê, é, Æ, «, Æ“—
l AfZfbfVfþf“+t, ð, ·, ×, Ä, ðfAfvfŠfP [fVfþf“, É“”B, ³, ê, éfŠf, [fg Eff [f^, Ä, , é, ÆÆ©, È, ³, ê, é B

dwDataSize

lpData,ªŽw, ·ff [f^ Efuf fbfN, ðfTfCfY, ðfofCf g’PÊ, 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,ª, Ä, «, é Bf [fJf< EfvfÆfCf,,, Í ADirectPlayIfufWfFfNfg, ð’Ê, µ A•j ”, ðfRf“fsf...
[f^ ä, ÄŽA s’t, ð”CÖ, ð ”, ðf [fJf< EfvfÆfCf,,, ä AfŠf, [fg, ðfvfÆfCf,,, Æ’b, ·, é, ±
, Æ,ª, Ä, «, é BfAfvfŠfP [fVfþf“, Í A•Ô, ³, ê, ½fvfÆfCf,,, ID, ðŽg—
p, µ, Ä Af fbfZ [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“, ð’t, 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,ª, Ä, «, é BlpPlayerName,ªŽ, ·¼’O, Í lŠÖ,ª—p, ·, é, ½, ß, ¼, ¬, È’ñ<Ÿ, ³, ê A“à•”, Ä, ÎŽg—p, ³, ê, È, Ç
, ½, ß Af+ftj [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,ª, Ä, «, é B

, ±, ðf ffbfh,ª ³ íÉ I—, ·, é, Æ A V, µ, ÇfvfÆfCf,,,ªfZfbfVfþf“, É%Ä“ü, µ, ½, ±
, Æ, ð’Ê’m, ·, é, ½, ß AfZfbfVfþf“+t, ð¼, ð, ·, ×, Ä, ðfvfÆfCf,,, ÉDPSYS_CREATEPLAYERORGROUPfvfXfef€ Ef fbfZ
[fW,ª—, Ç, é, é BfvfXfef€ Ef fbfZ [fW, ðfŠfXfg, É, Ä, Ç, Ä, ÍfvfXfef€ Ef fbfZ [fW, ÎŽg—p, ðŽQ Æ, ³, ê, ½, Ç B

DirectPlayf fbfZ [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,ª, Ä, «, é B, ±, ðfCxf“fg, Í A, ±
, ðfvfÆfCf,,,ªf fbfZ [fW, ðŽó, ¬Žæ, Ä, ½, Æ, «, ÉfZfbf g, ³, ê, é BhEvent, ÄŽ’, ³, ê, éfCxf“fg, Í A•j ”, ðfvfÆfCf,,,©, ÇŽg—
p, ·, é, ±, Æ,ª, 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,,,^a í œ,³,ê,éfOf < [fvID B

idPlayer

fOf < [fv,©,ç í œ,³,ê,éffvfƎfCf,,,ÌfvfƎfCf,,,ID B

fvfƎfCf,,,^a í œ,³,ê,é,Æ A•İ X,ð¼,ÌfvfƎfCf,,,É’Ê’m,·,é,½,ß,ÉDPSYS_DELETEPLAYERFROMGROUPfvfXfef€
Ef fbfZ [fW,^a ¶ ¬,³,ê,é BfvfXfef€ Ef fbfZ [fW,ÌfŠfXfg,É,Â,¢,Ä,İfVfXfef€ Ef fbfZ [fW,İŽg=
p,ðŽQ Æ,³,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,³,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,³,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,³,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,³,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,Ê,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 AÆ» 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,ÉŽw`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,ÍÄä,©,ÄIDirectPlay2::Close
,·,æ,ÑIDirectPlay2::Openf ffbfh,ÍÄÄ,Ñ o,µ,ÍÖ,É s,í,È,~è,Í,Ê,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,İfGf%o [’l,İ,Ç,,ê,©,ð•Ô,· B

DPERR_INVALIDOBJECT

DPERR_INVALIDPARAMS

DPERR_UNSUPPORTED

lpguidInstance

ŠÖÆW,·,éDirectPlayfZfbfVfzf“,İfCf“fXf^f“fX BDPENUMPLAYERS_SESSIONftf%ofo,ðŽw’è,μ,È,Ç ê ±,Í A,
±,İfpf%of [f^,ðNULL,ÉfZfbf,μ,È,,Ä,Í,È,Ç,È,Ç B

lpEnumPlayersCallback2

fZfbfVfzf“,İšefOf< [fv,É,Ä,Ç,ÄÆÄ,Ñ o,³,ê,é**EnumPlayersCallback2**ŠÖ ”,Ö,İf|fCf“f^ B

lpContext

fR [f<fofbfNŠÖ ”,É“n,³,ê,éAfvfŠfP [fVfzf“”è<,İRf“fefLXfg,Ö,İf|fCf“f^ B

dwFlags

fR [f<fofbfNŠÖ ”,İdwFlagsfpf%of [f^,É“n,³,ê,éftf%ofo B

DPENUMPLAYERS_SESSION

lpguidInstance ,É,æ,Ä,ÄŽ~•Ê,³,ê,½fZfbfVfzf““à,İfOf< [fv,ð—
ñ<“,·,é B

’Ê í,±,İf f\fbfh,Í AÆ» Ý,İfZfbfVfzf“,İf [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“,İfzfX
fg,É—ñ<“fŠfXfg,İ’ñ<Ÿ,ð—v< ,·,é B,±,İf f\fbfh,Í A**IDirectPlay2::EnumSessions**—ñ<“,İ’†,©,ÇÆÄ,Ñ o,·,±
,Æ,Í,Ä,«,È,Ç B,³,Ç,É ADPENUMPLAYERS_SESSIONftf%ofo,ðŽg—p,·,é ê ± A,±
,İf f\fbfh,İÆÄ,Ñ o,μ,Í A**IDirectPlay2::EnumSessions**f f\fbfh,İÆÄ,Ñ o,μ,İÆä,Ä,©,Ä**IDirectPlay2::Close**
,“,æ,Ñ**IDirectPlay2::Open** f f\fbfh,İÆÄ,Ñ o,μ,İ‘O,É s,í,È,_,ê,Í,È,Ç,È,Ç B

ŽQ Æ @**IDirectPlay2::CreateGroup**, **IDirectPlay2::DestroyGroup**, **IDirectPlay2::EnumSessions**

IDirectPlay2::EnumPlayers

HRESULT EnumPlayers(LPGUID lpguidInstance,
LPDPENUMPLAYERSCALLBACK2 lpEnumPlayersCallback2,
LPVOID lpContext, DWORD dwFlags);

fZfbfVfþf“ , ðfvfœfCf,,, ð—ñ“ , ·, é B

—œ÷, ·, ê, îDD_OK AŽ, ”s, ·, ê, îŽŸ, ðfGf%o [’l, ð, ·, ê, ©, ð•Ô, · B

DPERR_EXCEPTION

DPERR_GENERIC

DPERR_INVALIDOBJECT

DPERR_UNSUPPORTED

lpguidInstance

*ŠÖœW, ·, éDirectPlay fZfbfVfþf“ , ðfCf“fXf^f“fX BDPENUMPLAYERS_SESSIONftf%ofo, 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“+ , ðSefOfœ [fv, É, Â, œ, ÄœÄ, Ñ o, ³, ê, éEnumPlayersCallback2ŠÖ ”, Ö, ðf|fCf“f^ B

lpContext

fR [fœfofbfNŠÖ ”, É“n, ³, ê, éAfvfŠfP [fvfþf“èœ , ðfRf“fefLfXfg, Ö, ðf|fCf“f^ B

dwFlags

fR [fœfofbfNŠÖ ”, ðdwFlagsfpf%of [f^, É“n, ³, ê, éftf%ofo B

DPENUMPLAYERS_GROUP

fvfœfCf,,, ð—ñ“ , ÉfOfœ [fv, ðŠŸ, Þ B

DPENUMPLAYERS_LOCAL

, ±, ð

*DirectPlayIfufWfFfNfg, É, œ, Ä, Äf [fJfœ, É ð ¬, ³, ê, ½fvfœfCf,,,
¾, ¬, ð—ñ“ , ·, é B*

DPENUMPLAYERS_REMOTE

*fŠf, [fg, ðDirectPlayIfufWfFfNfg, É, œ, Ä, Ä ð ¬, ³, ê, ½fvfœfCf,,, ¾
 , ¬, ð—ñ“ , ·, é B*

DPENUMPLAYERS_SESSION

*lpguidInstance , É, œ, Ä, ÄŽ¬•Ê, ³, ê, ½fZfbfVfþf““à, ðfOfœ [fv, ð—
ñœ , ·, é B*

*’Ê í, ±, ðf f\fbfh, Í Aœ» ÝfI [fvf“ , ³, ê, Ä, œ, éfZfbfVfþf“ , ðfvfœfCf,,, ð—ñœ , ·, é B fOfœ [fv, àŠŸ, Þ, Ä—ñœ , ð s, □
 , É, Í ADPENUMPLAYERS_GROUPftf%ofo, ðŽg—*

*p, ·, é BDPENUMPLAYERS_SESSIONftf%ofo, ðfZfbfVfþf“ EfCf“fXf^f“fXGUID, œ, œ, à, ÉŽw’è, ·, é, œ AfZfbfVfþf
“ , ðfzfXfg, É—ñœ“fŠfXfg, ðñœŸ, ð—vœ , ·, é B, ±, ðf f\fbfh, Í AIDirectPlay2::EnumSessions —ñœ , ð†, ©, çœÄ, Ñ o, ·, ±
 , œ, Í, Ä, œ, È, œ B, ³, ç, È ADPENUMPLAYERS_SESSIONftf%ofo, 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, ¬, œ, ÑIDi
rectPlay2::Openf f\fbfh, ðœÄ, Ñ o, µ, ð’O, É s, í, È, ¬, ê, î, È, ç, È, œ B*

ŽQ œ @IDirectPlay2::CreatePlayer, IDirectPlay2::DestroyPlayer, IDirectPlay2::EnumSessions

IDirectPlay2::EnumSessions

HRESULT EnumSessions(LPDPSESSIONDESC2 lpsd,
DWORD dwTimeout,
LPDPENUMSESSIONSCALLBACK2 lpEnumSessionsCallback2,
LPVOID lpContext, DWORD dwFlags);

,±, Ì DirectPlayfIfufWfFfNfg, Å—LÆø, ÈfZfbfVf±f“, ð—ñ“, ·, é B
—Æ÷, ·, é, ÎDD_OK AŽ, ”s, ·, é, ÎŽŸ, ÌfGf%o [‘l, Ì, Ç, ·, é, ©, ð•Ô, · B

DPERR_EXCEPTION

DPERR_INVALIDOBJECT

DPERR_INVALIDPARAMS

lpsd

—ñ“, ·, é, éfZfbfVf±f“, ð•, · **DPSESSIONDESC2** \‘ç‘ì, Ò, Ìf|fCf“f^ B, ±, Ì \‘ç‘ì, ÌŠî €fZfbfg, ð—
Ž, ½, ·fZfbfVf±f“, Ì, Ÿ, ^—
ñ“, ·, é, é **BDPSESSIONDESC2** \‘ç‘ì, Ì**guidApplication** f“fo, É, Í AfAfvfŠfP [fVf±f“, ÉŠÖ~A, ·, éfOf [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 A•a, ©, 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, ^—ñ“f fbfZ [fW, Ò, Ì%ž“š, ð•Ô, Å‘S‘ì, ÌŽžŠÖ, ðf~fŠ•b, ÄŽw’è, ·, é i—ñ“, ÌŠÖŠu, Å, Í, È, Ç j B, ±
, Ìfpf%of [f^, É, Í, ð Ÿ’è, ·, é, ±, Æ, ð „ §, ·, é B, ±, Ì ê ± AfT [ftrfX Efvf fofCf_, É“K^—
, ÈftftfHf<fg, Ìf^fCf€fAfEf, ðDirectPlay, ^EvŽŽ, ·, é B

lpEnumSessionsCallback2

ŠeDirectPlayfZfbfVf±f“, É%ž“š, µ, ÄÆÄ, Ñ o, ·, é, é**EnumSessionsCallback2**ŠÖ ”, Ò, Ìf|fCf“f^ B

lpContext

fR [f<fofbfNŠÖ ”, É“n, ·, é, éf† [fU’è<, ÌfRf“fefLfXfg B

dwFlags

, ±, Ìfpf%of [f^, ÉÖ, ^ Ÿ’è, ·, é, ½ ê ± AŽg—p%Å”, ÈfZfbfVf±f“, ¾, —, ^—
ñ“, ·, é, é **IDPENUMSESSIONS_AVAILABLE** j B
IDPENUMSESSIONS_AVAILABLE
, ±, ÌfAfvfŠfP [fVf±f“, ^ŽQ%Å, Å, «, é, ·, ×, Ä, ÌfZfbfVf±f“, ð—ñ“, ·, é B

IDPENUMSESSIONS_ALL

%Å“ü, Å, «, é, ©, Ç, □
, ©, ÉŠÖ, i, Ç, ·, A, ·, ×, Ä, ÌfAfNfefBfu, ÈfZfbfVf±f“, ð—
ñ“, ·, é Bfvf€fCf, ·, §ÆÄ, É‘B, µ, ½fZfbfVf±f“, à A V, µ, Çfvf€fC
f, ·, ^—³Æø, É, ·, é, ½fZfbfVf±f“, à AŽQ%Å, ^—
³Æø, É, È, Å, ½fZfbfVf±f“, à—ñ“, ·, é, é B fAfvfŠfP [fVf±f“, Í, ±
, Ì \‘ç‘ì, Ì**dwFlags** f“fo, ð’², × AfZfbfVf±f“, ^ V, µ, ÇfAfvfŠfP [f
Vf±f“, ÌŽQ%Å, ð<—%Å, ·, é, ©, Ç, □, ©, ð”»’è, ·, é, ±, Æ, ^a, Å, «, é B

’Ê í, ±, Ìf f\fbfh, Í **ADirectPlayCreate** ŠÖ ”, ð—p, Ç

, ÅDirectPlayfIfufWfFfNfg, ^ Ì ¬, ·, é, ½’¼Æä, ÉÆÄ, Ñ o, ·, é, é BfZfbfVf±f“, É Ú±, µ, Å, Ç
, ÉŠÖ, â AfAfvfŠfP [fVf±f“, ^fZfbfVf±f“, ð Ì ¬, µ, ½Æä, ÉÆÄ, Ñ o, ·, ±
, Æ, Í, Å, «, È, Ç **BIDirectPlay2::EnumSessions**, Í AfT [ftrfX Efvf fofCf_, Éflfbfgf [fN ä, É, ð, Æ, Å`È ä, ÌzfXfg, Ì
Ÿ—§, ð—v<, µ A, »), é, Ç, È—ñ“, ÌfŠfNfGfXfg, ð’—M, ·, é, Æ“® Ì, ·, é B%ž“š, ðŽó M, ·, é, Æ A—
ñ“, ·, é, éfZfbfVf±f“, ^—p^Ô, ·, é, é BDirectPlay, ^, ±
, é, Ç, Ì%ž“š, ð•Ô, ÄŽžŠÖ, ÌdwTimeoutfpf%of [f^, É, æ, Å, Ä §Æä, ·, é, é B, ±, ÌŽžŠÖ, ^—
^, é, Ç, Å fR [f<fofbfNŠÖ ”, ÉDPESC_TIMEDOUTftf%ofO, ^Ê’m, ·, é **AlpThisSDfpf%of** [f^, ÉNULL’l, ^“n, ·, é, é B, ±
, ÌŽž“_, Å A—ñ“, ð±, —, é, É, Í AdwTimeout, É V, µ, Ç’l, ðfZfbfg, µ, ÅTRUE, ð•Ô, · B—
ñ“, ð†ž~, ·, é, É, Í AFALSE, ð•Ô, · BdwTimeout, É, Í AÖ, ð Ÿ’è, µ, Ä, —, Æ, æ, Ç B, ±
, Ì ê ± ADirectPlay, ^fT [ftrfX Efvf fofCf_, É“K Ø, Èf^fCf€fAfEf, ðEvŽŽ, ·, é B

’Ê í, Í AŽQ%Å, ·, é, ±, Æ, ^a, Å, «, éfZfbfVf±f“, ¾, —, ^—ñ“, ·, é, é **BDPENUMSESSIONS_ALL**ftf%ofO, ÄŽw’è, ·, é, Å, Ç
, é, Æ A V, µ, Çfvf€fCf, ·, ð Ì ¬, ·, é, ±, Æ, ^a, Å, «, È, ÇfZfbfVf±f“, à—ñ“, ·, é, é B, ±
, Ì ê ± AfAfvfŠfP [fVf±f“, ÌfZfbfVf±f“, ÉŽQ%Å, Å, «, È, Ç, ±, Æ, É’ ^Ô, µ, È, ·, Ä, Í, È, Ç, È, Ç B

f fr [,^a $fAfvfŠfP$ [$fVf‡f$ “, $đŠJŽn,μ,È,©,Á,½,Æ,«,$ Í AfT [$frfX$ $Efvf$ $fofCf_$,Í $f†$ [$fU,©,ç$ $î•ñ,đŽæ$ “ $¾,$ ·, $éf_fCfA$
 f $fO,đ•Ž,$ ·, $é$ $ê$ $‡,^a,$, $é$ $B,½,Æ,,$ Í $Af\}$ $fCfNf$ $f\ftfg$ $EfVfŠfAf<$ EfT [$frfX$ $Efvf$ $fofCf_$,Í $COMf$]
[$fg,$ Ì $Ý'è,đ-â,¢$ $‡,í,^1,$ é $A,Û,½f,f\ff€$ EfT [$frfX$ $Efvf$ $fofCf_$,Í“ $d`b”Ô$ $†,đ-$
 $â,¢$ $‡,í,^1,$ é $B,Û,½$ $AfCf$ “ $f^$ [$flfbfg$ EfT [$frfX$ $Efvf$ $fofCf_$,Í $fzfXfg,$ Ì $PfAfhfœfX,$ Ì“ $ü-Í,đ-v<$,·, $é$ B
 $fpfXf$ [fh $Efvf$ $fefNfg,$ Ì,©,©,Á,½ $fZfbfVf‡f$ “,Á,Í A $^3,μ,¢$ $fpfXf$ [$fh,$ ^a“ $ü-Í,$ ³ $ê,é,Û,Å$ $A-ñ<$ “,Í $s,í,ê,È,¢$ B
ŽQ $Æ$ @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,Í,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,İDD_OK AŽ,”s,·,ê,İŽŸ,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^,İfTfCfY,İ,Ý,ª•K—
v,Ê 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,ÊfTfCfY,ª Ý’è,³,ê,é B

lpdwDataSize

f f\fbfh,ðÆÄ,Ń o,·‘O,Éfofbftf@,İfTfCfY,Ä %oŠú%o»,³,ê,é•İ ”,Ö,İf|fCf“f^ Bf f\fbfh,ª §Æä,ð—
ß,µ,½Æä A,±
,İfpf%of [f^,É,İfOf< [fv Eff [f^,İfTfCfY,ªfofCfYg’P^Ê,ÄfZfbfg,³,ê,é Bfofbftf@,ª ¬,³,·,¬,é iDPERR_BUF
ERTOOSMALL j ê ± A,±,İfpf%of [f^,É,Í A•K—v,Êfofbftf@ EfTfCfY,ª Ý’è,³,ê,é B

dwFlags

,±,İfpf%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,ŃfŠf, [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,Éfobftf@,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 Bfobftf@,ª ¬,³,·,¬,é iDPERR_BUFFERTOOSMALL j ê ‡ A
,±,Ìfpf%of [f^,É,Í A•K—v,Èfobftf@,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,¹,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,^a §Œä,ð-ß,·,Æ,« Af fbfZ [fW,ì ”,“Ši”[,³,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* *D* *i* *r* *e* *c* *t* *P* *l* *a* *y* *f* *A* *f* *h* *f* *Œ* *f* *X* *,* *đ* *Ž* *æ* “ *¾* *,* *·* *,* *é* *B* *D* *i* *r* *e* *c* *t* *P* *l* *a* *y* *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* *_* *,* *đ* *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* *,* *©* *,* *đ* *•* *Ô* *,* *·* *B*

DPERR_BUFFERTOOSMALL

DPERR_INVALIDOBJECT

DPERR_INVALIDPARAMS

DPERR_INVALIDPLAYER

idPlayer

f *A* *f* *h* *f* *Œ* *f* *X* *,* *đ* *Ž* *æ* “ *¾* *,* *·* *,* *é* *f* *v* *f* *Œ* *f* *C* *f* *,* *,* *Ì* *f* *v* *f* *Œ* *f* *C* *f* *,* *ID* *B*

lpAddress

D *i* *r* *e* *c* *t* *P* *l* *a* *y* *f* *A* *f* *h* *f* *Œ* *f* *X* *,* *ˆ* *‘* *,* *«* *Ž* *Ü* *,* *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* *,* *–* *,* *đ* *Ž* *æ* “ *¾* *,* *·* *,* *é* *ê* *‡* *Í* *A* *,* *±*
, *Ì* *f* *p* *f* *%* *o* *f* *[* *f* *^* *,* *É* *N* *U* *L* *L* *,* *đ* *f* *Z* *f* *b* *f* *g* *,* *·* *,* *é* *B* *,* *±* *,* *Ì* *,* *Æ* *,* *«* *l* *p* *d* *w* *A* *d* *d* *r* *e* *s* *s* *i* *z* *e* *f* *p* *f* *%* *o* *f* *[* *f* *^* *,* *É* *Í* *A* *f* *f* *[* *f* *^* *,* *đ* *•* *Ů* *Ž* *,* *·* *,* *é* *,* *½* *,* *ß* *,* *É* *•* *K* *—*
v *,* *É* *f* *T* *f* *C* *f* *Y* *,* *ˆ* *Ý* *’* *è* *,* *³* *,* *é* *,* *é* *B*

lpdwAddressSize

, *±* *,* *Ì* *f* *f* ** *b* *f* *h* *,* *đ* *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* *,* *é* *,* *é* *•* *Ì* *”* *,* *Ö* *,* *Ì* *f* *|* *f* *C* *f* “ *f* *^* *B* *f* *f* ** *b* *f* *h* *,* *ˆ* *§* *Œ* *ä* *,* *đ*–
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* *,* *é* *,* *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* *,* *é* *,* *é* *B*

IDirectPlay2::GetPlayerCaps

HRESULT GetPlayerCaps(DPID idPlayer,
LPDPCAPS lpPlayerCaps, DWORD dwFlags);

Žw'è,³,ê,½fvfĈfCf,,İĈ» Ý,İ"―İ,ðŽæ"¾,·,é B

¬Ĉ÷,·,ê,İDD_OK AŽ,"s,·,ê,İŽŸ,İfGf%o [¹,Ì,Ĉ,,ê,©,ð•Ô,· B

DPERR_INVALIDOBJECT

DPERR_INVALIDPARAMS

DPERR_INVALIDPLAYER

idPlayer

"\―İ,ðĈvŽZ,·,éfvfĈfCf,,İfvfĈfCf,,ID B

lpPlayerCaps

"\―İ,ðŽó,-Žæ,éDPCAPS \‘Ĉ'İ,Ö,İf|fCf"f^ B**IDirectPlay2::GetPlayerCaps**,ðŽg—
p,·,é‘O,Ė ADPCAPS \‘Ĉ'İ,İdwSizef f“fo,ð Ý'è,µ,Ė,,Ă,İ,Ė,ç,Ė,Ĉ B

dwFlags

,±,İfpf%of [f^,É0,ðŽw'è,·,é,Ĉ A-³•Ŭ Ø,Èf fb fZ [fWĈðŠ·,É'İ,·,é"―İ,ªĈvŽZ,³,ê,é B

DPGETCAPS_GUARANTEED

•Ŭ Ø,³,ê,½f fb fZ [fW"z M,É'İ,·,é"―İ,ðŽæ"¾,·,é B

IDirectPlay2::GetCapsf f\fbfh,ªĈ» Ý,İfZfbfVf±f“,İ"―İ,ð•Ô,·,İ,É'İ,µ A,±,İf f\fbfh,Í A—
v< ,³,ê,½fvfĈfCf,,İ"―İ,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,Œ,,ê,©,ð•Ô,· B

DPERR_BUFFERTOOSMALL

DPERR_INVALIDFLAGS

DPERR_INVALIDOBJECT

DPERR_INVALIDPLAYER

idPlayer

ff [f^,ðŽæ“¾,·,éfvfŒfCf,,,İfvfŒfCf,,ID B

lpData

fAfvfŠfP [fVf‡f“ŒÄ—L,İfvfŒfCf,, Eff [f^,a ‘,« ž,Û,ê,éfofbftf@,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,Éfofbftf@,İfTfCfY,Ä %oŠú%o»,³,ê,éİ ”,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,Èfofbftf@,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,İfOf< [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,Œ 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);

$f v f \mathbb{C} f C f,, \acute{E} \ddot{S} \ddot{O} \sim A \cdot t, \bar{\cdot}, \varsigma, \hat{e}, \frac{1}{2} - \frac{1}{4} ' O, \delta \check{Z} \mathfrak{a} " \frac{3}{4}, \cdot, \acute{e} \quad B$

$-\mathbb{C} \div, \cdot, \hat{e}, \hat{I} D D_O K \quad A \check{Z}, " s, \cdot, \hat{e}, \hat{I} \check{Z} \ddot{Y}, \grave{I} f G f \% \text{ } [' l, \grave{I}, \mathbb{C},,, \hat{e}, \odot, \delta \bullet \hat{O}, \cdot \quad B$

DPERR_BUFFERTOOSMALL

DPERR_INVALIDOBJECT

DPERR_INVALIDPLAYER

idPlayer

$-\frac{1}{4} ' O, \delta \check{Z} \mathfrak{a} " \frac{3}{4}, \cdot, \acute{e} f v f \mathbb{C} f C f,, \grave{I} f v f \mathbb{C} f C f,, I D \quad B$

lpData

$-\frac{1}{4} ' O f f \quad [f ^{\wedge}, ^{\circ}, \ll \quad \check{Z}, \ddot{U}, \hat{e}, \acute{e} f o f b f t f @, \grave{I} f A f h f \mathbb{C} f X \quad B f f \quad [f ^{\wedge}, \grave{I} f T f C f Y, \frac{3}{4}, \bar{\cdot}, \delta \check{Z} \mathfrak{a} " \frac{3}{4}, \cdot, \acute{e} \quad \hat{e} \quad \ddagger, \acute{I} \quad A, \pm$
 $, \grave{I} f p f \% o f \quad [f ^{\wedge}, \acute{E} N U L L, \delta f Z f b f g, \cdot, \acute{e} \quad B, \pm, \grave{I}, \mathbb{A}, \ll \quad A l p d w D a t a S i z e f p f \% o f \quad [f ^{\wedge}, \acute{E}, \acute{I} \quad A f f \quad [f ^{\wedge}, \delta \bullet \ddot{U} \check{Z} \quad , \cdot, \acute{e}, \frac{1}{2}, \mathbb{B}, \acute{E} \bullet K -$
 $v, \acute{E} f T f C f Y, ^{\circ} \quad \acute{Y} ' \grave{e}, ^3, \hat{e}, \acute{e} \quad B$

lpdwDataSize

$, \pm, \grave{I} f \quad f \backslash f b f h, \delta \mathbb{C} \ddot{A}, \tilde{N} \quad o, \cdot ' O, \acute{E} f o f b f t f @, \grave{I} f T f C f Y, \mathbb{A} \quad \% \acute{o} \acute{S} \acute{u} \% \text{ } \text{ } ^3, \hat{e}, \acute{e} \bullet \check{I} \quad " \quad B \quad f \quad f \backslash f b f h, ^{\circ} \quad \S \mathbb{C} \ddot{a}, \delta - \mathbb{B}, \mu, \frac{1}{2} \mathbb{C} \ddot{a} \quad A, \pm$
 $, \grave{I} f p f \% o f \quad [f ^{\wedge}, \acute{E}, \acute{I} \quad A f O f < \quad [f v \quad E f f \quad [f ^{\wedge}, \grave{I} f T f C f Y, ^{\circ} f o f C f g ' P ^{\circ} \hat{E}, \mathbb{A} f Z f b f g, ^3, \hat{e}, \acute{e} \quad B f o f b f t f @, ^{\circ} \quad \neg, ^3, \cdot, \neg, \acute{e} \quad i D P E R R_B$
 $U F F E R T O O S M A L L \quad j \quad \hat{e} \quad \ddagger \quad A, \pm, \grave{I} f p f \% o f \quad [f ^{\wedge}, \acute{E}, \acute{I} \bullet K - v, \acute{E} f o f b f t f @, \grave{I} f T f C f Y, ^{\circ} \quad \acute{Y} ' \grave{e}, ^3, \hat{e}, \acute{e} \quad B$

$, \pm, \grave{I} f \quad f \backslash f b f h, ^{\circ} \quad \S \mathbb{C} \ddot{a}, \delta - \mathbb{B}, \mu, \frac{1}{2} \mathbb{C} \ddot{a} \quad A f O f < \quad [f v - \frac{1}{4} f f \quad [f ^{\wedge}, \delta " \mathbb{C}, \acute{Y} \quad o, \cdot, \frac{1}{2}, \mathbb{B}, \acute{E}, \acute{I} \quad A f | f C f " f ^{\wedge} l p D a t a, \delta \underline{\underline{D P N A M E}}$
 $\backslash ^{\circ} \mathbb{C} ' \grave{I}, \acute{E} \acute{f} L f f f X f g, \mu, \acute{E},,, \mathbb{A}, \acute{I}, \acute{E}, \varsigma, \acute{E}, \mathbb{C} \quad B$

$\check{Z} \mathbb{Q} \quad \mathbb{A} \quad @ \underline{\underline{D P N A M E}}, \underline{\underline{I D i r e c t P l a y 2 :: S e t P l a y e r N a m e}}$

IDirectPlay2::GetSessionDesc

HRESULT GetSessionDesc(LPVOID lpData,
LPDWORD lpdwDataSize);

«» ÝfI [fvf“,3,ê,Ä,¢,éfZfbfVf‡f“,ì“Á «,ðŽæ“¾,·,é B
¬œ÷,·,ê,İDD_OK AŽ,”s,·,ê,İŽŸ,İfGf%o [‘l,İ,¢,,ê,©,ð•Ô,· B

DPERR_BUFFERTOOSMALL

DPERR_INVALIDOBJECT

DPERR_NOCONNECTION

lpData

fZfbfVf‡f“«L qff [f^,ª ‘,« ž,Ü,ê,éfofbftf@,Ö,İf|fCf“f^ Bff [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•ÜŽ ,·,é,½,ß,Ê•K—
v,ÊfTfCfY,ª Ý’è,3,ê,é B

lpdwDataSize

,±,İf f\fbfh,ðœÄ,Ń o,·“O,Éfobftf@,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,ªfocfg’PÊ,ÄfZfbfg,3,ê,é Bfobftf@,ª ¬,3,·,¬,é iDPERR_B
UFFERTOOSMALL j ê ‡ A,±,İfpf%of [f^,É,Í•K—v,Êfobftf@,İfTfCfY,ª Ý’è,3,ê,é B

,±,İf f\fbfh,ª §œä,ð–ß,µ,½œä AfZfbfVf‡f“«L qff [f^,ð“Ç,Ý o,·,½,ß,É,Í Af|fCf“f^lpData,ð**DPSESSIONDESC2**
‘¢‘İ,ÊfLffffXfg,µ,Ê,,Ä,Í,Ê,ç,È,¢ B

ŽQ Æ @**DPSESSIONDESC2**, **IDirectPlay2::EnumSessions**, **IDirectPlay2::Open**

IDirectPlay2::Initialize

HRESULT Initialize(LPGUID lpGUID);

,±,łf f\bfbh,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,łfOf [fof< Ef†fj [fNŽ¯•ÊŽq iGUID j,łfAfhfÆfX B

DirectPlayIfufWfFfNfg,Í ì ¬Žž,É %Šú%»»,³,ê,é,½,ß A,±
,łf f\bfbh,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—§, ·, 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, Œ, 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‘ŒfCf“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“, aŽQ‰Á, ·, é j AŠù‘Œ, 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‘Œ, 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, ÌfvfŒfCf,, §ŒÄ, É‘B, µ, ½ ê ‡ ADPERR_UNAVAILABLEfGf‰ [·•Ô, ³, ê, 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,±
,İfpf%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,ðDPSB_GENERIC \’ç’İ,ÉfLffXfg,µ A ^—
,ð s,ªO,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,±
,İfpf%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,±,İfpf%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 [,ªÖ,³,ê,é,±,Æ,ª, ,é B ÄP,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

$f v f \mathbb{C} f C f,, ID \quad DPID_SYSMSG, \odot, \zeta' \text{---}$
 $M, ^3, \hat{e}, \dot{,}, \times, \ddot{A}, \grave{I} f \quad f b f Z \quad [f W, \acute{I} \quad A f z f X f g, \acute{E}, \mathfrak{a}, \acute{A}, \ddot{A} \quad \P \quad \neg, ^3, \hat{e}, \frac{1}{2} f V f X f e f \in \quad E f \quad f b f Z \quad [f W, \acute{A}, \quad, \acute{e} \quad B, \pm$
 $, \grave{I} \quad \hat{e} \quad \ddagger \quad A f V f X f e f \in \quad E f \quad f b f Z \quad [f W, \grave{I} p D a t a, \delta \underline{DPMSG_GENERIC}, \acute{E} f L f f X f g, \mu, \ddot{A} \quad A, \rangle, \grave{I} f V f X f e f \in \quad E f \quad f b f Z \quad [f W,$
 $^{\circ} \% \frac{1}{2}, \acute{A}, \quad, \acute{e}, \odot, \delta " \acute{A}' \grave{e}, \cdot, \acute{e}, \frac{1}{2}, B, \acute{E} d w T y p e f \quad f " f o, \delta ' ^2, \times, \acute{e}, \times, \ll, \acute{A}, \quad, \acute{e} \quad B$
 $, \cdot, \times, \ddot{A}, \grave{I} f v f \mathbb{C} f C f,, \acute{E} f u f \quad [f h f L f f f X f g, \mu, \frac{1}{2}, \grave{e} \quad A f O f \prec \quad [f v " \grave{a}, \grave{I}, \cdot, \times, \ddot{A}, \grave{I} f v f \mathbb{C} f C f,, \acute{E}' \text{---}$
 $M, \cdot, \acute{e}, \frac{1}{2}, B, \acute{E} f O f \prec \quad [f v, \acute{E} " \P, \ddot{A}, \zeta, \hat{e}, \frac{1}{2} f \quad f b f Z \quad [f W, \acute{I} \quad A f v f \mathbb{C} f C f,, ID \quad DPID_SYSMSG, \acute{E}' \text{---}, \zeta, \hat{e}, \ddot{A}, \grave{a} \quad A' \text{---} \quad M' \sqcap$
 $, \grave{I} f v f \mathbb{C} f C f,, ID, \odot, \zeta \text{---} \wedge, \frac{1}{2}, \grave{a}, \grave{I}, \mathcal{A}, \mu, \acute{A} \bullet \backslash$
 $, ^3, \hat{e}, \acute{e} \quad B f A f v f \acute{S} \acute{P} \quad [f V f \ddagger f " \acute{,} \acute{I} \quad A f \quad [f J f \prec, \grave{E} f v f \mathbb{C} f C f,, \acute{E} " \P, \ddot{A}, \zeta, \hat{e}, \frac{1}{2} f \quad f b f Z \quad [f W, \frac{3}{4}, \quad, \delta \acute{Z} \acute{o}, \quad \acute{Z} \mathfrak{a}, \acute{e} \quad B l p i d F r o m, \mathcal{A} l p i d T o f p$
 $f \% o f \quad [f ^{\wedge}, ^{a " T M}, \mu, \P' l, \delta \acute{Z}' l, \cdot f \quad f b f Z \quad [f W, \acute{I} \quad A f v f \mathbb{C} f C f,, ^a \acute{Z} \acute{o} \quad M, \cdot, \acute{e}, \pm, \mathcal{A}, ^a, \acute{A}, \ll, \grave{E}, \P \quad B$
 $DPSESSION_NOMESSAGEID f t f \% o f O, ^a f Z f b f V f \ddagger f " \acute{,} \acute{E} \acute{Z} w' \grave{e}, ^3, \hat{e}, \ddot{A}, \P, \acute{e}, \mathcal{A} \quad \mathcal{A} l p i d F r o m, \mathcal{A} l p i d T o f p f \% o f \quad [f ^{\wedge}, \acute{I} \% \frac{1}{2}, \grave{a} \acute{O} \text{---}$
 $i, \delta \acute{Z} \quad, \frac{1}{2}, \grave{E}, \P \quad B$
 $DirectPlay, \mathcal{A}, \mathcal{A}, \grave{a}, \acute{E} " \textcircled{,} \quad i, \cdot, \acute{e}, \cdot, \times, \ddot{A}, \grave{I} f T \quad [f r f X \quad E f v f \quad f o f C f _{,} \acute{I} \quad A f f \quad [f ^{\wedge}, \grave{I} " j' ^1, \delta " \delta, \quad, \acute{e}, \frac{1}{2}, B \quad A \acute{S} \textcircled{,} S \quad \ll, \grave{I} f ` f F f b f N, \delta \acute{Z} \acute{A}$
 $s, \cdot, \acute{e} \quad B, \cdot, \times, \ddot{A}, \grave{I} \acute{Z} \acute{o} \quad M f \quad f b f Z \quad [f W, \acute{I} \mathbb{C} \acute{Y} \quad \emptyset, ^3, \hat{e} \quad A f f \quad [f ^{\wedge}, \grave{I} " j' ^1, ^a \mathbb{C} \acute{Y} \quad o, ^3, \hat{e}, \frac{1}{2} \quad \hat{e} \quad \ddagger \quad A, \rangle, \grave{I} f f \quad [f ^{\wedge}, \acute{I} " p \acute{S} \ddot{u} \quad i \bullet \hat{U} \quad \emptyset, ^3, \hat{e}, \acute{A}, \P$
 $, \grave{E}, \P \quad \hat{e} \quad \ddagger \quad j, \ddot{U}, \frac{1}{2}, \acute{I} \quad \acute{A}' \text{---} \quad i \bullet \hat{U} \quad \emptyset, ^3, \hat{e}, \acute{A}, \P, \acute{e} \quad \hat{e} \quad \ddagger \quad j, ^3, \hat{e}, \acute{e} \quad B$
 $\acute{Z} Q \quad \mathcal{A} \quad @ \underline{DPMSG_GENERIC}, \underline{IDirectPlay2::Send}$

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 • Ô 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 “ , , è, 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 • Ô 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 Ű, 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,Û,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• Øt,«,Ä,à• Ø,È,µ,Ä,à'— M,Ä,«,é BfftfHf<fg,Ä,İ• 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•Ü Øt,«,İf fbfZ [fW,ð'—
M,·,é,É,İ A•Ü Ø,È,µ,İf fbfZ [fW,æ,è,à Ä'á2 A3"[,İŽžŠÖ,ªK—v,Ä, ,é BfAfvfŠfP [fvfþf',İ A•Ü Øt,«,İf
fbfZ [fW,ð'— M,·,é%œ " ,ð Ä ¬ĖÄ,É—},!é,×,«,Ä, ,é B,Û,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•Ü Ø,³,è,Ä,ç
,È,ç ê þ j,Û,½,İ Ä'— i•Ü 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•Ü 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•Ü 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•Ü Ø,³,è,È,ç BŽŲ,İfo [fwfþf',İDirectPlay,Ä,İ A•Ü Ø,È,µ,İfT [frfX Efvf fofCf_ ä,
Ä,à"z M,İ•Ü Ø,ðfCf"fvfŠf f"fg,·,é—'è,Ä, ,è A•Ü Ø,İfTf| [fg,ðŽ,·CAPSftf%foO,İ,Ä,È,É'Ó-i,ðŽ ,Ä,æ,µ
,É,È,é B
fAfvfŠfP [fvfþf',ª•Ü 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•Ü 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•Ů Ø,È,μ,łf fbfZ [fW,É,æ,Ā,
Ā’Ē’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•Ů 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•ŮŽ ,·,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’Ē’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,▯,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,Ā,«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,·,éfOf< [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

```
HRESULT SetPlayerData(DPID idPlayer, LPVOID lpData,
    DWORD dwDataSize, DWORD dwFlags);
```

fvfƎfCfCf,,ID,ÉfAfVfŠfP [fVf‡f“ƎÅ—L,İf [f^ Efuf fbfN,đŠÖ^A•t,^,é B
 ^Ǝ÷,•,ê,İDD_OK AŽ,”s,•,ê,İŽỲ,İGf%o [’l,İ,Ɔ,,ê,©,đ•Ö,• B

DPERR_INVALIDFLAGS

DPERR_INVALIDOBJECT

DPERR_INVALIDPLAYER

idPlayer

$$ff \ [f^{\wedge}, \delta \ \acute{Y}'\grave{e}, \cdot, \acute{e}f v f \mathbb{E} f C f, \,, \grave{I} f v f \mathbb{E} f C f, \,, ID \ B$$

lpData

$$fZfbfg,^3,\hat{e},\acute{e}ff\ [f^{\wedge},\grave{\imath}f|fCf^{\smash{\scriptstyle\text{“}}}f^{\wedge}\ B\check{S}\grave{u}'\P,\grave{\imath}fvf\mathbb{E}fCf,,\ Eff\ [f^{\wedge},\check{o}fNf\check{S}fA,\cdot,\acute{e}\ \hat{e}\ \ddagger,\acute{I}NULL,\check{o}\check{Z}w'\grave{e},\cdot,\acute{e}\ B$$

dwDataSize

$$f f \left[f^{\wedge} E f o f b f t f @, \dot{f} T f C f Y \right. B$$

dwFlags

$$\begin{array}{l} \text{,}\pm \\ \text{,}\mathfrak{l}\mathfrak{p}\mathfrak{f}\%f\quad [f^\wedge,\acute{\text{E}}0,\delta\check{z}w',\cdot,\acute{\text{e}},\mathbb{A}\text{ }Af\check{S}f,\text{ }[fg\text{ }Ef\mathfrak{v}\mathfrak{f}\mathbb{C}fCf,,\text{ }Eff\text{ }[f^\wedge,afZf\mathfrak{b}fg,3,\hat{\text{e}}\text{ }A\bullet\hat{\text{U}}\text{ }\emptyset,\grave{\text{E}},\mu,\mathfrak{l}\mathfrak{f}\text{ }f\mathfrak{b}fZ\text{ }[fW,\acute{\text{E}},\mathfrak{a},\acute{A}, \\ \check{A}^{\text{``}\text{'}B,3,\hat{\text{e}},\acute{\text{e}}\text{ }B \end{array}$$

DPSET_REMOTE

$$\pm, \text{iff } [f \wedge, \dot{\cdot}, \times, \ddot{\cdot}] f A f v f \check{S} f P [f V f \ddot{+} f " \acute{E}, \text{æ}, \acute{A}, \ddot{A} \check{Z} g -$$
DPSET_LOCAL
$$\begin{array}{l} \pm, \dot{\pm}, \dot{\dot{\pm}}, \dot{\dot{\dot{\pm}}} \quad [f^{\wedge}, \dot{f}^{\wedge}, \dot{\dot{f}}^{\wedge}, \dot{\dot{\dot{f}}^{\wedge}}] \quad [fJf^{\wedge}, \dot{E}\ddot{Z}g-p, \dot{I}, \frac{1}{2}, \mathbb{B}, \frac{3}{4}, -, \dot{E}-p^{\wedge}\dot{O}, ^3, \hat{e} \quad A^{\prime\prime\prime}, B, ^3, \hat{e}, \acute{e}, \pm \\ \mathcal{A}, \dot{\mathcal{A}}, \dot{\dot{\mathcal{A}}}, \dot{\dot{\dot{\mathcal{A}}}} \quad \mathbb{B} \end{array}$$
DPSET_GUARANTEED

i%oÂ"\,Å,ê,Î j·Û Ø•t,«f fbfZ [fW,É,æ,Á,Äff [f^,ð“”B,·,é B,±
 ,Ìftf%ofO,ÍDPSET_REMOTE,Æê ,ÉŽw'è,μ,È,,Ä,Í,É,ç,È,¢ B

DirectPlay.Í Af [fJf<“,æ,ÑfŠf, [fg,]Ö,¼,Â,Ìf^fCfv,ÌfOf< [fv Eff [f^,ð•ŰŽ ,.é,±
,Æ,ª,Ä,«,é Bf [fJf< Eff [f^,Í Af [fJf< EfRf“fsf... [f^ ã,ÌAfAvfŠfP [fVf‡f“,É‘,µ,Ä,]Ÿ—LÆø,Ä, ,é Bf
Šf, [fg Eff [f^,Í AfZfbfVf‡f““à,]„×,Ä,]¼,ÌAfAvfŠfP [fVf‡f“,É“„,ç,ê,é BDPSESSION_NODATAMESSAGES
,ªŽw“è,³,ê,Ä,Ç
,È,çfZfbfVf‡f“,Ä,Í Aff [f^,]• X,ð’Ê’m„,é,½,ß A„×„Ä,]¼,ÌfvfÇfCf„,ÉDPSYS_SETPLAYERORGROUPDATAf
VfXfef€ Ef fbfZ [fW,“—,ç,ê,é BfŠf\ [fX,Ö,]fCf<f^,Íf [fJf< Eff [f^,ÉŠ“],„é,Ì,ª’S,Ä, ,é Bf [fJf<
Eff [f^ Efuf fbfN,] iDPMSG_DESTROYPLAYERORGROUP fVfXfef€ Ef fbfZ [fW,ª—
,ç,ê,Ä jfOf< [fv,“]Šü,³,ê,æ,ð,Æ,µ,Ä,Ç,é,Æ,«,É,à—LÆø,Ä, ,é,½,ß AfAfAvfŠfP [fVf‡f“,Í,±
,ê,ç,]Šf\ [fX,ð%øð•ú„,é,±,Æ,ª,Ä,«,é BfVfXfef€ Ef fbfZ [fW,ÌfŠfXfg,É,Ä,Ç,Ä,ÌfVfXfef€ Ef fbfZ [fW,]žg
—p,ðŽQ Æ,³,ê,½,Ç B

ŽQ æ @DPMSG_SETPLAYERORGROUPDATA, IDirectPlay2::GetPlayerData, IDirectPlay2::Send

IDirectPlay2::SetPlayerName

HRESULT SetPlayerName(DPID idPlayer,
LPDPNAME lpPlayerName, DWORD dwFlags);

*f**v**f*Ɛ*f*C*f*,,,İ ì -Ɛă,É*f**v**f*Ɛ*f*C*f*,,,İ-¼‘O,đ Ý’è,·,é B DPSESSION_NODATAMESSAGES ,^aŽw’è,³,ê,Ă,¢
,È,¢*f*Z*f*b*f*V*f*‡*f*“,Ă,İ A-
¼‘O,İ•İ X,đ’Ê’m,·,é,½,B A’¼,İ,·,×,Ă,İ*f**v**f*Ɛ*f*C*f*,,,ÉDPSYS_SETPLAYERORGROUPNAME*f*V*f*X*f*€ Ef *f*b*f*Z [*f*W,
^a—,ç,ê,é B*f*V*f*X*f*€ Ef *f*b*f*Z [*f*W,İ*f*Š*f*X*f*g,É,Ă,¢,Ă,İ*f*V*f*X*f*€ Ef *f*b*f*Z [*f*W,İŽq—*p*,đŽQ Æ,³,ê,½,¢ B
-Ɛ÷,·,ê,İDD_OK AŽ,”s,·,ê,İŽŸ,İ*f*G*f*%o [’l,İ,¢,,ê,©,đ•Ô,· B

DPERR_INVALIDOBJECT

DPERR_INVALIDPLAYER

idPlayer

-¼‘O,^a Ý’è,·,é*f**v**f*Ɛ*f*C*f*,,,İ*f**v**f*Ɛ*f*C*f*,,,ID B

lpPlayerName

*f**v**f*Ɛ*f*C*f*,,,İ-¼‘O î•ñ,đŠŸ,ĐDPNAME \‘¢‘İ,İ*f*A*f*h*f*Ɛ*f*X B *f**v**f*Ɛ*f*C*f*,,,^a-¼‘O î•ñ,đŽ ,½,È,¢ ê ‡,İ A,±
,İ*f**p*%o*f* [*f*^,É NULL,đ Ý’è,·,é B

dwFlags

,±,İ*f**p*%o*f* [*f*^,É0,đŽw’è,·,é,Æ A,·,×,Ă,İ*f*Š*f*, [*f*g EfV*f*X*f*€É•Ů Ø,È,µ,İ*f* *f*b*f*Z [*f*W,É,æ,Ă,Ă-
¼‘O,^a““,!,ç,ê,é B

DPSET_GUARANTEED

i%oÂ”\,Ă, ,ê,İ j•Ů Ø•t,«,İ*f* *f*b*f*Z [*f*W,É,æ,Ă,Ă*f* [*f*^,đ“‘B,·,é B

ŽQ Æ @DPNAME,DPMSG_SETPLAYERORGROUPNAME, IDirectPlay2::GetPlayerName, IDirectPlay2::Send

IDirectPlay2::SetSessionDesc

HRESULT SetSessionDesc(LPDPSESSIONDESC2 lpSessDesc,
DWORD dwFlags);

,±,İf f\fbfh,ÍŒ» ÝfTf| [fg,³ê,Ä,¢,È,¢ B

Œ» Ý,İfZfbfVf‡f“,ì“Á «,ð•İ X,·,é B,±,İf f\fbfh,Í AfZfbfVf‡f“,İfzfXfg,Ä, ,éfRf“fsf...
[f^ ã,ÄŒÄ,Ñ o,³ê,½,Æ,«,İ,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

,±,İf f\fbfh,Ä,ÍŒ» Ýftf%œfO,ÍŽg—p,³ê,Ä,¢,È,¢ B

ŽQ Æ @DPSESSIONDESC2, IDirectPlay2::GetSessionDesc

IDirectPlayLobby

fAfvfŠfP [fVf‡f“,Í AIDirectPlayLobbyfCf“f^ [ftfFcCfX,lf f\bfh,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^ [ftfFcCfX Ef f\bfh,lfŠftf@fŒf“fX,Ä, ,é BŠT”O,É,Â,¢,Ä,İŠT—
v,ÍIDirectPlayLobbyfCf“f^ [ftfFcCfX,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†,Áf 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,Á,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_ĈÅ—
L,ìflfbfgf [fN EfAfhfĈfX,©,ç ADirectPlayfAfhfĈfX,ð ì ¬,·,é BĈ<%oÊ,ìfAfhfĈfX,É,Í AfT [frfX Efvf
fofCf_,ìfOf [fof< Ef+fj [fNŽ·ÊŽq iGUID j A,“,æ,ÑfT [frfX Efvf fofCf_,^flfbfgf [fN EfAfhfĈfX,
Æ,μ,Ä%oðŽß,·,é,±,Æ,^,Ä,«,éff [f^,^ŠÜ,Ü,ê,é B

–Ĉ÷,·,ê,îDD_OK AŽ,”s,·,ê,îŽŸ,ìGf%o [‘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

ĈÅ—

L,ìflfbfgf [fN EfAfhfĈfX Ef^fCfv,ðŽ·Ê,·,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

ĈÅ—L,ìflfbfgf [fN EfAfhfĈfX,ðŠÜ,bfofbftf@,Ö,ìf|fCf“f^ B

dwDataSize

lpData,ìflfbfgf [fN EfAfhfĈfX,ìfTfCfY,ðfofCfg’P^Ê,ÄŽw’è,·,é B

lpAddress

¶ ¬,³,ê,½DirectPlayfAfhfĈfX,^ ‘,« ž,Ü,ê,éfofbftf@,Ö,ìf|fCf“f^ B

lpdwAddressSize

DirectPlayfAfhfĈfX Efofbftf@,ìfTfCfY,ðŠÜ,b•İ ”,Ö,ìf|fCf“f^ BfT [frfX Efvf fofCf_,Í A,±
,ìf f\fbfh,ðĈÄ,Ñ o,·‘O,ÉlpdwAddressSize,ðfofbftf@,ìfTfCfY,Ä %oŠú%o»,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,½fofCfg ”,^Ši”[,³,ê,é Bfofbftf@,^ ¬,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,³,ê,éEnumAddressCallback ŠÖ ”,Ö,Ìf|fCf“f^ B

lpAddress

DirectPlayfAfhfEfX Efofbftf@,Ì æ“^a,Ö,Ìf|fCf“f^ B

dwAddressSize

DirectPlayfAfhfEfX,ÌfTfCfY B

lpContext

fR [f<fofbfNŠÖ ”,É“n,³,ê,éfRf“fefLfXfg B

ŽQ Æ @DirectPlayfAfhfEfX, IDirectPlayLobby::CreateAddress

IDirectPlayLobby::EnumAddressTypes

HRESULT EnumAddressTypes(
LDDPLENUMADDRESSTYPESCALLBACK lpEnumAddressTypeCallback,
REFGUID guidSP, LPVOID lpContext,
DWORD dwFlags);

Žw'è,³,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_,İŠefAfhfŒfX Ef^fCfv,É,Â,Œ,ÄŒÄ,Ñ o,³,ê,eEnumAddressTypeCallbackŠÖ ”,Ö,İf|
fCf“f^ B fT [frfX Efvf fofCf_,^fAfhfŒfX Ef^fCfv,ð,Æ,ç,È,Œ,ç AfR [f<fofbfN,İŒÄ,Ñ o,³,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,³,ê,éfRf“fefLfXfg B

dwFlags

—\–ñ,³,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‰o [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,İŽÝ,İfGf%o [‘l,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-•Ê,·,é if fr [EfN
f%ofCfAf“fg,İ,ċ,,Ä,©,İ fAfvfŠfP [fVf‡f“,Æ’Ê 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,©’Ê 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•ÛŽ ,·,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^Ê,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,·,ŠëE⁻,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“,ÊfCxf“fg,ð’Ê’m,·,éVfXfef€ Ef fbfZ [fW,
Ä,·,é,±,Æ,ðŽ!,· B” ¶,µ,½fCxf“fg,İŽi—p,ðE~è,·,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,Éfofbftf@,İfTfCfY,Ä %Šú%o»,³,ê,éİ ”,İfAfhfEfX Bf f\fbfh,ª ŠEä,ð–
ß,µ,½Eä A,±
,İfpf%of [f^,É,İf fbfZ [fW,İfTfCfY,ªfofCfP’P^Ê,ÄZfbfg,³,ê,é Bfofbftf@,ª –,³,·,–,é iDPERR_BUFFERT
OOSMALL j ê ‡,İ A,±,İfpf%of [f^,É,İ•K—v,È Ä –,İfofbftf@ 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,Ì,¢,,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 Ñ,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 Ñ,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%đ•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 fbfZ [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,³,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,·,éfAfvfŠfP [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,-
,Ä,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,±
,İİD”Ô †,İ**IDirectPlayLobby::RunApplication**,©,çŽæ“¾,³,ê,é B

lpData

‘— M,·,éf fbfZ [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);

$fAfvfŠfP [fVf‡f“,\iŠJŽn,Æ \acute{U}‘\pm,É\bullet K—v,È,\cdot,\times,\ddot{A},\grave{I} \hat{\imath}\cdot\grave{n},\delta\check{S}\grave{U},\grave{n},\frac{3}{4}\underline{\text{DPLCONNECTION}} \backslash^{\text{c}}\grave{I},\delta\cdot\grave{I} X,\cdot,\acute{e} B$
 $-\text{C}\acute{E}\div,\cdot,\hat{e},\hat{I}DD_OK A\check{Z},”s,\cdot,\hat{e},\hat{I}\check{Z}\check{Y},\grave{I}fGf\%o [^l,\grave{I},\text{c},,,\hat{e},\odot,\delta\cdot\hat{O},\cdot B$

DPERR_GENERIC

DPERR_INVALIDINTERFACE

DPERR_INVALIDOBJECT

DPERR_INVALIDPARAMS

DPERR_OUTOFMEMORY

dwFlags

$—\backslash-\grave{n},^3,\hat{e},\ddot{A},\text{c},\acute{e} B0,\ddot{A},È,,\ddot{A},\acute{I},È,\zeta,\grave{E},\text{c} B$

dwAppID

$f fr [EfNf\%o fCfAf“fg,\text{a}\text{C}\acute{E}\ddot{A},\grave{N} o,\cdot \hat{e} ‡ A \acute{U}‘\pm \acute{Y}’\grave{e},\delta\check{Z}\text{a}“\frac{3}{4},\cdot,\acute{e} fAfvfŠfP [fVf‡f“,\delta\check{Z}^-\bullet\hat{E},\cdot,\acute{e} if fr [EfN f\%o fCfAf“fg,\acute{I},\text{c},,\ddot{A},\odot,\grave{I} fAfvfŠfP [fVf‡f“,Æ’\hat{E} M,\cdot,\acute{e} j BfAfvfŠfP [fVf‡f“,^{\text{a}}\text{C}\acute{E}\ddot{A},\grave{N} o,\cdot,\text{A}\acute{E},\ll,\acute{I} A,\pm ,\grave{I}fpf\%o f [f^,\acute{I}0,\ddot{A},È,- ,\ddot{A},\acute{I},È,\zeta,\grave{E},\text{c} ifAfvfŠfP [fVf‡f“,^{\acute{I}} A,\text{D},\text{A}\acute{E},\hat{A},\grave{I}f fr [EfNf\%o fCfAf“fg,\text{A}\acute{E},\mu,\odot’\hat{E} M,\mu,\grave{E},\text{c} j B,\pm ,\grave{I}ID”\hat{O} †,\acute{I}\underline{\text{IDirectPlayLobby::RunApplication}} ,\odot,\zeta\check{Z}\text{a}“\frac{3}{4},^3,\hat{e},\acute{e} B$

lpConn

$\check{S}JŽn,\cdot,\acute{e} fAfvfŠfP [fVf‡f“,\delta\check{Z}w’\grave{e},\mu Af_fCfAf fO Ef\{fbfNfX,\delta\cdot\check{Z}',^1,,\acute{E}fZfbfVf‡f“ EfCf“fXf^f“fX,\acute{E} \acute{U}‘\pm ,\cdot,\acute{e},\frac{1}{2},\text{B},É\bullet K—v,È,\cdot,\times,\ddot{A},\grave{I} \hat{\imath}\cdot\grave{n},\delta\check{S}\grave{U},\grave{n},\frac{3}{4} \underline{\text{ADPLCONNECTION}} \backslash^{\text{c}}\grave{I},\ddot{O},\grave{I}f|fCf“f^ B$

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,±,lf f\fbfh,đÆÄ,Ň o,³,È,,Ä,Í,È,ç,È,¢ Bf fr [EfNf%oCfAf“fg,Í A,±
,lf f\fbfh,É,æ,Ä,Ä**IDirectPlayLobby::RunApplication** f f\fbfh,ìÆÄ,Ň o,µ,ÅŽw’è,³,ê,½fCfxf“fg,đ•İ X,·,é,±
,Æ,ª,Ä,«,é B

–Æ÷,·,ê,ÎDD_OK AŽ,”s,·,ê,ÎŽŸ,İfGf%o [’l,ì,¢,,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,Ň 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,Ň 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**

١٤٩

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'âfTfCfY B, », ê, æ, è, à'â, «, 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'âfvfÆfCf, , " 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’èç’,·,é’è ”,Í AWinbase.h,Ä’èç’,³,ê,Ä,¢,é B

DPLAPPINFO

```
typedef struct DPLAPPINFO {
    DWORD dwSize;
    GUID guidApplication;
    union
    {
        LPSTR lpszAppNameA;
        LPWSTR lpszAppName;
    };
} DPLAPPINFO, * LPDPLAPPINFO;
```

f *Œ* *f* *W* *f* *X* *f* *g* *f* *Š*, *É* *Š* *i*” [³, *ê* *A* *IDirectPlayLobby::EnumLocalApplications* *f* *R* [*f* *◁* *f* *of* *b* *f* *N* *Š* *Ö* ”, *É* “*n*, ³, *ê*, *é* *A* *f* *A* *f* *v* *f* *Š* *f* *P* [*f* *V* *f* *±* *f* “, *Í* *D* *P* *L* *A* *P* *P* *I* *N* *F* *O* ” \ ‘*Œ* ‘*İ*, *đ* *Ž* *g* — *p*, ·, ·, *é* ‘*O*, *É*, *±* *±* *f* “, *É*, *Ä*, *č*, *Ä*, *İ* *î* · *ñ*, *đ* *Š* *Ü*, *p* *B*

dwSize

D *P* *L* *A* *P* *P* *I* *N* *F* *O* ” \ ‘*Œ* ‘*İ*, *İ* *f* *T* *f* *C* *f* *Y*, *đ* *f* *o* *f* *C* *f* *g* ‘*P* ^ *Ê*, *Â* *Ž* *w* ‘*è*, ·, ·, *é* *B* *f* *A* *f* *v* *f* *Š* *f* *P* [*f* *V* *f* *±* *f* “, *Í* *D* *P* *L* *A* *P* *P* *I* *N* *F* *O* ” \ ‘*Œ* ‘*İ*, *đ* *Ž* *g* — *p*, ·, ·, *é* ‘*O*, *É*, *±* *İ*, *İ* *f* “*f* *o*, *đ* *Ý* ‘*è*, *µ*, *È*, ·, *Ä*, *İ*, *È*, *ç*, *È*, *č* *B*, » , *␣*, *Ä*, *È*, *č* *ê* *±*, *İ* *f* *G* *f* % *o* [, *Æ*, *È*, *é* *B*

guidApplication

f *A* *f* *v* *f* *Š* *f* *P* [*f* *V* *f* *±* *f* “, *İ* *f* *O* *f* [*f* *o* *f* ◁ *E* *f* *†* *f* *j* [*f* *N* *Ž* ^ · *Ê* *Ž* *q* *i* *G* *U* *I* *D* *j* *B*

lpszAppNameA, lpszAppName

f *A* *f* *v* *f* *Š* *f* *P* [*f* *V* *f* *±* *f* “, *İ* — ¹/₄ ‘*O*, *đ* *Ž* *İ*, · *A* *N* *S* *I*, *Ü*, ¹/₂, *İ* *U* *n* *i* *c* *o* *d* *e* · ¶ *Ž* *š* — *ñ* *B* · ¶ *Ž* *š* — *ñ*, *İ* *Œ* ^, *İ* *Ž* *g* — *p*, *µ*, *Ä*, *č* *é* *f* *C* *f* “*f* ^ [*f* *t* *f* *F* *f* *C* *f* *X*, *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,»,ı,Ă,È,Ć ê ‡,İfGf%o [,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,·,éfZfbfVf‡f“,đ•\,·DPSESSIONDESC2 \‘Ć‘İ,Ö,İf|fCf“f^ B

lpPlayerName

fVf(ƎfCf,, 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,·,éfT [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,ĐDirectPlayfAfhf(ƎfX,Ö,İf|fCf“f^ B

dwAddressSize

fAfhf(ƎfX Eft [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,³,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%fo,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%fo,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%fo,ªŽw’è,³,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,ÉÆÿ o,·,é B,±
,ê,Ç,İfvfÆfCf,,İfZfbfVfzf“„©,Ç í æ,³,ê,é BêŽŽ“İ,Éflfbfgf [fN,
İ<@”\,ªâŽ~,µ,½,±
,Æ,É,æ,Ä,ÄfvfÆfCf,,ª í æ,³,ê,½ ê ± A,»,İfvfÆfCf,,ª—
ß,Ä,Ä,«,½,Æ,« AfZfbfVfzf“„©,Ç æŠO,³,ê,½,±
,Æ,ªÊ‘m,³,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,³,ê,½,Ç B,±,İftf%fo,ªŽw’è,³,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%fo,ªŽw’è,³,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“,±
,ìfZfbfVf‡f“,É‘Î,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“,“fZfbfVf‡f“,ÉŽQ%oÄ,·,é,±,Æ,à,Ä,«È,¢ B,±
,ìftf%ofo,“Žw’è,³,ê,Ä,¢
,È,¬,ê,Î AfZfbfVf‡f“ EfvfŒfCf,, ”,ì §ŒÄ,É‘B,·,é,Ü,ÄfvfŒfCf,,
ð ì ¬,·,é,±,Æ,“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^,“
İ X,³,ê,½,Æ,« AfVfXfef€ Ef fbfZ [fW,ð‘— M,μ,È,¢ B,±
,ìftf%ofo,“Žw’è,³,ê,Ä,¢
,È,¬,ê,Î Af f [f^,İ•İ X,ðŽ!,·f fbfZ [fW,“ ¶ ¬,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,“ d—v,Ä,È,¬,ê,Î Af fbfZ [fW EfI [fo [fwfbfh,ð ß—
ñ,·,é,±
,Æ,“Ä,«É B i Ú ×,İIDirectPlay2::Receive f\fbfh,ðŽQ Æ j,±
,ìftf%ofo,“Žw’è,³,ê,Ä,¢,È,¬,ê,Î Af fbfZ [fW,h,c,“t%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,¢,é¼,İfRf“fsf...
[f^,É,¾,¬ Ú±,·,é B,·,×,Ä,İfAfvfŠfP [fVf‡f“,É‘Î,·,éfZfbfVf‡f“,ð—ñ<“,·,é,É,İ A,±
,ìf f“fo,ÉGUID_NULL,ðŽw’è,·,é B

dwMaxPlayers

,±,İfZfbfVf‡f“,Ä<¬,³,ê,é Ä‘âfvfŒfCf,, ” B

dwCurrentPlayers

,±,İfZfbfVf‡f“,İŒ» Ý,İfvfŒfCf,, ” B

lpszSessionName and lpszPassword

fZfbfVf‡f“,İ¼¼‘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

lpszSessionNameA and lpszPasswordA

fZfbfVf‡f“,İ¼¼‘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,³ê,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,^a I—

¹,μ AfAfvfŠfP [fVf‡f“,^aŠJŽn,μ,½,±,Æ,ð•\,· B

DPLSYS_CONNECTIONSETTINGSREAD

IDirectPlayLobby::RunApplication*f f\bfh,^a Ú‘± Ý’è,ð“Ç,Ý o,μ*

AfAfvfŠfP [fVf‡f“,^aŠJŽn,μ,½,±,Æ,ð•\,· B

DPLSYS_DPLAYCONNECTFAILED

IDirectPlayLobby::RunApplication,^a*fZfbfVf‡f“,Ö,Ì Ú‘±*

,ÉŽ,”s,μ AfAfvfŠfP [fVf‡f“,^aŠJŽn,μ,½,±,Æ,ð•\,· B

DPLSYS_DPLAYCONNECTSUCCEEDED

IDirectPlayLobby::RunApplication,^a*fZfbfVf‡f“,ð ì ¬,μ,Ä‘¼,ÌfAfvf*

ŠfP [fVf‡f“,ðŽQ%oÁ,³,¹é €”ö,^aÄ,«,½,© AfZfbfVf‡f“,Ö,ÌŽQ%oÁ,^a

¬Ç÷,μ,½,±,Æ,É,æ,è AfAfvfŠfP [fVf‡f“,^aŠJŽn,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%Á,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 Eff [f^,Ö,İf|fCf“f^ B
,±,İf f“fo [,ªNULL,İ,Æ,«,Í AfŠf, [fg Eff [f^,İ,È,¢ B

dwDataSize
lpData,É,æ,Á,ĂŽQ Æ,³,ê,éfofbftf@,ðŠÜ,Đff [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_DELETEPLAYERFROMGROUP *fVfXfef€ Ef fbfZ [fW,İ î•ñ,ðŠÜ,Ð B ,±,İ \‘¢‘İf f“fo,İ,É,Â,¢*
,Ä,İ**DPMSG_ADDPLAYERTOGROUP** \‘¢‘İ,ðŽQ Æ,³,ê,¹/₂,¢ 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< Eff [f^,Ö,lf|fCf“f^ B

dwLocalDataSize
f [fJf< Eff [f^,lfTfCfY B

lpRemoteData
,±,lfvf€fCf,,Ü,½,ÍfOf< [fv,ÉŠÖ~A•t,¯,ç,ê,½fŠf, [fg Eff [f^,Ö,lf|fCf“f^ B

dwRemoteDataSize
fŠf, [fg Eff [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[−]•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_SYSMMSG,
É“™,μ,ç,Æ,« j A,Ü,,-

ç’m,Ìf fbfZ [fW Eff [f^,ðDPMSG_GENERICĈ^,ÉfLfffXfg,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,ÉfLfffXfg,·,é,±,Æ,ª,Â,«,é B

DPMSG_HOST

```
typedef DPMSG_GENERIC    DPMSG_HOST;
typedef DPMSG_HOST      *LPDPMSG_HOST;
```

œ» Ý, ìfZfbfVf‡f“ EfzfXfg, afZfbfVf‡f“, ð I—¹, ·, é, Æ, « A, ±, ìf fbfZ [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,È,¢ 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•Ű‘¶,•,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

$fCf^{\wedge} [ftfFfCfX, \dot{I}fPf\%of \quad [f^{\wedge}, ^a\text{--}^3\mathbb{E}\emptyset, \hat{A}, , \acute{e} \text{ } B$
DPERR_INVALIDOBJECT
 $DirectPlayIfufWfFfNfg, \dot{I}f|fCf^{\wedge}, ^a\text{--}^3\mathbb{E}\emptyset, \hat{A}, , \acute{e} \text{ } B$
DPERR_INVALIDPARAMS
 $\check{S}\check{O} \text{ } ^{\circ}, \acute{e}^{\circ}n, ^3, \hat{e}, \frac{1}{2}, \mathbb{D}, \mathbb{A}, \hat{A}^{\circ}\hat{E} \text{ } \ddot{a}, \dot{I}fPf\%of \quad [f^{\wedge}, ^a\text{--}^3\mathbb{E}\emptyset, \hat{A}, , \acute{e} \text{ } B$
DPERR_INVALIDPLAYER
 $fvf\mathbb{E}fCf,,ID, \acute{I} \text{ } A, \pm, \dot{I}fQ \quad [f\in \text{ } EfZfbfVf\ddot{+}f^{\circ}, \hat{A}\text{---}$
 $L\mathbb{E}\emptyset, \hat{E}fvf\mathbb{E}fCf,,ID, \mathbb{A}, \mu, \hat{A}^{\circ}F\check{Z}^{\circ}, ^3, \hat{e}, \hat{E}, \mathbb{C} \text{ } B$
DPERR_NOCAPS
 $DirectPlay, ^{\circ}\check{Z}g, ^{\circ}, \varpi, \mathbb{A}, \mu, \hat{A}, \mathbb{C}, \acute{e}^{\circ}\hat{E} \text{ } Mf\check{S}f^{\circ}fN, \acute{I} \text{ } A, \pm$
 $, \check{I}\check{S}\check{O} \text{ } ^{\circ}, \hat{A}, \acute{I}\check{Z}\hat{A} \text{ } s, \hat{A}, \ll, \hat{E}, \mathbb{C} \text{ } B$
DPERR_NOCONNECTION
 $^{\circ}\hat{E} \text{ } Mf\check{S}f^{\circ}fN, ^a\check{S}m\text{---}\S, ^3, \hat{e}, \hat{A}, \mathbb{C}, \hat{E}, \mathbb{C} \text{ } B$
DPERR_NOINTERFACE
 $, \pm, \dot{I}fCf^{\wedge} [ftfFfCfX, \acute{I}fTf| \quad [fg, ^3, \hat{e}, \hat{A}, \mathbb{C}, \hat{E}, \mathbb{C} \text{ } B$
DPERR_NOMESSAGES
 $\check{Z}\acute{o} \text{ } M, ^3, \hat{e}, \frac{1}{2}f \text{ } fbfZ \quad [fW, ^a, \hat{E}, \mathbb{C} \text{ } B$
DPERR_NONAMESERVERFOUND
 $f\dot{I} \quad [f\in fT \quad [fo \text{ } ifzfXfg \text{ } j, ^a\mathbb{E}\odot, \hat{A}, \odot, \mathbb{C}, \hat{E}, \mathbb{C} \text{ } Bfvf\mathbb{E}fCf,,, \dot{I} \text{ } \dot{I} \text{ } \neg, \acute{E}, \acute{I}fzfXf$
 $g, ^a\text{--}^{\circ}K\text{---}v, \hat{A}, , \acute{e} \text{ } B$
DPERR_NOPLAYERS
 $, \pm, \dot{I}fZfbfVf\ddot{+}f^{\circ}, \acute{E}, \acute{I}\text{---}L\mathbb{E}\emptyset, \hat{E}fvf\mathbb{E}fCf,,, ^a, \mathbb{C}, \hat{E}, \mathbb{C} \text{ } B$
DPERR_NOSESSIONS
 $, \pm, \dot{I}fQ \quad [f\in, \acute{E}, \acute{I}\check{S}\grave{u}^{\circ}\P, \dot{I}fZfbfVf\ddot{+}f^{\circ}, ^a, \hat{E}, \mathbb{C} \text{ } B$
DPERR_NOTLOBBIED
 $\underline{IDirectPlayLobby::RunApplication}, \acute{E}, \mathbb{a}, \hat{A}, \hat{A}fAfvf\check{S}fP \quad [fVf\ddot{+}f^{\circ}, ^a\check{S}J\check{Z}n, ^3,$
 $\hat{e}, \hat{E}, \odot, \hat{A}, \frac{1}{2} \text{ } \hat{e} \text{ } \ddot{+} \text{ } A \underline{IDirectPlayLobby::Connect}, ^a\hat{O}, ^{\circ}fGf\%o \quad [^{\circ}l \text{ } B$
DPERR_OUTOFMEMORY
 $\text{---}v\ll \text{ } ^3, \hat{e}, \frac{1}{2} \text{ } ^{\circ}\text{---} \text{ } , \check{d}\check{Z}\hat{A} \text{ } s, ^{\circ}, \acute{e}, \dot{I}, \acute{E} \text{ } \backslash^{\circ}, \hat{E}f \text{ } f, f\check{S}, ^a, \hat{E}, \mathbb{C} \text{ } B$
DPERR_PLAYERLOST
 $fZfbfVf\ddot{+}f^{\circ}, \acute{E} \text{ } \acute{U}^{\circ}\pm, \mu, \hat{A}, \mathbb{C}, \frac{1}{2}fvf\mathbb{E}fCf,,, ^a, \mathbb{C}, \hat{E}, \hat{E}, \hat{A}, \frac{1}{2} \text{ } B$
DPERR_SENDTOOBIG
 $\underline{IDirectPlay2::Send}f \text{ } f\backslashfbfh, \acute{E}^{\circ}n, ^3, \hat{e}, \frac{1}{2}f \text{ } fbfZ \quad [fW \text{ } Efofbftf@, ^a \text{ } \leftarrow$
 $\%o\hat{A}, ^3, \hat{e}, \hat{A}, \mathbb{C}, \acute{e}, \mathbb{a}, \hat{e}, \grave{a}^{\circ}\hat{a}, \ll, \mathbb{C} \text{ } B$
DPERR_SESSIONLOST
 $fZfbfVf\ddot{+}f^{\circ}, \check{O}, \dot{I} \text{ } \acute{U}^{\circ}\pm, ^a\check{Z}, \acute{I}, \hat{e}, \frac{1}{2} \text{ } B$
DPERR_TIMEOUT
 $\check{Z}w^{\circ}\hat{e}, ^3, \hat{e}, \frac{1}{2}\check{Z}\check{Z}\check{S}\hat{O}^{\circ}\grave{a}, \acute{E} \text{ } ^{\circ}\text{---} \text{ } , ^a \text{ } I\text{---}1, \mu, \hat{E}, \odot, \hat{A}, \frac{1}{2} \text{ } B$
DPERR_UNAVAILABLE
 $\text{---}v\ll \text{ } ^3, \hat{e}, \frac{1}{2}\check{S}\check{O} \text{ } ^{\circ}, \acute{I}\mathbb{E}^{\circ} \text{ } \acute{Y}\text{---}L\mathbb{E}\emptyset, \hat{A}, \acute{I}, \hat{E}, \mathbb{C} \text{ } B$
DPERR_UNKNOWNAPPLICATION
 $^{\circ}s\text{---}\mathbb{A}, \hat{E}fAfvf\check{S}fP \quad [fVf\ddot{+}f^{\circ}, ^a\check{Z}w^{\circ}\hat{e}, ^3, \hat{e}, \frac{1}{2} \text{ } B$
DPERR_UNSUPPORTED
 $, \pm, \check{I}\check{S}\check{O} \text{ } ^{\circ}, \acute{I}\mathbb{E}^{\circ} \text{ } \acute{Y}, \dot{I}fo \quad [fWf\ddot{+}f^{\circ}, \hat{A}, \acute{I}\text{---}L\mathbb{E}\emptyset, \hat{A}, \acute{I}, \hat{E}, \mathbb{C} \text{ } B$
DPERR_USERCANCEL
 $\underline{IDirectPlay2::Open}f \text{ } f\backslashfbfh\mathbb{E}\hat{A}, \check{N} \text{ } o, \mu, \dot{I}^{\circ}r^{\circ}\dagger, \hat{A} \text{ } A \text{ } \acute{U}^{\circ}\pm fvf \text{ } fZfX, ^af\ddot{+}$
 $[fU, \hat{E}, \mathbb{a}, \hat{A}, \hat{A}fLfff^{\circ}fZf\ll, ^3, \hat{e}, \frac{1}{2} \text{ } B$

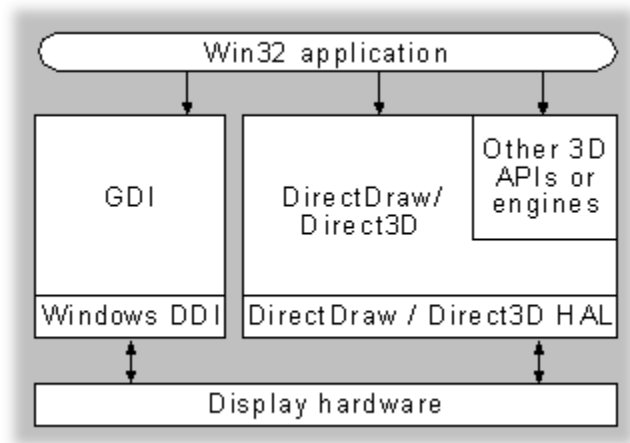
Direct3D,É,Â,¢,Ä

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» ÝŽž—¬,Æ,È,Á,Ä,Ç,éfp [f\if<fRf“fsf... [f^ iPC j,ðffXfNfgfbfv,âfCf“f^ [flfbfg ã,Žžg—p,·,éft [fU,ì,½,ß,ÉMicrosoft,“ñŸ,·,é AfŠfAf<f^fCf€,ÄfCf“f^f%ofNfefBfu,È3D<Z p,Ä,·,é BDirect3D,Í ,““® ì,ð‘æê,ÉffUfCf“,³,è,Ä,Ç,é B

Direct3D,Í AŠJ”ŽÖ,ª•K—

v,Æ,·,éAPIfT [frfX,ÆfffofCfX”ñÊ•¶ «,ð’ñ<Ÿ,µ Afn [fhfEfFA Efxf“f_ [É,Íê”Ê“I,Èfhf%ofCfo Ef,ff<,ð<Ÿ<<·,é BDirect3D,È,æ,Ä,Ä Afp [f\if< EfRf“fsf... [f^,ì »‘¢³,Ì3DfOf%oftfBfbfNŠÄ<<,ð,·,®,ÉfTf [fg,·,é,±,Æ,ª,Ä,« AfGf“fh Eft [fU,ªfVfXfef€,ÉfnfCfGf“fh,È3DfOf%oftfBfbfNŠÄ<<,ð’Ç%oÄ,·,é,±,Æ,àŠÈ’P,É,È,é BfVfXfef€,Í,í,,©,Éf f,fŠ,µ,©•K—v,Æ,µ,È,Ç,½,ß AfCf“fXfg [f< Ì,Ÿ,Ì,Û,Æ,ñ,Ç,ìRf“fsf... [f^ EfVfXfef€ ã,Ä%oð“K,Ê“® ì,·,é B

Direct3D,ÍfŠfAf< Ef^fCf€ 3D

fOf%oftfBfbfNfX EfT [frfX,ÌŠ®‘SfZfbfg,Ä,·,è Af\ftfgEfFA EfX [fX,Ì ,“¬,ÈfEf“f_Šf“fO EfpfCfvf%ofCf“ i•ÌŠ. A Æ¾ Af%ofXf^ ^—

j,ã Afn [fhfEfFA EfAfNfZf%of€ [f^,Ö,ì¼ Ú“I,ÈfAfNfZfX,ðŽÀÆ»,·,é BAPIfT [frfX,É,Í A“ ê,³,è,½,·,fEfxf<,È•ŸŽ f, [fhAPI,Æ A’áfEfxf<,È¼ Úf, [fhAPI,ª,·,è ADirect3D,ðŽg—p,µ,Ä3Dfn [fhfEfFA EfAfNfZf%of€ [f^,ÉfAfNfZfX,·,éVfXfef€,ðfTf [fg,·,é BDirect3D,ÌŠ®‘S,ÉfXfP [f%ofuf<,Ä Afn [fhfEfFA,Í ADirect3D,È,æ,Ä,Ä3DfEf“f_Šf“fO EfpfCfvf%ofCf“,ìê”,Û,½,ì‘S”,ð ,“%o»,·,é,±

,Æ,ª,Ä,«é BDirect3D,Í AZfofbftf@fŠf“fO AfAf“f’fGfCfŠfAfVf“fO AfAf<ftf@ EfufEf“ffBf“fO Af~fbfv f}fbfv AfGftfFfNfg A ³Sm,Èfp [fX,É,æ,éfefNfXf^ff Ef} fbfsf“fO,È,Ç,ì A3Dfn [fhfEfFA EfAfNfZf%of€ [f^,ÌŠg’EfOf%oftfBfbfNfX”—Í,ð ¶,©,·,±,Æ,ª,Ä,«é BDirect3D,Í¼,ÌDirectXfefNfmf fW [ÆŠ®‘S,Ê“ ±,³,è,Ä,Ç,é,½,ß Afrffl Ef} fbfsf“fO A2D,ìfI [fo [fEfC Efvf€ [f“,Ä,ì3DfEf“f_Šf“fO AfXfvf%ofCfG,Æ,Ç,Ä,½Šg’£<@”,à< Ú,µ,Ä,Ç,é B,±

,è,É,æ,Ä,Ä AfCf“f^f%ofNfefBfu,Èf ffbfA Ef^fCfGf<,Ä AfV [fEfEfX,É2D,Æ3D,ÌfOf%oftfBfbfNfX,ðŽg—p,·,é,±,Æ,ª,Ä,«é B

Direct3D,ìfCf“fvfŠf f“fg•û—@,É,Í A•ŸŽ f, [fh,Æ¼ Úf, [fh,Æ,Ç,ª A,Û,Ä,½,^Û,È,é

,Ó,½,Ä,Ìf, [fh,ª,·,é B•ŸŽ f, [fh,Í AfAfvfŠfP [fVf±f“,ªfOf%oftfBfbfN Eft [f^,ð•ŸŽ ,·,é ,fEfxf<API,Ä,·,é B¼ Úf, [fh,Í AfAfvfŠfP [fVf±f“,ª¾Ž,“I,ÉŽÄ sfobftf@,Éff [f^,ð o—Í,·,é’áfEfxf<API,Ä,·,é B

,±,ì Í,Ä,Í ADirect3D,ì¼ Úf, [fh,Æ•ŸŽ f, [fh,É,Ä,Ç,Ä à¾,·,é,Æ,Æ,à,É ADirect3D,ð’Ê,µ,Ä—~p,·,é,±,Æ,ª,Ä,«éfn [fhfEfFA EfAfufXfgf%ofNfVf±f“ i’Š Ū%o» j,ÆfGf~f...f€ [fVf±f“,É,Ä,Ç,Ä,àŽæ,èµ,ª B

•ŸŽ f, [fh

¼ Úf, [fh

fn [fhfEfFA EfAfufXfgf%ofNfVf±f“ i’Š Ū%o» j,ÆfGf~f...f€ [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,Ü,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,Â,Ü,èfAfvfŠfP [fVf‡f“,Í A'è< Ĭ,Ý,ì 3D
fIfufWfFfNfg,ðf [fh,·,éŒÄ,Ñ o,µ,ð1%oñ s,!,Î 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,¼áfƎfxfƎ3D 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,ĂŽÀƎ»,.,é,±,Æ,ª,Ă,«,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,¼ 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 ,¼,¹,é,±,Æ,ª,Ă,«,é B

¼ Úf, [fh,Æ,Í A’áfƎfxf<,ĂfAfNfZf%Ǝ [f^ Efn [fhEfFfA,Æ’Ê M,.,é,¼,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,±,¼,¼,ß A¼ Úf, [fh,ð—~—
p,.,éfAfvfŠfP [fVf‡f“,Í A“ÆŽ©,¼IfufWfFfNfg,â%œ—Ê §Ǝäf< [f`f“,ð—p^Ó,µ,È,-
,Ă,Í,È,ç,È,Ǝ B,µ,¼,ª,Ă,Ă A¼ Úf, [fh,ðƎø—“I,É—p,Ǝ,é,¼,ß,É,Í A3DfOf%oftfBfbfN,¼fvf fOf%of~f“fO,É,Á,Ǝ
,Ă,¼ \ª,Ê’mŽ—ª•K—v,Á, ,é B

Direct3D,ÍOLEfRf“f| [flf“fg EfIfufWfFfNfg Ef,fff< iCOM j,ÉŠî,Ă,Ǝ,Ă,“,è ADirectDraw,ÆŠ@‘S,É“ ‡,³,è,Ă,Ǝ
,é BMicrosoft,Í A «—^,¼fo [fWf‡f“,¼Windows,ÉDirect3D,ð’g,Ÿ ž,ð—`è,Á, ,é B Ú,µ,,Í ufCf“fgf f_fNfVf‡f“:
Direct3D,¼ Úf, [fh EfIfufWfFfNfg v,ðŽQ Æ,³,è,¼,Ǝ B

fn [fhEfFfA EfAfufXfgf%fNfVf‡f“(’Š Ű%»),ÆfGf~f...fŒ [fVf‡f“

Direct3D API,Í A‘¼,ÌDirectX API,Æ“—

l,É Afn [fhEfFfA EfAfufXfgf%fNfVf‡f“ EfŒfCf,, iHAL j,Ì ã,É‘g,Ý ž,Ü,ê,Ä,Œ

,é BHAL,Ífn [fhEfFfA,ÏffofCfX`Ë‘¶ «,ð%»B•Ä,·,é BDirect3D HAL,É,æ,Ä,ÄfTf|

[fg,³,ê,È,Œ•”•ª,Í Afn [fhEfFfA EfGf~f...fŒ [fVf‡f“ EfŒfCf,, iHEL j,É,æ,Ä,Ä•âŠ®,³,ê,é B Direct3D

HEL,Í Afn [fhEfFfA,ª”ñ<Ÿ,µ,È,Œ<@”\,ðf\ftfgfEfFfA“l,ÉfGf~f...fŒ [fg,·,é B,±

,ê,ç,Ïfn [fhEfFfA EfAfufXfgf%fNfVf‡f“ i’Š Ű%» j,ÆfGf~f...

fŒ [fVf‡f“,l’g,Ý ‡,í,¹,É,æ,Ä,Ä AAPIfT [frfX,^a,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“ ‡,³,ê,Ä,Œ

,é BHAL,Í AMicrosoft,ÏfO%oftfBfbfNAPI,Ö,Ï’P`êfCf“f^ [ftfFfCfX,Æ A3DfAfNfZf%oŒ [f^,l“ ^ê,³,ê,½fhf%oCfo Ef,ftf<,ðfn [fhEfFfA »•i,É’ñ<Ÿ,·,é Bfn [fhEfFfA »•i,Í ADirect3D,âDirectDraw AGDI AOpenGL,ð ,‘¬%»»,·,éfhf%oCfo’P‘l,Ï,Ÿ,ð—

p`Ó,·,ê,Î,æ,Œ Bfhf%oCfo,É,æ,Ä,Ä Afn [fhEfFfA,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,^a,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,³,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%oftfB f b f N,â3DfOf%oftfB f b f N A,,æ,N"@%œ,ì,½,B,ìWindows,ð \ ¬,.,é f G f "f W f",Å, ,é BDirectDraw,Í f C f [f W,ì·%œ ,Æ^Ú"@,ð"ñ í,É ,‘¬,É s,¢ A f X f € [f Y,È f A f j f [f V f ‡ f",ðŽÅ¢»,.,é B,±,ì,æ,µ,ÈDirectDraw,ì<@"\ ,É,æ,Å,Ä A ,‘¬,È f Q [f €,â f }

f<f`f f f B f A E f A f v f Š f P [f V 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,%œÅ",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 "f W f",Å,à, ,é BDirectDraw,ð—p,¢,ê,ì AWindows

GDI,âDirect3D AActiveMovie™ AOpenGL,É,æ,Å,Ä ¶ ¬,³,ê,½ f C f [f W,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:,â f T f] [f g,µ A f r f f f I,ì Ä ¶,ð ,‘¬,É s,µ,±,Æ,%œÅ"\" ,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 "f X,ÈC%œÊ,ð"% ,é,±,Æ,ª,Å,«,é B

DirectDraw,ÍCOMfx [f X,ìAPI,Å, ,é BMicrosoft,Í A «—^,ìfo [f W f ‡ 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,Å—p,¢,ç,ê,é ,—š,È3D<Z p,Å 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,Å’ñ<Ÿ,³ê AWindows95 ã,Å,à“® ì,·,é BWi
ndows95,ÅOpenGL,ð—~p,·,é,É,Í AWin32f [fNfXfe [fVf‡f“ ã,ÅWin32 OpenGL,^aŽÅ s,³ê,Å,¢,é•K—
v,^a, ,é BŒ» Ý,ÌOpenGL,Í AOpenGL—
p,É ÝŒv,³ê,½fNf%oCfAf“fg Efhf%oCfo Ef,ffŧ<,É,æ,Á,Ä AOpenGL,Ì<@”\,ðfTf|
[fg,μ,½fnfC EfGf“fh,Èfn [fhfEfFfA,ð~—p,μ,Ä,¢,é B «—
^,Ìfo [fWf‡f“,Å,Í ADirect3D,ð•âŠ®,·,éfn [fhfEfFfA Ef\ŧŠf... [fVf‡f“,ð’ñ<Ÿ,μ ADirect3D API,ð’Ê,μ,Ä’á%
¿Ši,È3Dfn [fhfEfFfA iOpenGL,^a•K—v,Æ,·,é ,—š,È ðŒ ,ðfTf| [fg,μ,½,à,Ì j,ð~—p,Å,«,é,æ,□,É,·,é—\’è,Å, ,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, ß, È ÝÆv, ³, è, Å, ¢ , é BDirect3D, ĩ Af fofCfX, È`È“¶, ½3Dfrffl E f 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} fbf sf“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} fbf sf“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• A3DfNfŠfbf sf“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, ± , ĩf pfCfvf%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

, ±, ĩZfNfVf‡f“, ĩ ĩ•ñ, ĩ`½, , ĩ ADirect3D, ĩfCf“fvfŠf f“fg, È, Å, ¢, Å Û, µ, à¾, µ, Å, ¢ , é B•ŰŽ f, [fh, ĩfCf“f^ [ftfFfCfX, ð—p, ¢, é è ‡, ĩ A, ±, ĩ ĩ•ñ, ”¼ Ű“K—p, ³, è, é, ± , Æ, ĩ, È, ¢ B, µ, ©, µ A`¼ Űf, [fh, ĩfCf“f^ [ftfFfCfX, ð—~—p, ., é è ‡, 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...

