

## DirectX, ě-Ú“Ī

Microsoft DirectX™ Software Development Kit (SDK), Ī AfnfCfpftfH [f}f“fX, ĀfŠfAf<f^fCf€  
, ěfAfvfŠfP [fVf‡f“, đ ŸŒv, ., é, ½, β, ě•K—v, ěfŠf\ [fX, đ’ñ<Ÿ, ., ×, A , I, ěf f...  
[fj}f“fO, đ s, Ā, ½fAfvfŠfP [fVf‡f“fvf fOf%of~f“fO EfCf“f^ [ftfFfCfX(API)fZfbfg, Ā, .é BDirectXfefNfmf  
fW [, Ī AŽŸ Ć’ā, ĪfRf“fsf... [f^fQ [f€, āf}f<f`f ffbfAfAfvfŠfP [fVf‡f“ŠJ”, ě-đ—š, Ā, ¾, ě, □ B

Microsoft, Ī AMicrosoft WindowsfĪfyfŒ [fefBf“fOfVfXfef€, Ā“® ĩ, ., éfAfvfŠfP [fVf‡f“, ĪfpftfH [f}  
f“fX, đ AMS-DOS, āfA [fP [fhfQ [f€<@. Ā“® ĩ, ., éfAfvfŠfP [fVf‡f“, ĪfpftfH [f}f“fX” ě ĩ, ĩ, à, ĩ, ě, μ, æ, □  
, ěDirectX, đŠJ”, μ, ½ BŠæ<, Ā A•W €%», ¾, ě A“K Ø, ě•¶ “%», ¾, ě, ½ AfQ [f€, đ ‘, -  
, ½, β, ĪfĪfyfŒ [fefBf“fOŠĀ««, đ’ñ<Ÿ, ., é, ±, Ā, ě, æ, ě AWindows, Ā, ĪfQ [f€ŠJ”, đ’Ē ĩ, ., é, ½, β, ě A, ±, ĪSDK, ĪŠJ”-  
, ¾, ě, ½, Ī, Ā, ., é B

, ±, ĩ Ī, Ā, Ī ADirectX, đŽg—p, ., é, Ó, ½, Ā, Ī d—v, ě—~“\_đ à-¾, ., é Bf\ftfgfEfffAŠJ”-  
ŽŌ, ĩ, ½, β, Īfn [fhfEfffA”ñěĒ¶ «, ĩ’ñ<Ÿ, Ā Afn [fhfEfffAŠJ”ŽŌ, ĩ, ½, β, ĪfKfCfhf%ofCf“, ĩ Ÿ’è, Ā, ., é B

DirectX WindowsfAfvfŠfP [fVf‡f“ŠJ”, Ī—~“  
fn [fhfEfffAŠJ”, ĩ, ½, β, ĪfKfCfhf%ofCf“, ĩ’ñ<Ÿ

**DirectX Windows AfvfŠfP [fVf‡f“ŠJ”,İ—“\_**

DirectX,İ’æ^ê,İ-Ú“I,Í A ;“úMS-DOS,ÁŽg—p,³,ê,Ä,ç,é<@”\,Ö,ÌEÝŠ· «,ì, ,éfAfNfZfX,đ’ñ<ÿ,µ AMS-DOSfRf“f\ [f<fx [fX,ÌfAfvfŠfP [fVf‡f“•Ä,Ý, ,é,ç,Í,»„êÈ ã,ÌfpftfH [f} f“fX,đ o,³,¹ A,»„µ,Äfp [f\if<fRf“fsf... [f^,É,“; ,éfn [fhfEfFfA<Z pŠv V,Ì áŠQ,đŽæ,è æ,,±,Æ,Ä, ,é B

Microsoft,Í AWindowsfx [fX,ÌfAfvfŠfP [fVf‡f“É ACE» Ý,»„µ,Ä «—^,ÌfRf“fsf... [f^fVfXfef€ ã,Ä—p%oÄ”\,Èfn [fhfEfFfA,Ö,ÌfnfCfpftfH [f}f“fX,ÁfŠfAf<f^fCf€,ÈfAfNfZfX,đ’ñ<ÿ, : ,é,½,ßDirectX,đŠJ”- ,µ,½ BDirectX,Í AfCf“fXfg [f<,âfRf“ftfBfMf... f€ [fVf‡f“„Ì”İŽG,³,đE,,ç,µ Afn [fhfEfFfA,Ì’ Š,đ Á’âEÀŠ^,©,µ,È,ª,ç Afn [fhfEfFfA,ÆfAfvfŠfP [fVf‡f“, Æ,ÌŠÖ,É^êŠÑ,µ,½fCf“f^ [ftfFfCfX,đ’ñ<ÿ,µ,Ä,ç,é B

fnfCfpftfH [f}f“fX,ÈWindowsfx [fX,ÌfQ [f€,Í A^È%°,ÌfefNfmf fW [,đ—~—p,µ,Ä,ç,é B

fpftfH [f}f“fX€ü ã,Ì,½,ß“Á•Ê ÝE v,³,ê,½fAfNfZf%of€ [f^fJ [fh fvf%ofOfAf“fhfvf€fC,Æ A’¼,ÌWindowsfn [fhfEfFfA,âf\ftfgefFfA DirectPlay,đŠÜ,Đ AWindowsfrf<fgfCf“,ÌÊ MfT [frfX

**fn [fhfEFAŠJ",ì,½,B,ìfKfCfhf%oCf",ìñ.ÿ**

Microsoft,°DirectX,ðŠJ",µ,½,Æ,«,ì'æ^ê,ì-Ú"l,ì,ð,Æ,Á,Í AWindowsIfyfCE [fefBf"FOŠÁ««,Á,ìfQ [f€ŠJ"-  
,ì'É i,¾,Á,½ BDirectX"È"O,Í Afp [f\fi\<fRf"fsf... [f^—p,ÉŠJ",¾,ê,½fQ [f€,Ìžâ—,ìMS-  
DOSfx [fX,¾,Á,½ B,»è,ç,ìfQ [f€,ìŠJ"ŽÖ,Í A,¾,Û,Û,ÈfJ [fh,ì "½,çfn [fhfEFAŽÀ"•,É ]  
,í,È,¯,ê,ì,È,ç,È,©,Á,½ B,µ,©,µDirectX,Á,Í AfQ [f€ŠJ"ŽÖ,Í Afn [fhfEFA,Ö,ìf\_CfCEfNfgfAfNfZfX,ì—  
~"\_,ðž,¾,±,Æ,È, Af\fofCfX"ñ"È"¶ «,Æ,ç,ç—~"\_,¾,ç,è,é,ì,Á, ,é B

,à,µ,ð,Æ,Á,ì d—v,È-Ú"l,Í Afn [fhfEFA%oiŽĐ,È,ì,µ AfnfCfpftfH [f}f"fx,ÈfAfvfŠfP [fvf±f",ìŠJ"-  
ŽÖ,âfn [fhfEFAfxf"f\_ [(IHV),©,ç,ìftfB [fhfofbfN,ÉŠì,Á,ç,½fKfCfhf%oCf",ð'ñ<ÿ,·,é,±,Æ,Á, ,é BDirectX  
SDKfRf"f [f\ffg,Í ACE%oÈ,Æ,µ,Á,Û,¾¶¶ Ý,µ,È,çfn [fhfEFAfNfZf%oCE [f^<@",ìžd—l,ð'ñ<ÿ,·,é,±  
,Æ,È,È,é,©,à,µ,è,È,ç B'½,ì ê ±,Á,Í Af\ftfgEFA,»è,ç,ì<@",ðfGf~f...  
fCE [fg,·,é B,»è,ÈŠO,Á,Í Af\ftfgEFA,Ífn [fhfEFA,È,ì,µ,»è,ì"l—Í,È,Á,ç,Á-â,ç ±,í,¹ A,à,µfTf [fg,¾,è,Á,ç  
,È,¯,è,ì-¾ž<,·,é,Æ,ç,µ,±,Æ,È,È,é B

«B Xžg—p%oÁ",È,È,é,Á, ,è,µffBfXfvfCEfCfn [fhfEFA<@",Í A^È%°,ðŠÛ,ñ,Á,ç,é B

fi [fo [fCEfC Bfy [fW EftfŠfbfsf"fo,ðfOf%oftfBfbfNffofCfXfCf" f^ [ftfCfX(GDI)fEfBf"fhfE"à,Á%o  
Á",È,·,é,½,ß,ÈfTf [fg,¾,è,é,¾,è,µ Bfy [fW EftfŠfbfsf"fo,Í AfXfNfŠ [f""S'ì,È, ,éftfCE [f€,ð•ž,·,é,½,ßžg  
—p,¾,è,é,è\_fuf<ofobftf@ EfXfL [f€,Á, ,é B

fXfvf%oCfGfG"fwf" BfXfvf%oCfG,ðfi [fo [fCEfC,¾,¹,é,±,Æ,ð—e"Ö,È,·,é B

•ãšÖ,È,æ,é L'· B -¾,çftfCE [f€,Á,àfXfNfŠ [f""S'ì,ÈftfBfbfg,·,é,æ,µ  
,Éšg'ã,·,é,½,ß AfffBfXfvfCEfCf f,fš,ðCEø—"l,È ß-ñ,·,é B

fAf<ftf@ EfufCE"ffBf"fo Bfn [fhfEFAfNfZf<,ìfCEfxf<,Á F,ð ¬ ±,·,é B

fp [fX,¾,³ Šm,ÈfefNfXf"ff,ðž ,ÁžžYCE³(3D)fAfNfZf%oCE [f^ B3D,ì-  
È,ÈfefNfXf"ff,ð"ž,Á,«é B,½,Æ,ì,Í A3Df\ftfgEFA,Á ¶ ¬,µ,½ é,ìCE°šÖ,È Afp [fX,ð ¾Šm,È•Û,Á,½,Û,  
Û—ùšç•çf\fbfgf)fbfv,ìfefNfXf"ff,ð",é,±,Æ,¾,Á,«é B

Zfobftf@,ð l—¶,È"ü,è,½3DfOf%oftfBfbfN,ìfuf fbfn"j— B

•W €2f fKfOfCfG(MB),ìffBfXfvfCEfCf f,fš B"è"È"l,È A3DfQ [f€,È Á'áCEÀ•K—v,Æ,¾,è,é B

¾ kZ-@,ì•W € BffBfXfvfCEfCf f,fš,È,æ,è'½,,ìff [f^,ðŠì"l,Á,«é,æ,µ,È,·,é B,±,ì•W €  
,Í Af\ftfgEFA Afn [fhfEFA'o•ù,ÈžÁ'•,¾,è,è,ì,½,ç,Ö,ñ ,'-,È,È,é,¾,è,µ BfefNfXf"ff,Éžg—  
p,¾,è A"§%oß¾ k,ðšÛ,b B

«B Xžg—p%oÁ",È,È,é,Á, ,è,µfi [ffBfIfn [fhfEFA<@",Í A^È%°,ðŠÛ,ñ,Á,ç,é B

~Û,È,è%o¹,ð3D<óšÖ,È"z'u,·,éfn [fhfEFA,ÆfGf"fnf"FT B

fi [ffBfIf { [fh,ìIf"ff { [fhf f,fš B

fIf"ff { [fhf f,fš,ðç—L,·,é AfI [ffBfI Ef\ffI EfRf"frI [fvf±f"ff { [fh B

%oÁ,¾,Á A «—,ìDirectXÈÝš·fn [fhfEFAfAfNfZf%oCE [f^,È,æ,è AfrffI Ä ¶,à%o¶CEb,ðžó,¯,é,¾,è,µ B «—  
^fšš [fX,¾,è,èDirectX,ì"è<@",Æ,µ,Á AYUVf\ffI,ì"WSJfn [fhfEFAfAfNfZf%oCE [fvf±f"ff"ffTf  
[fg,¾,è,é,¾,è,µ B

## DirectX SDK

,±,ìfZfNfVf±f“,Á,Í ADirectX SDK,Æ,¢,,Á,©,ìDirectXŽÀ‘,ì Ú ×,ðL q,·,é B`È%°,ìfgfsfbfN,É,Á,¢,Ä à-¾,·,é B

DirectX SDKfRf“f|\_ [f|f“fg

f}fNf `èc`ìŽq-p



**f}fNf 'è',İŽg—p**

DirectXfCf“f^ [ftfFfCfX,İfwfbf\_ftf@fCf<,İ½,,Í AŞef f\fbfh,İf}fNf 'è',ðŠÜ,ñ,Á,¢,é B,±,ê,ç,İf}  
fNf ,É,æ,è Afvf fOf%of~f“fO,Áf f\fbfh,ðŽg—p,.,é,İ,ª—eˆÖ,É,È,é B

ˆÈ%º,İ—á,Á,Í A **IDirectDraw2::CreateSurface** f\fbfh,ðCE,Á,Ô,½,ß**IDirectDraw2\_CreateSurface**}fNf ,ðŽg—  
p,µ,Á,¢,é B Á %º,İpf%of [f^,Í ADirectDrawfIfufWfFfNfg,Ö,İŽQ Æ,Á, ,é B

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

f}fNf 'è',“fTf| [fg,.,éf f\fbfh,İCE» 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“,Á,Í AfRf“f| [flf“fg EfIfufWfFfNfg Ef,fff<(COM)

,Æ ACOM,ìfIfufWfFfNfg,“,æ,ÑfCf“f^ [ftfFfCfX,ÌŽÀ‘,É,Â,ç,Ä<L 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,Á,ÌCOMfIfufWfFfNfg,Ö,ÌfAfNfZfX

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

fRf“f| [flf“fg EfIfufWfFfNfg Ef,ff<

DirectX SDK,ì'â'”•ª,ìAPI,Í ACOM,ÉŠì,Ä,-  
flfufWfFfNfg,¨,æ,ÑfCf“f^ [ftfFfCfX,©,ç \ ¬,³,ê,é BCOM,Í AfCf“f^ [ftfFfCfX,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^ [ftfFfCfX,ð,c,,Ä,Ä,à \z,Ä,«„é,æ,²,ÉfCf“f^ [ftfFfCfXZd—l,Ä,à, ,é BCOM,Í AOSf€fxf<,Ä,ìflfufWfFfNf  
gf,ff<,È,ì,Ä, ,é B

½,,ìDirectX  
API,Í AOLEfIfufWfFfNfg,ì W ‡,Æ,µ,ÄfCf“fXf^f“fX%»,Ä,«„é BflfufWfFfNfg,Í Afn [fhfEFA,ð•\  
,µfCf“f^ [ftfFfCfX,ð'È,µ,ÄfAfvfŠfP [fvf‡f“,Æ'È M,·,é•K—v,ì, ,éfuf%ofbfNf{fbfNfX,Æ l,|,é,±  
,Æ,ª,Ä,«„é BCOMfCf“f^ [ftfFfCfX,ð'È,µ,ÄflfufWfFfNfgŠÖ,ÄŽó,~“n,µ,³,ê,éfRf}  
f“fh,Íf f\fbfh,ÆE¾,i,ê,é B,½,Æ,!,ì AfIfBfXfvf€fCfAf\_fvf^,ìE» Ý,ìffBfXfvf€fCf, [fh,ðŽæ“¾,·,é,½,ß A  
DirectDrawflfufWfFfNfg,©,çIDirectDraw2::GetDisplayModef f\fbfh,ªIDirectDraw2fCf“f^ [ftfFfCfX,ð'È,µ,Ä‘—  
,ç,ê,é B

flfufWfFfNfg,Í AŽÀ sŽž,É'¼,ìflfufWfFfNfg,ÆfOfCf“fh,Ä,« A¼,ìflfufWfFfNfg,ªñ•Ý,·,éfCf“f^ [ftfFfCfX,ð  
ŽÀ'•,µ,ÄŽg—p,Ä,«„é BflfufWfFfNfg,ªOLEfIfufWfFfNfg,Ä, ,è A,»,µ,Ä,»,ìflfufWfFfNfg,ªfTf|  
[fg,·,éfCf“f^ [ftfFfCfX,ª,i,©,ê,ì AfAfvfŠfP [fvf‡f“(Ü,½,Í¼,ìflfufWfFfNfg),Í A Ä %  
,ìflfufWfFfNfg,ªŽÀ s,Ä,«„éT [frfX,ðE“è,·,é,±,Æ,ª%Ä”,Ä, ,é B  
QueryInterface f\fbfh,Í AOLEfIfufWfFfNfg,·,×,Ä,ªEp ³,·,éf f\fbfh,ì,Ð,Æ,Ä,¾,ª A,±,ê,É,æ,è A, ,éfIfufWfFf  
Nfg,ªfTf| [fg,·,éfCf“f^ [ftfFfCfX,ðE“è,Ä,«„é B,»,ê,ç,ìfCf“f^ [ftfFfCfX,Ö,ìf|Cf“f^,ì,±  
,ìf f\fbfh,Ä ì ¬,·,é B Ú × îñ,Í AIUnknownfCf“f^ [ftfFfCfX,ðŽQ Ä,·,é,±,Æ B

**IUnknownfCf“f^ [ftFfCfX**

COMfCf“f^ [ftFfCfX,Í,·,×,Ä AIUnknown,ÆCEÄ,Î,ê,éfCf“f^ [ftFfCfX,©,ç“± o,³,ê,é B,± ,ÏfCf“f^ [ftFfCfX,Í AfIfufWfFfNfg,ÏŽö-½,Ï §CEä,â½ dfCf“f^ [ftFfCfX,ð‘€ ì,·,é,é@“\ ,ðDirectX,É’ñ<ÿ,·,é BIUnknown,Í A,R,Â,Ïf f\fbfh,ðŽ ,Â B

**AddRef**,Í AfCf“f^ [ftFfCfX A,Û,½,Í¼,ÏAfAvfŠfP [fVf‡f““,»»,éŽ© g,ðfIfufWfFfNfg,ÆfofCf“fh,µ,½,Æ,« AfIfufWfFfNfg,ÏŽQ ÆfJfEf“fg,ðfCf“fNfŠf f“fg,·,é B

**QueryInterface**,Í AŽw’è,µ,½fCf“f^ [ftFfCfX,Ö,Ïf|fCf“f^,ð—v< ,·,é,±,Æ,É,æ,è AfIfufWfFfNfg,³fTf| [fg,·,é@“\,É,Ä,ç,Ä Æ%öi,·,é B

**Release**,Í AfIfufWfFfNfg,ÏŽQ ÆfJfEf“fg,ðffNfŠf f“fg,·,é BfJfEf“fg,³0,É,È,Á,½,Æ,« AfIfufWfFfNfg,Í%öü,³,ê,é B

**AddRef,ÆRelease**,ÏŽQ ÆfJfEf“fg,ðf f“fefif“fX,·,é B,½,Æ,Ï,ÏDirectDrawSurfacefIfufWfFfNfg,ð ì ¬,·,é,Æ AfIf ufWfFfNfg,ÏŽQ ÆfJfEf“fg,Í1,É Ý’è,³,ê,é BŠÖ ”,³fIfufWfFfNfg,ÏfCf“f^ [ftFfCfX,Éf| fCf“f^,ð·Ö,·,½,Ñ AŽQ ÆfJfEf“fg,ðfCf“fNfŠf f“fg,·,é B,»»,ÏŠÖ ”,Í·Ö,µ,½f| fCf“f^,ð’È,µ,ÄAddRef,ðCEÄ,Ñ o,³,È,¯,ê,Ï,È,ç,È,ç B,Û,½AddRef,ÏŠeCEÄ,Ñ o,µ,É,ÍRelease,ÏCEÄ,Ñ o,µ,ð’Ï%ž,³,1,È,- ,Ä,Í,È,ç,È,ç Bf|fCf“f^,ð”jŠü,³,ê,é‘O,É A,»»,Ïf|fCf“f^,ð’È,µ,ÄRelease,ðCEÄ,Ï,È,¯,ê,Ï,È,ç,È,ç,Ï,Ä, ,é BfIfufWfFfNfg ,ÏŽQ ÆfJfEf“fg,³0,É,È,é,Æ AfIfufWfFfNfg,Ï”jŠü,³,ê A,·,×,Ä,ÏfCf“f^ [ftFfCfX,Í-³CEø,Æ,È,é B

**QueryInterface**,Í AfIfufWfFfNfg,³Žw’è,³,ê,½fCf“f^ [ftFfCfX,ðfTf| [fg,·,é,©,Ç,µ ,©E“è,·,é BfIfufWfFfNfg,³fCf“f^ [ftFfCfX,ðfTf| [fg,µ,Ä,ç ,é ê ‡ A**QueryInterface**,Í A,»»,ÏfCf“f^ [ftFfCfX,Ö,Ïf| fCf“f^,ð·Ö,· B,·,é,ÆfIfufWfFfNfg,Æ’È M,·,é,½,ß,ÉfCf“f^ [ftFfCfX,ðŽ ,Äf f\fbfh,³Žg— p,Ä,«»,é BfCf“f^ [ftFfCfX,Ö,Ïf| fCf“f^,ð·Ö,·,Ï,É -CE÷,·,é,Æ A**QueryInterface**,Í AŽQ ÆfJfEf“fg,ðfCf“fNfŠf f“fg,·,é,×,- ^Ä,ÉAddRef,ðCEÄ,Ö B,»»,Ï,½,ßfAvfŠfP [fVf‡f““,Í AfCf“f^ [ftFfCfX,Ö,Ïf| fCf“f^”jŠü,·,é‘O,É AŽQ ÆfJfEf“fg,ðffNfŠf f“fg,·,é,×,Release,ðCEÄ,Ï,È,¯,ê,Ï,È,ç,È,ç B

**IUnknown::AddRef**

ULONG AddRef ();

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

V, µ, ĆŽQ 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, ÌfCf“f^ [ft fFfCfX, ðŽæ“¾, ·, é, © AAddRef f\bfbh, ðCEÄ, Ñ o, ·, ½, Ñ, Ê AfIfufWfFfNfg, ÌŽQ ÆfJfEf“fg, ÍfCf“fNfŠf f“fg,³, ê, é BfIfufWfFfNfg, ÌŽQ ÆfJfEf“fg, ðffNfŠf f“fg, ·, é, É, ÍRelease f\bfbh, ðŽg—p, ·, é, ±, Æ B

, ±, Ìf\bfbh, Í AfIfufWfFfNfg, É, æ, Á, ÄEp ³,³,ê,é, IUnknown fCf“f^ [ftfFfCfX, Ì1•, Å, , é B

**IUnknown::QueryInterface**

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

fIfufWfFfNfg,“Á’è,ÌCOMfCf“f^ [ftFfCfX,ðTf| [fg,µ,Ä,¢,é,©,Ç,µ,©E^è,.,é BfTf| [fg,µ,Ä,¢ ,é ê ‡ AfVfXfef€  
 ,ÍfIfufWfFfNfg,ÌŽQ ÆfJfEf“fg,ð’ ,â,µ AfAfvfŠfP [fVf‡f“ ,Í,½,¾,¿,É,» ,ÌfCf“f^ [ftFfCfX,ðŽg—p,Ä,« ,é B

ÆÄ,Ñ o,µ,ª -E÷,µ,½ ê ‡ AS\_OK,ð•Ö,· BCEÄ,Ñ o,µ,ªŽ,”s,µ,½ ê ‡ Af f\fbfh,Í AE\_NOINTERFACE,Ü,½ ,ÍÈ%°,ÌfCf“f^ [ftFfCfXÆÄ—L,ÌfGf% [‘l,Ì,Ð,Æ,Ä,ð•Ö,· BfCf“f^ [ftFfCfXÆÄ—L,ÌfGf% [‘l,Í AfRf“f| [flf“fg’P’È,ÄfŠfXfg,³,è,é B

DirectDraw

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

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

DirectSound

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

**DSERR\_INVALIDPARAM**

DirectPlay

**DPERR\_INVALIDOBJECT**

**DPERR\_INVALIDPARAMS**

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

riid

—v< ,³,è,½fCf“f^ [ftFfCfX,ÌŽQ ÆŽ~•ÈŽq B

obp

Æ%öi,ª -E÷,µ,½ ê ‡ AfCf“f^ [ftFfCfXf|fCf“f^,ª•Ö,³,è,é|fCf“f^,ÌfAfhfÆfX B

,±,Ìf f\fbfh,ðEÄ,Ö,±,Æ,ÄŽæ“¾,µ,½fCf“f^ [ftFfCfX,ª•—  
 v,É,È,Ä,½ ê ‡ AfAfvfŠfP [fVf‡f“ ,Í AfCf“f^ [ftFfCfX,ð%ð•ú,.,é,½,B,ÉRelease f\fbfh,ðEÄ,Ñ o,••K—v,ª ,é BQueryInterface f\fbfh,É,æ,è AMicrosoft,ÆfT [fhfp [fefB,Í ACE»‘¶, ,é,¢,Í «—^,Ì<@”\,ÆŠ± Ä,.,é,±,Æ,È,- fIfufWfFfNfg,ðŠg’£,Ä,« ,é,æ,µ,È,é B

,±,Ìf f\fbfh,Í AfIfufWfFfNfg,É,æ,Ä,ÄEp ³,³,è,éIUnknownfCf“f^ [ftFfCfX,Ìê•”,Ä, ,é B

**IUnknown::Release**

ULONG Release();

fIfufWfFfNfg, ĹŽQ AfJfEf“fg, đffNfŠf f“fg, ·, é B

V, μ, ĆŽQ AfJfEf“fg, đ•Ō, · B

ŽQ AfJfEf“fg, °0, É, È, Á, ½, Æ, « AfIfufWfFfNfg, ĹŽ©•Ž© g, đ%đ•ú, ·, é BfIfufWfFfNfg, ĹŽQ AfJfEf“fg, đfCf“fNfŠf f“fg, ·, é, Ĺ, Ĺ AddRef f\fbfh, đŽg—p, ·, é, ±, Æ B

, ±, Ĺf f\fbfh, Ĺ AfIfufWfFfNfg, É, æ, Á, ÄĈp ³,³, ê, é Unknown Cf“f^ [ftfCfX, Ĺê•”, Å, , é B

**DirectX COMfCf“f^ [ftFfCfX**

DirectX SDK,lfCf“f^ [ftFfCfX,Í ACOMfvf fOf%of~f“fOŠK‘w,Ì”ñ í,ÉŠî-{"I,ÈfCfxf<,Á ì ¬,³,ê,½ B  
**IDirectDraw2 AIDirectSound AIDirectPlay**,Æ,¢,Á,½ AfffofCfX,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,ÌŠî-{"fIfufWfFfNfg,Ì ì ¬,Í ACOMfIfufWfFfNfg ì ¬,É^ê”Ê,É—p,¢  
,ç,ê,éWin32,Ì**CoCreateInstance**ŠÖ ”,æ,è,Í,Ð,µ,è AŞefIfufWfFfNfg,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 AŞefffofCfX,É,Ð,Æ,Á,ÌŽâ—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,ì,Í ADirectDrawfIfufWfFfNfg,Í AfffBfXfvfCfCfAf\_fvf^,ð\,µ,Ä,¢,é B,±,lfIfufWfFfNfg,ð—  
p,¢ AftfBfXfvfCfCf f,fŠ,ð\,·DirectDrawSurfacefIfufWfFfNfg,ð Afn [fhEfFfAfpfCfbf,ð\  
,·DirectDrawPalettefIfufWfFfNfg,ð ì ¬,·,é,±,Æ,ª,Á,«,é B“—  
l,É ADirectSoundfIfufWfFfNfg,ÍfI [ffBfIfJ [fh,ð\,µ A,»,lfJ [fh ã,ì%¹CE¹,ð\  
,·DirectSoundBufferfIfufWfFfNfg,ð ì ¬,·,é B

%o^ÊfIfufWfFfNfg ¶ ¬,Ì”\—Í,É%oÁ,¡ AŽâ—  
v,ÈfffofCfXfIfufWfFfNfg,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 [fhEfFfAfffofCfX,Ì”\—Í,ðCE”è,·,é B

C++,ÆCOM,İfCf“f^ [ftfFfCfX

C++fvf fOf%of},É,Æ,Ä,Ä ACOMfCf“f^ [ftfFfCfX,Í AŠ ŮŠî-{fNf%ofX,ÉŽ—,Ä,¢ ,é B,·,È,í,ç AfVfOfIf`ff,ÆfZf) f“fefBfbfNfX,ð`èç`·,é,ª AŽÄ`·,Í`èç`¹, AfXfe [fg,Ìff [f^,ðfCf“f^ [ftfFfCfX,ÉŠÖ`A,Ä,¯,È,ç,Ì,Ä, ,é BC++ ,ÍŠ ŮŠî-{fNf%ofX,Ä,Í A, ,ç,ä,éf f\fbfh,Í AŠÖ`A,·,éfR [fh,ðŽ ,½,È,¢,Æ,¢,øÖ- j,Ä A f ~%¼'z,Æ,µ,Ä`èç`³,è,é B

f ~%¼'zC++ŠÖ ”,ÆCOMfCf“f^ [ftfFfCfX,Í A,Æ,à,ÉVfe [fuf<,ÆÆÄ,Í,è,éfffofCfX,ð—p,¢ ,é BVfe [fuf<,Í A—^,¡,ç,è,½fCf“f^ [ftfFfCfX,ðŽÄ`·,·,éŠÖ ”,·,×,Ä,ÌfAfhfÆfX,ðŽ ,Ä B,±,è,ç,ÌŠÖ ”,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,ª,©Šm”F,µ A,»,İfCf“f^ [ftfFfCfX,Ö,Ìf) fCf“f^,ð“¾,è,±,Æ,ª,Ä,«,é B

**QueryInterface**,ðÆÄ,×,é,Ì,ÍfIfufWfFfNfg,ªŽÄ`·,·,éCf“f^ [ftfFfCfXf f\fbfh,¾,ª AŽÄ Ů,É,Í,±,Ìf f\fbfh,Í— MCEä AfAfvfšfP [fVf‡f“,âfIfufWfFfNfg,Í AVfe [fuf<,Ö,Ìf)Cf“f^,ðfIfufWfFfNfg,©,çŽó,~Žæ,é,± ,Æ,É,È,é B,±,Ìf fJjfYf€,Í AfIfufWfFfNfg,ªŽg— p,·,éfvf%ofCfX [fgf [f^,ÆÆÄ,Ñ o,µªfNf%ofCfAf“fgfvf fZfX,Æ,ð Ø,è—£,· B

COM fIfufWfFfNfg,ÆC++fIfufWfFfNfg,Æ,ÌŠÖ,Ì,à,ª,D,Æ,Ä,Ì—DŽ—“\_,Í Af f\fbfh,Ì Ä % ,Ìø ”,ª,»,İfCf“f^ [ftfFfCfX,Ü,½,ÍfNf%ofX,Ì-¼`O,Ä, ,é,±,Æ,Ä, ,é BC++,Ä,Íthis`ø ”,ÆE¾,í,è,é,à,Ì,Ä, ,é BCOMfI fufWfFfNfg,ÆC++fIfufWfFfNfg,ÌŠ®`S,ÉfofCfifŠÆÝŠ·,È,½,ß AfRf“fpfCf%,ÍCOMfCf“f^ [ftfFfCfX,ðC+ +`Š ŮfNf%ofX,Ì,æ,ª,É`µ,¢ A““,¶•¶—@,Ä, ,é,à,Ì,Æ%¼`è,·,é B,±,ÌCE%oÈ AfR [fh,Ì•jŽG,³,ªEyE,³,è,é,Ì,Ä, ,é B,½, Æ,¡,Í AC++ ,Ä`ø ”,Ìthis,Í A,·,Ä,É%ðŽß,³,è,½fppf%of [f^,Æ,µ,Ä`µ,í,è,ÄfR [fh%»»,³,è, AVfe [fuf<,ð`È,µ,½`s ³,ÍC++ ,Ä`Ä,É ^— ,³,è,é B

### C,Ä,ÏCOMfIfufWfFfNfg,Ö,ÏAfNfZfX

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

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

^È%°,Ï—á,Ä,Í ACE¾CEê,Ä**IDirectDraw2::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,;È,Ý,É,±  
,Ïf f\fbfh,Í AfT [ftfFfX ïñ \“Ï(&ddsd),ð Ý’è,µ A V,µ,çfT [ftfFfX,Ö,Ï|fCf“f^(&lpDDS),ð•Ö,· B

**IDirectDraw2::CreateSurface** f\fbfh,ðCEÄ,Ñ o,·,É,Í A,Û,DirectDrawfIfufWfFfNfgVfe [fuf<,Ö,ÏŽQ Æ,ðŠO,µ  
A,»,µ,ÄVfe [fuf<,©,çf f\fbfh,Ö,ÏŽQ Æ,ðŠO,· Bf f\fbfh,Ä<ÿ<<,³,é,é Ä %  
,Ïpf%of [f^,ª Af f\fbfh,ðN“@,·,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,Ï,µ,Ä,µ,Û,ª) B

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

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

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

,±,ê,É%oÁ,| 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,ÍfCf“f^ [ftfFfCfX,Ö,ìthisf|fCf“f^,ðŠÛ,Û,È,ç BCE¾CEê,Á,Í AfCf“f^ [ftfFfCfX,Ö,ìf|fCf“f^,ÍŠef f\fbfh,ÉŠÛ,Û,ê,Ä,ç,é•K-v,ª, ,é B^È%°,ì-á,Á **AIDirectDraw2::GetCaps**f f\fbfh,ìC++,Á,ì•¶-@,ðŽ,· 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 \‘ç‘ì,Ö,ìf|fCf“f^,Á, ,é B



•\L

^È%°,É-{\•¶,Á,Ì•\L,ð à-¾,·,é B

•\L

^Ó-i

fCf^fšfbfN'ì

fVfCE [fXfzf<f\_ [,Û,½,Í'í ",ð\,· BŽÀ Û,ì'1,ð—  
^,ì,È,¯,ê,Ì,È,ç,É,¢ B,½,Æ,ì,Î AfXfe [fgf f“fg  
SetCursorPos(X, Y)  
,Á,Í AX AYfpf%of [f^,É'ã,í,éŽÀ Û,ì'1,ð—  
^,ì,È,¯,ê,Ì,È,ç,É,¢ B

[]

fIfvfVfšf“,ìfpf%of [f^,ðšš,é B

|

,Ç,ç,ç,©, ,é,¢,Í—¼•û,Ì'I'ðŽ^,ðª,¯,é B

...

'¼'O,ì €-Ú,ìCEJ,è•Ö,µ,ðŽ',· B

.

fTf“fvf<fAfvfšfP [fVfšf“,ì È—ª•ª,ð\,· B

.

ŽŸ,ì “ì,Í,»»,ê,¼,ê^È%°,ÌÓ-i,ð\,· B

•\L

^Ó-i

SMALL CAPITALS

fL [ AfL [fV [fPf“fX AfL [fRf“fRf [fVfšf“  
,ì-¼'O,ð\,· B,½,Æ,ì,Î AALT+SPACEBAR B

FULL CAPITALS

'â•ª,ìCE^,â \‘c'ì,ì-¼'O,ð\  
,· B,»»,ê,ç,Íf{ [f{fh,Á,à•\L,³,ê,é B'è ”,à\,· B

monospace

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

**DirectDraw,É,Â,ç,Ä**

DirectDraw®.Í AftfBfXfvfœFc Ef f,fŠ Afn [fhEfffA Efuf fbn“]—  
Afi [fo [fœFc AftfŠfbfsf“fo,È,Ç,Ì¼ Ú‘É ì,ð%Â”\,É,.,éDirectX™ SDKRf“f| [flf“fg,Ä, ,é B,±,é,ç,ì<@”  
,ð A DirectDraw,ÍŠù“¶,ÌMicrosoft® Windows®  
fx [fX,ÌfAfvfŠfP [fVf‡f“,âffofCfX Efhf%ofCfo,Æ,ìœÝŠ: «,ð•Û,ç,È,ª,çŽÄœ»,.,é B

DirectDraw.Í A,.,Ü,ÄWindows fOf%oftfBfbfN EfffofCfX EfCf“f^ [ftfFfCfX (GDI)  
,Æ,ìœÝŠ: «,ð•Û,ç,È,ª,ç,à AftfBfXfvfœFc EfffofCfX,Ö,Ì¼ ÚfAfNfZfX,ð’ñ<ÿ,.,é\ftfgfEfffA EfCf“f^ [ftfF  
fCfX,Ä, ,é AfOf%oftfBfbfNfX,Ì,½,B,Ì ,fœfxf<,ÈfAfvfŠfP [fVf‡f“ Efuf fOf%of~f“fo EfCf“f^ [ftfFfCfX  
(API),Ä,Í,È,ç B3DfOf%oftfBfbfNfX EfpfbfP [fW,âffWf^f< Efrfffi Efr [fffbfNfX,ð~—p,µ,½fQ [fœ  
,âWindowsfTfufVfXfefœ,É,Í,µ AfffofCfX,ÉÈ“¶,µ,È,ç“Á’èffBfXfvfœFc EfffofCfX<@”  
,Ö,ÌfAfNfZfX,ð’ñ<ÿ,.,é,à,Ì,Ä, ,é B

DirectDraw.Í A,³,Ü,´,Ü,ÈftfBfXfvfœFc Efn [fhEfffA,Ä“® ì,.,é B,»),Ì’Í,Í AfVf“fvf<,ÈSVGAf,fjf^ [,©,ç A  
fnfŠfbfsf“fo,â L’ A”nRGBfJf%o [ftfH [f}fbfg,ðfTf| [fg,.,é Ä V,Ìfn [fhEfffA,É,Ü,ÄŽŠ,é B  
DirectDraw,ÌfCf“f^ [ftfFfCfX,Í AŠt’b,É, ,éfn [fhEfffA,Ì”—Í,ð”FŽ~ ,µ AfTf|  
[fg,³,é,½,.,x,Ä,Ìfn [fhEfffA EfAfNfZf%ofœ [fVf‡f“,ðŽg,µ,±,Æ,ª,Ä,«,,é,æ,µ,É, Ýœv,³,é,Ä,ç  
,é Bfn [fhEfffA,ªŽÀ’•,µ,Ä,ç,È,ç<@”\,Í ADirectX,ªfGf~f...fœ [fg,.,é,æ,µ,É,È,Ä,Ä,ç,é B

DirectDraw.Í A ]—^,È,ç“Á’è,ÌffBfXfvfœFc EfffofCfX,ÉÈ“¶,µ,½fR [fh,ð•K—  
v,Æ,.,éAfvfŠfP [fVf‡f“,Ä,µ,©,Ä,«,,È,©,Ä,½È%o,Ì,æ,µ,È~—,ð AfffofCfX,ÉÈ“¶,µ,È,ç,©,½,ç,Ä’ñ<ÿ,.,é B

f\_fuf<fobftf@,ÆftfŠfbfsf“fo EfOf%oftfBfbfNfX,ÌfTf| [fg  
ffBfXfvfœFc EfJ [fh,Ìfn [fhEfffA Efuf fbn“]—,Ö,ÌfAfNfZfX,Æ §œä  
3D Zfobftf@,ÌfTf| [fg  
ZfI [f\_Šf“fo,Ìfn [fhEfffA EfI [fo [fœFc,ÌfTf| [fg  
fCf [fW L’·fn [fhEfffA,Ö,ÌfAfNfZfX  
fXf^f“f\_ [fh,ª,ÑfGf“fnf“fXfh’o•ù,ÌffBfXfvfœFc Ef f,fŠ—Ìæ,Ö,Ì“~ŽzfAfNfZfX

DirectDraw,Ì—Ú“Í,Í A—{—  
^ AftfBfXfvfœFc Ef f,fŠ,Ö,ÌfffofCfX,ÉÈ“¶,.,éAfNfZfX,ð AfffofCfX,ÉÈ“¶,µ,È,ç•û—@,Ä’ñ<ÿ,.,é,±,Æ,Ä, ,é  
BŽ—ŽÄ ä ADirectDraw,ÌftfBfXfvfœFc Ef f,fŠ,ðŠÇ—  
,.,é BfAfvfŠfP [fVf‡f“,Í ARGB,ÆYUVfJf%o [ EftfH [f}  
fbfg,âf%ofXf^ŠÔfsfbf^,È,Ç Afn [fhEfffAZÄ’•,ÉŠÖ,.,éW €“I,ÈŠt—  
{“IfffofCfXÈ“¶ «,ð”FŽ~ ,.,é,¾,¯,Ä,æ,ç Bfuf fbn“]—,âpfœfbfg EfœfWfXf^,Ì~—p,É•K—  
v,È“Á’è,Ìfvf fV [fWffœÄ,Ñ o,µ,É,Ä,ç,Ä 1—¶,.,é•K—v,ª,È,ç,Ì,Ä, ,é B  
DirectDraw,ðŽg,!,Í A~Ü,È,é^fCfv,Ìfn [fhEfffA,ªŽ ,Äfuf fbn“]—,â F L’.,ì<@”  
,ðftf<,Éø,« o,µ,È,ª,ç A,µ,©,âfn [fhEfffA,Ì“Á’è”~È,ÉÈ“¶,.,é,±,Æ,È, A  
ffBfXfvfœFc Ef f,fŠ,ðŠÈ’P,É‘É ì,.,é,±,Æ,ª,Ä,«,,é B

Windows 95,Æ Windows NT® version 4.0È ~,ª“® ì,.,éRf“fsf... [f^ ä,Ä L,Žg,!,éfQ [fœ EfOf%oftfBfbfNfX,ð A  
DirectDraw,Ì’ñ<ÿ,.,é,Ì,Ä, ,é B

**DirectDrawA [fLfefNf`ff**

DirectDraw,Í AfffBfXfvfCefC Ef f,fŠ,ÆffBfXfvfCefC Efn [fhEfFfAŠÇ— fT [frfX,ð'ñ<ÿ,µ Af f,fŠŠÇ—  
,ÉŠÖ`A,µ,½f f,fŠ,ÌŠ,,è“-Ä A`Ú“® A“]— A%øð•ú,È,Ç,Ïê”Ê“I<@”\,à'ñ<ÿ,·,é BDirectDraw,³ŠÇ—  
,·,éf f,fŠ,Í%æ‘æfCf [fW,ð•\,µ AfT [ftfFfX,ÆÆÄ,Í,ê,é B  
fAfvfŠfP [fVf‡f“,ÍDirectDraw,Ìfn [fhEfFfA EfAfufXfgf%ofNfVf‡f“ EfCefC,, (HAL)  
,ð'Ê,¶ A L'·,âfI [fo [fCefC AfefNfXf`ff Ef}  
fbfsf“fO A%øñ“] Af~f%o [fŠf“fO,ðŠÛ,b“Æ“Á,ÈffBfXfvfCefC Efn [fhEfFfA<@”\,ð—~—p,Å,«,é B

## DirectDrawST—v

,±,ì ß,Â,Í ADirectDrawfRf“f| [flf“fg,îê”Ê“L,È,±,Æ,É,Â,ç,Ä à→4,·,é B

DirectDraw

„»,î¼,î DirectDraw,î“Á’Ÿ

DirectDraw HAL

DirectDraw HEL

DirectDrawfIfufWfFfNfq.îf^Cfy

• Æfsbf`

3D fT [ftfFX,îfTf] [fg

DirectDraw,ÆDirect3D,î“ ±

f, [fhXfffBfXfvfÇfC Ef, [fh

fsNfZf< EftfH [f}fbfq

**DirectDraw**

DirectDraw,Í Afn [fhfEfffA,Æf\ftfgfEfffA'o•û,ÄŽÀ'•,³,é,é B  
DirectDraw,ðŽg,²fAfvfŠfP [fVf±f“,Í Afn [fhfEfffA,“,æ,Ñf\ftfgfEfffA EfGf~f...fÆ [fVf±f“,ì,Q,Á,Ì”-Í,ð-  
-p,.,é,±,Æ,Á,«é BfAfvfŠfP [fVf±f“,Í A DirectDraw,²%½,ðfGf~f...fÆ [fVf±f“,μ,Á,é,© A,»,μ,Ä,Ç,Ì<@”\  
,²fn [fhfEfffA,Ä'ñ<ÿ,³,é,Ä,é,© AŠÈ'P,É'² ,Ä,«é BDirectDraw,Í A DirectDraw  
fn [fhfEfffA EfAfuXfgf%NfVf±f“ EfÆfCf,.(HAL),Ì-B^è,ìfNf%ofCfAf“fg,Á,è AfAfvfŠfP [fVf±f“,Í  
•K, DirectDraw,É'í,μ,ÄfAfNfZfX,ð s,ì,È,è,È,È,Ç, A,»,é,æ,è'áfÆfxf<,ÈHAL,É'¼ ÚfAfNfZfX,.,é,±  
,Æ,Í,Ä,«É,Ç B

DirectDraw,Í A Ddrawf\_fCfif~fbfn EfŠf“fn Ef%ofCfuf%ofŠ (DLL),É,æ,Á,ÄŽÀ'•,³,é,Ä,é B,±  
,Ì32f\_rfbfgDLL,Í A DirectDraw,Ì-v< ,.,é,ç'È<@”\,.,×,Ä,ðŽÀ'•,μ,Á,é B,±,IDL,Í Afpf%of [f^,ðŠ@'S,É-  
L<Eø%»,.,é,ì,à,ç,è,ñ A Win32@,ÆHAL,Ì16f\_rfbfg”•,Æ,ÌŠÖ,É•K-  
v,ÈfTf“fN,ð,.,×,Ä s,ç AfIfxfNfŠ [f“ EfffBfXfvfÆfC Ef f,fŠ,ðŠÇ- ,μ A DirectDraw,ª-v< ,.,é,.,×,Ä,ÌŠÇ  
- <L^,áfZf}f“fefBfbfn Ef fwfbfn,ð'S“-.,é B,Û,½fNfŠfbfv EfŠfXfg,Æ,»,ì'¼,.,×,Ä,ìfffofCfX“Æ-§<@”\  
,ð'ñ,ÿ,.,éEfBf“fhfE Efnf“fhf<,ðftfbfn,.,é,±,Æ,Á AfAfvfŠfP [fVf±f“,Ö,ìfRf“f]  
[flf“fg EfIfufWfFfNfg Ef,fff< iCOM jfCf“f^ [ftfFfCfX,ð'ñ<ÿ,.,é B

DirectDraw,Í AIDirectDraw2 AIDirectDrawSurface2 AIDirectDrawPalette AIDirectDrawClipper,Æ,Ç  
,²,Ä,ÌCOMfCf“f^ [ftfFfCfX,Ì'g,ÿ ±,ì,¹,Ä, é BCOM,ÌŠT”O,É,Ä,é,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,ÌIfIfufWfFfNfg,ÍDirectDraw,ÆDirectDrawSurface,Ä, é B  
DirectDrawfIfufWfFfNfg,Í A**DirectDrawCreate**ŠÖ ”,ð-p,ç,Ä ì ¬,³,è A ffbfXfvfÆfC EfAf\_fvf^ EfJ [fh,ð<  
,. BfAfvfŠfP [fVf±f“,Í AfIfufWfFfNfg,Ö,Ì**IDirectDraw2**fCf“f^ [ftfFfCfX,ðŽæ“¼,μ,½Eä Afvf%ofCf}  
fŠDirectDrawSurfacefIfufWfFfNfg,ð ì ¬,.,é,½,ß Af,fjf^•%oæ-p,ÌffBfXfvfÆfC Ef f,fŠ,ð<  
,. **IDirectDraw2::CreateSurface** ffbfh,ðEÄ,Ñ o,¹,é,æ,²,É,É,é B,Û,½ Afvf%ofCf}  
fŠ EFT [ftfFfX,©,çA<Æ'ŠfXfg•ûŽ®,ÄfIfxfNfŠ [f“ EFT [ftfFfX,ð ì ¬,.,é,±,Æ,à,Ä,«é B

'È í Afvf%ofCf}  
fŠ EFT [ftfFfX,Æ•Ž'fCf [fW,ðftfŠfbfsf“fO,.,é,½,ß Afofbfn Efofbtf@,ð,D,Æ,Ä ì ¬,.,é Bfvf%ofCf}  
fŠ EFT [ftfFfX,Ì•Ž'fCf [fW,ð- ,.,é,ì,ÉfxfNfŠ [f“²rfW [É,È,Ä,Ä,ç  
,éŠÖ Afofbfn Efofbtf@ EFT [ftfFfX EftfE [fÉ,Ö•%oæ,.,é B,±  
,é,ÌffBfXfvfÆfC Ef f,fŠ,ÍDirectDrawSurfacefIfufWfFfNfg,ÉŠi”l,³,é,Ä,é,éèA,ìfIfxfNfŠ [f“ Etrfbfgf}  
fbfv,ðfobfn Efofbtf@,É“]-.,é,±,Æ,É,æ,éŽÆ»,.,é BfAfvfŠfP [fVf±f“,Í A'¼'Ö,É•%oæ,μ,½ftfE [fÉ  
,ð•Ž',.,é,½,ß,É **AIDirectDrawSurface2::Flip** f\fbfh,ðEÄ,Ñ o, B,±  
,Ìf ffbfh,Í AfxfNfŠ [f“ if,fjf^ j,ª ,¼•ùEü,Ì Ä- ,ð s,²,Æ,«É%oæ-È,ð•,«Š',.,é,æ,²  
,ÉfÆfWfXf^,ðfZfbfg,.,é B,±,ì'€ Ì,Ì”ñ-Šú,È,½,ß Af ffbfh,ðEÄ,ñ,Ä,©,ç,àfAfvfŠfP [fVf±f“,Í ~ ,ð±  
,-,ç,é,é ì,±,Ìf f\fbfh,ÆÄ,Ì,é,é,Æ A•,«Š',.,ç,é,é,Û,ÄŽ@“l,Éfobfn Efofbtf@,Í ',ç,±  
,ÿ<Ö~.Æ,É,é j Bfvf%ofCf}  
fŠ EFT [ftfFfX,ª,«Š',.,ç,é,½Eä AfAfvfŠfP [fVf±f“,Ífobfn Efofbtf@,ÉŽÿ,ÌftfE [fÉ  
,ð \ ¬,μ**IDirectDrawSurface2::Flip**,ðEÄ,Ñ o,.,È,Ç,Ì ^- ,ð±,¯,é B

Windows 3.1 GDIf,fff<,Ä,ÌffBfXfvfÆfC Ef f,fŠ,ìf\_rfbfgf}fbfv,Ö,ì'¼ ÚfAfNfZfX,ð,.,é,ì,Ä,Í,È,ç,ª A  
DirectDraw,É,æ,è,»,ìfpftfH [f]f“fX,ÍEü ã,.,é BŽÄ,Í AGDI,ìfpftfH [f]f“fX'á%o,ì ª-“l,È-  
vö,Í Afuf fbfn“]-,ð,Û, fVfXfef€ Ef f,fŠ ã,ÄŽÀ s,μ A,»,ìE%oÈ,ðffBfXfvfÆfC Ef f,fŠ,Ö“]-  
,.,é A,Æ,ç,²,ñ d,ÌfI [fo [fwfbfh,É, é B,μ,©,μ A DirectDraw,ð-~p,.,é è ± A%oÄ”\  
,È,©,¬,èffBfXfvfÆfC 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 ”,²fn [fhfEfffA ^- ,ð%oÄ”\  
,É,.,é,ª A DirectDraw,Í,»,ìfpftfH [f]f“fX,àEü ã,³,¹,é B

'æŽO,Ì DirectDrawfIfufWfFfNfg,Í DirectDrawPalette,Ä, é B•-  
ffBfXfvfÆfC EfpfÆfbfg,ÍÈ iffbfXfvfÆfC Efn [fhfEfffA“à,ÉŽ ,½,è,é,½,ß A,D,Æ,Ä,ÌIfufWfFfNfg,É,  
æ,è,»,è,ð•,μ'€ ì,.,é,±,Æ,É,È,é B  
**IDirectDrawPalette**fCf“f^ [ftfFfCfX,Í AfpfÆfbfg,ðfn [fhfEfffA ã,ÄŽÀ'•,.,é B,±  
,é,ç,É,æ,èWindowsfpfÆfbfg,ÍfofCfpfX,³,è AfQ [fÉ  
,²ffBfXfvfÆfC Efn [fhfEfffA,ð'r“¼“l,ÉfAfNfZfX,.,é,Æ,«¼,~Žg,ì,é,é B  
DirectDrawPalettefIfufWfFfNfg,à,Û,½ A DirectDrawfIfufWfFfNfg,©,ç ì ¬,³,é,é B

ÄEä,ì DirectDrawfIfufWfFfNfg,ÍDirectDrawClipper,Ä, é B DirectDraw,Í,±  
,ÌIfufWfFfNfg,ðŽg,Ä,Ä AfBfXfvfÆfC Ef f,fŠ,ìfNfŠfbfsf“fO,³,é,½-ìæ,ðŠÇ- ,.,é B

,» , Ì¼, ÌDirectDraw, Ì“Á’Ÿ

DirectDraw ß, ÄŽ, Ì, µ, ½“Á’Ÿ, É%Á, Ì ADirectDraw, Ì“%ßCE^fuf fbfN“]“—, ÆfI [fo [fCEfC, àfTf] [fg, µ, Ä, ç, é B

“%ßCE^fuf fbfN“]“—’†, Ì Afrfbfgr}fbfv, ÌfT [ftfFX, É“]“—, ³, ê Afrfbfgr}fbfv’†, Ì, , é F, Ü, ½, Ì F—  
Ìæ, Ì“%ß, Æ, µ, Ä’èç, ³, é, é B“%ßCE^fuf fbfN“]“—, Ì AfJf% [ Efl [ , ðŽg, Á, ÄŽÀCE», ³, é, é B “]“—  
CE³fJf% [ Efl [ , Ì A“]“— ^— ’† Afrfbfgr}fbfv, Ì, Ç, Ì F A, Ç, Ì F—Ìæ, ð“%ß, É, , , é, © A, Ä, Ü, èfRfs [ , µ, È, ç  
Ì, ©, ð’èç, , , é, ±, Æ, É, æ, è s, í, ê, é B“]“— æfJf% [ Efl [ , Ì A“]“—CE³ftrfbfgr}fbfv, Ì, » , Ì F A F—  
Ìæ, ðŽ , ÄfsfNfZfç, É, æ, Á, Ä AfT [ftfFX, Ì, Ç, Ì F A, Ç, Ì Fæ, ð ä , , «, ³, ê, é, ©, ð’èç, , , é, ±  
, Æ, É, æ, è s, í, ê, é B Ú ×, Ì ufJf% [ Efl [fCf“fQ v, ðŽQ Æ, , , é, ±, Æ B

ÄCEä, É A DirectDraw, Ìfn [fhfEfffA, ÌfI [fo [fCEfC, Æf\ftfgfEfffA EfGf~f...

fCE [fVfçf“ , É, æ, éfI [fo [fCEfC, Ì—¼•û, ðfTf]

[fg, , , é BfI [fo [fCEfC, Ì AfXfvf%fcfg, ÌŽÄ’•, âfAjjf [fVfçf“ , Ì; ”fCEfCf, , ŠÇ— , Ì A, æ, èŠÈ’P, ÈŽè’i, Ä, , é  
BfI [fo [fCEfC, ¾, , ÉŠÖ~A, µ, ½’Ç%Á”—Ì, É%Á, Ì A, » , Ì¼, Ç, ñ, ÈfT [ftfFX, Ì”—  
Ì, à, , ×, ÄŽ , ÄfI [fo [fCEfC, Æ, µ, Ä A , ç, ä, éDirectDrawSurfacefIufWfFfNfg, ð ì ¬, Ä, «, é B, ±, ê, ç, Ìç@”  
, Ì’Ç%Á, ÌffBfXfvfCEfC Ef f, fŠ, ð•K—v, Æ, µ AfffBfXfvfCEfC Ef f, fŠ, ÉfI [fo [fCEfC, ç@”  
, ð, È, , è, Ì AfVfXfef€ Ef f, fŠ ä, ÉfI [fo [fCEfC Ef f, fŠ, ð’u, ±, Æ, à, Ä, «, é B

fJf% [ Efl [ , Ì A fI [fo [fCEfC, É’Î, µ, Ä, à“%ßCE^fuf fbfN“]“—, É’Î, µ, Ä, Æ“—Ì, É“ , B  
fI [fo [fCEfCZfI [f [ , Ì A fI [fo [fCEfCŠÖ, Ì d, È, , í, Ì ^— , Æ“%ß ^— , ðŽç@“I, Éµ, □ B

**DirectDraw HAL**

DirectDraw fn [fhEFA EfAfufXfg%NfVfzf“ EfCEfCf,, (HAL)  
,Í Afn [fhEFA,ÉÈ‘¶,µ Afn [fhEFAEÁ—L,ÌR [fh,¾,¯,©,Ç,È,é B  
HAL,Í A16frfbfg,Ä,à32frfbfg,Ä,à A,Ü,½ Windows 95 ä,Ä,Í‘o•û,Ì‘g,Ý ‡,í,¹,ÄŽÄ‘•,³,ê“¾,é BWindows  
NT ã,Ä,Í,Ä,È,É32 frfbfg,ÄŽÄ‘•,³,ê,é B  
HAL,Í AfffBfXfvfCfC Efhf%ofCfo,É“ ‡,³,ê,½ê”É,à A,Ü,½fhf%ofCfo ì -ŽÒ,ªè‘,µ,½fvf%ofCfx [fg EfC  
f“f^ [ftfFfCfX,ð’È,µ,ÄffBfXfvfCfC Efhf%ofCfo,Æ’È M,·,é“Æ—§,µ,½DLL,É,à,È,è“¾,é B

DirectDraw HAL,Í Af`fbfvf [fJ [ Af{ [fhf [fJ [ A,n,d,l,É,æ,èŽÄ‘•,³,ê,é B HAL,ÍfffofCfXCEÁ—  
L,ÌR [fh,¾,¯,©,ÇŽÄ‘•,³,ê AfGf~f...fCE [fvfzf“,Í s,í, Afn [fhEFA,É,È,Ç<@”\,Í’È’m,µ,È,Ç B  
HAL,Í Afpf%of [f^,ÌŠm”F,ð s,í,È,, Afpf%of [f^ Ef`fffbfN,Í AHAL,ªCEÄ,Ñ o,³,ê,é‘O,ÉDirectDraw,É,æ,è s  
,í,ê,é B

**DirectDraw HEL**

DirectDrawfn [fhfEfffA EfGf~f...fCE [fVfzf“ EfCEfCf,(HEL),Í AHAL,ª s,ª,Ì,Æ“—l,É A  
DirectDraw,É‘Î,µ,»„Ï“—Í,ð‘Ê‘m,·,é B,±,ª,µ,½“—Í,ðfAfvfŠfP [fVfzf“ %Šú%»’iŠK,Á’² ,·,é,±  
,Æ,É,æ,Á,Ä AfpftfH [f}f“fX,ð Á“K%»„µ Afvf%ofbfgftfH [f€  
,²,Æ,ÉfAfvfŠfP [fVfzf“,Ïpf%of [f^,ð’² ®,Á,«,é B,à,µDirectDraw HAL,ªCE©,Á,©,ç,È,¢ ê ÷ A,Û,½,Í—  
v< ,³,ê,½<@“\,ðfn [fhfEfffA,ªñ<ÿ,µ,Ä,ç,È,¢ ê ÷ A DirectDraw,Í,»„Ï<@“\,ðfGf~f...fCE [fg,·,é,±,Æ,É,È,é B

**DirectDrawIfufWfFfNfg,Îf^fCfv**

DirectDrawIfufWfFfNfg,ÎfffBfXfvfEfC EfffofCfX,ðŽ,· BŠe~\_— ffbfXfvfEfC EfffofCfX,É‘Î,μ•i ”,Ï  
DirectDrawIfufWfFfNfg,ð ì ¬,·,é,±,Æ,ª,À,«,é B  
,»,ê,¼,ê“ÆŽ©,ÏDirectDrawIfufWfFfNfg,Í A,»,Ï¼,·,×,Ä,ÏDirectDrawIfufWfFfNfg,©,ç“Æ—  
§,μ,½fT [ftfFfX AfpfEfbbfg AfNfŠfbfp [,È,Ç,ÏIfufWfFfNfg,ð ì ¬,·,é B

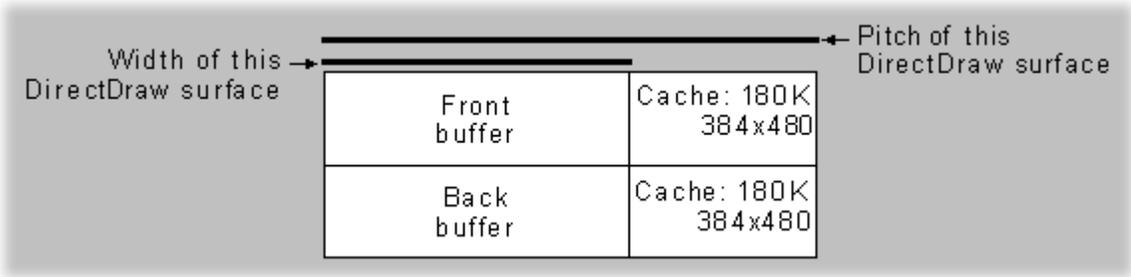
DirectDrawSurfaceIfufWfFfNfg,Í A¼ ÚfAfNfZfX,μ,½,è‘€ ì,μ,½,è,À,«,éfffbfXfvfEfC Ef f,fŠ,ÏA‘±”ª,ð\  
,· B,±,ê,ç,ÏffBfXfvfEfC Ef f,fŠ,ÏAfhfEfX,Í A%Ž<ftfE [f€ Efobftf@ Ef f,fŠ ifvf%ofCf}  
fŠ EfT [ftfFfX j, ,é,ç,Í \*s%Ž<fobftf@ ifIfXfNfŠ [f“ EfT [ftfFfX,Û,½,ÍfI [fo [fEfC EfT [ftfFfX)  
,ðŽw,· B\*s%Ž<fobftf@,Í‘Ê í AffBfXfvfEfC Ef f,fŠ,É í“;·,é B,μ,©,μ AfN [fh ÝEv ã,Ï— —  
R,©,ç A,Û,½,Í DirectDraw,ªf\ftfgfEfffA EfGf~f...fE [fvf±f“,ðŽÀ s,μ,Ä,ç  
,é ê ± AfVfXfefE Ef f,fŠ ã,É ì ¬,·,é,±,Æ,à,À,«,é B

DirectDrawPaletteIfufWfFfNfg,Í A16 F,Æ256 F‘o•ù,ÏfC“ffbfNfX EfpfEfbbfg,ð\,· B fpfEfbbfg,Í A  
fefNfXf`ff AfIfXfNfŠ [f“ EfT [ftfFfX AfI [fo [fEfC EfT [ftfFfX,É‘Î,μ’ñ<ÿ,³,é,é B,±  
,é,ç,Í,Ç,é,à Afvf%ofCf}fŠ EfT [ftfFfX,Æ“ ,ÏfpfEfbbfg,ðŽ ,½,È,,Æ,à,æ,ç B

DirectDrawIfufWfFfNfg,ÍDirectDrawSurface ADirectDrawPalette ADirectDrawClipper,ÏŠefIfufWfFfNfg,ð ì ¬,·,é  
B DirectDrawPalette fIfufWfFfNfg,Æ DirectDrawClipperfIfufWfFfNfg,Í A,»,ê,ª ì—  
p,·,éDirectDrawSurface,ÉfAf^fbf\_,μ,È,¯,é,Ï,È,ç,È,ç BDirectDrawSurfaceIfufWfFfNfg,Í A  
DirectDrawPalettefIfufWfFfNfg,ðfAf^fbf`,·,é—v< ,ð<”Û,·,é%Ž”\ «,ª, ,é B‘â”ª,Ïfn [fhEfFfA,Íi ”fpfEfbbfg,ðf  
Tf| [fg,μ,Ä,ç,È,ç,½,ß,À A,μ,Ï,μ,Ï<N,«,é,±,Æ,Æ,μ,Ä’ ^Ó,μ,È,,Ä,Í,ç,¯,È,ç B

• **Æfsfbf**

ffBfXfvfCfC Ef f,fŠ,É ‘,«±,p,æ,µ,ÈfAfvfŠfP [fVf‡f“,ì ê ‡ Af f,fŠ,ÉŠi”[<sup>3</sup>,ê,½frfbfgf}fbfv,Í A±  
 ,µ,½f f,fŠ ã,É,È,,Æ,à—Ç, A,±,ì ê ‡ Afrfbfgf}fbfv ã,ìf%ofCf“,ì• ,Æfsfbf“,“Ü,È,Á,Ä,ç  
 ,Á,à,æ,ç B• ,Í AŠi”[<sup>3</sup>,ê,½frfbfgf}fbfv,ìf%ofCf“,ìŽn“\_,Æ I“\_,Æ,ð•,·f f,fŠ ã,ì“ñfAfhfCfXŠÖ,ì←—£,Á, ,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,ðŠÜ,Ü,È,ç Bfsfbf“,Í AŠi”[<sup>3</sup>,ê,½frfbfgf}  
 fbfv,ìE» Ý,ìf%ofCf“,ìŽn“\_,ÆŽY,ìf%ofCf“,ìŽn“\_,Æ,ð•,·f f,fŠ ã,ì“ñfAfhfCfXŠÖ,ì←—£,Á, ,é B  
 ,½,Æ,·,ìéCf f,fŠ,Á,Í AftfBfXfvfCfC Ef f,fŠ,ìfsfbf“,Í Afrfbfgf}fbfv,ì• fvf%ofX AfLfffbfVf...  
 •“•,ðŠÜ,ð BŽY,ì } ,Í AéCf f,fŠ,É,·,·,é• ,Æfsfbf“,ìá,ç,ðŽ,µ,Á,ç,é B



,±,ì } ,Á,Í Aftf f“fg Efofbftf@,ÆfofbfN Efofbftf@,Í640’480’8 AfLfffbfVf...,Í384’480’8,Á, ,é B  
 ŽYf%ofCf“,ìfAfhfCfX,ðç ,ß,é,É,Í A 640,Æ384,ð“«,µ,Á1024,Æ,µ A,±,ê,“ŽYf%ofCf“,ìŽn“\_,Æ,È,é B

,µ,½,“Á,Ä AfT [ftfFX Ef f,fŠ,É’¼ ÚfCf“f\_Šf“fO,·,é,Æ,«,Í A,Á,È,ÉIDirectDrawSurface2::Lock f ffbfh  
 (,Ü,½,Í A IDirectDrawSurface2::GetDCf ffbfh),“Ö,·,ì,ðŽg—p,·,é B’P f,ÉffBfXfvfCfC Ef, [fh,ÉŠi,Á,-  
 fsfbf“,ð’O’ñ,Æ,µ,Á,Í,È,ç,È,ç B’P,ÉfffBfXfvfCfC Ef, [fh,ÉŠi,Á,-  
 fsfbf“,ð’O’ñ,Æ,·,é,Æ AfAfvfŠfP [fVf‡f“,“ffBfXfvfCfC EfAf\_fvf^,É,æ,Á,Ä“@,ç,½,è,µ,Ü,-  
 “@,©,È,©,Á,½,è,·,é ê ‡,“ ,é B

**3DfT [ftFfX,ifTf] lfg**

,±,ì ß,À,ÍDirectDraw,Ì3DfT [ftFfX<@”\,É,Â,ç,Ä à-¼,·,é B

fefNfXf`ff\_Ef}fbfv

f~fbfvf}fbfv

Zfofbftf@

**fefNfXf`ff Ef}fbfv**

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

**IDirectDraw2::CreateSurface** f\fbfh,É“n,·**DDSURFACEDESC** \‘ç‘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 ufefNfXf`ff Ef}fbfv,ÌftfH [f}fbfg v,ðŽQ Æ,·,é,±,Æ B



```

ddres = lpDDLLevel->GetAttachedSurface(
    &ddsCaps, &lpDDNextLevel);
lpDDLLevel->Release();
lpDDLLevel = lpDDNextLevel;
}
if ((ddres != DD_OK) && (ddres != DDERR_NOTFOUND))
.
.
.
f~fbfvf}fbfv,İftfŠfbfsf“fO Ef`fF [f“,đ \ -,;é,±,Æ,à,À,«é B,±,İ ê ‡ AŞef~fbfvf}
fbfv Ef(ƒxf<,ª AŠO`A,.,éfofbfN Efofbftf@ EfefNfXf`fffT [ftfFfX,đŽ ,Á BŞefofbfN Efofbftf@ EfefNf
Xf`fffT [ftfFfX,İ Af~fbfvf}fbfv,İ`éf(ƒxf<,ÉfAf^bf^,³,ê,Ä,ƒ,é B
f`fF [f“,İftf f`fg Efofbftf@,¾,İ,İDDSCAPS_MIPMAP ftf%oO,İfZfbfg,đŽ ,ı A,»İ¼,İP,È,éfefNfXf`ff Ef}
fbfv,Á,é İDDSCAPS_TEXTURE ftf%oO,đŽg,ƒ İ -,³,ê,éfefNfXf`ff Ef}fbfv) B,Đ,Æ,Á,İf~fbfvf}
fbfv Ef(ƒxf<,İ AfAf^bf^,³,ê,½fefNfXf`ff Ef}fbfv,đ,Ó,½,ÄŽ ,Á,±,Æ,ª,Á,«é B,Đ,Æ,Á,İf~fbfvf}
fbfv Ef`fF [f“,İŽŸf(ƒxf<,Á, éDDSCAPS_MIPMAPfZfbfg A,à,ª
,Đ,Æ,Á,İftfŠfbfsf“fO Ef`fF [f“,İfofbfN Efofbftf@,Á, éDDSCAPS_BACKBUFFERftf%oO,İfZfbfg,Á, é BŞef
tŠfbfsf“fO Ef`fF [f“,İfT [ftfFfX,İ A,.,x,Ä““İftfCfY,Á,È,_,ê,İ,È,ç,È,ƒ B
.±,İ,æ,ª,ÈfT [ftfFfX,İ @—ñ,İ A
IDirectDraw2::CreateSurface ffbfh,İCEÄ,Ñ o,µ`è%ñ,Á,İ \ -,Á,«È,ƒ BftfŠfbfsf“fO Ef~fbfvf}fbfv,đg,Ÿ—
ş,Ä,é,É,İ A; ‡f~fbfvf}fbfv Ef`fF [f“,đ \ -,µIDirectDrawSurface2::AddAttachedSurface
f ffbfh,É,æ,éfofbfN Efofbftf@,đŽè“@,ÁfAf^bf^,.,é,© A, é,ƒ
,İftfŠfbfsf“fO Ef`fF [f“,İfV [fPf“fX,đ İ -,µ,Á IDirectDrawSurface2::AddAttachedSurface,É,æ,èf~fbfvf}
fbfv,đ \ -,.,é,±,Æ,È,È,é B

```

---

**Note**

fuf bfn“]’—‘€ İ,İ Af~fbfvf}fbfv Ef`fF [f“,İ`éf(ƒxf<,É,İ,Ÿ“K—p,³,ê,é Bf~fbfvf}
fbfv,İ`Sf`fF [f“,đfuf bfn“]’—,.,é,½,B,É,İ AŞef(ƒxf<,đ•È X,Éfuf bfn“]’—,µ,È,\_,ê,İ,È,ç,È,ƒ B

---

**IDirectDrawSurface2::Flip** ffbfh,İ A—^,ı,ç,ê,½f(ƒxf<,©,çf~fbfvf}
fbfv’İ,İ Á`áf(ƒxf<,Ü,Á A,.,x,Á,İf(ƒxf<,đftfŠfbfsf“fO,.,é BftfŠfbfsf“fO æ,İfT [ftfFfX,à`ñ<Ÿ,³,ê,ª A,»İ ê
‡f~fbfvf}fbfv,İ`Sf(ƒxf<,ª,»„,İftfŠfbfsf“fO Ef`fF [f“,İfofbfN Efofbftf@,ÉftfŠfbfsf“fO,³,ê,é B,±
,İfofbfN Efofbftf@,İ A—^,ı,ç,ê,½fI [fof%oCfh,Æ`è`v,.,é B,½,Æ,ı,İftfŠfbfsf“fOf`fF [f“,İfgfbfvf(ƒxf<,É, é,
R”Ö—Ü,İfofbfN Efofbftf@,ªfI [fof%oCfh,Æ,µ,Á—^,ı,ç,ê,½ ê ‡ Af~fbfvf}fbfv,İ`Sf(ƒxf<,İ,»İ,R”Ö—
Ü,İfofbfN Efofbftf@,ÉftfŠfbfsf“fO,.,é B

f~fbfvf}fbfv Ef`fF [f“,İf(ƒxf< ”,İ A—¾Ž“İ,ÉŠİ”[³,ê,é B
fAfVfŠfP [fVf‡f“,ª **IDirectDrawSurface2::Lock**,Ü,½,İ**IDirectDrawSurface2::GetSurfaceDesc** ffbfh,đCEÄ,Ñ o,µ,
Ä)f~fbfvf}fbfv,İfT [ftfFfX EftfXfNfŠfVf^,đŽæ“¾,.,é,Æ,« Afgfbfvf(ƒxf<,đŠÜ,Đf~fbfvf}fbfv,İf(ƒxf< ”,İ
**DDSURFACEDESC** \ƒı,İ **dwMipMapCount** f“fo,ªŽ ,Á,Á,ƒ,é Bf~fbfvf}
fbfv,İfgfbfvf(ƒxf<,ÈŠO,İf(ƒxf<,É,Á,ƒ,Á,İ A **dwMipMapCount** f“fo,İ A,»İ,İf~fbfvf}
fbfv,©,çf`fF [f“,İ Á -f~fbfvf}fbfv,Ü,Á,İf(ƒxf< ”,đŽw`è,.,é B

## Zfobftf@

DirectDraw HEL,Í A Direct3D™

,â,»,'¼3DfEf“f\_Šf“fo Ef\ftfgfEfffA,žg,²Zfobftf@,đ ì ¬,Á,«,é BHEL,Í16frfbfg,Æ32frfbfg'o•û,ìZfobftf@,đfTf| [fg,·,é B3DfAfNfZf%ofE [fVfžf“,đŽ ,ÁffBfXfvfEfC EfJ [fh—

p,ÌDirectDrawffofCfX Efhf%ofCfo,Í A **DDSCAPS\_ZBUFFER**ftf%ofO,đfGfNfXf| [fg,·,é,±

,Æ,É,æ,è AfifBfXfvfEfC Ef f,fŠ,ÉZfobftf@,đ ì,é,±,Æ,ª,Á,«,é B,»,'ì ê žffofCfX Efhf%ofCfo,Í A **DDCAPS** \‘c‘ì,ìdwZBufferBitDepths f“fo,đŽg,Á,Ä AfTf| [fg,·,é Zfobftf@,ì [,³,žw'è,µ,È,,Á,Í,È,ç,È,¢ B

fAfVfŠfP [fVfžf“,Í A **IDirectDrawSurface2::Blit** f\fbfh,đŽg,²,±,Æ,É,æ,Á,Ä A Zfobftf@,đfNfŠfA,·,é,±,Æ,ª,Á,«,é **BDDBLT\_DEPTHFILL**ftf%ofO,Í A fuf fbfN“]‘—,²Zfobftf@,đfNfŠfA,·,é,±,Æ,đŽ',µ,Á,¢,é B,±

,ìftf%ofO,ªŽw'è,³,è,Á,¢,é,Æ A **IDirectDrawSurface2::Blit** f\fbfh,É“n,³,è,½**DDBLTDX** \‘c‘ì,Í A—

v< ,³,è,½Zfobftf@'l,đdwFillDepth f“fo,ÉfZfbfg,·,é B3DfAfNfZf%ofE [fVfžf“,đŽ ,ÁffBfXfvfEfC EfJ [f

h,ì,½,ß,Ì DirectDrawffofCfX Efhf%ofCfo,ª AZfobftf@,ìfNfŠfA,đfn [fhfEfFfA,ÁfTf| [fg,·,é,æ,²

,É ÝEv,³,è,Á,¢,é ê ± A **DDCAPS\_BLTDEPTHFILL**ftf%ofO,đfGfNfXf| [fg,µ A **DDBLT\_DEPTHFILL**

fuf fbfN“]‘—,đ~µ,²,Í,,Á, ,é B%œ s,«,ð—,ß,éfuf fbfN“]‘—,ì“]‘— æfT [ftFfX,Í A

Zfobftf@,Á,È,¬,è,Í,È,ç,È,¢ B

---

### Note

%œ s,«'l,ìŽÀ Û,ì%œđŽß,Í A3DfEf“f\_Šf“fo EfVfXfef€,É`È'¶,·,é B

---

**DirectDraw,ÆDirect3D,ì“ ‡**

,±,ì ß,À,Í ADirectDraw,Æ Direct3D,ÌŠÖEW,É,Â,ç,Ä q,×,é B

Direct3Dfhf%ofCfo EfCf“f^ [ftFfCfX

Direct3DffofCfX EfCf“f^ [ftFfCfX

Direct3DfefNfXf`ff EfCf“f^ [ftFfCfX

DirectDraw HEL,ÆDirect3D

**Direct3Dfhf%ofCfo EfCf“f^ [ftFfCfX**

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%ofCfo,ÌCOMfCf“f^ [ftFfCfX,ÆDirect3Dfhf%ofCfo,ÌCOMfCf“f^ [ftFfCfX,Í A,Æ,à,É AŠî’b,É, ,  
é“~êfIfufWfFfNfg,Æ,Ì’Ê M,“%oÂ”\,Á, ,é BfAfvfŠfP [fVf±f“,ª Direct3D,ðŽg,²,Æ,« A  
Direct3DfIfufWfFfNfg,Í ì ¬,³,ê,È,¢ BfAfvfŠfP [fVf±f“,ªDirectDrawfIfufWfFfNfg,Ö,ÌDirect3D  
fCf“f^ [ftFfCfX,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^ [ftFfCfX,ð“¾,é•û-  
@,ðŽ’,µ,Á,¢,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,ÁŽ’,³,ê,Ä,¢  
,éR [fh,Á,Í A,Ð,Æ,Â,ÌIfufWfFfNfg,ð ì ¬,µ A,»,ÌIfufWfFfNfg,É’Î,.,é,Ó,½,Á,ÌfCf“f^ [ftFfCfX,ð“¾,Ä,¢  
,é B,µ,½,ª,Á,Ä AfIfufWfFfNfg,ÌŽQ ÆfJfEf“fg,Í A **IDirectDraw2::QueryInterface**  
f f\fbfh,ÌÆÄ,Ñ o,µEã,Í2,Æ,È,é B,±,±,Á d—v,È,Ì,Í ADirect3Dfhf%ofCfo EfXfe [f^fX,ÌŽð-½,Í A  
DirectDrawfIfufWfFfNfg,ÌŽð-½,Æ“~„,Á, ,é,Æ,¢,²,±,Æ,Á, ,é B Direct3D fCf“f^ [ftFfCfX,ðŠJ•ú,µ,Á,à A  
Direct3Dfhf%ofCfo EfXfe [f^fX,ªŽg,|,È,,È,é,í,~Á,Í,È,¢ B  
,»,ÌfXfe [f^fX,Í A,»,ÌIfufWfFfNfg,Ö,ÌŽQ Æ,ª i,»,ÌŽQ Æ,ªDirectDraw,Û,½,Í Direct3D,Ì,¢  
,,ê,Á, ,é,©,È,©,í,ç,, j,.,×,ÁŠJ•ú,³,ê,é,Û,Á,È,,È,é,±,Æ,Í,È,¢ B,µ,½,ª,Á,Ä ADirectDrawfhf%ofCfo  
EfCf“f^ [ftFfCfX,ðŽQ Æ,µ,½,Û,ÛDirect3DfCf“f^ [ftFfCfX,ðŠJ•ú,µ A Ä,ÑDirect3D  
fCf“f^ [ftFfCfX,ð Æ%oï,µ,½ ê ±,Á,à ADirect3DXfe [f^fX,Í^ÛŽ ,³,ê,Ä,¢,é B

**Direct3DffofCfX EfCf“f^ [ftfFfCfX**

Direct3DfIfufWfFfNfg,ì ê ‡,Æ“—l A“Æ—§,μ,½ Direct3DffofCfX EfIfufWfFfNfg,Í,È,¢ B  
Direct3DffofCfX,Í A 3DfÆf“f\_Šf“fO,ÌÍ Û,Æ,μ,ÄŽg,í,ê,é  
DirectDrawSurfacefIfufWfFfNfg,Æ’Ê M,·,é,½,ß,Ì’P,È,éfCf“f^ [ftfFfCfX,È,Ì,Ä, ,é BŽŸ,Ì—á,Ä,Í A  
DirectDrawSurfacefIfufWfFfNfg,Ö,ÌDirect3D ffofCfX EfCf“f^ [ftfFfCfX,đ 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,ÌŽö-½,É,Ä,¢,Ä A“¬,¶f< [f<,ªDirectDrawSurfacefIfufWfFfNfg,Æ  
Direct3DffofCfX,É“K—p,³,ê,é(±,ê,ç,Ìf< [f<,Ä,¢  
,Ä,Í A uDirect3Dfhf%ofCfo EfCf“f^ [ftfFfCfX v,đŽQ Æ,·,é,±,Æ) B,³,ç,É A“¬ê,Ì  
DirectDrawSurfacefIfufWfFfNfg,É’Ì,μ A\*i ”,Ì“ÆŽ©,È Direct3D ffofCfX EfCf“f^ [ftfFfCfX,đ“¾,é,±  
,Æ,ª,Ä,«é B,μ,½,ª,Ä,Ä A’P^ê,Ì  
DirectDrawSurfacefIfufWfFfNfg,đ Af%of“fvfx [fX EffofCfX,ÆRGBfx [fX EffofCfX’o·ù,Ìf^ [fQfbfg,Æ,·,é,  
±,Æ,à,Ä,«é B

### Direct3DfefNfXf`ff EfCf“f^ [ftFfCfX

Direct3DfefNfXf`ff,Í“ÆŽ©,ÌfufWfFfNfg^fCfv,Á,Í,È, A DirectDrawSurfaceIfufWfFfNfg,Ì,à,□  
,Đ,Æ,Â,ÌfCf“f^ [ftFfCfX,Á, ,é BŽŸ,Ì—  
á,Á,Í A DirectDrawSurfaceIfufWfFfNfg,©,çDirect3DfefNfXf`ff EfCf“f^ [ftFfCfX,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^fXŽđ-½,É,Â,¢,Ä A““,¶f< [f<,ªDirect3DfefNfXf`ff,É“K—p,³,ê,é(±,ê,ç,Ìf< [f<,Á,¢  
,Á,Í A uDirect3Dfhf%ofCfo EfCf“f^ [ftFfCfX v,đŽQ Æ,·,é,±,Æ) B  
,Đ,Æ,Â,ÌDirectDrawSurfaceIfufWfFfNfg,đfÆf“f\_Šf“fO,Ìf^ [fQfbfg,ÆfefNfXf`ff,Ì“o•û,É•l—p,·,é,±,Æ,ª%oÁ”,Á,  
,é B

**DirectDraw HEL,ÆDirect3D**

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

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

f, [fhX,Í A•W €VGAf, [fh13,©,ç”h ¶,µ,½fnfCfufŠfbfh EffBfXfvfCfC Ef, [fh,Ä, ,é B,±,Ïf, [fh,Ä,Í A  
VGAffBfXfvfCfC EfAf\_fvf^,ÏEGA•; ”frffl EfvfC [f“ EfVfXfef€  
,É,æ,è256KfofCfG,Û,Ä,ÏffBfXfvfCfC Ef f,fŠ,ðŽg,±,±,Æ,ª,Ä,«,(f, [fh13,Ä,Í64KfofCfG,Û,Ä) BWindows  
95 ā,Ä,Í A DirectDraw,Í, ,ç,ä,éffBfXfvfCfC EfJ [fh,É,Ó,½,Ä,Ïf, [fhXf, [fh (320’200’8,Æ320’240’8)  
,ð’ñ,ÿ,.,,é B,Û,½ AfŠjA,È’á%ð’æ“xf, [fh,ðfTf| [fg,.,,éJ [fh,à, ,è AfŠjA,È’á%ð’æ“xf, [fh,Ä,Ífvf%oCf}  
fŠ EfT [ftfFfX,ðf fbN,µ,Ä’¼ ÚfAfNfZfX,Ä,«,(é Bf, [fhXf, [fh,Ä,Ífvf%oCf}

f, [fhXf, [fh,ÍC» ÝWindows NT,Ä,ÍfTf| [fg,³,è,Ä,“,ç,., AfŠjA’á%ð’æ“xf, [fh,à L,fTf| [fg,Í,³,è,Ä,ç,È,ç B

**fsfNfZf< EftfH [f}fbfg**

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

fefNfXf`ff Ef}fbfv,ìftfH [f}fbfg

fIfTfXfNfŠ [f“ EfT [ftfEfX,ìftfH [f}fbfg

**fefNfXf`ff Ef}fbfv,ÌftfH [f}fbfg**

HEL,Í L”Í,ÈfefNfXf`ff EfsfNfZf< EftfH [f}fbfg,ðfTf| [fg,·,é BŽŸ•,»,ê,ç,ÌftfH [f}fbfg,ðŽ!,µ,Ä,c,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%ofo,Æfrfbfg [“x,Æ,Ì’g,Ý ‡,í,¹,É’Î%ž,·,é B

<b>fsfNfZf&lt; EftfH [f} fbfg Eftf%ofo</b>	<b>frfbfg [“x</b>	<b>f}fXfN</b>
DDPF_RGB   DDPF_PALETTEINDEXED1	1	R: 0x00000000 G: 0x00000000 B: 0x00000000 A: 0x00000000
DDPF_RGB   DDPF_PALETTEINDEXED1   DDPF_PALETTEINDEXEDTO8	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_PALETTEINDEXED2   DDPF_PALETTEINDEXEDTO8	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_PALETTEINDEXED4   DDPF_PALETTEINDEXEDTO8	4	R: 0x00000000 G: 0x00000000 B: 0x00000000 A: 0x00000000
DDPF_RGB   DDPF_PALETTEINDEXED8	8	R: 0x00000000 G: 0x00000000 B: 0x00000000 A: 0x00000000
DDPF_RGB	8	R: 0x000000E0 G: 0x0000001C B: 0x00000003 A: 0x00000000

DDPF_RGB   DDPF_ALPHAPIXELS	16	R: 0x0000F00 G: 0x00000F0 B: 0x000000F 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,ÌftfH [f}fbfg,ðfVfXfef€ Ef f,fŠ ã,É ì ¬,·,é,±  
,Æ,<sup>a</sup>,Å,«,«,é B3DfAfNfZf%of€ [fVf±f“ EfffBfXfvf€fC EfJ [fh,Ì,½,ß,ÌDirectDrawfffofCfX Efhf%ofCfo,Í Af  
fBfXfvf€fC Ef f,fŠ,É¼,ÌftfH [f}fbfg,ð ì ¬,·,é ê ±,<sup>a</sup>,é B,»,<sup>□</sup>  
,μ,½fhf%ofCfo,Í AfefNfXf`ff,ð ì ¬,Å,«,«,é,±,Æ,ðŽ!,·,½,ß DDSCAPS\_TEXTURE ftf%ofO,ðfGfNfXf| [fg,·,é B

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

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

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

DDPF\_RGB 32 R: 0x00FF0000  
G: 0x0000FF00  
B: 0x000000FF  
A: 0x00000000

DDPF\_RGB 32 R: 0x000000FF  
G: 0x0000FF00  
B: 0x00FF0000  
A: 0x00000000

HEL,Í,Ü,½ A L”Í,ÈfIfXfNfŠ [f“ EfT [ftfEfX,ÌfTf] [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,ç,Ä,Ï^ê”Ê“I,ÈŠT—v,ð à→¼,.,é B*

*IDirectDraw2 fCf“f^ [ftfFfCfX*

*IDirectDrawClipper fCf“f^ [ftfFfCfX*

*IDirectDrawPalette fCf“f^ [ftfFfCfX*

*IDirectDrawSurface2 fCf“f^ [ftfFfCfX*

**IDirectDraw2fCf“f^ [ftFfCfX**

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

DirectDrawIfufWfFfNfg

IDirectDraw2,Á%½,ª V,µ,,È,Á,½,©?

^— ,²,Æ,ì· ”DirectDrawIfufWfFfNfg

\_,%ò‘æ“x,ÆfgDf< [fJf%o [,ìfrfbfg [“xfTf\ [fg

fvf%ofCf}fŠ EfT [ftFfX EfŠf\ [fX<□—Lf,fff<

f, [fh•ï X,Æ”r‘¼“IfAfNfZfX

CoCreateInstance,ð—p,ç,½DirectDrawIfufWfFfNfg,ì ì ñ

## DirectDrawIfufWfFfNfg

DirectDrawIfufWfFfNfg,Í AfffBfXfvfŒfC Efn [fhEfffA,ð·\,· B  
fCf“fXf^f“fX%»»,³,ê,½fftfBfXfvfŒfC EfffofCfX,²fn [fhEfffA EfAfNfZf%Œ [fVf±f“,ðŽ ,Â ê ± AfIfuf  
WfFfNfg,Ífn [fhEfffA EfAfNfZf%Œ [fVf±f“,² s,í,ê,é B DirectDrawIfufWfFfNfg,ÍŽŒi—  
p,ÌfIfufWfFfNfg,ð ì ¬,·,é BDirectDrawSurface ADirectDrawPalette ADirectDrawClipper,Â, ,é B

DirectDrawIfufWfFfNfg,Í A^ê“x,É,Ó,½,Â^È ãfCf“fXf^f“fX%»»,Â,«,é B Â,à’P f,È—á,Æ,µ,Ä,Í AWindows 95  
fVfXfef€ ã,Â,Ó,½,Â,Ìf,fjf^ [,ðŽg,² ê ±,², ,é B Windows 95Ž©‘Ì,Í Afff...fAf< Ef,fjf^,ðfTf| [fg,µ,È,Œ  
,² AfffBfXfvfŒfC EfffofCfX,»,ê,¼,ê,ÉDirectDraw HAL,ð ‘,±,Æ,²,Â,«,é B Windows  
95,ÆGDI,“FŽ,·,éfftfBfXfvfŒfC EfffofCfX,Í AffftfHf<fg,ÌDirectDrawIfufWfFfNfg,²fCf“fXf^f“fX%»»,³,ê,é,Æ,  
«—p,Œ,ç,ê,é,à,Ì,Â, ,è A,»,²,Â,È,ŒfffofCfX,Í A“æ“ñ,ÌfftfBfXfvfŒfC EfffofCfX,ÌfOf [fof< Eftj [fNŽ·ÉŽq  
(GUID),ðŽg,Â,Ä ì ¬,³,ê,½“Æ—§,µ,½,à,²,Ð,Æ,Â,ÌDirectDrawIfufWfFfNfg,É,æ,èfAfhfŒfX,·,é B,±,Ì  
GUID,Í **ADirectDrawEnumerate** ŠŒ ”,ðŽg,Â,ÄŽæ“¼,Â,«,é B

DirectDrawIfufWfFfNfg,Í ì ¬,µ,½fIfufWfFfNfg,·,×,Ä,ðŠŒ— ,µ AffftfHf<fg,ÌfpfŒfbfg ifvf%ŒfC}  
fŠ Eft [ftfFfX,²8frfbfg/  
fsfNfZf< Ef, [fh,Ì ê ± j AffftfHf<fg,ÌJf% [ Efl ] Afn [fhEfffA EfffBfXfvfŒfC Ef, [fh,ð §Œä,·,  
é B,»,µ,Ä,Ç,ÌfŠf\ [fX,²Š,,è“—,Ä Ì,Ý,Â,Ç,ÌfŠf\ [fX,²Žg—p%Œ”\,©,ð² ,·,·,é B

**IDirectDraw2, Á%½,ª V,µ,É,Á,½,©?**

DirectX,žg—p,·,éCOMf,ffç,Í A V,µ,çfCf“f^ [ftFfCfX,ìñÿ,É,æ,è V,µ,ç@”\,ð’Ç%Á,Á,«é,Æ,ç,«Á’¥  
,ð,à,Á,Á,,è A

IDirectDraw2fCf“f^ [ftFfCfX,Í AIDirectDrawfCf“f^ [ftFfCfX,ð‘ä‘Ö,·,é,à,ì,Á, ,é BDirectDraw2fCf“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,  
DDSCL\_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,±  
,ÍfCf“f^ [ftFfCfX,ÍIDirectDraw2::GetAvailableVidMem f f\fbfh,ðŠÜ,ñ,Á,ç,é,ª A,±,Íf f\fbfh,ðIDirectDraw  
fCf“f^ [ftFfCfX,çŽg,,ª,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,Íf f\fbfh,Á, ,é  
ÍIDirectDraw2::SetDisplayMode,ÆIDirectDraw2::EnumDisplayModes,ì,Ó,½,Á,Íf f\fbfh,Í  
AIDirectDraw2,ÉŠÜ,Ü,è,½,Æ,«É•Í X EŠg’£,ª,È,³,è,½ j B

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

**IDirectDraw2::SetCooperativeLevel f f\fbfh,ÆIDirectDraw2::SetDisplayMode f f\fbfh,Æ,Ì‘ŠÉÝ 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,ðCEÄ,Ñ o,µ,Ä”r¼“Í iftf<fXfNfŠ [f“ jf, [fh,ðŽæ“¾ A

**IDirectDraw2::SetDisplayMode,ðŽg,Á,Áf, [fh,ð•Í, ADDSCL\_NORMALftf%ofO,ðfZfbfg,µIDirectDraw.Q::SetCoop**

**erativeLevel,ðCEÄ,Ñ o,µ,Ä”r¼“If, [fh,ð%ð•ú,µ,½ ê ±,ÉfIfŠfWfif<,ÍffBfXfvfÇfC Ef, [fh,ªœE³,³,è,È,ç,ì,Á, ,**

é B,±,ì ê ±,ÍfAfvfŠfP [fVf‡f“,ª IDirectDraw::RestoreDisplayMode f f\fbfh,ðCEÄ,Ñ o,·,© A

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

,µ,©,µ AIDirectDraw2fCf“f^ [ftFfCfX,ðŽg,Á,Á,ç,é ê ± AfAfvfŠfP [fVf‡f“,ª—1,ÍfXfefbfv,ð“¥

,ð,Æ A”r¼“If, [fh,ªŽ,í,è,è,ÍfIfŠfWfif<,ÍffBfXfvfÇfC Ef, [fh,ªŽ©“@“Í,ÉfŠfXfgfA,³,è,é,æ,ª,È,È,é B

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

,Á,©•Í X,³,è,é B,»,ì,½,ß AfCf“f^ [ftFfCfX Ef f\fbfh,ì V<Çfo [fWf‡f“ i,½,Æ,!,ÍIDirectDraw,Æ

**IDirectDraw2 j,ð ¬—p,·,é,Æ A—\‘zŠO,ìE<%oÈ,ð˘ø,«<N,±**

,· B“Á”è,Ífo [fWf‡f“,ÍfCf“f^ [ftFfCfX,ç,¾,¬f f\fbfh,ðŽg,ª,×,«Á, ,é B

^— ,²,Æ,İ; ”DirectDrawIfufWfFfNfg

DirectDraw,Á,Í A•K—v,È%õñ ”,¾,¯,ì **DirectDrawCreate** ŠÖ ”ĈÄ,Ñ o,µ ^— ,%oÁ”\,Á, ,é B  
ĈÄ,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,Á^Ě“¶ «,ª,È,ĉ B,Û,³,É A“ÆŽ©fvf fZfX,©,ç ì ¬,³,ê,½,  
©,Ì,æ,²,É U,é•,²,Ì,Á, ,é B

DirectDrawIfufWfFfNfg,“Æ—§,µ,Á,ĉ,é,±,Æ,©,ç A“Á’è,ì DirectDrawIfufWfFfNfg,É,æ,Á,Ä ì ¬,³,ê,½  
DirectDrawSurface ADirectDrawPalette ADirectDrawClipper,ÌšefIfufWfFfNfg,Í A ì ¬Ĉ¹^ÈŠÖ,ìDirectDrawIfufWfF  
fNfg,Æ,Æ,à,ÉŽg,í,ê,Ä,Í,È,ç,È,ĉ B,±  
,ê,ç,ìfIfufWfFfNfg,Í ì ¬Ĉ¹,ìDirectDrawIfufWfFfNfg,“”jŠü,³,ê,é,Æ,«,ÉŽ©“@“I,É%ø•ú,³,ê,é,©,ç,Á, ,é B¼,ì  
DirectDrawIfufWfFfNfg,Æ,Æ,à,ÉŽg,í,ê,½ ê ‡ A,à,Æ,ìfIfufWfFfNfg,“”jŠü,³,ê,é,Æ<@”\,ªªž~µ,Á,µ,Û,²%oÁ”\ «,ª,  
,é B

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

,%øð'œ"x,ÆfgDf< [fJf%o [lÏrfrbfg ["xfTf] [fg

DirectDraw,Í A fffBfXfvfCfC EfffofCfX Efhf%oCfo,ªfTf] [fg,·,é,·,×,Ä,ÏfXfNfŠ [f"%øð'œ"x,Æfrfbfg ["x,ðfTf] [fg,·,é B

DirectDraw,É,æ,è AfAfvfŠfP [fVf‡f“,Í AfRf“fsf... [f^,ÏffBfXfvfCfC Efhf%oCfo,ªfTf] [fg,·,é,Ç,Ïf, [fh,É,à•Í X,Ä,«,é,æ,ð,É,È,é B,±,ê,É,ÍfTf] [fg,³,ê,Ä,ç,é24-bpp,Æ32-bpp,Ïf, [fh,·,×,Ä,ªŠÜ,Ü,ê,é B

DirectDraw,Í,Ü,½ A HEL,ª24- bpp,Æ 32-bpp fT [ftfFX,Ïfuf fbfN“]‘—,àfTf] [fg,µ,Ä,ç,é B fffBfXfvfCfC EfffofCfX Efhf%oCfo,ª,±,ê,ç,Ï%øð'œ"x,Äfuf fbfN“]‘—,ðfTf] [fg,µ,Ä,ç,é ê ‡,Í A fffBfXfvfCfC Ef f, fŠŠÖ,Ïfuf fbfN“]‘—,Éfn [fhEfFfA Efuf fbfN“]‘—,ªŽg,í,ê A,»,ð,Ä,È,ç,Æ,«,ÍHEL,ªŽg—p,³,ê,é B

Windows,Ä,Í A Žg,Ä,Ä,ç,éf,fjf^,Ïf^fCfv,ðf† [fU,ªŽw'è,·,é,±,Æ,ª,Ä,«,é B DirectDraw,Í AfCf“fXfg [f<,³,ê,½f,fjf^,ÏffBfXfvfCfC §CEÄ,ðf`fFfbfN,·,é B— v<,³,ê,½f, [fh,ªf† [fU,Ïf,fjf^,Ä•Ž,Ä,«,É,ç,Æ A **IDirectDraw2::SetDisplayMode** f f\fbfh,ÏCEÄ,Ñ o,µ,ÍŽ,”s,·,é B,Ü,½ A **IDirectDraw2::EnumDisplayModes** f f\fbfh,ðCEÄ,Ñ o,µ,½,Æ,«,É— ñ<,³,ê,é,Ï,Í AfCf“fXfg [f<,³,ê,Ä,ç,éf,fjf^,ªfTf] [fg,·,éf, [fh,¾,¯,Ä,·,é B

**fvf%ofCf}fŠ EFT [ftfFfX EfŠf\ [fX<α—Lf,fff<**

DirectDraw,ÍP f,ÈfŠf\ [fX<α—Lf,fff<,Á, ,é B fffBfXfvfCfC Ef f,fŠ,Í<α—LfŠf\ [fX,Á, ,è A\*s'«„μ„,ç„Á, ,é B fffBfXfvfCfC Ef, [fh„<sup>a</sup>Í X„<sup>3</sup>,é,é,Æ A fffBfXfvfCfC Ef f,fŠ,ÉŠi”[„<sup>3</sup>,é,½fT [ftfFfX,Í,·,×,ÄŽ„í,é,é i Ú,μ,-,Í A ufT [ftfFfX,Í ÄŽ v,ðŽQ Æ,·,é,±,Æ j B

DirectDraw,Í A GDI,Æ<α—L,·,éffBfXfvfCfC EfffofCfX,½,½,ÉfCf“fXf^f“fX%»„<sup>3</sup>,é,é,Æ,« A^Ä—Û“Í,É GDI fvf%ofCf}fŠ EFT [ftfFfX,ð ì ¬,·,é B GDI,Í A fvf%ofCf}fŠ EFT [ftfFfX,Ö,Í<α—LfAfNfZfX,ð—^„,ç„é,é B DirectDraw,Í A GDI,^ fvf%ofCf}fŠ EFT [ftfFfX,Æ,μ,Ä”FŽ¬,·,éfT [ftfFfX Ef f,fŠ,ð<L%—,μ,Ä,ç,é B GDI,Í fvf%ofCf}fŠ EFT [ftfFfX,ð Š— L,·,éDirectDrawSurfaceIfufWfFfNfg,Í A,Ä,È,É **DirectDraw2::GetGDISurface** f f\fbfh,ðŽg,μ,±,Æ,É,æ,Á,Ä“¾,ç,é,é B

GDI,Í A DirectDraw,ŠÇ— ,·,éffBfXfvfCfC Ef f,fŠ ä,ÍftfHf“fg Afuf%ofV A fffofCfX^È“¶ftrfbfgf} fbv(DDB),ðfLfffbfVf...,Ä,«„È,ç B—~p,Ä,«„é f,fŠ,ð DirectDraw,lfq [fvf}fl [fWff,È'È'm,·,é'O A, ,é,ç,ÍDirectDraw,lfq [fvf}fl [fWff,©,çfLfffbfVf...,<sup>3</sup>,é,½ff [f^,½,½,ÉffBfXfvfCfC Efhf%ofCfo,^f f,fŠ,ðŠ„,è“—,Ä,Ü,½,Í%ð•ú,Ä,«„é,æ,μ,É,È,é'O,É AHAL,Í A DIBfGf“fWf“ Efhf%ofCfo,^K—v,Æ,·,éffBfXfvfCfC Ef f,fŠ,ð —\ñ,μ,È,¬,é,Í,È,ç,È,ç B

f, [fh•Ī X,Æ”r¼“IfAfNfZfX

fAfvfŠfP [fVf‡f“,Ī A IDirectDraw2::SetDisplayMode f f\fbfh,đŽg,Á,ÄffBfXfvfĚfC Ef, [fh,đ•Ī X,·,é,±,Æ,ª,Á,«,«,é B ^ê-‡,ĪffBfXfvfĚfC EfJ [fh,đ<□—L,μ,Á,¢,é,©,-,è A,·,×,Ä,ĪfAfvfŠfP [fVf‡f“,ªf, [fh,đ•Ī X,Á,«,«,é B

ffBfXfvfĚfC Ef, [fh,ĪfsfNfZf< [“x,Ī A DirectDrawIfufWfFfNfg,Ō,Ī”r¼“IfAfNfZfX,ªŽæ“¾,Á,«,½ ê ‡,É,¾,- AfAfvfŠfP [fVf‡f“,©,¢Ī X,Á,«,«,é Bf, [fh,ªĪ X,³,è,é,Æ A,·,×,Ä,Ī DirectDrawSurfaceIfufWfFfNfg,ĪfT [ftfFfX Ef f,fŠ,đŽ,,¢‘€ ì’s”\,É,È,é B fT [ftfFfX,Īf f,fŠ,Ī A IDirectDrawSurface2::Restore f f\fbfh,đŽg,□,±,Æ,Á ÄŠ,,è“- ,Ä,μ,È,,Ä,Ī,È,ç,È,¢ B