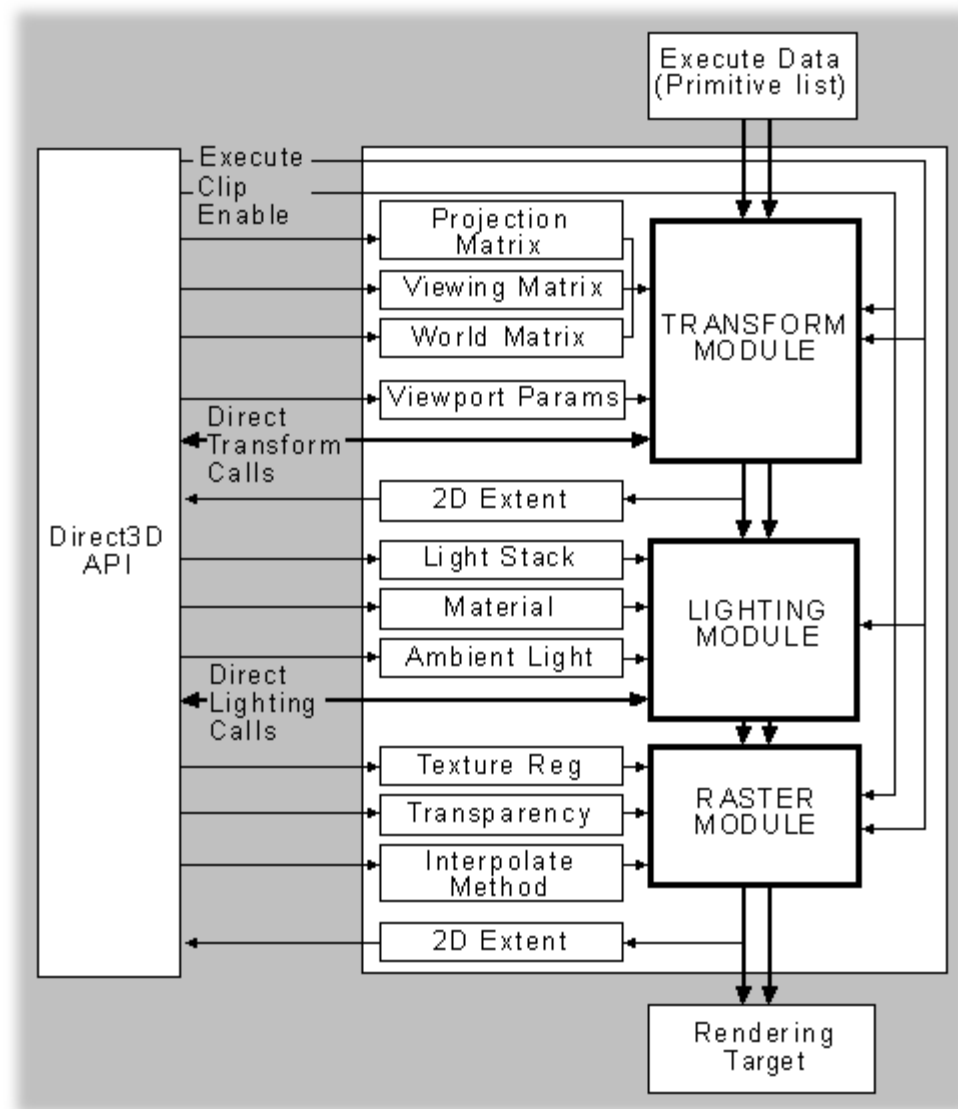
[f<,©,ç \ ¬,³,ê,é A%¼'z3DfÆf“f_Šf“fO EfGf“fWf“,ÉŠi,Ã,¢,Ä,¢,é B

•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”C^O,İŽÈ%œ,ðfTf| [fg,µ A“§Ž<“Š%œ,â·½ s“Š%œ,É,æ,éfrf... [,ðŽÄÆ»,·,é B

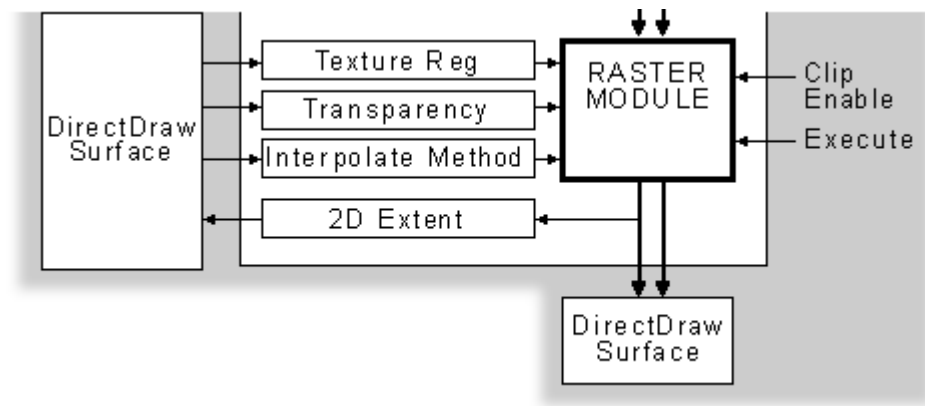
Æ—¾f,fWf... [f< B,±,İf,fWf... [f<,İŠð%½“İ,ÈÈðÈ¹EvŽŽ,ð s,¢ A‘S‘İ,İÈð AÆð,İ·ûÈü Af|
fCf“fgf%ofCfg,âfXf|fbfgf%ofCfg,İÈðÈ¹,ðfTf| [fg,·,é B

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%œ,ðŽg—p,·,é B ¶ ¬,³,ê,½fV [f<,Í AfffBfXfvfÆfC EfŠfXfg,ÉŠi,Ã,¢
,½ L k%œÄ”,ÈftfH [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“I,É ,‘-‰»,·,é,±,Æ,à Af\ftfgfEfFfA“I,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

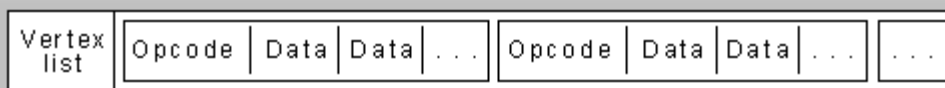
,±,ì,R,Â,ìf,fWf... [f<Í“®“I,Éf [fh,·,é,±,Æ,ª‰Â”\,Â, ,è AfŒf“f_Šf“fO,³,ê,½ftfŒ [fŒŠÔ,Â•İ X,·,é,±
,Æ,ª,Â,«é B,±,ì,½,ß A V,µ,¢f,fWf...
[f<,đ ì ¬,µ Afn [fhfEfFfA EfAfNfZf%ofŒ [fVf‡f“,â¼,ìfŒf“f_Šf“fOŒ‰Ê,đŽÀŒ»,·,é,±
,Æ,ª,Â,«é BDirect3D,žg,¤•İŠ·f,fWf... [f<Í,D,Æ,Â,Â, ,éª A Æ-¾f,fWf... [f<,Æf%ofXf^ ^— f,fWf...
[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,«É _“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,¼,ß AfvfŠf~fefBfu,İ” “_Ž<—“ä,İŠO•”,É, ,é ê ‡ A•İŠˆf,fWf... [f<,É,»,İfobftf@‘S‘İ,ð–³Ž<³,¹,é,±,Æ,ÍŠÈ’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,Ì A4,Â,Ì·İ X‰oÂ”\
ÈfĈfWfXf^,^, é B,±,ê,ç,İfpf‰of [f^,Ì,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,Ĉ,é s—ñ,Ě Ý’è,³,ê,é B·İŠ· s—ñ,Í A3DfIfufWfFfNfg,Ì’“_,ÌfZfbfg,Ì‰on”]
,ÆŽĚ‰oe,đ’è<,μ Af,fffc Â·W,©,ç2DfEfBf“fhfE,Ö·İŠ·,·,é B

fAfvfŠfP [fVf‡f“,Í·İŠ· s—ñ,đ’¼ Ú,É Ý’è,·,é,±,Æ,à,Â,«é,^ A,Â,«é,¾,~”đ,~é,×,«,Â, ,é B Â“K‰o»,³,ê,½·İŠ·ĈEv
ŽZ,đŽg,□Ĉ< ‡ftfF [fY,Â,Í A·İŠ· s—ñ,ÌfNf‰ofX^,~^‰o½“x,à s,í,ê,é B,μ,©,μ AfAfvfŠfP [fVf‡f“,^ s—
ñ,đŽw’è,·,é,Æ AfNf‰ofX^,~ÌŽÀ s,^—W,°,ç,ê,Â,μ,Ů,□ B

fffbfXfvfĈfC EfŠfXfg,Í A,½,³,ñ,Ì’Ù,È,éf^fCfv,Ì’“_ îñ,đfTf| [fg,·,é B

f‰ofXf^ ^— ,Ì,Ý,đfTf| [fg,·,éfn [fhfEfFA,Â,Í AfAfvfŠfP [fVf‡f“,ÍD3DTLVERTEX \‘Ĉ’Ì,đŽg—p,·,é,×,«,Â, ,
é BD3DTLVERTEX \‘Ĉ’Ì,Í·İŠ·,â Æ—¾ ^— ,đ s,Â,½ĈĚ,Ì’“_,đŽ,μ,Â,Ĉ
,é,½,ß AfXfNfŠ [f“ Â·W,Æ F,đŠŮ,ñ,Â,Ĉ,é Bfn [fhfEfFA,^·İŠ·‘Ĉ İ,đfTf|
[fg,·,é ê ‡ AfAfvfŠfP [fVf‡f“,ÍD3DLVERTEX \‘Ĉ’Ì,đŽg—p,·,é B,±
,Ì \‘Ĉ’Ì,Í Aff [f^,Æ AĈöĈ¹,đf\ftfgfEfFA“L,Ě ^— ,·,é,Æ,«Ě Ý’è,³,ê,é F,Ì îñ,đŠŮ,ñ,Â,Ĉ
,é BfNfŠfbfsf“fO,đ·K—
v,Æ,·,éf,fffc Â·Wff [f^,đfAfvfŠfP [fVf‡f“,^ñ<Ÿ,·,é,Æ,« AD3DLVERTEX \‘Ĉ’Ì,É,æ,Â,Ě A“K Ø,È’,“_,^è<,³,ê
,é Bfn [fhfEfFA,^ĈöĈ¹,đfTf| [fg,·,é ê ‡,Í AfAfvfŠfP [fVf‡f“,Í’P f,ĚD3DVERTEX \‘Ĉ’Ì,đ—
p,·,ê,Ì,æ,Ĉ B,±,Ìf^fCfv,Ì’“_,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,Ì,·,×,Â,Ìf^fCfv,Ì’“_ îñ,đfTf| [fg,·,é B

•İŞ·f,fWf... [f<,É,Í,Ó,½,Â,Ìf^fCfv,Ìf f\fbfh,^, ,é B,Đ,Æ,Â,Í·İŠ·f,fWf... [f<,Ì ó’Ô,đ Ý’è,·,é,à,Ì,Â, ,è A,à,□
,Đ,Æ,Â,Í A·İŠ·f,fWf... [f<,đ’¼ ŮŽg—p,μ,Â A’“_fZfbfg,đ’Ĉ İ,·,é,à,Ì,Â, ,é B·İŠ·f,fWf...
[f<,Ì’¼ ÚĈĚ,Ň o,μ,Í A<«ŠE ũ,Ìf{fŠf... [fĈ,đfefXfg,μ,½,è AfxfNfgf< EfZfbfg,đ·İŠ·,·,é,Æ,«Ě·Ö—,Â, ,é B
,±,ê,ç,Ì’Ĉ İ,Í AĈ» Ý,Ì·İŠ· s—ñ,đ—p,Ĉ,Â AfWfIf fgfŠ·İŠ·,đŽÀ s,·,é B,Ů,½ AĈ» Ý,Ìfrf...
[É,Í,μ,ĈfNfŠfbfsf“fO EfefXfg,đ s,□,±,Æ,à,Â,«é B·İŠ·f,fWf...
[f<,đ’¼ ÚĈĚ,Ň o,·ŠÖ ”ĈEQ,Í A,·,×,Â AD3DTRANSFORMDATA \‘Ĉ’Ì,đŽg—p,·,é B

•İŠ·É,Â,Ĉ,Ä,Ìè”Ê”L,È îñ,Í A·ŮŽ f, [fh,Ìfrf... [f| [fg,É,Â,Ĉ,Ä à—¾,μ,½fZfNfVf‡f“ u·İŠ· v,Â“¾,é,±
,Æ,^,Â,«é BftfĈ [fĈ“à,Â,Ì·İŠ·É,Â,Ĉ,Ä,Í u·İŠ· v,đŽQ Æ,³,ê,½,Ĉ B,Ç,·,ç,ÌfZfNfVf‡f“,à·ŮŽ f, [fh,ÌAPI,É,Â,Ĉ
,Â à—¾,μ,Â,Ĉ,é,^ A·İŠ·,ÌfA [fLfefNf`ff,Æ ”Ž®,Í A·ŮŽ f, [fh,Æ’¼ Úf, [fh,Ì—¼·û,É“K—p,·,é,±
,Æ,^,Â,«é B·İŠ·,Â—p,Ĉ,ç,ê,é ”Šw“TmŽ~,İŠT—v,É,Â,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•ŮŽ ,µ,Ä,¢,é B

Æ-¾f,fWf... [f<,ð'¼ ŮŽg—p,·,é ê ± A,±,Ìf,fWf... [f< **iD3DLIGHTINGELEMENT** \‘¢‘ì j,É“ü—
Í,³,ê,½ff [f^,ÌŠe—v‘f,É,Í A•ûŒüxfNfgf<,ÆˆÊ‘u if[fCf“fgf%oCf g,âfXf[fbf g f%oCf g,Ì,æ,¤
,Ê A<Ç Š“Í,ÊÆðŒ¹,Ì,½,ß j,ªŠŮ,Ů,ê,Ä,¢,é B

fTf| [fg,·,éŒðŒ¹f,ff<,Í Af,fmfNf ,“,æ,ÑRGB,Ì,Ó,½,Ä,Â, ,é
BD3DLIGHTDATA \‘¢‘ìf f“fo,iD3DLIGHTINGELEMENT \‘¢‘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,D,Æ,Â,Ì%oA%oe'l,ðŒvŽZ,·,é,½,ß,É A,»,ê,
¼,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,ðŠgŽŮ,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,ÆŠgŽŮ,Ì—
¼•û,ðŒŒ< ±,µ,Ä%oe,ðŒvŽZ,·,é B

$shade = \frac{3}{4} (diffuse \times (1 - specular)) + specular$

,±,Ì%oA%oe'l,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,ÍŠgŽŮ,µ,½ F,Ìf%o f“fv,Ä A,»,Ì”ÍÍ,ÍfAf“frfGf“fg EfJf%o [iŠÄ<Œð F j,©,ç Ä,àˆÄ,¢ F,Ů,Ä,Ä, ,é B Ä
Œä,Ì4ª,Í1,É,Í A Ä,àˆÄ,¢ F,©,ç Ä,à-¾,é,¢ F,Ì”ÍÍ,Ìf%o f“fv,ª±, BfŒf“f_Šf“fO,É,“,¢
,Ä,Í A%oA%oe'l,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))
```

,Ů,½ AfpfbfN,³,ê,½RGBAfJf%o [,Ì’è<,ðˆÈ%°,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,D,Æ,Ä A,·,É,Í,¿ AD3DLIGHT_DIRECTIONAL AD3DLIGHT_POINT AD3DLIGHT_PARALLELPO
INT AD3DLIGHT_SPOT AD3DLIGHT_GLSPT,Ì,¢,,ê,©,Ä,È,,Ä,Í,É,ç,È,¢ B,±,Ì—
ñ“Œ^,Í **AD3DLIGHT** \‘¢‘ì,Ì’è”,Ä, ,é B,±
,Ì \‘¢‘ì,É,Í A¼,É**ED3DCOLORVALUE** \‘¢‘ì,ªŠŮ,Ů,ê,Ä,“,è AŒðŒ¹,Ì F,ðŽw’è,µ,Ä,¢,é B Ô A—Í A Ä,Ì—
v‘f,Ì,Ì”ÍÍ,Í A’è”É,É0,ç1,Ů,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,Ì'l,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•ŮŽ ,·,é•ûŒüxfNfgf<,Í Af,ff<,©,çŒðŒ¹,Ů,Ä,Ì•ûŒü,ð•\,µ,Ä,¢,é B,±
,ÌfxfNfgf<,Í A—**LEŮŒðŒ¹**,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•,³,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,^aÄ,«₁,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<,³İ2ŽÝCE, 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®,^a ¬—§,·,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,³,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,^a, ,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,^a—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—ß,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 ^— ,³,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,^a ¶ ¬,³,ê,é B,±,±,Äfrf...

[“à,É’,“_,^a,Đ,Æ,Ä,à,È,ĉ ê ‡ Afofbftf@‘S’l,^{a-3}Ěø,É,³,ê,é,±,Æ,^a,·,é BŽŸ,É A Æ-¾f,fWf...

[f<,É,æ,Ä,Ä’,“_,^a ^— ,³,ê AŽÀ sfofbftf@,lŽwŽl,É,μ,½,^a,Ä,Ä F,^a Ý’è,³,ê,é B ÄĚä,Éf%oFXf^ ^— f,fWf...

[f<,^{a-½}—ßfXfgfŠ [fĚ,ð%ð Í,μ A ¶ ¬,³,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,^aİŠ·,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,ĉ,l’Ě î,^aŠ®—l,μ,½Ěä,É-½—ßfŠfXfg,^a%ð“Ĉ,³,ê AfĚf“f_Šf“fO,^a 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),©,ĉ AfffofCfX,l%E%“(• -1,
·,¾-1),Û,Ä,Ä,·,é B [“x,ì”Íl,Ío iŽ<_ ‘ä,lftf f“fg j,©,ĉl ifofbfN j,Û,Ä,Ä,·,é B,Ó,½,Ä,lŽOŠpĚ`,^a,Ó,½,Ä,l’,“_,
ð<□—L,μ,Ä,ĉ,é ê ‡ Af%oFXf^ ^— ,Í A<□—L,³,ê,½’,“_l Ú ü,É%o^,Ä,½fsfNfZf<,ð•i ”%oñfĚf“f_Šf“fO,·,é,±
,Æ,^a,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,³,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 Œ,·,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%œÈ,ð“¾,é,±,Æ,ª,Ä,«,é B

ftfHfO

ftfHfO,Í AD3DTLVERTEX \‘ç‘ì,ìspecularf f“fo,ÉŽw’è,³ê,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,^a •,ç,Æ,« A,Û,½,ÍĚöĚ¹,^aÈ,ç ,Æ,«,É,¾,¯ ³Šm,É“® ì,·,é BĚöĚ¹,^aÈ,ç,Æ,«,É,Í AftfHfO,^a%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,^a ,é BĚ» ó,Á,Í AfŠfjA EftfHfO Ef, [fh, ì,Ý,^afTf| [fg,³ê,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,³ê,½ŠJŽn“_,©,çŽn,Û,è A I—1“_Á Á‘â—§“x,É’B,·,é,Û,Á A”ä— á“Ĭ,É‘ %oÁ,·,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‘ %oÁ,·,é BŽw ”ftfHfO Ef, [fh,Á,íŽŸ,ìĚöŽ®,^a ¬—§,·,é B

$$f = e^{-(density \times z)}$$

•½•ûŽw ”ftfHfO Ef, [fh,Á,Í AŽw ”ftfHfO Ef, [fh,æ,è,à< }‘¬,ÉftfHfOĚø%Ě,^a %oÁ,·,é BŽŸ,ìĚöŽ®,^a ¬— §,·,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,^a ¬,³ç,Û,Ç AfIfufWfFfNfg,ÍĚ©,ì,É,,È,é j B

fAfvfŠfP [fVf‡f“,^aŽw ”ftfHfO Ef, [fh,ðŽg—p,·,é ê ‡ AftfHfO,ì—§“x,^a0.5,Á, ,é,Æ,·,é,Æ AŽŸ,ì—á,ÉŽì,·,æ,□ ,É AfJf f%o,©,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,è,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

,»,è,¼,è,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,»,è`È ã,ì•İ X,Í s,í,è,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,İ•ÜŽ f, [fh,Ä,Í AfXfe [fg EfI [fo [f%ofCfh,ð~—
p,μ,ÄŽÄ s,ª,è,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,ª 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,à**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,è,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,Đ,Æ,Ä,Ä,é B,Ü,½
AD3DSHADE_GOURAUD,Í**D3DSHADEMODE**—ñ“ƒ^,ìf f“fo,ì,Đ,Æ,Ä,Ä,é B

ŽÄ sfobftf@,ð ^— ,μ,½ƒEä AfVfF [ffBf“fO Ef, [fh,ð•İ X,Ä,«,é,æ,ª
ì,É,·,é,½,B,É AfAfVfŠfP [fVf‡f“,Í,à,ª1“**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,è,Ä,¢,é B,±
,è,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,ðƎðŠ·,·,é,±,Æ,ª%Â”\,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 ”,İŽQ Æ,ðŽ ,Ä,±,Æ,ª%Â”\,Å, ,é B

Direct3D,Ìftf@fCf<¼,É,Í AŠg’£Žq.x,ª•t%Â,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

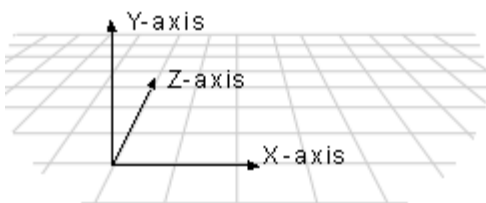
3D
A•WĈn

3DfOf%ftfBfbfNfX,É,Í A ¶Žè À•WĈn,Æ%oEŽè À•WĈn,Ì2Ží—p,Ì fffJf<fg À•WĈn,^a,,é B,Ç,ç,ç,Ì À•WĈn,Ā,à A ³•ûĈü,ÌxŽ²,Í%oE,ðĈü,« A ³•ûĈü,ÌyŽ²,Í ã,ðĈü,¢,Ā,¢ ,é B ³•ûĈü,Ìz À•W,^a,Ç,ç,ç,ðĈü,¢,Ā,¢ ,é,©,Í A ¶Žè,Û,½,Í%oEŽè,ÌŽw,ð ³,ÌxŽ²•ûĈü,ÉĈü,[−] A,»,ê,ð ³,ÌyŽ²•ûĈü,É%oñ“],³,¹,é,±,Æ,É,æ,Ā,Ā'm,é,± ,Æ,^a,Ā,«,é B eŽw,ÌŽ',••ûĈü,^a AŽ©•^a,ðŽw,μ,Ā,¢,Ā,à,»,ϩ,Ā,È,,Ā,à A,»,Ì À•WĈn,Ā,Ì ³,ÌzŽ²,ÌĈü,«,Ā,,é B ,±,ÌfZfNfVf‡f“,Ā,Í AfAfvfŠfP [fVf‡f“,Ā—~—p,·,·,é,±,Æ,^a,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, ¯, ĩf A f v f Š f P [fVf±f“, ð ĩ ¬, μ, Ä, ĸ, é ê ± j, Ĩ A Direct3D, É“n, ³, ê, é f f [f^, ð , μ• Ĩ X, ·, ê, Ĩ, æ, ĸ B

fVfXf ef€, ª“O—Ê, ©, çŽžĈv%œ ĩ, è, É’H, é, æ, ▯
, É A ŽOŠpĈÛ, 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, Ä Direct3D, 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,³,ê,é BvxfNfgf<,Í AfefNfXf`ff,Ì•ûŒü,Û,½,ÍŒü,«,ðŽ!,µ AzŽ²,É%ˆ,Á,Ä,¢
,é BvxfNfgf< i,Û,½,Í ãvxfNfgf< j,Í A^ê”Ê,É AŒ““_ [0,0,0] ,ðŽn“_,Æ,µ,ÄyŽ²,É%ˆ,Á,Ä,¢
,é Bu Å•W,“,æ,Ñv Å•W,É,Â,¢,Ä Ú,µ,,Í A uDirect3DRMWrapfCf“f^ [ftfFfCfX v,ðŽQ Æ,³,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'İ,·,é'Š'ÎÊ'u,đ•\E»,·,é ê ‡ B
 fIfufWfFfNfg,ì%õñ“] A í æ AfTfCfY•İ X,đ s,¤ ê ‡ B
 Ž<“_ A•ûEü A“ŠŽ<“Š%œ,đ•İ X,·,é ê ‡ B

”CˆÓ,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'İ,µ,ĂˆE%œ°,ì'€ ì,ª s,í,ê,é B

$$\begin{aligned} x' &= (M_{11} \times x) + (M_{21} \times y) + (M_{31} \times z) + (M_{41} \times 1) \\ y' &= (M_{12} \times x) + (M_{22} \times y) + (M_{32} \times z) + (M_{42} \times 1) \\ z' &= (M_{13} \times x) + (M_{23} \times y) + (M_{33} \times z) + (M_{43} \times 1) \end{aligned}$$

Ă,ăˆê”Ê“İ,Ê•İŠ•,É,Í AˆÚ“® A%õñ“] A,·,æ,ŦfXfP [fŠf“fO,ª,·,é Bˆê“x,É•ı ”,ì•İŠ•ÆvŽZ,đ s,¤
 ,É,Í A„,ê,ç,ìEø%Ê,đ ¶,Ÿ o,•ı ”,ì s—ñ,đ,Đ,Æ,Ă,ì s—ñ,É,Û,Æ,ß,ê,İ,æ,¢ B,½,Æ,ı,İ A,Đ,Æ,Ă,ì s—
 ñ,đ ì ¬,µ,Ă A“(„ì•Ă,Ŧ,ìˆÚ“®„Æ%õñ“],đ s,¤,±,Æ,ª,Ă,«,é B

s—ñ,Í A—ñ,đ ‡”Ô,É•Ă,×,ĂŽw'è,·,é B,½,Æ,ı,İ 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,¤,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

ˆÚ“®
%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•ŮŽ f, [fh,É,·,ˆ,éfrf... [f] [fg,É,Ă,¢,Ă à—¾,µ,½fZfNfVf‡f“ u•İŠ• v,É,Í A•İŠ•,É,Ă,¢,Ă,ìˆê”Ê“İ,È îñ,ªL Ú,³,ê,Ă,¢,é BftfE [f€•İŠ•,É,Ă,¢
 ,Ă,Í u•İŠ• v,đŽQ Æ,³,ê,½,¢ B,Ç,ç,ç,ìfZfNfVf‡f“,à•ŮŽ f, [fh,İAPI,É,Ă,¢,Ă à—¾,µ,Ă,¢
 ,é,ª A•İŠ•,İfA [fLfefNf`ff,Æ ”Ž®,Í A•ŮŽ 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,¢,¤fZfNfVf‡f“,ªŠÜ,Û,ê,Ă,¢,é B

Ů“®

ŽŸ, Ì•Š·, í A“(x, y, z), ð V, μ, €“(x', y', z'), ÉˆÚ“®, ·, 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,ÅĖ“(̄,ð’,ß,½ ê ± AŽžĖvŽü,è,É‘ª’è,µ,½’l,ª—p,¢,ç,ê,é B

$$fXfP\ [f\check{S}f^{\text{“}}fO$$

$$\check{Z}\check{Y},\grave{\text{ł}}\text{•}\grave{\text{I}}\check{S}\text{•},\acute{\text{I}}\text{ }A^{\text{“}}_{\text{ }}(x,y,z),\partial x\text{ }Ay,\text{”},\text{æ},\tilde{N}z\check{Z}^2\text{•}\hat{u}\mathbb{E}\ddot{u},\acute{E}^{\text{”}}C^{\wedge}\acute{O},\grave{\text{I}}\check{S},,\text{ }\ddot{\pm},\hat{A}fXfP\ [f\check{S}f^{\text{“}}fO,\mu\text{ }A\text{ }V,\mu,\P^{\text{“}}_{\text{ }}(x',y',z'),\partial\text{ }\P\text{ }\neg,\text{•},\acute{e}\text{ }B$$

$$[x'\ y'\ z'\ 1]=[x\ y\ z\ 1]\begin{bmatrix}s_x&0&0&0\\0&s_y&0&0\\0&0&s_z&0\\0&0&0&1\end{bmatrix}$$

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,ϣ,±,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

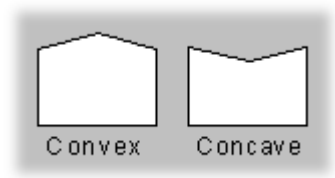
-Ê-@ ü,Æ',“-@ ü

fVfF [fffBf“fO Ef, [fh

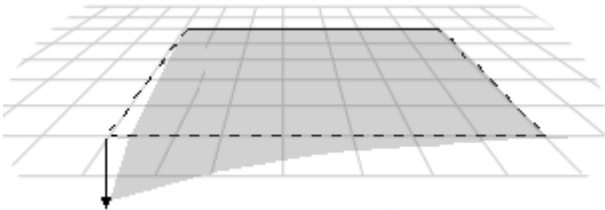
ŽOŠpŒ`,İ•âŠ®—v'f

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

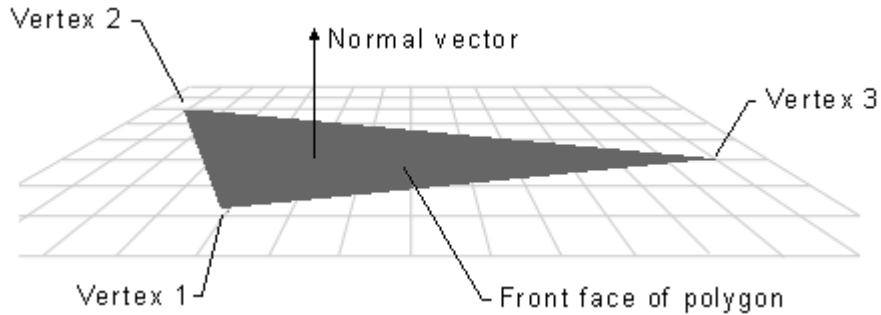


ŽOŠpĲ`İ,R,Â,İ’ “_İ•½-Ê,đ•\,·,ª A,»,±,É•Ê,İ’ “_đ”Ç%Á,·,é,±,Æ,É,æ,Á,Ä A—e^Ö,É—§‘İf|fŠfSf“,đ İ ¬,·,é,±
,Æ,ª,Â,«é B

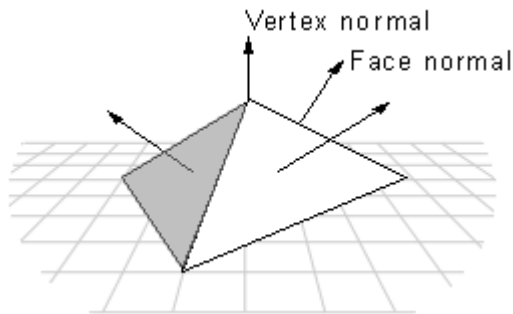


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,é ‡ ~,Æ A À•WĈEn,^a%EŽè À•WĈEn,Æ ¶Žè À•WĈEn,ì,Ç,ç,ç,Ä, ,é,©,É,æ,Ä,ÄĈ~^è,³,ê,é B–@ üfxfNfgf<,^afrf...
[fA,ÉĈü,©,Ä,Ä,¢,é‘[□],^a–Ê,ì•,Ä, ,é BDirect3D,Ä,Í A–Ê,ì•,ì,Y,^aŽ< ‘ä,Ä, ,é B,Û,½Direct3D,Ä,Í A•\,©,ç–
Ê,ðĈ©,½ ê ‡ A•K,ŽžĈv%oñ,è,É’,“[–],^aè<³,ê,Ä,¢,é B



Direct3DfAfvfŠfP [fVf‡f“^Í A–Ê–@ ü,ðŽw’è,•,é•K–v,Í,È,¢ B•K–vŽž,É,Í AfVfXfef€,^aŽ©“@“l,É–Ê–
@ ü,ðĈvŽž,•,é BfVfXfef€,^a–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,ÑĈðĈ¹,âfefNfXf`ffĈ
ø%oÊ,ð §Ĉä,•,é ê ‡,É,Í AfVfXfef€,Í’,“–@ ü,ðŽg–p,•,é B



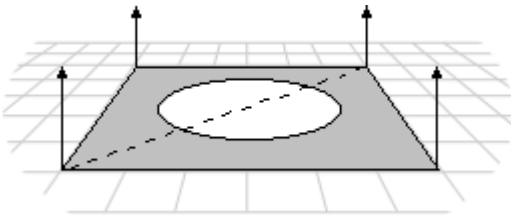
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Ê‘S’Ī,Ê•Ī ».,‘é BfOf [EfVfF [ffBf“fO Ef, [fh,ÆftHf“ EfVfF [ffBf“fO Ef, [fh,Ā,Ī A’，“_@ ü,ð–
p,¢,Āf|fŠfSf“ EfIfufWfFfNfg,ĪŠÖĪ,ðfXf€ [fY,É,µ A,»,ĪŠÖ,ĪfXfy [fX,É,Ī—
× Ū,µ,½’,“_Ī F,ÆP“x,”}“ü,³,ê,é BftHf“ EfVfF [ffBf“fO Ef, [fh,Ā,Ī AfVfXfef€,“
Ê,ĪŠefsNfZf<,É“K Ø,ÈfVfF [ffBf“fO’l,ðEvŽZ,‘,é B

Note

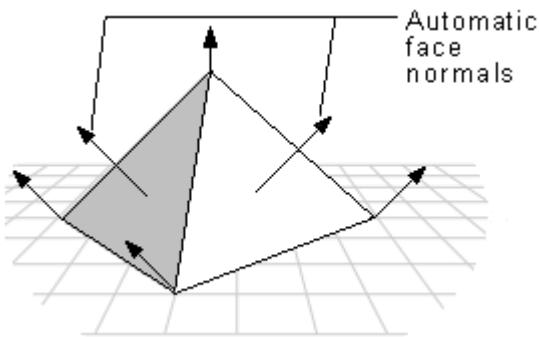
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Ī,½,ß A’½,,ĪfAfVfŠfP [fVf±f“,ĪfOf [EfVfF [ffBf“fO Ef, [fh,ð—~
p,‘,é B,µ,©,µ AfOf [EfVfF [ffBf“fO Ef, [fh,Ī AftHf“ EfVfF [ffBf“fO Ef, [fh,Ā,Ī<N,±
,ç,È,¢ ×,©,Èf~fX,ð ¶,¶,é,±,Æ,“, ,é B,½,Æ,,Ī A%° } ,ÉŽ’|,‘æ,ϱ,É–Ê,ÊŠ@‘S,ÊfXf|fbfgf%oCfg,““–,½,Ā,Ā,¢
,é ê ± AfOf [EfVfF [ffBf“fO Ef, [fh,ÆftHf“ EfVfF [ffBf“fO Ef, [fh,Ā,Ī’S,-
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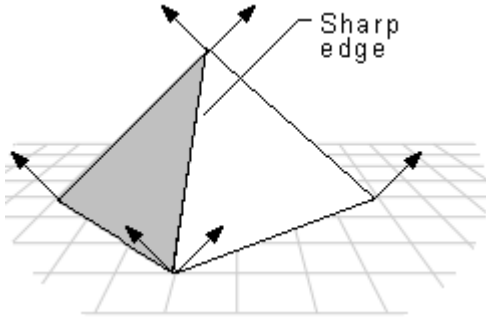


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fbfgf%oCfg,ðˆŽ’|,‘,é B’,“_ĪŠÖ,ÊfsfNfZf<,ð’}“ü,‘,é fOf [EfVfF [ffBf“fO Ef, [fh,Ā,Ī AfXf|
fbfgf%oCfg,ð’S,-³Ž<,µ,Ā,µ,Ū,¢ AfXf|fbfgf%oCfg,“¶ Ý,µ,È,¢,©,Ī,æ,ϱ,É–Ê,“fÆf“f_Šf“fO,³,ê,é B

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,éÓ igGfbfW j,“fVff [fv,É•Ž’|,³,ê AfVfXfef€,“Ž©“@“Ī,É–Ê–
@ ü,ð ¶ Ū,‘,‘,é B,µ,©,µ AfOf [EfVfF [ffBf“fO Ef, [fh,âftHf“ EfVfF [ffBf“fO Ef, [fh,Ā,Ī A%oA
%oe’l,“Ó,Īžü•Ó,Ê•âŠ@,³,ê A Ā Ī’l,É,ĪÈ–Ê,Ā \ ¬,³,ê,½ŠÖĪ,Æ,È,é B



fOf [EfVfF [ffBf“fO Ef, [fh,âftHf“ EfVfF [ffBf“fO Ef, [fh,ð–p,¢,Ā<Ê–
Ê,ð•Ž’|,µ A,³,ç,ÉfVff [fv,É•Ó,ðŽ ,Ā,½fIfufWfFfNfg,âŠŪ,ß,½,¢ ê ± AfAfVfŠfP [fVf±f“,Ī A•Ó,“K–v,È–
Ê,Ī,·,×,Ā,ĪÈð ü,Ê,Ā,¢,Ā A’ ,“_@ ü,ð•Ī ».,µ,È,,Ā,Ī,É,ç,È,¢ B



$fOf \quad [\quad EfVfF \quad [ffBf“fO \quad Ef, \quad [fh, \acute{I} \quad A, \mathfrak{D}, \mathcal{A}, \hat{A}, \grave{I}fIfufWfFfNfg \quad \tilde{a}, \acute{E} \cdot \grave{E} - \hat{E}, \mathcal{A} \cdot \frac{1}{2} - \hat{E}, \partial \check{U}, \mathfrak{B}, \acute{e}, \pm, \mathcal{A}, \partial \% \hat{A} \backslash$
 $, \acute{E}, \cdot, \acute{e}, \frac{3}{4}, \bar{\quad}, \hat{A}, \hat{E}, \quad A \cdot \frac{1}{2} - \hat{E}, \acute{E} “ -$
 $, \frac{1}{2}, \hat{A}, \frac{1}{2} \mathfrak{C} \tilde{o}, \partial f t f \% o b f g \quad EfVfF \quad [ffBf“fO \quad Ef, \quad [fh, \mathfrak{x}, \grave{e}, \grave{a} f \check{S} f A f \langle, \acute{E} \cdot \backslash \mathfrak{C} \rangle, \cdot, \acute{e} \quad B f t f \% o b f g \quad EfVfF \quad [ffBf“fO \quad Ef, \quad [f$
 $h, \grave{I} - \hat{E}, \grave{I} \quad F, \acute{I} \check{r} \hat{e}, \hat{A}, \quad , \acute{e}, ^a \quad A fOf \quad [\quad EfVfF \quad [ffBf“fO \quad Ef, \quad [fh, \hat{A}, \acute{I} \quad A - \hat{E}, \partial \quad ^3 \check{S} m, \hat{E} \sim \hat{A}, \cdot, \cdot, \acute{e}, \pm, \mathcal{A}, ^a, \hat{A}, \langle, \acute{e} \quad B, \pm$
 $, \grave{I} \mathfrak{C} \emptyset \% \hat{E}, \acute{I} \quad A, \cdot, @ \langle \mathfrak{B}, , \acute{E} \mathfrak{C} \tilde{o} \mathfrak{C} \mathfrak{E}^1, ^a, \quad , \acute{e} \quad \hat{e} \quad \ddagger, \acute{E} \mathfrak{C} \mathfrak{E}^{\circ} \sim, \hat{A}, \quad , \acute{e} \quad B$
 $, \grave{U}, \mathcal{A}, \tilde{n}, \check{C}, \grave{I} Direct3D f A f v f \check{S} f P \quad [fVf\ddagger f“ \quad , \acute{E} “ \mathfrak{K} \quad \emptyset, \hat{E} \grave{E} V f F \quad [ffBf“fO \quad Ef, \quad [fh, \acute{I} \quad A fOf \quad [\quad EfVfF \quad [ffBf“fO \quad Ef, \quad [$
 $fh, \hat{A}, \quad , \acute{e} \quad B$

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

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,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

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ċ,³,ê,é BftfHf“ EfVfF [ffBf“fO Ef, [fh,ĭĚ» ó,Ā,ĭfT
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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€
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,ĭ A‘,“_ĭ F,ĭ Ā,ĭ—v‘f,¾,¯,đŽg—p,·,é B

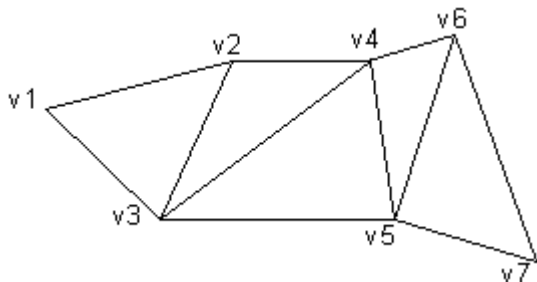
,½,Ą,,ĭ Ā‘,“_ĭ ĭ F,ĭ Ô,ĭ—v‘f,ª0.8,Ā A‘,“_ĭ Ô,ĭ—v‘f,ª0.4,ĭ,Ą,« A,±
,ĭ,Ô,½,Ā,ĭ‘,“_ĭ,đĚ<,Ô ü,ĭ† S,ĭfsfNfZf<,ÉfVfXfef€,ªŠ,,è“—,Ā,é Ô,ĭ—
v‘f,ĭ AfOf [EfVfF [ffBf“fO Ef, [fh,ĭRGBfJf% [Ef,fffc,Ā,ĭ0.6,Ā, ,é B

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@,É,æ,Ā,Ā“ş-¾“x,đfCf“fvfŠf f“fg,Ā,«é,½,ß,Ā, ,é B

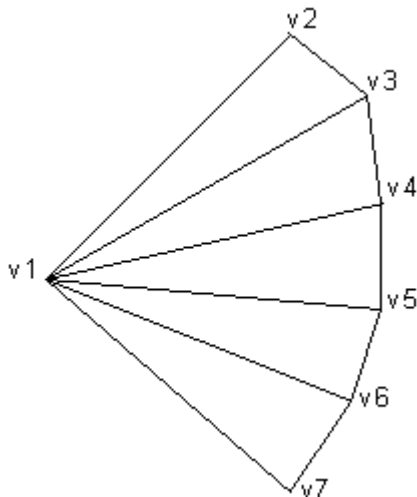
fAfvfŠfP [fVf‡f“,ĭ AĚ» Ý,ĭfffofCfX Efhf%ofCfo,ªfTf| [fg,·,é
•ăš®ĚŽ®,đŽæ“¾,·,é,½,ß,Ě AD3DPRIMCAPS,ĭdwShadeCapsf f“fo,đŽQ Ą,·,é,±,Ą,ª,Ā,«é B

ŽOŠpĚ, ĭ“WŠJ } ,Æ ĭĚ`

$fT [ftfFX'S' \dot{\iota}, \delta \prec L \ q, \cdot, \acute{e}, \acute{E}, \acute{I} \ A\acute{S}e\acute{Z}O\acute{S}p\acute{E}, \dot{\iota}', \text{“} _ \delta, \cdot, \times, \acute{A}\acute{Z}w' \acute{e}, \cdot, \acute{e}, \dot{\iota}, \acute{A}, \acute{I}, \acute{E}, \ A\text{“}W\acute{S}J \ } , \acute{a} \ \acute{I}\acute{E}, \delta \acute{Z}g \text{—} p, \cdot, \acute{e}, \pm$
 $, \acute{E}, ^a, \acute{A}, \text{«} \acute{e} \ B, \frac{1}{2}, \acute{A}, , \acute{I}\acute{Z}\acute{Y}, \dot{\iota}, \acute{a}, \sqcap, \acute{E}\text{“}W\acute{S}J \ } , \delta' \acute{e} \prec, \cdot, \acute{e} \ \acute{e} \ \nmid \ A \bullet K \text{—} v, \acute{E}', \text{“} _ \acute{I}7, \acute{A}, \frac{3}{4}, \text{—}, \acute{A}, \ , \acute{e} \ B$



$fVfXfef\epsilon, \acute{I} \ A \ \acute{A} \ \%_0, \dot{\iota}\acute{Z}O\acute{S}p\acute{E}, \delta \bullet \%_{0\acute{a}}, \cdot, \acute{e}, \frac{1}{2}, \beta, \acute{E}', \text{“} _ v0 \ Av1 \ Av2, \delta \acute{Z}g \text{—} p, \cdot, \acute{e} \ B2'' \acute{O} \text{—}$
 $\acute{U}, \dot{\iota}\acute{Z}O\acute{S}p\acute{E}, \acute{E}, \acute{I}v1 \ Av3 \ Av2, \delta \ A3'' \acute{O} \text{—} \acute{U}, \dot{\iota}\acute{Z}O\acute{S}p\acute{E}, \acute{E}, \acute{I}v3 \ Av4 \ Av2, \delta \text{—} p, \text{¢}, \acute{e} \ B2'' \acute{O} \text{—}$
 $\acute{U}, \dot{\iota}\acute{Z}O\acute{S}p\acute{E}, \dot{\iota}', \text{“} _ \acute{I} \ \nmid \acute{O}, \acute{E}, \acute{E}, \acute{A}, \acute{A}, \text{¢}, \acute{E}, \text{¢}, ^a \ A, \pm, \acute{e}, \acute{I}, \cdot, \times, \acute{A}, \dot{\iota}\acute{Z}O\acute{S}p\acute{E}, ^a \acute{Z}\acute{Z}\acute{E}v\%_{0\acute{n}}, \acute{e}, \dot{\iota}\acute{E}\ddot{u}, \text{«}, \acute{E} \bullet \%_{0\acute{a}}, ^3, \acute{e}, \acute{e}, \frac{1}{2}, \beta, \acute{A}, \ , \acute{e} \ B$
 $\acute{I}\acute{E}, \acute{I}\text{“}W\acute{S}J \ } , \acute{A}\acute{Z} \text{—}, \acute{A}, \text{¢}, \acute{e}, ^a \ A, \cdot, \times, \acute{A}, \dot{\iota}\acute{Z}O\acute{S}p\acute{E}, ^a \ \acute{D}, \acute{A}, \acute{A}, \dot{\iota}', \text{“} _ \delta \prec \sqcap \text{—} L, \cdot, \acute{e} \text{“} _ ^a \acute{U}, \acute{E}, \acute{A}, \acute{A}, \text{¢}, \acute{e} \ B$



$fVfXfef\epsilon, \acute{I} \ A', \text{“} _ v0 \ Av1 \ Av2, \delta \text{—} p, \text{¢}, \acute{A} \ \acute{A} \ \%_0, \dot{\iota}\acute{Z}O\acute{S}p\acute{E}, \delta \bullet \%_{0\acute{a}}, \cdot, \acute{e} \ B2'' \acute{O} \text{—}$
 $\acute{U}, \dot{\iota}\acute{Z}O\acute{S}p\acute{E}, \dot{\iota} \bullet \%_{0\acute{a}}, \acute{E}, \acute{I} \ A', \text{“} _ v0 \ Av2 \ Av3, \delta \acute{Z}g \text{—} p, \cdot, \acute{e} \ B$
 $\text{“}W\acute{S}J \ } , \acute{a} \ \acute{I}\acute{E}, \delta \acute{Z}g \text{—} p, \cdot, \acute{e}, \acute{E}, \acute{I} \ \underline{\underline{AD3DTRIANGLE}} \ \backslash \text{¢} \acute{I}, \dot{\iota}w\text{Flags}f \ f\text{“}fo, \acute{E}ftf\%_0fo, \delta \acute{Z}w' \acute{e}, \cdot, \acute{e} \ B$

$fxfNfgf\langle A', _ AfNfH [f^{\wedge}fjIf\langle$

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•ŰŽ 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‰Ä,·,é B,±,ê,Í A3D‰ñ“],Â^ê”Ê“İ,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‰^,Ä,½‰ñ“],ð•\,μ,Ä,¢ ,é B,½,Æ,İ,İfNfH [f^{\wedge}fjIf\langle,Í AŽ²(1, 1, 2),Æ1f‰fWfAf\langle,İ‰ñ“],ðŽ',·,±,Æ,ª,Ä,«„é BfNfH [f^{\wedge}fjIf\langle,İ—ð,É— §,Â î•ñ,ð•ŰŽ ,μ,Ä,¢,é,ª A,»,İ ^‰ö,Í ≠ ¬,Æ•âŠ®,Æ,¢,²,Ó,½,Â,İ'€ i,ðŽÀ s,·,é,Æ,«„Ê”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,Ü,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,ÄŽ²,ðŠî €„Æ,μ,Ä‰ñ“],μ,½Eä A‰ñ“]1,É,æ,Ä,ÄŽ²1,ðŠî €„Æ,μ,Ä‰ñ“],·,é v,± ,Æ,Â, ,é B ”Šw“İ,Ê,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‰^,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 ±— “İ,ÊEvŽŽ,·,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<Ÿ,·,é B,±,İ•û— @,Í A^êE©•jŽG,»,²,ÊE©,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,Ê,Í AŽ²2,ðŠî €„Æ,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 İ'İ,ÊfNfH [f^{\wedge}fjIf\langle,Í,İ,©,Ä,Ä,¢,È,¢ B ± ¬,ð—p,¢,é,Æ A,Ó,½,Â,İ‰ñ“] ,ð'g,Ÿ ±,İ,¹ ACE‰öÊ,Æ,μ,Ä,Ð,Æ,Â,İfNfH [f^{\wedge}fjIf\langle,ð“¾,é,± ,Æ,ª,Ä,«„é B,»,İEä AfXf€ [fY,Ê^Ű s,·,é,½,ß,É ACE³,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•ŰŽ 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“]ŽŽ²,ð'è\langle,·,éxfNfgf\langle,É‰ñ“]'l,ð'Ç‰Ä,μ AD3DRMQUATERNION \‘¢İ,ÄŽ',³,ê,é fNfH [f^{\wedge}fjIf\langle,ÊE‰öÊ,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<...İ,İfŠfjA•âŠ®,ð s,² B

•ŰŽ f, [fh EfAfvfŠfP [fVf±f\langle,Â,Í AfxfNfgf\langle,âfNfH [f^{\wedge}fjIf\langle,ð~μ,²fafXfN,ðŠÊ— ^‰ö,·,é,½,ß A^Ê‰ö,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,^aÄ,«_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 Efhf%oCfo if,fmfNf EfJf%o [Ef,ff<,ì,½,ß j,ÆRGBfhf%oCfo,ì,¢
,,ê,©,ðŽg—p,·,é,±,Æ,^aÄ,«_é B`È%°,ìfZfNfVf‡f“,Ä q,×,ç,ê,Ä,¢,éfpftfH [f}f“fX,Í Af%of“fv Efhf%oCfo,É,Ä,¢
,Ä“K—p,³ê,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,đfƎf“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 AfƎf“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,ÈƎ< ‡f{fŠf... [f€,đf,ff<,É“K—p,μ A,»,ê,đ Å %o,É•İŠ·,·,é,±,Æ,Ä, ,é B,±
 ,İ•İŠ·Ǝ<%oÈ,đŽQ Æ,·,ê,İ Aff [f^‘S’İ,đ–³Ǝø,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,đƎ”è,·,
 é,±,Æ,ª,Ä,«é B’¼ Úf, [fh,Ä,İ **AD3DSTATUS** \‘¢ì,İftf%ofO,đ—~—p,μ,Ä A,±,ê,ç,İ<@”\
 ,đ,Đ,Æ,Ä,İŽÀ sfobftf@’†,É—pˆÓ,·,é B,»,μ,Ä**3DOPCODE**—
 ñ<“Ǝ^,İ**D3DOP_BRANCHFORWARD**f f“fo,đŽw’è,μ AƎ< ‡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_Šf“fO EfpftfH [f}f“fX,ð“¾,é,½,ß,É,Í AfvfŠf~fefBfu,ðfofbf` ^—

,µ AfƎf“f_Šf“fO EfXfe [fg,İ• X,ð,Å,«,é,¾,¯ ,È,-
,·,é B,½,Æ,!,Î A,Ó,½,Â,İfefNfXf`ff,ðŽ ,ÂIfufWfFfNfg,^a, ,é,Æ,« A,Ü,, Å %
,İfefNfXf`ff,ðŽg,▯ŽOŠpƎ`,ðfOf< [fv%»»,µ A'±,Ɖ,Â AfefNfXf`ff,ð•İ X,·,é,½,ß,É•K—
v,ÈfƎf“f_Šf“fO EfXfe [fg,ð Ý'è,·,é B,»,µ,Â A,Ó,½,Â,ß,İfefNfXf`ff,ðŽg,▯
,·,×,Ä,İŽOŠpƎ`,ðfOf< [fv%»»,·,é BDirect3D,ðfTf]

[fg,·,é Å,à'P f,Èfn [fhfEfFfA,Í Afn [fhfEfFfA EfAfufXfgf%»fNfVf‡f“ EfƎfCf,, iHAL j,ð'Ê,µ,Ä AfƎ
f“f_Šf“fO EfXfe [fg,âfvfŠf~fefBfu,İfofbf` ^— ,ð s,▯ Bfofbf`→½—ß,^aƎø—|“I,Å, ,é,Ù,Ç AŽÀ s'†,ÉHAL,^aƎ
Ä,Ñ o,³,è,é,±,Æ,^a ,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 AĚä,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,½Ěä,ìŽOŠpĚ`Í A
D3DTRIFLAG_ODD,ÆD3DTRIFLAG_EVENftf%ofo,ð—p,¢,Ä•Ó,ð◁—L,·,é,±,Æ,ª,Ä,«,é B

fifofbfO 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 ä,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`à,«,ÈŽOŠpĖ`,Íftf%fbfg EfVfF [ffBf“fO Ef, [fh,ÂfĖf“f_Ÿf“fO,·,é B

,Đ,Æ,Â`È ä,lfpfĖfbfg,ðŽg—p,·,é•K—v,ª ,éŠJ”ŽÒ,Í A,Đ,Æ,Â,lfpfĖfbfg,ðf}fXf^ [EfpfĖfbfg,Æ,µ,Ä—
p,¢ A`¼,lfpfĖfbfg,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 ‡,í¹,é,ì,^a— ‘z“l,Å, ,é B

Zfofbftf@

f%of“fv Efhf%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“,“B,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“,“%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”Íİ,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,µ
,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,«,É,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,ç,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,İtrffI Ef f,Š,É‘İ,·,éfXfs [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,ı,È,,Ä,Í,È,ç,È,¢ BfRfs [Ef, [fh,İŒð,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,Äfpfth [f}
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,ı,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,ı,,©,É’á%°,·,é B,±,İ ê ‡,É,à AfVfXfefŒ,İfpfth [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\fiƒ Efrf“fsf...
[f^ ã,Ā3DfOf%oftfBfbfNfX,đŽĀĒ»,·,é,½,ß,ÉMicrosoft,“ñŸ,·,éƒ\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 óŮ,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 Ą,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”ŽŮ,É,Æ,Ā,Ā,Í“é õ,Y [,¢
,à,ĭ,¾,ë,▯ B,µ,©,µ A %o,ß,Ā3Dfvf fOf%of~f“fO,đ s,▯ŠJ”ŽŮ,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”ŽŮ,à AŽn,ß,½,ĭ,©,è,ĭŠJ”ŽŮ,à A,±,ĭSDK,ÉŠŮ,Ů,ê,Ā,¢
,éƒTf“fvfƒ Efr [fh,đ’ ^Ó [,“Ç,ñ,Ā,¢
,½,¾,«,½,¢ BfTf“fvfƒ 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,Ů,ĭfCf“fgf f_fNfVf‡f“,Ā, ,é B,±,±,Ā,Í AMicrosoft,ĭ3D
fOf%oftfBfbfNfX,É‘ĭ,·,éƒ\Ÿf... [fVf‡f“,Æ A3 ŽŸĒ³ ã,ĭ“_,đ‘€ ĭ,·,é,½,ß,É•K—v,È A,¢,,Ā,©,ĭZ 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...
[fgfŠfAfƒ v,đŽQ Ą,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

Žâ,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%oÄŽ<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,İĈöĈ¹,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,□ ,ÉĈö,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%oÄŽ< ó’Ô,Ä,Ê,- ,Ä,à,æ,¢ B,½,Æ,!,Î AftfĈ [fĈ,đfrfWf... fAf< EfIfufWfFfNfg,Æ,µ,Ä’Ç%oÄ,.,é,± ,Æ,à,Ä,«,é B

Direct3DRMWrap

,±,İfIfufWfFfNfg,Í A-Ê,âf fbfVf...
,İfefNfXf`ff Â•W,ðEvŽZ,·,é B

‘½,,İfIfufWfFfNfg,Í A”z—ñfIfufWfFfNfg,ÆĖĂ,Î,ê,é”z—ñ,ÉfOf< [fv%o»,·,é,±,Æ,^aĂ,«,é B”z—
ñfIfufWfFfNfg,É,æ,Ă,Ă AfOf< [fv‘S‘İ,É‘Ě ì,ð“K—p,·,é,±,Æ,^a—e˘Ö,É,È,é B”z—ñfIfufWfFfNfg,ðŽg,²,±
,Æ,^aĂ,«,éCOMfCf“f^ [ftfFfCfX,É,Í AGetElement,ÆGetSizef f\fbfh,^aŠÜ,Ü,ê,Ă,ċ,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,ċ,Ă Ú,μ,,Í A uDirect3DRM”z—
ñfCf“f^ [ftfFfCfX v,ðŽQ Æ,³,ê,½,ċ 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>IDirect3DRMAnimation</u> |
| Direct3DRMAnimationSet | <u>IDirect3DRMAnimationSet</u> |
| Direct3DRMDevice | <u>IDirect3DRMDevice</u> , <u>IDirect3DRMWinDevice</u> |
| Direct3DRMFace | <u>IDirect3DRMFace</u> |
| Direct3DRMFrame | <u>IDirect3DRMFrame</u> , IDirect3DRMVisual |
| Direct3DRMLight | <u>IDirect3DRMLight</u> |
| Direct3DRMMaterial | <u>IDirect3DRMMaterial</u> |
| Direct3DRMMesh | <u>IDirect3DRMMesh</u> , IDirect3DRMVisual |
| Direct3DRMMeshBuilder | <u>IDirect3DRMMeshBuilder</u> , IDirect3DRMVisual |
| Direct3DRMShadow | <u>IDirect3DRMShadow</u> , IDirect3DRMVisual |
| Direct3DRMTexture | <u>IDirect3DRMTexture</u> , IDirect3DRMVisual |
| Direct3DRMUserVisual | <u>IDirect3DRMUserVisual</u> , IDirect3DRMVisual |
| Direct3DRMViewport | <u>IDirect3DRMViewport</u> |
| Direct3DRMWrap | <u>IDirect3DRMWrap</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 fbZ [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**
bjectfCf“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,»,Í’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>IDirect3DRMFrame::GetChildren</u> |
| | <u>IDirect3DRMFrame::GetLights</u> |
| <u><i>IDirect3DRMPickedArray</i></u> | <u>IDirect3DRMViewport::Pick</u> |
| <u><i>IDirect3DRMViewportArray</i></u> | <u>IDirect3DRM::CreateFrame</u> |
| <u><i>IDirect3DRMVisualArray</i></u> | <u>IDirect3DRMFrame::GetVisuals</u> |

fIfufWfFfNfg,ÆŽQ ÆfJfEf“fg

fIfufWfFfNfg,ª ¶ ¬,³,ê,é,Æ A,Â,Ë,É,»,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,Ä 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,ðffofCfX,É‘Ç%oÁ,·,é ê ‡,ì,æ,º,É AfAfvfŠfP [fVf‡f“,ÍffofCfX,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 BIDirect3DRMFrame::AddChildf f\fbfh,ðŽg—p,µ,Ä A ,é efIfufWfFfNfg,©,ç•É,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 A**IDirect3DRMfIfufWfFfNfg**,ð ì ¬,µ AfVfXfef€ EfƎfxf<,İ•İ ”,ðŽg—p,·,é,±,Æ,^a,Å,«,é B,±
,İfCf“f^ [ftfFfCfX,İf f\fbfh,É,Ä,¢,Ä,Í A u**IDirect3DRM** v,ðŽQ Æ,³,ê,½,¢ B

IDirect3DRMfCf“f^ [ftfFfCfX,İf f\fbfh,Í A^È%°,İfIfufWfFfNfg,ð ¶ ¬,·,é,±,Æ,^a,Å,«,é B

fAfjf [fVf‡f“,ÆfAfjf [fVf‡f“ EfZfbfg

fffofCfX

–Ê iface j

ftfƎ [f€

%Šú%»,³,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’èç,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· ^—
,^a s,í,ê,é,©,ð’èç’,.é,à,Ì,Ä, ,é BfAfjf [fVf‡f“,Í ADirect3DRMFrameIfufWfFfNfg ä,Ä“@ ì,.,é,æ,¤
,É Ý’è,.,é,±,Æ,^a,Ä,«é B,±
,Ì,½,ßDirect3DRMAnimationIfufWfFfNfg,Í ADirect3DRMVisual ADirect3DRMLight A,¯,æ,ÑDirect3DRMViewport
fIfufWfFfNfg,ÌÊ’u EÆü,«,lfAfjf [fVf‡f“,âfXfP [fŠf“fO,ÉŽg—p,.,é,±,Æ,^a,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“,^f^fCf€’l99,lf|
fWfVf‡f“ EfL [,ð’Ç‰Ä,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 ‰,lf|fWfVf‡f“ EfL [,Ì,ç,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,ÇÊ’u,ÆEü,«,É•İŠ·,µ A Ä,àß,¢fL [,lfXfP [f<,É Ý’è,.,é BfAfjf [fVf‡f“ EfL
[,ð’Ç‰Ä,.,é f\fbfh,É,¯,¢
,Ä **AIDirect3DRMAnimation::SetTime**,lf^fCf€’l,Í AfAfvfŠfP [fVf‡f“,^,.,Ä,É’Ç‰Ä,µ,½fL [,ÌÊ’u,ÉŠî,Ä,¢
,½”C^Ó,Ì’l,Ä, ,é B

Direct3DRMAnimationSetfIfufWfFfNfg,Í ADirect3DRMAnimationSetfIfufWfFfNfg,ðfOf< [fv‰»,.,é,±
,Æ,^a,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—
“‰»,³,ê,é BfAfvfŠfP [fVf‡f“,Í **AIDirect3DRMAnimationSet::AddAnimation** f\fbfh,ð—p,¢
,ÄfAfjf [fVf‡f“,ðfAfjf [fVf‡f“ EfZfbfg,É’Ç‰Ä,.,é,±
,Æ,^a,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_fŠf“fO,·,é,±
,Æ,^a,Ä,«,«,é BŠef fbfVf...,Í“ÆŽ©,İfNfIfŠfefB,ðŽ ,Á,Ä,Ç,é,^a Af fbfVf...,^a—
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_fŠf“fO “x,ð•İ X,·,é,±
,Æ,^a,Ä,«,é BfffofCfX,İfÇf“f_fŠf“fO ,“x,ðŽæ“¼,·,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,¹,Æ,μ,Ä^μ,¢ A F,Ì•t,¢,½•i ”,ìœðœ¹,ðfTf|
[fg,·,é BfV [f“,ÄŽg,í,ê,é F ”,É,Í §œÄ,^a,È,¢ B,±,Ìf,ff<,Í A8 A16 A24 A32frfbfg,ÌffBfXfvfœfC,Ä—
p,·,é,±,Æ,^a,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,^a—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,^a,Ä,«„é B

f,fmfNf Ef,ff<,Ä,à•i ”,ìœðœ¹,ÍfTf| [fg,³,ê,é,^a A,»,Ì F—v‘f,Í—
³Ž<,³,ê,é B,»,ê,¼,ê,ìœðœ¹,Í AfOfœ [,ìœð“x,Ä Ý’è,³,ê,é B’,“„ìRGBfJf% [,Í<P“x,Æ,μ,Ä%ðŽB,³,ê A ifOf [
EfVfF [ffBf“fO Ef, [fh,Ä,Í j^Ü,È,é—
¾,é,³,Ä’,“„ìŠÔ,ð•âŠ®,·,é Bf,fmfNf Ef,ff<,Ä,Í AfV [f“ ã,ÌIfufWfFfNfg,ì F ”,ª §œÄ,³,ê,é BfVfXfef€
Efpfœfbfg,ì‘ó,«fGf“fgfŠ,ð,·,×,ÄŽg,¢ s,,·,Æ AfVfXfef€“à•”,Ìpfœfbfg Ef}
fl [fWff,Í ÄŽw’è,³,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,^a,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,^a,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 AfffofCfX ì ¬f f\fbfh,ì‘†,Ä,»,Ìfhf%ofCfo,ðŽw’è,μ,È,,Ä,Í,È,ç,È,¢ B

fEfBf“fhfEŠÇ—

³,μ,¢‘€ ì,ð s,σ,½,ℓ,É *AfIfyfœ [fefBf“fO EfVfXfef€*
,©,çWM_MOVE,âWM_PAINT AWM_ACTIVATE*f fbfZ [fW,ðŽó, ¯Žæ,Á,½,Æ,« AfAfvfŠfP [fVf±f“*,Í A**IDirect3**
DRMWinDevice::HandlePaint,“,æ,Ń**IDirect3DRMWinDevice::HandleActivate***f 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 *IDirect3DRMWinDevice* v,ðŽQ Æ,³,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,É,Â,¢,Ä,Í uIDirect3DRMFace v,ðŽQ Æ,³,ê,½,¢ B

IDirect3DRMFrame,ÆIDirect3DRMFrameArrayfCf“f^ [ftfFfCfX

ftfŒ [f€„Æ„¢„□—pŒê„Í AfIfufWfFfNfg„ḷ— ftfŒ [f€„ðŽQ Æ„μ„Ä„¢„é„±„Æ„©„ς—^„Ä„¢
,é B•ŮŽ f„ [fh„É„,„-„éftfŒ [f€„ḷ-ðŠ„„Í AfEfBf“fhfE EfVfXfef€„É„,„-„éEfBf“fhfE„ḷ-ðŠ„„ÉŽ—„Ä„¢
,é BfIfufWfFfNfg„Í A’P„Éf [f<fh<óŠŒ„É’u„©„ê„é„ḷ„Ä„Í„È„ AŠŒ~A„·„éŽQ ÆftfŒ [f€
,Æ„ḷ<óŠŒ“ḷ„ÈfŠfŒ [fVf‡f“fVfbfv i“ŠŒÝŠŒŒW j„ð<L q„·„é„±„Æ„É„æ„Ä„ÄfV [f“„É”z’u„³„ê„é BftfŒ [f€
,ÍfIfufWfFfNfg„ðfV [f“„É”z’u„·„é B„Ü„½ AfrfWf...fAf< EfIfufWfFfNfg„ð^Žḷ„·„é„Æ„«„É„Í AftfŒ [f€
,©„ς^É’u„âŒü„«„ðŽæ“¾„·„é B

•ŮŽ f„ [fh„ḷfV [f“„Í A eftfŒ [f€„ðŽ „½„È„¢ftfŒ [f€ A„Â„Ü„è AftfŒ [f€ŠK‘w„ḷfgfbfv„É„,éftfŒ [f€
,É„æ„Ä„Ä’è<„³„ê„é B„±„ḷftfŒ [f€„Í Af< [fg EftfŒ [f€
,ÆŒÄ„ḷ„ê„é BfV [f“„Í A’¼„ḷ„·„×„Ä„ḷfIfufWfFfNfg„Œ„ḷŽQ ÆftfŒ [f€„à’è<„μ„Ä„¢„é B

fV [f“„Í A’¼„ḷ„·„×„Ä„ḷfIfufWfFfNfg„É„Â„¢„ÄŽQ ÆftfŒ [f€„ð’è<„μ„Ä„¢
,é B’ælfpf%of [f^„ÉNULL„ðŽw’è„μ„Ä**IDirect3DRM::CreateFrame**ŠŒ ”„ðŒÄ„Ň o„μ AfV [f“„ð ì ¬„·„é„±
,Æ„ª„Ä„«„é B

ftfŒ [f€„ð’€ ì„·„é„½„ß„É„Í ADirect3D„ḷ ¶Žè Ä•WŒn„ð— %ð„μ„È„„Ä„Í„È„ς„È„¢ B Ä•WŒn„É„Â„¢„Ä Ů„μ„-
,Í u3D Ä•WŒn v„ðŽQ Æ„³„ê„½„¢ B

ŠŒ~A î•ñ„É„Â„¢„Ä„Í uIDirect3DRMFrame v„ðŽQ Æ„³„ê„½„¢ B

,±„ḷfZfNfvf‡f“„Ä„Í AftfŒ [f€„Æ„»„ḷŽg—p—@„É„Â„¢„Ä à-¾„·„é B

ŠK‘w

•İ•

“®„« if„ [fVf‡f“ j

fR [f<fofbfNŠŒ ”

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,ÆÆü,«,ðŽ,μ,Ä,¢,é B eftfCE [f€,ª’Ú“®,.,é,Æ AŽqftfCE [f€
,à’Ú“®,.,é B

ftfCE [f€,ì’Ê’u,âÆü,«,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€,ÎfWfWf...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€,ðfWfWf...
fAf< EfIfufWfFfNfg,Æ,μ,Ä’Ç%Ä,.,é,Æ,«,É,ì,Ý%Ä^,Ä, ,é B

•İŠ•

$f\text{tf}\in [f\in, \text{îÊ}^{\text{'u,âEü,«},\text{Í A eftf}\in [f\in, \text{©,ç}^{\text{'Š'î"l,É l,,'é,±,Æ,à,Â,«},\text{é B,±,î ê ‡ A üE}^{\text{'İŠ,É,æ,Á,Ä eftf}\in [f\in, \text{©,çŽqftf}\in [f\in, \text{Ö,î}^{\text{'Š'îfxfNfgf<,ðŽæ"¾,µ A eftf}\in [f\in, \text{Ö,î}^{\text{'Š'îfxfNfgf<,ð< ,ß,é B$

•İŠ•,Í4 s4—ñ,î s—ñ,É,æ,Á,Ä•E»³,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

$\text{Žqftf}\in [f\in, \text{É,}^{\text{'-,}}\text{,é Ä•W,ðvchild,Æ,•,é,Æ A}^{\text{'-,}}\text{Ä•W,ð eftf}\in [f\in, \text{Ä•\,}^{\text{'Ž@,Í AŽŸ,î,æ,µ,É'è<^3,ê,é B$

vparent=vchildTchild

Tchild,Í AŽqftf $\in [f\in, \text{î}^{\text{'İŠ• s—ñ,Ä, ,é B$

$\text{Žqftf}\in [f\in, \text{©,çf< [fg_Eftf}\in [f\in, \text{Ü,Ä,î,•,×,Ä,î eftf}\in [f\in, \text{î}^{\text{'İŠ•,Í AŽqftf}\in [f\in, \text{^f [f<fh Ä•W,ð ¶ ¬,•,é}^{\text{'İŠ•,ÆE<,N•t,^,ç,ê,Ä,ç,é B,±$
 $\text{,İf [f<fh}^{\text{'İŠ•,Í AfE}^{\text{'f_fŠf"fo,î'O,É AŽqftf}\in [f\in \text{ ã,İtfWf...fAf< EfIfufWfFfNfg,É'î,µ,Ä"K—$
 $\text{p,}^3,ê,é B\text{Žqftf}\in [f\in, \text{É'î,}^{\text{'•,é'Š'î Ä•W,Í Af,fff< Ä•W,ÆEÄ,î,ê,é,±,Æ,^a, ,é Bf [f<fh}^{\text{'İŠ•,^a s,í,ê,½ Ä•W,Í$
 $\text{Af [f<fh Ä•W,ÆEÄ,î,ê,é B$

$f\text{tf}\in [f\in, \text{î}^{\text{'İŠ•,Í AIDirect3DRMFrame::AddTransform AIDirect3DRMFrame::AddScale AIDirect3DRMFrame::AddRotation AIDirect3DRMFrame::AddTranslation,İŠef f\fbfh,É,æ,Á,Ä A^{¼} \text{Ü'İ X,•,é,±$
 $\text{,Æ,^a,Ä,«},\text{é B,»},\text{ê,¼,ê,İf f\fbfh,É,İD3DRMCOMBINETYPE—ñ<"E^,İf f"fo,ð"n,µ A,Ç,î,æ,µ$
 $\text{,ÉfAfvfŠfP [fVf‡f" ,"}\text{ñ<Ÿ,µ,½ s—ñ,ðE}^{\text{'Ÿ,İftf}\in [f\in, \text{î s—ñ,Æ ‡ ¬,•,é,©,ðŽw'è,•,é B$

$\text{IDirect3DRMFrame::GetRotation,ÆIDirect3DRMFrame::GetTransformf f\fbfh,Í Aftf}\in [f\in, \text{î‰ñ"}\text{Ž}^2,Æ^{\text{'İŠ• s—ñ,ðŽæ"¾,•,é Bftf}\in [f\in, \text{î‰ñ"}\text{,ð}^{\text{'İ X,•,é,É,Í AIDirect3DRMFrame::SetRotationf f\fbfh,ð—~—p,•,é B$

$f [f<fh Ä•W,Æf,fff< Ä•W,ð^{\text{'İŠ•,•,é,É,Í AIDirect3DRMFrame::Transform,ÆIDirect3DRMFrame::InverseTransformf f\fbfh,ðŽg—p,•,é B$

•İŠ•,É,Ä,ç,Ä,î‘ ‡“İ,È îñ,Í Afrf... [f| [fg,É,Ä,ç,Ä à–¾,µ,½fZfNfVf‡f“ u•İŠ• v,Ä“¾,é,±
 $\text{,Æ,^a,Ä,«},\text{é B}^{\text{'İŠ•f,fWf... [f<,É,Ä,ç,Ä,Í A uDirect3DfA [fLfefNf`ff v,ÉŠÜ,Ü,ê,é u}^{\text{'İŠ•f,fWf...$
 $[f< vfZfNfVf‡f“ ,ÄŽæ,è^{\text{'µ,Ä,Ä,ç,é B}^{\text{'İŠ•E}^{\text{'vŽŽ,İST—v,É,Ä,ç,Ä,Í A u3D}^{\text{'İŠ• v,ðŽQ }^{\text{'Æ,}^3,ê,½,ç B$

“®,« if, [fVf‡f“ j

ŠeftfƉ [f€,ÍƉÅ—L,ì%õñ“],â‘¬“x,Å“®, B%õñ“],àˆÚ“®,à,µ,È,ƉftfƉ [f€,Å,Í A,±,ê,ç,ì‘® «,Í0,Å, ,é B,± ,ê,ç,ì‘® «,Í AfV [f“,ðfƉf“f_fŠf“fO,µ,ÄfIfufWfFfNfg,ð“®,©,·‘O,ÉŽg— p,³,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,Œ
,é BfAfvfŠfP [fVf‡f“,“““o~^,µ,½fR [f<fofbfNŠÖ ”,Í Af, [fVf‡f““® «,“K—p,³,é,é‘O,ÉftfŒ [f€
,©,çŒÄ,Ñ o,³,é,é BŠK‘w,É•j ”,ÌftfŒ [f€,ª, ,è A,»,ê,¼,ê,ªfR [f<fofbfNŠÖ ”,ÉŠÖ~A•t,¯,ç,ê,Ä,Œ
,é ê ‡,Í AŽqftfŒ [f€,Ì‘O,É eftfŒ [f€,ªŒÄ,Ñ o,³,é,é B,±,Ì,æ,□
,ÈŠK‘w,Ä,Í AfR [f<fofbfNŠÖ ”,Ì,·,×,Ä,ªŒÄ,Ñ o,³,é,é,Ü,Ä AfŒf“f_Šf“fO,ÍŽÀ s,³,é,É,Œ 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,Œ
,é,Æ Afvf fOf‰of€ Ĭ,Ý,ÌfAfjf [fVf‡f“ EfV [fPf“fX,É V,µ,Œ~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 AfffBfŒfNfVf‡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««Œõ j

fAf“frfGf“fgŒõŒ¹,Í AfIfufWfFfNfg,ìŒü,« A^Ê'u AfT [ftfFfX,ì“Á «,È,Ç,ÆŠÖŒEW,È,-
AfV [f“ ã,ì,·,×,Ä,ð Æ,ç,·Œõ,Ä, ,é BfV [f“,ì,·,×,Ä,ì ê Š,ð““,¶Œõ“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

ffBfŒfNfVf‡fif<

—LŒÛŒðŒ¹,ÍŒÛ,«,ðŽ ,Â,ª A^Ê'u,ÍŽ ,Á,Ä,¢,È,¢ BftfŒ [f€
,ÉfAf^fbf^,³,ê,é,Æ,·,×,Ä,ÌfIfufWfFfNfg,ð““,¶P“x,Ä Æ,ζ,μ AŒðŒ¹,ªfIfufWfFfNfg,©,ζ,,Á,Æ—£,ê,½^Ê'u,É, ,é,æ,
□,ÈŒø‰Ê,ð—^,!,é BffBfŒfNfVf‡fif<ŒðŒ¹,Í A‘¾—z,Ì,æ,□,È‰“,—£,ê,½ŒðŒ¹,ðfVf~f...fŒ [fg,·,é,½,ß,É—~—
p,³,ê,é B

fpf%oƒŒƒ< Ef|fCƒ“fg

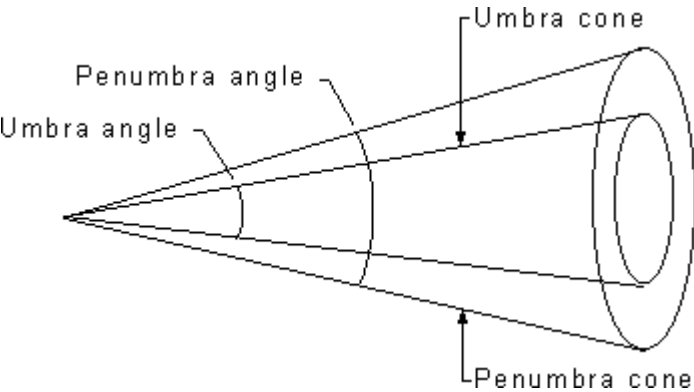
fpf%oƒŒƒ< Ef|
fCƒ“fgŒðŒ¹,Îfpf%oƒŒƒ< Ef%oƒCƒg,ÅfIfufWfFfNƒg,ð Æ,ç,·,ª AŒð,ÌŒü,«,ÍŒðŒ¹,ÌÊ’u,©,çŒ’è,³,ê,é B,Â,Û,è A
fpf%oƒŒƒ< Ef|fCƒ“fgŒðŒ¹,Ê,ÍffBƒŒƒNƒVƒ‡ƒif<ŒðŒ¹,Ì,æ,□,ÉŒü,«ª, ,è A,³,ç,ÉÊ’u,àŽ ,Á,Ä,¢
,é B,½,Æ,,Î Afpf%oƒŒƒ< Ef|fCƒ“fgŒðŒ¹,Ì¼□,Éf fbƒVƒ...,ª, ,é ê ‡ AŒðŒ¹,Ê-Ê,µ,Ä,¢,é,Û,□,Ìf fbƒVƒ...,ª-
¼,é,,Ê,é Bfpf%oƒŒƒ< Ef|fCƒ“fgŒðŒ¹,ÌŒƒƒ“f_Šƒ“fO EfXƒs [fh,Í AffBƒŒƒNƒVƒ‡ƒif<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%ofŒf< 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



IDirect3DRMMaterialfCf“f^ [ftfFfCfX

f}fefŠfAf<,Í AfT [ftfFfX,^a,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,^a,·,é B”½ŽĚ,
Ì—¾,é,³,Í A<“x,Ì Ý’è,É,æ,Á,ÄÆ”è,³,è,é B<“x,Ì’l,Í”½ŽĚ,ÌfnfCf%ofCf^g••^a,Ì‘N—¾“x,ðÆ”è,·,é B<-
“x,^a5,Ì,Æ,«,Íà‘®“I,ÈŠOŠÌ,É,È,è A,»,ê~È ã,Ì’l,Á,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

IDirect3DRMMaterialfCf“f^ [ftfFfCfX,Ìf ffbfh,ÌfŠftf@fÆf“fX,Í A uDirect3DRMMaterial v,ðŽQ Æ,³,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•l%», ,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“f_fŠf“fO,ðŽÄ s, ,é'O,É AIDirect3DRMMeshBuilderfIfufWfFfNfg,ðDirect3DRMMeshfIfufWfFfNfg,É•lŠ•,µ,È
,,Ä,Í,È,ç,È,¢ Bf fbfVf...,ª“S,ªl%»,µ,È,¢ A, ,é,¢,Í-Ä'½,É•l%»,µ,È,¢ ê ‡,Í A,±,l•lŠ•,ªfpftfH [f}f“fX,É—
^,l,é%œ<ç,Í-³Ž<,Ä,«,é“ö“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,!,Í 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,!,Í AfE(f“f_fŠf“fO, ,éfn [fhEfFfA,ª64,jfofCfG,l §EÄ,ðŽ ,Ä,Ä,“,è Af fbfVf...
,lftfCY,ª,»,ê,æ,è,ä,ª,«,¢ ê ‡,É,Í A,±,ê,ç,lfcf“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,lfcf 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“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...,lfcf“fXf^f“fX,ð•i ” ¶ ¬,µ,Ä A,Ð,Æ,Ä,lfcf 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 AÇ» ó,Ä,ÍftfHf“ EfVfF [ftfBf“fO Ef, [fh,Íftf [fg,³,ê,Ä,¢,È,¢ j B,±
,lfcf 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,ÌIfufWfFfNfg,É,ò'Ê,ÈŠî-{fNf%ofX,Ä, ,é BDirect3DRMObjectfIfufWfFfNfg,Í A,·,×,Ä,ÌIfufWfFfNfg,É,ò'Ê,È"Ä «,ð"ð,ì,Ä,¢,é B

Direct3DRMObjectfIfufWfFfNfg,Í ACOMfIfufWfFfNfg,Æ,μ,ÄfCf"Xf^f"X ¶ ¬,ª s,í,ê,é BŠefIfufWfFfNfg,Í AUnknownfCf"f^ [ftfFfCfX,Ê%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"Xf^f"X,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•Ì 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^,ª%ð 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 \¢'Ì,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 \¢'Ì,Ö,Ìf|fCf"f^,ð—

p,¢ AŽžŠÖ,Ì,©,©,¢EŸ òð s,í,,È—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,È-¼'O,ðŠ,,è"—,Ä,½,¢,±,Æ,ª, ,é,¾,è,ð BfIfufWfFfNfg,Ì-

¼'O,ð Ý'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-

Ê,ðfTfufZfbfg,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-Ê,ª,Ç,ç,ç,ÌfOf< [fv,Ê'®,·,©,ðL%—,·,é,½,ß,É AfAfvfŠfP [fVf±f""è',Ìff [f^,ð—p,·,é,±,Æ,ª,Ä,«,é B

fAfvfŠfP [fVf±f",Í AfIfufWfFfNfg,ª"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 æ,·,é,É,Í ADirect3DRMObject::DeleteDestroyCallbackf f\fbfh,ðCEÄ,Ñ o,· B

fR [f<ofbfNŠÖ ",Í AfIfufWfFfNfg,ª"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'Ê'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,^a,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,^a,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,lfgbfv,É,·,é eftfŒ [f€,Í A”z—ñ,ì æ“^a,ÉŠì”[,³,ê,é B

IDirect3DRMShadowfCf“f^ [ftFfCfX

fAfvfŠfP [fVf‡f“,Í A**IDirect3DRM::CreateShadow**f f\fbfh,ðŒÄ,Ñ o,·,¾,¯,Å A %Šú%» Ĩ,Ý,ÌŽg—p%Â”\
,È%A%œ,ð ¶ ¬,·,é,±
,Æ,^a,Ä,«,é B**IDirect3DRMShadowfCf“f^ [ftFfCfX,ì“¶** Ý,É,æ,Ä,Ä A**IDirect3DRM::CreateObject**f f\fbfh,ð—p,¢
,Ä%A%œ,ð ì ¬,·,é fAfvfŠfP [fVf‡f“,Í A,»,Ì %Šú%»,ð**IDirect3DRMShadow::Init**,ðŒÄ,Ñ o,μ,Ä s,□,±
,Æ,^a,Ä,«,é B

IDirect3DRMTexturefCf“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

IDirect3DRMTexturefCf“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,ÌŠÖEW,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,ðEvŽZ,.,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_Šf“fO,·,é,±,Æ,^aÄ,«_é 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•ŮŽ f, [fh,Ä ì—p,³,ê,½—
pCê,Ä, ,é BfffJ [f<,Í Afrf... [f| [fg,Æˆê'v,μ,½<éC`,Éfœf“f_Šf“fO,³,ê,é B,±
,ì<éC`,Í AfrfVfVf‡f“,Æ,μ,Ä AfffJ [f<,ì—§ˆİÊ'u,É,æ,éfXfP [fŠf“fO,%oÄ”,Ä, ,é
BIDirect3DRMTexture::SetDecalSize f\fbfh,ðŽg—p,·,é,Æ Aftfœ [f€
,Éˆİ,μ,ÄˆŠˆİ“I,É'è<,³,ê,½<éC`,©,çfffJ [f<,ìfTfCfY,ð Ý'è,·,é,±
,Æ,^aÄ,«_é B ifAfvfŠfP [fVf‡f“,Í ADirect3DRMTexture::GetDecalSize f\fbfh,É,æ,Ä,ÄfffJ [f<,ìfTfCfY,ð'm,
é,±,Æ,^aÄ,«_é B j,»,ìCã AfffJ [f<,Í•İŠˆ,³,ê A“§Ž<“Š%oe,³,ê,é B

fffJ [f<,ìC““_,Í AfrfvfŠfP [fVf‡f“,©,ç Ý'è,ˆ,æ,ÑŽæ“¼,·,é,±,Æ,^aÄ,«_é B,±
,ê,É,ÍDirect3DRMTexture::SetDecalOrigin,âDirect3DRMTexture::GetDecalOrigin f\fbfh,ð—p,¢,é BE
“_,Í AfffJ [f<,Ì ¶ ã<÷,©,ç,ìfIfzfZfbfg,Ä•,³,ê,é BffftfHf<fg,ìC““_,Í[0, 0]
,Ä, ,é Bfœf“f_Šf“fO,Ì Ů,É,Í AfffJ [f<,ìC““_,Íftfœ [f€,İÊ'u,É ‡,í,¹,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“,ÉŒõ,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,½fefNfXf`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,ìfÆf“f_Šf“fO ,“x,ð ,,ß,éŽè'i,Å, ,é Bf~fbfvf}
fbfv'†,ìftfBf<f^,³,ê,½fCf [fW,âfÆfxf<,Í A'O,ìfÆfxf<,æ,è,à ¬,³,,È,Å,Å,¢, Bf~fbfvf}
fbfv,Í AIDirect3DRMDevice::SetTextureQualityf f\fbfh,ðÆÄ,Ñ 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 uf~fbfvf}fbfv v,ðŽQ Æ,³,ê,½,¢ B

fefNfXf`ff EftfBf<f^fŠf“fO

fefNfXf`ff,ª-Ê,Éf}fbfsf“fO,³,ê,½Œä,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‘ä,«,È W ‡‘ì,© A,D,Æ,Â,ìfefNfZf<,ì ¬·”ª,É‘Š-
,·,é BfsfNfZf<,ÉfefNfZf<,ì‘l,ð•äŠ®,·,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,^afTf| [fg,·,éfJf%o [EfL [,ðŽg—p,·,é•û-@,^a,é
BfJf%o [EfL [,Æ,Í Afuf fbfN“]‘—,âfI [fo [fŒfC‘€ ì,É,·,é A“]‘—Œ³,é,¢,Í“]‘—
æ•”^a,ì F,Û,½,Í F,ì”ÍÍ,Ä, ,é B,±,ê,ç,İ F,Í A,Ä,Ê,É ã ‘,«,³ê,é,æ,▯,É,à AŒ^,µ,Ä•İ X,³ê,È,¢,æ,▯,É,ðŽw’è,·,é,±
,Æ,^a,Ä,«,é B

DirectDraw,İfJf%o [EfL [EfTf| [fg,É,Ä,¢,Ä Ú,µ,,Í A ufJf%o [EfL [fCf“fQ v,ðŽQ Æ,³ê,½,¢ B
ŠÖ`A î•ñ,É,Ä,¢,Ä,Í uIDirect3DRMTexture v,ðŽQ Æ,³ê,½,¢ B

IDirect3DRMUserVisual*fCf“f^ [ftfFfCfX*

*f† [fU EfrfWf...fAf< EflfufWfFfNfg,Í AfV [f“,âfœf“f_Šf“fO,É’Ç%Á,·,é,±
,Æ,^a,Ä,«,é fAfvfŠfP [fVf‡f““è<,İff [f^,Ä, ,é B^ê”Ê“I,É,Í AfJfXf^f}fCfY,³ê,½fœf“f_Šf“fO Ef,fWf...*

*[f<,^aŽg—p,·,é B,½,Æ,,İ 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,^a,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,İ %Šú%»,ð s,□ B*

IDirect3DRMViewport,ÆIDirect3DRMViewportArrayfCf“f^ [ftfFfCfX

f_rf... [f] [fg,Í A3DfV [f“,ªÇ,ìæ,ϩ,É2DfEfBf“fhfE,ÉfEf“f_fŠf“fO,³,ê,é,©,ð'èç`,·,é Bf_rf... [f]
[fg,Í AfIfufWfFfNfg,ªfEf“f_fŠf“fO,³,ê,éfffofCfX ã,ì«É—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_rf... [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

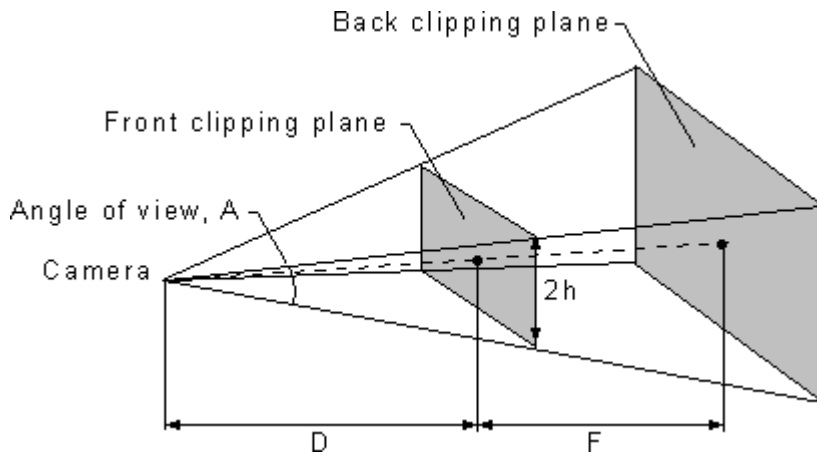
fJf f%

frf... [f] [fg,ÍDirct3DRMFrame,ðfJf f%,Æ,μ,ÄŽg—p,·,é BfJf f% EftfŒ [f€
,Í AfŒf“f_Šf“fO,³,ê,éfV [f“ A•Ž,^Ê'u,“,æ,Ñ•ûŒü,ð'è',·,é Bfrf... [f] [fg,Í AfJf f% EftfŒ [f€
,l ³,lzŽ² ã,É, ,é%oÄŽ<fIfufWfFfNfg,¾,¯,ð AyŽ² ã,l ³•ûŒü,ÉŒf“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,ª,Ä,«é B,±,lf f\fbfh,Í Afrf... [f]
[fg,l^Ê'u A•ûŒü AŒü,«ðfJf f% EftfŒ [f€,É Y'è,·,é BŒ» Y,lJf f%,l Y'è,ðŽæ“¾,·,é,É,Í A
IDirect3DRMViewport::GetCameraf f\fbfh,ðŒÄ,Ñ 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, ,è 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,Ü,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,ðÆvŽZ,•,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,é,é B

•İŠ•

3D À•W,İfIfufWfFfNfg,đ2DfEfBf“fhfE,ÉfƎf“f_ŧŠf“fO,·,é,½,ß,É,Í AfIfufWfFfNfg,đfJf_f%o EftfƎ [fƎ“à,É•İ Š·,µ,È,,Ä,Í,È,ç,È,Ǝ B»,±,Ä A4,Ä,İ—v‘f,đŽ ,Ä“Žĭ,İ À•W[xyzw],đċ ,ß,é,½,ß AŽĚ%oe s—ñ,ª—p,Ǝ ,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,ÍƎã•ûfNfŠfbfv—Ê,Æ,È,é BŽĚ%oe s—ñ,Í A“ŠŽ•İŠ·,İƎã,ÉfIfufWfFfNfg,İfXfP [fŠf“fO,ÆˆÚ“®,đƎċ ‡,µ,½,à,İ,Ä, ,é B

ŽŸ,İ s—ñ,ªŽĚ%oe s—ñ,Ä, ,é B,±,İ“™Ž®,É,“,Ǝ,Ä Ah,ÍŽċ ‘ä,İ”¼ª,İ ,,³ AF,ÍƎã•ûfNfŠfbfv—Ê,İz À•W AD,Í‘O•ûfNfŠfbfv—Ê,İz À•W,đŽ!,µ,Ä,Ǝ,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,Ǝ B

ŽŸ,İ s—ñ,Í AfEfBf“fhfE EfXfP [fŠf“fO,đ s,ª ifXfP [fċ,ÍfEfBf“fhfE,İTfCfY,ÆˆÊ’u,ÉˆĚ‘¶,·,é j B,± ,İƎöŽ®,Ä,Í As,ÍfEfBf“fhfE,İfXfP [fŠf“fOƎW ” Ao,ÍfEfBf“fhfE,İƎ“_,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 ‡ ¬ AƎ¾,ƎŠ·,‘,ê,İP,ÆW,İ İ,Ä, ,é B

$$V = P \bullet W = \begin{bmatrix} s_x & 0 & 0 & 0 \\ 0 & -s_y & 0 & 0 \\ \frac{ho_x}{D} & \frac{ho_y}{D} & \frac{hF}{D(F-D)} & \frac{h}{D} \\ 0 & 0 & \frac{-hF}{F-D} & 0 \end{bmatrix}$$

fXfP [fŠf“fOƎW ”,ÆƎ“_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,ÉˆIˆđ,³,ê,é B

fXfNfŠ [f“ À•W,©,çf [fċfh À•W A,Û,½ċt,Éf_ [fċfh À•W,©,çfXfNfŠ [f“ À•W,ÉfxfNfgfċ,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);
```


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,“%ÅŽ<,È,È,é,Ì,Í A,»,ÌfV [f“,ÌftfŒ [f€,É’Ç%Å,³,ê,½,Æ,«,¾,¯,Å, ,é BfAfvfŠfP [fVf‡f“,Í
AIDirect3DRMFrame::AddVisualf f\bfh,ð—p,¢,ÄfrfWf...fAf< EfIfufWfFfNfg,ðftfŒ [f€
,É’Ç%Å,·,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,^a,Â,«,é Bf%ofbfv,ð ì ¬,.,é,É,Í AfAfvfŠfP [fVf‡f“,Í Af%ofbfv,lf^fCfv,âŽQ Æftfœ [f€ Aœ
‘“ A•ûœüxfNfgf< A ãfxfNfgf<,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,^a, ,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,^aŠÛ,Û,ê,Ä,¢,é B**IDirect3DRMWrap::Apply**,Í AfIfufWfFfNfg,ì’,“_Éf%ofbfv,ð“K—
p,.,é B**IDirect3DRMWrap::ApplyRelative**,Í A“K—p,³,ê,½f%ofbfv,ì’,“_ð•İŠ,.,é B

fTf“fvf<,Ä,Í A•ûœüxfNfgf< ivxfNfgf< j,ÍzŽ²,É%o^,¢ A ãfxfNfgf< iufxfNfgf< j,ÍyŽ²,É%o^,Ä,Ä,¢,é Bœ
‘“_Í[0, 0, 0],Ä, ,é B

IDirect3DRMWrapCf“f^ [ftFfCfX,lf f\fbfh,lfŠftf@fœf“fX,Í uIDirect3DRMWrap** v,ðŽQ Æ,³,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

•½-Ê

%o~’œ

≤...î

fNf f€

f%fbfsf“fO Eftf%fO

D3DRMMAPPINGĖ^,É,Í AD3DRMMAP_WRAPUftf%fO,ÆD3DRMMAP_WRAPVftf%fO,ªŠÜ,Ü,ê,Ä,ċ,é B,±
,ê,ç,İftf%fO,É,æ,Ä,Ä Af%oXf^f%oCfU,ªfefNfXf`ff Ä•W,ð%ð Í,·,é•û—
@,ªĖ`è,³,ê,é Bf%oXf^f%oCfU,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%fbfsf“fO Eftf%fO,İŽg,ċ•û,É,æ,Ä,Ä`Ü,É,é Bftf%oF,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%ˆ,Ä,Ä A%~'Ė ó,©fh [fifc ó,İĖ` ó,©,İ,æ,□
,Éf%fbfvfAf%oEftf“fh,³,ê,é B

f%fbfsf“fO Eftf%fO,ªfZfbfg,³,ê,Ä,ċ,È,ċ•½—Êf%fbfsf“fO Ef, [fh,Ä,Í Au,Ü,½,İv Ä•W,ÄŽw'è,³,ê,½•½—
Ê,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%ß,·,é B

D3DRENDERSTATE_WRAPU,Ü,½,ÍD3DRENDERSTATE_WRAPV,İ,ċ
,,ê,©,ªfZfbfg,³,ê,½ ê ± AfefNfXf`ff,İ%~Žü1.0,İ I,İ,è,İ,È,ċ
%~“ªĖ`È,É,È,é B1.0`È ä,İfefNfXf`ff Ä•W,Í Af%fbfv,³,ê,Ä,ċ,È,ċ“ÍÍ“à,Ì,Ý—LĖø,Ä, ,é BfefNfXf`ff Ä•WŠ
Ö,İ Ä'Z<—£,İf%fbfsf“fO Eftf%fO,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%ß,·,é B

D3DRENDERSTATE_WRAPU,ÆD3DRENDERSTATE_WRAPVftf%fO,İ—
¼•û,ªfZfbfg,³,ê,½,Æ,«,Í AfefNfXf`ff,İ%~ŠÄ'İ ifh [fifc j ó,É,È,é BfVfXfef€,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%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%~'Ė ó,Éf%fbfv,·,é,½,ß,Éf%fbfsf“fO Eftf%fO,ðfZfbfg,·,é B,Đ,Æ,Ä,İ—Ê,ÉfefNfXf`ff,İ”¼•“È ä,ªŽg
—p,³,ê,é ê ±,É,Í Af%fbfsf“fO Eftf%fO,Í Ý'è,µ,È,ċ B

•½-Ê

•½-Êf%ofbfv,Â,Í AfefNfXf`ff,Í AfIfufWfFfNfg ã,ÉfXfgfƎfbf`,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

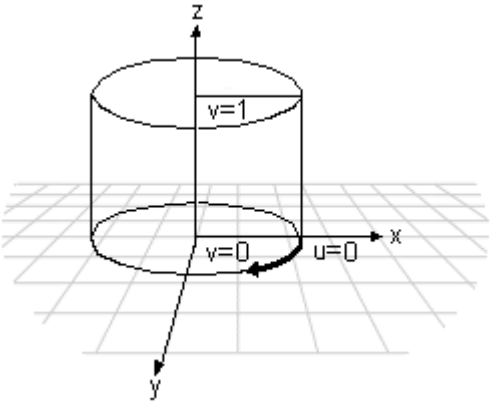
u=SuX-Ou

v=Svy-Ov

,±,ê,ç,ÌƎöŽ®,É,“,ç,Ä As,ÍfEfBf“fhfE,ÌfXfP [fŠf“fOƎW ” Ao,ÍfEfBf“fhfE,ÌƎ“_,ðŽ!,μ,Ä,ç
,é BfAfvfŠfP [fVf‡f“,Í A1‘g,ÌfXfP [fŠf“fOƎW ”,Æ Au,“,æ,Ñv,ª—LƎø,È'l,ðŽæ,é,æ,ϣ,Éx,Æy,ð0,©,ç1,Ì”ÍÍ,Éf}
fbfv,·,é,½,ß,ÌfIftfZfbfg,ðƎ~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,ª,Á,Ä,¢
,é BfIfufWfFfNfg,Í%o~Žü,ì'†%o>,É"z'u,³,ê AfIfufWfFfNfg,ìfT [ftfFfX,É ‡,í,¹,ÄfefNfXf`ff,ª•İŒ`,³,ê,é B
%o° },Í A%o~'ŒfefNfXf`ff Ef}fbfv,É,¨,´,éŠefxfNfgf<,ìŒø%oÊ,ðŽ'!,μ,½,à,ì,Â, ,é B



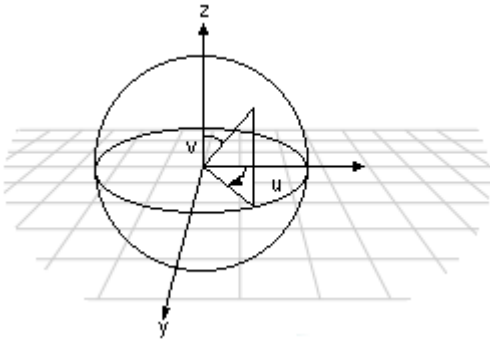
•ûŒüfxfNfgf<,Í%o~'Œ,ìŽ²,ðŽ'!,μ A ãfxfNfgf<,Í%o~<,ìŠO'ϱ,ìu = 0,Â, ,é“_,ðŽ'!,· BfVfXfef€,Í AfxfNfgf<[x y z]
,É'Î,·,éfefNfXf`ff,ì[u v] Â•W,ðŒvŽZ,·,é,½,ß,É AŽŸ,ì“™Ž®,ðŽg—p,·,é B

$$u = \frac{s_u}{2\pi} \tan^{-1} \frac{x}{y} - o_y$$
$$v = s_v z - o_v$$

'Ê í Au,ÍfXfP [fŠf“fO,³,ê,È,¢,Ü,Ü,Â, ,é Bv,ª—LŒø,È'l,ðŽæ,é,æ,ϱ,Éz,ð0,©,ç1,ì”Í'Í,Éf}
fbfv,μ,Â Av,ìfXfP [fŠf“fO,Æ•İŠ·,ª 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

$$u = \frac{S_u}{2\pi} \tan^{-1} \frac{x}{y} - o_u$$
$$v = \frac{S_v}{\pi} \tan^{-1} \frac{z}{\sqrt{x^2 + y^2 + z^2}} - o_v$$

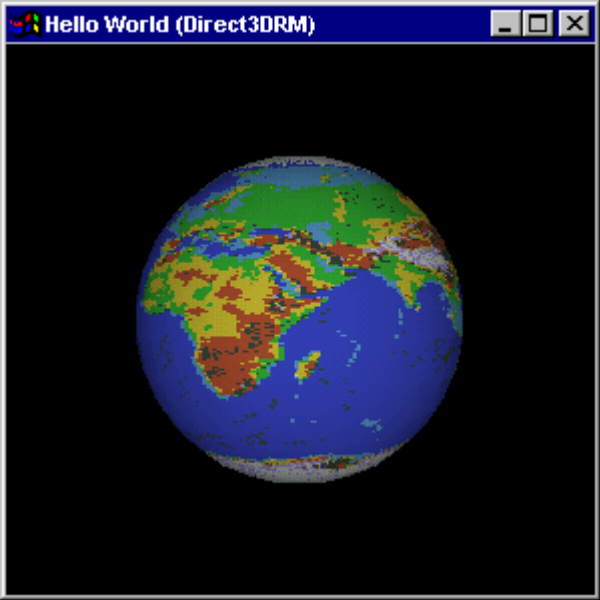
,±,±,Â,Í AfXfP [fŠf“fO,³,ê,Â,c,È,¢u,Æv,ì”Íí,Í,Â,È,É0,©,ç1,Â, ,é,½,ß AfXfP [fŠf“fOEW ”,ÆfefNfXf`ff,ìÆ
“_,Í•K—v,Æ,³,ê,È,c,±,Æ,ª“½,¢ B

fNf f€

fNf f€ Ef%ofbfv,Í AfefNfXf`ff,^afIfufWfFfNfg 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,^af%ofbfv,³,ê,Ă,ĉ,Ă,à Af fbfVf...,É”½ŽĚĈø%Ĉ,^a—^,,! ,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,Ìfrrfbfgf}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,¢,-
,Â,© 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,ìê•”,Ä, ,éGlobeTf“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 AGlobeTf“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, world!” ,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^fefBfbfN Ef%oCfuf%oŠ

Direct3D,ì•ŮŽ f, [fh EfAfvfŠfP [fVf‡f“,Í AfXf^fefBfbfN Ef%oCfuf%oŠWinmn.lib,ÆD3drm.lib,ðfŠf“fN,·,é•
K—v,^a, ,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,Ì,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,³,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,Ü,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•È,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,Ü,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,Ü,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 ”,Í 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,»,İÆä ADirect
Draw,âDirect3D,đ—p,¢,éfAfvfŠfP [fVf‡f“,É“Á—L,İ ^— ,đ s,¤ B

InitAppŠÖ ”,Í A,Ü,Æ,» Ý,İffBfXfvfÆfC,İfsNfZf“—,½,è,İrfbfg ”,đŽæ“¾,·,é B,±
,İl,Í AfAfvfŠfP [fVf‡f“,afÆf“f_Šf“fO,İiŽ,đ Ý’è,·,é Ü,ÉŽg—p,³,è,é B Ü,µ,-
,Í ufÆf“f_Šf“fO EfXfe [fg,İ Ý’è v,đŽQ Æ,³,è,½,¢ B

,»,İÆä A,Ç,İDirect3Dfhf%oCfo,ª—LÆø,Ä, ,é,©,đÆ”è,µ A“K Ø,Èfhf%oCfo,đ‘I’đ,·,é,½,ß,É Af [fJf‘èç,İEnum
DriversŠÖ ”,đÆÄ,Ñ o,· Bfhf%oCfo,İ—ñ“,É,Ä,¢,Ä Ü,µ,,Í A ufffofCfX Efhf%oCfo,İ—
ñ“ v,đŽQ Æ,³,è,½,¢ B

ŽÝ,É ADirect3DRMCreateŠÖ ”,đÆÄ,Ñ o,µ AIDirect3DRMfCf“f^ [ftfFfCfX,đ Ì ¬,·,é B,±
,İfCf“f^ [ftfFfCfX,Í 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,đÆÄ,Ñ o,·,Æ,«,ÉŽg—
p,³,è,é B

DirectDrawClipperfIfufWfFfNfg,Í A3DfV [f“,İ%ÄŽ“•ª,đ §Æä,·,éfNfŠfbfsf“fO fvfÆ [f“,İŠÇ—
,đŠÈ’P,É,·,é BHelwold.c,Ä,Í AIDirectDrawClipperfCf“f^ [ftfFfCfX,đ Ì ¬,·,é,½,ß,ÉDirectDrawCreateClipperŠÖ
”,đÆÄ,Ñ o,µ AIDirectDrawClipper::SetHWndf ffbfh,đŽg—
p,µ,Ä AfNfŠfbfsf“fO îñ,đŽæ“¾,·,éfEfBf“fhfE,İfnf“fhfç,đ Ý’è,·,é B

,»,µ,Ä Af [fJf‘èç,İCreateDevAndViewŠÖ ”,đÆÄ,Ñ o,µ ADirect3DffofCfX,Æfrf... [f] [fg,đ Ì ¬,·,é B,±
,İŠÖ ”,É,Ä,¢,Ä Ü,µ,,Í ufffofCfX,Æfrf... [f] [fg,İ Ì ¬ v,đŽQ Æ,³,è,½,¢ B

Direct3DfAfvfŠfP [fVf‡f“,afTf [fg,·,é,·,×,Ä,İ \‘ç,İ,İ %Šú%»,ªŠ@—1,·,é,Æ A3DfV [f“,đ ×,©, \ ¬,·,é,±
,Æ,ª,Ä,«,é,æ,¤,É,É,é B,±,İ ^— ,İMySceneŠÖ ”,ª s,Ä,Ä,¢,é BMySceneŠÖ ”,É,Ä,¢,Ä Ü,µ,,Í ufffofCfX,Æfrf...
[f] [fg,İ Ì ¬ v,đŽQ Æ,³,è,½,¢ B

ÄÆä,ÉInitAppŠÖ ”,Í 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,·,×,Ä,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,İffBfXfvfEfC,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,·,é fAfvfŠfP [fVf‡f“,Í A•K,, A—LÆø,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,¢
,ÄÆÂ X,É à~¾,·,é B

EnumDriversŠÖ ”

enumDeviceFuncfR [f<fofbfNŠÖ ”

BPPToDDBDfwf<fpŠÖ ”

EnumDriversŠÖ ”

EnumDriversŠÖ ”,Í AInitAppŠÖ ”,ªAfvfŠfP [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‰ [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‰Cfo,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 Ä,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‰Cfo,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‰Cfo,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‰Cfo‘I’ðfR [fh,ð ‰Šú‰»,·,é,½,ß ACurrDriver,É
// -¹,ð Ý’è,µ Afhf‰Cfo,ð—ñ‹,·,é B

myglobs.CurrDriver = -1;
lpD3D->lpVtbl->EnumDevices(lpD3D, enumDeviceFunc,
&myglobs.CurrDriver);

// ,È,,Æ,—LÆØ,Èfhf‰Cfo,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,Ĭ,±,ĭŠÖ ”,É AfCf“fXfg [f<,3,ê,Ā,Ĉ,éŠeDirect3Dfhf%oCfo,ĭŽ`•ĒŽq,Ā—¼‘O A,,æ,Ñfn [fhfEfFfA,ĀfGf~f...fĈ [fg,3,ê,½fhf%oCfo,Ĭ”——
Ĭ,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%oCfo,Ĭ,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,Ĭ «”,đ’2,×,é B

ŽŸ,É AfR [f<fofbfNŠÖ ”,Í A—ñ<“,3,ê,½fhf%oCfo,^Ĉ» Y,ĭfJf%o [Efrfbfg ”,ĀfĈf“f_Šf“fO,đ s,±,±
,Ā,^,Ā,«,,é,Ĉ,±,Ĉ,đ”»’è,,é B*s%oĀ”,Ē ê ±,ĬD3DENUMRET_OK,đ•Ö,μ A,»,ĭfhf%oCfo,ĒŠÖ,,éŽc,è,Ĭ ^—
,đfXfLfbfv,μ,Ā AŽŸ,ĭfhf%oCfo,Ĭ—ñ<“,đ’±,,é BfR [f<fofbfNŠÖ ”,Í Af [fJf<’è`^,ĭBPPToDDBDŠÖ ”,đ—
p,Ĉ A’Ē’m,3,ê,½fJf%o [Efrfbfg ”,Ā AĭnitAppŠÖ ”,Ā,ĭ**GetDeviceCaps**ŠÖ ”,ĭĈĀ,Ñ o,μ,Ē,é,Ā,Ā,ĀŽæ“¼,3,ê,½ F
%ođ’æ“x,Ā,đ”ăŠr,,é ĭBPPToDDBD,ĭbits-per-pixel to DirectDraw bit-depth,Ĭ—
^,Ā, ,é j BPPToDDBDŠÖ ”,ĭfR [fh,Ē,Ā,Ĉ,Ā,Ĭ A uBPPToDDBDfwf<fpŠÖ ” v,đŽQ Ā,3,ê,½,Ĉ B

—ñ<“,3,ê,½fhf%oCfo,Ē,Ā,Ĉ
,ĀŠĒ’P,ĒfefXfg,đ s,Ā,½ĈĀ,Ĭ **AD3DDEVICEDESC** \‘Ĉ’Ĭ,Ĭ¼,ĭf f“fo,đ”»’è,,é BfR [f<fofbfNŠÖ ”,Í Af\ftfgfE
fFfA fGf~f...fĈ [fVf±f“,æ,è,àfn [fhfEfFfA,đ Af,fmfNf Ef%oCfg,æ,è,àRGBf%oCfg,đ’T’đ,,é B

////////////////////////////////////
//
// enumDeviceFunc
// Žg—p%oĀ”,ĒD3Dfhf%oCfo,Ĭ—¼‘O,ĀGUID,đL%o^,,éfR [f<fofbfNŠÖ ” B
// fhf%oCfo,đ’T’đ,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%oCfo,ĭfn [fhfEfFfA,Ā, ,é
    static BOOL mono = FALSE;    // Ĉ» Y,ĭŠJŽnfhf%oCfo,ĭf,fmfNf ĈĈĈĈ^,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,Ĭ A,±,ĭfhf%oCfo,^fĈf“f_Šf“fO,đ s,Ĭ,Ē,Ĉ ê ± A
    // fhf%oCfo,đfXfLfbfv,μ,Ā—ñ<“,đ’± s,,é B

    if (!(lpDesc->dwDeviceRenderBitDepth & BPPToDDBD(myglobs.BPP)))
        return D3DENUMRET_OK;

    // ,±,ĭfhf%oCfo,Ĭ—¼‘O,ĀGUID,đL%o^,,é B

    memcpy(&myglobs.DriverGUID[myglobs.NumDrivers], lpGuid,
        sizeof(GUID));
    strcpy(&myglobs.DriverName[myglobs.NumDrivers][0], lpDeviceName);

    // f\ftfgfEfFfA,æ,è,àfn [fhfEfFfA,đ Af,fmfNf ĈĈĈĈ^,æ,è,àRGBĈĈĈĈ^,đ’T’đ,,é B

    if (*lpStartDriver == -1) {

        // ,±,Ē,^ Ā %o,Ĭ—LĈĈ,Ēfhf%oCfo,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);
}

```

BPPToDDBDfwf<fpŠÖ ”

```
enumDeviceFuncfR [f<fofbfNŠÖ ”,Í ABPPToDDBDfwf<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 uenumDeviceFuncfR [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

fffofCfX,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 ”ÆEQ,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,½ĖĀ ADirectDrawClipperfIfufWfFfNfg,Æ‘İđ,³,ē,½fhf%ofCfo A,“,æ,ÑfNf%ofCfAf“fg‘éĖ,İ ĩ-@,đfpf%of [f^,Æ,μ,Ä ACreateDevAndViewŠÖ ”,đĖÄ,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,Ė,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,İĖÄ,Ñ o,μ,ÄŽg,İ,ē,é BCreateDevAndViewŠÖ ”,İ AffofCfX,İ· ,â ,³,İ îñ,đ Žó,~Žæ,Ä,½ĖĀ A**IDirect3DRM::CreateViewport**f f\fbfh,đĖÄ,Ñ o,μ,Ä**IDirect3DRMViewport**fCf“f^ [ftFfCfX,đŽæ“¾,·,é B

ŽŸ,ĖCreateDevAndViewŠÖ ”,·**IDirect3DRMViewport::SetBack**f f\fbfh,Ė,æ,Ä,Äfrf... [f] [fg,İĖĀ·ŭfNfŠfbfv-Ė,đ Ÿ‘è,·,é,Æ Af [fJf‘è‘,İSetRenderStateŠÖ ”,“ĖÄ,Ñ o,³,ē,é BSetRenderStateŠÖ ”,Ė,Ä,¢,Ä,İ AŽŸ,İZfNfVf‡f“ ufĖf“f_fŠf“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 EftfĖ [fĖ,đŽg,Ä,ÄD3DRMfrf... [f] [fg,đ Ì Ñ,·,é B”wĖİ,İ [,³,đ‘â,«,Ė ”,Ė
    // 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;
    }

    // fĖf“f_fŠf“fO,İ·iŽĭ A“h,è,Ä,Ô,μf, [fh AĖđĖ¹,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“,Â, ,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,đfIf“ 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::SetQuality f\fbfh,İŒÄ,Œ o,µ,đ s,ç B,±
,İ,Œ,« AfBfU Ef, [fh,âfefNfXf`ff,İ•İŽđ,đ•İ X,.,é•K—v,ª, ,éfAfvfŒŒP [fVf‡f“,Í
AIDirect3DRMDevice::SetDither f\fbfh,âAIDirect3DRMDevice::SetTextureQuality 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,ŒAIDirect3DRM::SetDefaultTextureShades f\fbfh,đŒÄ,Œ o,µ,Ä,ç,é B

////////////////////////////////////
//
// SetRenderState
// fŒf“f_ŒŒf“fO,İ•İŽđ,Œ%ŒŒœ 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%ŒŒœf, [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;
 }

 // fBfU 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,İfBfg ”,ÉŒİ,Ä,ç,Ä A%ŒŒœf, [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;
}

```

fEf“f_Šf“fO Ef< [fv

WinMainŠÖ ”,Í AŽŸ,İftfE [f€,đ•`%œ,·,é,½,ß ARenderLoopŠÖ ”,đEÄ,Ñ o,· BRenderLoopŠÖ ”,Í A,¢,-
,Ä,©,İ’P f,È ^— ,đŽÄ s,·,é B

IDirect3DRMFrame::Move f\fbfh,đEÄ,Ñ o,µ AŠK‘w%°,İ,·,×,Ä,İftfE [f€,İ%ñ“],â‘¬“x,İ“K—p,đ s,□ B

IDirect3DRMViewport::Clear f\fbfh,đEÄ,Ñ o,µ AE» Ý,İfrf... [f| [fg,đ”wEi F,ÄfNfŠfA,·,é B

IDirect3DRMViewport::Render f\fbfh,đEÄ,Ñ o,µ AE» Ý,İfV [f“,đfrf... [f| [fg,ÉfEf“f_Šf“fO,·,é B

IDirect3DRMDevice::Update f\fbfh,đEÄ,Ñ o,µ AfEf“f_Šf“fO,³,ê,½fCf [fW,đfXfNfŠ [f“,ÉfRfs [,·,é
B

////////////////////////////////////
//
// RenderLoop
// frf... [f| [fg,đfNfŠfA,µ,ÄŽŸ,İftfE [f€,đfEf“f_Šf“fO,µ AfEfBf“fhfE,đ X V,·,é B
//
////////////////////////////////////

```
static BOOL
RenderLoop()
{
    HRESULT rval;

    // E» Ý,İfV [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,ÉfEf“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%oCfo,l̇I'ð A3DfffofCfX,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€ AŒö,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 ”,Í**Direct3DRMFrame::AddVisual**f f\bfh,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,µ**Release**f f\bfh,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 ADirect3DRM::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,Ň o,µ AHelworld.c,ªŽg,¼ftfŒ [fŒ
,İÊ’u,ÆŒü,«,ð Ý’è,·,é BSetMyPositionsŠÖ ”,İ A,±,İ ^—
,ðIDirect3DRMFrame::SetPosition,“,æ,ŇIDirect3DRMFrame::SetOrientation/ f\fbfh,İŒÄ,Ň o,µ,É,æ,Ä,ŽÄ s,·,é
BIDirect3DRMFrame::SetRotationf f\fbfh,İ A<...‘İ,ªÇ%Ä,³,ê,éftfŒ [fŒ,É%ñ“],ð Ý’è,·,é B

////////////////////////////////////
//
// SetMyPositions
// ŒöŒ¹ AfJf f% Af [f<fh EftfŒ [fŒ,İÊ’u,ÆŒü,«,ð Ý’è,·,é B
// <...‘İ,İ%ñ“],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...
,đf [fh,µ AfZfbfg,·,é,½,ß,ÉMakeMyMeshŠÖ ”,đĖÄ,Ñ o,· BMekeMyMeshŠÖ ”,ÍIDirect3DRM::CreateMeshBuild
derf f\fbfh,đĖÄ,Ñ o,µ,ÄIDirect3DRMMeshBuilderfCf“f^ [ftFfCfX,đ ¶ ¬,·,é BŽŸ,É AIDirect3DRMMeshBuild
er::Load AIDirect3DRMMeshBuilder::Scale A,»,µ,ÄIDirect3DRMMeshBuilder::SetColorRGBf f\fbfh,đĖÄ,Ñ o,µ
ASphere3.xftf@fCf<,ª Ž,·f fbVf...,đ—p`Ó,·,é iSphere3.xftf@fCf<,Í AfTf“fvf< EfR [fh,ªŽg—
p,·,éf ffbfA,İ,Đ,Æ,Ä,Æ,µ,ÄDirectX SDK,ÉŽû^,³,ê,Ä,¢,é j B

////////////////////////////////////
//
// MakeMyMesh
// MeshBuilderfIfufWfFfNfg,đ ì ¬,µ Af [fh AfXfP [fŠf“fO Af fbVf...,İ F•t,¬,đ s,□ B
//
////////////////////////////////////

void MakeMyMesh(LPDIRECT3DRMMESHBUILDER * lpSphere3_builder)
{
    lpD3DRM->lpVtbl->CreateMeshBuilder(lpD3DRM, lpSphere3_builder);

    (*lpSphere3_builder)->lpVtbl->Load(*lpSphere3_builder,
        "sphere3.x", NULL, D3DRMLOAD_FROMFILE, NULL, NULL);

    (*lpSphere3_builder)->lpVtbl->Scale(*lpSphere3_builder,
        D3DVAL(2), D3DVAL(2), D3DVAL(2));

    // —\zŠÖ,İfefNfXf`ff EfufEf“ffBf“fO,đ”đ,¬,é,½,ß A<...‘İ,đ”,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);

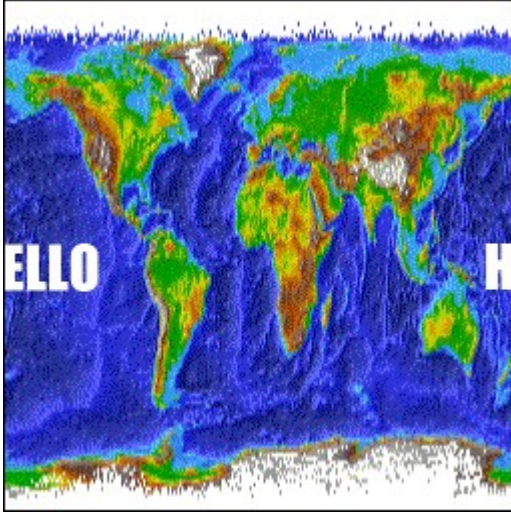
    maxy = box.max.y;
    miny = box.min.y;
    height = maxy - miny;

    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 ”,ðĈÄ,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,ðĈÄ,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,ðĈÄ,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,±,lfSDK,ÉŠÜ,Ü,ê,Ä,¢,éfTf“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

ffofCfX IDirect3DDevicefCf“f^ [ftfFfCfX

fn [fhEfFfA EffofCfX

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 sfofbtf@ IDirect3DExecuteBufferfCf“f^ [ftfFfCfX

’,“_ff [f^,ÌfŠfXfg,ÆfCEf“f_Šf“fO•û—@,ÌŽwŽ’

fCEf“f_Šf“fO,ÍŽÀ sfofbtf@,É,æ,Ä,Ä s,í,ê,é B,±,Ìfofbtf@,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 sfofbtf@ COMfIfufWfFfNfg,É,Í Af|fCf“f^,Æ Afofbtf@ EftfH [f}fbfg,É,Ä,¢,Ä,Ì à¬
¼,¼,¬,ªŠÜ,Ü,ê,Ä,¢,é B,±,Ìfofbtf@,Í“@“I,ÉŠm•Ů,³,ê 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

| | COMfCf“f^ [ftfFfCfX | \‘¢’ì | fnf“fhf< |
|---------------|---------------------|-------|----------|
| ffofCfX | ~ | | |
| fefNfXf`ff | ~ | ~ | ~ |
| f}fefŠfAf< | ~ | ~ | ~ |
| CEöCE¹ | ~ | ~ | |
| tf... [f [fg | ~ | | |
| s—ñ | ~ | ~ | ~ |
| ŽÀ sfofbtf@ | ~ | ~ | |

Direct3DIfufWfFfNfg

,±,lfZfNfVf±f“,Å,Í ADirect3D,lfIfufWfFfNfg,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,^a,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,³,ê,éfIfufWfFfNfg,Í Afrf... [f] [fg AĈðĈ¹ Af}
fefŠfAf< A,„æ,ŃfffofCfX,ìfŠfXfg,ðŠŮ,ñ,Ā,¢
,é BIDirect3D**,ìf f\fbfh,Í A‘¼,ìfIfufWfFfNfg,ð ì ¬,μ,½,è ADirect3DfffofCfX,ðĈ©,Ā, ¯,é,½,ß,ÉŽg—p,·,é,±**
,Æ,^a,Ā,«,é B

IDirect3DDeviceCf“f^ [ftFfCfX

IDirect3DDeviceCf“f^ [ftFfCfX,Í ADirectDrawSurfaceIfufWfFfNfg,Ö,lfCf“f^ [ftFfCfX,Ä, ,é B IDirect3DDeviceCfCf“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_Efobftf@,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,lfffofCfX EfIfufWfFfNfg,Í AfCf“f^ [ftFfCfX EfŠfXfg,É‘¶ Ý,µ i,.,é,ĉ ,Í u’®,µ v j AŽ© g,ìŽÄ sfobftf@,Æfrf... [f] [fg,lfŠfXfg,ðŽ ,Ä,Ä,ĉ,é B,Ü,½ AfefNfXf`ff,âf} fefŠfAf<,lfŠfXfg,àŠÜ,ñ,Ä,“,è A,»,è,ĉ,ÍfŠfXfg’t,ìŽŸ,lfefNfXf`ff,âf}fefŠfAf<,Ö,lfCf“f^,Æ A‘O,lfffofCfX,Ö,lfCf“f^,ì—¼•û,ð•ŮŽ ,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 [fhfEfFA”—Í,ð’Ê’m,µ Afrf... [f] [fg EfŠfXfg,ìŮŽ 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

IDirect3DTexturefCf“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

IDirect3DTexturefCf“f^ [ftfFfCfX,Í ADirectDrawSurfaceIfufWfFfNfg,Ö,ÌfCf“f^ [ftfFfCfX,Ä, ,é BIDirect3DText
urefCf“f^ [ftfFfCfX,ð ¶ ¬,‚,é,É,Í AIDirectDrawSurface2::QueryInterface f\fbfh,ðŽg—
p,µ,ÄIID_IDirect3DTexture,ðŽw`è,‚,é BDirect3D,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 AIDirect3DTexturefCf“f^ [ftfFfCfX,ì ì ¬•û—
@,Æ AIDirect3DTexture::GetHandle,¬,æ,ÑIDirect3DTexture::Loadf 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,ÌfCf“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 AIDirect3DTexturefCf“f^ [ftfFfCfX,ªŽg—p,Ä,«,é B

,±,ÌfZfNfVf±f“,Ä,Í ADirect3D,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,α,±,Æ,ª,Ä,«,é B

fefNfXf`ff À•W,Ì%ð Í,Ì•û-

@,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,Ê,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,¢•û,É,æ,Ä,Ä~Û,È,é B`O q,Ìftf%oF,ì•Ð•û, ,é,¢,Í—

¼•û,ªfZfbfg,³,ê,é,Æ A¼ ü,Í Au,Û,½,Ív•ûEü,ÌfefNfXf`ff,Ì•Ö,É%ˆ,Ä,Ä A%o~`E ó,©fh [fifc ó,ÌE` ó,ðŽ ,Ä,©

,Ì,æ,α,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,Û,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,Í.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,Û,½,ÍD3DRENDERSTATE_WRAPV,Ì,¢

,,ê,©,ªfZfbfg,³,ê,½ ê ‡ AfefNfXf`ff,Ì%~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~Û,È,é BD3DRENDERSTATE_WRAPU,ªfZfbfg,³,ê,Ä,¢

,é,Æ,«,Í A“(0.1, 0.1),©,ç(0.9, 0.9),Û,Ä,Ì Á`Z,ì¼ ü,Í A“_ i0, 0.5 j,ð`Ê%ß,·,é B

D3DRENDERSTATE_WRAPU,ÆD3DRENDERSTATE_WRAPVftf%oF,Ì—

¼•û,ªfZfbfg,³,ê,½,Æ,«,Í AfefNfXf`ff,Ì%~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),Û,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,ÉŽû,ß,½,Æ,µ,Ä,à A,»,Ì,Æ,«,Ì“® ì,Í•Û 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 Ú,µ,Í A ufCf“fgf f_NfVf‡f“:

Direct3D,Ì•ÛŽ f, [fh EfIfufWFfFNfg v,Ì uDirect3DRMWrapCf“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“f_fŠf“fO EfXfe [
fg,ð—p,¢,ÄŽw'è,·,é B

D3DRENDERSTATE_TEXTUREMAPBLENDfŒf“f_fŠf“fO EfXfe [fg,Å,Í AfefNfXf`ff EfufŒf“ffBf“fO,ìf^
fCfv,ðŽw'è,·,é,±,Æ,ª,Å,«,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,ðŽÅŒ»,·,é ê ‡,ÉŒø%œÊ“l,Å, ,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—@,Å, ,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“f_fŠf“fO EfXfe [
fg,ðŽg—p,·,é B ¬ FfIfvfVf‡f“ i ¬ Fftf@fNf^ l,ÆŒÄ,Î,ê,é j,Í AD3DBLEND—ñ“Œ^,ÉŽ',³,ê,Ä,¢,é B

f~fbfvf}fbfv

f~fbfvf}fbfv,Æ,ÎˆAˆ±

,μ,½^{efNfXf`ff,ðŽ|,μ} AŠ^{efNfXf`ff,Í} A“^{¯,¶fCf} [fW,É^{tfBf<f^,ð,©,¯,Ä} ™ X,É’á%ð‘œ“x,É,μ,½,à,Ì,Å, ,é B
f~fbfvf}fbfv,Í AÆ^{vŽZ} ã’á^{fRfXfg,É}^{efNfXf`ff,ÌfÆf“f_Šf“fO} ,“x,ð ,,ß,éŽ^{è’i,Å}, ,é B^{f~fbfvf}}
fbfv’†,Ì^{tfBf<f^,³,ê,½fCf} [fW,â^{fÆfxf<,Í} A‘O,Ì^{fÆfxf<,æ,è,à} ¬,³,,È,Á,Ä,¢, B

D3DTEXTUREFILTER—ñ“^{Æ^,Ì“K} Ø,È^{tfBf<f^} Ef, [fh,ðŽ^{w’è,μ,Ä}^{efNfXf`ff} E^{tfBf<f^fŠf“fO,ð} s,□
,Æ,« Af~fbfvf}fbfv,ðŽ^{g—p,·,é,±,Æ,ª,Ä},«^{,é} B^{ffofCfX,ª,Ç,Ì}^{f^Cfv,Ì}^{f~fbfvf}fbfv,ðfTf|} [fg,μ,Ä,¢
,é,©,ð’m,é,É,Í **AD3DPRIMCAPS** \‘¢‘^{Ì,Ì}^{dwTextureFilterCapsf} f“fo,ªŽ^{‘,μ,Ä,¢,é}^{tf%ofo,ðf`fFfbfN,·,ê,Î,æ,¢} B

DirectDraw,Ä,Ì^{f~fbfvf}fbfv,Ì} 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`ffflf<,â iD3DRENDERSTATETYPE—

ñ<“Æ^,ì jD3DRENDERSTATE_BLENDENABLEfÆf“f_Šf“fO EfXfe [fg,ð—p,¢,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,¢,Í“]—

æ•”ª,ì F,Û,½,Í F,ì”ÍÍ,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,¢,æ,²,É,àŽw’è,·,é,±
,Æ,ª,Â,«,é B

DirectDraw,ìfJf‰ [EfL [EfTf| [fg,É,Â,¢,Ä Ú,µ,,Í ufJf‰ [EfL [fCf“fO v,ðŽQ Æ,³,ê,½,¢ B

IDirect3DMaterialfCf“f^ [ftFfCfX

IDirect3DMaterialfCf“f^ [ftFfCfX,ð ¶ ¬,·,é,É,Í AIDirect3D::CreateMaterial f\fbfh,ìĖÄ,Ñ o,µ,ð s,▫ BŽŸ,ì
—á,Í AIDirect3DMaterialfCf“f^ [ftFfCfX,ì ¶ ¬•û—@,ðŽ!,µ,Ä,ĉ
,é B,»,µ,Ä AIDirect3DMaterial::SetMaterial,âIDirect3DMaterial::GetHandlef f\fbfh,ð—p,ĉ Af}
fefŠfAf<,ì Ý’è,Æfnf“fhf<,ìŽæ“¾,ð s,Ä,Ä,ĉ,é B

```
lpDirect3D->CreateMaterial(  
    lpDirect3DMaterial, // V,µ,ĉf}fefŠfAf<,Ö,ìf|fCf“f^  
    pUnkOuter); // NULL  
lpDirect3DMaterial->SetMaterial(  
    lpD3DMat); // D3DMATERIAL \‘ĉ‘Ì,Ö,ìf|fCf“f^  
lpDirect3DMaterial->GetHandle(  
    lpD3DDevice, // DIRECT3DDEVICE \‘ĉ‘Ì,Ö,ìf|fCf“f^  
    lpD3DMat); // D3DMATERIAL \‘ĉ‘Ì,Ö,ìf|fCf“f^
```

f}fefŠfAf<fIfufWfFfNfg,ÍfCf“f^ [ftFfCfX EfŠfXfg,ÉŠÜ,Ü,ê,Ä,“,è AfffofCfX EfŠfXfg’†,ìŽŸ,ìf}
fefŠfAf<,Ö,ìf|fCf“f^,Æ AŠÖ~A•t,¬,ĉ,ê,½ffofCfX,Ö,ìf|fCf“f^,ì—¼•û,ðŽ ,Á,Ä,ĉ,é i,±,ìŠK‘w \‘ĉ,É,Ä,ĉ,Ä Ú,µ,-
,Í ufIfufWfFfNfg,ìĖ< ‡ « v,ðŽQ Æ,³,ê,½,ĉ j Bf}
fefŠfAf<,É,Í F,*ŠÜ,Ü,ê,Ä,“,è AfefNfXf`ff Efnf“fhf<,ðŽ ,Á,Ä,ĉ,é ê ‡,à, ,é Bf}
fefŠfAf<fnf“fhf<,Í AŽÀ sfofbftf@,ì†,ÄŽg,í,ê,½,è Afrf... [f] [fg,ì”wĖi,ð Ý’è,·,é,½,ß,ÉŽg—
p,³,ê,é **BIDirect3DMaterial**fCf“f^ [ftFfCfX,ð—p,ĉ,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 A**IDirect3D::CreateLight**f f\fbfh,đĈĈ,Ń o,· BŽŸ,ì—
á,Í**IDirect3DLight***fCf“f^ [ftfFfCfX,ì ì ¬•û—@,đŽ,μ,Ä,ĸ
,é B,Ŭ,½ A ì ¬Ĉă,É,Í**IDirect3DLight::SetLight**f f\fbfh,đĈĈ,Ń o,μ AĈđĈ¹,đ Ý’è,·,é B**

```
lpDirect3D->CreateLight(  
    lpDirect3DLight, // V,μ,ĸĈđĈ¹,Ŏ,Ìf|fCf“f^  
    pUnkOuter);      // NULL  
lpDirect3DLight->SetLight(  
    lpLight);        // D3DLIGHT \‘ĸ‘Ì,Ŏ,Ìf|fCf“f^
```

ĈđĈ¹f|fufWfFfNfg,ÍfCf“f^ [ftfFfCfX EfŠfXfg,Æf_rf... [f| [fg EfŠfXfg,ÉŠŬ,Ŭ,ê,Ä,ĸ
,é B**IDirect3DLight***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 à¾,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 \‘Ć‘İ,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 EfTfofCfX 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

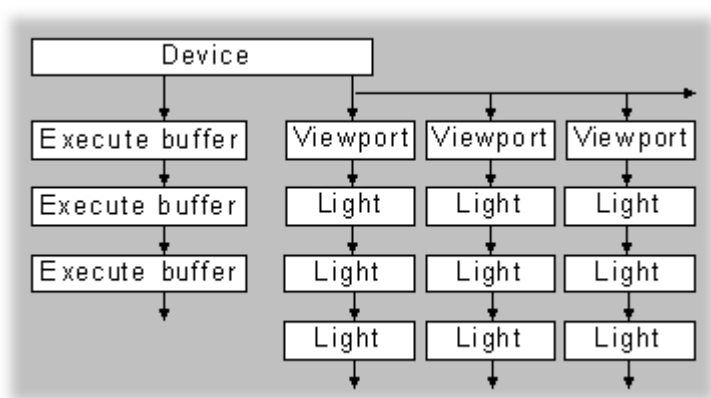
```
lpD3DExBuf->Lock(  
    lpDesc);.          // DIRECT3DEXECUTEBUFFERDESC \‘Ć‘İ,Ö,Ìf|fCf“f^  
// .  
// . Store contents through the supplied address  
// .  
lpD3DExBuf->Unlock();  
lpD3DExBuf->SetExecuteData(  
    lpData);           // D3DEXECUTEDATA \‘Ć‘İ,Ö,Ìf|fCf“f^
```

,±,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,·fAfhfCfX,©,ç,ÌŠ‘ÎÊ‘u,ÄŽw’è,.,é B

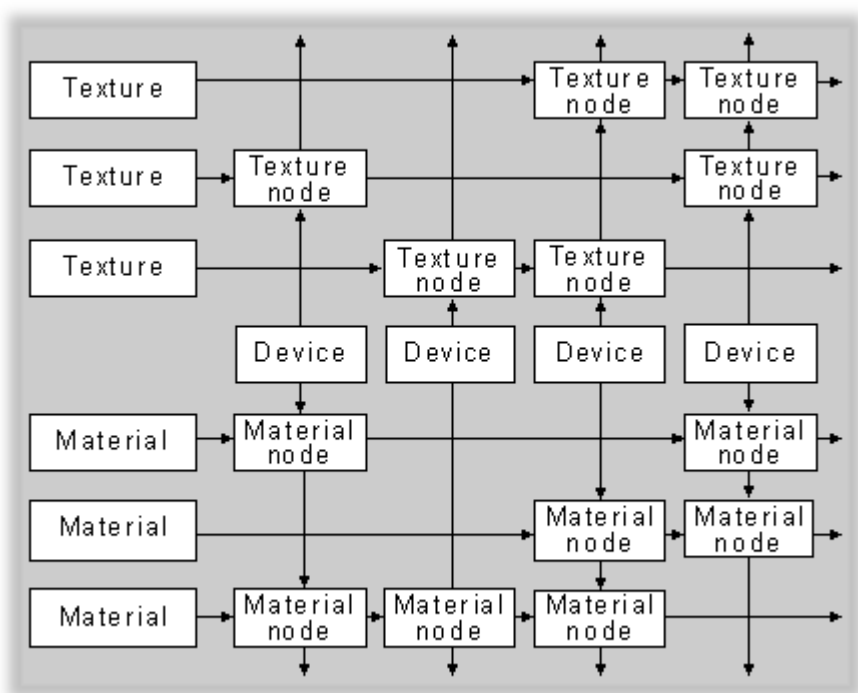
ŽÀ sff [f^,ÌŽæ“¾,â Ý’è Af fbfN AfAf“f fbfN A Ä“K%» A,“,æ,ÑŽÀ sfofbftf@,ÌEÿ Ø,ð s,□
,É,Í AIDirect3DExecuteBufferCf“f^ [ftFfCfX,ðŽg—p,.,é B

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

%oA-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,È 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,-

,Ä,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,ÄŽÂ 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 ‡,Ä,à A•j ”%oñ,Ê“n,Ä,Ä

IDirect3DDevice::BeginScene,âIDirect3DDevice::EndScene f\fbfh,ðŒÄ,Ñ o,µ,Ä,Í,Œ

, ,È,Œ BfAfNfZf%ofŒ [f^,Ê,æ,Ä,Ä,Í A%oA-Ê ÁŽ,Ì,½,ß,¾, ,Ä,È,-

A , ,“x,ÈŒŒf“f_fŠf“fOŒø%oÊ,ðŽÂŒŒ»,·,é,½,ß,Êfv [f“ EfLfffvf`ff,ð—~p,·,é ê ‡,ª, ,é B,½,Æ,!,Í AfV [f“
EfLfffvf`ff,ðfTf| [fg,µ,½fAfNfZf%ofŒ [f^,Ê,Í A%oe,â”¼“Œ—¾fIfufWfFfNfg,ðfŒf“f_fŠf“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,^a,Å,«,È,¢ ê ‡,^a,,é B,±,Ì §ŒÄ,ðŽ ,ÅfAfNfZf%œ [f^,Í ADirectDraw,Ì”\—
ÍfrfbfgDDCAPS2_NO2DDURING3DSCENE,É,æ,Å,ÄŽ!,³,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,^a 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,·,éXfefbfv,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,l̃àŠÜ,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,ÉÍ,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,éŒf“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,İfEfBf`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 Ú³,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 ",^a s,[□] Å %
,İf^fXfN,İ Af [fJf<,É'è<,³,ê,½AppInitŠÖ ",ðĖÄ,Ñ o,μ AfAfvfŠfP [fVf‡f“ EfEfBf“fhfE,ð ì ¬,μ 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,μ Af [fJf<'è<,İRenderLoopŠÖ ",ÆCleanupAndPostQuitŠÖ ",ðĖÄ,Ñ o,· BAppInitŠÖ ",İ
A ^— ,ð•â«·,·,é¼,İŠÖ ”ĖQ,ðĖÄ,Ñ o,μ A,±,ê,ç,İŠÖ ",İ A,³,ç,É•Ê,İŠÖ ”ĖQ,İĖÄ,Ñ o,μ,ð s,[□] B,±,İf`f...
[fgfŠfAf<,İ,Û,Æ,ñ,Ç,İ A %Šú%»ŠÖ ",İfOf< [fv,É,Ä,Ç,ÄŽæ,è^μ,Ä,Ä,Ç,é B
WindowsfAfvfŠfP [fVf‡f“,İ•W €“I,È %Šú%» ^—
,ðŽÄ s,μ AfOf [fof•İ ",ðfftHf<fg,İ Ý'è,Ä %Šú%»,μ,½Ėä AAppInitŠÖ ",İInitSceneŠÖ ",ðĖÄ,Ñ o,· B
3Dmain.cpp,ðŽg,□ŠefTf“fvf<,İ A,»,ê,¼,èInitSceneŠÖ ",ðfCf“fvfŠf f“fg,μ,È,,Ä,İ,È,ç,È,Ç BOct1.c,İ,æ,□
,È'P f,ÈTf“fvf< EfAfvfŠfP [fVf‡f“,Ä,İ AInitSceneŠÖ ",İ%½,à,¹,, ATRUE,ð•Ö,·,¾,¯,Ä, ,é BTunnel.c,È,Ç A,à
,Ä,Æ•;ŽG,ÈTf“fvf<,Žg,□InitSceneŠÖ ",İ Af f,fŠ,ðŠm•Û,μ A“_ð ¶ ¬,μ AfOf [fof•İ ",ðŽæ“¾,·,é B
ÄĖä,ÉAppInitŠÖ ",İ AD3dmain.cpp,ÉfCf“fvfŠf f“fg,³,ê,Ä,Ç
,éCreateD3DAppŠÖ ",ðĖÄ,Ñ o,· BCreateD3DAppŠÖ ",É,æ,Ä,ÄĖÄ,Ñ o,³,ê,éŠÖ ”ĖQ,İ A %Šú%» ^— ,İ½,-
,İ••,ðŽó,¯Ž ,Ä,Ä,Ç,é B

Step 2: DirectDraw, æ, Ñ Direct3D IfufWfFfNfg, Ì ì ñ

D3dmain.cpp, Ì CreateD3DAppŠÖ ”, Ì AfŒf“f_Šf“fO, ŠJŽn, ³, é, O, É DirectDraw, Æ Direct3D IfufWfFfNfg, ð %Šú%»
., é-ðŠ„, ðŽ „, Æ B CreateD3DAppŠÖ ”, Æ Ä, Ñ o., f [fJf, ŠÖ ”, Ì, ð, ç d—
v, È, à, Ì, Ì AD3DAppCreateFromHWND AD3DAppGetRenderState AOverrideDefaults AD3DAppSetRenderState AReleaseView AInitView, Ì ŠeŠÖ ”, Æ, é BD3DApp, ÄŽn, Ü, é-¼O, Ì ŠÖ ”, Ì AD3DAppfVfŠ [fY, Ì fwf, fpŠÖ ”, Ì è•”, Æ, é B

WinMainŠÖ ”, É“n, ³, é, éfRf}f“fh Ef%oCf“ EfIfvfVfƒf“, Æ““, Ì, à, Ì, Ì A CreateD3DAppŠÖ ”, É, à“n, ³, é, é B—
LŒø, ÈfIfvfVfƒf“, Ì A-systemmemory, Æ-emulation, Ä, é B-systemmemoryfIfvfVfƒf“, Ì AfffofbfO è—p, È—p, Ç
., ç, é, é B-
emulationfIfvfVfƒf“, ðŽw’è, ., é, Æ AfAvfVfŠfP [fVfƒf“, Ì DirectDraw, Æ Direct3D, Ì fn [fhEfFfA EfAfNfZf%oCf [f^
., ðŽg—p, Ì, È, Ç B

CreateD3DAppŠÖ ”, Ì AfefNfXf`ff, ð ¶ ñ, ., é, ½, Ì, È D3DAppAddTextureŠÖ ”, ð Ä, Ñ o., B, ., é, Æ AD3DAppAddTextureŠÖ ”, Ì Af\ [fX EfefNfXf`ff, ð fT [ftFfX, ÆfIfufWfFfNfg, ð fVfXfef€ Ef f, fŠ“à, È ¶ ñ, ., é B fn [fhEfFfA, ð frffl Ef f, fŠ, ðŽ „, Ä, Ç
., é è ƒ, Ì A %Šú óÖ, Ä, Ì ó, Ì fefNfXf`ff EfT [ftFfX, ð frffl Ef f, fŠ“à, È ¶ ñ, ., é B f\ [fX EfefNfXf`ff, Ì A“]— æ, Ì fefNfXf`ff EfT [ftFfX, Èf [fh, ³, é, ½, È Ä, Ä”jŠü, ³, é, é B, ±
., Ì 2iŠK, Ì fvf fZfX, È, æ, Ä, Ä AfffofCfX, Ì Afrffl Ef f, fŠ, È“]—, ³, é, é, Æ, «, È fefNfXf`ff Ef}
fbfv, ð³ k, Ü, ½, Ì ÄftfH [f}fbfg, ., é, ±
., Æ, Ì, Ä, «, é BfTf“fvf, EfR [fh, Ä, Ì A Direct3DTexturefCf“f^ [ftFfCfX, ðŽæ“¼, ., é, ½, Ì, È IDirectDrawSurface::QueryInterface f\fbfh, ð Ä, Ñ o., Ì A IDirect3DTexture::Loadf f\fbfh, ð—p, Ç
., Ä fefNfXf`ff, ð f [fh, ., é B fefNfXf`ff Efnf“fhf, Ì fŠfXfg, ð Ì ñ, ., é, È, Ì A IDirect3DTexture::GetHandlef f\fbfh, ðŽg—p, ., é B

fefNfXf`ff, Ì fŠfXfg, ð Ì ñ, Ì, ½, È Ä A CreateD3DAppŠÖ ”, Ì AfŒf“f_Šf“fO, Ì ŠJŽn, È•K—
v, È DirectDraw, Æ Direct3D IfufWfFfNfg, ð ¶ ñ, ., é BfTf“fvf, EfR [fh, Ä, Ì AD3DAppCreateFromHWND fwf, fpŠÖ ”, ðŽg—p, Ì, Ä, Ç
., é BD3DAppCreateFromHWNDŠÖ ”, Ì Af\ [fX Eftf@fCf<D3dapp.c AD3dcalls.c ATexture.c Addcalls.c, ÈfCf“fvfŠf f“fg, ³, é, Ä, Ç, è ŠÖ ”ŒQ, ð—~—p, ., é B

, Ü, , AD3DAppCreateFromHWNDŠÖ ”, Ì A DirectDrawEnumerate, Æ DirectDrawCreateŠÖ ”, ð—p, Ç
., Ä DirectDrawIfufWfFfNfg, Ì ¶ ñ, Æ %Šú%»», ð s, ð B, ±, ±
., ÄfOf [fof, Ì“” Ì, ð Y’è, Ì A IDirectDraw::EnumDisplayModesf f\fbfh, ð Ä, Ñ o., Ì, Ä ffbfXfvfŒfC Ef, [fh, ð—ñ““, ., é B

V, Ì, Ç AfAvfVfŠfP [fVfƒf“, Ì ½, Ì, Ì A IDirectDrawfCf“f^ [ftFfCfX, Ì ä, Ì, è, È IDirectDraw2fCf“f^ [ftFfCfX, ð—~—p, ., é B, ±, Ì fhfLf...f f“fg, Ì fTf“fvf, EfR [fh, Ì A IDirectDrawfCf“f^ [ftFfCfX, ðŽg—p, Ì, Ä, Ç
., é BfŠftf@fŒf“fX, Ì fZfNfVfƒf“, Ì A IDirectDrawf f\fbfh, ð², ×, é, Æ, «, Ì A V, Ì, Ç fo [fWfƒf“, Ì f f\fbfh, ðŽQ Œ, ³, é, ½, Ç B, Ä, Ü, è A IDirectDraw::EnumDisplayModes, Ì ä, Ì, è, È IDirectDraw2::EnumDisplayModes, ð², ×, é, Ì, æ, Ç B

ŽY, È AD3DAppCreateFromHWNDŠÖ ”, Ì Direct3D IfufWfFfNfg, ð ¶ ñ, Ì A Direct3DffofCfX Efhf%oCfo, ð—ñ““, ., é B Direct3D IfufWfFfNfg, Ì ¶ ñ, È, Ì A IID_IDirect3DfCf“f^ [ftFfCfX, Ì Ž~•ÈŽq, ð“n, Ì, Ä IDirectDraw::QueryInterface f\fbfh, ð Ä, Ñ o., BffofCfX Efhf%oCfo, ð—ñ““, ., é, È, Ì A IDirect3D::EnumDevicesf f\fbfh, ðŽg—p, ., é B

, Ì, ©, Ì A IDirect3D::EnumDevices, Ì Ä, Ñ o., Ì, Ì A Direct3DffofCfX Efhf%oCfo, ð Ä, Ñ, ., é, ½, Ì, Ì Ä, àŠÈ’P, Ä Ä—Ç, È•û—@, Ä, ., é, Æ, È ¾, Ì, È, Ç B’¼ Úf, [fh, Ì AfAvfVfŠfP [fVfƒf“, Ì, Ü, Æ, ñ, Ç, Ì A—
ñ“f< [f“f“, Ì fZfbfgfAfbfv, Ì ä, Ì, è, È IDirect3D::FindDevicef f\fbfh, ð—~—p, ., é B, ±, Ì f f\fbfh, Ì A—
., Ü, Ì, Ç fffofCfX, Ì“—, Ì Žw’è, ., é, ¾, ., Ä AfVfXfef€, ðŽg—p%Ä”\, È fhf%oCfo, ð², × A Ä %o, Èf}
fbf, Ì, ½ fffofCfX, Ì Ž~•ÈŽq iGUID j, ð•Ö, . BfVfXfef€, Ì, Ä, È, È Ä %o
., È fn [fhEfFfA, ð f ffbfN, Ì A fn [fhEfFfA, Æ f ftfgfEfFfA, Ì—¼•û, Ì fffofCfX, ð—v< , ³, é, ½, “—, Ì, ð fTf|
[fg, ., é è ƒ, Ì A fn [fhEfFfA EfffofCfX, Ì GUID, ð•Ö, . B

ffofCfX Efhf%oCfo, Æ ffbfXfvfŒfC Ef, [fh iftf<XfNfŠ [f“, © EfBf“fhfE, © j, ð 1’ð, Ì, ½, È Ä AD3DAppCreateFromHWNDŠÖ ”, Ì A, »., Ì ffbfXfvfŒfC Ef, [fh, Ì, ½, Ì, Ì ftf f“fg Efobf tf@, Æ fobfN Efobf tf@, ð Ì ñ, ., é B AfAvfVfŠfP [fVfƒf“, ð EfBf“fhfE, Ä“@ Ì, ., é, © ftf<XfNfŠ [f“, Ä“@ Ì, ., é, © A, Ü, ½ Afrffl Ef f, fŠ, Æ fVfXfef€ Ef f, fŠ, Ì, Ç, ç, ðŽg—p, ., é, ©, È, æ, Ä, Ä Afr [fh, Ì“—e, Ì Ü, È, Ä, Ä, -
., é BfEfBf“fhfE, ÄŽÄ s, ³, é, é AfAvfVfŠfP [fVfƒf“, Ä, Ì A IDirectDraw::CreateClipperf f\fbfh, ð Ä, Ñ o., Ì, Ä DirectDrawClipperf IfufWfFfNfg, ð ¶ ñ, Ì A IDirectDrawClipper::SetHwndf f\fbfh, È, æ, Ä, Ä IfufWfFfNfg, ð EfBf“fhfE, È ŠÖ A•t, — A IDirectDrawSurface::SetClipperf f\fbfh, È, æ, Ä, Ä ftf f“fg Efobf tf@, È AfAfbf, ., é B

ŽY, È D3DAppCreateFromHWNDŠÖ ”, Ì ftf f“fg Efobf tf@, È fpfŒfbfg, ð Y’è, ³, é, Ä, Ç, é, ©, Ç, ð
., ©, ð fFfbfN, ., é B Y’è, ³, é, Ä, Ç, é è ƒ, È, Ì A, »., Ì pffŒfbfg, ð %Šú%»», ., é B Ä %o
., È IDirectDraw::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%ð’æ“x,Æ A“K Ø,ÈffBfXfvfCfC 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 Ä,³,ê,½,¢ B

fffofCfX ì ¬fR [f<fofbfNŠÖ ”,İfZfbfgfAfbfv,ªŠ@— ¹,·,é,Æ AD3DAppCreateFromHWNDŠÖ ”,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 BD3DAppCreateFromHWNDŠÖ ”,İ Aftf f“fg Efofbftf@,ÆfofbfN Efofbftf@,İ<éE`,ðfNf%oCfAf“fg — ĩæ’S`İ,É Ý’è,·,éfg [fJf<ŠÖ ”,ðEÄ,Ñ o,μ AfAvfŠfP [fVf‡f“,ª %oŠú%»,³,ê AfCf“f_Šf“fO,ªŽÄ s,Ä,«,é,± ,Æ,ðŽ!,·ftf%ofo,ð Ý’è,μ,Ä ATRUE,ð•Ö,· B

D3DAppCreateFromHWNDŠÖ ”,İ ÄEä,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 AfffBfXfvfCfC Ef, [fh,Æ<’²fCfxf<,ðfŠfZfbfg,·,é B,»,μ,Ä A ¶ ¬,³,ê,½,·,×,Ä,İDirect3DfIfufWfFfN fg,ÆDirectDrawfIfufWfFfNfg,ð%ð•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,Ä`, `,é` `BAfterDeviceCreatedŠÖ` ”, `İDirect3Dfrf...` [`f`]
`[fg,ð` `ì` `¬,µ` `A,»`, `ê,ðD3DAppCreateFromHWNDSÖ` ”, `É•Ö`, `·` `B`

`Å` `%o,É` `IDirect3D::CreateViewportf` `f\fbfh,ðÆÄ,Ñ` `o,µ,Äfrf...` [`f`]
`[fg,ð` `ì` `¬,µ` `AIDirect3DDevice::AddViewport`, `É,æ,Ä,¢,ç,İ,ñ` `V,µ,¢Direct3DffofCfX,Éfrf...` [`f`]
`[fg,ð’Ç%oÄ,·,é` `BD3DVIEWPORT` `\‘¢’İ,İ’†,İfrf...` [`f`] [`fg,İfTfCfY,ð` `%oŠú%o»`, `µ,½Æä` `Afrf...` [`f`]
`[fg,ð,»`, `İfTfCfY,É` `Ý’è`, `·,é,½,ß,É` `AIDirect3DViewport::SetViewportf` `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 ì ¬,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,© ì ¬,µ %Šú%»,·,é Bf}fefŠfAf<,ð ì ¬,·,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 ì ¬,µ A Ý’è,·,é,½,ß,É AInitViewŠÖ ”,ÍMAKE_MATRIXf}fNf ,ðŽg—p,·,é BMAKE_MATRIXf}
fNf ,ÍD3dmacs.h,ÄŽŸ,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
ŽŸ,ÉInitViewŠÖ ”,Í AŽÀ sfofbtft@,î ì ¬,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 ì ¬,µ A“à
—e,ð Ý’è,·,é,½,ßIDirect3DExecuteBuffer::Lockf f\fbfh,É,æ,Ä,Äfobtft@,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€ ì,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
tft@,ðfAf“f fbfN,µ AIDirect3DExecuteBuffer::SetExecuteDataf f\fbfh,É,æ,Ä,Äfobtft@,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“„Ÿžè ‡,ð—p,¢,é Bf}fefŠfAf<,î ì ¬,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’l,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@—
î,·,é,Æ AInitViewŠÖ ”,Í•É,îŽÀ sfofbtft@,ð ì ¬,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, BD3DAppCreateFromH
WNDŠÖ ”,Í AD3dapp.c,©,çD3DAppISetRenderStateŠÖ ”,ðĈÄ,Ñ o,· B^ê”Ê“I,ÉfTf“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 Ý'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 Ý'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 Ý'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 Ý'è,.,é B ÄCEä,É AIDirect3DDevice::BeginScene AIDirect3DDevice::Execute AIDirect3DDevice::EndScenef 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 ”,©,çĖĂ,Ń o,³,ê,éCreateD3DAppŠÖ ”,Í ADirect3DfAfvfŠfP [fVf‡f“,İ“y‘ä,İ,Ù,Æ,ñ,Ç ,đ ì ¬,·,é,ª A,»,ê,Ā I,í,è,Ā,Ī,Ē,Ĉ BD3dmain.cpp,ªĈĖf“f_Šf“fO Ef< [fv,đĖĂ,Ń o,‘O,É ACreateD3DAppŠÖ ”, Ī, ,Æ ,μ,İf^fXfN,đŠ@—¹,μ,Ē,,Ā,Ī,Ē,ç,Ē,Ĉ B

CreateD3DAppŠÖ ”,Ī AĖ» Ý,İĈĖf“f_Šf“fO EfXfe [fg,đfAfvfŠfP [fVf‡f“ Ef [fJf<,ĒD3DAppRenderState \‘ĈĪ,ĒfRfs [,μ,½Ėă AOverrideDefaultsŠÖ ”,đĖĂ,Ń o,· BOverrideDefaultsŠÖ ”,Ī AD3dmain.cpp,đŽg— p,·,é,·,×,Ā,İfAfvfŠfP [fVf‡f“,ªfTf| [fg,μ,Ē,,Ā,Ī,Ē,ç,Ē,ĈŠÖ ”,İ,Đ,Æ,Ā,Ā, ,é BOverrideDefaultsŠÖ ”,Ā,Ī,Ù,Æ,ñ,Ç %½,à s,í,Ē,ĈfAfvfŠfP [fVf‡f“,à, ,é B,½,Æ,!,İOct1.cfTf“fvf<,Ī AffftfHf<fg,İf^fCfghf<•Žš—ñ,đ"Octagon D3D Example",Ē‘u,«Š,·,é,¾,–,Ā, ,é B

ŽŸ,ÉCreateD3DAppŠÖ ”,Ī AD3DAppSetRenderStateŠÖ ”,đĖĂ,Ń o,· BD3DAppSetRenderStateŠÖ ”,Ī A•Ů‘Ź,³,ê,½f Ĉf“f_Šf“fO EfXfe [fg,İ ó‘Ō,đf`fFfbfN,μ A i,à,μĈĖf“f_Šf“fO EfXfe [fg,Ē%½,à Ý‘è,³,ê,Ā,Ĉ ,Ē,©,Ā,½,ç jfŠfZfbfg,·,é,© AD3DAppISetRenderStateŠÖ ”,İĖĂ,Ń o,μ,İ‘O,Ē•Ů‘Ź,·,é,©,đ”‘è,·,é BD3DAppISetRen derStateŠÖ ”,Ē,Ā,Ĉ,Ā,Ī uStep 5: ‘¼ Ůf, [fh,İĈĖf“f_Šf“fO EfXfe [fg,İ Ý‘è v,ĀŽæ,è^μ,Ā,Ā,Ĉ,é B

fĈf“f_Šf“fO Ef< [fv,đŠJŽn,·,é‘O,İ ĀĖă,İfXfefbfv,Æ,μ,Ā ACreateD3DAppŠÖ ”,ĪReleaseView,ÆInitViewŠÖ ”,İ ĖĂ,Ń o,μ,đ s,▯ B,±,ê,ç,İŠÖ ”,Ī AOverrideDefaultsŠÖ ”,Æ“— l,Ē AŠefTf“fvf< EfAfvfŠfP [fVf‡f“,ªfCf“fvfŠf f“fg,·,é BReleaseViewŠÖ ”,Ī AInitViewŠÖ ”,İĖĂ,Ń o,μ,Ā ì ¬,³,ê,½fIfufWfFfNfg,đ%đ•ú,·,é,¾,–,Ā, ,é iInitViewŠÖ ”,İĖĂ,Ń o,μ,İ2“x–Ů,Ā, ,é B Ā %o ,İĖĂ,Ń o,μ,Ī AAfterDeviceCreatedfR [f<fofbfNŠÖ ”,ª s,Ā,Ā,Ĉ,é j B,± ,İInitViewŠÖ ”,İ ĀĖă,İĖĂ,Ń o,μ,Ā A iffofCfX ì –Žž,©,ç,Ī X,ª%Ā,!,ç,ê,Ā,Ĉ,é ê ‡,Ī jfrf... [f| [fg,İ ĀfZfbfgfAfbfv,đ s,Ĉ AfTf“fvf<,İŽĀ sfofbftf@,đ Ā \z,·,é BInitViewŠÖ ”,Ē,Ā,Ĉ,Ā Ů,μ,,Ī uStep 4: frf... [f| [fg,İ %Šú%» v,đŽQ Ė,³,ê,½,Ĉ B

,±,ê,ĀD3dmain.cpp,İCreateD3DAppŠÖ ”,ª I—¹,·,é B,»,ê,¾,–,Ā,Ē, AAppInitŠÖ ”,İ I—¹,Ā,à, ,é B %Šú%» ^— ,ªŠ@—¹,μ,½,İ,Ā AfR [fh,İĈĖf“f_Šf“fO Ef< [fv,đŠJŽn,Ā,«é B

ÅÊã,ÉRenderLoopŠÖ ",í AD3DAppRenderExtensfwf<ƣpŠÖ ",ðÊÄ,Ñ o,µ,Ä Aftf f"fg Efofbftf@,ÆfofbfN Efofbftf@,İİ X,³,ê,½,""ª,ð'²,× AfofbfN Efofbftf@,©,çftf f"fg Efofbftf@,Öfuf fbfn["]— Ü,½,İftfŠfbfv,ð s,² B

Step 8: $I \xrightarrow{1} \hat{}$

•æ<A,Ä,«,È,¢fGf% [,""-

¶,μ,½,è AWM_QUIT,Ü,½,ÍMENU_EXITf fbfZ [fW,ðŽó,~Žæ,Á,½,Æ,«,Í AfAfvfŠfP [fVf‡f“,ÍCleanupAndPostQuitŠÖ ”,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,□,ÈŠÈ’P,ÈfAfvfŠfP [fVf‡f“,Ä,Í AReleaseSceneŠÖ ”,Í’P,È,éXf^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,^a ¬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,ǒŽæ“¾,·,é B

¬Æ÷,·,é,Æ Ô F’l,ǒ•Ô,· BŽ,”s,·,é,Æ0,ǒ•Ô,· B

d3drmc

Ô—v‘f,ǒŽæ“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“,Ă’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“,Ă,Í•s \•ª,È ê ‡ AfAfvfŠfP [fVf‡f“,Í A“ÆŽ©,İf f,fŠ%ð•úŠÖ ”,ð’è`,·,é,±
,Æ,ª,Ă,«,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,³,ê,½Ž²,đ’† S,É AŽw’è,³,ê,½Šp“x if%oWfAf““P^Ê j,l%oñ“],đ s,▯ B

¬Œ÷,·,é,Æ A‘æ1fpf%of [f^,Æ,μ,Ä“n,³,ê,½4ŽŸ s—ñ,Ö,l̈f|fCf“f^,đ•Ô,· BŽ,”s,·,é,Æ0,đ•Ô,· B

lpquat
‘€ ìŒ<%oÊ,đŽó,¬Žæ,éD3DRMQUATERNION \‘¢‘İ B

lpv
%oñ“],l̈Ž²,đŽw’è,·,éD3DVECTOR \‘¢‘İ,l̈fAfhfŒfX B

theta
lpv fpf%of [f^,É,æ,Á,ÄŽw’è,³,ê,½Ž²,l̈Žü,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,³,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,¹,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 \‘¢‘İ,ð•âŠ@,·,é B

¬CE÷,·,é,Æ A‘æ1fpf%of [f^,Æ,μ,Ä“n,³,ê,½ \‘¢‘İ,ð•Ô,· BŽ,”s,·,é,Æ0,ð•Ô,· B

lpq
•âŠ@,μ,½CE<%oÊ,ðŽó,¬Žæ,éD3DRMQUATERNION \‘¢‘İ B

lpa, lpb
•âŠ@,ìŠJŽn^Ê‘u,Æ I—¹Ê‘u,Æ,μ,Ä—p,¢,ç,ê,éD3DRMQUATERNION \‘¢‘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,³,ê,½fxfNfgf<,ð•Ô,· BŽ,”s,·,é,Æ0,ð•Ô,· B

lpd
%oÁŽZ,ÌŒ<%oÊ,ðŽó,¬žæ,éD3DVECTOR \‘Œ‘Ì B

lps1, lps2
%oÁŽZ,³,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);
```

ƒxƒNƒgfĸ,İ“à Ĭ,đ•Ô,· B

¬Ĉ÷,·,é,Æ“à Ĭ,İĈ÷%oÊ,đ•Ô,· BŽ,”s,·,é,Æ0,đ•Ô,· B

lps1, lps2

“à Ĭ,*ĈvŽZ,³,ê,éD3DVECTOR \‘ċ‘İ B

D3DRMVectorModulus

D3DVALUE D3DRMVectorModulus(LPD3DVECTOR lpv) ;

È%°,ìŽ®,É,μ,½,ª,Á,ÄfxfNfgf€,Ì',³,ð•Ô,· B

length = √x² + y² + z²

¬Ɛ÷,·,é,ÆD3DVECTOR \‘¢‘İ,É',³,ð•Ô,· BŽ,”s,·,é,Æ0,ð•Ô,· B

lpv

',³,ðƐvŽZ,·,éD3DVECTOR \‘¢‘İ B

D3DRMVectorNormalize

LPD3DVECTOR D3DRMVectorNormalize(LPD3DVECTOR lpv);

â‘İ’l,ª1,É,È,é,æ,ð,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€,ÈfxNfgf< Eftfjfbfg,ð•Ô,· B

¬Ɛ÷,·,é,Æ A‘æ1fpf%of [f^,Æ,µ,Ä“n,³,ê,½fxNfgf<,ð•Ô,· BŽ,”s,·,é,Æ0,ð•Ô,· B

lpd

f%of“f_f€,ÈfxNfgf< Eftfjfbfg,ðŽó,¬Žæ,éD3DVECTOR \‘Ŧ‘İ B

D3DRMVectorReflect

```
LPD3DVECTOR D3DRMVectorReflect(LPD3DVECTOR lpd, LPD3DVECTOR lpRay,
                                LPD3DVECTOR lpNorm);
```

Žw’è,³,ê,½-@ ü,É,Â,¢,Ä AŒð ü,ð”½ŽĚ,·,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 ^— Œ%oÊ,ðŽó,¬Žæ,éD3DVECTOR \‘Œ‘İ B

lpRay -@ ü,Ä”½ŽĚ,³,ê,éD3DVECTOR \‘Œ‘İ B

lpNorm lpRay,ÄŽw’è,³,ê,½Œð ü,ð”½ŽĚ,·,é-@ ü,ðŽİ,· AD3DVECTOR \‘Œ‘İ B

D3DRMVectorRotate