DirectDraw,Ī”r¼“Ī iftf<fXfNfŠ [f“ jf, [fh,É,“,¢,Ä A¼,ĪfAfvfŠfP [fVf‡f“,Á,ĪDirectDrawSurfaceIfufWfFfNfg,đŠ,,è“- ,Ä,ç,è ADirectDraw,ĪŽg—p,âGDI,Ī<@”\,à—p%oĀ”\,Ä, ,é B,μ,©,μ A”r¼“If, [fh^ÈŠŌ,ĪfAfvfŠfP [fVf‡f“,ªffBfXfvfĚfC Ef, [fh,âfPfĚfbfg,đ•Ī X,·,é,±,Æ,Ī,ÖŽ~,³,è,é B

**CoCreateInstance**, $\delta$ — $p$ , $c$ , $\frac{1}{2}$ **DirectDrawIfufWfFfNfg**, $\dot{I}$   $\dot{i}$   $\neg$

**DirectDrawCreate** ŠÖ ”,Ä,Í,È, A**CoCreateInstance** ŠÖ ”,Ä**IDirectDraw2::Initialize**  $f$   $f\backslash bfh$ , $\delta$ Žg,Ä,Ä**DirectDrawIfufWfFfNfg**, $\delta$   $\dot{i}$   $\neg$ , $\cdot$ , $\acute{e}$ , $\pm$ ,Ä, $\acute{e}$ ,Ä,«, $\acute{e}$  B  $\hat{E}\%^\circ$ ,ÉŽè †,žž|,· B

```
1  $fAfvfŠfP$  [ $fVf\ddagger f$ “,İŽn,ß,Ä A NULL, $\delta$ Žw’è, $\mu$ ,ÄCoInitialize, $\delta$ CEÄ,Ñ o, $\mu$  ACOM, $\delta$  %Šú%», $\cdot$ , $\acute{e}$  B
   if (FAILED(CoInitialize(NULL)))
       return FALSE;
```

```
2 CoCreateInstance,ÄIDirectDraw2::Initialize  $f$   $f\backslash bfh$ , $\delta$ Žg,Ä,ÄDirectDrawIfufWfFfNfg, $\delta$   $\dot{i}$   $\neg$ , $\cdot$ , $\acute{e}$  B
   ddrval = CoCreateInstance(&CLSID_DirectDraw,
                             NULL, CLSCTX_ALL, &IID_IDirectDraw2, &lpdd);
   if(!FAILED(ddrval))
       ddrval = IDirectDraw2_Initialize(lpdd, NULL);
```

, $\pm$ ,İ**CoCreateInstance**,İCEÄ,Ñ o, $\mu$ † A Ä %o,İpf%of [ $f^{\wedge}$ CLSID\_DirectDraw,Í A  
DirectDrawfhf%ofCfo EfIfufWfFfNfg EfNf%ofX,İfNf%ofXŽ•ÉŽq,Ä, , $\acute{e}$  B IID\_IDirectDraw2  
fpf%of [ $f^{\wedge}$ ,Í A  $\dot{i}$   $\neg$ , $\cdot$ , $\acute{e}$ , $\acute{e}$ “Ä’è,İDirectDraw fCf“ $f^{\wedge}$  [ftfFfCfX, $\delta$ Ž•É,·, $\acute{e}$  B  
lpddfpf%of [ $f^{\wedge}$ ,Í AŽæ“ $\%4$ , $\cdot$ , $\acute{e}$ , $\acute{e}$ DirectDrawIfufWfFfNfg, $\delta$ Žw,· B CEÄ,Ñ o, $\mu$ , $\acute{a}$   $\neg$ CE $\ddagger$ , $\cdot$ , $\acute{e}$ ,Ä A, $\pm$   
İŠÖ ”,Í %Šú%», $\cdot$ , $\acute{e}$ ,Ä,c,È,c $f$ IfufWfFfNfg, $\delta$ Ö,· B

```
3 DirectDrawIfufWfFfNfg, $\delta$ Žg, $\mu$ ’O,É AIDirectDraw2::Initialize, $\delta$ CEÄ,Ñ o, $\cdot$ , $\acute{e}$ ,Ä,Í,È,c,È,c B, $\pm$ ,İf  $f\backslash bfh$ ,Í A
DirectDrawCreate ŠÖ ”, $\acute{a}$ “É“İ,ÉŽg, $\mu$ fhf%ofCfo GUID fpf%of [ $f^{\wedge}$  i, $\pm$ ,İ è †NULL j, $\delta$ ø ”,ÉŽæ, $\acute{e}$  B
DirectDrawIfufWfFfNfg %Šú%»CEä,Í ADirectDrawCreate ŠÖ ”, $\delta$ Žg,Ä,Ä  $\dot{i}$   $\neg$ , $\mu$ , $\frac{1}{2}$ ,İ,Ä“—İ,ÉŽg—
p A% $\delta$ •ú, $\cdot$ , $\acute{e}$ , $\pm$ ,Ä, $\acute{e}$ ,Ä,«, $\acute{e}$  B DirectDrawIfufWfFfNfg,ÄŠÖ~A,Ä, ,c, $\acute{e}$ , $\frac{1}{2}$   $f\backslash bfh$ , $\delta$ Žg, $\mu$ ’O,É A
IDirectDraw2::Initialize  $f$   $f\backslash bfh$ , $\delta$ CEÄ,Ñ o, $\cdot$ , $\acute{e}$ ,Ä,c,Ä A DDERR_NOTINITIALIZEDfGf%o [, $\mu$ ” ¶, $\cdot$ , $\acute{e}$  B.
```

$fAfvfŠfP$  [ $fVf\ddagger f$ “, $\delta$ •Ä,¶, $\acute{e}$ ’O,É A **CoUninitialize** ŠÖ ”, $\delta$ Žg,Ä,ÄCOM, $\delta$ fVfffbfgf\_fEf“, $\mu$ ,È,,Ä,Í,È,c,È,c B  
CoUninitialize());

**IDirectDrawClipper fCf“f^ [ftFfCfX**

IDirectDrawClipper fCf“f^ [ftFfCfX,Í AfNfŠfbfv EfŠfXfg,ì ì ¬,Æf f“fefif“fX,ìf^fXfN,ð’P f%».,.é B ,± ,ìfCf“f^ [ftFfCfX,Í A”r¼“I iftf<fXfNfŠ [f“ jf, [fh,æ,è,à AfEfBf“fhfE,Á“@ ì,.,éfAfvfŠfP [fVf‡f“,Á—L —p,Á, ,é BfEfBf“fhfE,Á“@ ì,.,éfAfvfŠfP [fVf‡f“,Í A•Ī X,³,ê,½— Īæ,¾,~fXfNfŠ [f“,ð X V,.,é,½,ß,É AfNfŠfbfv EfŠfXfg,ðŽg,±,±,Æ,ª,Á,«.,é B

ˆÈ%º,ìfgfsfbfN,Í **AIDirectDrawClipper fCf“f^ [ftFfCfX ,ÉŠÖ~A,.,é’Ç%Á ĩ•ñ,©,ç,È,é B**

fNfŠfbfv EfŠfXfg

DirectDrawClipperIfufWfFfNfg,Ī,α—L

fhf%oCfo”ñˆÈ“¶,ĪDirectDrawClipperIfufWfFfNfg

CoCreateInstance,ð—p,¢,½DirectDrawClipperIfufWfFfNfg,Ī ì ñ

**fNfŠfbfv EfŠfXfg**

DirectDraw,Í ADirectDrawClipperIfufWfFfNfg,ðŽg,Á,ÄfNfŠfbfv EfŠfXfg,ðŠÇ— ,·,é B  
fNfŠfbfv EfŠfXfg,Í AfT [ftFfX,ì%ŰŽ<—Íæ,ð<L q,·,é<É`ÌfŠfXfg,Á, ,é B  
DirectDrawClipperIfufWfFfNfg,Í A,Ç,ÌfT [ftFfX,É,àAf^fbf`,Á,«,é B,Û,½EfBf“fhfE Efnf“fhf<,ðDirectDraw  
ClipperIfufWfFfNfg,ÉfAf^fbf`,·,é,±  
,Æ,à,Á,« A,»Ì ê ‡DirectDraw,Í AfEfBf“fhfE,ìï X,É”º,Á,ÄEfBf“fhfE,©,ç“¾,ç,é,éfnfŠfbfv 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© ‡,ª<éÉ,Ìfuf fbfN“]‘—  
,É,¾, HAL,ðEÄ,Ñ o,· B,½,Æ,Ì,ÍfT [ftFfX,ì%E ä,ÌŽlŠpÉ`,ªfNfŠfbfsf“fO,³,ê A,»ÌfT [ftFfX,ðfvf%ofCf}  
fŠ EfT [ftFfX,Éfuf fbfN“]‘—,·,é,æ,ªfAfvfŠfP [fvf‡f“,ª DirectDraw,ÉŽwŽ,Ì,½ ê ‡ A  
DirectDraw,ÍHAL,É,Ó,½,Á,Ìfuf fbfN“]‘—,ð s,ì,¹,é B,Ð,Æ,Á,ÍfT [ftFfX,Ì ¶ äŠp A,à,ª  
,Ð,Æ,Á,ÍfT [ftFfX,ì%º”¼ª,Á, ,é B

fI [fo [fÇfC Efn [fhfEfFfA,ªfNfŠfbfsf“fO,ðfTf] [fg,µ A,©,Á“]‘—  
æJf% [ EfL ],ªfAfNfefBfu,Á,È,ç ê ‡,É,Ì,Ý AHAL,ÍfI [fo [fÇfC,ÉfNfŠfbfv EfŠfXfg,ð—~p,·,é B  
Ç» Ý,Ìfn [fhfEfFfA,Ì‘ä”ª,Í A“]‘— æJf% [ EfL [,É ],ì,È,ç,©,¬,è A•Á 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•Á Ç,Æ,È,é,ÆfI [fo [fÇfC,Í~³Çø%»»,³,ê,é B,±,Ì ê ‡ AHAL,ÍfNfŠfbfv EfŠfXfg,ð~³Ž<,·,é B

## DirectDrawClipperIfufWfFfNfg,Ī,α—L

DirectDrawClipperIfufWfFfNfg,Ī A•i ”fT [ftFfXŠÔ,Ā<α—L,·,é,±,Æ,³,Ā,«,é B,½,Æ,!,Ī“¬,¶  
DirectDrawClipperIfufWfFfNfg,Ī AftfŠfbfsf“fO Ef`fF [f“Īftf f“fg Efofbftf@,ÆfofbfN Efofbftf@,Ī‘o•û,Āf  
Zfbfg,·,é,±,Æ,³,Ā,«,é BfAfvfŠfP [fvf±f“³,Ī,irectDrawSurface2::SetClipper f f\fbfh,ðŽg,Ā,Ā  
DirectDrawClipperIfufWfFfNfg,ðfT [ftFfX,ÉfA^fbf`·,é,Æ,« AfT [ftFfX,Ī,»ĪIfufWfFfNfg,ĪŽQ ÆfJfEf“fg  
,ðfCf“fNfŠf f“fg,·,é BfT [ftFfX,ĪŽQ ÆfJfEf“fg,³0,É,È,é,Æ A  
fA^fbf`³,é,½DirectDrawClipperIfufWfFfNfg,ĪŽQ ÆfJfEf“fg,ĪffNfŠf f“fg,³,é,é B,³,ç,É A  
fNfŠfbfp [ EfCf“f^ [ftFfCfX Ef|fCf“f^,ðNULL,É,μ,ĀIDirectDrawSurface2::SetClipper,ðĀĀ,Ñ o,·,±  
,Æ,É,æ,èDirectDrawClipperIfufWfFfNfg,³fT [ftFfX,©,çff^fbf`³,é,½ ê ± A  
fT [ftFfX,ĪDirectDrawClipperIfufWfFfNfg,ĪŽQ ÆfJfEf“fg,ĪftfNfŠf f“fg,³,é,é B

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### Note

“¬,¶IDirectDrawClipperIfufWfFfNfg A“¬,¶fT [ftFfX,ÉĪ,μ A IDirectDrawSurface2::SetClipper,ð%½“x,©‘±  
,·,ĀĀĀ,Ñ o,μ,½ ê ± AfIfufWfFfNfg,ĪŽQ ÆfJfEf“fg,ĪĪ“x,μ,©fCf“fNfŠf f“fg,³,é,È,ç B`A‘±  
,·,éĀĀ,Ñ o,μ,Ī AfIfufWfFfNfg,ĪŽQ ÆfJfEf“fg,É%œç,ð—^,!,È,ç,Ī,Ā, ,é B

---

**fhf%ofCfo”ñ`Ě‘¶,İDirectDrawClipperfIfufWfFfNfg**

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

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

**İDirectDraw2::CreateClipper** f f\fbfh,đŽg,Á,Ä DirectDrawClipperfIfufWfFfNfg,đ ì ¬,·,é,±,Æ,ª,À,«,é B,± ,ê,ç,İDirectDrawClipperfIfufWfFfNfg,Í A,à,Æ,İDirectDrawfIfufWfFfNfg,ª%đ•ú,³,ê,½,Æ,«Ž©“®“I,É%đ•ú,³,ê,é B

**CoCreateInstance**, $\delta$ —p,¢,½**DirectDrawClipperIfufWfFfNfg**,İ ì ñ

```
DirectDrawClipperIfufWfFfNfg,Í ACOM,Æ,İEÝŠ· «,ì,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%Á,| ACoGetClassObject
ŠÖ ”,ðEÄ,ÑfNf%ofX Eftf@fNfgfŠ,ð“¼,Ä,©,çCoCreateInstanceŠÖ ”,ðEÄ,Ñ o,·,© A, ,é,¢,Í¼ Ú
CoCreateInstance,ðEÄ,Ñ o,·,±,Æ,É,æ,Á,Ä ADirectDrawClipperIfufWfFfNfg,ð ì ñ,·,é,±,Æ,ª,Ä,«,é B`È%º,ì—p—
á,Í A CoCreateInstance,ÆIDirectDrawClipper::Initialize
f f\fbfh,ðŽg,Ä,ÄDirectDrawClipperIfufWfFfNfg,ð ì ñ,·,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 %  
,İpf%of [f^CLSID\_DirectDrawClipper,Í A**DirectDrawClipperIfufWfFfNfg** EfNf%ofX,İfNf%ofXŽ·ÊŽq,Ä, ,é BII  
D\_IDirectDrawClipperpf%of [f^,Í ACE» ÝfTf| [fg,³,é,Ä,¢  
,éCf“f^ [ftfFfCfX,ðŽ·Ê,µ AlpClipperpf%of [f^,Í AŽæ“¼,³,é,½**DirectDrawClipperIfufWfFfNfg**,ðŽw,· B  
fNf%ofX Eftf@fNfgfŠ,İf fJfYf€,É,æ,Ä,Ä ì ñ,³,é,é**DirectDrawClipperIfufWfFfNfg**,ðŽg—  
p‘O,É %Šú%º»,·,é,½,ß,É AfAvfŠfP [fVf±f“,Í **IDirectDrawClipper::Initialize** f f\fbfh,ðŽg,±K—v,ª, ,é B  
OUL,İ‘l,İdwFlagpf%of [f^,Ä A,±,İ ê ‡,İftf%ofO,ªE» ÝfTf| [fg,³,é,Ä,¢,É,¢,½,ß‘l,ÍO,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 ñ,³,é,é i,±,è,Í**DirectDrawCreateClipper**  
ŠÖ ”,ðŽg,Ä,Ä**DirectDrawClipper**,ð ì ñ,·,é,±,Æ,Æ““,Ä, ,é j B  
fAvfŠfP [fVf±f“,ð I—,·,é‘O,É**CoUninitialize** ŠÖ ”,ðŽg,Ä,ÄCOM,ðfVfffbfgf\_fEf“,·,é,±,Æ,ªK—v,Ä, ,é B  
CoUninitialize());

**IDirectDrawPalette fCf“f^ [ftfFfCfX**

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

DirectDrawPalettefIfufWfFfNfg

”ñfvf%ofCf}fŠ Eft [ftfFfX,Á,îfpf(efbfq,ì Ý`è

fpf(efbfq,ì<□—L

fpf(efbfq\_Ef^fCfv

**DirectDrawPalettefIfufWfFfNfg**

DirectDrawPalettefIfufWfFfNfg,Í A16 F,Æ256 F,ÌfpfŒfbfg,ð¼ Ú‘€ ì,Á,«é,æ,ð,É,·,é,½,B’ñ<ÿ,³,ê,Ä,ç,é i  
DirectDrawPalettefIfufWfFfNfg,Íê”Ê,É ADirectDrawSurfacefIfufWfFfNfg,ÉfAf^fbf`,³,ê,é j B  
DirectDrawPalettefIfufWfFfNfg,Í A256 FfpfŒfbfg,ì,½,ß,É0,©,ç255,Û,Ä,ÌfGf“fgfŠ,ð—  
p^Ó,·,é B16 FfpfŒfbfg,ì,½,ß,ÌfGf“fgfŠ,Í—p^Ó,³,ê,É,ç B,±  
,ê,É,æ,èfJf%o [ Efe [fuf<,ð^ê,Ä,Ìfe [fuf<,Æ,µ,Ä¼ Ú‘€ ì,Á,«é BfJf%o [ Efe [fuf<,ÍfJf%o [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^Œ»,·,é16frfbfg,Æ24frfbfg,ÌRGBfGf“fgfŠ,ðŠÛ,ð B,Û,½16 FfpfŒfbfg,ì,½,ß,É  
Afe [fuf<,Í,à,ð,Ð,Æ,Ä,Ì256 FfpfŒfbfg,Ö,ÌfCf“fffbfNfX,àŽ ,Ä,±,Æ,ª,Ä,«é B

fAfvfŠfP [fVf‡f“,Í A **IDirectDrawPalette::GetEntries** f f\fbfh,ðŽg,Á,Ä,±  
,é,ç,Ìfe [fuf<^,ÌfGf“fgfŠ,ðŽæ“¾,Ä,«é B,Û,½ A **IDirectDrawPalette::SetEntries** f f\fbfh,ðŽg,Á,Ä A,±  
,é,ç,ÌfGf“fgfŠ,ð•Í X,·,é,±,Æ,à,Ä,«é B,±,Ìf f\fbfh,Í A fpfŒfbfg,Ö,Ì•Í X,ª,ç,Ä”Œø,·,é.©Žw`è,·,édwFlags  
fpf%of [f^,ðŽ ,Ä B

DirectDrawPalettefIfufWfFfNfg,ðŽg,Á,½ŠÈ’P,ÈfpfŒfbfgfAfjf [fVf‡f“,ð’ñ<ÿ,·,é,É,Í A,»,è,¼,ê,Ð,Æ,Ä,Ä,Ä,Ìf f\  
fbfh,ð—p,ç,½,Ó,½,Ä,Ì•û—@,ª, ,é B Ä %o,Ì•û—@,Í A“@%oæ,ÉŽg—  
p,³,ê,é F,É•Í%oŽ,·,éfpfŒfbfg EfGf“fgfŠ,ð¼ Ú•Í X,·,é,±,Æ,Ä, ,é B,±,è,É,Í**IDirectDrawPalette::SetEntries**  
f f\fbfh,ð^è%oñŒÄ,Ñ o,¹,Í,æ,ç B,à,ð,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,ðŒðŒÝ,ÉfAf^fbf`,·,é,±  
,Æ,ÄfAfjf [fVf‡f“,ðŽÄ s,·,é B,±,è,Í **IDirectDrawSurface2::SetPalette** f f\fbfh,ðŽg,Á,Ä s,±,±,Æ,ª,Ä,«é B

”ñvf%ofCf}fŠ Eft [ftFfX,Ä,ìpfCEfbfg,ì Ý`è

fpfCEfbfg,Í ApfCEfbfg%»,³,ê,½,Ç,ñ,Èft [ftFfX ifvf%ofCf}  
fŠ AfofbfN Efofbftf@ AfIfxfNfš [f“ EfvfCE [f“ AfefNfXf`ff Ef}fbfv j,É,àfAf^fbf`,·,é,±  
,Æ,ª,Ä,«,é,ª AfVfXfef€ EfpfCEfbfg,É%œç,ð—^,¡,é,ì,Í Afvf%ofCf}  
fŠ Eft [ftFfX,ÉfAf^fbf`³,ê,½fpfCEfbfg,¾,¯,Ä, ,é B’ ^Ó,·,×,« d—v,È“\_Í A DirectDraw fuf fbfN“]‘—  
,ª F·İŠ,ðŽÄ s,µ,È,Ç,Æ,Ç,ª,±,Æ,Ä, ,é Bfuf fbfN“]‘—,ì“]‘—CE³, ,é,Ç,Í“]‘—  
æft [ftFfX,ÉfAf^fbf`³,ê,½,·,×,Ä,ìpfCEfbfg,ª—Ž<,³,é,é,ì,Ä, ,é B,³,Ç,ÉIDirectDrawSurface2::GetDC  
f f\fbfh,Í AfT [ftFfX,É‘Í,µ,Ä‘Í,ê,½, ,ç,ä,éDirectDrawPalettefIfufWfFfNfg,ð—³Ž<,·,é B  
fAfvfŠfP [fvf±f“,âDirect3D(Ü,½,Í‘¼,ì3DfCEf“f\_šf“fOfVfXfef€),Í A”ñvf%ofCf}fŠ Eft [ftFfX  
EfpfCEfbfg,İŽg—p,ð‘O’ñ,É,µ,Ä,Ç,é B

## fpfCEfbfg,Î«—L

fpfCEfbfg,Î«—L  
L,·,é BftfŠfbsf“fo Ef`fF [f“,Ïtf f“fg Efofbftf@,ÆfofbfN Efofbftf@,Â“¯,¶fpfCEfbfg,²Zfbfg,³,ê A·i ”fe  
fNfXf`ff Eft [ftfFfXŠÔ,Â«—L,³,ê,é BfAfvfŠfP [fvf‡f“,ª **IDirectDrawSurface2::SetPalette**  
f f\fbfh,ðŽg,Á,ÄfpfCEfbfg,ðft [ftfFfX,ÉfAf^fbf`,·,é,Æ Aft [ftfFfX,Î,»ÏfpfCEfbfg,ÏŽQ ÆfJfEf“fg,ðCf“fNf  
Šf f“fg,·,é Bft [ftfFfX,ÏŽQ ÆfJfEf“fg,³,0,É,È,é,Æ Aft [ftfFfX,ÎfAf^fbf`,³,ê,½fpfCEfbfg,ÏŽQ ÆfJfEf“fg,ðf  
ffNfŠf f“fg,·,é B,³,ç,É AfpfCEfbfg Efcf“f^ [ftfFfCfX Efcf“f^,ðNULL,É,µ,Ä  
**IDirectDrawSurface2::SetPalette**,É,æ,èft [ftfFfX,©,çfpfCEfbfg,ðff^fbf`,µ,½ ê ‡ Aft [ftfFfX EfpfCEfbfg,ÏŽQ  
ÆfJfEf“fg,ÏffNfŠf f“fg,³,ê,é B

---

### Note

“¯,¶fpfCEfbfg A“¯,¶ft [ftfFfX,É,Î,µ A **IDirectDrawSurface2::SetPalette**,ª½“x,©‘±  
,·,ÄEÄ,Ñ o,³,ê,½ ê ‡ AfpfCEfbfg,ÏŽQ ÆfJfEf“fg,Îê“x,µ,©Cf“fNfŠf f“fg,³,ê,È,ç B`A‘±  
,·,éEÄ,Ñ o,µ,Í AfpfCEfbfg,ÏŽQ ÆfJfEf“fg,É%œ<ç,ð—^,!,È,ç,ì,Á, ,é B

---

**fpfEfbfg Ef^fCfv**

DirectDraw,Í A 1frfbfg (2 fGf“fgfŠ) A2frfbfg (4 fGf“fgfŠ) A 4frfbfg (16 fGf“fgfŠ) A 8frfbfg (256fGf“fgfŠ)  
fpfEfbfg,đfTf| [fg,·,é BfpfEfbfg,Í AfsfNfZf< EftfH [f}fbfg,“ê’v,·,éT [ftfFfX,É,¾,¯fA^fbf`³,ê,é,±  
,Æ,ª,Á,«,é B,½,Æ,·,Í A **DDPCAPS\_1BIT** ftf%ofO,đŽw’è,µ,Ä ì ¬,³,ê,½2fGf“fgfŠfpfEfbfg,Í A  
**DDPF\_PALETTEINDEXED1** ftf%ofO,đŽw’è,µ,Ä ì ¬,³,ê,½1frfbfgfT [ftfFfX,É,¾,¯fA^fbf`³,ê,é,±,Æ,ª,Á,«,é B.

,Ü,½ AfCf“fffbfNfX EfpfEfbfg,đ ì ¬,·,é,±  
,Æ,à,Á,«,é BfCf“fffbfNfX EfpfEfbfg,ìfGf“fgfŠ,ÍRGBfJf%o [ ,đŽ ,½, Af^ [fQfbfg,Æ,È,é¼,ìfpfEfbfg,ì**PAL**  
**ETTEENTRY** \‘c’ì,ì”z—  
ñ,Ö,ì ® ”fCf“fffbfNfX,đŽ ,Á BfCf“fffbfNfX EfpfEfbfg,ìfJf%o [ Efe [fuf<,Í A2 A4 A16 A256f ofCf g,ì  
”z—ñ,Á, ,è A,»,è,¼,è,êf ofCf g,Í AfpfEfbfg,ìfCf“fffbfNfX,đ·,· B

fCf“fffbfNfX EfpfEfbfg,đ ì ¬,·,é,É,Í A **IDirectDraw2::CreatePalette** f f\fbfh,đEÄ,Ñ o,·,Æ,«,É A  
**DDPCAPS\_8BITENTRIES** ftf%ofO,đŽw’è,·,é B,½,Æ,·,Í A,Sfrfbfg,ìfCf“fffbfNfX EfpfEfbfg,đ ì ¬,·,é,Æ,«,Í  
**DDPCAPS\_4BIT** |

**DDPCAPS\_8BITENTRIES**,đŽw’è,·,é B,Ü,½ AfCf“fffbfNfX EfpfEfbfg,đ ì ¬,·,é,Æ,«,Í **APALETTEENTRY**  
 \‘c’ì,ì”z—ñ|fCf“f^,æ,è,à Af ofCf g”z—ñ|fCf“f^,đ“n,·,Ü,¤,ª,–],Ü,µ,¢ B ,»,ì,Æ,«**IDirectDraw2::CreatePalette**  
 f f\fbfh,đŽg,¤ ê ‡,Í A **LPPALETTEENTRY**E^,Öf ofCf g”z—ñ|fCf“f^,đfLffXfg,µ,È,¯,ê,î,È,ç,È,¢ B

**fEfBf“fhfE Ef, [fh,Ā,ĪDirectDrawpfCEfbfgŽg—p**

IDirectDrawPalette

fCf“f^ [ftfFfCfX Ef f\fbfh,Ī AfFfBfXfvfCEfC,“r¼“I iftf<fXfNfŠ [f“ jf, [fh,Ī ê ± Afn [fhfEfFA,É¼  
Ú ‘,«,±  
Y,đ s,□ B,μ,©,μfffBfXfvfCEfC Ef, [fh,ª A”ñ”r¼“I ifEfBf“fhfE jf, [fh,Ī ê ± A¼,ĪfEfBf“fhfEfAfvfŠfP  
[fVf‡f“,Æ,‘”@ ĩ,·,é,½,β,É A **IDirectDrawPalette**  
fCf“f^ [ftfFfCfXf f\fbfh,ĪGDI,ĪfpfCEfbfg“€ iŠÖ ”,đĀ,Ī,Ē,̄,ê,Ī,Ē,ç,Ē,ç B,±,ê,É,æ,è A  
DirectDraw,ĪfEfBf“fhfE EfAfvfŠfP [fVf‡f“,Ā,ĪfpfCEfbfg,ĪŽŸ,Ī,æ,□,Ē•û-@,ĀŽg,Ī,é,é,±,Æ,Ē,Ē,é B

**(IDirectDraw2::CreatePalette,ÆIDirectDrawPalette::SetEntries** f\fbfh,É“n,³,ê,é) **PALETTEENTRY**  
\‘c‘Ī,ĪpeFlagsf f“fo,đ“ĪSm,ÉfZfbfg,μ,Ē,̄,ê,Ī,Ē,ç,Ē,ç B

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

ŽŸ,ĪfgfsfbfN,Ī Afvf%oCf}fŠ EfT [ftfFfX,â”Ē“Ē,Ē,ĒWindows,ĪfEfBf“fhfE,đ ĩ ¬ĒoĒ±,ª, ,é,±  
,Æ AWindows,ĪffXfNfgfbfv,ª8rfbfg EfpfCEfbfg Ef, [fh,Ā, ,é,±,Æ,đz’è,μ,Ā ‘,©,ê,Ā,ç,é B

fEfBf“fhfE Ef, [fh,ĪfpfCEfbfg EfGf“fgfŠ Ef^fCfv  
fEfBf“fhfE Ef, [fh,Ā,ĪDirectDraw::CreatePalette,ĪĒĀ,Ñ o,μ  
fEfBf“fhfE Ef, [fh,ĪDirectDrawPalette::SetEntries,ĪĒĀ,Ñ o,μ

**fEfBf“fhfE Ef, [fh,ĪfpfCEfbfg EfGf“fgfŠ Ef^fCfv**

”ñ”r¼“I ifEfBf“fhfE jf, [fh,Ā,Ī AfpfCEfbfg EfGf“fgfŠ,ĪÈ%°,ĪŠef^fCfv,Ī A’Ī%ž,·,é **PALETTEENTRY**  
\‘c‘Ī,ĪpeFlagsf f“fo,ÉŪ,Ē,éZfbfg,đŽ ,½,Ē,̄,ê,Ī,Ē,ç,Ē,ç B \‘c‘Ī,Ī**IDirectDraw2::CreatePalette**,Ū,½,Ī  
**IDirectDrawPalette::SetEntries** f\fbfh,É“n,“z—ñ”t,Ē, ,é B”r¼“I iftf<fXfNfŠ [f“ jf, [fh,Ā,ĪpeFlagsf f“fo,Ī—  
³Ž<,³,é,é,½,β A Ī—Ī,μ,Ē,̄,ê,Ī,Ē,ç,Ē,ç B  
”ñ”r¼“I ifEfBf“fhfE jf, [fh,Ā,Ī AfpfCEfbfg,ÉĪ,·,éGf“fgfŠ,ĪŽŸ,Ī3,Ā,Ī^fCfv,Ā, ,é B

Windows Ā“ĪfGf“fgfŠ  
Ē”Ē“Ī,Ē AWindows,Ī A0,©,ç9 A246,©,ç255,Ū,Ā,ĪfGf“fgfŠ,đ—  
ñ ifVfXfef€fpfCEfbfg j,μ,Ā,̄,è AfAfvfŠfP [fVf‡f“,ª,»,é,çGf“fgfŠ,Ī F’1,đ•Ī X,·,é,±,Æ,đ<ŌŽ~,μ,Ā,ç  
,é B,»,é,ç,Ī F,đŠŪ,p256 FfGf“fgfŠ EfpfCEfbfg,đ**GetSystemPaletteEntries** Win32  
ŠÖ ”,đĀ,Ī N o,μ,Ā \ ¬,·,é,±,Æ,Ī,Ā,«,é,ª AfAfvfŠfP [fVf‡f“,ª¼ Ū,±,é,ç,ĪfGf“fgfŠ,đŽQ Ā,·,é,ũ,ªĒo—  
Ī“Ī,Ā, ,é B,»,é,é,Ī,Ū, AfpfCEfbfg Efe [fuf<,Ī—^,Ī,ç,é,½Gf“fgfŠ,ª,ç,Ī•—  
“Ī,ĪfpfCEfbfg EfCf“fffbfNfX,đf}fbfv,·,é,©Žw’è,·,é BPC\_EXPLICIT ftf%oF,đ**PALETTEENTRY**  
\‘c‘Ī,ĪpeFlagsf f“fo ,ÉŠi”[μ AfGf“fgfŠ,ªf}fbfv,·,é•—  
fpfCEfbfg,ĪfCf“fffbfNfX,Æ,μ,Ā**peRed**f f“fo,đZfbfg,·,é B,±,□,μ,ĀAfAfvfŠfP [fVf‡f“,©,ç¼ ŪŽQ Ā,·,é,±  
,Æ,ª,Ā,«,é BfAfvfŠfP [fVf‡f“,Ī,Ū,½ A< §“Ī,ĒWindows,Ē0,Æ255,ĪfGf“fgfŠ,¾,̄,đ—ñ,·,é,æ,□  
,Ē,³,1,é,½,β A**SetSystemPaletteUse** Win32 ŠÖ ”,đĀ,Ī,¾,·,±,Æ,à,Ā,« A,±  
,Ī Ī ê ±,ĪPC\_EXPLICIT,ÉĪ,·,é**PALETTEENTRY** \‘c‘Ī,Ī0,Æ255,ĪfGf“fgfŠ,¾,̄,đŽw’è,·,é,×,«,Ā, ,é B

fAfjf [fVf‡f“ EfGf“fgfŠ  
fAfvfŠfP [fVf‡f“,ª AfpfCEfbfg EfAfjf [fVf‡f“Ēo%Ē,đ ĩ ¬,·,é,½,β,Ē•Ī X,Ā,«,é B  
fAfjf [fVf‡f“ EfGf“fgfŠ,Ī,½,β,ĪPC\_RESERVED ftf%oF,đAfAfvfŠfP [fVf‡f“,ªŽw’è,μ,½ Ī ± A  
Windows,Ī¼fAfvfŠfP [fVf‡f“,ª— fpfCEfbfg,đ•— fpfCEfbfg,Éf}fbfv,·,é,±,Æ,đ<ŌŽ~,·,é B,±  
,é,Ē,æ,è AfAfvfŠfP [fVf‡f“,ªGf“fgfŠ,ĒŪ,Ē,é F,đ Y’è,μ,½,Æ,«,Ē A¼,ĪfAfvfŠfP [fVf‡f“,ª,»Ī F,đ—  
β,μ,Ā,μ,Ū,□,±,Æ,đ”đ,̄,ç,é,é B  
”ñfAfjf [fVf‡f“ EfGf“fgfŠ  
fAfvfŠfP [fVf‡f“,ªĪ X,Ā,«,é,çGf“fgfŠ,Ā, ,é B”ñfAfjf [fVf‡f“ EfGf“fgfŠ,Ī A’P,ĒPC\_NOCOLLAPSE  
ftf%oF,Ā—,β,ç,é,Ā,̄,è A,±,Īftf%oF,Ī A¼,ĪŠ,,,è—,Ā Ī,Y•— fpfCEfbfg EfGf“fgfŠ,đWindows,ªu,«Š,Ī,Ē,ç  
,æ,□,Ē,μ,Ā,ç,é B

,Ū,Æ,β,é,Æ A **PALETTEENTRY** \‘c‘Ī,Ē,ĪÈ%°,Ī,æ,□,Ē3,Ā,Ī^fCfv,đ Y’è,·,é,±,Æ,Ē,Ē,é B

**fGf“fgfŠ Ef^fCfv**                      **peFlags’1**                      **peRed, peGreen, peBlue’1**  
Windows Ā“ĪfGf“fgfŠ(0-9,Æ      PC\_EXPLICIT                      peRed = index, peGreen = 0, peBlue = 0  
246-  
255 A,Ū,½,Ī0,Æ255,Ū,ĪfCf“ff  
fbfNfX)

```
fAfjf [fVf#f" EfGf"fgfŠ PC_RESERVED| F'1
PC_NOCOLLAPSE
"ñfAfjf [fVf#f" EfGf"fgfŠ PC_NOCOLLAPSE F'1
```

**fEfBf"fhfE Ef, [fh,Ä,ÏDirectDraw2::CreatePalette,ÏCEÄ,Ñ o,µ**

ŽÝ,É A"ñ"r¼"Í ifEfBf"fhfE jf, [fh,Ä DirectDrawpfCEfbfg,ð,Ç,Ï,æ,µ,É ï ¬,·,é,©,ðŽ',· B

**ÏDirectDraw2::CreatePalette** f f\fbfh,É"n,µ,½ PALETTEENTRY \c'Ï,Ï256fGf"fgfŠ,Ï,·,×,Ä,ðfZfbfgfAfbfv,·,é,±,Æ,ª,«,í,ß,Ä d—v,Ä,·,é B

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

// Windows Ä"ÍfGf"fgfŠ,ð Ý'è,·,é

for (index = 0; index < 10 ; index++)

```
{
    // Ä %o,Ï10,Ï Ä"ÍfGf"fgfŠ
    pPaletteEntry[index].peFlags = PC_EXPLICIT;
    pPaletteEntry[index].peRed = index;
    pPaletteEntry[index].peGreen = 0;
    pPaletteEntry[index].peBlue = 0;
```

```
    // ÄCEä,Ï10,Ï Ä"ÍfGf"fgfŠ
    pPaletteEntry[index+246].peFlags = PC_EXPLICIT;
    pPaletteEntry[index+246].peRed = index+246;
    pPaletteEntry[index+246].peGreen = 0;
    pPaletteEntry[index+246].peBlue = 0;
}
```

// fvf%oCfx [fgfGf"fgfŠ,ÏfZfbfgfAfbfv B,±,Ï—á,Ä,Í A—~—p,Ä,«,é

// Ä %o,Ï16fGf"fgfŠ,ªfAfjf [fVf#f"³,ê,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;
}
```

// Žc,è,ðfZfbfgfAfbfv B"ñfAfjf [fVf#f" EfGf"fgfŠ

for (; index < 246; index ++) // 'O,Ïfç [fv,ÄfCf"ffbfNfX,ðfZfbfg

```
{
    pPaletteEntry[index].peFlags = PC_NOCOLLAPSE;
    pPaletteEntry[index].peRed = 25;
    pPaletteEntry[index].peGreen = 6;
    pPaletteEntry[index].peBlue = 63;
}
```

// ,·,×,Ä,Ï256fGf"fgfŠ,ª,„,Û,Ä,½ BfpfCEfbfg,Ï ï ¬

ddrval = lpDD->CreatePalette(DDPCAPS\_8BIT, pPaletteEntry, &lpDDPal, NULL);

**fEfBf"fhfE Ef, [fh,Ä,ÏDirectDrawPalette::SetEntries,ÏCEÄ,Ñ o,µ**

**ÏDirectDrawPalette::SetEntries** f f\fbfh,Ä—p,ç,ç,é,éPALETTEENTRY \c'Ï,É"K—

p,³,ê,éç [fç,Í AÏDirectDraw2::CreatePalette f f\fbfh,É,à"K—p,³,ê,é B"è"È,ÉPALETTEENTRY \c'Ï,Ï"z—

ñ,ÍfAfvfŠfP [fVf#f"ŠJ"ŽÖŽ© g,ªf f"fefif"fx,·,é,½,ß A Ä \z,Ís—v,Æ l,ç,é,é B·K—v,È,ç,Ï"z—

ñ,ð·Í X,µ AfpfCEfbfg X VŽž,É,Í ÏDirectDrawPalette::SetEntries,ðCEÄ,Ñ o,·,±,Æ,à,Ä,«,é B

¼,Ï,Ï ê ± A"ñ"r¼"Í ifEfBf"fhfE jf, [fh,ÄWindows Ä"ÍfGf"fgfŠ,ð Ý'è,µ,æ,µ,Æ,µ,½ ê ± ACE%oÈ,Í—

```

\^a,Ä,«,È,¢ B ],Ä,Ä”ñ”r¼“I ifEfBf“fhfE jf, [fh,Ä,ìWindows Ä“IfGf“fgfŠ,Ö,ì Ý’è,Í,·,é,×,«,Ä,Í,È,¢ B —B^è,ì
—áŠO,Í A256fGf“fgfŠ,ð,·,×,ÄfŠfZfbfg,·,é ê ‡,Ä, ,é BfpfEfBfbfgAfjf [fVf‡f“,Ä,Í”è”È,É A
PALETTEENTRY”z—ñ,ì ¬,³,ÈfTfufZfbfg,¾,¬,ð•í X,·,é B ,»,é,ç,ìfGf“fgfŠ,¾,¬,ð
IDirectDrawPalette::SetEntries,É“n,·,ì,Ä, ,é B,»,ì,æ,µ,È ¬,³,¢fTfufZfbfg,ðfŠfZfbfg,·,é ê ‡,Í A
PC_NOCOLLAPSE,Æ PC_RESERVED ftf%oO,Äf} [fN,³,è,½fGf“fgfŠ,¾,¬,ðfŠfZfbfg,µ,È,-
,Ä,Í,È,ç,È,¢ B¼,ìfGf“fgfŠ,ðfAfjf [fVf‡f“,µ,æ,µ,Æ,·,é,Æ—Šú,µ,È,¢E%oÈ,ð µ,,±,Æ,É,È,è A D,Ü,µ,,È,¢ B

```

```

ŽŸ,ì—á,Í A”ñ”r¼“If, [fh,ìfpfEfBfbfgAfjf [fVf‡f“,ðŽ’,µ,Ä,¢,é B

```

```

LPDIRECTDRAW          lpDD;           // , ,ç,©,¶,ß %oŠú%o»,³,è,Ä,¢,é
PALETTEENTRY pPaletteEntry[256]; // , ,ç,©,¶,ß %oŠú%o»,³,è,Ä,¢,é
LPDIRECTDRAWPALETTE lpDDPal;         // , ,ç,©,¶,ß %oŠú%o»,³,è,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,±,è,È,æ,Ä,ÄfAfjf [fVf‡f“,ª s,í,è,é
temp = pPaletteEntry[10];
for (index = 10; index < 25; index ++)
{
    pPaletteEntry[index] = pPaletteEntry[index+1];
}
pPaletteEntry[25] = temp;

```

```

// ’l,ð Ý’è,·,é BfpfEfBfbfg EfGf“fgfŠ \c`ì’S`ì,Ö,ìf|fCf“f^,Ä,Í,È, A
// •í X,³,è,½fGf“fgfŠ,¾,¬,Ö,ìf|fCf“f^,ð“n,³,È,¬,è,Í,È,ç,È,¢
ddrval = lpDDPal->SetEntries(
    0,                // ftf%oO,Íf[f ,Ä,È,¬,è,Í,È,ç,È,¢
    10,               // Ä %o,ìfGf“fgfŠ
    16,               // fGf“fgfŠ ”
    & (pPaletteEntry[10])); // ff [f^,ª¾,ç,è,é,Æ,±,è

```

**IDirectDrawSurface2 fCf“f^ [ftFfCfX**

^È%°, ÌfgsfbfN, Á, Í A IDirectDrawSurface2 fCf“f^ [ftFfCfX, É, Â, Ç, Ä à-¾, ., é B

IDirectDrawSurface2

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

fT [ftFfX, Ì Ì ¬

ftfÇ [fÇ Efobftf@, ÌfAfNfZfX

ftfŠfbfsf“fO EfT [ftFfX, ÆGDIftfÇ [fÇ EfÇ [fg

fT [ftFfX, Ì ÁŽ

F•İŠ, ÆftfH [f}fbfg•İŠ

fJf% [ EfL [fCf“fO

fI [fo [fÇfCZfI [f \_ [

fIfXfNfŠ [f“ EfT [ftFfX, Ì, ½, ß, İ•j ”fpfÇfbbg

fuf fbfN“]’—, ÆfVfXfefÇ Ef f, fŠ EfT [ftFfX

**DirectDrawSurfaceIfufWfFfNfg**

DirectDrawSurfaceIfufWfFfNfg,Í2D•”ª,ð·\,· B,±,Ìff [f^,ÍffBfXfvfCfC Efn [fhEfffA,ª—  
%øð,Á,«,éCE`Ô,Æ,È,Á,Ä,“;è A,Û,½,»,Ìfn [fhEfffA,ÍDirectDrawSurfaceIfufWfFfNfg,ð ì ¬,·,é  
DirectDrawIfufWfFfNfg,É,æ,Á,Ä·\C»,³,ê,Ä,Ç,é B DirectDrawSurfaceIfufWfFfNfg,Í A  
**DirectDraw2::CreateSurface** f f\fbfh,ðŽg,Á,Ä ì ¬,·,é B DirectDrawSurfaceIfufWfFfNfg,ÍÊ í A·s—  
v,È ê ‡,Ä, ,Á,Ä,àffBfXfvfCfC EfJ [fh,ÌffBfXfvfCfC Ef f,fŠ,É í“,µ,Ä,Ç,é B  
DirectDrawIfufWfFfNfg,Í A DirectDrawSurfaceIfufWfFfNfg,Ì ì ¬† A“Á·Ê,ÉŽwŽ’,³,ê,È,Ç,©,¬,è A—  
v< ,³,ê,½<@”\,Ä Ä ,ÌfpftfH [f]f“fX,ª“¼,Ç,ê,é ê Š,ÉDirectDrawSurfaceIfufWfFfNfg,ð’u, B

DirectDrawSurfaceIfufWfFfNfg,Í AffBfXfvfCfC EfJ [fh,ÌŽ ,Á“Á%ø»,³,ê,½fvf fZfbfT,ð—LÇø,É—~—  
p,Á,« Af^fXfN,ð,æ,è ,¬,É s,ª,Í,©,è,Ä,È, A·Ä s,µ,ÄfVfXfef€,ÏCPU,Éf^fXfN,ðŽÄ s,³,¹,é B

DirectDrawSurfaceIfufWfFfNfg,Í AWindows,ÌffBfXfvfCfC EfVfXfef€,Ì¼,ÌfRf“f]  
[flf“fg,ð”FŽ¯,µ A,Û,½,»,ê,Ç,Æ“ ‡,³,ê,Ä,Ç,é B  
DirectDrawSurfaceIfufWfFfNfg,ª·\C»,·,éfT [ftFfX Ef f,fŠ,ÉGDI ŠÖ ”,ª ‘,«,±,Ý,Á,«,é,æ,ª,É,·,éWindows  
GDIffofCfX EfRf“fefLfxfg,Ö,Ìfnf“fhf<(HDC),ð A DirectDrawSurfaceIfufWfFfNfg,Í ì ¬,·,é,±,Æ,ª%øÄ”\  
,Ä, ,é B GDI,Í A,±  
,é,Ç,ÌHDC,ðf f,fŠ EfffofCfX EfRf“fefLfxfg,Æ,µ,Ä”FŽ¯,·,é,ª Afn [fhEfffA EfAfNfZf%øC [f^,ÍÊ í Aff  
fbfXfvfCfC Ef f,fŠ ã,É, ,é ê ‡HDC,ÉÍ,µ,Ä—LÇø,Æ,È,é B

## **IDirectDrawSurface2, Å%½,ª V,µ,,È,Á,½,©?**

DirectX,ªŽg,ªCOMf,ffç,Í A V,µ,çfCf“f^ [ftFfCfX,ìñ<ÿ,É,æ,è V<@”,ªÇ%oÁ,³,ê,é B IDirectDrawSurface2  
fCf“f^ [ftFfCfX,Í A **IDirectDrawSurface** fCf“f^ [ftFfCfX,ð·ã“Ö,·,é,à,ì,Á, ,é B,±  
,ì V,µ,çfCf“f^ [ftFfCfX,Í **IDirectDraw::QueryInterface** f\fbfh,ðŽg,Á,Á“¾,é,±,Æ,ª,Á,«,é B Žÿ,É—á,ðŽ,· B

```
LPDIRECTDRAW_SURFACE lpSurf;  
LPDIRECTDRAW_SURFACE2 lpSurf2;
```

```
// fT [ftFfX,ì ì ñ.  
memset(&ddsd, 0, sizeof(ddsd));  
ddsd.dwSize = sizeof(ddsd);  
ddsd.dwFlags = DDSD_CAPS | DDSD_WIDTH | DDSD_HEIGHT;  
ddsd.ddsCaps.dwCaps = DDSCAPS_OFFSCREENPLAIN |  
    DDSCAPS_SYSTEMMEMORY;  
ddsd.dwWidth = 10;  
ddsd.dwHeight = 10;
```

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

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

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

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

**IDirectDrawSurface2** fCf“f^ [ftFfCfX,Í A,R,Á,ì V,µ,çf f\fbfh i **IDirectDrawSurface2::GetDDInterface** A  
**IDirectDrawSurface2::PageLock** A **IDirectDrawSurface2::PageUnlock** j,ðŽn,ß A **IDirectDrawSurface**  
fCf“f^ [ftFfCfX,Á’ñ<ÿ,³,ê,é,·,×,Á,ìf f\fbfh,ðŠÛ,ñ,Á,ç,é B

**ft [ftFfX,ì ì -**

DirectDrawSurfaceIfufWfFfNfg,Í AfT [ftFfX ifsfNfZf<f f,fš j,ð\«»,·,é BfT [ftFfX,ÍÊ iftfBfXfvf«fC Ef f,fš,É í““,µ,Ä,«ç,é,ª AfBfXfvf«fC Ef f,fš,ª Á”i,³,ê,½ ê ‡,â-¾Ž“L,ÉfšfNfGfXfg,³,ê,½ ê ‡ AfVfXfef« Ef f,fš,É,à“¶ Ý,·,é,±,Æ,ª“Ä”,Ä, ,é Bfn [fhfEfFfA,ª—v< ,³,ê,½” —Í,ðfTf] [fg,Ä,«ç,É,«ç ê ‡,âfšf\ [fX,ª¼,ìDirectDrawSurfaceIfufWfFfNfg,É, ,ç,©,¶,ßš,,è“—,Ä,ç,é,Ä,«ç,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** \“ç,ì,ìdwCapsf f“fo,ìDDSCAPS\_FLIP ftf%o,ªfZfbfg,³,ê,Ä,«ç,é ê ‡ A **IDirectDraw2::CreateSurface** f f\fbfh,Í,« Ä,©,ìDirectDrawSurfaceIfufWfFfNfg,ð ì -,·,é B,»,ê,ç,Í,Ü,Æ,ß,Ä,ª; #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,Íf^fbf^,·,é,±,Æ,ª,Ä,«ç,É,«ç B Ú ×,Í A **IDirectDrawSurface2::DeleteAttachedSurface**,ðŽQ Ä,·,é,±,Æ B

,Ü,½ Afvf%oCf}fš EfT [ftFfX,æ,é L,ffBfXfvf«fC Ef f,fš EfT [ftFfX,ðŽæ,é,±,Æ,Í,Ä,«ç,É,«ç B òÈ%°,Í A—L«Ø,ÈfT [ftFfX ì -,ìfVfifšfI—á,Ä, ,é B

**fVfifšfI 1**

fvf%oCf}fš EfT [ftFfX,Í AE» Ýf† [fU,É«ç,ì,Ä,«ç,éft [ftFfX,Ä, ,é Bfvf%oCf} fš EfT [ftFfX,ð ì -,·,é,Æ,«ç,É,Í AGDI,ªŽ—p,µ,Ä,«ç,éš“¶,ìfT [ftFfX,ÉfAfNfZfX,·,é,½,ß ADirectDrawSurfaceIfufWfFfNfg,ð ì -,·,é B,µ,½,ª,Ä,Ä A **DDSURFACEDESC** \“ç,ì,ìdwHeightf f“fo,ìdwWidthf f“fo,ìl,ðfT [ftFfX,ì¼,ìf^fCfv,·,×,Ä,ª—v< ,µ,Ä,«ç,éšÖ,Í AE» Ý,ìfT [ftFfX,Æ““¶ŽY«ç,Ä, ,é,Æ,í,©,Ä,Ä,«ç,½,Æ,µ,Ä,à Afvf%oCf} fš EfT [ftFfX,Í,»,ìl,ðŽw”è,µ,Ä,Í,È,ç,È,«ç B

,»,µ,Äfvf%oCf}fš EfT [ftFfX ì -,ÉšÖEW,·,é**DDSURFACEDESC** \“ç,ì(òÈ%°,ìddsd),ìf f“fo,ª ‘,«ç,±,Ü,ê,é B

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

// ,Ç,ìf f“fo,ª—L«Ø,©DirectDraw,É”m,ç,¹,é  
ddsd.dwFlags = DDSD\_CAPS;

// fvf%oCf}fš EfT [ftFfX,ðfšfNfGfXfg  
ddsd.ddsCaps.dwCaps = DDSCAPS\_PRIMARYSURFACE;

**fVfifšfI 2**

fuf fbfN“—fn [fhfEfFfA,ª \ -,·,éfrfbfgf}fbfv,ìLfffbfVf... ,ÉŽg,í,é,é’P f,ÉfIfXfNfš [f“ EfT [ftFfX,ð ì -,µ,Ä,Ý,é B fvf%oCf} fš EfT [ftFfX,ÉšÖ,ì,·,×,Ä,ìfT [ftFfX,Ä,Í A ,³,Æ,· ,ð«ç,ß,é,K—v,ª, ,é B,·,é,ÆfIfXfNfš [f“ EfT [ftFfX ì -,ÉšÖEW,·,é **DDSURFACEDESC** \“ç,ì (ddsd below),ìf f“fo,ª ‘,«ç,±,Ü,ê,é B

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

// ,Ç,ìf f“fo,ª—L«Ø,©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,ðfBfXfvf«fC Ef f,fš,É ì -,·,é B,µ,©,µfffBfXfvf«fC Ef f,fš,É“ü,è,«ç,É,«ç ê ‡,É,Í AfT [ftFfX,ìfVfXfef« Ef f,fš,É ì -,³,ê,é B,±,ì,Æ,«**DDSCAPS** \“ç,ì,ìdwCapsf f“fo ,É,Í AfT [ftFfX,ðfVfXfef« Ef f,fš,Ä ì -,µ,È,è,Í,È,ç,È,«ç ê ‡,É,ÍDDSCAPS\_SYSTEMMEMORYftf%o,ð AfBfXfvf«fC Ef f,fš,Ä ì -,µ,È,è,Í,È,ç,È,«ç ê ‡,É,ÍDDSCAPS\_VIDEOMEMORYftf%o,ð A,»,è,¼,èŽg—

p,·,é BŽw'è,μ,½ ê Š,ÉfT [ftFfX,ð ì ¬,·,é,±,Æ,³,Ä,«,é B;í AfGf%o [,ª·Ö,³,ê,é B

DirectDraw,à;· ‡fT [ftFfX,ð ì ¬,·,é,±,Æ,³,Ä,«,é B;· ‡fT [ftFfX,Í ADirectDraw2::CreateSurface  
f f\fbfh,ð^è"xCEÄ,Ñ o,·,±,Æ,Ä ì ¬,³,ê,é fT [ftFfX,ìfZfbfg,Ä, ,é B

**IDirectDraw2::CreateSurface**,ìCEÄ,Ñ o,μ,ÄDDSCAPS\_COMPLEX ftf%ofo,ªfZfbfg,³,ê,Ä,«,é ê ‡ AŽw'è,μ,½-  
¾Ž,ì fT [ftFfX,ì¼,É,Ð,Æ,Ä^È ã,Ì^ÄŽ,ì fT [ftFfX,ªDirectDraw,É,æ,Ä,Ä ì ¬,³,ê,é B,Û,½ A;· ‡fT [ftFfX,Í

A,Ð,Æ,Ä,ìfT [ftFfX,Æ,μ,ÄŠÇ— ,³,ê,é B,Ä,Û,è **IDirectDraw::Release**

f f\fbfh,Ì^è"x,ìCEÄ,Ñ o,μ,Ä A \^c'ì,Ì,·,×,Ä,ìfT [ftFfX,ªð·ú,³,ê A

**IDirectDrawSurface2::Restore** f f\fbfh,Ì^è"x,ìCEÄ,Ñ o,μ,Ä,»è,ç,ªfŠfXfgfA,³,ê,é,Ì,Ä, ,é B

### fVfifŠfI 3

Ä,à—L—p,È;· ‡fT [ftFfX,ì,Ð,Æ,Ä,Í Afvf%oCf}

fŠ EfT [ftFfX,ÆfT [ftFfX EftfŠfbfsf"foŠÄ««ðCE` ¬,·,é,Ð,Æ,Ä^È ã,ìfofbfN Efofbftf@,ðŽ ,Ä,à,ì,Ä, ,é B

·;· ‡fT [ftFfX ì ¬,ÆŠÖEW,·,é**DDSURFACEDESC** \^c'ì (È%°,Ìddsd)

,ìf f"fo,Í AfofbfN Efofbftf@,ð,Ð,Æ,ÄŽ ,ÄftfŠfbfsf"fo EfT [ftFfX,ðL q,·,é,½,ß,É '«,±,Û,è,é B

DDSURFACEDESC ddsd;

ddsd.dwSize = sizeof(ddsd);

// ,Ç,ìf f"fo,ª—LCEø,©DirectDraw,É'm,ç,¹,é

ddsd.dwFlags = DDSD\_CAPS | DDSD\_BACKBUFFERCOUNT;

// ,Ð,Æ,Ä,ìfofbfN Efofbftf@,Æ,Æ,à,Éfvf%oCf}fŠ EfT [ftFfX,ð—v< ,·,é

//

ddsd.ddsCaps.dwCaps = DDSCAPS\_COMPLEX | DDSCAPS\_FLIP |

DDSCAPS\_PRIMARYSURFACE;

ddsd.dwBackBufferCount = 1;

,±,ê,ç,Í Af\_fuf<fofbftf@ EftfŠfbfsf"foŠÄ««ð \z,·,é B **IDirectDrawSurface2::Flip** f f\fbfh,ð^è"xCEÄ,Ñ o,·,±

,Æ,Ä Afvf%oCf}fŠ EfT [ftFfX,ìfT [ftFfX Ef f,š,ÆfofbfN Efofbftf@,Æ,ðCEðŠ·,·,é,Ì,Ä, ,é B

**DDSURFACEDESC** \^c'ì,ì BackBufferCount f f"fo,ð2,ÉŽw'è,·,é,Ì2CEÄ,ìfofbfN Efofbftf@,ª ì ¬,³,ê A

**IDirectDrawSurface2::Flip**,ðCEÄ,Ñ o,·,²,Æ,ÉfgfŠfvf<fofbftf@ EftfŠfbfsf"foŠÄ««,ªñ<ÿ,³,ê,Ä3,Ä,ì%o~CE^fpf^ [f",ì

,æ,ª,É Ø,è'Ö,ì,ç,é,é B

ftfCE [f€ Efofbftf@,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,ºÄ”\,Ä, ,é BfAfvfŠfP [fVf‡f“,ÍfAfNfZfX,ð  
—v,•,éft [ftfFfX ä,İ«É,ðRECT \‘c‘İ,ÄŽw’è,µ A **IDirectDrawSurface2::Lock** f f\fbfh,ðCEÄ,Ñ o,• B RECT  
\‘c‘İ,ðNULL,É,µ,Ä**IDirectDrawSurface2::Lock**,ðCEÄ,Ñ o,• è ‡ AfT [ftfFfX Ef f,fŠ,İ,•,×,Ä,İ”ª,É”r¼“IfAfN  
fZfX,ð—v« ,•,é,Æ,c,ºÖ—i,É,È,é B,±  
,İf f\fbfh,Í AfT [ftfFfX Ef f,fŠ,Ö,İfAfNfZfX,ð,•,é,½,ß,ÉfAfvfŠfP [fVf‡f“,ªK—  
v,È îñ,ð**DDSURFACEDESC** \‘c‘İ,É ‘,«,±,ð B,±,İ îñ,Í Afvf%ofCf}fŠ EfT [ftfFfX,ÆfsfNfZf< EftfH [f}  
fbfg,ªÜ,È,é è ‡ AfT [ftfFfX,İfsfbf i,Ü,½,İfXfgf%ofCfh 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 è ‡ AfT [ftfFfX Ef f,fŠ,Í A  
**IDirectDrawSurface2::Unlock**f f\fbfh,ð—p,c,Ä %øð•ú,•,é,±,Æ,ª,Ä,«,é B

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

ˆè`è,İffBfXfvfCEfC Efsfbf,ð‘O’ñ,Æ,µ,Ä,Í,È,c,È,c B,Ä,È,É**IDirectDrawSurface2::Lock**  
f f\fbfh,ªÖ,•fsfbf îñ,ð²,×,é,±  
,Æ Bfsfbf,Í AfT [ftfFfX Ef f,fŠ,İ è Š AfffBfXfvfCEfC EfJ [fh,İf^fCfv A  
DirectDrawfhf%ofCfo,İfo [fWf‡f“,Æ,c,Ä,½,³,Ü,‘,Ü,È— —R,©,ç•İ%»,•,é B  
**IDirectDrawSurface2::Lock**,İCEÄ,Ñ o,µ,Æ**IDirectDrawSurface2::Unlock** f f\fbfh,İŠÖ,İ,â,èŽæ,è,ð §CEÄ,•,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**,ðCEÄ,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 §CEÄ,•,é B

ffBfXfvfCEfC Ef f,fŠ,ð~A±,³,¹,ÄfRfs [,•,é,±,Æ B  
fof“fN EfXfCfbf Ef f,fŠ,ðŽg,Ä,½ffBfXfvfCEfC EfJ [fh,İ,½,ß,İ%¼‘zftf%ofbfg EftfCE [f€ Efofbftf@,  
ðŽÄ‘,•,é,½,ß,É AWindows 95,İfy [fW EftfH [f<fg Efnf“fhf% Vflatd.386,ðŽg,µ B,±,İfnf“fhf%  
,É,æ,Ä,Ä A,±,è,c,İffBfXfvfCEfC EfffofCfX,Í DirectDraw,É^A±,µ,½ftfCE [f€fofbftf@,ð“n,•,±  
,Æ,ª,Ä,«,é B”f,µ,½ffBfXfvfCEfC Ef f,fŠ,ÖfRfs [,•,é,Æ AfRfs [,ªf f,fŠfof“fN,È,İ,½,Ä,½ è ‡,É AfV  
fXfef€,ªèŽŽ’âŽ~,ðN,±, %Ä”\ «,ª, ,é B

ftfŠfbfsf“fO Eft [ftfFX,ÆGDIftfÆ [fE EfÆ lfg

DirectDraw,Ì,·,×,Ä,Ìft [ftfFX,²ftfŠfbfsf“fO Eft [ftfFX,Æ,µ,Ä—p,Ä,«é B  
ftfŠfbfsf“fO Eft [ftfFX,Í Aftf f“fg Efofbftf@,ÆfofbfN Efofbftf@ŠÖ,ÄfXf fbfv,³,é,éf f,š,Ì”CÓ,Ì”²,  
Ä,·,é B ftfŠfbfsf“fO Eft [ftfFX,Æ,µ,ÄDirectDrawft [ftfFX,ð \z,·,é,±,Æ,Í A ]—  
^,ÌEÄ,ç,é,½fy [fWftfŠfbfsf“fO,Ì 1,·,ü,É”ä,×½,,Ì—“\_,³,·,é B

fAvfšfP [fvfšf“,²ftfŠfbfsf“fO€ ì,Ì—v,·,éIDirectDrawSurface2::Flip f\fbfh,ðŽg,µ  
,Æ,« AftfŠfbfsf“fO,³,é,éDirectDrawSurface1fufWfFNfg,ÆŠÖA,Ä,·,ç,é,½ft [ftfFX Ef f,š—  
Ìæ,Í Ø,è,Ö,!,ç,é,é BftfŠfbfsf“fO,³,é,éDirectDrawSurface1fufWfFNfg,ÉfA^fbf`,³,é,½ft [ftfFX,É,Í%œç,µ,È,ç  
B,½,Æ,!,Íf\_fuf<ofbftf@,Ì óÖ,Ä,Í AfobfN Efofbftf@,É·%œ,·,éfAvfšfP [fvfšf“,Í,Ä,È,É““IDirectDrawSur  
face1fufWfFNfg,ðŽg—p,·,é B

IDirectDrawSurface2::Flip,²fšNfGfXfg,³,é,½,Æ,« AfIfufWfFNfg%°,Ìft [ftfFX Ef f,š,Í A’P,Éftf f“fg E  
fofbftf@,Ö Ø,è,Ö,!,ç,é,é B

ftf f“fg Efofbftf@,²%ÄŽ,Ä,·,é,Í A,»,é,Ífvf%ofCf}fš Eft [ftfFX,Ä,·,é,©,·,é,ç  
,ÍE) Y%ÄŽ,Ìfi [fo [fEfC,Ä,·,é,½,ß AfobfN Efofbftf@,ðÍ Ü,Æ,·,éIDirectDrawSurface2::Lock,Ü,½,ÍIDirect  
DrawSurface2::Bltf f\fbfh,ðA’±,µ,ÄEÄ,Ñ o,·,Æ AZÝ,Ì ,¼·üEü,ÌfšftfÆfbfVf...,²N,±,é,Ü,Ä,ÍŠÖŽ,”s,µ A  
DDERR\_WASSTILLDRAWING,ðÖ,· B,±

,é,Í Aftf f“fg Efofbftf@,ÌÈÖ,Ìf f,š,² AfobfN Efofbftf@,É,à,²fA^fbf`,³,é,Ä,ç,È,ç  
,É,à,©,©,í,ç,·, A,È,“fn [fhEFA,É,æ,è— ffbfXfvfÆfC,É·%œ,³,é±,·,é,½,ß,ÉN,±,é B,±  
,Ì óÖ,Í AZÝ,Ì ,¼·üEü,ÌfšftfÆfbfVf...“†,É Á-Ä,·,é B—  
fffbfXfvfÆfC,ð X V,·,éfn [fhEFA,² AfšftfÆfbfVf...  
,²,Æ,ÉfffbfXfvfÆfC Ef f,š,Ì”z’u,ð“Ç,Ý ž,Ý¼,µ,Ä,ç,é,©,ç,Ä,·,é B

,±,Ì,æ,µ,È— “I,ÈE“ö,©,ç A%ÄŽ<ft [ftfFX ä,ÍDirectDrawSurface2::Flip f f\fbfhEÄ,Ñ o,µ,Í”ñ“ŠúRf}  
f“fh,Æ,È,é BfQ [fE,ð ì,é,Æ,«,Í Af f\fbfh,²EÄ,Í,é,½Eä,ÄfQ [fE,Ì,·,×,Ä,Ì·s%ÄŽ<—v’f,ðŽA s,·,×,«Ä,·,é B,½,  
Æ,!,Í A“ü—Í,äfi [ftfBfi AfQ [fE,ÌfvfÆfC A,»,µ,ÄfvfXfefE Ef f,š·%œ“€ ì,²Š@—  
¹,µ,Ä,©,ç A%ÄŽ<fofbfN Efofbftf@,Ö,ÌfAfNfZfXŽæ“¼,ð—v,·,é·%œf^fXfN,ð,Í,¶,ß,é,±,Æ,²,Ä,«é B

fAvfšfP [fvfšf“,²EfBf“fhfE,Ä“@,·K—v,²,·,é A,È,“ftfŠfbfsf“fOŠÄ««ð—  
v,·,é,È,ç AftfŠfbfsf“fOfl [fo [fEfC Eft [ftfFX,Ì ì ,ðŽŽ,Ý,é Bfn [fhEFA,²fi [fo [fEfC,ðftf]  
[fg,µ,Ä,ç,È,·,Ä,à Afy [fW,ðftfŠfbfsf“fO,·,éfvf%ofCf}fš Eft [ftfFX,ð ì ,·,é,±,Æ,²,Ä,«é B  
ft [ftfFX,²fvf%ofCf}fš,É,È,è,è,µ,Ä,ç,é,Æ,«ÉGDI,²,»,Ìft [ftfFX,É,Ä,ç,Ä îñ,ðŽ ,Ä,Ä,ç  
,È,·,é,Í AGDI,² ‘,«±,ñ,Ä,ç,éfvf%ofCf}fš Eft [ftfFX,Ì† g,ð%ÄŽ,É,È,è,µ,Ä,ç  
,éofbftf@,Öfuf fbfN“]—,·,é,±,Æ,²,Ä,«é Bfuf fbfN“]—,Í”ñ“Šú,ÉŽA s,³,é,é,½,ß A,±  
,Ìf^fXfN,ÌŽŽŠÖ,²,©,©,é,Æ,µ,Ä,à,Ü,ñ,Ì,í,·,©,Ä,·,é B,µ,©,µ A  
fy [fW,²ftfŠfbfsf“fO,³,é,éEfBf“fhfE,ÌftfCfY,ÆfXfNfš [f“%ð“œ“x,ÉÈ“¶,·,éfuf fbfN“]—  
,Ìfof“fh· ,Æ,ð,©,È,è Ä”i,·,é BftfÆ [fEÆ [fg,²0fps,ð%œñ,ç,È,ç,©,·,è,Í AGDI,² ³,µ,“@ ì,µ,Ä,ç,é,æ,µ  
,ÉE©,!,é,Ä,·,é,µ B

DirectDrawIfufWfFNfg,ðfCf“fXf^f“fX%»,·,éÖ,É AGDI,Í AŽ© g,Ì·Ž’,ÉfffbfXfvfÆfC Ef f,š,ð,·,Ä,ÉŽg,Ä,  
Ä,ç,é Bfvf%ofCf}fš Eft [ftfFX,ðfCf“fXf^f“fX%»,·,é,½,ß,É  
DirectDraw,ðEÄ,Ñ o,·,Æ,« A,»,Ìft [ftfFX,Ìf f,šfAfhfÆfX,Í AGDI,²E» ÝŽg,Ä,Ä,ç,é,à,Ì,Æ““¶,Ä,·,é B

fofbfN Efofbftf@,Ä,·,±ft [ftfFX,ð ì ,·,é è ±,Í AGDI,Í A,Ü,·,fvf%ofCf}  
fš Eft [ftfFX,Ì,½,ß,ÌfffbfXfvfÆfC Ef f,š,ðŽv,· BGDIDirectDraw,æ,èEÄ,ç  
,½,ß ADirectDraw,Ì“@ ì,ð’m,é,±  
,Æ,²,Ä,«É,ç B,µ,½,²,Ä,ÄGDI,Í A,½,Æ,!,ftfŠfbfsf“fO,³,é·s%ÄŽ<fofbfN Efofbftf@,É,È,Ä,½,Æ,µ,Ä,à A,±  
,Ìft [ftfFX,ð€ ì,µ,±,·,é B

¼,ÌfAvfšfP [fvfšf“,Í A’SfXfNfš [f“·ð·ç,²á,è,ÉEfBf“fhfE,ð ì ,·,é,±,Æ,©,ç ^—  
,ðŽn,ß,é BfAvfšfP [fvfšf“,²AfNfefBfu,Ä A,©,ÄftfH [fJfX,ðŽ ,Ä,©,·,è A  
GDI,Ìfofbftf@,ÌRfs [,ð ‘,«±,Ü,È,ç BGDIDirectDraw [fç,·,é,à,Ì,Í Ä·%œ,ðK—v,Æ,µ,È,ç,©,ç,Ä,·,é B

¼,Ìfvfifšfi,Ä,Í AGDI,ÌfIfšfwfifç,Èft [ftfFX,Ì îñ,µ,©Ž ,½,·, ACE» Ýfvf%ofCf}  
fš Eft [ftfFX,È,Ì,©fofbfN Efofbftf@,È,Ì,©,Æ,ç,µ îñ,ðŽ ,½,È,ç,±,Æ,ðŽv,ç o,µ,Ä,Ü,µ,ç B  
GDIFXfNfš [f“·s—v,È,ç A ä q,ÌfefNfjfbfN,Žg,!,é BGDIDirectDraw,²K—v,Ä,·,é,Í AŽÝ,É,°  
,éfefNfjfbfN,ðŽŽ,µ,Ä,Ý,é,±,Æ,²,Ä,«é B

- 1 fofbN Efofbftf@,ð,Ö,½,ÄŽ ,Äfvf%ofCf}fš Eft [ftfFX,ð ì ,·,é B
- 2 %Šúfvf%ofCf}fš Eft [ftfFX(GDIFt [ftfFX),ð†ŠÖfofbfN Efofbftf@,Éfuf fbfN“]—,·,é B
- 3 GDI,ðÖ,Ì è Š,É’u,ç,Ä %ŠúRfs [,ð%ÄŽ<%»,·,é,½,ß AlpDDSurfaceTargetOverride  
fpf%of [f^,ðNULL,ÉfZfbfg,µ,Äft [ftfFX,ðftfŠfbfsf“fO,·,é B

,±,ê,ð s,î AGDIfofbftf@,©,ç†ŠÓfofbftf@,ÖfRfs [,ª,À,« A,»ìfofbftf@ ä,Åf† [fU,ÉE©,¹,½,ç  
,à,ì,ð`%œ,À,«,é BGDI,ð`À`S,É%°•û,É'u,ç,Ä,¨,« A,Ó,½,À,ìfofbftf@ŠÓ,ð% •œ,³,¹,é,±,Æ,à,À,«,é B•û-  
@,íŽŸ,ìÊ,è,À, ,é B

pPrimary->Flip(pMiddle);

**fT** [ftfFX,ì ÁŽ,

fT [ftfFX Ef f, fŠ, Ì•ª, ð•\CE», ·, ·é DirectDrawSurfaceIfufWfFfNfg,ªK, ·, µ, à%ð•ú, ·, ·éK—v,ª, È, ¢  
, È, àŠÖ, í, ç, · A DirectDrawSurfaceIfufWfFfNfg, ÆŠÖ~A, Æ, ¯, ç, è, ½fT [ftfFX Ef f, fŠ,ª%ð•ú,ª, è, é, ±  
, Æ,ª, ·é B DirectDrawSurfaceIfufWfFfNfg,ªfT [ftfFX Ef f, fŠ, ðŽ,ª, Á, ½ ê ± A'½,-  
, Ìf f\fbfh, **IDDERR SURFACELOST**, ð•Ö, µ A'¼, ÌfAfNfVf±f“, ðŽÄ s, µ, È, ¢ B

ffBfXfvfCEfC EfJ [fh, Ìf, [fh,ª, Ì X,ª, è, ½, è AfAfvfŠfP [fVf±f“,ªffBfXfvfCEfC EfJ [fh, Ö, Ì”r'¼“IfAfNfZfX  
, ðŽó, Žæ, èfJ [fh, ÈŠ,, è“-, Æ, ç, è, ½fT [ftfFX Ef f, fŠ, ð, ·, ×, Æ%ð•ú, µ, ½, è, µ, ½ ê ± AfT [ftfFX, ÌŽ,ª, í, è, é B

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

, Ì ÁŽ,ª, í, è, ½fT [ftfFX, ð Ä ì ¬, µ DirectDrawSurfaceIfufWfFfNfg, Ö Ä Ú±, ·, ·é B

,ª, ç, È Ú, µ, Ì A uf, [fh, Ì X, Æ”r'¼“IfAfNfZfX v, ðŽQ Æ, ·, ·é, ±, Æ B

F•İŞ•,ÆftfH [f]fbfg•İŞ•

”nRGBfT [ftfFX EftfH [f]fbfg,Í A4•¶žšfR [fh iFOURCCfR [fh)  
,É,æ,Á,ÄL q,³,ê,é BfAfvfšfP [fVf‡f“,³fsfNfZf< EftfH [f]fbfg,đfšfNfGfXfg,·,é,½,ß,É

**IDirectDrawSurface2::GetPixelFormat**

f f\fbfh,đCEÄ,Ñ o,· ê ‡ A,;æ,ÑfT [ftfFX,“nRGBfT [ftfFX,Ä, ,é ê ‡ ADDPF\_FOURCC  
ftf%oO,³fZfbfg,³,ê A **DDPIXELFORMAT** \‘c‘İ,İdwFourCCf f“fo,ª—LCEø,Æ,È,é B,à,µ AFOURCCfR [fh,ª  
YUVftfH [f]fbfg,đ\,· ê ‡ ADDPF\_YUV ftf%oO,àfZfbfg,³,ê A dwYUVBitCount,ÆdwYBits A dwUBits A  
dwVBits AdwYUVAAlphaBitsf f“fo,³fsfNfZf<,©,ç îñ,đ^ø,« o,·,½,ß,Éžg,í,ê,é—LCEø,Èf}fXfN,É,È,é B

RGB ftfH [f]fbfg,ª¶ Ý,·,é,Æ DDPF\_RGB ftf%oO,³fZfbfg,³,ê A dwRGBBitCount A dwRBits AdwGBits A  
dwBBits AdwRGBAlphaBitsf f“fo,³fsfNfZf<,©,ç îñ,đ^ø,« o,·,½,ß,Éžg,í,ê,é—LCEø,Èf}  
fXfN,É,È,é B”n•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•İŞ•,ÆftfH [f]

fbfg•İŞ•†,É AfAfvfšfP [fVf‡f“,É‘İ,µFOURCCfR [fh,ªQfZfbfgCEöšJ,³,ê,é BFOURCCfR [fh,İfZfbfg,İ,Đ,Æ,Ä,Í  
Afn [fhfEfFfA,İfuf fbN“]‘—\—İ,đ, ,ç,i,µ A,à,ª,Đ,Æ,Ä,Í Afn [fhfEfFfA,İfI [fo [fCEfC”\—İ,đ, ,ç,i,· B

**fJf% [ EfL [fCf“fO**

DirectDraw,Á,Í Afuf fbfN“]‘—,ÆfI [fo [fCfC,Ì,½,B,É“]‘—E³ E“]‘— æ ufJf% [ EfL [fCf“fO v,³fTf] [fg,³,è,Á,Ç,é B “]‘—E³ E“]‘— æ,Ì,Ç,ç,ç,É,è,à A,±,ÌfJf% [ EfL [ A,Û,½,Í Fæ,ðŽw’è,·,é,±,Æ,³,Á,«,é B “]‘—E³fJf% [ EfL [fCf“fO,Í Afuf fbfN“]‘—Žž,ÉfRfs [³,è,È,ç F,Û,½,Í Fæ AfI [fo [fCfCŽž,É“]‘— æ,Á\*%oÁŽ<,Ì F,Û,½,Í Fæ,ðŽw’è,·,é B “]‘— æfJf% [ EfL [fCf“fO,Í Afuf fbfN“]‘— Žž,É’u,«Š,·,ç,è,é F,Û,½,Í Fæ AfI [fo [fCfCŽž,É“]‘— æ,ð•ç,² F,Û,½,Í Fæ,ðŽw’è,·,é B “]‘— E³fJf% [ EfL [,ÍfT [ftfFX,©,ç%½,““Ç,Ý,Æ,è%½,““Ç,Ý,Æ,è,È,ç,©Žw’è,·,é B “]‘— æfJf% [ EfL [,Í A“]‘— æfT [ftfFX,Á ‘,ç,½,è•ç,Á,½,è,Á,«,é,à,ì,Æ,Á,«,È,ç,à,ì,Æ,ðŽw’è,·,é B “]‘— æfT [ftfFX,³fJf% [ EfL [,ðŽ ,Á,Æ AfJf% [ EfL [,Æf}fbf`μ,½fsfNfZf<,¾,“]‘— æfT [ftfFX ã,Á•İ X A ã ‘,«,³,è,é B

,ç,,Á,©,Ìfn [fhEfffA,Í AYUVfsfNfZf< Eff [f^,Ì,½,B,Ì Fæ,¾,“]‘—,ðfTf] [fg,·,é B YUVff [f^,ÍÊ ì,ÍfrrfL,Á,·,è A•İŠ·†,ÉCEè ·,³N,±,é,Ì,Á A“§%oBfofbfNfOf%ofEf“fh,ÍP F,Á,Í,È,ç%oÁ”\ «,³,·,é,³ A—{—,ÍfsfNfZf< EftfH [f}fbfg,É,æ,ç,·%oÁ”\,È,©,¬,è’P^è,Ì“§%oB F,Æ,·,é,x,«,Á,·,é B

fJf% [ EfL [,Í AfT [ftfFX,ÌfsfNfZf< EftfH [f}fbfg,ÁŽw’è,³,è,é BfT [ftfFX,³pfCfbfg%»³,è,½ftfH [f}fbfg,Á,·,é è ± A

fJf% [ EfL [,Í AfCf“fffbfNfX,Û,½,ÍfCf“fffbfNfX^æ,Æ,μ,ÁŽw’è,³,è,é BfT [ftfFX,ÌfsfNfZf< EftfH [f}fbfg,³YUV ftfH [f}fbfg,ðL q,·,éFOURCCfR [fh,É,æ,èŽw’è,³,è,Á,ç,é è ± AYUV fJf% [ EfL [,Í A **DDCOLORKEY** ‘ç’ì.

,ÌdwColorSpaceLowValue f“fo,ÆdwColorSpaceHighValue f“fo’o’û,Ì%o°Ê³fofCfg,ÁŽw’è,³,è,é B Á%o°ÊfofCfg, ÍVff [f^ A,Q”Ö–Û,ÍUff [f^ A Á ãÊfofCfg,ÍYff [f^,Á,·,é B **IDirectDrawSurface2::SetColorKey** f f\fbfh,Ì dwFlags fpf%of [f^,Í AfJf% [ EfL [,³fI [fo [fCfC,Û,½,Ífuf fbfN“]‘—,Ì,Ç,ç,ç,ÁŽg,ì,è,é,© A“]‘— E³,È,Ì,©“]‘— æ,È,Ì,©,ðŽw’è,·,é B^È%o,Í—LCEø,ÈfJf% [ EfL [,Ì—á,Á,·,é B

**8frfbfgfCfbfg%»f, [fh**

```
// fpfCfbfg EfGf“fgš26,ÍfJf% [ EfL [
dwColorSpaceLowValue = 26;
dwColorSpaceHighValue = 26;
```

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

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

**FourCC YUVf, [fh**

```
// YUVfJf% [ Y,Í100,Æ110,ÌŠÖ
// U,Û,½,Í v,Í50,Æ55,ÌŠÖ,Á“§%oB,Á,·,é
dwColorSpaceLowValue = YUVQUAD(100,50,50);
dwColorSpaceHighValue = YUVQUAD(110,55,55);
```

**fI [fo [fŒfCZfI [f\_ [**

fI [fo [fŒfCZfI [f\_ [,Í AfI [fo [fŒfC,ŒÉY,ç,ÉfNfŠfbfsf“fO,µ ‡,µ ‡”Ô,ðŒ”è,·,é B,±  
,é,É,æ,èDirectDraw%º,İfn [fhfEfFFA EfXfvf%ofCfç EfVfXfef€ŽĀ“•,º%oĀ”\  
,É,È,é BfI [fo [fŒfC,Í A¼,İfXfNfŠ [f“ EfRf“f [flf“fg,·,×,Ā,İ ãĒÉ,ÉĒĒ’u,·,é,à,İ,Æ%¼’è,³,é,é B“]‘—  
æfJf%o [ EfL [,Í Afvf%ofCf}  
fŠ EfT [ftfFfX,İfRfbfg,É,¾, ¯%oeç,³,é,é,×,«,Ā A¼,İfI [fo [fŒfC,ÉŽŒ,ç,é,½fI [fo [fŒfC,É%oeç,³,é,é,×,«,Ā,È  
,ç B“]‘—Œ³fJf%o [ EfL [,Í AZfI [f\_Žw’è,İ—L³,É,æ,ç,,fI [fo [fŒfC,É ì—  
p,·,é BŽw’è,³,é,½ZfI [f\_,ðŽ ,½,È,çfI [fo [fŒfC,Í Afvf%ofCf}fŠ EfT [ftfFfX ã,İ““,¶—  
İæ,ÉfI [fo [fŒfC,³,é,é,Æ A—Šú,µ,È,ç U,é•,ç,ð,·,é BZfI [f\_ [,İŽw’è,³,é,Ā,ç,È,çfI [fo [fŒfC,Í A  
ZfI [f\_ [0,Æ,Ý,È,³,é,é BZfI [f\_,İ”ÍÍ,Í Afvf%ofCf}fŠ EfT [ftfFfX Ā ãĒÉ,Ā ,é0,©,ç AŠİ“ŽŒ,É Ā,àçB,çĒĒ’u,  
İ40%,Ü,Ā,Ā ,é BZfI [f\_2,İfI [fo [fŒfC,Í AZfI [f\_1,İfI [fo [fŒfC,ð•ç,ç  
%oB,· B““,¶ZfI [f\_,ðŽ ,ĀfI [fo [fŒfC,Í¶ Ý,µ,È,ç B

**fIfTfXfNfŠ [f“ EfT [ftFfX,ì,½,ß,î; ”fpfŒfbfg**

DirectDraw,É,æ,è AfIftfXfNfŠ [f“ EfT [ftFfX,ÉfAf^fbf^,Á,«éfpfŒfbfg,ð•j ” ì ¬,·,é,±,Æ,ª,Á,«é B,±  
,Ì,Æ,«fIftfXfNfŠ [f“ EfT [ftFfX,Í Afvf%oCf}fŠ EfT [ftFfX,ÆfpfŒfbfg,ð<□—L,µ,È,Œ Bfvf%oCf}  
fŠ EfT [ftFfX,ì,à,Ì,Æ^Ù,È,Á,½fsfNfZf< EftfH [f}  
fbfg,ðŽ ,ÁfIftfXfNfŠ [f“ EfT [ftFfX,ð ì ¬,·,é ê ÷,Í AfN [fhfEfFfA,ª,»ê,ðŽg—p,Á,«é,±,Æ,ª“Oñ,Á, ,é B  
,½,Æ,·,Í Afvf%oCf}  
fŠ EfT [ftFfX,ª16frfbfg EfJf%o [f, [fh,Ì,Æ,«fpfŒfbfg%o»fIftfXfNfŠ [f“ EfT [ftFfX,ð ì ¬,·,é ê ÷ Af  
uf fbN“]‘—fn [fhfEfFfA,Í‘€ ì†,ÉfpfŒfbfg%o»fT [ftFfX,ðfgfDf< [fJf%o [Ö•İŠ·,·,é,±  
,Æ,ª,Á,«é,à,Ì,Æ%¼è,·,é B

DirectDraw,Á,Í A256 F,ð•Ž!,Á,«é•W €8frfbfg,ÌfpfŒfbfg%o»fT [ftFfX,Æ A,»,ê,¼,ê16 F,ð•Ž!,Á,«é,QŽí—  
p,Ì4frfbfgfpfŒfbfg%o»fT [ftFfX,Æ,ð ì ¬,·,é,±  
,Æ,ª,Á,«é B4frfbfgfpfŒfbfg%o»fT [ftFfX,Í‘æ^è,Ìf^Cfv,ÍfgfDf< [fJf%o [ÌfJf%o [ Efe [fuf<,ÁfCf“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,±  
,Í‘æ“ñ,Ìf^Cfv,Í A‘æ^è,Ìf^Cfv,Ì”¼ª,Ìf [f^—È,Á Í,Ý AfXfvf%oCf,ðŠi”[·,é,½,ß,ÈŠÖ Ú“I,É—p,Œ  
,ç,è,½,è,·,é B

,±,ê,ç,ÌT [ftFfX,ª ì ¬,³,ê,é,Æ,«É,Í Afuf fbN“]‘—fn [fhfEfFfA,Í‘€ ì†,ÉfpfŒfbfg,ÌuŠ·,ªoÁ”  
,Á,È,¯,ê,Ì,È,ç,È,Œ,µ,½,ª,Á,Á AfpfŒfbfg%o»fT [ftFfX,©,çfpfŒfbfg%o»fT [ftFfX,Öfuf fbN“]‘—‘€ 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,Á, ,é ê ÷,Æ,Á,¾,¯ s,í,ê,é B¼,Ì ê ÷,Á,Í AfCf“fffbfNfX EfpfŒfbfg,Í“]  
— æ,ÌfpfŒfbfg,É,È,é B

fpfŒfbfg%o»fT [ftFfX,Ìf%oXf^€ ì,Í-³Ž<,³,ê,é B,Û,½fAf^fbf^,³,ê,½fpfŒfbfg,Ì•I X‘€ ì,Í,«í,ß,Á ,¬,Á, ,é B,±  
,ê,çfpfŒfbfg%o»,³,ê,½fT [ftFfX,Ì,R,Á,·,×,Á,Í A3DfAfNfZf%oŒ [fvf÷f“ Efn [fhfEfFfA,ÌfefNfXf^ff,Æ,µ,Á  
fTf] [fg,³,ê,È,,Á,Í,È,ç,È,Œ,Œ B

fIftfXfNfŠ [f“ EfVfŒ [f“ EfT [ftFfX,ÌfsfNfZf< EftfH [f}fbfg,É,Á,Œ  
,Á,Ì,³,ç,É Ú,µ,Œ îñ,Í A uIftfXfNfŠ [f“ EfT [ftFfX,ÌftfH [f}fbfg v,ðŽQ Æ,·,é,±,Æ B

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

fVfXfef€ Ef f,fŠ,©,ç A,Ü,½,ÍfVfXfef€ Ef f,fŠ,ÖEø—“I,Èfuf fbfN“]‘—,ð%Â”\  
,É,·,éDMAfn [fhfEfFA,ð,à,ÁffBfXfvf€fC EfJ [fh,ª,é Bfhf%ofCfo,Í A,±,ì<@”\,ð**DDCAPS**  
 \‘ç‘Ì,ð‘È,µ,Ä’m,ç,¹,é B,±,Ì \‘ç‘Ì,ÍŽŸ,Ì12,Ì V,µ,çf f“fo,©,ç \ -,³,ê,é B

<b>dwSVBCaps</b>	<b>dwVSBCaps</b>	<b>dwSSBCaps</b>
<b>dwSVBCKeYCaps</b>	<b>dwVSBCKeyCaps</b>	<b>dwSSBCKeYCaps</b>
<b>dwSVBFXCaps</b>	<b>dwVSBFXCaps</b>	<b>dwSSBFXCaps</b>
<b>dwSVBRops</b>	<b>dwVSBRops</b>	<b>dwSSBRops</b>

—ªEêSVB,Í AfVfXfef€ Ef f,fŠ,©,çffBfXfvf€fC Ef f,fŠ,Ö,Ìfuf fbfN“]‘—,ÉŠÖEW,·,é”\—Í‘l,ðŽ‘,· B  
VSB,Í AffBfXfvf€fC Ef f,fŠ,©,çfVfXfef€ Ef f,fŠ,Ö,Ìfuf fbfN“]‘—,ÉŠÖEW,·,é”\—  
Í‘l,ðŽ‘,· BSSB,Í AfVfXfef€ Ef f,fŠ,©,çfVfXfef€ Ef f,fŠ,Ö,Ìfuf fbfN“]‘—,ÉŠÖEW,·,é”\—Í‘l,ðŽ‘,· B

**dwSVBCapsf** f“fo,Í **AdwCapsf** f“fo,É‘Í%ž,·,é B,½,¾,µ AfVfXfef€ Ef f,fŠ,©,çffBfXfvf€fCf f,fŠ,Ö,Ìfuf  
fbfN“]‘—,ÉŠÖEW,·,éffBfXfvf€fC Efhf%ofCfo,Ì”\—Í,ð‘L q,·,é ê ‡,ð œ, B “—

l,É **AdwSVBCKeYCapsf** f“fo,Í  
**dwCKeYCapsf** f“fo,É‘Í%ž,µ **AdwSVBFXCapsf** f“fo,Í**dwFXCapsf** f“fo,É‘Í%ž,·,é B **dwSVBRopsf** f“fo”z—  
ñ,Í A,±,Ìf^fCfv,Ìfuf fbfN“]‘—,Áfhf%ofCfo [,ªfTf| [fg,·,é%ofXf^€ ì,ð‘L q,·,é B

,±,ê,ç,Ìf f“fo [,Í A **dwCaps,Ä DDCAPS\_CANBLTSYSTEM** ftf%ofO,ªZfbfg,³,ê,Ä,ç,é ê ‡,É,Ì,Ÿ—  
LEø,Ä, ,é B,±,Ìftf%ofO,ªZfbfg,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%ofCfo [,É, ,é,±  
,Æ,ðŽ‘,µ,Ä,ç,é B

fn [fhfEfFA Efuf fbfN“]‘—,É,æ,Á,ÄŽg,í,ê,Ä,ç,éVfXfef€ Ef f,fŠ EfT [ftFFX,ªf fbfN,³,ê,Ä,ç  
,É,ç ê ‡ A DirectDraw,ÍŽ©“@“I,É AfT [ftFFX,É‘Í,µ **IDirectDrawSurface2::PageLock** f f\fbfh,ðEÄ,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•ù-@,ð Ð%oi,.,é B,±,ê,ç,ìf`f... [fgfŠfAf<,í ASDK,É,æ,Á,Ä`ñ<Ý,³,é,é  
DirectDrawTf“fvf<ftf@fCf<,ì‘½,ðŽg,Á,Ä,ç,é BfTf“fvf<,ì‘½,,í DDEX,Æ,ç,µ•¶Žš,ð æ““,É-¼•t,¯,ç,ê,Ä,ç,é B,±  
,ê,ç,ìfTf“fvf<,Á,í A DirectDraw,ð,Ç,ì,æ,µ,É,µ,ÄZfbfgfAfbfv,.,é,© A ŠÈ`P,Èf^fXfN,ðŽÀÆ»,.,é,½,ß,É DirectDraw  
f ffbfh,ð,Ç,ì,æ,µ,ÉŽg,µ,©,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`i X(DDEX5)

,±,ê,ç,ìf`f... [fgfŠfAf<,ìfTf“fvf<,í A IDirectDraw,Æ IDirectDrawSurface  
fCf“f^ [ftfFfCfX,ìEÄ,çfo [fWf±f“,ðŽg,Á,Ä,ç,é B DirectX 3 fCf“f^ [ftfFfCfX—IDirectDraw2,Æ  
IDirectDrawSurface2—,ðŽg,µ,±,ê,ç,ì—á,ðfAfbfvff [fg,.,é ê ±,í A—¼•ù,ìfCf“f^ [ftfFfCfX,É  
QueryInterface,ð%oÁ,!,é,±,Æ B,±,ê,É,Ä,ç,Ä,í A uIDirectDraw2,Á%½,“ V,µ,È,Á,½,©?  
v,Æ uIDirectDrawSurface2,Á%½,“ V,µ,È,Á,½,©? v,Á 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,½pf%of [f^,ð•í X,.,é•K—v,ª, ,é B

---

**Note**

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

---

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

DirectDraw,đŽg,ϩ,É,Í A,Û,Žn,Β,É A fRf“fsf...

[f^,İffBfXfvfCfC E fAf\_fvf^,đ•C».,éDirectDrawIfufWfFfNfg,İfCf“fXf^f“fX,đ ì ¬,μ,È,¯,ê,Î,È,ç,È,ϕ B,»μ  
,Ä A,».,İfIfufWfFfNfg,đ'€ ì,.,é,½,Β,İfCf“f^ [ftfFfCfXf f\fbfh,đŽg—p,.,é B%Á,!,Ä AfQ [f€  
,đOf%oftfBfbfNfT [ftfFfX ä,É•Ž,.,é,½,Β,É,Í A  
DirectDrawSurfaceIfufWfFfNfg,İfCf“fXf^f“fX,đ^ê,Â,©,».,êÈ ä ì ¬,.,é•K—v,a, ,é B,±,ê,đ à—  
¾,.,é,½,Β,É ASDK,ÉŠÛ,Û,ê,éDDEX1,İfTf“fvf<,đŽŸ,İfXfefbfv,Ä Đ%ô,.,é B

- Step 1: DirectDrawIfufWfFfNfg,İ ì ñ
- Step 2: fAfvfŠfP [fvf±f“,İ U,é•,ç,İC^è
- Step 3: fffBfXfvfCfC Ef, [fh,İ•İ X
- Step 4: ftfŠfbfsf“fO EfT [ftfFfX,İ ì ñ
- Step 5: fT [ftfFfX,Ö,İfCf“f\_fŠf“fO
- Step 6: fT [ftfFfX,Ö,İ ‘,«,±,Ÿ
- Step 7: ftfŠfbfsf“fO EfT [ftfFfX
- Step 8: DirectDrawIfufWfFfNfg,İŠ,.,è“—,Ä í α

**Step 1: DirectDrawIfufWfFfNfg,Ì ì ¬**

DirectDrawIfufWfFfNfg,ÌfCf“fXf^f“fX,ð ì ¬,·,é,É,Í A DDEX1fvf fOf%of€,ìdoInit ŠÖ ”“à,ÁŽ!,³,ê,é,æ,²  
,É A DirectDrawCreate ŠÖ ”,ðŽg,² B DirectDrawCreate,Í3,Â,Ìfpf%of [f^,ð•K—v,Æ,·,é B  
,æ^ê,Ìfpf%of [f^,É,Í AffBfXfvfCfC EfffofCfX,ð•\C»,·,éOf [fof< Eftfj [fNŽ~•ÊŽq (GUID)  
,ð,Æ,é B GUID,Í,Û,Æ,ñ,Ç,Ì ê ±NULL,ÉfZfbfg,³,ê,é,ª A,±,ê,ÍDirectDraw,ªfVfXfef€  
,ÌfftfHf<fg,ÌffBfXfvfCfC EfffofCfX,ðŽg,²,±,Æ,ð^Ó—i,µ,Â,Ç,é B  
,æ“ñ,Ìfpf%of [f^,Í A ì ¬,³,ê,½DirectDrawIfufWfFfNfg,Ìf fP [fVf±f“,ðŽ~•Ê,·,éf|  
fCf“f^,ÌfAfhfCfX,ðŽ ,Â BæŽO,Ìfpf%of [f^,Í,Â,Ë,ÉNULL,ÉfZfbfg,³,ê,Â,Ç,é,ª A,±,ê,Í «—^,ÌŠg’£  
,É”ö,!,é,½,ß,Â, ,é B

ŽŸ,Ì—á,Í A DirectDrawIfufWfFfNfg,Ì ì ¬•û—@,Æ A,»),Ì ^— ,ª ¬C±,µ,½,©,Ç,²,©,ð”»’f,·,é•û—@,ðŽ!,µ,Â,Ç,é B

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

**Step 2: fAfvfŠfP [fVf‡f“ì U,é•,ç,İĈ~è**

```
ffBfXfvfĈfC,İ%ò‘œ“x,ðĭ X,·,é‘O,É,Í A Á‘áĈÀIDirectDraw2::SetCooperativeLevel
f f\fbfh,İpf%of [f^dwFlags ,É, ,éDDSCL_EXCLUSIVE,Æ DDSCL_FULLSCREEN
ftf%ofO,ðŽw‘è,μ,È,̄,ê,İ,È,ç,È,ç B,±
,ê,É,æ,è AfAfvfŠfP [fVf‡f“,“ffBfXfvfĈfC EfffofCfX,ðŠ@‘S,ÉfRf“fgf [f<,Á,«,é,æ,μ
,É,È,è A‘¼AfAfvfŠfP [fVf‡f“,İffBfXfvfĈfC EfffofCfX,ð<—L,Á,«,È,È,é B%Á,İ,Á DDSCL_FULLSCREEN
ftf%ofO,Í AfAfvfŠfP [fVf‡f“,ð”r‘¼“İ iftf<fXfNfŠ [f“ jf, [fh,ÉfZfbfg,·,é B,·,é,ÆfAfvfŠfP [fVf‡f“,İffXf
Nfgfbfv,ç,Á,İ,ç,É L,ª,è A,Û,½,»,İfAfvfŠfP [fVf‡f“,¾,̄,ªfXfNfŠ [f“,É ‘,«,±,Đ,±,Æ,ª,Á,«,é,æ,μ
,É,È,é B,»,İ ó‘Ō,Á,à AffXfNfgfbfv,İ,Û,¾—~p%Á”,Á, ,é i,½,Æ,İ,İ A”r‘¼“If, [fh,Á“@,-
fAfvfŠfP [fVf‡f“,É,̄,ç,ÄffXfNfgfbfv,ðĈ©,é,É,Í ADDEX1,ðfXf^ [fg,³,¹ A ALT + TAB,ð%Ÿ,¹,İ,æ,ç j B
```

**ŽŸ,İ—á,Á,Í IDirectDraw2::SetCooperativeLevel ,İŽg,ç•û,ð à-¾,μ,Ä,ç,é B**

```
HRESULT ddrval;
LPDIRECTDRAW lpDD; // DirectDrawCreate,É,æ,Á,Ä,·,Á,É ì ¬,³,ê,Ä,ç,é

ddrval = lpDD->SetCooperativeLevel(hwnd, DDSCL_EXCLUSIVE |
    DDSCL_FULLSCREEN);
if(ddrval == DD_OK)
{
    // ”r‘¼“If, [fh,İ ¬Ĉ÷,μ,½.
}
else
{
    // ”r‘¼“If, [fh,İŽ,“s,μ,½
    // ,μ,©,μ AfAfvfŠfP [fVf‡f“,İ,Û,¾“@,ç,Á,ç,é
}
```

**IDirectDraw2::SetCooperativeLevel,ª**

```
DD_OK,ð‘Ō,³,È,ç ê ê ‡,Á,à AfAfvfŠfP [fVf‡f“,İ‘± s,Á,«,é B,μ,©,μ AfAfvfŠfP [fVf‡f“,”r‘¼“If, [fh,É,È,̄,ê
,İ A—v< ,³,ê,éfpftfH [f}f“fX,ðŽÀĈ»,Á,«,È,ç%Á”\ «,ª, ,é B,±,İ ê ê ‡ A‘± s,·,é,©,ç,μ
,©f† [fU,ÉĈ~è,³,¹,éf fbfZ [fW,ð‘Ž!,μ,½,Û,ª,ª—ç,ç,¾,è,μ B
```

**IDirectDraw2::SetCooperativeLevel,ðŽg,μ ê ê ‡ AfAfvfŠfP [fVf‡f“,“Û í I—¹,μ,½,±**

```
,Æ,ðWindows,É‘m,ç,¹,é,æ,²EfBf“fhfE Efnf“fhf<(HWND),ð“n,³,È,̄,ê,İ,È,ç,È,ç B,½,Æ,İ,İ A^è”Ê•ŪĈè
(GP)^á”½,ª,N,±,èGDI,ªfobfN Efofbftf@,ÉftfŠfbfsf“fO,³,è,Á,ç,é,Æ Af† [fU,İ Windows,İfXfNfŠ [f“,ðŽæ,è-ß,·,±
,Æ,ª,Á,«,È,ç B,±,è,ð-h,@,½,ß DirectDraw,Í A,»,İfBf“fhfE,É‘—
,ç,è,½f fbfZ [fW,ðfgf%bfv,·,éfofbfNfOf%ofEf“fh Efvf fZfX,ð‘ñ<Ÿ,μ,Ä,ç
,é Bfgf%obfv,μ,½f fbfZ [fW,ðŽg,ç A DirectDraw,İfAfvfŠfP [fVf‡f“,ª,ç,Á I—¹,μ,½,©Ĉ~è,·,é B,±,İ<@”
,É,İ §ĈÄ,ª,ç,Á,©, ,é B,Û, fAfvfŠfP [fVf‡f“,İ,½,ß,İf fbfZ [fW,ðŽæ“¾,μ,Ä,ç
,éEfBf“fhfE Efnf“fhf<,ðŽw‘è,μ,È,̄,ê,İ,È,ç,È,ç B,Á,Û,è AfEfBf“fhfE,ð,à,μ
,Đ,Æ,Á ì ¬,·,é ê ê ‡ AŽw‘è,·,éEfBf“fhfE,İŠmŽÀ,ÉfAfNfefBfu,Á,È,·,Á,İ,È,ç,È,ç B,³,à,È,ç,Æ AGDI,©,ç—
\Šú,μ,È,ç U,é•,ç,ª ¶,¶,½,è AALT+TAB,ð%Ÿ,μ,Ä,àfĈfXf|f“fX,ª,È,©,Á,½,è,Æ,ç,Á,½-â-è,É~ª,±,Æ,ª, ,é B
```

**Step 3: ffbfXfvfCfC Ef, [fh,İ•İ X**

fAfvfŠfP [fVf‡f“İ U,é•,ç,đfZfbfg,μ,½Ĉĕ,Ā A  IDirectDraw2::SetDisplayMode  
f f\fbfh,đŽg,ĉ AfffbfXfvfCfC,İ%đ’œ“x,đ•İ X,•,é,±,Æ,ª,Ā,«,é BŽŸ,İ—á,Ā,Í AfffbfXfvfCfC Ef, [fh,đ 640  
’480’8 bpp,ÉfZfbfg,•,é•ŭ—@,đŽ,μ,Ā,ç,é B

```
HRESULT      ddrval;  
LPDIRECTDRAW lpDD; // ,:Ā,É İ -,:ē,Ā,Ĉ,é  
  
ddrval = lpDD->SetDisplayMode(640, 480, 8);  
if(ddrval == DD_OK)  
{  
    // ffbfXfvfCfC Ef, [fh,İ•İ X,Í -Ĉē,μ,½  
}  
else  
{  
    // ffbfXfvfCfC Ef, [fh,İ•İ X,Ā,«,È,©,Ā,½  
    // f, [fh,ªfTf| [fg,ª,ē,Ā,Ĉ,È,ĉ,© A¼,İfAfvfŠfP [fVf‡f“,ª  
    // ”r¼“If, [fh,É,È,Ā,Ā,ç,é  
}
```

ffbfbfXfvfCfC Ef, [fh,đfZfbfg,•,é,É, ,½,è Af† [fU,İfn [fhfEfFfA,ª ,%đ’œ“x,đfTf| [fg,μ,Ā,Ĉ,È,ĉ,È,ĉ  
,Æ,«,É,İffbfbfXfvfCfC EfAf\_fvf^,İ’á’½ ”,ªfTf| [fg,μ,Ā,Ĉ,é•W €f, [fh,ÉfAfvfŠfP [fVf‡f“,ªœA,Ā,«,é,±  
,Æ,đ•Ū Ø,μ,Ā,•,©,È, - ,é,İ,È,ĉ,È,ĉ B,½,Æ,!,İ A640’480’8,Æ,ĉ,ª•W €,İfobfNfAfbfv%đ’œ“x,đfTf| [fg,μ,Ā,Ĉ  
,é,•,x,Ā,İfVfXfef€,Ā“@,,æ,ªfAfvfŠfP [fVf‡f“,đ ŸĈv,•,é,x,«,Ā, ,é (—  
v< ,•,é%đ’œ“x,ÉffbfbfXfvfCfC EfAf\_fvf^,đfZfbfg,Ā,«,È,©,Ā,½ ê ‡ A IDirectDraw::SetDisplayMode,ÍfGf%o [’  
l DDERR\_INVALIDMODE,đ•Ū,• B,μ,½,ª,Ā,Ā AfffbfXfvfCfC Ef, [fh,đfZfbfg,μ,æ,ª  
,Æ,•,é’O,É Af† [fU,İffbfbfXfvfCfC EfAf\_fvf^,İ“Á’è,Ā,«,É  IDirectDraw2::EnumDisplayModes f\fbfh,đŽg,ª  
,x,«,Ā, ,é) B

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

```

fffbfXfvfƒfC Ef, [fh,đfZfbfg,μ,½,ç AfAfvfŠfP [fvf±f“,Ăžg—
p,·,éft [ftfFfX,đ ì ¬,μ,È,¯,é,Î,È,ç,È,ƒ BDEX1,ì—
á,Ă,Í A”r¼“I iftf<fXfNfŠ [f“ jf, [fh,ÉfZfbfg,·,é,½,βIDirectDraw2::SetCooperativeLevel f f\fbfh,đžg,Ă,Ă,ƒ
,é,ì,Ă AfT [ftfFfXŠÖ,ĂftfŠfbfsf“fO,·,éft [ftfFfX,đ ì ¬,·,é,±
,Æ,ª,Ă,«,é Bf, [fh,δDDSCAP_NORMAL,ÉfZfbfg,·,é,½,βIDirectDraw2::SetCooperativeLevel,đžg,Ă,½ ê ± A
fT [ftfFfXŠÖ,Ăuf fbfN“]—
,·,éft [ftfFfX,μ,© ì ¬,Ă,«,È,ƒ BftfŠfbfsf“fO EfT [ftfFfX,đ ì ¬,·,é,É,Í AŽŸ,Ì,æ,µ,ÈfXfefbfv,Ă s,µ B
    fT [ftfFfX—v< ,ì'è<
    fT [ftfFfX ì ¬

```

**fT [ftfFfX—v< ,ì'è<**

```

ftfŠfbfsf“fO EfT [ftfFfX,đ ì ¬,·,é Ā %,ÌfXfefbfv,Í A DDSURFACEDESC \‘c‘ì,ÌfT [ftfFfX—
v< ,đ'è<,·,é,±,Æ,Ă, ,é BŽŸ,Ì—á,Ă,Í AftfŠfbfsf“fO EfT [ftfFfX,đ ì ¬,·,é,Ì,È•K—
v,È A \‘c‘ì'è<,Æftf%oO,đž,μ,Ă,ƒ,é B

```

```

// fofbfN Efofbftf@,đ,Đ,Æ,Ăž ,Ăfvf%oCf}fŠ EfT [ftfFfX,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;

```

```

,±,ì—á,Ă,Í A dwSizef f“fo,É DDSURFACEDESC \‘c‘ì,ÌfTfCfY,đfZfbfg,·,é B ,±,é,ÍDirectDraw
f f\fbfhĚĂ,Ň o,μ,Ă—LĚø,Ă,È,ƒf f“foGf%o [,ª•Ō,Ă,Ă,±,È,ƒ,æ,µ,É,·,é,½,β,Ă, ,é i dwSizef f“fo,Í A
DDSURFACEDESC \‘c‘ì,ì «—^,Ìšg'Ě,Ì,½,β,È—p^Ō,ª,é,½,à,ì,Ă, ,é j B

```

```

dwFlagsf f“fo,Í A DDSURFACEDESC \‘c‘ì,Ì,Ç,Ìf f“fo,É—LĚø,È î•ª,ª•Ō,ª,é,é,©Ě“è,·,é BDEX1,ì—
á,Ă,Í AdwFlags,đfZfbfg,·,é,±,Æ,Ă ADDSCAPS \‘c‘ì,đžg,ƒ(DDSD_CAPS)fofbfN Efofbftf@
,đ ì ¬,·,é(DDSD_BACKBUFFERCOUNT),±,Æ,đžw'è,μ,Ă,ƒ,é B

```

```

dwCapsf f“fo,Í A DDSCAPS \‘c‘ì,Ăžg,í,È,éftf%oO,đž,μ,Ă,ƒ,é B,±,Ì ê ±,Í Afvf%oCf}
fŠ EfT [ftfFfX(DDSCAPS_PRIMARYSURFACE),ÆftfŠfbfsf“fO EfT [ftfFfX
(DDSCAPS_FLIP) A; ±fT [ftfFfX (DDSCAPS_COMPLEX),đžw'è,μ,Ă,ƒ,é B

```

```

ĂĚĚ,é A,±,ì—á,Ă,ÍfofbfN Efofbftf@,đ,Đ,Æ,Ăžw'è,μ,Ă,ƒ
,é BfofbfN Efofbftf@,Í A”wĚi,ÆfXfvf%oCf,ªž Ā Ū,É ‘,«,±,Ū,È,é ê Š,Ă, ,é B,»,μ,ĂfofbfN Efofbftf@,Í
Afvf%oCf}fŠ EfT [ftfFfX,ÉftfŠfbfsf“fO,ª,é,é B DDEX1,ì—á,Ă,ÍfofbfN Efofbftf@,Ì ”,Í,ÉfZfbfg,ª,é,Ă,ƒ
,é,ª A fffBfXfvfƒfC Ef f,fŠ,ª<,·,©,¬,è,ƒ,,Ă,Ă,à ì ¬,·,é,±
,Æ,ª,Ă,«,é BfofbfN Efofbftf@,ÉŠŌ,·,é,ª,ç,É Ū,μ,ƒ î•Ň,Í A ufqfŠfvf< Efofbftf@fŠf“fO v,đžQ Ě,·,é,±
,Æ B.