```
LPD3DVECTOR D3DRMVectorRotate(LPD3DVECTOR lpr, LPD3DVECTOR lpv,
                                LPD3DVECTOR lpaxis, D3DVALUE theta);
```

Žw’è,³,ê,½Ž²,đ’† S,ÉfxfNfgf◁,đ%ñ“],³,¹,é B

¬(E÷,·,é,Æ A‘æ1fpf%of [f^,Æ,μ,Ä“n,³,ê,½fxfNfgf◁,đ•Ô,· BŽ,”s,·,é,Æ0,đ•Ô,· B

lpr ^— CE◁%oÊ,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 \‘Ŧ‘İ B

lps1 lps2 ,ª^ø,©,ê,éD3DVECTOR \‘Ŧ‘İ B

lps2 lps1 ,©,Ÿ^ø,D3DVECTOR \‘Ŧ‘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,Ň o,· ‡ ~,ðŒˆè,·,é,½,ß A,Û,,ŠK‘w,ìfgfbfv EfŒfxf<,É, ,éfIfufWfFfNfg,ð
ŒŸ ò,·,é BŽŸ,É A,»,ê,ç,^a ì ¬,³,ê,½ ‡”Ô,ÉfR [f<fofbfNŠÖ ”,ðŒĂ,Ň o,· B

[illegible]

•Ô'1,Í,È,¢ B

- $\ddot{\text{I}} \text{ X}_{,\mu,\text{æ},\varpi,\text{Æ},\mu,\ddot{\text{A}},\text{¢},\acute{\text{e}}\text{Direct3DRMFrame}f\text{I}u f\text{W}f\text{F}f\text{N}f\text{g} \text{ B}$

$fR \ [f\langle fofbfN\check{S}\ddot{O} \]^3, \acute{E}n, \acute{e}fAfvf\check{S}fP \ [fVf\ddagger f^{\prime\prime}e^{\prime\prime}, \grave{I}ff \ [f^{\wedge} B$

$$\begin{aligned} & \cdot \text{‰} \text{—} \hat{E} \text{ Bftf}(\mathbb{E} \text{ [} f\mathbb{E}, \text{îÊ}^{\text{u}}, \text{ð} \cdot \text{î} \text{ X}, \cdot, \acute{e}, \acute{E}, \acute{I} \text{ A}^{\text{U}} \text{“} \text{®}, \mathbb{E} \% \text{õñ} \text{”}], \mathbb{A}, \mathbb{C}, \mathbb{D}, \acute{O}, \frac{1}{2}, \hat{A}, \hat{I} \text{—} \text{v}^{\text{f}}, \text{^a}, \acute{e} \text{ B}\mathbb{S}\mathbb{e} \text{—} \\ & \text{v}^{\text{f}}, \acute{E}, \text{”}, \cdot, \acute{e} \cdot \text{î} \text{ X}, \text{î} \text{velocity_of_component' delta}, \hat{A} \cdot \text{^3}, \acute{e}, \acute{e} \text{ B}, \pm, \acute{e}, \mathbb{C}, \text{îÊ}^{\text{u}}, \text{î}, \frac{1}{2}, \hat{I} \text{—} \frac{1}{4} \cdot \hat{u}, \text{î}^{\text{—} \text{x}}, \acute{I} \text{ A}^{\text{C}} \acute{O}, \text{îftf}(\mathbb{E} \text{”} \text{ä} \text{—} \\ & \acute{a}, \mu, \hat{A} \text{ } \acute{Y} \text{è}, \cdot, \acute{e}, \pm, \mathbb{A}, \hat{A}, \ll, \acute{e} \text{ B}, \mu, \text{©}, \mu \text{fVfXfef} \mathbb{E}, \acute{I} \text{ Afff}, \text{f}^{\wedge} \text{Z}\mathbb{S}\hat{\text{O}}, \text{ð}^{\text{K}} \text{—} \text{p}, \cdot, \acute{e}, \frac{1}{2}, \mathbb{B} \text{ A}\hat{\text{Z}} \text{©} \text{“} \text{®} \text{^I}, \acute{E} \text{ eftf}(\mathbb{E} \text{”} \text{ä} \text{—} \\ & \acute{a}, \mu, \frac{1}{2} \text{”} \text{—} \text{x}, \hat{E} \cdot \text{î}\hat{\text{S}} \cdot, \cdot, \acute{e} \text{ B}. \end{aligned}$$

FAfAvfŠfP [fVfƒƒ“Í A eftfŒ [fĚ,Ě”ă—á,μ,ÄftfŒ [fĚ,Ĭ%Á“Ď ± ħ,Ě,±
 ,Æ,^a,Ä,«Ě B,»,Ĭ,½,Ě,Ě,Í AŠe uŠŒ,Ě“,Ě,Ä AZqftfŒ [fĚ,Ĭ“x,đFAfAvfŠfP [fVfƒƒ“ŽŒ g,Ě”ă—á,μ,½
 (1fefBfbfN, ,½,ēafƒfjfbfg)´ 1,ĚfZfbfg,μ,Ě“,Ä,Ĭ,Ě,Ě,Ě,Ě B,±,±,Ä Aa,Ĭ—vĥ, ,³,Ě,Ĭ%Á“—x,Ä,Ě B,±
 ,ē,ĬfefBfbfN—,½,ēĬ a´delta (A“TM,μĚ B“ă““Ĭ,Ě,Í AZqftfŒ [fĚ,Ě”ă—á,μ,½fefBfbfN—,½,ē,Ĭ a´delta
 Ĭ A eftfŒ [fĚ,Ě”ă—á,μ,½ (v+(a´delta) ƒƒjfbfg,Ě,ĬŠ,³,Ě,ē B,±,Ĭ,Æ,« Av,Í A e,Ě,Ĭ“,ĚĚ» Ý,ĬZqftfŒ [fĚ
 ,Ĭ“—x,đŠ“Ĭ,Ě,Ě,μ,½,à,Ĭ,Ä,Ě B

,l̥R [f\fofbfNŠÖ „ð'Ç%óÁ E í æ,,:é,É,Í AIDirect3DRMFrame::AddMoveCallback,,:æ,ÑIDirect3DRMFrame::DeleteMoveCallback f f\fbfh,ðŽg–p,,:é B

fVfXfef€‚Í AfR [f·fofbfNŠÖ ¨‚ðĖÄ‚Ń o‚· ‡ ¨‚ðĖ¨‚é‚‚é‚½‚B A‚Ü‚‚ŠK‘w‚lfgfbfv EfĖƖxf·‚‚É‚‚éflufWfFfNf g‚ðĖŸ ¨‚‚‚é BŽŸ‚É A Ĩ Ĩ‚³‚é‚½ ‡¨Œ‚ÉfR [f·fofbfNŠÖ ¨‚ðĖÄ‚Ń o‚· B

D3DRMLOADCALLBACK

```
void (*D3DRMLOADCALLBACK) (LPDIRECT3DRMOBJECT lpObject, REFIID ObjectGuid,  
    LPVOID lpArg);
```

IDirect3DRM::Load *f\fbfh“à•”,ÅfIfufWfFfNfg,lf [fh,ð s,▯ B,±*
,lfR [f<fofbfNŠÖ ”,İŽÀ‘İ,ÍfAvfŠfP [fVf‡f“,Ä’è` ,³,ê,é B

•Ô’l,Í,È,¢ B

lpObject

f [fh,³,ê,éDirect3DRMObject B

ObjectGuid

f [fh,³,ê,éIfufWfFfNfg,lfOf [fof< Ef†fj [fNŽ¯•ÊŽq iGUID j B

lpArg

fR [f<fofbfNŠÖ ”,É“n,³,ê,éfAvfŠfP [fVf‡f“”è` ,İff [f^ B

fVfXfef€,ÍfR [f<fofbfNŠÖ ”,ðĲÄ,Ń o,· ‡ ~,ðĲ~è,·,é,½,ß A,Ŭ,ŠK‘w,lfgfbfv EfĲfxf<,É, ,éfIfufWfFfNfg,ð
ĲY ò,·,é BŽY,É A ì ¬,³,ê,½ ‡”Ô,ÉfR [f<fofbfNŠÖ ”,ðĲÄ,Ń o,· B

ŽQ Æ @**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•ŮŽ 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,Ü,,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\bfbh, ðÄ, Ñ o, µ, É%ž“Š, ·, éIfufWfFfNfg, ð—ñ“, ·, é B, ±, ÌfR [f<fofbfNŠÖ ”, ÌŽÄ‘Ì, ÌfAfvfŠfP [fVf‡f““è‘, Ä, , é B*

•Ô’l, Í, È, ¢ B

lpD3DRMObj

fIfufWfFfNfg, ð—ñ“, ·, éIDirect3DRMObjectfCf“f^ [ftfFfCfX BfAfvfŠfP [fVf‡f“, Í A—ñ“, ·, ³, è, ½ŠefIfufWfFfNfg, É, Ä, ¢, ÄReleasef\bfbh, ðÄ, Ñ o, ³, È, , Ä, Í, È, ¢, È, ¢ B

lpArg

fR [f<fofbfNŠÖ ”, É“n, ³, è, éfAfvfŠfP [fVf‡f““è‘, Ìff [f^ B

fVfXfef€, ÍfR [f<fofbfNŠÖ ”, ðÄ, Ñ o, · ‡ ~, ðƎ^è, ·, é, ½, ß A, Ü, , ŠK‘w, Ìfgfbfv EfƎfxf<, É, , éIfufWfFfNfg, ðƎŸ ò, ·, é BŽŸ, É A ì ¬, ³, è, ½ ‡”Ô, ÉfR [f<fofbfNŠÖ ”, ðÄ, Ñ o, · B

ŽQ Æ @IDirect3DRM::EnumerateObjects

D3DRMUPDATECALLBACK

```
void (*D3DRMUPDATECALLBACK)(LPDIRECT3DRMDEVICE lpobj, LPVOID lpArg,  
    int iRectCount, LPD3DRECT d3dRectUpdate);
```

fffofCfX,•İ X,³,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 ”,ð“K—p,·,éDirect3DRMDeviceIfufWfFfNfg B

lpArg

fR [f<fofbfNŠÖ ”,É“n,³,ê,éfAfvfŠfP [fVf‡f““è“,İff [f^ B

iRectCount

d3dRectUpdatefpf%of [f^,ÉŽw’è,³,ê,½,é€`,İ ” B

d3dRectUpdate

X V,³,ê,é—İæ,ð•\,· A,D,Æ,Â`È ã,İ**D3DRECT** \‘¢‘İ,İ”z—ñ B À•W,İfffofCfX’P^Ê,ÅŽw’è,³,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 ¬,³,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,^a,é,±,Æ,ð'Ê'm,·,é B,±,İfR [f<fobfNŠÖ ”,İŽÀ'İ,İfAfvfŠfP [fVf‡f““è<,Ä, ,é B

lpD3DRMUVreasonfpf%of [f^,ÉD3DRMUSERVISUAL_CANSEE,^aŽw'è,³,ê Af† [fU EfrfWf...
fAf< EfIfufWfFfNfg,^afrf... [f| [fg“à,Ä%oÄŽ< ó'Ô,İ,Æ,«,İ ATRUE,ð•Ô,· B,»,[□]
,Ä,È,~,ê,İFALSE,ð•Ô,· BlpD3DRMUVreason fpf%of [f^,ÉD3DRMUSERVISUAL_RENDER,^aŽw'è,³,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,[°]À'S,Ä, ,é B

lpD3DRMUV

Direct3DRMUserVisualfIfufWfFfNfg B

lpArg

fR [f<fobfNŠÖ ”,É“n,³,ê,éfAfvfŠfP [fVf‡f““è<,İff [f^ B

lpD3DRMUVreason

D3DRMUSERVISUALREASON—ñ<“Œ^,İf f“fo,İ,Đ,Æ,Ä B

D3DRMUSERVISUAL_CANSEE

f† [fU EfrfWf...fAf< EfIfufWfFfNfg,^afrf... [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,³,ê,½ffofCfX,ðŽg—p,·,é B

D3DRMUSERVISUAL_RENDER

fAfvfŠfP [fVf‡f“,İ Af† [fU EfrfWf...
fAf< EfGfŒf f“fg,ðfŒf“f_Šf“fO,µ,È,,Ä,İ,È,¢,È,¢ B,±
,İ ê ‡ AfAfvfŠfP [fVf‡f“,İ AlpD3DRMDevfpf%of [f^,ÄŽw'
è,³,ê,½ffofCfX,ðŽg,□ B

lpD3DRMDev

Direct3DRMUserVisualfIfufWfFfNfg,ðfŒf“f_Šf“fO,·,é,½,ß,ÉŽg,İ,ê,éDirect3DRMDevicefIfufWfFfNfg B

lpD3DRMview

Direct3DRMUserVisual fIfufWfFfNfg,^aoÄŽ< 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,Û,ŠK'w,İfgfbfv EfŒfxf<,É, ,éfIfufWfFfNfg,ð
ŒŸ ò,·,é BŽŸ,É A ì ¬,³,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);
```

,±,̀lfR [f<fofbfNŠÖ ”,ÍfTf| [fg,³,ê,Ä,č,È,č 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,ðŒp³,·,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

IIDirect3DRMDeviceArray

fffofCfX EfIfufWfFfNfg,ðfOf< [fv%»»,·,é,É,Í A IIDirect3DRMDeviceArrayfCf“f^ [ftfFfCfX,lf f\fbfh,ð—~—
p,·,é B,±,lfZfNfVf‡f“,Í A IIDirect3DRMDeviceArrayfCf“f^ [ftfFfCfX Ef f\fbfh,lfŠftf@fÆf“fX,Â, ,é BŠT”O,
É,Â,¢,Â,İŠT—v,Í A u IIDirect3DRMDevice,Æ IIDirect3DRMDeviceArrayfCf“f^ [ftfFfCfX. v,ðŽQ Æ,·,é,±,Æ B

IIDirect3DRMDeviceArrayfCf“f^ [ftfFfCfX,Í AŽŸ,lf f\fbfh,ðfTf| [fg,·,é B

GetElement

GetSize

IIDirect3DRMDeviceArrayfCf“f^ [ftfFfCfX,Í A,·,×,Â,İCOMfCf“f^ [ftfFfCfX,Æ“—
l A[UnknownfCf“f^ [ftfFfCfX Ef f\fbfh,ðEp ³,·,é BIUnknownfCf“f^ [ftfFfCfX,İŽŸ,İ,R,Â,lf f\fbfh,ðfTf|
[fg,·,é B

AddRef

QueryInterface

Release

,³,ç,É A IIDirect3DRMDeviceArrayfCf“f^ [ftfFfCfX,Í A IIDirect3DRMObjectfCf“f^ [ftfFfCfX,©,çŽŸ,lf f\fbfh,ð
Ep ³,·,é B

AddDestroyCallback

Clone

DeleteDestroyCallback

GetAppData

GetClassName

GetName

SetAppData

SetName

Direct3DRMDeviceArrayfIfufWfFfNfg,Í A IIDirect3DRM::GetDevices
method f\fbfh,İCEÂ,Ń o,μ,É,æ,Â,ÄŽæ“¾,³,ê,é B

IDirect3DRMDeviceArray::GetElement

HRESULT GetElement(DWORD index, LPDIRECT3DRMDEVICE * lpD3DRMDevice);

Direct3DRMDeviceArrayIfufWfFfNfg,©,čŽw’è,³ê,¹/₂—v‘f,đŽæ“³/₄,·,é B

¬Ė÷,·,é,ÆD3DRM_OK AŽ,”s,·,é,ÆfGf%₀ [,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,Ì,R,Â,îf f\bfh,ðfT
f| [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,ìŒÄ,Ń o,μ,É,æ,Á,ĂŽæ“¾,³,ê,é B

IDirect3DRMFaceArray::GetElement

HRESULT GetElement (DWORD index, LPDIRECT3DRMFACE * lpD3DRMFace);

Direct3DRMFaceArrayIfufWfFfNfg,©,çŽw'è,³,ê,¹/₂—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 *AIDirect3DRMFrameArrayCf*“*f*^ [*ftfFfCfX*,*lf f\fbfh*,*ð—*—
p,·,·,é B,±,*lfZfNfVf‡f*“,Í *AIDirect3DRMFrameArrayCf*“*f*^ [*ftfFfCfX Ef f\fbfh*,*lfŠftf@fÆf*“*fX*,*Â*,·,é BŠT”O,
É,Â,¢,Â,*İŠT*—v,Í A *uIDirect3DRMFrame,ÆIDirect3DRMFrameArrayCf*“*f*^ [*ftfFfCfX* v,*ðŽQ* *Æ*,·,·,é,±,Æ B

IDirect3DRMFrameArrayCf“*f*^ [*ftfFfCfX*,Í *AŽŸ*,*lf f\fbfh*,*ðfTf*| [*f*g,·,·,é B

GetElement

GetSize

IDirect3DRMFrameArrayCf“*f*^ [*ftfFfCfX*,Í A,·,·,×,Â,*İCOMfCf*“*f*^ [*ftfFfCfX*,*Æ—*—
l *A[UnknownfCf*“*f*^ [*ftfFfCfX Ef f\fbfh*,*ðEp* ³,·,·,é *BIUnknownfCf*“*f*^ [*ftfFfCfX*,Í *AŽŸ*,*İ*,R,Â,*lf f\fbfh*,*ðfT*
f| [*f*g,·,·,é B

AddRef

QueryInterface

Release

,³,ç,É *AIIDirect3DRMFrameArrayCf*“*f*^ [*ftfFfCfX*,Í *AIDirect3DRMObjectfCf*“*f*^ [*ftfFfCfX*,©,*çŽŸ*,*lf f\fbfh*,*ð*
Ep ³,·,·,é B

AddDestroyCallback

Clone

DeleteDestroyCallback

GetAppData

GetClassName

GetName

SetAppData

SetName

Direct3DRMFrameArrayfIfufWfFfNfg,Í *AIDirect3DRMPickedArray::GetPick*,*Ü*,½,Í *IDirect3DRMFrame::GetChildre*
nf f\fbfh,*İE*Â,*Ň* o,µ,É,æ,Â,ÂŽæ“¾,³,ê,é B

IDirect3DRMFrameArray::GetElement

HRESULT GetElement(DWORD index, LPDIRECT3DRMFRAME * lpD3DRMFrame);

Direct3DRMFrameArrayIfufWfFfNfg,©,çŽw'è,³,ê,¹/₂—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,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,Ìf f\fbfh,ð—~p,·,é B,±,ÌfZfNfVf‡f“,Í AIDirect3DRMLightArrayCf“f^ [ftfFfCfX Ef f\fbfh,ÌfŠftf@fŒf“fX,Å, ,é BŠT”O,É,Â,¢,Ä,ÌŠT—v,Í A uIDirect3DRMLight,ÆIDirect3DRMLightArrayCf“f^ [ftfFfCfX v,ðŽQ Æ,·,é,±,Æ B

IDirect3DRMLightArrayCf“f^ [ftfFfCfX,Í AŽŸ,Ìf 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,ðŒp ³,·,é BIUnknownfCf“f^ [ftfFfCfX,ÍŽŸ,Ì,R,Â,Ìf f\fbfh,ðfTf|
[fg,·,é B

AddRef

QueryInterface

Release

,³,ç,É AIDirect3DRMLightArrayCf“f^ [ftfFfCfX,Í AIDirect3DRMObjectfCf“f^ [ftfFfCfX,©,çŽŸ,Ìf f\fbfh,ðŒp ³,·,é B

AddDestroyCallback

Clone

DeleteDestroyCallback

GetAppData

GetClassName

GetName

SetAppData

SetName

Direct3DRMFrameArrayfIfufWfFfNfg,Í A

IDirect3DRMFrame::GetLightsf f\fbfh,ÌŒÄ,Ñ o,μ,É,æ,Á,ÄŽæ“¾,³,ê,é B

IDirect3DRMLightArray::GetElement

HRESULT GetElement(DWORD index, LPDIRECT3DRMLIGHT * lpD3DRMLight);

Direct3DRMLightArray fIfufWfFfNfg,©,çŽw’è,³ê,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

f s f b f N E f I f u f W f F f N f g, ð f O f ˆ [f v % o » , . , é , É , Í A I D i r e c t 3 D R M P i c k e d A r r a y f C f “ f ^ [f t f F f C f X , ì f f \ f b f h , ð — — p , . , é B , ± , ì f Z f N f V f ‡ f “ , Í A I D i r e c t 3 D R M P i c k e d A r r a y f C f “ f ^ [f t f F f C f X E f f \ f b f h , ì f Š f t f @ f C f “ f X , Â , , é B Š T “ O , É , Â , ¢ , Ä , ì Š T — v , Í A u I D i r e c t 3 D R M P i c k e d A r r a y f C f “ f ^ [f t f F f C f X v , ð Ž Q Æ , . , é , ± , Æ B

IDirect3DRMPickedArray*fCf“f^ [ftfFfCfX,Í AŽŸ,ìf f\fbfh,ðfTf| [fg,. ,é B*

GetPick

GetSize

IDirect3DRMPickedArray*fCf“f^ [ftfFfCfX,Í A , . , × , Ä , ì C O M f C f “ f ^ [f t f F f C f X , Æ “ — l A I U n k n o w n f C f “ f ^ [f t f F f C f X E f f \ f b f h , ð C p ³ , . , é B I U n k n o w n f C f “ f ^ [f t f F f C f X , Í Ž Ÿ , ì , R , Â , ì f f \ f b f h , ð f T f | [f g , . , é B*

AddRef

QueryInterface

Release

,³,ç,É A I D i r e c t 3 D R M P i c k e d A r r a y f C f “ f ^ [f t f F f C f X , Í A I D i r e c t 3 D R M O b j e c t f C f “ f ^ [f t f F f C f X , © , ç Ž Ÿ , ì f f \ f b f h , ð C p ³ , . , é B

AddDestroyCallback

Clone

DeleteDestroyCallback

GetAppData

GetClassName

GetName

SetAppData

SetName

Direct3DRMPickedArray*fIfufWfFfNfg,Í A I D i r e c t 3 D R M V i e w p o r t : : P i c k f f \ f b f h , ì C Ä , Ñ o , μ , É , æ , Ä , Ä Ž æ “ ¾ , ³ , ê , é B*

IDirect3DRMPickedArray::GetPick

```
HRESULT GetPick(DWORD index, LPDIRECT3DRMVISUAL * lplpVisual,  
    LPDIRECT3DRMFRAMEARRAY * lplpFrameArray,  
    LPD3DRMPICKDESC lpD3DRMPickDesc);
```

Žw'è,³,ê,½fsfbfN,É,æ,Á,ÄĖđ ·,·,éDirect3DRMVisual,ÆDirect3DRMFramefIfufWfFfNfg,đŽæ“¾,·,é B

–Ė÷,·,é,ÆD3DRM_OK AŽ,”s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,Îê——,É,Â,ċ
,Ä,Í A uDirect3D•ŮŽ f. [fh,Î•Ô'l v,đŽQ Æ,·,é,±,Æ B

index

î•ñ,đŽæ“¾,·,éfsfbfN,đŽ–•Ê,·,é AfsfbfN”z—ñ,Ö,lfCf“fffbfNfX B

lplpVisual

Žw'è,³,ê,½fsfbfN,ÉŠÖ~A•t,–,ç,ê,½Direct3DRMVisual fIfufWfFfNfg,Îf|fCf“f^,ÎfAfhfĖfX B

lplpFrameArray

Žw'è,³,ê,½fsfbfN,ÉŠÖ~A•t,–,ç,ê,½Direct3DRMFrameArrayfIfufWfFfNfg,Îf|fCf“f^,ÎfAfhfĖfX B

lpD3DRMPickDesc

fsfbfN,ÎÊ'u A–

Ê AŽæ“¾,·,éIfufWfFfNfg,ÎOf< [fvŽ–•ÊŽq,đŽw'è,·,éD3DRMPICKDESC \‘ċ'Î,Ö,ÎfAfhfĖfX 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 AIDirect3DRMViewportArrayCf“f^ [ftfFfCfX,lf f\fbfh,ð —~—p,·,é B,±,lfZfNfVf±f“,IIDirect3DRMViewportArrayCf“f^ [ftfFfCfX Ef f\fbfh,lfŠftf@fÆf“fX,Å,·,é BŠ T”O,É,Å,ç,Ä,İŠT—v,Í A uIDirect3DRMViewport,ÆIDirect3DRMViewportArrayCf“f^ [ftfFfCfX v,ðŽQ Æ,·,é,± ,Æ B

IDirect3DRMViewportArrayCf“f^ [ftfFfCfX,İŽŸ,lf f\fbfh,ðfTf| [fg,·,é B

GetElement

GetSize

IDirect3DRMViewportArrayCf“f^ [ftfFfCfX,Í A,·,×,Ä,İCOMfCf“f^ [ftfFfCfX,Æ“—l AUnknown fCf“f^ [ftfFfCfX Ef f\fbfh,ðEp 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,ðEp ³,·,é B

AddDestroyCallback

Clone

DeleteDestroyCallback

GetAppData

GetClassName

GetName

SetAppData

SetName

Direct3DRMViewportArrayIfufWfFfNfg,Í A
IDirect3DRM::CreateFramef f\fbfh,İÆÄ,Ň o,μ,É,æ,Á,ÄŽæ“¾,³,ê,é B

IDirect3DRMViewportArray::GetElement

HRESULT GetElement(DWORD index, LPDIRECT3DRMVIEWPORT * lpD3DRMViewport);

Direct3DRMViewportArray fIfufWfFfNfg,©,çŽw'è,³,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

IDirect3DViewportArray::GetSize

DWORD GetSize();

Direct3DViewportArray fIfufWfFfNfg,ÉŠÜ,Ü,ê,Ä,č,é—v‘f ”,đŽæ“¾,·,é B
—v‘f ”,đ•Ô,· B

IDirect3DRMVisualArray

*frfWf...fAf< EfIfufWfFfNfg,ðfOf< [fv%o».,.é,É,Í A**IDirect3DRMVisualArray**fCf“f^ [ftfFfCfX,Ìf f\fbfh,ð—
—p,.,é B,±,ÌfZfNfVf±f“,Í A**IDirect3DRMVisualArray**fCf“f^ [ftfFfCfX Ef f\fbfh,ÌfŠftf@fœf“fX,Â, ,é BŠT”
O,É,Â,¢,Ä,ÌŠT—v,Í A u**IDirect3DRMVisual,ÆIDirect3DRMVisualArray**fCf“f^ [ftfFfCfX v,ðŽQ Æ,.,é,±,Æ B*

GetElement

GetSize

IDirect3DRMVisualArrayfCf“f^ [ftfFfCfX,Í A,.,×,Ä,ÌCOMfCf“f^ [ftfFfCfX,Æ“—
l A**IUnknown**fCf“f^ [ftfFfCfX Ef f\fbfh,ðœp³,.,é B**IUnknown**fCf“f^ [ftfFfCfX,ÍŽŸ,Ì,R,Â,Ìf f\fbfh,ðfTf|
[fg,.,é B

AddRef

QueryInterface

Release

,³,ç,É A**IDirect3DRMVisualArray**fCf“f^ [ftfFfCfX,Í A**IDirect3DRMObject**fCf“f^ [ftfFfCfX,©,çŽŸ,Ìf f\fbfh,ðœ
p³,.,é B

AddDestroyCallback

Clone

DeleteDestroyCallback

GetAppData

GetClassName

GetName

SetAppData

SetName

IDirect3DRMVisualArrayfIfufWfFfNfg,Í **IDirect3DRMFrame::GetVisuals**
method.f f\fbfh,ÌœÄ,Ñ o,µ,É,æ,Ä,Žæ“¾,³,ê,é B

IDirect3DRMVisualArray::GetElement

HRESULT GetElement(DWORD index, LPDIRECT3DRMVISUAL * lpD3DRMVisual);

Direct3DRMVisualArrayIfufWfFfNfg,©,çŽw'è,³,ê,¹/₂—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,j•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 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%°,l fOf< *[fv,É•a—D,·,é,±,Æ,ª,Å,«,é B*

fAfjf [fVf‡f“ [CreateAnimation](#)
[CreateAnimationSet](#)

fffofCfX [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 ò [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,ðŒp³,·,é **BIUnknown***f*C*f*“*f*^ [*f*t*f*F*f*C*f*X,ÍŽŸ,Ì,R,Â,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 ¬,³,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,Ň o,µ,^a ¬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

¬ℰ÷,·,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

ℰÄ,Ñ o,μ,^a ¬ℰ÷,μ,½,Æ,«,É uIDirect3DRMAnimationSet vfCf“f^ [ftfFfCfX,đŽó,¬Žæ,éf|fCf“f^,Ö,̀̀f|
fCf“f^ B

IDirect3D7M::CreateDevice

```
HRESULT CreateDevice(DWORD dwWidth, DWORD dwHeight,
    LPDIRECT3D9DEVICE* lplpD3D9Device);
```

Windows ã,É,ÍŽÀ‘•,³,ê,Ä,¢,È,¢ B

IDirect3DRM::CreateDeviceFromClipper

```
HRESULT CreateDeviceFromClipper(LPDIRECTDRAWCLIPPER lpDDClipper,  
    LPGUID lpGUID, int width, int height,  
    LPDIRECT3DRMDEVICE * lpD3DRMDevice);
```

Žw'è,³,ê,½DirectDrawClipperIfufWfFfNfg,ðŽg,Á,ÄDirect3DRM WindowsfffofCfX,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,éfffofCfX,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 AfVfXfefĖ,ĬfffofCfX,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 EfffofCfX,Ĭ
ì ¬•û-@,Æ,µ,Ä „ §,³,ê,Ä,ĉ,é B

fVfXfefĖ,Í A“à•”,ĬfffofCfX—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

D3DPTBLEND CAPS_COPY

D3DPTBLEND CAPS_MODULATE

D3DPTTEXTURECAPS_PERSPECTIVE

D3DPTTEXTURECAPS_TRANSPARENCY

D3DPTFILTERCAPS_NEAREST

fn [fhfEfFfA EfffofCfX,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,ÉfffofCfX,ð—ñ<“,·,é,×,«,Â, ,é
B

IDirect3DRM::CreateDeviceFromD3D

```
HRESULT CreateDeviceFromD3D(LPDIRECT3D lpD3D,  
    LPDIRECT3DDEVICE lpD3DDevice, LPDIRECT3DRMDEVICE * lpD3DRMDevice);
```

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,Í 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,^a ¬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,³,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
,Ä,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,^aŽw'è,³,ê,é,Æ AffftHf<fg,ĬfffofCfX Efhf%oCfo,^aŽg—p,³,ê,é B

lpDD

DirectDrawfT [ftfFfX,ĬŒ³,É,È,éDirectDrawfIfufWfFfNfg B

lpDDSBck

f ofbfN Ef ofbftf@,đ•\,·DirectDrawSurfacefIfufWfFfNfg B

lplpD3DRMDevice

ŒÄ,Ň o,μ,^a ¬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,^a ¬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* lpD3DRMFrame);
```

Žw'è,³,ê,½ eftfŒ [f€,É V,µ,¢ŽqftfŒ [f€,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 Œ,·,é,±,Œ B

lpD3DRMFrame

V,µ,¢ftfŒ [f€,Î eftfŒ [f€ B

lpD3DRMFrame

ŒÄ,Ń o,µ,^a ¬Œ÷,µ,½,Œ,«,ÉIDirect3DRMFramecf“f^ [ftFfCfX,ðŽó,¬Žæ,éf|fCf“f^,Ö,Îf|fCf“f^ B

ŽqftfŒ [f€,Î eftfŒ [f€,l“® ì‘® «,ðŒp ³,·,é B,½,Œ,,Î eftfŒ [f€,ªŽw'è,³,ê,½‘¬“x,Â“®,¢,Ä,¢
,é ê ‡ AŽqftfŒ [f€,à“¬,¶¬“x,Â“®, B,Ů,½ A eftfŒ [f€,ª%oñ“],µ,Ä,¢,ê,Î AŽqftfŒ [f€,à eftfŒ [f€,ÎŒ
‘“„ð'† S,Œ,µ,Ä%oñ“],·,é B eftfŒ [f€,ðŽ ,½,È,¢ftfŒ [f€

,ÎfV [f“,ŒŒÄ,Î,ê,é BfV [f“,ð ì ¬,·,é,É,Î A eftfŒ [f€,Œ,µ,ÄNULL

,ðŽw'è,·,ê,Î,æ,¢ BfAfvfŠfP [fVf‡f“,Î A e,ðŽ ,½,È,¢ftfŒ [f€,ð ì,Á,½Œä,É AIDirect3DRMFrame::AddChild
methodf f\fbfh,ð—p,¢,Ä,»,ÎftfŒ [f€,ð eftfŒ [f€,ÉŠÖ~A•t,¬,é,±,Œ,^a,Ä,«_é B

ŽQ Œ @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•ÛŽ 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,^a ¬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%∞ [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢
,Ä,Î A uDirect3D•ŮŽ 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,Ń o,μ,^a ¬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,³,ê,¹/₂”½ŽĚ“Á «,Âf}fefŠfAf<,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,Î•Ô’l v,ðŽQ Æ,·,é,±,Æ B

vPower

”½ŽĚ,ÎfnfCf%ofCf^g•”^a,Î’N–¾“x B,±,Î’l,É5,ðŽw’è,·,é,Æ AfĈf“f_fŠf“fO,³,ê,¹/₂•\–Ê,Íà‘@,Ì,æ,□
,ĚŠOŠĪ,É,È,è A,»^êÈ ã,Î’l,Â,Í,à,Á,Æ _^ç,©,¢ŠOŠĪ,Æ,È,é B

lpD3DRMMaterial

ĈĀ,Ñ o,μ,^a ¬Ĉ÷,μ,¹/₂,Æ,«^ÉIDirect3DRMMaterialfCf“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,^a ¬¢÷,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

¬Ǝ÷,·,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

ƎÄ,Ň o,μ,^a ¬Ǝ÷,μ,^{1/2},Æ,«,ÉIDirect3DRMMeshBuilderfCf“f^ [ftfFfCfX,Ö,Ï|fCf“f^,ðŽó,¬Žæ,éfAfhfƎfX B

IDirect3DRM::CreateObject

```
HRESULT CreateObject(REFCLSID rclsid, LPUNKNOWN pUnkOuter,  
    REFIID riid, LPVOID FAR* ppv);
```

‰Šú‰»³,ê,Ä,¢,È,¢ V,µ,¢fIfufWfFfNfg,ð ì ¬,·,é B

¬¢÷,·,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

rclsid

V,µ,¢fIfufWfFfNfg,ÎfNf‰fXŽ[−]•ÊŽq B

pUnkOuter

COM W ¬‰»«@”\,É‘Î‰ž,·,é B

riid

ì ¬³,ê,éIfufWfFfNfg,ÎfCf“f[^] [ftfFfCfXŽ[−]•ÊŽq B

ppv

f f\fbfh,^a §¢ä,ð−ß,µ,½,Æ,«,ÉfIfufWfFfNfg,ðŽó,¬Žæ,éf|fCf“f[^],Ö,Îf|fCf“f[^] B

,±,Îf f\fbfh,É,æ,è ì ¬³,ê,½fIfufWfFfNfg,Í AfAfvfŠfP [fVf‡f“,É,æ,Á,Ä ‰Šú‰»³,ê,È,-
,Ä,Í,È,ç,È,¢ iDirect3DRMfCf“f[^] [ftfFfCfX,Î¼,Ì ì ¬f f\fbfh,Í AŽ©“@“l,ÉfIfufWfFfNfg,ð ‰Šú‰»³,·,é j B
V,µ,¢fIfufWfFfNfg,ð ‰Šú‰»³,·,é,É,Í AInitf f\fbfh,ðŽg—
p,·,é BInitf f\fbfh,Î¢Ä,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 * lpShadow);
```

Žw'è,³,ê,½fṛfWf...fAf<,ÆCEôCE¹,ð—p,¢ AŽw'è,³,ê,½•½–Ê,É“Š‰e,³,¹,Ä‰A‰e,ð ì ¬,·,é B‰A‰e,Í AfṛfWf...
fAf<,ðŠÜ,ḐftfCE [f€,É'Ç‰Á,³,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•ŮŽ 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,³,ê,é•½–Ê B

nx, ny, nz
‰A‰e,“Š‰e,³,ê,é•½–Ê,Ì–@ ü B

lpShadow
CEÄ,Ñ o,µ,^a ¬CE÷,µ,½,Æ,« A‰A‰efṛfWf...fAf<,Ö—LCEø,Èf|fCf“f^,Å ‰Šú‰»,³,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•ŮŽ f, [fh,l•Ô'l v,ðŽQ Æ,·,é,±,Æ B*

lpImage

fefNfXf`ff,İf\ [fX,ð•\,·D3DRMIMAGE \‘¢‘İ B

lplpD3DRMTexture

ŒÄ,Ń o,μ,^a ¬Œ÷,μ,½,Æ,«,^ÉIDirect3DRMTexturefCf“f^ [ftfFfCfX,ðŽó,¬Žæ,éf|fCf“f^,Ö,İf|fCf“f^ B

fefNfXf`ff,^afŒf“f_Šf“fO,³,ê,é,½,Ń ADirect3DRM,İfofbftf@,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 * lpD3DRMTexture);
```

Žw'è,³,ê,½ DirectDrawfT [ftfFfX,©,çfefNfXf`ff,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•ŨŽ f, [fh,l•Ô'l v,ðŽQ Æ,.,é,±,Æ B

lpDDS
fefNfXf`ff,ðŠÜ,ÐDirectDrawSurfaceIfufWfFfNfg B

lpD3DRMTexture
ŒÄ,Ñ o,µ,^a ¬Œ÷,µ,½,Æ,«,ÉIDirect3DRMTexturefCf“f^ [ftfFfCfX,Ö,Îf|fCf“f^,ðŽó,¬Žæ,éfAfhfŒfX 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% [,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);
```

$f f f o f C f X \quad \tilde{a}, \tilde{l} (dwXPos, dwYPos), \odot, \zeta (dwXPos + dwWidth, dwYPos + dwHeight), \acute{E} f r f \dots [f]$
 $[f g, \delta \quad \grave{\imath} \neg, \cdot, \acute{e} \quad B^{\wedge} \acute{E}^{\prime} u, \acute{I} f f o f C f X \quad \grave{A} \bullet W, \grave{A} \bullet \setminus, ^3, \acute{e}, \acute{e} \quad B$

$\neg \mathbb{C} \div, \cdot, \acute{e}, \mathbb{A} D3DRM_OK \quad A \breve{Z}, ^{\circ} s, \cdot, \acute{e}, \mathbb{A} f G f \% \quad [, \delta \bullet \hat{O}, \cdot \quad B \bullet \hat{O}^{\prime} l, \grave{I} \hat{e} \text{---}, \acute{E}, \hat{A}, \mathfrak{C}$
 $, \grave{A}, \acute{I} \quad A \quad u \underline{Direct3D \bullet \breve{U} \breve{Z} \quad f, \quad [f h, \grave{I} \bullet \hat{O}^{\prime} l} \quad v, \delta \breve{Z} Q \quad \mathbb{A} e, \cdot, \acute{e}, \pm, \mathbb{A} \quad B$

$lpDev$

$f r f \dots [f] [f g, ^a \quad \grave{\imath} \neg, ^3, \acute{e}, \acute{e} f f o f C f X \quad B$

$lpCamera$

$f r f \dots [, \grave{I}^{\wedge} \acute{E}^{\prime} u, \mathbb{A} \bullet \hat{u} \mathbb{C} \ddot{u}, \delta \mathfrak{L} \quad q, \cdot, \acute{e} f t f \mathbb{C} \quad [f \mathbb{C}, \ddot{O}, \grave{I} f | f C f^{\circ} f^{\wedge} \quad B$

$dwXPos, dwYPos, dwWidth, \quad , ^{\circ}, \mathfrak{a}, \breve{N} \quad dwHeight$

$f r f \dots [, \grave{I}^{\wedge} \acute{E}^{\prime} u, \mathbb{A} f T f C f Y, \delta f f o f C f X \quad \grave{A} \bullet W, \grave{A} \breve{Z}^{\prime}, \cdot \quad B$

$lplpD3DRMViewport$

$\mathbb{C} \grave{A}, \breve{N} \quad o, \mu, ^a \quad \neg \mathbb{C} \div, \mu, ^{1/2}, \mathbb{A}, \ll, \acute{E} \underline{IDirect3DRMViewport} f C f^{\circ} f^{\wedge} \quad [f t f F f C f X, \delta \breve{Z} \acute{o}, ^{-} \breve{Z} \mathfrak{a}, \acute{e} f | f C f^{\circ} f^{\wedge}, \ddot{O}, \grave{I} f | f C f^{\circ} f^{\wedge} \quad B$

$f r f \dots [f] [f g, \acute{I} \quad A f J f \quad f \% \circ, \delta \breve{S} \ddot{U}, \mathfrak{P} f V \quad [f^{\circ} \quad \tilde{a}, \acute{E} f l f u f W f F f N f g, \delta ^{\circ} z^{\prime} u, \cdot, \acute{e} \quad B f r f \dots [, \grave{I} \bullet \hat{u} \mathbb{C} \ddot{u}, \mathbb{A} \quad \tilde{a} f x f N f g f \mathfrak{C}, \acute{I} f J f \quad f \% \circ$
 $, \odot, \zeta \breve{Z} \mathfrak{a}^{\circ} \text{‰} ^4, ^3, \acute{e}, \acute{e} \quad B$

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,ìĖ““_,ÍxfNfgf<
[ox oy oz] AzŽ²,Í [dx dy dz] AyŽ²,Í [ux uy uz] ,Ä—^,!,ç,ê,é B2DfxfNfgf< [ou ov] ,Æ [su sv] ,Í Af%ofbfv,ìĖ<%oÊ,Ê“K
—p,³,ê,éfefNfXf`ff,ìĖ““_,Æ kŽÚĖW ”,ðŽ!,· 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,Î•Ô'l v,ðŽQ Æ,·,é,±,Æ B

type

D3DRMWRAPTYPE—ñ<“Ė^f f“fo,ì,Đ,Æ,Â B

lpRef

f%ofbfv,ì,½,ß,ìŽQ ÆftfĖ [f€,Ö,Ìf|fCf“f^ B

ox, oy, oz

f%ofbfv,ìĖ““_ B

dx, dy, dz

f%ofbfv,ìzŽ² B

ux, uy, uz

f%ofbfv,ìyŽ² B

ou, ov

fefNfXf`ff,ìĖ““_ B

su, sv

fefNfXf`ff,Ì kŽÚĖW ” B

lpD3DRMWrap

ĖÄ,Ñ o,μ,^a ¬Ė÷,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^,ÄŽ!,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€‚Ä ì ¬,³,ê,½,·,×,Ä,Ì Direct3DRM fffofCfX,ð•Ô,· B

¬€÷,·,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

lpDevArray
Direct3DRMfffofCfX,î”z—ñ,ðŽó, ¯Žæ,éf|fCf“f^ BDirect3DRMDeviceArrayIfufWfFfNfg,É,Â,¢
,Ä,Î îñ,Î A uIDirect3DRMDeviceArrayCf“f^ [ftfFfCfX v,ðŽQ Æ,·,é,±,Æ 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,Í A uDirect3D•ÛŽ f, [fh,Î•Ô’l v,ðŽQ Æ,·,é,±,Æ B

lpName
    ŒŸ ð,·,éfIfufWfFfNfg,Ì-¼‘O B

lplpD3DRMObject
    ŒÄ,Ñ o,µ,a ¬Œ÷,µ,½,Æ,«,É A^ê’v,µ,½Direct3DRMObject,Ìf|fCf“f^,Ö,Ìf|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,Ĵ—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,Á,ÄŽ',³,ê,é ê Š,É•K—v,È•¶Žš—
ñ,ĴTfCfY,ð•Ô,· B

ŽQ Æ @IDirect3DRM::SetSearchPath

IDirect3DRM::Load

```
HRESULT Load(LPVOID lpvObjSource, LPVOID lpvObjID,
    LPIID * lpIIDs, DWORD dwcGUIDs, D3DRMLOADOPTIONS d3drmLOFlags,
    D3DRMLOADCALLBACK d3drmLoadProc, LPVOID lpArgLP,
    D3DRMLOADTEXTURECALLBACK d3drmLoadTextureProc, LPVOID lpArgLTP,
    LPDIRECT3DRMFRAME lpParentFrame);
```

IfufWfFfNfg,đf [fh,·,é B

¬Ĉ÷,·,é,ĈD3DRM_OK AŽ,·s,·,é,ĈfGf% [,đ•Ō,· B•Ō'l,İê——,É,Ĉ,ĉ
„Ĉ,Ĉ A uDirect3D•ŪŽ f, [fh,İ•Ō'l v,đŽQ Ĉ,·,é,±,Ĉ B

lpvObjSource

f [fh,·,éIfufWfFfNfg,İf\ [fX,Ō,İf|
fCf“f^ Bd3drmLOFlagsfpf%of [f^,ªŽ',·f\ [fX Eftf%ofO,É,æ,Ĉ,Ĉ Aftf@fCf< AfŠf\ [fX Af f,fŠ Efuf
fbfN A,Ū,½,İfXfgfŠ [fĉ,đŽw'è,·,é B

lpvObjID

f [fh,·,éIfufWfFfNfg,İ-¼'O,Ū,½,İĈ'u,Ō,İf|fCf“f^ B,±
,İfpf%of [f^,Ĉ Ad3drmLOFlagsfpf%of [f^,ªŽ',·Ž-•ÊŽqftf%ofO,É,æ,Ĉ,Ĉ%đŽB,³,è,é BD3DRMLOAD_BYPOSI
TIONftf%ofO,đŽw'è,µ,½ ê ± A,±,İfpf%of [f^,Ĉ Aftf@fCf<,İ†,İIfufWfFfNfg,İ ± ~,đŽ',•DWORD'l,Ō,İf|
fCf“f^,Ĉ, é B,±,İfpf%of [f^,É,İNULL,đŽw'è,·,é,±,Ĉ,à,Ĉ,«„é B

lpIIDs

f [fh,·,éfCf“f^ [ftfFfCfXŽ-•ÊŽq,İ”z—ñ,Ō,İf|fCf“f^ B,½,Ĉ,,İ A,±
,İfpf%of [f^,ªIID_IDirect3DRMMeshBuilder,ĈIID_IDirect3DRMAnimationSet,đŠŪ,Ĥ”z—
ñ,İ,Ĉ,« A,·,×,Ĉ,İfAfjf [fVf‡f“ EfZfbfg,Ĉf fbfVf... Efrf<f_ [EfIfufWfFfNfg,ªf [fh,³,è,é B

dwcGUIDs

lpIIDs fpf%of [f^,ĈŽw'è,³,è,½”z—ñ,İ—v'f ” B

d3drmLOFlags

f [fh EfIfvfVf‡f“,đŽ',•D3DRMLOADOPTIONSĈ^,İ'l B

d3drmLoadProc

Žw'è,³,è,½IfufWfFfNfg,đfVfXfefĉ,ª“Ĉ,Ý o,·,Ĉ,«Ĉ,Ń o,³,è,é AD3DRMLOADCALLBACK
fR [f<fofbfNŠŌ ” B

lpArgLP

D3DRMLOADCALLBACK fR [f<fofbfNŠŌ ”,É“n,³,è,é AfAfvfŠfP [fVf‡f““è<,İff [f^ B

d3drmLoadTextureProc

D3DRMLOADTEXTURECALLBACKfR [f<fofbfNŠŌ ” B,±,è,Ĉ A“Á•Ê,ÊftfH [f}fbfg,đ•K—
v,Ĉ,·,éIfufWfFfNfg,ª—p,ĉ,éfefNfXf`ff,đ“Ĉ,Ý o,·,Ĉ,«„ÉĈĈ,Ń o,³,è,é B,±
,İfpf%of [f^,É,İNULL,đŽw'è,·,é,±,Ĉ,ª,Ĉ,«„é B

lpArgLTP

D3DRMLOADTEXTURECALLBACKfR [f<fofbfNŠŌ ”,É“n,³,è,é AfAfvfŠfP [fVf‡f““è<,İff [f^,İfAfhfĈf
X B

lpParentFrame

eftfĈ [fĉ B,±
,İfpf%of [f^,İ îñ,Ĉ ADirect3DRMAnimationSet,âDirect3DRMFrameIfufWfFfNfg,ª İ ¬,³,è,é,Ĉ,«„Ĉ e,ÉNULL,
ªŽw'è,³,è,é,½,Ĉ A,±,İfpf%of [f^,Ĉ A,±,è,ç,İIfufWfFfNfg,đf [fh,·,é Ū,É—L—p,Ĉ, é B,±
,İfpf%of [f^,É,İNULL,đŽw'è,·,é,±,Ĉ,ª,Ĉ,«„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,^a,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% [,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,^a ¬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,³,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,^a ¬Œ÷,µ,½,Æ,«,É A—LŒø,ÈDirect3DRMTexturef|fCf“f^,Ö,îf|fCf“f^ B

IDirect3DRM::SetDefaultTextureColors

HRESULT SetDefaultTextureColors(DWORD dwColors);

Direct3DRMTextureIfufWfFfNfg,ĀŽg—p,³,ê,éfftfHf<fg,Ì F,đ Ý'è,·,é B

¬Ĉ÷,·,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

,±
,Ĭf f\fbfh,Í A**IDirect3DRM::CreateTexture**f f\fbfh,İ‘O,ÉĈĂ,Ň o,³,ê,½,Æ,«,É,Ì,ÝfefNfXf`ff,Ì F,É”½%of,³,ê,é B
,·,Ă,É ì ¬,³,ê,½fefNfXf`ff,É‘Î,μ,Ă,ÍĈø%oÊ,^a,Ê,¢ B

IDirect3DRM::SetDefaultTextureShades

HRESULT SetDefaultTextureShades(DWORD dwShades);

Direct3DRMTextureIfufWfFfNfg,ĀŽg—p,³,ê,éfftfHf<fg,ì%A%œ,ð Ý'è,·,é B
¬Ē÷,·,é,ÆD3DRM_OK AŽ,"s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢
,Ă,Î A uDirect3D•ŮŽ f, [fh,Ĵ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

dwShades
%oA%œ,ì " B

,±
,Ĵf f\fbfh,Î A**IDirect3DRM::CreateTexture**f f\fbfh,Î‘O,ÉĒĂ,Ň o,³,ê,½,Æ,«,É,Ĵ,ÝfefNfXf`ff,ì%A%œ,É”½%of,³,ê,
é B,·,Ă,É ì ¬,³,ê,½fefNfXf`ff,ÉÎ,μ,Ă,ÍĒø%ŎÊ,^a,È,¢ B

IDirect3DRM::SetSearchPath

HRESULT SetSearchPath(LPCSTR lpPath);

ftf@fCf⋅ŒŸ ðfpfX,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,j•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lpPath

ŒŸ ðfpfX,Æ,μ,Ä Ý'è,·,éfpfX,ðŽ|,· ANULL,Â L,í,é•¶Žš—ñ B

ffftfHf<fg,ÌŒŸ ðfpfX,ÍŠÂ«•İ ”D3DPATH,Ì'l,©,çŽæ,è o,³,ê,é B,±,ÌŠÂ«•İ ”,ª Ý'è,³,ê,Ä,¢
,È,¢ ê ‡ AŒŸ ðfpfX,Íó,É,È,é Bftf@fCf<,ðfI [fvf“,·,é,Æ,« AfVfXfef€
,Í,Ü,,fJfŒf“fgffBfŒfNfgfŠ,ð'T,μ AŽŸ,ÉŒŸ ðfpfX'†,Ì,·,×,Ä,ÌffBfŒfNfgfŠ,ðf`fFfbfN,·,é B

ŽQ Æ @IDirect3DRM::GetSearchPath

IDirect3DRM::Tick

```
HRESULT Tick(D3DVALUE d3dvalTick);
```

Direct3DRM fVfXfef€ Efn [fgfr [fg,đ s,▣ B,±,Ĭf f\fbfh,ªĈÄ,Ñ o,³,ê,é,Æ A,·,×,Ä,Ĭ%oÂ“@ftfĈ [f€ ,ĬÊ’u,ÍĈ» Ý,Ĭ“® ì‘® «,É,μ,½,ª,Ä,Ä X V,³,ê AfV [f“,ªĈ» Ý,ĬfffofCfX,ÉfĈf“f_Šf“fO,³,ê,é B,Ü,½ AŠÖ~A, μ,½fR [f<fofbfNŠÖ ”,ª“K Ø,Ê,Æ,«,ÉĈÄ,Ñ o,³,ê,é B,±,Ĭf f\fbfh,Í AfĈf“f_Šf“fO EftfCfNf<,ªŠ®—¹,μ,½,Æ,«,É §ĈÄ,đ•Ô,· B

¬Ĉ÷,·,é,ÆD3DRM_OK AŽ,”s,·,é,ÆfGf%o [,đ•Ô,· B•Ô’l,Ĭê——,É,Â,¢ ,Ä,Í A uDirect3D•ŬŽ f, [fh,Ĭ•Ô’l v,đŽQ Æ,·,é,±,Æ B

d3dvalTick

IDirect3DRMFrame::SetRotation,Æ**IDirect3DRMFrame::SetVelocity**f f\fbfh,Ĭ¬“x,“,æ,Ñ%oñ“]fXfefbfv B

fV [f“,ĬfĈf“f_Šf“fO,É _“Ĭ «,đŽ ,½,¹,é,½,ß A¼ Úf, [fh,Ĭ¼,Ĭf f\fbfh,đ—p,¢,Ä,± ,Ĭf f\fbfh,đfCf“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](#)

fIfvVf‡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 Æ,·,é,±,Æ B

rvTime

fAfjf [fVf‡f“,î’†,ÂÊ’ufL [,ð Ý’è,·,é,Æ,«,ìŽžŠÔ B0,ðŒ“_,Æ,·,é”C^Ó,î’P^Ê,ìŽžŠÔ,ðŽw’è,·,é,±
,Æ,ª,Â,«,é B ÂŒâ,îfL [,îrvTime,î’l,ª99,î,Æ,« ArvTime,ª49,Â, ,éfL [,ªfAfjf [fVf‡f“,î,ç,â,ª,Ç’†ŠÔ,Â, ,é B

rvX, rvY, rvZ

^Ê’u B

,±,îf 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 Æ,·,é,±
,Æ B

ŽQ Æ @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

IDirect3DRMAnimation::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 @IDirect3DRMAnimation::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€,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•ŨŽ f, [fh,İ•Ô’l v,đŽQ Æ,·,é,±,Æ B
lpD3DRMFrame
fAfjf [fVf‡f“,É Ý’è,·,éftfŒ [f€,đŽw’è,·,é•İ ”,ÎfAfhfŒfX 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

*fAfvfŠfP [fVf‡f“,Í ADirect3DRMAnimationIfufWfFfNfg,đfOf< [fv%»»,·,é,½,ß,ÉIDirect3DRMAnimationSetfCf“
f^ [ftfFfCfX,İf f\fbfh,đŽg—p,·,é,±,Æ,ª,Ä,«,é B,±,İfCf“f^ [ftfFfCfX,É,æ,Ä,Ä•;ŽG,ÈfAfjf [fVf‡f“,İ—
¬,ê,đ Ä ¶,·,é,±,Æ,ªŠÈ’P,É,È,é B,±
,İfZfNfVf‡f“,Í AIDirect3DRMAnimationSetfCf“f^ [ftfFfCfX Ef f\fbfh,İfŠftf@fEf“fX,Ä, ,é BŠT”O,É,Ä,¢
,Ä,İŠT—v,Í A uIDirect3DRMAnimation,ÆIDirect3DRMAnimationSetfCf“f^ [ftfFfCfX v,đŽQ Æ,·,é,±,Æ B*

IDirect3DRMAnimationSetfCf“f^ [ftfFfCfX,İf f\fbfh,Í A`È%°,İfOf< [fv,Éª—p,·,é,±,Æ,ª,Ä,«,é B

**’Ç%»Ä Af [fh A AddAnimation
í æ**

DeleteAnimation

Load

ŽžŠÔ SetTime

**IDirect3DRMAnimationSetfCf“f^ [ftfFfCfX,Í A,·,×,Ä,İCOMfCf“f^ [ftfFfCfX,Æ“—
l AUnknownfCf“f^ [ftfFfCfX Ef f\fbfh,đEp ³,·,é BIUnknownfCf“f^ [ftfFfCfX,İŽŸ,İ,R,Ä,İf f\fbfh,đTf|
[fg,·,é B**

AddRef

QueryInterface

Release

**,³,ç,É AIDirect3DRMAnimationSetfCf“f^ [ftfFfCfX,Í AIDirect3DRMObjectfCf“f^ [ftfFfCfX,©,çŽŸ,İf f\fbfh,đ
Ep ³,·,é B**

AddDestroyCallback

Clone

DeleteDestroyCallback

GetAppData

GetClassName

GetName

SetAppData

SetName

**Direct3DRMAnimationSetfIfufWfFfNfg,Í AIDirect3DRM::CreateAnimationSetf f\fbfh,İEÄ,Ń o,µ,É,æ,Ä,ÄŽæ“¼,
Ä,«,é 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,³,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,Ů,½,ÎfXfgfŠ [f€,ðŽw'è,·,é B

lpvObjID
f [fh,·,éIfufWfFfNfg,Î¼'O,Ů,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,ÍNULL,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,ÍNULL,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,Ů,ª,Ä,±,Æ,ð-hŽ~,·,é B

ffftfHf<fg,Ä,Í A,±,Îf ffbfh,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,İŽžŠŎ,ð Ý'è,·,é B

¬Œ÷,·,é,ÆD3DRM_OK AŽ,˝s,·,é,ÆfGf%o [,ð•Ŏ,· B•Ŏ'l,İê——,É,Â,¢
,Ä,Í A uDirect3D•ŬŽ f, [fh,İ•Ŏ'l v,ðŽQ Æ,·,é,±,Æ B

rvTime
V,µ,¢ŽžŠŎ

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,İEÄ,Ñ o,μ,É,æ,Á,ĂŽæ“¾,³,ê,é B

IDirect3DRMDevice::AddUpdateCallback

HRESULT AddUpdateCallback(D3DRMUPDATECALLBACK d3drmUpdateProc, LPVOID arg);

ffofCfX,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,³ê,½ X VfR [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

d3drmUpdateProc

fAfvfŠfP [fVf±f““è^,ìD3DRMUPDATECALLBACKfR [f<fofbfNŠÖ ",ìfAfhfŒfX B

arg

X VfR [f<fofbfNŠÖ ",É“n,³ê,éfvf%o fCfx [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,³ê,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,đ•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,³,ê,Ä,¢,é ê ‡,ÍTRUE A,»,␣,Â,È,¢,Æ,«,ÍFALSE,ð•Ô,· B

ŽQ Æ @IDirect3DRMDevice::SetDither

IDirect3DRMDevice::GetHeight

DWORD GetHeight () ;

ffofCfX,ì ,,³,ðfsfNfZf<’P^Ê,ÃŽæ“¾,·,é B
,,³,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,³,ê,Ä,¢,é F ”,Ä•\Œ»,³,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,³,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,lfxf... [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,Ũ o,µ,a ¬Œ÷,µ,½,Æ,«,É A—LŒø,ÈDirect3DRMViewportArrayIfufWfFfNfg,Ä,“ü,éf|fCf“f^,Ö,Îf|
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,³,ê,½fffofCfX,lf fCf,, [ftfŒ [f€ EfIfvfVf‡f“,ðŽæ“¾,·,é B

ˆÈ%°,İ'l,İfrfbfg**OR**,^a•Ô,³,ê,é B

D3DRMWIREFRAME_CULL
—-Ê,İftfŒ [f€,Í•`%œ,³,ê,È,¢ B

D3DRMWIREFRAME_HIDDENLINE
f fCf,, [ftfŒ [f€
,ÅfŒf“f_fŠf“fO,³,ê,½ ü,^a A‘O-
Ê,İfIfufWfFfNfg,É,æ,Á,Ä%B,³,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

IDirect3DRenderDevice::InitFromD3D

```
HRESULT InitFromD3D(LPDIRECT3D lpD3D, LPDIRECT3DDEVICE lpD3DRenderDevice);
```

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,Ï|fCf“f^ B

lpD3DRenderDevice

•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%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

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,Ä, ,é
B

fŒf“f_fŠf“fO•iŽç,Í AfffofCfX,lfŒf“f_fŠf“fO EfT [ftfFfX ã,ÄŽÀ s,³,ê,éŒfŒf“f_fŠf“fO,Ì•iŽç,Ì Ä’â’l,Ä, ,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,lffffofCfX,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 þ,¢,ð Ý'è,·,é B,±,Ì ”,Í AŽg—p,³,ê,Ä,¢,é F ”,Â•\Œ»,³,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,İ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

ulShades
V,µ,¢%oA%oe,Ì“x þ,¢ B,±,Ìfpf%of [f^,Í2,Ì—Ý æ,Ä,È,,Ä,Í,È,ç,È,¢ BffftfHfçfg,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,³,½fCf [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,“CÄ,Ň o,³,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“Í Af fbVfVf... ã,İ,Đ,Æ,Â,İf|fŠfSf“,ÆŒÝ,¢
,É,â,èŽæ,è,·,é,½,ß,ÉIDirect3DRMFacefCf“f^ [ftfFfCfX,İf f\fbfh,ðŽg—p,·,é B,±
,İfZfNfVf‡f“Í AIDirect3DRMFacefCf“f^ [ftfFfCfX Ef f\fbfh,İfŠftf@fŒf“fX,Â, ,é BŠT”O,É,Â,¢,Ä,İŠT—
v,Í AIDirect3DRMFace,ÆIDirect3DRMFaceArrayfCf“f^ [ftfFfCfX,ðŽQ Æ,·,é,±,Æ B*

IDirect3DRMFacefCf“f^ [ftfFfCfX Ef f\fbfh,Í A`È%º,İfOf< [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,İCOMfCf“f^ [ftfFfCfX,Æ“—
l A[UnknownfCf“f^ [ftfFfCfX Ef f\fbfh,ðŒp ³,·,é BIUnknownfCf“f^ [ftfFfCfX,İŽŸ,İ,R,Â,İf f\fbfh,ðfTf|
[fg,·,é B**

AddRef
QueryInterface
Release

**,³,ç,É AIDirect3DRMFacefCf“f^ [ftfFfCfX,Í AIDirect3DRMObjectfCf“f^ [ftfFfCfX,©,çŽŸ,İf f\fbfh,ðŒp ³,·,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•Ô’l v‚ðŽQ Æ‚‚é‚±‚Æ B

x, y, z
V‚µ‚¢‚“_ˆÊ’u‚łx 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,İ•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<,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•ŬŽ f, [fh,İ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lpMaterial
-Ê,Ê“K—p,³,ê,Ä,¢,éDirect3DRMMaterialIfuWfFfNfg,Ö,İf|fCf“f^,ðŽó,¬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,³,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,³,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,İfefNfXf`ff^Ê‘Š,đŽæ“¼,·,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

lpU, lpV
-Ê,İ%o~'Œf%ofbfv Eftf%ofO,É,µ,½,^a,Á,Ä A Ý'è,Ü,½,ÍfNfŠfA,³,ê,é•İ ”,İfAfhfŒfX B

ŽQ Æ @IDirect3DRMFace::SetTextureTopology

IDirect3DRMFace::GetVertex

```
HRESULT GetVertex(DWORD index, D3DVECTOR *lpPosition,  
                  D3DVECTOR *lpNormal);
```

```
Direct3DRMFaceIfuFWfFfNfg'†,Ì'“_„ÎÊ'u,Æ-@ 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•ŮŽ f, [fh,Î•Ô'l v,ðŽQ Æ,·,é,±,Æ B
```

```
index  
'“_„ÎfCf“fffbfNfX B
```

```
lpPosition, lpNormal  
'“_„ÎÊ'u,Æ-@ ü,ðŽó,¬Žæ,éD3DVECTOR \‘¢‘Î 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“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,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);

Direct3DRMFaceIfuƒWƒFfNfg,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);

Direct3DRMFaceIfuƒWƒFfNfg,İ F,đR, G, B'l,Â Ý'è,·,é B

¬Ɛ÷,·,é,ÆD3DRM_OK AŽ, ”s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,İê——,É,Â,¢
,Ä,Í A uDirect3D•ŨŽ f, [fh,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,ʹs,·,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

IDirect3DVertexShader::SetTextureCoordinates

```
HRESULT SetTextureCoordinates(DWORD vertex, D3DVALUE u, D3DVALUE v);
```

Direct3DRMFacefIfufWfFfNfg'†,Ì',“_ÌfefNfXf`ff À•W,ð Ý`è,:é B

$$\neg \text{E}^{\div}, \cdot, \acute{e}, \text{AED3DRM_OK } A\check{Z}, "s, \cdot, \acute{e}, \text{AefGf}\%_{0} [\cdot, \delta, \hat{\text{O}}, \cdot \text{B} \cdot \hat{\text{O}}'1, \grave{\text{i}}\hat{\text{e}} \text{---}, \acute{e}, \hat{\text{A}}, \text{¢}$$

vertex

Ý'è,·,é',“_̀,ÌfCf“fffbfNfX B,½,Æ,!,Î A-Ê,ŽŠpÆ“,̀,Æ,« A',“_̀,Í0 A1 A2,Æ,È,é B

 u, v

Žw'è,³,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 Æ j,ÆŒÝ,¢
,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,ÆIDirect3DRMFrameArrayfCf“f^ [ftfFfCfX v,ðŽQ Æ,·,é,±,Æ B*

IDirect3DRMFrame*fCf“f^ [ftfFfCfX Ef f\fbfh,Í A`È%º,İfOf< [fv,É•ª—b,·,é,±,Æ,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,Æ`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•ÛŽ f, [fh,Ĵ•Ô’l v,ðŽQ Æ,·,é,±,Æ B

lpD3DRMFrameChild

ŽqftfŒ [f€,Æ,μ,Ä’Ç%Á,·,éDirect3DRMFramefIfufWfFfNfg B

ŽqftfŒ [f€,Æ,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`ÛŽ ,·,é,½,ß AAddChildf f\fbfh,ðŽg—

p,·,é‘O,ÉIDirect3DRMFrame::GetTransform f\fbfh,ðŒÄ,Ñ 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,Ž',·f%ofWfAf“”PÊ,İŠp“x•ª A(rvX,rvY,rvZ),É‘Î,µ,Ä%œñ“],³,¹,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

rctCombine
V,µ,¢%œñ“],ðŒ» Ý,ìŒ» Ý,ìftfŒ [f€•İŠ,Æ ‡ ¬,·,é•û–@,ðŽ',· AD3DRMCOMBINETYPE—
ñ“Œ^,İf f“fo B

rvX,rvY,rvZ
%œñ“]Ž² B

rvTheta
f%ofWfAf“”PÊ,ÄŽ',µ,½%œñ“]Šp“x B

Žw'è,³,ê,½%œñ“],Î A,±,İDirect3DRMFramefCf“f^ [ftfFfCfX,É,æ,Á,ÄŽ~•Ê,³,ê,éftfŒ [f€,İ•İŠ· s—
ñ,¾,–,ð•İ X,·,é B,±,İf ffbfh,İ AfŒf“f_Šf“fO,İf^fCf~f“fO,²,Æ,É s—
ñ,ð•İ X,·,éIDirect3DRMFrame::SetRotation,Æ,ÎÛ,È,è AftfŒ [f€ ã,İfIfufWfFfNfg,İ•İ X,Í¹%œñ,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'è<,•,é B

Žw'è,³,ê,^½•İŠ,İ A,±,İIDirect3DRMFramefCf“f^ [ftfFfCfX,É,æ,Á,ÄŽ¯•Ê,³,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*[^],*l*¹,*É*],*¢* *Aftf* *€* [*f**€*,*l**f* [*f**Jf* *À*•*W*,*ðfAftfBf*“•*İ*Š•,•,é *B*

¬*€*÷,•,é,*ED3DRM_OK* *A*Ž,”*s*,•,é,*ÆfGf%*o [*l*,*ð*•*Ô*,• *B*•*Ô*¹,*l*^ê——,É,*Â*,*¢*
,Ä,*Í* *A* *uDirect3D*•*Ŭ*Ž *f*, *[fh,l*•*Ô*¹ *v*,*ð*Ž^Q *Æ*,•,é,±,Æ *B*

rctCombine

V,*μ*,*¢*•*İ*Š•,ð*€*» *Ý*,*l*•*İ*Š•,Æ ‡ ¬,•,é•*û*—@,ðŽ^l,• *AD3DRMCOMBINETYPE*—*ñ*“*€*[^],*l**f* *f*“*f*o *B*

rmMatrix

‡ ¬,³,ê,é•*İ*Š• *s*—*ñ*,ð[’]è[^],•,é*D3DRMMATRIX4D*”*z*—*ñ*,*l**f* *f*“*f*o *B*

•*İ*Š•,É,*Í*4 *s*4—*ñ*,*l* *s*—*ñ*,ðŽ^w’è,•,é,^a *AfAftfBf*“•*İ*Š•,ð—~—*p*,•,é,¹/₂,ß *A* *Â*€ã,*l*—*ñ*,*Í*[0 0 0 1],*l*“[]]*u* *s*—*ñ*,Ä,È,-
,Ä,*Í*,È,ç,È,¢ *B*

Ž^w’è,³,ê,¹/₂•*İ*Š•,*Í* *A*,±,*lIDirect3DRMFrame**fCf*“*f*[^] [*ftfFfCfX*,É,æ,Ä,Ž[—]•*Ê*,³,ê,é*ftf* *€* [*f**€*,*l*•*İ*Š• *s*—*ñ*,¾,¬,ð•*İ* *X*,•,é *B*
Ž^Q *Æ* @3*D*•*İ*Š•

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,İ^Ê'u•İ X,ð'è<,·,é B

Žw'è,³,ê,^½•İŠ·,İ A,±,İDirect3DRMFramefCf“f^ [ftfFfCfX,É,æ,Á,ÄŽ¯•Ê,³,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,ðŠÜ,Ð BftfŒ [f€,ÉfrfWf...
fAf< EfIfufWfFfNfg,ª'Ç%ŒÁ,³,ê,é,Œ AftfŒ [f€,ªfrf...
[,É'¶ Ý,·,ê,ÎfIfufWfFfNfg,Î%ŒŽ< ó'Ô,Œ,È,é BfrfWf...fAf< EfIfufWfFfNfg,ÎftfŒ [f€,©,çŽQ Œ,³,ê,é B

IDirect3DRMFrame::DeleteChild

```
HRESULT DeleteChild(LPDIRECT3DRMFRAME lpChild);
```

ftfœ [f€,đŠK‘w,©,ç í œ,·,é Bftfœ [f€,ªžQ Æ,³,ê,Ä,¢,È,¯,ê,Î A,·,×,Ä,ìžqftfœ [f€ Aœðœ¹ Af fbVf...
,Æ,Æ,à,É”jŠü,³,ê,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

lpChild
žqftfœ [f€,Æ,µ,Äžg,í,ê,Ä,¢,éDirect3DRMFrameIfufWfFfNfg,ðž!,•İ ” B

žQ Æ @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,»,ìŒðŒ¹,Í AftfŒ [f€,ª,Á,½fV [f“ ã,îf 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““èç,ÌD3DRMFRAMEMOVECALLBACKfR [f<fofbfNŠÖ ” B

lpArg

fR [f<fofbfNŠÖ ”,É“n,³,ê,½fAfvfŠfP [fVf‡f““èç,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, ìĈ`Ž®, ĀŽqftfĈ [fĈ, ìfŠfXfg, đŽæ“¾, ·, é B
¬Ĉ÷, ·, é, ĀD3DRM_OK AŽ, ”s, ·, é, ĄfGf%o [, đ•Ô, · B•Ô'l, ìê——, É, Ā, ċ
, Ā, Ī A uDirect3D•ŮŽ f, [fh, Ĵ•Ô'l v, đŽQ Ą, ·, é, ±, Ą B

lplpChildren
ĈĀ, Ñ o, μ, ^a ¬Ĉ÷, μ, ½, Ą, «, É A—LĈø, ÈDirect3DRMFrameArray|fCf“f^, “ü, éf|fCf“f^, ìfAfhfĈfX B

ŽQ Ą @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* lplpLights);

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

lplpLights
ĈÄ,Ň o,μ,a ¬Ĉ÷,μ,½,Æ,«,É A—LĈø,ÈDirect3DRMLightArrayf|fCf“f^,““ü,éf|fCf“f^,ÌfAfhfĈfX 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, ðŽæ“¼, ·, é B
¬€÷, ·, 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

lpParent
ftf€ [f€, ð e, ðŽ, ·Direct3DRMFrameIfufWfFfNfg, Ö, ðf|fCf“f^, ðŽó, ¬Žæ, éf|
fCf“f^, ðfAfhf€fX B«» Ý, ðftf€ [f€, ^a e, ðftf€ [f€, ð ê ‡ A, ±, ðf|fCf“f^, É, ÍNULL, ^a Ý'è, ³, ê, é B

IDirect3DRMFrame::GetPosition

HRESULT GetPosition(LPDIRECT3DRMFRAME lpRef, LPD3DVECTOR lprvPos);

Žw'è,³,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^êŽŸŒ³,ÌfTfCfY,Æ,µ,Ä,Ä,Í,È,- AfxfNfgf<,Æ,µ,ÄlprvPosfpf%of [f^,ÉŠi”[,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,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,³,ê,½ŽQ Æftf€ [f€,©,ç‘Š‘Î“l,É•\,³,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,¢,ç,ê,éDirect3DRMFramefIfufWfFfNfg,đŽ!,·•İ ” B

lprvAxis
ftf€ [f€,l̂%ñ“]Ž²,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,³,ê,½ftfĈ [fĚ,ðŠŮ,ḐŠK'w,ìfĸ [fg EftfĈ [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 ãÊftfĈ [fĚ,ðŽ',·Direct3DRMFrameIfufWfFfNfg,ðŽó,¬Žæ,éf|fCf“f^,Ö,Ìf|fCf“f^ B

IDirect3DRMFrame::GetSceneBackground

D3DCOLOR GetSceneBackground() ;

*f*V [f“,l”wŒi F,ðŽæ“¾,·,é B
F,ð•Ô,· B

IDirect3DRMFrame::GetSceneBackgroundDepth

```
HRESULT GetSceneBackgroundDepth(  
    LPDIRECTDRAWSURFACE * lpLPDDSurface);
```

fV [f“,lŒ» Ý,l”wŒi [“xfobftf@,ðŽæ“¾,·,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

lpLPDDSurface

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

f_tfHfO,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,ì'l,ðŽó,~Žæ,é•İ ” B

IDirect3DRMFrame::GetSortMode

D3DRMSORTMODE GetSortMode();

ŽqftfĖ [fĖ,đ ^— ,;é,½,ß,ÉŽg,í,ê,é•ª—pf, [fh,đŽæ“¾,;é B
•ª—pf, [fh,đŽ!,•D3DRMSORTMODE—ñ“Ė^,łf f“fo,đ•Ô,• B

ŽQ Æ @IDirect3DRMFrame::SetSortMode

IDirect3DRMFrame::GetTexture

HRESULT GetTexture(LPDIRECT3DRMTEXTURE* lpTexture);

Žw'è,³,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,Ĵ•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,³,ê,½ftfĈ [f€ ã,łflfufWfFfNfg,Éf}fbfv,³,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•Ĭ ” BfefNfXf`ff,^au•ûĈü,âv•ûĈü,Éf}fbfv,³,ê,é,Æ,« A,»,ê,¼,ê,ł•Ĭ ”,ÉTRUE,^a Ý'è,³,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€,Î'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,Î•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lpRef
ŽQ Æ,Æ,µ,Ä—p,Œ,ç,ê,éDirect3DRMFramefIfufWfFfNfg,ðŽ',·•İ ” B

lprvVel
ftfŒ [f€,Î'¬“x,ðŽó,¬Žæ,éD3DVECTOR \‘Œ'Î,ÎfAfhfŒfX B

fRotVel
êŽŸŒ³,Î'¬“x,ðŽæ“¾,·,é ê ‡fIfufWfFfNfg,Ì%õñ“]‘¬“x,ª l—¶,É“ü,ê,ç,ê,é,©,Ç,¤,©,ðŽ',·ftf%ofO B,±
 ,Îfpf%of [f^,ÉTRUE,ðŽw'è,·,é,ÆfIfufWfFfNfg,Ì%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,Ñ o,μ,^a ¬ϵ÷,μ,½,Æ,«,É A—Lϵø,ÈDirect3DRMVisualArray f|fCf“f^,Â %oŠú%o»,³,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 u*Direct3D•ŮŽ f, [fh,İ•Ó'l* v,đŽQ Æ,·,é,±,Æ B

lprvDst
•İŠ·Æ<%oÊ,đŽó,¬Žæ,é**D3DVECTOR** \‘¢‘İ B

lprvSrc
•İŠ·,İf\ [fX,Æ,Ê,é**D3DVECTOR** \‘¢‘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

–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

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,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%ofO,É,æ,Á,Ä%ðŽB,³,ê,é BD3DRMLOAD_BYPOSITIO
Nftf%ofO,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^,Ê,ÍNULL,ðŽw'è,·,é,±,Æ,à,Ä,«,é B

d3drmLOFlags

f [fh EfIfvfVf±f“,ðŽ',•**D3DRMLOADOPTIONS**(Ê^,î'l B

d3drmLoadTextureProc

D3DRMLOADTEXTURECALLBACKfR [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,±
,îfpf%of [f^,Ê,ÍNULL,ðŽw'è,·,é,±,Æ,^a,Ä,«,é B

lpArgLTP

D3DRMLOADTEXTURECALLBACKfR [f<fofbfNŠÖ ”,É“n,³,ê,é AfAfvfŠfP [fVf±f““è<,îff [f^ B

ffftfHf<fg,Ä,Í A,±,îf f\fbfh,Í lpvObjSource fpf%of [f^,ÄŽw'è,³,ê,½ftf@fCf<,î'†,î Ä %o
,îftfœ [f€ŠK‘w,ðf [fh,·,é B,±,îf f\fbfh,ðÆÄ,Ñ o,·ftfœ [f€,Í A V,µ,¢ftfœ [f€ŠK‘w,î 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,İftfĖ [fĖ,É%oñ“],Æ‘¬“x,ð“K—p,·,·,é B
¬Ė÷,·,·,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

delta
•İ X,·,·,é‘¬“x,Æ%oñ“],İ—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,l•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);
```

ftf€ [f€,l̇ F,đ Y'è,.,é **BD3DRMMATERIALMODE**—
ñ<“€^,°D3DRMMATERIAL_FROMFRAME,l̇,Æ,« Aftf€ [f€ ã,l̇f fbfVf...,É,±,l̇ F,ªŽg—p,³,ê,é B
–€÷,.,é,ÆD3DRM_OK AŽ,»s,.,é,ÆfGf%o [l̇,đ•Ô,· B•Ô'l̇,Îê——,É,Â,¢
,Ä,Í A uDirect3D•ŮŽ f, [fh,l̇•Ô'l̇ v,đŽQ Æ,.,é,±,Æ B

```
rvRed, rvGreen, rvBlue  
ftf€ [f€,l̇ V,µ,¢ F BŠe F—v'f,í0,©,ç1,l̇”ÍÍ,É,È,,Ä,Í,È,ç,È,¢ B
```

ŽQ Æ @**IDirect3DRMFrame::SetMaterialMode**

IDirect3DRMFrame::SetMaterialMode

HRESULT SetMaterialMode(D3DRMMATERIALMODE rmmMode);

ftf€ {f€,lf}fefŠfAf<f, [fh,đ Ý'è,·,é Bf}fefŠfAf<f, [fh,Í Aftf€ {f€,Éf€f“f_Ÿf“fO,³,ê,éfrfWf...fAf<,lf}
fefŠfAf< î•ñ,lf\ [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‰e,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€ ,l%õñ“]Ž²,Æ%õñ“]Šp“x,đ Ý’è,·,é B,±,Ì Ý’è,[IDirect3DRM::Tick,Û,½,Í IDirect3DRMFrame::Movef f\fbfh,ªCEÄ,Ñ o,³,ê,é,½,Ñ,É“K—p,³,ê,é B•üCEüxfNfgf<[rvX, rvY, rvZ] ,Í AŽQ Æftf€ [f€,Ä’è`³,ê,é B

¬CE÷,·,é,ÆD3DRM_OK AŽ, ”s,·,é,ÆfGf%o [,đ•Ô,· B•Ô’l,Îê——,É,Â,¢ ,Ä,Í A uDirect3D•ÛŽ f, [fh,Î•Ô’l v,đŽQ Æ,·,é,±,Æ B

lpRef
ŽQ Æ,Æ,µ,Ä—p,¢,ç,ê,éDirect3DRMFramefIfufWfFfNfg,đŽ!,·İ ” B
rvX, rvY, rvZ
%õñ“]Ž²,Æ,È,éfxfNfgf< B

rvTheta
f%oFWfAf““P^Ê,Ì%õñ“]Šp“x B

ftf€ [f€ ã,ÌIfufWfFfNfg,đ1%õñ,µ,©•İ X,µ,È,¢IDirect3DRMFrame::AddRotationf f\fbfh,Æ^Û,È,è A,± ,Ìf f\fbfh,Í AŽw’è,³,ê,½%õñ“,É,æ,Ä,ÄfCEf“f_fŠf“fO,Ìf^fCf~f“fO,²,Æ,É•İŠ· s—ñ,đ•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,Îê——,É,Â,¢
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ĵ•Ó’l v,đŽQ Æ,·,é,±,Æ B

lpImage
fV [f“,l V,µ,¢”wEi [“x,đŠi”[,·,éDirectDrawfT [ftfFfX B

fCf [fW,Ĵ [“x,Í16,Â,È,,Ä,Í,È,ç,È,¢ BfCf [fW,Æfxf... [f] [fg,ĴTfCfY,ª˘Ù,È,Á,Ä,¢
,é ê ‡ A,Ů,, AfCf [fW,ªfXfP [fŠf“fO,³,ê,é B”wEi [“xfobftf@,ĴfAfjf [fVf‡f“,Á Ä ,,Ĵpfth [f}
f“fX,đ“¾,é,½,ß,É,Í AfCf [fW,ĴTfCfY,ªfxf... [f] [fg,Æ“¬,Ĵ,Â,È,,Ä,Í,È,ç,È,¢ B,±,ê,É,æ,Á,Ä A
—]•ª,ÈfI [fo [fwfbfh,È,µ,É A [“xfobftf@,đfCf [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”wEifCf [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,¢”wEifV [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”wEi,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”wEi,ðfCf [fW Ef f,fŠ,©,ç’¼ ÚfŒf“f_ſf“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,đ—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•ŬŽ f, [fh,Ĵ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

bEnable

ftfHfO,İ 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^,Ĵf f“fo,Ĵ,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,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

rvStart, rvEnd

fŠfjfAftfHfO Ef, [fh,Â,Ì AftfHfO,ìŠJŽn,Æ I—¹Ê’u B,±,ê,ç,Ì Ý’è,Í A Â %o
,ÉftfHfOŒø%oÊ,ªŒ»,ê,éfjf f%o,©,ç,Ì←—£,Æ AftfHfO,ª Â‘â–š“x,É’B,·,é←—£,ðŒ^è,·,é B

rvDensity

Žw ”ftfHfO Ef, [fh,Â,ìftfHfO,ì–š“x B,±,ì¹,Í,O,©,ç,P,Ü,Â,ì”ÍÍ,Â,È,,Ä,Í,È,ç,È,¢ B

ŽQ Æ @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€,\ìfefNfXf`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
Žg—p,³,ê,éDirect3DRMTexturefIfufWfFfNfg,ðŽ',·.İ " B

D3DRMMATERIALMODE—

ñ<“œ^,ªD3DRMMATERIAL_FROMFRAME,Ì,Æ,« AfefNfXf`ff,Íftfœ [f€ ã,\ìf fbfVf...,Ì,½,ß,ÉŽg—
p,³,ê,é Bftfœ [f€,\ìfefNfXf`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 AfefNfXf`ff À•W,l̃rÊ‘Š“Á «,đ’è<’,,é B
¬Є÷,.,é,ÆD3DRM_OK AŽ,”s,.,é,ÆfGf%o [,đ•Ô,• B•Ô’l,l̃rê——,É,Â,¢
,Ă,Í A uDirect3D•ŨŽ f, [fh,l̃•Ô’l v,đŽQ Æ,.,é,±,Æ B
bWrap_u, bWrap_v
Ý’è,.,é’l,đŽ’,.ˆø ” B,••ûЄü,Ũ,½,Í,—•ûЄü,ÉfefNfXf`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,³,ê,½ftfĈ [f€,l̇ AŽQ ÆftfĈ [f€
,©,ç,l̇Š'İ'¬“x,đ Y'è,·,é B**IDirect3DRM::Tick**,Ü,½,İ**IDirect3DRMFrame::Move**f f\fbfh,ìĈÄ,Ñ o,μ,^a ¬Ĉ÷,·,é,½,Ñ
AftfĈ [f€,İfxfNfgf<[rvX,rvY,rvZ],É,æ,Á,Ä`Ú“[@],³,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,İ•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 [f€,l̇ V,μ,ĉ'¬“x B

fRotVel
^êŽŸĈ³,l̇¬“x,đ Y'è,·,é ê ± AfIfufWfFfNfg,l̇%ñ“]‘¬“x,đ l—¶,É“ü,ê,é,©,Ç,ϣ,©,đŽw'è,·,éftf%ofO B,±
,l̇fpf%of [f^,"TRUE,İ,Æ,« AfIfufWfFfNfg,l̇%ñ“]‘¬“x,^aĈvŽZ,ÉŠÜ,ß,ç,ê,é B

ŽQ Æ @**IDirect3DRMFrame::GetVelocity**

IDirect3DRMFrame::SetZbufferMode

HRESULT SetZbufferMode(D3DRMZBUFFERMODE d3drmZBM);

Zfofbftf@ Ef, [fh,ð Ý'è,·,é B,·,È,í,¿ AZfofbftf@fŠf“fO,ð—LŒø,Û,½,Í—Œø,É,·,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

d3drmZBM

Zfofbftf@ Ef, [fh,ðŽw'è,·,éD3DRMZBUFFERMODE—
ñ“Œ^,îf f“fo,ì,D,Æ,Â BfftfHf'fg'l,ÍD3DRMZBUFFER_FROMPARENT,Â, ,é B

ŽQ Æ @IDirect3DRMFrame::GetZbufferMode

IDirect3DRMFrame::Transform

HRESULT Transform(D3DVECTOR *lpd3dVDst, D3DVECTOR *lpd3dVSrc);

lpd3dVSrcpfpf%of [f^,^Ž!,·fxfNfgf<,đL,fff< À•W,©,çf [f<fh À•W,É•İŠ·,µ AÆ<%oÊ,đlpd3dVDstfpf%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^ [ftfFfCfX,Ìf f\fbfh,ðŽg—
p,·,é B,±,ÌfZfNfVf‡f“,Í AIDirect3DRMLightfCf“f^ [ftfFfCfX Ef f\fbfh,ÌfŠftf@fÆf“fX,Â, ,é BŠT”O,Ê,Â,¢
,Â,ÌŠT—v,Í A uIDirect3DRMLight,ÆIDirect3DRMLightArrayfCf“f^ [ftfFfCfX v,ðŽQ Æ,·,é,±,Æ B

IDirect3DRMLightfCf“f^ [ftfFfCfX Ef f\fbfh,Í A`È%°,ÌfOf< [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^ [ftfFfCfX,Í A,·,×,Ä,ÌCOMfCf“f^ [ftfFfCfX,Æ“—
l A|UnknownfCf“f^ [ftfFfCfX Ef f\fbfh,ðÆp ³,·,é BIUnknownfCf“f^ [ftfFfCfX,ÍŽŸ,Ì,R,Â,Ìf f\fbfh,ðfTf|
[fg,·,é B

AddRef
QueryInterface
Release

,³,ç,É AIDirect3DRMLightfCf“f^ [ftfFfCfX,Í AIDirect3DRMObjectfCf“f^ [ftfFfCfX,©,çŽŸ,Ìf 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“%4,³,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();

Direct3DRMLightIfufWfFfNfg,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%œċ,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();

GetLinearAttenuation returns the linear attenuation value of the light.

The linear attenuation value is a float value ranging from 0.0 to 1.0.

See [IDirect3DRMLight::SetLinearAttenuation](#) for more information.

IDirect3DRMLight::GetPenumbra

D3DVALUE GetPenumbra () ;

fXf|fbfgf%ofCfg,îÃ%oe•”,lŠp“x,ðŽæ“¾,·,é B
^Ã%oe•”,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,³,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();

Direct3DRMLightIfuFWfNfg,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,³,ê,½ŒðŒ¹,İ F,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 uDirect3D•ŨŽ f, fh,İ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

rcColor
ŒðŒ¹,İ V,µ,¢ F B

ŽQ Æ @IDirect3DRMLight::GetColor

IDirect3DRMLight::SetColorRGB

HRESULT SetColorRGB(D3DVALUE rvRed, D3DVALUE rvGreen,
D3DVALUE rvBlue);

Žw'è,³,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%₀ [,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,Î A uDirect3D•ŮŽ f, fh,İ•Ô’l v,ðŽQ Æ,·,é,±,Æ B

rvAtt
V,µ,¢Œ, ŠŒW ” B

Œ, Š’è ”,İ¹,İ”½”ä“l,ÉŒð“x,É%œç,ð—^,!,é B,½,Æ,!,Î AŒ, Š’è ”,²,İ,Æ,« AŒð,İ“x,İ”¼•³,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, ¢

, 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,İ•Ô’l v,ðŽQ Æ,:é,±,Æ B

rvAtt
V,µ,¢Œ, ŠŒW ” B

ŽQ Æ @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,lîê——,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);

ŒðŒ¹, Ìf^fCfv, ð•İ X, ·, é B

¬Œ÷, ·, é, ÆD3DRM_OK AŽ, ”s, ·, é, ÆfGf%o [, ð•Ô, · B•Ô'l, Ìê——, É, Â, ĸ
, Ä, Í A uDirect3D•ŮŽ f, [fh, Ĩ•Ô'l v, ðŽQ Æ, ·, é, ±, Æ B

d3drmtType

V, µ, ĸŒðŒ¹f^fCfv, ðD3DRMLIGHTTYPE—ñ“Œ^, Ìf f“fo, Ì, Ð, Æ, Â, ÅŽw'è, ·, é B

ŽQ Æ @IDirect3DRMLight::GetType

IDirect3DRMLight::SetUmbra

HRESULT SetUmbra(D3DVALUE rvAngle);

%o~ ,l-¾•”,lŠp“x,đ Y’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,«, Y’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

$fAfvf\check{S}fP\ [fVf\ddot{+}f^{\text{“},\acute{I}\ A\{f}ef\check{S}fAf\langle fIfufWfFfNfg,\mathcal{A}\mathcal{E}\acute{Y},\mathcal{C}$
,É,â,èŽæ,è,·,é,½,ß,É**IDirect3DRMMaterial** $fCf^{\text{“}f^{\wedge}\ [ftfFfCfX,\grave{\imath}f\ f\backslash fbfh,\delta\check{Z}g\text{—}p,\cdot,\acute{e}\ B,\pm$
, $\grave{\imath}fZfNfVf\ddot{+}f^{\text{“},\acute{I}\ A$ **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 $fCf^{\text{“}f^{\wedge}\ [ftfFfCfX\ Ef\ f\backslash fbfh,\acute{I}\ A^{\text{`}}\mathcal{E}\%{}^o,\grave{\imath}fOf\langle\ [fv,\acute{E}\cdot^a\text{—}p,\cdot,\acute{e},\pm,\mathcal{A},^a,\mathring{A},\mathfrak{«},\acute{e}\ B$

•úŽĚ

GetEmissive

SetEmissive

”½ŽĚŽw ”,ì<“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

,³,ç,É A**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** $f\ f\backslash fbfh,\grave{\imath}\mathcal{E}\mathring{A},\tilde{N}\ o,\mu,\acute{E},\mathfrak{x},\mathring{A},\mathring{A}\check{Z}\mathfrak{x}^{\text{“}}\mathfrak{z},^3,\acute{e},\acute{e}\ B$

IDirect3DRMMaterial::GetEmissive

HRESULT GetEmissive(D3DVALUE *lpr, D3DVALUE *lpg, D3DVALUE *lpb);

f}fefŠfAf<,İ•úŽĚ“Á_«,İ Ý’è,ðŽæ“¼,·,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,^a §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,³,ê,½f}fAfŠfAf<,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%ofCfɡ,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•ŨŽ f, [fh,İ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lpr, lpg, lpb
f f\fbfh,^a §Ĉä,ð•Ô,·,Æ,« A”½ŽĚfnfCf%ofCfɡ,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 ”,đ Ý’è,:é B

¬Ė÷,:é,ÆD3DRM_OK AŽ,”s,:é,ÆfGf%o [,đ•Ô,: B•Ô’l,Îĕ——,É,Â,¢
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ĵ•Ô’l v,đŽQ 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

¬Ė÷,·,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

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 fbVf...,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,l•Ô'l v,ðŽQ Æ,·,é,±,Æ B

vCount, fCount

fOf< [fv,ÊŠÜ,Ü,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^,ÍŽŸ,Ì,æ,²,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^,ìÆ`Ž@,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);

$fOf\langle [fv,\grave{\imath} F,\delta\check{Z}\mathfrak{a}^{\text{“}\frac{3}{4},\cdot,\acute{e}} B$
 $\neg\mathfrak{E}\dot{+},\mu,\frac{1}{2} \hat{e} \mp A F,\delta\check{Z}_{\imath},\cdot D3DCOLOR'l,\delta\bullet\hat{O},\cdot B,\gg,\varpi,\hat{A},\grave{E},\mathfrak{C} \hat{e} \mp,\acute{\imath}0,\delta\bullet\hat{O},\cdot B$
id
 $fOf\langle [fv,\grave{\imath}\check{Z}^{-}\bullet\hat{E}\check{Z}q B,\pm,\grave{\imath}\check{Z}^{-}\bullet\hat{E}\check{Z}q,\acute{\imath}\underline{\text{IDirect3DRMMesh::AddGroup}},\delta\check{Z}g,\acute{A},\check{A} \P \neg,3,\hat{e},\frac{1}{2},\grave{a},\grave{\imath},\hat{A},\grave{E},,\check{A},\acute{\imath},\grave{E},\varsigma,\grave{E},\mathfrak{C} B$
 $\check{Z}Q \mathrel{\vDash} @\underline{\text{IDirect3DRMMesh::SetGroupColor}}, \underline{\text{IDirect3DRMMesh::SetGroupColorRGB}}$

IDirect3DRMMesh::GetGroupCount

unsigned GetGroupCount();

Žw'è,³,ê,½Direct3DRMMeshIfufWfFNfg,ÌfOf< [fv,Ì ",ðŽæ“¾,·,é B
¬Œ÷,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,^af}fbfv,³,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[–]•ÊŽq B,±,ìŽ[–]•ÊŽq,ÍIDirect3DRMMesh::AddGroup,ðŽg,Á,Ä ¶ ¬,³,ê,½,à,Ì,Â,È,,Ä,Í,È,Ç,È,Œ 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,^a §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,³,ê,½fOf< [fv,lfEf“f_fŠf“fO•iŽĭ,ðŽæ“¾,·,é B

¬Œ÷,·,é,ÆD3DRMRENDERQUALITY,ĂŽ_i,³,ê,—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,ç,é B

id

fOf< [fv,İŽ⁻•ÊŽq B,±,İŽ⁻•ÊŽq,İIDirect3DRMMesh::AddGroup,ðŽg,Á,Ă ¶ ¬,³,ê,½,à,ĭ,Ă,È,,Ă,Ĭ,È,ç,È,ç B

ŽQ Æ @IDirect3DRMMesh::SetGroupQuality

IDirect3DRMMesh::GetGroupTexture

```
HRESULT GetGroupTexture(D3DRMGROUPINDEX id,
    LPDIRECT3DRMTEXTURE *returnPtr);
```

fOf< [fv,ÉŠÖ~A•t,¯,ç,ê,½fefNfXf`ff,Ö,Ïf|fCf“f^,ðŽæ“¾,·,é B
¬Æ÷,·,é,ÆD3DRM_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Ïê——,É,Â,¢
,Ä,Í A uDirect3D•ÛŽ f, [fh,l•Ô'l v,ðŽQ Æ,·,é,±,Æ B

id
fOf< [fv,ÏŽ¯•ÊŽq B,±,ÏŽ¯•ÊŽq,ÍIDirect3DRMMesh::AddGroup,ðŽg,Á,Ä ¶ ¬,³,ê,½,à,Ì,Â,È,,Ä,Í,È,ç,È,¢ B
returnPtr
f f\fbfh,^a §Æä,ð•Ô,·,Æ,« AfOf< [fv,ÏIDirect3DRMTexturefCf“f^ [ftfFfCfX,ðŽó,¯Žæ,é•İ ”,Ö,Ïf|fCf“f^,Ö,Ïf|
fCf“f^ B

ŽQ Æ @IDirect3DRMMesh::SetGroupTexture

IDirect3DRMMesh::GetVertices

```
HRESULT GetVertices(D3DRMGROUPINDEX id, DWORD index,
    DWORD count, D3DRMVERTEX *returnPtr);
```

Žw'è,³,ê,½fOf< [fv,l',“_Ê'u,ðŽæ“¾,·,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

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

index

',“_Ê'u,ðŽæ“¾,·,éŽn“_,ðŽl,·D3DRMVERTEX \‘¢‘Ì,Ì”z—ñ,ÌfCf“ffbfNfX B

count

indexfpf%of [f^,ªŽl,·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,^a §Æä,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,Î•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⁻•ÊŽq B,±,ìŽ⁻•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,İ•Ô'l v,ǒŽQ Æ,·,é,±,Æ B

id
fOf< [fv,İŽ¯•ÊŽq B,±,İŽ¯•ÊŽq,İIDirect3DRMMesh::AddGroup,ǒŽg,Á,Ä ¶ ¬,³,ê,½,à,İ,Ä,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'†,l̃fOf< [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,©,đĈ^`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,l•Ô'l v,đŽQ Æ,·,é,±,Æ B

id
fOf< [fv,ÌŽ⁻•ÊŽq B,±,ÌŽ⁻•ÊŽq,ÍIDirect3DRMMesh::AddGroup,đŽg,Á,Ä ¶ ¬,³,ê,½,à,Ì,Â,È,,Ä,Í,È,Ç,È,¢ B
value
fOf< [fv,Ìf}fbfsf“fO,đŽw'è,·,éD3DRMMAPPINGĈ^,Ì¹ 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,³,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,ìŽ⁻•ÊŽq B,±,ìŽ⁻•ÊŽq,ÍIDirect3DRMMesh::AddGroup,đŽg,Á,Ă ¶ ¬,³,ê,½,à,Ĭ,Ă,È,,Ă,Í,È,Ç,È,¢ B

value
D3DRMRENDERQUALITYœ^,Ă•\,³,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,^aŠŨ,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
¬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
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,ÌfAfhfŒfX 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,ªÙ,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,³,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,³,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} B **Unknown***fCf“f^ [ftFfCfX,ÍŽŸ,ì,R,Â,ìf f\fbfh,ðfTf|*
[fg,·,é B

AddRef

QueryInterface

Release

,^{3,ς,É} A**IDirect3DRMMeshBuilder***fCf“f^ [ftFfCfX,ÍIDirect3DRMObjectfCf“f^ [ftFfCfX,©,ςŽŸ,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,δDirect3DRMMeshBuilderIfufWfFfNfg,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•ŬŽ f, [fh,j•Ô’l v,ðŽQ Æ,·,é,±,Æ B

lpD3DRMFace
’Ç%oÁ,·,é–Ê,ÌfAfhfŒfX B

,Đ,Æ,Â,Ì–Ê,Í A1“x,É,Đ,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% [,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,İfpf%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 İ ¬,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%oÁ,·,é B
¬œ÷,·,é,ÆD3DRM_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô’l,l̈ê——,É,Â,¢
,Ä,Í A uDirect3D•ŮŽ f, fh,j•Ô’l v,ðŽQ Æ,·,é,±,Æ B

lpD3DRMFrame
ftfœ [f€,l̈fAfhfœfX B,±,l̈ftfœ [f€,l̈fRf“fef“fc,”Ç%oÁ,³ê,é B
,±,l̈ ^— ,ð s,Á,Ä,à Aœ³ftfœ [f€,ªİ X,Ů,½,ÍŽQ Æ,³ê,é,±,Æ,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...,ĭfAfhfŒfX 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);

Direct3DRMMeshBuilderIfWfFfNfg,©,ç V,µ,¢f fbVf...,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,éfAfhfŒfX 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‘Î 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 () ;

Direct3DRMMeshBuilderIfufWfFfNfg’†,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,▯,©,ǫŽæ“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,³,ê,½ A',“_,İfefNfXf`ff Ä•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,^a §Œä,ð•Ô,·,Æ,« A',“_,İfefNfXf`ff Ä•W,ðŽó,¬Žæ,é•İ ” B

ŽQ Æ **IDirect3DRMMeshBuilder::SetTextureCoordinates**

IDirect3DRMMeshBuilder::GetVertexColor

D3DCOLOR GetVertexColor(DWORD index);

Direct3DRMMeshBuilderfIfufWfFfNfg’†,İŽw’è,³,ê,^{1/2},“_ ,İ F,đŽæ“¾,·,é B
F,đ•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

–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

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 Efu f b fN A,Ü,½,ÍfXfgfŠ [f€,ðŽw'è,·,é B

lpvObjID

f [fh,·,éIfuFWfFfNfg,î–¼‘O,Ü,½,ÍÊ'u B,±
 ,îfpf%of [f^,Íd3drmLOFlagsfpf%of [f^,ªŽ',·Ž–•ÊŽqftf%ofo,É,æ,Á,Ä%ðŽß,³,ê,é BD3DRMLOAD_BYPOSITIO
 Nftf%ofo,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 EIfvfVf±f“,ðŽ',·**D3DRMLOADOPTIONS**(Œ^,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,Y o,·,Æ,«,ÉŒÄ,Ñ o,³,ê,é B,±
 ,îfpf%of [f^,É,ÎNULL,ðŽw'è,·,é,±,Æ,ª,Ä,«,é B

lpvArg

D3DRMLOADTEXTURECALLBACKfR [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 fb fVf...
 ,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, èƐø—!“I, Éf f, fŠ, ðŽg,, !, é, æ, ¢, É, È, é B

¬Ɛ÷, ·, 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,  
             D3DRMXOFFORMAT 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,Ŏ,îf|fCf“f^ Bftf@fCf<¼,ìŠg’£Žq,Í.X,Â,È,,Ä,Í,È,ç,È,¢ B

d3drmXOFFFormat

D3DRMXOFFORMAT—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% [,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% ^,Á,Ä“K—p,³,ê,é kŽÚŒW ” B

IDirect3DRMMeshBuilder::SetColor

```
HRESULT SetColor(D3DCOLOR color);
```

Direct3DRMMeshBuilderIfufWfFfNfg,Ì,·,×,Ä,Ì-Ê,É AŽw'è,³,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,³,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,Î 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);

Direct3DRMMeshBuilderIfuWfFfNfg,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

Direct3DRMMeshBuilderIfuWfFfNfg,ÌIDirect3DRMMaterialfCf“f^ [ftFfCfX B

IDirect3DRMMeshBuilder::SetNormal

HRESULT SetNormal(DWORD index, D3DVALUE x, D3DVALUE y, D3DVALUE z);

Direct3DRMMeshBuilderIfufWfFfNfg,ÅŽw’è,³,ê,½,’“_,-@_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,İfCf“fffbfNfX B

x, y, z
Žw’è,μ,½-@ ü,ÉŠ,,è“-Ä,éfxfNfgfç,İx Ay Az,İŠe—v’f B

IDirect3DRMMeshBuilder::SetPerspective

HRESULT SetPerspective(BOOL perspective);

Direct3DRMMeshBuilderIfufWfFfNfg,Ì A%“«ß•â ³fefNfXf`ff Ef}fbfsf“fO,ð—LŒø,Û,½,Í¬Œø,É,·,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,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_Œf“fO•iŽç,ð Ý’è,·,é B

¬Ǝ÷,·,é,ÆD3DRM_OK AŽ, ”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢
,Ä,Î A uDirect3D•ŬŽ f, [fh,Ĵ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

quality
V,µ,Žg—p,·,éfƎf“f_Œf“fO•iŽç,ðŽ',· 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“ffbfNfX 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,İ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

cylU, cylV
uŽŸŒ³,ÆvŽŸŒ³,Ì^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,³ê,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•ŬŽ f, fh,İ•Ô’l v,ðŽQ Æ,·,é,±,Æ B

index
Ý’è,·,é’,“_,İfCf“ffbfNfX B

x, y, z
Žw’è,³ê,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,³,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,³,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,³,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,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
 ',“_„ÉŠ,,,è“-,Ä,é F,Ì Ô A—Î A Â,ÌŠe—v'f B

IDirect3DRMMeshBuilder::Translate

HRESULT Translate(D3DVALUE tx, D3DVALUE ty, D3DVALUE tz);

Direct3DRMMeshBuilderfIfufWfFfNfg,ì'“_ ,ìÊ'u,É AŽw'è,³,ê,½fIftfZfbfg,đ'Ç%oÁ,·,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,j•Ô'l v,đŽQ Æ,·,é,±,Æ B

tx, ty, tz
Še',“_Ê'u,ìx Ay Az Â•W,»,ê,¼,ê,É'Ç%oÁ,³,ê,éfIftfZfbfg 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•^a—b,·,é,±,Æ,^aÄ,«,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^lUnknownfCf“f^ [ftfFfCfX Ef f\fbfh,ðÆp ³,·,é B^IUnknownfCf“f^ [ftfFfCfX,ÍŽŸ,Ì,R,Â,Ìf f\fbfh,ðfTf|
[fg,·,é B

AddRef

QueryInterface

Release

Direct3DRMObjectfIfufWfFfNfg,Í A“K Ø,È^ÈQueryInterface f\fbfh,ðÆÄ,Ñ o,·,±,
Æ,É,æ,è A,Ç,ÌDirect3DRMfIfufWfFfNfg,©,ç,Ä,àŽæ“¾,·,é,±,
Æ,^aÄ,«,é B,·,×,Ä,ÌDirect3DRMfIfufWfFfNfg,Í AIDirect3DRMObjectfCf“f^ [ftfFfCfX Ef f\fbfh,ðÆp ³,·,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•_i » ,đ ì ¬,·,é B

¬Œ÷,·,é,ÆD3DRM_OK AŽ, ”s,·,é,ÆfGf%_o [,đ•Ô,· B•Ô'l,Îê——,É,Â,¢
,Ä,Î A uDirect3D•ŬŽ f, [fh,İ•Ô'l v,đŽQ Æ,·,é,±,Æ B

pUnkOuter

COM W ¬%o»«@”\,É‘Î%ož,·,é,½,ß,É‘¶ Ý,·,éfpf%_of [f^ B

riid

•_i » ,·,éfIfufWfFfNfg,İŽ[−]•ÊŽq B

ppvObj

f f\fbfh,^a §Œä,đ•Ô,·,Æ,« AfIfufWfFfNfg,İ•_i » ,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“ĖĀ—L,ì32f‡fbfg 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,ªfofCfY’P^Ê,Å“ü,é•Ĭ ” B

lpName

f f\fbfh,ª §Æä,ð•Ô,·,Æ,« AfIfufWfFfNfg,Ï¼‘O,ðŽ|,·NULL,Å 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);

fIfufWfFfNfg,ÉfAfvfŠfP [fVf‡f“ĈĀ—L,ł32frfbfg Eff [f^,ð Ý’è,·,é B

*¬Ĉ÷,·,é,ĀD3DRM_OK AŽ,”s,·,é,ĀfGf%o [,ð•Ô,· B•Ô’l,Îĉ——,É,Ā,ĉ
,Ă,Í A uDirect3D•ŮŽ f, [fh,Ĵ•Ô’l v,ðŽQ ĀE,·,é,±,ĀE B*

ulData

fIfufWfFfNfg,ÉŠi”[,³,ê,éf† [fU’èċ,łff [f^ B

ŽQ ĀE @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,Ň o,.,Æ,«,Í A,±,İ %Šú%»»,Í•s—v,Ä, ,é B %Šú%»»,“K—v,È,İ,Í AIDirect3DRM::CreateObjectf f\fbfh,đĖÄ,Ň 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,Ň 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,î•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•^a—D,·,é,±,Æ,^a,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 ³,·,é BIUnknownfCf“f^ [ftfFfCfX,ÍŽŸ,Ì,R,Â,Ìf f\fbfh,ðfTf|
[fg,·,é B*

AddRef

QueryInterface

Release

*,³,ç,É AIDirect3DRMTexturefCf“f^ [ftfFfCfX,Í AIDirect3DRMObjectfCf“f^ [ftfFfCfX,©,çŽŸ,Ìf f\fbfh,ðŒp ³,
·,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,Îê——,É,Â,¢
,Ä,İ A uDirect3D•ŮŽ_f, [fh,İ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

bPixels

fsfNfZf<,•İ X,³,ê,½,Æ,«,ÍTRUE,ð Ý'è,·,é B

bPalette

fpfŒfbfg,•İ X,³,ê,½,Æ,«,ÍTRUE,ð Ý'è,·,é B

IDirect3DRMTexture::GetColors

DWORD GetColors();

fe fNfXf`ff, Ì fÇf“f_fŠf“fO, ÅŽg, í, ê, é Å‘å F ”, ðŽæ“¾, ·, é B
F ”, ð•Ô, · B

, ±, Ì f f\fbfh, Í AfefNfXf`ff, Ì ì ¬, ÊŽg, í, ê, ½fCf [fW, Ì F ”, Å, Í, È, A, ±
, ê, Ü, Å, ÊfefNfXf`ff, Ê Ý’è, ³, ê, ½ F, Ì ”, ð•Ô, · B, µ, ½, ^a, Á, Ä A’Ê í•Ô, ³, ê, é F, Ì ”, Í AIDirect3DRMTexture::SetColo
rsf f\fbfh, Å–
¾Ž, “I, ÊfefNfXf`ff, Ì F, ð•İ X, µ, È, ÇÈÀ, è AIDirect3DRM::SetDefaultTextureColorsf f\fbfh, ðÇÄ, Ñ o, µ, Ä Ý’è, µ,
½ F, Æ““, ¶, Å, , é B

ŽQ Æ @IDirect3DRMTexture::SetColors

IDirect3DRMTexture::GetDecalOrigin

HRESULT GetDecalOrigin(LONG * lplX, LONG * lplY);

fffj [*f*⌵,l̂E» Ý,l̂E“_„ðŽæ“¾,·,é B
¬E±,·,é,ÆD3DRM_OK AŽ, ”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,l̂e——,É,Â,¢
,Ä,Í A uDirect3D•ŮŽ f. fh,l̂•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lplX, lplY
f f\fbfh,^a §Eä,ð•Ô,·,Æ,« AfffJ [*f*⌵,l̂E“_„ðŽó,¬Žæ,é•l̂ ” B

ŽQ Æ @IDirect3DRMTexture::SetDecalOrigin

IDirect3DRMTexture::GetDecalScale

DWORD GetDecalScale();

Žw'è,³,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,l̈rê——,É,Â,¢
,Ä,Í A uDirect3D•ŨŽ f, [fh,l̈•Ô'l v,đŽQ Æ,·,é,±,Æ B*

*lprvWidth, lprvHeight
f f\fbfh,^a §Œä,đ•Ô,·,Æ,«,ÉfffJ [f<,l̈• ,Æ ,,³,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, ^a, , 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,ĂŽg,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,³,ê,½ftf@fCf<,î 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,³,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,İ•Ô'l v,đŽQ Æ,·,é,±,Æ B

^{rs}
fŠf\ [fX,Îfnf“fhf<,đŽw'è,·,é B

ŽQ Æ @IDirect3DRMTexture::InitFromFile, IDirect3DRMTexture::InitFromSurface

IDirect3DRMTexture::InitFromSurface

HRESULT InitFromSurface(LPDIRECTDRAWSURFACE lpDDS);

Žw'è,³,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<,l̂CE´“_„đ AffffJ [f<,l̂ ¶ ã,©,ç,l̂fIftfZfbfg,Æ,μ,Ä Ý’è,·,é B
¬CE÷,·,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,ðŽQ Æ,·,é,±,Æ B

lX, lY
V,μ,¢CE´“_„đffffJ [f< Ä•W,ÄŽw’è,·,é BffftfHf<fg,l̂CE´“_„Í[0, 0],Ä, ,é B

fCEf“f_fŠf“fO,Æ,«,É,Í AffffJ [f<,l̂CE´“_„Í,»„l̂tfCE [f€,l̂Ê’u,Éf}fbfv,³ê,é B,½,Æ,,l̂ A \Žš,l̂ffffJ [f<,l̂CE
´“_„ÍffffJ [f<,l̂’†%o»,É A%o°CEü,«,l̂-ĩô,l̂CE´“_„Í’ê•Ó,l̂’†%o»,ÉfZfbfg,³ê,é B
ŽQ Æ @IDirect3DRMTexture::GetDecalOrigin

IDirect3DRMTexture::SetDecalScale

```
HRESULT SetDecalScale(DWORD dwScale);
```

ffffJ [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,ÄffffJ [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“Á «,ðfZfbfg,·,é B

¬Œ÷,·,é,ÆD3DRM_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,İ^ê——,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,³ê,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,l•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*,ð %Šú%»»,·,é,½,ß,ÉI*Direct3DRMUserVisualfCf“f^ [f*
tfFfCfX,İf f\fbfh,ðŽg—
p,·,é BfAfvfŠfP [fVf‡f“,^a*IDirect3DRM::CreateUserVisual f\fbfh,ðĖĂ,Ń o,·,Æ,«*,Í A,±,İ %Šú%»»,Í•s—v,Ă, ,é
B %Šú%»»,^a•K—v,Ė,İ,Í A **IDirect3DRM::CreateObject** *f\fbfh,ðĖĂ,Ń o,μ,ĂrfWf...*
fAf· EfIfufWfFfNfg,ð ¶ ¬,·,é ê ‡,¼, ,Ă, ,é B,±
,İfZfNfVf‡f“,Í A*Direct3DRMUserVisualfCf“f^ [ftfFfCfX Ef f\fbfh,İfŠftf@fĖf“fX,Ă, ,é BŠT”O,É,Ă,¢*
*,Ă,İŠT—v,Í A**Direct3DRMUserVisualfCf“f^ [ftfFfCfX,ðŽQ* *Æ,·,é,±,Æ B*

*IDirect3DRMUserVisualfCf“f^ [ftfFfCfX,Í***Init***f f\fbfh,ðfTf| [fg,·,é B*

IDirect3DRMUserVisualfCf“f^ [ftfFfCfX,Í A,·,×,Ă,İCOMfCf“f^ [ftfFfCfX,Æ“—

l A*UnknownfCf“f^ [ftfFfCfX Ef f\fbfh,ðĖp* ³,·,é B*UnknownfCf“f^ [ftfFfCfX,İŽŸ,İ,R,Ă,İf f\fbfh,ðfTf|*
[fg,·,é B

AddRef

QueryInterface

Release

³,ç,É A*Direct3DRMUserVisualfCf“f^ [ftfFfCfX,Í A**Direct3DRMObjectfCf“f^ [ftfFfCfX,©,çŽŸ,İf f\fbfh,ðĖp*
³,·,é B

AddDestroyCallback

Clone

DeleteDestroyCallback

GetAppData

GetClassName

GetName

SetAppData

SetName

*Direct3DRMUserVisualIfufWfFfNfg,Í A***IDirect3DRM::CreateUserVisual** *f\fbfh,İĖĂ,Ń o,μ,É,æ,Ă,ĂŽæ“¼,³,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,Ä,« ,é BIDirect3DRMUserVisual::Init,đŒÄ,Ň o,·K—
v,^a, ,é,Ĭ,Í AIDirect3DRM::CreateObjectf f\fbfh,É,æ,Ä,Äf† [fU EfrfWf...

fAf< EfIfufWfFfNfg,đ ì ¬,μ,^{1/2} 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—Đ,·,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

,³,ç,É AIDirect3DRMViewportfCf“f^ [ftfFfCfX,ÍIDirect3DRMObjectfCf“f^ [ftfFfCfX,©,çŽŸ,Ìf f\fbfh,ðŒp³,·,
é B

AddDestroyCallback

Clone

DeleteDestroyCallback

GetAppData

GetClassName

GetName

SetAppData

SetName

Direct3DRMViewportIfufWfFfNfg,Í AIDirect3DRM::CreateViewportf f\fbfh,ÌŒÄ,Ñ o,μ,É,æ,Á,ÄŽæ“¾,³ê,é B

IDirect3DRMViewport::Clear

HRESULT Clear();

«» Ý,ì”wEi F,Â AŽw’è,³ê,½f_rf... [f| [fg,ðfNfŠfA,·,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

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,Î 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,¢
,ÎlX 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,³,ê,¹/₂—
l̂æ,Í AŽŸ%oñ,ìIDirect3DRMDevice::Updatef f\fbfh,ìĖÄ,Ñ o,µ,ÅfXfNfŠ [f“,ÉfRfs [,³,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,³,ê,¹/₂<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,³,ê,é,±,Æ,à ,é B

IDirect3DRMViewport::GetBack

D3DVALUE GetBack();

frf... [f| [fg,ìĒâ•ûfNfŠfbfv-Ê ,ìÊ'u,ðŽæ“¾,·,é B
Ê'u,ðŽ',·l,ð•Ô,· B

ŽQ Æ @IDirect3DRMViewport::SetBack, Ž_⋈—ä

IDirect3DRMViewport::GetCamera

HRESULT GetCamera(LPDIRECT3DRMFRAME *lpCamera);

frf... [f| [fg,lfJf f%o,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 Æ,·,é,±,Æ B
lpCamera
fJf f%o,ð•\,·Direct3DRMFrameIfufWfFfNfg,a“ü,é•İ ”,Ö,lf|fCf“f^ B
ŽQ Æ @IDirect3DRMViewport::SetCamera, fJf f%o

IDirect3DRMViewport::GetDevice

HRESULT GetDevice(LPDIRECT3DRMDEVICE *lpD3DRMDevice);

frf... [f| [fg,ÆŠÖ~A•t,¯,ç,ê,½fffofCfX,ðŽæ“¾,·,é
¬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

lpD3DRMDevice
Direct3DRMDeviceIfufWfFfNfg,““ü,é•İ ” B

IDirect3DRMViewport::GetDirect3DViewport

HRESULT GetDirect3DViewport(LPDIRECT3DVIEWPORT * lplpD3DViewport);

«» Ý,ìDirect3DRMViewport,É‘Î%ž,·,éDirect3Dfıf... [f| [fg,ðŽæ“¾,·,é 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

lplpD3DViewport
Direct3DViewportIfufWfFfNfg,Ö,Ìf|fCf“f^,“ü,éf|fCf“f^ B

IDirect3DRMViewport::GetField

D3DVALUE GetField();

frf... [f| [fg,lfvf... [EftfB [f<fh,ðŽæ“¾,·,é B
frf... [,lfvfB [f<fh,ðŽ',·'l,ð•Ô,· B

ŽQ Æ @IDirect3DRMViewport::SetField, Ž<__ä

IDirect3DRMViewport::GetFront

D3DVALUE GetFront();

frf... [f| [fg,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, đžæ“¾, ·, é B*f*r*f*... [*f*] [*f*g, É, Í A•½ s“Š%œ,Æ“Šž,“Š%œ, ì, Ç, ĭ, Ç, Å, à—p, ċ, é, ±, Æ, ª, Å, «, é B

D3DRMPROJECTIONTYPE—ñ<“Ė^, ì*f* f“*f*o, ì, Đ, Æ, Â, đ•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,ß,É—p,¢,ç,ê,é A kŽÚ“Á «,đŽæ“¾,·,é B
fzf... [f| [fg,“ê’è,ì”ä—,ĀfXfP [fŠf“fO,³,ê,é ê ‡,ÍTRUE A,»,²,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 ã,ìfrf... [f| [fgŽn“_,ìx À•WfIftfZfbfg,ðŽæ“¾,·,é B
xfIftfZfbfg,ð•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% [,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% EftfŒ [f€ B

xpos, ypos

frf... [f| [fg,î ¶ ā÷,îx À•W,¨,æ,Ŋy À•W B

width, height

frf... [f| [fg,î• ,Æ ,,³ 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,^a §Æä,ð•Ô,·,Æ,«,É ^— Æ<%oÊ,ðŽó,¬Žæ,éD3DVECTOR \‘¢‘Î B

lprvSrc
•İŠ·,³,é,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,ðŠÛ,þftfŒ [f€,É“Ž’B,·,é,Û,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•ÛŽ f, fh,Î•Ô’l v,ðŽQ Æ,·,é,±,Æ B

lX, lY
fsfbfLf“fO,ÉŽg,í,ê,é À•W B

lp 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,Ìf|fCf“f^ B

IDirect3DRMViewport::Render

HRESULT Render(LPDIRECT3DRMFRAME lpD3DRMFrame);

ftfŒ [f€ŠK‘w,đ AŽw’è,³,ê,¹/₂frf... [f| [fg,ÉfŒf“f_fŠf“fO,·,é BŽw’è,³,ê,¹/₂ftfŒ [f€ ã,ìfrfWf...
fAf<,Æ A,»,ì%°,ìŠK‘w,ìftfŒ [f€,¾,¯,^afŒf“f_fŠf“fO,³,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,ìĈã•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
Ĉã•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,Îê——,É,Â,¢
,Ä,Í A uDirect3D•ŮŽ f, [fh,İ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

rvField
frf... [,İ V,µ,¢ftfB [f<fh BffftfHf<fg'l,Í0.5,Â ,é B,±,İ'l,É0`È%°,ðŽw'è,·,é,Æ A,±
,İf 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
–Œ÷,·,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%o,łzŽ²,É‘Î,·,éfrf... [f| [fg,İfTfCfY,ð‘O•ûfNfŠfbfv–Ê,É Ý’è,·,é B

–Œ÷,·,é,ÆD3DRM_OK AŽ,˝s,·,é,ÆfGf%o [‚ð•Ô,· B•Ô’l,İˆê——,É,Â,¢
,Ä,Î A uDirect3D•ŮŽ f, [fh,İ•Ô’l v,ðŽQ Æ,·,é,±,Æ B

rvLeft, rvRight, rvBottom, rvTop
frf... [f| [fg,İ Ä –‚İx Ä•W A Ä‘â,İx Ä•W A Ä –‚İy Ä•W A Ä‘â,İy Ä•W B

‘†%o,É’² ®,³,ê,½frf... [f| [fg,ðŽw’è,·,é**IDirect3DRMViewport::SetField**f f\fbfh,ÆˆÛ,Ê,è A,±
,İf f\fbfh,É,æ,Ä,Ä A”CˆÓ,İ”ä—‘,ÆˆÊ’u,İfrf... [f| [fg,ðŽw’è,·,é,±,Æ,ª,Ä,«é B,½,Æ,ı,Î A•ª—£
,µ,½Ž<—‘ä,ð \’z,µ,Ä A‰E–Ů,â ¶–Ů,İfXfefŒfİ Efrf... [‚ðfCf“fvfŠf f“fg,·,é,±,Æ,ª,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
¬Œ÷,·,é,ÆD3DRM_OK AŽ,"s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,Îê——,É,Â,¢,Ä,Í A¢Direct3D•ŮŽ f. [fh,ĭ•Ô'lŒ
,đŽQ Æ,·,é,±,Æ B

rptType
D3DRMPROJECTIONTYPE—ñ<“Œ^,ĭf f“fo,ĭ,Đ,Æ,Â B

ŽQ Æ @IDirect3DRMViewport::GetProjection

IDirect3DRMViewport::SetUniformScaling

HRESULT SetUniformScaling(BOOL bScale);

•Ž|f{fŠf... [f€,ðfEfBf“fhfE,l̈fTfCfY,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,l̈ê——,É,Â,¢,Ä,Í A¢Direct3D•ŮŽ f. [fh,l̈•Ô’l̈f
,ðŽQ Æ,·,é,±,Æ B

bScale

V,µ,¢ kŽÚ“Á « B,±,l̈fpf%of [f^,ÉTRUE,ðŽw’è,·,é,Æ A ...•½•ûŒü,Æ ,’¼•ûŒü,É“¬,¶ kŽÚŒW ”,aŽg—
p,³,ê,é B,»,¤,Ä,È,¬,ê,Î A•Ž|f{fŠf... [f€,ðfEfBf“fhfE,É^ê’v,³,¹,é,½,ß A^Û,È,é kŽÚŒW ”,a—p,¢
,ç,ê,é BffftfHf<fg,l̈ Ý’è,ÍTRUE,Ä, ,é B

’Ê í,±,l̈f f\fbfh,Í Af of“ff fBf“fO,ðfTf| [fg,·,é,½,ß,É**IDirect3DRMViewport::SetPlane**f f\fbfh,Æ,Æ,à,ÉŽg—
p,³,ê,é B

ŽQ Æ @**IDirect3DRMViewport::GetUniformScaling**

IDirect3DViewport::Transform

```
HRESULT Transform(D3DRMVECTOR4D * lprvDst, D3DVECTOR * lprvSrc);
```

lprvSrc is a pointer to a D3DVECTOR structure that contains the source coordinates. *lprvDst* is a pointer to a D3DRMVECTOR4D structure that contains the destination coordinates.

The function transforms the source coordinates into the destination coordinates using the current viewport's transformation matrix. The function returns S_OK if successful, or an HRESULT error code if an error occurs.

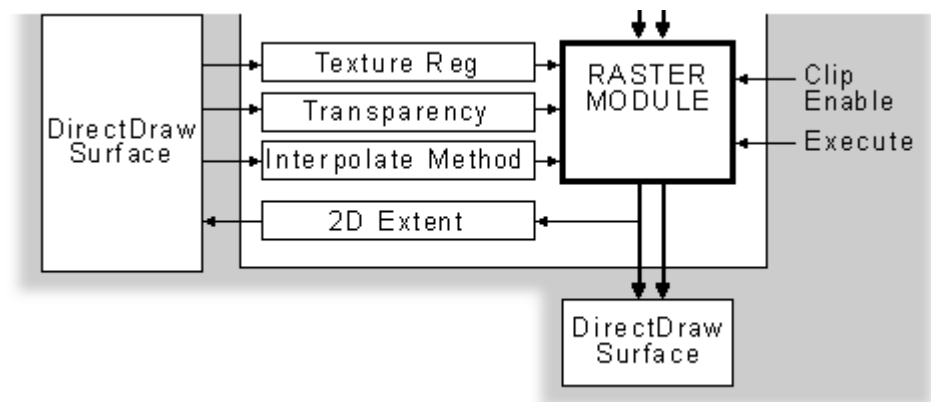
lprvDst

• is a pointer to a D3DRMVECTOR4D structure that contains the destination coordinates.

lprvSrc

• is a pointer to a D3DVECTOR structure that contains the source coordinates.

The function transforms the source coordinates into the destination coordinates using the current viewport's transformation matrix. The function returns S_OK if successful, or an HRESULT error code if an error occurs.



IDirect3DRMWinDevice

fAfvfŠfP [fVf‡f“,Í AfEfBf“fhfE Efvf fV [fWff,ÅfEfBf“fhfE Ef fbfZ [fW,É%ž“š,·,é,½,ß,ÉIDirect3DRM WinDevicefCf“f^ [ftfFfCfX,lf f\fbfh,ðŽg—p,·,é B,± ,lfZfNfVf‡f“,ÍIDirect3DRMWinDevicefCf“f^ [ftfFfCfX Ef f\fbfh,lfŠftf@fEf“fX,Å, ,é BŠT”O,É,Â,ç,Ä,İŠT— v,Í A ufEfBf“fhfEŠÇ— v,ðŽQ Æ,·,é,±,Æ B

IDirect3DRMWinDevicefCf“f^ [ftfFfCfX Ef f\fbfh,Í A`È%°,lfOf< [fv,É•ª—p,·,é,±,Æ,ª,Ä,«,é B

HandleActivate

HandlePaint

IDirect3DRMWinDevicefCf“f^ [ftfFfCfX,Í A,·,×,Ä,İCOMfCf“f^ [ftfFfCfX,Æ“—l AUnknown fCf“f^ [ftfFfCfX Ef f\fbfh,ðEp ³,·,é BIUnknownfCf“f^ [ftfFfCfX,íŽŸ,İ,R,Ä,lf f\fbfh,ðfTf| [fg,·,é B

AddRef

QueryInterface

Release

Direct3DRMWinDeviceIfufWfFfNfg,Í AIID_IDirect3DRMWinDevice,ðŽw’è,µ,ÄIDirect3DRM::QueryInterface f\fb fhCEÄ,Ň o,·,© AIDirect3DRM::CreateDeviceFromD3D,İ,æ,□,Èf f\fbfh,ðŽg— p,·,ê,İŽæ“¾,Ä,«,é BDirect3DRMWinDeviceIfufWfFfNfg,lf 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,Â F,ð ³,µ,•Ŭ,Â,±,Æ,ª,Â,«,é B
¬Œ÷,·,é,ÆD3DRM_OK AŽ,”s,·,é,ÆfGf% [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢,Ä,Í A¢Direct3D•ŬŽ f, [fh,ĭ•Ô'lE
,ðŽQ Æ,·,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,³,ê,éPAINTST
RUCT \‘c‘ì,©,çŽæ“¾,³,ê,é B,±,ìf f\fbfh,Í AfffofCfX ä.É ì ¬,³,ê,½frf... [f] [fg,ÌŠO‘▯,ì—Ìæ,ð Ä•%æ,·,é,±
,Æ,^a, ,é,½,ß AfEfBf“fhfE“à,ÌfAfvfŠfP [fVf±f“—Ìæ,ð Ä•%æ,·,é‘O,É•K,,CEÄ,Ñ o,·•K—v,^a, ,é B

¬Æ÷,·,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

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* *f* *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* ^ *È* % *°*, *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,·,éDirect3DRMWrapfIfufWfFfNfg* *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,ĈD3DRM_OK AŽ,”s,·,é,ĈfGf% [,đ•Ô,· B•Ô’l,îê——,É,Ĉ,ĉ,Ĉ,Ĉ AĉDirect3D•ŮŽ f. [fh,î•Ô’lÉ
,đŽQ ĈE,·,é,±,Ĉ B

d3drmw

D3DRMWRAPTYPE—ñĈ“Ĉ^,îf f“fo,î,Đ,Ĉ,Ĉ B

lpd3drmfRef

,±,îDirect3DRMWrapIfufWfFfNfg,îŽQ ĈftfĈ [fĈ,đŽ’,·Direct3DRMFrameIfufWfFfNfg,îfAfhfĈfX B

ox, oy, oz

f%ofbfv,îĈ’“ _ B

dx, dy, dz

f%ofbfv,îžŽ² B

ux, uy, uz

f%ofbfv,îyŽ² B

ou, ov

fefNfXf`ff,îĈ’“ _ B

su , ,æ,Ń sv

fefNfXf`ff,î kŽÚĈW ” B

ŽQ Ĉ @**IDirect3DRM::CreateWrap**

١٤٩

D3DRMBOX

```
typedef struct _D3DRMBOX {
    D3DVECTOR min, max;
} D3DRMBOX;
typedef D3DRMBOX *LPD3DRMBOX;
```

```
IDirect3DRMMesh::GetBox,IDirect3DRMMeshBuilder::GetBox f\fbfh,ÅŽæ“¾,·,é«É”ÍÍ,ð’è`,·,é B
min, #max
«éÉ”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,±,ÍfCf [fW,ÍfAfhfEfX,ð•Ö,· B*

width,*·,æ,Ñheight*
fsfNfZf<P'Ê,Ä,ÍfCf [fW,Ì· ,Æ ,³ B

aspectx,*·,æ,Ñaspecty*
"ñ ³•ûE`fsfNfZf<,ÍfAfXfyfNfg"ä B

depth
fsfNfZf<“-½,è,Ìrfbfg ” B

rgb
,±,Íf f“fo,“FALSE,Ì ê ± AfsfNfZf<,ÍpfEfbbfg,ÍfCf“fffbfNfX,ðŽ',· B,±
,Íf f“fo,“TRUE,Ì,Æ,«,Í AfsfNfZf<,ÍfR [fh%»³,ê,½RGB'l,Ä, ,é B

bytes_per_line
1f%ofCf““-½,è,ÌofCfg ” B,±,Ì'l,Í4,Ì”{ ”,Ä, ,é B

buffer1
fEf“f_Œf“fO,ª s,í,ê,éf f,Œ i Ä %,Ìfobftf@ j,ÍfAfhfEfX B

buffer2
2 dfobftf@fŒf“fO,Ì2”Ö–
Ú,ÍfEf“f_Œf“fO Efobftf@ BfVf“fOf< Efobftf@fŒf“fO,Ì,Æ,«,ÍNULL,ð Ý'è,·,é B

red_mask, #green_mask, #blue_mask, #alpha_mask
rgb,*“TRUE,Ì,Æ,« A,±,ê,ç,Íf f“fo,ÍfsfNfZf<,Ì Ö A—Î A Ä•ª,Íf}fXfN,Ä, ,é*
Brgb,“FALSE,Ì,Æ,«,Í AfpfEfbbfg't,Ä d—v,Ë Ö A—Î A Ä,ÌŒe—v'ffrfbbfg,Íf}fXfN,Ä, ,é B,½,Æ,,Í'½,,Ì
SVGAfBfXfXfEfC,Ä,Í AŽg—p,·,é Ö A—Î A Ä,Ì“x ±,Í64,Ä, ,é,½,ß A,·,×,Ä,Íf}
fXfN,Í0xfc,ÉfZfbbfg³,ê,é B

palette_size
fpfEfbbfg EfGf“fgŒ,Ì ” B

palette
rgb,*“FALSE,Ì ê ± A,±,Íf f“fo,ÍfpfEfbbfg EfGf“fgŒ,ðŽ',·D3DRMPALETTEENTRY \‘‘ì,ÍfAfhfEfX,Ä, ,é*
B

ŽQ Ä @**IDirect3DRM::CreateTexture, IDirect3DRMTexture::GetImage**

D3DRMLOADMEMORY

```
typedef struct _D3DRMLOADMEMORY {
    LPVOID lpMemory;
    DWORD dSize;
} D3DRMLOADMEMORY, *LPD3DRMLOADMEMORY;
```

*fAfvfŠfP [fVf‡f“,**D3DRMLOAD_FROMMEMORY**,ðŽw’è,μ,Ä**IDirect3DRM::Load**f f\fbfh i,Ü,½,Í¼,Ì**Load**f f\fbfh j,ðĖÄ,Ñ o,μ,½,Æ,«,Éf [fh,³,ê,éfŠf\ [fX,ðŽ,· B*

lpMemory

f [fh,³,ê,éf f,fŠ Efuf fbfn B

dSize

f [fh,³,ê,éf f,fŠ Efuf fbfn,lfTfCfY,ðfofCfg’P^Ê,ÅŽ!,· 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,Ä**IDirect3DRM::Load** 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,İŽÀ s%oÂ”\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,đŽ·Ê,·,éf† [fU’è<,İf^fCfv B

*lpName,âlpTypef f“fo,Ì ãÊf [fh,“0,İ ê ‡ A%o°Êf [fh,Í A,»,Ì¼‘O,İ ® ”Ž·ÊŽq,Ü,½,ÍŽw’è,³,ê,½fŠf\ [fX,İf^fCfv,đŽ,· B,»,Ĳ,Ä,Ê,·,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,İ ® ”Ž·ÊŽq,đŽ,·10 i ”,đ\
,· B,½,Æ,,İ A•¶Žš—ñ”#258”,Í ® ”Ž·ÊŽq258,đ\,· B¼‘O,İ‘ä,İ,è,É ® ”Ž·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,±,İ ê ‡ AfVfXfefĲ,“ŽĲ®“I,É,»,İ ^— ,đ s,Ĳ 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 \‘ċ’İ,ÅŽg—p,³,ê,éfJf%o [EfpfĖfbfg,ðĸL q,·,é B,±
,İ \‘ċ’İ,Í AD3DRMIMAGE \‘ċ’İ,İrgbf f“fo,ÉFALSE,^aŽw’è,³,ê,Ä,Ĉ,é,Æ,«,İ,Ý—~—p,³,ê,é iTRUE,^aŽw’è,³,ê,Ä,Ĉ
,é,Æ,«,Í ARGB’l,^a—p,Ĉ,ç,ê,é j B

red, #green, #blue

fpfĖfbfg,ð’èĸ’,·,éĖ F—v’f,ð’èĸ’,·,é’l B0,©,ç255,İ”ÍÍ,İ’l,ðŽw’è,·,é,±,Æ,^a,Ä,«,é B

flags

fĖf“f_fŠf“fOŽž,ÉfpfĖfbfg,^aÇ,İ,æ,ᳵ,ÉŽg—p,³,ê,é,©,ð’èĸ’,·,é’l B,±,İ’l,ÍD3DRMPALETTEFLAGS—
ñĸ“Ė^,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,ÍD3DVECTOR \‘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,Û,½ ADirect3D,ì ”ŠwŠÖ ”,ì,¢,-,Å,©,Å,àŽg—p,³,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,³,ê,é B

x, #y, #z, #w
D3DVALUEŒ^,ì¹ B•İŠ·Œ«‰Œ,““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

', "_, ðÊ'u B

normal

', "_, ð-@ üfxfNfgf< B

tu, ", æ, Ñ #tv

', "_, ð ...•½, ", æ, Ñ , '¼fefNfXf`ff À•W B

color

', "_, ð 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 $\mathbb{C}^{\wedge}, \mathbb{I}'\hat{\epsilon}^{\text{`}}, \mathbb{A}\check{Z}g, \mathbb{I}, \hat{e}, \acute{e} - \tilde{n}^{\text{`}} \mathbb{C}^{\wedge}, \mathbb{I}, \mathbb{D}, \mathbb{A}, \mathbb{A}$ B

D3DRMFILL_POINTS

$\text{“}_{\text{`}}, \mathbb{I}, \acute{Y}, \delta^{\text{“}}h, \hat{e}, \mathbb{A}, \hat{O}, \cdot$ B \mathbb{A} $\neg, \mathbb{I}^{\text{“}}h, \hat{e}, \mathbb{A}, \hat{O}, \mu f,$ [fh B

D3DRMFILL_WIREFRAME

f $fCf,$, [ftf \mathbb{C} [f \mathbb{E} , $\delta^{\text{“}}h, \acute{e}$ B

D3DRMFILL_SOLID

$\text{—}\S^{\text{`}}\mathbb{I}f\mathbb{I}fufWfFfNfg, \delta^{\text{“}}h, \acute{e}$ B

D3DRMFILL_MASK

$f\}\mathbb{f}XfN, \delta\check{Z}g\text{—}p, \mu, \mathbb{A}^{\text{“}}h, \acute{e}$ B

D3DRMFILL_MAX

$\text{“}h, \hat{e}, \mathbb{A}, \hat{O}, \mu f,$ [fh, \mathbb{I} $\mathbb{A}^{\text{`}}\mathbb{a}^{\text{`}}l$ B

$\check{Z}Q$ \mathbb{A} $@$ **D3DRMLIGHTMODE**, **D3DRMSHADEMODE**, **D3DRMRENDERQUALITY**

D3DRMFOGMODE

```
typedef enum _D3DRMFOGMODE{
    D3DRMFOG_LINEAR,
    D3DRMFOG_EXPONENTIAL,
    D3DRMFOG_EXPONENTIALSQUARED
} D3DRMFOGMODE;
```

$f = \frac{end - z}{end - start}$

D3DRMFOG_LINEAR

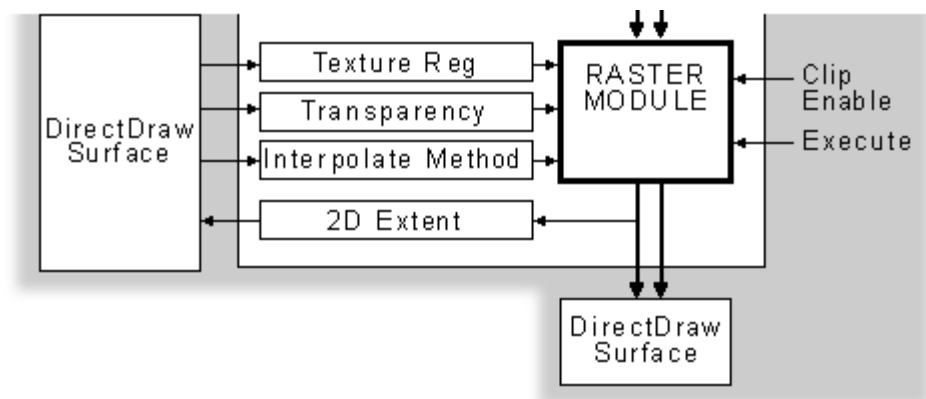
$f = \frac{end - z}{end - start}$

$$f = \frac{end - z}{end - start}$$

$f = \frac{end - z}{end - start}$

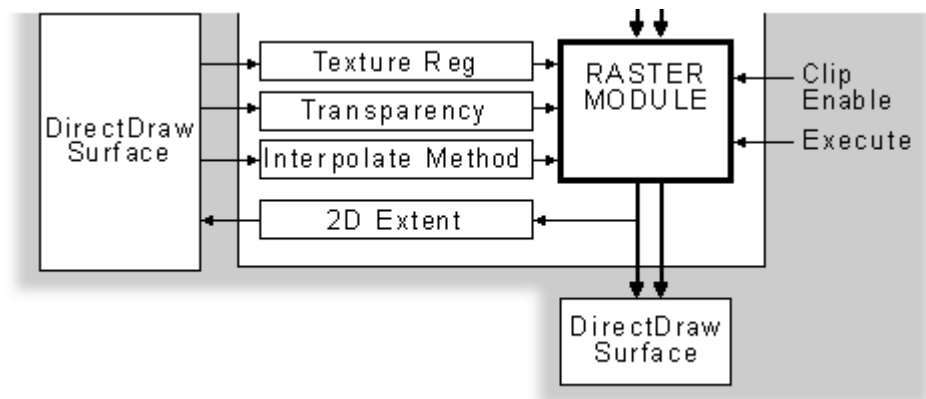
D3DRMFOG_EXPONENTIAL

$f = \frac{end - z}{end - start}$



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%õñ“,·,éŽ²,đ<L q,·,é B,±,Ì—
ñ<“Æ^,İDirect3DRMFrame::LookAtf f\fbfh,É,æ,Á,ĂŽg—p,³,ê,é B

D3DRMCONSTRAIN_Z
x,“,æ,Ńy%õñ“,Ì,ÝŽg—p,·,é B

D3DRMCONSTRAIN_Y
x,“,æ,Ńz%õñ“,Ì,ÝŽg—p,·,é B

D3DRMCONSTRAIN_X
y,“,æ,Ńz%õñ“,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, ÌÄ, Ñ o, μ, Å A Æ ð Æ¹ f^f Cfv, ð'è<, ·, é B*

D3DRMLIGHT_AMBIENT

fAf“frfGf“fg Æ ð Æ¹ B

D3DRMLIGHT_POINT

f|fCf“fg Æ ð Æ¹ B

D3DRMLIGHT_SPOT

fXf|fbfgf%ofCfg Æ ð Æ¹ B

D3DRMLIGHT_DIRECTIONAL

—LÆü Æ ð Æ¹ B

D3DRMLIGHT_PARALLELPOINT

fpf%ofÆf< Ef|fCf“fg Æ ð Æ¹ B

D3DRMMATERIALMODE

```
typedef enum _D3DRMMATERIALMODE{
    D3DRMMATERIAL_FROMMESH,
    D3DRMMATERIAL_FROMPARENT,
    D3DRMMATERIAL_FROMFRAME
} D3DRMMATERIALMODE;
```

f}*fefŠfAf*<*f*, [*fh*,*đŽ*!,· *B*,±
,*l*Ē^,*l* *AIDirect3DRMFrame::GetMaterialMode* *f*\fbfh,*É*,*æ*,*Á*,*ĂŽæ*“¾,³*ê* *AIDirect3DRMFrame::SetMaterialMode*
f *f*\fbfh,*É*,*æ*,*Á*,*Ă* *Ý*’*è*,³*ê*,*é* *B*

D3DRMMATERIAL_FROMMESH

f}*fefŠfAf*< *î*•*ñ*,*l*f_r*fWf*...*fAf*< *EfIfufWfFfNfg* if *fbfVf*... *j*,»,*l*,*à*,*l*,©,*çŽæ*“¾,³*ê*,*é* *B*,±,*ê*,*l*ff_t*fHf*<*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_p ³,³*ê*,*é* *B*

D3DRMMATERIAL_FROMFRAME

f}*fefŠfAf*< *î*•*ñ*,*l*ftfĒ [*f*€,©,*çŽæ*“¾,³*ê* *Af_rfWf*...*fAf*< *EfIfufWfFfNfg*,^³•*ŬŽ* ,*μ*,*Ă*,*¢*
,½^*È*‘*O*,*l* *î*•*ñ*,*đfI* [*f*o [*f*%*o*C*f*h,·*é* *B*

ŽQ *Æ* @*IDirect3DRMFrame::GetMaterialMode*,*IDirect3DRMFrame::SetMaterialMode*

D3DRMPALETTEFLAGS

```
typedef enum _D3DRMPALETTEFLAGS {  
    D3DRMPALETTE_FREE,  
    D3DRMPALETTE_READONLY,  
    D3DRMPALETTE_RESERVED  
} D3DRMPALETTEFLAGS;
```

D3DRMPALETTEENTRY \‘ćì,Ā,Ĭ F,İŽg—p•û—@,đ’è‘,·,é B

D3DRMPALETTE_FREE

fĈf“f_f%o [,Ĭ,±,ĭfGf“fgfŠ,đŽ©—R,ÉŽg—p,Ā,«,é B

D3DRMPALETTE_READONLY

ĈĀ’è,³,ê,Ā,Ĉ,é,^a AfĈf“f_f%o [,^aŽg,▯,±,Ĉ,^a,Ā,«,é B

D3DRMPALETTE_RESERVED

fĈf“f_f%o [,^aŽg,▯,±,Ĉ,Ĭ,Ā,«,È,Ĉ B

ŽQ Ĉ @**D3DRMPALETTEENTRY**

D3DRMPROJECTIONTYPE

```
typedef enum _D3DRMPROJECTIONTYPE{
    D3DRMPROJECT_PERSPECTIVE,
    D3DRMPROJECT_ORTHOGRAPHIC
} D3DRMPROJECTIONTYPE;
```

Direct3DRMViewportIfufWfFfNfg,ÅŽg—p,³,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,İ,Ý,ð•Ž,·,é B

D3DRMRENDER_UNLITFLAT

ĖĖĖ,Ė,µ,İtf%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,±,İfVfF [ffBf“fO Ef, [fh,ÍĖ» Ý,ÍfTf| [fg,³,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, **IDirect3DRMDevice::GetTextureQuality** *f\fbfh, Å—p, ¢, ç, ê, é fefNfXf`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, Å, ĺfsfNfZf<, ð üĖ, É•ăŠ®, ., é B

D3DRMTEXTURE_MIPNEAREST

D3DRMTEXTURE_NEAREST, ÉŽ—, Å, ¢, é, ^a A fefNfXf`ff, ĺ’ă, í, è, É“K Ø, Èf~fbfvf}fbfv, ðŽg—p, ., é B

D3DRMTEXTURE_MIPLINEAR

D3DRMTEXTURE_LINEAR, ÉŽ—, Å, ¢, é, ^a A fefNfXf`ff, ĺ’ă, í, è, É“K Ø, Èf~fbfvf}fbfv, ðŽg—p, ., é B

D3DRMTEXTURE_LINEARMIPNEAREST

D3DRMTEXTURE_MIPNEAREST, ÉŽ—, Å, ¢, é, ^a A Å, àŁ, ¢, Ó, ½, Å, ĺf~fbfvf}fbfvŠÔ, ð•ăŠ®, ., é B

D3DRMTEXTURE_LINEARMIPLINEAR

D3DRMTEXTURE_MIPLINEAR, ÉŽ—, Å, ¢, é, ^a A Å, àŁ, ¢, Ó, ½, Å, ĺf~fbfvf}fbfvŠÔ, ð•ăŠÔ, ., é B

D3DRMUSERVISUALREASON

```
typedef enum _D3DRMUSERVISUALREASON {  
    D3DRMUSERVISUAL_CANSEE,  
    D3DRMUSERVISUAL_RENDER  
} D3DRMUSERVISUALREASON;
```

fVfXfef€,"D3DRMUSERVISUALCALLBACKfR [f<fofbfNŠÖ ",ðCEÄ,Ň o,μ,½— —R,ð'è<`,·,é B

D3DRMUSERVISUAL_CANSEE

*f† [fU EfurfWf...fAf<fIfufWfFfNfg,ªfurf... [f| [fg ã,Â%oÂŽ< óˆÔ,Â, ,ê,Î AfR [f<fofbfNŠÖ ",ÍTRUE,ð•Ô,
³,È,,Ä,Í,È,ç,È,¢ B*

D3DRMUSERVISUAL_RENDER

fR [f<fofbfNŠÖ ",Íf† [fU EfurfWf...fAf< EfIfufWfFfNfg,ðfœf“f_Šf“fO,μ,È,,Ä,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,^a,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,^afIfufWfFfNfg ã,Ä”½ŽÊ,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,³,ê,étf@fCf< Ef^fCfv,ð'è`.,,é B

D3DRMXOF_BINARY

ftf@fCf<,ÍfofCfiŒŠ EftfH [f}fbfg,Å, ,é B,±,ê,ÍftftfHf<fg Ý'è,Å, ,é B

D3DRMXOF_COMPRESSED

Œ» Ý,ÍfTf| [fg,³,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–
@,đ'è< ,·,é'l,đŽw'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 %o, 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%o 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

```
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
```

| | | | |
|--|--------------------------------|--|-------------------|
| <u>IDirect3DRMAnimationSet::Load</u> | <u>AIDirect3DRMFrame::Load</u> | <u>A,~,ÑIDirect3DRMMeshBuilder::Load</u> | <u>f\fbfh,İfİ</u> |
| f\vfVfİf±,ð'èç,,'é B,±,è,ç,İfİf\vfVfİf±,Í AfİfufWfFfNfg,³f | | [fh,³,è,è•@,ð,İ X,,'é B | |

$$ftf@fCf\langle,\otimes,\zeta f \quad [fh,\cdot,\acute{e} \ B,\pm,\hat{e},\acute{I}ffftfHf\langle fg \ \acute{Y}'\acute{e},\text{\AA},\acute{e} \ B$$

AD3DRMLOADRESOURC

f f,f,Š,©,čf [fh,·,é B,±,łftf%oF,0,đŽw',è,μ,½ ê ± ALoadf f\fbfhh,İEÄ,Ń o,μ,İ lpvObjSource
pfp%of [f^,İ AD3DRMLLOADMEMORY \`c'İ,đŽw',³,È,Ä,İ,É,Ç,È c B

$$fXfgf\check{S} \quad [f\in, \odot, \zeta f \quad [fh, \cdot, \acute{e} \quad B$$

Žw'è,³,ê,^{1/2-1/4}‘O,ǒŽg—p,μ,ÄfIfufWfFfNfg,ǒf [fh,·,é B

$$\begin{aligned} & \wedge^1_!,\zeta,\epsilon,\tfrac{1}{2}\ A0,\odot,\zeta\check{Z}n,\ddot{U},\acute{\epsilon}\hat{E}'u,E\ XfXf^\wedge f''fh\ EfAf\ f'',\dot{l}fIfufWfFfNfg,\delta f\ [fh,\cdot,\acute{\epsilon}\ i,\ddot{A},\ddot{U},\acute{\epsilon}\ Af tf@fCf\cdot\t,'ln'\hat{O}- \\ & \ddot{U},\dot{l}fIfufWfFfNfg,\delta f\ [fh,\cdot,\acute{\epsilon}\ j\ BfXf^\wedge f''fh\ EfAf\ f'',\dot{l}fIfufWfFfNfg,\acute{I}\tfrac{1}{4},\dot{l}fIfufWfFfNfg,\delta\ddot{S}\ddot{U},\flat,\pm \\ & ,\mathcal{A},^a\mathbb{A},\langle,\acute{\epsilon},^a\ A\tfrac{1}{4},\dot{l}fIfufWfFfNfg,\acute{E}\ddot{S}\ddot{U},\ddot{U},\acute{\epsilon},\acute{\epsilon},\pm,\mathcal{A},\acute{I},\acute{E},\clubsuit\ B \end{aligned}$$

Žw'è,³,ê,¹/₂fOf [fof< Ef†fj [fNŽ⁻•ÊŽq iGUID j,ðŽg—p,μ,ÄfIfufWfFfNfg,ðf [fh,·,é B

[illegible]

Žw'è,³è,^{1/2}-^{1/4}O,Æ⁺⁻,¶-^{1/4}O,ÌfIfufWfFfNfg,^a¶ Ý,[·],é,©,Ç,[□]
 ,©,ðf'FFfbfN,[·],é B'¶ Ý,[·],é ê ± A V,μ,¢fIfufWfFfNfg,ð ì ¬,[·],éã,ì,è,É A,»,ÌfIfufWfFfNfg,ÌfCf'fXf^f'f
 X,ðŽg—p,[·],é B

Žw'è,³ê,¼-¼'O,Æ⁺⁻,¶¼'O,İfIfufWfFfNfg,⁺⁺¶ Ý,·,é,©,Ç,[□]
 ,©,ðf'fFfbfN,·,é B'¶ Ý,·,é ê ± A V,µ,çfIfufWfFfNfg,ð ì ¬,·,é'ă,í,è,É A,»,'İfIfufWfFfNfg,ðfRfs [,·,é
 B

p,μ,ÄfIfufWfFfNfG,lf\ [fX,ðŽw'ē,μ AlpvObjIDfpf%of [f^,É,æ,Ä,ÄfIfufWfFfNfG,ðŽ-Ê,.,é BfVfXfef€
 ,Äf [fX Eftf%ofO,l'î'ð,ÉŠi,Ä,ç,ÄlpvObjSourcepf%of [f^,ð%ðŽŽ,.,é B,»,μ,Ä AZ-ÊŽqftf%ofO,l'î'ð,ÉŠi,Ä,ç
 ,ÄlpvObjIDfpf%of [f^,l'ä-e,ð%ðŽŽ,.,é B

fCf“fXf^f“fX Eftf%ofo,Í Afpf%of [f^,ì%ođŽß•û–
@,É,Í%o½,à•Í X,ð%oÁ,,È,¢ BD3DRMLOAD_INSTANCEBYREFERENCEftf%ofo,đ—p,¢
,é,Æ A V,µ,¢fIfufWfFfNfg,đ ì ¬,·,é,±,Æ,È,“¬,¶ftf@fCf<,đ2%oñf [fh,·,é,±,Æ,^a,Å,«,é BfIfufWfFfNfg,^a–
¼‘O,đŽ ,Á,Ä,¢
,È,¢ ê ‡ AD3DRMLOAD_INSTANCEBYREFERENCEftf%ofo,đfZfbfg,·,é,Æ AD3DRMLOAD_INSTANCEBYCOPY
INGftf%ofo,đfZfbfg,µ,½,Æ,«,Æ“¬,¶Eø%oÊ,đ“¾,é,±,Æ,^a,Å,«,é Bf [f_,Í A“^ê,ìfIfufWfFfNfg,^a¶ 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 BIDirect3DRMMesh::GetGroupMapping,âIDirect3DRMMesh::SetGroupMappingf 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,ªfeNfXf`ff À•W,ð%oðŽß,·,é•û–
@,ðÆ^è,·,é Bf%ofXf^f%ofCfU,Í,Ä,Ë,É AfeNfXf`ff À•W,Ä Ä,à'Z,ç<—£ A,Ä,Ü,è'¼ ü,ð•âŠ@,·,é B,±
,Í'¼ ü,ðpfX,Æ Au,“,æ,Ñv Ä•W,ð—LÆø'l,Í Af%ofbfsf“fO Eftf%ofO,ðŽg,ç•û,É,æ,Ä,Ä^Ü,È,é B^ê•û,Ü,½,Í—
¼•û,ðftf%ofO,ªfZfbfg,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,ð,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\fbfh,lIfIvfVf‡f“‚ð’è<‚‚‚é B*

D3DRMXOFSAVE_NORMALS

Šî-{"I,È-Ê,É‰Á,| A-@ üfxfNfgf<‚ð•Û‘¶‚‚‚é B

D3DRMXOFSAVE_TEXTURECOORDINATES

Šî-{"I,È-Ê,É‰Á,| AfefNfXf`ff À•W‚ð•Û‘¶‚‚‚é B

D3DRMXOFSAVE_MATERIALS

Šî-{"I,È-Ê,É‰Á,| Af}fefŠfAf<‚ð•Û‘¶‚‚‚é B

D3DRMXOFSAVE_TEXTURENAMES

Šî-{"I,È-Ê,É‰Á,| AfefNfXf`ff,Ì-¼‘O‚ð•Û‘¶‚‚‚é B

D3DRMXOFSAVE_ALL

Šî-{"I,È-Ê,É‰Á,| A-@ üfxfNfgf< AfefNfXf`ff À•W Af}fefŠfAf< AfefNfXf`ff,Ì-¼‘O‚ð•Û‘¶‚‚‚é B

D3DRMXOFSAVE_TEMPLATES

ftf@fCf<‚Ìfef“fvfŒ [fg‚ð•Û‘¶‚‚‚é BffftfHf<fg,Å,Ífef“fvfŒ [fg,Í•Û‘¶‚‚‚é,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•Ô,· 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[▯]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^{cb} Š|,⁻ ‡,í,³,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 →l,đ F,l,É•řš.,,é B

RGB →l,đD3DCOLORl,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,l”ÍÍ,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 →^al,đ F,l,É•İŠ·,·,é B

RGBA →^al,đD3DCOLOR’l,É•İŠ·,·,é B

r, g, b, a
F,İ Ô(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 ,Ă s,±,Æ,a,Ă,«,é B

•Ô’l,Í,È,¢ B

type

fI [fo [f%ofCfh,İ ó‘Ô B,±,İfpf%of [f^,İD3DTRANSFORMSTATETYPE AD3DLIGHTSTATETYPE A
D3DRENDERSTATETYPE Ą^,İf f“fo,İ,Đ,Æ,Ă,Ă, ,é B

,½,Æ,İ,İ ASTATE_DATAf}fNf (DirectX SDK,İfTf“fvf<fR [fh,İMisc/D3dmacs.hftf@fCf<,Ă’è<’)

,ðŽg,¢ AD3DSTATE_OVERRIDE,ĂD3DRENDERSTATE_SHADEMODE,İfĄf“f_Šf“fO,İ ó‘Ô,İf fbfN,Æ%oð æ,ð s
,² B

// -¾“xf, [fh,ðf fbfN

STATE_DATA (D3DSTATE_OVERRIDE (D3DRENDERSTATE_SHADEMODE), TRUE, lpBuffer);

// fŠ [fhfIf“fŠ [,Ă,È,¢,Æ,« A-¾“xf, [fh,ðŽĂ s,µf fbfN%oð æ,·,é

STATE_DATA (D3DSTATE_OVERRIDE (D3DRENDERSTATE_SHADEMODE), FALSE, lpBuffer);

fĄf“f_Šf“fO,İ ó‘Ô,İfI [fo [f%ofCfh,É,Ă,¢

,Ă,İ Ú ×,Í A ufXfe [fg,ÆfXfe [fg EfI [fo [f%ofCfh v,ðŽQ Ą,·,é,±,Æ B

D3DVAL

D3DVAL(val) ((float)val)

D3DVALUE(ϵ^{\wedge} ,l',É•İŠ·,·,é B

•İŠ· ϵ^{\wedge} ã,l',ð•Ô,· B

val

•İŠ·,³,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·,³,ê,é'l B

prec

−³Ĉø B

D3DVALf}fNf ,ĭ ,“x,ĭ A'l,ĭ ¬ ”•”•^a,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 ǎ•'l,©,çRGBA F,đ ì ǎ,·,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 ¬•ª,ðŽæ,è o,· B

Â ¬•ª'l,ð•Ô,· B

rgb

Â ¬•ª,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, **3DCOLOR**’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 ȳ•ª¹l,©,çfAf<ftf@ ȳ•ª,đ æ,¢,Ä ARGB, D3DCOLOR 'l,đ ì ȳ,·,é B

RGB F,đ•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,³,ê,éAfvfŠfP [fVf±f“`è<`f [f^,Ö,lf|fCf“f^ B

fR [f<fofbfNŠÖ ”,ðĖĂ,Ń o,· ± ~,ðĖ~`è,.,é,Æ,« AfVfXfef€,Í Ā %
,É Ā,à ,,čŠK‘w,lfIfufWfFfNfg,ðĖŸ ō,μ,Ā AŽŸ,É,»,ê,ç,^a ì ¬,³,ê,½ ± ~,ĀfR [f<fofbfNŠÖ ”,ðĖĂ,Ń o,· B

D3DVALIDATECALLBACK

```
typedef HRESULT (WINAPI* LPD3DVALIDATECALLBACK)  
(LPVOID lpUserArg, DWORD dwOffset);
```

*fAfvfŠfP [fVf‡f“^a 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,³,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,^a ì ¬,³,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,ª,Â,«,é B,±,ì ß,Â,Í A***IDirect3D***fCf“f^ [ftfFfCfX,lf f\fbfh,É,Â,¢,Â à–¾,·,é BŠT–ª,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 ³,·,é B***IUnknown***fCf“f^ [ftfFfCfX,ªTf| [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::CreateLight 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 BIDirect3D::CreateMaterialf 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,±,Ìrf... [f] [fg,Í AIDirect3DDevice::AddViewport f\fbfh,ĀŽg—
p,³,ê,éDirect3DffofCfXfIfufWfFfNfg,ÆÆ< ‡,³,ê,é B

¬Æ÷,·,ê,ÎD3D_OK AŽ,”s,·,ê,Î AŽŸ,Ì'l,Ì,¢,,ê,©,đ•Ô,· B

DDERR_INVALIDOBJECT

DDERR_INVALIDPARAMS

lpD3DViewport

ÆĀ,Ń o,μ,É ¬Æ÷,·,ê,Î AIDirect3DViewport fCf“f^ [ftfFfCfX,Ö,Ìf|fCf“f^,ÌfAfhfÆfX B

pUnkOuter

,±,Ìfpf%of [f^,Í ACOM‘S‘ì,đ «—^ AŠg’£,·,é,½,ß,Ì,à,Ì,Ā, ,é BIDirect3D::CreateViewport f\fbfh,Í A,±
,Ìfpf%of [f^,“NULL^ÈŠO,Ì,Æ,«fGf%o [,đ•Ô,· B

IDirect3D::EnumDevices

```
HRESULT EnumDevices(LPD3DENUMDEVICESCALLBACK lpEnumDevicesCallback,  
    LPVOID lpUserArg);
```

fVfXfef€,É*fCf*“*fXfg* [*f*◁,³ê,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,³ê,é,½,Ñ,ÉŒÄ,Ñ o,³ê,é—ñ◁“ ^— ,**ID3DENUMDEVICESCALLBACK** 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,đĈŸ o,μ A,»,ĭ ĭ•ñ,đŽæ“¾,·,é B

¬Ĉ÷,·,ê,ĪD3D_OK,ª•Ô,³,ê,é B•Ô'l,É,Â,ĉ,Ä,Í A uDirect3D'¼ Úf, [fh,ĭ•Ô'] v,đŽQ Æ,·,é,±,Æ B

lpD3DFDS

Žæ“¾,·,éfffofCfX,đŽĭ,·**D3DFINDDEVICESEARCH** \‘ĉ‘ĭ,ĭf|fCf“f^ B

lpD3DFDR

ĈŸ oŽž,ÉfffofCfX,đŽĭ,·**D3DFINDDEVICERESULT** \‘ĉ‘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,^a ¶ ¬,³,ê,é,Æ,«,É %oŠú%o»,³,ê,é,½,ß ADDERR_ALREADYINITIALIZED,ð•Ô,· B

lpREFIID

f†fjfo [fTf< Ef†fj [fNŽ⁻•ÊŽq(UUID),Ö,ìf|fCf“f^,ð•Ô,· B

IDirect3DDevice

IDirect3DDevice fCf“f^ [ftFfCfX,lf f\fbfh,ðŽg,ϱ,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

î•ñ **EnumTextureFormats**
GetCaps
GetDirect3D
GetPickRecords
GetStats

”z—ñ **CreateMatrix**
DeleteMatrix
GetMatrix
SetMatrix

,»,ì¼ **Initialize**
Pick
SwapTextureHandles

fV [f“ **BeginScene**
EndScene

fxf... [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,ÉĖÄ,Ñ o,·,±,Æ,ÄŽæ“¼,³,è,é B

IDirect3DDevice::AddViewport

HRESULT AddViewport(LPDIRECT3DVIEWPORT lpDirect3DViewport);

Žw'è,³,ê,½fṛf... [f| [fg,đ AfffofCfX,É”z'u,³,ê,½fṛf... [f| [fg EfIfufWfFfNfg,İfŠfXfg,É’Ç%Á,·,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 AIDirect3DDevice::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 ,Âfofbftf@“à,İ,·,×,Ä,İff
fBfXfvfEfC EfvfŠf~fefBfu,İ A,»,ê,ç,İ’“_“đ“-¶fofbftf@“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,±
,İfofbftf@,İfTfCfY,‘«è, fIfufWfFfNfg,ª ¶ ¬,³,ê,È,¢,Æ,«„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“®,đ—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,Ìnf“fhf< 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, ìfhf%o fCfo, ÅfTf| [fg, ³, ê, Ä, ¢, éfefNfXf`ffÆ^, ÌfŠfXfg, ð—ñ<“, ·, é B
-Æ÷, ·, ê, ÎD3D_OK AŽ,”s, ·, ê, Î AŽŸ, Ì'l, Ì, ¢,, 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, Ìf|
fCf“f^ B

lpArg

fR [f<fofbfNŠÖ ”, É“n, ³, ê, éfAfvfŠfP [fVf‡f““è<`ff [f^, Ö, Ìf|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,³,ê,éŽÀ sfofbftf@,Ö,îf|fCf“f^ B

lpDirect3DViewport

•Ž',³,ê,éŽÀ sfofbftf@,î•İŠ·fRf“fefLfXfg,ð«L q,·,éDirect3DViewportfIfufWfFfNfg,Ö,îf|fCf“f^ B

dwFlags

fofbftf@,îfIfufWfFfNfg,ðfNfŠfbfsf“fO,·,é,©,ðŽw'è,·,éftf%ofo B,±,îfpf%of [f^,î AŽŸ,ì'l,ì,¢,,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,¢) 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,ðŠÛ,ðD3DDEVICEDESC \‘¢‘İ,Ö,Ìf|fCf“f^ B

lpD3DHELDevDesc

—^,!,ç,ê,Ä,¢,éf\ftfgfEfFfA,ÌfGf~f...fŒ [fVf‡f“ î•ñ,ðŠÛ,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);
```

Ⓔ» Ÿ,ìDirect3D fCf“f^ [ftfFfCfX,ðŽæ“¾,·,é B
¬Ⓔ÷,·,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,ðD3DMATRIX \‘¢İ,Ö,İf|fCf“f^ B

ŽQ Æ @AIDirect3DDevice::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

¬Œ÷,·,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*

IDirect3DDevice::Pick

```
HRESULT Pick(LPDIRECT3DEXECUTEBUFFER lpDirect3DExecuteBuffer,  
             LPDIRECT3DVIEWPORT lpDirect3DViewport, DWORD dwFlags,  
             LPD3DRECT lpRect);
```

$f \in f_{\text{f}} \check{S} f_{\text{f}} f_{\text{O}} \delta s, i, \check{Z} \check{A} s f o f b f t f @, \delta \check{Z} \check{A} s, \mu A l p R e c t f p f \% o f$ $[f^{\wedge}, \check{A} \check{Z} w' \grave{e}, ^3, \hat{e}, \frac{1}{2} \epsilon \mathbb{E} \text{`a}, \acute{E}, , \acute{e} f v f \check{S} f \sim f e f B f u, \ddot{O}, \grave{I} f I f t f$
 $Z f b f g, \grave{I} z f I [f_{-} [E f \check{S} f X f g, \delta \bullet \ddot{O}, \cdot B$

Direct3DExecuteBuffer $f I f u f W f F f N f g, ^a f f b f N, ^3, \hat{e}, \check{A}, \mathbb{C}, \acute{e}, \mathbb{A}, \ll, \acute{I} A, \pm, \grave{I} \mathbb{E} \check{A}, \tilde{N} o, \mu, \acute{I} \check{Z}, \text{`s}, \cdot, \acute{e} B$

$-\mathbb{E} \div, \cdot, \hat{e}, \hat{I} D3D_OK A \check{Z}, \text{`s}, \cdot, \hat{e}, \hat{I} A \check{Z} \check{Y}, \grave{I} \text{`l}, \grave{I}, \mathbb{C}, , , \hat{e}, \odot, \delta \bullet \ddot{O}, \cdot B$

D3DERR_EXECUTE_LOCKED

DDERR_INVALIDOBJECT

DDERR_INVALIDPARAMS

$l p D i r e c t 3 D E x e c u t e B u f f e r$

$\check{Z} \mathbb{A} \text{`}\mathbb{A}, ^3, \hat{e}, \frac{1}{2}, \check{S} f I [f_{-} [f \check{S} f X f g, \odot, \varsigma, \grave{I} \check{Z} \check{A} s f o f b f t f @, \ddot{O}, \grave{I} f | f C f \text{`} f^{\wedge} B$

$l p D i r e c t 3 D V i e w p o r t$

Direct3DDevice $f I f u f W f F f N f g, \acute{E} \text{`} z' u, ^3, \hat{e}, \frac{1}{2} f r f \dots [f | [f g f \check{S} f X f g, \grave{I} \text{`t}, \grave{I} f r f \dots [f | [f g, \ddot{O}, \grave{I} f | f C f \text{`} f^{\wedge} B$

$d w F l a g s$

$, \pm, \acute{I} f f \text{`} f b f h, \grave{I}, \frac{1}{2}, \mathbb{B}, \acute{E} \mathbb{E} \gg \acute{Y} \text{`e} \epsilon \text{`}, ^3, \hat{e}, \check{A}, \mathbb{C}, \acute{e} f t f \% o f O, \acute{I}, \grave{E}, \mathbb{C} B$

$l p R e c t$

$\check{Z} \mathbb{A}, \grave{e} o, ^3, \hat{e}, \acute{e} f f f o f C f X \check{A} \bullet W \text{---} \grave{I} \mathfrak{a}, \delta \check{Z} |, \cdot \underline{\underline{D3DRECT}} \text{`}\mathbb{C} \text{`}\grave{I}, \ddot{O}, \grave{I} f | f C f \text{`} f^{\wedge} B$

$l p R e c t f p f \% o f$ $[f^{\wedge}, \check{A} \check{Z} w' \grave{e}, ^3, \hat{e}, \frac{1}{2} \text{`}\mathbb{C} \text{`}\grave{I}, \grave{I} \mathbf{x} \mathbf{1}, \mathbb{A} \mathbf{x} \mathbf{2} f f \text{`} f o, \text{`a}^{\text{TM}}, \mu, A \mathbf{y} \mathbf{1}, \mathbb{A} \mathbf{y} \mathbf{2} f f \text{`} f o, \text{`a}^{\text{TM}}, \mu, \mathbb{C}$
 $, \mathbb{A}, \ll A f s f N f Z f \epsilon, \frac{3}{4}, \text{`}\check{Z} \mathbb{A}, \grave{e} o, ^3, \hat{e}, \acute{e} B \check{A} \bullet W, \acute{I} f f f o f C f X E f s f N f Z f \epsilon, \check{A} \check{Z} w' \grave{e}, ^3, \hat{e}, \acute{e} B$

$, \cdot, \times, \check{A}, \grave{I} D i r e c t 3 D E x e c u t e B u f f e r f I f u f W f F f N f g, \acute{I} A, \pm$

$, \grave{I} f f \text{`} f b f h, \delta -\mathbb{E} \div, ^3, ^1, \acute{e}, \frac{1}{2}, \mathbb{B} D i r e c t 3 D D e v i c e f I f u f W f F f N f g, \acute{E} \check{S} \ddot{O} \sim A \bullet \text{`t}, \text{`}, \text{`}, \text{`}, \hat{e}, \hat{I}, \grave{E}, \varsigma, \grave{E}, \mathbb{C} B$

$\check{Z} Q \mathbb{A} @ \underline{\underline{IDirect3DDevice::GetPickRecords}}$

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,³,ê,é s—ñfnf“fhf< B

lpD3DMatrix

Ÿ’è,³,ê,é s—ñ,ðŽ!,·D3DMATRIX \‘ç‘ì,Ö,Ìf|fCf“f^ B

s—

ñ,Ìfnf“fhf<,ðŠÜ,þŽÀ sfofbftf@“à,ð•İŠ·,·,é BIDirect3DDevice::SetMatrixf f\fbfh,ÍŽÀ sfofbftf@,ðf fbfN Af f
bfN%øð æ,¹,,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,îfefNfXf`fffnf“fhf<,ðŒðŠ·,·,é B

¬Œ÷,·,ê,îD3D_OK,ð•Ô,· B

lpD3DTex1,“,æ,Ñ lpD3DTex2
f f\fbfh,^a–ß,Â,½,Æ,« AŒðŠ·,³ê,éfefNfXf`ff,îfnf“fhf<,Ö,îf|fCf“f^ B

,[±]
,îf f\fbfh,Í A’Ê ífAfvfŠfP [fVf‡f“,^afIfufWfFfNfg,ì W ‡‘î,ì’†,Å,·,×,Ä,îfefNfXf`ff,ð•î X,·,é,Æ,«Žg,í,ê,é B