```

```

fT [ftfFfX Ef f,fŠ,ÍffBfXfvfƒfC Ef f,fŠ,É,àfvfXfefĚ Ef f,fŠ,É,à'u,,±,Æ,ª,Ă,«,é B
DirectDraw,Í AfAfvfŠfP [fvf±f“,ªftfBfXfvfƒfC Ef f,fŠŠŌ,Ă“@,,Æ,«,ÍfvfXfefĚ Ef f,fŠ,đžg,µ
(½,Æ,!,Í A1MB,ÌRAMf f,fŠ,μ,©,È,ƒffBfXfvfƒfC EfAf_fvf^ ā,Ă A,Đ,Æ,Ă^È ā,ÌfofbfN Efofbftf@,đžw'è,
·,é,æ,µ,È ê ±,Ă, ,é) B DDSCAPS
\‘c‘ì,ÌdwCapsf f“fo,đDDSCAPS_SYSTEMMEMORY,Ū,½,ÍDDSCAPS_VIDEOMEMORY,Éžw'è,·,é,±
,Æ,É,æ,Ă,Ă AfVfXfefĚ Ef f,fŠ,¾,¬,đžg,µ,©ffBfXfvfƒfC Ef f,fŠ,¾,¬,đžg,µ
,©,đžw'è,Ă,«,é iDDSCAPS_VIDEOMEMORY,đžw'è,μ,½,É,àŠŌ,í,ç,,fT [ftfFfX ì ¬,É [ª,Èf f,fŠ,đ—~
p,Ă,«,È,ƒ ê ±,Í AIDirectDraw2::CreateSurface,ª DDERR_OUTOFVIDEOMEMORYfGf%o [,ª•Ō,é j B

```

**fT [ftfFfX,ì ì ¬**

```

DDSURFACEDESC \‘c‘ì,Ìf f“fo,đ—,,β,½,ç A DirectDrawCreate ,ª ì ¬,μ,½DirectDrawIfufWfFfNfg,Ō,Ìf|Cf“f^
lpDD,ÆDDSURFACEDESC \‘c‘ì,Æ,đžg,Ă,Ă AIDirectDraw2::CreateSurface f f\fbfh,đĚĂ,Ň o,·,±
,Æ,ª,Ă,«,é BŽŸ,È—á,đž,· B

```

```

ddrval = lpDD->CreateSurface(&ddsd, &lpDDPrimary, NULL);
if(ddrval == DD_OK)
{
    // V,μ,ƒT [ftfFfX,đžw,lpDDPrimary

```

```

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

lpDDSPPrimary fpf%of [f^, Í AĒÄ, Ñ o, μ, a -Ē÷, μ, ½ ê ‡ A IDirectDraw::CreateSurface, a•Ô, ·fvf%ofCf}
fŠ EfT [ftFfX, Ö, Ìf|fCf“f^, Æ, È, é B

fvf%ofCf}fŠ EfT [ftFfX, Ö, Ìf|fCf“f^, ðŽæ“¾, μ, ½, ç AŽŸ, Ì—á, ÁŽ!, ·È, è AfobfN Efofbtf@, Ìf|
fCf“f^, ðŽæ“¾, ·, é, ½, ß, É IDirectDrawSurface2::GetAttachedSurface f f\fbh, ðŽg—p, Å, «, é B

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

fT [ftFfX, Ìfvf%ofCf}fŠ EfT [ftFfX, ÌfAfhfĒfX, ð’ñ<Ÿ, μ ADDSCAPS_BACKBUFFER ftf%ofO, Å”—
Í’l, ðfZfbfg, ·, é, ±, Æ, È, æ, Á, Ä A IDirectDrawSurface2::GetAttachedSurface, ÌĒÄ, Ñ o, μ, a -Ē÷, μ, ½ ê ‡ A
lpDDSBack fpf%of [f^, Í fobfN Efofbtf@, Ö, Ìf|fCf“f^, Æ, È, é B

```



**Step 6: fT [ftFfX,Ö,İ ‘,«,±,Ý**

DDEX1,İ WM\_TIMER f fbZ [fW,İ‘O”¼,Å,Í AŽÝ,İ—á,Ž,·’Ê,è ê,çfobfN Efofbtf@,Ö,İ ‘,«,±,Ý,đ s, B

```
case WM_TIMER:
    // fT [ftFfX,đftfŠfbfsf“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,đCEÄ,Ñ o. s,Å,Í A ‘,«,±,Ý,İ €”ö,ÅfobfN Efofbtf@,đf fbN,·,é B  
**SetBkColor,Æ SetTextColor** ŠÖ ”,É,æ,Á,Ä A”wEi,ÆfefLXfg,İ F,đŽw’è,·,é B

‘±,Ç,Ä Aphase·İ ”,Í Afvf%ofCf}  
fŠ Efofbtf@ Ef fbZ [fW,Ü,½,ÍfobfN Efofbtf@ Ef fbZ [fW,İ,Ç,¿,Ç,ª ‘,«,±  
,Ü,è,é,×,«,©,đCE”è,·,é Bİ ”phase,ª1,Å, ,è,İ Afvf%ofCf}fŠ EfT [ftFfX Ef fbZ [fW,ª ‘,«,±,Ü,è A  
·İ ”phase,Í0,ÉfZfbfg,³,è,é Bİ ”phase,ª0,É“™,µ,¯,è,İ AfobfN Efofbtf@ Ef fbZ [fW,ª ‘,«,±  
,Ü,è A·İ ”phase,Í1,ÉfZfbfg,³,è,é B,µ,©,µ A,Ç,¿,Ç,İ ê ±,É,àf fbZ [fW,ÍfobfN Efofbtf@,É ‘,«,±  
,Ü,è,é,Æ,Ç,ª,±,Æ,É’ ~Ó,·,é,±,Æ B

f fbZ [fW,ªfobfN Efofbtf@,É ‘,©,è,½Eä AfobfN Efofbtf@,Í A **IDirectDrawSurface2::ReleaseDC**  
f f\fbfh,É,æ,Á,Äf fbN%öð æ,³,è,é B

**Step 7: `ftfŠfbfsf“fO Eft [ftFfX`**

`fT [ftFfX Ef f, fŠ, f fbfN%ø æ, 3, ê, ½Eä, Ä AfobfN Efofbftf@, ðfvf%øCf}`  
`fŠ Eft [ftFfX, ÉftfŠfbfsf“fO, ·, éIDirectDrawSurface2::Flip f f\fbfh, ðŽg—p, Ä, «, é, æ, µ, É, È, é BŽŸ, Ì—`  
`á, ÄŽ!, ·É, è, Ä, , 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, Ä, Í A `lpDDSPPrimary`, Ífvf%øCf}fŠ Eft [ftFfX, æ, » , ê, ÉŠÖ`A, Ä, ¯, ç, ê, ½fobfN Efofbftf@, æ, ðŽ!, µ, Ä, ç, é B  
**IDirectDrawSurface2::Flip**, æÄ, Í, è, é, æ Aftf f“fg Eft [ftFfX, æfobfN Eft [ftFfX, æðŠ, 3, ê, é ifT [ftFfX  
, Ö, ÌffCf“f^, æ, í X, 3, ê, é, ¾, ¯, Ä AŽÄ Û, Éff [f^, æ“Ü“@, ·, é, í, ¯, Ä, Í, È, ç j BftfŠfbfsf“fO, æ -æ÷, µ  
DD\_OK, æ, Ö, 3, ê, é, æ AfAvfŠfP [fvf±f“, Íwhilef< [fv, ©, ç”2, ¯, é B

`ftfŠfbfsf“fO, æ, Ö`IDDERR_SURFACELOST, ð, Ö, · ê ± AIDirectDrawSurface2::Restore`  
`f f\fbfh, È, æ, Ä, Äft [ftFfX, ÌfŠfXfgfA, æŽŽ, Ý, ç, ê, é BfŠfXfgfA, æ -æ÷, ·, é, æ AfAvfŠfP [fvf±f“, Íf< [fv, È-`  
`ß, è`  
**IDirectDrawSurface2::Flip**, ÌEÄ, Ñ o, µ, ð Ä, ÑŽŽ, Ý, é BfŠfXfgfA, æŽ, s, ·, é, æ AfAvfŠfP [fvf±f“, Íwhilef< [fv, ð”  
², ¯, Ä AfGf%ø [, ð, Ö, · B

**Note**

**IDirectDrawSurface2::Flip**, ðEÄ, Ñ o, · ê ± AftfŠfbfsf“fO, Í, ·, ®, É, ÍŠ@—  
¹, ¹, , AŽŸ, Ì , ¼A üšúŠÖ, É s, í, è, é B, ½, æ, !, Í‘O, ÌftfŠfbfsf“fO, æ I, í, Ä, Ä, ç, È, ç, æ, « A **IDirectDrawSurface2::Flip**, Í  
DDERR\_WASSTILLDRAWING, ð, Ö, · B—á, Ä, Í A **IDirectDrawSurface2::Flip**, ÍDD\_OK, ð, Ö, ·, Û, Äf< [fv, µ±, ¯, é B

**Step 8: DirectDrawIfufWfFfNfg,İŠ,,è“-,Ä í œ**

F12fL [,ð%Ÿ,.,Æ ADDEX1 fAfvfŠfP [fVf‡f“,Í I—1‘O,É WM\_DESTROY f fbZ [fW,ð ^—  
,.é BŽŸ,ÉŽ!,‘È,è A,±,İf fbZ [fW,Í,.,×,Ä,İUnknown::ReleaseŠÖ ”,ðŠÜ,İfiniObjects ŠÖ ”,ðCEÄ,Ń o,. B

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

fAfvfŠfP [fVf‡f“,Í ADirectDrawIfufWfFfNfg,Ö,İf|fCf“f^(lpDD),ÆDirectDrawSurfaceIfufWfFfNfg,Ö,İf|  
fCf“f^(lpDDSPrimary),“NULL,Ä,È,ç,©,Ç,²,©f`fFfbfN,.,é B ,»,µ,ÄDDEX1,Í A  
DirectDrawSurfaceIfufWfFfNfg,İŽQ ÆfJfEf“fg,ð1,.,ÄCE,ç,.,½,B IDirectDrawSurface2::Release  
f f\fbfh,ðCEÄ,Ń o,. BŽQ ÆfJfEf“fg,º0,É,È,é,Æ A DirectDrawSurface,Í%ð•ú,³,è,é B DirectDrawSurface|  
fCf“f^,Í ANULL,ð'l,ÉfZfbfg,µ,Ä”jŠü,³,è,é BŽŸ,É A  
DirectDrawIfufWfFfNfg,İŽQ ÆfJfEf“fg,ð0,Ü,ÄCE,ç,.,½,B,É A IDirectDraw::Release,ðCEÄ,Ń o,. B  
DirectDrawIfufWfFfNfg,İŠ,,è“-,Ä,Í%ð œ,³,è,é B,±,İf|fCf“f^,à,Ü,½ A NULL,ð'l,ÉfZfbfg,µ,Ä”jŠü,³,è,é B

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

,±,ì`f`f... [fgfŠfAf<(DDEX2),Á%øđ à,·,éTf“fvf<,Í Af`f... [fgfŠfAf<1,Á%øđ à,μ,½ DDEX1 ,đŠg’E  
,μ,½,à,ì,Á, ,é B DDEX2,Í Afrfbfgf}fbfvtf@fCf<,đfofbfN Efofbftf@,Öf [fh,·,é<@”\,đŠÜ,ñ,Á,¢,é B,±  
,ì V,μ,¢<@”\,đ AŽŸ,ì,æ,□,ÈfXfefbfv,Á à~¼,·,é B

Step 1: fpfĈfbfg,ì ì ñ

Step 2: fpfĈfbfg,ì Ý’è

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

Step 4: fT [ftfFfX EftfŠfbfsf“fO

DDEX1,Æ“—l A doInit,Í DDEX2fAvfŠfP [fVf‡f“;ì %øŠú%ø»ŠÖ ”,Á, ,é B DirectDraw %øŠú%ø»fR [fh,Í A  
DDEX1,ÆDDEX2,Æ,Á,ì,¢,³,³,©`Ü,È,Á,ÄĈ©,,é,ª A—{Žč“l,É,Í“¯,¶,Á, ,è AŽŸ,ìfZfNfVf‡f“,ªÜ,È,é,¾,¯,Á, ,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 2: `ppfCbfg,İ` Ý'è**

`ppfCbfg,đ` ì ¬,µ,½Ā A **IDirectDrawSurface2::SetPalette** f f\bfh,đĀ,Ñ o,·,±  
,Ā,Ā A DirectDrawPaletteIfufWfFfNfg,Ö,İ|fCf“f^ iddpal j,đvf%ofCf}fŠ Eft [ftFfX,É“n,· BŽŸ,ì—  
á,ĀŽ',·Ē,è,Ā, ,é B

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

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

**IDirectDrawSurface2::SetPalette**,đĀ,Ñ o,·,±,Ā,É,æ,Ā,Ā A DirectDrawPaletteIfufWfFfNfg,İ  
DirectDrawSurfaceIfufWfFfNfg,ÉŠÖ`A,Ā, ,ç,è,é BppfCbfg,ìĪ X,ªK—v,È,Ā,«,Í,ĉ  
,Ā,Ā,à V,µ,ĉppfCbfg,đ ì ¬,µppfCbfg,đ Ā Ý'è,·,é,¾, ,Ā,æ,ĉ B i,±,è,İTf“fvf<,ĀŽg,í,è,Ā,ĉ,é•û—  
@,¾,ª AĀĀ,É à¾,·,é,Ā, ,è¼,É,à•û—@,ª, ,é B j

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

DirectDrawPaletefIfufWfFfNfg,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**,Í A Ddutil.cpp,É, ,é,à,µ,Đ,Æ,Ä,İŠÖ ”,Ä, ,é B,±,İŠÖ ”,İftf@fCf<,Ü,½,İfŠf\ [fX,©,çfrfbfgf}fbfv,ðŠù“İ,İDirectDrawfT [ftfFfX,Öf [fh,·,é B(ft [ftfFfX,ð ì ¬,µ Afrfbfgf}fbfv,ð,»),İfT [ftfFfX,Öf [fh,·,é,½,ß,É **DDLloadBitmap**,ðŽg,µ,±,Æ,ª,Ä,«é B³,ç,É Ú,µ,ç î•ñ,Í A u`f...  
[fgŠfAf<5:fpfCEfbfg,İ“@“I•Ī X v,ðŽQ Æ,·,é,±,Æ B) DDEX2,É,™,ç,Ä,Í 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 ”,Í Afrfbfgf}fbfv,ðf f,Š,ÉfRfs [µ Afrfbfgf}fbfv,İfTfCfY,ð²,×,é,½,ß,É **GetObject**  
ŠÖ ”,ðŽg,µ B,»µ,Äfrfbfgf}fbfv,ªu,©,ê,éfofbfN Efofbftf@,İfTfCfY,ð²,×,é,½,ß,ÉŽŸ,İ,æ,µ,É,µ,Ä,ç,é B

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

*ddsd*,Í A **DDSURFACEDESC** \`c`İ,Ö,İf|fCf“f^,Ä, ,é B,±,İ \`c`İ,Í A  
DirectDrawfT [ftfFfX,İCE» Ÿ,İkL q,ðŠi”[·,é B,±,İ ê ‡ A **DDSURFACEDESC** f“fo,Í 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,Í A \`c`İ,É“K Ø,È’l,ðf [fh,·,é B DDEX2,Ä,Í A ,³480 A• 640,Æ,È,Ä,Ä,ç,é B

**DDCopyBitmap** ŠÖ ”,Í AfT [ftfFfX,ðf fbfn,µ AŽŸ,İ—á,ÄŽ!,·,æ,µ  
,ÉfofbfN Efofbftf@,É, ,Ä,Í,Ü,é,æ,µ L’·,·,é,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<,Á,ìfT [ftFfX,ìftŠfbfsf“fO,Í A-Ž;“I,É AfT [ftFfX,ª ÁŽ,,µ,½ ê ± i  
DDERR\_SURFACELOST j,ð œ,ç,Ä DDEX1f`f... [fgfŠfAf<,Æ““¶,Á, ,é i uf`f... [fgfŠfAf<1:  
DirectDraw,ìŠí`b v,ðŽQ Æ,·,é,±,Æ) B,»„ì ê ± AfT [ftFfX,ªfŠfXfgfA,³,ê,½Eã **ADDReloadBitmap**  
ŠÖ ”,ðŽg,Á,Äftrfbfgf}fbfv,ðfofbfN Efofbftf@,Éf [fh,µ’¼,³,È,¯,ê,ì,È,ç,È,ç B

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

f`f... [fgfŠfAf<2 (DDEX2),İTf“fvf<,Í Afrfbfgrf}  
fbfv,đžæ“¾,µ,ÄfobfN Efofbtf@,É’u,« AfobfN Efofbtf@,Æfvf%ofCf}  
fŠfobfNf@,Æ,İŠÖ,đftfŠfbfsf“fO,µ,Ä,ç,é B,±,ê,Í Afrfbfgrf}fbfv,đžŽ,.,é,İ,É, ,Ü,èE»ŽÀ“l,È•û-  
@,Ä,Í,É,ç B,Ó,½,Ä,İfrfbfgrf}fbfv |,Đ,Æ,Ä,Í A<ô ”,İXfNfŠ [f“ A,à,µ,Đ,Æ,Ä,ÍŠi ”,İXfNfŠ [f“ |  
,“Ši”[,³,ê,½,Ó,½,Ä,İfIftfXfNfŠ [f“fobfNf@,đšÜ,Đ,±,Æ,É,æ,Ä,Ä A,±,İ f`f... [fgfŠfAf<3(DDEX3),İ—á,Ä,Í A  
DDEX2,İ”—Í,đšg’£,µ,Ä,ç,é BfIftfXfNfŠ [f“ EfT [ftfFfX,İ“à—e,đfobfN Efofbtf@,ÉfRfs [,.,é,½,B,É A  
**IDirectDrawSurface2::BltFast**  
f ffbfh,đžg,² B,»µ,Ä AfobfNf@,đftfŠfbfsf“fO,µ AŽŸ,İfIftfXfNfŠ [f“ EfT [ftfFfX,đfobfN Efofbtf@,  
ÉfRfs [,.,é B

DDEX3,ÄŽ,³,é,é V,µ,ç<@”\,đžŸ,İXfefbfv,Ä à-¾,.,é B

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

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

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

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

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

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

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

**dwFlags** f“fo,Á AfAvfšfP [fVf±f“,**DDSCAPS** \‘c‘ì,ðŽg,²,±,Æ,ðŽw’è,·,é B,»µ,Ä e  
DDSCAPS\_OFFSCREENft%fo,<sup>a</sup>**DDSCAPS** \‘c‘ì,ÉfZfbfg,<sup>3</sup>,é,é,±,Æ,É,æ,Á,ÄŽ!<sup>3</sup>,é,é,æ,²,É Afobftf@,ì ,<sup>3</sup>,Æ%  
i• ,ðfZfbfg,·,é B  
fT [ftFfX,ìfIfTfXfNfŠ [f“ EfvfŒ [f“ Efobftf@,É,È,é B ,<sup>3</sup>,Æ• ,í,»è,¼,ê A480,Æ640,É  
**DDSURFACEDESC** \‘c‘ì“à,ÁfZfbfg,<sup>3</sup>,é,é BfT [ftFfX,ì  
**IDirectDraw::CreateSurface** f\fbfh,ðŽg,Á,Ä ì -,·,é B

fIfTfXfNfŠ [f“ EfvfŒ [f“ Efobftf@,Í—¼•û,Æ,à“ ,¶fTfCfY,Á ,é,½,ß AfZfJf“fh Efobftf@,ð ì -,·,é,½,ß,É  
,Í A Ä,Ñ A`Ù,È,éf|Cf“f^¼,Á**IDirectDraw::CreateSurface**,ðŒÄ,Ñ o,<sup>1</sup>,Í,æ,¢ B

“Á,É **DDSCAPS** \‘c‘ì,IDDSCAPS\_SYSTEMMEMORY,Û,½,IDDSCAPS\_VIDEOMEMORY”—Í,ðfZfbfg,·,é,±  
,Æ,É,æ,Á,Ä AfIfTfXfNfŠ [f“ Efobftf@,ðfVfXfefŒ Ef f,fš,Û,½,ìfBfXfvfŒfCf f,fš,É’u,±,Æ,ðŽw’è,·,é,±  
,Æ,<sup>a</sup>,Ä,«é B ffbfXfvfŒfC Ef f,fš,Éfrfbfgf}fbfv,ð•Û“¶,·,é,±  
,Æ,É,æ,Á,Ä AfIfTfXfNfŠ [f“ EfT [ftFfX,ÆfobfN Efobftf@ŠÖ,ì“]—fXfs [fh,ð ã,°,é,±  
,Æ,<sup>a</sup>,Ä,«é Bfrfbfgf}fbfv EfAfjf [fVf±f“,ðŽg,²,Æ,«É,±è,Í,æ,è d—  
v,Æ,È,é B,µ,©,µfIfTfXfNfŠ [f“ Efobftf@,É DDSCAPS\_VIDEOMEMORY,ðŽw’è,µ,½ ê ‡ Afrfbfgf}  
fbfv’S”•ð•ÛŽ ,·,é,ì,É [“Èf f,fš,<sup>a</sup>,È,¢ ê ‡ AfT [ftFfX,ð ì -,·,é Û,ÉŽ,”s,µ ADDERR\_OUTOFVIDEOMEM  
ORYfGf% [,“Ö,<sup>3</sup>,é,é B



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

WM\_TIMER f fbfZ [fW ^— •”,Í AfT [ftfFfX,É ‘,«±,ĐfR [fh,Æ AfTfŠfbfsf“fO,·,éFR [fh,đŠÜ,ñ,Á,č,é B  
DDEX3,İ ê ‡ AZŸ,İ,æ,ρ,È A“K—,ÈfIfTfXfNfŠ [f“ EfT [ftfFfX,đ‘I,Ö,æ,ρ  
,ÈfR [fh,Æ AfofbfN Efofbftf@,É“]’—,·,éFR [fh,Æ,đŠÜ,ñ,Á,č,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->BlTFast(0, 0, pdds, &rcRect, FALSE);  
    if(ddrval == DD_OK)  
    {  
        break;  
    }  
}
```

phase,Í AfIfTfXfNfŠ [f“ EfT [ftfFfX,afofbfN Efofbftf@,Éfuf fbfN“]’—,³,é,½,β,İftf%o,Á, ,é B

**IDirectDrawSurface2::BlTFast**

f f\fbfh,Í A‘I,İ,ê,½fIfTfXfNfŠ [f“ EfT [ftfFfX,đofbfN Efofbftf@,É ¶ äŠp,İ À•W(0,0),©,çfuf fbfN“]’—  
,·,é,½,β,ÉĚÄ,Ñ o,³,é B rcRect fpf%of [f^,Í RECT \‘Ě,Á, ,è AfAf“fpfTf“fh i • j,đ,Á,Ě,Á,»İf|  
fCf“f^,Æ,È,é B,±,İĚÄ,Ñ o,μ,É,æ,è AfIfTfXfNfŠ [f“ EfT [ftfFfX,İ ¶ äŠp,©,ç%oE%oŠp,Ü,Á,İ—Īæ,““]’—  
,³,é,é B ĄĚä,İfpf%of [f^,Í FALSE (Ü,½,Í 0),É Y’è,³,é A“Á•Ě,È“]’—ftf%o,ÍŽg,í,È,č,±,Æ,đŽ,μ,Á,č,é B

**•K—v,È,ç,Í A IDirectDrawSurface2::BlT f f\fbfh,ÆIDirectDrawSurface2::BlTFast**

f f\fbfh,İ,ç,ç,àfIfTfXfNfŠ [f“ Efofbftf@,©,ç“]’—,·,é,½,β,ÉŽg,ρ,±,Æ,³,Á,«é B  
,à,ç,è,ñ AfIfTfXfNfŠ [f“ EfVfĚ [f“ Efofbftf@,©,ç,İ“]’—,İfpftfH [f}f“fX,đ, ,°é ê ‡ A  
**IDirectDrawSurface2::BlTFast**,đŽg,ρ,×,«,Á, ,é B ffbfXfVfĚfĚ EfAf\_fvf^ ã,İfn [fhfEfFfA Efuf fbfN“]’—  
,đŽg,Á,Á,à AfVfXfefĚ,İfXfs [fh,““¼,ç,é,È,č ê ‡ Afn [fhfEfFfA EfGf~f...fĚ [fVf±f“,”“]’—  
,đŽÄ s,·,é,Æ10fp [fZf“fg’đfpftfH [f}f“fX,³—Ž,ç,é B,±  
,İ,½,β AfIfBfXfVfĚfĚ Ef f,fŠ,©,çffBfXfVfĚfĚ Ef f,fŠ,Ö“]’—,³,¹,é,·,×,Á,İffbFfXfVfĚfĚĚ ĩ,İ,½,β,É,Í A  
**IDirectDrawSurface2::BlTFast**,đŽg,ρ,×,«,Á, ,é B,μ,©,μ AfVfXfefĚ Ef f,fŠ,©,ç“]’—  
,μ,½,è A“Á•Ě,Èfn [fhfEfFfA Eftf%o,đ—v< ,·,é ê ‡,Í A **IDirectDrawSurface2::BlT**,đŽg,í,È,Ě,ê,İ,È,ç,É,č B

fIfTfXfNfŠ [f“ EfT [ftfFfX,đofbfN Efofbftf@,Éf [fh,μ,½Ěä AfofbfN Efofbftf@,Æfvf%oCf]  
fŠ EfT [ftfFfX,Í‘Ö,İf`f... [fgfŠfAf<,ÁŽ],μ,½,İ,Æ,Ü,Æ,ñ,Ç“—,¶•û—@,ÄftfŠfbfsf“fO,³,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 ACE’Žn“I,È•û-@,ðŽg,Á,Ä,ç,é Bf`f... [fgfŠfAf<(DDEX4)  
,İftf“fvf<,Á,Í A‘O,İf`f... [fgfŠfAf<,Á à-  
¼,³,ê,½”wEi,Æê~A,İXfvf%ofCfG,ðfİftfXfNfŠ [f“ EfT [ftfFfX,Öf [fh,·,é,½,ß,İfefNfjfbfN,ðŽ!,· B,±,±  
,Á,İfİftfXfNfŠ [f“ EfT [ftfFfX,İê•”,ðfobfN 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,²frfbfgf}fbfvftf@fCf<,Í A”wEi,Æ •,İ”wEi,É Ô,ç—  
Ö,ª,®,é,®,é%ñ,é,»,İEJ,è•Ö,µ,©,ç \ ¬,³,ê,éAll.bmp,Á, ,é B DDEX4,İftf“fvf<,Í A%ñ“],µ,Ä,ç,é—  
Ö,ð d,È, ,í,¹,é,½,ß,İfJf% [ EfL [,ðfZfbfg,·,é V,µ,çŠÖ ”,ðŠÜ,ñ,Á,ç,é B,»,µ,ÄfTf“fvf<,Í A “K“—  
,ÈXfvf%ofCfG,ðfİftfXfNfŠ [f“ EfT [ftfFfX,©,çfobfN Efofbtf@,ÖfRfs [,·,é B

DDEX4,İ V,µ,ç<@”\,ðŽÿ,İ,æ,²,ÈXfefbfv,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 [,ì Ý'è**

```
'¼,ÌDirectDrawTf“fvf<,Á,Í A¼,ÌŠÖ ”,ÉdoInitŠÖ ”,ðE©,Á,¯,é,±,Æ,ª,Á,«,é B,µ,©,µ A
DDEX4,ÌTf“fvf<,Í AfXfvf%ofCf<,Ì½,ß,ÌfJf% [ Efl [,ðfZfbfg,·,éFR [fh,ðŠÜ,ñ,Á,¢
,é BfJf% [ Efl [,Í A“§-¾%»»,ÄŽg,í,ê,é F'Ì Ý'è,ð,·,é BfVfXfef€,ªfn [fhfEfFA“‘—”\—
Í,ðŽ ,Á,Æ,« A«E`ÌfsfNfZf<,Í AfJf% [ Efl [,Æ,µ,ÄfZfbfg,³,è,½'Ì,ð æ,¢
,Ä AfT [ftfFX ä,Ì”ñ«E`fXfvf%ofCf<,ð ì ¬,µ,È,ª,ç“‘—,³,è,é B DDEX4,ÄfJf% [ Efl [,ð Ý'è,µ,Ä,¢
,é.”ª,ÍŽÝ,ÌÈ,è,Ä ,é B
```

```
// ·,Ìfrfbfgf}fbfv,ðfJf% [ Efl [,É Ý'è,·,é
DDSetColorKey(lpDDOne, RGB(0,0,0));
```

```
return TRUE;
```

```
DDSetColorKey ŠÖ ”,ðEÄ,Ñ o,·,Æ,«,É AŽw'è,µ,½,¢ F,ÌRGB'Ì,ð Ý'è,·,é,±
,Æ,É,æ,Á,ÄfJf% [ Efl [,ð'I'ð,·,é B i ·,ÌRGB'Ì,(0,0,0),Á ,é j B DDSetColorKeyŠÖ ”,Í A DDColorMatch
ŠÖ ”,ðEÄ,Ñ,¾,· B i,Ç,·,ç,à ADdutil.cpp,É ,é j DDColorMatchŠÖ ”,Í A
lpDDOneT [ftfFX,É”z'u,³,è,½frfbfgf}fbfv ä,Ì(0,0),ÌfsfNfZf<,ÌE» Ý,ÌfJf% [¹,ðŠi”[µ AŽw'è,µ,½
RGB'Ì,ðŽæ,Á,Ä(0,0),ÌÈ'è'u,ÌfsfNfZf<,É,»Ì F,ðfZfbfg,·,é B ÄEä,É A—~p%»Ä”,ÈfsfNfZf<-
^,Ìfrfbfg ”,Á,»ÌfJf% [¹,Ì,ðf}fXfN,·,é B,±,è,ª I,í,é,Æ AŽn,ß,Ì F,Í(0,0)
,ÌÈ'è'u,ÌEä,è,É'u,©,è AŽÄ Ü,ÌfJf% [ Efl [,¹,Ì,Æ<ª,É A DDSetColorKey,Ö-ß,é B
DDColorMatch,ÌEÄ,Ñ o,µ,ª I,í,Á,½Eä AfJf% [ Efl [¹,Í A DDCOLORKEY
\`c'Ì,ÌdwColorSpaceLowValuef f“fo,É'u,©,è,é B,Ü,½ A dwColorSpaceHighValuef f“fo,É,àfrfs [,³,è,é B
IDirectDrawSurface2::SetColorKey,Ö,ÌEÄ,Ñ,¾,µ,É,æ,Á,ÄfJf% [ Efl [,ð Ý'è,·,é B
```

```
DDSetColorKey,ÆDDColorMatch,Ä A CLR_INVALID,ðŽQ Æ,µ,Ä,¢,é,±,Æ,É<C,Ä,¢,½,©,à,µ,è,È,¢ B iDDEX4,Ì
DDSetColorKey,ðEÄ,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,è,½ ê ‡ A(0,0)
,ÌfsfNfZf<,Ì F,ª AfOfE [,Ì%e,Æ,È,é,±,Æ`Ö-ì,·,é,í,¯,Á,Í,È,¢ B DDEX4,ÌTf“fvf<,Á A(0,0)
,ÌfsfNfZf<,ðfJf% [ Efl [,Æ,µ,ÄŽg,ª·ü-@,ð— %ð,µ,½,¯,è,Í Afrfbfgf}
fbfvftf@fCf<All.bmp,ðfhf [fCf“fOfAfvfŠfP [fVf‡f“,ÄŠJ,« A(0,0),ÌfsfNfZf<,ð ·,É·Ì X,µ,Ä,Ý,é,±,Æ B
j,»è,Í AŽÝ,ÌDDEX4 DDSetColorKey,ðEÄ,Ñ o,· s,Ä s,í,è,é B
```

```
DDSetColorKey(lpDDOne, CLR_INVALID);
```

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

Step 2: ŠÈ'P,ÈfAfjf [fVfzf“,ì ì ñ

DDEX4,ìftf“fvf“,Á,Í A All.bmpftf@fCf<,ÉŠÜ,Ü,ê,é Ô,¢—Ö,ðŽg,Á,½ŠÈ'P,ÈfAfjf [fVfzf“,ð ì ñ,·,é,½,ß,É  
updateFrameŠÖ ”,ðŽg,Á,Ä,¢,é B,»,ÌfAfjf [fVfzf“,Í A3,Á,Ì Ô,¢—Ö,³ŠpCE`,ðCE` ì,è A—  
l X,ÈfXfs [fh,Á%õñ“],·,é B,±,Ìftf“fvf“,Á,Í A Win32

GetTickCountŠÖ ”,ð A ÁEã,ÉGetTickCount,ðCEÄ,Ñ o,µ,Ä,©,çfXfvf%ofCf,ð Ä·%õæ,·,é,©,Ç,□  
,©,ðCE`è,·,é,½,ß,É%½f~fŠ·b,©,©,Á,½,©,Ä”ãŠr,µ,Ä,¢,é B,»,ìEã A,Ü,, A\_IDirectDrawSurface2::BltFast  
f f\fbfh,ðŽg,Á,Ä A”wEi,ðfIfXfNfŠ [f“ Eft [ftfFfX(lpDDSoe),©,çfobfN Efofbftf@,Ö“]‘—,µ A, ,ç,©,¶,ß  
,Ç,ìfsfNfZf<,ð“Š%ß,É,·,é,©CE`,ß,Ä,“,«fJf% [ Efl [,ðŽg,Á,ÄfobfN Efofbftf@,ÖfXfvf%ofCf,ð“]‘—  
,·,é BfobfN Efofbftf@,ÉfXfvf%ofCf,“]‘—,³,ê,½Eã ADDEX4,ÍfobfN Efofbftf@,Æfvf%ofCf}  
fŠ Eft [ftfFfX,ðftfŠfbfsf“fO,·,é,½,ß,É\_IDirectDrawSurface2::Flip,ðCEÄ,Ô B

fIfXfNfŠ [f“ Eft [ftfFfX,©,ç”wEi,ð“]‘—,·,é,½,ß,É\_IDirectDrawSurface2::BltFast,ðCEÄ,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“]‘—  
,Ä,Í“Š%ßfrfbfg,ª,È,Ç,±,Æ,ðŽ!,µ,Ä,¢,é B,»,ìEã A Ô,¢—Ö,³fobfN Efofbftf@,É“]‘—,³,ê,½,Æ,« AdwTrans  
fpf%of [f^,ð A DDBLTFast\_SRCOLORKEY,ÉfZfbfg,·,é B,±,ê,Í A`è<,³,ê,½“Š%ß,ì,½,ß,ÌfJf% [ Efl [ i,±  
,Ì ê ±lpDDSoe,É“¶ Ý,·,é j,ª¶ Ý,·,éfuf fbfN“]‘—,ð,·,é,±,Æ,ðŽ!,µ,Ä,¢,é B

,±,Ìftf“fvf“,Á,Í A updateFrame,É,æ,Á,Ä”wEi“S·”,ª~%õñ Ä·%õæ,³,ê,é B,±,Ìftf“fvf“,ð Ä“K%»,·,éè,Ä,ì·û—  
@,Í A Ô,¢—Ö,ªõñ“],µ,Ä,¢,éŠÔ A·Í X,³,ê,é·ª,¾,~”wEi,ð Ä·%õæ,·,é,±,Æ,Ä, é B—  
Ö,ª d,È ±,í,³,ê,éèE,ÌftfCY,â”z’u,Í·Í X,µ,È,¢,æ,ª,É ADDEX4,Ìftf“fvf“,ð Ä“K%»,·,é,½,ß,ÌŠÈ'P,È C ³,ð,·,é,±  
,Æ,ª,Ä,«,é B

f`f... [fgfŠfAf<5: fpfĀfbfg,ì“@“I•Ī X

,±,ìf`f... [fgfŠfAf<(DDEX5),Ā,Ī A f`f... [fgfŠfAf<4(DDEX4),Ā%đ à,<sup>3</sup>,ê,<sup>1/2</sup>fTf“fvf<,ì C <sup>3</sup>,É,Ā,ĉ,Ā à-  
¾,.,é B ,±,±,Ā,Ī AfAfvfŠfP [fVf±f“,““@,ĉ,Ā,ĉ,éŠŌ AfpfĀfbfg,ÌfGf“fgfŠ,đ“@“I,É•Ī X,.,é•û-@,đ%đ à,.,é B  
DDEX5,Ā%đ à,<sup>3</sup>,é,é V,μ,ĉ<@”\,đ AŽŸ,ÌfXfefbfv,Ā à-¾,.,é B

Step 1: fpfĀfbfg EfGf“fgfŠ,Īf [fh

Step 2: fpfĀfbfg,Īf [fe [fg

**Step 1: fpfCEfbfg EfGf“fgfŠ,İf [fh**

DDEX5,İŽŸ,İfR [fh,Í AfpfCEfbfg EfGf“fgfŠ,É AAll.bmpftf@fCf<,İCEã”¼•”•ª i Ô,¢—  
Ö,İ,đŠŮ,Ɓ•”•ª j,İ¹,đf [fh,µ,Ä,¢,é B

```
// ,İ,¶,ß,É A,·,×,Ä,İ F,đ-¢Žg—p,ÉfZfbfg,·,é  
for(i=0; i<256; i++)  
{  
    torusColors[i] = 0;  
}
```

```
// fT [ftfFfX,đf fbfN,µ ACEã”¼•”•ª,đfXfLfff“,·,é ifg [f%ofX EfGfŠfA j  
// CE,Ä,©,Á,½fCf“ffbfNfX,İL^,đ•ŮŽ ,·,é  
ddsd.dwSize = sizeof(ddsd);  
while (lpDDSDOne->Lock(NULL, &ddsd, 0, NULL) == DDERR_WASSTILLDRAWING)  
    ;
```

```
// fg [f%ofX EftfCE [fE,đCEŸ ò,µ AŽg—p F,đf} [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<,İCEã”¼•”•ª,ÄŽg,í,é,éJf% [ EfCf“ffbfNfX,İfCf“fWfP [f^,Æ,µ,ÄŽg,µ B Ä %o,É A  
**torusColors”z—**

ñ,İ¹,İ,·,×,Ä,đ0,ÉfŠfZfbfg,·,é BfİftXfNfŠ [f“ Efofbftf@,Í AfJf% [ EfCf“ffbfNfX¹,ªŽg,í,é,é ê ± A,»ê,ç,  
İ F,ªŠm’è,³,é,éO,Éf fbfN,³,é,é B

**torusColors”z—ñ,Í Afrfbfgf}fbfv,İ480—ñ,İ0E...,©,ç,Í,¶,ß,é,æ,µ,ÉfZfbfg,·,é B”z—**

ñ,İJf% [ EfCf“ffbfNfX¹,Í Afrfbfgf}fbfv EfT [ftfFfX,ª”z’u,³,é,é f, fŠ,İ”z’u ê Š,É,æ,èCE^è,·,é B,±  
,İ”z’u ê Š,Í A DDSURFACEDESC \‘ç’İ,İlpSurfacef f“fo,É,æ,Ä,ÄCE^è,³,é,é B,»ê,ÍfRfbfgf}fbfv,İ480—ñ0E...  
(y´IPitch + x),É’İ%ž,µ,½f f, fŠ,İ”z’u ê Š,Ö,İf|

fCf“f^,Æ,É,é B“Á’è,İfJf% [ EfCf“ffbfNfX¹,İ”z’u ê Š,Í1,ÉfZfbfg,·,é B’ly( srow),Í A IPitch¹ i  
**DDSURFACEDESC** \‘ç’İ,Ä, ,é jfŠfjAf f, fŠ,İfsfNfZf<,İŽÄ Ů,İ”z’u,đ“¾,é,±,Æ,ª,Ä,«é B

**torusColors,ÉfZfbfg,³,é,½fJf% [ EfCf“ffbfNfX¹,Í A ,Æ,ÄfpfCEfbfg“à,İ,Ç,İ F,đf [fe [fg,·,é,©CE^ß,é,Æ,«,  
ÉŽg,µ B”wEi,Æ Ö,¢—Ö,É,İ<µ’É,·,é F,ª,É,¢,½,ß A Ô,¢—Ö,ÆŠÖ^A,Ä,·,ç,é,½ F,¾,ª,ªf [fe [fg,³,é,é B,±  
,é,ªtrue,©,Ç,µ,©,đf fFfbfN,·,é,½,ß,É,Í A”z—ñ,©,ç”ddsd.lPitch”,đŽæ,è æ,« Afvf fOf%ofE,đ ÄfRf“fpfCf<,µ,½, ,  
Æ“®,©,·,Æ,«,É%½,ªN,±,é,©,đ— %òđ,·,é,±,Æ B (y´IPitch,ÄŠ),ŽZ,đ,µ,È,¢,Æ Ö,¢—Ö,İŽæ“¾,³,é,È,¢  
,µ”wEi,ÄCE©,ç,é,é F,¾,ª,ªfCf“ffbfNfX,³,é A ,Æ,Äf [fe [fg,³,é,é)  
,³,ç,É Ů,µ,¢ îñ,Í A u•,Æfsfbf` v,đŽQ Æ,·,é,±,Æ B**

## Step 2: `pfCbfg` `if` `lfe` `lfg`

```
DDEX5, l updateFrameŠÖ ", Ī A f f... [fgfŠfAf, 4 (DDEX4), Æ, Û, Æ, ñ, Ç, " , ĩ ũ - @, Ā, -,
B, Ī, ĩ, ß, É" wEi, ð f o f b f N E f o f b f t f @, É" ] ' - , µ A Ž Ÿ, É A 3, Ā, ĩ - Ö, ð ' O - Ē, É" ] ' -
, ., é B f T [ f t F f X, ð f t f Š f b f s f " f O, ., é ' O, É A u p d a t e F r a m e, Ī A f v f % o f C f }
f Š E f T [ f t F f X, Ī f p f C b f g, ð d o I n i t Š Ö ", Ā ĩ - , 3, ê, ½ p f C b f g E f C f " f f b f N f X, ©, Ç, Ī X, ., é B ũ -
@, Ī Ž Ÿ, ĩ f R [ f h, ĩ Ē, è B
```

```
// pfCbfg, ĩ Ī 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;
}
```

**DirectDrawPalette::GetEntries** f f b f h, Ī A Ā %, ĩ s, Ā

DirectDrawPalette, ©, Ç p f C b f g ' l, ð " ¾, é B f p f C b f g E f G f " f g f Š ' l, Ī A p e, ð f | f C f " f ^, Æ, ., é Ī " , É " ũ, è A f f b f h, Ī  
DD\_OK, ð Ő, µ A ^ - , ±, , Ç, ê, é B, » , ĩ Š Ö A f J f % [ E f C f " f f b f N f X, ³ Ī, É f Z f b f g, ³, ê, Ā, Ç, é, ©, Ç, ¢  
, © A t o r u s C o l o r s, ð f ` f f b f N, µ ±, , é B f Z f b f g, ³, ê, Ā, Ç, é ê ‡ A f p f C b f g E f G f " f g f Š, ĩ Ö A -  
Ī A Ā, ĩ ' l, Ī A f [ f e [ f g i z Š Ā j, ³, ê, é B

f} [fN, ³, ê, ½, ., x, Ā, Ī p f C b f g E f G f " f g f Š, a f [f e [f g, ³, ê, ½ Ć ä A

DirectDrawPalette f l f u f W f F f N f g, Ī f G f " f g f Š, ð Ī X, ., é, ½, ß, É **DirectDrawPalette::SetEntries** f f b f h, ð Ć Ä, Ñ o, . B, ±  
, ĩ Ī X, Ī A f v f % o f C f } f Š E f T [ f t F f X, Ö, Ī p f C b f g f Z f b f g, a - L Ć ø, É, Ē, é, Æ, ., @, É, , Ç, ĩ, é, é B

, ±, é, a Ī, é, Æ A ±, Ç, Ä f T [ f t F f X, Ī D D E X 5, ð f t f Š f b f s f " f O, ., é

»,ì¼,ì DirectDrawTf“fvf<

fAfvfŠfP [fVf‡f“,ÀDirectDraw,ð,Ç,ì,æ,α,ÉŽg,α,©Šw,Ô,É,Í A DirectX SDK,ÉŠÜ,Û,ê,éŽÝ,ìTf“fvf<,ì,¢,-  
,Â,©,ðf`FfbfN,·,é,Æ,æ,¢ B

Stretch

”ñ”r¼“I ifEfBf“fhfE jf, [fh EfAfjf [fVf‡f“,ð ifNfŠfbfsf“fO,³,ê,½“]—  
,Æ L’·,µfNfŠfbfsf“fO,³,ê,½“]—,Ì”\—Í,ª, ,é jfEfBf“fhfE“à,É ì ¬,·,é•û-@,ðŽ!,· B

Donut

‘½,,ì”r¼“If, [fh EfAfvfŠfP [fVf‡f“,”ñ”r¼“If, [fh EfAfvfŠfP [fVf‡f“,Æ‘ŠŒÝ ì—p,·,éŽŽ,Ý,ðŽ!,· B

Wormhole

fpfŒfbfg EfAfjf [fVf‡f“,ì•û-@,ðŽ!,· B

Dxview

ffBfXfvfŒfC Efn [fhEfEfA,ì”\—Í,ð²,×,é•û-@,ðŽ!,· B

,Û,©,É,àDirectDraw,ÉŠÖ,·,éTf“fvf<,Í A Duel, Iklowns, Foxbear, Palette,Flip2d,È,Ç,ª, ,é B

Å“K%»»,ÆfJfXf^f}fCfY

,±,ÌSDK,Å'ñ<ÿ,³,ê,éDirectDraw,ÌfTf“fvf<,Í”äŠr“IfVf“fvf<,È,à,ì,Å A“® ì,·,éVfXfef€,É½,,Ì'Oñ ðCE ,ð Ý,¯,Ä,¢  
,é B,±,Ì ß,Å,Í AfR [fh,\*E»ŽÀ,É,æ,è—Ç,“® ì,·,é,æ,±,ÈfTf“fvf<,Ì Å“K%» AfJfXf^f}fCfY,É,Å,¢,Ä à¾,·,é B

ftfŠfbfsf“fO,Æfuf fbfN“]’—,Ì ó‘ÔŽæ“¾

fJf%o [ftfBf<,ð”º,±fuf fbfN“]’—

fffBfXfvfCefC Efn [fhfEfFA”\—Í,ÌE~è

fffBfXfvfCefC Ef f,š,Ö,Ìfrfbgf}fbfv,ÌŠi”I

fgfŠfvf< Efofbftf@fŠf“fO

ftfŠfbfsf“fO,Æfuf fbfN“]—,ì ó‘ÖŽæ“¾

**IDirectDrawSurface2::Flip** f\fbfh,ªCEÄ,Î,ê,½,Æ,« Afvf%ofCf}fŠ Eft [ftFfX  
,ÆfobfN Efofbftf@,ÍCEđŠ,³,ê,é B,µ,©,µ A,»„,Î•İŠ,Í,·,®,É,Í s,í,ê,È,¢ B,½,Æ,,İ‘O,İftfŠfbfsf“fO,ª I—,µ,Ä,¢  
,È,¢ ê ‡ A,Ü,½,İftfŠfbfsf“fO,ÉŽ,“s,µ,È,©,Ä,½ ê ‡ A,±  
,İf f\fbfh,İDDERR\_WASSTILLDRAWING,đ•Ö,· BSDK,İftf“fvf<,Ä,Í A **IDirectDrawSurface2::Flip**,İCEÄ,Ñ o,µ,Í  
DD\_OK,ª•Ö,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,İ ,¼<A ü,ª,“±,Ä,½,Æ,«É s,í,ê,é B

DDERR\_WASSTILLDRAWING,ª•Ö,³,ê,é,È,é,Ü,Ä‘Ö,Ä,İ,ÍCEø—,ª<,¢ B‘ã,í,è,É AftfŠfbfsf“fO,ª I—,µ,½,©,Ç,ª  
,©,đCE“è,·,é,½,ß AfobfN Efofbftf@,Ä**IDirectDrawSurface2::GetFlipStatus**,đCEÄ,Ñ o,·ŠÖ ”,đ ì ¬,·,×,«Ä, é B

,à,µ‘O,İftfŠfbfsf“fO,ª I,í,Ä,Ä,“ç, AÆÄ,Ñ o,µ,Ä  
DDERR\_WASSTILLDRAWING,ª•Ö,Ä,½ ê ‡ AfAvfšfP [fvf±f“,Í AfXfe [f^fX,đ Ä,Ñf`fFfbfN,·,é‘O,É‘¼,İždŽ  
-,đ s,ª,±,Æ,ª,Ä,«é B,»,ª,Ä,È,¯,é,İ AŽŸ,İftfŠfbfsf“fO,đŽÄ s,Ä,«é BŽŸ,İ—á,Ä A,±,İŠT”O,đ à-¾,·,é B

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

// ‘O,İftfŠfbfsf“fO,ª I—,µ,½,İ,đ‘Ö,Ä  
// fAvfšfP [fvf±f“,Í,±,±,Ä A‘¼,İf^fXfN,đŽÄ s,Ä,«é

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

fuf fbfN“]—,ª I—,µ,½,©,Ç,ª,©,đ”»’f,·,é,½,ß,É““¶,æ,ª,È•û—  
@,Ä**IDirectDrawSurface2::GetBltStatus** f\fbfh,đŽg,ª,±,Æ,ª,Ä,«é **BIDirectDrawSurface2::GetFlipStatus**,Æ  
**IDirectDrawSurface2::GetBltStatus**,Í,·,®,É•Ö,é,½,ß AŽüŠú“İ,É,±  
,é,ç,đŽg,Ä,Ä,àfAvfšfP [fvf±f“,Í,Ü,Æ,ñ,ÇfXfs [fh,đf fX,µ,È,¢ B

**fJf% [ EftfBf<,đŽ”„mfuf fbfN“]‘—**

•Ž!,<sup>3</sup>,<sup>1</sup>/<sub>2</sub>,c<σ’Ê F,İfJf% [ EftfBf<,đŽÀĈ»,.,é,<sup>1</sup>/<sub>2</sub>,ß,É**IDirectDrawSurface2::Blt** f\fbfh,đŽg,□,±  
,Æ,<sup>a</sup>,Ā,«é B,<sup>1</sup>/<sub>2</sub>,Æ,;,İ AfAfvfŠfP [fVf†f“;•Ž!,.,é<σ’Ê F,<sup>a</sup> Ā,İ ê ‡ A Ā F,Ā Ā %o,ÉfT [ftfFfX,đ-  
,,ß,é,<sup>1</sup>/<sub>2</sub>,ß,ÉDDBLT\_COLORFILL ftf%ofo,Æ<σ,É**IDirectDrawSurface2::Blt**,đŽg,□ B,.,é,Æ A,»İ ã,É%<sup>1</sup>/<sub>2</sub>,Ā,à ‘,«,±  
,p,±,Æ,<sup>a</sup>,Ā,«é B<σ’Ê F,Ā,.,İ,â,-,,ß,é,±,Æ,<sup>a</sup>,Ā,«é,İ,Ā AfT [ftfFfX,Ö Ā -,İ F ”,đ ‘,©,È,-,ê,İ,c,-,È,c  
,<sup>3</sup>/<sub>4</sub>,-,Ā, ,é B

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

DDBLTFX ddbltfx;

```
ddbltfx.dwSize = sizeof(ddbltfx);  
ddbltfx.dwFillColor = 0;  
ddrval = lpDDSPimary->Blt(  
    NULL,          // “]— æ  
    NULL, NULL,    // “]—Ĉ3éĈ`  
    DDBLT_COLORFILL, &ddbltfx);
```

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

ffBfXfvfC Efn [fhfEFA]—Í,ÏE~è

DirectDraw,Í Af† [fU,Ìfn [fhfEFA,afTf] [fg,µ,Ä,Ç  
,È,ÇDirectDrawŠÖ ”,ðŽÀ s,·,é,½,ß,Éfn [fhfEFA EfGf~f...fCE [fVf‡f“,ðŽg,α B  
DirectDrawAfvfŠfP [fVf‡f“,ÌpftfH [f}f“fX,ð ,‘~%»»,·,é,½,ß,É A  
DirectDrawlfufWfFfNfg,ð ì ~,µ,½Eä,Ä Af† [fU,ÌffBfXfvfC Efn [fhfEFA,Ì]—Í,ðE~è,·,×,«,Ä, ,é B  
DirectDraw,Í Af† [fU,ÌfVfXfef€ ä,ÄŽg—p%Ä”\,È,Ç,ÌffBfXfvfC ,‘~%»»fn [fhfEFA,àŽg,α,±  
,Æ,ª,Ä,«,é BfAfvfŠfP [fVf‡f“,ª—  
v< ,·,éffBfXfvfC ,‘~%»»fn [fhfEFA,ðf† [fU,ÌfVfXfef€ ä,ÌffBfXfvfC EfAf\_fvf^,É¶ Ý,µ,È,Ç ê ‡  
AfAfvfŠfP [fVf‡f“,Í•K—v,Æ,·,éfn [fhfEFAfGf~f...fCE [fVf‡f“,ÌfŠfXfg,ðDirectDraw,É’ñ<Ý,µ,È,¯,ê,Í,È,ç,È,Ç  
,±,Æ,É’ ^Ó,·,é B

ffBfXfvfC Efn [fhfEFA,Ì]—Í,ðŽæ“¾,·,é,½,ß,É A **IDirectDraw2::GetCaps**,ðŽg,α,±  
,Æ,ª,Ä,«,é Bfn [fhfEFA,Ì,½,ß,ÌDirectDrawffofCfX Ehf%ofCfo,Í A **DDCAPS** \‘‘Ì,ÌdwCapsf f“fo,Ì’l,ð ‘,«\  
,· B ,±,ê,ç,Ì’l,Í AfVfXfef€,ÌffBfXfvfC ,‘~%»»fn [fhfEFA,Ì]—Í,ðŽ’,· B **DDCAPS**  
\‘‘Ì,Í AfAfvfŠfP [fVf‡f“,Ì—v< ,Äfn [fhfEFA EfGf~f...fCE [fVf‡f“,ð’ñ<Ý,·,é**DDSCAPS**  
\‘‘Ì,ÌfAfhfCfX,ðŠÜ,ñ,Ä,Ç,é B DirectDraw,Ìfn [fhfEFA §Eä”\—Í,ªffBfXfvfC EfAf\_fvf^ ä,Ä—  
p,Ä,«,È,Ç ê ‡ Afn [fhfEFA EfGf~f...fCE [fVf‡f“,ªŽg—p,³,ê,é B,±,Ì ê ‡ AfAfvfŠfP [fVf‡f“,ª**DDSCAPS**  
\‘‘Ì,Ä—v< ,³,ê,éfn [fhfEFA EfGf~f...fCE [fVf‡f“’l,ð’ñ<Ý,µ,È,¯,ê,Í,È,ç,È,Ç B.

ffBfXfvfCfC Ef f,fŠ,Ö,İfrfbfgf}fbfv,İŠi”[

ffBfXfvfCfC Ef f,fŠ,©,çffBfXfvfCfC Ef f,fŠ,Ö,İ“]—

,Í AfVfXfef€ Ef f,fŠ,©,çffBfXfvfCfC Ef f,fŠ,Ö,İ“]—,æ,è,à,Í,é,©,ÉEø—“I,Å, ,é B,Æ,ç,±,±  
,Æ,Í AfAfVfŠfP [fVf±f“,Í½,,İXfvf%oCfG,ðffBfXfvfCfC Ef f,fŠ,ÉŠi”[μ,½,Û,±,ç,±,Æ,É,È,é B

,Û,Æ,ñ,Ç,İffBfXfvfCfC Efn [fhfEfFfA,Í Afvf%oCf}fŠ EfT [ftFfX,ÆfofbfN Efofbftf@,¾,¯,Å,È,-

,à,Å,Æ½,,İ,à,İ,ðŠi”[,·,é,½,ß,É [ª,Èf f,fŠ,ðŽ ,Å,Å,ç,é BffBfXfvfCfC EfAf\_fvf^f f,fŠ,Éfrfbfgf}

fbfv,ðŠi”[,·,é,½,ß,É—p,Å,«,éf f,fŠ,İ`à,«³,ðE`è,·,é,½,ß,É **DDCAPS** \`ç`İ,İ dwVidMemTotal f“fo,Æ

**dwVidMemFree** f“fo,ðŽg,±,±,Æ,ª,Å,«,é B(à,μ Af+ [fU,İffBfXfvfCfC Efn [fhfEfFfA,İ”—Í,ð“¾,é,½,ß,É,

**IDirectDraw2::GetCaps** f\fbfh,ðŽg,Å,½ ê ‡),±,ê,ª,Ç,İ,æ,±,É“®,,,©— %ø,μ,½,¯,ê,Î A DirectX SDK,ª”ñ`Ï,·,é

DirectXfrf... [f EfAfVfŠfP [fVf±f“,ðŽg,± B DirectDrawffoCfX,İ,à,Æ,Å,Í A fvf%oCf}

fŠ EftfBfXfvfCfC Efhf%oCfo EftfHf<f\_,ðŠJ,« A,»,İEä`è”ÊftfHf<f\_,ðŠJ,,±

,Æ BffBfXfvfCfC Ef f,fŠ,İ ‡Ev,Æ ifvf%oCf}fŠ EfT [ftFfX,ð æ, j-çŽg—

pf f,fŠ,İ ‡Ev,ª`Ž!³,ê,é BfT [ftFfX,ª A DirectDrawIfufWfFfNfg,É`Ç%oÅ,³,ê,é“x,É A-çŽg—

pf f,fŠ,İ ‡Ev,Í A`Ç%oÅ,³,ê,½fT [ftFfX,ªŽg,Å,½ª,İf f,fŠªE,Å,Å,ç, B

## fgfŠfvf< Efofbftf@fŠf“fO

fgfŠfvf< Efofbftf@fŠf“fO,đŽg,Á,Ä AfAfvfŠfP [fVf‡f“,ì•Ž! ^— ,đ ,‘-‰»Á,«é ê ‡,ª,é AfgfŠfvf< Efofbftf@fŠf“fO,Í Aê,Á,Ìfvf%ofCf}fŠ Eft [ftFfX,Æ,Ó,½,Á,ÌfofbfN Efofbftf@,đŽg,□ BŽŸ,Ì— á,Á,Í AfgfŠfvf< Efofbftf@fŠf“fO EfXfL [f€,đ %šú‰»,·,é•û-@,đŽ!,μ,Á,¢,é B

```
// ,Ó,½,Á,ÌfofbfN Efofbftf@,Æfvf%ofCf}fŠ Eft [ftFfX,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, &lpDDSPrimary, NULL);
if(ddrval == DD_OK)
{
    // ‘æ~ê,ÌfofbfN Efofbftf@,Ö,Ìf|fCf“f^,đŽæ“¾
    ddscaps.dwCaps = DDSCAPS_BACKBUFFER;
    ddrval = lpDDSPrimary->GetAttachedSurface(&ddscaps,
        &lpDDSBackOne);
    if(ddrval != DD_OK)
        // ,±,±,ÁGf‰ [f fbfZ [fW,đ•Ž!
        // ‘æ“ñ,ÌfofbfN Efofbftf@,Ö,Ìf|fCf“f^,đŽæ“¾
        ddscaps.dwCaps = DDSCAPS_BACKBUFFER;
    ddrval = lpDDSPrimary->GetAttachedSurface(&ddscaps,
        &lpDDSBackTwo);
```

ftfŠfbfsf“fO,š@—,μ,È,,Ä,à A,Û,½‘æ~ê,ÌfofbfN Efofbftf@,“]‘—,đ I—,μ,È,-  
,Ä,à AfgfŠfvf< Efofbftf@fŠf“fO,É,æ,Á,ÄAfAfvfŠfP [fVf‡f“,ÌfofbfN Efofbftf@,É“]‘—,μ‘±,¯,é,±  
,Æ,ª,Á,«é BftfŠfbfsf“fO,ÌŽÀ s,Í,·,®,É,ÍkN,±  
,ç,È,¢ B,μ,½,ª,Á,Ä AfAfvfŠfP [fVf‡f“,ª,Đ,Æ,Á,ÌfofbfN Efofbftf@,¾,~Žg,□ ê ‡ A

**IDirectDrawSurface2::Flip** f\fbfh,ª DD\_OK,đ•Ô,·,ì,đ•Ô,ÁŠÔ AfAfCfhfŠf“fOŽžŠÔ,ª,©,©,é‰Á“\ «,ª,é B

DirectDrawŠft@fEf“fX

ŠÖ ”

## DirectDrawCreate

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

DirectDrawIfufWfFfNfg, ÌfCf“fXf^f“fX, ð Ì ¬, ·, é B

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

**DDERR\_DIRECTDRAWALREADYCREATED**

**DDERR\_GENERIC**

**DDERR\_INVALIDDIRECTDRAWGUID**

**DDERR\_INVALIDPARAMS**

**DDERR\_NODIRECTDRAWHW**

**DDERR\_OUTOFMEMORY**

lpGUID

Ì ¬, ·, ê, éfhf%ofCfo, ð•\, ·fOf [fof<f†fj [fNŽ¬•ÊŽq (GUID), Ö, ÌfAfhfCEfX B  
NULL, Í, Â, Ê, É AfAfNfefBfu, ÈffBfXfvfCEfC Efhf%ofCfo, ðŽ!, · B

lplpDD

CEÄ, Ñ o, µ,ª ¬CE÷, µ, ½ ê ‡ A—LCEø, ÈDirectDrawIfufWfFfNfg, Ì|fCf“f^, Â %oŠú%o», ·, é, éf|  
fCf“f^, Ö, ÌfAfhfCEfX B

pUnkOuter

COM W ¬%o»«@”\, Æ «—^, ÌEÝŠ· «, Ì, ½, ß, É, , é BCE» Ý, Í NULL, ð Ý'è, µ, È, ¢, ÆfGf%o [, Æ, È, é B  
, ±, ÌŠÖ ”, ÍDirectDrawIfufWfFfNfg, Ì %oŠú%o», ðŽŽ, Ý, é BCEÄ, Ñ o, µ,ª ¬CE÷, µ, ½ ê ‡ AfIfufWfFfNfg, Ö, Ì|  
fCf“f^,ªlplpDD, ÉfZfbfg, ·, é, é B %oŠú%o»'¼CEã, ÈDirectDraw2::GetCaps f f\fbfh, ðCEÄ, Ô, ±, Æ, Â A, ±  
, ÌfIfufWfFfNfg,ªfn [fhfEfffA, Â, Ç, Ì'ö“xfAfNfZf%ofCE [fg, ·, é, é, ©, ðCEÝ o, µ'm, ç, ¹, é B

**DirectDrawCreateClipper**

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

DirectDrawIfufWfFfNfg,ÉŠÖ~A,Ä,¯,ç,ê,È,¢DirectDrawClipperIfufWfFfNfg,ÌfCf“fXf^f“fX,ð ì ¬,·,é B  
-¢É±,·,ê,Î DD\_OK AŽ,”s,·,ê,ÎŽŸ,ÌfGf%o [,ð•Ô,· B

**DDERR\_INVALIDPARAMS**

**DDERR\_OUTOFMEMORY**

*dwFlags*

,±,Ìfppf%of [f^,Í¢» Ý-¢Žg—p,Ä A0,ÉfZfbfg,µ,Ä,“,©,È,¯,ê,Î,È,ç,È,¢ B

*lplpDDClipper*

V,µ,¢DirectDrawClipperIfufWfFfNfg,Ö,ÌfAfhf¢fX,ª•Ô,³,ê,é|fCf“f^,Ö,ÌfAfhf¢fX B

*pUnkOuter*

COM W ¬%o»«@”\,Æ «—^,Ì¢ÝŠ· «,Ì,½,ß,É, ,é BCE» Ý,Í A NULL,ð Ý’è,µ,È,¢,ÆfGf%o [,Æ,È,é B  
±,ÌŠÖ ”,Í A,Ç,ÌDirectDrawIfufWfFfNfg,ª ì ¬,³,ê,é‘O,É,à¢Ä,Ñ o,·,±  
,Æ,ª,Ä,«,é BDirectDrawClipperIfufWfFfNfg,Í,Ç,ÌDirectDrawIfufWfFfNfg,É,à Š—L,³,ê,È,¢  
,½,ß AfAvfŠfP [fVf±f“,ÌfIfufWfFfNfg,ª%ð•ú,³,ê,Ä,àŽ©“@“I,É%ð•ú,³,é,±,Æ,Í,È,¢ BfAvfŠfP [fVf±f“,ª-  
¾Ž,“I,ÉDirectDrawClipperIfufWfFfNfg,ð%ð•ú,µ,È,¢ ê ‡ A fAvfŠfP [fVf±f“ I—¹Žž,ÉDirectDraw,ª%ð•ú,·,é B

“Á’è,ÌDirectDrawIfufWfFfNfg,É,æ,Ä,Ä Š—L,³,ê,½DirectDrawClipperIfufWfFfNfg,ð ì ¬,·,é,½,ß,É,Í A  
**IDirectDraw2::CreateClipper** f f\fbfh,ðŽg,µ,±,Æ B

ŽQ Æ @**IDirectDraw2::CreateClipper**

## DirectDrawEnumerate

HRESULT DirectDrawEnumerate(LPDDENUMCALLBACK lpCallback,  
LPVOID lpContext);

*fVfXfef€*,ÉfCf“fXfg [f<,³,ê,½DirectDrawIfufWfFfNfg,ð—ñ<“,;é B NULL,ìGUIDfGf“fgfŠ,Í AGDI,Æ<□—  
L,³,ê,évf%ofCf}fŠ EfffBfXfvf€fC EfffofCfX,ðŽ,;· B

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

*lpCallback*

*fVfXfef€*,ìHALffXfNfŠfvf^,ðfpf%of [f^,É,µ,Ä€Ä,Ñ o,³,ê,é CallbackŠÖ ”,ìfAfhf€fX B

*lpContext*

—ñ<“fR [f<fofbfNŠÖ ”,ª€Ä,Ñ o,³,ê,é,²,Æ,É“n,³,ê,éAfvfŠfP [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 ”, Ì, ½, ß, ÌfAfvfŠfP [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, ÌfOf [fof<f‡fj [fNŽ~•ÊŽq i, f, t, h, c j, ÌfAfhfŒfX B

*lpDriverDescription*

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

*lpDriverName*

fhf%oCfo-¼, ðŽ!, ·•¶Žš—ñ, ÌfAfhfŒfX B

*lpContext*

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

## EnumModesCallback

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

**IDirectDraw2::EnumDisplayModes** *f f\fbfh,ì,½,ß,ìfAfvfŠfP [fVf‡f“,Á'è<,·,éfR [f<fofbfNŠÖ ” B*

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

*lpDDSurfaceDesc*

*f,fjf^ [,ÌŽü”g ”,Æ ì ¬,³,ê“¾,éf, [fh,đ'ñ<Ÿ,·,éDDSURFACEDESC \‘‘ì,ìfAfhfÆfX B,±*  
*,ìff [f^,Í“Ç,Ÿ o,μ ê—p,Á, ,é B*

*lpContext*

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

## EnumSurfacesCallback

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

**DirectDrawSurface2::EnumAttachedSurfaces** f f\bfh,ì,½,B,ìfAfvfŠfP [fVf‡f“,Á'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,ðL q,·,éDDSURFACEDESC \‘ç'ì,ìfAfhfŒfX B

*lpContext*  
 ŠÖ ”,ªŒÄ,Ñ o,³,ê,é,²,Æ,ÉFR [f<fofbfNŠÖ ”,É“n,³,ê,éfAfvfŠfP [fVf‡f“,Á'è`,µ,½ \‘ç'ì,Ö,ìf|fCf“f^ B

**fnCallback**

HRESULT WINAPI lpfnCallback(LPDIRECTDRAWSURFACE lpDDSurface,  
LPVOID lpContext);

**IDirectDrawSurface2::EnumOverlayZOrders** f f\bfh, l, 1/2, B, lAfvfŠfP [fVf‡f“, Á’èç, , éfR [f<fofbfNŠÖ ” B

—ñ“ , đ’±, -, é ê ‡, l DDENUMRET\_OK, đ•Ô, µ AŽ~, B, é ê ‡, l DDENUMRET\_CANCEL, đ•Ô, · B

*lpDDSurface*

fT [ftfFfX, ÉfI [fo [fCfC, 3, ê, Ä, ç, éfT [ftfFfX, lAfhfCfX B

*lpContext*

ŠÖ ”, aCÄ, Ñ o, 3, ê, é, 2, A, ÉfR [f<fofbfNŠÖ ”, É“n, 3, ê, éfAfvfŠfP [fVf‡f“, Á’èç, µ, 1/2 \‘c’i, Ö, l|fCf“f^ B

## IDirectDraw2

DirectDrawIfufWfFfNfg, ð ì ¬, µfVfXfef€ Efœfxf•İ ”, Å“® ì, ·, é, ½, B, É AfAfvfŠfP [fVf‡f“, ÍIDirectDraw2 fCf“f^ [ftfFfCfX, İf f\fbfh, ðŽg, ρ B, ±, İ B, Å, Í AIDirectDraw2 fCf“f^ [ftfFfCfX, İf f\fbfh, É, Å, ç, Ä à- ¼, ·, é BŠT”O, İŠT—v, Í A uDirectDrawIfufWfFfNfg v, ðŽQ Æ, ·, é, ±, Æ B

IDirectDraw2 fCf“f^ [ftfFfCfX, İf f\fbfh, Í AŽŸ, İ, æ, ρ, 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

ffBfXfvfœfC Ef, [f h

EnumDisplayModes

GetDisplayMode

GetMonitorFrequency

RestoreDisplayMode

SetDisplayMode

ffBfXfvfœfC EfXfe [f^fX

GetScanLine

GetVerticalBlankStatus

, „, İ¼

GetAvailableVidMem

GetFourCCCodes

WaitForVerticalBlank

“® ìŠÅ««, İ Ý’è

SetCooperativeLevel

fT [ftfFX

DuplicateSurface

EnumSurfaces

FlipToGDISurface

GetGDISurface

IDirectDraw2fCf“f^ [ftfFfCfX, Í A, ·, ×, Ä, İCOMfCf“f^ [ftfFfCfX, Æ“—

l AIUnknownfCf“f^ [ftfFfCfXf f\fbfh, ðœp ³, ·, é B IUnknownfCf“f^ [ftfFfCfX, Í AŽŸ, İB, Å, İf f\fbfh, ðfTf [fg, µ, Ä, ç, é B

AddRef

QueryInterface

Release

**IDirectDraw2::Compact**

HRESULT Compact ();

«» Ý A,±,Ïf f\fbfh,Í'è`³,ê,Ä,ç,é,¼,¯,Ä, ,è AŽÄ'•,Í,Û,¼,³,ê,Ä,ç,È,ç B  
-«±,·,ê,Î DD\_OK AŽ,»s,·,ê,ÎŽŸ,ÏfGf%o [,ð•Ô,· B

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

DDERR\_NOEXCLUSIVEMODE

DDERR\_SURFACEBUSY

,±,Ïf f\fbfh,Í AfffBfXfvfçfç EfJ [fh,ÏfT [ftfFfX Ef f,fŠ,Ï'f•D,ð'Ú"@,³,¹,Ä~A'±,µ,½^êfuf fbfN,ð,Æ,è A—  
~—p,Ä,«,é—çŽg—pf f,fŠ,ð Ä'â,É,·,é B,È,ñ,ç,©,Ï ^— ,ª s,í,ê,Ä,ç,é,Æ,«,ÉçÄ,Ñ o,·,ÆŽ,»s,·,é B  
,±,Ïf f\fbfh,ðçÄ,Ñ,¼,·fAfvfŠfP [fvf±f“,Í A«—Lfçfxfç,ð”r¼“Ifçfxfç,ÉfZfbfg,µ,Ä,“,©,È,¯,ê,Î,È,ç,È,ç B

## IDirectDraw2::CreateClipper

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

DirectDrawClipperIfufWfFfNfg,đ ì ¬,·,é B

—Ā,·,·,ê,Î DD\_OK AŽ,”s,·,ê,îŽŸ,ìfGf%o [,đ•Ô,· B

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

DDERR\_NOCOOPERATIVELEVELSET

DDERR\_OUTOFMEMORY

*dwFlags*

,±,ìfpf%of [f^,íĀ» Ý—ĀŽg—p,Ā A0,ÉfZfbfg,μ,Ā,·,©,È,·,ê,Î,È,ç,È,Ā B

*lplpDDClipper*

,±,ìf ffbfh,<sup>a</sup> —Ā,·,μ,½ ê †•Ô,<sup>3</sup>,ê,é V,μ,ĀDirectDrawClipperIfufWfFfNfg,đŽ!,·f|Cf“f^,ìfAfhfĀfX B

*pUnkOuter*

COM W —%o»«@”\,Ā «—^,ìĀŸŠ· «,ì,½,β,É, ,é BCE» Ý,Í A NULL,đ Ý’è,μ,È,Ā,ĀfGf%o [,Ā,È,é B

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

,Ā,<sup>a</sup>Ā,« AIDirectDrawSurface2::Blit AIDirectDrawSurface2::BlitBatch AIDirectDrawSurface2::UpdateOverlay,ì ^  
— ’†,É Žg—p,Ā,«,é B

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

DirectDrawCreateClipperŠŌ ”,đŽg—p,·,é,±,Ā B

ŽQ Ā @IDirectDrawSurface2::GetClipper AIDirectDrawSurface2::SetClipper

## IDirectDraw2::CreatePalette

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

DirectDrawPaletteIfufWfFfNfg,đ ì ¬,·,é B

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

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

**DDERR\_NOCOOPERATIVELEVELSET**

**DDERR\_NOEXCLUSIVEMODE**

**DDERR\_OUTOFCAPS**

**DDERR\_OUTOFMEMORY**

**DDERR\_UNSUPPORTED**

dwFlags

ŽŸ,Ïftf%ofO,ì,²,ç A,Đ,Æ,ÂÈ ã,ì'l,đŽæ,é B

DDPCAPS\_1BIT

fCf“fffbfNfX,Ílfrfbfg BfJf% [ Efe [fuf<,Ö,ÏfGf“fgfŠ,Í,Ó,½,Â,Â  
, ,é B

DDPCAPS\_2BIT

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

DDPCAPS\_4BIT

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

DDPCAPS\_8BITENTRIES

8frfbfgfJf% [ EfCf“fffbfNfX,đŽQ Æ,·,éCf“fffbfNfX,đŽì,· B,±  
,Ïftf%ofO,Í A  
DDPCAPS\_1BIT ADDPCAPS\_2BIT ADDPCAPS\_4BIT,đŽg,² ê ±,Æf  
^ [fQfbfg EfT [ftfFfX,²bpp,ì ê ±,¾,—  
LĒø,Æ,È,é BŞefJf% [fGf“fgfŠ,Í A,PfofCf’·,Â A8bpppfĒfbfg,Ï  
fT [ftfFfX,ÏfCf“fffbfNfX,đŽw,· B

DDPCAPS\_8BIT

fCf“fffbfNfX,Í8frfbfg BfJf% [ Efe [fuf<,Ö,ÏfGf“fgfŠ,Í256ĒÂ,Â,  
,é B

DDPCAPS\_ALLOW256

,±,ÏfpfĒfbfg,Í256ĒÂ,ÏfGf“fgfŠ,·,×,Ä,đ’è` ,Â,« ,é B

lpColorTable

,±,ÏDirectDrawPaletteIfufWfFfNfg,đ %šú%»,·,é,½,B,ì2 A4 A16 A256 F,Ô,ñ,ÏPALETTEENTRYĒ^”z—  
ñ,ÏfAfhfĒfX B

lplpDDPalette

,±,Ïf f\fbfh,ª ¬Ē÷,µ,½ ê ±•Ô,³,ê,é V,µ,ĒDirectDrawPaletteIfufWfFfNfg,Ö,ÏfCf“f^,ÏfAfhfĒfX B

pUnkOuter

COM W ¬%»<@”\,Æ «—^,ÏĒŸŠ· «,ì,½,B,É, ,é BĒ» Ý,Í NULL,đ Ý’è,µ,È,Ē,ÆfGf% [ ,Æ,È,é B

## IDirectDraw2::CreateSurface

```
HRESULT CreateSurface(LPDDSURFACEDESC lpDDSurfaceDesc,  
    LPDIRECTDRAW_SURFACE FAR * lpDDSurface,  
    IUnknown FAR * pUnkOuter);
```

DirectDrawSurfaceIfufWfFfNfg,đ ì ñ,·,é B

-Ĉ÷,·,ê,Î DD\_OK AŽ,”s,·,ê,ÎŽŸ,ÏfGf%o [,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 ñ,μ,½,ĈfT [ftfFfX,Ö,Ï—v< ,đ<L q,μ,½DDSURFACEDESC \‘Ĉ’Ï,Ö,Ïf|fCf“f^ B

lpDDSurface

ĈÄ,Ñ o,μ,<sup>a</sup> -Ĉ÷,μ,½ ê ‡ A—LĈø,ÈDirectDrawSurface|fCf“f^,É,æ,Á,Ä %oŠú%o»,<sup>3</sup>ê,éT [ftfFfX,Ö,Ï|fCf“f^,ÏfAfhfĈfX B

pUnkOuter

COM W -%o»<@”\,Æ «—^,ÏĈŸŠ· «,Ï,½,ß,É, ,é BE» Ý,Í NULL,đ Ý’è,μ,È,Ĉ,ÆfGf%o [,Æ,È,é B

## IDirectDraw2::DuplicateSurface

```
HRESULT DuplicateSurface(LPDIRECTDRAW_SURFACE lpDDSurface,  
                          LPLPDIRECTDRAW_SURFACE FAR * lpDupDDSurface);
```

DirectDrawSurfaceIfufWfFfNfg,Î•j »;ð s,□ B

-œ÷,·,ê,Î DD\_OK AŽ,„s,·,ê,ÎŽŸ,ÏfGf%o [,ð•Ô,· B

DDERR\_CANTDUPLICATE

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

DDERR\_OUTOFMEMORY

DDERR\_SURFACELOST

lpDDSurface

•j »;·,éDirectDrawSurface \‘c‘Ï,ÏfAfhfœfX B

lpDupDDSurface

V,µ, ì ¬,³,ê,é•j »;ÏDirectDrawSurface \‘c‘Ï,ðŽw,·DirectDrawSurfacef|fCf“f^,ÏfAfhfœfX B

,±,Ïf f\fbfh,Í A,·,Á,É‘¶ Ÿ,·,éDirectDrawSurfaceIfufWfFfNfg,ÏfT [ftfFfX Ef f,fŠ,ðœ—

p,·,é V,µ,œDirectDrawSurfaceIfufWfFfNfg,ð ì ¬,·,é B ,±,Ï•j »;Ï AfIfŠfWfif<,ÏfIfufWfFfNfg,Æ,Û,Á,½,-  
“¬,¶,æ,□,ÉŽg—

p,Á,«;é B Áœä,ÉŽQ Æ,³,ê,½fIfufWfFfNfg,ª%ð•ú,³,ê,é,ÆfT [ftfFfX Ef f,fŠ,Í%ð•ú,³,ê,é Bfvf%ofCf}  
fŠ EfT [ftfFfX A3DfT [ftfFfX A,Û,½,Í A^Ä-Û“l,É ì ¬,³,ê,½fT [ftfFfX,Í•j »;Á,«;È,œ B

## IDirectDraw2::EnumDisplayModes

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

DirectDrawIfuFwFfNfg,É,æ,Á,Ä'ñ<ÿ,³,ê,½fT [ftFfX,ÆÉÝŠ. «,ª, ,é,Æfn [fhfEfFA,ªFŽ¯,µ,½ffBfXfvfEfC Ef, [fh,ð—ñ<“,·,é BfT [ftFfX,ÉNULL,ª“n,³,ê,½ ê ‡ A,·,×,Ä,Ïf, [fh,ð—ñ<“,·,é B

—Æ÷,·,ê,Î DD\_OK AŽ,“s,·,ê,ÎŽÿ,ÏfGf%o [,ð•Ö,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

*dwFlags*

**DDEDM\_REFRESHRATES**

ˆÛ,È,éfŠftfEfbfVf...fE [fg,ð—ñ<“,·,é B  
**IDirectDraw2::EnumDisplayModes**,Í Šef, [fh,ªê“x,¾,¯,µ,©—  
ñ<“,³,ê,È,Ç,±,Æ,ð•Û Ø,·,é B,±  
,Ïftf%ofO,Í Af, [fh,ªftfj [fN,©,Ç,ª  
,©,ðÆˆ“è,·,éŽŽ,É AfŠftfEfbfVf...fE [fg,ª 1—  
¶,É“ü,ê,ç,ê,é,©,Ç,ª,©,ðŽw’è,·,é B

*lpDDSurfaceDesc*

—˜—p,Á,«,éf, [fh,ðf`fFbfN,·,é**DDSURFACEDESC** \‘ç‘Ï,Ö,Ïf  
fCf“f^,ÏfAfhfEfX BNULL,ðŽw’è,µ,½ ê ‡ A,·,×,Ä,Ïf, [fh,ª—ñ<“,³,ê,é B

*lpContext*

—ñ<“,³,ê,éf f“fo,»ª,ê,¼,É,È“n,³,ê,éfAfvfŠfP [fVf‡f“,Á’è<,µ,½ \‘ç‘Ï,Ö,Ïf|fCf“f^ B

*lpEnumModesCallback*

ðE ,É ‡‘v,µ,½,à,Ï,ªE©,Á,©,é“x,ÉEÄ,Î,ê,é**EnumModesCallback** ŠÖ ”,Ö,Ïf|fCf“f^  
,±,Ïf f\fbfh,ÍDDSURFACEDESC \‘ç‘Ï,ÏdwRefreshRatef f“fo,ð—ñ<“,·,é,±,Æ,ª,Á,«,é,æ,ª,É,È,Á,Ä,ç,é BÉÄ,ç  
**IDirectDraw2::EnumDisplayModes** f f\fbfh,É,Í A,»Ï<@“\,ª,È,ç B V<@“\,ÏfŠftfEfbfVf...  
f, [fh,ðfZfbfg,·,é,½,ß,É**IDirectDraw2::SetDisplayMode** f f\fbfh,ðŽg,ª Û,É,Í A **dwRefreshRate** f“fo,ð—  
ñ<“,·,é,½,ß,É **IDirectDraw2::EnumDisplayModes**,ðŽg,í,È,,Á,Í,È,ç,È,ç B

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

## IDirectDraw2::EnumSurfaces

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

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

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

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

dwFlags

ŽŸ,Ìftf%ofo,Ì,□,¿,Ì,Ð,Æ,Â B

DDENUMSURFACES\_ALL

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

**DDENUMSURFACES\_CANBECREATED**

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

**DDENUMSURFACES\_DOESEXIST**

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

**DDENUMSURFACES\_MATCH**

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

**DDENUMSURFACES\_NOMATCH**

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

lpDDSD

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

lpContext

—ñ<“,³,ê,½f f“fo,É“n,³,ê,éfAfvfŠfP [fVf†f““,“è<“,µ,½ \‘c'ì,Ö,Ìf|fCf“f^ B

lpEnumSurfacesCallback

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

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

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

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

## **IDirectDraw2::FlipToGDISurface**

HRESULT FlipToGDISurface();

GDI, a Afvf%ofCf}fŠ Eft [ftFfX,Æ,µ,Ä^µ,µfT [ftFfX,ð ì,é B

-Œ÷,µ,½,çDD\_OK,ð•Ô,µ AŽ,„s,•é,ÆŽŸ,ìfGf% [ Efr [fh,ð•Ô,• B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

**DDERR\_NOTFOUND**

,±,ìf f\fbfh,Í AGDI,ª ‘,«,±,ñ,Ä,ç,éffBfXfvfŒfC Ef f,fŠ,ª Af† [fU,É%oÄŽ<,Æ,È,é,±  
,Æ,ð•Ô Ø,•,é,½,ß,É Afy [fW EftŠfbfsf“fO EfAfvfŠfP [fVf±f“,ì ÅŒä,ÉŒÄ,î,é,é B

ŽQ Æ @**IDirectDraw2::GetGDISurface**

**IDirectDraw2::GetAvailableVidMem**

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

—p,Á,«éffBfXfvfEfC Ef f,fŠ,ì —e—Ê,ÆffBfXfvfEfC Ef, [fh,ìŒ» Ý,ìó,«e—Ê,ðŽæ“¾,·,é B  
¬Œ÷,·,ê,î DD\_OK AŽ,”s,·,ê,îŽŸ,ìfGf%o [,ð•Ö,· B

DDERR\_INVALIDCAPS

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

DDERR\_NODIRECTDRAWHW

lpDDSCaps

fT [ftfFX,ì AfN [fhEfFfA”\—í,ðŠÛ,ÞDDSCAPS \‘Œ‘ì,Ö,ìf|fCf“f^ B

lpdwTotal

—p,Á,«éffBfXfvfEfC Ef f,fŠ,ì —e—Ê,ðŽæ“¾,·,éİ ”,Ö,ìf|fCf“f^ B

lpdwFree

Œ» Ý,ìfVfXfvfEfCf f,fŠ,ìó,«e—Ê,ðŽæ“¾,·,éİ ”,Ö,ìf|fCf“f^ B

lpdwTotal,Û,½,ìlpdwFree ,ÉNULL,“n,¾,ê,½ ê ‡ Afpf%of [f^,É‘Í,·,é‘l,Í•Ö,¾,ê,È,Œ B

ŽŸ,ìC++,ì—á,Á,Í AfefNfXf`ff Ef}fbfv EfT [ftfFX,Á—p,Á,«éffBfXfvfEfC Ef f,fŠ,ì —e—  
Ê,Æó,«e—Ê,ðŒ`è,·,é IDirectDraw2::GetAvailableVidMem,ðŽg,Á,Á,Œ,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 AŒ» Ý,ìffBfXfvfEfC Ef f,fŠ,ì ó•Ö,ìfXfifbfbfvfVf±fbfg,ð`ñŸ,·,é BffBfXfvfEfC Ef f,fŠ,ìó,  
ó,«e—Ê,Í AfT [ftfFX,ì ì ¬,Æ%ð•ú,ì ‡”Ö,È,Œ,æ,Á,Á•ì,í,é B,µ,½,¾,Á,Á Aó,«f f,fŠ,ì—Ê,ì,·,·,Ü,Œ,È”»’f Þ  
—ç,Æ,µ,ÄŽg,²,×,«,Á, ,é B,¾,ç,É A“Á’è,ìffBfXfvfEfC EfAf\_fvf^ EfJ [fh,Í A,Ó,½,Á,ÌÛ,È,éf f,fŠf^fCfv,ðŒ  
æ•Ê,Á,«È,Œ B,½,Æ,ì,Í A  
Zfobfbtf@,ÆfefNfXf`ff,ðŠi”[,·,é,ì,É AfBfXfvfEfC Ef f,fŠ,ì“„Œ”•¾,ðfAf\_fvf^,Žg—p,·,é%Á”\ «,¾, ,é B,æ,  
Á,Á AfT [ftfFX,ìê,Á,ìf^fCfv i,½,Æ,,ì AZfobfbtf@ j,Í A,à,“è•ú,ìfT [ftfFX i,½,Æ,,ì AfefNfXf`ff j,  
—p,Á,«éffBfXfvfEfC Ef f,fŠ,ì—e—Ê,É%œç,ð—^,ì,é B,µ,½,¾,Á,Á A“@“IŽg—p ifefNfXf`ff Ef}  
fbfsf“fO,ì,æ,²,È j,È—p,Á,«éf f,fŠ,ì—e—  
Ê,ðŒ`è,·,é•O,É AfAfVfŠfP [fVf±f““ŒÁ’è,µ,½fŠf\ [fX ift f“fg Efofbtf@,ÆfofbfN Efofbtf@ AZfobfbt  
f@,ì,æ,²,È j,ð %o,ß,È”z’u,·,é,ì,¾ Á—Œ,ì•û—@,Á, ,é B

,±,ìf f\fbfh,Í A IDirectDraw2fCf“f^ [ftfFX,ì Vç”\,Á, ,è A IDirectDrawfCf“f^ [ftfFX,É,ÌŽÀ’•,¾,ê,Á,Œ  
,È,Œ B

## IDirectDraw2::GetCaps

HRESULT GetCaps(LPDDCAPS lpDDDriverCaps, LPDDCAPS lpDDHELCaps);

fn [fhfEfffA,ÆHEL ifn [fhfEfffA EfGf~f...fÆ [fVf‡f“ EfÆfCf,, j‘o•û,ìffofCfX Efhf%ofCfo,ì”\—  
Í,ðŽæ“¾,·,é B

¬Æ÷,·,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,·,éDDCAPS \‘ç‘ì,Ö,ìf|fCf“f^ B

lpDDHELCaps

HEL,ì”\—Í,ðŽæ“¾,·,éDDCAPS \‘ç‘ì,Ö,ìf|fCf“f^ B

ŽQ Æ @DDCAPS

**IDirectDraw2::GetDisplayMode**

HRESULT GetDisplayMode(LPDDSURFACEDESC lpDDSurfaceDesc);

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

-«÷, µ, ½, çDD\_OK, ð•Ô, µ AŽ, ”s, ·, ê, ÎŽÝ, Ì, æ, □, ÈfGf%o [, ð•Ô, · B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

**DDERR\_UNSUPPORTEDMODE**

lpDDSurfaceDesc

fT [ftfFfX, ðŽ!, ·**DDSURFACEDESC** \“ç·Ì, Ò, Ì|fCf“f^ B

fAfvfŠfP [fVf±f““, a, ±, Ìf f\bfh, Å•Ô, ³, ê, ½ î•ñ, ð—\

, ß•Û“¶, µ, Ä AfNfŠ [f“fAfbfv, Ì Û, ðffBfXfvf«fC Ef, [fh•æ«³, Ì, ½, ß, È—~—p, ·, é, ±, Æ, Í—], Û, µ, -

, È, ç B, µ, ½, a, Á, Ä Af}f`f`fvf fZfXŠÅ««„ Å«N, ±

, éf, [fh Ý’è, Ì«£ ±, ð”ð, -, é, ½, ß, È AfAfvfŠfP [fVf±f““, Í AfNfŠ [f“fAfbfv, Ì, ½, ß, Ìf, [fh•æ«³, È, 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);

DirectDrawIfuFWfNfg,ÅfTf| [fg,³,ê,Ä,¢,éFourCCfR [fh,ðŽæ“¾,·,é B,±,Ïf f\bfbh,Í AfTf| [fg,³,ê,Ä,¢,éfR [fh,Ï ”Žš,ð•Ö,·,½,ß,É,àŽg—p,³,ê,é B

¬E÷,·,ê,Î DD\_OK AŽ,”s,·,ê,ÏŽŸ,ÏfGf%o [,ð•Ö,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

lpNumCodes

lpCodes,ÄŽ!,³,ê,é”z—ñ,ÏfGf“fgfŠ ” BfGf“fgfŠ ”,ª ¬,³,·,¬,Ä,·,×,Ä,ÏfR [fh,ªŽû”[,Ä,«,È,¢ ê ‡,É,Í A lpNumCodes,É,Í—v< ,³,ê,½¹,ªfZfbfg,³,ê A ,»Ï ”,Ö,ñ,ªlpCodes,É“ü,é B

lpCodes

FourCCfR [fh,ª“ü,é”z—ñ,Ö,Ïf|fCf“f^ B NULL,ª“n,³,ê,é,Æ A lpNumCodes,É,Í FourCCfR [fh,ðfTf| [fg,·,é¹,ðfZfbfg,µ,Ä AfŠf^ [f“,·,é B

**IDirectDraw2::GetGDISurface**

HRESULT GetGDISurface(LPDIRECTDRAWSURFACE FAR \* lplpGDIDDSurface);

GDI, fvf%ofCf}fŠ Eft [ftFfX,Æ,μ,Ä^μ,ϣfT [ftFfX Ef f,fŠ,ð\ ,·DirectDrawSurfaceIfufWfFfNfg,ðŽæ“¾,·,é B

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

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

**DDERR\_NOTFOUND**

lplpGDIDDSurface

GDI,Ïfvf%ofCf}fŠ Eft [ftFfX,ðfRf“fgf [f<,μ,Ä,ϣ,éDirectDrawSurfaceIfufWfFfNfg,Ö,Ïf|Cf“f^ B ŽQ Æ @**IDirectDraw2::FlipToGDISurface**

## IDirectDraw2::GetMonitorFrequency

HRESULT GetMonitorFrequency(LPDWORD lpdwFrequency);

DirectDrawIfufWfFfNfg, "® ì,·,éf,fjf^Žü"g ",đŽæ"¾,·,é BŽü"g ",l,í100,đŠ|,~ŽZ,µ,½'l,Á, ,é B,½,Æ,!,î A60Hz ,Á, ,ê,î A 6000,·ô,é B

-œ÷,·,ê,î DD\_OK AŽ,"s,·,ê,îŽŸ,ìfGf%o [,đô,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

**DDERR\_UNSUPPORTED**

lpdwFrequency

f,fjf^ [Žü"g ",đŽ,·,î ",ìfAfhfœfX B

## **IDirectDraw2::GetScanLine**

HRESULT GetScanLine(LPDWORD lpdwScanLine);

f, f|f^, ^E» Ý·%æ, µ, Ä, ¢, éXfLfff“f%ofCf“, ðŽæ“¾, ·, é B  
-E÷, ·, ê, Î DD\_OK AŽ, ”s, ·, ê, ÎŽŸ, ìfGf% [, ð·Ô, · B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

**DDERR\_UNSUPPORTED**

**DDERR\_VERTICALBLANKINPROGRESS**

lpdwScanLine

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

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

## **IDirectDraw2::GetVerticalBlankStatus**

HRESULT GetVerticalBlankStatus(LPBOOL lpbIsInVB);

, '¼<A 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*

, '¼<A ü, Ì ó'Ô, ðŽæ“¼, ., é•Í ”, Ìf|fCf“f^ B, ±, Ìfpf%of [f^, Í A , '¼<A üŠúŠÔ, É, , é ê ÷, Í TRUE A, » , ð  
, Á, È, Ç ê ÷, Í FALSE, É, È, é B

, '¼<A ü, Æ“Šú, ðŽæ, é ê ÷, Í A **IDirectDraw2::WaitForVerticalBlank** f f\fbfh, ðŽg, ð, ±, 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,é,éDirectDrawIfufWfFfNfg,đ %Šú%»,·,é B

¬Ĉ÷,·,ê,Î DD\_OK AŽ,”s,·,ê,ÎŽŸ,ÏfGf%o [,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,é,éGUID ifOf [fof<f†fj [fNŽ~•ÊŽq j,ÏfAfhfĈfX B  
,±,Ïf f\fbfh,Í A COM ifRf“f| [fl“fg EfIfufWfFfNfg Ef,ff< jfvf fgfRf<,É,æ,Á,Ä’ñ<Ÿ,³,é,é B  
DirectDrawIfufWfFfNfg,đ ì ¬,·,é,½,ß,É**DirectDrawCreate**ŠÖ ”,ªŽg,i,ê,½ ê † A,±,Ïf f\fbfh,Í  
DDERR\_ALREADYINITIALIZED,đ•Ö,· B **IDirectDraw2::Initialize**,ª  
DirectDrawIfufWfFfNfg,đ ì ¬,·,é,½,ß,É**CoCreateInstance**,ª,·,Ä,ÉĈÄ,Î,ê,Ä,Ĉ  
,È,Ĉ ê †,Í AfGf%o [,Æ,È,è ADDERR\_NOTINITIALIZED,đ•Ö,· B

**CoCreateInstance**,Æ<ª,É**IDirectDraw2::Initialize**,đŽg,ª ê † A u**CoCreateInstance**,đ—p,Ĉ  
½DirectDrawIfufWfFfNfg,Ï ì ñ v,đŽQ Æ,·,é,±,Æ B

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

**IUnknown::Release**

## **IDirectDraw2::RestoreDisplayMode**

HRESULT RestoreDisplayMode();

*ff%ofCf}fŠ Eft [ftFfX,iffBfXfvfCfC EfffofCfX Efn [fhEfffA,đ A*

**IDirectDraw2::SetDisplayMode**,<sup>°CEĀ,Î,ê,éĚ‘O,Ě•œCE<sup>3</sup>,,é B”r¼“IfCfxf<,Ā,ĪfAfNfZfX,μ,½CEã,É,Í•K—v,È ^— ,Ā, ,</sup>  
é B

*-CE÷,.,ê,Î DD\_OK AŽ,”s,.,ê,ÎŽŸ,ĪfGf%o [,đ•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“® iŠÄ«„İ„²fŒfxf<,đ Y’è„,é B  
-Œ÷„,ê,î DD\_OK AŽ„s„,ê,îŽŸ„İfGf% [„đ•Ö„· B

- DDERR\_EXCLUSIVEMODEALREADYSET
- DDERR\_HWNDALREADYSET
- DDERR\_HWNDSUBCLASSED
- DDERR\_INVALIDOBJECT
- DDERR\_INVALIDPARAMS
- DDERR\_OUTOFMEMORY

hWnd

fAfVfŠfP [fVf‡f“„ÄŽg„í„ê„éEfBf“fhfE Efnf“fhf< B

dwFlags

ŽŸ„İftf%ofO„İ’l„ì„ı„ç A„Đ„Æ„Ä^È ä„đŽæ„é B

DDSCL\_ALLOWMODEX

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

DDSCL\_ALLOWREBOOT

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

DDSCL\_EXCLUSIVE

”r“¼“İfŒfxf<„İ—v< B

DDSCL\_FULLSCREEN

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

DDSCL\_NORMAL

fAfVfŠfP [fVf‡f“„“È í„İWindowsfAfVfŠfP [fVf‡f“„Æ„ı„Ä<@”\  
„,„é„±„Æ„đŽ’„· B

DDSCL\_NOWINDOWCHANGES

fAfNfefBfx [fgŽž A  
DirectDraw„“fAfVfŠfP [fVf‡f“fEfBf“fhfE„đ Ä —%o»„ı„½„èfŠfXfgfA  
„ı„½„è„³„¹„È„Œ B

“¼„İfAfVfŠfP [fVf‡f“„æ„è„à„Í„é„©„É—D æ“İ„È<@”\„đ—L„,„é„½„ß„É„Í ADDSCL\_EXCLUSIVEftf%ofO„đfZfbfg„,„é•K  
—v„³„,„é B **IDirectDraw2::Compact** f f\fbfh„đŒÄ„Ñ AfffBfXf‡fŒfC Ef„ [fh„đ•İ X„ı Afv‡f%ofCf}  
fŠ EfT [ftfFfX„İ“® ì i„½„Æ„ı„İftfŠfbfsf“fO j„đ“E ì„,„é„É„Í AfAfVfŠfP [fVf‡f“„İ”r“¼“İfŒfxf<„ÉfZfbfg„ı„Ä„,„-  
BfAfVfŠfP [fVf‡f“„“DDSCL\_EXCLUSIVEftf%ofO„ÆDDSCL\_FULLSCREENftf%ofO„đfZfbfg„ı„Ä**IDirectDraw2::SetCooperativeLevel**„đŒÄ„Ö ê ‡EfBf“fhfE„İftf<fXfNfŠ [f“Ö„İfŠfTfCfY„đ s„,„ı  
„Æ„,„é BDDSCL\_EXCLUSIVEftf%ofO„Ü„½„İDDSCL\_NORMALftf%ofO„Í„Ç„ç„ç„©„Đ„Æ„Ä„“fZfbfg„³„è„È„,„è„İ„È„Ç„È„Œ  
B„Ü„½ A DDSCL\_EXCLUSIVE„Í A DDSCL\_FULLSCREEN„İfZfbfg„à“Žž„É•K—v„Æ„,„é B

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

Windows„Ä„Íf„ [fhXf„ [fh„Í—ŒfTf [fg„Ä„,„é B„ı„½„³„Ä„Äf„ [fhXf„ [fh„Ä„İf‡f%ofCf}  
fŠ EfT [ftfFfX„đf fbfn„Ü„½„İ“—  
„,„é B**IDirectDrawSurface2::Lock** f f\fbfh„Æ**IDirectDrawSurface2::Blt** f f\fbfh„İŽg—p„Ä„«„È„Œ„Œ Bf‡f%ofCf}  
fŠ EfT [ftfFfX„**IDirectDrawSurface2::GetDC** f f\fbfh„đŽg„ı„±„Æ„à„Ä„«„È„Œ„Œ B„Ü„½ AfXfNfŠ [f“DC„Æ„ı  
„ÉGDI„đŽg„ı„±„Æ„à„Ä„«„È„Œ„Œ B f„ [fhXf„ [fh„Í A **IDirectDrawSurface2::GetCaps** f f\fbfh„Æ

**IDirectDraw2::EnumDisplayModes** *f\bfbfh,É,æ,Á,Ä•Ö,³,ê,é,±*  
*,Æ,É,È,é BDDSURFACEDESC \‘c‘ì,îê•ª,Á, ,éDDSCAPS \‘c‘ì,ìDDSCAPS\_MODEXftf%oO,ÄŽ,³,ê,é B*

**IDirectDraw2::SetCooperativeLevel** *Í AfAvfŠfP [fVf‡f“,ª DirectDraw,ðf}fˆfˆvfˆ EfEfBf“fhfE,ÄŽg,±,±*  
*,Æ,ª,Ä,«,é,æ,±,É ADDSCL\_NORMALf, [fh,ðŽw’è,µ,½ Ū,È,àEfBf“fhfE Efnf“fhfˆ,ð—*  
*vˆ ,µ,È,¢ BfEfBf“fhfE Efnf“fhfˆ,ÉNULL,ð“n,¹,Í A,·,×,Ä,ìfEfBf“fhfE,Í Afm [f}*  
*fˆ,ÈWindowsf, [fh,Ä“Žž,ÉDirectDraw,ÄŽg,¹,é,æ,±,É,È,é B*

**IDirectDraw::SetDisplayMode** *f\bfbfh,Æ IDirectDraw::SetCooperativeLevel* *f\bfbfh,Æ,ì‘ŠÉÝ ì—p,Í A*  
*IDirectDraw2,É,“,-,é,»,,ê,Æ,íÛ,È,Á,Ä,¢,é B,Ä,Û,èAvfŠfP [fVf‡f“,ª §ÆáfÆfxfˆ,ðfZfbfg,·,é,½,ß,É A,±*  
*,ê,ç,ìfCf“f^ [ftfFfCfX,ì IDirectDrawfo [fWf‡f“,ðŽg,± ê ‡,Í AÆ³,ìffBfXfvfÆfCf, [fh,Í A*  
**IDirectDraw::RestoreDisplayMode** *f\bfbfh,ðŽg,±,±,Æ,É,æ,Á,ÄfŠfXfgfA,³,ê,é B*

- 1 ”r¼“If, [fh,É,·,é,½,ß,É ADDSCL\_EXCLUSIVEftf%oO,ðfZfbfg,µ,Ä  
**IDirectDraw::SetCooperativeLevel**,ðÆÄ,Ñ o,· B
- 2 ffBfXfvfÆfCf, [fh,ð•í X,·,é,½,ß,É **IDirectDraw::SetDisplayMode**,ðÆÄ,Ñ o,· B
- 3 ”r¼“If, [fh,ð%ð æ,·,é,½,ß,ÉDDSCL\_NORMALftf%oO,Æˆ,É**IDirectDraw::SetCooperativeLevel**,ðÆÄ,Ñ o,· B

*,µ,©,µ A IDirectDraw2fCf“f^ [ftfFfCfX,ðŽg,Á,Ä“¬,¶,æ,±*  
*,ÈŽè ‡,ð,Æ,é ê ‡ AÆ³,ìffBfXfvfÆfC Ef, [fh,í”r¼“If, [fh,%ð æ,³,ê,½,Æ,«,ÉŽ©“@“I,É•æE³,³,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 EfffCfX Efn [fhEfFFA,lf, [fh,ð Ý'è,·,é B

-CÉ÷,·,ê,Î DD\_OK AŽ,·s,·,ê,ÎŽÝ,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,l· ,Æ ,·,³ B

dwBPP

V,μ,Cf, [fh,lfrfbfg ^fsfNfZf<(bpp) B

dwRefreshRate

V,μ,Cf, [fh,lřřftfCfBfVf...fC [fg B,±,lfpf%of [f^,ª,O,ÉfZfbfg,³,é,é,Æ A,±,lf f\fbfh,ÎDirectDraw  
fCf^ [ftfFfCfX Efo [fWfřf^,ªŽg—p,³,é,é B

dwFlags

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

**IDirectDraw2::SetCooperativeLevel** f\fbfh,Í Af, [fh,ªİ X,ª%Ä\

,É,É,è,O,É”r¼“IfCfxf<fAfnfZfX,ðfZfbfg,·,é,½,ß,ÉŽg—p,·,é B¼,lfAfvfřřfP [fvfřf^,ª Afvf%ofCf}

fř Eft [ftfFfX ä,ÎDirectDrawSurface,ð ì ¬,μ,Ä Af, [fh,ðªİ X,·,é ê ±,É,Í AfAfvfřřfP [fvfřf^,lfvf%ofCf}

fř Eft [ftfFfX EfIfufWfFfnfg,Í AfřřfXfgfA,³,é,é,Ü,Ä DDERR\_SURFACELOST,ð·Ô,· B

**IDirectDraw** fCf^ [ftfFfCfX,Ä,Í A,±,lf f\fbfh,lfpf%of [f^dwRefreshRate,ÆdwFlags,ðřÜ,ñ,Ä,ç,È,ç B

**IDirectDraw::SetDisplayMode,ÆIDirectDraw::SetCooperativeLevel,İřÔ,İ ‘řCÉÝ ì—**

p,ÍDirectDraw2,Ä,İ,»»,Æ^Ü,É,é B,Ä,Ü,èfAfvfřřfP [fvfřf^,ª A ŽÝ,İ,æ,µ

,ÉŽè ±,ÄfffBfXfvfCfC Ef, [fh,Æ řCäfCfxf<,ðfZfbfg,·,é,½,ß,É,±

,é,ç,lfCf^ [ftfFfCfX,ÎDirectDrawfo [fWfřf^,ðŽg,µ è ± ACE³,lfBfXfvfCfC Ef, [fh,Í

**IDirectDraw::RestoreDisplayMode** f\fbfh,ðŽg,Ä,Ä·æCE³,μ,È,¬,ê,Î,È,ç,È,ç B

1 ”r¼“If, [fh,É,·,é,½,ß,É ADDSCL\_EXCLUSIVEftf%ofO,ðfZfbfg,μ,Ä

**IDirectDraw::SetCooperativeLevel,ðCEÄ,Ñ o,· B**

2 fffBfXfvfCfC Ef, [fh,İ·İ X,İ,½,ß,É **IDirectDraw::SetDisplayMode,ðCEÄ,Ñ o,· B**

3 ”r¼“If, [fh,ð%ð æ,·,é,½,ß,ÉDSDCL\_NORMALftf%ofO,ðfZfbfg,μ,Ä**IDirectDraw::SetCooperativeLevel**

,ðCEÄ,Ñ o,· B

,μ,©,μ **IDirectDraw2,ðŽg,Ä,Ä“¬,¶,æ,µ,ÈŽè ±,ð“Ÿ**

,B ê ±,É,Í ACE³,İfffBfXfvfCfC Ef, [fh,İ·æCE³,Í A”r¼“If, [fh,ª%ð æ,³,é,½Žž,É s,í,é,é B

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

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

**IDirectDraw2::WaitForVerticalBlank**

HRESULT WaitForVerticalBlank(DWORD dwFlags, HANDLE hEvent);

fAfvfŠfP [fVf‡f“ , a , ¼A üŠúŠŎ,đŽg,Á,Ä“Šú,đŽæ,é•û-@,đň<Ÿ,·,é B  
-Œ÷,·,ê,Î DD\_OK AŽ,”s,·,ê,ÎŽŸ,ÌfGf%o [,đ•Ŏ,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

**DDERR\_UNSUPPORTED**

**DDERR\_WASSTILLDRAWING**

dwFlags

,¼A üŠúŠŎ,É‘Í,µ A,Ç,Ì,æ,µ,É‘Ò,Â,Ì,Œ“è,·,é B

DDWAITVB\_BLOCKBEGIN

,¼A üŠúŠŎ,ÌŠJŽnŽž,©,ç•Ŏ,· B

DDWAITVB\_BLOCKBEGINEVENT

,¼A ü,Žn,Ü,é,Æ,«,ÌfCfxf“fg EfgfŠfK B,±,ê,ÍŒ» ÝfTf|  
[fg,³,ê,Ä,ç,È,ç B

DDWAITVB\_BLOCKEND

,¼A üŠúŠŎ,ª I,í,è A•Ž!,đŠJŽn,µ,½,Æ,«,É•Ŏ,³,ê,é B

hEvent

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

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

## **IDirectDrawClipper**

*fAfvfŠfP [fVf±f“,ÍfNfŠfbfv EfŠfXfg,ðŠÇ—  
.,é,½,ß,ÉIDirectDrawClipperfCf“f^ [ftfFfCfX,Ìf f\fbfh,ðŽg,□ B,±,ÌfZfNfVf±f“,Å,Í A,±  
,ÌfCf“f^ [ftfFfCfX,Ìf f\fbfh,É,Å,ç,Ä%øð à,.,é BŠT—v,É,Å,ç,Ä,Í A uIDirectDrawClipper  
fCf“f^ [ftfFfCfX v,ðŽQ Æ,.,é,±,Æ B*

**IDirectDrawClipper***fCf“f^ [ftfFfCfX,Ìf f\fbfh,Í AŽŸ,Ì,æ,□,ÈfOf< [fv,É•ª,¯,ç,é,é B*

*f f,Š”z’u* **Initialize**

*fNfŠfbfv EfŠfXfg* **GetClipList**  
**IsClipListChanged**  
**SetClipList**  
**SetHWND**

*fnf“fhf<* **GetHWND**

**IDirectDrawClipper***fCf“f^ [ftfFfCfX,Í A,.,×,Ä,ÌCOMfCf“f^ [ftfFfCfX,Ì,æ,□,É=  
IUnknownfCf“f^ [ftfFfCfX Ef f\fbfh,ðEp ³,.,é BIunknownfCf“f^ [ftfFfCfX,ÍŽŸ,Ì,R,Å,Ìf f\fbfh,ðfTf|  
[fg,.,é B*

**AddRef**

**QueryInterface**

**Release**

## IDirectDrawClipper::GetClipList

```
HRESULT GetClipList(LPRECT lpRect, LPRGNDATA lpClipList,  
LPDWORD lpdwSize);
```

```
DirectDrawClipper fIfufWfFfNfg,ÉŠÖ`A,Ã,¯,ç,ê,½fNfŠfbfv EfŠfXfg,ìfRfs [,ðŽæ“¼,·,é BfNfŠfbfv EfŠfXfg,ðf  
NfŠfbfv“fO,·,ééE`,ð“n,·,±,Æ,É,æ,Á,Ä AfNfŠfbfv EfŠfXfg,ìfTfufZfbfg,ð`I`ð,·,é,±,Æ,³,Á,«,é B
```

```
–E÷,·,é,Î DD_OK AŽ,”s,·,é,ÎŽŸ,ìfGf% [,ð•Ô,· B
```

**DDERR\_GENERIC**

**DDERR\_INVALIDCLIPLIST**

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

**DDERR\_NOCLIPLIST**

**DDERR\_REGIONTOOSMALL**

*lpRect*

```
fNfŠfbfv EfŠfXfg,ðfNfŠfbfv“fO,·,é,½,B,ÉŽg—p,·,ééE`,ì \‘‘ì,Ö,ìf|fCf“f^ B
```

*lpClipList*

```
fNfŠfbfv EfŠfXfg,ìfRfs [E:‰Ê,ðŠÜ,ðRGNDATA \‘‘ì,Ö,ìf|fCf“f^ B
```

*lpdwSize*

```
fNfŠfbfv EfŠfXfg,ìfTfCfY,ð Ý`è,·,éï ”,Ö,ìf|fCf“f^ B
```

```
,±,ìf f\fbfh,ÄŽg,í,é,éRGNDATA \‘‘ì,Í AŽŸ,ì,æ,²,È•¶–@,ÄŽg,í,é,é B
```

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

```
RGNDATA \‘‘ì,ì rdhf f“fo,Í AŽŸ,ì,æ,²,È•¶–@,ÄŽg,í,é,éRGNDATAHEADER \‘‘ì,Á, ,é B
```

```
typedef struct _RGNDATAHEADER {  
    DWORD dwSize;  
    DWORD iType;  
    DWORD nCount;  
    DWORD nRgnSize;  
    RECT rcBound;  
} RGNDATAHEADER;
```

```
,±,ê,ç,ì \‘‘ì,É,Á,ç,Ä,ì,³,ç,É Ú,μ,ç îñ,Í A Win32SDK,ìfhfLf...f f“fg,ðŽQ Æ,·,é,±,Æ B
```

ŽQ Æ @**IDirectDrawClipper::SetClipList**

## **IDirectDrawClipper::GetHWnd**

HRESULT GetHWnd(HWND FAR \* lphWnd);

## **IDirectDrawClipper::SetHWnd**

f f\bfh,đŽg,Á,Ä ADirectDrawClipperIfufWfFfNfg,ÆŠÖ~A,Ä,¯,ç,ê,½fEfBf“fhfE Efnf“fhf<,đŽæ“¾,·,é B

-Œ÷,·,ê,Î DD\_OK AŽ,”s,·,ê,ÎŽŸ,ÏGf%o [,đ•Ô,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

*lphWnd*

,·,Ä,ÉIDirectDrawClipper::SetHWndf f\bfh,É,æ,Á,Ä A

DirectDrawClipperIfufWfFfNfg,ÆŠÖ~A,Ä,¯,ç,ê,½fEfBf“fhfE Efnf“fhf<,Ïf|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

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

**DDERR\_ALREADYINITIALIZED**

**DDERR\_INVALIDPARAMS**

lpDD

DirectDrawIfufWfFfNfg, Ì DirectDraw \c‘Ì, ÌfCf“f^ B, ±, Ìpf%of [f^, aNULL, ÉfZfbfg, ³, ê, é, Ā A“Ā—  
Š, μ, ½DirectDrawClipperIfufWfFfNfg, a ì ¬, ³, ê, é B(**DirectDrawCreateClipper**ŠÖ ”, đ Žg, □, Ì, Ā“™, μ, Ā)

dwFlags

, ±, Ìpf%of [f^, ÍĀ» Ý¬cŽg—p, È, Ì, Ā A0, ÉfZfbfg, μ, Ä, ”, ·, ±, Ā B

, ±, Ìf f\fbfh, Í AfRf“f| [f|f“fg EfIfufWfFfNfg Ef, fff<(COM)

, É, μ, ½, a, Á, Ä’ñ<Ÿ, ³, ê, é B, ·, Ä, ÉDirectDrawCreateClipper, Ü, ½, Í**IDirectDraw2::CreateClipper**f f\fbfh, aDirectDrawClip  
per, đ ì ¬, ·, é, ½, β, ÉŽg, í, ê, ½ ê ±, É, Í A, ±, Ìf f\fbfh, ÌfGf% [ , Ā, È, è A DDERR\_ALREADYINITIALIZED, đ•Ö, · B

**IDirectDrawClipper::Initialize, ĀCoCreateInstance, ÌŽg—p, É, Ā, Ā, Ì Ú ×, Í A uCoCreateInstance, đ—p, Ā**

**½DirectDrawClipperIfufWfFfNfg, Ì ì ¬ v, đŽQ Ā, ·, é, ±, Ā B**

ŽQ Ā @**IUnknown::AddRef** A **IUnknown::QueryInterface** A **IUnknown::Release** A **IDirectDraw2::CreateClipper**

## **IDirectDrawClipper::IsClipListChanged**

HRESULT IsClipListChanged(BOOL FAR \* lpbChanged);

DirectDrawClipperIfufWfFfNfg,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%o [,ð•Ô,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

*lpbChanged*

Œ%oÊ,ðŠi"[,·,é•İ ",Ö,Ìf|fCf"f^ BfNfŠfbfv EfŠfXfg,•İ X,³,ê,½ ê ‡ ATRUE,³fZfbfg,³,ê,é B

## IDirectDrawClipper::SetClipList

```
HRESULT SetClipList(LPRGNDATA lpClipList, DWORD dwFlags);
```

DirectDrawClipper, Ī efIfufWfFfNfg,ªfAf^fbf`³,ê,éfT [ftfFfX ã,Ī f f\fbfh**IDirectDrawSurface2::Blt** A **IDirectDrawSurface2::BltBatch** A **IDirectDrawSurface2::UpdateOverlay**,É,æ,Á,ÁŽg— p,³,ê,éfNfŠfbfv EfŠfXfg,ðfZfbfg,·,é,© A í œ,·,é B

–Œ÷,·,é,Ī DD\_OK AŽ,“s,·,é,ĪŽŸ,ĪfGf%o [ ,ð•Œ,· B

**DDERR\_CLIPPERISUSINGHWND**

**DDERR\_INVALIDCLIPLIST**

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

**DDERR\_OUTOFMEMORY**

## lpClipList

—LŒø,ÈRGNDATA \‘c‘Ī,Œ,Īf|fCf“f^ A,à,µ,,ĪNULL B ,·,Á,ÉDirectDrawClipper ,ÉŠŒ~A,Á,¯,ç,ê,½fNfŠfbfv EfŠfXfg,ª“Ÿ Y,µ A,È,“,©,Á,±,Ī¹,ªNULL,Á, ,ê,Ī AfNfŠfbfv EfŠfXfg,Ī í œ,³,ê,é B

## dwFlags

,±,Īfpf%of [f^,ÍŒ» Y–cŽg—p,Á A0,ÉfZfbfg,µ,Á,“,©,È,¯,ê,Ī,È,ç,È,Œ B

,·,Á,ÉEfBf“fhfE Efnf“fhf,ªDirectDrawClipperfIfufWfFfNfg,ÆŠŒ~A,Á,¯,ç,ê,Á,Œ ,é ê †,Ī AfNfŠfbfv EfŠfXfg,ðfZfbfg,·,é,±,Æ,Ī,Á,«,È,Œ B

**IDirectDrawSurface2::BltFast** f\fbfh,É,æ,é•%œ,Ī AfNfŠfbfv“fO,³,ê,È,Œ,±,Æ,É’ ^Œ,·,é B

,±,Īf f\fbfh,ÁŽg,í,ê,éRGNDATA \‘c‘Ī,Ī AŽŸ,Ī,æ,µ,È•Ÿ–@,ÁŽg,µ B

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

**RGNDATA** \‘c‘Ī,Īrdhf f“fo,Ī AŽŸ,Ī,æ,µ,È•Ÿ–@,ÁŽg,í,ê,éRGNDATAHEADER \‘c‘Ī,Á, ,é B

```
typedef struct _RGNDATAHEADER {
    DWORD dwSize;
    DWORD iType;
    DWORD nCount;
    DWORD nRgnSize;
    RECT rcBound;
} RGNDATAHEADER;
```

,±,ê,ç,Ī \‘c‘Ī,É,Á,Œ,Œ,Ī Ú ×,Ī A Win32 SDK,ĪfhfLf...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,đŠŮ,ĐfEfBf“fhfE Efnf“fhf<,đ Ý’è,·,é B*

*-Ĉ÷,·,ê,î DD\_OK AŽ,”s,·,ê,îŽŸ,ìfGf% [,đ•Ô,· B*

**DDERR\_INVALIDCLIPLIST**

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

**DDERR\_OUTOFMEMORY**

*dwFlags*

*,±,ìfpf%of [f^,íĈ» Ý-ĉŽg—p,Â A0,ÉfZfbfBg,µ,Ä,“,©,È,¯,ê,î,È,ç,È,ĉ B*

*hWnd*

*fNfŠfbfsf“fO î•ñ,đŠŮ,ĐfEfBf“fhfE Efnf“fhf<*

ŽQ Æ **@IDirectDrawClipper::GetHWnd**

## **IDirectDrawPalette**

DirectDrawPaletteIfufWfFfNfg,đ ì ¬,μfVfXfef€ EfCEfxf◀ĭ ”,Á“® ì,³,¹,é,É,Í AIDirectDrawPalettefCf“f^ [ftfFfCfX,ĭf f\fbfh,đŽg,² B,±,ĭ B,Í A,±,ĭfCf“f^ [ftfFfCfX,ĭf f\fbfh,É,Á,¢,Ä,ĭfŠftf@fCEf“fX,Á, ,é BŠT—v,É,Á,¢ ,Ä,Í A uDirectDrawPaletteIfufWfFfNfg v,đŽQ Æ,·,é,±,Æ B

**IDirectDrawPalette** fCf“f^ [ftfFfCfX,ĭf f\fbfh,Í AŽŸ,ĭ,æ,²,ÈfOf◀ [fv,É•ª,¬,ç,ê,é B

f f, fŠ”z’u Initialize

fpfCEfbfg,ĭ”—Í GetCaps

fpfCEfbfg EfGf“fgfŠ GetEntries

SetEntries

**IDirectDrawPalette** fCf“f^ [ftfFfCfX,Í A,·,×,Ä,ĭ COMfCf“f^ [ftfFfCfX,ĭ,æ,²,ÉIUnknown f f\fbfh,đCEp ³,·,é B  
**Iunknown**fCf“f^ [ftfFfCfX,ÍŽŸ,ĭB,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

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

lpdwCaps

DDPCAPS\_4BIT DDPCAPS\_8BIT DDPCAPS\_8BITENTRIES DDPCAPS\_ALLOW256 DDPCAPS\_PRIMARYSURFACE DDPCAPS\_PRIMARYSURFACELEFT DDPCAPS\_VSYNC

**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,İfpfĀfbfg'l,đ“¾,é B  
-Ā÷,.,ê,Î DD\_OK AŽ,”s,.,ê,ÎŽŸ,İfGf%o [,đ•Ō,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

**DDERR\_NOTPALETTIZED**

dwFlags

,±,İfpf%of [f^,ÍĀ» Ý-ĀŽg—p B0,ÉfZfbfg,μ,Ä,.,±,Ā B

dwBase

fGf“fgfŠ,İŠJŽnfCf“ffbfNfX B

dwNumEntries

lpEntries,ÉŽw'è,³,ê,½fAfhfĀfX,É“K%ž,μ,½fpfĀfbfg EfGf“fgfŠ,İ ” B,»,ê,¼,ê,İfpfĀfbfg EfGf“fgfŠ,İ F,Í  
‡,É•Ō,³,ê,é B dwStartingEntry,İ'l,©,çfpf%of [f^ dwCount,đf}fCfifX,P,μ,½'l,Ū,Ā i,±  
,ê,ç,İfpf%of [f^,Í A**IDirectDrawPalette::SetEntries**,É,æ,Ā,Ā%ŌŽ<,Ā,È,é j B

lpEntries

fpfĀfbfg EfGf“fgfŠ,İfAfhfĀfX B

DDPCAPS\_8BITENTRIESfif%ofO,³fZfbfg,³,ê,½ ê ‡ AfpfĀfbfg EfGf“fgfŠ,Í,PfofCfġ-^,Ā, ,é B,»,ê~ÈŠO,Í4fo  
fCfġ-^,Ā,È,é BŠeftfB [f<fh,Í FŽw'è,Ā, ,é B

ŽQ Ā @**IDirectDrawPalette::SetEntries**

**IDirectDrawPalette::Initialize**

HRESULT Initialize(LPDIRECTDRAW lpDD, DWORD dwFlags,  
LPPALETTEENTRY lpDDColorTable);

DirectDrawPaletteIfufWfFfNfg,đ %Šú%»,;é B

**DDERR\_ALREADYINITIALIZED**,đ•Ô,· B

lpDD

DirectDrawIfufWfFfNfg,đ^Ó-;·,éDirectDraw \‘c‘ì,ìfAfhfCEfX B

dwFlags and lpDDColorTable

,±,ê,ç,ìfppf%of [f^,ÍCE» Ý-¢Žg—p B0,ÉfZfbfg,μ,Ä,,±,Æ B

COM W -%»«@”\,Æ «—^,ÌEÝŠ· «,ì,½,ß,É, ,é BCE» 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‘, À,É s,ᵠ B

-Ĉ÷,·,ê,Ī DD\_OK AŽ,”s,·,ê,ĪŽÿ,lfGf%o [,đ•Ô,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

**DDERR\_NOPALETTEATTACHED**

**DDERR\_NOTPALETTIZED**

**DDERR\_UNSUPPORTED**

dwFlags

,±,Īpf%of [f^,ÍĈ» Ý-ĈŽg—p B0,ÉfZfbfg,μ,Ä,“,·,±,Æ B

dwStartingEntry

fZfbfg,³,ê,é %o,ß,Ä,lfGf“fgfŠ B

dwCount

·Ī X,³,ê,½fpfĈfbfg EfGf“fgfŠ ” B

lpEntries

fpfĈfbfg EfGf“fgfŠ,lfAfhfĈfX B,±,ĪpfĈfbfg EfGf“fgfŠ,Ī ADDPCAPS\_8BITENTRIES

ftf%ofO,³fZfbfg,³,ê,é,Æ AfpfĈfbfg EfGf“fgfŠ,Ī,PfofCfG,Ä A,»,ᵠ,Ä,È,Ĉ ê ±,Ī4fofCfG,Ä, ,é BšeftfB [f<f

h,Ī FŽw'è,ĪL q,³,³,ê,é B

**IDirectDrawPalette::SetEntries,đŽg—p,·,é‘O,ÉIDirectDrawSurface2::SetPalette**

f f\fbfh,đŽg,Ä,Ä AfpfĈfbfg,đfAf^fbf`,μ,Ä,“,©,È,,Ä,Ī,È,Ĉ,È,Ĉ B

ŽQ Æ @IDirectDrawPalette::GetEntries A IDirectDrawSurface2::SetPalette

## IDirectDrawSurface2

*fAfvfŠfP [fVf±f“ ,Í A IDirectDrawSurface2 fCf“f^ [ftFfCfX, Ìf f\fbfh, ðŽg—p, µ A DirectDrawSurface fIfufWfFfNfg, ð ì ¬, µ, ÄfVfXfef€ EfƒEfxf<, Ä“@ ì, ·, é B , ±, Ì B, Í, ±, ÌfCf“f^ [ftFfCfX Ef f\fbfh, É, Ä, ç , Ä, ÌfŠftf@fƒEf“fX, Ä, , é B ŠT”O, ÌŠT—v, Í A uDirectDrawSurface fIfufWfFfNfg v, ðŽQ Æ, ·, é, ±, Æ B*

**IDirectDrawSurface2** *fCf“f^ [ftFfCfX, Ìf f\fbfh, ÍÈ%°, ÌfOf< [fv, É•<sup>a</sup>, ¬, ç, ê, é B*

*f f, fŠ, ÌŠ,, è“—, Ä*

**Initialize**

**IsLost**

**Restore**

*fT [ftFfX, ÌfAf^fbf`*

**AddAttachedSurface**

**DeleteAttachedSurface**

**EnumAttachedSurfaces**

**GetAttachedSurface**

*fuf fbfN“]‘—*

**Blt**

**BltBatch**

**BltFast**

*fJf% [ EfL [*

**GetColorKey**

**SetColorKey**

*ffofCfX EfRf“fefLXfg*

**GetDC**

**ReleaseDC**

*fT [ftFfX EftfŠfbfsf“fO*

**Flip**

*fT [ftFfX Ef fbfN*

**Lock**

**PageLock**

**PageUnlock**

**Unlock**

*,», Ì¼*

**GetDDInterface**

*fI [fo [fƒEfC*

**AddOverlayDirtyRect**

**EnumOverlayZOrders**

**GetOverlayPosition**

**SetOverlayPosition**

**UpdateOverlay**

**UpdateOverlayDisplay**

**UpdateOverlayZOrder**

*ó‘Ô*

**GetBltStatus**

**GetFlipStatus**

*fT [ftFfX”\—Í*

**GetCaps**

*fT [ftFfX EfNšfbfp*      [GetClipper](#)  
[SetClipper](#)

*fT [ftFfXŁ q*      [GetPixelFormat](#)  
[GetSurfaceDesc](#)

*fT [ftFfX EfpfŒfbfg*      [GetPalette](#)  
[SetPalette](#)

**IDirectDrawSurface2** *fCf“f^ [ftFfCfX,Í A,·,×,Ä,Ì COM fCf“f^ [ftFfCfX,Æ“—l A [IUnknown](#)*  
*fCf“f^ [ftFfCfX Ef f\fbfh,ðŒp ³,·,é B **IUnknown** fCf“f^ [ftFfCfX,ÍžŸ,ì,R,Â,ìf f\fbfh,ðfTf| [fg,·,é B*

[AddRef](#)

[QueryInterface](#)

[Release](#)

**IDirectDrawSurface2::AddAttachedSurface**

```
HRESULT AddAttachedSurface(
    LPDIRECTDRAWSURFACE2 lpDDSAttachedSurface);
```

fT [ftFfX,ð,à,ð,Ð,Æ,Â,ÌfT [ftFfX,ÉfAf^fbf^,·,é B  
-CE÷,·,ê,Î DD\_OK AŽ,”s,·,ê,ÎŽÿ,ÌfGf%o [,ð•Ó,· 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
```

Zfobf@ AfAf<ftf@ Ef`fflf<,·,æ,ÑfobfN Efofbtf@,Ö,ÌfAf^fbf^,%oÂ”\,Â, ,é B  
 Ž©“@“I,É¼,ÌfAf^fbf^,ð Ø\*(ff^fbf^),·,éAfAf^fbf^,à, ,é B ,½,Æ,·,Ì3D  
 Zfobf@,²fAf^fbf^,Â,«,é,Ì,Ìê“x,É,Ð,Æ,Â,ÌfobfN Efofbtf@,Ö,Ì,ÿ,Æ,È,Â,Ä,¢,é B fAf^fbf^,Í‘o•ûCEü“I,Â,Í,È,-  
 AfT [ftFfX,»èŽ© g,Ö,ÌfAf^fbf^,Í·s%oÂ”\,Â, ,é B ,Û,½ A(fVfXfefE Ef f,fŠ,Â)fGf~f...  
 fE [fg,³,è,½fT [ftFfX,Í AfGf~f...fE [fVf±f“,Â,È,¢fT [ftFfX,É,ÍfAf^fbf^,Â,«,È,¢ B  
 ,Ð,Æ,Â,ÌfT [ftFfX,²fefNfXf`ff Ef}  
 fbfv,Â,È,¢ ê ±,Í AfAf^fbf^,ÌÍ Û,Æ,È,é,Ó,½,Â,ÌfT [ftFfX,Í“¬,¶fTfCfY,Ì•K—v,ª, ,é B  
 ftfŠfbfsf“fO,·,éT [ftFfX,Í A“f^Cfv,ÌftfŠfbfsf“fO EfT [ftFfX,É,ÍfAf^fbf^,Â,«,È,¢  
 ,ª A`Û,È,é,f^Cfv,Ì,Ó,½,Â,ÌfT [ftFfX,ðfAf^fbf^,·,é,±,Æ,Í,Â,«,é B  
 ,½,Æ,·,Ì AftfŠfbfsf“fO,·,éZfobf@,ðftfŠfbfsf“fO,·,éÈ í,ÌfT [ftFfX,ÉfAf^fbf^,·,é,±,Æ,Í,Â,«,é B  
 ftfŠfbfsf“fO,µ,È,¢fT [ftFfX,““f^Cfv,Ì,â,Ì,èftfŠfbfsf“fO,µ,È,¢fT [ftFfX,ÉfAf^fbf^,³,è,é,Æ A,Ó,½,Â,ÌfT [f  
 tfFfX,ÍftfŠfbfsf“fO Ef`fF [f“,É,È,é B,Û,½ AftfŠfbfsf“fO,µ,È,¢fT [ftFfX,²ftfŠfbfsf“fO,·,éT [ftFfX,ÉfAf  
 ^fbf^,³,è,é,Æ AŠù“¶,ÌftfŠfbfsf“fO Ef`fF [f“,Ìê“,É,È,é B ,±  
 ,Ìf`fF [f“,É,ÌfT [ftFfX,Ì`Ç%oÂ,ª,Â,« AIDirectDrawSurface2::Flip f ffbfh,ÌSeEÄ,Ñ o,µ,Í AfT [ftFfX,Ì ^—  
 ,ð I,·,é,ÆêXfefbfv i,Ð,±,Æ,ª,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,ªĀ,Ñ o,³,ê,é,Ā,«,É X V,·,é•K—v,ª, ,é«éĀ,ÏŠfXfg,đ  
ì ¬,·,é B

—Ā÷,·,ê,Ï DD\_OK AŽ,”s,·,ê,ÏŽŸ,ÏfGf%o [,đ•Ô,· B

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

DDERR\_INVALIDSURFACETYPE

DDERR\_UNSUPPORTED

lpRect

X V,·,é•K—v,ª, ,é RECT \‘ĉ‘Ï,Ï,Ï|fCf“f^ B

,±,Ïf f\fbfh,ÏfI [fo [fĀfC,đf\ftfgfEfffA,ÅŽÀ‘•,·,é,Ā,«,Ï,½,ß,ÉŽg—p,³,ê,é B  
fn [fhfEfffA,ªfI [fo [fĀfC,đfTf| [fg,·,é ê ‡,É,Ï•K—v,È,ĉ B

ŽQ Ā @IDirectDrawSurface2::UpdateOverlayDisplay

## IDirectDrawSurface2::Blt

```
HRESULT Blt(LPRECT lpDestRect, LPDIRECTDRAWSURFACE2 lpDDSrcSurface,  
            LPRECT lpSrcRect, DWORD dwFlags, LPDDBLTFX lpDDBltFx);
```

*f* *f* *b* *f* *g* *E* *f* *u* *f* *b* *f* *N* *]* *'* *—*, *đ* *s*, *μ* *B*

*—* *Ĉ* *÷*, *·*, *ê*, *Î* *DD\_OK* *A* *Ž*, *”* *s*, *·*, *ê*, *Î* *Ž* *Ÿ*, *Ì* *f* *G* *f* *%* *0* *[*, *đ* *•* *Ô*, *·* *B*

DDERR\_GENERIC

DDERR\_INVALIDCLIPLIST

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

DDERR\_INVALIDRECT

DDERR\_NOALPHAHW

DDERR\_NOBLTHW

DDERR\_NOCLIPLIST

DDERR\_NODDROPSHW

DDERR\_NOMIRRORHW

DDERR\_NORASTEROPHW

DDERR\_NOROTATIONHW

DDERR\_NOSTRETCHHW

DDERR\_NOZBUFFERHW

DDERR\_SURFACEBUSY

DDERR\_SURFACELOST

DDERR\_UNSUPPORTED

*lpDestRect*

*f* *u* *f* *b* *f* *N* *]* *'* *—*, *·*, *é* *]* *—* *æ*, *Ì* *f* *T* *[* *f* *t* *F* *f* *X* *ä*, *Ì* *é* *Ĉ*, *Ì* *¶* *ä*, *”*, *æ*, *Ń* *%* *E* *%* *0*, *Ì* *Ê* *'* *u*, *đ* *'* *è* *'* *μ*, *½* *RECT* *\* *'* *Ĉ* *Ì*, *Ì* *f* *|* *C* *f* *“* *f* *^* *B*

*lpDDSrcSurface*

*f* *u* *f* *b* *f* *N* *]* *'* *—* *€* *ì*, *Ì* *]* *—* *Ĉ*<sup>3</sup>, *Ä*, *·* *é* *DirectDraw* *f* *T* *[* *f* *t* *F* *f* *X*, *Ì* *f* *A* *f* *h* *f* *Ĉ* *f* *X* *B*

*lpSrcRect*

*f* *u* *f* *b* *f* *N* *]* *'* *—*, *3*, *ê*, *é* *]* *—* *Ĉ*<sup>3</sup> *f* *T* *[* *f* *t* *F* *f* *X* *ä*, *Ì* *é* *Ĉ*, *Ì* *¶* *ä*, *”*, *æ*, *Ń* *%* *E* *%* *0*, *Ì* *ê* *Š*, *đ* *'* *è* *'* *μ*, *½* *RECT* *\* *'* *Ĉ* *Ì*, *Ì* *f* *|* *C* *f* *“* *f* *^* *B*

*dwFlags*

*DDBLT\_ALPHADEST*

*f* *s* *f* *N* *f* *Z* *f* *<* *E* *f* *t* *H* *[* *f* *]* *f* *b* *f* *g*, *Ì* *f* *A* *f* *<* *f* *t* *@* *î* *•* *ñ*, *©* *A*, *±*, *Ì* *f* *u* *f* *b* *f* *N* *]* *'* *—*  
*·*, *Ì* *f* *A* *f* *<* *f* *t* *@* *E* *f* *ˆ* *f* *f* *f* *l* *f* *<*, *Æ*, *μ*, *Ä* *]* *—*  
*æ* *f* *T* *[* *f* *t* *F* *f* *X*, *É* *f* *A* *f* *^* *f* *b* *f* *'*, *3*, *ê*, *½* *f* *A* *f* *<* *f* *t* *@* *E* *f* *ˆ* *f* *f* *f* *l* *f* *<* *E* *f* *T* *[* *f* *t* *F* *f* *X*, *Ì*, *Ĉ*  
*·*, *·*, *ê*, *©*, *đ* *Ž* *g* *—* *p*, *·*, *é* *B*

*DDBLT\_ALPHADESTCONSTOVERRIDE*

*·*, *±*, *Ì* *f* *u* *f* *b* *f* *N* *]* *'* *—*, *Ì* *]* *—* *æ* *f* *T* *[* *f* *t* *F* *f* *X*, *Ì* *f* *A* *f* *<* *f* *t* *@* *E* *f* *ˆ* *f* *f* *f* *l* *f* *<*, *Æ*, *μ*, *Ä*  
DDBLTFX *\* *'* *Ĉ* *Ì*, *Ì* *dwAlphaDestConst* *f* *f* *“* *f* *o*, *đ* *Ž* *g* *—* *p*, *·*, *é* *B*

*DDBLT\_ALPHADESTNEG*

*f* *A* *f* *<* *f* *t* *@* *'*, *Ì* *'* *%* *Á*, *É*, *Ä*, *ê* *]* *—* *æ* *f* *T* *[* *f* *t* *F* *f* *X*, *“* *§* *—* *¾* *%* *»*, *·*, *é*, *±*, *Æ*, *đ* *•* *\*  
*·*, *·* *i* *0*, *Ì* *s* *“* *§* *—* *¾* *j* *B*

*DDBLT\_ALPHADESTSURFACEOVERRIDE*

*]* *—* *æ*, *Ì* *f* *A* *f* *<* *f* *t* *@* *E* *f* *ˆ* *f* *f* *f* *l* *f* *<*, *Æ*, *μ*, *Ä* *A* *DDBLTFX*  
*\* *'* *Ĉ* *Ì*, *Ì* *lpDDSAAlphaDest* *f* *f* *“* *f* *o*, *đ* *Ž* *g* *—* *p*, *·*, *é* *B*

*DDBLT\_ALPHAEDGEBLEND*

*f* *J* *f* *%* *0* *|* *E* *f* *L* *[*, *Ì* *F*, *đ* *%* *0* *Ž* *æ*, *é* *%* *æ* *'* *æ*, *Ì* *f* *G* *f* *b* *f* *W*, *Ì* *f* *A* *f* *<* *f* *t* *@* *E* *f* *ˆ* *f* *f* *f* *l* *f* *<*,  
*Æ*, *μ*, *Ä* *DDBLTFX* *\* *'* *Ĉ* *Ì*, *Ì* *dwAlphaEdgeBlend* *f* *f* *“* *f* *o*, *đ* *Ž* *g* *—* *p*, *·*, *é* *B*

*DDBLT\_ALPHASRC*

*f* *s* *f* *N* *f* *Z* *f* *<* *E* *f* *t* *H* *[* *f* *]* *f* *b* *f* *g*, *Ä*, *Ì* *f* *A* *f* *<* *f* *t* *@* *î* *•* *ñ*, *©* *A*, *±*, *Ì* *f* *u* *f* *b* *f* *N* *]* *'* *—*  
*·*, *Ì* *f* *A* *f* *<* *f* *t* *@* *E* *f* *ˆ* *f* *f* *f* *l* *f* *<*, *Æ*, *μ*, *Ä* *]* *—*

CE3fT [ftFFfX,ÉfAf^fbf`^3,ê,½fAf<ftf@ Ef`ffflf< EfT [ftFFfX,Ì,¢  
,,ê,©,ðŽg—p,·,é B

**DDBLT\_ALPHASRCCONSTOVERRIDE**

“]—CE3fT [ftFFfX,ÌfAf<ftf@ Ef`ffflf<,Æ,μ,Ä DDBLTFX \‘c‘ì,ì  
dwAlphaSrcConst f f“fo,ðŽg—p,·,é B

**DDBLT\_ALPHASRCNEG**

fAf<ftf@‘l,ì‘ %oÁ,É,Â,ê“]—CE3fT [ftFFfX,“§—¾%o»,·,é,±,Æ,ð\`  
,· i0,Ís“§—¾ j B

**DDBLT\_ALPHASRCSURFACEOVERRIDE**

“]—CE3,ÌfAf<ftf@ Ef`ffflf<,Æ,μ,Ä DDBLTFX \‘c‘ì,ìlpDDSAlphaSrc  
f f“fo,ðŽg—p,·,é B

**DDBLT\_ASYNC**

Žó,`Žæ,è ±,ìFIFO,ð‘Ê,μ,Ä,±,Ìfuf fbfn“]—,ð”ñ“ŠúŽÀ s,·,é B  
FIFO fn [fhfEfFfA,Ìó—Ìæ,“—p%oÁ”\,Á,É,¢  
,È,ç ACEÄ,Ñ o,μ,ÍŽ,”s,·,é B

**DDBLT\_COLORFILL**

“]— æfT [ftFFfX ā,ì“]— æ<éE`ð-,β,é RGB F,Æ,μ,Ä DDBLTFX  
\‘c‘ì,ìdwFillColor f f“fo,ðŽg—p,·,é B

**DDBLT\_DDFX**

,±,Ìfuf fbfn“]—,ÉŽg—p,·,éEø%oÊ,ðŽw’è,·,é,½,β,É DDBLTFX  
\‘c‘ì,ìdwDDFX f f“fo,ðŽg—p,·,é B

**DDBLT\_DDROPS**

Win32 API,ÉŠÜ,Ü,ê,È,¢f%ofXf^ ^— i ROPS  
j,ðŽw’è,·,é,½,β,ÉDDBLTFX \‘c‘ì,ìdwDDROPS f f“fo,ðŽg—p,·,é B

**DDBLT\_DEPTHFILL**

“]— æZfobftf@ EfT [ftFFfX ā,ì“]— æ<éE`ð-  
,,β,é [“x’l,Æ,μ,ÄDDBLTFX \‘c‘ì,ìdwFillDepth f f“fo,ðŽg—p,·,é B

**DDBLT\_KEYDEST**

“]— æfT [ftFFfX,ÆŠÖ`A,Ä,¯,ç,ê,½fJf%o [ EfL [,ðŽg—p,·,é B

**DDBLT\_KEYDESTOVERRIDE**

“]— æfT [ftFFfX,ÌfJf%o [ EfL [,Æ,μ,Ä DDBLTFX  
\‘c‘ì,ìdckDestColorkey f f“fo,ðŽg—p,·,é B

**DDBLT\_KEYSRC**

“]—CE3fT [ftFFfX,ÆŠÖ`A,Ä,¯,ç,ê,½fJf%o [ EfL [,ðŽg—p,·,é B

**DDBLT\_KEYSRCOVERRIDE**

“]—CE3fT [ftFFfX,ÌfJf%o [ EfL [,Æ,μ,Ä DDBLTFX  
\‘c‘ì,ìdckSrcColorkey f f“fo,ðŽg—p,·,é B

**DDBLT\_ROP**

,±,Ìfuf fbfn“]—,É,¯,éROP,É DDBLTFX \‘c‘ì,ì dwROP  
f f“fo,ðŽg—p,·,é B,±,ê,ç,Ì ROP,Í Win32 API,Ä’è<^3,ê,Ä,¢  
,é,à,Ì,Æ““,Á,Á,é B

**DDBLT\_ROTATIONANGLE**

fT [ftFFfX,Ì%oñ“]Šp i1/100“x’P^Ê,ÄŽw’è,^3,ê,é j,Æ,μ,ÄDDBLTFX  
\‘c‘ì,ì dwRotationAngle f f“fo,ðŽg—p,·,é B

**DDBLT\_WAIT**

fuf fbfn“]—,“frfW [,Ì ê ± A  
DDERR\_WASSTILLDRAWING•Ô’l,ð,·,®,É•Ô,^3,,É•Ô,Ä B,»,μ,Äfuf fb  
fn“]—,Ì €”ð,^Á,«<é,©, ,é,¢,Í¼,ÌfGf%o [,“” ¶Žÿ“æ A,½,¾,¿,É-  
β,é B

**DDBLT\_ZBUFFER**

fT [ftFFfX,Ì“]—CE3,Æ“]— æ,Æ,ÉfAf^fbf`^3,ê,½  
Zfobftf@ A,»,μ,ÄZfobftf@,ÌfIfyR [fh,Æ,μ,Ä,ìDDBLTFX \‘c‘ì,ì

**dwZBufferOpCode** f f“fo,đŽg—p,μ A Zfofbftf@ Efuf fbfN“]’—  
đŽÀ s,·,é B

**DDBLT\_ZBUFFERDESTCONSTOVERRIDE**

]’— æ,É,Â,ç,Ä A DDBLTFX \‘ç‘ì,ì dwZDestConst,“,æ,Ñ  
**dwZBufferOpCode** f f“fo,đ,»ê,¼,ê  
Zfofbftf@,“,æ,ÑZfofbftf@ EflfyfR [fh,Æ,μ,ÄŽg—p,μ A  
Zfofbftf@ Efuf fbfN“]’—,đŽÀ s,·,é B

**DDBLT\_ZBUFFERDESTOVERRIDE**

]’— æ,É,Â,ç,Ä A DDBLTFX \‘ç‘ì,ì lpDDSZBufferDest,“,æ,Ñ  
**dwZBufferOpCode** f f“fo,đ,»ê,¼,ê Zfofbftf@,“,æ,ÑZfofbftf@  
EflfyfR [fh,Æ,μ,ÄŽg—p,μ A Zfofbftf@ Efuf fbfN“]’—  
,đŽÀ s,·,é B

**DDBLT\_ZBUFFERSRCCONSTOVERRIDE**

]’— Ç³,É,Â,ç,Ä A DDBLTFX \‘ç‘ì,ì dwZSrcConst  
,“,æ,ÑdwZBufferOpCode  
f f“fo,đ,»ê,¼,êZfofbftf@,“,æ,ÑZfofbftf@ EflfyfR [fh,Æ,μ,ÄŽg—  
p,μ A Zfofbftf@ Efuf fbfN“]’—,đŽÀ s,·,é B

**DDBLT\_ZBUFFERSRCOVERRIDE**

]’— Ç³,É,Â,ç,Ä A DDBLTFX \‘ç‘ì,ì lpDDSZBufferSrc,“,æ,Ñ  
**dwZBufferOpCode** f f“fo,đ,»ê,¼,ê  
Zfofbftf@,“,æ,ÑZfofbftf@ EflfyfR [fh,Æ,μ,ÄŽg—p,μ A  
Zfofbftf@ Efuf fbfN“]’—,đŽÀ s,·,é B

lpDDBltFx

**DDBLTFX** \‘ç‘ì,ì fAfhfÇfX B

,±,ìf f\fbfh,í“Šú, ,é,ç,í”ñ“Šú,ìfuf fbfN“]’—  
,đ AffBfXfvfÇfC Ef f,fŠ,©,çffBfXfvfÇfC Ef f,fŠ,Ö AffBfXfvfÇfC Ef f,fŠ,©,çfVfXfef€ Ef f,fŠ,  
Ö AfVfXfef€ Ef f,fŠ,©,çffBfXfvfÇfC Ef f,fŠ,Ö AfVfXfef€ Ef f,fŠ,©,çfVfXfef€ Ef f,fŠ,Ö A,ì,ç  
,,ê,©,À s,“—Í,đŽ ,ç AZ îñ,âfAf<ftf@ îñ A“]’—Ç³fJf% [ EfL [ A“]’— æfJf% [ EfL [ ,đŽg—  
p,μ,Äfuf fbfN“]’—,đŽÀ s,·,é,±,Æ,ª,Ä,«é B“]’—Ç³,Æ“]’—  
æ,Æ,ìéÇ,ì‘â,«³,ªÜ,È,é ê ‡ A”CÖ,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“]’—  
,đfZfbfgfAfbfv,Ä,«È,©,Á,½ ê ‡ AfGf% [ ,đ•Ö,μ,Ä,½,¾,ç,É—B,é B,μ,©,μ ADDBLT\_WAIT  
ftf%ofo,đŽw’è,·,ê,Î Afuf fbfN“]’—,đ €”ðS@—1,·,é,©•Ê,ÌfGf% [ ,” ¶,·,éŽž,Ü,Ä Af ffbfh,đ•Ö<@,³,1,é B

## **IDirectDrawSurface2::BltBatch**

HRESULT BltBatch(LPDDBLTBATCH lpDDBltBatch,  
DWORD dwCount, DWORD dwFlags);

, Ą, Ā, ©, Ĩ“—Ē³, ©, Ğ, Ą, Ā, Ĩ“— æ, Ö A, Ü, Ą, ß, Ä **IDirectDrawSurface2::Blt** ^— , đŽÀ s, , é B, ±  
, Ĩf f\bfh, ĨĒ» Ý’è`³, é, Ą, Ĩ, Ą, é, à, Ĩ, Ĩ AŽĀ’•, Ĩ, Ü, ¼, Ē, ³, é, Ą, Ą, Ē, Ą B

—Ē±, , é, Ĩ DD\_OK AŽ, ”s, , é, ĨŽŸ, ĨfGf% [ , đ•Ö, . B

**DDERR\_GENERIC**

**DDERR\_INVALIDCLIPLIST**

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

**DDERR\_INVALIDRECT**

**DDERR\_NOALPHAHW**

**DDERR\_NOBLTHW**

**DDERR\_NOCLIPLIST**

**DDERR\_NODDROPSHW**

**DDERR\_NOMIRRORHW**

**DDERR\_NORASTEROPHW**

**DDERR\_NOROTATIONHW**

**DDERR\_NOSTRETCHHW**

**DDERR\_NOZBUFFERHW**

**DDERR\_SURFACEBUSY**

**DDERR\_SURFACELOST**

**DDERR\_UNSUPPORTED**

*lpDDBltBatch*

fuf fbfN“]—, Ĩ, ½, ß, Ĩfpf%of [f^, đ’è` , , é Ā % , Ĩ **DDBLTBATCH** \‘Ą’Ĩ, Ĩf|fĄf“f^ B

*dwCount*

ŽĀ s, , éfuf fbfN“]—Ē Ĩ, Ĩ ” B

*dwFlags*

, ±, Ĩfpf%of [f^, ĨĒ» Ý—ĄŽg—p B0, ĒfZfbf, μ, Ą, , , ±, Ą B

**IDirectDrawSurface2::BltFast**

HRESULT BltFast(DWORD dwX, DWORD dwY,  
LPDIRECTDRAWSURFACE2 lpDDSrcSurface, LPRECT lpSrcRect,  
DWORD dwTrans);

“]’—Ē³fJf% [ Efl [, ,é,ĉ,Í“]’—æfJf% [ Efl [,đŽg—p,μ A“]’—Ē³fRfs [ Efuf fbfN“]’—, ,é,ĉ  
Í“§%ßĒ^fuf fbfN“]’—,đŽÀ s, ,é B,±,ĭf f\fbfh,ĭfn [fhfEfFfA,“ñ“Šúfuf fbfN“]’—,đfTf  
[fg, ,é ê ‡ A í,É”ñ“Šúfuf fbfN“]’—,đŽŽ,Ý,é B

-Ē÷, ,é,ĭ DD\_OK AŽ,”s, ,é,ĭŽÝ,ĭfGf% [,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“]’—€ ĭ,ĭ“]’—Ē³ DirectDraw fT [ftfFfX,ĭf|fCf“f^ B

lpSrcRect

fuf fbfN“]’—,³,é,é“]’—Ē³fT [ftfFfX ã,ĭ,éĒ,ĭ ¶ ã, ,æ,Ñ%Ē%°,ĭ À•W,đ’è< , ,é RECT \ĉ‘ĭ,ĭf|fCf“f^ B

dwTrans

“]’—f^fCfv B

DDBLTFAST\_DESTCOLOR  
KEY

“]’—  
æ,ĭfJf% [ Efl [,đŽg—  
p, ,é“§%ßĒ^fuf fbfN“]’—  
,đŽw’è, ,é B

DDBLTFAST\_NOCOLORKE  
Y

“§%ß,Á,È,ĉĒ ĭ,ĭRfs [ Efuf fbfN“]’—,đŽw’è, ,é B

**DDBLTFAST\_SRCCOLORKEY**

“]’—Ē³,ĭfJf% [ Efl [,đŽg—p, ,é“§%ßĒ^fuf fbfN“]’—  
,đŽw’è, ,é B

**DDBLTFAST\_WAIT**

fuf fbfN“]’—,³fW [,ĭ ê ‡ A  
DDERR\_WASSTILLDRAWING•Ô’l,đ, ,@,É,ĭ•Ô,³, ,É‘Ò,Á B,»,μ,Äfuf  
fbfN“]’—,ĭ €”ò,ª,Á,«,é,©, ,é,ĉ,ĭ¼,ĭfGf% [,“” ¶ŽÝ‘æ A,½,¾,ĭ,É—  
ß,é B

,±

,ĭf f\fbfh,ĭftfBfXfvfĒfC Ef f,š EfT [ftfFfX ã,ĭ,Ý,Á“@ ĭ,μ Afuf fbfN“]’—’†,ĭftfšfbfsf“fO,Á,«,È,ĉ B  
**IDirectDrawSurface2::BltFast**,ĭf\ftfgfEfFfAŽÁ‘,ĭ **IDirectDrawSurface2::Bltf** f\fbfh,æ,è,à10fp [fZf“fg‘-,ĉ B  
,μ,©,μ AfffBfXfvfĒfC Efn [fhfEfFfA,Žg—p,³,é,Á,ĉ,é ê ‡,É,ĭ A—¼ŽÒ,ĭŠÓ,ÁfXfs [fh,ĭ ·Û,ĭ,É,ĉ B

‘Ê ĭ AIDirectDrawSurface2::BltFast,ĭfuf fbfN“]’—ŽÀ s’†,ĭ ê ‡ A,à,μ,,ĭfuf fbfN“]’—  
,đfZfbfgfAfbfv,Á,«,È,©,Á,½ ê ‡ AfGf% [,đ•Ô,μ,Á,½,¾,ĭ,É—ß,é BDDBLT\_WAIT ftf%ofO,ĭ,±  
,ĭ“@ ĭ,đ•ĭ X,μ Afuf fbfN“]’—,đ €”òŠ@—, ,é,©‘Ê,ĭfGf% [,“” ¶, ,é,Û,Á Af f\fbfh,đ‘Ò<@,³,1,é B

**IDirectDrawSurface2::DeleteAttachedSurface**

HRESULT DeleteAttachedSurface(DWORD dwFlags,  
LPDIRECTDRAWSURFACE2 lpDDSAttachedSurface);

,Ó,½,Á,ÏA f^f b f^,³,ê,Ä,ç,é f T [f t f F f X,ð Ø,è—É,(f f f^f b f^,;é) B f f f^f b f^,³,ê,½ f T [f t f F f X,Í%ð•ú,³,ê,È,ç B  
-œ÷,;,ê,Ï DD\_OK AŽ,”s,;,ê,ÏŽŸ,Ï f G f% [ ,ð•Ó,; B

DDERR\_CANNOTDETACHSURFACE

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

DDERR\_SURFACELOST

DDERR\_SURFACENOTATTACHED

dwFlags

,±,Ï p f% f [f^,Íœ» Ý-çŽg—p,Ï,½,ß A0,É f Z f b f g,µ,Ä,;,©,È,¯,ê,Ï,È,ç,È,ç B

lpDDSAttachedSurface

f f f^f b f^,³,ê,é DirectDraw f T [f t f F f X,Ï f h f œ f X B ,±,Ï p f% f [f^,^NULL,Ï ê ÷ A f A f^f b f^,³,ê,Ä,ç  
,é,;,x,Ä,Ï f T [f t f F f X,^f f f^f b f^,³,ê,é B

**IDirectDrawSurface2::AddAttachedSurface** f\fbfh,É,æ,è-¾Ž,“I,É f A f^f b f^,µ,½ f T [f t f F f X,ð f f^f b f^,;,é B,½,¾,µ

DirectDraw,^Ä-Û“I,É s,Á,½ f A f^f b f^ E f T [f t f F f X,Ï f f^f b f^,³,ê,È,ç B

f t f Š f b f s f“f O E f`f F [f“,©,ç f T [f t f F f X,ð f f^f b f^,;,é,Æ A f`f F [f““†,Ï¼ f T [f t f F f X,Í X,³,ê,é%Ä” «,³,;é B f t

f f“f g E f o f b f t f @,ð f t f Š f b f s f“f O E f`f F [f“,©,ç f f^f b f^,;,é,Æ A f`f F [f““†,ÏŽŸ f T [f t f F f X,Ï f t f f“f g E f o f b f t f

@,É,È,è A,»),ÏŽŸ,Ï f T [f t f F f X,Ï f o f b f N E f o f b f t f @,É,È,é B

f o f b f N E f o f b f t f @,ð f`f F [f“,©,ç f f^f b f^,;,é,Æ A ŽŸ f T [f t f F f X,Ï f o f b f N E f o f b f t f @,É,È,é B,Ó,Ä,□

,Ï T [f t f F f X,ð f`f F [f“,©,ç f f^f b f^,;,é,Æ A f`f F [f“,Í Z,È,é,¾,¯,Ä,;é B

f T [f t f F f X,^,Ó,½,Á,µ,©,È,ç f t f Š f b f s f“f O f`f F [f“,ð f f^f b f^,;,é,Æ A f`f F [f“,Í”jŠü,³,ê,Ä•o•ú,Ï f T [f t f F f X,Í È“O,Ï

ó“Ó,È-ß,é B

ŽQ Æ @**IDirectDrawSurface2::Flip**

## IIDirectDrawSurface2::EnumAttachedSurfaces

```
HRESULT EnumAttachedSurfaces(LPVOID lpContext,  
    LPDDENUMSURFACESCALLBACK lpEnumSurfacesCallback);
```

Žw'è,³,ê,½fT [ftfFfX,ÉfAf^fbf`³,ê,Ä,č,é,·,×,Ä,ìfT [ftfFfX,ð—ñ<“,·,é B

-Ĉ÷,·,ê,Î DD\_OK AŽ,”s,·,ê,ÎŽŸ,ìfGf%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 \‘ç’İ,Ö,ìf|fCf“f^ B

*lpEnumSurfacesCallback*

fAf^fbf`³,ê,Ä,č,éfT [ftfFfX-^,ÉĈÄ,Ñ o,³,ê,é **EnumSurfacesCallback** ŠÖ ”,ìf|fCf“f^ B

## IDirectDrawSurface2::EnumOverlayZOrders

HRESULT EnumOverlayZOrders(DWORD dwFlags, LPVOID lpContext,  
LPDDENUMSURFACESCALLBACK lpfnCallback);

Žw'è,³,ê,½“]‘— æ â,ÏfI [fo [fŒfC EfT [ftfFfX,ð—ñ<“,·,é B ftf f“fg,©,çfofbfN,Ö A, ,é,Œ  
,ÍfofbfN,©,çftf f“fg,Ö A,È,Ç—ñ<“,·,é † ~,ðŽw'è,Ä,«é B

-Œ±,·,ê,Î DD\_OK AŽ,”s,·,ê,ÎŽŸ,ÏfGf%o [,ð•Ô,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

dwFlags

ˆÈ%°,Ïftf%ofo,Ï,±,ç,ç,ç,©,Ð,Æ,Â,Ï'l,ðŽæ,é B

DDENUMOVERLAYZ\_BACKTOFRONT

fofbfN,©,çftf f“fg,ÖŒü,©,ŒfI [fo [fŒfC,ð—ñ<“,·,é B

DDENUMOVERLAYZ\_FRONTTOBACK

ftf f“fg,©,çfofbfN,ÖŒü,©,ŒfI [fo [fŒfC,ð—ñ<“,·,é B

lpContext

ŠefI [fo [fŒfC EfT [ftfFfX,ÏfR [f<fofbfNŠÖ ”,É“n,³,ê,é† [fU'è`fRf“fefLfXfg,Ö,Ïf|fCf“f^ B

lpfnCallback

,±,ÏfT [ftfFfX ä,ÉfI [fo [fŒfC,³,ê,½fT [ftfFfX-ˆ,ÉŒÄ,Ñ o,³,ê,é,Ï **fnCallback** ŠÖ ”,Ïf|fCf“f^ B

## IDirectDrawSurface2::Flip

```
HRESULT Flip(  
    LPDIRECTDRAW_SURFACE2 lpDDSurfaceTargetOverride,  
    DWORD dwFlags);
```

## DDSCAPS\_BACKBUFFER

```
fT [ftFfX,ÆŠÖ~A,Ä,~,ç,ê,½fT [ftFfX Ef f,fŠ,ð Aftf f“fg Efofbftf@ EfT [ftFfX,ÆŠÖ~A,Ä,~,é B  
-Æ÷,·,ê,Î DD_OK AŽ,”s,·,ê,ÎŽŸ,ÏGf%o [,ð•Ö,· B
```

## DDERR\_GENERIC

## DDERR\_INVALIDOBJECT

## DDERR\_INVALIDPARAMS

## DDERR\_NOFLIPHW

## DDERR\_NOTFLIPPABLE

## DDERR\_SURFACEBUSY

## DDERR\_SURFACELOST

## DDERR\_UNSUPPORTED

## DDERR\_WASSTILLDRAWING

## lpDDSurfaceTargetOverride

```
ftfŠfbfsf“fO,³,ê,é DirectDraw fT [ftFfX,Ï|fCf“f^ B ,±,Ïpf%of [f^,ÏfftfHf<fg,ÍNULL,Ä, ,è A,±  
,Ï,Æ,«IDirectDrawSurface2::Flip,Ïfofbftf@’†,ÄÆŸ,ç,ÉfAf^fbf^,³,ê,Ä,ç,é ‡,ÉfTfCfNf<,·,é B,±  
,Ïpf%of [f^,ÏfI [fo [f%ofCfh,Æ,µ,Ä,¾,~Žg—p,³,ê,é B
```

## dwFlags

## DDFLIP\_WAIT

```
ˆê”Ê,É AfffBfXfvfÇfC Efn [fhfEfffA,Ï ó•Ö,“K Ø,Ä,È,-  
ftfŠfbfsf“fO,Ï €”ö,ª,Ä,«,È,ç é ‡ ADDERR_WASSTILLDRAWING  
fGf%o [,ª,½,¾,ç,ç,É•Ö,è AftfŠfbfsf“fO,ÍN,±,ç,È,ç B,µ,©,µ A,±  
,Ïtf%ofO,ðfZfbfg,·,é,Æ A HAL,©,çDDERR_WASSTILLDRAWING  
fGf%o [,ðŽó, ~Žæ,Ä,Ä,àIDirectDrawSurface2::Flip,ÏftfŠfbfsf“fO,µ,æ,µ  
,Æ,µ±,~,é B,»),Ï ê ‡IDirectDrawSurface2::Flip,ÏftfŠfbfsf“fO ^—  
,ª -Æ÷,·,é,© A DDERR_SURFACEBUSY,Ï,æ,µ  
,È•Ê,ÏGf%o [,ª•Ö,³,ê,é,Û,Ä–B,ç,È,ç B
```

,±,Ïf f\fbfh,ðCEÄ,Ñ o,·,±,Æ,ª,Ä,«,é,Ï,Í A DDSCAPS\_FLIP,·,æ,Ñ

DDSCAPS\_FRONTBUFFER,ªfZfbfg,³,ê,½fT [ftFfX,¾,~,Ä, ,é B,±

,Ïf f\fbfh,ðCEÄ,Ñ o,ˆÈ•Ö,Éftf f“fg Efofbftf@,ÆŠÖ~A,Ä,~,ç,ê,Ä,ç

,½ffBfXfvfÇfC Ef f,fŠ,Í AfobfN Efofbftf@,ÆŠÖ~A,Ä,~,ç,ê,é B

•j ”,ÏfofbfN Efofbftf@,ª, ,é ê ‡,ÏfŠf“fO,ªE` ¬,³,ê Aft [ftFfX Ef f,fŠ Efofbftf@,Í

IDirectDrawSurface2::Flip,ªCEÄ,Ñ o,³,ê,é,½,Ñ,È,»,ÏfŠf“fO,ð,PfTfCfNf<,·,é B

lpDDSurfaceTargetOverride fpf%of [f^,Í AfobfN Efofbftf@,ªftf f“fg Efofbftf@,É,È,é,×,«fobftf@,Ä,Í,È,ç

,Æ,ç,µ A,Û,ê,ÉfP [fX,ÄŽg,í,ê,é B ˆê”Ê,É,Í,±,Ïpf%of [f^,ÍNULL,Ä, ,é B

IDirectDrawSurface2::Flipf f\fbfh,Í,Ä,È,É ,¼A ü,Æ“Šú,·,é B

ŽQ Æ @IDirectDrawSurface2::GetFlipStatus

**IDirectDrawSurface2::GetAttachedSurface**

```
HRESULT GetAttachedSurface(LPDDSCAPS lpDDSCaps,
    LPDIRECTDRAWSURFACE2 FAR * lplpDDAttachedSurface);
```

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,ÌfGf%o [,ð•Ô,· B

- DDERR\_INVALIDOBJECT
- DDERR\_INVALIDPARAMS
- DDERR\_NOTFOUND
- DDERR\_SURFACELOST

```
lpDDSCaps  
fT [ftFfX,Ìfn [fhfEfFfA" —Í,ǎŽ ,Â DDSCAPS \`ç'ì,ÌfAfhfŒfX B
```

```
lplpDDAttachedSurface  
EnumSurfacesCallback fR [f<fofbfNŠÖ ",ì lpDDSurface fpf%of [f^,Žw'è,;,éŒ» Ý,Ì DirectDraw  
fT [ftFfX,ÉfAf^fbf`³,ê A,©,ÂlpDDSCaps fpf%of [f^,ÌŽw'è,ÉŒ© ‡,ð" —Í,ǎŽ ,Á,½ DirectDraw  
fT [ftFfX,Ö,Ìf|fCf"f^,ÌfAfhfŒfX B
```

fAf^fbf`Í A; ",ÌDirectDrawSurface fIfufWfFfNfg,ð; ‡ \`ç'ì,É Ú±,;,é,½,ß,ÉŽg—  
p,³,ê,é B; ‡ \`ç'ì,Í AZfofbftf@,É,æ,é,R,cfy [fW EftfŠfbfsf"fo,ÌfTf] [fg,É•K—v,È,à,ì,È,Ç,Á, ,é B—  
v< ,³,ê,½" —Í,ÉŒ© ‡,ðfT [ftFfX,³,Ð,Æ,Â^É ãfAf^fbf`³,ê,Ä,ç,é,Æ A,±,Ìf f\fbfh,ÌŽ,"s,;,é B,±  
,ì ê ‡ AfAfvfŠfP [fVf‡f",ÍfAf^fbf`³,ê,Ä,ç  
,éfT [ftFfX,ð"¾,é,½,ß,É IDirectDrawSurface2::EnumAttachedSurfaces f f\fbfh,ǎŽg—p,µ,È,¯,ê,Î,È,ç,È,ç B

**IDirectDrawSurface2::GetBltStatus**

HRESULT GetBltStatus(DWORD dwFlags);

fu fbfN“]—fn [fhfEfffA, Ì ó•Ô, ðŽæ“¾, ., é B

fu fbfN“]—fn [fhfEfffA, “¶ Ý, ., é, È, Ç DD\_OK, ð•Ô, . Afuf fbfN“]—fn [fhfEfffA, “¶rW [, È, Ç  
DDERR\_WASSTILLDRAWING Afuf fbfN“]—fn [fhfEfffA, “¶ Ý, µ, È, Ç, È, Ç  
DDERR\_NOBLTHW AŽ, ”s, ., é, îŽÝ, ÌfGf%o [, ð•Ô, . B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

**DDERR\_NOBLTHW**

**DDERR\_SURFACEBUSY**

**DDERR\_SURFACELOST**

**DDERR\_UNSUPPORTED**

**DDERR\_WASSTILLDRAWING**

dwFlags

ˆÈ%o, Ìftf%ofO, Ì, □, Ç, ç, ©, Ð, Æ, Â, ðŽæ, é B

DDGBS\_CANBLT

, ±, ÌfT [ftfFX, ÉŠÖ, í, éfu 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

fu fbfN“]—, “ s, í, ê, ½, ©, Ç, □, ©, ð-â, Ç ‡, í, 1 A, ±  
, ÌfT [ftfFX, Ì ÅEã, Ìfu fbfN“]—, “Š®—1, µ, Å, Ç, é, È, Ç, DD\_OK  
, ð•Ô, . B

## **IDirectDrawSurface2::GetCaps**

HRESULT GetCaps(LPDDSCAPS lpDDSCaps);

HRESULT GetCaps(LPDDSCAPS lpDDSCaps);

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

lpDDSCaps

LPDDSCAPS lpDDSCaps; **DDSCAPS** DDSCAPS; B

**IDirectDrawSurface2::GetClipper**

HRESULT GetClipper(LPDIRECTDRAWCLIPPER FAR \* lpDDClipper);

±, ðT [ftfFX, ÆŠÖ~A, Ã, ¯, ç, ê, ½ DirectDrawClipper fIfufWfFfNfg, ðŽæ“¾, ·, é B  
-Æ÷, ·, ê, Î DD\_OK AŽ, ”s, ·, ê, ÎŽÝ, ðGf%o [, ð•Ô, · B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

**DDERR\_NOCLIPPERATTACHED**

lpDDClipper

fT [ftfFX, ÆŠÖ~A, Ã, ¯, ç, ê, ½ DirectDrawClipper fIfufWfFfNfg, Ö, ð|fCf“f^, ðAfhfÆfX B

ŽQ Æ @**IDirectDrawSurface2::SetClipper**

**IDirectDrawSurface2::GetColorKey**

HRESULT GetColorKey(DWORD dwFlags, LPDDCOLORKEY lpDDColorKey);

DirectDrawSurface fIfufWfFfNfg, ÌfJf% [ EfL [ 'l, ðŽæ“¾, , é B

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

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

**DDERR\_NOCOLORKEY**

**DDERR\_NOCOLORKEYHW**

**DDERR\_SURFACELOST**

**DDERR\_UNSUPPORTED**

dwFlags

, Ç, ÌfJf% [ EfL [, a—v< , ¾, ê, é, ©Žw’è, , é B

DDCKEY\_DESTBLT

\‘ç’Ì, ÌfJf% [ EfL [, , é, ç, Ífuf fbfN“]‘—, É, ;, ç, Ä“]‘—  
æfJf% [ EfL [, , Æ, µ, ÄŽg, í, ê, é F<óŠŎ, ðŽw’è, , é B

DDCKEY\_DESTOVERLAY

\‘ç’Ì, ÌfJf% [ EfL [, , é, ç, ÍfI [fo [ EfŒfC ^— , É, ;, ç, Ä“]‘—  
æfJf% [ EfL [, , Æ, µ, ÄŽg, í, ê, é F<óŠŎ, ðŽw’è, , é B

DDCKEY\_SRCBLT

\‘ç’Ì, ÌfJf% [ EfL [, , é, ç, Ífuf fbfN“]‘—, É, ;, ç, Ä“]‘—  
Œ¾fJf% [ EfL [, , Æ, µ, ÄŽg, í, ê, é F<óŠŎ, ðŽw’è, , é B

DDCKEY\_SRCOVERLAY

\‘ç’Ì, ÌfJf% [ EfL [, , é, ç, ÍfI [fo [fŒfC ^— , É, ;, ç, Ä“]‘—  
Œ¾fJf% [ EfL [, , Æ, µ, ÄŽg, í, ê, é F<óŠŎ, ðŽw’è, , é B

lpDDColorKey

DirectDrawSurface fIfufWfFfNfg, ÌŽw’è, ¾, ê, ½fJf% [ EfL [, ÌŒ» Ý, Ì’l, ðŠi”[, , é **DDCOLORKEY** \‘ç’Ì, Ìf|  
fCf“f^ B

ŽQ Æ @**IDirectDrawSurface2::SetColorKey**

**IDirectDrawSurface2::GetDC**

HRESULT GetDC(HDC FAR \* lphDC);

fT [ftFfX,ÌffofCfX EfRf“fefLfxfg,ÌGDIEŸŠ·fnf“fhf<,đ ì -,·,é B  
-Œ÷,·,ê,Î DD\_OK AŽ,”s,·,ê,ÎŽŸ,ÌfGf%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,Ì|fCf“f^ B

,±,Ìf f\fbfh,Í AfT [ftFfX,Ìf fbfN,É**IDirectDrawSurface2::Lock**f f\fbfh,Ì“à”fo [fWf±f“,đŽg—p,·,é B  
fT [ftFfX,Í A**IDirectDrawSurface2::ReleaseDC**f f\fbfh,“ŒÄ,Ñ o,³,ê,È,ŒŒÄ,è Af fbfN,“ŮŽ ,³,ê,é B

ŽQ Æ **@IDirectDrawSurface2::Lock**

**IDirectDrawSurface2::GetDDInterface**

HRESULT GetDDInterface(LPVOID FAR \*lpDD);

ft [ftFfX,đ ì -,·,é,½,ß,ÉŽg—p,³,ê,½ DirectDraw flfufWfFfNfg,Ö,ìfCf“f^ [ftFfCfX,đŽæ“¾,·,é B  
-Æ÷,·,ê,Î DD\_OK AŽ,“s,·,ê,ÎŽŸ,ìfGf%o [,đ•Ô,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

lpDD

DirectDraw f|fCf“f^,³•Ô,³,ê,éf|fCf“f^,ÌfAfhfÆfX BÆÄ,Ñ o,μ,ªŽ,“s,μ,½ ê ‡ A,±,Ì'l,Í-³Eø,Æ,È,é B

,±,ìf f\fbfh,ÍIDirectDraw2fCf“f^ [ftFfCfX,©,ç'Ç%Á,³,ê,½,à,ì,Å A IDirectDraw  
fCf“f^ [ftFfCfX,É,ÍŽÀ‘,³,ê,Ä,ç,È,ç B

## IDirectDrawSurface2::GetFlipStatus

HRESULT GetFlipStatus(DWORD dwFlags);

fT [ftfFfX,^ftfŠfbfsf“fO ^— ,đ I,!,½,©,Ç,²,©,đŽæ“¾,·,é B

-Ĉ÷,·,ê,Î DD\_OK AfT [ftfFfX,^ftfŠfbfsf“fO ^— ,đ I,!,Ä,ĉ,È,¯,ê,Î DDERR\_WASSTILLDRAWING  
A,» ,İ'¼,İ— —R,ÄŽ, ”s,µ,½,çŽŸ,İfGf%o [,đ•Ô,· B

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

DDERR\_INVALIDSURFACETYPE

DDERR\_SURFACEBUSY

DDERR\_SURFACELOST

DDERR\_UNSUPPORTED

dwFlags

^È%°,İftf%ofO,İ,²,ç,Đ,Æ,Â,đŽw'è,·,é B

DDGFS\_CANFLIP

,±,İfT [ftfFfX,đ,½,¾,ç,ÉftfŠfbfsf“fO,Ä,«,é,©,Ç,²,©,đ-  
â,ĉ ‡,í,¹ AfTŠfbfsf“fO,đŠ®—¹,Ä,«,é ê ‡ DD\_OK,ª•Ô,é B

DDGFS\_ISFLIPDONE

ftfŠfbfsf“fO,ª s,í,ê,½,©,Ç,²,©-â,ĉ ‡,í,¹ A,±  
 ,İfT [ftfFfX,İ ÄEâ,İftfŠfbfsf“fO,ªŠ®—¹,µ,Ä,ĉ,½ ê ‡,É,İDD\_OK  
,đ•Ô,· B

ŽQ Æ @IDirectDrawSurface2::Flip



**IDirectDrawSurface2::GetPalette**

HRESULT GetPalette(LPDIRECTDRAWPALETTE FAR \* lpDDPalette);

fT [ftFfX,ÉŠÖ~A,Ã,¯,ç,ê,½ DirectDrawPalette \‘ç‘ì,ðŽæ“¾,·,é B  
-Ç÷,·,ê,Î DD\_OK AŽ,”s,·,ê,ÎŽŸ,ìfGf%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‘ì,ìf|fCf“f^,Ö,ìfAfhfÇfX B ,±  
,ìfT [ftFfX,ÆŠÖ~A,Ã,¯,ç,ê,½ DirectDrawPalette \‘ç‘ì,ª,È,ç ê ÷ A NULL ,ÉfZfbfg,³,ê,é B ,±  
,ìfpf%of [f^,Í AfT [ftFfX,ªfvf%ofCf}fŠ EfT [ftFfX,ì ê ÷ A,à,µ,,Ífvf%ofCf}  
fŠ EfT [ftFfX,ìfofbfN Efofbftf@,Ã A,©,Ãfvf%ofCf}fŠ EfT [ftFfX,ª8  
bppf, [fh,Ã, ,é ê ÷ AfVfXfef€ EfpfÇfbbfg,Ö,ìf|fCf“f^,ðŽ ,Ã B

ŽQ Æ @IDirectDrawSurface2::SetPalette

## IDirectDrawSurface2::GetPixelFormat

HRESULT GetPixelFormat(LPDDPIXELFORMAT lpDDPixelFormat);

ft [ftFfX,lfJf%o [,ÆfsfNfZf< EftfH [f}fbfg,ðŽæ“¾,·,é B  
-Æ÷,·,ê,ÎDD\_OK AŽ,”s,·,ê,ÎŽŸ,lfGf%o [,ð•Ô,· B

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

DDERR\_INVALIDSURFACETYPE

lpDDPixelFormat

Æ» ÝfsfNfZf<,Ì Ú × îñ,ÆfT [ftFfX,Ì\_FóŠÔ EftfH [f}fbfg,Ì Ú ×,È<L q,ðŽæ“¾,·,é  
DDPIXELFORMAT \‘ç‘î,Ö,lf|fCf“f^ B

**IDirectDrawSurface2::GetSurfaceDesc**

HRESULT GetSurfaceDesc(LPDDSURFACEDESC lpDDSurfaceDesc);

fT [ftfFX,ìE» Ý,ì óÔ,ð Žw'è,μ,½DDSURFACEDESC \‘‘ì,ÉŽæ“¾,·,é B  
-E÷,·,ê,Î DD\_OK AŽ,„s,·,ê,ÎŽÝ,ìfGf%o [,ð•Ô,· B

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

lpDDSurfaceDesc

fT [ftfFX,ì óÔ,ðŽæ“¾,·,éDDSURFACEDESC \‘‘ì,Ö,Ìf|fCf“f^ B

ŽQ Æ @DDSURFACEDESC

**IDirectDrawSurface2::Initialize**

HRESULT Initialize(LPDDIRECTDRAW lpDD,  
LPDDSURFACEDESC lpDDSurfaceDesc);

DirectDrawSurface flufWfFfNfg,đ %Šú%»,·,é B

**DDERR\_ALREADYINITIALIZED**,đ•Ô,· B

lpDD

DirectDraw flufWfFfNfg,đ•),· DirectDraw \‘ċ‘İ,İ|fCf“f^ B

lpDDSurfaceDesc

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

,±,İf f\fbfh,İfRf“f| [flf“fg EfIfufWfFfNfg Ef,ffċ iCOM jfvf fgfRfċ,ÉŠİ,Ä,«’ñ<Ÿ,<sup>3</sup>ê,é B  
DirectDrawSurface flufWfFfNfg,İ ì ¬,<sup>3</sup>ê,<sup>½</sup>,Æ,«É %Šú%»,<sup>3</sup>ê,é,İ,Å A,±,İf f\fbfh,İ í,É  
DDERR\_ALREADYINITIALIZED,đ•Ô,· B

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

## **IDirectDrawSurface2::IsLost**

HRESULT IsLost();

DirectDrawSurface fIfufWfFfNfg, ŠÇ— , , éfT [ftFfX Ef f, fŠ, a, È, ñ, ç, ©, ÌE'ö, É, æ, Á, ÄŽ, , í, ê, ½, ©, Ç, □, ©, ð"»'f, , é B

Ž, , í, ê, Ä, ç, È, , ê, Î DD\_OK A, » , □, Ä, È, , ê, îŽÿ, ìfGf%o [, ð•Ô, · B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

**DDERR\_SURFACELOST**

fT [ftFfX Ef f, fŠ, ì ÄŠ, ,, è“–, Ä, ì, ½, ß, É A, ±, ìf f\fbfh, ðŽg—p, ·, é, ±, Æ, a, Ä, «, é B DirectDrawSurface fIfufWfFfNfg, a fT [ftFfX Ef f, fŠ, ðŽ, , □, Æ A'â•"•a, ìf f\fbfh, Í DDERR\_SURFACELOST , ð•Ô, µ, Ä'¼, ì ^—, ðŽÀ s, µ, È, ç B

ffBfXfvfÇfC EfJ [fh, ìf, [fh, ð•ï X, , éŽž A, , é, ç , ÍfAfvfŠfP [fvf±f“, a ffBfXfvfÇfC EfJ [fh, Ö, Ì"¼“I, ÈfAfnfZfX, ðŽó, –Žæ, Á, ÄÇ» ÝffBfXfvfÇfC EfJ [fh ã, ÉŠ, ,, è“–, Ä, ç, ê, Ä, ç, éfT [ftFfX Ef f, fŠ, ì, ·, ×, Ä, ð%ð•ú, ·, éŽž, É, Í AfT [ftFfX, Íf f, fŠ, ðŽ, , □%Ä" \ «, a, , é B

ŽQ Æ @**IDirectDrawSurface2::Restore**

**IDirectDrawSurface2::Lock**

HRESULT Lock(LPRECT lpDestRect, LPDDSURFACEDESC lpDDSurfaceDesc, DWORD dwFlags, HANDLE hEvent);

fT [ftFfX Ef f, fŠ, Ö, ð|fCf“f^, ðŽæ“¾, ·, é B  
-CE÷, ·, ê, Î DD\_OK AŽ, ”s, ·, ê, ÎŽŸ, ðfGf%o [, ð•Ö, · B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

**DDERR\_OUTOFMEMORY**

**DDERR\_SURFACEBUSY**

**DDERR\_SURFACELOST**

**DDERR\_WASSTILLDRAWING**

lpDestRect

f fbfN, ·, éfT [ftFfX—Ïæ, ðŽ!, · RECT \‘c‘ì, ð|fCf“f^ B

lpDDSurfaceDesc

fT [ftFfX, È, Â, Ç, Ä, Ì î·ñ, ðŽw’è, ·, é **DDSURFACEDESC** \‘c‘ì, Ö, ð|fCf“f^ B

dwFlags

DDLOCK\_EVENT

**IDirectDrawSurface2::Lock**,<sup>a</sup>—v< ,<sup>3</sup>, ê, ½fT [ftFfX Ef f, fŠ, ð|fCf“f^, ð•Ö, ·, ±, Æ, %oÂ”\ , È, Æ, «, ÈfCfxf“fg, ðì“@, ·, éftf%ofo BfCfxf“fg Efnf“fhf<, **IDirectDrawSurface2::Lock** , È“n,<sup>3</sup>, ê, Â, Ç, é ê ‡ AfZfbfg,<sup>3</sup>, ê, é B, ± , ðf^fCfv, ðf fbfN,<sup>a</sup>fT [ftFfX ã, È·i ”, ·, é, Æ, « AfCfxf“fg, ÍFIFO ‡, Â^ø, «N, ±, <sup>3</sup>, ê, é B

**DDLOCK\_READONLY**

f fbfN, ·, éfT [ftFfX, Í“Ç, Ý o, µ ê—p, Â, ·, é, ±, Æ, ðŽ!, ·ftf%ofo B

**DDLOCK\_SURFACEMEMORYPTR**

Žw’è, µ, ½<éE, Ì æ“a, Ö, ð—LEø, Èf f, fŠ Ef|fCf“f^, ð•Ö,<sup>3</sup>, È, ·, é, Ì, È, Ç, È, Ç, ±, Æ, ð•\, ·ftf%ofo B <éE, “Žw’è,<sup>3</sup>, ê, È, Ç ê ‡ A^è”Ö ã, ðfT [ftFfX, Ö, ð|fCf“f^, ð•Ö,<sup>3</sup>, ê, é B ffftfHf<fg, Â, Ì, ± , ðf%ofo, ðŽw’è, ·, é B

**DDLOCK\_WAIT**

’È í Afuf fbfN“]’— ^— ,<sup>a</sup>ftrfW [ ó•Ö, Ì, ½, ßf fbfN, ð“¾, Ç, ê, È, Ç ê ‡ Af f\fbfh, Í¼, ç, È I—, µ A DDERR\_WASSTILLDRAWING fGf%o [, ð•Ö, · B, µ, ©, µ, ± , ðf%ofo, ðfZfbfg, µ, ½ ê ‡ Af fbfN, “¾, Ç, ê, é, © DDERR\_SURFACEBUSY, È, Ç A•È, ðfGf%o [, “”- ¶, ·, é, Ü, **IDirectDrawSurface2::Lock**, ð ÄŽŽ s, ·, é B

**DDLOCK\_WRITEONLY**

f fbfN, ·, éfT [ftFfX, Í ‘, «, ±, Ý ê—p, Â, ·, é, ±, Æ, ðŽ!, · B

hEvent

fT [ftFfX, ðf fbfN, ð €”ö, “, Â, «, ½ uŠÖ, ðfGfŠfK, Æ, ·, éfVfXfef€ EfCfxf“fg, Ö, ðfnf“fhf< B

f|fCf“f^, ðŽæ“¾, µ, ½CEã A’Î%ž, ·, é

**IDirectDrawSurface2::Unlock** f\fbfh, ðEÄ, Ñ o, ·, Ü, Â AfAfvfŠfP [fVf±f“, ðfT [ftFfX Ef f, fŠ, ÈfAfNfZfX, ·, é, ±, Æ, “, Â, «, é B **IDirectDrawSurface2::Unlock** f\fbfhEÄ, Ñ o, µCEã, Í AfT [ftFfX Ef f, fŠ, Ö, ð|fCf“f^, Ì-<sup>3</sup>CEø, È, È, é B

fAfvfŠfP [fVf±f“, Í Af fbfN,<sup>3</sup>, ê, ½fT [ftFfX, ð—Ïæ, Afuf fbfN“]’—, ·, é, ±, Æ, Í, Â, «, È, Ç B f fbfN,<sup>3</sup>, ê, ½fT [ftFfX ã, Afuf fbfN“]’—, “ŽŽ, Ý, Ç, ê, ½ ê ‡ Afuf fbfN“]’—, Í DDERR\_SURFACEBUSY , ·, é, Ç, Í DDERR\_LOCKEDSURFACES fGf%o [, ð•Ö, · B

^è”È, È Afuf fbfN“]’— ^— ’†, Â, ·, é, Æ, Ç, «— —R, Af fbfN, ðŽæ“¾, Â, «, È, Ç ê ‡ A **IDirectDrawSurface2::Lock**, ðfGf%o [, ð•Ö, µ, Ä-ß, é B f fbfN, “Žæ“¾, Â, «, é, Ü, Â’Ö, Â, Ä, à—Ç, Ç ê ‡ A DDLOCK\_WAIT ftf%ofo, ðŽg—p, ·, é B

fT [ftFfX,Ö,ÏfAfNfZfX'†,ÉffBfXfvfŒfC Ef f,fŠ,Ž,í,ê,é,Ï,ð-h,®,½,ß A DirectDraw ,Í  
**IDirectDrawSurface2::Lock**,,æ,Ñ **IDirectDrawSurface2::Unlock**€ ì,ÏŠÔ,É A Win16 f fbfN,ð•ÛŽ ,µ,Ä,ç,é B  
Win16 f fbfN,Í GDI ,ÆUSER,ÏfAfNfZfXŽÄ s,É,©,í,é d'â,È•"ª,Ä, ,è A,±  
,ÏfefNfjfbfN,É,æ,èffBfXfvfŒfC Ef f,fŠ,Ö,Ï¼ ÚfAfNfZfX,"%oÂ"\,É,È,Ä,Ä,ç  
,é B,»ÏfAfNfZfX'†,É,Ï¼,ÏfAfvfŠfP [fVf‡f“,Íf, [fh•Ï X,ª,Ä,«È,ç  
,ª AWindows,Ï“ ì,ªŽ~,Û,Ä,Ä,µ,Û,ª B,»,Ï,½,ß A **IDirectDrawSurface2::Lock**/**IDirectDrawSurface2::Unlock**,©,ç  
**IDirectDrawSurface2::GetDC**/**IDirectDrawSurface2::ReleaseDC**,ÏŠúŠÔ,Í,Ä,«éEÀ,è'Z,,·,é,×,«Ä, ,é B,±  
,ÏŠúŠÔ AWindows,ªŽ~,Û,Ä,Ä,µ,Û,ª,½,ß A GUIfffofbfK,ÏŽg—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) “]—,ð—p,¢,½fVfXfef€ Ef f,fŠ“à,ì“]— A, ,é,¢  
,ÍfVfXfef€ Ef f,fŠ,ðŠÛ,þfuf fbfn“]—,Ì ^—

† AfVfXfef€ Ef f,fŠ EfT [ftFfX,³fy [fW EfAfEfg,³,ê,é,±,Æ,ð—h,® B

—€±,·,ê,î DD\_OK AŽ,”s,·,ê,îŽÿ,ìfGf%o [,ð•Ô,· B

**DDERR\_CANTPAGELOCK**

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

**DDERR\_SURFACELOST**

dwFlags

,±,Ífþf%of [f^,íE» Ý—¢Žg—p B0,ÉfZfbfg,µ,Ä,·,±,Æ B

f fbfn,ÍfIfyf€ [fefBf“fO EfVfXfef€,ÍfpftfH [f}f“fX,É^«%oe<¿,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,³EÄ,Ñ o,³,ê,½,Æ,«ffnfŠf f“fg,³,ê,é B  
fJfEf“fg,³0,É’B,µ,½ŽŽ Af f,fŠ,³f fbfn,ð%ð œ,µ AfVfXfef€ Ef f,fŠ EfT [ftFfX,ðfIfyf€ [fefBf“fO E  
fVfXfef€,³fy [fWf“fO’î Û,Æ,Ä,«,é,æ,µ,É,È,é B

,±,ìf f\fbfh,ÍfVfXfef€ Ef f,fŠ EfT [ftFfX ã,Ä,ì,Ý“® ì,·,é 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,ðEÄ,Ñ o,µ,½ ê ± Af f\fbfh,Í  
DD\_OK,ð•Ô,·^ÈŠO,Í%½,à,µ,È,¢ 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 œ,µ Afy [fW EfAfEfg,Ä,«,é,æ,µ,É,·,é B  
-€÷,·,ê,Î DD\_OK AŽ,»s,·,ê,ÎŽŸ,lfGf%o [,ð•Ô,· B

**DDERR\_CANTPAGEUNLOCK**

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

**DDERR\_NOTPAGELOCKED**

**DDERR\_SURFACELOST**

dwFlags

,±,lfpf%of [f^,í€» Ý-čŽg—p B0,ÉfZfbfg,µ,Ä,“,±,Æ B

f fbfN EfJfEf“fg,Í,»ê,¼,ê,lfT [ftFfX,É,Ä,č  
,Ä•ŮŽ ,³,ê A**IDirectDrawSurface2::PageLock**(EÄ,Ň o,µ,É,æ,Ä,ÄfCf“fNfŠf f“fg,³,ê A  
**IDirectDrawSurface2::PageUnlock**,ìEÄ,Ň o,µ,ì Ů,ÉffNfŠf f“fg,³,ê,é B  
fJfEf“fg,º,É’B,µ,½Žž Af f,fŠ,lf fbfN,ð%ð œ,³,ê AfIfyf€ [fefBf“fO EfVfXfef€  
,Í,»,lfVfXfef€ Ef f,fŠ EfT [ftFfX,ðfy [fWf“fO’Í Ů,Æ,Ä,«,é,æ,µ,É,È,é B

,±  
,lf ffbfh,lfVfXfef€ Ef f,fŠ EfT [ftFfX ä,Ä,ì,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,č BffBfXfvf€fC Ef f,fŠ EfT [ftFfX ä,Ä,±  
,lf ffbfh,ðEÄ,Ň o,µ,Ä,à Af ffbfh,Í DD\_OK,ð•Ô,·,¼,Ä,·,é B

,±,lf ffbfh,Í**IDirectDraw2**fCf“f^ [ftFfCfX,©,ç’ç%Á,³,ê,½,à,ì,Ä A**IDirectDraw**  
fCf“f^ [ftFfCfX,É,ÍŽÄ‘•,³,ê,Ä,č,È,č B

ŽQ Æ @**IDirectDrawSurface2::PageLock**

**IDirectDrawSurface2::ReleaseDC**

HRESULT ReleaseDC (HDC hDC) ;

**IDirectDrawSurface2::GetDC** method.

**HRESULT ReleaseDC**(

f f\fbfh,đŽg—p,μ,ÄŽæ“¾,μ,½ffofCfX EfRf“fefLfXfg,ìfnf“fhf<,đ%đ•ú,·,é B

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

**DDERR\_GENERIC**

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

**DDERR\_SURFACELOST**

**DDERR\_UNSUPPORTED**

hDC

**IDirectDrawSurface2::GetDC** f f\fbfh,đŽg—p,μ,ÄŽæ“¾,μ,½ffofCfX EfRf“fefLfXfg,ìfnf“fhf< B

,±,ìf f\fbfh,É,æ,Á,Ä A‘O%õñ

**IDirectDrawSurface2::GetDC** f f\fbfh,đÆÄ,Ñ o,μ,½ŽŽ,ìfT [ftFfX,ìf fbfN,%đ æ,³,ê,é B

ŽQ Æ @**IDirectDrawSurface2::GetDC**

**IDirectDrawSurface2::Restore**

HRESULT Restore();

Ž,Á,½fT [ftfFfX,đfŠfXfgfA,·,é B ,±,ê,Í DirectDrawSurface  
fIfufWfFfNfg,ÆŠÖ~A,Ä,¯,ç,ê,½fT [ftfFfX Ef f,fŠ,°%đ•ú,³,ê,½,Æ,«” ¶,·,é B

-Æ÷,·,ê,Î DD\_OK AŽ,”s,·,ê,ÎŽÿ,İfGf% [,đ•Ö,· B

DDERR\_GENERIC

DDERR\_IMPLICITLYCREATED

DDERR\_INCOMPATIBLEPRIMARY

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

DDERR\_NOEXCLUSIVEMODE

DDERR\_OUTOFMEMORY

DDERR\_UNSUPPORTED

DDERR\_WRONGMODE

ffBfXfvfÆfC EfJ [fh,İf, [fh•İ XŽž,â AfAvfŠfP [fVf‡f“,°ffBfXfvfÆfC EfJ [fh,Ö,İ”¼fAfNfZfX,đŽó,¯  
Žæ,Ä,ÄÆ» ÝfJ [fh ã,ÉŠ,,è“-Ä,ç,ê,Ä,Ç

,éfT [ftfFfX Ef f,fŠ,İ,·,×,Ä,đ%đ•ú,·,éŽž,É,Í AfT [ftfFfX,°Ž,ı,ê,é%Ä”\ «,°, ,é B DirectDrawSurface  
fIfufWfFfNfg,°,»İfT [ftfFfX Ef f,fŠ,đŽ,Á,½,Æ,« A’½,,İf f\fbfh,Í DDERR\_SURFACELOST  
,đ•Ö,µ A¼,İ, ,ç,ä,é<@”\,İŽÄ s,°s%Ä”\,É,È,é B

**IDirectDrawSurface2::Restore** f\fbfh,İfT [ftfFfX Ef f,fŠ,đ ÄŠ,,è“-Ä,µ A DirectDrawSurface  
fIfufWfFfNfg,É,»,ê,đ ÄfA^fbf”,·,é B

,±,İf f\fbfh,İÄÄ,Ñ o,µ,đ s,²,Æ A DirectDrawSurface fIfufWfFfNfg,ÉŠÖ~A,Ä,¯,ç,ê,½^Ä-

Ü,İfT [ftfFfX ifofbfN Efofbftf@,È,Ç j,°fŠfXfgfA,³,ê,é B ^Ä-

Ü“İ,É İ,ç,ê,½fT [ftfFfX,đfŠfXfgfA,·,éŽž,Ý,İfGf% [,Æ,È,é B

**IDirectDrawSurface2::Restore, İDirectDrawSurface2::AddAttachedSurface** f\fbfh,đŽg—p,µ,Ä İ ı,³,ê,½-  
¾Žı“İ,ÈfA^fbf”,Ü,Ä,İŽ©“®“İ,ÈfŠfXfgfA,µ,È,ç İ ,±,ê,ç,İfT [ftfFfX,İ,»,¼,ê,°ÆÄ X,ÈfŠfXfgfA,³,ı,ç,ê,È,-  
,Ä,İ,È,ç,È,ç j B

ŽQ Æ @**IDirectDrawSurface2::IsLost** A **IDirectDrawSurface2::AddAttachedSurface**

## **IDirectDrawSurface2::SetClipper**

HRESULT SetClipper(LPDDIRECTDRAWCLIPPER lpDDClipper);

DirectDrawClipper fIfufWfFfNfg,đ DirectDrawSurface fIfufWfFfNfg,ÉfAf^fbf` ,:é B

-Ĉ±,,:ê,Î DD\_OK AŽ,,"s,,:ê,ÎŽŸ,ÌfGf%o [,đ•Ô,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

**DDERR\_INVALIDSURFACETYPE**

**DDERR\_NOCLIPPERATTACHED**

lpDDClipper

DirectDrawSurface fIfufWfFfNfg,ÉfAf^fbf` ,:é DirectDrawClipper fIfufWfFfNfg,đ•\,μ,Ä,Ĉ,é DirectDrawClipper  
`Ĉ'İ,Ìf|fCf`f^ B ,à,μ,±,Ìfpf%of [f^,^f|f ,È,Ĉ,Î AĈ» Ý,Ì DirectDrawClipper fIfufWfFfNfg,đff^fbf` ,:é,±  
,Æ,đ•Ô-; ,:é B