IDirect3DExecuteBuffer

IDirect3DExecuteBuffer fCf“f^ [ftfFfCfX,lf f\fbfh,ðŽg,□
,Æ ADirect3DŽÀ sfofbftf@,lfZfbfgfAfbfv,â §Œä,ð s,□,±,Æ,ª,Å,«,é B,±,ì ß,Í A,±
,lfCf“f^ [ftfFfCfX,lf f\fbfh,É,Å,¢,Ä à–¾,·,é BŠT—ª,É,Å,¢
,Ä,Í A uIDirect3DExecuteBufferfCf“f^ [ftfFfCfX v,ðŽQ Æ,·,é,±,Æ B

IDirect3DExecuteBuffer fCf“f^ [ftfFfCfX,lf f\fbfh,Í AŽŸ,ÌfOf◁ [fv,©,ç,È,é B

f f^,ìŽÀ s **GetExecuteData**
SetExecuteData

f fbfN,Æ%ø 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,^a Ý’è,³,ê,½**D3DEXECUTEDATA** \‘Œ‘Ì,Ö,ìf|fCf“f^ B

Direct3DExecuteBufferIfufWfFfNfg,^af fbfN,³,ê,Ä,¢,é,Æ,«,Í A,±,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 fgRf<,Ö,Ì €<—p,É'ñ<Ÿ,³,ê,é B

Direct3DExecuteBufferfobftf@,ª ¶ ¬ŽŽ,É %Šú%»»,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 AĖĂ,Ń 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 AfAfvfŠfP [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 BfAfvfŠfP [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,îŽ,”s,·,é B,½,Æ,,î A’¼,lfXfÆfbfh,afobftf@,ðfAfNfZfX’†,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);

Direct3DExecuteBufferIfUfWfFfNfg, ĨŽÀ sff [f^, ĩ ó‘Ô, đ Ý’è, ·, é BŽÀ sff [f^, Í ADirect3DExecuteBufferIfUfWfFfNfg, Ĩ“à—e, đŽ‘, ·, ½, ß, ĚŽg—p, ³, ê, é B

–Œ÷, ·, ê, ĨD3D_OK AŽ,”s, ·, ê, Ĩ AŽŸ, Ĩ‘l, Ĩ, Ą,, ê, ©, đ•Ô, · B

D3DERR_EXECUTE_LOCKED

DDERR_INVALIDOBJECT

DDERR_INVALIDPARAMS

lpData

ŽÀ sfobftf@, ĩfŒfCfAfEf g, đŽ‘, ·**D3DEXECUTEDATA** \‘ć‘ĭ, Ö, ĩf|fCf“f^ B

Direct3DExecuteBufferIfUfWfFfNfg, ³f fbfN, ³, ê, Ä, ć, é, Æ, «, Í A, ±, ĩŒÄ, Ñ o, μ, ÍŽ,”s, ·, é B

ŽQ Æ @**IDirect3DExecuteBuffer::GetExecuteData**

IDirect3DExecuteBuffer::Unlock

HRESULT Unlock();

ŽÀ sfobftf@,ìfRf}f“fh,Ö,Ìf|fCf“f^,ð%øð•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);
```

Œ» 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);

Direct3DLightIfufWfFfNfg, ĨĖōĖ¹ ħ•ñ,đŽæ“¾,·,é B
¬Ė÷,·,ê,ĤD3D_OK AŽ,”s,·,ê,Ĥ AŽŸ,Ĭ¹,Ĭ,ċ,,ê,©,đ•Ō,· B

DDERR_INVALIDOBJECT
DDERR_INVALIDPARAMS

lpLight
Ė» Ÿ, ĨĖōĖ¹ff [f^,ª Ÿ’è,³,ê,½D3DLIGHT \‘ċ‘Ĭ,Ō,Ĭf|fCf“f^ B

ŽQ Æ @IDirect3DLight::SetLight

IDirect3DLight::Initialize

HRESULT Initialize(LPDIRECT3D lpDirect3D);

,±,ìf f\fbfh,Í ACOMfvf fgfRf€,ÌêŠÑ «,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, ÌŒõŒ¹ î•ñ, ð Ý'è, ·, é B

¬Œ÷, ·, ê, ÎD3D_OK AŽ, ”s, ·, ê, Î AŽŸ, Ì¹, Ì, Œ, ·, ê, ©, ð•Ô, · B

DDERR_INVALIDOBJECT

DDERR_INVALIDPARAMS

lpLight

Œ» Ý, ÌŒõŒ¹ff [f^, ð Ý'è, ·, é, ½, ß, ÉŽg—p, ³, ê, éD3DLIGHT \‘Œ‘Ì, Õ, Ìf|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,ðŒp 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

ffofCfX,“”jŠü,³,ê,½,Æ,« Af}fefŠfAf<,ÍffofCfX,©,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<,^a Ý’è,³,ê,é•İ ”,Ö,l|fCf“f^ B

IDirect3DMaterial::GetMaterial

HRESULT GetMaterial(LPD3DMATERIAL lpMat);

Direct3DMaterialIfuFWfFNfg,lf}fefŠfAf< E f f [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,éD3DMATERIAL \‘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

Direct3DMaterialIfufWfFfNfg,ð ¶ -Žž,É %Šú%»,·,é,½,ß ADDERR_ALREADYINITIALIZED,ª•Ô,é B

lpDirect3D

Direct3DfIfufWfFfNfg,ðŽ',·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“fhf<** **GetHandle**

%Šú%» **Initialize**

f **[fh** **Load**
Unload

f*p***fÆfbfg 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,ðEp ³,·,é B***IUnknown***fCf“f^ [ftFfCfX,ªfTf| [fg,·,éf f\fbfh,Í AŽŸ,ÌÊ,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,ðÆÄ,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,Œ,,ê,©,đ•Ô,· B

D3DERR_BADOBJECT

DDERR_INVALIDPARAMS

lpDirect3DDevice

f [fh,³,ê,Ä,Œ,éfefNfXf`ff,ÌDirect3DDeviceIfufWfFfNfg,Ö,İf|fCf“f^ B

lpHandle

Direct3DTextureIfufWfFfNfg,É‘Î%oož,·,éfefNfXf`ff,lfnf“fhf<,^a 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 \‘¢‘Ì,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,ç,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<,ìfrrf... [f| [fg,âfrrf... [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,³,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,³,ê,Ä,«,é,Æ,«)
,ìf«f“f_Šf“fO‘Î Û B

D3DCLEAR_ZBUFFER Zfobftf@,© A,»,±,É Ý’è,³,ê,Ä,«,é«» Ý,ì”w«Ei [“x(Ý’è,³,ê,Ä,«,é,Æ,«) B

IDirect3DViewport::DeleteLight

HRESULT DeleteLight (LPDIRECT3DLIGHT lpDirect3DLight);

frf... [f] [fg,ÉŠÖ^A,μ,½Direct3DLightIfufWfFfNfg,ÌfŠfXfg,©,ç AŽw'è,³,ê,½ŒöŒ¹,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);

frf... [f] [fg,ÉŠÖ~A,μ,½Œ» Ý,ì”wŒi,©,çf}fefŠfAf<,ìfnf“fhf<,ðŽæ“¾,·,é B
¬Œ÷,·,ê,ÎD3D_OK AŽ,”s,·,ê,Î AŽŸ,Ì¹,Ì,Œ,,ê,©,ð•Ô,· B

DDERR_INVALIDOBJECT

DDERR_INVALIDPARAMS

lphMat

”wŒi,Æ,μ,ÄŽg—p,³,ê,Ä,Œ,éf}fefŠfAf<,ìfnf“fhf<,Ö,ìf|fCf“f^ B

lpValid

”wŒi,ªfrf... [f] [fg,ÉŠÖ~A,μ,Ä,Œ,é,±,Æ,ðŽ¹,·,½,ß,É Ý’è,³,ê,é•Ĭ ”,Ö,ìf|fCf“f^ B,±
,ìfpf%of [f^,ªFALSE,Ì,Æ,« Afrf... [f] [fg,ÉŠÖ~A,·,é”wŒi,Í,È,Œ 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,^,È,Œ,Æ,«FALSE,^ 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,î'l,î,¢,,ê,©,ð•Ô,· B

DDERR_INVALIDOBJECT

DDERR_INVALIDPARAMS

lpData

frf... [f] [fg,ðŽæ“¾,·,éD3DVIEWPORT \‘¢‘î,Ö,îf|fCf“f^ B

ŽQ Æ @IDirect3DViewport::SetViewport

IDirect3DViewport::Initialize

HRESULT Initialize(LPDIRECT3D lpDirect3D);

,±,ìf f\fbfh,Í ACOMfvf fgfRf€,ÌêŠÑ «,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,ì,·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,Ì¹l,Ì,¢,,ê,©,ð•Ô,· B

DDERR_INVALIDOBJECT

DDERR_INVALIDPARAMS

lpDirect3DLight

Direct3DDeviceIfufWfFfNfg,ÉŠÖ~A,μ,½ŒðŒ¹fŠfXfg,Ì¹†,ÌŒðŒ¹,Ö,Ìf|fCf“f^ B

lplpDirect3DLight

Direct3DDeviceIfufWfFfNfg,ÉŠÖ~A,μ,½ŒðŒ¹fŠfXfg,Ì¹†,©,ç—v< ,³,ê,½ŒðŒ¹,ðŠÜ,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);

frf... [f] [fg,ÉŠÖ~A,μ,½”wŒi,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

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,Ì¹,Ì,ç,,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,ç
,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,ç B

ŽQ Æ @**IDirect3DViewport::GetBackgroundDepth**

IDirect3DViewport::SetViewport

```
HRESULT SetViewport(LPD3DVIEWPORT lpData);
```

$$\begin{aligned} & f\mathfrak{r}f\ldots [f] [fg,\mathfrak{l}f\mathfrak{r}f\ldots [f] [fg\ Ef\mathfrak{C}fWfXf\mathfrak{A},\mathfrak{d}\ \acute{Y}\acute{e},\acute{e}\ B \\ & -\mathfrak{C}\acute{e},\cdot,\hat{e},\mathfrak{I}\mathfrak{D}3\mathfrak{D}_{\text{OK}}\ A\check{Z},\text{,}\mathfrak{s},\cdot,\hat{e},\mathfrak{I}\ A\check{Z}\acute{Y},\mathfrak{l}\text{,}\mathfrak{l},\mathfrak{C},\cdot,\hat{e},\mathfrak{C},\mathfrak{d},\mathfrak{O},\cdot\ B \end{aligned}$$

DDERR_INVALIDOBJECT

DDERR_INVALIDPARAMS

lpData
V(Kfrf... [f| [fg,đŽ',**D3DVIEWPORT** \c`İ,Ö,İf|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 à¬¼,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•ªŠò \‘Œ‘l,Å, ,é B

dwMask

•ªŠò,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•ªŠò,·,é B

Žg—p%oÂ”\,Èfhf%oCfo ó‘Ôf}fXfN,lŒŠfXfg,Í AD3DSTATUS \‘Œ‘l,ldwStatus f 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

•ªŠò 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,ƞfJf%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, ðfofCfY'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

fffofCfX, ðfJf% [Ef, fffç, ðŽw'è, µ, Ä, Ç, é D3DCOLORMODEL—ñ<“Ç^f f“fo, Ì, Ð, Æ, Â B

dwDevCaps

fffofCfX, ð”—Í, ðŽ-•Ê, ·, éftf%ofo B

D3DDEVCAPS_EXECUTESYSTEMMEM

ORY

fVfXfef€ Ef f, fŠ, ðŽÀ sfobftf@, ÉŽg—p%oÂ”\ B

D3DDEVCAPS_EXECUTEVIDEOMEMORY

frfffl Ef f, fŠ, ðŽÀ sfobftf@, ÉŽg—p%oÂ”\ B

D3DDEVCAPS_FLOATTVERTEX

ĨŠ·Ĉĕă,ĭ'“_ff [f^,đ•,“@ ¬ ”“_„ĂŽæ“¾ B
3DDEVCAPS_SORTDECREASINGZ
 [“x,ĭĈ, •ûĈü,Éf\ [fg,³,ê,½ff [f^,³•K—v B
D3DDEVCAPS_SORTEXACT
 ,_ŝ,Éf\ [fg,³,ê,½ff [f^,³•K—v B
D3DDEVCAPS_SORTINCREASINGZ
 Z‘ %oÁ•ûĈü,Éf\ [fg,³,ê,½ff [f^,³•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
d3dTransformCaps
 fffofCfX,ĭ•ĬŠ·”—Ĭ,đŽw’è,,·,é**D3DTRANSFORMCAPS** \‘Ĉ‘Ĭ,ĭf f“fo,Ĭ,Đ,Æ,Â B
bClipping
 fffofCfX,³DfNfŠfbsf“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,ăŽŌŝpĈ,đ•%oæ,,·,é,½,ß AfffofCfX,ĭfTf| [fg ĭ•ñ,đ’èĈ’,·,é**D3DPRIMCAPS** \‘Ĉ‘Ĭ B
dwDeviceRenderBitDepth
 fffofCfX,ĭfĈf“f_ŝf“fo Efrfbfg [“x BŽŸ,ĬDirectDrawfrfbfg [“x’è ”DDBD_8 ADDBD_16 ADDBD_24 AD
 DBD_32,ĭ“à,Đ,Æ,ÂĖ ĩ,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 ĩ,đ Ý’è,Â,«,é B
dwMaxBufferSize
 ,±,ĭfffofCfX,ĬŽÀ sfofbftf@,Ĭ Â‘ăfTfCfY B,±,ĭf f“fo,³0,Ĭ,Æ,«,Ĭ AfAfvfŠfP [fVf‡f“,Ĭ,Ç,Ĭ,æ,□
 ,ÈfTfCfY,Â,ăŽg—p%oÁ”\,Â, ,é B
dwMaxVertexCount
 ,±,ĭfffofCfX,Ĭ Â‘ă’“_ ” 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,Ìf ofCfg’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,Ìˉ— ~a(OR) B

D3DDEBCAPS_SYSTEMMEMORY

ŽÀ sfobftf@,Ìff [f^,ÍfVfXfef€ Ef f,fŠ,É“¶ Ý,·,é B

D3DDEBCAPS_VIDEOMEMORY

ŽÀ sfobftf@,Ìff [f^,Íff ofCfXf f,fŠ,É“¶ Ý,·,é B

dwBufferSize

ŽÀ sfobftf@,Ìf ofCfg’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\fbfh, 1/2, 8 Aff [f^, 8Žw'è, ,é B, ±, 1f f\fbfh, 3CEÄ, Î, ê•İŠ·,ª I—
¹,·,é,Æ,« AdwInstructionOffset f“fo, ÄŽw'è,³,ê, 1/2¹, ÄŽn, Ü, é-1/2—8fŠfXfg,ª%đ Í,³,ê, Ä•Ž,³,ê,é B*

dwSize
,±,İ \“‘İ, 1fofCfg’PˆÊ, 1fTfCfY B

dwVertexOffset
,“_fŠfXfg, 1fIfzfZfbfg B

dwVertexCount
ŽÀ s,·,é,“_ ” B

dwInstructionOffset
ŽÀ s-1/2—8fŠfXfg, 1fIfzfZfbfg B

dwInstructionLength
ŽÀ s-1/2—8, İ¹,³ B

dwHVertexOffset
*fAfvfŠfP [fVf‡f“,ªfNfŠfbfsf“fO, đ•K—v,Æ,·,éfXfNfŠ [f“ À•Wff [f^,Ä—^,|,ç,ê,é,Æ,«,ÉŽg—
p,³,ê,é“Žč,İ,“_, 1fIfzfZfbfg B*

dsStatus
•İŠ· I—¹CEăŽg—p,³,ê,éfXfNfŠ [f““İÍ,đŠi”[·,·,é¹ B,±,İ¹,Í AD3DSTATUS \“‘İ,Ä, ,é B

ŽQ Æ @D3DSTATUS

D3DFINDDEVICERESULT

```
typedef struct _D3DFINDDEVICERESULT {
    DWORD          dwSize;
    GUID           guid;
    D3DDEVICEDESC ddHwDesc;
    D3DDEVICEDESC ddSwDesc;
} D3DFINDDEVICERESULT, *LPD3DFINDDEVICERESULT;
```

fAfvfŠfP [fVf±f“;“Direct3D::FindDevicef f\fbfh,ðĖÄ,Ñ o,μ AŽæ“¾,·,éffofCfX,ðŽ~•Ė,·,é B

dwSize

,±,ĭ \‘ċ‘ĭ,ĭf ofCfg’P~Ė,ĭfTfCfY B

guid

ĖŸ o,³,ê,½ffofCfX,ĭfOf [fof< 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\fbfh,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,Æ,ĂˆÈ ā,ª Ý’è,Ă,«,é B

D3DFDS_ALPHACMPCAPS

,±
,İ \‘ċ’İ,İdpcPrimCapsf f“fo,Æ,μ,ĂŽw’è,³,ê,½D3DPRIMCAPS \‘ċ’
İ,İdwAlphaCmpCapsf f“fo,Æˆê’v,·,é B

D3DFDS_COLORMODEL

,±
,İ \‘ċ’İ,İdcmColorModelf f“fo,ĂŽw’è,³,ê,½fJf%o [Ef,ffċ,Æˆê’v
,·,é B

D3DFDS_DSTBLENDCAPS

,±
,İ \‘ċ’İ,İdpcPrimCapsf f“fo,Æ,μ,ĂŽw’è,³,ê,½D3DPRIMCAPS \‘ċ’
İ,İdwDestBlendCapsf f“fo,Æˆê’v,·,é B

D3DFDS_GUID

,±
,İ \‘ċ’İ,İguidf f“fo,ĂŽw’è,³,ê,½fof [fofċ Ef†fj [fNŽˆ•ÊŽq(G
UID),Æˆê’v,·,é B

D3DFDS_HARDWARE

,±,İ \‘ċ’İ,İbHardwaref f“fo,É—^,!,ç,ê,Ă,ƒ
,éfn [fhfEfFfA,©f\ftfgfEfFfA,İŽæ“¾“à—e,Æˆê’v,·,é B

D3DFDS_LINES

D3DDEVICEDESC \‘ċ’İ,İdpcLineCapsf f“fo,ĂŽw’è,³,ê,½
D3DPRIMCAPS \‘ċ’İ,Æˆê’v,·,é B

D3DFDS_MISCCAPS

,±
,İ \‘ċ’İ,İdpcPrimCapsf f“fo,Æ,μ,ĂŽw’è,³,ê,½D3DPRIMCAPS \‘ċ’
İ,İdwMiscCapsf f“fo,Æˆê’v,·,é B

D3DFDS_RASTERCAPS

,±
,İ \‘ċ’İ,İdpcPrimCapsf f“fo,Æ,μ,ĂŽw’è,³,ê,½D3DPRIMCAPS \‘ċ’
İ,İdwRasterCapsf f“fo,Æˆê’v,·,é B

D3DFDS_SHADECAPS

,±,İ \‘ċ’İ,İdpcPrimCaps
f f“fo,Æ,μ,ĂŽw’è,³,ê,½D3DPRIMCAPS \‘ċ’İ,İdwShadeCapsf f“f
o,Æˆê’v,·,é B

D3DFDS_SRCBLENDCAPS

,±

, $\dot{\mathbf{l}}$ \‘ $\dot{\mathbf{l}}$, $\dot{\mathbf{l}}\mathbf{dpcPrimCaps}$ $f^{\text{“}fo, \mathcal{E}, \mu, \mathring{\mathcal{A}}\mathring{Z}w'è, ^3, \hat{e}, \frac{1}{2}\mathbf{D3DPRIMCAPS}$ \‘ $\dot{\mathbf{c}}$
 $\dot{\mathbf{l}}, \dot{\mathbf{l}}\mathbf{dwSrcBlendCaps}$ $f^{\text{“}fo, \mathcal{E}^{\hat{e}}v, \cdot, \acute{e} B$

D3DFDS_TEXTUREBLENDCAPS

, \pm
, $\dot{\mathbf{l}}$ \‘ $\dot{\mathbf{l}}$, $\dot{\mathbf{l}}\mathbf{dpcPrimCaps}$ $f^{\text{“}fo, \mathcal{E}, \mu, \mathring{\mathcal{A}}\mathring{Z}w'è, ^3, \hat{e}, \frac{1}{2}\mathbf{D3DPRIMCAPS}$ \‘ $\dot{\mathbf{c}}$
 $\dot{\mathbf{l}}, \dot{\mathbf{l}}\mathbf{dwTextureBlendCaps}$ $f^{\text{“}fo, \mathcal{E}^{\hat{e}}v, \cdot, \acute{e} B$

D3DFDS_TEXTURECAPS

, \pm , $\dot{\mathbf{l}}$ \‘ $\dot{\mathbf{l}}$, $\dot{\mathbf{l}}\mathbf{dpcPrimCaps}$ $f^{\text{“}fo, \mathcal{E}, \mu, \mathring{\mathcal{A}}\mathring{Z}w'è, ^3, \hat{e}, \frac{1}{2}$
 $\mathbf{D3DPRIMCAPS}$ \‘ $\dot{\mathbf{c}}$, $\dot{\mathbf{l}}, \dot{\mathbf{l}}\mathbf{dwTextureCaps}$ $f^{\text{“}fo, \mathcal{E}^{\hat{e}}v, \cdot, \acute{e} B$

D3DFDS_TEXTUREFILTERCAPS

, \pm , $\dot{\mathbf{l}}$ \‘ $\dot{\mathbf{l}}$, $\dot{\mathbf{l}}\mathbf{dpcPrimCaps}$ $f^{\text{“}fo, \mathcal{E}, \mu, \mathring{\mathcal{A}}\mathring{Z}w'è, ^3, \hat{e}, \frac{1}{2}\mathbf{dwTextureCaps}$
\‘ $\dot{\mathbf{c}}$, $\dot{\mathbf{l}}, \dot{\mathbf{l}}\mathbf{dwTextureFilterCaps}$ $f^{\text{“}fo, \mathcal{E}^{\hat{e}}v, \cdot, \acute{e} B$

D3DFDS_TRIANGLES

$\mathbf{D3DDEVICEDESC}$ \‘ $\dot{\mathbf{c}}$, $\dot{\mathbf{l}}, \dot{\mathbf{l}}\mathbf{dwTextureFilterCaps}$ $f^{\text{“}fo, \mathring{\mathcal{A}}\mathring{Z}w'è, ^3, \hat{e}, \frac{1}{2}$
 $\mathbf{D3DPRIMCAPS}$ \‘ $\dot{\mathbf{c}}$, $\dot{\mathbf{l}}, \mathcal{E}^{\hat{e}}v, \cdot, \acute{e} B$

D3DFDS_ZCMPCAPS

, \pm
, $\dot{\mathbf{l}}$ \‘ $\dot{\mathbf{l}}$, $\dot{\mathbf{l}}\mathbf{dpcPrimCaps}$ $f^{\text{“}fo, \mathcal{E}, \mu, \mathring{\mathcal{A}}\mathring{Z}w'è, ^3, \hat{e}, \frac{1}{2}\mathbf{D3DPRIMCAPS}$ \‘ $\dot{\mathbf{c}}$
 $\dot{\mathbf{l}}, \dot{\mathbf{l}}\mathbf{dwZCmpCaps}$ $f^{\text{“}fo, \mathcal{E}^{\hat{e}}v, \cdot, \acute{e} B$

bHardware

$\mathring{Z}\mathring{\mathcal{A}}^{\text{“}\frac{3}{4}, \cdot, \acute{e}fffofCfX, ^a}$ Afn $[fhEfFfA, \textcircled{f}ftfgfEfFfA, \dot{\mathbf{l}}, \mathring{C}, \dot{\mathbf{z}}, \mathring{C}, \mathring{\mathcal{A}}, \cdot, \acute{e}, \textcircled{\mathcal{O}}, \mathring{\mathcal{O}}\mathring{Z}w'è, \cdot, \acute{e}ftf\%oO$ B, \pm
, $\dot{\mathbf{l}}f$ $f^{\text{“}fo, ^a\mathbf{TRUE}, \dot{\mathbf{l}}, \mathcal{E}, \text{«}, \acute{\mathbf{I}}$ Afn $[fhEfFfA, \dot{\mathbf{l}}f\%oXf^{\wedge}, \mathring{\mathcal{O}}\mathring{Z}\mathring{\mathcal{A}}^{\text{“}\frac{3}{4}, \cdot, \acute{e} B, \text{»}, \mu, \mathring{\mathcal{A}}$ Afn $[fhEfFfA$ $EfAfNfZf\%o\mathcal{E}$ $[fV$
 $f\ddagger f^{\text{“}}, \mathring{\mathcal{O}} s, \square B, \pm, \dot{\mathbf{l}}ftf\%oO, \mathring{\mathcal{O}}\mathring{Z}g\text{—}$
 $p, \cdot, \acute{e}fAvf\mathring{S}fP$ $[fVf\ddagger f^{\text{“}}, \acute{\mathbf{I}}$ $AdwFlags$ $f^{\text{“}fo, \acute{\mathbf{E}}\mathbf{D3DFDS_HARDWARE}f\mathfrak{r}fbfg, \mathring{\mathcal{O}}$ $\acute{Y}'è, \cdot, \acute{e}, \pm, \mathcal{E} B$

dcmColorModel

$f\%of^{\text{“}fv, \mathring{a}RGBfJf\%o$ $[$ $Ef, fff\text{«}, \mathring{\mathcal{A}}\mathring{Z}\mathring{\mathcal{A}}^{\text{“}\frac{3}{4}, \cdot, \acute{e}fffofCfX, \mathring{\mathcal{O}}\mathring{Z}w'è, \cdot, \acute{e}\mathbf{D3DCOLORMODEL}$ $\text{—}\mathring{n}\text{«}\mathcal{E}^{\wedge}f$ $f^{\text{“}fo, \dot{\mathbf{l}}, \mathcal{D}, \mathcal{E}, \mathring{\mathcal{A}}$ B

guid

$\mathcal{E}\acute{Y}$ $o, \cdot, \acute{e}fffofCfX, \dot{\mathbf{l}}fOf$ $[fof\text{«}$ $Ef\ddagger fj$ $[fN\mathring{Z}^{\text{—}}\mathring{E}\mathring{Z}q(\mathbf{GUID}) B$

dwCaps

$\text{”}\text{—}\mathring{\mathbf{I}}, \dot{\mathbf{l}}ftf\%oO B$

dpcPrimCaps

, $\text{»}, \hat{e}, \frac{1}{4}, \hat{e}, \dot{\mathbf{l}}fvf\mathring{S}f\sim fefBfu\mathcal{E}^{\wedge}, \dot{\mathbf{l}}, \frac{1}{2}, \mathring{\mathcal{B}}, \dot{\mathbf{l}}fffofCfX, \dot{\mathbf{l}}\text{”}\text{—}\mathring{\mathbf{I}}, \mathring{\mathcal{O}}\mathring{Z}', \cdot, \mathbf{D3DPRIMCAPS}$ \‘ $\dot{\mathbf{c}}$, $\dot{\mathbf{l}}, \mathring{\mathcal{O}}\mathring{Z}w'è, \cdot, \acute{e} B$

$\mathring{Z}Q$ \mathcal{E} $@\mathbf{D3D\mathit{IND}DEVICE\mathit{RESULT}}$

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,Ü,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 fbVf...,Ă,Ă,«,Ă,¢,éŽOŠpƎ`,ì,æ,▯,È AŽ—,½-½—ß,ð,Ü,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, $\lambda, \alpha, \varphi, \vec{f} = f \backslash f b f h, \delta \mathbb{E} \tilde{\mathbb{A}}, \tilde{\mathbb{O}}, \frac{1}{2}, \beta, \tilde{\mathbb{I}} \quad \mathbb{A} \mathbb{E} \tilde{\mathbb{O}} \mathbb{E}^1 \mathbb{E}^{\wedge}, \delta \mathbb{E}^{\sim} \tilde{\mathbb{e}}, \cdot, \acute{\mathbb{e}} \quad \mathbb{B}$

dwSize

$, \pm, \tilde{\mathbb{I}} \quad \backslash \mathbb{C}^{\circ} \tilde{\mathbb{I}}, \tilde{\mathbb{I}} f o f \mathbb{C} f g^{\circ} \mathbb{P}^{\circ} \tilde{\mathbb{E}}, \tilde{\mathbb{I}} f T f \mathbb{C} f Y \quad \mathbb{B}$

dltType

$\mathbb{E} \tilde{\mathbb{O}} \mathbb{E}^1, \tilde{\mathbb{I}} \mathbb{E}^{\wedge} \quad \mathbb{B}, \pm, \tilde{\mathbb{I}}^1, \tilde{\mathbb{I}} \quad \mathbb{A} \mathbb{D} \underline{\mathbb{D} \mathbb{3} \mathbb{D} \mathbb{L} \mathbb{I} \mathbb{G} \mathbb{H} \mathbb{T} \mathbb{T} \mathbb{Y} \mathbb{P} \mathbb{E}} \text{---} \tilde{\mathbb{n}} \mathbb{C}^{\wedge}, \tilde{\mathbb{I}} f \quad f^{\circ} f o, \tilde{\mathbb{I}}, \mathbb{D}, \mathbb{A}, \tilde{\mathbb{A}}, \acute{\mathbb{e}} \quad \mathbb{B}$

dcColor

$\mathbb{E} \tilde{\mathbb{O}} \mathbb{E}^1, \tilde{\mathbb{I}} \quad \mathbb{F} \quad \mathbb{B}, \pm, \tilde{\mathbb{I}} f \quad f^{\circ} f o, \tilde{\mathbb{I}} \quad \mathbb{A} \mathbb{D} \underline{\mathbb{D} \mathbb{3} \mathbb{D} \mathbb{C} \mathbb{O} \mathbb{L} \mathbb{O} \mathbb{R} \mathbb{V} \mathbb{A} \mathbb{L} \mathbb{U} \mathbb{E}} \quad \backslash \mathbb{C}^{\circ} \tilde{\mathbb{I}}, \tilde{\mathbb{A}}, \acute{\mathbb{e}} \quad \mathbb{B}$

dvPosition= dvDirection

$f \quad [f \langle f h \circ \acute{\mathbb{S}} \tilde{\mathbb{O}}, \tilde{\mathbb{A}}, \tilde{\mathbb{I}} \mathbb{E} \tilde{\mathbb{O}} \mathbb{E}^1, \tilde{\mathbb{I}}^{\circ} \tilde{\mathbb{E}}^{\circ} u, \hat{\mathbb{a}}^{\circ} \acute{\mathbb{I}}^{\circ} \quad \mathbb{B}$

dvRange

$\mathbb{E} \tilde{\mathbb{O}} \mathbb{E}^1, \tilde{\mathbb{I}} \text{---} \mathbb{L} \mathbb{E} \emptyset^{\circ} \acute{\mathbb{I}}^{\circ} \quad \mathbb{B}$

dvFalloff

$\frac{-34 \cdot}{\tilde{\mathbb{I}} \tilde{\mathbb{S}} \tilde{\mathbb{O}}, \tilde{\mathbb{A}}, \mathbb{P}^{\circ} \mathbb{X},^{\circ} \mathbb{E}, \tilde{\mathbb{S}}, \cdot, \acute{\mathbb{e}} \quad \mathbb{B}^{\circ} \frac{1}{4} \% \mathbb{O} \mathbb{E}^{\circ} \hat{\mathbb{a}}, \tilde{\mathbb{I}} \text{---}, \tilde{\mathbb{A}}, \tilde{\mathbb{I}} \mathbb{C} \mathbb{P}^{\circ} \mathbb{X}, \tilde{\mathbb{I}} \quad \mathbb{A} \tilde{\mathbb{Z}} \tilde{\mathbb{Y}}, \tilde{\mathbb{I}} \cdot \hat{\mathbb{u}}^{\circ} \tilde{\mathbb{O}} \tilde{\mathbb{Z}} @, \tilde{\mathbb{A}} \tilde{\mathbb{Z}} \tilde{\mathbb{I}},^3, \acute{\mathbb{e}}, \acute{\mathbb{e}} \quad \mathbb{B}$

$$Light \times \cos^{falloff} \left| \frac{\pi}{2} \frac{2\rho \theta - dvTheta}{dvPhi - dvTheta} \right|$$

$, \pm, \tilde{\mathbb{I}} \cdot \hat{\mathbb{u}}^{\circ} \tilde{\mathbb{O}} \tilde{\mathbb{Z}} @, \tilde{\mathbb{A}}, \tilde{\mathbb{I}} \quad \mathbb{A} \quad \mathbb{A} \tilde{\mathbb{E}} \tilde{\mathbb{Z}}^2, \mathbb{A} f \mathbb{X} f | f b f g f \% o f \mathbb{C} f g^{\circ} n^{\circ} \text{---}, \mathbb{A}, \tilde{\mathbb{I}} \tilde{\mathbb{S}} \mathbb{P}^{\circ} \mathbb{X}, \tilde{\mathbb{O}} \cdot \backslash, \cdot \quad \mathbb{B}$

dvAttenuation0

$\hat{\mathbb{e}}^{\circ} \tilde{\mathbb{e}}, \tilde{\mathbb{I}} \mathbb{C}^{\circ} \mathbb{X} \quad \mathbb{B} \mathbb{E} \tilde{\mathbb{O}} \mathbb{E}^1, \mathbb{A} \mathbb{d} \mathbb{v} \mathbb{R} \mathbb{a} \mathbb{n} \mathbb{g} \mathbb{e} f \quad f^{\circ} f o, \acute{\mathbb{E}}, \mathbb{A}, \mathbb{e} \text{---} \wedge, \mathbb{I}, \mathbb{C}, \hat{\mathbb{e}}, \frac{1}{2}^{\circ} \hat{\mathbb{a}} \tilde{\mathbb{Z}} \sim \text{---}, \tilde{\mathbb{I}} \tilde{\mathbb{S}} \tilde{\mathbb{O}}, \tilde{\mathbb{A}} \mathbb{E}, \quad \tilde{\mathbb{S}}, \mu, \tilde{\mathbb{E}}, \mathbb{C} \mathbb{E} \tilde{\mathbb{O}} \mathbb{E}^1 f \mathbb{C} \mathbb{E} f \mathbb{X} f \langle, \tilde{\mathbb{O}} \tilde{\mathbb{Z}} w^{\circ} \tilde{\mathbb{e}}, \cdot, \acute{\mathbb{e}} \quad \mathbb{B}$

dvAttenuation1

$f \tilde{\mathbb{S}} f j f \mathbb{A}, \acute{\mathbb{E}} \mathbb{E}, \quad \tilde{\mathbb{S}}, \cdot, \acute{\mathbb{e}} \mathbb{C}^{\circ} \mathbb{X} \quad \mathbb{B} \mathbb{C} \mathbb{P}^{\circ} \mathbb{X}, \tilde{\mathbb{I}} \quad \mathbb{A} \mathbb{d} \mathbb{v} \mathbb{R} \mathbb{a} \mathbb{n} \mathbb{g} \mathbb{e} f \quad f^{\circ} f o, \acute{\mathbb{E}}, \mathbb{A}, \mathbb{e} \text{---} \wedge, \mathbb{I}, \mathbb{C}, \hat{\mathbb{e}}, \frac{1}{2}^{\circ} \hat{\mathbb{a}} \tilde{\mathbb{Z}} \sim \text{---}, \tilde{\mathbb{I}} \tilde{\mathbb{S}} \tilde{\mathbb{O}}, \tilde{\mathbb{I}}^{\circ} \tilde{\mathbb{S}} \tilde{\mathbb{O}}, \tilde{\mathbb{A}} \quad \mathbb{A}, \pm, \tilde{\mathbb{I}}^1, \tilde{\mathbb{I}} 50 f p \quad [f \mathbb{Z} f^{\circ} f g, \tilde{\mathbb{A}}, \acute{\mathbb{e}} \quad \mathbb{B}$

dvAttenuation2

$2 \tilde{\mathbb{Z}} \tilde{\mathbb{Y}} \mathbb{E}, \quad \tilde{\mathbb{S}} \text{---} \mathbb{I}, \acute{\mathbb{E}} \quad \mathbb{I}, \tilde{\mathbb{A}}, \tilde{\mathbb{A}} \mathbb{E}, \quad \tilde{\mathbb{S}}, \cdot, \acute{\mathbb{e}} \mathbb{C}^{\circ} \mathbb{X} \quad \mathbb{B}$

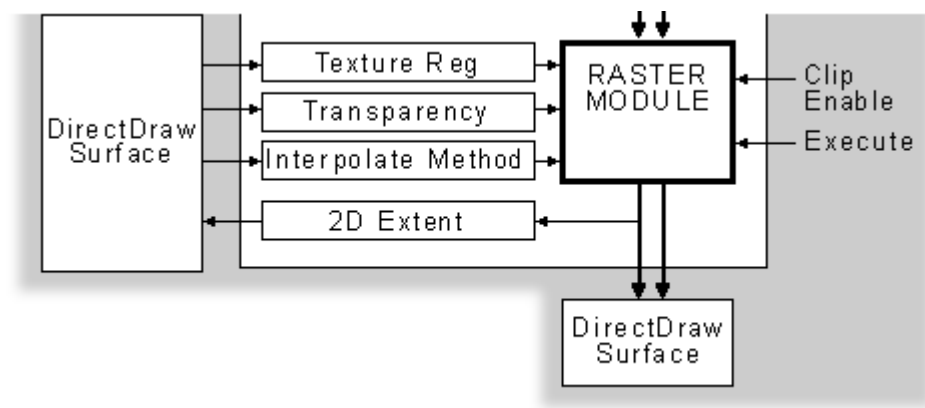
dvTheta

$f \mathbb{X} f | f b f g f \% o f \mathbb{C} f g, \tilde{\mathbb{I}}^{\circ} \hat{\mathbb{a}} \tilde{\mathbb{S}} \mathbb{P} (f \% o f \mathbb{W} f \mathbb{A} f^{\circ}) \quad \mathbb{B} \quad \mathbb{A}, \mathbb{C},^3, \hat{\mathbb{e}}, \frac{1}{2} f \mathbb{X} f | f b f g f \% o f \mathbb{C} f g, \tilde{\mathbb{I}} \tilde{\mathbb{Z}} \langle \quad \hat{\mathbb{a}}, \tilde{\mathbb{A}}, \acute{\mathbb{e}} \quad \mathbb{B}$

dvPhi

$f \mathbb{X} f | f b f g f \% o f \mathbb{C} f g, \tilde{\mathbb{I}} \tilde{\mathbb{S}} \tilde{\mathbb{O}} \tilde{\mathbb{S}} \mathbb{P} (f \% o f \mathbb{W} f \mathbb{A} f^{\circ}) \quad \mathbb{B}, \pm, \tilde{\mathbb{I}} \tilde{\mathbb{Z}} \langle \quad \hat{\mathbb{a}}, \tilde{\mathbb{I}} \tilde{\mathbb{S}} \tilde{\mathbb{O}}^{\circ} \mathbb{I}, \tilde{\mathbb{I}} \text{---}, \tilde{\mathbb{I}} \quad \mathbb{A} f \mathbb{X} f | f b f g f \% o f \mathbb{C} f g, \acute{\mathbb{E}} \quad \mathbb{A}, \mathbb{C},^3, \hat{\mathbb{e}}, \tilde{\mathbb{E}}, \mathbb{C} \quad \mathbb{B}$

$f \mathbb{V} f \mathbb{X} f e f \mathbb{E}, \tilde{\mathbb{I}} \quad \mathbb{A} \text{---} \mathbb{E}, \acute{\mathbb{E}}, \mathbb{A}, \acute{\mathbb{e}} \mathbb{E} \tilde{\mathbb{O}} \mathbb{E}^1, \tilde{\mathbb{I}} \mathbb{E}, \quad \tilde{\mathbb{S}}, \delta \mathbb{C} \mathbb{v} \tilde{\mathbb{Z}} \mathbb{Z}, \cdot, \acute{\mathbb{e}}, \frac{1}{2}, \beta \mathbb{E}, \quad \tilde{\mathbb{S}}, \delta 3 \tilde{\mathbb{Z}} \tilde{\mathbb{I}}, \mathbb{A}, \hat{\mathbb{a}} \tilde{\mathbb{Z}} g \text{---} p, \cdot, \acute{\mathbb{e}} \quad \mathbb{B} \tilde{\mathbb{Z}} \tilde{\mathbb{Y}}, \tilde{\mathbb{I}} \cdot \hat{\mathbb{u}}^{\circ} \tilde{\mathbb{O}} \tilde{\mathbb{Z}} @, \tilde{\mathbb{I}} \quad \mathbb{A} \mathbb{E}, \quad \tilde{\mathbb{S}}, \tilde{\mathbb{I}} \quad \mathbb{Y}^{\circ} \tilde{\mathbb{e}} \cdot \hat{\mathbb{u}} \text{---} @, \tilde{\mathbb{O}} \tilde{\mathbb{Z}} \tilde{\mathbb{I}}, \cdot \quad \mathbb{B}, \pm, \tilde{\mathbb{I}}, \mathbb{A}, \mathbb{C}^{\circ} \mathbb{I} \mathbb{d}, \tilde{\mathbb{I}} \quad \mathbb{A} \quad \mathbb{A} \tilde{\mathbb{E}} \tilde{\mathbb{Z}} \tilde{\mathbb{E}},^3, \hat{\mathbb{e}}, \tilde{\mathbb{A}}, \mathbb{C}, \acute{\mathbb{e}}^{\circ}, \text{---}, \mathbb{A} \mathbb{E} \tilde{\mathbb{O}} \mathbb{E}^1, \tilde{\mathbb{I}} \tilde{\mathbb{S}} \tilde{\mathbb{O}}, \tilde{\mathbb{I}} \text{---} \mathbb{E}, \tilde{\mathbb{O}} \cdot \backslash, \cdot \quad \mathbb{B}$



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\fbfh,Ö,ìĖÄ,Ñ o,μ,É,,̄,éĖðĖ¹'n“_,Æ F,ðŽ',· B*

dwSize
,±,ì \‘ċ‘ì,ìfofCfɡ’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,³,ê,é B

wRepeatFactor

fpf^ [f“ŠJŽn,ì €”õ,Æ,μ,Ä AŠJŽn‘O,ÉŽg—p,³,ê,éwLinePatternf f“fo,ÅŽw’è,³,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,¢ Æ—¾,³,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
, », é, ¼, ê Af} fefŠfAf<, ĩŠgŽU F A•řÍ F A“Š‰oe F A•úŽĚ F, đŽw’è, ., é’l B, ±
, é, ċ, ĩ’l, Í **AD3DCOLORVALUE** \‘ċ’ĩ, Á, , é B

dvPower
“Š‰oe, ĩfnfCf‰ofCfġ, ĩċ, ³, đŽw’è, ., é**D3DVALUE**Ė^, ĩ’l B

hTexture
fefNfXf`ff Ef}fbfv, ĩfnf“fhf< B

dwRampSize
F, ĩĖXŽĪ, ĩ’á, «, ³ B’P F, ĩ(ĖXŽĪ)fhf‰ofCfo, Á, Í A”wĖEi, ÉŽw’è, ³, é, ½f} fefŠfAf<, ĩ, ½, Ĥ, É A, ±
, ĩ’l, ĩ1^È‰°, Á, È, ¯, ê, ĩ, È, ċ, Ė, Ą B, », ĩ’¼, ĩ, Ė, « A”wĖEi, ĩ•Ž, ³, é, È, Ą B, ±
, ĩ“®, «, Í A”wĖEi, ÉŽw’è, ³, é, ½fefNfXf`ff, **dwRampSize** f“fo, ¹1^Ě ā, Ąf} fefŠfAf<, đĖ< ±, µ, Á, Ą, é, Ė, «, É, à•
, é, é B

fefNfXf`ff, ĩfnf“fhf<, đŽæ“¾, ., é, É, Í Afhf‰ofCfo, ĩfefNfXf`ff, đf [fh, ., é B, ±
, é, Í AfffofCfX, Ėf [fh, ³, é, é, Ė, «, É, ĩ, ÝŽg, ĩ, é, 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**,l,æ,□,Èf f\fbfh,l,½,ß,l s—ñ,ðŽ|,· B

Direct3D,Å A“Š‰œ s—ñ,l_44—v‘f,Í•‰o ”,ð Ý‘è,Å,«,È,¢ BfAfvfŠfP [fVf‡f“,Å,±,lˆÊ‘u,É•‰o ”,ðŽg,□•K—v,a, ,é
ê ‡ A,»,lˆã,í,è,É-1,Å“Š‰œ s—ñ‘S‘l,ð kŽÚ,·,é B

ŽQ Æ @**IDirect3DDevice::GetMatrix** **AIDirect3DDevice::SetMatrix**

D3DMATRIXLOAD

```
typedef struct _D3DMATRIXLOAD {
    D3DMATRIXHANDLE hDestMatrix;
    D3DMATRIXHANDLE hSrcMatrix;
} D3DMATRIXLOAD, *LPD3DMATRIXLOAD;
```

D3DOPCODE— \tilde{n} “ $\langle \mathbb{E}^\wedge, \tilde{\imath} \underline{\underline{\mathbf{D3DOP_MATRIXLOAD}}} f l f y f R \quad [f h, \tilde{\imath}, \frac{1}{2}, \mathbb{B}, \tilde{\imath} f l f y f \% o f “ f h \quad E f f \quad [f^\wedge, \delta \tilde{Z}_i, \cdot \quad \mathbf{B}$

hDestMatrix \sqcap **hSrcMatrix**

“ $\tilde{\imath}$ “ $\text{---} \quad \mathfrak{a}, \mathbb{A} “ \tilde{\imath} \text{---} \mathbb{E}^3, \tilde{\imath} \quad s \text{---} \tilde{n}, \tilde{\imath} f n f “ f h f \langle \quad \mathbf{B}$

$\tilde{Z} \mathbf{Q} \quad \mathbb{A} \quad @ \underline{\underline{\mathbf{D3DOPCODE}}}$

D3DMATRIXMULTIPLY

```
typedef struct _D3DMATRIXMULTIPLY {  
    D3DMATRIXHANDLE hDestMatrix;  
    D3DMATRIXHANDLE hSrcMatrix1;  
    D3DMATRIXHANDLE hSrcMatrix2;  
} D3DMATRIXMULTIPLY, *LPD3DMATRIXMULTIPLY;
```

D3DOPCODE— \tilde{n} “ \mathbb{C}^{\wedge} , $\hat{\imath}$ **D3DOP_MATRIXMULTIPLY** $fIfyfR$ $[fh,\hat{\imath},\frac{1}{2},\beta,\hat{\imath}fIfyf\%of$ “ fh Eff $[f^{\wedge},\delta\check{Z}',\cdot$ B

hDestMatrix

$\mathbb{C}v\check{Z}Z\mathbb{C}\langle\%o\hat{E},\delta\check{S}i$ ” $[\cdot,\acute{e}$ $s\text{---}\tilde{n},\hat{\imath}fnf$ “ $fhf\langle$ B

hSrcMatrix1 \sqcap hSrcMatrix2

$1^{\circ}\hat{O}\text{---}\acute{U},\mathbb{A}2^{\circ}\hat{O}\text{---}\acute{U},\hat{\imath}\mathbb{C}v\check{Z}Z^{\circ}\hat{\imath}$ $\hat{U},\hat{\imath}$ $s\text{---}\tilde{n},\hat{\imath}fnf$ “ $fhf\langle$ B

$\check{Z}Q$ \mathbb{A} $@$ **D3DOPCODE**

D3DPICKRECORD

```
typedef struct _D3DPICKRECORD {  
    BYTE      bOpcode;  
    BYTE      bPad;  
    DWORD     dwOffset;  
    D3DVALUE  dvZ;  
} D3DPICKRECORD, *LPD3DPICKRECORD;
```

IDirect3DDevice::GetPickRecords f\fbfh—p,É AŽÀ sfofbftf@,l‘I‘ðfvfŠf~fefBfu,É,Â,¢,Ä,Ì î•ñ,ð•Ô,· B

bOpcode

‘I‘ðfvfŠf~fefBfu,ÌfIfyfR [fh B

bPad

PadfofCf g B

dwOffset

ŒŸ o,³,ê,½‘I‘ðfvfŠf~fefBfu,ÌŽÀ sfofbftf@,Ì æ“³,©,ÌfIftfZfbfg B

dvZ

‘I‘ðfvfŠf~fefBfu,Ì [“x B

‘I‘ðfvfŠf~fefBfu,Ìx Ay À•W,Í A‘I‘ðfŒfR [fh,Ä ¶ ¬,³,ê,é**IDirect3DDevice::Pick**f\fbfh,É,æ,èŽw’è,³,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~fefBfuĖ^,ì”—Í,ð’èĸ,.,é BfffofCfX,ì ¶ ÑŽž,âfffofCfX,ì”—Í,ðŽæ“¾,.,é,Æ,«,ÉŽg—p,³,é,é B,±
,ì \‘ċ’ì,Í AD3DDEVICEDESC \‘ċ’ì,ì†,ì,ċ,,Â,©,ìf f“fo,ð’èĸ,.,é B

dwSize

,±,ì \‘ċ’ì,ìfofCfX’P’Ê,ìfTfCfY B

dwMiscCaps

,±,ìfvfŠf~fefBfu,ì‘ ‘I,È”—Í B,±,ìf f“fo,É,Í AŽŸ,ìl,ì,Ð,Æ,Â^È ã,ð Ý’è,Â,«,é B

D3DPMISCCAPS_CONFORMANT

fffofCfX,Í AOpenGL•W €É €¶,Ä,ċ,é B

D3DPMISCCAPS_CULLCCW

fffofCfX,Í AD3DRENDERSTATE_CULLMODE ó’Ô,Â‘T’ð,μ,½ ¶%oñ,è
,ðfTf| [fg,.,é(ŽOŠpĖ^,ìfvfŠf~fefBfu,ì ê ±,ì,Ý) BD3DCULL—
ñĸ“Ė^,ìD3DCULL_CCWf f“fo,É‘Î%ož,.,é B

D3DPMISCCAPS_CULLCW

fffofCfX,Í AD3DRENDERSTATE_CULLMODE ó’Ô,Â‘T’ð,μ,½%oE%oñ,
è,ìŽOŠpĖ^,ðfTf|
[fg,.,é(ŽOŠpĖ^,ìfvfŠf~fefBfu,ì ê ±,ì,Ý) BD3DCULL—
ñĸ“Ė^,ìD3DCULL_CCWf f“fo,É‘Î%ož,.,é B

D3DPMISCCAPS_CULLNONE

fffofCfX,Í A‘T’ð,μ,Ä,ċ,éŽOŠpĖ^,ðŽÀ s,Â,«,É,ċ BD3DCULL—
ñĸ“Ė^,ìD3DCULL_NONEf f“fo,É‘Î%ož,.,é B

D3DPMISCCAPS_LINEPATTERNREP

fffofCfX,Í AD3DLINEPATTERN \‘ċ’ì,ìwRepeatFactorf f“fo,É1^È
ã,ìl,ðŽg—p,Â,«,é(‘¼ ü•%oæ,ìfvfŠf~fefBfu,ì ê ±,ì,Ý) B

D3DPMISCCAPS_MASKPLANES

fffofCfX,Í A F,ìftrfbfgf}fXfN,ðŽÀ s,Â,«,é B

D3DPMISCCAPS_MASKZ

fffofCfX,Í AfsfNfZfĸ ^— ,ÄZfofbftf@,ì C ³,ð%oÂ”\
,Æ,μ,½,è•s%oÂ”\,Æ,μ,½,è,.,é B

dwRasterCaps

f%oXf^•%oæ,ì”—Í îñ B,±,ìf f“fo,É,Í AŽŸ,ìl,ð,Ð,Æ,Â^È ã Ý’è,Â,«,é B

D3DPRASTERCAPS_DITHER

fffofCfX,Í A F,ì ÄĖ»—Í,ð—ĸ,.,é,½,B,ÉffBfU^Ž,Ä,«,é B

D3DPRASTERCAPS_FOGTABLE

fffofCfX,Í AfsfNfZfĸ,ì [,³,ðŽw,·ftfHfO’l,ð•İŠ,.,éŽæ“¾fe [fufĸ,Æ
Æ ±,μ,Ä AftfHfO’l,ðŽŽ o,.,é B

D3DPRASTERCAPS_FOGVERTEX

fffofCfX,Í A Æ-¾ ^—
,İŠÖ'† AD3DTLVERTEX \‘c‘İ,İspecularf f“fo,Ä—
^,İ,ç,ê,½D3DCOLOR‘l,İfAf<ftf@ ¬“”†,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“•%œ,ð ^—
,Ä,«é B(D3DRENDERSTATE_LINEPATTERN,â
D3DRENDERSTATE_STIPPLEPATTERNfœf“f_Šf“fO ó‘Ö,İ,Đ,Æ,Ä,Ä,
İ ü•,â“h,è,Ä,Ö,µ)fvfŠf~fefBfu—p,Ê Æ%öİ,³,ê,é B

D3DPRASTERCAPS_ROP2

fffofCfX,Í AR2_COPYPEN^ÈŠÖ,İf%ofXf^ ^— ,ðfTf| [fg,Ä,«é B

D3DPRASTERCAPS_STIPPLE

fffofCfX,Í A”¼“§-¾,ðfVf~f...fœ [fg,·,éf|fŠfSf“,ð“_•,Ä,«é B

D3DPRASTERCAPS_SUBPIXEL

fffofCfX,Í A^ê”Ö,œ,œ ® ”œ^,İfsfNfZf< Ä•W,Ä,È,-
AZ A F AfefNfXf`ff,İff [f^,İfTfufsfNfZf<”z’u,Ä ^— ,·,é B,±
,é,İ AZ,İfufŠ [fh ü,ð”ð,_,é,İ,ð •,_,é(F,İfWfbf^,ÆfsfNfZf<,İfefNf
Xf`ff’l,à) B,±,é,ç,Í A—Lœø,Æ,µ,½,è-³œø,Æ,µ,½,è,Ä,«É,œ,œ
(fffofCfX,Í AfTfufsfNfZf<”z’u,ðŽÄ s,µ,½,è A,µ,È,©,Ä,½,è,·,é) B,
±,İftrfbfg,Í Afœf“f_Šf“fO,İŽç,ðœ”è,·,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,İ‘
— ü,ð İ,Ý ä,°,½,à,İ,Ä ,é BfTfufsfNfZf<”z’u,É,Ä,œ
,Ä,İ Ú ×,İ AD3DPRASTERCAPS_SUBPIXEL,ðŽQ Æ,·,é,±,Æ B

D3DPRASTERCAPS_XOR

fffofCfX,Í”r¼“T— ~a ^— (XOR),ðfTf| [fg,·,é B,±
,İftf%ofo,ª Y’è,³,ê, AD3DPRIM_RASTER_ROP2,ª Y’è,³,ê,Ä,œ,œ
,é ê ‡,İ A”r¼“T— ~a ^— ,ªfTf| [fg,³,è,Ä,œ,œ,È,_,è,İ,È,ç,È,œ B

D3DPRASTERCAPS_ZTEST

fffofCfX,İZfefXfg ^— ,ðŽÄ s,Ä,«é B,±
,é,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‘,·,é B

dwZCmpCaps

fhf%ofCfo,ªŽÄ s%œÄ”\,ÈŠÖ ”,ð”äŠr,·,éZfofbftf@ B,±,İf f“fo,Í AŽŸ,İ‘l,ð,Đ,Æ,Ä^È ä Y’è,Ä,«é B

D3DPCMPCAPS_ALWAYS

,Ä,È,ÉZfefXfg,ð’Ê,· B

D3DPCMPCAPS_EQUAL

V<K,İZ,ªœ» Ý,İZ,Æ“™,µ,œ ê ‡ AZfefXfg,ð’Ê,· B

D3DPCMPCAPS_GREATER

V<K,İZ,ªœ» Ý,İZ,æ,è‘ä,«œ ê ‡ AZfefXfg,ð’Ê,· B

D3DPCMPCAPS_GREATEREQUAL

V<K,İZ,ªœ» Ý,İZ,æ,è‘ä,«œ,©“™,µ,œ ê ‡ AZfefXfg,ð’Ê,· B

D3DPCMPCAPS_LESS

V<K,İZ,ªœ» Ý,İZ,æ,è ¬,³,œ ê ‡ AZfefXfg,ð’Ê,· B

D3DPCMPCAPS_LESSEQUAL

V<K,İZ,ªœ» Ý,İZ,æ,è ¬,³,œ,©“™,µ,œ ê ‡ AZfefXfg,ð’Ê,· B

D3DPCMPCAPS_NEVER

,Ä,È,ÉZfefXfg,ðŽ,”s,·,é B

D3DPCMPCAPS_NOTEQUAL

V<K,İZ,ªœ» Ý,İZ,Æ“™,µ,,È,œ ê ‡ AZfefXfg,ð’Ê,· B

dwSrcBlendCaps

$f \setminus [fX, \text{ifuf}\mathbb{E}f\text{“}ffBf\text{“}fO \hat{\imath}\tilde{n} B, \pm$
 $, \text{if} f\text{“}fo, \hat{I} \text{ } \mathbb{A}\mathbb{Z}\mathbb{Y}, \hat{I}, \delta, \mathbb{D}, \mathbb{E}, \hat{A}\mathbb{E} \hat{a} \text{ } \mathbb{Y}'\hat{e}, \hat{A}, \ll, \acute{e}(\text{RGBA}'l, \hat{l}) \setminus [fX, \mathbb{A}ffXfefBf \mid [fVf\pm f\text{“}, \hat{I} \text{ } A, \gg, \hat{e}, \tfrac{1}{4}, \hat{e}s, \mathbb{E}d, \hat{A}\bullet, \cdot) \text{ } B$
D3DPBLENDCAPS_BOTHINVSRCALPHA

$f \setminus [fX, \text{ifuf}\mathbb{E}f\text{“}ffBf\text{“}fO\mathbb{E}W \text{”}(1\text{-}A_s, 1\text{-}A_s, 1\text{-}A_s, 1\text{-}A_s)$
 $, \mathbb{A}ffXfefBf \mid [fVf\pm f\text{“}, \text{ifuf}\mathbb{E}f\text{“}ffBf\text{“}fO\mathbb{E}W \text{”}(A_s, A_s, A_s,$
 $A_s) \text{ } BffXfefBf \mid [fVf\pm f\text{“}, \text{ifuf}\mathbb{E}f\text{“}ffBf\text{“}fO, \hat{I}'\delta, \hat{I} \text{ } A\text{--}\mathbb{E}\emptyset, \mathbb{E}, \hat{e} \text{ } B$

D3DPBLENDCAPS_BOTHSRCALPHA

$f \setminus [fX, \text{ifuf}\mathbb{E}f\text{“}ffBf\text{“}fO\mathbb{E}W \text{”}(A_s, A_s, A_s, A_s)$
 $, \mathbb{A}ffXfefBf \mid [fVf\pm f\text{“}, \text{ifuf}\mathbb{E}f\text{“}ffBf\text{“}fO\mathbb{E}W \text{”}(1\text{-}A_s, 1\text{-}A_s, 1\text{-}A_s, 1\text{-}$
 $A_s) \text{ } BffXfefBf \mid [fVf\pm f\text{“}, \text{ifuf}\mathbb{E}f\text{“}ffBf\text{“}fO, \hat{I}'\delta, \hat{I} \text{ } A\text{--}\mathbb{E}\emptyset, \mathbb{E}, \hat{e} \text{ } B$

D3DPBLENDCAPS_DESTALPHA

$\text{fuf}\mathbb{E}f\text{“}ffBf\text{“}fO\mathbb{E}W \text{”}(Ad, Ad, Ad, Ad) \text{ } B$

D3DPBLENDCAPS_DESTCOLOR

$\text{fuf}\mathbb{E}f\text{“}ffBf\text{“}fO\mathbb{E}W \text{”}(Rd, Gd, Bd, Ad) \text{ } B$

D3DPBLENDCAPS_INVDESTALPHA

$\text{fuf}\mathbb{E}f\text{“}ffBf\text{“}fO\mathbb{E}W \text{”}(1\text{-}Ad, 1\text{-}Ad, 1\text{-}Ad, 1\text{-}Ad) \text{ } B$

D3DPBLENDCAPS_INVDESTCOLOR

$\text{fuf}\mathbb{E}f\text{“}ffBf\text{“}fO\mathbb{E}W \text{”}(1\text{-}Rd, 1\text{-}Gd, 1\text{-}Bd, 1\text{-}Ad) \text{ } B$

D3DPBLENDCAPS_INVSRCALPHA

$\text{fuf}\mathbb{E}f\text{“}ffBf\text{“}fO\mathbb{E}W \text{”}(1\text{-}A_s, 1\text{-}A_s, 1\text{-}A_s, 1\text{-}A_s) \text{ } B$

D3DPBLENDCAPS_INVSRCOLOR

$\text{fuf}\mathbb{E}f\text{“}ffBf\text{“}fO\mathbb{E}W \text{”}(1\text{-}Rd, 1\text{-}Gd, 1\text{-}Bd, 1\text{-}Ad) \text{ } B$

D3DPBLENDCAPS_ONE

$\text{fuf}\mathbb{E}f\text{“}ffBf\text{“}fO\mathbb{E}W \text{”}(1, 1, 1, 1) \text{ } B$

D3DPBLENDCAPS_SRCALPHA

$\text{fuf}\mathbb{E}f\text{“}ffBf\text{“}fO\mathbb{E}W \text{”}(A_s, A_s, A_s, A_s) \text{ } B$

D3DPBLENDCAPS_SRCALPHASAT

$\text{fuf}\mathbb{E}f\text{“}ffBf\text{“}fO\mathbb{E}W \text{”}(f, f, f, 1) \text{ } Af = \min(A_s, 1\text{-}Ad) \text{ } B$

D3DPBLENDCAPS_SRCCOLOR

$\text{fuf}\mathbb{E}f\text{“}ffBf\text{“}fO\mathbb{E}W \text{”}(R_s, G_s, B_s, A_s) \text{ } B$

D3DPBLENDCAPS_ZERO

$\text{fuf}\mathbb{E}f\text{“}ffBf\text{“}fO\mathbb{E}W \text{”}(0, 0, 0, 0) \text{ } B$

dwDestBlendCaps

$\text{ffXfefBf} \mid [fVf\pm f\text{“} \neg \pm \hat{\imath}\tilde{n} B, \pm, \text{if} f\text{“}fo, \hat{I} \text{ } AdwSrcBlendCaps f \text{“}fo, \hat{A}'\acute{e}\grave{c}, 3\hat{e}, \tfrac{1}{2}”\neg \hat{I} \hat{\imath}\tilde{n}, \mathbb{E}\text{“}\neg, \mathbb{I}, \hat{A}, \text{ } , \acute{e} \text{ } B$

dwAlphaCmpCaps

$\text{fhf}\%ofCfo, a\mathbb{Z}\hat{A} \text{ } s\% \hat{A}”, \mathbb{E}\mathbb{S}\mathbb{O} \text{”}, \delta”\grave{a}\mathbb{S}r, \cdot, \acute{e}fAf\textless ftf@ \text{ } EfefXfg \text{ } B, \pm, \text{if} f\text{“}fo, \hat{I} \text{ } AdwZCmpCaps f \text{“}fo, \hat{A}'\acute{e}\grave{c}, 3\hat{e}, \tfrac{1}{2}”\neg \hat{I} \hat{\imath}\tilde{n}, \mathbb{E}\text{“}\neg, \mathbb{I}, \hat{A}, \text{ } , \acute{e} \text{ } B$

dwShadeCaps

$\text{ffofCfX}, a\mathbb{Z}\hat{A} \text{ } s, \hat{A}, \ll, \acute{e}fVfF \text{ } [ffBf\text{“}fO \text{ } \neg \text{ } B\hat{e}”\hat{E}\text{“}I, \acute{E} \text{ } AfffofCfX, a\neg, !, \zeta, \hat{e}, \tfrac{1}{2}fRf\}$
 $f\text{“}fh(\textbf{D3DOP_TRIANGLE}, \hat{l}, \mathbb{a}, \sqsupset, \mathbb{E}), \delta\mathbb{Z}\hat{A} \text{ } s, \hat{A}, \ll, \acute{e} \text{ } \hat{e} \text{ } \pm, \hat{I} \text{ } AD3DSHADE_FLATf, \text{ } [fh(\textbf{D3DSHADEMODE}\neg$
 $\hat{n}\text{“}\mathbb{E}\wedge, \hat{A}\mathbb{Z}w'\acute{e}, 3\hat{e}, \acute{e}, \mathbb{a}, \sqsupset, \mathbb{E}), \delta fTf \mid [fg, \cdot, \acute{e} \text{ } B, \pm$

$, \text{iftf}\%ofo, \hat{I} \text{ } AfOf \text{ } [\text{ } EfVfF \text{ } [ffBf\text{“}fO, \mathbb{A}ftfHf\text{“} \text{ } EfVfF \text{ } [ffBf\text{“}fO, \delta fTf \mid$
 $[fg, \cdot, \acute{e}fhf\%ofCfo, \hat{a} \text{ } A, R, \hat{A}, \text{ifJf}\% [\text{ } \mathbb{I} \text{ } \neg f, [fh, \acute{E}, \gg, \hat{e}, \tfrac{1}{4}, \hat{e}fTf \mid [fg, 3\hat{e}, \acute{e}fAf\textless ftf@ \text{ } EfJf\% [\text{ } EfRf\text{“}f \mid$
 $\neg [lf\text{“}fg, \delta\mathbb{Z}w'\acute{e}, \cdot, \acute{e} \text{ } BfAf\textless ftf@ \neg v'\acute{f}, a\neg, !, \zeta, \hat{e}, \tfrac{1}{2}f, [fh, \hat{A}fTf \mid$
 $[fg, 3\hat{e}, \mathbb{E}, \mathbb{C} \text{ } \hat{e} \text{ } \pm \text{ } A, \gg, \text{if}, [fh, \hat{A} \text{ } \mathbb{I} \text{ } \neg, 3\hat{e}, \tfrac{1}{2} \text{ } F, \text{ifAf\textless ftf@}'l, \hat{I}\bullet K, 255\acute{E}, \mathbb{E}, \acute{e} \text{ } B, \pm$
 $, \hat{l} \text{ } ”l, a \text{ } AfAf\textless ftf@, \hat{l} \text{ } \hat{A}'\grave{a}'l(fAf\textless ftf@, a \text{ } \hat{A}\textless), \hat{A}, \text{ } , \acute{e} \text{ } B$

$\mathbb{Z}\mathbb{O}\mathbb{S}p\mathbb{E}\text{”}, \hat{l} \text{ } F \text{ } AfnfCf\%ofCf\text{g}\text{“}\mathbb{S}\%oe \text{ } AftfHfO \text{ } AfAf\textless ftf@ \text{ } \neg a, \acute{E}, \hat{I}, \gg, \hat{e}, \tfrac{1}{4}, \hat{e} \text{ } AfffofCfX \text{ } Efhf\%ofCfo, afAfvf\mathbb{S}fP$
 $[fVf\pm f\text{“}, \acute{E}'\hat{e}'m, \cdot, \acute{e}”\neg \text{iftf}\%fo, a, \text{ } , \acute{e} \text{ } B$

$, \pm$
 $, \text{iftf}\%ofo, \hat{I} \text{ } AfVfF \text{ } [ffBf\text{“}fO \text{ } Ef, [fh \text{ } AfJf\% [\text{ } Ef, fff\textless \text{ } A, \gg, \mu, \hat{A} \text{ } \neg \text{ } \pm, \hat{a}\text{“}\neg, 3\hat{e}, \acute{e} \text{ } F, \text{ifAf\textless ftf@ \text{ } \neg a, \hat{A} \text{ } X$
 $V, 3\hat{e}, \acute{e} \text{ } B \text{ } \acute{U} \text{ } \times, \hat{I} \text{ } A \text{ } uf\textbf{fSfSf}\text{“} \text{ } v, \delta\mathbb{Z}Q \text{ } \mathbb{E}, \cdot, \acute{e}, \pm, \mathbb{E} \text{ } B$

,±,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,¬ª
,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,-,ê,Î,È,
ç,È,¢(f~fbfvf}
fbfv EfefNfXf`ff,Í A•K,2 æŽŸƐ³,Â,È,-,ê,Î,È,ç,È,¢) B

D3DPTTEXTURECAPS_SQUAREONLY

fefNfXf`ff,Í A,·,×,Ä<éƐ',Â,È,-,ê,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,-,ê,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<,ªŽg—p,³,ê,é B,±
,ê,í AŠg'â,Æ k ¬,ì—¼•û,ÀŽg—p,³,ê,é BŠg'â,© k ¬,ªfTf|
[fg,³,ê,À,¢,é,Æ,«,í A—¼•û,ªfTf| [fg,³,ê,À,¢,È,¬,ê,î,È,ç,È,¢ B

dwTextureBlendCaps

fefNfXf`ff ¬ ð îñ BfefNfXf`ff ¬ ðf, [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,À,«,é B

D3DPTBLENDCAPS_COPY

fefNfXf`ff ¬ ðf, [fh,ìfRfs [(D3DTEXTUREBLEND—
ñ<“Ĉ^,æ,èD3DPTBLEND_COPY),ðfTf| [fg,·,é B

D3DPTBLENDCAPS_DECAL

fffJ [f< EfefNfXf`ff ¬ ðf, [fh(D3DTEXTUREBLEND—
ñ<“Ĉ^,æ,èD3DPTBLEND_DECAL),ðfTf| [fg,·,é B

D3DPTBLENDCAPS_DECALALPHA

fffJ [f< EfAf<ftf@ EfefNfXf`ff ¬ ðf, [fh(D3DTEXTUREBLEND—
ñ<“Ĉ^,æ,èD3DPTBLEND_DECALALPHA),ðfTf| [fg,·,é B

D3DPTBLENDCAPS_DECALMASK

fffJ [f< Ef{fXfN EfefNfXf`ff ¬ ðf, [fh(D3DTEXTUREBLEND—
ñ<“Ĉ^,æ,èD3DPTBLEND_DECALMASK),ðfTf| [fg,·,é B

D3DPTBLENDCAPS_MODULATE

•ì²fefNfXf`ff ¬ ðf, [fh(D3DTEXTUREBLEND—
ñ<“Ĉ^,æ,èD3DPTBLEND_MODULATE),ðfTf| [fg,·,é B

D3DPTBLENDCAPS_MODULATEALPHA

•ì²fAf<ftf@ EfefNfXf`ff ¬ ðf, [fh(D3DTEXTUREBLEND—
ñ<“Ĉ^,æ,èD3DPTBLEND_MODULATEALPHA),ðfTf| [fg,·,é B

D3DPTBLENDCAPS_MODULATEMASK

•ì²f{fXfN EfefNfXf`ff ¬ ðf, [fh(D3DTEXTUREBLEND—
ñ<“Ĉ^,æ,èD3DPTBLEND_MODULATEMASK),ðfTf| [fg,·,é B

dwTextureAddressCaps

fefNfXf`ff,ìfAfhfĈfX îñ B,±,ìf f“fo,í AŽŸ,ì'1,ð,Đ,Æ,Â^È ã Ý'è,À,«,é B

D3DPTADDRESSCAPS_CLAMP

fffofCfX,í AfefNfXf`ff,ìĈÀ'è,“%oÂ”,À, ,é B

D3DPTADDRESSCAPS_MIRROR

fffofCfX,í AfefNfXf`ff,ì”½“,“%oÂ”,À, ,é B

D3DPTADDRESSCAPS_WRAP

fffofCfX,í AfefNfXf`ff,ì'£,è•t,¬,“%oÂ”,À, ,é B

dwStippleWidth □ dwStippleHeight

fTf| [fg,³,ê,½“_•,ì À•â• ,Æ ,³(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, ÅŽg—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,ª%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, ÅdwFlagsf 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·Æä, Ì’, “_Ì”ÍÍ B, ±
Ì î•ñ, ÌD3DSTATUS \‘ç‘Ì, ÌdrExtentf f“fo, É•Ô, é B

wStart

f\ [fX, Ì Å %o, Ì’, “_ÌfCf“fffbfNfX B

wDest

f [fJfç Efobftf@, Ì Å %o, Ì’, “_ÌfCf“fffbfNfX B

dwCount

^ — , ³, ê, é’, “_ ” B

dwReserved

—\ñ İ, Ý B0, Å, È, ^, ê, Ì, 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;
```

«éÇE`,l'è<` B

IX1 ⇐ **lY1**

«éÇE`,l ¶ ã<÷,ì À•W B

IX2 ⇐ **lY2**

«éÇE`,l‰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,³,ê,é“ ĆEv î•ñ,ðŠŮ,Ð B*

dwSize

,±,İ \‘ċ‘İ,İf of Cf g’PˆÊ,İf Tf Cf Y B

dwTrianglesDrawn, dwLinesDrawn, dwPointsDrawn, dwSpansDrawn

ff of Cf X,İ ¶ ¬ˆÈĈã•`%oæ,³,ê,½ŽOŠpĈ` A ü A“ _ Af X fpf“,İ ” B

dwVerticesProcessed

ff of Cf X,İ ¶ ¬ˆÈĈã ^— ,³,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,ĭĉ•”,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,ĭĈĖĀ•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,³,ê,é B
D3DCLIP_BOTTOM
Ž< ‘ä,ì’ê-Ê,É,æ,èfNfŠfbfsf“fO,³,ê,é B
D3DCLIP_FRONT
Ž< ‘ä,ì‘O-Ê,É,æ,èfNfŠfbfsf“fO,³,ê,é B
D3DCLIP_LEFT
Ž< ‘ä,ì ¶‘□-Ê,É,æ,èfNfŠfbfsf“fO,³,ê,é B
D3DCLIP_RIGHT
Ž< ‘ä,ì%oE‘□-Ê,É,æ,èfNfŠfbfsf“fO,³,ê,é B
D3DCLIP_TOP
Ž< ‘ä,ì ã’ê-Ê,É,æ,èfNfŠfbfsf“fO,³,ê,é B
D3DCLIP_GEN0 `D3DCLIP_GEN5
fAfvfŠfP [fVf‡f““è<,ìfNfŠfbfv-Ê B

drExtent

,·,×,Ä,ì’,“_,ð,»,ì“à,ÉŠÜ,Ð<é€`,ð’è<’,·,éD3DRECT \‘¢‘İ B,½,Æ,,Î AD3DPROCESSVERTICES
\\‘¢‘İ,ì’†,Ä Ý’è,³,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,³,ê,é B<é€`,ì‘ä,«,³,Í AŠeŽÀ s,Ä‘ ‘ä,·,é,^aŽû k,μ,È,¢ BD3DOP_SE
TSTATUS*fIfyfR [fh,É,æ,èfŠfZfbfg,Ä,«,é B*

ŽQ Æ @D3DEXECUTEDATA AD3DOPCODE A D3DRECT

D3DTEXTURELOAD

```
typedef struct _D3DTEXTURELOAD {  
    D3DTEXTUREHANDLE hDestTexture;  
    D3DTEXTUREHANDLE hSrcTexture;  
} D3DTEXTURELOAD, *LPD3DTEXTURELOAD;
```

D3DOPCODE—ñ““ĈĤ,Ĭ†,Ĭ**D3DOP_TEXTURELOAD**fIfyfR [fh,ĬIfyf%of“fh Efh [f^,đŽw’è,·,é B

hDestTexture

“]‘— æfefNfXf`ff,Ĭfnf“fhf< B

hSrcTexture

“]‘—Ĉ³fefNfXf`ff,Ĭfnf“fhf< B

fefNfXf`ff,Ĭ 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

D3DVALUEĈ^,İ’l B,±,İ’l,Í A,P,ðZŽ²,É%ˆ,Á,½Ĉ“_,©,çfIfufWfFfNfg,Ö,İ<—£,ÅŠ,,,Á,½’l,Å, ,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€,^afNfŠfbfsf“fO,·,é,©,Ç,¤,©,đŽw’è,·,éftf%ofo B,±
 ,İf f“fo,İ A0,Û,½,İŽŸ,İftf%ofo,^a 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• ĩ•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

ĬŽ;•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

fAfVfŠfP [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,±,İf 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,ðE^è,·,é'l B,±,İ \‘ċ‘İ,Í AfWfIf fgfŠ·İŠ·Ĉëä,İfXfNfŠ [f““ÍÍ,İ·İŠ·f,fWf...
[f<,É,æ,èfZfbfg,³,é,é BfNfŠfbfsf“fO,³,é,é,½,ß A,±,İ”ÍÍ,ÍŽ< “ä“ä•”,ì’ “_ ,¾,¯,ðŠÜ,Ð B,±
,ì'l,Í**D3DRECT** \‘ċ‘İ,Ä, ,é B

Še“ü—Í’ “_ ,Í AfWfIf fgfŠ Ef,ff<óŠÔ,Ä,İ[x y z] Ä•W,Ä—

^,!,ç,ê,½,R,Ä,İfxfNfgf<’ “_ ,Ä, ,é BdwInSizef f“fo,Í AŠe’,“_ ,^a A—

äŠOf f [f^,ðfCf“f%oCf“,ÄŠi”[·,é,½,ß,İfAfvfŠfP [fVf‡f“,ð<~%oÄ,·,é’,“_ ŠÔ,ð~Ú“®,·,é—Ê,ð—^,!,é B

•İŠ·f,fWf... [f<,É,æ,è ¶ ¬,³,é,½’,“_ ,Í A16frfbfg ,“x'l,Æ,µ,ÄŠi”[³,é,é BfNfŠfbfsf“fO,Í A—

^,!,ç,ê,½•İŠ·Ĉëä,ì’ “_ ,ðfNfŠfbfsf“fO,·,éŽ< “äfvfĈ [f“,İ·İŠÜ“T—

~a,Ä Ý'è,³,é,½ ® ”frfbfg EftfB [f<fh,Æ,µ,Ä^µ,İ,é,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,İŠî-{\Ě^,ðŽw'è,·,é BŽOŠpĚ,Í AŠî-{"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",ÈfGfbfW,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 [ffBf"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~Ž,·,é,Æ,« A2%ñfGfbfW,ð•,·,İ,ð"ð,¯,é,½,ß A—×,è ‡,µ,Ç,¿,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<,Ä,İf,fff< Ä•W) B

ŠÖ~A î•ñ,É,Ä,¢,Ä,Í AD3DOPCODE—ñ<“ĈE^,İ’†,İD3DOP_TRIANGLEf f“fo,ðŽQ Æ,·,é,±,Æ B

dvX A dvY A dvZ

⟨İŽ¿,È Ä•W,Ä’,“_,ðŽw’è,·,éD3DVALUEĈE^,İ’l B

dvNX A dvNY A ,“,æ,Ñ dvNZ

³K Ä•W,Ä’,“_,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’èç,.,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“ ,ÉçİŽç,ÈfXfP [fç”ä,ðŽw’è,.,éD3DVALUEĈ^,İ’l B

dvMaxX A **dvMaxY** A **dvMinZ** A **dvMaxZ**
x Ay Az,İçİŽç 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_SRCCOLOR****D3DBLEND_INVSRCCOLOR****D3DBLEND_SRCALPHA****D3DBLEND_INVSRCALPHA****D3DBLEND_DESTALPHA****D3DBLEND_INVDESTALPHA****D3DBLEND_DESTCOLOR****D3DBLEND_INVDESTCOLOR****D3DBLEND_SRCALPHASAT****D3DBLEND_BOTHSRCALPHA**

D3DBLEND_BOTHINVSRCALPHA

$$BfffXfefBfl \quad [fVf\pm f\text{“},\grave{I}uf\mathbb{E}f\text{“}fffBf\text{“}fO\mathbb{E}W \text{ ”},\acute{I} \quad A(As, As, As, As)$$