,±,Ìf f\fbfh,ÌŽâ,ÉfT [ftfFfX,^ Ä %o,ÌfT [ftfFfX,Ì ã,ÉfI [fo [fĈfC,^,ê,é,Ĉ A ,:é,Ĉ,Ífuf fbfN`]-  
,^,ê,é,½,ß,ÉŽg-p,^,ê A ,:ç,ã,éft [ftfFfX ã,ÄŽg-p,Ä,«,é B DirectDrawClipper  
fIfufWfFfNfg,^fAf^fbf` ,^,ê A,»μ,ÄfNfŠfbfv EfŠfXfg,^,»ê,ÆĈ<,Ñ•t,^,ç,ê,½Ĉã A DirectDrawClipper  
fIfufWfFfNfg,Ì**IDirectDrawSurface2::Blt** A **IDirectDrawSurface2::BltBatch** A ,: ,æ,Ñ  
**IDirectDrawSurface2::UpdateOverlay** ^- ,Ì,½,ß,ÉŽg-p,^,ê,é B,±,Ìf f\fbfh,Ì DirectDrawSurface  
fIfufWfFfNfg,ÌĈ» Ý,Ì DirectDrawClipper fIfufWfFfNfg,đff^fbf` ,:é,±,Æ,^,Ä,«,é B

,±,Ìf f\fbfh,^Ĉ,¶ DirectDrawClipper fIfufWfFfNfg,É'İ,μ,Ä'^êfT [ftfFfX ã,Ä^A'±  
,μ,Ä %oñĈÄ,Ñ o,^,½ ê ‡,Ä,à AfIfufWfFfNfg,ÌŽQ ÆfJfEf`fg,Í,P,μ,Ĉ' %oÁ,μ,È,Ĉ B  
d•j,,:éĈÄ,Ñ o,μ,Í AfIfufWfFfNfg,ÌŽQ ÆfJfEf`fg,É%e<ç,đ-^,!,È,Ĉ B

ŽQ Æ @**IDirectDrawSurface2::GetClipper**

## IDirectDrawSurface2::SetColorKey

HRESULT SetColorKey(DWORD dwFlags, LPDDCOLORKEY lpDDColorKey);

fn [fhfEfffA,^fT [ftfFfX Efx [fX-^ÉfJf% [ EfL [,ðfTf] [fg,·,é ê ‡ A DirectDrawSurface  
fIfufWfFfNfg,İfJf% [ EfL [,ðfZfbfg,·,é B

-CE÷,·,ê,İ DD\_OK AŽ,·s,·,ê,İŽY,İfGf% [,ð·Ö,· B

DDERR\_GENERIC

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

DDERR\_INVALIDSURFACETYPE

DDERR\_NOOVERLAYHW

DDERR\_NOTAOVERLAYSURFACE

DDERR\_SURFACELOST

DDERR\_UNSUPPORTED

DDERR\_WASSTILLDRAWING

dwFlags

,ç,,ê,İfJf% [ EfL [,^vç ,³,ê,é,©Žw'è,·,é B

DDCKEY\_COLORSPACE

\ç'İ,^ F<óŠÖ,ðŠÜ,ñ,Ä,ç,é ê ‡fZfbfg,·,é B

\ç'İ,^P^ê,İfJf% [ EfL [,ðŠÜ,ñ,Ä,ç,é,Æ,«,İfZfbfg,μ,Ä,İ,ç,¯,È,ç B

DDCKEY\_DESTBLT

fuf fbfN" ]^—,İ" ]^— æfJf% [ EfL [,Æ,μ,ÄŽg—

p,³,ê,éfJf% [ EfL [, ,é,ç,İ" ]^— æ F<óŠÖ,ð \ç'İ,^Žw'è,μ,Ä,ç

,é ê ‡fZfbfg,·,é B

DDCKEY\_DESTOVERLAY

fI [fo [fçfC ^— ,İ" ]^— æfJf% [ EfL [,Æ,μ,ÄŽg—

p,³,ê,éfJf% [ EfL [, ,é,ç,İ" ]^— æ F<óŠÖ,ð \ç'İ,^Žw'è,μ,Ä,ç

,é ê ‡fZfbfg,·,é B

DDCKEY\_SRCBLT

fuf fbfN" ]^—,İ" ]^— Ç³fJf% [ EfL [,Æ,μ,ÄŽg—

p,³,ê,éfJf% [ EfL [, ,é,ç,İ" ]^— æ F<óŠÖ,ð \ç'İ,^Žw'è,μ,Ä,ç

,é ê ‡fZfbfg,·,é B

DDCKEY\_SRCOVERLAY

fI [fo [fçfC ^— ,İ" ]^— Ç³fJf% [ EfL [,Æ,μ,ÄŽg—

p,³,ê,éfJf% [ EfL [, ,é,ç,İ" ]^— æ F<óŠÖ,ð \ç'İ,^Žw'è,μ,Ä,ç

,é ê ‡fZfbfg,·,é B

lpDDColorKey

DirectDrawSurface fIfufWfFfNfg,İ V,μ,çfJf% [ EfL [,ðŠÜ,ñ,Ä,ç,é DDCOLORKEY \ç'İ,İf|fCf" f^ B

ŽQ Æ @IDirectDrawSurface2::GetColorKey

**IDirectDrawSurface2::SetOverlayPosition**

HRESULT SetOverlayPosition(LONG lX, LONG lY);

*lX* and *lY*  
V,μ,ϕ,~ffBfXfvfϕfC À•W,“,æ,Ñ,™ffBfXfvfϕfC À•W B

**DDERR\_GENERIC**

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

**DDERR\_SURFACELOST**

**DDERR\_UNSUPPORTED**

*lX* and *lY*

V,μ,ϕ,~ffBfXfvfϕfC À•W,“,æ,Ñ,™ffBfXfvfϕfC 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 ^— ,Á,Í,± ,İfpfĀfbfg,đŽg—p,·,é B fpfĀfbfg•Í X,İfŠftfĀfbfVf... Ef^fCf~f“fO,ÉŠÖĀW,È,‘, Á,É s,í,ê,é B

-Ā÷,·,ê,Í DD\_OK AŽ,”s,·,ê,İŽŸ,İfGf%o [,đ•Ō,· B

DDERR\_GENERIC

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

DDERR\_INVALIDSURFACETYPE

DDERR\_NOEXCLUSIVEMODE

DDERR\_NOPALETTEATTACHED

DDERR\_NOPALETTEHW

DDERR\_NOT8BITCOLOR

DDERR\_SURFACELOST

DDERR\_UNSUPPORTED

lpDDPalette

DirectDrawPalette \‘Ā,İf|fCf“f^ B

,±,İf f\fbfh,“~ēfT [ftfFfX ã,Á~A‘±

,μ,Á ”%ñĀ,Ñ o,³,ê,½ ê ‡,Á,à AfpfĀfbfg,İŽQ ĀfJfEf“fg,Í,P,Á‘ %Á,·,é,¾,¯,Á, ,é B d·i,·,éĀ,Ñ o,μ,İfp fĀfbfg,İŽQ ĀfJfEf“fg,É%œ<¿,đ—^,‘,É,Ā B

ŽQ Ā @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::Lockf f\fbfh,É,æ,Á,Ä•Ô,³,ê,½f|fCf“f^,ÌfAfhfCEfX B“¯,¶fT [ftfFfX,Â^Ù,È,é“]—  
æ<é€`Ì,½,ß,É•; ”,Ì IDirectDrawSurface2::Lock€Ä,Ñ o,µ,“%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);
```

*fI [fo [fCfC Eft [ftFfX, ĨŽŠo'« «,đ'uŠ·,Ü,½,Í C ³,·,é B ,±,ê,ç, Ĩft [ftFfX, Í DDSCAPS\_OVERLAY  
'lfZfbfg,đŽ ,Á,Á,ç,È,.,Á,Í,È,ç,È,ç B*

*-C±,·,ê, Ĩ DD\_OK AŽ,·s,·,ê, ĨŽŸ, ĨfGf%o [,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*

*“]—C³fT [ftFfX,³fI [fo [fCfC,ÁŽg,□,· A,™· ,·,æ,Ñ—Ĩæ, Ĩ ,,³,đ'èç',·,é RECT \‘ç'Ĩ, Ĩ|fCf“f^ B*

*lpDDDestSurface*

*fI [fo [fCfC,³,ê,Ä,ç,é DirectDraw fT [ftFfX, Ĩ|fCf“f^ B*

*lpDestRect*

*fI [fo [fCfC,³ s,í,ê,é“]— æfT [ftFfX, Ĩ ä,É,· A,™· ,·,æ,Ñ—Ĩæ, Ĩ ,,³,đ'èç',·,é RECT \‘ç'Ĩ, Ĩ|f|  
fCf“f^ B*

*dwFlags*

**DDOVER\_ADDDIRTYRECT**

*fGf~f...fC [fVf±f“,ÁfI [fo [fCfC,³,ê,½fT [ftFfX,É A X V,μ,È,·,ê,Ĩ,È,ç,È,ç—  
Ĩæ,đ%Á,!,é B*

**DDOVER\_ALPHADEST**

*fsfNfZf< EftfH [f}fbfg,Á, ĨfAf<ftf@ î·ñ, ,é,ç, ĨfAf<ftf@ Ef`ffflf< Eft [ftFfX,đ A,±  
, ĨfI [fo [fCfC, Ĩ“]— æfAf<ftf@ Ef`ffflf<,Æ,μ,ÁfT [ftFfX,ÉfAf^fbf',·,é,½,ß,ÉŽg—  
p,·,é B*

**DDOVER\_ALPHADESTCONSTOVERRIDE**

*,±, ĨfI [fo [fCfC, Ĩ“]— æfAf<ftf@ Ef`ffflf<,Æ,μ,ÁDDOVERLAYFX \‘ç'Ĩ, Ĩ  
dwAlphaDestConst f f“fo,đŽg—p,·,é B*

**DDOVER\_ALPHADESTNEG**

*fAf<ftf@'1, Ĩ' %oÁ,É,Á,ê“]— æfT [ftFfX,“§—¾%o»,·,é,±,Æ,đ·\,· i0,Í·s“§—¾ j B*

**DDOVER\_ALPHADESTSURFACEOVERRIDE**

*,±, ĨfI [fo [fCfC, Ĩ“]— æfAf<ftf@ Ef`ffflf<,Æ,μ,ÁDDOVERLAYFX \‘ç'Ĩ, Ĩ  
lpDDSAlphaDest f f“fo,đŽg—p,·,é B*

**DDOVER\_ALPHAEDGEBLEND**

*fJf%o [ EfL [ F,Æ<<,đ Ú,·,é%oæ'œ, ĨfGfbfW, ĨfAf<ftf@ Ef`ffflf<,Æ,μ,ÁDDOVERLAYFX  
\‘ç'Ĩ, Ĩ dwAlphaEdgeBlend f f“fo,đŽg—p,·,é B*

**DDOVER\_ALPHASRC**

*fsfNfZf< EftfH [f}fbfg,Á, ĨfAf<ftf@ î·ñ, ,é,ç, ĨfAf<ftf@ Ef`ffflf< Eft [ftFfX,đ A,±  
, ĨfI [fo [fCfC, Ĩ“]— C³fAf<ftf@ Ef`ffflf<,Æ,μ,ÁfT [ftFfX,ÉfAf^fbf',·,é,½,ß,ÉŽg—  
p,·,é B*

**DDOVER\_ALPHASRCCONSTOVERRIDE**



## IDirectDrawSurface2::UpdateOverlayDisplay

HRESULT UpdateOverlayDisplay(DWORD dwFlags);

—LCEø,È,·,×,Ä,ÏfI [fo [fCEfC,Ï,ρ,ç A X V,μ,È,¯,ê,Î,È,ç,È,ç«éCE`ÏfŠfXfg,Ä«éCE`ð Ä·`%øæ,·,é B,Û,½ A ^—  
,ª I,í,é,Æ,»»,Ï«éCE`fŠfXfg,ðfNfŠfA,·,é B ,±,Ïf f\fbfh,Ïf\ftfgfEfffA EfGf~f...fCE [fVf‡f“Žž,Ï,Ý—  
LCEø,Ä Afñ [fhfEfffA,ÄfI [fo [fCEfC,ªfTf| [fg,³,ê,Ä,ç,é ê ‡ A%ø½,à,μ,È,ç B

-CE‡,·,é,Î DD\_OK AŽ,”s,·,é,ÎŽÝ,ÏfGf%ø [,ð•Ô,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

**DDERR\_INVALIDSURFACETYPE**

**DDERR\_UNSUPPORTED**

*dwFlags*

^— ,·,×,« X Vf^fCfv B ^È%ø°,Ïftf%øfO,Ï,ρ,ç,ð,Æ,Ä,Ï'l,ðŽæ,é B

DDOVER\_REFRESHDIRTYRECTS

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

DDOVER\_REFRESHALL

X V,·,×,««éCE`ÏfŠfXfg,ð-³Žç,μ,Ä AfI [fo [fCEfC EfffBfXfvfCEfC,ðŠ@‘S,É X V,·,é B  
,Û,½ A,»,Ï«éCE`fŠfXfg,ðfNfŠfA,·,é B

ŽQ Æ @**IDirectDrawSurface2::AddOverlayDirtyRect**

## **IDirectDrawSurface2::UpdateOverlayZOrder**

HRESULT UpdateOverlayZOrder (DWORD dwFlags,  
LPDIRECTDRAWSURFACE2 lpDDSReference);

fI [fo [fCfC,ÌZfI [f\_ [,ð Ý'è,·,é B  
-CÉ÷,·,ê,Î DD\_OK AŽ,"s,·,ê,ÎŽŸ,ÌfGf%o [,ð•Ô,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

**DDERR\_NOTAOVERLAYSURFACE**

*dwFlags*

È%°,Ìftf%ofO,Ì,ð,ç,Đ,Æ,Â,Ì'l,ðŽæ,é B

**DDOVERZ\_INSERTINBACKOF**

,±,ÌfI [fo [fCfC,ðfI [fo [fCfC Ef`fF [f“,ÌŽQ ÆfI [fo [fCfC,ÌCĚă,ě,É'“ü,·,é B

**DDOVERZ\_INSERTINFRONTOF**

,±,ÌfI [fo [fCfC,ðfI [fo [fCfC Ef`fF [f“,ÌŽQ ÆfI [fo [fCfC,Ì'O,É'“ü,·,é B

**DDOVERZ\_MOVEBACKWARD**

,±,ÌfI [fo [fCfC,ðfI [fo [fCfC Ef`fF [f“,Ì,Đ,Æ,ÂCĚă•û,É^Ú“@,·,é B

**DDOVERZ\_MOVEFORWARD**

,±,ÌfI [fo [fCfC,ðfI [fo [fCfC Ef`fF [f“,Ì,Đ,Æ,Â'O•û,É^Ú“@,·,é B

**DDOVERZ\_SENDBACK**

,±,ÌfI [fo [fCfC,ðfI [fo [fCfC Ef`fF [f“,ÌCĚă•û,É^Ú“@,·,é B

**DDOVERZ\_SENDFRONT**

,±,ÌfI [fo [fCfC,ðfI [fo [fCfC Ef`fF [f“,Ì'O•û,É^Ú“@,·,é B

*lpDDSReference*

fI [fo [fCfC Ef`fF [f“,É,“,·,é'S'Î“l,È^Ê'u,Æ,μ,ĂŽg—p,³,ê,éDirectDraw fT [ftfFX,Ìf|fCf“f^ B,±  
ÌfPf%of [f^,Í DDOVERZ\_INSERTINBACKOF,“,æ,Ň DDOVERZ\_INSERTINFRONTOF ,¼,¯,Ì,½,ß,É•K—  
v,Æ,³,ê,é B

ŽQ Æ @**IDirectDrawSurface2::EnumOverlayZOrders**



## DDBLTBATCH

```
typedef struct _DDBLTBATCH{
    LPRECT          lprDest;
    LPDIRECTDRAW_SURFACE lpDDSSrc;
    LPRECT          lprSrc;
    DWORD           dwFlags;
    LPDDBLTFX      lpDDBltFx;
} DDBLTBATCH, FAR *LPDDBLTBATCH;
```

**IDirectDrawSurface2::BltBatch** *f* \fbfh,É“n,·fuf fbfN“]—‘€ ì B

### lprDest

*fuf fbfN“]— æ,ð’è<,·,é RECT \‘ç’ì,ìf|fCf“f^ B*

### lpDDSSrc

*fuf fbfN“]—€³,ð’è<,·,é DirectDrawSurfacefIfufWfFfNfg,ìfAfhfœfX B*

### lprSrc

*fuf fbfN“]—€³,ì<é€’,ð’è<,·,é RECT \‘ç’ì,ìfAfhfœfX B*

### dwFlags

*fIfvfVf‡f“ §œäftf%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,ç  
ìfAf<ftf@ Ef`ffflf< Eft [ftfFfX,ì,ç,,é,©,ðŽg—p,·,é B*

DDBLT\_ALPHADESTCONSTOVERRIDE

*,±,ìfuf fbfN“]—,É,“,·,éfuf fbfN“]—  
æfT [ftfFfX,ìfAf<ftf@ Ef`ffflf<,Æ,μ,Ä ADDBLTFX \‘ç’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,Í·s“§–¾ j B*

DDBLT\_ALPHADESTSURFACEOVERRIDE

*,±,ìfuf fbfN“]—,É,“,·,éfuf fbfN“]—  
æfT [ftfFfX,ìfAf<ftf@ Ef`ffflf<,Æ,μ,Ä ADDBLTFX \‘ç’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 \‘ç’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,ç  
ìfAf<ftf@ Ef`ffflf< Eft [ftfFfX,ì,ç,,é,©,ðŽg—p,·,é B*

DDBLT\_ALPHASRCCONSTOVERRIDE

*,±,ìfuf fbfN“]—,É,“,·,éfuf fbfN“]—  
€³fT [ftfFfX,ìfAf<ftf@ Ef`ffflf<,Æ,μ,Ä ADDBLTFX \‘ç’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,Í·s“§–¾ j B*

DDBLT\_ALPHASRCSURFACEOVERRIDE

*,±,ìfuf fbfN“]—,É,“,·,éfuf fbfN“]—  
€³fT [ftfFfX,ìfAf<ftf@ Ef`ffflf<,Æ,μ,Ä ADDBLTFX \‘ç’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,É<ó—ì’æ,ª,È,ç,È,ç ACEÄ,Ñ o,μ,ÍŽ,”s,·,é B*

DDBLT\_COLORFILL

*fuf fbfN“]’— æfT [ftfFfX ã, ìfuf fbfN“]’— æ<éCE`ð-ž,½,· RGB F,Æ,μ,Ä A **DDBLTFX** \‘c‘ì, ì dwFillColor f f“fo, ðŽg—p, ·, é B*

**DDBLT\_DDFX**

*,±, ìfuf fbfN“]’—, ÄŽg—p,³, é, éCEø%Ê, ðŽw’è, ·, é **DDBLTFX** \‘c‘ì, ì dwDDFX f f“fo, ðŽg—p, ·, é B*

**DDBLT\_DDROPS**

*Win32 API , ìê·”, Å, È, çf%oFXf^ ^— i ROPs j, ðŽw’è, ·, é, ½, ß, É**DDBLTFX** \‘c‘ì, ì dwDDROPS f f“fo, ðŽg—p, ·, é B*

**DDBLT\_KEYDEST**

*fuf fbfN“]’— æfT [ftfFfX, ÆCE<, Ñ·t, ¯, ç, é, ½fJf% [ EfL [, ðŽg—p, ·, é B*

**DDBLT\_KEYDESTOVERRIDE**

*fuf fbfN“]’— æfT [ftfFfX, ìfJf% [ EfL [, Æ, μ, Ä **ADDBLTFX** \‘c‘ì, ì dckDestColorkey f f“fo, ðŽg—p, ·, é B*

**DDBLT\_KEYSRC**

*fuf fbfN“]’— CE³fT [ftfFfX, ÆCE<, Ñ·t, ¯, ç, é, ½fJf% [ EfL [, ðŽg—p, ·, é B*

**DDBLT\_KEYSRCOVERRIDE**

*îñCE³fT [ftfFfX, ìfJf% [ EfL [, Æ, μ, Ä **ADDBLTFX** \‘c‘ì, ì dckSrcColorkey f f“fo, ðŽg—p, ·, é B*

**DDBLT\_ROP**

*,±, ìfuf fbfN“]’—, ì ROP , ì, ½, ß, É **DDBLTFX** \‘c‘ì, ì dwROP f f“fo, ðŽg—p, ·, é B ROP , Í Win32 API , Ä’è<³, é, é, à, ì, Æ“¯, ¶, Ä, ·, é B*

**DDBLT\_ROTATIONANGLE**

*fT [ftfFfX, ì%oñ“]Šp i1/100“x’P^Ê, ÄŽw’è,³, é, é j, Æ, μ, Ä **ADDBLTFX** \‘c‘ì, ì dwRotationAngle f f“fo, ðŽg—p, ·, é B*

**DDBLT\_ZBUFFER**

*fuf fbfN“]’— CE³, ¯, æ, Ñfuf fbfN“]’— æfT [ftfFfX, ÉfAf^fbf`³, é, ½Zfobftf@, ðŽg—p, μ, Ä Zfobftf@ Efuf fbfN“]’—, ð s, ¢ B **DDBLTFX** \‘c‘ì, ì dwZBufferOpCode f f“fo, ð Zfobftf@ EfIfyfR [fh, Æ, ·, é B*

**DDBLT\_ZBUFFERDESTCONSTOVERRIDE**

**DDBLTFX** \‘c‘ì, ì dwZDestConst, ð“]’— æ Zfobftf@, ÉŽg—p, μ, Ä AZfobftf@ Efuf fbfN“]’—, ðŽÄ s, ·, é B“¯ \‘c‘ì, ì dwZBufferOpCode f f“fo, ð“]’— æ Zfobftf@ EfIfyfR [fh, Æ, ·, é B

**DDBLT\_ZBUFFERDESTOVERRIDE**

**DDBLTFX** \‘c‘ì, ì lpDDSZBufferDest, ð“]’— æ Zfobftf@, ÉŽg—p, μ, Ä AZfobftf@ Efuf fbfN“]’—, ðŽÄ s, ·, é B“¯ \‘c‘ì, ì dwZBufferOpCode f f“fo, ð“]’— æ Zfobftf@ EfIfyfR [fh, Æ, ·, é B

**DDBLT\_ZBUFFERSRCCONSTOVERRIDE**

**DDBLTFX** \‘c‘ì, ì dwZSrcConst, ð“]’— CE³Zfobftf@, ÉŽg—p, μ, Ä AZfobftf@ Efuf fbfN“]’—, ðŽÄ s, ·, é B“¯ \‘c‘ì, ì dwZBufferOpCode f f“fo, ð“]’— CE³Zfobftf@ EfIfyfR [fh, Æ, ·, é B

**DDBLT\_ZBUFFERSRCOVERRIDE**

**DDBLTFX** \‘c‘ì, ì lpDDSZBufferSrc, ð“]’— CE³Zfobftf@, ÉŽg—p, μ, Ä AZfobftf@ Efuf fbfN“]’—, ðŽÄ s, ·, é B“¯ \‘c‘ì, ì dwZBufferOpCode f f“fo, ð“]’— CE³Zfobftf@ EfIfyfR [fh, Æ, ·, é B

**lpDDBlTfX**

*‘Ç%oÄ,³, é, ½fuf fbfN“]’— CEø%Ê, ðŽw’è, ·, é **DDBLTFX** \‘c‘ì, ì f|fCf“f^ B*



**DDBLTFX\_MIRRORUPDOWN**

*Ž<sup>2</sup> ä, ÄfT [ftFFX,ð%õñ“],.é B,±,ìfuf fbfN“]—,ÍfT [ftFFX,ð ä,©,ç%°,É“ŽË,.,é B*

**DDBLTFX\_NOTEARING**

*,±,ìfuf fbfN“]—,É,“,ÄfefBfAfŠf“fO,ð”ð,–,é,æ,µ,É l—¶,.,é B*

**DDBLTFX\_ROTATE180**

*,±,ìfuf fbfN“]—,ìŠŎ,ÉfT [ftFFX,ðŽžCEv%õñ,è,Ä180“x%õñ“],<sup>3,1</sup>,é B*

**DDBLTFX\_ROTATE270**

*,±,ìfuf fbfN“]—,ìŠŎ,ÉfT [ftFFX,ðŽžCEv%õñ,è,Ä270“x%õñ“],<sup>3,1</sup>,é B*

**DDBLTFX\_ROTATE90**

*,±,ìfuf fbfN“]—,ìŠŎ,ÉfT [ftFFX,ðŽžCEv%õñ,è,Ä90“x%õñ“],<sup>3,1</sup>,é B*

**DDBLTFX\_ZBUFFERBASEDEST**

*,±,ìfuf fbfN“]—,ìŠŎ,É A”äŠr,.;é’O,ìfuf fbfN“]—CE<sup>3</sup>,š’l,.,æ,Ñ,šfuf fbfN“]—  
.,é’fuf fbfN“]— æ,š’l,ì,»,è,¼,é,ÉdwZBufferBaseDest f f“fo,ð%Ä,!,é B*

**DDBLTFX\_ZBUFFERRANGE**

*,±,ìfuf fbfN“]—,ìŠŎ,Éfuf fbfN“]—  
CE<sup>3</sup>fT [ftFFX,©,ç; »µ,½frfbfg,ÌCEÀŠE,ðŽw’è,.,é”ÍÍ’l,Æ,µ,ÄdwZBufferLow,.,æ,Ñ  
dwZBufferHigh f f“fo,ðŽg—p,.,é B*

**dwROP**

*Win32 f%ofXf^ ^— B*

**dwDDROP**

*DirectDraw f%ofXf^ ^— B*

**dwRotationAngle**

*fuf fbfN“]—,ì%õñ“]Šp“x B*

**dwZBufferOpCode**

*Zfobftf@”äŠr B*

**dwZBufferLow**

*Zfobftf@,ì Ä’áCEÀŠE B*

**dwZBufferHigh**

*Zfobftf@,ì Ä ,CEÀŠE B*

**dwZBufferBaseDest**

*Zfobftf@,ìfuf fbfN“]— æŠ’è’l B*

**dwZDestConstBitDepth**

*fuf fbfN“]— æ,š’è ”,ìfrfbfg [“x B*

**dwZDestConst**

*fuf fbfN“]— æZfobftf@,Æ,µ,ÄŽg—p,<sup>3</sup>,é,é’è ” B*

**lpDDSZBufferDest**

*fuf fbfN“]— æZfobftf@,Æ,µ,ÄŽg—p,<sup>3</sup>,é,é’fT [ftFFX B*

**dwZSrcConstBitDepth**

*fuf fbfN“]—CE<sup>3</sup>,š’è ”,ìfrfbfg [“x B*

**dwZSrcConst**

*fuf fbfN“]—CE<sup>3</sup>Zfobftf@,Æ,µ,ÄŽg—p,<sup>3</sup>,é,é’è ” B*

**DDSZBufferSrc**

*fuf fbfN“]—CE<sup>3</sup>Zfobftf@,Æ,µ,ÄŽg—p,<sup>3</sup>,é,é’fT [ftFFX B*

**dwAlphaEdgeBlendBitDepth**

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

**dwAlphaEdgeBlend**

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

**dwReserved**

*«—,ì,½,ß,É—\—ñ,<sup>3</sup>,é,Ä,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

**lpDDSAlphaDest**

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

**dwAlphaSrcConstBitDepth**

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

**dwAlphaSrcConst**

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

**lpDDSAlphaSrc**

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

**dwFillColor**

DDBLT\_COLORFILL ,aŽw’è,³,ê,éŽŽ AfT [ftFfX,ð•â [.,é,½,ß,ÉŽg—p,³,ê,é F,ìŽw’è B,±,Ì’l,Í  
fT [ftFfX Ef^fCfv,ÉˆË’¶,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 [ftFfX 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    dwSVBCKeysCaps;
    DWORD    dwSVBFXCaps;
    DWORD    dwSVBRops[DD_ROP_SPACE];
    DWORD    dwVSBCaps;
    DWORD    dwVSBCKeysCaps;
    DWORD    dwVSBFXCaps;
    DWORD    dwVSBRops[DD_ROP_SPACE];
    DWORD    dwSSBCaps;
    DWORD    dwSSBCKeysCaps;

    DWORD    dwSSBCFXCaps;
    DWORD    dwSSBRops[DD_ROP_SPACE];
    DWORD    dwReserved4;
    DWORD    dwReserved5;
    DWORD    dwReserved6;
} DDSCAPS, FAR* LPDDSCAPS;
```

DirectDrawIfufWfFfNfg,©,ç“¾,ç,ê,½fn [fhEfFfA”—Í,ð\,· B ,±,Ì \‘ç‘Í,Í,±,ÌfRf“fefLfXfg,Á,Ç,ñ,È  
DirectDrawSurface fIfufWfFfNfg,ð ì ¬,;é,±,Æ,ª,Á,«,é,©L q,;é **DDSCAPS** \‘ç‘Í,ðŠÛ,ñ,Á,ç,é B ,µ,©,µ“~Žž,É,±  
,ê,ç,ì”—Í,É,æ,Á,ÁL q,³,ê,½fT [ftfFfX,Ì,·,×,Á,ð ì,é,±,Æ,Í\*s%Á”\,È%Á”\ «,à, ,é B ,±,Ì \‘ç‘Í,Í

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

**dwSize**

\`c`ì,ì`â,«,³ B ,±,ìf f“fo,Í \`c`ì,`aŽg,í,ê,é`O,É Ý`è,³,ê,È,,Á,Í,È,ç,È,ç B

**dwCaps**

fhf%ofCfo“Á`è”\—Í,ð, ,ç,í,·ftf%ofO B

**DDCAPS\_3D**

ffBfXfvfCfC Efn [fhfEfFfA,³,R,cfAfNfZf%ofC [fVf±f“,ðŽ ,Á,Ä,ç,é,±,Æ,ð·,· B

**DDCAPS\_ALIGNBOUNDARYDEST**

DirectDraw,ìfuf fbfN“]—C³·éCÈ,ì À·W,Í A **dwAlignBoundaryDest**  
,ì”{ ”,Á, ,é ê ±,ì,Ý,ðfTf| [fg,·,é,±,Æ,ð·,· B

**DDCAPS\_ALIGNBOUNDARYSRC**

DirectDraw,ìfuf fbfN“]—C³·éCÈ,ì À·W,Í A **dwAlignBoundarySrc**,ì”{ ”,Á, ,é ê ±,ì,Ý,ðfTf|  
[fg,·,é,±,Æ,ð·,· B

**DDCAPS\_ALIGNSIZEDEST**

DirectDraw ,³ofCfG`P`Ê,Á,Ì,~Ž·ûCÛ,ì`â,«,³,³**dwAlignSizeDest**,ì”{ ”,Á, ,é ê ±,ìfuf fbfN“]—  
C³·éCÈ,¾,¯,ðfTf| [fg,·,é,±,Æ,ð·,· B

**DDCAPS\_ALIGNSIZESRC**

DirectDraw ,³ofCfG`P`Ê,Á,Ì,~·ûCÛ,ì`â,«,³,³**dwAlignSizeSrc**,ì”{ ”,Á, ,é ê ±,ìfuf fbfN“]—  
C³·éCÈ,¾,¯,ðfTf| [fg,·,é,±,Æ,ð·,· B

**DDCAPS\_ALIGNSTRIDE**

DirectDraw ,³**dwAlignStrideAlign** `l,Æ“™,µ,çfXfgf%ofCfh\_EfAf%ofCf“f f“fg,ðŽ ,Á,Ä,ç  
,éffBfXfvfCfC Ef f, fŠ Eft [ftfX,ð ì -,·,é,±,Æ,ð·,· B

**DDCAPS\_ALPHA**

fuf fbfN“]—`€ ì,ŠÔ AfBfXfvfCfC Efn [fhfEfFfA,³Af<ftf@\_Ef`fff|fç,ðfTf|  
[fg,·,é,±,Æ,ð·,· B

**DDCAPS\_BANKSWITCHED**

ffBfXfvfCfC Efn [fhfEfFfA,³of“fN Ø,è`Ö,ì,Á, ,è AfBfXfvfCfC Ef f, fŠ,ìf%of“f\_fç  
EfAfNfZfX,³ñ ì,É`x,ç%Å”\ «,³, ,é,±,Æ,ð·,· B

**DDCAPS\_BLT**

ffBfXfvfCfC Efn [fhfEfFfA,ìfuf fbfN“]—`€ ì,³,Á,«,é,±,Æ,ð·,· B

**DDCAPS\_BLTCOLORFILL**

ffBfXfvfCfC Efn [fhfEfFfA,³fuf fbfN“]—,ÁJf% [ EftBfç,³,Á,«,é,±,Æ,ð·,· B

**DDCAPS\_BLTDEPTHFILL**

ffBfXfvfCfC Efn [fhfEfFfA,³fuf fbfN“]—,ÁZfobftf@ [“x·â [,³,Á,«,é,±,Æ,ð·,· B

**DDCAPS\_BLTFOURCC**

ffBfXfvfCfC Efn [fhfEfFfA,³fuf fbfN“]—,Á\_FóŠÔ·ìŠ,³,Á,«,é,±,Æ,ð·,· B

**DDCAPS\_BLTQUEUE**

ffBfXfvfCfC Efn [fhfEfFfA,³ñ“Šúfuf fbfN“]—,³,Á,«,é,±,Æ,ð·,· B

**DDCAPS\_BLTSTRETCH**

fuf fbfN“]—`€ ì,Á AfBfXfvfCfC Efn [fhfEfFfA,³ L·,Á,«,é,±,Æ,ð·,· B

**DDCAPS\_CANBLTSYSTEMEM**

ffBfXfvfCfC Efn [fhfEfFfA,³VfXfefç Ef f, fŠ,É, ,é,ç  
,ìVfXfefç Ef f, fŠ,ç,çfuf fbfN“]—,Á,«,é,±,Æ,ð·,· B

**DDCAPS\_CANCLIP**

ffBfXfvfCfC Efn [fhfEfFfA,³fuf fbfN“]—,ÁNfŠfbsf“fo,Á,«,é,±,Æ,ð·,· B

**DDCAPS\_CANCLIPSTRETCHED**

ffBfXfvfCfC Efn [fhfEfFfA,³ A L·fuf fbfN“]—`†,ÉfNfŠfbsf“fo,Á,«,é,±,Æ,ð·,· B

**DDCAPS\_COLORKEY**

fI [fo [çfç,Û,½,ìfuf fbfN“]—`€ ì,ì,ç,,è,ç,ÁJf% [ EfL [,ì,ç,,Á,ç,ìC`Ž,ðfTf|  
[fg,·,é B“Á`è,ìJf% [ EfL [”\—ì îñ,ì **dwCKeyCaps** f f“fo,É, ,é B



F<óŠŌ,É,æ,é“§%ßŒ^fuf fbfN“’—,ðfTf| [fg,·,é B F<óŠŌ,ÍYUV F,lfuf fbfN“’—  
æfT [ftfFfX,Á’uŠ·%oÁ”\,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,Á’uŠ·%oÁ”\,Èfrfbfg,ðŽ],· B

**DDCKEYCAPS\_DESTOVERLAY**

fJf%o [ EfL [fCf“fO,É,æ,éfi [fo [fŒfC,ðfTf| [fg,·,é BfJf%o [ EfL [,ÍRGB  
F,Áfi [fo [fŒfC,³,è,éfuf fbfN“’— æfT [ftfFfX,Á’uŠ·%oÁ”\,Èfrfbfg B

**DDCKEYCAPS\_DESTOVERLAYCLRSAPCE**

RGB F,lfuf fbfN“’— æfJf%o [ EfL [,Æ,µ,Ä F<óŠŌ,ðfTf| [fg,·,é B

**DDCKEYCAPS\_DESTOVERLAYCLRSAPCEYUV**

YUV F,lfuf fbfN“’— æfJf%o [ EfL [,Æ,µ,Ä F<óŠŌ,ðfTf| [fg,·,é B

**DDCKEYCAPS\_DESTOVERLAYONEACTIVE**

%oÄŽ< ó’Ō,lfI [fo [fŒfC EfT [ftfFfX,É A,Đ,Æ,Á,¾,¯,ì—LŒø,Èfuf fbfN“’—  
æfJf%o [ EfL [,ðfTf| [fg,·,é B

**DDCKEYCAPS\_DESTOVERLAYYUV**

fJf%o [ EfL [fCf“fO,É,æ,éfi [fo [fŒfC,ðfTf| [fg,·,é BfJf%o [ EfL [,Í  
YUV F,Áfi [fo [fŒfC,³,è,éfuf fbfN“’— æfT [ftfFfX,Á’uŠ·%oÁ”\,Èfrfbfg B

**DDCKEYCAPS\_NOCOSTOVERLAY**

fi [fo [fŒfC,ÁfJf%o [ EfL [,ðŽg—p,·,é,±,Æ,É,î,µ,Ä ^ — ‘~“x,É%oe<ç,ª,È,Œ,±,Æ,ð·,· B

**DDCKEYCAPS\_SRCBLT**

RGB FfT [ftfFfX,lfuf fbfN“’—Œ³fJf%o [ EfL [,É,æ,é“§%ßŒ^fuf fbfN“’—,ðfTf|  
[fg,·,é B

**DDCKEYCAPS\_SRCBLTCLRSAPCE**

RGB FfT [ftfFfX,lfuf fbfN“’—Œ³ F<óŠŌ,É,æ,é“§%ßŒ^fuf fbfN“’—,ðfTf| [fg,·,é B

**DDCKEYCAPS\_SRCBLTCLRSAPCEYUV**

YUV FfT [ftfFfX,lfuf fbfN“’—Œ³ F<óŠŌ,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\_SRCOVERLAYCLRSAPCE**

RGB Ffi [fo [fŒfC EfT [ftfFfX,Áfuf fbfN“’—  
Œ³fJf%o [ EfL [,Æ,µ,Ä F<óŠŌ,ðŽg,Á,½fi [fo [fŒfC,ðfTf| [fg,·,é B

**DDCKEYCAPS\_SRCOVERLAYCLRSAPCEYUV**

YUV Ffi [fo [fŒfC EfT [ftfFfX,Áfuf fbfN“’—Œ³fJf%o [ EfL [,Æ,µ,Ä F<óŠŌ,ðfTf|  
[fg,·,é B

**DDCKEYCAPS\_SRCOVERLAYONEACTIVE**

%oÄŽ< ó’Ō,lfI [fo [fŒfC EfT [ftfFfX,É A,Đ,Æ,Á,¾,¯,ì—LŒø,Èfuf fbfN“’—  
Œ³fJf%o [ EfL [,ðfTf| [fg,·,é B

**DDCKEYCAPS\_SRCOVERLAYYUV**

YUV Ffi [fo [fŒfC EfT [ftfFfX,Áfuf 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‘á,·,éfefNfjfbfN,Á,Í,È,-  
Afuf fbfN“’—‘€ ì,İŠŌ,ÉŠg‘á,µ AfT [ftfFfX,ð k ~,·,é%o%ŽZ ^ — ,ðŽg—p,·,é B,±  
,è,í A,™Z² i ,¼,É j,É%o^,Á,Ä s,í,è,é B

**DDFXCAPS\_BLTARITHSTRETCHYN**

fsfNfZf<,đ,Q æ,É,µ,ĀŠg'ā,·,éfefNfjfbfN,Ā,Ī,È,-  
Afuf fbfN["]—'€ ì,ĪŠŌ,ÉŠg'ā,µ,Ā AfT [ftfFfX,đ k ¬,·,é%ŽZ ^— ,đŽg—p,·,é B,±  
,ê,Ī,™Ž<sup>2</sup> i ,¼,É j,É%Ā,Ā s,í,ê A ® ""{ i'1, '2, Ī,æ,µ,É j,ĀŠg'ā,·,é,½,ß,É"® ì,·,é B

**DDFXCAPS\_BLMIRRORLEFTRIGHT**

fuf fbfN["]—'€ ì†,É ¶%E"½["],·,é,±,Æ,đfTf| [fg,·,é B

**DDFXCAPS\_BLMIRRORUPDOWN**

fuf fbfN["]—'€ ì†,É ã%""½["],·,é,±,Æ,đfTf| [fg,·,é B

**DDFXCAPS\_BLTROTATION**

fuf fbfN["]—'€ ì†,É"ĀÓ,Ī%ñ["],đfTf| [fg,·,é B

**DDFXCAPS\_BLTROTATION90**

fuf fbfN["]—'€ ì†,É,X,O"x,Ī%ñ["],đfTf| [fg,·,é B

**DDFXCAPS\_BLTSHRINKX**

,ž<sup>2</sup> i ...½ j,É%Ā,Ā AfT [ftfFfX,đ"ĀÓ,É k ¬,·,é,±,Æ,đfTf| [fg,·,é B,±  
,Īftf%oF,O,Īfuf fbfN["]—'€ ì,Ī,Ý,É—LÆø,Ā, ,é B

**DDFXCAPS\_BLTSHRINKXN**

,ž<sup>2</sup> i ...½ j,É%Ā,Ā AfT [ftfFfX,đ ® "ª,Īê i'1/2 A'1/3,Ī,æ,µ,É j,Ā k ¬,·,é,±,Æ,đfTf|  
[fg,·,é B,±,Īftf%oF,O,Īfuf fbfN["]—'€ ì,Ī,Ý,É—LÆø,Ā, ,é B

**DDFXCAPS\_BLTSHRINKY**

,™Ž<sup>2</sup> i ,¼ j,É%Ā,Ā AfT [ftfFfX,đ"ĀÓ,É k ¬,·,é,±,Æ,đfTf| [fg,·,é B,±  
,Īftf%oF,O,Īfuf fbfN["]—'€ ì,Ī,Ý,É—LÆø,Ā, ,é B

**DDFXCAPS\_BLTSHRINKYN**

,™Ž<sup>2</sup> i ,¼ j,É%Ā,Ā AfT [ftfFfX,đ ® "ª,Īê i'1/2 A'1/3,Ī,æ,µ,É j,Ā k ¬,·,é,±,Æ,đfTf|  
[fg,·,é B,±,Īftf%oF,O,Īfuf fbfN["]—'€ ì,Ī,Ý,É—LÆø,Ā, ,é B

**DDFXCAPS\_BLTSTRETCHX**

,ž<sup>2</sup> i ...½ j,É%Ā,Ā AfT [ftfFfX,đ"ĀÓ,ÉŠg'ā,·,é,±,Æ,đfTf| [fg,·,é B,±  
,Īftf%oF,O,Īfuf fbfN["]—'€ ì,Ī,Ý,É—LÆø,Ā, ,é B

**DDFXCAPS\_BLTSTRETCHXN**

,ž<sup>2</sup> i ...½ j,É%Ā,Ā AfT [ftfFfX,đ ® ""{ i'1, '2, Ī,æ,µ,É j,ĀŠg'ā,·,é,±,Æ,đfTf|  
[fg,·,é B,±,Īftf%oF,O,Īfuf fbfN["]—'€ ì,Ī,Ý,É—LÆø,Ā, ,é B

**DDFXCAPS\_BLTSTRETCHY**

,™Ž<sup>2</sup> i ,¼ j,É%Ā,Ā AfT [ftfFfX,đ"ĀÓ,ÉŠg'ā,·,é,±,Æ,đfTf| [fg,·,é B,±  
,Īftf%oF,O,Īfuf fbfN["]—'€ ì,Ī,Ý,É—LÆø,Ā, ,é B

**DDFXCAPS\_BLTSTRETCHYN**

,™Ž<sup>2</sup> i ,¼ j,É%Ā,Ā AfT [ftfFfX,Ī ® ""{ i'1, '2, Ī,æ,µ,É j,ĀŠg'ā,·,é,±,Æ,đfTf|  
[fg,·,é B,±,Īftf%oF,O,Īfuf fbfN["]—'€ ì,Ī,Ý,É—LÆø,Ā, ,é B

**DDFXCAPS\_OVERLAYARITHSTRETCHY**

fsfNfZf<,đ,Q æ,É,µ,ĀŠg'ā,·,éfefNfjfbfN,Ā,Ī,È,-  
Afuf fbfN["]—'€ ì,ĪŠŌ,ÉŠg'ā,µ AfT [ftfFfX,đ k ¬,·,é%ŽZ ^— ,đŽg—  
p,·,é B,™Ž<sup>2</sup> i ,¼ j,É%Ā,Ā s,í,ê,é B

**DDFXCAPS\_OVERLAYARITHSTRETCHYN**

fsfNfZf<,đ,Q æ,É,µ,ĀŠg'ā,·,éfefNfjfbfN,Ā,Ī,È,-  
Afuf fbfN["]—'€ ì,ĪŠŌ,ÉŠg'ā,µ AfT [ftfFfX,đ k ¬,·,é%ŽZ ^— ,đŽg—  
p,·,é B,™Ž<sup>2</sup> i ,¼ j,É%Ā,Ā s,í,ê A ® ""{ i'1, '2, Ī,æ,µ,É j,ĪŠg'ā, s,í,ê,é B

**DDFXCAPS\_OVERLAYMIRRORLEFTRIGHT**

¶%E"½["]fI [fo [fÆfC,đfTf| [fg,·,é B

**DDFXCAPS\_OVERLAYMIRRORUPDOWN**

ã%""½["]fI [fo [fÆfC,đfTf| [fg,·,é B

**DDFXCAPS\_OVERLAYSHRINKX**

,ž<sup>2</sup> i ...½ j,É%Ā,Ā AfT [ftfFfX,đ"ĀÓ,É k ¬,·,é,±,Æ,đfTf| [fg,·,é B,±,Īftf%oF,O,Ī  
DDSCAPS\_OVERLAY fT [ftfFfX,Ī,Ý,É—LÆø,Ā, ,é B,±,Īftf%oF,O,ĪfT [ftfFfX,Ī"¬  
Ī,¾,¬,đŽ,µ A k ¬,ª%Ā"Ī,Ā, ,é,±,Æ,đª,³,È,¢ B

**DDFXCAPS\_OVERLAYSHRINKXN**

,~Ž2 i ...½ j,É%o^,Á,ÄfT [ftFfX,ð ® ""{ i'1, '2, ì,æ,ð,É j,Ä k -,.,é,±,Æ,ðfTf| [fg,.,é B ,±,Ïftf%oFO,Í DDSCAPS\_OVERLAY fT [ftFfX,Ì,Ý,É—LÆø,Ä, ,é B ,±,Ïftf%oFO,ÍfT [ftFfX,Ì"~—Í,¾,¯,ðŽ',µ A k -,.,%oÄ"~,Ä, ,é,±,Æ,ð,³,È,ç B

**DDFXCAPS\_OVERLAYSHRINKY**

,™Ž2 i ,¼ j,É%o^,Á,ÄfT [ftFfX,ð"Ó,É k -,.,é,±,Æ,ðfTf| [fg,.,é B ,±,Ïftf%oFO,Í DDSCAPS\_OVERLAY fT [ftFfX,Ì,Ý,É—LÆø,Ä, ,é B ,±,Ïftf%oFO,ÍfT [ftFfX,Ì"~—Í,¾,¯,ðŽ',µ A k -,.,%oÄ"~,Ä, ,é,±,Æ,ð,³,È,ç B

**DDFXCAPS\_OVERLAYSHRINKYN**

,™Ž2 i ,¼ j,É%o^,Á,ÄfT [ftFfX,Ì ® ""{ i'1/2 A'1/3, ì,æ,ð,É j,Ä k -,.,é,±,Æ,ðfTf| [fg,.,é B ,±,Ïftf%oFO,Í DDSCAPS\_OVERLAY fT [ftFfX,Ì,Ý,É—LÆø,Ä, ,é B ,±,Ïftf%oFO,ÍfT [ftFfX,Ì"~—Í,¾,¯,ðŽ',µ A k -,.,%oÄ"~,Ä, ,é,±,Æ,ð,³,È,ç B

**DDFXCAPS\_OVERLAYSTRETCHX**

,~Ž2 i ...½ j,É%o^,Á,ÄfT [ftFfX,ð"Ó,ÉŠg'ä,.,é,±,Æ,ðfTf| [fg,.,é B ,±,Ïftf%oFO,Í DDSCAPS\_OVERLAY fT [ftFfX,Ì,Ý,É—LÆø,Ä, ,é B ,±,Ïftf%oFO,ÍfT [ftFfX,Ì"~—Í,¾,¯,ðŽ',µ A k -,.,%oÄ"~,Ä, ,é,±,Æ,ð,³,È,ç B

**DDFXCAPS\_OVERLAYSTRETCHXN**

,~Ž2 i ...½ j,É%o^,Á,ÄfT [ftFfX,ð ® ""{ i'1, '2, ì,æ,ð,É j,ÄŠg'ä,.,é,±,Æ,ðfTf| [fg,.,é B ,±,Ïftf%oFO,Í DDSCAPS\_OVERLAY fT [ftFfX,Ì,Ý,É—LÆø,Ä, ,é B ,±,Ïftf%oFO,ÍfT [ftFfX,Ì"~—Í,¾,¯,ðŽ',µ A k -,.,%oÄ"~,Ä, ,é,±,Æ,ð,³,È,ç B

**DDFXCAPS\_OVERLAYSTRETCHY**

,™Ž2 i ,¼ j,É%o^,Á,ÄfT [ftFfX,ð"Ó,ÉŠg'ä,.,é,±,Æ,ðfTf| [fg,.,é B ,±,Ïftf%oFO,Í DDSCAPS\_OVERLAY fT [ftFfX,Ì,Ý,É—LÆø,Ä, ,é B ,±,Ïftf%oFO,ÍfT [ftFfX,Ì"~—Í,¾,¯,ðŽ',µ A k -,.,%oÄ"~,Ä, ,é,±,Æ,ð,³,È,ç B

**DDFXCAPS\_OVERLAYSTRETCHYN**

,™Ž2 i ,¼ j,É%o^,Á,ÄfT [ftFfX,Ì ® ""{ i'1, '2, ì,æ,ð,É j,ÄŠg'ä,ðfTf| [fg,.,é B ,±,Ïftf%oFO,Í DDSCAPS\_OVERLAY fT [ftFfX,Ì,Ý,É—LÆø,Ä, ,é B ,±,Ïftf%oFO,ÍfT [ftFfX,Ì"~—Í,¾,¯,ðŽ',µ A k -,.,%oÄ"~,Ä, ,é,±,Æ,ð,³,È,ç B

**dwFXAlphaCaps**

fhf%oCfo"Á'è,ÏfAf<ftf@"~—Í B

**DDFXALPHACAPS\_BLTALPHAEDGEBLEND**

fuf fbfN"']—  
Æ³fJf%o [ EfL [,ÏfT [ftFfX,ÏfGfbfWŽü,è,ÏfAf<ftf@ EfufÆf"ffBf"fo,ðfTf| [fg,.,é Bfuf fbfN"']—'€ ì,½,ß,ÉŽg—p,³,è,é B

**DDFXALPHACAPS\_BLTALPHAPIXELS**

fsfNfZf< EftfH [f}fbfg,ÄfAf<ftf@ îñ,ðfTf| [fg,.,é B fsfNfZf< EftfH [f}fbfg,Ä,ÏfAf<ftf@ îñ,Ïfufbfg ["x,Í,P A,Q A,S A, ,é,ç,Í,W,Ä, ,é B fAf<ftf@'l,Í' %oÄ,.,é,É,Ä,è,Ä"s"š-¾,É,È,é B fAf<ftf@ îñ,Ì ["x,É,©,í,ç,, A,O,³,Ä,È,ÉŠ@'S,É"s"š-¾,È'l,Ä, ,é B fuf fbfN"']—'€ ì,½,ß,ÉŽg—p,³,è,é B

**DDFXALPHACAPS\_BLTALPHAPIXELSNEG**

fsfNfZf< EftfH [f}fbfg,ÄfAf<ftf@ îñ,ðfTf| [fg,.,é B fsfNfZf< EftfH [f}fbfg,Ä,ÏfAf<ftf@ îñ,Ïfufbfg ["x,Í,P A,Q A,S A, ,é,ç,Í,W,Ä, ,é B fAf<ftf@'l,Í' %oÄ,.,é,É,Ä,è,Ä"s"š-¾,É,È,é B fAf<ftf@ îñ,Ì ["x,É,©,í,ç,, A,O,³,Ä,È,ÉŠ@'S,É"s"š-¾,È'l,Ä, ,é B ,±,Ïftf%oFO,Í DDSCAPS\_ALPHA,³fZfbfg,³,è,½ è ‡,ÉÆÄ,èŽg,±,±,Æ,³,Ä,«,é B fuf fbfN"']—'€ ì,½,ß,ÉŽg—p,³,è,é B

**DDFXALPHACAPS\_BLTALPHASURFACES**

fAf<ftf@ è—pfT [ftFfX,ðfTf| [fg,.,é BfAf<ftf@ è— pfT [ftFfX,Ïfufbfg ["x,Í,P A,Q A,S A, ,é,ç,Í,W,Ä, ,è"¾,é B fAf<ftf@'l,Í' %oÄ,.,é,É,Ä,è,Ä"s"š-¾,É,È,é B fAf<ftf@ îñ,Ì ["x,É,©,í,ç,, A,O,³,Ä,È,ÉŠ@'S,É"s"š-¾,È'l,Ä, ,é B fuf fbfN"']—'€ ì,½,ß,ÉŽg—p,³,è,é B

**DDFXALPHACAPS\_BLTALPHASURFACESNEG**

fAf<ftf@ Ef`ffflf<,<sup>a</sup> AfAf<ftf@'l,ì' %oÁ,É,Â,ê,Ä“§-¾,É,È,é,±,Æ,ð·,· B  
fAf<ftf@ Ef`ffflf< 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,<sup>a</sup>,Ä,Ë,ËŠ@‘S,É·s“§-¾,È'l,Ä, ,é B,±,ìftf%ofo,ÍDDCAPS\_  
ALPHASURFACES,<sup>a</sup>fZfbfg,<sup>3</sup>,é,½ ê ‡,ÉCEÀ,èfZfbfg,·,é,±,Æ,<sup>a</sup>,Ä,«<sup>a</sup>,é B  
fuf fbfN“]’—€ ì,½,ß,ÉŽg—p,<sup>3</sup>,é,é B

**DDFXALPHACAPS\_OVERLAYALPHAEDGEBLEND**

fuf fbfN“]’—  
€³Jf%o [ Efl [,ìfT [ftfFfX,ìfGfbfWŽü,è,ìfAf<ftf@ Efuf€f“ffBf“fo,ðfTf]  
[fg,·,é BfI [fo [f€fC,ì,½,ß,ÉŽg—p,<sup>3</sup>,é,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,<sup>a</sup>,Ä,Ë,ËŠ@‘S,É“§-¾,È'l,Ä, ,é B fI [fo [f€fC,ì,½,ß,ÉŽg—  
p,<sup>3</sup>,é,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·s“§-¾,É,È,é B  
fAf<ftf@ î·ñ,ì [“x,É,©,í,ç,, A,O,<sup>a</sup>,Ä,Ë,ËŠ@‘S,É·s“§-¾,È'l,Ä, ,é B,±,ìftf%ofo,ÍDDCAPS\_  
ALPHAIXELS,<sup>a</sup>fZfbfg,<sup>3</sup>,é,½ ê ‡,ÉCEÀ,èŽg,±,±,Æ,<sup>a</sup>,Ä,«<sup>a</sup>,é B fI [fo [f€fC,ì,½,ß,ÉŽg—  
p,<sup>3</sup>,é,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,<sup>a</sup>,Ä,Ë,ËŠ@‘S,É“§-¾,È'l,Ä, ,é B fI [fo [f€fC,ì,½,ß,ÉŽg—  
p,<sup>3</sup>,é,é B

**DDFXALPHACAPS\_OVERLAYALPHASURFACESNEG**

fAf<ftf@ Ef`ffflf<,<sup>a</sup> AfAf<ftf@'l,ì' %oÁ,É,Â,ê,Ä“§-¾,É,È,é,±,Æ,ð·,· B  
fAf<ftf@ Ef`ffflf< 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,<sup>a</sup>,Ä,Ë,ËŠ@‘S,É·s“§-¾,È'l,Ä, ,é B,±,ìftf%ofo,ÍDDCAPS\_  
ALPHASURFACES,<sup>a</sup>fZfbfg,<sup>3</sup>,é,½ ê ‡,ÉCEÀ,èfZfbfg,·,é,±,Æ,<sup>a</sup>,Ä,«<sup>a</sup>,é B  
fI [fo [f€fC,ì,½,ß,ÉŽg—p,<sup>3</sup>,é,é B

**dwPalCaps**

fPf€fbfg”\—Í,ð·,·ftf%ofo B

**DDPCAPS\_1BIT**

fCf“fffbfNfX,<sup>a</sup>PfRfbfg,Ä, ,é,±,Æ,ð·,· B fJf%o [ Efe [fuf<,É2,Ä,ì €-Ú,<sup>a</sup>, ,é B

**DDPCAPS\_2BIT**

fCf“fffbfNfX,<sup>a</sup>QfRfbfg,Ä, ,é,±,Æ,ð·,· B fJf%o [ Efe [fuf<,É4,Ä,ì €-Ú,<sup>a</sup>, ,é B

**DDPCAPS\_4BIT**

fCf“fffbfNfX,<sup>a</sup>SfRfbfg,Ä, ,é,±,Æ,ð·,· B fJf%o [ Efe [fuf<,É16,ì €-Ú,<sup>a</sup>, ,é B

**DDPCAPS\_8BIT**

fCf“fffbfNfX,<sup>a</sup>WfRfbfg,Ä, ,é,±,Æ,ð·,· B fJf%o [ Efe [fuf<,É256,ì €-Ú,<sup>a</sup>, ,é B

**DDPCAPS\_8BITENTRIES**

fCf“fffbfNfX,ð,WfRfbfg,ìJf%o [ EfCf“fffbfNfX,ÉŽw`è,·,é B,±  
,ìftfB [f<fh,Í A,½,¾DDPCAPS\_1BIT A DDPCAPS\_2BIT A, ,é,¢,Í DDPCAPS\_4BIT”\—  
Í,Žg,í,è,éŽž,ì,Ý A,·,æ,Ñ-Ú·WfT [ftfFfX,<sup>a</sup>fsfNfZf< i bpp j-^,É,WfRfbfg,Ä, ,é ê ‡,É—  
L€ø,Ä, ,é B,»,è,¼,è,ì F €-Ú,<sup>a</sup>,PfofCfG,Ä, ,è Afuf fbfN“]’— æfT [ftfFfX ä,ì,W bpp  
fPf€fbfg,ìfCf“fffbfNfX,Ä, ,é B

**DDPCAPS\_ALLOW256**

,±,ìfPf€fbfg,<sup>a</sup>256,ì €-Ú,·,×,Ä,ð`è<,Ä,«<sup>a</sup>,é,±,Æ,ðŽ,· B

**DDPCAPS\_PRIMARYSURFACE**

fPf€fbfg,<sup>a</sup>fVf%oCf}fŠ Eft [ftfFfX,ÉfAf^fbf`<sup>3</sup>,é,Ä,¢,é,±,Æ,ð·,· B fPf€fbfg,ì· X,Í A



fuf fbfN“]‘—E³<éE`ì‘â,«³ B

**dwAlignBoundaryDest**

fuf fbfN“]‘— æ<éE`ì À•W,ì’P^Ê B

**dwAlignSizeDest**

fuf fbfN“]‘— æ<éE`ì‘â,«³,ì’P^Ê B

**dwAlignStrideAlign**

fXfgf%ofCfh @—ñ B

**dwRops[DD\_ROP\_SPACE]**

f%ofXf^ ^— ,ìfTf| [fg B

**ddsCaps**

^ê”Ê“I,Ê”\—í,ðŽ,ì. **DDSCAPS** \‘ç‘ì B

**dwMinOverlayStretch** and **dwMaxOverlayStretch**

1000”{,³,ê,é Å ÷ E Å‘âEÀ,ìfI [fCEfCŠg‘âEw ” B,½,Æ,,ì A1.3=1300 B

**dwMinLiveVideoStretch** and **dwMaxLiveVideoStretch**

1000”{,³,ê,é Å ÷ E Å‘âEÀ,ìf%ofCfu EfrffIŠg‘âEw ” B,½,Æ,,ì A1.3=1300 B

**dwMinHwCodecStretch** and **dwMaxHwCodecStretch**

1000”{,³,ê,é Å ÷ E Å‘âEÀ,ìfn [fhfE/FFA Efr [ffbfNŠg‘âEw ” B,½,Æ,,ì A1.3=1300 B

**dwReserved1, dwReserved2, dwReserved3**

«—,ì,½,ß,Ê—\—ñ,³,ê,Å,ç,é B

**dwSVBCaps**

fVfXfef€ Ef f,šš |ffBfXfvfCEfC Ef f,ššfuf fbfN“]‘—,ìfhf%ofCfo”\—í B

**dwSVBCKeyCaps**

fVfXfef€ Ef f,šš |ffBfXfvfCEfC Ef f,ššfuf fbfN“]‘—,ìfhf%ofCfofJf% [ EfL [EYŠ. « B

**dwSVBFXCaps**

fVfXfef€ Ef f,šš |ffBfXfvfCEfC Ef f,ššfuf fbfN“]‘—,ìfhf%ofCfoFXEYŠ. « B

**dwSVBRops[DD\_ROP\_SPACE]**

fVfXfef€ Ef f,šš |ffBfXfvfCEfC Ef f,ššfuf fbfN“]‘—,ìf%ofXf^ ^— fTf| [fg B

**dwVSBCaps**

ffBfXfvfCEfC Ef f,šš |fVfXfef€ Ef f,ššfuf fbfN“]‘—,ìfhf%ofCfo”\—í B

**dwVSBCKeyCaps**

ffBfXfvfCEfC Ef f,šš |fVfXfef€ Ef f,ššfuf fbfN“]‘—,ìfhf%ofCfofJf% [ EfL [EYŠ. « B

**dwVSBFXCaps**

ffBfXfvfCEfC Ef f,šš |fVfXfef€ Ef f,ššfuf fbfN“]‘—,ìfhf%ofCfoFXEYŠ. « B

**dwVSBRops[DD\_ROP\_SPACE]**

ffBfXfvfCEfC Ef f,šš |fVfXfef€ Ef f,ššfuf fbfN“]‘—,ìf%ofXf^ ^— fTf| [fg B

**dwSSBCaps**

fVfXfef€ Ef f,šš |fVfXfef€ Ef f,ššfuf fbfN“]‘—,ìfhf%ofCfo”\—í B

**dwSSBCKeyCaps**

fVfXfef€ Ef f,šš |fVfXfef€ Ef f,ššfuf fbfN“]‘—,ìfhf%ofCfofJf% [ EfL [EYŠ. « B

**wSSBCFXCaps**

fVfXfef€ Ef f,šš |fVfXfef€ Ef f,ššfuf fbfN“]‘—,ìfhf%ofCfoFXEYŠ. « B

**dwSSBRops[DD\_ROP\_SPACE]**

fVfXfef€ Ef f,šš |fVfXfef€ Ef f,ššfuf fbfN“]‘—,ìf%ofXf^ ^— fTf| [fg B

**dwReserved4, dwReserved5, dwReserved6**

«—,ì,½,ß,Ê—\—ñ,³,ê,Å,ç,é 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,éfl [fofŒfC îñ B*

**dwSize**

*‘ç‘ì,ì‘â,«,³ B ,±,ìf f“fo,Í ‘ç‘ì,ªŽg,í,ê,é‘O,É‘l,ª Ý’è,³,ê,È,¯,ê,Î,È,ç,È,ç B*

**dwAlphaEdgeBlendBitDepth**

*fAf<ftf@ EfGfbfw 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,·,éuf fbfN“]‘— æfJf%o [ EfL [ B*

**dckSrcColorkey**

*—D æ,·,éuf fbfN“]‘—Œ³fJf%o [ EfL [ B*

**dwDDFX**

*fI [fo [fŒfC fXftf%oO B*

**DDOVERFX\_ARITHSTRETCHY**

*,à,µŠg‘â,·,é,È,ç A,™Ž²,É%ˆ,Á,Ä%‰ŽŽŠg‘â,ðŽg—p,·,é B*

**DDOVERFX\_MIRRORLEFTRIGHT**

¶%E”½“],đ s,□ B

**DDOVERFX\_MIRRORUPDOWN**

ã%o”½“],đ s,□ B

**dwFlags**

,±,Íf f“fo,ÍE» ÝŽg,í,ê,Ä,ç,È,ç B,O,³fZfbfg,³,ê,È,,Ä,Í,È,ç,È,ç 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;
```

**dwSize**  
The size of the DDPIXELFORMAT structure, in bytes. It must be equal to the value of the DDPIXELFORMAT.dwSize member.

**dwFlags**  
The flags that describe the pixel format. The flags are defined in the DDPIXELFORMAT.dwFlags member.

**DDPF\_ALPHA**  
The pixel format is an alpha format. The alpha format is a format that has an alpha channel. The alpha channel is a channel that is used to control the transparency of the pixels. The alpha channel is a channel that is used to control the transparency of the pixels.

**DDPF\_ALPHAPIXELS**  
The pixel format is an alpha pixel format. The alpha pixel format is a format that has an alpha channel and a color channel. The alpha channel is a channel that is used to control the transparency of the pixels. The alpha channel is a channel that is used to control the transparency of the pixels.

**DDPF\_COMPRESSED**  
The pixel format is a compressed format. The compressed format is a format that has a compressed color channel. The compressed color channel is a channel that is used to control the transparency of the pixels. The compressed color channel is a channel that is used to control the transparency of the pixels.

**DDPF\_FOURCC**  
The pixel format is a four-CC format. The four-CC format is a format that has four color channels. The four-CC format is a format that has four color channels. The four-CC format is a format that has four color channels.

**DDPF\_PALETTEINDEXED1**

**DDPF\_PALETTEINDEXED2**

**DDPF\_PALETTEINDEXED4**

**DDPF\_PALETTEINDEXED8**

The pixel format is a palette indexed format. The palette indexed format is a format that has a palette. The palette indexed format is a format that has a palette. The palette indexed format is a format that has a palette.

**DDPF\_PALETTEINDEXEDTO8**

$fT [ftfFX, \hat{I}, Pfrfbfg A, Qfrfbfg, , \acute{e}, \text{c}, \hat{I}$   
 $, Sfrfbfg, \hat{I} F, \delta, Wfrfbfg Efpf\text{Efbfg}, \acute{E}fCf \text{“}ffbfNfX, \mu, \hat{A}, \text{c}, \acute{e} B$

**DDPF\_RGB**

$fsNfZf\langle EftfH [f]fbfg \backslash \text{c}^{\hat{I}}, \hat{A}, \hat{I}RGB ff [f^{\wedge}, \hat{I} - L\text{E}\emptyset, \hat{A}, , \acute{e} B$

**DDPF\_RGBTOYUV**

$fT [ftfFX, \hat{I}RGB ff [f^{\wedge}, \delta\acute{Z}\acute{o}, \text{“}\ddot{u}, \acute{e}, \hat{A} A, \rangle, \mu, \hat{A} \text{ ‘}, \langle, \pm, \acute{Y} \hat{\text{—}}, \hat{I}\acute{S}\acute{O}, \acute{E}YUV$   
 $ff [f^{\wedge}, \hat{E} \cdot \hat{I}\acute{S} \cdot, , \acute{e} B \text{ ‘}, \langle, \pm, \acute{Y}, \hat{I}ff [f^{\wedge}, \hat{I}ftfH [f]fbfg, \hat{I}fsfNfZf\langle EftfH [f]$   
 $fbfg \backslash \text{c}^{\hat{I}}, \hat{E}\acute{S}\acute{U}, \ddot{U}, \acute{e}, \acute{e} B DDPF\_RGB ftf\%ofO, \text{A}, \grave{a}, \acute{E}fZfbfg, ^3, \acute{e}, \acute{E}, \text{“}, \acute{e}, \hat{I}, \acute{E}, \text{c}, \acute{e}, \text{c} B$

**DDPF\_YUV**

$fsNfZf\langle EftfH [f]fbfg \backslash \text{c}^{\hat{I}}, \hat{A}, \hat{I}YUV ff [f^{\wedge}, \hat{I} - L\text{E}\emptyset, \hat{A}, , \acute{e} B$

**DDPF\_ZBUFFER**

$Zfofbtf@ \acute{e} - pfT [ftfFX, \hat{I}fsfNfZf\langle EftfH [f]fbfg, \hat{A} \langle L q, ^3, \acute{e}, \acute{e} B$

**dwFourCC**

$FourCC fR [fh B$

**wRGBBitCount**

$fsfNfZf\langle \text{“}, \hat{I}RGB frfbfg i4, 8, 16, 24, , \acute{e}, \text{c}, \hat{I}32 j B$

**dwYUVBitCount**

$fsfNfZf\langle \text{“}, \hat{I}YUV frfbfg iDDBD\_4 A DDBD\_8 A DDBD\_16 A DDBD\_24 A, , \acute{e}, \text{c}, \hat{I}DDBD\_32 j B$

**dwZBufferBitDepth**

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

**dwAlphaBitDepth**

$fAf\langle ftf@ Ef\text{“}ffflf\langle Efrfbfg [“x iDDBD\_1 A DDBD\_2 A DDBD\_4 A, , \acute{e}, \text{c}, \hat{I}DDBD\_8 j B$

**dwRBitMask**

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

**dwYBitMask**

$, xfrfbfg, \hat{I}f\}fXfN B$

**dwGBitMask**

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

**dwUBitMask**

$, tfrfbfg, \hat{I}f\}fXfN B$

**dwBBitMask**

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

**dwVBitMask**

$, ufrfbfg, \hat{I}f\}fXfN B$

**dwRGBAlphaBitMask**

$fAf\langle ftf@ Ef\text{“}ffflf\langle, \hat{I}f\}fXfN B$

**dwYUVAAlphaBitMask**

$fAf\langle ftf@ Ef\text{“}ffflf\langle, \hat{I}f\}fXfN B$

## DDSCAPS

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

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

## dwCaps

```
fT [ftFfX, l" — í, ð•\, · B ^È%° , lftf%oO, l, ð, ç, Ð, Æ, Á, Û, ½, í, , é, ç, í•j ", l'® «, ðŽ , Á B
DDSCAPS_3D
, ±, ê, í%° ÈÉYŠ· «, l, ½, ß, ÉfTf| [fg, ³, ê, Á, ç, é, ^ AfAfVfŠfP [fvf±f“, í'ã, í, è, É A
DDSCAPS_3DDEVICE ftf%oO, ðŽg, ð, ×, «, Á, , é B
```

## DDSCAPS\_3DDEVICE

```
, ±, lT [ftFfX, ^R, c•E» — p, É — ~ — p%Á", È, ±, Æ, ð•\, · B
fAfVfŠfP [fvf±f“, íftfOfCfX, ^K Ø, Èfq [fv, ©, çŠ„, è —
, Á, ç, ê, ½fIfXfNfŠ [f“ Eft [ftFfX, ðŽ , Á, Á, ç, é A“Á'è, lfq [fv, l, Ý, ð•E„ , , é, ±
, Æ, ^, Á, «, é, ±, Æ, ð•Û Ø, ·, é, ½, ß, É A, ±, lftf%oO, ðŽg — p, ·, é, ±, Æ, ^, Á, «, é B , à, µ, ±
, lftf%oO, ^fq [fv, l, ½, ß, ÉfZfbfg, ³, ê, Á, ç, é, È, ç AfT [ftFfX, í, » , lfq [fv, ©, çŠ„, è — , Á, ç, ê, È, ç B
```

## DDSCAPS\_ALLOCONLOAD

```
fT [ftFfX, ^IDirect3DTexture::Load f\fbfh, É, æ, Á, Äf [fh, ³, ê, é, Û, Á AfT [ftFfX, Éf f, f
Š, ðŠ„, è — , Á, È, ç, Æ, ç, ðŽw'è B
```

## DDSCAPS\_ALPHA

```
, ±, lT [ftFfX, ^fAf<ftf@ îñ, ðŠÛ, ñ, Á, ç, é, ±, Æ, ð•\, · B fsfNfZf< EftH [f]fbfg, í, ±
, lT [ftFfX, ^, ½, ¾fAf<ftf@ îñ, , é, ç, lfsfNfZf< Fff [f^ iRGBA , , é, ç, íYUVA, l, æ, ð
, È j, Æ ¬ ±, ³, é, ½fAf<ftf@ îñ, ¾, , ðŠÛ, ñ, Á, ç, é, ©, Ç, ð, ©E"è, ·, é, ½, ß, ÉŽæ“¾, ³, ê, È, -
, Á, l, È, ç, È, ç B
```

## DDSCAPS\_BACKBUFFER

```
, ±, lT [ftFfX, ^fT [ftFfX EftfŠfbfsf“fO \ 'ç'í, lfofbfN Efofbftf@, Á, , é, ±, Æ, ð•\, · B
^è"É, É, ±, lftf%oO, l DDSCAPS_FLIPftf%oO, ^Žg —
p, ³, ê, ½IDirectDraw2::CreateSurface f\fbfh, É, æ, Á, Ä Ý'è, ³, ê, é BDDSCAPS_FRONTBUFFERf
T [ftFfX, æ, è'¼ Ú æ s, ·, éfT [ftFfX, ¾, , ±, lftf%oO, ðŽ , Á, Á, ç, é B '¼, lT [ftFfX, l
DDSCAPS_FLIP ADDSCAPS_BACKBUFFER ftf%oO, l'¶ Y A, ·, æ, Ñ
DDSCAPS_FRONTBUFFER, lE±" @, É, æ, èfofbfN Efofbftf@, Æ, µ, Ä" F'm, ³, ê, é B, ±, l" — í, ^
IDirectDraw2::CreateSurface f\fbfh, É' — , ç, é, é, Æ A“Æ —
§E^, lfofbfN Efofbftf@, ^ ñ, ³, ê, é B, ±, l f\fbfh, ^EÄ, Ñ o, ³, ê, ½Eã A, ±
, lT [ftFfX, l AfT [ftFfX EftfŠfbfsf“fO \ 'ç'í, ðE" ¬, ·, é, ½, ß, Éftf f“fg Efofbftf@ A, ^
, ð, Ð, Æ, Á, lfofbfN Efofbftf@ A, , é, ç, í — ¼•û, Æ, à, ÉfA f^fbf' , ·, é, ±, Æ, ^, Á, «, é B Ú ×, l
IDirectDrawSurface2::AddAttachedSurface, ðŽQ Æ, ·, é, ±, Æ B DirectDraw
, lftfŠfbfsf“fO \ 'ç'í, Á" C^O, l " , lT [ftFfX, ðfTf| [fg, ·, é B
```

## DDSCAPS\_COMPLEX

```
•j ±fT [ftFfX, ^<L q, ³, ê, Á, ç, é, ±, Æ, ð•\, · B
•i ±fT [ftFfX, l, P'È ã, lT [ftFfX, l ñ, ð, à, ½, ç, · B
'Ç%°ÁfT [ftFfX, l f< [fg Eft [ftFfX, ÉfA f^fbf' , ³, ê, é B •j ± \ 'ç'í, l, ½, ¾f< [fg, ð"Šü, ·, é, ±
, Æ, É, æ, Á, Ä"Šü, ·, é, ±, Æ, ^, Á, «, é B
```

## DDSCAPS\_FLIP

```
, ±, lT [ftFfX, ^fT [ftFfXftfŠfbfsf“fO \ 'ç'í, l'ê•", Á, , é, ±, Æ, ð•\, · B , ±, l" — í, ^
IDirectDraw2::CreateSurface f\fbfh, É"n, ³, ê, é, Æ, « A, Ð, Æ, Á, lftf f“fg Efofbftf@, ·, æ, Ñ, Ð,
Æ, Á^È ã, lfofbfN Efofbftf@, ^ ñ, ³, ê, é B DirectDraw
, lftf f“fg Efofbftf@, lDDSCAPS_FRONTBUFFERf\fbfg, ·, æ, Ñftf f“fg Efofbftf@, É —
× Ú, µ, Á, ç, éfT [ftFfX, l DDSCAPS_BACKBUFFERf\fbfg, ðfZfbfg, ·, é B , ±
, lftf%oO, ðŽw'è, ·, é ê ± ADDSURFACEDESC \ 'ç'í, l dwBackBufferCountf f“fo, l , È, -
, Æ, à, P, ÉfZfbfg, µ, È, , é, l, ç, , È, ç B IDirectDraw2::CreateSurface f\fbfh, ðŽg — p, µ, Á
'½ " , lT [ftFfX, ð ì, éŽž A í, ÉDDSCAPS_COMPLEXftf%oO, ðfZfbfg, µ, È, , Á, l, È, ç, È, ç B
```

## DDSCAPS\_FRONTBUFFER

```
, ±, lT [ftFfX, ^fT [ftFfX EftfŠfbfsf“fO \ 'ç'í, lftf f“fg Efofbftf@, Á, , é, ±, Æ, ð•\, · B , ±
, lftf%oO, l'è"É, É DDSCAPS_FLIP" — í, ^fZfbfg, ³, ê, 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,é,é B ,±,ÌfT [ftfFfX,Í  
DDSCAPS\_FLIPftf%ofO,ðŽ ,½,È,ç BftfŠfbfsf“fo \“c`ì,ðE` ¬,·,é,½,ß,É A**IDirectDrawSurfa**  
**ce2::AddAttachedSurface**,ðŽg—p,·,é,±,Æ,É,æ,Á,Ä¼,ÌfobfN Efofbftf@,ÉfAf^fbf`Ä,«é,é B

**DDSCAPS\_HWCODEC**

,±,ÌfT [ftfFfX,ªfn [fhEFeFA,É,æ,Á,Ä³ k%ð æ,³,é,½fXfgfŠ [fE,ðŽ ,Á,±,Æ,ª,Ä,«é,±  
,Æ,ð\,· B

**DDSCAPS\_LIVEVIDEO**

,±,ÌfT [ftfFfX,ªf%ofCfu Efrfffi,ÌŽó,¬Žæ,è,ª%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,è**IDirectDrawSurface2::AddAttachedSurface** f\fbfh,ðŽg—p,·,é,±  
,Æ,Ä¾Ž,“I,É s,í,é,é,© A ,é,ç,Í **IDirectDraw2::CreateSurface** f\fbfh,ðŽg—p,·,é,±,Æ,Ä^Ä—  
Ü“I,É s,í,é,é B ,à,µ,±,Ìftf%ofO,ðfZfbfg,·,é,É,ç A DDSCAPS\_TEXTURE,àfZfbfg,µ,È,-  
,Ä,Í,È,ç,È,ç B

**DDSCAPS\_MODEX**

,±,ÌfT [ftfFfX,ª 320`200 ,é,ç,Í 320`240,Ìf, [fhX10 (f, [fhX) fT [ftfFfX,Ä ,é,±,Æ,ð\,· B

**DDSCAPS\_OFFSCREENPLAIN**

,±  
,ÌfT [ftfFfX,ªfi [fo [fCEfC AfefNfXf`ff AZfobftf@ Aftf f“fg Efofbftf@ AfobfN  
Efofbftf@ A ,é,ç,ÍfAf<ftf@ Eft [ftfFfX,Ì,Ç,é,Ä,à,È,ç AfXfNfŠ [f“ŠO,ÌfT [ftfFfX,Ä ,  
,é,±,Æ,ð\,· BfvfE [f“ Eft [ftfFfX,ðŽ•É,·,é,½,ß,ÉŽg,í,é,é B

**DDSCAPS\_OVERLAY**

,±,ÌfT [ftfFfX,ªfi [fo [fCEfC,Ä ,é,±,Æ,ð\,· B E» Ý Ä %  
,ÌfT [ftfFfX,Éfi [fo [fCEfC,³,é,Ä,ç,é,©,Ç,ª,©,É,æ,Ä,Ä A%ÄŽ<,Ä ,é,© A,»,ª,Ä,È,ç  
,©,ªE^Ü,é B DDSCAPS\_VISIBLE,Í AfT [ftfFfX,ªE» Ýfi [fo [fCEfC,³,é,Ä,ç,é,©,Ç,ª  
,©”»f,·,é,½,ß,ÉŽg,ª,±,Æ,ª,Ä,«é,é B

**DDSCAPS\_OWND**

,±,ÌfT [ftfFfX,ª·ŽžŠÖ,É,í,½,èffofCfX Efrf“fefLXfg i,c,b j,Æ,ÌŠÖ~A,ðŽ ,Ä,Ä ,é,ª,±  
,Æ,ð\,· B

**DDSCAPS\_PALETTE**

,±,ÌffofCfX Efhf%ofCfo,É,æ,èèÓ“I,ÈDirectDrawPalette flfufWfFfNfg,ð ì ¬,µ,Ä,±  
,ÌfT [ftfFfX,ÉfAf^fbf`Ä,«é,±,Æ,ð\,· B

**DDSCAPS\_PRIMARYSURFACE**

,±,ÌfT [ftfFfX,ªfvf%ofCf}fŠ Eft [ftfFfX,Ä ,é,±,Æ,ð\,· B ,±,ÌfT [ftfFfX,ª%ÄŽ<,Ä ,é,±  
,Æ,ðÓ—i,·,é B

**DDSCAPS\_PRIMARYSURFACELEFT**

,±,ÌfT [ftfFfX,ª ¶—p,Ìfvf%ofCf}fŠ Eft [ftfFfX,Ä ,é,±,Æ,ð\,· B ,±  
,ÌfT [ftfFfX,Íf† [fU,Ì ¶—p,ÌÉE©,ª,é,à,Ì,Ì“à—e,ð\,· B ,±,ÌfT [ftfFfX,ª i,ç,é,éŽž A  
DDSCAPS\_PRIMARYSURFACEftf%ofO,ðŽ ,Ä,Ä,ç,éft [ftfFfX,Í A^Ä—Ü,Ì,ª,ç,É%E—Ü—  
p,Ìfvf%ofCf}fŠ Eft [ftfFfX,Æ%ðŽB,³,é,é B

**DDSCAPS\_SYSTEMMEMORY**

,±,ÌfT [ftfFfX Ef f, fŠ,ªfvXfefE 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,ç,¬,È,ç,Æ,ç,ª,±,Æ,Ä,Í,È,ç B

**DDSCAPS\_VIDEOMEMORY**

,±,ÌfT [ftfFfX,ªffBfXfvfCEfC Ef f, fŠ,É¶ Ý,·,é,±,Æ,ð\,· B

**DDSCAPS\_VISIBLE**

,±,ÌfT [ftfFfX,ÉÍ,µ,Ä s,í,é,éİ X,ª“ Ä,É%æ—É,É”½%of,³,é,é,±,Æ,ð\,· B,Ä,È,Éfvf%ofCf}  
fŠ Eft [ftfFfX,ÉfZfbfg,³,é,é B

**DDSCAPS\_WRITEONLY**

fT [ftFfX,ª ‘,«±,Ý ê—p,Æ,È,é,±,Æ,ð\,· B  
fT [ftFfX,©,ç,Ì“Ç,Ý o,µfAfNfZfX,ª“ê”Ê•ÛËì i,f,o j—áŠO,ð ¶ ¬,·,é%Å”\ «,à, ,é B,±  
,ÌfT [ftFfX,©,ç,Ì“Ç,Ý o,µË%Ê,Ì“à—e,Í•Û Ø,³,ê,È,Ç B

**DDSCAPS\_ZBUFFER**

,±,ÌfT [ftFfX,ªZfofbftf@,Å, ,é,±,Æ,ð\,· B Zfofbftf@,Í\Ž,Å,«È,Ç îñ,ðŠÛ,ñ,Å,Ç  
,é BfsfNfZfç,Ì%A—Ê ÁŽ“™,É—~—p,³,ê,éfrfbfg [“x îñ,ðŠÛ,ñ,Å,Ç,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 ddckCKDestBlit;

    DDCOLORKEY ddckCKSrcOverlay;
    DDCOLORKEY ddckCKSrcBlit;
    DDPIXELFORMAT ddpfPixelFormat;
    DDSCAPS ddsCaps;
} DDSURFACEDESC, FAR* LPDDSURFACEDESC;
```

FT [ftFFX,ð ì ¬,;éffXfNfŠfvf^,ð·\· B ,±,Ì \‘ç’ì,ÍIDirectDraw2::CreateSurface f\fbfh,É“n,³,ê,é B  
“K Ø,Èf f“fo,Í,»è,¼,ê,¼f^Cfv,¼T [ftFFX,É,æ,è“Ü,È,é B

### dwSize

\‘ç’ì,ì’á,«,³ B ,±,¼f f“fo,Í \‘ç’ì,ªŽg,í,ê,é‘O,É’l,ª Ý’è,³,ê,È,ª,Á,Í,È,ç,È,ç B

### dwFlags

fIfvfVf±f“ §Eäftf%o B ^È%°,¼ftf%ofo,Ì,¼,ç,Ð,Æ,Â,Ü,½,Í,¼ ”,ì‘® «,ðŽ ,Â B \‘ç’ì,Ì,ç,¼f f“fo,ª—  
LÆø,È,Ì,©Žw’è,·,é B

### DDSD\_ALL

“ü—Í,³,ê,¼,·,×,Ä,¼f f“fo,ª—LÆø,Á, ,é,±,Æ,ð·\· B

### DDSD\_ALPHABITDEPTH

dwAlphaBitDepth f f“fo,ª—LÆø,Á, ,é,±,Æ,ð·\· B

### DDSD\_BACKBUFFERCOUNT

dwBackBufferCount f f“fo,ª—LÆø,Á, ,é,±,Æ,ð·\· B

### DDSD\_CAPS

ddsCaps f f“fo,ª—LÆø,Á, ,é,±,Æ,ð·\· B

### DDSD\_CKDESTBLT

ddckCKDestBlit f f“fo,ª—LÆø,Á, ,é,±,Æ,ð·\· B

### DDSD\_CKDESTOVERLAY

ddckCKDestOverlay f f“fo,ª—LÆø,Á, ,é,±,Æ,ð·\· B

### DDSD\_CKSRCLBLT

ddckCKSrcBlit f f“fo,ª—LÆø,Á, ,é,±,Æ,ð·\· B

### DDSD\_CKSRCOVERLAY

ddckCKSrcOverlay f f“fo,ª—LÆø,Á, ,é,±,Æ,ð·\· B

### DDSD\_HEIGHT

dwHeight f f“fo,ª—LÆø,Á, ,é,±,Æ,ð·\· B

### DDSD\_MIPMAPCOUNT

dwMipMapCount f f“fo,ª—LÆø,Á, ,é,±,Æ,ð·\· B

**DDSD\_PITCH**

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

**DDSD\_PIXELFORMAT**

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

**DDSD\_REFRESHRATE**

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

**DDSD\_WIDTH**

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

**DDSD\_ZBUFFERBITDEPTH**

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

**dwHeight**

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

**dwWidth**

“ü—Í  $fT$   $[ftfFfX, \grave{\text{I}} \cdot$  B

**IPitch**

ŽŸ, ð% $fCf$ “ŠJŽn, Ü, Å, ð—É  $i \cdot \hat{O}^{\text{‘}l, \grave{\text{I}}, \acute{\text{Y}}}$   $j$   $ifsfbf^{\text{‘}}$   $j$  B

**dwBackBufferCount**

$f$   $ofbfN$   $E$   $f$   $ofbftf@, \grave{\text{I}}$  ” B

**dwMipMapCount**

$f \sim f$   $bfvf\}$   $fbvf$   $f\mathbb{E}fxf^{\text{‘}}, \grave{\text{I}}$  ” B

**dwZBufferBitDepth**

$Z$   $f$   $ofbftf@, \grave{\text{I}}$  [ $x$  B

**dwRefreshRate**

$f$   $\$$   $ftf\mathbb{E}fbfVf \dots$  ‘— $x$   $iffBfXfvf\mathbb{E}fC$   $Ef$ ,  $[fh,^aL$   $q,^3, \acute{e}, \acute{e}\acute{z}\acute{z}\acute{g}$ — $p,^3, \acute{e}, \acute{e}$   $j$  B

**dwAlphaBitDepth**

$fA$   $f^{\text{‘}}$   $ftf@$   $E$   $f$   $ofbftf@, \grave{\text{I}}$  [ $x$  B

**dwReserved**

— $\backslash$ — $\grave{\text{n}},^3, \acute{e}, \mathbb{A}, \mathbb{C}, \acute{e}$  B

**lpSurface**

ŠÖ~ $A, \mathbb{A}, \bar{,}, \grave{c}, \acute{e}, \frac{1}{2}fT$   $[ftfFfX$   $Ef$   $f, f$   $\$$ , ð  $fAfhf\mathbb{E}fX$  B

**ddckCKDestOverlay**

$fI$   $[fo$   $[f\mathbb{E}fC$   $\acute{a}, \acute{E}\acute{z}\acute{g}$ — $p, \cdot, \acute{e}fJf\%$   $[$   $EfL$   $[$  B

**ddckCKDestBlit**

$fuf$   $fbfN$ “ $^{\text{‘}}$ —  $\acute{a}, \acute{E}\acute{z}\acute{g}$ — $p, \cdot, \acute{e}fJf\%$   $[$   $EfL$   $[$  B

**ddckCKSrcOverlay**

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

**ddckCKSrcBlit**

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

**ddpfPixelFormat**

$fT$   $[ftfFfX, \grave{\text{I}}f sfNfZf^{\text{‘}}$   $E$   $ftfH$   $[f\}$   $fbfg^{\text{‘}}$   $L$   $q$  B

**ddsCaps**

DirectDraw  $fT$   $[ftfFfX^{\text{‘}}$ —Í B

•Ô¹

fGf%o [ ,Í•%o,Ì¹,É,æ,Á,Ä•³,ê A'g,Ý ‡,í,³,ê,é,±,Æ,Í,È,¢ B ,±,Ïfe [fuf<,Í,·,×,Ä,Ì  
IDirectDraw2 AIDirectDrawSurface2 AIDirectDrawPalette, ,æ,Ñ  
IDirectDrawClipperfCf“f^ [ftFfCfX,Ïf f\fbfh,É,æ,Á,Ä•Ô,³,ê,é%oÄ”\ «,Ì, ,é¹,ðfŠfXfgfAfbfv,µ,Ä,¢  
,é B,» ,ê,¼,ê,Ïf f\fbfh,³•Ô, %oÄ”\ «,Ì, ,éfGf%o [fR [fh,ÏfŠfXfg,Í Af f\fbfh,ÌL q,ðŽQ Æ,·,é,±,Æ B

DD\_OK

—v< ,Í ¬E÷,µŠ@—¹,µ,½ B

DDERR\_ALREADYINITIALIZED

fIfufWfFfNfg,Í,·,Ä,É %oŠú%o»,³,ê,Ä,¢,é B

DDERR\_BLTFASTCANTCLIP

DirectDrawClipper  
fIfufWfFfNfg,³IDirectDrawSurface2::BltFastf f\fbfh,ÏEÄ,Ñ o,µ,É“n,³,ê,é“’—  
E³fT [ftFfX,ÉfAf^fbf,³,ê,Ä,¢,é B

DDERR\_CANNOTATTACHSURFACE

—v< ,³,ê,½fT [ftFfX,É,ÏfT [ftFfX,ðfAf^fbf,Ä,« ,È,¢ B

DDERR\_CANNOTDETACHSURFACE

—v< ,³,ê,½fT [ftFfX,©,çfT [ftFfX,ðff^fbf,Ä,« ,È,¢ B

DDERR\_CANTCREATEDC

Windows,Í,» ,êÈ ä,ì,¢,©,È,éffofCfX Efrf“fefLfxfg i DC j,ð ì,é,±,Æ,³,Ä,« ,È,¢ B

DDERR\_CANTDUPLICATE

fvf%ofCf}fŠ Eft [ftFfX A3DfT [ftFfX A~Ä-Ü“I,É ì,ç,ê,éft [ftFfX,Íi » ,Ä,« ,È,¢ B

DDERR\_CANTLOCKSURFACE

DCI fTf| [fg,È,µ,Äfvf%ofCf}fŠ Eft [ftFfX,Ïf fbfn,ð,µ,æ,µ,Æ,µ,½,½,ß A,±  
,ÏfT [ftFfX,Ö,ÏfAfNfZfX,³,“Ü,³,ê,½ B

DDERR\_CANTPAGELOCK

fT [ftFfX,Ïfy [fW Ef fbfn,³Ž,”s,µ,½ B  
fy [fW Ef fbfn,ÏffBfXfvfEfc Ef f,fŠ Eft [ftFfX, ,é,¢,ÏfGf~f...  
fE [fg,³,ê,½fvf%ofCf}fŠ Eft [ftFfX,Ï ä,Ä,Í“@ ì,µ,È,¢ B

DDERR\_CANTPAGEUNLOCK

fT [ftFfX,Ïfy [fW Ef fbfn%oð æ,³Ž,”s,µ,½ B  
fy [fW Ef fbfn%oð æ,ÏffBfXfvfEfc Ef f,fŠ Eft [ftFfX, ,é,¢,ÏfGf~f...  
fE [fg,³,ê,½fvf%ofCf}fŠ Eft [ftFfX,Ï 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,µ,Æ,µ,½ B

DDERR\_COLORKEYNOTSET

“]‘—E³fJf%o [ Efl [,³Žw’è,³,ê,Ä,¢,È,¢ B

DDERR\_CURRENTLYNOTAVAIL

E» ÝfTf| [fg,³,ê,Ä,¢,È,¢ B

DDERR\_DCALREADYCREATED

ffofCfX Efrf“fefLfxfg(DC),Í,·,Ä,É,±,ÏfT [ftFfX,É,Í,µ•Ô,³,ê,Ä,¢,é B  
^êfT [ftFfX,É,Ä,« ,Ð,Æ,Ä,Ï,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,µŠÖ,É—áŠO,“” ¶,µ,½ B

DDERR\_EXCLUSIVEMODEALREADYSET

,·,Ä,É”r¼“If, [fh,³fZfbfg,³,ê,Ä,¢,é,È,à,©,ì,ç, , Acl’²fEfxf<,ðfZfbfg,µ,æ,µ,Æ,µ,½ B

DDERR\_GENERIC

—c’èc’,ÏfGf%o [ óÔ,Ä, ,é B

**DDERR\_HEIGHTALIGN**

—^,!,ç,ê,½<éC`Ì ,³,Í•K—v,Æ,³,ê,é @—ñ,Ì”{ ”,Á,Í,È,ç B

**DDERR\_HWNDALREADYSET**

DirectDraw<”²fCEfxf< EfEfBf“fhfE Efnf“fhf<,Í,·,Á,É Ý’è,³,ê,Ä,ç  
,é BfEfBf“fhfE Efnf“fhf<,Ífvf fZX,ªT [ftfFX, ,é,ç,Í ¶ ¬,µ,½pfCEfbfg,ð•ÛŽ ,µ,Ä,ç  
,éŠÖ,ÍfŠfZfbfg,Á,«,,È,ç B

**DDERR\_HWNDSUBCLASSED**

DirectDraw<”²fCEfxf< EfEfBf“fhfE Efnf“fhf<,ª fTfufNf%ofX%»»,³,ê,Ä,ç,é,½,ß A  
DirectDraw,Ì ó’Ô,ÌfŠfXfgfA,ªjŽ~³,ê,½ B

**DDERR\_IMPLICITLYCREATED**

^Ä—Û“Í,É ì,ç,ê,½fT [ftfFX,ðfŠfXfgfA,µ,æ,ð,Æ,µ,½ B

**DDERR\_INCOMPATIBLEPRIMARY**

fvf%ofCf}fŠ EfT [ftfFX ì ¬—v< ,ªšù“¶,Ìfvf%ofCf}fŠ EfT [ftfFX,Æ^è’v,µ,Ä,ç,È,ç B

**DDERR\_INVALIDCAPS**

fR [f<fobfNŠÖ ”,É“n,³,ê,½,Ð,Æ,Ä^È ã,Ì”\—Írfbfg,ªs ³,Ä, ,é B

**DDERR\_INVALIDCLIPLIST**

DirectDraw ,Í—^,!,ç,ê,½fNfŠfbfv EfŠfXfg,ðfTf| [fg,µ,È,ç B

**DDERR\_INVALIDDIRECTDRAWGUID**

DirectDrawCreate ŠÖ ”,É“n,³,ê,éOf [fof< Eftfj [fNŽ~•ÈŽq iGUID j,Í—LÆø,È  
DirectDraw fhf%ofCfoŽ~•ÈŽq,Á,Í,È,ç B

**DDERR\_INVALIDMODE**

DirectDraw ,Í—v< ,³,ê,½f, [fh,ðfTf| [fg,µ,È,ç B

**DDERR\_INVALIDOBJECT**

DirectDraw ,Í—³Æø,ÈDirectDraw fIfufWfFfNfg,Ì|fCf“f^,ðŽÓ, ~Žæ,Á,½ B

**DDERR\_INVALIDPARAMS**

f f\fbfh,É“n,³,ê,½,Ð,Æ,Ä^È ã,Ìpf%of [f^,ª ³,µ,,È,ç B

**DDERR\_INVALIDPIXELFORMAT**

Žw’è,³,ê,½fsfNfZf< EftfH [f}fbfg,Í—³Æø,Á, ,é B

**DDERR\_INVALIDPOSITION**

“]— æ ã,ÌfI [fo [fCEfC,Ì^È’u,ªs ³,Ä, ,é B

**DDERR\_INVALIDRECT**

—^,!,ç,ê,½<éC’,ª³Æø,Á, ,é B

**DDERR\_INVALIDSURFACETYPE**

fT [ftfFX,ªŠÖ^á,Á,½f^fCfv,Á, ,Á,½,½,ß A—v< ,³,ê,½ ^— ,ðŽÀ s,Á,«,,È,©,Á,½ B

**DDERR\_LOCKEDSURFACES**

,Ð,Æ,Ä^È ã,ÌfT [ftfFX,ªf fbfN,³,ê,Ä,¨,è A—v< ,³,ê,½ ^— ,ÉŽ,”s,µ,½ B

**DDERR\_NO3D**

,R,çfn [fhfEfFfA, ,é,ç,ÍfGf~f...fCE [fvfþf“ª¶ Ý,µ,È,ç B

**DDERR\_NOALPHAHW**

fAf<ftf@ EfAfNfZf%ofCE [fvfþf“ Efn [fhfEfFfA,ª¶ Ý,µ,È,ç,©, ,é,ç,Í—~—  
p,Á,«,,È,©,Á,½,½,ß A—v< ,³,ê,½ ^— ,ÉŽ,”s,µ,½ B

**DDERR\_NOBLTHW**

fuf fbfN“]—fn [fhfEfFfA,ª¶ Ý,µ,È,ç B

**DDERR\_NOCLIPLIST**

fNfŠfbfv EfŠfXfg,ª~—p,Á,«,,È,ç B

**DDERR\_NOCLIPPERATTACHED**

,±,ÌfT [ftfFX EfIfufWfFfNfg,É,ÍDirectDrawClipper fIfufWfFfNfg,ðfAf^fbf^,Á,«,,È,ç B

**DDERR\_NOCOLORCONVHW**

F•İŠ·fn [fhfEfFfA,ª¶ Ý,µ,È,ç A, ,é,ç,Í—~—p,Á,«,,È,ç,½,ß A ^— ,ªŽÀ s,Á,«,,È,ç B

**DDERR\_NOCOLORKEY**

fT [ftFfX,ÍE» ÝfJf%o [ Efl [,ðŽ ,Á,Ä,¢,È,¢ B

**DDERR\_NOCOLORKEYHW**

“]— æfJf%o [ Efl [,É‘Î,·,éfn [fhfEfFfAfTf] [fg,ª,È,¢,½,ß A ^— ,ªŽÀ s,Á,«,È,¢ B

**DDERR\_NOCOOPERATIVELEVELSET**

DirectDraw2::SetCooperativeLevel f f\fbfh,ðEÄ,Ñ o,·,±,Æ,È, ì -ŠÖ ”,ªEÄ,Ñ o,³,ê,½ B

**DDERR\_NODC**

,c,b,Í A,±,ê,Û,Á,É,±,ÌfT [ftFfX—p,É ì,ç,ê,Ä,¢,È,©,Á,½ B

**DDERR\_NOODDROPSHW**

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

**DDERR\_NODIRECTDRAWHW**

fn [fhfEfFfA ê~p DirectDraw  
flfufWfFfNfg ì ¬,Á,«,È,¢ Bfhf%oCfo,Ífn [fhfEfFfA,ðfTf] [fg,µ,È,¢ B

**DDERR\_NODIRECTDRAWSUPPORT**

E» Ý,ÌftfBfXfvfEfc Efhf%oCfo,ÍDirectDraw,ðfTf] [fg,µ,Á,¢,È,¢ B

**DDERR\_NOEMULATION**

f\ftfgEfFfA EfGf~f...fE [fVf±f“,ª—~p,Á,«,È,¢ B

**DDERR\_NOEXCLUSIVEMODE**

fAfvfŠfP [fVf±f“,É‘Î,µ”r¼“If, [fh,ª—  
v< ,³,ê,½,ª AfAfvfŠfP [fVf±f“,Í”r¼“If, [fh,ðŽ ,Á,Ä,¢,È,¢ B

**DDERR\_NOFLIPHW**

%oÄŽ<fT [ftFfX,ÍftfŠfbfsf“fO,Á,«,È,¢ B

**DDERR\_NOGDI**

GDI,ª“¶ Ý,µ,È,¢ B

**DDERR\_NOHWND**

fNfŠfbfsf“fO‘È‘m,ªfEfBf“fhfE Efnf“fhf<,ð•K—v,Æ,·,é A, ,é,¢  
,ÍfEfBf“fhfE Efnf“fhf<,ª‘²fEfxfc EfEfBf“fhfE Efnf“fhf<,Æ,µ,Ä, ,ç,©,¶,ßfZfbfg,³,ê,Ä,¢  
,È,¢ B

**DDERR\_NOMIPMAPHW**

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

**DDERR\_NOMIRRORHW**

f~f%o [fŠf“fO Efn [fhfEfFfA,ª“¶ Ý,µ,È,¢,©, ,é,¢,Í—~p,Á,«,È,¢,½,ß A ^—  
,ªŽÀ s,Á,«,È,¢ B

**DDERR\_NOOVERLAYDEST**

“]— æŠm—š,½,ß,ÌDirectDrawSurface2::UpdateOverlay f\fbfhEÄ,Ñ o,µ,ð,µ,Á,¢  
,È,¢fI [fo [fEfc,É‘Î,µ DirectDrawSurface2::GetOverlayPosition f\fbfh,ªEÄ,Ñ o,³,ê,½  
B

**DDERR\_NOOVERLAYHW**

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

**DDERR\_NOPALETTEATTACHED**

fpfEfbfg EflfufWfFfNfg,ª,±,ÌfT [ftFfX,ÉfAf^fbf,³,ê,Ä,¢,È,¢ B

**DDERR\_NOPALETTEHW**

16 F, ,é,¢,Í256 F,ÌfpfEfbfg,É‘Î,·,éfn [fhfEfFfA EfTf] [fg,ª,È,¢ B

**DDERR\_NORASTEROPHW**

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

**DDERR\_NOROTATIONHW**

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

**DDERR\_NOSTRETCHHW**

Šg'áfn [fhfEFA,ª¶ Ý,µ,Ä,¢,È,¢,©, ,é,¢,Í~—p,Ä,«,È,¢,½,ß A ^— ,ªŽÄ s,Ä,«,È,¢ B

**DDERR\_NOT4BITCOLOR**

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

**DDERR\_NOT4BITCOLORINDEX**

DirectDrawSurface flfufWfFfNfg,Í A—  
v< ,³,ê,½,Sfrfbfg,ÏfJf% [ EfCf“ffbfNfX EfpfEfbfg,ðŽg,Ä,Ä,¢,È,¢ B

**DDERR\_NOT8BITCOLOR**

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

**DDERR\_NOTAOVERLAYSURFACE**

”ñfi [fo [fEFC EfT [ftFfX,É'Í,µ AfI [fo [fEFC EfRf“f [flf“fg,ªEÄ,Ñ o,³,ê,½ B

**DDERR\_NOTTEXTUREHW**

fefNfXf`ff Ef}fbfsf“fO Efn [fhfEFA,ª¶ Ý,µ,Ä,¢,È,¢,©, ,é,¢,Í~—p,Ä,«,È,¢,½,ß A ^  
— ,ªŽÄ s,Ä,«,È,¢ B

**DDERR\_NOTFLIPPABLE**

ftfŠfbfs“fO,Ä,«,È,¢fT [ftFfX,ðftfŠfbfsf“fO,µ,æ,²,Æ,µ,½ B

**DDERR\_NOTFOUND**

—v< ,³,ê,½ €—Ú,ÍE©,Ä,©,ç,È,©,Ä,½ B

**DDERR\_NOTINITIALIZED**

flfufWfFfNfg,ª %Šú%»,³,ê,é'O,É A CoCreateInstance,Ä ì ¬,³,ê,½ DirectDraw  
flfufWfFfNfg,ÏfCf“f^ [ftFfCfX Ef f\fbfh,ðEÄ,Ñ o,»,²,Æ,µ,½ B

**DDERR\_NOTLOCKED**

f fbfN,³,ê,Ä,¢,È,¢fT [ftFfX,Ïf fbfN%ð æ,ª s,í,ê,½ B

**DDERR\_NOTPAGELOCKED**

—¢ ^— ,Ïfy [fW Ef fbfN,ª,È,¢fT [ftFfX,Ïfy [fW Ef fbfN%ð æ,ª s,í,ê,½ B

**DDERR\_NOTPALETTIZED**

Žg—p,µ,Ä,¢,éft [ftFfX,ÏfpfEfbfg Efx [fX,ÏfT [ftFfX,Ä,Í,È,¢ B

**DDERR\_NOVSYNCHW**

,¼A ü“Šú ^— ,É'Í,·,éfn [fhfEFAfTf] [fg,ª,È,¢,½,ß A ^— ,ðŽÄ s,Ä,«,È,¢ B

**DDERR\_NOZBUFFERHW**

Zfofbftf@,É'Í,·,éfn [fhfEFA EfTf] [fg,ª,È,¢,½,ß AfffBfXfvfEFC Ef f,fŠ,Ä,ÏZfofbftf@ ì ¬, ,é,¢,ÍZfofbftf@,ðŽg—  
p,µ,½fuf fbfN“]—,ªŽÄ s,Ä,«,È,¢ B

**DDERR\_NOZOVERLAYHW**

fI [fo [fEFC EfT [ftFfX,Í Afn [fhfEFA,ª¶ fI [fo [fEFC EZfI [f\_ [,ðfTf] [fg,µ,È,¢,½,ß AZfI [f\_ [,ªŽ<,³,ê,½ B

**DDERR\_OUTOFCAPS**

—v< ,³,ê,½ ^— ,É•K—v,Èfn [fhfEFA,ª,·,Ä,ÉŠ,,,è“—,Ä,ç,ê,Ä,¢,é B

**DDERR\_OUTOFMEMORY**

DirectDraw,ª ^— ,ð s,²,Ì,É \ª,Èf f,fŠ,ª,È,¢ B

**DDERR\_OUTOFVIDEOMEMORY**

DirectDraw,ª ^— ,ð s,²,Ì,É \ª,ÈffBfXfvfEFC Ef f,fŠ,ª,È,¢ B

**DDERR\_OVERLAYCANTCLIP**

fn [fhfEFA,ÍfNfŠfbfsf“fO EfI [fo [fEFC,ðfTf] [fg,µ,È,¢ B

**DDERR\_OVERLAYCOLORKEYONLYONEACTIVE**

fI [fo [fEFC ä,É,Ð,Æ,Ä`È ä,Ì—LÆØ,ÈfJf% [ EfL [,ðŽ ,Æ,²,Æ,µ,½ B

**DDERR\_OVERLAYNOTVISIBLE**

IDirectDrawSurface2::GetOverlayPosition  
f f\fbfh,ª%ÄŽ<fI [fo [fEFC ä,ÄEÄ,Ñ o,³,ê,½ B

**DDERR\_PALETTEBUSY**

f p f C E f b f g , a , a , p , D , A E , A , I f X f C E f b f h , E , a e , A , A f f b f N , 3 , e , A , C , e , 1/2 , B A f A f N f Z f X , a ' ' U , 3 , e , 1/2 B

**DDERR\_PRIMARYSURFACEALREADYEXISTS**

, ± , i ^ — , I , A , E f v f % o f S f } f S E f T [ f t f F f X , d i ~ , μ , A , C , e B

**DDERR\_REGIONTOOSMALL**

IDirectDrawClipper::GetClipList f f \ f b f h , E ^ n , 3 , e , 1/2 — I ^ a e , a ~ , 3 , ~ , ~ , e B

**DDERR\_SURFACEALREADYATTACHED**

, : , A , E f A f ^ f b f ^ , μ , A , C , e , a , p , D , A E , A , I f T [ f t f F f X , E f T [ f t f F f X , d f A f ^ f b f ^ , μ , a e , p , A E , μ , 1/2 B

**DDERR\_SURFACEALREADYDEPENDENT**

, : , A , E ^ 1/4 , I f T [ f t f F f X , E ^ E ^ ¶ , μ , A , C , e f T [ f t f F f X , d ^ E ^ ¶ , 3 , 1 , a e , p , A E , μ , 1/2 B

**DDERR\_SURFACEBUSY**

f T [ f t f F f X , a , a , p , D , A E , A , I f X f C E f b f h , E , a e , A , A f f b f N , 3 , e , A , C , e , 1/2 , B A f T [ f t f F f X , O , I f A f N f Z f X , a ' ' U , 3 , e , 1/2 B

**DERR\_SURFACEISOBSCURED**

f T [ f t f F f X , O , I f A f N f Z f X , a A f T [ f t f F f X , a \* C , C % B , 3 , e , A , C , e , 1/2 , B < ' ' U , 3 , e , 1/2 B

**DDERR\_SURFACELOST**

f T [ f t f F f X E f f , f S , I s ^ « , I , 1/2 , B A f T [ f t f F f X , O , I f A f N f Z f X , a ' ' U , 3 , e , 1/2 B , ± , I f T [ f t f F f X , d \* , ~ , D i r e c t D r a w S u r f a c e f l u f W f F f N f g , E , I , IDirectDrawSurface2::Restore f f \ f b f h , a C E A , N o , 3 , e , E , ~ , e , I , E , c , E , C B

**DDERR\_SURFACENOTATTACHED**

— v < , 3 , e , 1/2 f T [ f t f F f X , I f A f ^ f b f ^ , A , « , E , C B

**DDERR\_TOOBIGHEIGHT**

D i r e c t D r a w , E , a e , A , A — v < , 3 , e , 1/2 , , 3 , a a , « , ~ , ~ , e B

**DDERR\_TOOBIGSIZE**

D i r e c t D r a w , E , a e , A , A — v < , 3 , e , 1/2 a ^ a , « , 3 , a a , « , ~ , ~ , e B , μ , © , μ A C E A ^ E , I , , 3 , A \* , I — a ^ e , a , E , C B

**DDERR\_TOOBIGWIDTH**

D i r e c t D r a w , E , a e , A , A — v < , 3 , e , 1/2 \* , a a , « , ~ , ~ , e B

**DDERR\_UNSUPPORTED**

f T f | [ f g , 3 , e , A , C , E , C ^ — , A , A , 1/2 B

**DDERR\_UNSUPPORTEDFORMAT**

— v < , 3 , e , 1/2 F o u r C C f t f H [ f } f b f g , I D i r e c t D r a w , E , a e , A , A f T f | [ f g , 3 , e , A , C , E , C B

**DDERR\_UNSUPPORTEDMASK**

— v < , 3 , e , 1/2 f s f N f Z f < E f t f H [ f } f b f g , A , I f r f b f g f } f X f N , I D i r e c t D r a w , E , a e , A , A f T f | [ f g , 3 , e , A , C , E , C B

**DDERR\_UNSUPPORTEDMODE**

f f B f X f v f C f C , I C » Y f T f | [ f g , 3 , e , A , C , E , C f , [ f h , A , e B

**DDERR\_VERTICALBLANKINPROGRESS**

, 1/4 < A ü Š ú Š Ö , A , e B

**DDERR\_WASSTILLDRAWING**

, ± , I f T [ f t f F f X , © , ç A , Ü , 1/2 , I f T [ f t f F f X , Ö , I ^ O % ñ , I f u f f b f N " ] ^ — € i , a Š @ — 1 , μ , A , C , E , C B

**DDERR\_WRONGMODE**

^ Ü , E , A , 1/2 f , [ f h , A i , ç , e , 1/2 , 1/2 , B A , ± , I f T [ f t f F f X , I f Š f X f g f A , ~ , e , ± , A e , a , A , « , E , C B

**DDERR\_XALIGN**

— ^ , 1 , ç , e , 1/2 e C ^ , d \* K — v , A e , 3 , e , e ' ' I ^ I , E ... \* 1/2 ^ e — ñ , E \* A , x , e , ± , A e , a , A , « , E , © , A , 1/2 B

## DirectSound, É, Â, ç, Ä

The Microsoft® DirectSound® fAfvfŠfP [fVf‡f“ Efvf fOf%of~f“fO EfCf“f^ [ftfFfCfX(API),Í ADirectX™ 3 Software Development Kit (SDK),İfI [ffBfI EfRf“f [flf“fg,Â, ,é BDirectSound,Í‘Ö,¿ŽŽŠÖ ifŒfCfef“fV j,İ - ,È,çf~fLfvf“fO Afn [fhEfffA,İfAfNfZf%ofŒ [fVf‡f“ A,»µ,ÄfTfef“fh EfffofCfX,Ö,İfCfŒfNfg,ÈfAfNfZfX,đŽÄŒ»,·,é B,±,ê,ç,İ<@”\ ,İŽÄŒ»,İ,½,ß,É,Í ACE»‘¶,İWindows ä,İfAfvfŠfP [fVf‡f“,ÆfffofCfX Efhf%ofCfo,Æ,İŠÖ,İŒÝŠ· «,ª•K— v đŒ ,Æ,È,é B

## DirectX

3,É,æ,Á,Ä Afn [fhEfffA,ÉŠÖ,·,é Ú ×,È’mŽ̄,È,µ,ÄffBfXfvŒfC,âfI [ffBfI EfffofCfX,ÖfAfNfZfX,·,é,± ,Æ,%oÂ”\,É,È,é BDirectX ÝŒvŽŽ,İ Á—D æ—Ú“İŽ— €,İfXfs [fh,Á, ,é B ,fŒfxf<ŠÖ ”ŒQ,É,æ,è A DirectSound,İfffofCfX”ñÈ‘¶fCf“f^ [ftfFfCfX,đ’ñ<Ÿ,µ A,»ê,É,æ,Á,ÄfAfvfŠfP [fVf‡f“,ÍfI [ffBfI<@Ši,İ”— Í,đ Á‘âŒÄ,É^ø,« o,·,±,Æ,ª,Ä,«é B

**DirectSoundfA [fLfefNf`ff**

,±,ì ß,Â,Í ADirectSoundfRf“f| [flf“fg,Æ,»„ì“¼,ì

DirectX AfIfyfÆ [fefBf“fO EfVfXfef€ AfVfXfef€ Efn [fhEfFfA,ÏŠÖEW,É,Â,c,Ä,Ïê”Ê“I,È îñ,ð à-  
¾,·,é B

fA [fLfefNf`ffŠT-v

fIfufWfFfNfg Ef^fCfv

f\ftfqfEfFfA EfGf~f...fÆ [fVf#f“

fffofCfX Efhf%ofCfo

ç'²fÆfxfç

fVfXfef€,Ï“ ±

**fA [fLfefNf^fŠT—v**

fnfCfpfth [f]f^fX,lfAfvfšfP [fvf#f^,âfQ [f€,lfvf fOf%of~f^fO,É,Í ACEø%oÊ^I,Ä—Í-  
,çTfEf^fh ì,è,^,ç,è,é BMicrosoft,^,»,ì,½,ß,É'ñ<ÿ,µ,Ä,ç,é,ì,^MIDIxfgfš [f€  
,ÆDirectSound,ì,Ó,½,Ä,lf f\fbfh,Ä, é B MIDIxfgfš [f€,Í AWindows 95}f<f ffbfAAPI,ì^è,^,Ä, é B  
MIDIxfgfš [f€,ÍMIDIf fbfZ [fW,Éf^fCf€fXf^f^fv,ðt,^ A,»,lf fbfZ [fW,lfobftf@,ðfVfXfef€,Ö—  
M,^,é BMIDIxfgfš [f€,É,Ä,ç,Ä,ì Ú × îñ,Í A Microsoft Win32® Software Development Kit (SDK)  
,ÉŠÜ,Ü,è,éfhfLf...f f^fg,ðŽQ Æ,^,é,±,Æ B

^ê•û ADirectSound,Í AfffWf^f^%1,3,è,½fTf^fvfšf^fO EftfEf^fh,ì Ä ¶,ÆfTf^fvfšf^fO%1€1,lf~fLfvf^fO,Ì  
V,µ,çf,ff<,ðŽÄ^,µ,Ä,ç,é B ^¼,ìDirectX 3 SDK,lfIfufWfFfNfg EfNf%ofX,Æ—l A  
DirectSound,Ífn [fhEfFfA,ì<@^,ð Ä^â€Ä,É^ø,« o,µ AfN [fhEfFfA,Ä€» Ý—çfTf| [fg,ì^—Í,^,è,Í A,»,è,ðf  
tfgEfFfA,ÄfGf~...f€ [fg,^,é BŽÄ sŽž,Éfn [fhEfFfA,ì^—Í,ì Æ%öi,^,Ä,« Afpf\rf^šÄ<<,É,©,©,í,è,È,-  
Ä ,,ì <^,ð^ø,« o,^,±,Æ,^,Ä,«é B

DirectSound,ÍDirectSound,ÆDirectSoundBuffer,Æ,ç  
,pCOMfx [fX,lfCf^f^ [ftfFfCfX ä,É \z,3,è A^¼,lfCf^f^ [ftfFfCfX,ÖŠg^£,à,Ä,«é BDirectX 3  
SDK,ÄfAfvfšfP [fvf#f^,ì ì ^,É,ÍCOM,ÌŠT^O,Ö,ì— %øð,ð—v,^,é,^ A,±,è,È,Ä,ç,Ä,ÍRf^f|  
—flf^fg EfIfufWfFfNfg Ef,fff<,ðŽQ Æ,^,é,±,Æ B

DirectSoundIfufWfFfNfg,Í AfTfEf^fh EfJ [fh,Æ,»,ì—l X,È^@ <,ð^  
,^ BfAfvfšfP [fvf#f^,ìDirectSoundIfufWfFfNfg,ìDirectSound::CreateSoundBuffer f\fbfh,ðŽg—  
p,µ,ÄDirectSoundBufferIfufWfFfNfg,ð ì ^,^,é BDirectSoundBufferIfufWfFfNfg,Æ,Í Afobftf@,ðŠÜ,ðfTfEf^fh  
Eft [f^,ì,±,Æ,Ä,^,é Bfvf%ofCf}  
fšDirectSoundBufferIfufWfFfNfg,É,Í; ^,ìDirectSoundBufferIfufWfFfNfg,^¶ Ý,µ A^Š€Ý,Éf~fLfvf^fO,^oÄ^  
,Ä, é BDirectSoundfobftf@,ÍŽü”g ” EftfH [f}  
fbfg,È,Ç,ì^@ <,ð Ýè,^,é,Æ,Æ,à,È AfTfEf^fh,ì Ä ¶ E^âž~ E^èžž^âž~,ÉŽg—p,3,è,é B

DirectSoundfobftf@,Í AfIf^f{ [fhRAM A  
fEfF [fufe [fuf< Ef f,š Af\_fCf€fNfg Ef f,š EfAfNfZfX(DMA)^ffflf< A%¼^zfobftf@(UOf|  
[fg,^,ð,Æ,Ä,lfI [ffBfI EfJ [fh,ì è #),ì,ç,,è,©,lfN [fhEfFfA—  
p,É ì ^,3,è,é Bfobftf@ ì ^,Í AfJ [fh,lf^fCfv,É^È¶,^,é BDirectSoundfobftf@,ì,½,ß,lfN [fhEfFfA,^,È,ç è  
‡,Í AfVfXfef€ Ef f,š,ÄfGf~...f€ [fg,3,è,é B

fvf%ofCf}fš EftfEf^fh Efofobftf@,ÍÈ ífZfJf^f fš EftfEf^fh Efofobftf@,©,ç—  
,ç,è,éTfEf^fh,lf~fLfvf^fO,ì,½,ß,ÉŽg—  
p,3,è,é,^ AfJfXf^f€ Ef~fLfvf^fO,â,»,ì¼,ì^Ä•È,è^@ ì,Ä^¼ ÚfAfNfZfX,^,é,±,Æ,à,Ä,«é(fvf%ofCf}  
fš Efofobftf@,ðf fbfN,^,é,Æ AfTfEf^fh<šI,Ö,ì¼,lf [fX,©,ç,lfAfNfZfX,àuf fbfN,3,è,Ä,µ,Ü,ð Bf fbfN,^,  
é Û,ÍEx ,ð o,^,±,Æ) B

fZfJf^f\_fš Efofobftf@,É,Í AfQ [f€ EfAfvfšfP [fvf#f^,ìŽÄ s^t A,-  
,è•Ö,µ Ä ¶,3,è,éç^ÉfTfEf^fh,ðL%—,µ,Ä,,^,±  
,Æ,^,Ä,«é BfZfJf^f\_fš Efofobftf@,ÉL%—,3,è,½fTfEf^fh,Í AfAfvfšfP [fvf#f^,ì^t,Ä A1%ñ€Ä,è,lfCfxf^fg,Æ  
,µ,Ä Ä ¶,^,é,±,Æ,à A^A^±,µ,Ä,è•Ö,µ Ä ¶,3,è,éç [fsf^fO EftfEf^fh,Æ,µ,Ä Ä ¶,^,é,±,Æ,à%Ä^,Ä, é B

,3,ç,É AfZfJf^f\_fš Efofobftf@,Í A—  
L€ø,ÈfTfEf^fh Efofobftf@ Ef f,š,æ,è,à^â,«çTfCfY,lfTfEf^fh,ð Ä ¶,^,é,±  
,Æ,^,Ä,«é BfTfEf^fh Efofobftf@ Ef f,š,æ,è,à^â,«çTfEf^fh,ì Ä ¶,ÉfZfJf^f\_fš Efofobftf@,ðŽg—  
p,^,é,Æ AfZfJf^f\_fš Efofobftf@,Í Ä ¶,^,éTfEf^fh,ìè•^,ðL%—,^,éLf... [ð—p^Ó,^,é,æ,µ,É,È,é B

**flfufWfFfNfg Ef^fCfv**

,Ü,, A'æ^ê,îŠî-["I,ÈflfufWfFfNfg Ef^fCfv,ÍDirectSoundflfufWfFfNfg,Á A,±,è,ÍfTfEf"fh EfJ [fh,ì,±,Æ,Á, ,é  
BIDirectSoundflfufWfFfNfg,ð §Eä,µ,Ä,ç,é,ì,Í AIDirectSoundfRf"f

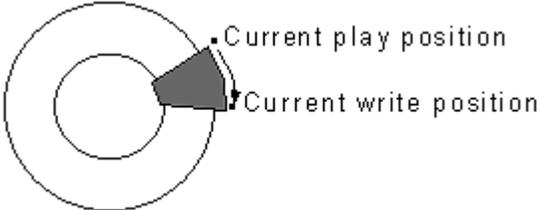
[flf"fg EfIfufWfFfNfg Ef,ff<(COM)fCf"f^ [ftfFfCfX,Á, ,é B,±  
,ÍfCf"f^ [ftfFfCfX,Íf f\fbfh,É,æ,è AfAvfšfP [fvf±f",©,çJ [fh,ì"Á «,ð•Í X,.,é,±,Æ,ª,«,é B

'æ"ñ,ÍflfufWfFfNfg Ef^fCfv,ÍfTfEf"fh Efobftf@,Á, ,é BDirectSound,Ífvf%ofCf}  
fŠ EfTfEf"fh Efobftf@ A,.,æ,ÑfZfJf"f\_š EfTfEf"fh Efobftf@,ðŽg—p,.,é Bfvf%ofCf}  
fŠ EfTfEf"fh Efobftf@,Æ,ÍŽÀ Û,Éf† [fU,ª,.,Žæ,é,éfi [ftfBfI Eff [f^,ì,±,Æ,Á, ,é AfZfJf"f\_š EfTfEf"fh  
h Efobftf@,Æ,Í,»,é,¼,è,ì%°¹E¹,ì,±,Æ,Á, ,é BDirectSound,Í Afvf%ofCf}  
fŠ EfTfEf"fh Efobftf@ A,.,æ,ÑfZfJf"f\_š EfTfEf"fh Efobftf@,É,Í,µ,Ä §Eä,ð s,ç A,»,é,ç,Í  
IDirectSoundBufferfCf"f^ [ftfFfCfX"à,É, ,é B

fvf%ofCf}fŠ Efobftf@,Í A o—ÍEŽ® Afg [f^f< Ef{fšf... [f€  
,È,Ç AfTfEf"fh,ì"Á «,ð §Eä,.,é B,Û,½ A ì -µ,½fAvfšfP [fvf±f",©,ç¼ Úfvf%ofCf}  
fŠ Efobftf@,Ö,ì '«,±  
,Ý,ð s,»,é B,½,¾,µ,»,ì è ±,Í ADirectSoundf~fLfvf"fo,Æfn [fhfEfffA EfAfNfZf%ofE [fvf±f",ì@",Í-  
³Eø,É,È,é B,³,ç,É Afvf%ofCf}fŠ Efobftf@,Ö,ì¼ Ú"Í,È '«,±  
,Ý,Í A'¼,ÍDirectSoundfAvfšfP [fvf±f",ì"® ì,ð-W,°,é,±,Æ,É,à,È,é B,µ,½,ª,Á,ÄfAvfšfP [fvf±f",©,ç,ì '«,±  
,Ý,Í Afvf%ofCf}fŠ Efobftf@,É,Á,Í,É,fZfJf"f\_š Efobftf@,Ö s,µ,ü,ª,æ,ç BfZfJf"f\_š Efobftf@,Á, ,é,Í A  
fn [fhfEfffA,³E ŽÝ ,Á,Ä,ç,È,ç<@",ðfGf~f...fE [fg,.,é,±  
,Æ,ª,Á,« A,³,ç,ÉfTfEf"fh EfJ [fh,ðfvfXfef€"à,ì¼,ÍfAvfšfP [fvf±f",Æ,ç—L,.,é,±,Æ,ª,à,Á,«,é,©,ç,Á, ,é B

fZfJf"f\_š Efobftf@,Æ,ÍfAvfšfP [fvf±f",ªŽg—p,.,éEÄ X,ì%°¹E¹,ì,±,Æ,Á, ,é B,Ð,Æ,Á,ÍfAvfšfP [fvf±f",  
©,ç A,»,é,¼,è,Ífobftf@,ðEÄ X,É Ä ¶ E'áz~,.,é,±  
,Æ,ª,Á,«,é BDirectSound,Í A ¶†,Ífobftf@,ð,.,x,Áfvf%ofCf}fŠ Efobftf@ ä,Äf~fLfvf"fo,µ A,»,Ífvf%ofCf}  
fŠ Efobftf@,ðfTfEf"fh EfffofCfX,Ö o—Í,Á,«,é BfZfJf"f\_š Efobftf@,Ífn [fhfEfffA A,à,µ,-  
,ÍfvfXfef€ Efobftf@,Ö i"³,¹,é,±  
,Æ,ª,Á,«,é Bfn [fhfEfffA Efobftf@,ÍfTfEf"fh EfffofCfX ä,Äf~fLfvf"fo,³,è,é,ì,Á AfvfXfef€ ä,ì ~  
,È,°S,ð,©, -,é,±,Æ,ª,È,ç B

fZfJf"f\_š EfTfEf"fh Efobftf@,É,Í AfXf^fefBfbfn EfTfEf"fh Efobftf@ A,.,æ,ÑfXfgš [f€ EfTfEf"fh  
Efobftf@,ì,QŽì—p,ª, ,é BfXf^fefBfbfn EfTfEf"fh Efobftf@,Æ,Í AfTfEf"fh Eff [f^S'ì,ðŽû—  
e,.,éofobftf@,Á, ,é BfXfgš [f€ EfTfEf"fh Efobftf@,Æ,ÍfTfEf"fh,ì"è",¾, -,ðŽû—e,.,éofobftf@,Á, ,é A,»,ì,  
½,B,É Ä ¶†,ÍfAvfšfP [fvf±f",©,ç ä,», V,µ,çff [f^,ðfobftf@,Ö '«,±,±,•K—v,ª, ,é BfTfEf"fh<@Ší ä,ÍfTfE  
f"fh Ef f, fŠ,ª—LÉø,Á, ,é,è,Í A DirectSound,Í,»,é,ð—p,µ,ÄfXf^fefBfbfn Efobftf@,ðŠm•Û,µ,æ,µ  
,Æ,.,é BfTfEf"fh<@Ší ä,ÉŠm•Û,³,è,½fobftf@,Í Afn [fhfEfffA ä,Äf~fLfvf"fo,ªŠ®—1,µ,Ä,ç  
,é,½,ß A Ä ¶†,ÉfvfXfef€ ~ ŽžŠÖ,ð Á"i,.,é,±,Æ,ª,È,ç B e °%¹,È,Ç,ì,-  
é,Ö,µŽg,ì,è,éTfEf"fh,É,Í AfXf^fefBfbfn Efobftf@,ìŽg—p,ª ÄK,Á, ,é B  
fAvfšfP [fvf±f",Í AfTfEf"fh Efobftf@"à,É, ,éJfEf"fg EfvfEfc Ef|  
fWfVf±f",ÆJfEf"fg Ef%ofCf Ef|fWfVf±f",Æ,ç,µ,Ó,½,Á,ì d—v,Èf|  
fWfVf±f",Á"® ì,.,é BfJfEf"fg EfvfEfc Ef|  
fWfVf±f",Í Afobftf@,ì†,ÍfTfEf"fh,ì Ä ¶,ªŠŽn,³,è,éÈ'u,ðŽ,µ,Ä,ç,é BfJfEf"fg Ef%ofCf Ef|  
fWfVf±f",Í Afobftf@,ì†,Á'À'S,Éff [f^,ð•Í X,Á,ç,éÈ'u,ðŽ,µ,Ä,ç,é BŽÝ,ì },ì,±,ì,Ó,½,Á,Íf|  
fWfVf±f",ìŠÖEW,ðŽ,µ,Ä,ç,é B



DirectSoundfobftf@,ÍŠT"O"Í,É,Ífšf"fo ó,é,È,Á,Ä,ç,é,ª AŽÀ Û,É,Í'A±,µ,½fšfjA,Èf f, fŠ,Á ì -³,è,Á,ç  
,é išf"fo Efobftf@ j BfJfEf"fg EfvfEfc Ef|fWfVf±f",Ífobftf@,ì ÁEä,Û,Á, ,é,ÆŠJŽn^È'u,Û,Á-ß,é B  
,±,ì Í,Á,Í ADirectSound A,.,æ,Ñ DirectSoundBufferflfufWfFfNfg,É,Á,ç,Ä,Æ AfAvfšfP [fvf±f",É,.,-,é,±  
,è,çIfufWfFfNfg,ì~—p•û—@,ð%ð à,.,é B

DirectSoundflfufWfFfNfg  
DirectSoundBuffer flfufWfFfNfg



**DirectSoundIfufWfFfNfg**

fVfXfef€,ÉfCf“fXfg [f<,³,ê,Ä,ç,é,»»,¼,ê,ÌfTfEf“fh EfffofCfX,ÍDirectSoundIfufWfFfNfg,Á, ,è A  
IDirectSoundCf“f^ [ftfFfCfX,ð'Ê,µ,ÄfAfNfZfX,ª s,í,é,é BDirectSoundIfufWfFfNfg,Ì ì ¬,Í  
DirectSoundCreateŠÖ ”,ðCEÄ,Ñ o,µ,Ä s,± B,±  
,İŠÖ ”,İ•Ö'l,Æ,µ,Ä A,Đ,Æ,Ä,İIDirectSoundCf“f^ [ftfFfCfX,ð•Ö,· B  
DirectSoundEnumerateŠÖ ”,ðCEÄ,Ñ o,·,Æ AfVfXfef€,ÉfCf“fXfg [f<,³,ê,Ä,ç,éDirectSoundIfufWfFfNfg,ð—  
ñ<“,·,é B

Windows,Íf}f<f^fXfN EfIfyfœ [fefBf“fO EfVfXfef€,Á, ,é Bf† [fU,^è“x,É•; ”,Ìfvf fOf%of€,ð‘–  
,ç,¹ A,»»,ê,ç,·,×,Ä,ÉfŠf\ [fX,ð<α—L,³,¹,½,ç,Æ l,!,é,ì,Í“–R,Á, ,é BDirectSoundIfufWfFfNfg,Í“ü—  
ÍftfH [fJfX,ì'Ç Ö,ð s,Á,ÄTfEf“fh EfffofCfX,ð<α—L,·,é BDirectSoundIfufWfFfNfg,Í A,»»,ê,¼,ê,ªS“–  
,·,éAfvfŠfP [fVf±f“,ª“ü—ÍftfH [fJfX,ð“¾,½Žž,É,¾,¯%o¹,ð–Ä,ç,· B, ,éAfvfŠfP [fVf±f“,ª“ü—  
ÍftfH [fJfX,ðŽ,·,±,Æ A,»»,ÌfIfufWfFfNfg,©,ç,ÌfI [ffBfI EfXfgfŠ [f€,Íf~f...  
[fç,³,ê,é B•; ”,ÌfAfvfŠfP [fVf±f“,ª“ü—,¶fTfEf“fhffofCfX,É'Í,·,é,»»,¼,ê,ÌDirectSoundIfufWfFfNfg,ð ì ¬,·,é,  
±,Æ,à%oÄ”,Á, ,é BfAfvfŠfP [fVf±f“ŠÖ,Á“ü—ÍftfH [fJfX,ª•İ,í,é,Æ AfI [ffBfI o—  
Í,ÍŽ©“@“I,É,»»,ÌfAfvfŠfP [fVf±f“,ÌfXfgfŠ [f€,©,çŽŸ,ÌfAfvfŠfP [fVf±f“,ÌfXfgfŠ [f€  
,Ö Ø,è'Ö,í,é Bœ%oÊ“I,É AfAfvfŠfP [fVf±f“,Í“ü—  
ÍftfH [fJfX,ª•İ,í,é,½,Ñ,Éfobftf@,ì Ä ¶ E'âž~,ðœJ,è•Ö,·K—v,ª,È,,É,é B

**Note**

DirectSound,Ìfwbfb\_ftf@fCf<,ÍIDirectSound,Ìf f\fbfh,ÆIDirectSoundBufferCf“f^ [ftfFfCfX,Á'è<,³,ê,½ ACœ¾œê  
,Ìf}fNf 'è<,ðŠÜ,ñ,Ä,ç,é B

**DirectSoundBufferIfufWfFNfg**

,D,Æ,Â,Ð,Æ,Â,ÏfTfEf“fh,“,æ,ÑfI [ffBfI EfXfgfŠ [f€ ,ÍDirectSoundBuffer,Â, ,è AfAvfŠfP [fVf±f“,  
ÍDirectSoundBufferfCf“f^ [ftfFfCfX,ð'È,µ,Ä,±  
,è,ç,Ö,ÏfAfNfZfX,ð s,µ BDirectSound::CreateSoundBuffer f\fbfh,ðÆÄ,Ñ o,·,Æ ADirectSoundBufferIfufWfFNfg  
Nfg,ð ì ¬,·,é,±,Æ,ª,Â,«,é B,±,ì·Ö'l,ÍDirectSoundBufferfCf“f^ [ftfFfCfX,Â, ,é B

,Ü,½ AfAvfŠfP [fVf±f“,ÍfVf%ofCf}  
fŠ EfTfEf“fh Efofbftf@,ÆZfJf“f fŠ EfTfEf“fh Efofbftf@,ð ì ¬,·,é,±,Æ,ª,Â,«,é BÈ» Ý,Ì,Æ,±  
,è,Í A,Ð,Æ,Â,ÍDirectSoundfIfufWfFNfg,È,Ä,« A,Ð,Æ,Â,ÏfVf%ofCf}fŠ Efofbftf@,µ,©Ž ,Â,±,Æ,ª,Â,«,È,ç B

fAvfŠfP [fVf±f“,È,æ,éfTfEf“fh Efofbftf@,Ö,Ïf [f^,ì ‘,«,±,Ý,Í A,Ü,·,fofbftf@,ðf fbfN,µ,Ä,©,ç ‘,«,±  
,Ý,ð s,ç A,»,ìÆä,Èfofbftf@,Ïf fbfN,ð%ð æ,·,é Bfofbftf@,ðf fbfN,·,é,È,ÍDirectSoundBuffer::Lock f\fbfh,  
ðÆÄ,Ñ o,· B,±,Ïf f\fbfh,Ïf fbfN,³,è,½fofbftf@,Ïf  
fC“f^,ð·Ö,· Bfofbftf@,f fbfN,³,è,é,Æ AfAvfŠfP [fVf±f“,È,æ,éI [ffBfI Eff [f^,Ïfofbftf@,Ö,ÏfRfs [,ª  
%oÄ”\,È,È,é Bfofbftf@,Ö,Ïf [f^ ‘,«,±,Ý I—Æä Afobftf@,Ïf fbfN,ð%ð æ,µ,Ä ‘,«,±,Ý‘€ ì,ðŠ®—  
¹,·,é Bfofbftf@,Ïf fbfN,ð%ð æ,·,é,È,ÍDirectSoundBuffer::Unlock f\fbfh,ðÆÄ,Ñ o,· B

fVf%ofCf}fŠ EfTfEf“fh Efofbftf@,È,ÍŽÀ Û,È·,«Žæ,è%oÄ”\,Èff [f^,ªŠi”[,³,è,é B\_  
IDirectSoundBuffer::Play f\fbfh,ðŽg—p,·,é,±  
,Æ,È,æ,è AfZfJf“f\_fŠ EfTfEf“fh Efofbftf@,©,ç,ÏfI [ffBfI Ä ¶,à%oÄ”\,Ä, ,é B,±,Ïf f\fbfh,ðŽg—  
p,·,é,Æ ADirectSound,ÏfZfJf“f\_fŠ Efofbftf@,ðfVf%ofCf}  
fŠ Efofbftf@,Öf~fLfvf“fo,·,é Bf~fLfvf“fo,Â,«,È,ç è ± A  
IDirectSoundBuffer::Play,Í,P%õñ,¾,~fofbftf@,ð Ä ¶,µ,Ä ÄÆä,Ä'âŽ~,·,é B,±,Ïf f\fbfh“à,È  
DSBPLAY\_LOOPINGftf%ofO,ðŽw'è,·,é,Æ A^A^±f< [fv,ì'†,ÄÆJ,è·Ö,µfTfEf“fh,ð Ä ¶,Ä,«,é B Ä ¶'†,Ïfofbftf@  
,ð'âŽ~,·,é,È,ÍDirectSoundBuffer::Stop f\fbfh,ðŽg—p,·,é B

fTfEf“fh Efofbftf@,²,Æ,ÏfAvfŠfP [fVf±f“,È,æ,éŽg,çª,¬,Í AfTfEf“fh,Ì Ä ¶ŽžŠÖ,ÄÆ~è,·,é BfTfEf“fh,Ì'·,³,ª  
”b'ò“x,Ä, ,è,Ï AfXf^fefBfbfN EfTfEf“fh Efofbftf@,ÖfTfEf“fh,ðŠi”[,·,é,±  
,Æ,ª,Ä,«,é B,»,è,æ,è,à'·,çfTfEf“fh,Ä, ,è,Ï AfXfgfŠ [f€ EfTfEf“fh Efofbftf@,ðŽg—p,·,é,Æ,æ,ç B

fXf^fefBfbfN Efofbftf@,ðŽ ,ÂDirectSoundBufferIfufWfFNfg,ð ì ¬,·,é,È,Í A  
IDirectSound::CreateSoundBuffer f\fbfh,ðŽg—p,µ,Ä A DSBCAPS\_STATICftf%ofO,ð~¾L,·,é (±  
,Ïftf%ofO,ðŽw'è,µ,È,¬,è,Ï AfXfgfŠ [f€ Efofbftf@,ª ì ¬,³,è,é) B DirectSound,Í AfTfEf“fh<@Ši,ª—  
LÆø,Ä, ,è,Í A,»,ì<@Ši ä,È, ,éfTfEf“fh Ef f,fŠ,ðŽg—  
p,µ,ÄfXf^fefBfbfN Efofbftf@,Ö,ÏŠi”[,ðŽž,Ý,é BfTfEf“fh<@Ši ä,È<L%~³,è,½fofbftf@,Ïf~fLfvf“fo,ªfn [fhfE  
FFA ä,Ä s,í,è,é,½,ß A Ä ¶'†,ÉCPUfPf [ð Ä”i,µ,È,ç BfGf“fWf“%o¹ AŠ½ ° A,â,¶,È,Ç,Ì,-  
,è·Ö,µŽg,í,è,éfTfEf“fh,Í AfXf^fefBfbfN Efofbftf@—p,Æ,µ,Ä Ä“K,Ä, ,é B

fn [fhfEFFF A Ef~fLfvf“fo,ðfTf] [fg,µ,½ ‘,¬fofX iPCI,ì,æ,µ,È j ä,ÏfTfEf“fh EfffofCfX,Ä, ,è,Í AfXfgfŠ  
[f€ Efofbftf@,ð~—p,·,é,±,Æ,à%oÄ”\,Ä, ,é B,µ,©,µRf“fsf... [f^,ª ‘,¬fofX,ðŽ ,Ä,Ä,ç  
,È,ç è ±,Í Afn [fhfEFFF A Ef~fLfvf“fo,ì—~\_,æ,èff [f^“]—,ÏfI [fo [fwfbfh,Ì,Ü,µ,ª,ª,«,·,È,Ä,Ä,µ,Ü,µ B  
DirectSound,Í AfTfEf“fh EfffofCfX,ª ‘,¬fofX ä,È, ,é è ±,È,¾,¬fXfgfŠ [f€ Efofbftf@,ðfn [fhfEFFF A ä,È  
ì ¬,·,é B

**f\ftfgfEfFfA EfGf~f...fE [fVf‡f“**

DirectSound,Í A, ,éfTfEf“fh EfJ [fh,žÀ Ű,É,ÍfTf] [fg,µ,Ä,ç,È,ç<@”\,ð Af\ftfgfEfFfA,ÄfGf~f...  
fE [fg,Ä,«,é B **DirectSound::GetCaps**f f\fbfh,ðŽg—

p,·,ê,Î AfAfvfŠfP [fVf‡f“,©,çDirectSound,É‘Î,µ,ÄfI [ffBfI<@Ší,İ<@”\,ð•ñ ,·,é,æ,□—v< ,Ä,«,é B,±  
,ê,É,æ,Ä,Ä AfnfCfpftfH [f}f“fX,İfQ [f€,Ä,» ,İfI [ffBfI,İ“Ä «,ð²,×,é,Æ,ç,Ä,½,±,Æ,%oÄ”\,Ä, ,é B

**ffofCfX Efhf%oCfo**

DirectSound,Í AfI [ffBfI EfffofCfX Efhf%oCfo,ŽÀ‘•,·,éCf“f^ [ftFfCfX A DirectSound HAL,ð—p,¢ ,ÄTfEf“fh<@Ší,ÒfAfNfZfX,·,é B,±,ê,ÍWindows,ÌfI [ffBfI EfffofCfX Efhf%oCfo ,Á, ,è AHAL,ðfTf] [fg,·,é,½,ß,É·Ī X,ð%Á,!,ç,ê,Ä,¢,é B ,± ,Ìfhf%oCfo EfA [fLfefNf`ff,Í ACE»‘¶,·,éWindowsfx [fX,ÌfAfvfŠfP [fVf‡f“ ,É%o°ÊCEÝŠ· «,ð’ñ<ÿ,·,é BDirectS ound HAL,ª’ñ<ÿ,·,é<@”\,Í AŽÿ,Ì’Ê,è,Á, ,é B

fI [ffBfI<@Ší,É’Ī,·,éRf“fgf [f<,ÌŽæ“¾,Æ%oð•ú

fI [ffBfI<@Ší,Ì «”°]‰%¿

fn [fhfEfFfA,ª—LÆø,È ê ‡,Ì“Á’è,Ì‘€ ì,ÌŽÀ s

fn [fhfEfFfA,ª—³Æø,È ê ‡,Ì‘€ ì—v< ,Ì‘”Û

ffofCfX Efhf%oCfo,Íf\ftfgfEfFfA EfGf~f...fÆ [fVf‡f“ ,ð^ê Ø s,í,È,¢ Bfn [fhfEfFfA,Ì «”\ ,ðDirectSound,Ö’È’m,µ ADirectSound,©,ç,Ì—v< ,ðfn [fhfEfFfA,É“ ,!,é,¾,¯,Á, ,é B,à,µ— v< ,³,ê,½‘€ ì,ðfn [fhfEfFfA,ªŽÀ s,Á,« ,È,¢ ê ‡ ADirectSound,ª,» ,ê,ðfGf~f...fÆ [fg,·,é B

DirectSound,ªfn [fhfEfFfA,Æ,ÌÆð M,ð s,ªŽŽ,ÉDirectSoundfhf%oCfo,ª—LÆø,Á,È,¢ ê ‡,É,Í A•W € ,ÌWindows 95 AWindows NT® AWindows 3.1,ÌfI [ffBfI EfffofCfX Efhf%oCfo,ðŽg—p,·,é B,±,Ì ê ‡ ADirectSound,Ì<@”\ ,Íf\ftfgfEfFfA EfGf~f...fÆ [fVf‡f“ ,É,æ,è,·,×,Ä— LÆø,Æ,È,é,ª Afn [fhfEfFfA,ÌfAfNfZf%oCfE [fVf‡f“ ,Í•s%oÁ”\ ,Æ,È,é B

Ā'²fĀfxf<

DirectSound,Ā AfTfEf“fh EfffofCfX,É'Ī,μ,Ā•W ∈ A—D æ A”r¼ A ‘,«±,Ý—  
D æ,Ī4,Ā,Ī'²fĀfxf<,đ'è<’,,é BfAfvfŠfP [fVf‡f“,Ī **IDirectSound::SetCooperativeLevel** f\fbfh,đŽg—  
p,μ,ĀfTfEf“fh EfffofCfX,Ī'²fĀfxf<,đ Ý'è<’,,é B,Ū,½ A ‘,«±,Ý—D æ,đ æ,-  
,:×,Ā,Ī'²fĀfxf<“à,ÉfOf [fof< EfTfEf“fh Efofbftf@ A,à,μ,-  
,ĪXfefBfbfL [ EfTfEf“fh Efofbftf@,đ ì ¬,.,é,±,Æ,ª,Ā,«é B

u•W ∈ v,Ī'²fĀfxf<,Ī,à,Ā,Æ,à%°Ê,ĪfĀfxf<,Ā, ,é B•W ∈fĀfxf<,Ā,Ī A  
**IDirectSoundBuffer::SetFormat** A,.,æ,Ñ**IDirectSound::Compact** f\fbfh,ĪĀĀ,Ñ o,μ,Īs%Ā”,Ā, ,é B  
,³,ç,É AfAfvfŠfP [fVf‡f“,Ā,Īvf%ofCf}fŠ Efofbftf@,Ō,Ī ‘,«±,Ý,ª,Ā,«É,Ĉ B,±  
,Ī'²fĀfxf<,ĀfAfvfŠfP [fVf‡f“,đŽg—p,μ,Ā,ç,éŽž,ÉfXf€ [fY,Èf^fXfN Ø,è'Ō,Ī,đ s,ª,É,Ī A22 kHz,Īvf%ofCf}  
fŠ Efofbftf@ AfXfefĀfTfEf“fh A,»,μ,Ā8ftrfbfgfTf“fvfŠf“fO,ĪftfH [f]fbfg,đŽg—p,.,é B

DirectSoundIfufWfFfNfg,đ u—D æ v,Ī'²fĀfxf<,ĀŽg—  
p,.,é,Æ AfAfvfŠfP [fVf‡f“,Ī Afn [fhfEfFfA Ef~fLVf“fO,È,Ç,Īfn [fhfEfFfA EfŠf\ [fX,É'Ī,μ,Ā'æ^è<%o,Ī—  
D æ“x,đŽ ,Ā,±,Æ,ª,Ā,« A **IDirectSoundBuffer::SetFormat** ,Æ **IDirectSound::Compact**,đĀĀ,Ñ o,.,±,Æ,ª,Ā,«é B

DirectSoundIfufWfFfNfg,đ u”r¼ v,Ī'²fĀfxf<,ĀŽg—p,.,é,Æ AfAfvfŠfP [fVf‡f“,Ī—  
D æfĀfxf<,É,.,é,.,×,Ā,Ī“ĀĀ,đŽ ,Ā,±,Æ,ª,Ā,«é B,μ,©,μ A,»,ĪfAfvfŠfP [fVf‡f“,“ü—  
ĪftfH [fJfX,đŽ ,Ā é ‡ A,»,Īfobftf@,Ī,Ÿ,©,ç,μ,©%o',ª,.,±,Ī,É,Ĉ B“ü—  
ĪftfH [fJfX,ĪŠĪ“¾ĀĀ ADirectSound,ĪfAfvfŠfP [fVf‡f“,Ā—D æ,³,è,éwaveftfH [f]fbfg,đfŠfXfgfA,.,é B—  
D æ,³,è,éwaveftfH [f]fbfg,Æ,Ī A **IDirectSoundBuffer::SetFormat**,ĪĀĀ,Ñ o,μ,Ā,à,Ā,Æ,à Ā<ß,É'è<’,³,è,½,à,Ī,Ī,±  
,Æ,Ā, ,é (DirectSound,Ī—D æfĀfxf<,ÉŠŌĀEW,È,wave,đfŠfXfgfA,.,é) B

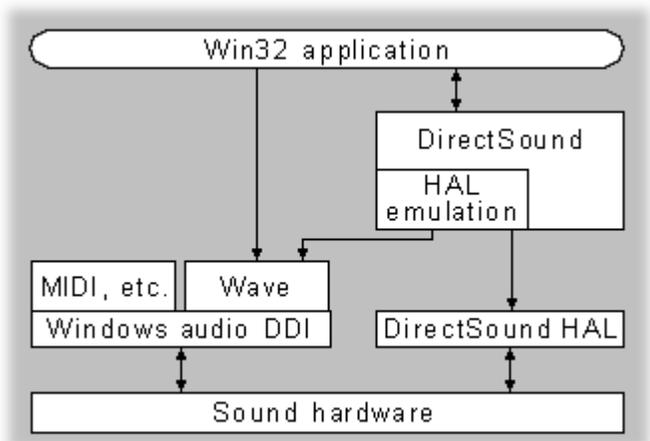
Ā,à ãÊ,Ī'²fĀfxf<,Ī u ‘,«±,Ý—D æ v,Ā, ,é B DirectSoundIfufWfFfNfg,đ ‘,«±,Ý—D æĪ'²fĀfxf<,ĀŽg—  
p,.,é,Æ AfTfEf“fh Efofbftf@,Ōf\_CfĀfNfg,ÉfAfNfZfX,Ā,«é B,±  
,Īf, [fh,Ā,Ī AfAfvfŠfP [fVf‡f“,ª**IDirectSoundBuffer::Lock** f\fbfh,đ—p,ç,Āfobftf@,đf fbfn,μ Afvf%ofCf}  
fŠ Efofbftf@,É'¼ Ū ‘,« ž,b,±,Æ,É,È,é B,±,Ī Ū AfZfJf“f\_fŠ Efofbftf@,Ī Ā ¶,Ī,Ā,«É,Ĉ B

‘,«±,Ý—D æĪ'²fĀfxf<,É Ý'è<’,³,è,Ā,ç,éAfAfvfŠfP [fVf‡f“,“ü—  
ĪftfH [fJfX,đŽæ“¾,.,é,Æ A'¼,ĪfAfvfŠfP [fVf‡f“,ĪfZfJf“f\_fŠ Efofbftf@,Ī,.,×,Ā'āž~³,è Af f [f^,Īž,.,í,è,é(±  
,é,ç,Īfobftf@,đ Ā,Ñ Ā ¶,³,¹,é,Ī A**IDirectSoundBuffer::Restore** f\fbfh,ĀfŠfXfgfA,đ s,ª•K—v,ª, ,é) B,±  
,ĪfAfvfŠfP [fVf‡f“,“ü—ĪftfH [fJfX,đŽ,.,Ī Afvf%ofCf}  
fŠ Efofbftf@,Īf [f^,Īž,.,í,è,é,ª AfAfvfŠfP [fVf‡f“,“ü—ĪftfH [fJfX,đ Āžæ“¾,.,é,ĪfŠfXfgfA,à%Ā”,Ā, ,é B

‘,«±,Ý—D æfĀfxf<,Ī Afvf%ofCf}fŠ Efofbftf@,đ ì ¬,.,é,½,ß,Ī•K—  
v â'Ī đĀĀ,Ā,Ī,É,Ĉ B,μ,©,μ Afvf%ofCf}  
fŠ Efofbftf@“à,ĪTf“fvfŠf“fO EfI [ffBfL,ŌfAfNfZfX,.,é,½,ß,É,Ī AfAfvfŠfP [fVf‡f“,ª ‘,« ž,Ý—  
D æfĀfxf<,É Ý'è<’,³,è,Ā,ç,é•K—v,ª, ,é B,±,ĪfĀfxf<,ÉfZfbfg,³,è,Ā,ç,È,Ĉ  
,Æ A,½,Æ, **IDirectSoundBuffer::GetFormat**, **IDirectSoundBuffer::SetFormat**,  
**IDirectSoundBuffer::GetVolume**,È,Ç,Īf f\fbfh,ĪĀĀ,Ñ o,μ,É ¬Ā÷,μ,½,Æ,μ,Ā,à A **IDirectSoundBuffer::Lock**  
A,.,æ,Ñ **IDirectSoundBuffer::Play**,ĪĀĀ,Ñ o,μ,É,Īž,.,s,.,é B

**fvXfef€‚†**

ŽŸ,ĭ },ĪDirectSound,Æ,»„ĭ¼,ĭfvXfef€fĪ [ffBfĪ EfRf“f] [flf“fg,Æ,ĭŠÖEW,đŽ,ĭ,μ,Ä,¢,é B



DirectSound HAL—p,É ĭ,ç,é,½fTfEf“fh EfffofCfX Efhf%ofCfo,Ī AfĪ [ffBfĪ Ä ¶Žž,É Ä „ĭ”Ī—Ī,đ”-  
 Šö,.,é BfffofCfX Efhf%ofCfo,ĪHAL,ĭ<@”\,đŠe XŽÄ s,μ,ÄfTfEf“fh<@Šĭ,ĭfA [flfEfNf“ff,Ö“-  
 „,©,“ A,»„ĭ<@”\ „,ÆfpftfH [f}f“fX,đ”ø,« o. BHAL,Īfn [fhEfFfA,ĭ”\—  
 Ī,đDirectSound,Ö,Æ“m,ç,ĭ ADirectSound,©,ç,ĭ—v< ,đfn [fhEfFfA,Ö,Æ“„ĭ,é B,à,μfn [fhEfFfA,“—v< ,É%ž,ĭ,é”\  
 —Ī,“„É,¢ é †,Ī ADirectSound,“fvtfgfEfFfA,ÄfGf~f...f€ [fg,.,é B

DirectSoundfhf%ofCfo,“É,¢ é †,Ä,àfAvfšfP [fvf†f“„Ä,ĪDirectSoundŠÖ ”,ĭžg—p,Ī%Ä”\,Ä, ,é BfTfEf“fh<@Šĭ,É  
 DirectSoundfhf%ofCfo,“fCf“fXfg [f<,“„é,Ä,¢,É,¢ é † ADirectSound,Žg—p,.,é,Ī,ĪHALfGf~f...  
 f€ [fvf†f“ Ef€fCf,„Ä, ,é B,±,ĭf€fCf,„Ä,ĪWindowsf}f~f ffBfA,ĭfEfF [fuftfH [f€ EfĪ [ffBfĪŠÖ ”,đžg  
 —p,μ,Ä,¢,é B

DirectSoundŠÖ ”,ÆfEfF [fu EfĪ [ffBfĪŠÖ ”,đ—p,¢  
 ,é,Æ AfTfEf“fh<@Šĭ,ĭfEfF [fuftfH [f€ EfĪ [ffBfĪ,Ö,ĭfPfX,É“T’đŽ^,“—^,ĭ,ç,é,é B  
 ,Đ,Æ,Ä,ĭfffofCfX,Ä,Ī A“è“x,ÉfAfNfZfX,đ”ñ<Ÿ,.,épfX,Ī,Đ,Æ,Ä,Ä, ,é BfEfF [fuftfH [f€ EfĪ [ffBfĪ Efhf%  
 fCfo,“Đ,Æ,Ä,ĭfffofCfX,đŠ,„è“—,Ä,é é † ADirectSound,Ä,ĭ“fffofCfX,Ö,ĪŠ,„è“—,Ä,Īž,”s,.,é B“—  
 Ī,É ADirectSound,“Đ,Æ,Ä,ĭfffofCfX,đŠ,„è“—  
 ,Ä,é,Æ AfEfF [fuftfH [f€ EfĪ [ffBfĪ Efhf%ofCfo,Ä,ĭfffofCfX,ĪŠ,„è“—,Ä,Īž,”s,.,é B

fAvfšfP [fvf†f“„“—¼•ü,ĪŠÖ ”,đžg—p,.,éK—v,“ ,éžž,É,Ī A,„,é,¼,é,ĪŠÖ ”,đ€đ€Ý,Éžg—  
 p,.,é,Ī,æ,¢ B,Ä,Ü,è A **DirectSoundCreateŠÖ** ”,ÄfTfEf“fh Efn [fhEfFfA,đfĪ [fvf“„μ A  
**IDirectSound**,”æ,Ñ**IDirectSoundBufferCf**“f^ [ftfFfCfX,ÄfTfEf“fh,đ Ä ¶,μ A  
**IDirectSound:~Release** f\fbfh,Ä“fn [fhEfFfA,đfnf [fY,.,é,Æ,¢,Ä,½,±,Æ,“%Ä”\,Ä, ,é BfTfEf“fh Efn [fhf  
 EfFfA,“—L€ø,Æ,É,é,Ī,Ī Awin32 SDK,ĭfEfF [fuftfH [f€ EfĪ [ffBfĪŠÖ ”,É,æ,é B

,Ö,½,Ä,ĭTfEf“fh EfffofCfX,“fvXfef€„ÉfCf“fXfg [f<,“„é,Ä,¢,é é †,à,Ü,½“—  
 Ī,É ADirectSoundŠÖ ”,ÆfEfF [fuftfH [f€ EfĪ [ffBfĪŠÖ ”,Ī,Ç,ç,ç,đ—p,¢  
 ,Ä,à AfAvfšfP [fvf†f“„Ī,„,é,¼,é,ĭfffofCfX,É“Æ—š,μ,½fAfNfZfX,“%Ä”\,Ä, ,é B  
 , ,éžĪ,ĭfAvfšfP [fvf†f“„É,“„,éEfF [fuftfH [f€ EfĪ [ffBfĪŠÖ ”,ĭžg—p,Ī A”ñ Ī,É—L€ø,É%đ€^—  
 @,Æ,É,é,±,Æ,“μ,Ī,μ,Ī, ,é B,½,Æ,ĭ,Ī A **PlaySound**,”æ,Ñ**WaveOutŠÖ** ”,ĭžg—  
 p,É,æ,Ä,Ä A“±“ü%Ī,É,Ç,ĭP“è,ĭTfEf“fh,âfĪ [ffBfĪ EfXfgš [f€,Ī Ä ¶,“—e^Ö,É,È,é B

**Note**  
 Microsoft Video for Windows,Ī ACE» Ýavi(audio visual interleaved)ftf@fCf<,ĭfĪ [ffBfĪ Efgh%ofbfN,đ o—  
 Ī,.,é,Ī,ÉfEfF [fuftfH [f€ EfĪ [ffBfĪŠÖ ”,đžg—p,μ,Ä,¢,é B,„,Ī,½,B AfAvfšfP [fvf†f“„DirectSound,đžg—  
 p,μ,Ä,©,çaviftf@fCf<,đ Ä ¶,μ,æ,μ,Æ,μ,Ä,à A,„,ĭfĪ [ffBfĪ Efgh%ofbfN,Ī Ä ¶,Ä,„,É,¢ B“—  
 Ī,Ä Aaviftf@fCf<,đ Ä ¶,μ,Ä,©,çDirectSoundfĪufWfFfNfg,đ ĭ ĩ,μ,æ,μ  
 ,Æ,μ,Ä,à A ĭ —žž,ĪŠÖ ”,ĭfGf% [,đ•Ö,· B  
 €» Ý,Ī,Æ,±  
 ,é,Ä,Ī AfAvfšfP [fvf†f“„DirectSoundfĪufWfFfNfg,đ%đ•ú,.,é,½,B,É,Ī Aaviftf@fCf<,Ī Ä ¶“O,É**IDirectSound::**

**Release**, ÌĈÄ, Ñ o, μ, ð s, □ BfAfvfŠfP [fvf‡f“, Ífrffl, Ì Ä ¶ I—  
'Ĉä, ÉDirectSoundIfufWffNfg, Æ, » ÌDirectSoundBufferIfufWffNfg, Ì Ä ì ¬, Æ Ä Ý'è, ð s, !, é B

---

**DirectSoundŠT—v**

,±,ì ß,À,ÍDirectSoundfRf“f| [flf“fg,ìê”Ê“I,È îñ,É,Â,ç,Ä%ø à,·,é B

DirectSound,ì“Á’Ÿ

3DfTfEf“fh

**DirectSound, ì“Á’¥**

,±, ì ß, Â, ÍDirectSound, ìfi [ffBfi Ef~fLfvf“fO, Æ Afn [fhfEfFfA EfAfNfZf%ofCE [fvf±f“, ð—~—p, µ, ½”\—  
Í, É, Â, Ç, Ä%ø ò, ·, é B, ³, ç, É AfAvfšfP [fVf±f“, ðffUfCf“, ·, é Û, ìfvf%ofCf}  
fš EfTfEf“fh Efofbftf@, Ö, ì ‘, «, ±, ÝŽž, É l—¶, ·, ×, «“\_, É, Â, Ç, Ä, à%ø ò, ·, é B

f~fLfvf“fO

fn [fhfEfFfA EfAfNfZf%ofCE [fvf±f“

fvf%ofCf}fš Efofbftf@, Ö, ì ‘, «, ±, ÝfAfNfZfX

**f~fLfVf“fO**

DirectSound, ĀŽg—p•p“x, à, Ā, Ā, Ā, à , , c, ì, Í A, í, , , ©, ÈfCefCfef“fV, ĀfI [ffBfI Ef~fLfVf“fO, ð s, p, «@”\, Ā, , é BfCefCfef“fV, Ā, Í AfTfEf“fh Efofbftf@, à ì ¬, ³, è, Ā, ©, çfXfs [fJ, Ā Ā ¶, ³, è, é, Ü, Ā, É, ©, éžššŌ, Ì, ±, Ā, Ā, , é BfAf vfŠfP [fVf‡f“ , Í A, Đ, Ā, Ā, Ü, ½, Í, » , è È ã, ìfZfJf“f fŠ EftfEf“fh Efofbftf@, ð ì ¬, µ, Ā, » , è, ç, ÉfI [ffBfI Eff [f^, ð ‘, «, ±, p, ± , Ā, à, Ā, «, é B, » , µ, Ā A Ā ¶ A, Ü, ½, Í, àž~, , , éfofbftf@, ì, I, ð, à, Ā, «, é BDirectSound, Í Ā ¶, +, ìfofbftf@, ð, , , x, Āf~fLfVf“fO, , , é B, » , µ, Ā Af~fLfVf“fO, µ, ½, Ā, %oÈ, ð AfTfEf“fh<@Ší, Ō, ÌfI [ffBfI Eff [f^, Ì, Ÿ<<, ð, µ, Ā, c, évf%ofCf} fŠ EftfEf“fh Efofbftf@, É ‘, «, ±, p, ±, Ā, à, Ā, «, é BDirectSound, àf~fLfVf“fO, Ā, «, éfofbftf@, Ì ”, Í A—LĀø, È ^— ŽžšŌ, É, æ, Ā, Ā, Ì, Ÿ §ĀĀ, ðžó, , , é B

fCefCfef“fV, à20f~fŠ•b~È%o, Ì ê ± Af† [fU, àfofbftf@, Ì ì ¬, ©, çfXfs [fJ, Ì Ā ¶, Ü, Ā, Ì, x%o, , , ðŠ, ¶, é, ± , Ā, Í, È, ç BDirectSoundf~fLfT [, ÌfCefCfef“fV, Í20f~fŠ•b, È, Ì, Ā A Ā ¶, àŽn, Ü, é, Ü, Ā, Ì, x%o, , , Í, mŠo, ³, è, È, c, Ì, Ā, , é B, ± , Ì ðĀ %o, ¾, Ā Afobftf@, ð Ā ¶, , , é, Ā“žž, ÉfXfNfŠ [f“ EfAfjf [fVf‡f“, ðšJŽn, , , è, Ì AfI [ffBfI, ĀftrffI, Í“žž, ÉfXf^ [fg, , , é B, µ, ©, µ ADirectSound, àHEL, ðŽg—p, µ, È, , Ā, Í, È, ç, È, c ê ±(fTfEf“fh<@Ší— p, ÌDirectSoundfhf%ofCfo, à, È, c ê ±) Afn [fhfEfFA, É, È, ¶, , , é, x%o, , (È í100 `500f~fŠ•b) , à AfTfEf“fh, à Ā ¶, ³, è, é, O, É” ¶, , , é B

, Ç, Ì, æ, µ, È ê ±, Ā, à A Ā ¶, Ā, «, é, Ì, Đ, Ā, Ā, ÌfAfvfŠfP [fVf‡f“, Ìfofbftf@, Ì, Ÿ, Ā, È, é B, ± , è, Í A^è“x, É“Á, è, ÌDirectSoundfhf%ofCfo, ðfI [fvf“, Ā, «, é, Ì, à, Đ, Ā, Ā, ÌfAfvfŠfP [fVf‡f“, Ì, Ÿ, Ā, , é, ½, ß, Ā, , é B

**fn [fhfEfFfA EfAfNfZf%ofCE [fVf‡f“**

DirectSound,Ífn [fhfEfFfA Ef~fLfVf“fO,âfn [fhfEfFfA EfTfEf“fh Efobftf@f f,fŠ“™,ìTfEf“fh<@Ší,ðŽ©“  
®“I,É ,‘-‰»,·,é BfAfvfŠfP [fVf‡f“,©,ç,Í A“Á,Éfn [fhfEfFfA EfAfNfZf%ofCE [fVf‡f“,ì Ý’u—v< ,ð s,•K  
—v,Í,È,ç B

,½,¾,µ ACE» Ý,ìfn [fhfEfFfA,ìfŠf\ [fX,ð Á‘âCEÀ,É—~—p,µ,½,ç,Æ l,é,È,ç A  
DirectSound,É‘Í,µ,ÄfTfEf“fh EfffofCfX,Ífn [fhfEfFfA «”\ î•ñ,ì•Ž!,ð—v< ,·,é•û-@,ª ,é B,±  
,ì î•ñ,©,ç Afn [fhfEfFfA EfAfNfZf%ofCE [fVf‡f“,ð s,• Ū,ìî Ū,Æ,È,éfTfEf“fh Efobftf@,ìŽw’è,ª,Á,«,é,æ,  
•,É,È,é B

,±,é,Í A,»,é,¼,ê,ìCEø%ÊŽg—p,âfTfEf“fh Efobftf@ Ä ¶,ìf^fCf~f“fO Afobftf@Žæ“¾,ì—  
D æ“x,È,Ç,ðfAfvfŠfP [fVf‡f““•,ÁCE^è,·,é,±,Æ,ª,Á,« A•K—  
v,Éfn [fhfEfFfA,ìfŠf\ [fX,ìŠ,,è U,è,ª,Á,«,é,©,ç,Á, ,é B

**fvf%ofCf}fŠ Efofbftf@,Ö,İ ‘,«,±,ÝfAfNfZfX**

fvf%ofCf}fŠ EfTfEf“fh Efofbftf@,İfTfEf“fh EfffofCfX,©,çfTf“fvfŠf“fO EfI [ffBfI,đ o—  
Í,·,é BDirectSound,Á,İfvf%ofCf}fŠ Efofbftf@,Ö,İ¼ Ú ‘,«,±,ÝfAfNfZfX,ª,Á,«,é B,±,İ<@”\,  
,Í A”ñ í,ÉĈÈÀ,ç,ê,½Ží—  
b,İfAfvfŠfP [fVf‡f“ A,Â,Ü,è“Á%»,ª,ê,½f~fLfvf“fO,â A,»,İ¼fZfJf“f\_fŠ Efofbftf@,ÂfTf [fg,µ,Á,ç  
,È,ç<@”\t,«fAfvfŠfP [fVf‡f“,Á,İ,Ý—L—p,Á, ,é BfAfvfŠfP [fVf‡f“,©,çfvf%ofCf}fŠ Efofbftf@,Ö¼ Ú ‘,«,±  
,Ý,đ s,ª,Æ A,Ç,ª,µ,Ä,àfTfEf“fh,“r Ø,ê,â,·,·,È,é Bfvf%ofCf}  
fŠ Efofbftf@,Ö¼ ÚfAfNfZfX,đ s,µfAfvfŠfP [fVf‡f“,Í AfpftfH [f}f“fX đĈ ,ªĈµ,µ,È,é,İ,Á, ,é B  
fvf%ofCf}fŠ Efofbftf@,İÊ í,Æ,Ä,à ¬,ª,ç B,»,İ,½,ß A,±,İŽí,İfobftf@,Ö¼ Ú ‘,«,±  
,Ý,đ s,ª ê ±,Í A,·,Ä,Éfobftf@“à,É, ,éfuf fbfn,ªĈJ,è•Ö,µ Ä ¶,ª,ê,È,ç,æ,ª Aff [f^ Efuf fbfn,Ö,İ ‘,«,±  
,Ý,đ’Z,çŠŌŠu,Á s,í,È,·,è,İ,È,ç,È,ç Bfobftf@ ì ¬’†,İfobftf@,İfTfCfY,İŽw’è,Á,«,È,ç,½,ß A ì ¬ ì<Æ I—  
¹Ĉä,É,Á,«, ,ª,Á,½fTfCfY,đŽó, “ü,ê,é,±,Æ,É,È,È é B  
fvf%ofCf}fŠ EfTfEf“fh Efofbftf@,É’İ,·,é ‘,«,±,ÝfAfNfZfX,đŠl“¾,·,é,Æ A¼,İDirectSound,İ<@”\,Í—  
ªĈø,É,È,é BfZfJf“f\_fŠ Efofbftf@,İf~fLfvf“fO,ª,ê,È,ç  
,½,ß AfN [fhEfFfA EfAfNfZf%ofĈ [fVf‡f“ Ef~fLfvf“fO,Í¬Ĉø,É,È,é  
(DirectSound,ªfZfJf“f\_fŠ Efofbftf@,Âf~fLfvf“fO,đ s,ª,Æ Af~fLfvf“fO,ª,ê,½fI [ffBfI Eff [f^,İfvf%ofCf}  
fŠ Efofbftf@,É’u,©,ê,é) B  
fAfvfŠfP [fVf‡f“,İ¼,·,Í Afvf%ofCf}fŠ Efofbftf@,Ö¼ ÚfAfNfZfX,¹,·,ÉfZfJf“f\_fŠ Efofbftf@,đŽg—  
p,·,é BfZfJf“f\_fŠ Efofbftf@,Ö,İ ‘,«,±,Ý,İŽ©—R,É s,!,é B’â,«,Èfobftf@,ªŽŸ,İff [f^ Efuf fbfn,Ö,İ ‘,«,±  
,Ý,Ü,Á,İŽžŠŌ,đ%Ō,¬ A,»,è,È,æ,Á,ÄfI [ffBfI,Á%o¹,“r Ø,è,éŠèĈ,đ Ä ¬ĈÈÀ,É,Æ,Ç,ß,é,İ,Á, ,é B,½,Æ,·, AfAfV  
fŠfP [fVf‡f“,©,ç,İfI [ffBfI,Ö,İ—v< ,ª Af~fLfvf“fO,đ•K—v,Æ,µ,È,çfI [ffBfI EfXfgfŠ [fĈ,İ,æ,ª  
,ÈfVf“fvf<,È,à,İ,Á, ,Á,Ä,à A,»,İfI [ffBfI Eff [f^,İ Ä ¶,ÉfZfJf“f\_fŠ Efofbftf@,đŽg—p,·,é,±  
,Æ,Ä ,·,çfpftfH [f}f“fX,đŽÆĈ,·,é,±,Æ,ª,Á,«,é B

### 3DfTfEf“fh

DirectSound,É,æ,è AfAfvfšfP [fVf±f“,Í%¹CE¹,ªŽ¯·Ê,³,ê,é^Ê'u i'èÊ j,ð·Ī X,·,é,±,Æ,ª,Á,«,é B,±  
,é,É,Ī AIDirectSound3DBuffer A,“,æ,ÑIDirectSound3DListenerfCf“f^ [ftfFfCfX,ðŽg—  
p,·,é B,ç,È,Ý,É%¹CE¹,Æ,Ī A%¹,ª“S·ûCEü,Ö L,ª,é,Æ,«,Ī'† S^Ê'u A,à,µ,,Í%¹,ª%~ ó,É ¬,³,,È,Á,Ä,ç,-  
,Æ,«,Ī,“\_Ī,±,Æ,Á, ,é B,Û,½ Afhfbfvf%o [CEø%Ê,ð,©,¯,é,±,Æ,à,Á,«,é B·W €“I,Èf%ofEfH EfXfs [fJ,ðŽg—  
p,µ,Á,à,±,è,ç,ĪCEø%Ê,Ī·,«Žæ,è%oĀ”\,¾,ª Afwfbfhfzf“,ðŽg,Ī,±,è,ç,ĪCEø%Ê,ª,³,ç,É-¾Šm,É·,«Žæ,è,é B

3DfTfEf“fh,ĪŠT—v,Æ,µ,Ä A,±,±,Á,ÍÈ%º,ĪfgfsfbfN,É,Á,ç,Ä à-¾,·,é B

%¹'æ'è^Ê,Ī”FŽ¯

fŠfXfi\_l

fTfEf“fh EfR [f“

Á'Z<—£,Æ Á'<—£

Ê'u,Æ'¬“x

Direct3D,Ö,Ī“ ±

“è'P^Ê,Æ<—£—v'f

f,fmf%of<%¹CE¹,ÆfXfefCEfI%¹CE¹

%0'œ'è'Ê,ì"ŔŽ

œ»ŽÀ œŠE,Á,Í A óŠÔ,É,,"é%0'œ'è'Ê,ì"ŔŽ,Í A'½ " ,ì—v'f,É%œç,³,ê,é BŽŸ,ÉŽ',,ì,Í,»,ì"è",Á, ,é B

fŕŕŔ... [f€ B%0¹,ð o,·"·ì,ªŔŔXfi [,©,ç—£,ê,é,Ù,Ç A,»,ì%0¹,Í ¬,³,,È,Á,Ä,ç, B,±  
 ,ìœ» Û,Íŕ [f<ŕŕft,ÆœÄ,Í,ê,Ä,ç,é B

"Ž'B,ì,,é BŔŔXfi [,ì%0E•ùœü,©,ç",¹,ç,ê,½%0¹,Í,ªŔŔXfi [,ì%0EŽ",É"Ž'B,·,é,ì,Í A ¶Ž",æ,è,à,Ù,ñ,ì ,µ æ,Á, ,é  
(,±,ì,,é,ìŽ "±ŽŽŠÔ,Í A-ñ1f~fŠ•b,Á, ,é) B

Á%0¹ BŔŔXfi [,ìœã,è,©,ç,,é%0¹,Í A'O,©,ç,«½%0¹,É"ä,×,Ä,©,·,©,É Á%0¹,³,ê,Ä,ç,é B,±  
,é,É,æ,è 1,ìŽ",ì•ùœüŠm"Ŕ,ÍŠmŽÀ,É,È,é B,³,ç,É AfŔŔXfi [,ì%0E,©,ç%0¹,ª,«½ ê ±,à A ¶Ž",É"Í,-  
%0¹,Í"ª,Đ,Æ,Á,Ô,ñ Á%0¹,³,ê,é B

,±,ê,ç,Í A 1,ª%0¹,ì"È'u,ðŽ"•Ê,·,é,½,B,ì A,·,×,Ä,Á,Í,È,ç,ªŽ,È—v'f,Á, ,é B,»,µ,Ä,±,ê,ç,ì—v'f,ªDirectSound,ìŕ|  
fWfVf±ŕŕf"ŔO EfVfXfœf€,ì"†,Ä"ñ•Ÿ,³,ê,Ä,ç,é,ì,Á, ,é B «~³DfTfEf"fh,ðfTf|

[fg,·,éfn [fhfEfFfA,"è"È"Í,É,È,ê,Í A,±,è"ÈŠO,ìŕ|fWfVf±ŕŕf"ŔO—v'f,ªVfXfœf€,É'g,Ÿ ž,Û,ê,é,±  
,Æ,¾,è,± B,½,Æ,ì,Í AfŔŔXfi [,ì"ª,ìŽç—  
È,Û,½,Íœ",ãŠOŽ",Ô,ì"½ŽÈ,É,æ,é Á%0¹,Í A ,Žü"g,Æ'áŽü"g,Æ,Á,ÍÛ,È,Á,Ä,,é B

,µ,©,µ A Ä,à d—v,È%0¹,ì"È'uŽ"•Ê—v'f,Í A%0¹œ¹,ìŽ<Šo"Í,È"È'u,Á, ,é B,½,Æ,ì,Í A%0¹,,É, ,é A ¬,³,È"\_,Æ,µ,Äœ  
©,¹,Ä,ç,½"ŽÈ'ì,ª Aœ©,Ä,ç,é 1,ì"ª ä,ð%0z,¹,é'O,É'ä—œŠÔ'e"¹ŕ~ŕŕŔŔçç<,ì'ä,«³,É,È,È,Á,Ä,ç,é,ì A,±  
,Û,²,Û,Æ,µ,½Žè,ª,©,è,È,Ç,ª,È,,Ä,à A%0¹,ÍŠmŽÀ,É,»,ìŕŔŔXfi [,É<B,Ä,« AŽ,Á,Ä,Ä,ç,,¾,è,± B

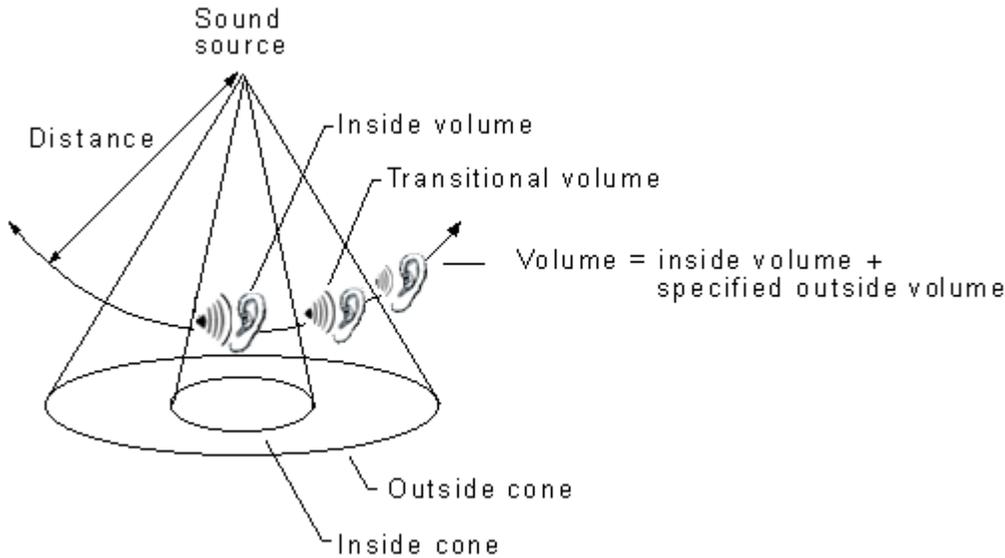
**fŠfXfi [**

•“İ,afŠfXfi [,İžü,è,ð90“x%õ“],μ,½ ê ‡,Æ AfŠfXfi [,““İ,É‘Š‘İ,μ,Ä90“x““a,ð%õ““]  
,<sup>3,1,½</sup> ê ‡,Æ,Ä,Í AfŠfXfi [,“EoE±,·,é%¹çEø%õÊ,Í“~ê,Ä, ,é B,μ,©,μfvf fOf%of€ ã,Ä,Í AfŠfXfi [,İ^Ê‘u,â•û  
Eü,ð•İ X,·,é•û,<sup>a</sup> A ê-Ê,İ‘†,İ‘¼,İ,·,×,Ä,İ•“İ,İ^Ê‘u,ð•İ,|,é,æ,èŠÈ‘P,È,±  
,Æ, <sup>a,½</sup>,ç BDirectSound,Í AIDirectSound3DListenerfCf“f^ [ftfFfCfX,ð’Ê,¶,Ä,±,İ”\—İ,ð’ñ<ÿ,μ,Ä,ç,é B

**ftTfEf“fh EfR [f“**

^Ê'u,Í, ,é,ª•ûĈÛ,Ì,È,Ĉ%o¹,Í“\_‰o¹Ĉ¹,Á, ,é B,Ç,Ì•ûĈÛ,Á, ,Á,Ä,àŠfXfi [,ª%o¹,©,ç—Ē,ê,ê,Î A%o¹,Í ¬,³,-  
 ,È,é B'Ê'u,Æ•ûĈÛ,Ì, ,é%o¹,ðfTfEf“fh EfR [f“,Æ,ç,ª B

DirectSound,ÌfTfEf“fh EfR [f“,É,Í“à•”fR [f“,ÆŠO•”fR [f“,ª, ,é B“à•”fR [f“,Ì,È,©,Á,Í Af{fŠf... [fĈ  
 ,Í,» ,Ì%o¹Ĉ¹,Ì Á“âfĈfxf<,Æ,È,é(DirectSound,Á,Í“ • ,ðfTf| [fg,µ,Á,ª,ç, , A Á“âf{fŠf... [fĈ EfĈfxf<,ÍO,Á, ,é B,»  
 ,Í¼,Ì,·,×,Á,Ìf{fŠf... [fĈ EfĈfxf<,Í A Á“âf{fŠf... [fĈ,©,çĈ, Š,µ,Á,Ĉ, ,Æ,ç,ªÓ-j,Á A%o  
 ,Ì¹,É,È,é) BŠO•”fR [f“,ÌŠO•ª,Á,Í Af{fŠf... [fĈ,Í A“à•”f{fŠf... [fĈ,É“Á“è,ÌŠO•”f{fŠf... [fĈ  
 ,ð%oÁ,¼,à,à,Ì,Æ,È,é B,½,Æ,¼,Í AfAfvfŠfP [fVfªf“,ªŠO•”f{fŠf... [fĈ  
 ,ð-10,000,ÉfZfbfg,·,é,Æ A,» ,Ì%o¹Ĉ¹,ÌŠO•”fR [f“,ÌŠO,Á,Í•,«Žæ,ê,È,Ĉ BŠO•”fR [f“,Æ“à•”fR [f“,ÌŠO,Á,Í Af{fŠf  
 ... [fĈ,Í, ,éĈfxf<,©,ç•Ê,ÌĈfxf<,É ™ X,É•Í%o»,·,é BfTfEf“fh EfR [f“,ÌŠT”O,ðŽŸ,Ì } ,ÉŽ,· B

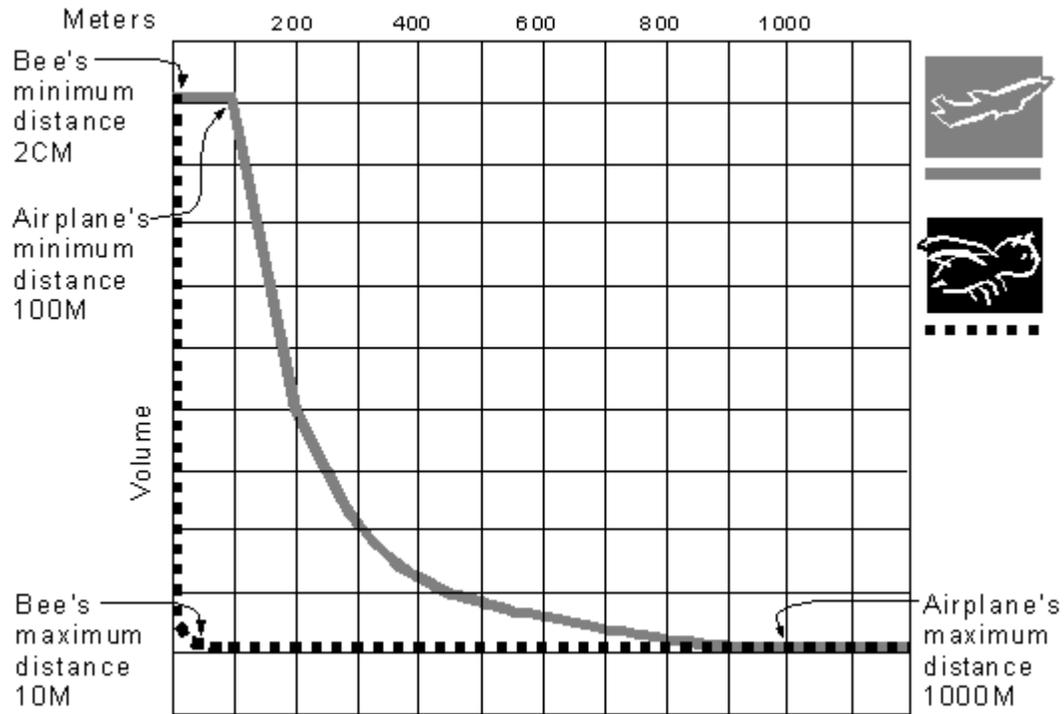


<Z p“l,É,Í A  
IDirectSound3DbufferfCf“f^ [ftfFfCfX,Á, ,éTfEf“fh Efobftf@,Í,·,×,ÄfTfEf“fh EfR [f“,Á, ,é B,½,Æ,¼,Í AfT  
 fEf“fh EfR [f“,ÌŠO•”,Ìf{fŠf... [fĈ,Ì %Šú¹,ÍO,Á, ,é BfAfvfŠfP [fVfªf“,Á,±,Ì¹,ð•Ì,Ì,à Af{fŠf... [fĈ  
 ,ÍfR [f“,Ì“à•”,Á,àŠO•”,Á,à““,¶,Á A%o¹,Í-  
 ¾Šm,È•ûĈÛ,ðê Ø,à,½,È,Ĉ B,³,ç,É AfTfEf“fh EfR [f“,ÌŠp“x,Í D,«È,¾, L,°  
 ,ç,é,é,ª AŽÀ Û,ÌfTfEf“fh EfR [f“,Í<... ó,É ì,ç,é,Á,Ĉ, B

Á'Z<—É,Æ Á'◀—É

fŠfXfi [,°%¹CE¹,É<ß,Ä,¯,Í A%¹,Í'á,«,.,È,Á,Ä,ç, B,µ,©,µ A Á'á'l(0),É'ž'B,µ,½,è A%¹CE¹,Ì «Ž,Ì ã—  
 "I,ÈCEÀŠE,ÉŽŠ,Á,½ ê ‡,È,Ç A^è'è,Ìf|fCf"f g,ð'È%ß,µ,½ŽŽ^ÈCEã,Í Af{fŠf... [f€,Í'á,«,.,È,è'±,¯,È,ç B,±  
 ,è,ð%¹CE¹,Ì Á'Z<—É,Æ,ç,µ B^—l,É A%¹CE¹,Ì Á'◀—É,Æ,Í A,±,è^È ã%¹,ª ¬,³,,È,ç,È,ç,Æ,ç  
 ,µ^È'u,ð',,½ ê ‡,Ì<—É,ðCE¾,µ B

•È X,Ì%¹,Ì ã'Íf{fŠf... [f€ EfCEfxf<,Í'á,ç,ð•á ž,µ,È,¯,è,Í,È,ç,È,ç ê ‡ A Á'Z<—É,Í'Á,É—L—p,Á, ,é B,½,Æ,!  
 ,Í AfWfFfbfg<@,Ì%¹,Í,Ý,Á,Ì,ç,Ì%¹H%¹,æ,è,á'á,«,.,È, ,è,Í,È,ç,È,ç,ª A, ,é— —R,©,ç,±,è,ç,Ì%¹,Í'¯,¶ ã'Íf{fŠf...  
 [f€ EfCEfxf<,Á^%¹,³,è,È,¯,è,Í,È,ç,È,ç(16ftrfbfg,ÌfI [ffBfI,É,Í,±,Ì,æ,µ,Èf{fŠf...  
 [f€ EfCEfxf<,Ì ^á,ðzŽû,·,é,¾, ,Ì—]n,ª,È,ç) B,½,Æ,!,Í A  
 fWfFfbfg<@,É,Í100f [fgf<,Í A,Ý,Á,Ì,ç,É,Í2fZf"f`f [fgf<,Ì Á'Z<—É,ðŽg—p,µ,½,Æ,·,é B,±,Ì Ý'è,Á, ,è,Í A  
 fWfFfbfg<@,ÍfŠfXfi [,²00f [fgf<—É,è,½,Æ,«,Éf{fŠf... [f€  
 ,ª¼ª,É,È,é,ª A,Ý,Á,Ì,ç,ÍfŠfXfi [,²4fZf"f`f [fgf<—É,è,½,¾,¯,Á"¼ª,Ìf{fŠf... [f€,É,È,é B,±,ÌŠT"O,ÍŽÝ,Ì }  
 ,ÉŽ!,· B



Ê'u,Æ'¬x

,·,×,Ä,Ì3DfTfEf“fh Efofbftf@,Æ3DfŠfXfi [,É,Í, ,éÊ'u,Æ, ,é¬x,ª, ,é BfOf%oftfBfbfN,ÆfAfjf [fVf‡f“,Ì©' n,©,ç,Í A,±,ê,ç,Ì“Á «,Í,Û,Á,½,-

“¬,¶,É,Ý,¡,é B,»,ÌC,É,È,ê,Î A3DfTfEf“fh Efofbftf@,Û,½,Í3DfŠfXfi [,Ê'u,ð A,»,Ì3D<óŠÔ“à,É,·,¬,éÊ'u,Æ,µ,Ä ·\,·,±,Æ,Í,Ä,«é B,µ,©,µ Afobftf@,âfŠfXfi [,ª,»,Ì“Í,ª,óŠÔ,ð“Ú“©,µ,Ä,ç,é¬,³,ð¬x,Ä·\,·,± ,Æ,Í,Ä,«É,ç Bfobftf@,âfŠfXfi [,Ì¬x,Í A DirectSound,Ä,Ífhfbfvf% [Çø%Ê,ÌEvŽZ,ÉŽg—p,³,ê,é B

‘¬x’² B,Í A““Ì,Ìfhfbfvf% [Çø%Ê,ð²,µ,½,ç ê ‡,É—L—p,Ä, ,é B,½,Æ,¡,Í A,µ,È,è,ð, ,°,Ä¬,Ä,Ä,- ,éfÇ [fVf“fOfJ [,ªfŠfXfi [,Ì%oi,ðÊ,è%ß,¬,é,Æ,«Ì%¹,ª—,µ,ç ,Æ,µ,æ,µ B,à,µfŠfXfi [,ÉÍ,µ,Äfhfbfvf% [Çø%Ê,ð²,³,¹,½,Æ,·,é,Æ A,»,Ì²,ÍfŠfXfi [,É·,«Žæ,è%Ä”\ ,È,·,×,Ä,ÌfTfEf“fh Efofbftf@,È%œç,ðçy,Ú,µ,Ä,µ,Û,µ B fÇ [fVf“fOfJ [,É,¾,¬,±,ÌÇø%Ê,ð< ’²,³,¹,é,È,Í AfÇ [fVf“fOfJ [,Ì3DfTfEf“fh Efofbftf@,Ì¬x Ý’è,ðŠg’â,·,é,Í,æ,ç B

fVfXfef€,Ífhfbfvf% [Çø%Ê,ð—Ý Ì“Í,Éµ,µ BfAfvfŠfP [fVf‡f“,ÌfŠfXfi [,Æ%¹Ç¹,ª¬x,ðŽ ,Á,Ä,ç ,ê,Í AfVfXfef€,ÍŽ©“@“Í,É,»,Ì¬xŠÔ,ÌŠÖEW,ðEvŽZ,µ Afhfbfvf% [Çø%Ê,ð¬,â,©,É² B,·,é B

**Direct3D, Ö, İ“ ‡**

IDirectSound3DBuffer A, ¨, æ, Ñ IDirectSound3DListener fCf“f^ [ftfFfCfX, ÍDirect3D™, Æ^ê ,É“® ì, ·, é, æ, □  
, É ÝÇEv, ³, ê, Ä, Ç, é B Direct3D, %¼‘zŠÄ««, Ì, È, ©, ÌfIfufWfFfNfg, ðfAfÇf“fW, ·, é, ½, B, ÉŽg—p, ·, éf|  
fWfVf‡fj“fO îñ, Í A%¹Ç¹, ðfAfÇf“fW, ·, é, ½, B, É, àŽg—p, ³, ê, é B Direct3DŠJ”-  
ŽÖ, É, ÍŽü’m, ID3DVECTOR, ÆD3DVALUE f^fCfv, Í A

**IDirectSound3Dbuffer**, Æ**IDirectSound3DListener** fCf“f^ [ftfFfCfX, Ä, àŽg—p, ³, ê, é B , Ü, ½ A Direct3D, ÄŽg—  
p, ³, ê, Ä, Ç, é ¶Žè Ä·WÇEn, Æ““, ¶, à, Ì, ¸DirectSound, Ä, à Ì—p, ³, ê, Ä, Ç, é( Ä·WÇEn, É, Ä, Ç, Ä, Í A Direct3DŠT—  
v, Ì‘†, Ì3D Ä·WÇEn, ðŽQ Æ, ·, é, ±, Æ) B

3DfTfEf“fh, Ì Ä ¶, ðŠÈ’P, É, ·, é, ½, B, É, Í A Direct3D, ÌfVfXfef€ EfR [f<fofbfN<@ \, ð—~—p, ·, é B, ½, Æ, Ì, Í A  
**D3DRMFRAMEMOVECALLBACK** fR [f<fofbfNŠÖ ”, ðŽg—p, ·, é, Í AfAfvfŠfP [fVf‡f““à, ÌftfÇE [f€  
, Ì“®, «, ðŠÄŽ<, µ A“Á’è, Ì ó’Ô, É’B, µ, ½, Æ, «, ¾, ¯%¹, ÌŠÄ««, ð·Ì, Ì, é, ±, Æ, ¸, Ä, «, é B

“è’P^Ê,Æ<—£—v’f

3DfTfEf“fhEø%Ê,ÏfftfHf<fg’l,Í AŽ©’RŠE,ð-í·i,μ,½,ì,à,À, ,é B,μ,©,μ A’½,ì ÝEvŽÒ,Í A,æ,èfhf%of}  
fefBfbfN,ÈEø%Ê,ð’Ç< ,μ,Ä,±,Ï’l,ð·í X,μ,æ,□  
,Æ,·,é BfAfvfŠfP [fVf±f“,Í,æ,èfGfLfTfCfefBf“fO,È,à,ì,Æ,·,é,½,B,É,Í Afhfbfvf%o [Eø%Ê,ð’²,μ,½,è A<—£  
,É,æ,é%¹,ÏE, Š,ð’²,³,¹,é B

DirectSound,Ï3DEø%Ê,Ä,Í A<—£,ì“è’P^Ê,Æ,μ,Ä Af [fgf<,ðŽg—  
p,·,é B,à,μfAfvfŠfP [fVf±f“,Äf [fgf<,ðŽg—p,μ,Ä,ç,È,ç è ±,à A,»,”fRf“f [flf“fg,ì”—  
Í,ð^ÚŽ ,·,é,½,B,É“è’P^Ê,Ï·Š·,Í·s—v,Ä, ,é B’ä,í,è,ÉfAfvfŠfP [fVf±f“,Ä,Í<—£—v’f,ð Ý’è,·,é,±,Æ,ª,Ä,«,é B,±  
,é,ÍfAfvfŠfP [fVf±f“,ÄŽw’è,μ,½<—£’P^Ê,ðf [fgf<,ÉŠ·ŽZ,·,é•,“® ¬ ”“\_ì’l,Ä, ,é B,½,Æ,ì,Í AfAfvfŠfP [fV  
f±f“,“è’P^Ê,Æ,μ,ÄftfB [fg,ðŽg—p,μ,½ è ± A<—£—v’f,Æ,μ,Ä0.30480006096,ðŽw’è,Ä,«,é B,±  
,Ï’l,Í A1ftfB [fg,ðf [fgf<,ÉŠ·ŽZ,μ,½’l,Ä, ,é B

**f, fmf%of<%o¹CE¹, ÆfXfefCEfI%o¹CE¹**

3DfTfEf“fh, ÌŠÂ««, Å, ÍfXfefCEfI%o¹CE¹, Í“Á, É—

LCEø, Å, Í, È, ç B'P^ê, ÌfXfefCEfI M †, Í ACE<%oÈ“I, É A“~Žž, É•Ê X, ÌfXfs [fJ, Å Ä ¶, ³, ê, é, Ó, ½, Â, Ì•Š,,, ³, ê, ½f, fmf  
%of< Efgf%ofbfN, Æ, µ, Å \ ¬, ³, ê, é B

DirectSound, Ì3D<@”\, ð—~—p, ·, é, Æ, «, Í Af, fmf%of<%o¹CE¹, ð—p^Ó, ·, é, ±, Æ BfVfXfef€

, ³fXfefCEfI%o¹CE¹, ðf, fmf%of<, É•İŠ·, ·, é<@”\, ð”ö, !, Å, ç, ½, Æ, µ, à AfXfefCEfI, ðŽg—p, ·, é~Ó—; Í, È, A•İŠ·ŽžŠÔ, Ì—  
³•Ê, È, È, é B

**DirectSoundfCf“f^ [ftFfCfXŠT—v**

,±,ì ß,Â,Í^È%°,ìDirectSoundfCf“f^ [ftFfCfX,É,Â,ç,Ä^ê”Ê“I,È î•ñ,ð%ð à,·,é B

IDirectSoundfCf“f^ [ftFfCfX

IDirectSound3DBuffer fCf“f^ [ftFfCfX

IDirectSound3DListener fCf“f^ [ftFfCfX

IDirectSoundBuffer fCf“f^ [ftFfCfX

**IDirectSoundCf“f^ [ftFfCfX**

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 AIDirectSoundBufferCf“f^ [ftFfCfX,ðŽQ Æ,.,é,±  
,Æ BIDirectSoundCf“f^ [ftFfCfX,ðŽg—  
p,.,é,Æ AfTfEf“fh EfJ [fh AfXfs [fJ Af f,fŠŠÄ««,ìfAfvfŠfP [fVf±f“,©,ç,ì‘è‘,“%oÂ”\,É,È,é B

,±,ì ß,Ä,Í AfVfXfef€“à,ÌfTfEf“fh EfffofCfX,ì «”,ìŽæ“¼•û-@ AfTfEf“fh Efofbftf@,ì ì —  
@ AfVfXfef€ EfXfs [fJ,ìŠÄ«« Ý’è-@,“,æ,Ñfn [fhfEfFfA,ÌfRf“fpfNfg,Èf f,fŠ Ý’è•û-@,ì%ð à,ð,.,é B

fffofCfX,ì «”

fobftf@,ì ì —

fXfs [fJ,ìŠÄ«« Ý’è

fn [fhfEfFfAf f,fŠŠC—

**ffofCfX,ì «”\**

**DirectSoundCreate**ŠÖ ”,ðĀ,Ñ o,μ,ÄDirectSoundfIfufWfFfNfg,ð ì ¬,μ,½Ā,Í **AI****DirectSound::GetCaps**f f\bf  
h,ðŽg—p,·,é,±,Æ,ÅfTfEf“fh EfffofCfX,ì «”\,ðŽæ“¾,Å,«,é B Å“K,ÈfpftfH [f}f“fX,ð“¾,é,½,ß,É,Í A,±  
,ìĀ,Ñ o,μ,ð s,±,Æ,Å í“,ìfTfEf“fh EfJ [fh,ì «”\  
,ð“è,μ AfTfEf“fh,ìfpf%of [f^,ð“K ³,È,à,ì,É,İ X,·,é B

fobftf@,î ì ñ

**DirectSoundCreate**ŠÖ ”,ðĀÄ,Ñ o,µ,ÄDirectSoundIfufWfFfNfg,ð ì ñ,µ AfTfEf“fh EfffofCfX,ì «”  
,ð’² „,µ,½ĀĒ,Ī AfAvfšfP [fVfšf“,Ī AfI [ffBfI Eff [f^,ðŠÜ,ðfTfEf“fh Efofbftf@,ð ì ñ E—ñ<“,·,é,±  
,Æ,ª,Ä,«,é **BIDirectSound::CreateSoundBuffer** f\fbfh,ĪfTfEf“fh Efofbftf@,ð ì ñ,·,é **BIDirectSound::Duplicate  
SoundBuffer** f\fbfh,Ī A Ä %o,Æ““,¶·— fobftf@ Ef f,fŠ,ðŽg—  
p,µ,ÄZfJf“fh EfTfEf“fh Efofbftf@,ð ì ñ,·,é BfTfEf“fh Efofbftf@,ðfRfs [µ,½ ê ± Afobftf@ Ef f,f  
Š,ð Á”i,·,é,±,Æ,È,—¼•û,Īfobftf@,ð•Ê X,É Ä ¶,·,é,±,Æ,ª,Ä,«,é B

fTfEf“fh EfffofCfX,É’Ī,µ,Ä,‘²fĀfxf<,ð Ý’è,·,é,É,Ī**DirectSound::SetCooperativeLevel** f\fbfh,ðŽg—p,·,é B,±  
,ê,Ī AfTfEf“fh Efofbftf@,ð Ä ¶,·,é’O,É s,•K—v,ª,·,é B,Û,Æ,ñ,Ç,ĪfAvfšfP [fVfšf“,Ī•W Ē,Ī,‘²fĀfxf<,Ä,·,é  
DSSCL\_NORMAL,ðŽg—p,·,é B,±,ĪfĀfxf<,Ī A’¼,ĪfAvfšfP [fVfšf“,Æ<Ē ±,·,é,±,Æ,ĪĀ^,µ,Ä,È,Ĉ B

**fXfs [fJ,İŠĂ« Ý'è**

IDirectSoundfCf“f^ [ftfFfCfX,É,Í AfVfXfef€“à,İfXfs [fJ,İ’² , EŠĂ«« Ý’è,ð s,□,Ó,½,Â,İf f\fbfh,ŠÜ,Ü,ê,Ä,¢  
,é **IDirectSound::GetSpeakerConfig**“,æ,Ñ**IDirectSound::SetSpeakerConfig** f\fbfh,Å, ,é BCE» Ý,İ,Æ,±  
,ë AŠĂ««,Æ,µ,Ä,Í AfCf„fzf“ Afwfbfhfzf“ AfXfef€fI A4f`fff“flf<,İ^%¹ Ä ¶ AfTf%ofEf“fh EfTfEf“fh,³,  
,é B

fn [fhfEfFfAf f,fŠŠÇ—

**IDirectSound::Compact** f\fbfh,ðŽg—

p,·,é,Æ Af1f“f{ [fh,ìfTfEf“fh Ef f,fŠ,ð,·,×,Ä~A‘±fuf fbfn,Ö^Ú“@,μ,Ä Å‘â,ìftfŠ [f f,fŠ—îæ,ð ì ¬,·,é,±  
,Æ,<sup>a</sup>,Ä,«,é B

**IDirectSound3DBufferCf“f^ [ftFfCfX**

IDirectSound3DBufferCf“f^ [ftFfCfX,Í AfTfEf“fh Efofbftf@,ì3Dfpf%of [f^,É:Í,·,éAfNfZfX,ð'ñ<ÿ,µ,Ä,c  
,é B,±,ìfCf“f^ [ftFfCfX,Í,·,×,Ä,ìTfEf“fh Efofbftf@,ÁfTf] [fg,³,ê,Ä,c,é,í,¯,Á,Í,È,c B

,±,ì B,Á,Í**IDirectSound3DBufferCf“f^ [ftFfCfX,ìf|Cf“f^,ðŽæ“¾,·,é•û-**  
**@,Æ AfCf“f^ [ftFfCfX Ef f\fbfh,ðŽg—p,µ,½fofbftf@ Efpf%of [f^,ìŠÇ— ,É,Á,c,Ä à-**  
**¾,·,é B`È%°,ìfgfsfbfN,É,Á,c,Ä à-¾,·,é B**

IDirectSound3DBufferCf“f^ [ftFfCfX Ef|fCf“f^,ìŽæ“¾

fobf`fpf%of [f^€ ì

Á'Z<—£'l,Æ Á'<—£'l

€ ìf, [fh

Ê'u,Æ'¬“x

fTfEf“fh Efvf fWfEfNfVf#f“ EfR [f“



**fofbf`fpf%of [f^€ ì**

fAfvfŠfP [fVf±f“Í3DfTfEf“fh Efpf%of [f^,İŽæ“¼ E Ý’è,ð ACEÂ X,É Ä ¶,·,é,±,Æ,à Afofbf`,ðŽg—  
p,µ,Ä Ä ¶,·,é,±,Æ,à,Ä,«é BCEÂ X,İ’l,ð Ý’è,·,é,½,ß,É,Í A“K—p%oÄ”\  
·ÉIDirectSound3DBufferCf“f^ [ftfFfCfX Ef f\fbfh,ðŽg—  
p,·,é B,µ,©,µ Afofbftf@,ð·\CE»,·,é,·,×,Ä,İ’l,ð`è“x,ÉŽæ“¼ E Ý’è,·,é•K—v.<sup>a</sup>,·,é,±,Æ,à, ,é B,»İ ê ±,Í A  
**IDirectSound3DBuffer::GetAllParameters**,·,æ,Ñ **IDirectSound3DBuffer::SetAllParameters**f f\fbfh,ðŽg—  
p,·,é,Æ Afofbf` Efpf%of [f^€ ì,ð1%oñ,İCEÄ,Ñ o,µ,ÄŽÄ s,Ä,«é B

Á'Z<—É'1,Æ Á'·<—É'1

3DfTfEf“fh Efofbftf@,É'Î,μ,Ä A Á'Z<—É'1,Æ Á'·<—É'1,ðŽw'è,·,é,±,Æ,ª,Ä,«,é B Á'Z<—É,Æ,Í A%o¹,ª,±,ê^È ã'â,«,È,ç,È,ç<—É,Ä,é B'½'Î,É A Á'·<—É,Æ,Í%o¹,ª,±,ê^È ã'³,È,ç,È,ç<—É,Ä,é B,±,ê,ç,ì1,İŠÖEW,É,Ä,ç,Ä,Í Á'Z<—É,Æ Á'·<—É,ðŽQ Æ,·,é,±,Æ B

Á'Z<—É'1,ì Ý'è,ÆŽæ“¾,É,Í **IDirectSound3DBuffer::SetMinDistance** A,“,æ,Ñ  
**IDirectSound3DBuffer::GetMinDistance** f\fbfh,ðŽg—p,·,é B“—l,É A Á'·<—  
É'1,ì Ý'è,ÆŽæ“¾,É,Í **IDirectSound3DBuffer::SetMaxDistance** A,“,æ,Ñ  
**IDirectSound3DBuffer::GetMaxDistance** f\fbfh,ðŽg—p,·,é B

‘€ if, [fh

fTfEf“fh Efofbftf@,Í A•W € A““Š‘Î A<sup>-3</sup>Eø,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 âÍfpf%of [f^,Í AfŠfXfi [ Efpf%of [f^,³İ X,³,ê,½,Æ,«,ÉŽ©“@“I,É X V,³,ê,é,ì,  
Â A‘Š‘Îfpf%of [f^,Í,İ,ı,ç,È,c,Ü,Ü,Â, ,é B

3DfTfEf“fh Efofbftf@,Ìf, [fh Ý’è,É,ÍDirectSound3DBuffer::SetMode f f\fbfh,đŽg—p, ,é B,±  
,Ìf f\fbfh,Í AdwModetf%ofO,đ,à,Æ,É‘€ if, [fh,đ Ý’è, ,é B,±,Ìftf%ofO,Í1”Ô–Ú,Ìfpf%of [f^,Æ,μ,ĂŽw’è, ,é B

^Ê'u,Æ'¬“x

3D:óŠÔ,É,“,¯,é3DfTfEf“fh,îÊ'u,ð Ý'è EŽæ“%,.,é,É,Í **AIDirectSound3DBuffer::SetPosition** A,“,æ,Ñ  
**IDirectSound3DBuffer::GetPosition** f f\fbfh,ðŽg—p,.,é B

DirectSound,<sup>a</sup>fŠfXfi [,É'î,.,éfhfbfvf%o [Eø%oÊ,îEvŽZ,ÉŽg—

p,.,é'¬“x'l,ð Ý'è EŽæ“%,.,é,É,Í **AIDirectSound3DBuffer::SetVelocity** A,“,æ,Ñ

**IDirectSound3DBuffer::GetVelocity** f\fbfh,ðŽg—

p,.,é Bf ofbfif@,îÊ'u,Í A,»,î'¬“x,l%oeç,ðŽó,¯,È,¢ B'Ê'u,Æ'¬“x,İŠÖÆW,É,Â,¢  
,Ä,î Ú ×,Í A<sup>^</sup>Ê'u,Æ'¬“x,ðŽQ Æ,.,é,±,Æ B

**fTfEf“fh Efvf fWfFfNfVf‡f“ EFR [f“**

3DfTfEf“fh Efofbftf@,Í A“à”fR [f“,EŠO”fR [f“,Ì,Ó,½,Â,ÌfR [f“,ðŽ ,Â B,³,Ü,‘,Û,ÈIDirectSound3DBuffer f\fbfh,ðŽg—p,µ,Ä AFR [f“,ÌŠp“x A Á’←—£,Æ Á’Z←— £ Afofbftf@,ÌfTfEf“fh Efvf fWfFfNfVf‡f“ EFR [f“,ÌÊ’u E•ûŠp,Æ,ç,Á,½,±,Æ,ð Ý’è EŽæ“¾,‘,é,± ,Æ,³,Ä,«,é BfTfEf“fh Efvf fWfFfNfVf‡f“ EFR [f“,Ì“@ ì A“Á’Ï,Á,ç,Ä,Í AfTfEf“fh EFR [f“,ðŽQ Æ,‘,é,± ,Æ B

fTfEf“fh EFR [f“,ð“K Ø,É Ý’è,‘,é,Ì AfAfVfŠfP [fVf‡f“,Éfhf%of}fefBfbfN,ÈEø%øÈ,ð%Á,‘,é,± ,Æ,³,Ä,«,é B,½,Æ,,Ì—H—ì,Ì °,ª•K—v,È ê ‡ AfTfEf“fh,ð’W X,Æ Á ¶,‘,é,©,í,è,É IDirectSound3DBuffer f\fbfh,ðŽg—p,‘,é,Ì AŽŸ,ì,æ,µ,É,µ,Ä^ê’wfTfXfyf“fXCEø%øÈ,ð,‘,é,± ,Æ,³,Ä,«,é B%ø¹E¹,ð”%ø@,Ì† S,ÉÊ’u,t,µ A•ûŠp,ðfhfA,ÉEü,©,Á,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%øÁ’%ø¹),É Ý’è,‘,é B,± ,é,ç,Ì“Á «,ªC ‡,³,é,é,Æ AfhfA,©,ç%ø¹,““¹,ç,é,é,æ,µ,É•,±,‘,é,Ì,Ä ,é B

,±,Ì ß,Ä,Í A^È%ø,ÌfTfEf“fh“Á «,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†Í,ð’è,ß,éŠp“x,ð Ý’è EŽæ“¾,‘,é,É,Í IDirectSound3DBuffer::SetConeAngles A,‘,æ,Ñ IDirectSound3DBuffer::GetConeAngles f\fbfh,ðŽg— p,‘,é BfTfEf“fh EFR [f“,Ì•ûŠp,ð Ý’è EŽæ“¾,‘,é,É,Í IDirectSound3DBuffer::SetConeOrientation A,‘,æ,Ñ IDirectSound3DBuffer::GetConeOrientation f\fbfh,ðŽg—p,‘,é B

fR [f“Šp“x,ÌffftfHf<fg’l,Í360“x A,Ä,Ü,è,·,×,Ä,Ì•ûEü,É’Î,µ,Ä“^,¶f{fŠf... [f€,Ä%ø¹,““¹,ç,é,é,æ,µ,É,È,Ä,Ä,ç ,é B¹,ð%ø°,° ,é,Æ A’è<³,é,½fR [f“,ÌŠO“µ,Ä,Ìf{fŠf... [f€ ,%ø°,° ,é BŠO”fR [f“Šp“x,Í,Ä,È,É“à”fR [f“Šp“x,Æ“^,¶,©,» ,é,æ,è,à’ä,«,È¹l,Ä ,é•K—v,ª ,é B

**“à•” EŠO”fR [f“ Ef{fŠf... [f€**

ŠO”fR [f“ Ef{fŠf... [f€,Æ,Í AfŠfXfi [,ªfofbftf@,ÌfTfEf“fh EFR [f“,ÌŠO“µ,É,ç,é,Æ,«,Ì•t%øÁ“l,Èf{fŠf... [f€,ÌE, Š,Ì,±,Æ,Ä ,é B,±,Ì—v’f,Í100dB,Ä•C³,é,é BŠO”f{fŠf... [f€,ÌffftfHf<fg’l,Í0,Ä ,é B,Ä,Ü, èfTfEf“fh EFR [f“,Í A,±,Ìfpf%of [f^,ªÍ X,³,é,È,çEÄ,è“Á•È,ÈEø%øÈ,ðŽ¹,³,È,ç B

ŠO”fR [f“ Ef{fŠf... [f€,Ì Ý’è EŽæ“¾,É,Í IDirectSound3DBuffer::SetConeOutsideVolume A,‘,æ,Ñ IDirectSound3DBuffer::GetConeOutsideVolume f\fbfh,ðŽg—p,‘,é B,½,¾,µ%øÁ’@,ÈŠO”fR [f“ Ef{fŠf... [f€,Ä ,Ä,Ä,à A%ø¹E¹,©,ç—£,é,é,²,Æ,ÉE, Š,µ,Ä,ç, B

fŠfXfi [,ªfTfEf“fh EFR [f“,Ì†,É,ç,é,Æ,«,Ífm [f}fç,Èfofbftf@ Ef{fŠf... [f€,ªŽg—p,³,é,é(± ,Ì¹,ÍIDirectSoundBuffer::GetVolume f\fbfh,È,æ,è•Ö,³,é,é) BfŠfXfi [,ªfTfEf“fh EFR [f“,ÌŠO,É,ç ,é,Æ,«,Ìf{fŠf... [f€,ÌŠO“µ,ÌfR [f“,à—p,ç,ç,é A,±,Ì,Ó,½,Ä,ª ‡,í,³,Á,½f{fŠf... [f€,Æ,È,é BfR [f“,Ì«ŠEç, - ,Ä,Ì%ø¹,ÌfXf€ [fY,É Á,¹,Ä,ç,« AŽ©’R,ÈEø%øÈ,ð“¾,é,±,Æ,ª,Ä,« ,é B

**IDirectSound3DListenerfCf“f^ [ftFfCfX**

3DfŠfXfi [,Æ,Í A3D.óŠÔ“à,ìfTfEf“fh Efobfbtf@ EfIfufWfFfNfg,É,æ,Á,Ä” ¶,µ,½‰¹,ð•, l,ì,±  
,Æ,ðŽw,· BIDirectSound3DListenerfCf“f^ [ftFfCfX,ÍfŠfXfi [,Ì3D.óŠÔ,É,;,-,éÊ'u,ÆÆ» Ý,ì-“x,ð §Æä,·,é B,Û,  
½,Í AfŠfXfi [,©,ç-£,ê,½ ê ‡,ìfhfbvf%o [Æø‰Ê,ì-Ê,âf{fŠf... [f€,ìÆ, Š,Æ,ç,Á,½ ADirectSoundfRf“f]  
[flf“fg,ì“® ì,É‰œç,;:éŠÄ««fpf%of [f^,ð §Æä,·,é B

,±,ì ß,Á,Í AIDirectSound3DListenerfCf“f^ [ftFfCfX,ìf|fCf“f^,ðŽæ“¾,·,é•û-  
@,Æ AfCf“f^ [ftFfCfX Ef ffbfh,ðŽg—p,µ,½fŠfXfi [ Efpf%of [f^,ìŠÇ— •û-@,É,Á,ç,Ä à-¾,·,é B  
Ê‰‰,ìfgfsfbfN,É,Á,ç,Ä à-¾,·,é B

IDirectSound3DListenerfCf“f^ [ftFfCfX Ef|fCf“f^,ìŽæ“¾

fobf` Efpf%of [f^€ ì

~,'u,« Ý'è

←-£-v'f

fhfbvf%o [-v'f

fŠfXfi [,ìÊ'u,Æ'-“x

fŠfXfi [,ì•ûÆü

f [fçIf-t-v'f

**IDirectSound3DListener** fCf“f^ [ftFfCfX Ef|fCf“f^,İŽæ“¾

IDirectSound3DListener fCf“f^ [ftFfCfX,Öf|fCf“f^,đŽæ“¾,·,é,É,Í A,Ü,·,fvf%ofCf}

fŠ3DfTfEf“fh Efofbftf@,đ ì ¬,·,é•K—v,<sup>a</sup>,,é B,±

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

**DSBUFFERDESC** \“c‘İ,İdwFlagsf f“fo‘†,ÉDSBCAPS\_CTRL3Dftf%ofO,đŽw‘è,·,é B,»μ,Ä ì ¬,<sup>3</sup>ê,½fofbftf@ ā,Ä

**IDirectSoundBuffer::QueryInterface** f\fbfh,đŽg—

p,μ,Ä A,»İfofbftf@,İDirectSound3DListener fCf“f^ [ftFfCfX,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‘€ ì,đŽÀ s,·,é  
    .  
    .  
    .  
}
```