BfffXfefBfl [fVf±f“, ìfufŒf“fffBf“fO ß,Í A-³Œø,Æ,È,é B

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,³,ê,½”ăŠrŠÖ ”,đ’è‘,·,é B

D3DCMP_NEVER

,Â,Ë,ÉfefXfg,ÍŽ,”s,·,é B

D3DCMP_LESS

V,μ,ƆfsfNfZf<’l,^a AŒ» Ý,ÌfsfNfZf<’l,æ,è ¬,³,Ɔ,Æ,«,É%ž,¶,é B

D3DCMP_EQUAL

V,μ,ƆfsfNfZf<’l,^a AŒ» Ý,ÌfsfNfZf<’l,Æ“™,μ,Ɔ,Æ,«,É%ž,¶,é B

D3DCMP_LESSEQUAL

V,μ,ƆfsfNfZf<’l,^a AŒ» Ý,ÌfsfNfZf<’l`È%°,ì,Æ,«,É%ž,¶,é B

D3DCMP_GREATER

V,μ,ƆfsfNfZf<’l,^a AŒ» Ý,ÌfsfNfZf<’l,æ,è ‘ă,«,Ɔ,Æ,«,É%ž,¶,é B

D3DCMP_NOTEQUAL

V,μ,ƆfsfNfZf<’l,^a AŒ» Ý,ÌfsfNfZf<’l,Æ“™,μ,,È,Ɔ,Æ,«,É%ž,¶,é B

D3DCMP_GREATEREQUAL

V,μ,ƆfsfNfZf<’l,^a 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%o [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,³,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,³,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;
```

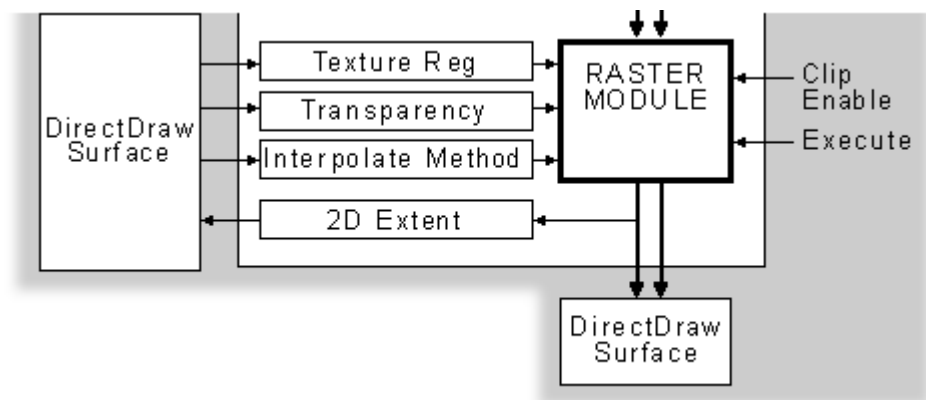
ftfHfO Ef, [fh,đŽw'è,·,é'è ",đ Ý'è,·,é B,±,ê,ç,ì'l,Í AD3DRENDERSTATETYPE—
ñ<“Ĉ^,ì†,ìD3DRENDERSTATE_FOGTABLEMODEfĈf“f_Šf“fO ó‘Ô,ì,½,ß,ÉŽg—p,³,é,é B

D3DFOG_NONE

ftfHfOĈø%Ŏ,Í,È,ċ B

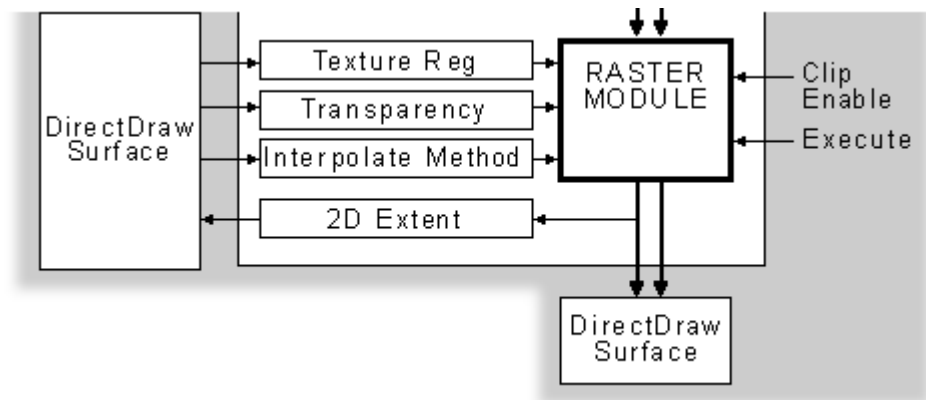
D3DFOG_EXP

ŽŸ,ì•û'öŽ@,ì'í ",Å AftfHfOĈø%Ŏ,“ ,· B



D3DFOG_EXP2

ŽŸ,ì•û'öŽ@,ì'í "2 æ,Å AftfHfOĈø%Ŏ,“ ,· B



D3DFOG_LINEAR

ŽŸ,ì•û'öŽ@,ìŽn“_,E I“_,ìŠÔ,Å üĈ',É AftfHfOĈø%Ŏ,“ ,· B

$$f = \frac{\text{end} - z}{\text{end} - \text{start}}$$

,±,ê,Í AĈ» ÝfTf| [fg,³,ê,Ä,ċ,é—B^è,ìftfHfO Ef, [fh,Å, ,é B
ftfHfO,Í A“Š—¾“x,đ•,·Šì Ĉ,Å, ,é B,±,ì ê ± AftfHfO,ì'l,“ ¬,³,ċ,Ù,Ç AfIfufWfFfNfg,“Ĉ©,!,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, Ĭĥ•”, 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 Ą—¼, “—, Ā, ç, ê, éf}
fefšfAfĸ, ð’èĸ, ·, é BfftfHfĸfg¹, ĬNULL, Ā, , é B

D3DLIGHTSTATE_AMBIENT

F, ĄĖ» Ý, ìĖōĖ¹, Ĭ“x ‡, ĸ, ð Ý’è, ·, é BfAfvfšfP [fVf‡f“, ¸, ±
, 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 \‘ç‘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 Æ,·,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 Æ,·,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 Æ,·,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 Æ,·,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,·,éfIfyfR [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 f “ f _ f Š f “ f O ó ‘ Ô , ð Ý ’ è , , é B , ± , ì — ñ “ C E ^ , Í A D 3 D S T A T E \ ‘ C ‘ ì , ì ‘ è • ” , Å , , é B Ž Ÿ , ì L q , È C L Û , ³ , è , ½ ’ l , Í A , ± , ì \ ‘ C ‘ ì , ì 2 ” Ô — Û , 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 N U L L , 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 F A L S E , Å , , é B

D3DRENDERSTATE_TEXTUREADDRESS

D3DTEXTUREADDRESS — ñ “ C E ^ , ì f f “ f o , ì , ð , Å , Ê B f f f t f H f < f g ’ l , Í D 3 D T A D D R E S S _ W R A P , Å , , é B

D3DRENDERSTATE_TEXTUREPERSPECTIVE

T R U E , ì , Å , « A “ § Ž < C ³ B f f f t f H f < f g ’ l , Í F A L S E , Å , , é B

D3DRENDERSTATE_WRAPU

T R U E , ì , Å , « A u • û C ü , È ’ £ , è • t , _ , é B f f f t f H f < f g ’ l , Í F A L S E , Å , , é B

D3DRENDERSTATE_WRAPV

TRUE,Ì,Æ,« Av•ûĈÛ,É'Ě,è•t,¯,é BfftfHf<fg'l,ÍFALSE,Â, ,é B

D3DRENDERSTATE_ZENABLE

TRUE,Ì,Æ,« AZfofbftf@,Ì"ăŠrfefXfg,ð%Â",É,·,é BfftfHf<fg'l,ÍFALSE,Â, ,é B

D3DRENDERSTATE_FILLMODE

D3DFILLMODE—ñ<“Ĉ^,Ìf f“fo,Ì,Đ,Æ,Â BfftfHf<fg'l,ÍD3DFILL_SOLID,Â, ,é B

D3DRENDERSTATE_SHADEMODE

D3DSHADEMODE—ñ<“Ĉ^,Ìf f“fo,Ì,Đ,Æ,Â BfftfHf<fg'l,ÍD3DSHADE_GOURAUD,Â, ,é B

D3DRENDERSTATE_LINEPATTERN

D3DLINEPATTERN \‘ĉ'Ì,Â, ,é BfftfHf<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 BfftfHf<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 AfffofCfX,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 BfftfHf<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 AfTf| [fg,³,è,é'Ç%oÁf%oXf^ ^— ,Ì,Đ,Æ,Â BfftfHf<fg'l,Í AR2_COPYPEN,Â, ,é BfAfvfŠfP [fVf‡f“,Í AfTf| [fg,³,è,é'Ç%oÁf%oXf^ ^— ,ðĈ^è,·,éD3DPRIMCAPS \‘ĉ'Ì,ÌdwRasterCapsf f“fo,ÌD3DPRASTERCAPS_ROP2ftf%o,Žg—p,Â,«,é B

D3DRENDERSTATE_PLANEMASK

ULONGĈ^,Ì•— fvfĈ [f“f}fXfN BfftfHf<fg'l,Í A0,Â, ,é B

D3DRENDERSTATE_ZWRITEENABLE

TRUE,Ì,Æ,« AZ ‘,« ž,Ý,ð%Â",Æ,·,é BfftfHf<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@ EfefXfg,ð%Â",Æ,·,é,½,ŠTRUE BfftfHf<fg'l,Í AFALSE,Â, ,é B,± ,Ìf f“fo,Í AfAfvfŠfP [fVf‡f“,ÉfAf<ftf@'Ì,Šİ €,Æ,È,éfsfNfZf<,İŽó,~Žæ,è,âŽó,~Žæ,è,“Ū,Ì'âŽ~,ð<–%oÂ,·,é B

D3DRENDERSTATE_LASTPIXEL

TRUE,Ì,Æ,« A ü,Ì ÂĈă,ÌfsfNfZf<,ð•%oæ,·,é,Ì,ðŽ~,ß,é BfftfHf<fg'l,Í ATRUE,Â, ,é B

D3DRENDERSTATE_TEXTUREMAG

D3DTEXTUREFILTER—ñ<“Ĉ^,Ìf f“fo,Ì,Đ,Æ,Â BfftfHf<fg'l,Í AD3DFILTER_NEAREST,Â, ,é B

D3DRENDERSTATE_TEXTUREMIN

D3DTEXTUREFILTER—ñ<“Ĉ^,Ìf f“fo,Ì,Đ,Æ,Â BfftfHf<fg'l,Í AD3DFILTER_NEAREST,Â, ,é B

D3DRENDERSTATE_SRCBLEND

D3DBLEND—ñ<“Ĉ^,Ìf f“fo,Ì,Đ,Æ,Â BfftfHf<fg'l,ÍD3DBLEND_ONE,Â, ,é B

D3DRENDERSTATE_DESTBLEND

D3DBLEND—ñ<“Ĉ^,Ìf f“fo,Ì,Đ,Æ,Â BfftfHf<fg'l,ÍD3DBLEND_ZERO,Â, ,é B

D3DRENDERSTATE_TEXTUREMAPBLEND

D3DTEXTUREBLEND—ñ<“Ĉ^,Ìf f“fo,Ì,Đ,Æ,Â BfftfHf<fg'l,ÍD3DTBLEND_MODULATE,Â, ,é B

D3DRENDERSTATE_CULLMODE

D3DCULL—ñ<“Ĉ^,Ìf f“fo,Ì,Đ,Æ,Â BfftfHf<fg'l,ÍD3DCULL_CCW,Â, ,é Bf\ftfgfEfFfA,ÌĈf“f_Šf“fO,Í A ĈĈ^è,Ì Ø,è”²,« ‡ ~,ðŽ ,ç A Ø,è”²,«f, [fh,Ì'İ X,ÍfTf| [fg,µ,È,Ĉ B

D3DRENDERSTATE_ZFUNC

D3DCMPFUNC—ñ<“Ĉ^,Ìf f“fo,Ì,Đ,Æ,Â BfftfHf<fg'l,ÍD3DCMP_LESSEQUAL,Â, ,é B,± ,Ìf f“fo,Í AfAfvfŠfP [fVf‡f“,ÉfJf f%o,©,ç,Ì<—Ł,ðŠİ €,Æ,·,éfsfNfZf<,İŽó,~Žæ,è,âŽó,~Žæ,è,“Ū,ð<–%oÂ,·,é B

D3DRENDERSTATE_ALPHAREF

fAf<ftf@ EfefXfg,%oÂ",É,Æ,« AfefXfg,³,è,éfsfNfZf<,É'İ,·,éŽQ æfAf<ftf@'Ì,ðŽw'è,·,é'Ì B,± ,Ì'Ì,ÌĈ^,ÍD3DFIXED,Â, ,é BfftfHf<fg'l,Í0,Â, ,é B

D3DRENDERSTATE_ALPHAFUNC

D3DCMPFUNC—ñ<“Ĉ^,Ìf f“fo,Ì,Đ,Æ,Â BfftfHf<fg'l,Í AD3DCMP_ALWAYS,Â, ,é B,± ,Ìf f“fo,Í AfAfvfŠfP [fVf‡f“,ÉfAf<ftf@'Ì,ðŠİ €,Æ,·,éfsfNfZf<,İŽó,~Žæ,è,âŽó,~Žæ,è,“Ū,ð<–%oÂ,·,é B

D3DRENDERSTATE_DITHERENABLE

TRUE,Ì,Æ,« ffbfUfŠf“fO,ð%Â",Æ,·,é BfftfHf<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,«ZĲŸ ,ð%Å”\,Æ,·,é BfftfHf<fg’l,ÍFALSE,Å, ,é BZĲŸ ,Æ,Í A•`%œ,·,é|fŠfSf“,ðĲ©,Å,¯,é,½,ßZfofbftf@,Ē‘Í,μ,ĀfefXfg,³,ē,é A,·,×,Ā,Ì|f|fŠfSf“,ÌfOf< [fv,ÌfXfNfŠ [f“<óŠÔ,Ē•,©,ē,éf|fŠfSf“,Å,Ì Ø,è”²,«<Z,Ì,±,Æ,Å, ,é B

D3DRENDERSTATE_SUBPIXEL

TRUE,Ì,Æ,«fTfu fsfNfZf<,Ì`³,ð%Å”\,Æ,·,é BfftfHf<fg’l,ÍFALSE,Å, ,é B

D3DRENDERSTATE_SUBPIXELX

TRUE,Ì,Æ,«X,¼,¯,Ì`³,ð%Å”\,Æ,·,é BfftfHf<fg’l,ÍFALSE,Å, ,é B

D3DRENDERSTATE_STIPPLEDALPHA

TRUE,Ì,Æ,«“_•,³,ē,½fAf<ftf@,ð%Å”\,Æ,·,é BfftfHf<fg’l,ÍFALSE,Å, ,é B

D3DRENDERSTATE_FOGCOLOR

D3DCOLORĲ^,Ì`l BfftfHf<fg’l,Í0,Å, ,é B

D3DRENDERSTATE_FOGTABLEMODE

D3DFOGMODE—ñ“Ĳ^,Ìf f“fo,Ì,Ð,Æ,Ā BfftfHf<fg’l,ÍD3DFOG_NONE,Å, ,é B

D3DRENDERSTATE_FOGTABLESTART

ftfHfO Efe [fuf<,ÌŠJŽn B,±,ē,Í üĲ`ftfHfO Ef, [fh,Ì,½,ßŠJŽn,³,ē,½ftfHfOĲø%Ē,Ì`Ē’u,Å, ,é B

D3DRENDERSTATE_FOGTABLEEND

ftfHfO Efe [fuf<,Ì I—¹ B,±,ē,Í A üĲ`ftfHfO Ef, [fh,Ì Ā‘ā–§“x,É“ž’B,μ,½ftfHfOĲø%Ē,Ì`Ē’u,Å, ,é B

D3DRENDERSTATE_FOGTABLEDENSITY

üĲ`ftfHfO Ef, [fh,Ì Ā‘āftfHfO–§“x,ð Ý’è,·,é B,±,Ì`l,Ì”ÍÍ,Í A0,©,ç1,Å, ,é B

D3DRENDERSTATE_STIPPLEENABLE

ffofCfX Ef hf%ofCfo,Ö,Ì“_•,ð%Å”\,Æ,·,é B“_•,³,ē,½fAf<ftf@,“%Å”\,Ē,Æ,« AĲ» Ý,Ì“_•`f pf^ [f“,ð–³Ĳø,Æ,μ,Ē,¯,ē,Ì,Ē,ç,Ē,Ĳ B

D3DRENDERSTATE_STIPPLEPATTERN00 `D3DRENDERSTATE_STIPPLEPATTERN31

“_•`f pf^ [f“ B,»,ē,¼,ē,ÌfĲf“f_fŠf“fo ó‘Ô,Í A“_•`f pf^ [f“,Ì“—£ ü,Ē“K%ž,³,ē,é B

ŽQ Æ @D3DOPCODE AD3DSTATE

D3DSHADEMODE

```
typedef enum _D3DSHADEMODE {  
    D3DSHADE_FLAT      = 1,  
    D3DSHADE_GOURAUD   = 2,  
    D3DSHADE_PHONG     = 3,  
} D3DSHADEMODE;
```

D3DRENDERSTATETYPE— $\tilde{n}^{\circ}\mathbb{C}^{\wedge}, \underline{\text{D3DRENDERSTATE_SHADEMODE}}$ $f\mathbb{C}f^{\circ}f_{\check{S}}f^{\circ}f\mathcal{O}$ $\acute{o}^{\circ}\hat{\mathcal{O}}\text{---p}, \acute{E}fTf|$
 $[fg,^3,\acute{e},\acute{e}fVfF$ $[ffBf^{\circ}f\mathcal{O}$ $Ef,$ $[fh,\delta\check{Z}w^{\circ}\grave{e},^{\circ},\acute{e}$ B

D3DSHADE_FLAT

$\bullet\frac{1}{2}\text{---}\hat{E}fVfF$ $[ffBf^{\circ}f\mathcal{O}$ $Ef,$ $[fh$ $B\check{Z}\mathcal{O}\check{S}p\mathbb{C}^{\circ},\grave{\text{I}}$ \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

$f\mathcal{O}f$ $[$ $EfVfF$ $[ffBf^{\circ}f\mathcal{O}$ $Ef,$ $[fh$ $B\bullet\text{---}$
 $\hat{E},\grave{\text{I}}$ $F,\acute{\text{I}}$ $A\check{Z}\mathcal{O}\check{S}p\mathbb{C}^{\circ},\grave{\text{I}},R,\mathring{A},\grave{\text{I}}^{\circ},\text{---}\check{S}\hat{\mathcal{O}},\mathring{A}$ $^{\circ},\ll$ $\check{Z},\ddot{U},\acute{e},\frac{1}{2}$ $\ddot{u}\mathbb{C}^{\circ},\acute{E},\mathfrak{a},\grave{e}\mathbb{C}^{\circ}\grave{e},^3,\acute{e},\acute{e}$ B

D3DSHADE_PHONG

$ftfHf^{\circ}$ $EfVfF$ $[ffBf^{\circ}f\mathcal{O}$ $Ef,$ $[fh$ $B,\pm,\grave{\text{I}}f,$ $[fh,\acute{\text{I}}$ $A\mathbb{C}^{\circ}\gg$ $\acute{Y}fTf|$ $[fg,^3,\acute{e},\mathring{A},\mathfrak{C},\grave{E},\mathfrak{C}$ B

$\check{Z}Q$ $\mathcal{A}E$ $@\underline{\text{D3DRENDERSTATETYPE}}$

```
typedef enum D3DTEXTUREADDRESS {
    D3DTEXTUREADDRESS_WRAP = 1,
    D3DTEXTUREADDRESS_MIRROR = 2,
    D3DTEXTUREADDRESS_CLAMP = 3,
} D3DTEXTUREADDRESS;
```

D3DTADDRESS_WRAP

[illegible]

f^fCfŠf“fO EfefNfXf ff,İfAfhf(EfX,Æ“™,µ,¢ B(D3DRENDERSTATE_WRAPU,Â,âD3DRENDERSTATE_WRA
PV,Â,â,Ê,¢,Æ,«),».,ê,İ A .,x,Ä,İ ® ” Ú ‡ftfŠfbfsf“fO,³ê,½fefNfXf ff,ð æ,-
B,½,Æ,¹,İfefNfXf ff,İ A0,Æ1,İŠÔ,İu¹,İ A ³KfAfhf(EfX,Â, é B1,Æ2,İŠÔ,Â,İ AftfŠfbfv(“½”)
³,ê,é B,Ü,½2,Æ3,İŠÔ,Â,İ A Ä,Ñ ³K,Ê-ß,é B

$$f e f N f X f f f \quad \bar{A} \bullet W, {}^a 1.0, \text{æ}, \text{è}, \text{â}, \text{«}, \text{,}, \text{ê}, \text{î} \quad A 1.0, {}^a \quad \acute{Y}, \text{è}, {}^3, \text{ê}, \acute{e} \quad B 0.0, \text{æ}, \text{è} \quad \neg, {}^3, \text{,}, \text{ê}, \text{î} \quad A 0.0, {}^a \quad \acute{Y}, \text{è}, {}^3, \text{ê}, \acute{e} \quad B$$

ŽQ Æ @**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 [*f*g,³ê,é*fefNfXf`ff* ∩ *‡f*, [*f*h,ð'è<`.,é B,±,ì—ñ<“Ĉ^,Í AD3DRENDERSTATETYPE—
ñ<“Ĉ^,ÍD3DRENDERSTATE_TEXTUREMAPBLEND*f*Ĉf“f_Šf“fO ó'Ô,É,æ,èŽg—p,³ê,é B

D3DTBLEND_DECAL

*ff*J [*f*< B*fefNfXf`ff* ∩ *‡f*, [*f*h,^a*fTf*] [*f*g,³ê,é B,±
,ì*f*, [*f*h,Ā,Í A*fefNfXf`ff*,ìRGB,Æ*fAf<ftf@`l*,Í A*fefNfXf`ff*,ĀŽg—p,³ê,Ā,Ĉ,È,Ĉ F,ð'uŠ.,.,é B

D3DTBLEND_MODULATE

•İ² B*fefNfXf`ff* ∩ *‡f*, [*f*h,^a*fTf*] [*f*g,³ê,é B,±,ì*f*, [*f*h,Ā,Í A*fefNfXf`ff*,ìRGB'l,Í A*fefNfXf`ff*,ĀŽg—
p,³ê,Ā,Ĉ,È,ĈRGB'l,ðĈJ,è•Ô., B*fefNfXf`ff*,ì*fAf<ftf@`l*,Í A*fefNfXf`ff*,ĀŽg—p,³ê,Ā,Ĉ
,È,Ĉ F,ì*fAf<ftf@`l*,ð'uŠ.,.,é B

D3DTBLEND_DECALALPHA

*ff*J [*f*< E*fAf<ftf@* B*fefNfXf`ff* ∩ *‡f*, [*f*h,^a*fTf*] [*f*g,³ê,é B,±
,ì*f*, [*f*h,Ā,Í A*fefNfXf`ff*,ìRGB,Æ*fAf<ftf@`l*,Í AŽŸ,İ•û'öŽ®,Ā*fefNfXf`ff*,ĀŽg—p,³ê,Ā,Ĉ
,È,Ĉ F,Ā ∩ *‡*,³ê,é B

$$C = (1 - A_t) C_o + A_t C_t$$

,±,İ•û'öŽ®,Ā AC,Í F AA,Í*fAf<ftf@* At,Í*fefNfXf`ff* Ao,ÍĈ³,ì*fIfufWfFfNfg*(∩ *‡*'O,ì),ð•\., B

D3DTBLEND_DECALALPHA*f*, [*f*h,Ā A*fefNfXf`ff*,ì*fAf<ftf@`l*,Í A*fefNfXf`ff*,ĀŽg—p,³ê,Ā,Ĉ
,È,Ĉ F,ì*fAf<ftf@`l*,ð'uŠ.,.,é B

D3DTBLEND_MODULATEALPHA

•İ²*fAf<ftf@*,ì*fefNfXf`ff* ∩ *‡f*, [*f*h,^a*fTf*] [*f*g,³ê,é B,±
,ì*f*, [*f*h,Ā A*fefNfXf`ff*,ìRGB'l,Í ARGB'l,ð' ,â,μ A*fefNfXf`ff*,ì*fAf<ftf@`l*,à' ,â., B

D3DTBLEND_DECALMASK

*ff*J [*f*< E*f*}*fXfN*,ì*fefNfXf`ff* ∩ *‡f*, [*f*h,^a*fTf*] [*f*g,³ê,é B

D3DTBLEND_MODULATEMASK

•İ²*f*}*fXfN*,ì*fefNfXf`ff* ∩ *‡f*, [*f*h,^a*fTf*] [*f*g,³ê,é B

D3DTBLEND_COPY

•ĩŽĈ*fefNfXf`ff* ∩ *‡f*, [*f*h,^a*fTf*] [*f*g,³ê,é B

•İ²,Í AĈðĈ¹,Æ*fefNfXf`ff*,İ ì—

p,Æ'Š æ,.,é B F,Í AÔÈ ãl`È‰°,ì'l,ĀŽw'è,³ê,é B,»,μ,Ā A*fefNfXf`ff*,âf\ [*f*X,æ,è<P“x,ì'á,Ĉ F,É *‡*,í,¹,Ā A^ê
,É ¶ ∩ ,³ê,½ĈĀ X,ì F,ð•İ²,.,é B,»,ì ∩•^a,ìf\ [*f*X,ì,Đ,Æ,Ā,^a”(1),ì,Æ,« A<P“x,ì'á,Ĉ F ∩•^a,ÍĈ, ,μ,È,Ĉ B“—
l,É A*fIfufWfFfNfg*,É'‰‰Ž.,é*fefNfXf`ff*,^a A”(1 A1 A1)
,ì,Æ,« A*fefNfXf`ff*,ì F,Í A^ŮŽ ,³ê A•İ X,³ê,È,Ĉ 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,³,ê,½fefNfXf`ff EftfBf<f^ Ef, [fh,ð’è<^,·,é B

D3DFILTER_NEAREST

—v< ,³,ê,½fsfNfZf<’l,É Ā,à&Œ,Œ Ā•W,İfefNfZf<,aŽg—p,³,ê,é B,±,ê,Í AŠg‘â,Æ k ¬,İ—¼•û,Ā—p,Œ
,ç,ê,é BŠg‘â,© k ¬,afTf| [fg,³,ê,Ā,Œ,é,Æ,«Í A—¼•û,afTf| [fg,³,ê,Ā,Œ,È,¬,ê,Î,È,ç,È,Œ B

D3DFILTER_LINEAR

2 ~2,İ—İ^æ,İ d,³,İ•½İ BfefNfZf<ŠĀ<«,İ—v< ,³,ê,½fsfNfZf<,aŽg—p,³,ê,é B,±,ê,ÍŠg‘â,Æ k ¬,İ—¼•û,Ā—p,Œ
,ç,ê,é BŠg‘â,© k ¬,afTf| [fg,³,ê,Ā,Œ,é,Æ,«Í A—¼•û,afTf| [fg,³,ê,Ā,Œ,È,¬,ê,Î,È,ç,È,Œ B

D3DFILTER_MIPNEAREST

D3DFILTER_NEAREST,Æ“—l,¾,^a A‘I’ðfefNfZf<ŒĀ—L,İf~fbfvf}fbfv,ðŽg—p,·,é B

D3DFILTER_MIPLINEAR

D3DFILTER_LINEAR,Æ“—l,¾,^a A‘I’ðfefNfZf<ŒĀ—L,İf~fbfvf}fbfv,ðŽg—p,·,é B

D3DFILTER_LINEAR_MIPNEAREST

D3DFILTER_MIPNEAREST,Æ“—l,¾,^a A,Ó,½,Ā,İ&Ž—f~fbfvf}fbfv,Ā İ,è‘Ö,İ,é B

D3DFILTER_LINEAR_MIPLINEAR

D3DFILTER_MIPLINEAR,Æ“—l,¾,^a 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 , $\tilde{\mathbf{D3DOP_STATE_TRANSFORM}}$ ” $fIfyfR$ [fh—p,É• $\tilde{\mathbf{I}}\tilde{\mathbf{S}}$ · ó‘Ô,ðŽw’è,·,é B,±,Ì—
 \tilde{n} “ \mathcal{C}^\wedge , $\tilde{\mathbf{A}}$ **D3DSTATE** \‘ \mathfrak{c} ‘ $\tilde{\mathbf{I}}$, $\tilde{\mathbf{I}}^\wedge\mathfrak{e}$ ”, $\tilde{\mathbf{A}}$, ,é B

D3DTRANSFORMSTATE_WORLD

D3DTRANSFORMSTATE_VIEW

D3DTRANSFORMSTATE_PROJECTION

• $\tilde{\mathbf{I}}\tilde{\mathbf{S}}$ ·,·,éf [f<fh Afrf... [A“ $\mathcal{S}\%oe$, $\tilde{\mathbf{i}}$ ”z— \tilde{n} ,ð’è<’,·,é BffftfHf<fg’l, $\tilde{\mathbf{I}}$ ANULL, $\tilde{\mathbf{A}}$, ,é(“ $\sim^\wedge\mathfrak{e}$, $\tilde{\mathbf{i}}$ ”z— \tilde{n}) B

ŽQ \mathcal{A} @**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',· BĖÂ 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—ÍfffofCfX,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 EfffofCfX,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 EfffofCfX,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 EfffofCfX,É‘Î,μ,ÄCOM,“•t%Ä,³,ê,é,± ,Æ,É,È,é BftfH [fX ftfB [fhfofbfN,ðfTf| [fg,·,éfWf‡fCfXfefBfbfN EfffofCfX,É‘Î,μ,Ä,Í A DirectInput,Ä,à,»,ìfTf| [fg,“t%Ä,³,ê,é B”Ä—p“ü—ÍfffofCfX(“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,Å,« ,é BDirectInput,Í A“ü—
ÍfffofCfX Eff [f^,Ö,Ì ,‘¬,Å•Ö—~,ÈfAfNfZfX,ð%oÂ”\,Æ,·,éDirectX SDKfRf“f| [flf“fg,Å, ,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,Ä, ,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,ª’ñ<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,³,ê,é BDirectInput,ÍfAfif fO,“,æ,ÑffWf
^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,^a,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,^aÇ Ö,·,éŠe%““@Žž,É,Í i“@”ÍÍ,^a, ,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,^afTf| [fg,·,éfWf‡fCfXfefBfbfN ”,đ‘2,×,é,±,Æ,^a,Â,«,é B,±
,İŠÖ ”,İfhf%ofCfo,^afTf| [fg%Â”\
,ÈfWf‡fCfXfefBfbfN ”,đŽw‘è,·,é•, †,È,µ @ ”,đ•Ô,· BfWf‡fCfXfefBfbfN,^afTf| [fg,³,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,^a Ú‘±
,³,ê,Â,¢,é,©,Ç,©,²,×,é,±,Æ,^a,Â,«,é B,±,İŠÖ ”,Í AŽw‘è,³,ê,½fffofCfX,^a Ú‘±,³,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<@”\,^a,¢,,Â,©‘¶ Ý,·,é B,»,İ<@”\
,Í AjoyGetDevCapsŠÖ ”,đ—p,¢,Â‘2,×,é,±,Æ,^a,Â,«,é B,±,İŠÖ ”,Í AfWf‡fCfXfefBfbfN,İ—
Lœø,È%““@Žž,â Â•Wœn,İ Â ¬‘l,“,æ,Ñ Â‘â‘l AfWf‡fCfXfefBfbfN â,İf{f^f“ ”,Æ,¢
,Â,½fWf‡fCfXfefBfbfN,İ<@”\,đJOYCAPS \‘¢‘İ,É‘â“ü,·,é B

’ °

joyGetNumDevs,İ•Ô‘l,Í AfVfXfef€,É Ú‘±,³,ê,½fWf‡fCfXfefBfbfN ”,Â,Í,È, AfVfXfef€,^afTf|
[fg,·,éfWf‡fCfXfefBfbfN ”,đŽ!,· B

fWf‡fCfXfefBfbfN,lfLfffŠfufŒ [fVf‡f“,“,æ,ÑfefXfg

ı“®”ÍÍ,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

fJXf^f€ EfWf‡fCfXfefBfbfN

,±,lfAfvfŠfP [fVf‡f“,É,æ,è AŠefWf‡fCfXfefBfbfN,É‘Î,µ,Ä A Ä‘â6–
{,İ‰^“®Ž² A32,İf{f^f“,“,æ,ÑŽ<“_fnfbfg,lfLfffŠfufŒ [fVf‡f“,‰‰Ä”\
,Æ,È,é BfLfffŠfufŒ [fVf‡f“ î•ñ,lfŒfWfXfgfŠ,ÉŠı”[³,è,é,İ,Ä A ÄfLfffŠfufŒ [fVf‡f“,·,é,±,Æ,È,-
fWf‡fCfXfefBfbfN,ð•Ê,İ,à,İ,ÉŽæ,è‘Ö,İ,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‘Tð³,è,½fWf‡fCfXfefBfbfN,“,æ,ÑfLfffŠfufŒ [fVf‡f“ î•ñ,É,Ä,¢
,ÄfŒfWfXfgfŠ,ð X V,µ A,»,è,ðfWf‡fCfXfefBfbfN Efhf‰ofCfo,É’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‘Î,µ A‰œ‘ç,İ, ,éŒfWfXfgfŠ•İ 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^

’èĲ,³,è,Ä,¢,é¹,İ”ÍÍ,Â•]‰Ĳ,³,è,½ff [f^

’† S,É, ,é•]‰Ĳff [f^

fWf‡fCfXfefBfbfN,İfjf... [fgf‰fĲÊ’uŽüÍ,İfffbfhf] [f“,ðŠÜ,B,½•]‰Ĳff [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,Ñ o,µ,Ä**DirectInput***fIfufWfFfNfg*,**ð** ì ¬,·,é **B DirectInputCreate**
API,Í **AIDirectInput***fCf“f^ [ftfFfCfX*,**ð**•Ô,· **B**

IDirectInput*fCf“f^ [ftfFfCfX*,**Ö**,**ì***fCf“f^*,**““**¾,ç,ê,é,é,Æ **ADirectInput**,**““**® ì%oÂ”\,È**“**ü—**Í***ffofCfX*,**ð**—ñ<“,·,é,±
,Æ,^a,Â,«,«^é **B**“ü—**Í***ffofCfX*,**ÍIDirectInput::EnumDevices***f f\bfh*,É,æ,è—ñ<“,³,ê,é **B**

DirectInputDevice fIfufWfFfNfg

DirectInputDevicefIfufWfFfNfg,Í Af}fEfX,âfL {f{ [fh,»,l'¼,l"ü—ÍffofCfX,ð•\ ,· BfAfvfŠfP [fVf‡f“,Í**DirectInput::CreateDevice**f f\bfh,ðĖĂ,Ń o,μ,Ă**DirectInputDevice**fIfufWfFfNfg,ð ì ¬, ·,é B **DirectInput::CreateDevice**f f\bfh,Í A**DirectInputDevice**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%ö,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,Ä•Öü,ÖÜ“@,µ,½,±,Æ,ðŽİ, B

’ ˆÓ,.,×,«È,İ,İ Af}fEfX,Éİ âİÊü,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,.,×,Ä,İ•ŠİÜ“@,ðP,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 Eft†fCf“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,«,İ âİÊü,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%ö,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 ^,É•ŠİfffofCfX(f}fEfX,È,Ç)
,É,.,,é âİ Ä•W,İ AÈÖ,ÉL~³,é,½Êü,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,İÊü,äSef{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†fCf“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,Ä ADirectInput,İ Ä,àĖÄ,çf}fEfX Eff [f^,©,ç”z—ñ,È,Ä,ç, B
IDirectInputDevice::GetDeviceData,©,ç,Ö,³,é,éftfCfYİ ”,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’Pê†fufWfFfNfg,İ óÖ,ÉŠÖ,.,éİ X“,Ä, ,é B,½,Æ,İ A“TĖ^“İ,Èf}
fEfX,É,İÄ,İ†fufWfFfNfg 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,İ†fufWfFfNfg,ðŽQ Ä,µ,Ä,ç,é,©,ðm,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,İ†fZfbfg,ðŽQ Ä,.,é B,±,é,ç,İè ”,ð—p,ç
,Ä ADIDEVICEOBJECTDATA \‘çİ,İff [f^,“f}fEfX ä,İ,Ç,İ†fufWfFfNfg,ðŽQ Ä,µ,Ä,ç,é,©,ð Šm,É’m,é,±
,Æ,Ä,Ä,«é B,»,İ†fufWfFfNfg,Éİ,.,éŽÄff [f^,İ \‘çİ,İdwDataftB [f<fh,É¶ Ý,.,é Bf{f^f“ EftfufWfFfNfg,É,
Ä,ç,Ä,İdwData,İ%°Êfocfçg,¼,_,—LÖ,Ä, ,é B,±,İfocfçg,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 ê ±,İ,Y ÄŽŽ •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,ÍfEfBf“fhfE,ªfŠfTfCfY, ,é,¢
,ÍÜ“@,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“,ÍIDirectInputDevice::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 ã,É“Ÿ Ý,·,é“Ç%ÁfL [,İ,©,è, Á,È,Šg“EfL [f{ [fh ã,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 ã“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 ã“Èftrfbf,µ,©Žg— p,µ,È,ç B ã“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,·,é,©,·,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 ã,İ“P“èfIfufWfFfNfg,İ ó“Ö,ÉŠÖ,·,é·İ X—,Ä,·,é BfL [f{ [fh ã,İSefL [,Ü,½,İf{f^f ^,İfIfufWfFfNfg,ð·,· Bf† [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,“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,©,Ÿ,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,·,ç,İfIfufWfFfNfg(Ü,½,İfL [),ðŽQ Ä,µ,Ä,ç,é,©,ð“m,é,±,Æ,·,Ä,“é B,Ü,½**DIK_***”è ”,ð—p,ç ,Ä **ADIDeviceObjectData** \“ç“İ,İff [f^,³fL [f{ [fh ã,İ,ç,İfIfufWfFfNfg,ðŽQ Ä,µ,Ä,ç,é,©,ð ³Šm,É“m,é,± ,Æ,·,Ä,“é BfIfufWfFfNfg,İŽÄff [f^,İ \“ç“İ,İdwDataftfB [f<fh,É“Ÿ Ý,·,é BfL [f{ [fh ã,İfL [,İ,æ,µ ,Éf{f^f“fIfufWfFfNfg,É,Ä,ç,Ä,İdwData,İ%“ÈfofCf,¾,·,“—L“Ó,Ä,·,é B,± ,İfofCf,İ ã“Èftrfbf,İ AfL [,“%Ÿ,³,è,é,ÆfZfbf,³,è AfL [,“—£,³,è,é,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%Ä”],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%fo,ðfZfbf,µ,Ä**IDirectInputDevice::SetCooperativeLevel**,ðEÄ,Ñ o,· BWindows 95ŠÄ<“%o,Ä,Í AfL [f{ [fh EfffofCfX,É“İ,µ,Ä“È%o,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**,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 ã,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<,ðŽQ,µ,±,Æ,È,È,é BfL [f{ [fhfh%foCfo,İfTf] [fgfCefxf<,É,æ,Ä,Ä,Í AWindows 95 ã,İDirectInput,Ä,Ä**DISCL_FOREGROUND | DISCL_NONEXCLUSIVE**,¾,·,İfTf] [fg,ÉEÄ“è,³,è,é%Ä”\ “,·,·,é B,µ,½,³,Ä,Ä A,·,é,¾,·,·,×,Ä,İfvf%fofbfgftfH [fç ,·,æ,ÑfL [f{ [fhfh%foCfo ã,ÄAfvfŠfP [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,èfL [f{ [fh EfffofCfX,©,çff [f^,ðŽæ“¾,·,é“O,É A**IDirectInputDevice::Acquire**,ðEÄ,Ñ o,µ,ÄfffofCfX,ð”F Ž—,µ,Ä,·,©,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,^a „ §,³,ê,é BfAfvfŠfP [fVf‡f“ Ef fjf... [, ,é,¢,ÍfVfXfef€ Ef fjf...
[,^a‘I’ð,³,ê,é,© A,Û,½,ÍfEfBf“fhfE,^afŠfTfCfY, ,é,¢
,Í‘Ú“®,³,ê,é ê ‡,à AfffofCfX,ð%ð•ú,µ,È,¯,ê,Î,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“,ÍIDirectInputDevice::Acquire,ðŒÄ,Ñ o,µ,ÄfL [f{ [fh EfffofCfX,ð”FŽ¯,µ’¼,•K—v,^a , ,é B
fAfvfŠfP [fVf‡f“,“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,^a „ §,³,ê,é BfAfvfŠfP [fVf‡f“,“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 [,“” ¶,µ,½ Û,Ä,à^{−3} ðŒ ,ÉDirectInputfffofCfX,ð”FŽ¯,µ’¼,³,¹,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^{−3}ŒÄf< [fv,ÉŠx,é%Ä”\ «,^a , ,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 EfŒfCfAfEfeg,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—{fŒfCfAfEfeg,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| [fg,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◻'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%%ŽŽq,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,^a 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,^adwSequence2,æ,èŽŽÇn—ñ“I,É æ s,·,é,©,ðf`fFfbfN,·,é B

```
if (DISEQUENCE_COMPARE(dwSequence1, <, dwSequence2)) {  
    ...  
}
```

ŽŸ,ì—á,ÍdwSequence1,^adwSequence2,æ,èŽŽÇn—ñ“I,ÉÇæ˘±,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^f^fCfv EfR [fh,δfffofCfX Ef^fCfv<L qfR [fh,©,ç'Š o,·,é BfTfu^f^fCfv EfR [fh,l%δŽŒ,Íff
ofCfX,l^fv^f%ofCf}fŠ Ef^fCfv,É^ˆÈ[•]¶,·,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,É¹,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 †,İO B,Ü,Æ,ñ,Ç,İÆÄ,Ñ o,µª,İO,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 ¬¹,ª—v< ,·,éIDirectInput,Ö,İf|fCf“f^,Ä,Í,È,Ç,±,Æ,É’ ^Ó 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“,É¹,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%öï,·,é B

,±,İŠÖ ”,ð—p,¢,Ä Afhf%oCfo,ªfTf| [fg,·,éfWf‡fCfXfefBfbfN EfffofCfX ”,ð’m,é,±,Æ,ª,Ä,«,é B

uJoyID

Æ%öï,³,ê,éfWf‡fCfXfefBfbfN,İŽ¯•ÊŽq BJOYSTICKID1,Ü,½,ÍJOYSTICKID2,Ä, ,é B

pjc

fWf‡fCfXfefBfbfN<@”\,ðŠÜ,b**JOYCAPS** \‘¢‘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_INVALPARAM

MMSYSERR_NODRIVER

JOYERR_REGISTRYNOTVALID

ŽQ Æ @**JOYCAPS**, **joyGetNumDevs**

joyGetNumDevs

UINT joyGetNumDevs (VOID) ;

fWf‡fCfXfefBfbfN Efhf%ofCfo,^fTf| [fg,μ,Ä,¢,éfWf‡fCfXfefBfbfN ”,ðfhf%ofCfo,©,çŽæ“¾,·,é B
Žw’è,³,ê,½fWf‡fCfXfefBfbfN,^fRf“fsf... [f^,É•— “I,É Ú‘±,³,ê,Ä,¢,é,©,Ç,²,©,ð²,×,é,É,Í AjoyGetPosExŠÖ ”,ð
—p,¢,é B

•Ô’l

fhf%ofCfo,^fTf| [fg,·,éfWf‡fCfXfefBfbfN ”,ð•Ô,· Bfhf%ofCfo,^“¶ Ý,μ,È,¯,ê,î0,ð•Ô,· 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 \‘c‘İ,İdwFlags—
v‘f,Ê,Đ,Æ,Â^Ê ã,İftf%oO,ðfZfbfg,μ,Ä AfAfvfŠfP [fVf‡f“,^a Æ%öİ,·,é €–Ú,ðŽw’è,μ,È,–,ê,Î,È,ç,È,¢ B

,±,İŠÖ ”,É,æ,è Af%of_ [fyf_f‘ AŽ‘“_fnfbfg A‘½ ”,İf{f^f“,ðŽ ,ÂfffofCfX,Æ,¢
,Ä,½Šg‘£fffofCfX,“,æ,Ñ Ä‘â6Ž²,ð—p,¢,½ Ä•WĖn,Ö,İfAfNfZfX,“%Â”\,Æ,È,é B

uJoyID
Æ%öİ,³,ê,éfWf‡fCfXfefBfbfN,İŽ–•ÊŽq B

pji
fWf‡fCfXfefBfbfN,İŠg‘£^Ê‘u î•ñ,“,æ,Ñf{f^f“ ó‘Ô,ðŠÛ,þJOYINFOEX \‘c‘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<fofbfNŠÖ ”**

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::EnumObjectsŠÖ ”,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<,lIUknown::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^ [ftfFfCfX,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 §Œä,Ö,Ìf|fCf“f^ A,Û,½,ÍfCf“f^ [ftfFfCfX,ª W ¬%»»,³,ê,Ä,¢
,È,¢ ê ‡,Í0 B,Û,Æ,ñ,Ç,ÌŒÄ,Ñ o,µ‘²,Í0,ð“n,· B

riid

•K—v,ÈfCf“f^ [ftfFfCfX B,±,Ìfpf%of [f^,Í—LŒø,ÈfCf“f^ [ftfFfCfXŽ~•ÊŽq,ðŽw,µŽ!,·•K—v,ª, ,é B

ppvOut

³ íŽÄ s,³,ê,é ê ‡ A ì ¬,³,ê,½fCf“f^ [ftfFfCfX,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,ÍŒÄ,Ç,È,¢ B
S_OK: ‘€ ì,Í ³ í I—¹,µ,½ B
E_INVALIDARG: ppvOutpf%of [f^,Í—LŒø,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^ [ftfFfCfX,ÍfTf| [fg,³,ê,Ä,¢,È,¢ B

IClassFactory::LockServer

```
HRESULT LockServer(  
    LPCLASSFACTORY lpClassFactory,  
    BOOL fLock);
```

DLLf fbfN EfJfEf“fg,ðfCf“fNfŠf f“fg,Ü,½,ÍffNfŠf f“fg,·,é BDLLf fbfN 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 fbfN EfJfEf“fg,ðfCf“fNfŠf f“fg,·,é B  
    FALSE,Å, ,é ê ± Af fbfN 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,Š,ªs‘«,µ,Ä,¢,é B

IClassFactory::QueryInterface

```
HRESULT QueryInterface(  
    LPCLASSFACTORY lpClassFactory,  
    REFIID riid,  
    LPVOID * ppvObj);
```

*fIfu*fWfFfNfg ã,Ì‘¼,ÌfCf“f^ [ftfFfCfX,ÉfNf%*fCfAf*“fg EfAfNfZfX,ð—^,‘,é BOLEf}fjf...
*fAf*ç,Ì*IUnknown::QueryInterface*,ðŽQ Æ,·,é,±,Æ B

riid
•K—v,ÈfCf“f^ [ftfFfCfXIID B

ppvObj
“¾,ç,ê,éfCf“f^ [ftfFfCfX,Ö,Ìf|fCf“f^,ðŽó,¬Žæ,é B

•Ô‘l
COMfGf% [fR [fh,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,º0,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—ÍffofCfX,ð•\
,•**DirectInputDevice***fIfufWfFfNfg,ð ì ¬,•,é B*

IDirectInput::AddRef

```
DWORD AddRef(  
    LPDIRECTINPUT lpDirectInput);
```

IDirectInput,^aĈp³,;éIUnknownfCf“f^ [ftfFfCfX,î`ê•” BŠÖ`A,ì, ,éCOMfIfufWfFfNfg,ÌŽQ ÆfJfEf“fg,ð‘ ,â,·,½
,ß,É—p,Ĉ,ç,ê,é BfIfufWfFfNfg,^a Å %
,É ì ¬,³,ê,é Ŭ,É AŽQ ÆfJfEf“fg,Í1,ÉfZfbfg,³,ê,é B**AddRef**,^aĈÄ,Ñ o,³,ê,é,½,Ñ,ÉŽQ ÆfJfEf“fg,ÍfCf“fNfŠf
f“fg,³,ê A**Release**,^aĈÄ,Ñ o,³,ê,é,½,Ñ,ÉŽQ ÆfJfEf“fg,ÍftfNfŠf f“fg,³,ê,é BŽQ ÆfJfEf“fg,^a0,É,È,é,Æ A,»,ÌfIf
ufWfFfNfg,Í%ðð•ú,³,ê,é B

lpDirectInput
,±,Ìf f“fo,^aĈÄ,Ñ o,³,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, ^aŽw'è, ·, éfffofCfX, ÌfCf“fXf^f“fX, ð Ì ¬, μ %oŠú%o», ·, é B

, ±, ÌŠÖ ”, ðpunkOuter = NULL, ÅÆÄ, Ñ o, ·, ±, Å, Í A **CoCreateInstance**(&CLSID_DirectInputDevice, NULL, CLSCTX_INPROC_SERVER, riid, lplpDirectInputDevice), ð%oi, μ, ÄfIfufWfFfNfg, ð Ì ¬, μ **Initialize**, Å %oŠú%o», ·, é, ±, Å, Å““™, Å, , é B

, ±, ÌŠÖ ”, ðpunkOuter != NULL, ÅÆÄ, Ñ o, ·, ±, Å, Í A **CoCreateInstance**(&CLSID_DirectInputDevice, punkOuter, CLSCTX_INPROC_SERVER, &IID_IDirectInput, lplpDirectInput), ð%oi, μ, ÄfIfufWfFfNfg, ð Ì ¬, ·, é, ±, Å, Å““™, Å, , é B W ¬%o», ³, è, ½fIfufWfFfNfg, ÍŽè Ì Å, Å %oŠú%o», ³, è, È, ¬, è, Í, È, Ç, È, Ç B

lpDirectInput
, ±, Ìf f“fo, ÅÆÄ, Ñ o, ³, è, ½DirectInputfIfufWfFfNfg, ðŽw, μŽ!, · B

rguid
•K—v, È“ü—ÍfffofCfX, ð·\, ·GUID, Ö, ÌŽQ Å B, ±, ÌGUID, ÍEnumDevicesf f\fbfh, ð'Ê, μ, ÄŽæ“¾, ³, è, é, © A, , é, Ç, Í, , Ç, ©, ¶, ß'èç, ³, è, Ä, Ç, éGUID, Ì, Ð, Å, Ä, Å, , é B

lplpDirectInputDevice
³ í, ÉŽÀ s, ³, è, é è ‡ A **IDirectInputDevice**fCf“f^ [ftfFfCfX Ef|fCf“f^, ðŽw, μŽ!, · B

punkOuter
OLE W ¬%o»«@”, ^a—Ç'm, Ì §Æä, Ö, Ìf|fCf“f^ A, Ü, ½, ÍfCf“f^ [ftfFfCfX, ^a W ¬%o», ³, è, Ä, Ç, È, Ç è ‡, Í0 B, Ü, Å, ñ, Ç, ÌÆÄ, Ñ o, μ‘¤, Í0, ð“n, · B

•Ö¹

COMfGf%o [fR [fh, ð•Ö, · B`È%o°, ÌfGf%o [fR [fh, Í•Ö, ³, è, éfR [fh, Ì, ·, ×, Ä, Å, ÍÆÄ, Ç, È, Ç B

DI_OK = S_OK: ‘€ Ì, Í ³ í I—, μ, ½ B

DIERR_INVALIDPARAM = E_INVALIDARG: ppvOutpf%of [f^, Í—LÆø, Èf|fCf“f^, Å, È, Ç B

DIERR_OUTOFMEMORY = E_OUTOFMEMORY: f f, fŠ, ^as‘«, μ, Ä, Ç, é B

DIERR_NOINTERFACE = E_NOINTERFACE: Žw'è, ³, è, ½fCf“f^ [ftfFfCfX, Í, ±, ÌfIfufWfFfNfg, É, æ, èfTf| [fg, ³, è, Ä, Ç, È, Ç B

DIERR_DEVICENOTREG: fffofCfX EfCf“fXf^f“fX, ^a ADirectInput, Å“o~^, ³, è, Ä, Ç, éfffofCfX, É‘Š“—, μ, È, Ç B

IDirectInput::EnumDevices

```
HRESULT EnumDevices(  
    LPDIRECTINPUT lpDirectInput,  
    DWORD dwDevType,  
    LPDIENUMCALLBACK lpCallback,  
    LPVOID pvRef,  
    DWORD dwFlags);
```

*fRf“fsf... [f^,ÉÆ» Ý Ú‘±,³,ê,Ä,¢,é,© A, ,é,¢,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,¢
,È,¢,Æ,¢,Ä,½ ê ±,ª, ,é,½,ß A Ú‘±,³,ê,Ä,¢,éfffofCfX,¾,¯,ð—ñ<“,·,é,©fCf“fXfg [f<,³,ê,Ä,¢,éfffofCfX,·,×,Ä,ð—
ñ<“,·,é,©,ðŽ[,·ftf%oFO,ðdwFlagsfpf%of [f^,ÉfZfbfg,·,é Bftf%oFO **DIEDFL_ATTACHEDONLY**,ªfZfbfg,³,ê,Ä,¢,É,¢
,Æ AfCf“fXfg [f<,³,ê,Ä,¢,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,¹,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,¢,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,¢ ê ±,ÍDIDEVTYPE_*¹,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 \‘c¹,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,¢,éftf%oFO,ÍŽŸ,Ì,Ð,Æ,Ä,¾,¯,Ä, ,é B
DIEDFL_ATTACHEDONLY-Æ» Ý Ú‘±,³,ê,Ä,¢,éfffofCfX,Ì,Ý,ð—ñ<“,·,é B*

•Ö¹

*COMfGf%o [fR [fh,ð•Ö,· BÈ%°,ÌfGf%o [fR [fh,Í•Ö,³,ê,éfR [fh,Ì,·,×,Ä,Æ,ÍÆÄ,ç,È,¢ B
DI_OK = S_OK: ‘€ Ì,Í ³ í I—¹,µ,½ BfR [f<fofbfN,ª“r¹,Ä—ñ<“,ð¹Ž~,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,¢
,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,³ê,½ffofCfX,ªE» ÝDirectInput,É Ú‘±,³ê,Ä,¢,é,©,ðf`fFfbfN,·,é BffofCfX,^a Ú‘±,³ê,Ä,¢
,é ê ‡,É,ÍOK,ð A,³ê,Ä,¢,È,¢ ê ‡,É,ÍfGf%o [,ð•Ô,· B

lpDirectInput
,±,Ïf f“fo,ªEÄ,Ñ o,³ê,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,³ê,éfR [fh,Ï,·,×,Ä,Æ,ÍEÀ,ç,È,¢ B

DI_OK = **S_OK**: fffofCfX,Í Ú‘±,³ê,Ä,¢,é B

DI_NOTATTACHED = **S_FALSE**: fffofCfX,Í Ú‘±,³ê,Ä,¢,È,¢ B

DIERR_GENERIC = **E_FAIL**: fffofCfX,^a Ú‘±,³ê,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,^a ì ¬,³,ê,é,ÆDirectInputCreatef f\fbfh,^aŽ©“@“I,É %Šú%»,đ s,□,½,ß A’Ê í,ÍfAfvfŠfP [fVf‡f“,©,ç,±,İŠÖ ”,đÆÄ,Ñ o,•K—v,İ,È,¢ B

hinst

DirectInputIfuFwFfNfg,đ ì ¬,μ,Ä,¢,éfAfvfŠfP [fVf‡f“,Ü,½,ÍDLL,ÌfCf“fXf^f“fX Efnf“fhf< B

dwVersion

Žg—p,³,ê,½dinput.hfwfbf_ftf@fCf<,Ìfo [fWf‡f“”Ô † B,±,Ì¹,ÍDIRECTINPUT_VERSION,Ä,È,¬,ê,İ,È,ç,È,¢ B

DirectInput,İ,±,Ì¹,đ—p,¢

,Ä A,Ç,Ìfo [fWf‡f“,İDirectInput,É‘İ,μ,ÄfAfvfŠfP [fVf‡f“,Ü,½,ÍDLL,^a ÝÆv,³,ê,½,Ì,©,đŠm’è,·,é B

•Ô¹

COMfGf% [fR [fh,đ•Ô,· B^È%°,ÌfGf% [fR [fh,İ•Ô,³,ê,é,·,×,Ä,ÌfR [fh,Æ,ÍÆÄ,ç,È,¢ B

DI_OK = S_OK: fffofCfX,Í Ú‘±,³,ê,Ä,¢,é B

DIERR_OLDDIRECTINPUTVERSION: DirectInput,Ìfo [fWf‡f“,ªÆÄ,¢ B

DIERR_BETADIRECTINPUTVERSION: fTf|

[fgŠO,Ä, ,éDirectInputfx [f^ Efo [fWf‡f“,É‘İ,μ,ÄfAfvfŠfP [fVf‡f“,ª ‘,©,ê,Ä,¢,½ B

IDirectInput::QueryInterface

```
HRESULT QueryInterface(  
    LPDIRECTINPUT lpDirectInput,  
    REFIID riid,  
    LPVOID FAR* ppvObj);
```

IDirectInput,^aⒸp³,·,éIUnknownfCf“f^ [ftfFfCfX,îrê•” BfAfvfŠfP [fVf‡f“,žg—p,μ,æ,ϱ,Æ,μ,Ä,¢
,éfCf“f^ [ftfFfCfX,ð,»»,îIfufWfFfNfg,^afTf| [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,^afTf| [fg,μ,Ä,¢
,é ê ‡ AfAfvfŠfP [fVf‡f“,Í,»,îfCf“f^ [ftfFfCfX,ð’¼,¿,ÉŽg—p,μŽn,ß,é,±,Æ,^a,Ä,«,é B•K—
v,ÈfCf“f^ [ftfFfCfX,^afTf| [fg,³ê,Ä,¢,é ê ‡ AfAfvfŠfP [fVf‡f“,ìppvObjpf%of [f^,Éf|
fCf“f^,^aÔ,³ê,é BfAfvfŠfP [fVf‡f“,^a,»,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,^aĈÄ,Ñ o,³ê,½DirectInputfIfufWfFfNfg,ðŽw,μŽ!,· B

riid
•K—v,ÈfCf“f^ [ftfFfCfX,ðŽ~•Ê,·,éfCf“f^ [ftfFfCfXŽ~•ÊŽq(IID),ðŽw,μŽ!,· B

ppvObj
—â,¢ ‡,í,¹,^a ³ í,ÉŽÀ s,³ê,é ê ‡•Ô,³ê,éfCf“f^ [ftfFfCfX Ef|fCf“f^,^a“ü,³ê,é~Ê’u,ðŽw,μŽ!,· B

•Ô¹

DI_OK
DIERR_INVALIDPARAM
DIERR_NOINTERFACE

IDirectInput::Release

```
DWORD Release(  
    LPDIRECTINPUT lpDirectInput);
```

IDirectInput,^aEp³,,éIUnknownfCf“f^ [ftfFfCfX,îê” BŠÖ^A,î,,éCOMfIfufWfFfNfG,îŽQ AƒJfEf“fg,đE,,ç,,½,ß,Ê—p,ç,ç,é,é BfIfufWfFfNfG,^a A %
“É ì ¬,é,é,éA,« AZQ AƒJfEf“fg,î,ÉZfbfG,³,é,é BAddRef,“EÄ,Ñ o,³,é,é,½,Ñ,ÉŽQ AƒJfEf“fg,îfCf“fNfŠf f
“fg,³,é,é ARelease,“EÄ,Ñ o,³,é,é,½,Ñ,ÉŽQ AƒJfEf“fg,îfNfNŠf f“fg,³,é,é BŽQ AƒJfEf“fg,⁰,E,É,é,É A,»,îfIfu
fWfFfNfG,î%ôó,ú,³,é,é B Ú ×,É,Ä,ç,Ä,î AOlef}fjf...fAfç,î IUnknown::QueryInterface,đŽQ A,,é,±,Ä 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'l

V,½,ÈŽQ ÆfJfEf“fg,đŠÜ,ĐDWORD B,±,ì•’l,ÍfffofbfO—p“r,É,¾,¬Žg—p,³,ê,é,±,Æ,É’ ^Ó B

IDirectInput::RunControlPanel

```
HRESULT RunControlPanel(  
    LPDIRECTINPUT lpDirectInput,  
    HWND hwndOwner,  
    DWORD dwFlags);
```

f^{\dagger} [fU,^a V,¹/₂,È“ü—
ÍfffofCfX,ðfCf“fXfg [f<,μ,¹/₂,èfZfbfgfAfbfv,ð C³,μ,¹/₂,è,Ä,«,é,æ,□ AWindows,ÌDirectInputfRf“fgf [f<fpflf<,ð
ŽÀ s,.,é,¹/₂,ß,É—p,¢,ç,ê,é BfT [fhfp [fefB,ìfRf“fgf [f<fpflf<,ÌŽÀ s,μ,È,¢ B

lpDirectInput
 ,±,ìf f“fo,^aÆÄ,Ñ o,³,ê,¹/₂DirectInputfIfufWfFfNfg,ðŽw,μŽ',. B

hwndOwner
 Ɛä‘±,ÌUI,É‘Î,.,é efEfBf“fhfE,Æ,μ,Ä—p,¢
 ,ç,ê,éEfBf“fhfE Efnf“fhf<,ðŽ[−]•Ê,.,é BNULL,Í efEfBf“fhfE,^a¶ Ý,μ,È,¢,±,Æ,ðŽ',. B

dwFlags
 Ɛ»Žž“_,Ä,Íftf%fo,Í'è`³,ê,Ä,¢,È,¢ B,±,ìfpf%of [f^,Í0,Ä,È,[−],ê,Î,È,ç,È,¢ B

•Ô'I

COMfGf%o [fR [fh,ð•Ô,· B`È%o°,ÌfGf%o [fR [fh,Í•Ô,³,ê,éfR [fh,ì,.,×,Ä,Æ,ÍƐÄ,ç,È,¢ B
DI_OK = **S_OK**: fffofCfX,Í Ú‘±,³,ê,Ä,¢,é B

IDirectInputDevice

IDirectInputDevicefCf“f^ [ftfFfCfX,Í A“ü—ÍfffofCfX,ìfCf“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,ðÆÄ,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,³ÆÄ,Ñ o³,ê,½DirectInputffofCfX EfIfufWfFfNfg,ðŽw,μŽ!,· B

•Ô¹

COMfGf%o [fR [fh,ð•Ô,· B`È%°,ÌfGf%o [fR [fh,Í A•Ô³,ê,éfR [fh,Ì,·,×,Ä,Æ,ÍÆÄ,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}fbfgÆ`Ž®,Ä,Í,È,¢ B

IDirectInputDevice::AddRef

```
DWORD AddRef(LPDIRECTINPUTDEVICE lpDirectInputDevice);
```

IDirectInputDevice,^aEp³,·,éIUnknownfCf“f^[ftfFfCfX,îê•” BŠÖ~A,Ì, ,éCOMfIfufWfFfNfg,ìŽQ ÆfJfEf“fg,ð‘
,â,·,½,ℓ,É—p,¢,ç,ê,é BfIfufWfFfNfg,^a Ä %
,É ì ¬,³,ê,é Ů,É AŽQ ÆfJfEf“fg,Í1,ÉfZfbfg,³,ê,é B**AddRef**,^aĈÄ,Ñ o,³,ê,é,½,Ñ,ÉŽQ ÆfJfEf“fg,ÍfCf“fNfŠf
f“fg,³,ê A**Release**,^aĈÄ,Ñ o,³,ê,é,½,Ñ,ÉŽQ ÆfJfEf“fg,ÍffNfŠf f“fg,³,ê,é BŽQ ÆfJfEf“fg,⁰É,È,é,Æ A,»,ìfIf
ufWfFfNfg,Í%øð•ú,³,ê,é B Ů ×,É,Â,¢,Ä,Í AOLEf}fjf...fAf<,ì I**Unknown::AddRef**,ðŽQ Æ,·,é,±,Æ B

lpDirectInputDevice

,±,Ìf f“fo,^aĈÄ,Ñ o,³,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<’?fÇfxf<,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,ðfofCfY,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^,İ,Ç,±,É,àŠi”[,³,ê,È,Ç,“ A,»,ê^ÈŠO,İ“@ İ,İ 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,İŽÄ Û,É“¾,Ç,ê,½—v‘f ” B

fl

ff [f^Žæ“¾,İ•û—@,ð §ÇÄ,·,éftf%ofO B0, ,é,Ç,İÈ%°,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,İ Aff [f^,İ“Ç,ÝŽæ,ç,ê,½ÇÄfobftf@,©,ç í æ,³,ê,é B

•Ö’l

DI_OK = S_OK: ·,·,×,Ä,İff [f^,İ 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,«,İ Afofobftf@,“ó,Ä, ,é,±,Æ,ðŽ!,· B

DI_BUFFEROVERFLOW = S_FALSE:

ff [f^,İ 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 Efofobftf@,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,İ 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,İ A10ÇÄ,İfobftf@ Eff [f^—
v‘f,ð“Ç,ÝŽæ,è A“Ç,ÝŽæ,èÇÄffofCfX Efofobftf@,©,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@,İ ³ İ,Éftf%ofbfVf...,³,ê,½

// dwItems = ftf%ofbfVf...,³,ê,½—v‘f ”


```

    if (hres == DI_BUFFEROVERFLOW) {
        // fofbftf@,^fI [fo [ftf [μ,½
    }
}

rgdod,ÉNULL,ð“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,ð“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
        // ,·,x,Ä,Ìff [f^,ª ³ í,ÉfLfffvff`ff,³ê,½,í,-,Á,Í,È,¢
    }
}

rgdod,ÉNULL,ð“n,μ €-Ú,ð‘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‘□
,**IDIDEVICEINSTANCE** \‘¢‘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%o°,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‘▯
 ,İDIDEVICEOBJECTINSTANCE \‘ċ'İ,İdwSizeftfB [f<fh,ð %Šú%»»,μ,È,⁀,ê,İ,È,Ç,È,ċ B*

dwObj

fvf fpfefB,³fAfNfZfX,³,ê,éfIfufWfFfNfg,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,İĖÄ,Ç,È,ċ B*

DI_OK = S_OK: ‘Ė 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—ÍffofCfX,ÉŠÖ,·,é îñ,ðŽæ“¾,·,é B,¢,-
,Ä,©,ìfvf fpfefB,ÍDirectInputDevice::SetPropertyf f\fbfh,ìÄ,Ñ o,µ,ÄfZfbfg,³,é,é B,»„êÈŠÖ,Í“Ç,Ý o,µ ê—
p,Ä, ,é BÍDirectInputDevice::SetPropertyf f\fbfh,ìfZfbfg%Ä”\,Èfvf fpfefB,ìfŠfXfg,ðŽQ Ä,·,é,±,Ä B

lpDirectInputDevice

,±,ìf f“fo,ªÄ,Ñ o,³,é,½DirectInputffofCfX EfIfufWfFfNfg,ðŽw,µŽ!,· B

rguidProp

Žæ“¾,³,é,éfvf fpfefB,ìŽ·ÊŽq B, ,ç,©,¶,ß’èç³,é,Ä,¢
,éDIPROP_*¹¹,Ð,Ä,Ä,© Afvf fpfefB,ðŽ·Ê,·,éGUID,Ö,ìf|fCf“(C++,ðŽg—p,·,é ê ±,ÍŽQ Ä) B
È%°,ìfvf fpfefB,ª“ü—ÍffofCfX,É‘Î,µ,Ä, ,ç,©,¶,ß’èç³,é,Ä,¢,é B

DIPROP_AXISMODE

DIPROP_BUFFERSIZE

DIPROP_GRANULARITY

DIPROP_RANGE

,±,é,ç,ìfvf fpfefB,»„ê,¼,é,ì Ú ×,É,Ä,¢,Ä,Í A \“‘ì,“,æ,Ñ’è ”,ì B,ÄÄÄ X,ìfvf fpfefB,ìL q,ðŽQ Ä,·,é,±
,Ä B

pdiph

fvf fpfefB,ÉÈ“¶,·,é \“‘ì,ìDIPROPHEADER·”,ðŽw,µŽ!,· B

•Ö¹

COMfGf% [fR [fh,ð·Ö,· BÈ%°,ìfGf% [fR [fh,Í·Ö,³,é,éfR [fh,ì,·,×,Ä,Ä,ÍÄÄ,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,é,Ä,¢

,È,ª,çdwObjftfB [f<fh,ª0,Ä,È,¢ B

DIERR_OBJECTNOTFOUND: Žw’è,³,é,½fIfufWfFfNfg,ª¶ Ý,µ,È,¢ B

DIERR_UNSUPPORTED = E_NOTIMPL:ffofCfX,Ü,½,ÍfIfufWfFfNfg,ªfvf fpfefB,ðfTf| [fg,µ,Ä,¢,È,¢ B

—á

È%°,ìÄ¾ÄÊfR [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(Ž² Af{f^f“,È,Ç),ð—ñ<“,·,é B

lpDirectInputDevice

,±,İf f“fo,“EÄ,Ñ o,³,ê,½DirectInputffofCfX EfIfufWfFfNfg,ðŽw,μŽ!,· B

lpCallback

DirectInputDeviceIfufWfFfNfg,ðŽó, Žæ,éfAfvfŠfP [fVf‡f“,É,æ,è’è’,³,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<“,³,ê,éfIfufWfFfNfg,İf^fCfv,ðŽw’è,·,éftf%ofo Bff [f^ EftfH [f}fbfg Ef^fCfv,İ‘g,Ý ‡,í,¹,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,³,ê,éfR [fh,İ,·,×,Ä,Æ,ÍEÄ,ç,È,ç B
DI_OK = S_OK: ‘€ ì,İ³ í,É I—¹,μ,½ BfR [f<fofbfN,“r’†,Ä—ñ<“,ð’†Ž~,μ,½ ê ‡ A—ñ<“,İ³ í I—
¹,μ,½,ÆE©,È,³,ê,é,±,Æ,É’ ^Ó B
DIERR_INVALIDPARAM = E_INVALIDARG: flfpf%of [f^,É—³Eø,Èftf%ofoO,^a, ,Ä,½,© A, ,é,ç
,İfR [f<fofbfN,^a—³Eø,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,^a 3 í,ÉŽÀ s,³ê,È,©,Á,½ ê ± AfIfufWfFfNfg,Í ó‘Ô,^as’è,Á, ,é,ÆÆ©,È,³é,é B‘±
, ,Á,»,lfIfufWfFfNfg,đŽg—p,·,é,É,Í Ä“x %Šú%»,l•K—v,^a ,é,±,Æ,É’ ^Ó B

IDirectInput::CreateDevicef f\fbfh,ÍfffofCfX,đ ì ¬,·,é,ÆŽ©“@“I,É,»,ê,đ %Šú%»,·,é,½,ß A^Ê í,ÍAfvfŠfP [fVf±f“,©,ç,±,İŠÖ ”,đÆÄ,Ñ o,•K—v,Í,È,¢ B

lpDirectInputDevice

,±,lf f“fo,^aÆÄ,Ñ o,³ê,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,³ê,Ä,¢,é,©,Ç,²,©,đ’m,é B

dwVersion

Žg—p,³ê,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,^a ÝÆv,³ê,½,Î,©,đŠm’è,·,é B

rguid

fCf“f^ [ftfFfCfX,ÉŠÖ~A,Ì ,éfffofCfX,lfCf“fXf^f“fX,đŽ~•Ê,·,é B**IDirectInput::EnumDevices**f f\fbfh,đ—p,¢
,Ä AfVfXfef€,^,Ç,lfCf“fXf^f“fXGUID,đfTf| [fg,μ,Ä,¢,é,©,đ’m,é,±,Æ,^aÄ,«,é B

•Ô’l

COMfGf%o [fR [fh,đ•Ô,· B^È%°,lfGf%o [fR [fh,Í•Ô,³ê,éfR [fh,Ì,·,×,Ä,Æ,ÍÆÄ,ç,È,¢ B

DI_OK = S_OK: fffofCfX,Í Ú‘±,³ê,Ä,¢,é B

DIERR_OLDDIRECTINPUTVERSION: DirectInput,lfo [fWf±f“,^ÆÄ,¢ B

DIERR_BETADIRECTINPUTVERSION: fTf|

[fgŠÖ,Á, ,éDirectInputfx [f^ Efo [fWf±f“,É‘Î,μ,ÄAfvfŠfP [fVf±f“,^ , ,©,ê,Ä,¢,½ B

S_FALSE: fffofCfX,Írguid,É“n,³ê,½Cf“fXf^f“fXGUID,Ä,·,Á,É %Šú%»,³ê,Ä,¢,½ B

DIERR_ACQUIRED: fffofCfX,Í”FŽ~,³ê,Ä,¢,é,^a %Šú%»,Ä,«,È,©,Á,½ B

IDirectInputDevice::QueryInterface

```
HRESULT QueryInterface(  
    LPDIRECTINPUTDEVICE lpDirectInputDevice,  
    REFIID riid,  
    LPVOID FAR* ppvObj);
```

IDirectInputDevice,^aEp³,·,éIUnknownfCf“f^ [ftfFfCfX,îê•” BfAfvfŠfP [fVf‡f“,^aŽg—p,μ,æ,ϱ,Æ,μ,Ä,¢ ,éfCf“f^ [ftfFfCfX,ð,»,îIfufWfFfNfg,^afTf| [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,^afTf| [fg,μ,Ä,¢ ,é ê ‡ AfAfvfŠfP [fVf‡f“,Í,»,îfCf“f^ [ftfFfCfX,ð’¼,¿,ÉŽg—p,μŽn,ß,é,±,Æ,^aÄ,«,é B•K—v,ÈfCf“f^ [ftfFfCfX,^afTf| [fg,³ê,Ä,¢,é ê ‡ AfAfvfŠfP [fVf‡f“,ìppvObjpf%of [f^,Éf| fCf“f^,^aÔ,³ê,é BfAfvfŠfP [fVf‡f“,^a,»,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,^aĀ,Ñ o,³ê,½DirectInputffofCfX EfIfufWfFfNfg,ðŽw,μŽ!,· B

riid

•K—v,ÈfCf“f^ [ftfFfCfX,ðŽ•Ê,·,éfCf“f^ [ftfFfCfXID(IID),ðŽw,μŽ!,· B

ppvObj

—â,¢ ‡,í,¹,^a ³ í,ÉŽÀ s,³ê,½ ê ‡•Ô,³ê,éfCf“f^ [ftfFfCfX Ef|fCf“f^,^aã“ü,³ê,éÊ’u,ðŽw,μŽ!,· B

•Ô¹

DI_OK

DIERR_INVALIDPARAM

DIERR_NOINTERFACE

IDirectInputDevice::Release

```
DWORD Release(LPDIRECTINPUTDEVICE lpDirectInputDevice);
```

IDirectInputDevice,^aEp³,·,éIUnknownfCf“f^[[ftfFfCfX,î~ê•” BŠÖ~A,Ì, ,éCOMfIfufWfFfNfg,ìŽQ ÆfJfEf“fg,ðE_{,,ç,·,½,ß,É—p,ç,ç,ê,é BfIfufWfFfNfg,^a Ä %_o}
,É ì ¬,³,ê,é,Æ,« ÄŽQ ÆfJfEf“fg,Í1,ÊfZfbfg,³,ê,é BAddRef,^aĒÄ,Ñ o,³,ê,é,½,Ñ,ÉŽQ ÆfJfEf“fg,ÍfCf“fNfŠf f
“fg,³,ê ARelease,^aĒÄ,Ñ o,³,ê,é,½,Ñ,ÉŽQ ÆfJfEf“fg,ÍffNfŠf f“fg,³,ê,é BŽQ ÆfJfEf“fg,⁰,É,È,é,Æ A,»,ìfIfu
fWfFfNfg,Í%øð•ú,³,ê,é B Ú ×,É,Â,ç,Ä,Í AOLEf}fjf...fAf<,ì IUnknown::QueryInterface,ðŽQ Æ,·,é,±,Æ B

lpDirectInputDevice

,±,Ìf f“fo,^aĒÄ,Ñ o,³,ê,½DirectInputffofCfX EfIfufWfFfNfg,ðŽw,μŽ!,· B

•Ô'l

V,½,ÈŽQ ÆfJfEf“fg,ðšÜ,ÐDWORD B,±,ì•Ô'l,ÍfffbfO—p“r,É,^¾,¬Žg—p,³,ê,é,±,Æ,É’ ^Ó B

IDirectInputDevice::RunControlPanel

```
HRESULT RunControlPanel(  
    LPDIRECTINPUTDEVICE lpDirectInputDevice,  
    HWND hwndOwner,  
    DWORD dwFlags);
```

$f f f o f C f X, \acute{E} \acute{S} \acute{O} \sim A, \tilde{A}, \bar{}, \grave{}, \hat{}, \frac{1}{2} f R f \text{“} f g f \quad [f \langle f p f l f \langle, \delta \acute{Z} \tilde{A} \quad s, \cdot, \acute{e} \quad B f f f o f C f X, \acute{E} \acute{S} \acute{O} \sim A, \tilde{A}, \bar{}, \grave{}, \hat{}, \frac{1}{2} f R f \text{“} f g f \quad [f \langle f p f l f \langle, \text{“} \P \quad \acute{Y}, \mu$
 $, \grave{E}, \P \quad \hat{e} \quad \ddagger \quad A f f f t f H f \langle f g, \grave{I} f f f o f C f X \quad E f R f \text{“} f g f \quad [f \langle f p f l f \langle, \text{“} N \text{“} \textcircled{R}, 3, \hat{e}, \acute{e} \quad B$

lpDirectInputDevice
 $, \pm, \grave{I} f \quad f \text{“} f o, \text{“} \mathbb{E} \tilde{A}, \tilde{N} \quad o, 3, \hat{e}, \frac{1}{2} D i r e c t I n p u t f f f o f C f X \quad E f I f u f W f F f N f g, \delta \acute{Z} w, \mu \acute{Z} \text{!}, \cdot \quad B$

hwndOwner
 $\mathbb{E} \tilde{a} \text{“} \pm, \grave{I} U I, \acute{E} \text{“} \hat{I}, \cdot, \acute{e} \quad e f E f B f \text{“} f h f E, \mathbb{A}, \mu, \tilde{A} \text{—} p, \P$
 $, \varsigma, \hat{e}, \acute{e} f E f B f \text{“} f h f E \quad E f n f \text{“} f h f \langle, \delta \acute{Z} \text{—} \bullet \hat{E}, \cdot, \acute{e} \quad B N U L L, \acute{I} \quad e f E f B f \text{“} f h f E, \text{“} \P \quad \acute{Y}, \mu, \grave{E}, \P, \pm, \mathbb{A}, \delta \acute{Z} \text{!}, \cdot \quad B$

dwFlags
 $\mathbb{E} \gg \acute{Z} \acute{z} \text{“} \text{—}, \tilde{A}, \acute{I} f t f \% o f O, \acute{I} \text{’} \grave{e} \text{`}, 3, \hat{e}, \tilde{A}, \P, \grave{E}, \P \quad B, \pm, \grave{I} f p f \% o f \quad [f \wedge, \acute{I} 0, \tilde{A}, \grave{E}, \bar{}, \hat{e}, \hat{I}, \grave{E}, \varsigma, \grave{E}, \P \quad B$

•Ô'l

$C O M f G f \% \quad [f R \quad [f h, \delta \bullet \hat{O}, \cdot \quad B \text{^} \grave{E} \% \circ, \grave{I} f G f \% \quad [f R \quad [f h, \acute{I} \bullet \hat{O}, 3, \hat{e}, \acute{e} f R \quad [f h, \grave{I}, \cdot, \times, \tilde{A}, \mathbb{A}, \acute{I} \mathbb{E} \tilde{A}, \varsigma, \grave{E}, \P \quad B$
DI_OK = **S_OK**: ‘€ ì, í ³ í, É I —¹, μ, ¹/₂ B

```
HRESULT SetCooperativeLevel(
    LPDIRECTINPUTDEVICE lpDirectInputDevice,
    HWND hwnd,
    DWORD dwFlags);
```

$$\begin{array}{l} f\vee fXf\text{ef}\in \text{Ef}\rangle f\text{EfX},{}^{\text{a}}\text{r}^{\text{1}}\text{4f},\text{ [fh,}\mathring{\text{A}}^{\text{F}}\text{Z}^{\text{-3},\hat{\text{e}},\ddot{\text{A}},\text{C},\text{e}}\hat{\text{e}}\neq \text{AfffofCfX},{}^{\text{\%}}\text{o}\hat{\text{o}}\cdot\acute{\text{u}},^3,\hat{\text{e}},\hat{\text{e}},\ddot{\text{U}},\mathring{\text{A}}\text{f} \} \\ f\text{EfX}\text{EfJ}\text{ [f}\langle\text{f},{}^{\text{a}}\text{fXfNf}\mathring{\text{S}}\text{ [f}^{\text{-}},\text{\textcircled{C}},\text{\textcircled{C}}\text{\textcircled{C}},\text{\textcircled{!}},\ddot{\text{E}},\ddot{\text{E}},\hat{\text{e}},\pm,\mathring{\text{A}},\acute{\text{E}}'\text{ }\text{^}\acute{\text{O}}\text{ B} \end{array}$$

hwnd

dwFlags

•Ô'1

COMFGf%0 [fR [fh,ð,Ô,· B`È%0,ÌfGf%0 [fR [fh,Í,Ô,³,ê,é fR [fh,Ì,·,×,Ä,Æ,ÍEÀ,ç,È,¢ B
DI_OK = S_OK: ‘€ ,ì,Í ³ ,é,É I—,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 ±,ì,¹,ª 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,ÌfZfbfg,Í,½,¾^ê"x,¾,¯,Ä,È,¯,ê,Î,È,ç,È,¢ Bff [f^ EftfH [f]fbfg,ÍfffofCfX,"FŽ~³,ê,Ä,¢,éŠÔ,Í•İ X,·,é,±
,Æ,ª,Ä,«,È,¢ Bff [f^ EftfH [f]fbfg,ÌfZfbfg,ÉŽ,"s,·,é,Æ Aff [f^ EftfH [f]
fbfg îñ,Í,·,×,ÄŽ,·,í,ê,é B»,»l,½,ßfffofCfX,"FŽ~³,ê,é'O,É—LÆø,Èff [f^ EftfH [f]
fbfg,ðfZfbfg,µ,Ä,"©,È,¯,ê,Î,È,ç,È,¢ BfAfvfŠfP [fVf‡f"´,Í'Ê í A, ,ç,©,¶,ß'è`³,ê,Ä,¢,éff [f^ EftfH [f]fbfg,Ä,
,éc_dfDIMouse,Û,½,Í c_dfDIKeyboard,Ì,¢,,ê,©,ð—p,¢,é B

lpDirectInputDevice

,±,Ìf f"fo,"ÆÄ,Ñ o,³,ê,½DirectInputffofCfX EfIfufWfFfNfg,ðŽw,µŽ',· B

lpdf

DirectInputDevice,ª•Ô,·ff [f^ EftfH [f]fbfg,ðL q,·,é `¢'Ì,ðŽw,µŽ',· B

•Ô'İ

COMfGf%o [fR [fh,ð•Ô,· B`È%°,ÌfGf%o [fR [fh,ÍŽÀ—á,ðŽ',·,±,Æ,ð`Ó }

,µ,Ä,"è A•Ô,³,ê,éfR [fh,Ì,·,×,Ä,Æ,ÍÆÄ,ç,È,¢ B

DI_OK = S_OK: '€ ì,Í ³ í,È I—¹,µ,½ B

DIERR_INVALIDPARAM = E_INVALIDARG: lpdfp%of [f^,Í—LÆø,Èff|fCf"f^,Ä,Í,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,î XŽž,ÉfZfbfg,³,é,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'Î,µCloseHandle,ðCEÄ,Ñ o,·,ÆfGf%o [,É,È,é B,»,ì,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,—,è,ì,È,ç,É,ç B

fffofCfX,“FŽ—,³,è,Ä,ç,éŠÖ,ÍfCxf“fg'Ê'mfnf“fhf<,ð•İ X,·,é,±,Æ,Í,Ä,«,È,ç B

ŠÖ ”,ª ³ í,ÉŽÀ s,³,è,½ è ± AfAvfŠfP [fVf±f“,Í A'¼,ÌWin32fCxf“fg Efnf“fhf<,Æ“—l,î•û—
@,ÄfCxf“fg Efnf“fhf<,ð—p,ç,é,±,Æ,ª,Ä,«,é BŽg—p@,ì—á,ð`È%o°,ÉŽ',· BWin32fEfCfCfGŠÖ ”,ð—p,ç
,é Ū,ì îñ,É,Ä,ç,Ä,Í AWin32 SDK,“,æ,ÑŠÖ`A,ìf}fj...fAf<,ðŽQ Æ,·,é,±,Æ B

lpDirectInputDevice

,±,ìf f“fo,ªCEÄ,Ñ o,³,è,½DirectInputfffofCfX EfIfufWFFfNfg,ðŽw,µŽ,ì,· B

hEvent

fffofCfX ó'Ô,î XŽž,ÉfZfbfg,³,é,éfCxf“fg,Ö,ìfnf“fhf< BDirectInput,ÍfffofCfX,ì ó'Ô,ª'İ%o»,·,é,Æ,«,Éfnf“fh
f<,ðSetEvent,·,é B

Žè“@fŠfZfbfg EfCxf“fg,ìfnf“fhf<,ð ì ¬,·,é,É,Í A CreateEventŠÖ ”,ð—p,ç
,é BfCxf“fg,ðŽ“@fŠfZfbfg EfCxf“fg,Æ,µ,Ä ì ¬,µ,½ è ± AfEfFfCfGŽžŠÖ,ð%oß,¬,é,ÆOS,ªŽ“@“I,ÉfC
xf“fg,ðfŠfZfbfg,·,é BfCxf“fg,ðŽè“@fŠfZfbfg EfCxf“fg,Æ,µ,Ä ì ¬,µ,½ è ± AResetEvent,ðCEÄ,Ñ o,µ,
ÄfŠfZfbfg,·,é,ì,ÍfAvfŠfP [fVf±f“,ì—
ðŠ,,Æ,È,é BDirectInput,ÍfCxf“fg'Ê'mfnf“fhf<,ð¾,é,½,ß,ÉResetEvent,ðCEÄ,Ñ o,·,±
,Æ,Í,µ,È,ç B,Ū,Æ,ñ,Ç,ìfAvfŠfP [fVf±f“,Ä,ÍfCxf“fg,ðŽ“@fŠfZfbfg EfCxf“fg,Æ,µ,Ä ì ¬,·,é B

hEvent,ªNULL,ì è ± A'Ê'm,Í•s%oÄ”\,Æ,È,é B

•Ô'1

COMfGf%o [fR [fh,ð•Ô,· B`È%o°,ìfGf%o [fR [fh,Í•Ô,³,è,éfR [fh,ì,·,×,Ä,Æ,ÍCEÄ,ç,È,ç B
DI_OK = S_OK: € ì,Í ³ í,É I—¹,µ,½ B

DIERR_ACQUIRED: IDirectInputDeviceIfufWFFfNfg,Í'FŽ—,³,è,Ä,ç

,é BIDirectInputDevice::Unacquire,ðCEÄ,Ñ o,µ,Ä A'Ê'm ó'Ô,î X'O,ÉfffofCfX,ð%oð•ú,µ,È,—,è,ì,È,ç,È,ç B

DIERR_HANDLEEXISTS:

IDirectInputDeviceIfufWFFfNfg,É,Í AfCxf“fg'Ê'mfnf“fhf<,ª,·,Ä,É'¶ Ý,·,é BDirectInput,Ä,Í A,Ð,Æ,Ä,ìIDire
ctInputDeviceIfufWFFfNfg,É'Î,µfTf [fg,³,è,éfCxf“fg'Ê'mfnf“fhf<,Í,Ð,Æ,Ä,¾,—,Ä, ,é B

E_INVALIDARG: fCxf“fg Efnf“fhf<,Ä,Í,È,ç B

—á

fnf“fhf<,ªE”Žž“—,ÄfZfbfg,³,è,Ä,ç,é,ç,ç,ª Afuf fbfLf“fO,¹,,Éf`fFfbfN,·,é B

```
dwResult = WaitForSingleObject(hEvent, 0);
if (dwResult == WAIT_OBJECT_0) {
    // fCxf“fg,ªfZfbfg,³,è,½
    // fCxf“fg,ªŽ“@fŠfZfbfg,Æ,µ,Ä ì ¬,³,è,½ è ± A
    // ,»,è,à,Ū,½fŠfZfbfg,³,è,é
}
```

ŽŸ,ì—á,Ä,Í AfCxf“fg,ªfZfbfg,³,è,é,Ū,Ä—³ §CEÄ,Éfuf fbfLf“fO,µ,Ä,ç,é B,±,ìŽè—
@,ÍCE~,µ,Ä „ §,Ä,«,È,ç BfEfFfCfGŽžŠÖ,‰oß,¬,é,Ū,Ä AfXfÆfbfh,ªfVfXfef€(“Ä,ÉWindowsf fbfZ [fW)
,É'Î,µ,Ä%ž“š,µ,È,ç,ç,Ä, ,é B

```
dwResult = WaitForSingleObject(hEvent, INFINITE);
if (dwResult == WAIT_OBJECT_0) {
    // fCxf“fg,ªfZfbfg,³,è,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 Efc [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“ Efc [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€,³fAfCfhf< ó‘Ô,ì ê ‡ AŽŸ,ìfEfFfCfƒ,É‘Î,μ,Ä
// “ü—Í,âf fbfZ [fW,ð¬³ §ÆÄ,É‘Ö,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~•ÊŽq B, ,ç,©,¶,ß'è<`³,ê,Ä,Œ,éDIPROP_*¹,İ,Œ,,ê,© A, ,é,Œ

,İfvf fpfefB,đŽ~•Ê,.,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,Ä,Í A \Œ'İ,“,æ,Ŧ'è ”,İ B,ÄŒÄ X,İfvf fpfefB<L q,đŽQ Œ,.,é,±
,Œ B

pdiph

fvf fpfefB,ÉˆÊ‘¶,.,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,İfIfufWfFfNfg,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,*ŒÄ,Ñ o,³,ê,½DirectInputffofCfX EfIfufWfFfNfg,ðŽw,μŽ_i,· B*

•Ô'l

COMfGf%o [fR [fh,ð•Ô,· B`È%°,İfGf%o [fR [fh,Í•Ô,³,ê,éfR [fh,İ,·,×,Ä,Æ,ÍŒÀ,ç,È,¢ B
DI_OK = S_OK: ‘€ ì,İ³ í,É I—¹,μ,½ B
S_FALSE: fIfufWfFfNfg,ÍŒ» Ý”FŽ⁻,³,ê,Ä,¢,È,¢ B`È‘O,É“ü—Í,ðŽ,,Á,½,½,ß,Ä, ,é%oÂ”\ «,^a, ,é B,±
,ê,İ³ 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,^,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%ofo B

^È%°,Ìftf%ofo,^è^,³,ê,Ä,¢,é B

DIDF_RELAXIS: *Ž²,ð â‘İf, [fh,ÉfZfbfg,·,é B,±,Ìftf%ofo,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%ofo,ðDIDF_ABSAXIS,Æ‘g,Ý ‡,í,¹,é,±,Æ,Í,Ä,«„È,¢ B

DIDF_ABSAXIS: *Ž²,ð â‘İf, [fh,ÉfZfbfg,·,é B,±,Ìftf%ofo,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%ofo,ðDIDF_RELAXIS,Æ‘g,Ý ‡,í,¹,é,±,Æ,Í,Ä,«„È,¢ B

dwDataSize

fffofCfX,^•Ô,·fffofCfX Eff [f^,ÌfTfCfY B,±
,Ì¹,Ì,Ì”{ ”,Ä,È,_,é,Í,È,ç,, AfIfufWfFfNfgfŠfXfg,ÄŽw’è,³,ê,Ä,¢,éIfufWfFfNfg,·,×,Ä,É,Ä,¢
,ÄdwOfs’l,ð%oz,¹,Ä,¢,È,_,é,Í,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^,^fffofCfX
Eff [f^,É,“,¢,Ä,Ç,Ì,æ,²,É’Ê’m,³,é,é,×,«,©,ðL q,μ,Ä,¢,é B““¶ ê Š,É,Ó,½,Ä,Ì’Ü,È,é îñ,^u,©,é,Ä,¢
,é,© A,Ü,½,Ì““è,Ì îñ,^2f— 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“,ÍÈ%°,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,^dword,Ì”{ ”,Ä,È,_,é,Í,È,ç,È,¢
} MYDATA;
```

// ,»,μ,Ä^È%°,Ìff [f^ EftfH [f]fbfg,ð—p,¢,é,±,Æ,^,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,ðfofCfç,ÅŽw’è,·,é B IDirectInputDevice::GetCapabilities,ðŒÄ,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“@Œ^,Â,Í,È,f| [fŠf“foŒ^,Â,·,é Bff [f^,ð“¾,é,½,B,É,ÍfAfvfŠfP [fVf‡f“,ª—*

*¾Ž“I,É***IDirectInputDevice::GetDeviceState***,ðŒÄ,Ń o,³,È,¯,ê,Î,È,ç,È,¢ Bfofbftf@fŠf“fo,“,æ,ŃfCfxf“fg’Ê’m,ÍŒø%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•Û‘ł,µ AĖă,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 ADirectInputff 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,¹,é,Æ A**IDirectInputDevice::GetDeviceState**
,ð%î,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,²,É,È,é B
fffofCfX,ªf}fEfX,Æ,µ,ÄfAfNfZfX,³,ê,Ä,¢,é ê ± **ADIMOFs** *¹,ì,Ð,Æ,Â B
fffofCfX,ªFL [f [fh,Æ,µ,ÄfAfNfZfX,³,ê,Ä,¢,é ê ± **ADIK** *¹,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,ªŠ'ÎŽ²f, [fh,Â, ,é ê ± A'Š'ÎŽ²%ª^“®,ªÊ'm,³,ê,é BfffofCfX,ª â'ÎŽ²f, [fh,Â, ,é ê ± A â'ÎŽ² Â·
W,ªÊ'm,³,ê,é B*