**f ofbf` Efpf%of [f^€ ì**

fAfvfŠfP [fVf‡f“„À,ì3DfTfEf“fhfpf%of [f^,ìŽæ“¼ E Ý’è,Í ACEÂ X,ìŽÀ s,À,à Af ofbf`,ðŽg—  
p,μ,½ŽÀ s,À,à%À”\,À, ,é BCEÂ X,ì’l,ð Ý’è,.,é,½,ß,É A“K—p%oÀ”\  
,È DirectSound3DListener fCf“f^ [ftfFfCfX Ef f\fbfh,ðŽg—p,.,é,±  
,Æ,ª,À,«é B,μ,©,μ Af ofbftf@,ð•\E»,.,é,.,x,À,ì’l,ðê“x,ÉŽæ“¼ E Ý’è,.,é•K—v,ª, ,é ê ‡,à, ,é B,» ,ì Û,É,Í A\_  
DirectSound3DListener::GetAllParameters A,.,æ,Ñ DirectSound3DListener::SetAllParameters f\fbfh,ðŽg—  
p,.,é,Æ Af ofbf` Efpf%of [f^€ ì,ð1%oñ,ìCEÁ,Ñ o,μ,ÀŽÀ s,À,«é B

~,'u,« Ý'è

3DfŠfXfi [ Efpf%of [f^,ð•İ X,·,é,½,Ñ,É A3D^Ê'u ftfBf<f^ Efpf%of [f^,İ ÄE vŽZ,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 „,İpfH [f}f“fX,ð“¼,é,±,Æ,ª,Ä,«,é B,»,μ,Ä Ý'è,ª,·,×,ÄŠ@—  
İ,·,ê,İ AIDirectSound3DListener::CommitDeferredSettings,ðEÄ,Ñ o,·,±,Æ,ª,Ä,«,éj

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**Note**

,Ç,İ ~,'u,« Ý'è,à AIDirectSound3DListener::CommitDeferredSettings,ðEÄ,Ñ o,·,Ü,Ä,Í A““,¶ Ý'è,ðDS3D\_IMME  
DIATEftf%ofO,ðŽg—p,μ,ÄEÄ,Ñ o,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,»,İEã DirectSound3DListener::CommitDeferredSettings f\fbfh,ðEÄ,Ñ o,·,Æ A‘-“x,Í(4,5,6),Æ,È,é B

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←—£—v'f

DirectSound,ÍffftfHf<fg,l<—£<sup>aa</sup>è'PÊ,Æ,μ,Äf [fgf<,ðŽg—p,μ,Ä,ç,é B,à,μfAfvfŠfP [fVf‡f“,<sup>a</sup>f [fgf<,ðŽg—  
p,μ,Ê,ç ê ‡ A<—£—v'f,ð Ý'è,·,é,±,Æ,<sup>a</sup>,Ä,«<sup>a</sup>,é B<—£—v'f,Ê,Ä,ç,Ä,Ì î•ñ,Í A<sup>aa</sup>è'PÊ,Æ<—£—  
v'f,ðŽQ Æ,·,é,±,Æ B

ftfB [fg,ðŽg—p,μ,Ä,ç,éfAfvfŠfP [fVf‡f“,Ö<—£—  
v'f,ð Ý'è,·,é,É,Í A**DirectSound3DListener::SetDistanceFactor**,ðŽg—p,μ,ÄfDistanceFactorpf%of [f^,É  
0.30480006096,ðŽw'è,·,é(±,Ì'l,Í A1ftfB [fg,ðf [fgf<,ÉŠ·ŽZ,μ,½'l,Ä, ,é) B<—£—  
v'f,Ì Ý'èÆã,Í AfŠfXfi [,É“K—p%Ä”,Èf f\fbfh,Ä, ,é,Î AfAfvfŠfP [fVf‡f“ÆÄ—L,Ì<—£—v'f,ðŽg—  
p,μ,ÄÆÄ,Ñ o,μ,Ä,«<sup>a</sup>,é B

fAfvfŠfP [fVf‡f“,Í,Ü,½ ACE» Ý,Ì<—£—v'f Ý'è,ð**DirectSound3DListener::GetDistanceFactor**f f\fbfh,ðŽg—  
p,μ,ÄŽæ<sup>34</sup>,·,é,±,Æ,<sup>a</sup>,Ä,«<sup>a</sup>,é BffftfHf<fg'l,ÍDS3D\_DEFAULTDISTANCEFACTOR (1.0),Ä, ,é B,±,é,Í,Đ,Æ,Ä,Ì<—  
£'PÊ,<sup>a</sup>1f [fgf<,É'Š—,·,é,Æ,ç,σ^Ó—j,Ä, ,é BffftfHf<fg'l,Ä,Í A^Ê'ufxfNfgf<(3.0,7.2,-20.9),Æ,ç,σ  
,Ì,Í•“í,<sup>a</sup>Æ<sup>3</sup>,ÌÊ'u,æ,è3m%oE A7.2m ã A20.9mÆã,è,É, ,é,Æ,ç,σ^Ó—j,É,È,é B<—£—  
v'f,<sup>a</sup>2.0,É•Í X,<sup>3</sup>,è,é,Æ A“<sup>—</sup>,¶Ê'ufxfNfgf<,Ä,à•“í,<sup>a</sup>6m%oE A14.4m ã A41.8mÆã,è,É, ,é,Æ,ç,σ^Ó—j,É,È,é B

**fhfbfvf%o [—v'f**

DirectSound,Í,Ð,Æ,Â,Û,½,Í,»,ê`È ã,ì3DfTfEf“fh Efofbftf@,É,Î,μ,Ä AfŠfXfi [,Ì-“x,ð,à,Æ,ÉfTfEf“fh,Éfhfbfvf  
%o [Cø%oÊ,ð%oÁ,|,é,±,Æ,ª,Ä,«,é Bfhfbfvf%o [—v'f,ð Ý'è,·,é,±,Æ,É,æ,è A DirectSound,Í ACE»ŽÀ ĆŠE,Â`ìCE±  
,Ä,«,éfhfbfvf%o [Cø%oÊ,ð AfTfEf“fh,É,Î,·,éCø%oÊ,ð10”{,Û,Ä<,ß,Ä ¶,¶,³,¹,é,±,Æ,ª,Ä,«,é B,±,ì—  
v'f,ð Ý'è,·,é,É,Í**DirectSound3DListener::SetDopplerFactor** f\fbfh,ðŽg—p,·,é Bfhfbfvf%o [—  
v'f,Í0,©,ç10,Ì”ÍÍ,Ä Ý'è,Ä,«,é B0,Ífhfbfvf%o [Cø%oÊ,ªfTfEf“fh,É%oÁ,|,ç,ê,Ä,ç,È,ç,±  
,Æ,ðŽ|,· B¼,Ì1,Í,·,×,Ä ACE»ŽÀ ĆŠE,Â`ìCE±,Ä,«,éfhfbfvf%o [Cø%oÊ,Ì”{ ”,ð•,· B,Ä,Û,è A1,Í ACE»ŽÀ ĆŠE,ÄŠ  
,¶,ç,ê,éfhfbfvf%o [Cø%oÊ,ª%oÁ,|,ç,ê,é,±,Æ,ð•,μ A2,ÍCE»ŽÀ ĆŠE,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,Ñ **IDirectSound3DListener::GetPosition** f f\fbfh,đŽg—  
p,μ,Ä A3D<óŠÔ,É,“,̄,éfŠfXfi [,İÊ'u,đ Ý'è EŽæ“¾,Ä,«,é B

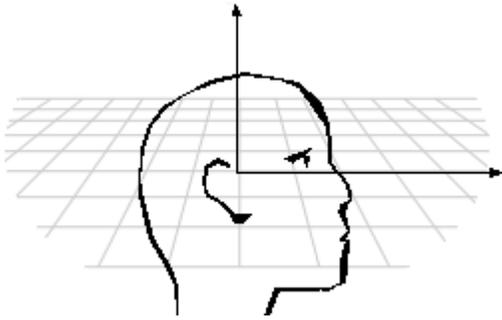
fŠfXfi [,Ö,İfhfbfvyf%o [Eø%oÊ,đEvŽZ,·,é,½,ß,ÉŽg—

p,·,é'¬“x,đ Ý'è EŽæ“¾,·,é,É,İ **IDirectSound3DListener::SetVelocity** A,“,æ,Ñ **IDirectSound3DListener::GetVelocity**  
f f\fbfh,đŽg—p,·,é BfŠfXfi [,İÊ'u,İ,»İ'¬“x,É,İ%oe<¿,đŽó,̄,É,¢ B^Ê'u,Æ'¬“x,İŠÖEW,É,Ä,¢  
,Ä,İ Ú ×,İ A^Ê'u,Æ'¬“x,đŽQ Æ,·,é,±,Æ B

### fŠfXfi [l̂•ûĈü

fŠfXfi [l̂•ûĈü, í3DEø%Ê, Ì ^ — ,É,“,ç,Ä—Í,È-ðŠ,,ð%Ê,½,· B<óŠŎ“à,ìè’è,ìÈ’u,Á%o¹,ª” ¶,µ,½,æ,□  
,È öŠo,ð ì,è o,·,½,ß,É ADirectSound,ÍfTfEf“fh EfLf... [f,ðŠTŽZ,·,é BfLf... [É,Á,ç  
,Ä,Ì Ú ×,Í A%o¹‘æ’è’Ê,Ì”FŽ,ðŽQ Æ,·,é,±,Æ B

fŠfXfi [l̂•ûĈü,Í A ã•ûfxNfgf<,Æ‘O•ûfxNfgf<,Æ,ç,□ ACE’“\_ ,ð<□—  
L,·,é,Ó,½,Ä,ÌfxNfgf<,ÌŠŎEW,É,æ,Á,Ä’è<³,è,é B ã•ûfxNfgf<,ÍfŠfXfi [l̂“a,ì’t S,©,çŽn,Ü,è A“a,ìè”Ŏ ã,ÉĈü,  
©,Á,Ä’è’¼ ü,È’Ê%ß,·,é B‘O•ûfxNfgf<,à,Ü,½fŠfXfi [l̂“a,ì’t S,©,çŽn,Ü,é,ª A ã•ûfxNfgf<,©,çĈE©,é,Æ%E,ŎĈ  
ü,©,ç AfŠfXfi [l̂Šç,ì‘O-È,ð’Ê%ß,·,é BŽŸ,Ì },Í,±,é,ç,ÌfxNfgf<,ÌŠŎEW,ðŽ,µ,Ä,ç,é B



fŠfXfi [l̂•ûĈü,ð Ý’è EŽæ“¼,·,é,É,ÍDirectSound3DListener::SetOrientation A,“,æ,Ñ  
IDirectSound3DListener::GetOrientation f f/bfh,ðŽg—p,·,é Bf ftfHf<fg’l,Í A‘O•ûfxNfgf<,ª  
(0,0,1.0) A ã•ûfxNfgf<,ª(0,1.0,0),É,È,Á,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 ĆŠE,Á'ìCE±,Á,«é10”{,Û,Á,Ì”ÍÍ,Á ¶,¶,³,¹,é,±,Æ,ª,Á,«é B,±,Ì—  
v'f,đ Ý'è,·,é,É,Í**DirectSound3DListener::SetRolloffFactor**f f\fbfh,đŽg—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,Ć,È,Ć,±  
,Æ,đŽ',· B,»,·,Ì¼,Ì ”¹,ÍCE»ŽÀ ĆŠE,Á'ìCE±,Á,«éf [f<fIft,Ì”{ ”,đ·\,· B,Á,Û,è A1,Í ACE»ŽÀ ĆŠE,ÁŠ  
,·,¶,ç,ê,é,f [f<fIft,ººÁ,!,ç,é,±,Æ,đ·\,µ A2,ÍCE»ŽÀ ĆŠE,ÁŠ',¶,ç,ê,é,f [f<fIft,²”{ººÁ,!,ç,ê,é,±,Æ,đ·\  
,· Bf [f<fIft—v'f,đŽæ“¼,·,é,É,Í**DirectSound3DListener::GetRolloffFactor**f f\fbfh,đŽg—p,·,é B

**IDirectSoundBufferfCf“f^ [ftFfCfX**

*IDirectSoundBufferfCf“f^ [ftFfCfX,É,æ,è AfAfvfŠfP [fvf‡f“,ÍfI [ffBfI Eff [f^,Ìfobftf@,ð‘€ ì,Ä,«é,æ,‡,É,È,é BfI [ffBfI Eff [f^,ÍDirectSoundfobftf@,É í“,·,é B Ä ¶,³,è,éTfEf“fh,âfI [ffBfI EfXfgfŠ [f€ ,Ì,Đ,Æ,Â,Đ,Æ,Â,É‘Í,µ,ÄfAfvfŠfP [fvf‡f“,ÍDirectSoundfobftf@,ð ì ¬,·,é B*

*fvf%ofCf}fŠ EfTfEf“fh Efobftf@,Í AfTfEf“fh EfffofCfX,ÖE» Ý‘—,ç,è,Ä,ç ,éTf“fvfŠf“fO EfI [ffBfI,ð•\,· B,±,è,ç,ÌTf“fvfç,ÍPˆè,ÌfXfgfŠ [f€,Ä,à A•i ”,ÌfI [ffBfI EfXfgfŠ [f€ ,ðf~fLfVf“fO,µ,Ä o—Í,µ,½,à,ì,Ä,à,æ,ç B’È í,Ìfvf%ofCf} fŠ EfTfEf“fh Efobftf@“à,ÌfI [ffBfI Eff [f^,É,Í¼ ÚfAfNfZfX,Í s,í,È,ç B,½,¾,µ A o—Íf{fŠf... [f€ A”gE`ì Ý’è,È,Ç A §Eä,ì-Ú“Í,Äfvf%ofCf}fŠ Efobftf@,ðŽg—p,·,é,±,Æ,Í,Ä,«é B*

*fZfJf“f fŠ EfTfEf“fh Efobftf@,ÍPˆè,ÌfXfgfŠ [f€ o—Í,·,æ,ÑTfEf“fh o—Í,ð•\,· B,±,Ìfobftf@,Ìfvf%ofCf} fŠ EfTfEf“fh Efobftf@,Ä Ä ¶,·,é,±,Æ,³,Ä,«é B“Žž,É Ä ¶,³,è,½fZfJf“f\_fŠ Efobftf@,Ìfvf%ofCf} fŠ Efobftf@,Äf~fLfVf“fO,³,è A,»,è,çfTfEf“fh EfffofCfX,Ö‘—,ç,è,é B*

**Note**

DirectSoundBufferfIfufWfFfNfg,Í,»,è,ç,ð ì ¬,µ,½DirectSoundfIfufWfFfNfg,Ì Š— L,Æ,È,é BDirectSoundfIfufWfFfNfg,³%ð•ú,³,è,é,Æ A,»,ÌfIfufWfFfNfg,ª ì ¬,µ,½fobftf@,à,·,×,Ä%ð•ú,³,è AŽQ Æ,³,è,é,±,Æ,Í,È,ç B

*,±,ì B,Ä,Í AfTfEf“fh Efobftf@,Ìˆ%¹ E Ä ¶,ÌŠÇ— •û-@ Af{fŠf... [f€ ,Ìfgf%ofbLf“fO,Æ §Eä AŽü”g ” Afpf“ Ý’è AfTfEf“fh Efobftf@ î•ñ,Ìžæ“¾ Af f,fŠŠÇ— ,É,Ä,ç,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 §CEä,·,é,½,ß,É,Í A***IDirectSoundBuffer::Play**,Æ  
**IDirectSoundBuffer::Stop***f f\fbfh,ðŽg—p,·,é BfTfEf“fh,İ Ä ¶,É,Í***IDirectSoundBuffer::Play**,ðŽg—  
p B ÄCEä,Û,Ä,·,é,Æfobftf@,İŽ©“@“I,É’âŽ~,·,é B,½,¾,µ Af< [fv,ðŽw’è,·,é,Æ A  
**IDirectSoundBuffer::Stop**,ðCEÄ,Ñ o,·,Û,Äfobftf@,Í,,è•Ö,µ Ä ¶,³,ê,é B

**IDirectSoundBuffer::Lock***f f\fbfh,ÍCE» Ý,İfTfEf“fh Efobftf@,İ ‘,«±,Ýf|*  
*fCf“f^,ðŽæ“¾,·,é Bfobftf@,ÖfI [ffBfI Efİ [f^,ð ‘,«±,ñ,¾CEä,Í A***IDirectSoundBuffer::Unlock***f 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@,İfJfEf“fg^Ê’u,ðŽæ“¾,·,é,É,Í A***IDirectSoundBuffer::GetCurrentPosition** A,à,µ,Í  
**IDirectSoundBuffer::SetCurrentPosition**,ðŽg—p,·,é B

*fTfEf“fhšÁ«šÇ—*

**IDirectSoundBuffer::GetVolume** A,“,æ,Ñ **IDirectSoundBuffer::SetVolume** *f f\fbfh,ðŽg—*

p,“,é,Æ A Ä ¶†,ìfobftf@,ìf{fšf... [f€,ìžæ“¾ E Ý’è,“ s,!,é Bfvf%ofCf}fš EfTfEf“fh Efofbftf@,ìf{fšf... [f€,ð Ý’è,“,é,±,Æ,Á AfTfEf“fh EfJ [fh,ìfEfF [fufth [f€ EfI [ffBfI Ef{fšf... [f€,“ï X,³,è,é B

“—l,É A **IDirectSoundBuffer::GetFrequency** A,“,æ,Ñ **IDirectSoundBuffer::SetFrequency** *f f\fbfh,ðŽg—*

p,µ,Ä AfTf“fvfšf“fO EfI [ffBfI,“ Ä ¶,³,è,éžü”g ”,ðžæ“¾ E Ý’è,“,é,±,Æ,“Ä,«é Bfvf%ofCf} fš Efofbftf@,ìžü”g ”,ð•ï X,“,é,±,Æ,í,Ä,«È,ç B

*fpf“,ìžæ“¾ E Ý’è,É,í A **IDirectSoundBuffer::GetPan** A,“,æ,Ñ*

**IDirectSoundBuffer::SetPan** *f f\fbfh,ðCEÄ,Ñ o,· Bfvf%ofCf}fš Efofbftf@,ìfpf“,ð•ï X,“,é,±,Æ,í,Ä,«È,ç B*

îñ,İŽæ“¾

**IDirectSoundBuffer::GetCaps**,Í ADirectSoundBufferIfufWfFfNfg,Ì «”\,ðŽæ“¾,.,é B

**IDirectSoundBuffer::GetStatus** f\fbfh,ðŽg—  
p,µ,Ä AfJfCEf“fg,İfTfEf“fh Efofbftf@,ª Ä ¶†,©’âŽ~†,©,ðCEÀ’è,.,é,±,Æ,ª,Ä,«,é B

**IDirectSoundBuffer::GetFormat** f\fbfh,ðŽg—p,µ,Ä Afofbftf@“à,İfTfEf“fh Eff [f^,İCE`Ž®,ðŽæ“¾,.,é,±,Æ,ª,Ä,«,é B,Û,½ A **IDirectSoundBuffer::GetFormat** ,ª,Ñ **IDirectSoundBuffer::SetFormat** f\fbfh,ðŽg—  
p,µ,Ä Afvf%ofCf}fŠ EftfEf“fh Efofbftf@“à,İfTfEf“fh Eft [f^,İCE`Ž®,ð Y’è,.,é,±,Æ,ª,Ä,«,é

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**Note**

fZfJf“f fŠ EftfEf“fh Efofbftf@,ª ì ¬,³,ê,é,Æ A,»,ìCE`Ž®,ÍCEÀ’è,³,ê,é B,à,µ•ÊCE`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

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f f,fššÇ—

**IDirectSoundBuffer::Restore** f\fbfh,ðŽg—

p,μ,Ä AŽw'è,<sup>3</sup>,ê,½DirectSoundBufferIfufWfFfNfg,ìfTfEf“fh Efofbftf@f f,fš,ðfšfXfgfA,·,é,±,Æ,<sup>a</sup>,Ä,«<sup>é</sup> B,±  
,ê,Ífofbftf@,<sup>a</sup>Ž,<sup>í</sup>,ê,½ ê ‡,É—L—p,<sup>¾</sup>,<sup>a</sup> A

**IDirectSoundBuffer::Restore**,<sup>a</sup>fšfXfgfA,·,é,ì,í,»,ìf f,fšž@·ì,ì,Ý,Ä, ,é Bf f,fš,ìfRf“fgf [f<,ÍfšfXfgfA,μ,È,ç  
Bfofbftf@ Ef f,fš,<sup>a</sup>fšfXfgfA,<sup>3</sup>,ê,½Eä,Í A,»,±,Ö—LÆø,ÈfTfEf“fhff [f^,ð ‘,«,±,Đ•K—v,<sup>a</sup>, ,é B

**DirectSound, ĨŽg—p—á**

DirectSound, ð Ä ¶, ·, é, É, Í È%°, ĨŽè ±, É ], ¢•K—v, ¢, é B

- 1 **DirectSoundCreate**ŠÖ ”, ðCEÄ, Ñ o, µ, ÄDirectSoundfIfufWfFfNfg, ð ì ¬, ·, é B
- 2

**IDirectSound::SetCooperativeLevel**f f\fbfh, ðCEÄ, Ñ o, µ, Ä'²fCEfxf<, ðŽw'è, ·, é B, Û, Æ, ñ, Ç, ĨfAvfšfP [fVf±f“, Ä, Í Ä%°°ÊfCEfxf<, Ä, éDSSCL\_NORMAL, ðŽg—p, ·, é B

- 3 **IDirectSound::CreateSoundBuffer**f f\fbfh, ðŽg—p, µ, ÄfZfJf“f fŠ EftfEf“fh Efofbftf@, ð ì ¬, ·, é **BDSBUFFERDESC** \‘ç‘ì, ì‘†, Ä, Í A, »), Ĩfofbftf@, ¢fZfJf“f fŠ Efofbftf@, Ä, ·, é, ±, Æ, ðŽw'è, ·, é•K—v, Í, È, Ç BftftfHf<fg, ÄfZfJf“f fŠ Efofbftf@, ¢ ì ¬, ¢, é, æ, ¢, É, È, Ä, Ä, Ç, é B

- 4 fZfJf“f fŠ Efofbftf@, Éff [f^, ð“Ç, Ý ž, Ð Bff [f^—Ìæ, Éf|Cf“f^, ðŽæ“¾, ·, é, É, **IDirectSoundBuffer::Lock** f f\fbfh, ðŽg—p, µ A, »), ĨffofCfX, Éff [f^, ðfZfbfg, ·, é, É, **IDirectSoundBuffer::Unlock**f f\fbfh, ðŽg—p, ·, é B

- 5 **IDirectSoundBuffer::Play**f f\fbfh, ðŽg—p, µ, ÄfZfJf“f fŠ Efofbftf@, ð Ä ¶, ·, é B

- 6 fAvfšfP [fVf±f“, ¢TfEf“fh, Ĩ Ä ¶, ð I—¹, µ, ½, Ç ADirectSoundBufferfofbftf@, **IDirectSoundBuffer::Stop**f f\fbfh, ðŽg—p, µ, Ä, ·, é, Ä, Ĩfofbftf@, ð‘âŽ~³, ¢, é B

- 7 fZfJf“f fŠ Efofbftf@, ð%ð•ú, ·, é B
- 8 DirectSoundfIfufWfFfNfg, ð%ð•ú, ·, é B

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

fVf%ofCf}fŠ Efofbftf@, ð ì ¬, µ, Ä**IDirectSoundBuffer::SetFormat**f f\fbfh, ðCEÄ, Ñ o, µ AfvVf%ofCf}fŠ EftfEf“fh Efofbftf@, Ĩ o—ÍCE`Ž@, ð Ý'è, ·, é B, ±, Ĩ Ý'è, Ì'O, É AfAvfšfP [fVf±f“, Ĩ'²fCEfxf<, ¢DSSCL\_PRIORITY, É Ý'è, ¢, é, Ä, Ç, é•K—v, ¢, é B

fVf%ofCf}fŠ EftfEf“fh Efofbftf@, ð ì ¬, µ A **IDirectSoundBuffer::Play**f f\fbfh, ðŽg—p, µ, Ä, »), Ĩfofbftf@, ð Ä ¶, ·, é B, ±, é, Í A, ½, Æ, |fZfJf“f fŠ Efofbftf@, ¢ Ä ¶, ¢, é, Ä, Ç, É, , Ä, à AfvVf%ofCf}fŠ Efofbftf@, ¢, Ä, È, È Ä ¶, ¢, é, Ä, Ç, é, ±, Æ, ð•Û Ø, ·, é B, ±, Ĩ“® ì, ĨCPUfPf [, ð, Ç, -, Ç, © Á”i, ·, é, ¢ AfZfJf“f fŠ Efofbftf@, ¢ Ä ¶, ¢, é, Æ, «, ĨŠŽnŽšŠÖ, ð'Z k, ·, é B

, ±, Ĩ ß, É, Í ADirectSoundRf“f [fLf“fg, ÉŠÖ~A, µ, ½ È%°, Ĩè”È“I, Èf^fXfN, ðŽÄ s, ·, éfR [fh, Ĩftf“fvf<, ¢Žû, ß, Ç, é, Ä, Ç, é BfR [fh, Ĩ%ð à, Ĩše X, Ĩftf“fvf<, Ä s, ¢ B

- DirectSoundfIfufWfFfNfg, Ĩ ì ¬
- CoCreateInstance, ðŽg—p, µ, ½DirectSoundfIfufWfFfNfg, Ĩ ì ¬
- fn [fhEfFfA «”\, Ĩ Æ%öi
- fTfEf“fh Efofbftf@, Ĩ ì ¬
- fTfEf“fh Efofbftf@, Ö, Ĩ ‘, «, ±, Ý
- DirectSoundf~fLft [, ĨŽg—p
- fJfXf^f€ Ef~fLft [, ĨŽg—p
- ³ kwave, ĨŽg—p

### DirectSoundIfufWfFfNfg, ĩ ĩ ĩ

```
DirectSoundIfufWfFfNfg, ĩ ĩ ĩ, é Ā, àŠÈ'P, È•û-@, ĩ A DirectSoundCreateŠÖ ", ðĀĒ, Ñ o, µ, ĀNULL  
GUID, ðŽw'è, ., é•û-@, Ā, , é B, ±  
, ĩŠÖ ", ĩffftfHf<fg EfEfBf"fhfE, ĩfEfF [fu EfffofCfX, Ā"™, ĩfIfufWfFfNfg, ĩ ĩ ĩ, µ, æ, µ, Ā, ., é B, » ĩ, ,  
ĀIDirectSound::SetCooperativeLevelf f\fbfh, ðĀĒ, Ñ o, .•K-v, a, , é B, ±  
, ĩf f\fbfh, ĩĀĒ, Ñ o, µ, a s, i, é, é, Ü, Ā, ĩfTfEf"fh Efobf tf@, ĩ ĩ ĩ, 3, é, È, Ą BŽŸ, ĩ-á, Ā A, ±, ĩfvf fZfX, ðŽ, . B
```

```
LPDIRECTSOUND lpDirectSound;  
if(DS_OK == DirectSoundCreate(NULL, &lpDirectSound,  
    NULL)) {  
    // ĩ ĩ ĩ, Ē -Ā±, µ, ½ ê ‡  
    lpDirectSound->lpVtbl->SetCooperativeLevel(lpDirectSound,  
        hwnd, DSSCL_NORMAL);  
    // .  
    // . DirectSound, ÖfAfNfZfX, ., é, ½, ß, ĩfR [fh, ð, ±, ±, Ē"z'u, ., é  
    // .  
} else {  
    // ĩ ĩ ĩ, ĒŽ, "s, µ, ½ ê ‡  
    // .  
    // .  
    // .  
}
```

**DirectSoundEnumerate**ŠÖ ", ðŽg-p, ., é, Ā A"Á'è, ĩfTfEf"fhffofCfX, ĩ ĩ ĩ, ðŽw'è, ., é, ±, Ā, a, Ā, «, é B, ±, ĩŠÖ ", ðŽg  
-p, ., é, Ē, ĩ **ADSEnumCallback**ŠÖ ", Ā A, Ü, Ā, ñ, Ą, ĩ ê ‡fCf"fxf^f"fx Eff [f^ \Ą'ĩ, à ĩ ĩ ĩ, ., é BŽŸ, Ē-  
á, ðŽ, . B

```
typedef struct {  
    // GUIDs, ÖĀL%-, ., é  
    // fffofCfX, ĩffBfXfvfŠfNfVf‡f"•Ÿš-ñ, ÖĀL%-, ., é  
} APPINSTANCEDATA, *LPAPPINSTANCEDATA;  
BOOL AppEnumCallbackFunction(  
    LPGUID lpGuid,  
    LPTSTR lpstrDescription,  
    LPTSTR lpstrModule,  
    LPVOID lpContext)  
{  
    LPAPPINSTANCEDATA lpInstance = (LPAPPINSTANCEDATA)  
        lpContext;  
    // lpInstance \Ą'ĩ, ÖGUID, ðfRfs [, ., é  
    // StrcpyĀ q•Ÿš-ñ, ðlpInstance \Ą'ĩ, Ö  
    return TRUE; // -ñĄ, ð'±, -, é  
}
```

, 3, Ą, Ē AŽŸ, ĩ-á, ðŽg-p, µ, ĀDirectSoundIfufWfFfNfg, ĩ ĩ ĩ, ., é, ±, Ā, à, Ā, «, é B

```
AppInitDirectSound()  
{  
    APPINSTANCEDATA AppInstanceData;  
    LPGUID lpGuid;  
    LPDIRECTSOUND lpDirectSound;  
    HRESULT hr;  
    DirectSoundEnumerate(AppEnumCallbackFunction,  
        &AppInstanceData);  
    lpGuid = AppLetUserSelectDevice(&AppInstanceData);  
  
    // DirectSoundCreate, aGf%o [ĩ, Ā, «, ĩ  
    // •Ö'l, ðf`fFfbfN, ., é•K-v, a, , é  
  
    hr = DirectSoundCreate(lpGuid, &lpDirectSound, NULL);  
    // .  
}
```

```
// .  
// :  
}
```

*fTfEf*“fh EfffofCfX,ª,È,©,Á,½,è A  
*lpGuidfpf%of* [f^,ÁŽw’è,³,è,½*fTfEf*“fh EfffofCfX,ÈfEfF [fuftfH [f€ EfI [ffBfIŠÖ ”,ªŠ,,è U,ç,ê,Ä,ç  
,é,Æ A **DirectSoundCreate**ŠÖ ”,ÍŽ,”s,·,é B*fTfEf*“fh,È,µ,Á±,¯,é,È,¹,æ Af† [fU,É,»,*fTfEf*“fh EfffofCfX,ðŽg—  
p,µ,Ä,ç,éfAfvfŠfP [fVf±f“,ì I—¹,ð‘£,·,É,¹,æ A,±,ìCEÄ,Ñ 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*, $\dot{I}$   $\dot{I}$   $\dot{I}$

**CoCreateInstance**, $\delta\check{z}g-p,\mu,\dot{A}$ **DirectSound***fIfufWfFfNfg*, $\delta$   $\dot{I}$   $\dot{I}$ , $\cdot$ , $\dot{e}$ , $\dot{E}$ , $\dot{I}$  $\dot{E}$  $\%^\circ$ , $\dot{I}\check{z}$   $\dot{z}$ , $\delta$   $s,\square$  B

1  $\check{S}\check{O}$   $\dot{I}$ , $\dot{E}$ NULL, $\delta\check{z}w'$  $\dot{e}$ , $\mu,\dot{A}$  ACOM, $\delta$   $\%^\circ\check{S}\check{u}\%^\circ$ , $\cdot$ , $\dot{e}$  B

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

2 **DirectSoundCreate**  $\check{S}\check{O}$   $\dot{I}$ , $\delta\check{z}g-p,\cdot$ , $\dot{e}$ , $\dot{a}$ , $\dot{e}$  A**CoCreateInstance**, $\dot{I}$ , $\dot{a}$ , $\dot{N}$  **IDirectSound::Initialize** *f\fbfh*, $\delta\check{z}g-p,\mu,\dot{A}$ **DirectSound***fIfufWfFfNfg*, $\delta$   $\dot{I}$   $\dot{I}$ , $\cdot$ , $\dot{e}$  B

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

*CLSID\_DirectSound*, $\dot{I}$ **DirectSound***fhf%ofCfo EfIfufWfFfNfg EfNf%ofX,\dot{I}fNf%ofX\check{z}^\cdot\dot{E}\check{z}q,\dot{A} A  
*IID\_IDirectSound*, $\dot{I}$ **DirectSound***fCf^f^ [ftFfCfX,\dot{A}, $\dot{e}$  B *lpdsfpf%of [f^,\dot{I}**CoCreateInstance**, $\dot{a}$  $\cdot\check{O}$ , $\dot{I}$   
 $\dot{I}$   $\%^\circ\check{S}\check{u}\%^\circ$ *fIfufWfFfNfg*, $\dot{A}$ , $\dot{e}$  B***

**DirectSound***fIfufWfFfNfg*, $\delta\check{z}g-p,\cdot$ , $\dot{e}$  $\dot{O}$ , $\dot{E}$ **IDirectSound::Initialize**, $\delta\check{E}\dot{A}$ , $\dot{N}$   $o^3,\dot{E}$ , $\dot{A}$ , $\dot{I}$ , $\dot{E}$ , $\dot{c}$ , $\dot{E}$ , $\dot{c}$  B, $\dot{I}$  *f\fbfh*, $\dot{I}$  A  
**DirectSoundCreate**, $\dot{a}$  $\dot{E}$   $\dot{I}\check{z}g-p,\cdot$ , $\dot{e}$ *fhf%ofCfo*, $\dot{I}$ **GUID***fpf%of [f^(\dot{I}  $\dot{e}$   $\dot{z}$ , $\dot{I}$ NULL), $\delta$   $\dot{I}$   
 $p,\cdot$ , $\dot{e}$  B**DirectSound**, $\dot{a}$   $\%^\circ\check{S}\check{u}\%^\circ$ , $\dot{I}$ , $\dot{e}$ , $\dot{e}$ , $\dot{A}$  A**DirectSoundCreate**, $\dot{A}$   $\dot{I}$   $\dot{I}$ , $\dot{e}$ , $\frac{1}{2}$ , $\dot{A}$ , $\dot{e}$ , $\dot{A}$ , $\dot{e}$ , $\dot{I}$ , $\dot{a}$ , $\square$   
 $\dot{I}$ , $\dot{E}$ **DirectSound***fIfufWfFfNfg*, $\delta\check{z}g-p,\mu,\frac{1}{2}$ , $\dot{e}$  $\%^\circ\delta^\cdot\dot{u}$ , $\mu,\frac{1}{2}$ , $\dot{e}$ , $\cdot$ , $\dot{e}$ , $\dot{I}$ , $\dot{A}$ , $\dot{e}$ , $\dot{a}$ , $\square$ , $\dot{E}$ , $\dot{E}$ , $\dot{e}$  B*

*fAfvf\check{S}fP [fVf\dot{z}f^\cdot,\delta  $\dot{I}$  $\dot{I}$ , $\cdot$ , $\dot{e}$  $\dot{O}$ , $\dot{E}$ , $\dot{I}$  A $\dot{E}$  $\%^\circ$ , $\dot{I}$ , $\dot{a}$ , $\square$ , $\dot{E}$ **CoUninitialize**, $\delta\check{z}g-p,\mu,\dot{A}$ COM, $\dot{I}$ *fVfffbf\_gf\_fEf^\cdot,\delta  $s,\square$  B  
**CoUninitialize**());**

fn [fhfEfffA «”\,ì Æ%öï

DirectSound,Á,Í AfAvfšfP [fVf‡f“,ÁfIfufWfFfNfg,žg—p,·,éTfEf“fh EfffofCfX,ìfn [fhfEfffA «”\ ,đŽæ“¾,·,é,±,Æ,ª,Ä,«,é BDirectSound,ÍŽ©“@“I,Éfn [fhfEfffA EfAfNfZf%fCE [fVf‡f“,đ s,□ ,ì,Ä A,Ü,Æ,ñ,Ç,ÌfAvfšfP [fVf‡f“,Ä,Í,±,ê,đ•K—v,Æ,µ,È,Ç B,µ,©,µfnfCfpftfH [f} f“fX,ÈfAvfšfP [fVf‡f“,Ä,Í A,»ÌfTfEf“fh—v< ,É%ž,ì,éfn [fhfEfffA,ì<@”\,đ’m,é,½,ß,É,±,Ì î•ñ,đŽg—p,·,é,± ,Æ,ª,Ä,«,é B,½,Æ,ì,Í Afn [fhfEfffA Ef~fLfVf“fO,ª—LCEø,È,ç A Ä ¶,Ä,«,éTfEf“fh,ª,æ,è½,·,É,é B

fn [fhfEfffA «”\,đŽæ“¾,·,é,½,ß,É,ÍIDirectSound::GetCapsf f\fbfh,đŽg—p,·,é B,±,ìf f\fbfh,Í AŽŸ,ì—á,ì,æ,□ ,ÉDSCAPS \‘ç‘ì“à,É—,ß ž,Ü,ê,Ä,Ç,é B

AppDetermineHardwareCaps (LPDIRECTSOUND lpDirectSound)

```
{
    DSCAPS dscaps;
    HRESULT hr;
    dscaps.dwSize = sizeof(DSCAPS);
    hr = lpDirectSound->lpVtbl->GetCaps(lpDirectSound,
    &dscaps);
    if(DS_OK == hr) {
        // -CE±,µ,½,çDSCAPS \‘ç‘ì,đ•%öđ,·,é
        // .
        // .
        // .
    }
    // .
    // .
    // .
}
```

DSCAPS \‘ç‘ì,É,Í A,»ê,¼,ê,ìf^Cfv,ì Ä‘âfšf\ [fX,âCE» Ý— LCEø,Èfšf\ [fX î•ñ,È,Ç AfTfEf“fh EfffofCfX,ìfpftfH [f}f“fX,Æfšf\ [fX,ÉŠÖ,·,é î•ñ,ªŠÜ,Ü,ê,Ä,Ç,é B,± ,ê,ç,í,³,Ü,·,Ü,Èfšf\ [fXŠÖ,Ä—µ ,,đ ¶,¶,³,¹,é ê ‡,ª, ,é B,½,Æ,ì,Í A’Pê,ìfn [fhfEfffA EfXfgfš [f€ EfTfEf“fh Efofbftf@,ìŠ,,è— ,Ä,Í A,Ó,½,Ä,ÌfXf^fefBfbfN Ef~fLfVf“fO Ef`fff“flf<,đ Á”i,·,é Bfn [fhfEfffA «”\ ,đ“è,·,é ê ‡ Afobftf@,ìŠ,,è—,Ä,Æš,,è— ,Ä,ìŠÖ,ÉIDirectSound::GetCaps,ðCEÄ,Ñ o,µ,Ä Afobftf@ ì ¬,É \ª,Èfšf\ [fX,ª, ,é,©,đf`fffbfN,·,é•K—v,ª, ,é B

fTfEf“fhffofCfX,ì“@ ì,É,Ä,Ç,Ä ŸŽè,É%¼’è,·,é,±,Æ,Í”đ,¯,é,×,«,Ä, ,é B,³,à,È,Ç ,Æ ì ¬,µ,½fAvfšfP [fVf‡f“,ª A, ,éTfEf“fh EfffofCfX,Ä,Í“@,,ì,É•È,ÌffofCfX,Ä,Í“@,©,È,Ç,Æ,Ç,Ä,½,± ,Æ,É,È,é B,»Ì ä A «—~ñ<Ÿ,³,é,éfffofCfX,ª ACE»¶,·,éfffofCfX,Æ,ÍÜ,È,é“@ ì,đ,·,é,±,Æ,à l,ì,ç,é,é B

fn [fhfEfffA,ìfšf\ [fXš,,è—,Ä,đ s,□,Æ AfAvfšfP [fVf‡f“,Í‘á,ì,é,È,»ê,ç,đf\ftfgfEfffA Efofbftf@,Öš,,è— ,Ä,æ,□ ,Æ,·,é B,Ä,È,·,·,×,Ä,ìfn [fhfEfffA Efšf\ [fX,É‘Í,µ,Äš“S,ÈfAfNfZfX,đ s,ì,é,í,¯,Ä,Í,È,Ç B,½,Æ,ì,ÍIDirectSou nd::GetCapsf f\fbfh,Íó,«fšf\ [fX,đ•Ž!,·,é,ª AWindows,Íf}f<f^fXfN,ÈIfyfCE [fefBf“fO EfVfXfef€,Ä, ,é,½,ß A fšf\ [fXš,,è—,Ä,đ,µ,æ,□,Æ,µ,Ä,à•È,ÌfAvfšfP [fVf‡f“,Èš,,è—,Ä,ç,é,é%Ä”\ «,ª, ,é B

**fTfEf“fh Efofbftf@,ì ì ñ**

,±,ì ß,À,İŞÈ’P,ÈfTfEf“fh Efofbftf@,ì ì ñ•û-@,ð à-  
¾,.,é B,Û,½ A ì ñ,µ,½,»,é,¼,é,İfTfEf“fh Efofbftf@,É Ý’è%oÂ”\,È §EäfIfvfVf‡f“,É,Â,ç,Ä,à à-  
¾,.,é B,³,ç,É AfXf^fefBfbfN EfTfEf“fh Efofbftf@,ÆfXfgfŠ [f€ EfTfEf“fh Efofbftf@ Afñ [fhEfFfA  
EfTfEf“fh Efofbftf@,Æf\ftfgfEfFfA EfTfEf“fh Efofbftf@ Afvf%oCf}  
fŠ EfTfEf“fh Efofbftf@,ÆfZfJf“f\_fŠ EfTfEf“fh Efofbftf@,İfI [ffBfIf [f^,İL%o~^æ,İ^á,ç,É,Â,ç  
,Ä,à G,é,Ä,ç,é B

Šî-“L,ÈfTfEf“fh Efofbftf@,ì ì ñ

§EäfIfvfVf‡f“

fXf^fefBfbfN EfTfEf“fh Efofbftf@,ÆfXfgfŠ [f€ EfTfEf“fh Efofbftf@  
fn [fhEfFfA EfTfEf“fh Efofbftf@,Æf\ftfgfEfFfA EfTfEf“fh Efofbftf@  
fvf%oCf}fŠ EfTfEf“fh Efofbftf@,ÆfZfJf“f\_fŠ EfTfEf“fh Efofbftf@

Ši-{"l,ÈfTfEf"fh Efofbftf@,ì ì ñ

fTfEf"fh Efofbftf@,ð ì ñ,·,é,É,Í A **DSBUFFERDESC** \c'ì,ð'ø ",É A **IDirectSound::CreateSoundBuffer**  
f f\fbfh,ðĀ,Ñ o,· B,±,ê,ÍDirectSoundBufferIfufWfFfNfg,ð ì ñ,μ A **IDirectSoundBuffer** fCf"f^ [ftFfCfX,Öf|  
fCf"f^,ð·Ö,· B,±,ìfCf"f^ [ftFfCfX,Í Afobfbftf@,ì '«,±,Ý E ^— ;,æ,Ñ Ā ¶,ÉŽg—p,Ā,«,é B

,Ü,Žn,B,É A Ā,à d—v,ÈfTfEf"fh,ìfobfbftf@,ð ì ñ,μ,Ā,©,ç A,»,Ì'¼,ìfobfbftf@,ð d—  
v"x,ì ,,ç ‡,É ì ñ,·,é BDirectSound,Ífn [fhfEfffA,ÍfŠf\ [fX,ð A—~—p%Ā",É^è"Ö Ā %,ìfobfbftf@,ÖŠ,,è—  
,Ā,é B

ŽÝ,ì—á,Ā,Í AfZfJf"f fŠ EfTfEf"fh Efofbftf@,ì ì ñ•û—@,ðŽ',μ,Ā,ç,é B

```
BOOL AppCreateBasicBuffer(  
    LPDIRECTSOUND lpDirectSound,  
    LPDIRECTSOUNDBUFFER *lplpDsb)  
{  
    PCMWAVEFORMAT pcmwf;  
    DSBUFFERDESC dsbdesc;  
    HRESULT hr;  
    // wavftfH [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);  
    // ftfHf<fg,ìfRf"fgf [f<,ð—v< ,·,é(fpf" Af{fŠf... [f€ AŽü"g ") B  
    dsbdesc.dwFlags = DSBCAPS_CTRLDEFAULT;  
    // 3•b,ìfobfbftf@  
    dsbdesc.dwBufferBytes = 3 * pcmwf.wf.nAvgBytesPerSec;  
    dsbdesc.lpwfxFormat = (LPWAVEFORMATEX)&pcmwf;  
    // fobfbftf@,ð ì ñ,·,é  
    hr = lpDirectSound->lpVtbl->CreateSoundBuffer(lpDirectSound,  
        &dsbdesc, lplpDsb, NULL);  
    if(DS_OK == hr) {  
        // ñĀ÷ B—LĀø,ÈfCf"f^ [ftFfCfX,Í*lplpDsb  
        return TRUE;  
    } else {  
        // Ž,"s B  
        *lplpDsb = NULL;  
        return FALSE;  
    }  
}
```

§CEäIfvfVf‡f“

fTfEf“fh Efofbftf@,ð ì ¬,·,é,Æ,«,Í Afobftf@,É< ,ß,ç,ê,é §CEäIfvfVf‡f“,ðŽw’è,·,é•K—v,<sup>a</sup> ,é B,± ,é,É,Í,DSBUFFERDESC \‘c’ì,ìdwFlagsf f“fo,ðŽg—

p,·,é BfTfEf“fh Efofbftf@,Éfn [fhfEfFfA EfŠf\ [fX,<sup>a</sup>Š,,è“- ,Ä,ç,ê,Ä,ç

,é,Æ ADirectSound,ÍAfvfŠfP [fVf‡f“,<sup>a</sup>Žw’è,μ,½fIfvfVf‡f“,ðŽg—

p,·,é B,½,Æ,·,Í AfffofCfX,<sup>a</sup>fn [fhfEfFfA Efofbftf@,ðfTf| [fg,μ,Ä,ç

,Ä,à A,»,ìfobftf@,É’Í,·,éfpf“ §CEä,Íñ<Ÿ,μ,Ä,ç,È,ç ê ‡,<sup>a</sup> ,é B,±

,ì ê ‡DirectSound,Í ADSBCAPS\_CTRLPANftf%o,<sup>a</sup>Žw’è,<sup>3</sup>,ê,Ä,ç,é ê ‡,ð œ,ç

,Ä Afn [fhfEfFfA EfAfNfZf%oçE [fVf‡f“,ðŽg—p,·,é B

,·,×,Ä,ìfTfEf“fh EfJ [fh,©,ç Ä ,,ì”—Í,ð^ø,« o,·,É,Í AfAfvfŠfP [fVf‡f“,<sup>a</sup>Ž©<sup>a</sup>,ÄŽg—

p,·,éIfvfVf‡f“,ì,Ÿ,ðŽw’è,·,é B

fobftf@,<sup>a</sup>Ž ,Á,Ä,ç,È,çf f\fbfh,ðCEÄ,Ñ o,μ,Ä,àŽ,“s,É I,í,é B,½,Æ,·,Í A\_

**IDirectSoundBuffer::SetVolume** f\fbfh,ðŽg—p,μ,Äf{fŠf... [fç,ð•Í X,μ,æ,□

,Æ,μ,½ ê ‡ A,»,ìfobftf@,ì ì -ŽŽ,É DSBCAPS\_CTRLVOLUMEftf%o,<sup>a</sup>Žw’è,<sup>3</sup>,ê,Ä,ç

,é,Íf f\fbfh,Í -CE÷,·,é Bftf%o,<sup>a</sup>Žw’è,<sup>3</sup>,ê,Ä,ç,È,·,ê,Íf f\fbfh,ÍŽ,“s,É I,í,è A

DSERR\_CONTROLUNAVAILfGf%o [fR [fh,<sup>a</sup>•Ô,<sup>3</sup>,é,é Bfobftf@,ì §CEä,É,æ,è ACE»‘¶,àŠŪ,ñ,Ä «—

ˆñ<Ÿ,<sup>3</sup>,é,éfffofCfX ä,Ä,ìfAfvfŠfP [fVf‡f“,ì“® ì•Ū Ø,<sup>a</sup>,æ,èŠmŽÄ,É,È,é B

**fXf^fefBfbfN EfTfEf“fh Efofbftf@,ÆfXfgfŠ [f€ EfTfEf“fh Efofbftf@**

fXf^fefBfbfN EfTfEf“fh Efofbftf@.Í Af f,fŠ“à,ÉfTfEf“fh‘S‘ì,ðŠ”[.,é B,±  
,Ìfobftf@,Í AfTfEf“fh‘S‘ì,ðfobftf@,Ö1%ñ,¾, - ‘,«,±,ß,Í,æ,c,ì,ÅŽèEy,Å, ,é  
BfXfgfŠ [f€ EfTfEf“fh Efofbftf@.ÍfTfEf“fh,Ìê”,ðŽw,· B,½,Æ,!,Í A2•ŠÖ Ä ¶,³,ê,éfTfEf“fh,Ì,□  
,ç,Ì3•bŠÖ,ÌfI [ffBfIff [f^,¾, - ,ð•ÜŽ ,Å,«,éfofbftf@,Å, ,é B,±  
,.Ì ê ‡ AfAfVfŠfP [fVf‡f“,ÌèŠú“I,É V,µ,cff [f^,ðfTfEf“fh Efofbftf@,Ö ‘,«,±  
,Ü,È, -,é,Ì,È,ç,È,ç B,µ,©,µ AfXfgfŠ [f€ Efofbftf@,ÍfXf^fefBfbfN Efofbftf@,æ,è,àf f,fŠ,Ì Á”i,ª ,È,-  
,Å,·,ð B

fTfEf“fh Efofbftf@,ð ì ¬,·,é,Æ,« ADSBCAPS\_STATICftf%fo,ðŽw’è,·,é,Æ Afobftf@,ªfXf^fefBfbfN,Å, ,é,±  
,Æ,ðŽ,·,±,æ,ª,Å,«,é B,±,Ìftf%fo,ðŽw’è,µ,È, -,é,Í Afobftf@,ÍfXfgfŠ [f€ Efofbftf@,Æ,È,é B

,à,µfTfEf“fh EfffofCfX,ªfIf“f{ [fh,ÌfTfEf“fhf f,fŠ,Ì ê ‡ ADirectSound,ÍfXf^fefBfbfN Efofbftf@,ðfn [fhf  
EfFFA ã,Ìf f,fŠ,É”z’u,µ,æ,ª,Æ,·,é B,±,Ìfobftf@,Ífn [fhfEfFFA Ef~fLfVf“fo,ð—p,·,é,±  
,Æ,ª,Å,« AfVfXfefE,Ì,±,ê,ç,ÌfTfEf“fh Ef~fLfVf“foŽž,ÌfI [fo [fwfbfh,ð Ä ¬CEÀ,É%ÿ,³,!,é,±  
,Æ,ª,Å,«,é BfTfEf“fh Eff [f^,ªfn [fhfEfFFA Ef f,fŠ,É~è“xf [fh,³,è,é,¾, -,Å Ì,ð,½,ß A,±  
,ê,Í“Á,É‘%«¹,â• Ší,È,Ç,Ì,·,è•Ö,µ Ä ¶,³,ê,éfTfEf“fh,É—LEø,Å, ,é B

fXfgfŠ [f€ Efofbftf@,Í APCL,â,»,ì¼,Ì ,·¬fofX ã,Åfn [fhfEfFFA Ef~fLfVf“fo,ð—  
p,Å,«,é ê ‡,Å,à A,æ,èCEø—“I,È ‘,«,±,Ý,ª,Å,«,é,æ,ª  
,Éf fCf“ EfVfXfefE Ef f,fŠ,É”z’u,³,è,é BfXfgfŠ [f€ Efofbftf@,ðŽg—p,·,é,½,ß,Ì•K—  
v ðE ,Í“Á,É,È,ç B,½,Æ,!,Í Afobftf@,É \ª,È‘â,«,³,ª ,ê,Í 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,ç,Å,à,è,ÌfTfEf“fh,È,ç AfXfgfŠ [f€ Efofbftf@,ðŽg—  
p,µ,½•û,ª Afn [fhfEfFFA Ef f,fŠ,Éf [fh,·,é•K—v,ª,È,ç,½,ßCEø—“I,Å, ,é B

---

**Note**

fobftf@,ðfXf^fefBfbfN,É,·,é,©fXfgfŠ [f€,É,·,é,©,ðŽw’è,·,é,Ì,ÍpftfH [f}f“fX,Ì Ä“K%»,ì,½,ß,Å, ,é Bfobftf  
@,ð,Ç,Ì,æ,ª,ÉŽg—p,·,é,©,ð §CEÀ,·,é,à,Ì,Å,Í,È,ç 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  
,ŽÀ s,³,ê,é Bf\ftfgfEFFFa EfTfEf“fh Efofbftf@,ÍCPU,É,æ,Á,Äf~fLfVf“fO,ŽÀ s,³,ê,é B,Û,Æ,ñ,Ç,Ì ê ‡ A  
fAfVfŠfP [fVf‡f“,É•K—v,È,±,Æ,Ífobftf@,ðfXf^fefBfbfN,É,·,é,©fXfgfŠ [f€,É,·,é,©Žw’è,·,é,¾,¯,Ä,·,é BDirect  
Sound,³fn [fhEFFFa,©f\ftfgfEFFFa A,Ç,·,é,©“K Ø,È,ù,Öfobftf@,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,Ì,È,ç,È,¢ ê ‡,É,Í A  
**DSBUFFERDESC** \‘ç‘Ì,Ì†,ÄSBCAPS\_LOCHARDWARE A,à,μ,,Í

DSBCAPS\_LOCSOFTWAREftf%oF,ðŽw’è,·,é,Ì,æ,¢ BDSBCAPS\_LOCHARDWAREftf%oF,Žw’è,³,ê,Ä,¢

,Ä Afn [fhEFFFa Ef f,fŠ,âf~fLfVf“fO”—Í,³s \‘³,È,Æ,«,Í Afobftf@,Ì ì ¬—  
v< ,ÍŽ,”s,·,é B,Û,½ AÆ» Ý,ÌfTfEf“fh EfffofCfX,Í,Û,Æ,ñ,Ç,³fn [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@,ÌÈ’u,ÌÈÀ’è,É,ÍDirectSoundBuffer::GetCapsf f\fbfh,ðŽg—

p,μ,Ä **ADSBCAPS** \‘ç‘Ì,ÌdwFlagsf f“fo,ÄSBCAPS\_LOCHARDWARE,à,μ,,Í

DSBCAPS\_LOCSOFTWAREftf%oF,ðŠm”F,·,é,Ì,æ,¢ B,Ä,È,È,Ç,·,é,©,ÉŽw’è,³,ê,Ä,¢,é B

**fvf%ofCf}fŠ EftfEf“fh Efofbftf@,ÆfZfJf“f\_Š EftfEf“fh Efofbftf@**

*fvf%ofCf}fŠ EftfEf“fh Efofbftf@,Í AŽÀ Û,ÉfŠfXfi [,\*,«Žæ,éfTf“fvfŠf“fO EfI [ffBfI,Á, é BfZfJf“f\_Š EftfEf“fh Efofbftf@,Í,»,é,¼,èPè,ÌfTfEf“fh,“,æ,ÑfI [ffBfI EfXfgš [fÉ,Á, é Bfvf%ofCf} fŠ Efofbftf@,ð ì -,.,é,É,Í A\_*

**DSBUFFERDESC** \‘ç‘ì,ì†,ÀDSBCAPS\_PRIMARYBUFFERftf%ofO,ðŽw’è,.,é,Í,æ,ç BfZfJf“f\_Š Efofbftf@,ª ì - ,³,è,é,Í,Í A,±,Ìftf%ofO,ªŽw’è,³,è,È,çŽž,Á, ,é B

‘È í,Í,Ð,Æ,Â,ÌfAfvfŠfP [fvf±f“,É,.,-,é,.,×,Ä,ÌfTfEf“fh,É:Í,µ,ÄfZfJf“f\_Š Efofbftf@,ð ì -,.,é BCEÄ,çff [f^, É V,µ,çff [f^,ð ã ‘,.,é,±,Æ,ÄfTfEf“fh Efofbftf@,Ì Ä~—p,“%Ä”,Ä, é BDirectSound,ª s,ª ^— ,Í Afn [fhfEfFfA,Ìfšf\ [fXŠ,,,è—,Ä,â A Ä ¶†,Ì,.,×,Ä,Ìfobftf@,Ìf~fLfVf“fO,Á, é B

*fAfvfŠfP [fvf±f“,ªfZfJf“f\_Š Efofbftf@,ðŽg—p,µ,Ä,ç,é,È,ç,Í A“Á’è,ì §Eä,ð s,ª,½,ß,Éfvf%ofCf} fŠ Efofbftf@,ð ì -,.,é,±,Æ,à,Ä,«,é B,½,Æ,!,Í Afvf%ofCf}*

*fŠ Efofbftf@ ã,ÄIDirectSoundBuffer::SetFormat ffbfh,ðEÄ,Ñ o,.,Æ Afn [fhfEfFfA,Ì o— ÍE`Ž@,ð §Eä,.,é,±,Æ,ª,Ä,«,é B,½,¾,µ*

**IDirectSoundBuffer::Lock** â**IDirectSoundBuffer::GetCurrentPosition**,È,ç,Ì Afobftf@ Ef f, fŠ,ÖfAfnfZfX,ð s,ª ffbfh,Í,.,×,ÄŽ,”s,.,é B

*fAfvfŠfP [fvf±f“,ªf~fLfVf“fO,ðŽÀ s,.,é Û ADirectSound,Ífvf%ofCf}fŠ Efofbftf@,Ö,Ì ‘,«,± ,ÝfAfnfZfX,ðñçY,.,é B,±,Ìfobftf@,Ö,Ì ‘,« ž,Ý,Í A,.,Í,â, s,í,é,é•K—v,ª, é B,à,µff [f^,ª X V,³,é,È,ç ,Æ Afobftf@,Í‘O%ñ,Ìff [f^,ðEJ,è•Ö,µ A%o’ °,É,,é,ª ¶,¶,é Bfvf%ofCf}fŠ Efofbftf@,Ö,Ì ‘,«,± ,ÝfAfnfZfX,Í AfAfvfŠfP [fvf±f“,ªDSSCL\_WRITEPRIMARY,ç‘²fçfxfç,ð Ý’è,µ,Ä,ç,é è †,Ì,Ý—LÉø,Á, é B,± ,Ì,ç²fçfxfç,Á,ÌfZfJf“f\_Š Efofbftf@,Í,Û,Ä,½, Ä ¶,³,è,È,ç B*

*fvf%ofCf}fŠ EftfEf“fh Efofbftf@,Ífç [fv,Ä Ä ¶,³,è,é,± ,Æ,É’ ^ó,.,é B•K,DSBPLAY\_LOOPINGftf%ofO,ðfZfbfg,.,é,±,Æ B*

*fvf%ofCf}fŠ Efofbftf@,Ö,Ì ‘,«,±,ÝfAfnfZfX,ðŽæ“¾,.,éû—@,ðŽÝ,Ì—á,ÄŽ’,µ,Ä,ç,é B*

```
BOOL AppCreateWritePrimaryBuffer(
    LPDIRECTSOUND lpDirectSound, LPDIRECTSOUNDBUFFER *lpDsb,
    LPDWORD lpdwBufferSize, HWND hwnd)
{
    DSBUFFERDESC dsbdesc;
    DSBCAPS dsbcaps;
    HRESULT hr;
    // wave format, Ì \‘ç‘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 \‘ç‘ì,ð Ý’è,.,é
    memset(&lpDsb, 0, sizeof(DSBUFFERDESC)); // 0,É Ý’è
    dsbdesc.dwSize = sizeof(DSBUFFERDESC);
    dsbdesc.dwFlags = DSBCAPS_PRIMARYBUFFER;
    // fobftf@ftfCfY,ÍfTfEf“fhç@Ší,É,æ,è §EÄ,³,è,é
    dsbdesc.dwBufferBytes = 0;
    dsbdesc.lpwfxFormat = NULL; // fvf%ofCf}fŠ Efofbftf@,ÍNULL,Á,È,,Ä,Í,È,ç,È,ç

    // ‘,« ž,Ý—D æç‘²fçfxfç,ðŽæ“¾
    hr = lpDirectSound->lpVtbl->SetCooperativeLevel(lpDirectSound,
        hwnd, DSSCL_WRITEPRIMARY);
    if(DS_OK == hr) {
        // -E÷ Bfobftf@,Ì ì -,ðŽž,Ý,é
        hr = lpDirectSound->lpVtbl->CreateSoundBuffer(lpDirectSound,
            &dsbdesc, lpDsb, NULL);
        if(DS_OK == hr) {
            // -E÷ Bfvf%ofCf}fŠ Efofbftf@,ð—vç ,³,è,½E`Ž@,É Ý’è
            hr = (*lpDsb)->lpVtbl->SetFormat(*lpDsb, &pcmwf);
        }
    }
}
```

```
    if(DS_OK == hr) {
        // fofbftf@fTfCfY,đ'm,è,½,¢,Æ,«,ÍGetCaps,đĀ,Ñ o,
        dsbcaps.dwSize = sizeof(DSECAPS);
        (*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“¼,·,é,É,ÍDirectSoundBuffer::Lock f\fbfh,ðŽg—  
p,·,é Bfofbftf@,Ö,İff [f^ ‘,«,±,Ý AfRfs [,Í AfTfEf“fh Efofbftf@(f f,fŠ),ªf fbfn,³,é,½Eã,É%Å”\  
,É,È,É Bfofbftf@ Ef f,fŠ,İf fbfn,Ì,»),ÌEãDirectSoundBuffer::Unlock f\fbfh,Å%ð æ,·,é,±,Æ B

·È í AfXfgfŠ [f€ EfTfEf“fh Efofbftf@,ÎA±  
,µ,Ä Ä ¼,³,é,é,Ì,Ä AfTfEf“fh Efofbftf@,ðf fbfn,·,é,½,ß,ÉDirectSound,Í,Ó,½,Ä,Ìf%ofCfG Ef|  
fCf“f^,ð•Ö,· B,½,Æ,,Ì A400fofCfG,Ìfofbftf@,Ì“r”t,Ä300fofCfG,ðf fbfn,µ,½ ê ‡ A  
IDirectSoundBuffer::Lock,Í Ä %o,Ìfofbftf@,ðŽc,è,Ì300fofCfG,Ìf|fCf“fg,Æ,µ,Ä•Ö,µ A Ä %o  
,Ì100fofCfG,ðŽÝ,Ìfofbftf@,Æ,µ,Ä•Ö,· Bfofbftf@,ÌfIfzfzfbfg,Æ’·,³,É,æ,Ä,Í A,Ó,½,Ä,ß,Ìf|  
fCf“f^,ÍNULL,É,È,é ê ‡,à, é B

fTfEf“fh Efofbftf@,Ìf f,fŠ,ÍŽ,·,í,é,é,±,Æ,à, é B,±  
,é,Í,Ä,Éfofbftf@,ªfn [fhfEFA AfTfEf“fh Ef f,fŠ,É”z’u,³,é,Ä,c,é ê ‡,É<N,±,è,â,·,ç B Ä,à’½,ç,Ì,ÍŽg—  
p’+ ,ÉfTfEf“fh EfJ [fhŽ©’ì,ª²,«Žæ,ç,é,Ä,µ,Ü,ª ê ‡,Ä, é B,±,è,ÍPCMIA,ÌTfEf“fh EfJ [fh,Ä,æ,<N,±  
,é B,Ü,½ A ‘,« ž,Ý—D æ<’²fCfxf<,ÌfAfvfŠfP [fVf‡f“,ª“ü—ÍftH [fJfX,ð“¼,½ ê ‡,É,à<N,±,è,â,·,ç B,±  
,Ìftf%ofO,ª Ý’è,³,é,Ä,c,é,Æ Afth [fJfX,ðŽ ,ÄfAfvfŠfP [fVf‡f“,ªfvf%ofCf}fŠ Efofbftf@,Ö’¼ Ü ‘,«,±  
,Ý,ð s,·,é,½,B ADirectSound,Í’¼,Ì,·,×,Ä,ÌTfEf“fh Efofbftf@,ð ÄŽ,µ,Ä,µ,Ü,ª B,±  
,é,ªN,«¼ ê ‡ ADirectSound,Í IDirectSoundBuffer::Lock,ª,Ñ

IDirectSoundBuffer::Play f\fbfh,É’Í,µ,ÄDSERR\_BUFFERLOSTfGf%o [fR [fh,ð•Ö,· B,»,ÌfAfvfŠfP [fVf‡f“,ª ‘  
,« ž,Ý—D æ<’²fCfxf<,©,ç’¼,ÌfCfxf<,É%o,ª,Ä,½,è A“ü—  
ÍftH [fJfX,ðŽ,Ä,½,è,·,é,Æ A’¼,ÌfAfvfŠfP [fVf‡f“,ªIDirectSoundBuffer::Restore f\fbfh,ðEÄ,Ñ o,µ,Äfofbftf  
@ Ef f,fŠ,Ì ÄŠ,,é—,Ä,ðŽÄ s,Ä,«é B -E±,·,é,Æ A,±,Ìf f\fbfh,Ìfofbftf@ Ef f,fŠ,â A,»,Ì’¼,Ìf{fŠf...  
[f€

,âfpf“ Ý’è,È,Ç,Ìfofbftf@,Ì Ý’è,·,×,Ä,ðfŠfXfgfA,·,é B,µ,©,µ AfŠfXfgfA,³,é,½fofbftf@,ÌTfEf“fh Ef [f^,Í”  
%óó,³,é,Ä,ç,é B efAfvfŠfP [fVf‡f“,ªÍfŠfXfgfA,³,é,½fofbftf@,Öff [f^,ð Ä ‘,«,±,Ý,·,é•K—v,ª, é B

ŽÝ,Ì—á,Ä,ÍDirectSoundBuffer::Lock,ª,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%ofCfGf|fCf“f^,ÌŽæ“¼
    hr = lpDsb->lpVtbl->Lock(lpDsb, dwOffset, dwSoundBytes, &lpvPtr1,
        &dwBytes1, &lpvPtr2, &dwBytes2, 0);

    // BUFFERLOST,ª•Ö,³,é,½ ê ‡ AfŠfXfgfA,Æ Äf fbfn,ð s,ª
    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,ª
        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) {
            // -E± B
            return TRUE;
        }
    }
}
```

```
}  
// f bfN Af bfN%ođ æ A,à,μ,,Í—v< ,lŽ,”s  
return FALSE;  
}
```

**DirectSound~fLFT [,İŽg—p**

DirectSound,Ä; ”,İfXfgfŠ [f€,đf~fLfvf“fO,·,é,İ,İŠÈ’P,Ä, ,é B’P,  
ÉfZfJf“f fŠ EFTfEf“fh Efofbtft@,đ ì ¬,µ A,»,é,¼,é,İfofbtft@,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,Äfofbtft@,Éff [f^,đ ‘,«,±,Ý A  
IDirectSoundBuffer::Play,Äfofbtft@,đ Ä ¶,·,é,±,Æ,ª,Ä,«,é B,Ü,½ A IDirectSoundBuffer::Stopf f\fbfh,đŽg—  
p,µ,Ä A Ä ¶†,İfofbtft@,đ,ç,Ä,Ä,à’âŽ~,·,é,±,Æ,ª,Ä,«,é B

IDirectSoundBuffer::Playf f\fbfh,İ,Ä,È,Éfofbtft@,İfJfEf“fg EflfWfVf#f“,©,ç Ä ¶,đŽn,ß,é BfJfEf“fg Efl  
fWfVf#f“,Í Afobtft@“à,İfIfZfbfg,ÄfofCfG’P’È,ÄŽw’è,³,é,é B V<K ì ¬,³,é,½fofbtft@,İfJfEf“fg Efl  
fWfVf#f“,İO,Ä, ,é Bfofbtft@,ª’âŽ~,·,é,Æ AfJfEf“fg EflfWfVf#f“,Í,Žž,ÉŽÝ,É Ä ¶,³,é,ÉfTf“fvf<,Ö’Ü“®,·,é B  
IDirectSoundBuffer::SetCurrentPositionf f\fbfh,đCEÄ,Ñ o,¹,İfJfEf“fg EflfWfVf#f“,đ¬¾Šm,É Ý’è,·,é,±  
,Æ,ª,Ä,« A IDirectSoundBuffer::GetCurrentPositionf f\fbfh,đCEÄ,Ñ o,¹,İfJfEf“fg EflfWfVf#f“,đŽæ“¾,Ä,«,é B

ffftHf<fg,Ä,İDirectSoundBuffer::Play,İfofbtft@,İ I,İ,é,È“ž’B,µ,½,Æ,«,É Ä ¶,đ I—,·,é B,±  
,é,İf< [fv,È,µ,İfXf^fefBfbfn Efofbtft@,İ“K ØÈ“® ì,Ä, ,é(fJfEf“fg EflfWfVf#f“,Í,±  
,İŽž“\_Äfofbtft@,İŠJŽn’È’u,Ü,ÄfŠfZfbfg,³,é,é) B  
fXfgfŠ [f€ Efofbtft@,¬,æ,ÑfXf^fefBfbfn Efofbtft@,đ’A“±“I,É Ä ¶,·,é é ±,Í A  
IDirectSoundBuffer::Play,đCEÄ,Ñ o,µ,Ä AdwFlagsfpf%of [f“à,ÉDSBPLAY\_LOOPINGftf%ofO,đŽw’è,·,é B,±  
,é,È,æ,è Afobtft@,ª I,İ,é,Ü,Ä“ž’B,·,é,Æ,Ü,½ŠJŽn’È’u,Ü,Ä—ß,é,æ,µ,É,È,é B

fXfgfŠ [f€ EFTfEf“fh Efofbtft@,Ä,Í A Ä ¶fJ [f<,ªŠJŽn’È’u,Ü,ÄŠª,«—  
ß,é’O,É AŽÝ,İfuf fbfn,İff [f^,ª ‘,«,±,Ü,é,Ä,ç,é•K—v,ª, ,é B,±,İ,½,ß,É,İWin32ŠÖ ”,İSetTimer,à,µ,Í  
SetEvent,đŽg—p,µ,Ä A’èŠú“I,Éf fbz [fW,âfR [f<fofbfNŠÖ ”,ªŽÄ s,³,é,é,æ,µ,É,·,é,İ,æ,ç B,³,ç,É A’½,  
,İDirectSoundAfvfŠfP [fVf#f“,Í AfŠfAf<f^fCfEDirectDrawRf“f]  
[f“fg,đŽ ,Ä,Ä,¬,è AfBfBfXfvfEfC,É’I,µ,Ä’èŠú“I,ÉfT [frfX,đ s,µ,à,İ,Ä, ,é B,±,İfRf“f]  
[f“fg,İDirectSoundfofbtft@,É,à“—l,ÉfT [frfX,đŽY<,·,é,±,Æ,ª,Ä,«,é BEø—  
,İCEü ä,đ I,¹ A Ä ¶†,İfi [ffBfi o—  
İ,İ,·,é,đ Ä ¬CEÄ,É,“³,¹,é,½,ß,É,Í AfAfvfŠfP [fVf#f“,İfJfEf“fg,İ Ä ¶fJ [f<,æ,è ,È,,Æ,à¹b,Í æ,É ‘,«,±  
,Ý,đ s,µ•K—v,ª, ,é B

,à,µfXf^fefBfbfn Efofbtft@,É’I,µ,ÄDSBCAPS\_STATICftf%ofO,đŽw’è,µ,Ä,ç  
,é,İ ADirectSoundf~fLFT [,İfn [fhEfFFA EfAfNfZf%ofCE [fVf#f“,İCEø—p,đ Ä’âCEÄ,ÉŽó,¬,é,±,Æ,ª,Ä,«,é B,±  
,İftf%ofO,Í Ä—p,³,é,ÉfXf^fefBfbfn Efofbtft@,Ä,Í•K,Žw’è,µ,½,Ü,µ,ª,æ,ç BDirectSound,İ,±,é,ç,İfofbtft@,đ—  
LEø,Èfn [fhEfFFA Ef f,fŠ,Éf [fh,·,é,İ,Ä Af~fLfvf“fOŽž,İfi [fo [fwfbfh,İ,È,ç B Ä,à d—  
v,ÈfXf^fefBfbfn EFTfEf“fh Efofbtft@,Í Afn [fhEfFFA EfAfNfZf%ofCE [fVf#f“,đ—D æ“I,ÉŽó,¬,ç,é,é,æ,µ  
,É’è’Ö Ä %ø,É ì ¬,·,é,Ü,µ,ª,æ,ç B

fAfvfŠfP [fVf#f““à,İfTfEf“fh,ª,·,×,Ä“¬,¶wave,đŽg—p,µ Afn [fhEfFFA,Ö,İ o—  
İCE’Ž®,ª,»,é,ç,İfTfEf“fh,Æ ±,Ä,ç,é,İ A DirectSoundf~fLFT [,Í Ä ,«%•iŽç,İfTfEf“fh,đ ì,è o,· B,±  
,İ đCE %ø,Ä,Í Af~fLFT [,İCE’Ž®•İŠ·,đ,·,é•K—v,ª,È,ç,½,ß,Ä, ,é B

fn [fhEfFFA,Ö,İ o—İCE’Ž®,đ•İ X,·,é,É,Í Afvf%ofCf}  
fŠ EFTfEf“fh Efofbtft@,đ ì ¬,µ,ÄIDirectSoundBuffer::SetFormatf f\fbfh,đCEÄ,Ñ o,· B,½,¾,µ A,±  
,İfvf%ofCf}fŠ Efofbtft@,Í §CEä,İ—U“I,Ä,µ,©Žg—p,Ä,«, , A,±  
,İŠÖ ”,đCEÄ,Ñ o,¹,ÉfAfvfŠfP [fVf#f“,Í ADSSCL\_PRIORITY,à,µ,Í,»,é’È ä,İç’²fCefxf<,É Ý’è,³,é,Ä,ç,é,à,İ,Ý,Ä,  
,é B,»,µ,ÄDirectSound,Í AfAfvfŠfP [fVf#f“,ª“ü—  
İftfH [fJfX,đ“¾,é,½,Ñ,É Afn [fhEfFFA,İCE’Ž®,đ’O%ñ,İDirectSoundBuffer::SetFormatf f\fbfh,İCEÄ,Ñ o,µ,Ä  
Ý’è,µ,½CE’Ž®,É•Ö,· B

fJfXf^f€ Ef~fLFT [,lžg—p

,Û,Æ,ñ,ç,lfAfvfŠfP [fVf‡f“,Á,ÍDirectSoundf~fLFT [,džg—p,·,é,ª A,±,ê,Í A,Û,Ú,·,×,Ä,lf~fLfvf“fO,ì—v< ,đ-  
ž,½,µ A,Û,½ Až@“@“I,Éfn [fhfEfffA EfAfNfZf%ofCE [fVf‡f“,đ—  
p,·,é B,µ,©,µ ADirectSound,“ñ<ÿ,µ,È,ç<@“\,đfAfvfŠfP [fVf‡f“,ª•K—v,Æ,·,é ê ‡ Afvf%ofCf}  
fŠ EFTfEf“fh Efofbftf@ ,Ö,ì ‘,«,±,ÝfAfNfZfX,đŠl“¾,µ A,»„±,Á¼ ÚfXfgfŠ [f€,đf~fLfvf“fO,·,é,±  
,Æ,ª,Ä,«,é B,±,ì<@“\,ÍRf“f [flf“fg,²,Æ,É’ñ<ÿ,³,ê A,²,CEÄ,ç,ê,½fnfCfpftfH [f}f“fX,lfAfvfŠfP [fVf‡f“,Á,Ì,Ý  
—LÆø,Á, ,é B,±,ì<@“\,đ—p,µ,½fAfvfŠfP [fVf‡f“,ÍfI [fffBfI,Ì,,é,đ%ñ”ð,·,é,ì,“i,µ,,È,é,Ì,Á AfpftfH [f}  
f“fX—v< ,ªEµ,µ,,È,é B

fJfXf^f€ Ef~fLFT [,đ ì ¬,·,é,É,Í A,Û, DSSCL\_WRITEPRIMARY<‘‘²fCEfxf<,đžæ“¾,µ Afvf%ofCf}  
fŠ EFTfEf“fh Efofbftf@,đ ì ¬,·,é Bžÿ,ÉIDirectSoundBuffer::Lock f\fbfh,đCEÄ,Ñ o,µ A•Ö,³,ê,½f}  
fCf“f^,Öff [f^,đ ‘,«,±  
,Ý A,»„µ,ÄIDirectSoundBuffer::Unlock f\fbfh,đCEÄ,Ñ o,µ,ÄDirectSound,Öff [f^,đ•Ö,· BfAfvfŠfP [fVf‡f“,ÍID  
irectSoundBuffer::Play f\fbfh,ÌCEÄ,Ñ o,µ,Áfvf%ofCf}fŠ Efofbftf@,đ Ä ¶,µ Af f [f^,đfXfs [fJ,É o—Í,µ,È,-  
,Á,Ì,È,ç,È,ç BDSBPLAY\_LOOPINGf%ofO,©Žw’è,³,ê,Á,ç,È,ç,Æ  
IDirectSoundBuffer::Play,ÌCEÄ,Ñ o,µ,Éž,“s,·,é,ì,Á’ ^Ó,·,é,±,Æ B

fJfXf^f€ Ef~fLFT [,l ì ¬û-@,đžÿ,Éž,µ,Ä,ç,é B—á,ì†,É, ,éAppMixIntoPrimaryBufferŠÖ ”,Í AfTfEf“fh Efff  
ofCfX,ªff [f^ Efuf fbfn,Ì Ä ¶,đCEJ,è•Ö,³,È,ç,æ,ª^è,ÌŠÖŠu,ÁCEÄ,Ñ o,µ,³,é,é•K—v,ª, ,é BCustomMixerŠÖ ”,Íf  
AfvfŠfP [fVf‡f“,ª^è<,µ,½ŠÖ ”,Ä A  
fAfvfŠfP [fVf‡f“,ª^è<,µ,½CustomMixer,ì†,Ážw’è,³,ê,½,Æ,«,É•j ”,lfXfgfŠ [f€  
,đf~fLfvf“fO,µ ACE%øÈ,đžw’è,³,ê,½ffCf“f^,Ö ‘,«,±,Đ B

```
BOOL AppMixIntoPrimaryBuffer(
    LPAPPSTREAMINFO lpAppStreamInfo, LPDIRECTSOUNDBUFFER lpDsbPrimary,
    DWORD dwDataBytes, DWORD dwOldPos, LPDWORD lpdwNewPos)
{
    LPVOID lpvPtr1;
    DWORD dwBytes1;
    LPVOID lpvPtr2;
    DWORD dwBytes2;
    HRESULT hr;
    // ‘,«,±,ÝffCf“f^,đžæ“¾
    hr = lpDsbPrimary->lpVtbl->Lock(lpDsbPrimary, dwOldPos, dwDataBytes,
        &lpvPtr1, &dwBytes1, &lpvPtr2, &dwBytes2, 0);
    // DSERR_BUFFERLOST,ª•Ö,Á,Ä,«,½ ê ‡,É AfŠfXfgfA,µ,Ä Af fbfn,đ,©,¬,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,½ffCf“f^,Öff [f^,đf~fLfvf“fO,·,é
        CustomMixer(lpAppStreamInfo, lpvPtr1, dwBytes1);
        *lpdwNewPos = dwOldPos + dwBytes1;
        if(NULL != lpvPtr2) {
            CustomMixer(lpAppStreamInfo, lpvPtr2, dwBytes2);
            *lpdwNewPos = dwBytes2; // Šª,«-ß,Á,½,½,ß
        }
        // DirectSound,Öff [f^,đ•Ö,·
        hr = lpDsbPrimary->lpVtbl->Unlock(lpDsbPrimary, lpvPtr1,
            dwBytes1, lpvPtr2, dwBytes2);
        if(DS_OK == hr) {
            // -CE÷
            return TRUE;
        }
    }
    // f fbfn,ª,Ñf fbfn%đ æ,ìž,“s
    return FALSE;
}
```

### ^3 kwave, ĹŽg—p

CE» Ý, ĹDirectSound, Ĺ A^3 kwave, ĹTf] [fg, μ, Ĺ, Ĺ  
, Ĺ, Ĺ B^3 k, Ĺ, Ĺ, Ĺ, Ĺ [ffBfI Eff [f^, Ĺ AfTfEf“fh Efofbftf@, Ĺ ‘, «, ±, b‘O, ĹPCM(pulse-coded  
modulation)ff [f^, Ĺ, Ĺ, Ĺ, Ĺ, Ĺ, Ĺ A Win32 SDK, Ĺ Ĺ, μ, Ĺ, Ĺ, Ĺ, Ĺ [ffBfI^3 kf}fI [fWff(ACM) ŠÖ ”, ĹŽg—p, Ĺ, Ĺ•K  
—v, Ĺ, Ĺ BŽĹ Ű, Ĺ, Ĺ Af|fCf“f^, ĹTfEf“fh Efofbftf@ Ef f, fŠ, Ĺ|fCf“f^, Ĺf fbN, μ, Ĺ ACM, Ĺ“n, Ĺ, Ĺ A Ĺ, Ĺ, Ĺ, Ĺ  
—, Ĺ, Ĺ, ff [f^, Ĺ, Ĺ, Ĺ ŰTfEf“fh Efofbftf@, ĹffR [fh, Ĺ, Ĺ, Ĺ, Ĺ B

DirectSoundŠftf@fœf“fX

ŠÖ ”

## DirectSoundCreate

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

IDirectSound fCf“f^ [ftfFfCfX,Ì ì ¬,Æ %Šú%»»,đ s,□ B

–Æ÷,·,ê,ÎDS\_OK AŽ,”s,·,ê,ÎŽŸ,ÌfGf% [fR [fh,đ•Ô,· B

DSERR\_ALLOCATED

DSERR\_INVALIDPARAM

DSERR\_NOAGGREGATION

DSERR\_NODRIVER

DSERR\_OUTOFMEMORY

lpGuid

fTfEf“fhffofCfX,đŽ•Ê,·,éGUID,Ö,Ì|fCf“f^ B,±  
·,Ìfpf%of [f^,Ì¹,ÍDirectSoundEnumerate,É,æ,è•Ô,³,ê,éGUIDs,Ì,Đ,Æ,Â A,à,µ,,ÍfftfHf<fg,ÌffofCfX,đ—  
v< ,·,é,½,ß,ÉNULL,Æ,È,é B

ppDS

,±,ÌŠÖ ”,É%ž“š,µ,Ä ì ¬,³,ê,éDirectSoundfIfufWfFfNfg,Ö,Ì|fCf“f^ B

pUnkOuter

–Ç'è`,Ìø ” B,±,Ì¹,ÍNULL,Ä,È,¬,ê,Î,È,ç,È,Ç B

DirectSoundfIfufWfFfNfg,Ì ì ¬Æä,Í A,·,Ý,â,©,ÉDirectSound::SetCooperativeLevel f\fbfh,đÆÄ,Ñ o,³,È,-  
,Ä,Í,È,ç,È,Ç B

ŽQ Æ @IDirectSound::GetCaps, IDirectSound::SetCooperativeLevel

## DirectSoundEnumerate

```
BOOL DirectSoundEnumerate(  
    LPDSENUMCALLBACK lpDSEnumCallback, LPVOID lpContext);  
  
fVfXfef€,ÉfCf“fXfg [f<,³,ê,Ä,¢,éDirectSoundfhf%ofCfo,ð—ñ<“,;é B  
    -€÷,·,ê,Î,c,r_,n,j AŽ,”s,·,ê,ÎDSERR_INVALIDPARAM,ÏfGf%o [fR [fh,ð•Ô,· B  
  
lpDSEnumCallback  
    DSEnumCallbackŠÖ ”,Ö,Ï|fCf“f^ B,±,ê,ÏfVfXfef€,ÉfCf“fXfg [f<,³,ê,Ä,¢  
    ,é,»,ê,¼,ê,ÏDirectSoundfIfufWfFfNfg,©,ç€Ä,Ñ o,³,ê,é B  
  
lpContext  
    f† [fU’è<`fRf“fefLfXfg,Ö,Ï|fCf“f^ B,±,ÏfRf“fefLfXfg,Í A—  
    ñ<“fR [f<fofbfNSÖ ”,€Ä,Ñ o,³,ê,é,½,Ñ,É A,»,ÏŠÖ ”,Ö“n,³,ê,é B  
ŽQ Æ @DSEnumCallback
```

fR [f<fofbfNŠÖ ”

## DSEnumCallback

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

DirectSoundfHf%ofCfo,đ-ñ<“,·,é,½,ß,Ì AfAvfšFP [fVfšf“è`fR [f<fobfNšÖ ” BfVfXfef€  
,Í¼‘O,ÌDirectSoundEnumeratešÖ ”,ÌĀ,Ñ o,μ,É%ž“š,μ,Ā,±,ÌšÖ ”,đĀ,Ñ o,· B

fHf%ofCfo,Ì-ñ<“,·,é,½,ß,Ì AfAvfšFP [fVfšf“è`fR [f<fobfNšÖ ” BfVfXfef€  
,Í¼‘O,ÌDirectSoundEnumeratešÖ ”,ÌĀ,Ñ o,μ,É%ž“š,μ,Ā,±,ÌšÖ ”,đĀ,Ñ o,· B

### lpGuid

—ñ<“,·,é,½,ß,Ì AfAvfšFP [fVfšf“è`fR [f<fobfNšÖ ” BfVfXfef€  
,Í¼‘O,ÌDirectSoundEnumeratešÖ ”,ÌĀ,Ñ o,μ,É%ž“š,μ,Ā,±,ÌšÖ ”,đĀ,Ñ o,· B

### lpstrDescription

DirectSoundfffofCfX,ÌfefLXfg<L q,đ-^,|,é ANULL,Ā I,í,é•Źš—ñ,Ö,Ìf|fCf“f^ B

### lpstrModule

,±,ÌfffofCfX,É‘š“-·,·,éDirectSoundfHf%ofCfo,Ìf,fWf... [f<-¼,đžw’è,·,é ANULL,Ā I,í,é•Źš—ñ,Ö,Ìf|fCf“f^ B

### lpContext

fAvfšFP [fVfšf“è`fR [f^,Ö,Ìf|fCf“f^ B,»é,½,é,ÌfR [f<fobfNšÖ ”,Ö“n,³,é,é B

lpstrDescription,“,æ,Ñ lpstrModulefPf%of [f^,É“n,³,é,½•Źš—ñ,Í Afq [fv,©,çš,,,è“-  
,Ā,ç,é,½f f,fš,ÖfRfs [,μ,Ā•Źš—ñ,đ,±,ÌfR [f<fobfNšÖ ”,Ö“n,·,Ì,Éžg—  
p,³,é,½f f,fš,Í A,±,ÌfR [f<fobfNšÖ ”,žĀ s’†,Ì,Ā,«,É,Ì,Ý—LĀø,Ā,È,é B

žQ Ā @DirectSoundEnumerate

**IDirectSound**

*fAfvfŠfP [fVf‡f“f,ÍDirectSoundIfufWfFfNfg,ì ì ¬,ÆŠÂ« Ý’è,ÉIDirectSoundfCf“f^ [ftfFfCfX,ìf f\fbfh,ðŽg  
—p,.,é B,±,ì B,Í,±,ìfCf“f^ [ftfFfCfX,ìf f\fbfh,ìfŠftf@fEf“fX,Æ,È,Á,Ä,ç,é BŠT”O,É,Á,ç,Ä,ìŠT—  
v,ìIDirectSoundfCf“f^ [ftfFfCfX,ðŽQ Æ,.,é,±,Æ B*

**IDirectSoundfCf“f^ [ftfFfCfX,ìf f\fbfh,ÍÈ%°,ìfOf< [fv,Å•Ò ¬,³,ê,Ä,ç,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“—1 AIDirectSoundfCf“f^ [ftfFfCfX,Í\_  
IUknownfCf“f^ [ftfFfCfXf f\fbfh,ðEp ³,µ,Ä,ç,é BIUknownfCf“f^ [ftfFfCfX,ÍÈ%°,ì,R,Ä,ìf f\fbfh,ðfTf|  
[fg,µ,Ä,ç,é B*

**AddRef**

**QueryInterface**

**Release**

**IDirectSound::Compact**

HRESULT Compact ();

fIf“f{ [fh EftTfEf“fhf f,fŠ,ì-čŽg—p•”•a,đ~A‘±fuf fbfN,Ö~Ú“@,μ A Ā‘â,ìftfŠ [f f,fŠ—ÿæ,đŽg—p%Ā”\ ,É,·,é B

-Ĉ÷,·,ê,ĪDS\_OK AŽ,”s,·,ê,ĪŽŸ,ìfGf%o [fR [fh,đ•Ô,· B

**DSERR\_INVALIDPARAM**

**DSERR\_PRIOLEVELNEEDED**

**DSERR\_UNINITIALIZED**

,±  
,Īf f\fbfh,đĈĀ,Ñ o,·,Æ AfAfvfŠfP [fVf±f“,ÍDirectSoundfIfufWfFfNfg,Æ”r¼“I,È<’²fĈfxf<,đŽ ,½,È,¯,ê,Ī,È,ç,  
È,č (“r¼“IfAfNfZfX,đ“¾,é,É,Ī A **IDirectSound::SetCooperativeLevel**  
f f\fbfh,Ī†,ĀDSSCL\_EXCLUSIVE,đŽw’è,·,é) B i s†,Ī‘Ĉ ì,ª,Đ,Æ,Ā,Ā,à ,é,Æ A,±,Īf f\fbfh,ĪŽ,”s,·,é B

ŽQ Æ @IDirectSound, **IDirectSound::SetCooperativeLevel**

**IDirectSound::CreateSoundBuffer**

```
HRESULT CreateSoundBuffer(LPDSBUFFERDESC lpDSBufferDesc,
    LPLPDIRECTSOUNDBUFFER lplpDirectSoundBuffer,
    IUknown FAR * pUnkOuter);
```

fTf“fvfŠf“fO Efi [ffBfi,İfv [Ppf“fX,đ•ŮŽ ,.é,½,ß,İDirectSoundBufferIfufWfFfNfg,đ ì ¬,·,é B  
-Ĉ±,·,é,İDS\_OK AŽ,”s,·,é,İŽŸ,İfGf%o [fR [fh,đ•Ů,· B

- DSERR\_ALLOCATED**
- DSERR\_BADFORMAT**
- DSERR\_INVALIDPARAM**
- DSERR\_NOAGGREGATION**
- DSERR\_OUTOFMEMORY**
- DSERR\_UNINITIALIZED**
- DSERR\_UNSUPPORTED**

```
lpDSBufferDesc
    ì ¬,³,é,½fTfEf“fh Efofbftf@,ìL q,ªŠŮ,Ů,é,Ä,ĉ,éDSBUFFERDESC \‘ċ,İ,Ö,İffCf“f^ B
lplpDirectSoundBuffer
    V<K,İDirectSoundBufferIfufWfFfNfg,Ö,İffCf“f^ Bfofbftf@,ª ì ¬,³,é,È,©,Á,½ ê ±,İNULL,Æ,È,é B
pUnkOuter
    -ĉ‘èċ,İŕø ” B,±,ì¹,İNULL,Ä,È,.,Ä,Í,È,ç,È,ĉ B
```

fTfEf“fh Efofbftf@,đ Ä ¶%oÄ”\,É,·,é,½,ß,É AŽ-‘O,É**IDirectSound::SetCooperativeLevel**f f\fbfh,đŽg—  
p,µ,ÄDirectSoundIfufWfFfNfg,İċ’²fĈfxfċ,đŽw’è,µ,Ä,“,©,È,.,Ä,Í,È,ç,È,ĉ B

```
lpDSBufferDescpf%of [f^,Í AĈ`Ž@ AfTfCfY A «”\,Æ,ĉ,Á,½ A—  
v< ,³,é,½fofbftf@,İffCfv î•ñ,đŠŮ,Đ \‘ċ,İ,đŽ,· BfAfvfŠfP [fVf±f“,ªK—v,Æ,·,é”\—Í,É,Ä,ĉ,ÄŽw’è,µ,Ä,ĉ,È,ĉ  
,Æ,±,é,ç,Í-³Ĉø,É,È,é B,½,Æ,.,İDirectSoundIfufWfFfNfg,đ ì ¬,·,é,Æ,«,É  
DSBCAPS_CTRLFREQUENCYftf%fo,đŽw’è,µ,Ä,“,©,È,ĉ,Æ A  
IDirectSoundBuffer::SetFrequency.İĈÄ,Ň o,µ,Í,·,×,ÄŽ,”s,·,é B
```

```
fn [fhEfFfA Ef~fLfVf“fO,İ—~—p,ì,½,ß,É AŽg—p%oÄ”\  
,ÈfIf“f{ [fh Ef f,fŠ ä,İfofbftf@,đ“Ĉ,Ÿ ž,Đ ê ±,Í A DSBCAPS_STATICftf%fo,đŽw’è,·,é,±  
,Æ,à,Ä,«,é Bfn [fhEfFfA Ef~fLfVf“fO,Æf\ftfgEfFfA Ef~fLfVf“fO A,±,İ,Ĉ,ç,ç,đŽg—p,·,é,©,đfofbftf@,Ö<-  
§“L,ÉŽw’è,·,é,É,Í ADSBCAPS_LOCHARDWARE A,à,µ,.,İ DSBCAPS_LOCSOFTWAREftf%fo,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,đ V<K ì ¬,·,é B,±  
,ê,Í“”,¶f ofbftf@ Ef f,fŠ,đfIfŠfWfif<,ìfIfufWfFfNfg,Æ,µ,ÄŽg—p,·,é B  
-Æ÷,·,ê,ÎDS\_OK AŽ,”s,·,ê,ÎŽÿ,ìfGf%o [fR [fh,đ•Ô,· B

- DSERR\_ALLOCATED
- DSERR\_INVALIDCALL
- DSERR\_INVALIDPARAM
- DSERR\_OUTOFMEMORY
- DSERR\_UNINITIALIZED

lpDsbOriginal  
•j »’,³,ê,½DirectSoundBufferIfufWfFfNfg,Ö,ìf|Cf“f^ B  
lpDsbDuplicate  
V<K,ìDirectSoundIfufWfFfNfg,Ö,ìf|Cf“f^ B

V<K,ìfIfufWfFfNfg,ÍfIfŠfWfif<,Æ““,¶,æ,µ,ÉŽg—p,Ä,«,é B  
•j »’¼Æä,ìf ofbftf@,Í AfIfŠfWfif<f ofbftf@,Æ““,¶f p%of [f^,đŽ ,Â B,½,¾,µ A,»,ê,¼,ê,ìf p%of [f^,đÆÄ  
X,É•İ X,µ,Ä A’ŠŽè,É%œç,đ<y,Ú,·,±,Æ,È, A Ä ¶,·,æ,Ñ’âŽ~,đ s,µ,±,Æ,ª,Ä,«,é B  
f ofbftf@“à,ìf [f^,ª,Ç,ç,ç,©,ìfIfufWfFfNfg,É,æ,Á,Ä•İ X,³,ê,é,Æ Af f,fŠ,ª<µ—L,³,ê,Ä,ç  
,é,½,ß,É A,»,ì•İ X,Í,à,µ’ê•û,ìfIfufWfFfNfg,É,à”½%of,³,ê,é B  
ÄÆä,ìfIfufWfFfNfgŽQ Æ,ª%đ•ú,³,ê,é,Æ Af ofbftf@ Ef f,fŠ,Í%đ•ú,³,ê,é B

ŽQ Æ @IDirectSound, IDirectSound::CreateSoundBuffer



**IDirectSound::GetSpeakerConfig**

HRESULT GetSpeakerConfig(LPDWORD lpdwSpeakerConfig);

DirectSoundIfufWfFfNfg, ĀŽw'è,³,ê,½fXfs [fJ Ý'è,ðŽæ“¾,·,é B  
-Ē÷,·,ê,ĪDS\_OK AŽ,”s,·,ê,ĪŽŸ,ĪfGf%o [fR [fh,ð•Ō,· B

**DSERR\_INVALIDPARAM**

**DSERR\_UNINITIALIZED**

*lpdwSpeakerConfig*

,±,ĪDirectSoundIfufWfFfNfg,ĪfXfs [fJ Ý'è,Ō,Ī|fCf“f^ BfXfs [fJ Ý'è,Ī^È%°,Ī'l,ĀŽw'è,³,ê,é B

DSSPEAKER\_HEADPHONE

fI [ffBfI,Īfwfbfhfzf“,©,ç o—Ī,·,é B

DSSPEAKER\_MONO

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

DSSPEAKER\_QUAD

fI [ffBfI,Ī4f`fff“flf< EfXfs [fJ,©,ç o—Ī,·,é B

DSSPEAKER\_STEREO

fI [ffBfI,ĪfXfefĒfl EfXfs [fJ,©,ç o—Ī,³,ê,é(ffftfHf<fg'l) B

DSSPEAKER\_SURROUND

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

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

**IDirectSound::Initialize**

HRESULT Initialize(GUID FAR \* lpGuid);

**CoCreateInstance** SÖ ”,É,æ,è ì ¬,³,ê,½DirectSoundfIfufWfFfNfg,ð %Šú%»,·,é B  
-Œ÷,·,ê,ÎDS\_OK AŽ,”s,·,ê,ÎŽŸ,ÏfGf%o [fR [fh,ð•Ô,· B

**DSERR\_ALREADYINITIALIZED**

**DSERR\_GENERIC**

**DSERR\_INVALIDPARAM**

**DSERR\_NODRIVER**

lpGuid

fOf [fof<f†fj [fNŽ~•ÊŽq(GUID),Ö,Ïf|fCf“f^ B,±,ÏŽ~•ÊŽq,Í A,±  
,ÏDirectSoundfIfufWfFfNfg,ðŒ< ‡,·,é,½,ß,ÏfTfEf“fhfhf%ofCfo,ðŽw’è,·,é BNULL,Ï ê ‡,Ïfvf%ofCf}  
fŠ EfTfEf“fh Efofbftf@,ªI’ð,³,ê,é B

,±,Ïf f\fbfh,ÍCOMfvf fgRf,É €’,µ,Ä,Œ,é B,à,µDirectSoundfIfufWfFfNfg,Ï ì ¬,É**DirectSoundCreate**SÖ ”,ªŽg  
—p,³,ê,Ä,Œ,é,Æ A,±,Ïf f\fbfh,ÍDSERR\_ALREADYINITIALIZED,ð•Ô,· B **CoCreateInstance**,ðŽg—  
p,µ,ÄDirectSoundfIfufWfFfNfg,ð ì ¬,µ,½,Æ,«,É**IDirectSound::Initialize**,ªŒÄ,Ñ o,³,ê,È,Œ  
,Æ A,»,ÏŒä,ÉŒÄ,Ñ o,³,ê,éf f\fbfh,Í,·,×,Ä**DSERR\_UNINITIALIZED**,ð•Ô,· B

**CoCreateInstance**,ð~—p,µ,½**IDirectSound::Initialize**,ÏŽg—p,É,Ä,Œ,Í A **CoCreateInstance**,ðŽg—  
**p,µ,½DirectSoundfIfufWfFfNfg,Ï ì ¬,ðŽQ** Æ,·,é,±,Æ B

ŽQ Æ **@DirectSoundCreate**

**IDirectSound::SetCooperativeLevel**

HRESULT SetCooperativeLevel (HWND hwnd, DWORD dwLevel);

ftTEf“fh EfffofCfX,ÉĪ,·,éAfvfŠfP [fVf‡f“,ĪĪ’²fĈfxf<,đ Ý’è,·,é B  
-Ĉ÷,·,ê,ĪDS\_OK AŽ,”s,·,ê,ĪŽŸ,ĪfGf%o [fR [fh,đ•Ō,· B

**DSERR\_ALLOCATED**

**DSERR\_INVALIDPARAM**

**DSERR\_UNINITIALIZED**

**DSERR\_UNSUPPORTED**

hwnd

fAfvfŠfP [fVf‡f“,ĪfEfBf“fhfE Efnf“fhf< B

dwLevel

—v< ,³,ê,½Ī’²fĈfxf< B ŽŸ,Ī’l,²Žw’è,Ā,«,é B

DSSCL\_EXCLUSIVE

fAfvfŠfP [fVf‡f“,đ”r’¼fĈfxf<,É Ý’è,·,é B“ü—  
ĪftfH [fJfX,đ“¾,é,Ā A,»ĪfAfvfŠfP [fVf‡f“,¾,“—B^ê—  
Ā,ç,¹,é,æ,²,É,È,é  
(DSBCAPS\_GLOBALFOCUSftf%fo Ý’è,ĪfAfvfŠfP [fVf‡f“,©,ç,Īf  
TfEf“fh,Īf~f... [fg,³,ê,é) B,±,ĪfĈfxf<,É,“—,é  
fAfvfŠfP [fVf‡f“,Ī ADSSCL\_PRIORITYfĈfxf<,Ī,·,×,Ā,Ī“ĀĈ ,đ—  
L,· B Ā V,Ī**IDirectSoundBuffer::SetFormat** f\fbfh,ĪĈĀ,Ñ o,μ,Ā  
Žw’è,³,ê,é,Ā IDirectSound,Īfn [fhfEfFfĀĈ Ž®,đfŠfXfgfA,·,é  
(,½,¾,μ IDirectSound,Ī Ý’è,³,ê,½—  
D æfĈfxf<,ÉŠŌ,í,ç,, A,Ā,Ē,Éwave,đfŠfXfgfA,·,é) B

DSSCL\_NORMAL

fAfvfŠfP [fVf‡f“,É \\*²,ĒĪ’² ó’Ō,đ Ý’è,·,é B Ā,àXf€ [fY,Èf}  
f<f^fXfLf“fo,ĀfŠf\ [fX<α—L,đ s,α  
,Ī,Ā A,Ū,Ā,ñ,ç,ĪfAfvfŠfP [fVf‡f“,Ī,±,ĪfĈfxf<,É Ý’è,·,×,« B

DSSCL\_PRIORITY

fAfvfŠfP [fVf‡f“,đ—D æfĈfxf<,É Ý’è,·,é B,±  
,ĪfĈfxf<,ĪfAfvfŠfP [fVf‡f“,Ī**IDirectSoundBuffer::SetFormat**,“æ,ÑĪ  
**IDirectSound::Compact** f\fbfh,đĈĀ,Ñ o,·,±,Ā,ª,Ā,«,é B

DSSCL\_WRITEPRIMARY

,±,é,Ī Ā ãÊ,ĪfĈfxf<,Ā, ,é BfAfvfŠfP [fVf‡f“,ĪfVf%ofCf}  
fŠ EfTfEf“fh Efobftf@,Ō,Ī ‘,«,±,ÝfAfNfZfX,đ—L,μ,Ā,ç  
,é BfZfJf“f fŠ EfTfEf“fh Efobftf@,Ī Ā ¶,Īê Ø,Ā,«,È,ç B

fobftf@,đ Ā ¶,·,é’O,É A,±,Īf f\fbfh,đĈĀ,Ñ o,μ,ĀĪ’²fĈfxf<,đ Ý’è,μ,Ā,“±,Ā,Ī•K {,Ā, ,é B „ §,ĪĪ’²fĈfxf  
<,ĪDSSCL\_NORMAL,Ā, ,é B¼,Ī—D æfĈfxf<,Ī•K—v,É%ž,¶,ĀŽg—p,·,é B Ū ×,É,Ā,ç  
,Ā,Ī AĪ’²fĈfxf<,đŽQ Ā,·,é,±,Ā B

ŽQ Ā @IDirectSound, **IDirectSound::Compact**, **IDirectSoundBuffer::GetFormat**, **IDirectSoundBuffer::GetVolume**,  
**IDirectSoundBuffer::Lock**, **IDirectSoundBuffer::Play**, **IDirectSoundBuffer::Restore**, **IDirectSoundBuffer::SetFormat**

## **IDirectSound::SetSpeakerConfig**

HRESULT SetSpeakerConfig(DWORD dwSpeakerConfig);

DirectSoundIfuFWfFfNfg, ðXfs [fJ Ý'è, ðŽw'è, ·, é B

-E÷, ·, ê, ÎDS\_OK AŽ, ”s, ·, ê, ÎŽŸ, ðGf%o [fR [fh, ð•Ô, · B

**DSERR\_INVALIDPARAM**

**DSERR\_UNINITIALIZED**

*dwSpeakerConfig*

DirectSoundIfuFWfFfNfg, ðXfs [fJ Ý'è B`È%o, ðl, ðŽw'è, Å, «, é B

DSSPEAKER\_HEADPHONE

fXfs [fJ, ðfwfbfhfzf“, É, È, é B

DSSPEAKER\_MONO

fXfs [fJ, ðf, fmf%of“, É, È, é B

DSSPEAKER\_QUAD

fXfs [fJ, ð4f`fff“flf“, É, È, é B

DSSPEAKER\_STEREO

fXfs [fJ, ðXfefEfl, É, È, é(fftfHf<fg'l) B

DSSPEAKER\_SURROUND

fXfs [fJ, ðTf%ofEf“fh EtfEf“fh, É, È, é B

ŽQ Æ @*IDirectSound*, **IDirectSound::GetSpeakerConfig**

## IDirectSound3DBuffer

*fŠfXfi* [,l3D<ôšÔ,É,;,éÊ'u A•ûEü AfTfEf“fh Efobftf@ŠÂ««,ð^,·fpf%of [f^,İžæ“¾,;,æ,Ñ Ý’è,ð s,□  
,½,ß,É,Í **IDirectSound3DBuffer**fCf“f^ [ftFfCfX,İf f\fbfh,ðžg—p,·,é B,±,İ ß,Í,±  
,İfCf“f^ [ftFfCfX,İf f\fbfh,İfŠftf@fEf“fX,Ä, ,é BŠT”O,É,Ä,ç,Ä,İŠT—v,Í A  
*IDirectSound3DBuffer*fCf“f^ [ftFfCfX,ðžQ Æ,·,é,±,Æ B

**IDirectSound3DBuffer** fCf“f^ [ftFfCfX,İf f\fbfh,İžŸ,İfOf< [fv,Ä \ -³,é,Ä,ç,é

fobf`fpf%of [f^

[GetAllParameters](#)

‘€ ì

[SetAllParameters](#)

←—£

[GetMaxDistance](#)

[GetMinDistance](#)

[SetMaxDistance](#)

[SetMinDistance](#)

‘€ ìf, [fh

[GetMode](#)

[SetMode](#)

Ê’u

[GetPosition](#)

[SetPosition](#)

fTfEf“fh Efvf fWfFfNfvf#f“

[GetConeAngles](#)

fR [f“

[GetConeOrientation](#)

[GetConeOutsideVolume](#)

[SetConeAngles](#)

[SetConeOrientation](#)

[SetConeOutsideVolume](#)

←“x

[GetVelocity](#)

[SetVelocity](#)

,·,x,Ä,İCOMfCf“f^ [ftFfCfX,Æ“—1 A**IDirectSound3DBuffer** fCf“f^ [ftFfCfX,Í  
*IUnknown*fCf“f^ [ftFfCfX Ef f\fbfh,ðEp ³,µ,Ä,ç,é B**IUnknown**fCf“f^ [ftFfCfX,İžŸ,İ,R,Ä,İf f\fbfh,ðfTf|  
[fg,µ,Ä,ç,é B

[AddRef](#)

[QueryInterface](#)

[Release](#)

**IDirectSound3DBuffer::GetAllParameters**

HRESULT GetAllParameters(LPDS3DBUFFER lpDs3dBuffer);

Žw'è,µ,½Žž“\_„Ä,ÍfTfEf“fhfobftf@,ì3D“Á «,É,Ä,ç,Ä,ì î•ñ,ðŽæ“¾,·,é B

-E÷,·,ê,ÎDS\_OK AŽ,”s,·,ê,ÎDSERR\_INVALIDPARAMfGf%o [fR [fh,ð•Ô,· B

lpDs3dBuffer

DS3DBUFFER \ç'ì,Ö,ìf|fCf“f^ B,±,ì \ç'ì,ÍfTfEf“fh Efobftf@,ì3D“Á «,É,Ä,ç,Ä,ì î•ñ,ðŽ ,Á,Ä,ç,é B

### **IDirectSound3DBuffer::GetConeAngles**

```
HRESULT GetConeAngles(  
    LPDWORD lpdwInsideConeAngle, LPDWORD lpdwOutsideConeAngle);  
  
fTfEf“fh Efofbftf@,ÏfTfEf“fh Efvf fWfFfNfVf‡f“ EfR [f“,ì“à•”Šp,ÆŠO•”Šp,ðŽæ“¼,.,é B  
    -Æ÷,.,ê,ÏDS_OK AŽ,”s,.,ê,ÏDSERR_INVALIDPARAM fGf%o [fR [fh,ð•Ô,· B  
  
lpdwInsideConeAngle ;,æ,Ñ lpdwOutsideConeAngle  
    fTfEf“fh Efvf fWfFfNfVf‡f“ EfR [f“,ì“à•”Šp,ÆŠO•”Šp,ðŽ!,·Ï ”,Ö,Ïf|fCf“f^ B
```

**IDirectSound3DBuffer::GetConeOrientation**

HRESULT GetConeOrientation(LP3DVECTOR lpvOrientation);

fTfEf“fh Efofbftf@,İfTfEf“fh Efvf fWfFfNfVf‡f“ EfR [f“İ•ûEü,đŽæ“¾,·,é B  
-E÷,·,ê,İDS\_OK AŽ,”s,·,ê,İDSERR\_INVALIDPARAMfGf%o [fR [fh,đ•Ô,· B

lpvOrientation

**D3DVECTOR** \‘c‘İ,Ö,İf|fCf“f^ B,±  
,İ \‘c‘İ,İfTfEf“fh Efvf fWfFfNfVf‡f“ EfR [f“,İE» Ý,İ•ûEü,đŽ,µ,Ä,ç  
,é BfxfNfgf< îñ,İfTfEf“fh EfR [f“,İ† S,đ•\,· B

f f\fbfh,İfR [f“Šp“x,ÆfR [f“f{fŠf... [f€,İ—v‘f,à Ý’è,³,ê,Ä,ç,È,ç,ÆEø%Ê,ª,È,ç 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,;,̄,éE» Ý,ÌfR [f“ŠO”f{fŠf... [f€,đŽæ“¾,.,é B  
-E÷,.,ê,ÎDS\_OK AŽ,”s,.,ê,ÎDSERR\_INVALIDPARAM fGf%o [fR [fh,đ•Ô,· B

lplConeOutsideVolume  
fofbftf@,ÌE» Ý,ÌfR [f“ŠO”f{fŠf... [f€,đŽ!,•İ ”,Ö,Ìf|fCf“f^ B

f{fŠf... [f€ EfEfxf<,ÍE, Š,đ•\,· B<—e”ÍÍ,Í0(E, Š,È,µ),©,ç-10,000(-³%o¹),Û,À,À, ,é B‘ · ,ÍE» Ý,ÌDirectSoun  
d,À,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 Æ,.,é,±,Æ B  
ŽQ Æ @IDirectSoundBuffer::SetVolume

**IDirectSound3DBuffer::GetMaxDistance**

HRESULT GetMaxDistance(LPD3DVALUE lpflMaxDistance);

ffTfEf“fh Efofbftf@,ìE» Ý,ì Á'·<—É,ðŽæ“¾,·,é B

-E÷,·,ê,îDS\_OK AŽ,”s,·,ê,îDSERR\_INVALIDPARAM fGf%o [fR [fh,ð•Ô,· B

lpflMaxDistance

E» Ý,ì Á'·<—É Ý'è,ðŽ!,·,ï ”,Ö,ìf|fCf“f^ B

ffftfHf<fg,Á,Í Á'·<—É'l,Í-³EÀ,É,È,Á,Ä,ç,é B Á'Z<—É,Æ Á'·<—É,É,Â,ç,Ä,ì Ú × î•ñ,Í A\_Á'Z<—  
É'l,Æ Á'·<—É'l,ðŽQ Æ,·,é,±,Æ B

ŽQ Æ @IDirectSound3DBuffer::GetMinDistance, IDirectSound3DBuffer::SetMaxDistance

**IDirectSound3DBuffer::GetMinDistance**

HRESULT GetMinDistance(LPD3DVALUE lpflMinDistance);

fftfHf<fg,Á,Í Á'Z<—£'l,Í1.0,É,È,Á,Ä,ç,é B,±,ê,ÍfftfHf<fg,ì<—£'l,ì'P^Ê,Éf [fgf< Ý'è,³,ê,Ä,ç

-Ç÷,·,ê,ÎDS\_OK AŽ,„s,·,ê,ÎDSERR\_INVALIDPARAMfGf%o [fR [fh,ð•Ô,· B

lpflMinDistance

Ç» Ý,Ì Á'Z<—£ Ý'è,ðŽ!,·İ ”,Ö,Ìf|fCf“f^ B

fftfHf<fg,Á,Í Á'Z<—£'l,Í1.0,É,È,Á,Ä,ç,é B,±,ê,ÍfftfHf<fg,ì<—£'l,ì'P^Ê,Éf [fgf< Ý'è,³,ê,Ä,ç  
,é ê ±,Í1.0f [fgf<,Æ,ç,±,±,Æ,Ä, ,é B Á'Z<—£,Æ Á'·<—£,É,Ä,ç,Ä,Ì Ú × îñ,Í A\_Á'Z<—  
£'l,Æ Á'·<—£'l,ðŽQ Æ,·,é,±,Æ B

ŽQ Æ @IDirectSound3DBuffer::SetMinDistance, IDirectSound3DBuffer::GetMaxDistance

### IDirectSound3DBuffer::GetMode

HRESULT GetMode(LPDWORD lpdwMode);

3DfTfEf“fh ^— ,ì€» Ý,ì€ ìf, [fh,ðžæ“¾,·,é B

-€÷,·,ê,îDS\_OK Až,„s,·,ê,îDSERR\_INVALIDPARAMfGf%o [fR [fh,ð•Ô,· B

lpdwMode

€» Ý,ì€ ìf, [fh,ðž|,·,ï ”,Ö,ìf|fCf“f^ BžÝ,ì'l,Á•Ô,é B

DS3DMODE\_DISABLE

3DfTfEf“fh ^— ,ì-

³€ø,É,È,é BfTfEf“fh,ÍfŠfXfi [,ì“a,ì† S,©,ç•,±,!,é,æ,¤,ÉŠ´,¶,é B

DS3DMODE\_HEADRELATIVE

fTfEf“fhpf%of [f^(Ê'u A'¬“x A•û(Eü)

,ÍfŠfXfi [,ìfpf%of [f^,Æ'Š'îŠÖEW,É, ,é B,±

,ìf, [fh,Á,Í AfTfEf“fh,ì â'îfpf%of [f^,ÍfŠfXfi [ Efpf%of [

f^,ª•İ X,³,ê,½,Æ,«,Éž©“@“I,É X V,³,ê,é,ì,Á A'Š'îfpf%of [f^,É,Í  
•İ%o»,Í,È,ç,Û,Û,Á, ,é B

DS3DMODE\_NORMAL

•W €,ì ^— B,±,ê,ªffftfHf<fgf, [fh,É,È,Á,Ä,ç,é B

**IDirectSound3DBuffer::GetPosition**

HRESULT GetPosition(LPD3DVECTOR lpvPosition);

ftfEf“fh Efofbftf@,ìE» Ý,îÊ’u,ð<—£’P^Ê,ÅŽæ“¾,·,é BfftfHf<fg,Å,Í<—  
£’P^Ê,Íf [fgf<,¾,a A’P^Ê,ìî X,í**IDirectSound3DListener::SetDistanceFactor** f\fbfh,ðŽg—p,µ,Ä s,!,é B  
-E÷,·,ê,îDS\_OK AŽ,”s,·,ê,î**DSERR\_INVALIDPARAM**fGf%o [fR [fh,ð•Ô,· B

lpvPosition

**D3DVECTOR** \c’ì,Ö,ìf|fCf“f^ B,±,ì \c’ì,ÍfTfEf“fh Efofbftf@’t,ìfJfEf“fg E|fWfVf±f“,ðŽ!,µ,Ä,c,é B

**IDirectSound3DBuffer::GetVelocity**

HRESULT GetVelocity(LPD3DVECTOR lpvVelocity);

ftfEf“fh Efofbftf@,ìE» Ý,ì“x,đŽæ“%4,·,é B

–E÷,·,ê,îDS\_OK AŽ,”s,·,ê,îDSERR\_INVALIDPARAM fGf% [fR [fh,đ•Ô,· B

lpvVelocity

**D3DVECTOR** \‘c‘ì,Ö,ìf|fCf“f^ B,±,ì \‘c‘ì,ÍftfEf“fh Efofbftf@,ìE» Ý,ì“x,đŽ,μ,Ä,č,é B

‘–“x,Ífhfbfvf% [Eø%Ê,À,ì,ÝŽg—p,³,ê,é BŽÀ Û,Éfofbftf@,đ~Ú“®,·,é,±,Æ,Í,È,č B Ú ×,ÍÊ‘u,Æ‘–“x,đŽQ Æ,·,é,±,Æ B

ŽQ Æ @**IDirectSound3DBuffer::SetPosition, IDirectSound3DBuffer::SetVelocity**

**IDirectSound3DBuffer::SetAllParameters**

HRESULT SetAllParameters(  
LPDS3DBUFFER lpDs3dBuffer, DWORD dwApply);

ftTfEf“fh Efofbftf@,ì,é ušŌ,ì ó‘Ô,ì,·,×,Ä,ðŽ!,μ,Ä,¢,éDS3DBUFFER \‘¢‘ì,©,ç—  
^,!,ç,ê,½ A,·,×,Ä,ì3DfTfEf“fh Efofbftf@ Efpf%of [f^,ð Ý’è,·,é B

-Æ±,·,é,ÎDS\_OK AŽ,”s,·,é,ÎDSERR\_INVALIDPARAMfGf%o [fR [fh,ð•Ô,· B

lpDs3dBuffer

DS3DBUFFER \‘¢‘ì,Ö,ìf|fCf“f^ B,±,ì \‘¢‘ì,ìfTfEf“fh Efofbftf@,ì3D“Á «,ðŽ!,μ,Ä,¢,é B

dwApply

Ý’è,ìf^fCf~f“fO,ðŽ!,·l BŽŸ,ìl,ÄŽ!,³,ê,é B

DS3D\_DEFERRED fAfvfŠfP [fVf±f“,“IDirectSound3DListener::CommitD  
eferredSettingsf f\fbfh,ðÆÄ,Ñ o,·,Û,Ä Ý’è,ì s,ì,ê,È  
,¢ B•j ”,ì Ý’è,ð•ì X,μ,½,è A’P“Æ,ì ÄÆvŽŽ,ðŽÄ s  
,·,é,±,Æ,“%oÄ”\ B

DS3D\_IMMEDIATE Ý’è,ì‘Žž,É s,ì,ê AfVfXfef€  
,ì,·,×,Ä,ì3DfTfEf“fh Efofbftf@,É‘ì,·,é3D À•w,ì Ä  
ÆvŽŽ,ð s,± B

**IDirectSound3DBuffer::SetConeAngles**

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

fTfEf“fh Efofbftf@,İfTfEf“fh Efvf fWfFfNfVf‡f“ EfR [f“,İ“à”Šp,ÆŠO”Šp,đ Ý’è,·,é B  
-Æ±,·,ê,İDS\_OK AŽ,”s,·,ê,İDSERR\_INVALIDPARAMfGf%o [fR [fh,đ•Ô,· B

dwInsideConeAngle,·,æ,Ñ dwOutsideConeAngle  
fTfEf“fh Efvf fWfFfNfVf‡f“ EfR [f“,İ“à”Šp,ÆŠO”Šp B

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

DS3D\_DEFERRED fAfvfŠfP [fVf‡f“,<sup>a</sup>**IDirectSound3DListener::Commi**  
**tDeferredSettings**f f\fbfh,đCEĂ,Ñ o,·,Û,Ă Ý’è,Í s,í  
,ê,È,¢ B·j ”,İ Ý’è,đ•İ X,μ,½,è A’P“Æ,İ ĀÆvŽŽ,đ  
ŽĂ s,·,é,±,Æ,%oĂ”\ B

DS3D\_IMMEDIATE Ý’è,Í;ŽŽ,É s,í,ê AfVfXfef€  
,Í,·,×,Ă,İ3DfTfEf“fh Efofbftf@,É.Í,·,é3D Ā•W,İ  
ĀÆvŽŽ,đ s,± B

Šp“x,İ”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•ûCEü,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,è,Ä,ç,È,ç,ÆCEø%oÊ,““¾,ç,è,È,ç B  
-CE±,·,è,İDS\_OK AŽ,”s,·,è,İDSERR\_INVALIDPARAM fGf%o [fR [fh,đ•Ô,· B

x, y, , ;æ,Ñ z  
D3DVALUE,İf^fCfv,đŽ!,·l B,±,è,İ V<K,İfTfEf“fh EfR [f“,İ•ûCEüfxfNfgf<,İ À•W,đ•\,· B

dwApply  
Ý’è,ª s,í,è,éf^fCf~f“fO,đŽ!,·l B^È%o,İl,ÄŽ!,³,è,é B

DS3D\_DEFERRED fAfVfŠfP [fVf±f“,ª**IDirectSound3DListener::Commi**  
**tDeferredSettings**f f\fbfh,ðCEÄ,Ñ o,·,Û,Ä Ý’è,İ s,í  
,è,È,ç B•j ”,İ Ý’è,đ•İ X,µ,½,è A’P“Æ,İ ÄCEvŽZ,đ  
ŽÄ s,·,é,±,Æ,“%oÄ”\ B

DS3D\_IMMEDIATE Ý’è,İ!ŽŽ,É s,í,è AfVfXfef€  
,İ,·,×,Ä,İ3DfTfEf“fh Efofbftf@,É.İ,·,é3D À•W,İ  
ÄCEvŽZ,đ s,ª B

**IDirectSound3DBuffer::GetConeOrientation** f f\fbfh,İ  
lpvOrientationfpf%of [f^“à,İfxfNfgf< î•ñ,İ AfTfEf“fh EfR [f“,İ+ S,đ•\,µ,Ä,ç,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@,ÍE» Ý,ÌfR [f“ŠO•”f{fŠf... [f€„đ Ý’è,·,é B  
-CE÷,·,ê,ÎDS\_OK AŽ,”s,·,ê,ÎDSERR\_INVALIDPARAMfGf%o [fR [fh,đ•Ô,· B

*lConeOutsideVolume*

fTfEf“fh Efofbftf@,ÌfR [f“ŠO•”f{fŠf... [f€  
„đ100ffVfxf< idB j,Ì”ÍÍ,ĂŽw’è,·,é B”F’è%oÂ”\”ÍÍ,Í0(CE, Š,È,µ),©,ç-10,000(-3%o¹),Û,Ă,Ă, ,é B

*dwApply*

Ý’è,<sup>a</sup> s,í,ê,éf^fCf~f“fO,đŽ!,·¹ B^È%o°,ì¹,ĂŽ!,³,é,é B

**DS3D\_DEFERRED** fAfvfŠfP [fVf‡f“,**IDirectSound3DListener::CommitD  
eferredSettings**f f\fbfh,ðCEĂ,Ñ o,·,Û,Ă Ý’è,Í s,í,ê,È  
,ç B•j ”,Ì Ý’è,đ•Í X,µ,½,è A’P“Æ,Ì ĂCEvŽZ,đŽĂ s  
,·,é,±,Æ,%oÂ”\ B

**DS3D\_IMMEDIATE** Ý’è,Í‘Žž,É s,í,ê AfVfXfef€  
,Í,·,×,Ă,Ì3DfTfEf“fh Efofbftf@,ÉÍ,·,é3D À•W,ì Ă  
CEvŽZ,đ s,± B

f{fŠf... [f€ EfCEfxf<,ÍE, Š,đ•\,· B’ • ,ÍDirectSound,Ă,ÍE» ÝfTf| [fg,³,ê,Ă,ç,È,ç B

fR [f“ŠO•”f{fŠf... [f€,ÌŠT”O,É,Ă,ç,Ă,Ì Ú ×,Í AfTfEf“fh Efvf fWfFfNfVf‡f“ Efr [f“,đŽQ Æ,·,é,±,Æ B

ŽQ Æ @**IDirectSoundBuffer::SetVolume**

**IDirectSound3DBuffer::SetMaxDistance**

HRESULT SetMaxDistance(  
D3DVALUE flMaxDistance, DWORD dwApply);

» Ý, Ì Á'·<—É'1, ð Ý'è, ·, é B  
-CE±, ·, ê, ÎDS\_OK AŽ, ”s, ·, ê, ÎDSERR\_INVALIDPARAM fGf%o [fR [fh, ð·Ô, · B

flMaxDistance  
V, µ, Ç Á'·<—É'1 B

dwApply  
Ý'è, · s, í, ê, éf^fCf~f“fO, ðŽ, ·, 1 B^È%°, Ì'1, ÁŽ, 3, é, é B

**DS3D\_DEFERRED** fAfvfŠfP [fVf±f“, **IDirectSound3DListener::CommitD  
eferredSettings** f\fbfh, ðCEÄ, Ñ o, ·, Ü, Ä Ý'è, Í s, í, é, È  
, Ç B·j ”, Ì Ý'è, ð·Í X, µ, ½, è A'P“Æ, Ì ÄEvŽZ, ðŽÄ s  
, ·, é, ±, Æ, “%oÄ”\ B

**DS3D\_IMMEDIATE** Ý'è, Í'Žž, É s, í, é AfVfXfefÉ  
, Í, ·, ×, Ä, Ì3DfTfEf“fh Efofbftf@, É'Í, ·, é3D Ä·W, Ì Ä  
CEvŽZ, ð s, µ B

ffftfHf<fg, Ä, Í Á'·<—É'1, Í-³CEÄ, É, È, Ä, Ä, Ç, é B Á'Z<—É, Æ Á'·<—É, É, Ä, Ç, Ä, Ì Ú × îñ, Í A\_Á'Z<—  
É'1, Æ Á'·<—É'1, ðŽQ Æ, ·, é, ±, Æ B

ŽQ Æ @**IDirectSound3DBuffer::GetMaxDistance**, **IDirectSound3DBuffer::SetMinDistance**

**IDirectSound3DBuffer::SetMinDistance**

HRESULT SetMinDistance(  
D3DVALUE flMinDistance, DWORD dwApply);

» Ý,ì Á'Z<—É'l,ð Ý'è,;é B

-É÷,;é,îDS\_OK AŽ,"s,;é,îDSERR\_INVALIDPARAMfGf%o [fR [fh,ð•Ó,· B

flMinDistance

V,µ,¢ Á'Z<—É'l B

dwApply

Ý'è,ª s,í,ê,éf^fCf~f"fo,ðŽ!,·l B^È%º,ì'l,ÁŽ!,ª,é,é B

**DS3D\_DEFERRED** fAfvfŠfP [fVf‡f“,ª**IDirectSound3DListener::CommitD  
eferredSettings**f f\fbfh,ðCEÄ,Ñ o,;Ü,Ä Ý'è,Í s,í,ê,È  
,¢ B•j ”,Ì Ý'è,ð•Í X,µ,½,è A'P“Æ,ì ÄEvŽZ,ðŽÄ s  
,;é,±,Æ,ª%oÂ”\ B

**DS3D\_IMMEDIATE** Ý'è,Í;Žž,É s,í,ê AfVfXfef€  
,Í,;x,Ä,ì3DfTfEf“fh Efofbftf@,É'î,;é3D Ä•W,ì Ä  
EvŽZ,ð s,ª B

ffftHf<fg,Á,Í Á'Z<—É'l,í1.0(ffftfHf<fg,ì<—É'l'P^Ê,Íf [fgf<,È,ì,Ä A1.0f [fgf<,ð°Ó-j,;é),É,È,Á,Ä,¢  
,é B Á'Z<—É,Æ Á'·<—É,É,Ä,¢,Ä,ì Ú × îñ,Í A Á'Z<—É'l,Æ Á'·<—É'l,ðŽQ Æ,;é,±,Æ B

ŽQ Æ @**IDirectSound3DBuffer::SetMaxDistance**

## IDirectSound3DBuffer::SetMode

```
HRESULT SetMode(
    DWORD dwMode, DWORD dwApply);

3DfTfEf“fh ^— ,É‘Í,·,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,ĂŽ‘,3,ê,é B
DS3DMODE_DISABLE
3DfTfEf“fh ^— ,Í-3Œø BfTfEf“fh,ÍfŠfXfi [,ì“a,ì† S,©,ç•,±
,!,é,æ,α,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,Ă,Í AfTfEf“fh,Î â‘Îfpf%of [f^,ÍfŠfXfi [ Efpf%of [
f^,“İ X,3,ê,½,Æ,«,ÉŽ©“®“I,É X V,3,ê,é,ì,Ă A‘Š‘Îfpf%of [f^,Í‘İ
,í,ç,È,ç,Û,Ů,Ă, ,é B
DS3DMODE_NORMAL
•W €,ì ^— B,±,ê,“ffftfHf<fg Ef, [fh,É,È,Ă,Ă,ç,é B

dwApply
Ý’è,“ s,í,ê,éf^fCf~f“fO,ðŽ‘,·‘l B^È%o,ì‘l,ĂŽ‘,3,ê,é B
DS3D_DEFERRED fAfvfŠfP [fVfžf“,“IDirectSound3DListener::CommitDef
erredSettingsf f\fbfh,ðŒĂ,Ň o,·,Û,Ă Ý’è,Í s,í,ê,È,ç
B•; ”,ì Ý’è,ð•İ X,μ,½,è A‘P“Æ,ì ĂŒvŽZ,ðŽĂ s,·,é,±
,Æ,“%oĂ”\ B
DS3D_IMMEDIATE Ý’è,Í‘Žž,É s,í,ê AfVfXfef€
,Í,·,×,Ă,ì3DfTfEf“fh Efofbftf@,É‘Í,·,é3D Ă•W,ì ĂŒ
vŽZ,ð s,α B
```

### IDirectSound3DBuffer::SetPosition

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

*fTfEf“fh Efofbftf@,ìE» Ý,ìÊ‘u,ð<—£’P^Ê,Á Ý’è,·,é BffftfHf<fg,ì<—  
£’P^Ê,Íf [fgf<,¾,ª AIDirectSound3DListener::SetDistanceFactor methodf f\fbfh,ðŽg—p,µ,Ä’P^Ê,ì•ĩ X,à s,!,é B  
-CE±,·,ê,îDS\_OK AŽ,”s,·,ê,îDSERR\_INVALIDPARAMfGf%o [fR [fh,ð•Ô,· B*

*x, y, , ;æ,Ñ z  
D3DVALUE,ìf^fCfv,ðŽ!,·! B,±,ê,Í V,µ,¢^Ê‘ufxfNfgf<,ì À•W,ð•\,· B*

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

**DS3D\_DEFERRED** *fAfvfŠfP [fVfšf“,ªIDirectSound3DListener::CommitD  
eferredSettings  
f f\fbfh,ðCEÄ,Ñ o,·;Ü,Á Ý’è,Í s,ì,ê,È,¢ B•j ”,ì Ý  
’è,ð•ĩ X,µ,½,è A’P“Æ,ì ÄEvŽZ,ðŽÄ s,·,é,±  
,Æ,ª%oÄ”\ B*

**DS3D\_IMMEDIATE** *Ý’è,Í‘Žž,É s,ì,ê AfVfXfef€  
,Í,·,×,Ä,ì3DfTfEf“fh Efofbftf@,É‘Í,·,é3D À•W,ì Ä  
CEvŽZ,ð s,ª B*

**IDirectSound3DBuffer::SetVelocity**

HRESULT SetVelocity(D3DVALUE x,  
D3DVALUE y, D3DVALUE z, DWORD dwApply);

fTfEf“fh Efofbftf@,ìE» Ý,ì“x,đ Ý’è,·,é B

-CE÷,·,ê,ÎDS\_OK AŽ,”s,·,ê,ÎDSERR\_INVALIDPARAMfGf%o [fR [fh,đ•Ô,· B

x, y, ·,·,æ,Ñ z

D3DVALUE,ìf^fCfv,đŽ!,·l B,±,ê,Í V,μ,¢“xfxfNfgf<,ì À•W,đ•\,· B

dwApply

Ý’è,ª s,í,ê,éf^fCf~f“fO,đŽ!,·l B^È%°,ìl,ÁŽ!,³,ê,é B

**DS3D\_DEFERRED** fAfvfŠfP [fVf±f“,ª**IDirectSound3DListener::CommitD  
eferredSettings**f f\fbfh,đCEÄ,Ñ o,·,Ü,Ä Ý’è,Í s,í,ê,È  
,¢ B•j ”,ì Ý’è,đ•Í X,μ,½,è A’P“Æ,ì ÄCEvŽZ,đŽÄ s  
,·,é,±,Æ,ª%oÄ”\ B

**DS3D\_IMMEDIATE** Ý’è,Í‘žž,É s,í,ê AfVfXfef€  
,Í,·,×,Ä,ì3DfTfEf“fh Efofbftf@,É‘Í,·,é3D À•W,ì Ä  
CEvŽZ,đ s,ª B

“x,Ífhfbfvf%o [CEø%oÊ,Ä,ì,ÝŽg—p,³,ê,é BŽÀ Û,Éfofbftf@,đ~Ú“®,·,é,±  
,Æ,Í,È,¢ B Û ×,Í^Ê’u,Æ“x,đŽQ Æ,·,é,±,Æ B

ŽQ Æ @**IDirectSound3DBuffer::SetPosition, IDirectSound3DBuffer::GetVelocity**

## IDirectSound3DListener

*fŠfXfi* [,l3D<đšŌ,É,“,ēÊ’u A•ûEü AfšfXfj“fOšĀ<<,đ•\,·fpf%of [f^,ìŽæ“%4,“,æ,Ñ Ý’è,đ s,α,É,Í  
**IDirectSound3DListener***fCf“f^ [ftfFfCfX,ìf f\fbfh,đŽg—p,·,é B,±,ì B,Í,±*  
*,ìfCf“f^ [ftfFfCfX Ef f\fbfh,ìfŠftf@fCf“fX,Ā, ,é BŠT”O,É,Ā,č,Ā,ìŠT—*  
*v,Í AIDirectSound3DListenerfCf“f^ [ftfFfCfX,đŽQ ĀE,·,é,±,Ā B*

**IDirectSound3DListener** *fCf“f^ [ftfFfCfX,ìf f\fbfh,ìÊ%°,ìOf< [fv,Ā \ ¬,³,ê,Ā,č,é*

*f ofbf`fpf%of [f^€ ì*

[GetAllParameters](#)

[SetAllParameters](#)

*~,!’,u,« Ý’è*

[CommitDeferredSettings](#)

*←—£—v’f*

[GetDistanceFactor](#)

[SetDistanceFactor](#)

*fhfbfvf%o [—v’f*

[GetDopplerFactor](#)

[SetDopplerFactor](#)

*•ûEü*

[GetOrientation](#)

[SetOrientation](#)

*^Ê’u*

[GetPosition](#)

[SetPosition](#)

*f [f<f|ft—v’f*

[GetRolloffFactor](#)

[SetRolloffFactor](#)

*‘—“x*

[GetVelocity](#)

[SetVelocity](#)

*,·,×,Ā,ìCOMfCf“f^ [ftfFfCfX,Ā“—l AIDirectSound3DBuffer fCf“f^ [ftfFfCfX,Í*  
*IUunknownfCf“f^ [ftfFfCfXf f\fbfh,đCp ³,μ,Ā,č,é BIUunknownfCf“f^ [ftfFfCfX,ìÊ%°,ì,R,Ā,ìf f\fbfh,đfTf|*  
*[fg,μ,Ā,č,é B*

[AddRef](#)

[QueryInterface](#)

[Release](#)

## IDirectSound3DListener::CommitDeferredSettings

```
HRESULT CommitDeferredSettings();
```

'O%ñ,ì,±,ìf f\fbfh,ìĀ,Ñ o,μ^ÈĀ,É ì ¬,³,ê,½ ~,|u,« Ý'è,ðfRf~fbfg,·,é B

-Ē÷,·,ê,ĤDS\_OK AŽ,„s,·,ê,ĤSERR\_INVALIDPARAMfGf%o [fR [fh,ð•Ô,· B

À'â,ì"¬,Á ~,|u,« Ý'è,ðŽg—p,·,é•û-@,É,Ā,ĉ,Ā,Ì Ú ×,Í ~,|u,« Ý'è,ðŽQ Æ,·,é,±,Æ B

**IDirectSound3DListener::GetAllParameters**

HRESULT GetAllParameters(LPDS3DLISTENER lpListener);

3Df [f<fh,;,æ,Ñ3DfŠfXfi [,]È» Ý,Ì ó‘Ô,ð·\,· î•ñ,ðŽæ“¾,·,é B  
-È÷,·,ê,ÎDS\_OK AŽ,”s,·,ê,ÎDSERR\_INVALIDPARAMfGf%o [fR [fh,ð·Ô,· B

*lpListener*

**DS3DLISTENER** \‘c‘ì,Ö,ìf|fCf“f^ B,±,ì \‘c‘ì,Í3Df [f<fh,;,æ,Ñ3DfŠfXfi [,]È» Ý,Ì ó‘Ô,ðŽ!,· B  
ŽQ Æ @IDirectSound3DListener::SetAllParameters

**IDirectSound3DListener::GetDistanceFactor**

HRESULT GetDistanceFactor(LPD3DVALUE lpflDistanceFactor);

«» Ý, Ì«—É—v'f, ðŽæ“¾, ·, é B

—É÷, ·, ê, ÎDS\_OK AŽ, ”s, ·, ê, ÎDSERR\_INVALIDPARAM fGf%o [fR [fh, ð•Ô, · B

lpflDistanceFactor

D3DVALUE f^fCfv, Ì•ï ”, Ö, Ì|fCf“f^ B, ±, ê, Í«» Ý, Ì«—É—v'f, Ì'1, ³Ž', ³, é, é B

«—É—v'f, É, Â, ç, Ä, Ì Ú ×, Í A«—É—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•ï ”, Ö, ìf|fCf“f^ B, ±, ê, ÍE» Ýfhfbfvf% [-v’f, ì’l, aŽ’, 3, ê, é B

fhfbfvf% [-v’f, ì”Í, Í0(fhfbfvf% [-v’f, È, µ), ©, ç10.0(ŽÀ Û, ì ĆŠE, ì10”{, ìfhfbfvf% [-v’f), Ä, , é

BfìftfHf<fg’l, ÎDS3D\_DEFAULTDOPPLERFACTOR(1.0), Ä, , é Bfhfbfvf% [-v’f, É, Ä, Ć  
, Ä, Ì Ú ×, Í Afhfbfvf% [-v’f, ðŽQ Æ, , é, ±, Æ B

ŽQ Æ @IDirectSound3DListener::SetDopplerFactor

### **IDirectSound3DListener::GetOrientation**

```
HRESULT GetOrientation(  
    LPD3DVECTOR lpvOrientFront,  
    LPD3DVECTOR lpvOrientTop);
```

ŠfXfi [,lE» Ý,l•üEü,đ'O•ûfxfNfgf<,Æ ã•ûfxfNfgf<,l,Ó,½,Â,lfxfNfgf<,ÅŽæ“¾,•,é B  
-E±,•,ê,ÎDS\_OK AŽ,”s,•,ê,ÎDSERR\_INVALIDPARAM fGf%o [fR [fh,đ•Ô,• B

*lpvOrientFront*

**D3DVECTOR** \c'ì,Ö,lf|fCf“f^ BfŠfXfi [,l'O•ûfxfNfgf<,đŽ',μ,Ä,ç,é B

*lpvOrientTop*

**D3DVECTOR** \c'ì,Ö,lf|fCf“f^ BfŠfXfi [,l ã•ûfxfNfgf<,đŽ',μ,Ä,ç,é B

'O•ûfxfNfgf<,lfŠfXfi [,l•@,É^Ê'u,μ A ã•ûfxfNfgf<,lfŠfXfi [,l“ã ã,©,ç^Ê'u,•,é BffftfHf<fg,Ä,Í'O•ûfxfNfgf<,Í(0,0,1.0) A ã•ûfxfNfgf<,Í(0,1.0,0),Æ,È,Á,Ä,ç,é B

ŽQ Æ @**IDirectSound3DListener::SetOrientation**

### **IDirectSound3DListener::GetPosition**

HRESULT GetPosition(LPD3DVECTOR lpvPosition);

*fŠfXfi* [,ìE» Ý,îÊ'u,ð«—É'P^Ê,ÅŽæ“¾,·,é BfftfHf<fg,ì«—  
É'P^Ê,Íf [fgf<,¾,ª **IDirectSound3DListener::SetDistanceFactor** f\fbfh,ðŽg—p,µ,Ä«—É'P^Ê,ð•Ī X,·,é,±  
,Æ,à,Ä,«,é B

—E÷,·,é,îDS\_OK AŽ,”s,·,é,îDSERR\_INVALIDPARAM fGf%o [fR [fh,ð•Ô,· B

*lpvPosition*

**D3DVECTOR** \c'ì,Ö,îf|fCf“f^ BfŠfXfi [,ìE» 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

—E÷, ·, ê, ÎDS\_OK AŽ, ”s, ·, ê, ÎDSERR\_INVALIDPARAM fGf%o [fR [fh, ð•Ô, · B

*lpflRolloffFactor*

D3DVALUEf^fCfv, ì•ï ”, Ö, ìf|fCf“f^ B» Ý, ìf [f<fIft—v'f, ì'l, ðŽ', µ, Ä, ç, é B

fftfHf<fg'l, ÎDS3D\_DEFAULTROLLOFFFACTOR (1.0), Ä, ·, é Bf [f<fIft—v'f, É, Ä, ç, Ä, ì Ú ×, í Af [f<fIft—  
v'f, ðŽQ Æ, ·, é, ±, Æ B

ŽQ Æ @IDirectSound3DListener::SetRolloffFactor

**IDirectSound3DListener::GetVelocity**

HRESULT GetVelocity(LPD3DVECTOR lpvVelocity);

fŠfXfi [,ìĚ» Ý,ì‘-“x,đŽæ“¾,·,é B

-Ě÷,·,ê,îDS\_OK AŽ,“s,·,ê,î**DSERR\_INVALIDPARAM** fGf%o [fR [fh,đ•Ô,· B

lpvVelocity

**D3DVECTOR** \‘c‘ì,Ö,ìf|fCf“f^ B,±,ì \‘c‘ì,ÍfTfEf“fh Efofbftf@,ìĚ» Ý,ì‘-“x,đŽ,μ,Ä,č,é B

‘-“x,Ífhfbfvf%o [—v‘f,Ä,ì,ÝŽg—

p,³,ê,é BŽÀ Ů,ÉfŠfXfi [,ìÊ‘u,ìŮ“@,Í,È,č BfŠfXfi [,ìÊ‘u,đ•ï X,·,é,É,ì**IDirectSound3DListener::SetPosition**  
f f\fbfh,đŽg—p,·,é BffftfHf<fg,ì‘-“x,Í(0,0,0),Ä, ,é B

ŽQ Æ @**IDirectSound3DListener::SetVelocity**

**IDirectSound3DListener::SetAllParameters**

HRESULT SetAllParameters(  
LPDS3DLISTENER lpListener, DWORD dwApply);

**DS3DLISTENER** \^c'í,ÉŽw'è,³,ê,½,.,×,Ä,ì3DfŠfXfi [ Efpf%of [f^,ð Ý'è,.,é B,±,ì \^c'í,í, ,é uŠÔ,ìfŠfXfi [,ì ó'Ô,ð,.,×,ÄŽ',μ,Ä,ç,é B

-ÇE±,.,é,ÎDS\_OK AŽ,„s,.,é,ÎDSERR\_INVALIDPARAMfGf%o [fR [fh,ð•Ô,· B

lpListener

**DS3DBUFFER** \^c'í,Ö,ìf|fCf“f^ BCE» Ý,ì3DfŠfXfi [ Efpf%of [f^ îñ,ð,.,×,ÄŽ',μ,Ä,ç,é B

dwApply

Ý'è,^ s,í,ê,éf^fCf~f“fO,ðŽ',.l B^È%o,ì'l,ÄŽ',³,ê,é B

DS3D\_DEFERRED fAfvfŠfP [fVfšf“,^IDirectSound3DListener::CommitD  
eferredSettingsf f\fbfh,ðCEÄ,Ñ o,.,Ü,Ä Ý'è,í s,í,ê,È  
,ç B•j ”,ì Ý'è,ð•í X,μ,½,è A'P“Æ,ì ÄÇvŽŽ,ìŽÄ s  
,^%oÄ”,Ä, ,é B

DS3D\_IMMEDIATE Ý'è,í'žž,É s,í,ê AfVfXfef€  
,í,.,×,Ä,ì3DfTfEf“fh Efofbftf@,É'í,.,é3D Ä•W,ì Ä  
ÇvŽŽ,ð s,² B

ŽQ Æ @IDirectSound3DListener::GetAllParameters

**IDirectSound3DListener::SetDistanceFactor**

```
HRESULT SetDistanceFactor(
    D3DVALUE flDistanceFactor, DWORD dwApply);
```

«» Ý, Ì«—É—v'f, ð Ý'è, , é B  
-«É±, , ê, ÎDS\_OK AŽ, »s, : , ê, ÎDSERR\_INVALIDPARAMfGf%o [fR [fh, ð•Ô, : B

*flDistanceFactor*  
V, µ, ««—É—v'f B

*dwApply*  
Ý'è, ^a s, í, ê, éf^fCf~f“fO, ðŽ, , 'l B^È%°, ì'l, ÅŽ, , 3, é, 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 ”, Ì Ý'è, ð•Í X, µ, ½, è A'P“Æ, Ì ÄCEvŽZ, ðŽÄ s  
, , é, ±, Æ, ^%oÄ”\, Ä, , é B

DS3D\_IMMEDIATE      Ý'è, Í'Žž, É s, í, ê AfVfXfef€  
, Í, , ×, Ä, Ì3DfTfEf“fh Efofbftf@, É'Í, , é3D Ä•W, Ì Ä  
CEvŽZ, ð s, ± B

«—É—v'f, É, Ä, «, Ä, Ì Ú ×, Í«—É—v'f, ðŽQ Æ, , é, ±, Æ B

ŽQ Æ @IDirectSound3DListener::GetDistanceFactor

**IDirectSound3DListener::SetDopplerFactor**

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

» Ý, ìfhfbfvf%o [-v'f, Ì—v'f, ð Ý'è, ·, é B  
-CE±, ·, ê, ÎDS\_OK AŽ, ”s, ·, ê, ÎDSERR\_INVALIDPARAM fGf%o [fR [fh, ð•Ô, · B

flDopplerFactor  
V, µ, çfhfbfvf%o [-v'f, Ì'l B

dwApply  
Ý'è, ° s, í, ê, éf^fCf~f“fO, ðŽ, ·, l B^È%°, Ì'l, ÅŽ, ·, 3, ê, é B

DS3D\_DEFERRED fAfvfŠfP [fVf±f“, **IDirectSound3DListener::CommitD  
eferredSettings** f\fbfh, ðCEÄ, Ñ o, ·, Ü, Ä Ý'è, Ì s, í, ê, È  
, ç B•j ”, Ì Ý'è, ð•Ì X, µ, ½, è A'P“Æ, Ì ÄEvŽZ, ðŽÄ s  
, ·, é, ±, Æ, °%oÄ”\, Ä, ·, é B

DS3D\_IMMEDIATE Ý'è, Ì'Žž, É s, í, ê AfVfXfef€  
, Ì, ·, ×, Ä, Ì3DfTfEf“fh Efofbftf@, É'Ì, ·, é3D Ä•W, Ì Ä  
CEvŽZ, ð s, ± B

fhfbfvf%o [-v'f, Ì”Í, Í0(fhfbfvf%o [-v'f, È, µ), ©, ç10.0(ŽÄ Ü, Ì çŠE, Ì10”{, Ìfhfbfvf%o [-v'f), Ä, ·, é B  
ffftfHf<fg'l, ÎDS3D\_DEFAULTDOPPLERFACTOR (1.0), Ä, ·, é Bfhfbfvf%o [-v'f, È, Ä, ç, Ä, Ì Ú ×, Ì Afhhfbfvf%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 [,lE» Ý,Î•ûEü,ð'O•ûfxNfgf<,Æ ã•ûfxNfgf<,l,Ó,½,Â,lfxfNfgf<,ÅŽæ“¾,·,é B  
-CE÷,·,ê,ÎDS\_OK AŽ,”s,·,ê,ÎDSERR\_INVALIDPARAMfGf%o [fR [fh,ð•Ô,· B

xFront, yFront, ,”æ,Ñ zFront  
**D3DVALUE**f^fCfv,Ì'l B'O•ûfxNfgf<,l À•W,ðŽ',µ,Ä,¢,é B

xTop, yTop, ,”æ,Ñ zTop  
**D3DVALUE**f^fCfv,Ì'l B ã•ûfxNfgf<,l À•W,ðŽ',µ,Ä,¢,é B

dwApply  
Ý'è,ª s,í,ê,é f^fCf~f“fO,ðŽ',·'l B^È%º,Ì'l,ÅŽ',¾,é,é B

DS3D\_DEFERRED fAfVfŠfP [fVf†f“ªIDirectSound3DListener::CommitD  
eferredSettings

f 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,Ì ÄEvŽZ,ðŽÄ s,·,é,±  
,Æ,“%oÄ”\,Ä, ,é B

DS3D\_IMMEDIATE Ý'è,Í'Žž,É s,í,ê AfVfXfef€  
,Í,·,×,Ä,Ì3DfTfef“fh Efofbftf@,É'Í,·,é3D À•W,Ì Ä  
EvŽZ,ð s,µ B

'O•ûfxNfgf<,ÍfŠfXfi [,l•@,É^Ê'u,µ A ã•ûfxNfgf<,ÍfŠfXfi [,l“ª ã,É^Ê'u,·,é BfftfHf<fg,Ä,Í'O•ûfxNfgf<,Í(0,0,  
1.0) A ã•ûfxNfgf<,Í(0,1.0,0),Æ,È,Ä,Ä,¢,é B

ŽQ Æ @IDirectSound3DListener::GetOrientation

**IDirectSound3DListener::SetPosition**

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

fŠfXfi [,lE» Ý,İÊ'u,ð«—É'PÊ,À Ý'è,·,é BfftfHf<fg,l«—  
É'PÊ,Íf [fgf<,¾,ª **IDirectSound3DListener::SetDistanceFactor** f\fbfh,ðŽg—p,µ,Ä'PÊ,İ·İ X,à s,ı,é B  
—CE±,·,é,İDS\_OK AŽ,»s,·,é,İDSERR\_INVALIDPARAMfGf%o [fR [fh,ð•Ô,· B

x, y, z, æ, Ñ z  
**D3DVALUE**f^fCfv,İ'l BfŠfXfi [,l V<K,İÊ'ufxfNfgf<,İ À•W,ðŽ!,µ,Ä,ç,é B

dwApply  
Ý'è,ª s,ı,é,éf^fCf~f“fO,ðŽ!,·l BÊ%o,İ'l,ÄŽ!,¾,é,é B

DS3D\_DEFERRED fAfvfŠfP [fVf#f“,ª**IDirectSound3DListener::CommitD  
eferredSettings**f f\fbfh,ðCEÄ,Ñ o,·,Ü,Ä Ý'è,İ s,ı,é,È  
,ç B•j ”,İ Ý'è,ð•İ X,µ,½,è A'P“Æ,İ ÄCEvŽZ,ðŽÄ s  
,µ,½,è,Ä,«,é B

DS3D\_IMMEDIATE Ý'è,İ'Žž,É s,ı,é AfVfXfef€  
,İ,·,x,Ä,İ3DfTfEf“fh Efofbftf@,É'İ,·,é3D À•W,ð Ä  
CEvŽZ,·,é B

ŽQ Æ **@IDirectSound3DListener::GetPosition**

### **IDirectSound3DListener::SetRolloffFactor**

HRESULT SetRolloffFactor(  
D3DVALUE flRolloffFactor, DWORD dwApply);

f [f<fIft—v'f,đ Y'è,·,é B  
-Æ÷,·,ê,ÎDS\_OK AŽ,„s,·,ê,ÎDSERR\_INVALIDPARAMfGf%o [fR [fh,đ•Ô,· B

fRolloffFactor  
V<K,İf [f<fIft—v'f B

dwApply  
Y'è,ª s,í,ê,éf^fCf~f“fO,đŽ,·,l B^È%°,ì'l,ÄŽ,³,é,é B

DS3D\_DEFERRED fAfvfŠfP [fVfžf“,ª**IDirectSound3DListener::CommitD  
eferredSettings**f f\fbfh,đCEÄ,Ñ 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 ÄEvŽZ,İŽÄ s  
,“%oÄ”\,Ä, ,é B

DS3D\_IMMEDIATE Y'è,İ'žž,É s,í,ê AfVfXfef€  
,İ,·,×,Ä,İ3DfTfEf“fh Efofbftf@,É'İ,·,é3D Ä•W,İ Ä  
CEvŽZ,đ s,ª B

ffftfHf<fg'l,İDS3D\_DEFAULTROLLOFFFACTOR (1.0),Ä, ,é Bf [f<fIft—v'f,É,Ä,¢,Ä,İ Ú ×,İ Af [f<fIft—  
v'f,đŽQ ÄE,·,é,±,Æ B

ŽQ Ä @**IDirectSound3DListener::GetRolloffFactor**

**IDirectSound3DListener::SetVelocity**

HRESULT SetVelocity(D3DVALUE x,  
D3DVALUE y, D3DVALUE z, DWORD dwApply);

fŠfXfi [,l'-'x,đ Y'è,;é B

-Ĉ÷,;ê,ĪDS\_OK AŽ,;s,;ê,ĪDSERR\_INVALIDPARAM fGf%o [fR [fh,đ•Ô,· B

x, y, ;,æ,Ñ z

**D3DVALUE**f^fCfv,Īl BfŠfXfi [,l V<K,Ī'-'x,Ī À•W,đŽ',μ,Ä,Ĉ,é B

dwApply

Y'è,ª s,í,ê,éf^fCf~f"fo,đŽ',·l B^È%°,Īl,ÄŽ',ª,ê,é B

DS3D\_DEFERRED fAfvfŠfP [fVfžf",ª**IDirectSound3DListener::CommitD  
eferredSettings**  
f f\fbfh,đĈÄ,Ñ o,;Ü,Ä Y'è,Ī s,í,ê,È,Ĉ B•j ",Ī Y  
'è,đ•Ī X,μ,½,è A'P"Æ,Ī ÄĈvŽZ,ĪŽÄ s,ª%oÄ",Ä, é  
B

DS3D\_IMMEDIATE Y'è,Ī'Žž,É s,í,ê AfVfXfef€  
,Ī,·,x,Ä,Ī3DfTfEf"fh Efofbftf@,É'Ī,;é3D À•W,Ī Ä  
ĈvŽZ,đ s,ª B

'-'x,Īfhfbfvf%o [—v'f,Ä,Ī,YŽg—p,ª,é BŽÀ Ū,ÉfŠfXfi [,đ'Ū"®,;é,±  
,Æ,Ī,È,Ĉ BfŠfXfi [,Ī^Ê'u,đ•Ī X,;é,É,Ī**IDirectSound3DListener::SetPosition**f f\fbfh,đŽg—p,;é BffftfHf<fg,Ī'-'x,Ī  
(0,0,0),Ä, é B

ŽQ Æ @**IDirectSound3DListener::GetVelocity**

## IDirectSoundBuffer

DirectSoundBuffer fIfufWfFfNfg,đ ì ¬,μ,ÄŠÂ«« Ý'è,đ s,α,É,Í A

IDirectSoundBuffer fCf“f^ [ftfFfCfX,ìf f\fbfh,đŽg—p,·,é Bf f\fbfh,ÍÈ%°,ìfOf< [fv,Å \ ¬,³,è,Ä,ç,é B

îñ 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,ðEp ³,μ,Ä,ç,é B,±,ìCf“f^ [ftfFfCfX,ÍÈ%°,Ì,R,Ä,ìf f\fbfh,ðfTf|  
[fg,μ,Ä,ç,é B

AddRef

QueryInterface

Release

**IDirectSoundBuffer::GetCaps**

HRESULT GetCaps(LPDSBCAPS lpDSBufferCaps);

DirectSoundBufferIfufWfFfNfg,ì”—Í,đŽæ“¾,·,é B

-Ē÷,·,ê,ÎDS\_OK AŽ,”s,·,ê,ÎDSERR\_INVALIDPARAMfGf%o [fR [fh,ð•Ô,· B

lpDSBufferCaps

**DSBCAPS** \‘c‘ì,Ö,Ìff|Cf“f^ BfTfEf“fh Efobftf@,Ì «”\,đŽ!,μ,Ä,ĉ,é B

**DSBCAPS** \‘c‘ì,É,Í**IDirectSound::CreateSoundBuffer**f f\fbfh,Ö“n,³,ê,é**DSBUFFERDESC** \‘c‘ì,Æ“™,Ì î•ñ,É%oÁ,|, Ä X,È,é’Ç%oÁ î•ñ,ª,Ĉ,Â,©ŠÛ,Û,ê,Ä,ĉ,é B,±,Ì’Ç%oÁ î•ñ,Æ,Í Afn [fhfEfFfA Af\ftfgfEfFfA— ¼•û,Ìfobftf@,Ì ê Š,Æ AfrfXfg,Ä, ,é BfrfXfg,É,Í Afn [fhfEfFfA Efobftf@,Ö,ÌfEf“f [fh,É,©,éŽžŠ Ô,â AfVfXfef€f f,fŠ ã,É, ,éfobftf@,Ìf~fLfVf“fO,â Ä ¶Žž,Ì ^— ,ÌfI [fo [fwfbfh,È,Ç,Æ,ĉ,Ä,½,à,Ì,ª, ,é B

**DSBCAPS** \‘c‘ì,ÌdwFlagsf f“fo“à,ÄŽw’è,³,ê,½ftf%ofo,Í**DSBUFFERDESC** \‘c‘ì,ÄŽg—p,³,ê,éftf%fo,Æ“¯,¶,à,Ì,Ä, ,é B,μ,©,μ A**DSBCAPS** \‘c‘ì,ÄŽg—p,·,éftf%fo,Ì•û,Í**DSBCAPS\_LOCHARDWARE**,à,μ,Í **DSBCAPS\_LOCSOFTWARE**,Ì,Ç,¿,ç,©,ªfobftf@—pf f,fŠ,Ì ê Š,É,æ,Ä,ÄŽw’è,³,ê,é“\_,ª—B^è,Ìá,ĉ,Ä, ,é **BDSBUFFERDESC** \‘c‘ì,Ä,Í,±,ê,ç,Ìftf%fo,Í‘ð%oÄ”\,Ä, ,è AŽw’è,³,ê,Ä,ĉ ,éftf%fo,É,æ,Ä,Äfobftf@,Ì”z’u,ðfn [fhfEfFfA,Æf\ftfgfEfFfA,Ì,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,ÌE» Ý,ì Ä ¶fJ [f\<,æ,Ñ ‘,«,±,ÝfJ [f\<,ÌÊ’u,ðŽæ“¾,;é B  
-E÷,;ê,ÎDS\_OK AŽ,”s,;ê,ÌŽÿ,ÌfGf%o [fR [fh,ð•Ô,· B

**DSERR\_INVALIDPARAM**

**DSERR\_PRIOLEVELNEEDED**

lpdwCurrentPlayCursor

DirectSoundBufferIfufWfFfNfg“à,ÌfJfEf“fg EfvfEfC EflfWfVf±f“,ðŽ|,·ï ”,Ö,Ìf|fCf“f^ B,±  
,ÌÊ’u,ÌfTfEf“fh Efofbftf@“à,Ìf|ftfZfbfg,Ä, ,è AfofCfg,ÄŽw’è,¾,ê,é B

lpdwCurrentWriteCursor

DirectSoundBufferIfufWfFfNfg“à,ÌfJfEf“fg Ef%ofCfg EflfWfVf±f“,ðŽ|,·ï ”,Ö,Ìf|fCf“f^ B,±  
,ÌÊ’u,ÌfTfEf“fh Efofbftf@“à,Ìf|ftfZfbfg,Ä, ,è AfofCfg,ÄŽw’è,¾,ê,é B

‘,«,±,ÝfJ [f\<,Í Afofbftf@,Ö,Ìff [f^ ‘,«,±,Ý,^À’S,É,Ä,«,éÊ’u,ðŽ|,;é B ‘,«,±  
,ÝfJ [f\<,Í A Ä ¶fJ [f\<,æ,è’Ê í15f~fŠ•b‘Š“-ÌfI [ffBfI Eff [f^•¾,¾, æ,É, ,é B

lpdwCurrentPlayCursorpf%of [f^,ÄŽ|,¾,ê,½^Ê’u,æ,è,àEä,è,Ìff [f^,ð•ï X,·,é,Ì,Í,Ä,È,É^À’S,Ä, ,é B

ŽQ Æ @IDirectSoundBuffer; **IDirectSoundBuffer::SetCurrentPosition**

**IDirectSoundBuffer::GetFormat**

HRESULT GetFormat(LPWAVEFORMATEX lpwfxFormat,  
DWORD dwSizeAllocated, LPDWORD lpdwSizeWritten);

fobf@“à,ÌTfEf“fh Eff [f^,ÌE`Ž®,É,Â,c,Ä,Ì îñ,ðŽæ“¾,·,é B,à,µ,ÌE`Ž®,É,Â,c,Ä,Ì îñ,ÌŽæ“¾,É•K—  
v,Èfobf@ EfTfCY,ðŽæ“¾,·,é B

—E±,·,é,ÎDS\_OK AŽ,”s,·,é,ÎDSERR\_INVALIDPARAMfGf%o [fR [fh,ð•Ô,· B

lpwfxFormat

fobf@“à,ÌTfEf“fh Eff [f^,É,Â,c,Ä,Ì îñ,ðŠÛ,ðWAVEFORMATEX \‘c‘Ì,Ö,Ì|fCf“f^ BÈ`Ž®,Ì îñ,É•K—  
v,Èfobf@ EfTfCY,ðŽæ“¾,·,é ê ±,ÎNULL,ðŽw’è,·,é B

dwSizeAllocated

WAVEFORMATEX \‘c‘Ì,Ìf ofCf g’P`Ê,ÌTfCY BDirectSound,Ì|fCf“f^,Ö ‘,«,±,ð,Ì,Í,¹,¢  
,°,¢dwSizeAllocated,Ìf ofCf g ”,Ì,Ý,Â, ,é B,à,µWAVEFORMATEX \‘c‘Ì,ª,à,Á,Æ‘½,Ìf f, fŠ,ð—  
v« ,µ,½ ê ±,Í í,ç,è,Ä,µ,Û,µ B

lpdwSizeWritten

WAVEFORMATEX \‘c‘Ì,Ö ‘,«,±,Û,è,½f ofCf g ”,ðŽ!,·,Í ”,Ö,Ì|fCf“f^ B,±,Ìf pf%of [f^,ÎNULL,Â,à,æ,¢ B

WAVEFORMATEX \‘c‘Ì,Í%oÂ•î’·,Â, ,é BfAfvfŠfP [fVf±f“,ÌE`Ž®,Ì îñ,ðŽæ“¾,·,éO,É A,±,Ìf f\fbfh,ðŽg—  
p,µ,ÄDirectSoundBuffer,Ö A,»,ÌE`Ž®,ÌTfCY,ð Æ%oi,·,éK—v,ª, ,é B \‘c‘Ì,ÌTfCY,  
ÌlpdwSizeWrittenfpf%of [f^,Ö•Ô,³,è,é B,»,ÌEãfAfvfŠfP [fVf±f“,Í \ª,Èf f, fŠ,ðŠ,,è—  
,Ä,Ä Ä“xIDirectSoundBuffer::GetFormat,ðEÄ,Ñ o,·,±,Æ,Ä AÈ`Ž®,É,Â,c,Ä,Ì îñ,ÌŽæ“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•bŠŎ,ìŽü”g ”,ðŽæ“¾,·,é B  
-Æ÷,·,ê,îDS\_OK AŽ,”s,·,ê,îŽŸ,ìfGf%∞ [fR [fh,ð•Ŏ,· B

**DSERR\_CONTROLUNAVAIL**

**DSERR\_INVALIDPARAM**

**DSERR\_PRIOLEVELNEEDED**

lpdwFrequency

fI [ffBfI Efofbftf@,ª Ä ¶,³,ê,Ä,¢,é ê Š,ìŽü”g ”,ðŽ,·,î ”,Ŏ,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%E,İfI [ffBfI Ef`fff“flf<,İŠİf{fŠf... [f€„đŽ!,•İ ”,đŽæ“¾,•é B  
-Æ÷,•,ê,İDS\_OK AŽ,”s,•,ê,İŽŸ,İfGf%o [fR [fh,đ•Ö,• B

DSERR\_CONTROLUNAVAIL

DSERR\_INVALIDPARAM

DSERR\_PRIOLEVELNEEDED

lplPan

%E,Æ ¶,İŠİf~fbfNfX,đŽ!,•İ ”,Ö,İf|fCf“f^ B

•Ö¹,İ-10,000,©,ç10,000,İ”ÍÍ,Å10,000,đ100dBŠ“-,Æ,µ,Ä“²è,³,ê,é B-10,000,İ¹,Í%E,İf`fff“flf<,”100dBŽã,,È,Á,Ä,ç,é,±  
,Æ,đÖ-ı,•,é B10,000,İ¹,Í ¶,İf`fff“flf<,”100dBŽã,,È,Á,Ä,ç,é,±,Æ,đÖ-ı,•,é BffftfHf<fg,İ¹,ÍÖ,Ä, ,é B  
lplPanfpf%of [f^,Ä,ÍÖ,İ—¼•û,İf`fff“flf<,”ftf<f{fŠf... [f€„Ä, ,é,±,Æ,đÖ-ı,•,é(Ç,ç,ç,à0dBŽã,,È,Á,Ä,ç  
,é) BÖÈŠÖ,İ Ýè,İ,Ç,ê,à A•Đ•û,”ftf<f{fŠf... [f€„Ä A,à,ç•Đ•û,”Žã,,È,Á,Ä,ç,é B

-2173,İfpf“,Í A ¶f`fff“flf<,”ftf<f{fŠf... [f€„Ä A%Ef`fff“flf<,”21.73 dBŽã,,È,Á,Ä,ç,é,±,Æ,đÖ-ı,•,é B“—  
l,É870,İfpf“,Í A ¶f`fff“flf<,”8.7 dBŽã,,È,Á,Ä,“,è A%Ef`fff“flf<,”ftf<f{fŠf... [f€„Ä, ,é,±,Æ,đÖ-  
ı,•,é B-10,000,İfpf“,Í A%Ef`fff“flf<,”³%¹,Ä AfTfEf“fh,ª u ¶“ı,İ,Ý v,Ä, ,é,±,Æ,đÖ-  
ı,•,é Bê•û A10,000,İfpf“,Í A ¶f`fff“flf<,”³%¹,Ä AfTfEf“fh,ª u%E“ı,İ,Ý v,Ä, ,é,±,Æ,đÖ-ı,•,é B

fpf“ §Eä,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);

ftTfEf“fh Efofbftf@,ìE» Ý,ì ó‘Ô,ðŽæ“¾,·,é B

-E÷,·,ê,îDS\_OK AŽ,”s,·,ê,îDSERR\_INVALIDPARAMfGf%o [fR [fh,ð•Ô,· B

*lpdwStatus*

ftTfEf“fh Efofbftf@,ì ó‘Ô,ðŽ,·,î ”,Ö,ì|fCf“f^ B ó‘Ô,ÍŽÝ,ì¹,Á Ý’è,³,ê,é B

**DSBSTATUS\_BUFFERLOST**

fobftf@,ÍŽ,,í,ê,Ä,“,è A Ä ¶,“,æ,Ñf fbfn,ð s,“O,ÉfŠfXfgfA,µ,ª  
K—v,Á, ,é B

**DSBSTATUS\_LOOPING**

fobftf@,Íf< [fv,µ,Ä,¢,é B¹,ª—  
¢ Ý’è,ì,Æ,«,Í Afobftf@,ÌfTfEf“fhff [f^,ì ÅEã,Ä Ä ¶,Í’âŽ~,·,é  
B,±,ì¹,ì Ý’èŽŽ,É,Í Afobftf@,ì Ä ¶,à s,í,ê,Ä,¢,é,±,Æ,É’ ^Ó,·,é B

**DSBSTATUS\_PLAYING**

fobftf@,Í Ä ¶¹†,Ä, ,é B,±,ì¹,ª Ý’è,³,ê,Ä,¢,È,¢  
,Æfobftf@,Í’âŽ~,µ,Ä,¢,é B

ŽQ Æ @IDirectSoundBuffer

**IDirectSoundBuffer::GetVolume**

HRESULT GetVolume(LPLONG lplVolume);

ffTfEf“fh Efofbftf@,ìE» Ý,ìf{fŠf... [f€,đŽæ“¾,·,é B  
-E÷,·,ê,îDS\_OK AŽ,”s,·,ê,îŽŸ,ìfGf%o [fR [fh,đ•Ö,· B

**DSERR\_CONTROLUNAVAIL**

**DSERR\_INVALIDPARAM**

**DSERR\_PRIOLEVELNEEDED**

lplVolume

Žw’è,³,ê,½DirectSoundfofbftf@,ìf{fŠf... [f€,đŽ!,·,î ”,Ö,ìf|fCf“f^ B

f{fŠf... [f€,í100dB,ì”í,đ0,©,ç-10,000,ì”í,Á AŽw’è,³,ê,é B0,í Á %o,ì AfXfgfŠ [f€,ì-ç,î X,ìf{fŠf... [f€,đ•\ ,· B-10,000,ÍfI [ffBfIf{fŠf... [f€,ª 100 dBŽã,,È,Á,Ä,ç,é,±,Æ,đ•\,· B’ • ,íE» Ý,ìDirectSound,Á,ÍfTf| [fg,³,ê,Ä,ç,È,ç B

ffVfxfç,ìŽÚ“x,í’®—í,é,í,µ,Ä,í ”,Ä,í%ož,µ,Ä,ç ,é B,½,Æ,,í A10dBCE, Š,·,é,Æ,Ífofbftf@,ìTfEf“fh,í”¼ª,É,È,è A20dBCE, Š,·,é,Æ4ª,ì1,É,È,é B

ŽQ Æ @IDirectSoundBuffer, **IDirectSoundBuffer::SetVolume**

**IDirectSoundBuffer::Initialize**

HRESULT Initialize(LPDIRECTSOUND lpDirectSound,  
LPDSBUFFERDESC lpDSBufferDesc);

«Šú»<sup>3</sup>,ê,Ä,č,È,čDirectSoundBufferfIfufWfFfNfg,đ «Šú»<sup>3</sup>,·,é B

**DSERR\_ALREADYINITIALIZED**fGf% [fR [fh,đ•Ô,· B

*lpDirectSound*

DirectSoundBufferfIfufWfFfNfg,ÆÆ< ‡,μ,½DirectSoundfIfufWfFfNfg,Ö,ì|fCf“f^ B

*lpDSBufferDesc*

fTfEf“fh Ef of bftf@,ì «Šú»<sup>3</sup>,ÉŽg—p,·,é'l,đŽ',μ,Ä,č,éDSBUFFERDESC \‘c‘ì,Ö,ì|fCf“f^ B

**IDirectSound::CreateSoundBuffer**f f\bfh,í“à”,Å**IDirectSoundBuffer::Initialize**,đCEÄ,Ñ o,·,ì,Ä AÆ» Ý,ìfŠfŠ [fX  
,ìDirectSound,Ä,í•K—v,È,č B,±,ê,í «—^,ìŠg'É «,ì,½,ß,É—p^Ó,<sup>3</sup>,ê,½,à,ì,Ä, ,é B

ŽQ Æ @DSBUFFERDESC, **IDirectSound::CreateSoundBuffer**, *IDirectSoundBuffer*

## IDirectSoundBuffer::Lock

```
HRESULT Lock(DWORD dwWriteCursor, DWORD dwWriteBytes, LPVOID lplpvAudioPtr1, LPDWORD lpdwAudioBytes1, LPVOID lplpvAudioPtr2, LPDWORD lpdwAudioBytes2, DWORD dwFlags);
```

ftfEf“fh Efofbftf@,İfi [ffBfi Efi [f^,É‘İ,μ,Ä—LÆø,È ‘,«±,ÝfAfNfZfX,ðŽæ“¾,·,é B  
-Æ±,·,é,İDS\_OK AŽ,”s,·,é,İŽÿ,İfGf%o [fR [fh,ð•Ö,· B

### DSERR\_BUFFERLOST

### DSERR\_INVALIDCALL

### DSERR\_INVALIDPARAM

### DSERR\_PRIOLEVELNEEDED

dwWriteCursor

fobftf@,İŠJŽn^Ê‘u,©,çf fbfN,ðŠJŽn,·,é^Ê‘u,Ü,Ä,İ AfofCfG‘P^Ê,İfIfZfbfg B  
dwFlagsfpf%of [f^,ÄDSBLOCK\_FROMWRITECURSORftf%ofO,^Žw’è,³,é,Ä,ç,é ê ±,İ A,±,İfpf%of [f^,İ-  
³Ž,³,é,é B

dwWriteBytes

f fbfN,·,éofobftf@—İæ,İ AfofCfG‘P^Ê,İfTfCY BftfEf“fh Efofbftf@,İŠT”O“İ,É,İ%o~,É,È,Ä,Ä,ç  
,é ifŠf“fOfobftf@ j,±,Æ,É’ ^Ö,·,é,±,Æ B

lplpvAudioPtr1

f fbfN,³,é,éofobftf@,İ Ä %o,İfuf fbfN,Ö,İf|Cf“f^ B

lpdwAudioBytes1

lplpvAudioPtr1fpf%of [f^,ÄŽ,³,é,½ofCfG ”,ðŽ,·,İ ”,Ö,İf|Cf“f^ B,±  
,İl,^dwWriteBytesfpf%of [f^,æ,è -³,ç ê ± A lplpvAudioPtr2,^ftfEf“fhf [f^,İŽÿ,İfuf fbfN,ðŽ,· B

lplpvAudioPtr2

f fbfN,³,é,éftfEf“fh Efofbftf@,İ2”Ö-Ú,İ—İæ,Ö,İf|Cf“f^ B,±,İfpf%of [f^,İl,^NULL,İ ê ± A  
lplpvAudioPtr1fpf%of [f^,İftfEf“fh Efofbftf@,İf fbfN,³,é,½—İæ‘S‘İ,ðŽ,· B

lpdwAudioBytes2

lplpvAudioPtr2 fpf%of [f^,Äf|Cf“fg,³,é,½ofCfG ”,ðŽ,·,İ ”,İfAhfÆfX B lplpvAudioPtr2,^NULL,İ ê ± A,±  
,İl,İÖ,Æ,È,é B

dwFlags

f fbfN,İfCxf“fg,ð C ³,·,éftf%ofO B^È%o,İl,ÄŽ,³,é,é B

DSBLOCK\_FROMWRITECURSOR

«» Ý,İ ‘,«±,ÝfJ [fvç,©,çf fbfN,ð s,ç A,±  
,é,É,æ,è,İDirectSoundBuffer::GetCurrentPosition,İÆÄ,Ñ o,μ,^s•K—  
v,É,È,é B,±,İftf%ofO,^Žw’è,³,é,é,ÆdwWriteCursorfpf%of [f^,İ-  
³Ž,³,é,é B,±,İftf%ofO,İ^C^Ö,ÉŽw’è,Ä,«±,é B

,±,İf f\fbfh,İfIfZfbfg,Æ—İæfJfEf“fg,ðŽó,~Žæ,è A,Ó,½,Ä,İ ‘,«±,Ýf|Cf“f^,Æ,±

,é,ð ±,İ,½TfCY,ð•Ö,· B,Ó,½,Ä,İf|Cf“f^,ð•K—

v,Æ,·,é,İ,İftfEf“fh Efofbftf@,^ŠÄ ó ifŠf“fO Efofbftf@ j,½,Ä,Ä,·,é Bf fbfN,³,é,½ofobftf@,^ I—  
r^Ê‘u,Ä zŠÄ,μ,È,ç ê ± A,Ó,½,Ä,Ä,İf|Cf“f^,Ä,·

élplpvAudioBytes2,İNULL,É,È,é B,½,¾,μ zŠÄ,·,é ê ±,İ A,Ó,½,Ä,Ä,İf|Cf“f^,İfobftf@,İŠJŽn^Ê‘u,ðŽ,· B

lplpvAudioPtr2,·,æ,Ñ

lpdwAudioBytes2fpf%of [f^,É‘İ,μ,ÄNULL,ð“n,·,Æ ADirectSound,İfobftf@,İf%obfvfAf%ofEf“fh—  
İæ,ðf fbfN,μ,È,ç B

fAfvfŠfP [fvf±f“,İIDirectSoundBuffer::Lockf f\fbfh,É,æ,è•Ö,³,é,½f|Cf“f^,Öff [f^,ð ‘,«±  
,Ý ADirectSound,Öfobftf@,ð•Ö,·,½,Ä,É,İDirectSoundBuffer::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,é,é,Æ A Ä ¶fJ [fvç,^f fbfN,³,é,½—  
İæ,Ö“ž‘B,μ,Ä,μ,Ü,ç Af%of“f\_fëmfCY,Æ,ç,Ä,½ AçŠí \ ^È“¶,İfi [ffBfi-â“è,^” ¶,·,é B

## Warning

,±,İf f\fbfh,İ ‘,«±,Ýf|Cf“f^,İ,Ý,ð•Ö,· B,±,İf|

fCf“f^,©,çfTfEf“fhff [f^,Ï“Ç,Ý ž,Ý,Í s,i,È,Ç B,½,Æ,|DirectSoundBufferfIfufWfFfNfg,a—  
LÇø,ÈfTfEf“fh Eff [f^,ðŠÛ,ñ,À,c,Ä,à A,»,Ïff [f^,Í³Çø,Ä, ,é B,½,Æ,|,Î Afobftf@,³fIf“f{ [fh Ef f,fŠ,É”z  
'u,³,è,Ä,c,½ ê ‡ Af|fCf“f^,Íf fCf“ EfVfXfef€f f,fŠ“à,Ïfef“f|  
f%ofŠ Efobftf@,ÏfAfhfÇfX,Æ,È,é BDirectSoundBuffer::Unlock,³ÇÄ,Ñ o,³,è,é,Æ A,±,Ïfef“f|  
f%ofŠ Efobftf@,ÍIf“f{ [fh Ef f,fŠ,É“]‘—,³,è,é B

---

ŽQ Æ @IDirectSoundBuffer, IDirectSoundBuffer::GetCurrentPosition, IDirectSoundBuffer::Unlock

**IDirectSoundBuffer::Play**

HRESULT Play(DWORD dwReserved1, DWORD dwReserved2, DWORD dwFlags);

fTfEf“fh Efofbftf@,ðŒ» Ý,ÏÊ'u,©,ç Ä ¶,³,¹,é B  
-Œ±,·,ê,ÏDS\_OK AŽ,»s,·,ê,ÏŽÝ,ÏfGf%o [fR [fh,ð•Ö,· B

**DSERR\_BUFFERLOST**

**DSERR\_INVALIDCALL**

**DSERR\_INVALIDPARAM**

**DSERR\_PRIOLEVELNEEDED**

dwReserved1  
,±,Ïpf%of [f^,Í—\—ñ Ï,Ý,Ä, ,é B,±,Ï¹,ÏÖ,Ä,È, ,é,Ï,È,ç,È,ç B

dwReserved2  
,±,Ïpf%of [f^,Í—\—ñ Ï,Ý,Ä, ,é B,±,Ï¹,ÏÖ,Ä,È, ,é,Ï,È,ç,È,ç B

dwFlags  
fofbftf@,Ï Ä ¶•û—@,ðŽw'è,·,é B`È%°,Ï¹,ÄŽ¹,³,é,é B

**DSBPLAY\_LOOPING**

fI [ffBfI Efofbftf@,Ï I—  
¹Ê'u,Û,Ä“ž'B,·,é,Æ Afofbftf@,ÏŠJŽn^Ê'u,©,ç Ä,Ñ Ä ¶,ð s,ç  
A'âŽ~·,ð—¾Ž¹,·,é,Û,ÄŒJ,è•Ö,· B,±,Ïftf%oO,Ïfvf%oCf}  
fŠ EftfEf“fh Efofbftf@,Ï Ä ¶¹,É Ý'è,·,é•K—v,ª, ,é B

,±,Ïf f\fbfh,É,æ,è AfZfJf“f fŠ EftfEf“fh Efofbftf@,Ïfvf%oCf}  
fŠ Efofbftf@“à,Äf~fLfVf“fO,³,é,Ä,©,çfTfEf“fh EfffofCfX,Ö—,ç,é,é B,±,é,ª Ä %o,É Ä ¶,³,é,éfofbftf@,Ä, ,  
é ê ± A“à”,Äfvf%oCf}  
fŠ Efofbftf@,ð ï ¬,µ A,».,Ïfofbftf@,Ï Ä ¶,ðŠJŽn,·,é BfAfvfŠfP [fVf±f“,Ïfvf%oCf}  
fŠ Efofbftf@,ð¼ Ú Ä ¶,·,é•K—v,Ï,È,ç B

,à,µf f\fbfh,ÄŽw'è,³,é,½fofbftf@,ª,·,Ä,É Ä ¶¹,¾,Ä,½ ê ± Af f\fbfh,ÏŒÄ,Ñ o,µ,Ï ¬Œ±,µ Afofbftf@,Ï Ä  
¶,ð±,·,é B,½,¾,µ¬%o¹ E Ä ¶«@”,ª'èç',³,é,½ftf%oO,Ï'è"Ö ÄB,É'èç',³,é,½ftf%oO,ÉŽæ,Ä,Ä'ã,í,ç,é,é B

fvf%oCf}fŠ Efofbftf@,ÏDSBPLAY\_LOOPINGftf%oO,Ï Ý'è,É,æ,è Ä ¶,µ,È, ,é,Ï,È,ç,È,ç B

fvf%oCf}fŠ EftfEf“fh Efofbftf@,Ï,±  
,Ïf f\fbfh,É,æ,Ä,ÄfTfEf“fhfffofCfX,Ï Ä ¶,ðŠJŽn,·,é BfAfvfŠfP [fVf±f“,ª '« ž,Ý—  
D æç'²fŒfxfç,É Ý'è,³,é,Ä,ç,é ê ± Afvf%oCf}  
fŠ Efofbftf@“à,ÏfI [ffBfI Eff [f^,ðfTfEf“fh EfffofCfX,Ö,Æ—  
,é B,µ,©,µ AfAfvfŠfP [fVf±f“,ª¼,Ïç'²fŒfxfç,É Ý'è,³,é,Ä,ç,é ê ±,Ï A,±  
,Ïf f\fbfh,É,æ,éZfJf“f\_ÏfŠ Efofbftf@,Ï Ä ¶,ª,ª,Ä,à s,í,é,Ä,ç,È,,Ä,àfvf%oCf}  
fŠ Efofbftf@,ª Ä ¶,³,é,é B,±,Ï ê ±,Ï—¾o¹,Æ,É,é B,±,Ï ê ± AfTfEf“fh,ª ±ŽÝ,É Ä ¶ E'âŽ~·,é,Æ,«,Ï ^—  
fI [fo [fwfbfh,ð Ä ¬ŒÄ,É,·,é,±,Æ,ª,Ä,«é B,±,é,Ï A'âŽ~ A Ä ¶,ðfZfJf“f\_ÏfŠ Efofbftf@ŠÖ,Ä s,µ  
,æ,è,à A,æ,èA±“Ï,Éfofbftf@,ª Ä ¶,³,é,é,½,ß,Ä, ,é B

**Note**

,ç,ÏfTfEf“fh Efofbftf@,É,·,ç,Ä,à AfAfvfŠfP [fVf±f“,Ï,±  
,Ïf f\fbfh,ªŒÄ,Ñ o,³,é,éO,É**IDirectSound::SetCooperativeLevel** f f\fbfh,ðŒÄ,Ñ o,µ Aç'²fŒfxfç,ðŽw'è,·,é•K—  
v,ª, ,é B`È ï,ÏSSCL\_NORMAL,ðŽw'è,·,é B,à,µ**IDirectSound::SetCooperativeLevel** f\fbfh,ªŒÄ,Ñ o,³,é,é,Ä,ç,È,ç  
,Æ A **IDirectSoundBuffer::Play** f\fbfh,Ï**DSERR\_PRIOLEVELNEEDED**fGf%o [¹,ð•Ö,· B

ŽQ Æ @**IDirectSoundBuffer**, **IDirectSound::SetCooperativeLevel**

**IDirectSoundBuffer::Restore**

HRESULT Restore();

“Á’è,ÌDirectSoundBufferIfufWfFfNfg,ì AŽ,í,ê,½fTfEf“fh Efofbftf@,É’Î,·,éf f,fŠ,ìŠ,,è“-,Ä,ðfŠfXfgfA,·,é B  
-E÷,·,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,ç,È,ç,ÆDirectSoundBuffer::Restore,Í -E÷,μ,È,ç B,½,Æ,,Í A“ü—  
ÍftfH [fJfX,ðŽ ,ÄfAfvfŠfP [fVf÷f“,“DSSCL\_WRITEPRIMARY<’²fçfxfç,É Ý’è,³,ê,Ä,ç  
,é ê ÷ A¼,ì,·,×,Ä,ÌfAfvfŠfP [fVf÷f“,Ífofbftf@,ÌfŠfXfgfA,ª,Ä,«,È,ç ó’Ô,É,È,é B“—  
l,ÉDSSCL\_WRITEPRIMARY ‘,« ž,Ý—D æ<’²fçfxfç,ÌfAfvfŠfP [fVf÷f“,“fvf%oCf}  
fŠ EftfEf“fh Efofbftf@,ðfŠfXfgfA,·,é,½,ß,É,Í A“ü—ÍftfH [fJfX,ðŽ ,Á,Ä,ç,é•K—v,ª, ,é B

DirectSound,ªfofbftf@ Ef f,fŠ,ðfŠfXfgfA,μ,½ ê ÷ A—LCEø,ÈftfEf“fh Eft [f^,ì Ä ‘,«±,Ý,ª•K—v,Ä, ,é BD  
irectSound,Ìf f,fŠ,ì“à—e,ðfŠfXfgfA,·,é,±,Æ,Í,Ä,«, Af f,fŠ,ÌfŠfXfgfA,ì,Ý,ð s,ª B

**IDirectSoundBuffer::Lock**,à,μ,,Í **IDirectSoundBuffer::Play**f f\fbfh,ìCEÄ,Ñ o,μžž,Éfofbftf@,ðŽw’è,μ,Ä,“-  
,Æ A,»,Ìfofbftf@,ªŽ,,í,ê,½,Æ,ç,ª’m,ç,¹,ðŽó,¯,é,±,Æ,ª,Ä,«,é B,±  
,é,ç,Ìf f\fbfh,Í Afofbftf@,ªŽ,,í,ê,½ ê ÷,ÍDSERR\_BUFFERLOST,ð•Ô,· B**IDirectSoundBuffer::GetStatus**f f\fbfh,  
à,Û,½ AfTfEf“fh Efofbftf@,ì ó’Ô,ìŽæ“¾,ÆDSBSTATUS\_BUFFERLOSTftf%ofo,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\<, 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•Ö, · B

**DSERR\_INVALIDCALL**

**DSERR\_INVALIDPARAM**

**DSERR\_PRIOLEVELNEEDED**

*dwNewPosition*

fTfEf“fh Efofbftf@, Ì Ä ¶, ÉŽg—p, 3, ê, éfofCf g’PÊ, ÌlftfZfbfg’l B

, ±, Ìf f\fbfh, Ìfvf‰ofCf}fŠ EfTfEf“fh Efofbftf@ ã, Å, ÍÆÄ, Ñ o, 1, È, Ç B

fobftf@, ¢ Ä ¶’+, Ì ê ‡, Í A’| Ä, É V<K, ÌÊ’u, ÖÚ“@, µ, ÄÆp’±, 3, ê, é B’ãŽ~’+, Ì ê ‡, Í A

**IDirectSoundBuffer::Play** f\fbfh, ¢ÆÄ, Ñ o, µ, 3, ê, ½, , Æ, Å A V<K, ÌÊ’u, ©, ÇŠŽn, ·, é B

ŽQ Æ @IDirectSoundBuffer, **IDirectSoundBuffer::GetCurrentPosition**, **IDirectSoundBuffer::Play**

**IDirectSoundBuffer::SetFormat**

HRESULT SetFormat(LPWAVEFORMATEX lpfxFormat);

*f*v%*Cf*}*f*Š *E*fT*E*f“*f*h *E*f*o*f*b*f*t*f@,İ*f*A*f*v*f*Š*f*P [*f*V*f*‡*f*“,Ä,İCE`Ž@,đ *Y*'è,·,é B,±,İ*f*A*f*v*f*Š*f*P [*f*V*f*‡*f*“,“ü—  
İ*f*t*f*H [*f*J*f*X,đŽ ,Ä,½,Ñ,ÉDirectSound,İ*f*v*f*%*f*Cf}fŠ *E*f*o*f*b*f*t*f@,đ“Ä'è,İCE`Ž@,É *Y*'è,·,é B

-CE÷,·,è,İDS\_OK AŽ,”s,·,è,İŽŸ,İ*f*G*f*% [*f*R [*f*h,đ•Ö,· B

**DSERR\_BADFORMAT**

**DSERR\_INVALIDCALL**

**DSERR\_INVALIDPARAM**

**DSERR\_OUTOFMEMORY**

**DSERR\_PRIOLEVELNEEDED**

**DSERR\_UNSUPPORTED**

*lpfxFormat*

**WAVEFORMATEX** \‘c’İ,Ö,İ*f*|*Cf*“*f*^ B*f*v*f*%*f*Cf}fŠ *E*fT*E*f“*f*h *E*f*o*f*b*f*t*f@,İ V,µ,CE`Ž@,đ•\,· B

‘,« ž,Ÿ—D æ‘’<sup>2</sup>*f*CE*f*x*f*ˆ,Ä*f*A*f*N*f*Z*f*X,<sup>3</sup>è,Ä,c,é*f*v*f*%*f*Cf}fŠ *E*f*o*f*b*f*t*f@ ä,Ä,±  
,İ*f* *f*\b*f*h,đCEÄ,Ñ o,· è ‡ A*f**o*f*b*f*t*f@,đ**IDirectSoundBuffer::SetFormat**,“CEÄ,Ñ o,<sup>3</sup>è,é‘O,É’âŽ~,µ,Ä,“,©,È,¯,è,İ,È,  
ç,È,c B,±,İ*f* *f*\b*f*h,<sup>a</sup> ‘,« ž,Ÿ—D æ^ÈŠO,İ‘’<sup>2</sup>*f*CE*f*x*f*ˆ ä,ÄCEÄ,Ñ o,<sup>3</sup>è,½ è ‡,İ ADirectSound,İ“à•”,Ä*f*v*f*%*f*Cf}  
fŠ *E*f*o*f*b*f*t*f@,đ’âŽ~,µ ACE`Ž@,đ•İ X,µ A*f*v*f*%*f*Cf}fŠ,đ*f*Š*f*X*f*^ [*f*g,·,é B*f*A*f*v*f*Š*f*P [*f*V*f*‡*f*“,<sup>a</sup>±,è,ç,İ ìÆ,đ-  
¾Ž!,·,é•K—v,İ,È,c B

—vˆ ,<sup>3</sup>è,½PCME`Ž@,đ*f*n [*f*h*f*E*f*F*f*A,<sup>a</sup>¼ Ú*f*T*f*] [*f*g,µ,Ä,c,È,c è ‡ A,±  
,İ*f* *f*\b*f*h,İCEÄ,Ñ o,µ,İŽ,”s,·,é B*f*A*f*v*f*Š*f*P [*f*V*f*‡*f*“,“DSSCL\_NORMALˆ’<sup>2</sup>*f*CE*f*x*f*ˆ,đŽ ,Ä,Ä,c,é è ‡,âŽ,”s,·,é B

*f*Z*f*J*f*“*f* *f*Š *E*fT*E*f“*f*h *E*f*o*f*b*f*t*f@,İCE`Ž@,đ•İ X,·,é•K—  
v,<sup>a</sup> ¶,¶,½ è ‡ A VˆKDirectSoundBuffer*f*I*f*u*f*W*f*F*f*N*f*g,đ V,µ,CE`Ž@,Ä ì -,·,é•K—v,<sup>a</sup>,é B

DirectSound,İPCME`Ž@,đ*f*T*f*] [*f*g,µ,Ä,c,é BCE» *Y*,Í<sup>3</sup> kCE`Ž@,İ*f*T*f*] [*f*g,µ,Ä,c,È,c B

ŽQ Æ @*IDirectSoundBuffer*, **IDirectSoundBuffer::GetFormat**

## **IDirectSoundBuffer::SetFrequency**

HRESULT SetFrequency(DWORD dwFrequency);

ftf“fvfŠf“fO EfI [ffBfI,ª Ä ¶,³,ê,Ä,¢,éÊ’u,İŽü”g ”,đ Ý’è,·,é B  
-Œ÷,·,ê,İDS\_OK AŽ,”s,·,ê,İŽŸ,İfGf%o [fR [fh,đ•Ö,· B

**DSERR\_CONTROLUNAVAIL**

**DSERR\_GENERIC**

**DSERR\_INVALIDPARAM**

**DSERR\_PRIOLEVELNEEDED**

dwFrequency

ftf“fvfŠf“fO EfI [ffBfI,ª Ä ¶,³,ê,Ä,¢,éÊ’u,İŽü”g ” B’PÊ,İfwf<fc(Hz) B’l,İ”ÍÍ,Í100,©,ç  
100,000,Û,Ä,Æ,È,é B  
’l,ª0,İ ê ± AŽü”g ”,ÍŒ» Ý,İfobftf@Œ`Ž®,ÉfŠfZfbfg,³,ê,é B,±  
,İŒ`Ž®,**IDirectSound::CreateSoundBuffer** f\fbfh,ÄŽw’è,³,ê,Ä,¢,é B

Žü”g ”,İ’ • EŒ, Š,É,æ,è AfI [ffBfI Eff [f^,İ<Ÿ<<fsfbf`ª•İ,í,é B,±  
,İf f\fbfh,İfobftf@,İŒ`Ž®,É,İ%œ<ç,µ,È,Œ B

ŽQ Æ @IDirectSoundBuffer, **IDirectSound::CreateSoundBuffer**, **IDirectSoundBuffer::GetFrequency**,  
**IDirectSoundBuffer::Play**, **IDirectSoundBuffer::SetFormat**

**IDirectSoundBuffer::SetPan**

HRESULT SetPan(LONG lPan);

¶%E,lf`fff`flf<,ìŠ`îf{fŠf... [f€,đ Ý`è,·,é B  
-E±,·,ê,îDS\_OK AŽ,„s,·,ê,îŽŸ,