DIDFT_BUTTON: dwData,ì%ª°ÊfofCf,ì,Ý,ªÓ—

ì,ðŽ ,Â Bf{f^f“,ª%Ÿ,³,ê,é,Æ%ª°ÊfofCf,ì ãÊÊrfbfg,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' %ªÁ,·,é ± ~Ô †,ªŠ,,,è—,Ä,ç,ê,Ä,¢
,é B,±,ê,É,æ,è AÜ,È,éfffofCfX,©,ç,ÌfCxf“fg,ðŽŽ€ñ—ñ“¹,Éf\ [fg,Â,«é B,±,ì¹,Í'ê „,·,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,¢,Â,±
,ì”äŠr,ð^Â'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 ;ĬĖă’è<³,ê,é%ŎÂ” «,ª, ,é(,½,Æ,!,,Ĭ AGUID_Fire AGUID_Throttle AGUID_SteeringWheel j B

dwOfs

,±,ĬfIfufWfFfNfg,ªÊ’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,ˉ—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 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
 $f\}fEfX,\dot{\imath}x\check{Z}^2,\acute{E}\acute{S}\ddot{O},\cdot,\acute{e}\ \hat{\imath}\cdot\hat{n}\ BfffofCfX,\acute{a}\acute{S}\acute{\imath}\check{Z}^2f,\ [fh,\acute{A},\acute{e}\ \hat{e}\ \ddagger\ Af\}$
 $fEfX,\dot{\imath}x\check{Z}^2\cdot\hat{u}\acute{E}\ddot{u},\dot{\imath}\cdot\hat{\imath}\hat{E}\ BfffofCfX,\acute{a}\ \hat{a}\acute{\imath}\check{Z}^2f,\ [fh,\acute{A},\acute{e}\ \hat{e}\ \ddagger\ Af\}fEfX,\dot{\imath}x\check{Z}^2\cdot\hat{u}\acute{E}\ddot{u},\dot{\imath}\ \hat{a}\hat{\imath}\hat{E}'u\ B$

IY
 $f\}fEfX,\dot{\imath}y\check{Z}^2,\acute{E}\acute{S}\ddot{O},\cdot,\acute{e}\ \hat{\imath}\cdot\hat{n}\ BfffofCfX,\acute{a}\acute{S}\acute{\imath}\check{Z}^2f,\ [fh,\acute{A},\acute{e}\ \hat{e}\ \ddagger\ Af\}$
 $fEfX,\dot{\imath}y\check{Z}^2\cdot\hat{u}\acute{E}\ddot{u},\dot{\imath}\cdot\hat{\imath}\hat{E}\ BfffofCfX,\acute{a}\ \hat{a}\acute{\imath}\check{Z}^2f,\ [fh,\acute{A},\acute{e}\ \hat{e}\ \ddagger\ Af\}fEfX,\dot{\imath}y\cdot\hat{u}\acute{E}\ddot{u},\dot{\imath}\ \hat{a}\hat{\imath}\hat{E}'u\ B$

IZ
 $f\}fEfX,\dot{\imath}z\check{Z}^2,\acute{E}\acute{S}\ddot{O},\cdot,\acute{e}\ \hat{\imath}\cdot\hat{n}\ BfffofCfX,\acute{a}\acute{S}\acute{\imath}\check{Z}^2f,\ [fh,\acute{A},\acute{e}\ \hat{e}\ \ddagger\ Af\}$
 $fEfX,\dot{\imath}z\check{Z}^2\cdot\hat{u}\acute{E}\ddot{u},\dot{\imath}\cdot\hat{\imath}\hat{E}\ BfffofCfX,\acute{a}\ \hat{a}\acute{\imath}\check{Z}^2f,\ [fh,\acute{A},\acute{e}\ \hat{e}\ \ddagger\ Af\}fEfX,\dot{\imath}z\check{Z}^2\cdot\hat{u}\acute{E}\ddot{u},\dot{\imath}\ \hat{a}\hat{\imath}\hat{E}'u\ B$
 $f\}fEfX,\acute{E}z\check{Z}^2,\acute{a},\acute{E},\hat{-},\acute{e},\hat{\imath}\ A,\pm,\dot{\imath}^1,\acute{\imath}0,\acute{A},\acute{E},\acute{e}\ B$

$$f\{f^{\wedge}f^{\circ},\grave{\text{I}}\acute{\text{O}},\grave{\text{I}}^{\text{z}}\text{—}\tilde{\text{n}}\text{B}^{\text{Š}}\text{—},\cdot,\acute{\text{e}}f\{f^{\wedge}f^{\circ},\text{\text{‰}}\ddot{\text{Y}},^3,\hat{\text{e}},\ddot{\text{A}},\text{¢},\acute{\text{e}}\hat{\text{e}}\neq\text{A}\tilde{\text{a}}^{\text{Ê}}\text{f}\text{r}\text{f}\text{b}\text{f}\text{g},^{\text{a}}\text{f}\text{Z}\text{f}\text{b}\text{f}\text{g},^3,\hat{\text{e}},\acute{\text{e}}\text{B}$$

DIOBJECTDATAFORMAT

```
typedef struct {
    const GUID * pguid;
    DWORD dwOfs;
    DWORD dwType;
    DWORD dwFlags;
} DIOBJECTDATAFORMAT;
```

IDirectInputDevice::SetDataFormat *f\fbfh,^ AfffofCfX^à,ìP^êfIfufWfFfNfg,É'î,μ,Äff [f^ EftfH [f] fbf,ðfZfbfg,·,é,î,È—p,¢,é Bff [f^ EftfH [f] fbf,î·j ”,ìDIOBJECTDATAFORMAT \‘¢'î,©,ç \ ¬,³,ê AŠefIfufWfFfNfg(Ž² Af{f^f“,È,Ç) ,É'î,μ,Ä,Ð,Æ,Ä,ì \‘¢'î,^—,Ä,ç,ê,é B,±,ê,ç,ì \‘¢'î,ì”z— ñ,í AIDirectInputDevice::SetDataFormat,É“n,³,ê,éDIDATAFORMAT \‘¢'î,^Ž ,Ä B'Ê í,ÍfAfvfŠfP [fVf±f“,^DIOB JECTDATAFORMAT \‘¢'î,ì”z—ñ,ð ì ¬,·,é•K—v,Í,È, A,±,ì \‘¢'î,É'î,μ Y'è,^, ,ç,©,¶,ß'è^,³,ê,Ä,¢ ,éc_dfdIMouse,Ü,½,Í c_dfdIKeyboard,ì,¢,,ê,©,ð—p,¢,é B*

pguid

Ž² Af{f^f“, ,é,¢,í¼,ì“ü—Íf\ [fX,É'î,·,éŽ·ÊŽq Bff [f^ EftfH [f]fbf,ð—v< ,·,é Ü,É,± ,ìftfB [f<fh,ðNULL,ÉfZfbfg,·,é,Æ A,Ç,ì,æ,μ,Éf^fCfv,ìfIfufWfFfNfg,Ä,à,¢,¢,Æ,¢,□Ö—j,É,È,é B

dwOfs

“ü—Íf\ [fX,É'î,·,éff [f^,“Ši”[,³,ê,éff [f^ EfpfPfbfg“à,Ä,ìfIfZfbfg,Ä AŽ²,ì,æ,μ ,ÉDWORDfTfCfY,ìff [f^,É,Ä,¢,Ä,Í4,ì”{ ”,Ä,È,—,ê,î,È,ç,È,¢ B,à,μ,- ,Í Af{f^f“,É'î,μ,Ä•Ä,×,ç,ê,½fofCf, EfAf%oCf“f f“fg,ì¹ B

dwType

*fIfufWfFfNfg,ð<L q,·,éfffofCfX Ef^fCfvŽw'èŽq B,±,ê,í AfIfufWfFfNfgf^fCfv(Ž² Af{f^f“,È,Ç) ,ð<L q,·,éDIDFT_*ftf%oO,ì'g,Y ±,í,¹,Ä A ãÊêfofCf,É,ÍfIfufWfFfNfg EfCf“f^f“fX”Ö †,“ü,é Bff [f^ E ftfH [f]fbf,ð—v< ,·,é Ü,É A”C^Ö,ìfCf“fXf^f“fX,^—e,³,ê,é,± ,Æ,ðŽ',·,½,ß,È AfCf“fXf^f“fX”•^,ðDIDFT_ANYINSTANCE,ÉfZfbfg,·,é,±,Æ,^,Ä,«,é B*

dwFlags

Æ»ŽŽ“_,Ä,Íftf%oO,Í%½,à'è^,³,ê,Ä,¢,È,¢ B,±,ìftfB [f<fh,Í0,Ä,È,—,ê,î,È,ç,È,¢ B

—á

ŽY,ìfIfufWfFfNfg Eff [f^ EftfH [f]fbf,ðŽw'è,Ä,Í ADirectInput,^ Ä %o,ì—~p%oÄ”\ ,ÉŽ²,ð'íð,μ A'ì,ðfffofCfX Eff [f^,Æ,μ,ÄfIfZfbfg4,ÉDWORD,Ä'Ê'm,·,é B

```
DIOBJECTDATAFORMAT dfAnyAxis = {
    0, // f fCf<fhfJ [fh
    4, // fIfZfbfg
    DIDFT_AXIS | DIDFT_ANYINSTANCE, // ,Ç,ìŽ²,Ä,à,©,Ü,í,È,¢
    0, // 0,Ä,È,—,ê,î,È,ç,È,¢
};
```

ŽY,ìfIfufWfFfNfg Eff [f^ EftfH [f] fbf,ðŽw'è,Ä,Í AfffofCfX,ìXŽ²,ðfffofCfX Eff [f^,Æ,μ,ÄfIfZfbfg12,ÉDWORD,ÄŠi”[,·,é BfffofCfX,É·j ”,ì XŽ²,^¶ Y,·,é ê ± A Ä %o,È—~p%oÄ”\,È,à,ì,“íð,³,ê,é B

```
DIOBJECTDATAFORMAT dfAnyXAxis = {
    &GUID_XAxis, // xŽ²,Ä,È,—,ê,î,È,ç,È,¢
    12, // fIfZfbfg
    DIDFT_AXIS | DIDFT_ANYINSTANCE, // ,Ç,ìxŽ²,Ä,à,©,Ü,í,È,¢
    0, // 0,Ä,È,—,ê,î,È,ç,È,¢
};
```

ŽY,ìfIfufWfFfNfg Eff [f^ EftfH [f]fbf,ðŽw'è,Ä,Í ADirectInput,^ Ä %o,ì—~p%oÄ”\ ,Éf{f^f“,ð'íð,μ A,»,ì¹,ìBYTE,ì ãÊêf^f,ðfffofCfX Eff [f^,Æ,μ,ÄfIfZfbfg16,É'Ê'm,·,é B

```
DIOBJECTDATAFORMAT dfAnyButton = {
    0, // f fCf<fhfJ [fh
    16, // fIfZfbfg
    DIDFT_BUTTON | DIDFT_ANYINSTANCE, // ,Ç,ìf{f^f“,Ä,à,©,Ü,í,È,¢
    0, // 0,Ä,È,—,ê,î,È,ç,È,¢
};
```

```

ŽŸ,İfİfufWfFfNfg Eff [f^ EftfH [f}fbfgŽw'è,Ä,Í A DirectInput,ª Ä %o,İ—~p%oÄ"
,ÈÖFire"ff{f^f“,δ·I'ð,µ A,»,İ'l,İBYTE,İ ãÊfrfbfg,ðffofCfX Eff [f^,Æ,µ,ÄfİftfZfbfg17,É'Ê'm,·,é B
fffofCfX,ÈÖFire"ff{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,³,ê,é'l,^aŠÜ,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,Ñ 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, ^a A Ž², 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, ^a —³ § Ç È, Å, , é ê ± A' Ê^m, ³, ê, é ” í í, í l **Min** = DIPROP RANGE_ NOMIN, ”, æ, Ñ l **Max** = DIPROP RANGE_ NOMAX, Æ, È, é B ” í í, ^a —³ § Ç È, Å, , é f f f o f C f X, Å, í % ñ, è ž, Ý, ^a 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, Ì % ð Ž Ž • û — @ B

lMin

” í í, Ì % ° Ç È B

lMax

” í í, Ì 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,³,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,³,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,Ńf{f^f“,İ ó'Ô,ÉŠÖ,·,éŠg'£ îñ B

dwSize

,±,İ \‘ç'İ,İfTfCfY,đfofCfg ”,ĂŽ',· B

dwFlags

*,±,İ \‘ç'İ,ÉŠi”[³,ê,½ îñ,^a—LÆø,Ă, ,é,©,đŽ',·ftf%ofOı—LÆø,È îñ,đŠÜ,Ü,È,¢—
v'f,İ0,ÉfZfbfg,³,ê,é;^È%°,İftf%ofO,“è^³,ê,Ă,¢,é B*

JOY_RETURNALL

*JOY_RETURNRAWDATA,đ æ,,·,×,Ă,İJOY_RETURN'l,đfZfbfg,·,é,±
,Æ,Æ““™,Ă, ,é;*

JOY_RETURNBUTTONS

*dwButtons—
v'f,É,İ AŠefWf‡fCfXfefBfbfN,İf{f^f“,İ ó'Ô,ÉŠÖ,·,é—
LÆø,È îñ,^aŠÜ,Ü,ê,é B*

JOY_RETURNCENTERED

ŠeŽ²,İ·İÊ,İ'†%o',l,ÉfWf‡fCfXfefBfbfN,İfjf... [fgf%of^Ê'u,đ'u, B

JOY_RETURNPOV

*dwPOV—v'f,É,İ A—£ŽU“İ,È'P^Ê,đ—p,¢
,ĂŽ',³,ê,éŽ<“_fRf“fgf [f<,ÉŠÖ,·,é—LÆø,È îñ,^aŠÜ,Ü,ê,é B*

JOY_RETURNPOVCTS

*The dwPOV—
v'f,É,İ A“A‘±“İ,Ă100•^a,İ1“x,đ'P^Ê,Æ,µ,ĂŽ',³,ê,éŽ<“_fRf“fgf [f<,
ÉŠÖ,·,é—LÆø,È îñ,^aŠÜ,Ü,ê,é B*

JOY_RETURNR

*The dwRpos—v'f,É,İ A—LÆø,Èf%of_ [fyf_f< îñ,^aŠÜ,Ü,ê,é B,±
,ê,İ4”Ô—Ü,İŽ²,“¶ Ý,·,é,±,Æ,đŽ',·;*

JOY_RETURNRAWDATA

*fLfffŠfufÆ [fVf‡f“,³,ê,Ă,¢,È,¢fWf‡fCfXfefBfbfN,İŽwŽ',^a,±
,İ \‘ç'İ,ÉŠi”[³,ê,Ă,¢,é,±,Æ,đŽ',·;*

JOY_RETURNU

*dwUpos—v'f,É,İ AfWf‡fCfXfefBfbfN,İ5”Ô—Ü,İŽ²,^aŽg—p%oÂ”\,Ă, ,ê,
İ A,±,İŽ²,ÉŠÖ,·,é—LÆø,Èff [f^,^aŠÜ,Ü,ê,é B,»,□
,Ă,È,¢ ê ‡,İ0,^aÔ,³,ê,é B*

JOY_RETURNV

*dwVpos—v'f,É,İ AfWf‡fCfXfefBfbfN,İ6”Ô—Ü,İŽ²,^aŽg—p%oÂ”\,Ă, ,ê,
İ A,±,İŽ²,ÉŠÖ,·,é—LÆø,Èff [f^,^aŠÜ,Ü,ê,é B,»,□
,Ă,È,¢ ê ‡,İ0,^aÔ,³,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"ÍÍ,ðŠg'£,µ A,±
,Ì"ÍÍ,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,Ì0,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,Ì0,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,Ì0,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,Ì0,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,ĭrÊ’u B

dwUpos AdwVpos

,»,ê,¼,ê A5”Ô–Ú A6”Ô–Ú,ĭŽ²,ĭrÊ’u B

dwButtons

32,ĭfWf‡fCfXfefBfbfNf{f^f“,ĭĖ» Ý,ĭ óÔ B,±,ĭ—
v’f,ĭ’l,ĭJOY_BUTTONNnflags,ĭ”C”Ô,ĭ’g,Ý ‡,í,¹,ÊfZfbfg,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“,Ê’Š–,.,é B

dwButtonNumber

Ė» Ý%Ÿ,³,ê,Â,ĉ,éf{f^f“—v’f B

dwPOV

Ė» Ý,ĭŽ<“_fRf“fgf [f<,ĭrÊ’u B,±,ĭ—v’f,Ê’ĭ,.,é’l,ĭ0,©,ç35,900,Ü,Â,ĭ”Í’â,Ê, ,é B,±
,ê,ç,ĭ’l,ĭ AŠeŽ<Šp,ð“x’PÊ,Â•\,μ100”{,μ,½,à,ĭ,Â, ,é B

dwReserved1 AdwReserved2

—\–ñ,³,ê,Â,ĉ,é,½,ßŽg—p,μ,È,ĉ B

dwSize—v’f,ĭ’l,ĭ A **joyGetPosEx**ŠÖ ”,É“n,³,ê,é Ũ,É,ĭ A,±,ĭ—v’f,ĭ \“ĉ’ĭ,Ê’ĭ,.,éfo [fWf‡f“”Ô †,ðŽ–Ê,.,é,½,ß,É,à
—p,ĉ,ç,ê,é B

Ž<“_fRf“fgf [f<,ðŽ ,ÂfffofCfX,ĭ,Ũ,Æ,ñ,Ç,ĭ A5,Â,ĭrÊ’u,μ,©Ž ,½,È,ĉ B
JOY_RETURNPOVftf%fo,³fZfbfg,³,ê,Â,ĉ,é,Æ,« A,±,ê,ç,ĭrÊ’u,ĭrÊ%°,ĭJOY_POV’è ”,ð—p,ĉ,Â’Ê’m,³,ê,éj

Ž<“_ÉŠÖ,.,éÊ’u

, Žß

JOY_POVBACKWARD

Ž<“_fnfbfg,³Ėă,ë“□,É, ,é B’18,000,ĭ180.00“x,ĭ•ûĖü,ð•\
,’i

JOY_POVCENTERED

Ž<“_fnfbfg,ĭfj f... [fgf%of^Ê’u,É, ,é B’1-1,ĭ AŽ<“_fn
fbfg,³Šp“x,ð’Ê’m,μ,Â,ĉ,È,ĉ,±,Æ,ð”Ô–i,.,é B

JOY_POVFORWARD

Ž<“_fnfbfg,ĭ’O“□,É, ,é B’10,ĭ10.00“x,ĭ•ûĖü,ð•\, B

JOY_POVLEFT

Ž<“_fnfbfg,ĭ ¶“□,É, ,é B’127,000,ĭ270.00“x,ĭ•ûĖü,ð•\
,. B

JOY_POVRIGHT

Ž<“_fnfbfg,ĭ%ŸE“□,É, ,é B’19,000,ĭ90.00“x,ĭ•ûĖü,ð•\
,. B

Windows 95,ĭffftfHf<fg,ĭfWf‡fCfXfefBfbfNfhf%fofCfo,Â,ĭ AĖ»ŽŽ“_,Â,ĭ,±,ê,ç,ĭ5,Â,ĭ—ĖŽU“ĭ,È•ûĖü,³fTf|
[fg,³,ê,Â,ĉ,é B’è<’,³,ê,½Ž<“_,ĭ’l,μ,©fAfvfŠfP [fVf‡f“,Â—p,ĉ,é,±,Æ,³,Â,«,Ė,ĉ ê ‡JOY_RETURNPOVftf%fo,ð
—p,ĉ,È, –,ê,ĭ,È,ç,È,ĉj¼,ĭ’l,ĭŠp“x,ðfAfvfŠfP [fVf‡f“,Â—p,ĉ,é,±,Æ,³,Â,«,Ė ê ‡—p%ŸÂ”\
,Â, ,ê,ĭA“±“ĭ,Èff [f^,ðJOY_RETURNPOVCTStf%fo,ð—p,ĉ,ÂŽæ“¾,μ,È, –,ê,ĭ,È,ç,È,ĉ
j,Ü,½JOY_RETURNPOVCTStf%fo,ĭ AJOY_RETURNPOVftf%fo,Æ,Æ,à,Ê—p,ĉ,ç,ê,éJOY_POV’è ”,àfTf|
[fg,μ,Â,ĉ,é B

ŽQ Æ @joyGetPosEx

fOf [fɒf•ɪ ”

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_dfDIMouse

, ,ç,©,¶,ß'è<',³,ê,Ä,¢,é**DIDATAFORMAT** \‘¢‘İ,Å Af}}fEfX EfffofCfX,ð<L q,·,é B,±
,İfIfufWfFfNfg,ÍDINPUT.LIBf%ofCfuf%fŠftf@fCf<,Å—^,|,ç,ê,Ä,¢,é B

,±,İ \‘¢‘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'ì,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'Í,·,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 Ý'è,Í A“Á'è,lfIfufWfFfNfg,É'Í,µ,Ä,Æ,¢,²,æ,è,ÍfffofCfX'S'Í,É“K—
p,³,ê,é,l,Â AdwHowftfB [f<fh,ÍDIPH_DEVICE,Â,È,¯,ê,Í,È,ç,È,¢ B

,±,lfvf fpfefB,ÍDIPROPDWORD \‘¢'ì,ð—p,¢
,é BDIPROPDWORD \‘¢'ì,lpdiphftfB [f<fh,ÍDIPROPHEADER \‘¢'ì,Ö,lf|
fCf“f^,Â,È,¯,ê,Í,È,ç,È,¢ BdwDataftfB [f<fh,ÍŽ²f, [fh,ðŠÜ,ð,© A, ,é,¢,ÍŽó,¯Žæ,é,±,Æ,É,È,é B

DIPROPHEADER \‘¢'ì,ldwObjftfB [f<fh,Í0,Â,È,¯,ê,Í,È,ç,, A,±,ê,Í,±
,lfvf fpfefB Ý'è,““Á'è,lfIfufWfFfNfg,Â,Í,È,fffofCfX'S'Í,É“K—p,³,ê,é,±
,Æ,ðŽ',· BdwSizeftfB [f<fh,É,ÍDIPROPDWORD \‘¢'ì,lfTfCfY,ðfZfbfg,µ,È,¯,ê,Í,È,ç,È,¢ B

DIPROPDWORD \‘¢'ì,ldwDataftfB [f<fh,Í^È%°,l'l,l,ð,Æ,Â B

DIPROPAXISMODE_ABS: â'Í À•W,ÂŽ²Ê'u,ð'Ê'm,·,é BŽ²Ú“®,ÍŽžŠÔ,É,Â,¢,Ä—Ýœv,³,ê,é B

DIPROPAXISMODE_REL: Ž²Ê'u,ð'S'Í À•W,Â'Ê'm,·,é BŽ²Ú“®,Í A'O%ñŽ²Ê'u,ð—
v< ,µ,½,Æ,«,«,l ,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'í,µ,Ä,Æ,¢,²,æ,è,ÍffofCfX'S'ì,É“K—
p,³,ê,é,ì,Ä AdwHowftfB [f<fh,ÍDIPH_DEVICE,Ä,È,¯,ê,î,È,ç,È,¢ B

,±,ìfvf fpfefB,ÍDIPROPDWORD \‘¢'ì,ð—p,¢
,é BDIPROPDWORD \‘¢'ì,ìpdiphftfB [f<fh,ÍDIPROPHEADER \‘¢'ì,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 \‘¢'ì,ìdwObjftfB [f<fh,Í0,Ä,È,¯,ê,î,È,ç,, A,±,ê,Í,±
,ìfvf fpfefB Ý'è,““Á'è,ìfIfufWfFfNfg,Ä,Í,È,fffofCfX'S'ì,É“K—p,³,ê,é,±
,Æ,ðŽ',· BdwSizeftfB [f<fh,É,ÍDIPROPDWORD \‘¢'ì,ìfTfCfY,ðfZfbfg,µ,È,¯,ê,î,È,ç,È,¢ B

fAfvfŠfP [fVf±f“,^fffofCfX,©,çfofbftf@ Eff [f^,ð“Ç,Ý,Æ,ç,È,¢ ê ±,É,Í ADIPROPDWORD \‘¢'ì,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,°fffofCfX,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 Afobftf@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,Å,,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,Â,ç,È,ç,±,Æ,É’ ^Ó B

DISCL_EXCLUSIVE

SetCooperativeLevel,Ö,ĺfpf%of [f^,Å A”r¼“IfAfNfZfX,ª•K—v,Å, ,é,±,Æ,δŽ!,· B”r¼“IfAfNfZfX,ª—
^,!,ç,ê,é,Æ Afff of CfX,İ¼,ĺfCf“fXf^f“fX,Í A”FŽ[—],³,ê,Ä,ç
,éff of CfX,Ö,İ”r¼“IfAfNfZfX,Í“¾,ç,ê,È,ç B,µ,©,µ A¼,ĺfAfvfŠfP [fVf‡f“,”r¼“IfAfNfZfX,δ“¾,Ä,ç
,é ê ‡,Ä, ,Ä,Ä,à Afff of CfX,Ö,İ”r¼“I,ÈfAfNfZfX,Í,Ä,È,É<-,³,ê,Ä,ç,é,±,Æ,É’ ^Ó,·,é,±,Æ(u”r¼“I v,Æ,ç
,⊞CEê,Í,±,±,Ä,ÍCEê,Ä,½CE¾,ç%ñ,µ,Ä, ,é,ª ADirectDraw,É,“,é—bŽ—,İŠT”O,Æ”äŠr,·,é,½,ß,ÉŽæ,è ã,°,ç,ê,Ä,ç,é) B

WM_ENTERSIZEMOVE,“,æ,Ñ **WM_ENTERMENULOOP**f fbfZ [fW,δŽó,¯Žæ,Ä,½ Ū,É Af}fEfX, ,é,ç
,ÍfL [f{ [fh Efff of CfX,δ”r¼f, [fh,Å”FŽ[—],·,éfAfvfŠfP [fVf‡f“,Íff of CfX,δ%δ•ú,·,é,±,Æ,δ<,-
„ §,·,é B,³,à,È,ç,Æ Af† [fU,Íf fjf... [‘€ ì,âfEfBf“fhfE,İ^Ú“® EfŠfTfCfY,ª,Ä,«,È,,È,é B

DISCL_EXCLUSIVE,Æ**DISCL_NONEXCLUSIVE**,ì,⊞,¿,Ì,ç,,ê,©,δ**SetCooperativeLevel**,É“n,³,ê,È,¯,ê,Î,È,ç,È,ç B—
¼•û,δ“n,µ,½,è,ç
,,ê,à“n,³,È,ç 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, ,éEfBf“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,Ì'l,Í AŽw'è,³,ê,½ff [f^,“Ši”l,³,ê,Ä,¢,é”z—ñ—
v'f,Ì˙Š˙İ˙Ê˙u,ðŽ˙•Ê˙,˙,é B,»,ÌfIfZfbfg,Ì˙Ê˙u,É, ,éff [f^,Í AfL [f{ [fh,ÌfL [,É˙İ%ž,µ,Ä,¢,é B˙ê”Ê,É A,±
,ê,ç,Ì'l,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

˙ê”Ê“l,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-îó fL [</i> |
| DIK_PRIOR | <i>PgUpfL [</i> |
| DIK_LEFT | <i>¶-îó fL [</i> |
| DIK_RIGHT | <i>%oE-îó fL [</i> |
| DIK_END | <i>EndfL [</i> |
| DIK_DOWN | <i>%o°-îó fL [</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,³,ê Aff [f^,^f}fEfXf{f^f“0,É“K—p,³,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,³,ê Aff [f^,^f}fEfXf{f^f“1,É“K—p,³,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,³,ê Aff [f^,^f}fEfXf{f^f“2,É“K—p,³,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,³,ê Aff [f^,^f}fEfXf{f^f“3,É“K—p,³,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,³,ê Aff [f^,^f}fEfX,İx•ûĖü,İ^Ê’u,É“K—
p,³,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,³,ê Aff [f^,^f}fEfX,İy•ûĖü,İ^Ê’u,É“K—
p,³,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,³,ê Aff [f^,^f}fEfX,İz•ûĖü,İ^Ê’u,É“K—
p,³,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,Ì Ā%“ÊfofCfG,ÍfffofCfX Ef^fCfv,ðŽw’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—Ú,ÌfofCfG,ÍfffofCfX,ÌfTfuf^fCfv,ðŽw’è,·,é B

f}fEfXf^fCfv,ÌfffofCfX,É,Ā,¢,Ă,Í AŽŸ,ÌfTfuf^fCfv,“è<`,³,ê,Ă,¢,é:

DIDEVTYPE_MOUSE_UNKNOWN: fTfuf^fCfv,ðŠm’è,Ā,«,È,¢ B

DIDEVTYPE_MOUSE_TRADITIONAL: ““ “I,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,ÌfffofCfX,É,Ā,¢,Ă,Í AŽŸ,ÌfTfuf^fCfv,“è<`,³,ê,Ă,¢,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 [,Ü,½,ÍMicrosoftfif`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,Ì 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,Ì,»,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,Ì Af{f^f“,ª%Ý,³,è,Ä,¢
,é,Æ,«ÉfAfvfŠfP [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 AfAfvfŠfP [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 AfAfvfŠfP [fVf±f“,ÍfffofCfX,ð”FŽ² ,μ,½¼Æä,É â'Î'Ê'u,ðL^,·,é,×,«Ä, ,é B,±,Ì'l,Í%¼'zÆ
‘—,Æ,È,é B,»,èÊ ~,ÌÆÄ,Ñ 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,Ì 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,Ì,»,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 äª,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 ",•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,ÍfÆfWfXfgfŠ,©,ç,ìfffofCfX îñ,ð X V
,Ä,«,È,¢ B

JOYERR_NOERROR

—v< ,Í ³ í I—¹,μ,½ B

JOYERR_REGISTRYNOTVALID

fÆfWfXfgfŠ,ì,D,Æ,Â^È ã,ìfWf±fCfXfefBfbfNfGf“fgfŠ,É—
³Æø,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—³Æø,Å, ,éi

MMSYSERR_INVALIDPARAM

—³Æø,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,İ•ŽG,Èfvf f_fNfg,È,İ,Ä AfCf“fXfg [f<,à•İŽG,È ì<Æ,ð—v,·,é B,µ,½,^a,Ä,ÄDirectX
3,ðŽè ì<Æ,ÄfCf“fXfg [f<,·,é,×,«,Ä,İ,È,¢ B

,³,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,İ ADirectPlayLobbyIfufWfFfNfg,^afAfvfŠfP [fVf‡f“,ð<N“®,·,é Û,É•K—v,Æ,È,é B

DirectSetup,İ,R,Ä,İAPIŠÖ ”,ð”ö,‘,Ä,¢,é,^a A,»,ì,□,¿fAfvfŠfP [fVf‡f“ŠJ”ŽÒ,É,Æ,Ä,Ä—L%ov,È,İ,Í,Ó,½,Ä,¾,¯,Ä, ,é
B,»,êÈŠO,İ,Ð,Æ,Ä A**DirectXDeviceDriverSetup**,İ ADirectXfffofCfX Efhh%ofCfo,ðfCf“fXfg [f<,µ,æ,□
,Æ,·,é l,İ,½,B,İ,à,İ,Ä A,±,İf}fjf...fAf<,Ä,İÆ¾y,µ,È,¢ B

DirectSetup,İŠT—v

,±,ìfZfNfVf‡f“,Å,Í ADirectSetup,ìfRf“f| [f|f“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,³,ê,éDsetup.dll,ÅŠefAfvfŠfP [fVf‡f“,É'ñ<Ÿ,³,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,^a A,±,ê,Í „ Š,Ä,«„È,¢ B,È,^o,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,İÆ~è A“K Ø,ÈDirectX,İfCf“fXfg [f<,İ3,Â,İ ì<Æ,ð s,□ B,»,µ,Ä”z•z”}‘İ,ÉffBfÆfNfgfŠ,ð ì Ñ,µ AfAfvfŠfP
[fVf‡f“,İ‘Sftf@fCf<,,æ,Ñ•%oÁ,³,ê,½DirectXfRf“f| [flf“fg,ð,±,İffBfÆfNfgfŠ,É’u, BŽŸ,É,±
,ê,ç,İfXfefbfbv,ð à-¾,.,é B

fZfbfgfAfbfv Efvf fOf%of€,İ ì Ñ

fAfvfŠfP [fVf‡f“ EffBfÆfNfgfŠ,İfZfbfgfAfbfv

fZfbfgfAfbfv Efvf fOf%of€,ì ì ~

,±,ìSDK,É“Y•t,³,è,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,è,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, ,éfŠfXfg,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•Í X,.,é B

Dinstall,ìffftfHf<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,«„É,ç B,½,¾,µ Af† [fU,ì,à,ÄfR [fh,ð“ü—Í,.,é,ì,±,ì<@”\,ð•t%ªÄ,.,é,±,Æ,ª,Ä,«„é B,±
,ìfR [fh,ð“ü—Í,.,é é Š,ÍDinstall.cftf@fCf<,É2%º Š ,é,ª 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,ìfpfX,ðŽw”è,.,é B“Ä,É— —R,ª,È,çŒÄ,è A,±
,é,ç,ìf_cCif~fbfNfŠf“fNf%ofCuf%ofŠ A,.,æ,Ñ,±,ìffBfŒfNfgfŠ,ÍŽÄ s—
p(fRf“fpfCf<Œä)Dinstall,Æ““,ìffBfŒfNfgfŠ,É,É,.,é,ì,É,ç,È,ç B,±
,é,ç,ì,.,x,Ä,ìftf@fCf<,.,æ,ÑffBfŒfNfgfŠ,““,ìffBfŒfNfgfŠ,É•Ÿ,.,é é ± 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,í,Ä,Ä,à ADirectXSetup,Í ³ í,É<@”\,.,é,±
,Æ,ª,Ä,«„é B

,½,Æ,.,Í 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,»,é,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,É,ç,Í ADsetup*.dll,.,æ,ÑDirectxffBfŒfNfgfŠ,Ö,ìfpfX,ìfJfŒf“fg EfffBfŒfNfgfŠ,É•Ÿ,.,é,ç,Ä,
,é B

Dinstall.exe,ª, ,éfBfŒfNfgfŠ~ÈŠÖ,ì é Š,ÉDsetup*.dllftf@fCf<,.,æ,ÑDirectxffBfŒfNfgfŠ,ð,.,-
é ± 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,É,.,é,ì,É,ç,È,ç B,³,ç,É ALoadLibrary,.,æ,ÑGetProcAddress,Æ,ç
,ªWin32®,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•Í,µ,ÄÈ%º,ì•Í 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•Í X,.,é B

3

fZfbfgfAfbfv,.,æ,Ñfšfu [fg Ef_cCfAf fOf{fbfNfX,Ä•Ž!,³,è,éfOf%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•Í X,.,é,±,Æ,ª,Ä,«„é B

4 ŽÄ s—pDinstall,É•Í,.,éAfCfRf“,ìfŠf\ [fX Eftf@fCf<,É,.,ç

,Ä,ÍSetup.ico,ŒŒÄ,Í,è ASETUP ICON,ÄŽw”è,³,è,é BŒÄ 1,ìfAfCfRf“ Eftf@fCf<,ì-
¼ ì,ðSetup.ico,Ä,.,é,© A, ,é,ç,ìŒÄ 1,ìfAfCfRf“ Eftf@fCf<,ì¼ ì,É, ,¼,æ,¼,ÉŠf\ [fX Eftf@fCf<,É,.,-
¼ ì,ð•Í X,.,é,±,Æ,ª,Ä,«„é B

5 fIfvfVf‡f“,Æ,µ,Ä AŒÄ 1,ìfAfvfŠfP [fVf‡f“,ðfCf“fXfg [f<.,éffftfHf<fgffBfŒfNfgfŠ,ð•Í 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 ³,µ,½Œã A,»,ê,ç,ðŽÀ s—
pDinstall.exe,ÖfRf“fpfCf<,•,é,±,Æ,^a,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,ªD: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—
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%°,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 ADirectX 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,ı,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,İ,È,ĉ B,»„ê^ÈŠÖ,İ ê ‡,İ A,±,İftf@fCf<,đ•Ö W,μ AĖÂ l,İfZfbfgfAfbfv Efvf fOf%ofĖ–
¼,đ“ü,ê,È,¬,ê,Î,È,ç,ĉ BAutorun.infft@fCf<,ÉŠÖ,·,é Ú ×,È î•ñ,É,Â,ĉ,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

³ í,ÉŽÀ s,³,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,^a,Ä,«,é B

hWnd

efEfBf“fhfE,ìfnf“fhf< B,±,ìfpf%of [f^,^NULL,É,È,Á,Ä,¢,é,Æ AfffXfNfgfbfv,^a 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

³ í,ÉŽÀ s,³,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•ŲŽš—ñ,ÌfAfhfÆfX B,±,Ì•ŲŽš—
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<,³,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•æE³,
,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<,^a,·,Ä,É•Ų Ý,·,é ê ±,Ís—v) B

١٤٩

DIRECTXREGISTERAPP

```
typedef struct _DIRECTXREGISTERAPP {
```

```
    DWORD   dwSize;  
    DWORD   dwFlags;  
    LPSTR    lpzApplicationName;  
    LPGUID   lpGUID;  
    LPSTR    lpzFilename;  
    LPSTR    lpzCommandLine;  
    LPSTR    lpzPath;  
    LPSTR    lpzCurrentDirectory;
```

```
} 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

lpzApplicationName

fAfvfŠfP [fVf‡f“,İ—¼ ì B

lpGUID

fAfvfŠfP [fVf‡f“,İfOf [fof< Ef†fj [fNŽ¯•ÊŽq(GUID) B

lpzFilename

ŒÄ,Ñ o,³,ê,éŽÄ sftf@fCf<,İ—¼ ì B

lpzCommandLine

ŽÄ sftf@fCf<,É‘Î,·,éfRf}f“fhf%ofCf“,Ä,İˆø ” B

lpzPath

ŽÄ sftf@fCf<,İpfX B

lpzCurrentDirectory

fJfŒf“fg EfffBfŒfNfgfŠ,ðŽ!,· B’Ê í,İlpzPath ,Æ““,¶ B

•Ô¹

DirectXSetupŠÖ ”,íÊ%°,ì¹,ð•Ô,· B

DSETUPERR_BADSOURCESIZE

$ftf@fCf<fTfCfY,ð\mathbb{E}\ddot{Y} \varnothing, \mathbb{A}, \ll, \mathbb{E}, \odot, \mathbb{A}, \frac{1}{2}, \odot \text{ } \mathbb{A}\mathbb{E}\ddot{e}, \mathfrak{e}, \mathbb{A}, , \mathbb{A}, \frac{1}{2} \text{ } \mathbb{B}$

DSETUPERR_BADSOURCETIME

$ftf@fCf<, \grave{\imath} \text{“}\acute{u} \cdot t, \text{“}, \mathfrak{a}, \mathbb{N}\mathbb{Z}\mathbb{Z} \quad , \mathfrak{d}\mathbb{E}\ddot{Y} \varnothing, \mathbb{A}, \ll, \mathbb{E}, \odot, \mathbb{A}, \frac{1}{2}, \odot \text{ } \mathbb{A}\mathbb{E}\ddot{e}, \mathfrak{e}, \mathbb{A}, , \mathbb{A}, \frac{1}{2} \text{ } \mathbb{B}$

DSETUPERR_BADWINDOWSVERSION

$\text{DirectX}, \acute{\imath}, \pm, \grave{\imath} fo \text{ } [fWf\sharp f\text{“}, \grave{\imath} \text{Windows}, \mathfrak{d}fTf| \text{ } [fg, \mu, \mathbb{A}, \mathfrak{c}, \mathbb{E}, \mathfrak{c} \text{ } \mathbb{B}$

DSETUPERR_CANTFINDDIR

$fZfbfgfAfbfv \text{ } Efvf \text{ } fOf\%f\mathbb{E}$
 $,^a \text{ } \grave{\imath} \mathfrak{A}ffBf\mathbb{E}fNfgf\mathbb{S}, \mathfrak{d}^{\prime}T, \mu \text{ } o, ^1, \mathbb{E}, \odot, \mathbb{A}, \frac{1}{2} \text{ } \mathbb{B}$

DSETUPERR_CANTFINDINF

$\bullet K \text{---} v, \mathbb{E} \text{ } .inf \text{ } ftf@fCf<, \mathfrak{d}^{\prime}T, \mu \text{ } o, ^1, \mathbb{E}, \odot, \mathbb{A}, \frac{1}{2} \text{ } \mathbb{B}$

DSETUPERR_INTERNAL

$\text{“}\grave{a}\text{”}fGf\%o \text{ } [, ^a\mathbb{N}, \pm, \mathbb{A}, \frac{1}{2} \text{ } \mathbb{B}$

DSETUPERR_NOCOPY

$ftf@fCf<, \grave{\imath} fo \text{ } [fWf\sharp f\text{“}, \mathfrak{d}\mathbb{E}\ddot{Y} \varnothing, \mathbb{A}, \ll, \mathbb{E}, \odot, \mathbb{A}, \frac{1}{2}, \odot \text{ } \mathbb{A}\mathbb{E}\ddot{e}, \mathfrak{e}, \mathbb{A}, , \mathbb{A}, \frac{1}{2} \text{ } \mathbb{B}$

DSETUPERR_NOTPREINSTALLEDONNT

$fVfXfef\mathbb{E}, \grave{\imath} \text{Windows NT}, \grave{\imath} fo \text{ } [fWf\sharp f\text{“}, \acute{E}, \acute{\imath} \text{DirectX } 3fRf\text{“}f|$
 $[flf\text{“}fg, \text{”}\mathfrak{e} \varnothing fCf\text{“}fXfg \text{ } [f<, ^3, \mathfrak{e}, \mathbb{A}, \mathfrak{c}, \mathbb{E}, \mathfrak{c} \text{ } \mathbb{B}$

DSETUPERR_OUTOFDISKSPACE

$fCf\text{“}fXfg \text{ } [f<^{\prime} \dagger, \acute{E}fZfbfgfAfbfv \text{ } Efvf \text{ } fOf\%f\mathbb{E}, ^a ffbfXfN$
 $\text{---} e \text{---} \mathbb{E}, \mathfrak{d}\mathbb{Z}g, \mathfrak{c}\%o\mathbb{E}, \frac{1}{2}, \mu, \frac{1}{2} \text{ } \mathbb{B}$

DSETUPERR_SOURCEFILENOTFOUND

$\bullet K \text{---} v, \mathbb{E} f\backslash \text{ } [fXftf@fCf<, \grave{\imath}, \mathfrak{c}, \grave{\imath}, \grave{\imath}, \mathfrak{D}, \mathfrak{A}, \mathbb{A}, \mathfrak{d}^{\prime}T, \mu \text{ } o, ^1, \mathbb{E}, \odot, \mathbb{A}, \frac{1}{2} \text{ } \mathbb{B}$

DSETUPERR_UNKNOWNOS

$fTf| \text{ } [fg, ^3, \mathfrak{e}, \mathbb{A}, \mathfrak{c}, \mathbb{E}, \mathfrak{c} fo \text{ } [fWf\sharp f\text{“}, \grave{\imath} OS, \mathbb{A}, , \acute{e} \text{ } \mathbb{B}$

DSETUPERR_USERHITCANCEL

$fAfvf\mathbb{S}fP \text{ } [fVf\sharp f\text{“}, ^a\mathbb{S}\text{“}\mathbb{S}, \acute{E}fCf\text{“}fXfg \text{ } [f<, ^3, \mathfrak{e}, \acute{e}^{\prime}O, \acute{E} \text{ } \mathbb{A} \text{Cancel}$
 $f\{f^{\wedge}f\text{“}, ^a\% \mathbb{Y}, ^3, \mathfrak{e}, \frac{1}{2} \text{ } \mathbb{B}$

SUCCESS

$fZfbfgfAfbfv, \grave{\imath} \text{ } ^3 \text{ } \acute{\imath} \text{ } I \text{---}^1 \text{ } \mathbb{B} \text{ } \mathbb{A} \mathfrak{c} N \text{“}\mathbb{R}, \grave{\imath} \bullet K \text{---}$
 $v, ^a, \mathbb{E}, \text{“}, \mathfrak{e}, \acute{\imath} \text{ } A0, ^a\bullet \mathbb{O}, ^3, \mathfrak{e}, \acute{e} \text{ } \mathbb{B}$
 $fZfbfgfAfbfv, \grave{\imath} \text{ } ^3 \text{ } \acute{\imath} \text{ } I \text{---}^1 \text{ } \mathbb{B} \text{ } \mathbb{A} \mathfrak{c} N \text{“}\mathbb{R}, \grave{\imath} \bullet K \text{---} v, ^a, , \mathfrak{e}, \acute{\imath} \text{ } A1, ^a\bullet \mathbb{O}, ^3, \mathfrak{e}, \acute{e} \text{ } \mathbb{B}$

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

’ °

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%oCfo,İfZfbfg B,±
,ê,ç,İfffofCfX Efhh%oCfo,İ Af† [fU,°CD,ðCD-ROMfhf%oCfu,É‘}“ü,µ,½,±,Æ,ðŒŸ’m,·,é i,½,¾,µMS-DOS, ,
é,ç,İÈ·O,İfo [fWf‡f“,İWindows,İfffofCfX Efhh%oCfo,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%oCfu,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•Û—L,·,é,±,Æ,ª,Ä,«é B,±
,İftf@fCf<,İ Û ×,É,Â,ç,Ä,İ AÄutorun.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“®,Û,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.inftf@fCf<,ÍCD,Ìf< [fg EfftBfEfNfgfŠ,É,éfefLfXfgftf@fCf<,Á,é B,±,Ìftf@fCf<,É,Í AfffBfXfN,Á,ÌXf^ [fgfAfbfv EfAfvfŠfP [fVf±f" iftfBfXfN,ðCD-ROMfhf%oCfu,É}:"ü.,é,ÆŽ©"®"I,É"® ì.,éAfvfŠfP [fVf±f" j,Ì-¼ Î,â AWindowsf† [fU EfCf" ^ [ftfFfCfX,É.,ç,ÄAutoPlay"® ì%oÂ",ÈCD,Á,é,±,Æ,ðŽì,·fAfCfRf",šÜ,Ü,è,é B,Ü,½Autorun.inftf@fCf<,É,Í AfVf± [fgfJfbfg Ef fjf... [É%oÂ,½,çfÌfvfVfÜf",Ìf fjf... [fRf}:"fh,àŠÜ,Ü,è,Á,cé B,±,ÌVf± [fgfJfbfg Ef fjf... [Í ACD-ROMfAfCfRf",ðf}fEfX,Ä%oEfNfŠfbfN,·,é,Æ,Žì,³,è,é B

```
[autorun]
open=filename.exe
icon=filename.ico
```

Autorun.inf\ftf@fCf<,É ARISCfvf fZfbfT â,Ã® Ì,µ,Ä,¢,éWindows NT 4.0,ÌfA [fLfefNf`ff“Á—
L,ÌfZfNfVf‡f“,ðŠÜ,ß,é,±,Æ,à,Â,«é B»,Ì,½,ß,É,Í A,»,é,¼,ê,Ì^fCfVf,Ìfvf fZfbfT EfA [fLfefNf`ff,É,í,¹,Ä A,
»,ÌfA [fLfefNf`ff,ÄŽÄ s,µ,½,¢fXf^ [fgfAfbfv EfAfvfŠfP [fVf‡f“,Ìtf@fCf<—
¼,ðŠÜ,ðAutorun.inf\ftf@fCf<,ÉfZfNfVf‡f“,ð‰Ä,¹,é Bx86fA [fLfefNf`ff,É,Í A•W €[autorun] s,ð—p,¢
é BMIPsfA [fLfefNf`ff â,ÄfAfvfŠfP [fVf‡f“,ðŽÄ s,·,é ê ±,É,Í [autorun.mips]
AAlphafA [fLfefNf`ff â,ÌfAfvfŠfP [fVf‡f“,É,Í [autorun.alpha] APowerPCfA [fLfefNf`ff,É,Í [autorun.ppc]
ð—p,¢,é BfRf“fsf...
[f^ EfA [fLfefNf`ff,É,æ,è`Ü,È,éfXf^ [fgfAfbfv EfAfvfŠfP [fVf‡f“,ðŽÄ s,·,éAutorun.inf\ftf@fCf<,Ì Ì ¬
@,Ì—á,ð A`È‰%,ÉŽ,· B

```
[autorun.ppc]
open=filenam4.exe
icon=filename.ico
```

fVFfFf<,Í Å %o,ÉfA [fLfefNf`fffEÅ—
L,ÌfZfNfVfVf±f“,ðf`fFfbfN,·é BfZfNfVfVf±f“,ðE©,Â,¯,ç,ê,È,©,Á,½ ê ±,Í A [autorun] fZfNfVfVf±f“,Ì îñ,ð—~
p,·é BfZfNfVfVf±f“,ðE©,Â,¯,é,ÆfVfFf<,Í¼,ÌfZfNfVfVf±f“,ð,·,×,Ä-³Ž,µ,Ä,µ,Ü,□
,Ì,Ä A,»,ê,¼,ê,ÌfZfNfVfVf±f“,³fA [fLfefNf`ff,Ì,·,×,Ä,Ì îñ,ðŽ ,Ä,Ä,ç,é,±,Æ,ðSm”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–¾,.,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[^] [fgfAfbfv EfAfvfŠfP [fVf‡f“,ìfI [fvf“

AutoPlayCD,ðfhf%oCfu,É‘}“ü,·,é,Æ,·,®,É AfXf[^] [fgfAfbfv EfAfvfŠfP [fVf‡f“,ª—§,¿ ã,ª,é B,±
,ê,É,Í AAutorun.infftf@fCf<,ìopenfRf}

f“fh,É A ,‘¬,Éf [fh,Ä,«é ¬Œ^,ìXf[^] [fgfAfbfv EfAfvfŠfP [fVf‡f“,ðŽw’è,·,é B,»,ìfAfvfŠfP [fVf‡f“,É,Í
AŽÀ s,·,éf^fCfgef<,ì•Ž,âfLfff“fZf< Ef{f^f“,È,Ç,ð”ö,!„Ä,“, B

fofbfNfOf%ofEf“fh,Ä,İf [fh

fXf^ [fgfAfbfv EfAfvfŠfP [fVf‡f“,ª A ^— ,ð‘±,¯,Ä,¢,©,Ç,◻,©,ðf_fCfAf fO Ef{fbfNfX,Å•,-
,Æ Af† [fU,İ’Ê íOK,ðfNfŠfbfN,·,é B,±,İ,Æ,« Af† [fU,ªf{f^f“,ð%Ÿ,·,Û,Å,İŽžŠÔ,ð—
p,µ,Ä AfofbfNfOf%ofEf“fh,ÅfXf^ [fgfAfbfv EfAfvfŠfP [fVf‡f“,İf [fh,ðŽn,ß,é•ÊfXfƎfbfh,ðN“@,³,¹,Ä,“, -
,Æ AŽžŠÔ,ð—LƎø,É—~p,Ä,«,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,^a,,é B,±,±,Â,Ífn [fhfffBfXfN,ð Ɓ-ñ,·,é,½,ℓ,ĭAfhfofCfX,ð,¢,,Â,©◁“,°,é B

fCf“fXfg [f◁—pAfvfŠfP [fVf‡f“,ðŽÀ s,¹,, ACD,©,ç’¼ ÚfAfvfŠfP [fVf‡f“,ðŽÀ s,·,é B

fAfvfŠfP [fVf‡f“,^afn [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,³,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,³,ê,Ä,¢,éf}fjf...fAf◁,ðŽQ Æ,·,é,±,Æ B

fAfvfŠfP [fVf‡f“,^afn [fhfffBfXfNfhf%oCfu,ðff [f^fLfffbfVf...,Æ,μ,Ä—~—p,·,é•K—v,^a,,é ê ‡ Af^fCfg

f◁,Ü,½,ÍfQ [f€,ĭ I—

¹Žž,ÉfLfffbfVf...“à,ĭff [f^,ð ÁŽ,·,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 Bf ŒfWfXfgfŠ,đ•€ İ,.,éAPI,ÉŠÖ,.,é î•ñ,É,Ä,¢,Ä,Í AWin32 SDK,É“Y•t,³,é,Ä,¢,éf}fj...fAf<,đŽQ Œ,.,é,±,Œ B

»i,^a %Šú%» î•ñ,đ“o^,µ,Ä,¢,é,Œ A,»,İ î•ñ,İfŒfWfXfgfŠ,ÉŠi”[,³,é AŒă,©,çŽæ,è o,.,±,Œ,%Œ”\ ,É,È,é BfAfvfŠfP [fVf‡f“,İfŒfWfXfgfŠ’†,İ î•ñ,đŒŒ,Ä A »i,đfCf“fXfg [f<,.,é•K—v,^a ,é,©,Ç,□,©,đŒ^,ß,é,± ,Œ,^a,Ä,«,é B »i,İfŒfWfXfgfŠfGf“fgfŠ,“¶ Ý,µ,È,¢ ê ‡,Í i,Ä,Ü,è »i,^aŽg,í,é,é Ä % ,İ,Œ,« j AfZfbfgfAfbfv,İfİfvfVf‡f“,đ•ê—— ,.,éf_fCfAf fOf{fbfNfX,đ•Ž,³,¹,é B »i,^afŒfWfXfgfŠ,É“o^ İ,Ý,İ ê ‡ A »i,Í,.,Ä,ÉfCf“fXfg [f<,³,é,Ä,¢ ,é,½,ß AfZfbfgfAfbfvİfVfVf‡f“,đ È—^a,Ä,«,é B

fVfXfefŒfŒfWfXfgfŠ,đ•İ X,.,é,Œ Aftf fbfs [ffBfXfN,©,çAutorun.inf@fCf<,đ“Ç,Ý ž,Ü,¹,é,±,Œ,%Œ”\ ,Œ,È,é Bftf fbfs [ffBfXfN,ÄAutoPlay,đ“® İ,³,¹,Ä,àÖ—,İ,È,¢ ,^a AAutorun.inf@fCf<,đCD,É Ä,«t,_,é‘O,İfffofbfO,É,Í—đ—§,Ä BAutoPlay,ÍCD,Ä,¾,“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%°,ÉŽ,_,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,%ŒÖ“®,.,é B,µ,©,µ Aftf fbfs [ffBfXfN ä,ÉfCf“fXfg [f<,³,é,Ä,¢ ,é,Œ,«,Í AAutoPlay,đŽè İŒ,Ä^N“®,µ,È,_,é,İ,È,ç,È,¢ B,±,é,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,^aŠ®—¹,µ,½Œă ANoDriveTypeAutoRun,İ‘l,đ0000 95 00 00 00,ÉfŠfZfbfg,.,é B

d—vž– €

ftf fbfs [ffBfXfN,ÄAutoPlay,đ“® İ,³,¹,é,Œ AfRf“fsf... [f^fEfBf<fX,đŠÈ’P,É– %Œ,,³,¹,é,± ,Œ,^a,Ä,«,Ä,µ,Ü,□ B^”Ê”z•z,³,é,Ä,¢,éftf fbfs [ffBfXfN,ÉAutorun.inf@fCf<,”ü,Ä,Ä,¢ ,½,ç AfEfBf<fX,İ“¶ Ý,đ^,□•K—v,^a ,é B

NoDriveTypeAutoRun‘l,ÉŠÖ,.,é Ú ×,È î•ñ,É,Ä,¢,Ä,Í ANoDriveTypeAutoRun‘l,İfZfbfg,đŽQ Œ,.,é,±,Œ B

NoDriveTypeAutoRun'l,İfZfbfg

fŒfWfXfgfŠ,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,³,ê,éŽí X,İfhf%ofCfu,ð•\,· B,±,İfofCfg,İ %Šú Ý'è,İ0x95,Ä A,± ,ê,İ" FŽ⁻³,ê,È,Œf^fCfv,İfhf%ofCfu,Ä, ,éDRIVE_UNKNOWN ADRIVE_REMOVEABLE,"æ,ŇDRIVE_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,²'10x91,ðŽw'è,·,é,©,İ,Ç,ı,ç,©,ð s,²•K—v,^a, ,é BfŒfWfXfgfŠ'l,İ•İ X-@,ÉŠÖ,·,é î•ñ,É,Ä,Œ ,Ä,İ AfŒfWfXfgfŠ,İŽq—p,ðŽQ Æ,·,é,±,Æ Bfrfbfg Afrfbfgf}fXfN'è " , ,æ,Ňfhf%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 ⁻³ ,ê,È,Œfhf%ofCfu^fC fv B |
| 1 | DRIVE_NO_ROOT_DIR | f< [fgffBfŒfNfgfŠ,"¶ Ÿ,µ,È,Œ B |
| 2 | DRIVE_REMOVEABLE | ffBfXfN,ðfhf%ofCfu(ftf fbfs [ffBfXfN) ,©,çŽæ,èŠO, ¹ ,é B |
| 3 | DRIVE_FIXED | ffBfXfN,ðfhf%ofCfu(fn [fhffBfXfN) ,©,çŽæ,èŠO, ¹ ,È,Œ 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, ³ ,ê,Ä,Œ,é B |

' ~Ö

Windows NT,É,Ä,Œ,Ä,İ A•İ X,ð—LŒø,É,·,é'O,ÉWindows Explorer,ð ÄN"® ,µ,È, ,ê,İ,È,ç,È,Œ B

AutoPlay,İ—} §

CD,ð‘}“ü,·,é Ü,ÉSHIFTfL [,ð%Ÿ,³,!,é,Æ AfffBfXfN ã,İAutorun.inf\tf@fCf<,%ð Í EŽÀ s,³,ê,é,İ,ðŽè ì<Æ,Å—}
§,Å,«,é BWindows NTfo [fWf‡f“4.0,“,æ,ÑWindows 95,ÅInternet Explorerfo [fWf‡f“4.0,ð—p,¢,Ä,¢
,éf† [fU,Í AŽ©“®“I,ÉAutoPlay,ð—} §,·,é,±,Æ,ª,Å,«,é B,±,İ<@”\
,Í AfXf^ [fgfAfbfv EfAfvfŠfP [fVf‡f“,İ†,Åf† [fU,ÉAutorun.inf\tf@fCf<,İ“ü,Á,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<@”\,Í•s—v,Å, ,
é BfXf^ [fgfAfbfv EfAfvfŠfP [fVf‡f“,ªftfHfAfOf%ofEf“fh,É, ,é,Æ,«AutoPlay,ð—}
§,·,é,É,Í A`È%°,İfR [fh,ðfZfbfgfAfbfv %oŠú%o»fR [fh,É%oÁ,!,é B

uMessage - RegisterWindowMessage(TEXT("QueryCancelAutoPlay"));

,»,µ,Ä`È%°,İfR [fh,ðfZfbfgfAfbfv EfEfBf“fhfE Efvf fV [fWff,É%oÁ,!,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 AAutoPlay,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‘Î,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,ð,É,·,é BfXf^ [fgfAfbfv EfAfvfŠfP [fVf‡f“,Í•K—v,É%ž,¶,Ä,»,lMS-DOSfAfvfŠfP [fVf‡f“,l ÄN“@,ðWindows,ÉŽwŽ!,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.inftf@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,³,ê,éftf@fCf<¼,Í Aopen fRf}
f“fh,ÄŽw’è,³,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“ffbfNfX),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,³,ê,Ä,¢,é B Ä ‰
,İfAfCfRf“,İfCf“ffbfNfX,Í0,ÉfZfbfg,³,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“,ìpfX,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,Ñftf@fCf<-
¼ Bftf@fCf<,"fhfLf...f f“fg,ì ê ‡ AWindows,ÍŽw'è,³,è,½fhfLf...
f f“fg,ÉŠÖ`A,Ä,¯,ç,è,½fAfvfŠfP [fVf‡f“,ðN“®,·,é BpfX,ªŽw'è,³,è,Ä,¢
,È,¢ ê ‡ AWindows,ÍCD ä,ìf< [fgffBfÆfNfgfŠ,Äftf@fCf<,ðÆY ò,·,é B‘Š‘îpfX,ðŽw'è,µ,Ä A,»,ìftf@fCf
<,ðfTfuffBfÆfNfgfŠ,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

,±,ìfRf}f“fh,ðŽg—p,µ,ÄfXf^ [fgfAfbfv EfAfvfŠfP [fVf‡f“,ðŠJ,,±
,Æ,Ä Af† [fU,©,ç,ì%oŽ“š,ð,»,ì ê,ÄŽó,¯Žæ,è,é BfXf^ [fgfAfbfv EfAfvfŠfP [fVf‡f“,ì Ú ×,É,Ä,¢
,Ä,Í AfXf^ [fgfAfbfv EfAfvfŠfP [fVf‡f“,ìfI [fvf“,ðŽQ Æ,·,é,±,Æ B

shell

shell=verb

fVf‡ [fgfJfbfg Ef fjf... [,lffftHf<fgfGf“fgfŠ,ð AŽw’è,³,ê,½fJfXf^f€fRf}f“fh,É•İ X,·,é B

verb

fJfXf^f€fRf}f“fh,İ È—ªE` BfJfXf^f€fRf}f“fh,ÍAutorun.inf ftf@fCf<,Å’è<,³,ê,Ä,¢,È,¬,ê,Î,È,ç,È,¢ B
AutoPlay,ÍAutoPlay““® ì%oÂ”,ÈffBfXfN,lffftHf<fgf fjf... [€–Ú,Ä, ,é B

f† [fU,ªCD,ð•\,·fAfCfRf“,ðf_fuf<fNfŠfbfN,·,é,Æ Averb,ÅŽ!,³,ê,éRf}f“fh,ªŽÀ s,³,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%oÂ”\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%oÂ”\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.infftf@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,ŃfXfy [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,ê,é BAutorun.infftf@fCf<,ªCD ã,É•¶ Ý,·,é ê ‡ AWindows,l,»,lftfBfXfN,lAfCfRf“,lVf‡ [fgfJfbfg
Ef fjf... [É AAutoPlay,ðŽ©“@“l,É•t%oÄ,·,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%oÄ,µ A•¶Žš gMÓ,ðfVf‡ [fgfJfbfgfL [,É,·,é ê ‡,É,l A^È%°,ðAutorun.infftf@fCf<,É%oÄ,!,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% ∞ NfVf‡f“ EfŒEfCf,, BfffofCfXŒÅ—
L,İŽÀ‘•,©,çfAvfŠfP [fVf‡f“,đ•ŬŒì,·,é Afn [fhEfFFA,âfffofCfX Efhf% ∞ Cfo,İf fJjfYf€
,É,æ,è \ \neg ,³,ê,é BfAvfŠfP [fVf‡f“,©,ç—v< ³,ê,½<@”\,đŒ» Ý,İfn [fhEfFFA,^aŽÀ‘•,μ,Ä,¢
,È,¢ ê ‡ A,»,İ<@”\,İf\ftfgEfFFA,^afGf~f...fŒ [fg,·,é B

HEL

f_n [fhEfFFA EfGf~f...fŒ [fVf‡f“ EfŒEfCf,, Bfn [fhEfFFA,^afTf| [fg,μ,È,¢<@”\
,İf\ftfgEfFFA Efx [fX,É,æ,éfGf~f...fŒ [fVf‡f“,đ'ñ<Ÿ,·,é B

Zfofbftf@ iz-buffer j

f_V [f“ ã,İšefsfNfZf<,İ [“x,đŠi”[,μ,½fofbftf@ BZ’l,İ \neg ,³,¢fsfNfZf<,ÍZ’l,İ‘â,«,¢fsfNfZf<,đ ã ‘,«,·,é B

,
fAf^fbf` iattach j

•_i ",IDirectDrawSurfaceIfufWfFfNfg,ð AZfofbftf@,É,æ,é3Dfy [fW EftfŠfbfsf"fO,Â•K—v,Æ,³,ê,é,æ,□
,Ê•_i ‡ `c'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< îñ j,Ì—p—@,Ì,D,Æ,Â BfsfNfZf<,Ì"K—
p"ÍÍ,ÉŠİ,Â,¢,ÄGfbfW,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,ð32frfbfg,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,ªt%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@ Efffffl< 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,İs"§—¾"x,ð'è<,·,é¹ B,Ü,½,Í"Æ—§,µ,½fAf<ftf@ EfT [ftfFfX,ÉŠİ"[³,ê,½ AfsfNfZf<—,½,è,İ•s"§—
¾"x¹ B,Ü,½,Í AfT [ftfFfX'S'İ,İs"§—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,Ì"—^Ä,¢•"ª B—¾•",ðŽæ,è'Í,Ý AŽü•Ó,Ì"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,Ì"Á «,ÉŠÖ,í,ç,, AfV [f""S'İ,ð Ä,ç,·EðE¹ BfV [f",Ì
,·,×,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,Ê,Ä,İfV [f",Ä,Í A•_i ",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,©,Ì"Ü,Ê,éf f\fbfh,İ,¢
,,ê,©,ðŽw,· B Ä,à"ê"E"Í,ÉfJf%o [EfXfy [fX,İf^fCfv,Í ARGB,ÆYUV,Ì,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 BftrfFI E\ [fX,İYUVfJf%o [,
©,çffBfXfvfEfC,İRGBfJf%o [,Ö,İ•İŠ,ª"TE^"Í,Ä, ,é B

fI [ffBfI EfXfgfŠ [f€ iaudio stream j

gf~fLfVf"fO,³,ê,½ A,Ü,½,İf~fLfVf"fO,³,ê,é%oÄ"» «,Ì, ,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—İæ B"ê"E"Í,É A•Ž'Í'O,ÉfobfNfobftf@,Öfuf fbfN"']—,³,ê,éfrfbfgf}
fŠ EfT [ftfFfX,İfCf [fW îñ,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—İæ B"ê"E"Í,É 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,^a—p,¢,éDirect3DRMFramefIfufWfFfNfg Bfrf... [f]
[fg,Í AfJf f% EftfĖ [f€,İ³,ìzŽ² ã,Ê, ,é%oÂŽ<fIfufWfFfNfg,¾,¯,ð AyŽ² ã,İ³•ûĖü,ÉfĖf“f_Šf“fO,.,é
B

fJf% [EfL [icolor key j

“Œ–¾Ėø%oÊ,â”¼“Œ–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,³,ê,½ F,ð œ,<éĖ—ÎæfsfNfZf<.,×,Ä,^afuf fbfn“]‘—,³,ê,é B,±
,ê,Ê,æ,Á,Ä A<éĖ',Ä,Ê,¢fXfvf%oCf g,^afT [ftfFfX ã,Ê ì³,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,^a Ä ¶,³,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,^aÄ,«,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^ê”Ê“l,É—~—p,³,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<,^aDirectDrawClipperfIfufWfFfNfg,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,,] W ± B

Ėâ•ûfNfŠfbfv–Ê iback clipping plane j

Ž< 'ä,İ%oœ s,«,İĖÄŠE B,±,İ æ,É, ,éfIfufWfFfNfg,İfĖf“f_Šf“fO,³,ê,È,¢ B

ŽQ Æ @'O•ûfNfŠfbfv–Ê

,³

fT [frfX Efvf fofCf_ iservice provider j

DirectPlay,^a—

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,ÌfR [fh,ð”ð,ĭ,Ā,ċ,é Bf**I**f“f%oCf“ EfT [frfX,àŠÜ,ß,½, ,ç,
ä,é'g D,Í A“Ā%o”,³,é,½fn [fhEfFfA,â'Ê M”’ĭ,ĭ,½,ß,ÌfT [frfX Ef**v**f fofCf_,ð<Ÿ<.,,é,±,Æ,^aĀ,Ā,«^a,é B

fT [ftfFfX isurface j

Ž<ŠofCf [fW,ð•ŮŽ ,.,éf f,fŠ B,μ,ĭ,μ,ĭffBfXfvfĖfC Ef f,fŠ,ðŽw,.,^a AfVfXfefĖ Ef f,fŠ,Ā, ,Ā,Ā,à,æ
,ċ 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,ċ 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,ÌfJfEf“f^ Bf**I**fufWfFfNfg,^a
ĭ -³,é,é,Æ AŽQ ÆfJfEf“fg,ĭĭ,É Ÿ’è,³,é,é BfCf“f^ [ftfFfCfX,^af**I**fufWfFfNfg,ĖĖ<,Ť,Ā, -,ç,é,é,½,Ť,ÉŽQ
ÆfJfEf“fg,ĭfCf“fNfŠf f“fg,³,é A,»,ĭ Ů’±
,^a Ø’f,³,é,é,Æ AŽQ ÆfJfEf“fg,ĭf**I**fNfŠf f“fg,³,é,é BŽQ ÆfJfEf“fg,^a0,É,Ė,Ā,½,Æ,« Af**I**fufWfFfNfg,ĭ’jŠü,
³,é A,»,ĭ**I**fufWfFfNfg,Ŏ,ĭ,.,×,Ā,ĭfCf“f^ [ftfFfCfX,ĭ—Ėø,Æ,Ė,é B

fV [f“ iscene j

%¼’zŠĀ<<,ð \ -³,.,éf**I**fufWfFfNfg‘S’ĭ,ĭZfbfg B%ĀŽ<f**I**fufWfFfNfg AfTfEf“fh AĖð AftfĖ [fĖ
,ðŠÜ,ð BDirect3D,Ā,ĭ Af< [fg EftfĖ [fĖ,ÉŠÜ,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,³,é,½fV [f“,ĭ—š’ĭ BŽ< ‘ä,ĭ’†,É, ,éf**I**fufWfFfNfg,ĭ%ĀŽ< ó’Ŏ,Ā, ,
é B“Ž<“Š%o,Ā,ĭ A’O·ûfNfŠfbfv—Ė,ÆĖä·ûfNfŠfbfv—
Ė,ĭŠŎ,ĭ%¼’z“ĭ,Ėfsf%o~fbfhĖ^,ðŽw,· B·½ s“Š%o,Ė,“,ċ,Ā,ĭ—š·û’ĭ,É,Ė,é B

ŽÀ sfobftf@ iexecute buffer j

3DfV [f“,ð<L q,.,é AŠ@‘S,ÉŽ<ĖĖ“à·iĖ^,ĭ A“Æ—š,μ,½ ĭñfpfPfbfg BŽÀ sfobftf@,É,ĭ AĖä,É—½—
ßfXfgfŠ [fĖ,“±,’,“_,ĭfŠfXfg,“ŠÜ,Ů,é,Ā,ċ,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,^aĖ ĭ,.,éff [f^,©,ç \ -³,é,Ā,ċ,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,ċ,éf f,fŠ BfTfEf“fh‘S’ĭ,ð~“x,Ėfobftf@,É ‘,«,±,ß,é,½,ß A·Ŏ—,Ā, ,é B

fXfefBfbfL [EftfH [fJfX isticky focus j

DirectSound,Ė,“,ċ,Ā Af**I** [f**i** [EfAf**v**fŠfP [fVf‡f“,“ü—ĭftfH [fJfX,ðŽ ,Ā,Ā,ċ,Ė,ċ
,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,ċ
,é,Æ,«,Ā,à AfTfEf“fh Efofbftf@,ð Ā ¶,μ’±, -,é,±,Æ,^aĀ,«,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,ĭŠŎ,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 ‡,^a,é B

fXfgfŠ [fĖ EfTfEf“fh Efofbftf@ istreaming sound buffer j

’,ċfTfEf“fh,ð Ā ¶,.,é,±

,Æ,^aĀ,«,é A -³,ĖfTfEf“fh Efofbftf@ BfAf**v**fŠfP [fVf‡f“,ĭ Af**I** [ffBf**I** Ef**f** [f^,ð Ā ¶,μ,Ė,^aç“@‘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·^a,ĭfT
fEf“fh,ð Ā ¶,.,é,½,ß,ÉŽg—p,.,é,±

,Æ,^aĀ,«,é BfXfgfŠ [fĖ Efofbftf@,ĭ AfXf^fefBfbfN Efofbftf@,æ,è,à,ĭ,é,©,Ė ,Ė,ċf f,fŠ,μ,©·K—
v,Æ,μ,Ė,ċ B

fXfI**fbfgf%oCfg ispotlight j**

%o~ ó,ĭĖð,ð•Ů,ĀĖðĖ¹ B%o~ ,ĭ’†,É, ,éf**I**fufWfFfNfg,¾, -,^a Æ,ç,³,é,é B%o~ ,ĭ,Ŏ,½,Ā,ĭ·P“x,ð ¶ -³,.,é
B’†%o,ĭ—¾,é,ċ”·^a ĭ—¾·” j,ĭf**I**fCf“fgĖðĖ¹,Æ—,¶,«,ð,μ AŽü~ĭ,ĭ—Ā,ċ”·^a ĭ—Ā%o,·” j,ĭ AŽü·Ŏ,ĭ~Ā,ċ%o,Æf}

[fW,³,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 ¶,³,ê,éĈÂ X,İfTfEf“fh,ðŠi”[µ,½•”^a 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,¢,éTfEf“fh,İ^ê•”^a,ðŠi”[.,éLf... [,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,İĈÂŠE B‘O•ûfNfŠfbfv-Ê,æ,è,àfJf f%o,É<ð,Ĉ^Ê’u,É, ,éfIfufWfFfNfg,İfĈf“f_fŠf“fO,³,ê,È,¢ B‘

O•ûfNfŠfbfv-Ê,İ ,,³,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,È,é,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,ê 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,ê,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,ê,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,ê,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,ê,éfefNfXf`ff Bfrf... [f]
[fg,Æ”è`v,µ,½,éœ`,Éfœf“f_Šf“fO,³,ê,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,³,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,^a€» 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”[³,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,©•,³, A<é€`f f,fŠ,Ë,Ç,Æ`á,Â,Äfrfbfgf}fbfv,ÌŽÝ,Ì ü,ÌŽn“_,Ü,Â’B,·,é,Ì,É•K
 —v,Ë•â<`f f,fŠ,ðŠÜ,Ü,Ë,¢ B

fpf%of€f< EflfCf“fg iparallel point j
 fpf%of€f< Ef%ofCf,ÄfIfufWfFfNfg,ð Æ,ç,·€ö€¹,^¾,^a A€ö,Ì€ü,«,Ípf%of€f< Efl
 fCf“fg€ö€¹,ÌÈ`u,©,ç€”è,³,ê,é B,½,Æ,ì,Î Afpf%of€f< EflfCf“fg€ö€¹,Ì—¼`¤,Éf fbvVf...,^a,é ê ± A€ö
 €¹,Ë—Ë,µ,Â,¢,é,Ü,¤,Ìf fbvVf...,^a¾,é,Ë,é B

fpf€fbfg ipalette j
 fIfufWfFfNfg,âfAfvfŠfP [fvf±f“,“Žg—
 p,·,é F,ÌfZfbfg BDirectX,Â,Í ADirectDrawPalettefIfufWfFfNfg,ðŽw,· B

fpf€fbfg Efcf“fffbfNfX ipalette index j
 F,ð’Ìð,·,é,½,ß,Ë—p,¢,ç,ê,é Afpf€fbfg 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,ð€”è,·,é’l B,±
 ,ì’l,“5,Ì,Æ,«,Ìà@“I,ÈŠÖŠÌ,Ë,Ë,è A,»,èÈ ã,Ì,Æ,«,Ì,à,Â,Æ _ç,©,»,¤,ÈŠÖŠÌ,Ë,Ë,é B

”½ŽË“Á « ispecular property j
 €ö€¹,ì”½ŽË,Ë`ì%ö,µ,½€ö,éfIfufWfFfNfg ã,Ì€ö“,^aÇ,Ì,æ,¤
 ,Ë•Žì,³,é,©,ð€”è,·,é A’f p,Ì“Á « B”½ŽË“Á «,Í A’f p,^aÇ,¤€ö,ð”½ŽË,·,é,©€”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•,³,ê,é B

frf... [f| lfg iviewport j
 3DfV [f“,^aÇ,Ì,æ,¤
 ,É2DfEfBf“fhfE,Éf€f“f_Šf“fO,³,ê,é,©,ð`è<,µ,½<€€` B,Ü,½fIfufWfFfNfg,^af€f“f_Šf“fO,³,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< EflfufWfFfNfg,ð`T ò,·,é,±,Æ B

fsfbf` ipitch j
 f f,fŠ,ËŠì”[³,ê,½frfbfgf}fbfv“à,Â A ,é ü,ÌŽn“_,ÆŽÝ,Ì ü,ÌŽn“_,Æ,ðŽì,·,Ó,½,Â,Ì<——
 £ BDirectDraw,Â,Í A,·,×,Â,ÌffBfXfvf€fC Ef f,fŠ,^að,Æ,Â,Ì ü€`fuf fbfn,Æ,µ,Ä”z’u,³,ê,é,Æ,Í€À,ç,Ë,¢
 ,Ì,Â Af f,fŠ Efsfbf`,Æf f,fŠ• ,Ìá,¢,Í d—v,Â,·,é B,½,Æ,ì,Ìé€€,Ìf f,fŠ,Â,Í AffBfXfvf€fC Ef f,fŠ,Ì
 fsfbf`,Ë,Í Afrfbfgf}fbfv• ,É%oÄ,|fLfffbfVf...,Ì`è•”,“ŠÜ,Ü,Ë,é ê ±,^a,é B
 ŽQ Æ @_—

• **±fT [ftfFfX icomplex surface j**
 DirectDrawSurfacefIfufWfFfNfg,Â Af< [fg EfT [ftfFfX,ÉfAf^fbf`³,ê,é,à,Ì,ð,Ü,Æ,ß,ÄŽw,·€ê B•i ±fT [ftf
 FfX `€`ì,Í Af< [fg,“”jŠü,³,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@,ÌfAfhf€fX,ð€ðŠ•,·,évf fZX BŽÀ Û,É,ÍfobfN Efofbftf@,Ìf
 Cf [fW,^aftf f“fg Efofbftf@,É€ðŠ•,³,ê A,»,ê,Ë,æ,Â,ÄfCf [fW,^aŽì,³,ê,é B

ftf€ [f€ iframe j
 fV [f“ ã,Â,ÌfIfufWfFfNfg,Ì”z’u,Ì€³,Ë,Ë,é A”ñ•Žì,Ì`g BfIfufWfFfNfg,Í AŠÖ`A,µ,½ŽQ Æftf€ [f€

,É'Î,·,éóŠÔ“İŠÖEW,ðŽw'è,·,é,±,Æ,É,æ,Á,Ä AfV [f“ ã,É”z'u,³,é,é BfrfWf...
fAf< EfIfufWfFfNfg,Í A,»,İ'Ê'u,âCEü,«,ðftfCE [f€
,©,çŽæ“¾,·,é B,Ü,½ A“®%œ,âfAfjf [fVf‡f““†,İ,Đ,Æ,Â,İfCf [fW,àftfCE [f€,©,çŽæ“¾,³,é,é B

ftf f“fg Efofbftf@ ifront buffer j

ftfŠfbfsf“fO Ef`fF [f“,İ Å %œ,İfofbftf@ B'½,,İ ê ‡ A%œÄŽ< ó'Ô,İfvf%ofCf}
fŠ EfT [ftfFfX,ðŽw,· B,»,□,Ä,È,¢,Æ,«,Í AfefNfXf`ff,İftfŠfbfsf“fO Ef`fF [f“,İ,æ,□
,É A3DfGf“fWf“,“fefNfXf`ff,ðŽæ“¾,·,éft [ftfFfX,İ,±,Æ,Â, ,é B,±,İ ê ‡,İfvf%ofCf}
fŠ EfT [ftfFfX,Ä,İ,È,-
A•Ž!,à,³,é,È,¢ BftfŠfbfsf“fO EfI [fo [fCEfC EfT [ftfFfX,Ä,İftf f“fg Efofbftf@,Í•Ž!,³,é,é,“ A,±
,ê,ÍP,Éfvf%ofCf}fŠ EfT [ftfFfX,ÉfI [fo [fCEfC,³,é,½fT [ftfFfX,É,·,¬,È,¢ B
ŽQ Æ @fvf%ofCf}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,“Ç,İ,æ,□,É ¬ F,³,é,é,©,ðŽ!,·CEW ” B

fufCEf“ffBf“fO Ef, [fh iblend mode j

fefNfXf`ff,“Ç,İ,æ,□,Éf}fbfv æ,İfT [ftfFfX,İ F,Æ ¬ F,³,é,é,©,ðCE”è,·,éAf<fSfŠfYf€ B

fvf%ofCf}fŠ EfT [ftfFfX iprimary surface j

f,fjff^ [ã,É•Ž!,³,é,éCf [fW,ðŠÜ,ñ,¾f f,fŠ—İæ BDirectX,Ä,Í Afvf%ofCf}fŠ EfT [ftfFfX,İfvf%ofCf}
fŠDirectDrawSurfaceIfufWfFfNfg,É,æ,Ä,Ä•\,³,é,é B

fvf%ofCf}fŠ EfTfEf“fh Efofbftf@ iprimary sound buffer j

fQ [f€†,Äf† [fU [,İŽ·,É•,±
,!,é%œ!,ðŽ ,Äfofbftf@ B”è”É,É,İfZfJf“fh Efofbftf@,©,ç,İfTfEf“fh,ðf~fLfVf“fO,·,é,İ,É—p,¢
,é,“ AfJfXf^f€ Ef~fLfVf“fO,â,»,İ’¼,İ“Ä•Ê,È“® İ,ð s,□,½,ß Af_fCfCEfNfg,ÉfAfNfZfX,·,é,±,Æ,à,Ä,«,é B

fvfCEfCf,, iplayer j

DirectPlayZfbfVf‡f“,İŠeŽQ%œÄŽÒ BŠefvfCEfCf,,Í AfvfCEfCf,,ŠÖ,İf fbfZ [fWCEðŠ·,ð%œÄ”\
,É,·,éfvfCEfCf,,ID,ÉŠÖ~A,Ä,¬,ç,é,é B

fvfCEfCf,,ID iplayer ID j

DirectPlayZfbfVf‡f“,İŠeŽQ%œÄŽÒ,ÉŠÖ~A,Ä,¬,ç,é,é†fj [fN,ÈŽ·•ÊŽq BfvfCEfCf,,İ İ -Žž,ÉŠ,,è—
,Ä,ç,é,é BfAfvfŠfP [fVf‡f“,İfvfCEfCf,,ID,ðŽg—p,µ,Ä AfvfCEfCf,,ŠÖ,Äf fbfZ [fW,ðCEðŠ·,·,é,±
,Æ,“Ä,«,é BfzfXfg,É,İ,Ä,È,ÉDPID_SYSMMSGfvfCEfCf,,ID,“Š,,è—,Ä,ç,é,é B

fy [fW EftfŠfbfsf“fO ipage flipping j

ŽQ Æ @ftfŠfbfv

fzfXfg ihost j

DirectPlay,É,·,¢,Ä AID,“DPID_SYSMMSG,Ä, ,é%œ¼‘zfvfCEfCf,, [BfvfXfef€ Ef fbfZ [fW,â AfZfbfVf‡f““†,
İ,·,×,Ä,İfvfCEfCf,, [,É’Ê’m,³,é,é fbfZ [fW,Í AfzfXfg,É,æ,Ä,Ä ^— ,³,é,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“Ä «

•úŽÈ“Ä « iemissive property j

‘f Þ,İ“Ä «,İ,Đ,Æ,Ä B‘f Þ,“CEð,ð•úŽÈ,·,é,©,Ç,□
,©,ðŽ!,· B•úŽÈ“Ä «,Í A‘f Þ,İCEð,İ”½ŽÈ,İ,µ,©,½,ðCE”è,·,é,Ó,½,Ä,İ“Ä «,İ,□,ç,İ,Đ,Æ,Ä,Ä, ,é B
ŽQ Æ @”½ŽÈ“Ä «

—@ üfxNfgf< inormal vector j

—É,İCEü,«,ð’è<·,·,é AfT [ftfFfX,©,ç ,’¼,É,İ,Ñ,é%œËó,İCEð ü B

,Ü

f}fefŠfAf< imaterial j

-Ê,ª,Ç,Ì,æ,ð,ÊÊð,ð”½ŽĚ,·,é,©,ðĈĖˆè,·,é“Á « B‘f Þ,É,Í A•úŽĚ“Á « iĈĖð,ð•úŽĚ,·,é,©,Ç,ð
,© j,Æ”½ŽĚ“Á «,Ì,Ó,½,Â,Ì \ ¬—v‘f,ª, ,é B”½ŽĚ,Ì¬¼,é,³,Í A<“x,Ì Ý’è,É,æ,Á,ĂĈĖˆè,³,é,é B

f~fLfVf“fO imixing j

DirectSound,É,·,¢,Ă A Ā ¶|†,ÌfTfEf“fh Efofbftf@,ð ‡ ¬,µ AĈ<%ĖÊ,ðfvf%oCf}
fŠ EfTfEf“fh Efofbftf@,É ‘,«„±,Þfvf fZfX BfTfEf“fh Efn [fhfEfFfA,ÉfI [ffBfI 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 §ĈĖĀ,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,Ă, ,é
B%ĖĀŽ<fIfufWfFfNfg,ªŠĩ“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,Ă Ā A,æ,è’á%ðð‘æ“x,ÌfCf [fW,ª—p,¢,ç,è,é B

-¼•” iumbra j

fXf|fbfgf%oCf,Ì%~ ó,ÌĈĖð,Ă A‘†%“,Ì¬¼,é,¢•”ª Bf|fCf“fgĈĖðĈĖ¹,Æ“¬,¶“® i,ð,·,é,±,Æ,à, ,é B
ŽQ Æ @^Ā%œ•” AfXf|fbfgf%oCf,Ì%~

f fbVf... imesh j

’P f,Èf|fŠfSf“,Ă•ĈĖ»,³,è,é-Ê,ÌfZfbfg B

-Ê iface j

f fbVf...’†,Ì,Ð,Æ,Ă,Ìf|fŠfSf“ B

f, [fhX iMode X j

fXf^f“f_ [fhVGaf, [fh13,ª¬ŃŸ,·,éfnCfufŠfbfh,ÈffBfXfvfĈfC Ef, [fh B,±
,Ìf, [fh,Ă,Í AVGAfAf_vf^,ÌEGAf}f<f`fvf< EfıffI EfvfĈ [f“ EfVfXfefĈ,É,æ,Ă,Ă iMode 13,ĂŽg—
p,Ă,«„é64K,Ì,©,i,è,É j256K,Ü,Ă,ÌffBfXfvfĈfC Ef f,fŠ,ðŽg,ð,±,Æ,ª,Ă,«„é B

f,ff< Ā•W imodel coordinates j

ŽqftfĈ [fĈ,É‘İ,·,é‘Š‘İ Ā•W B

ŽQ Æ @f__ [f<fh Ā•W

,â

—LĈÛ 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—LĈÛĈĉĈ¹,ÍĈÛ,«,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,İZfbfg,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

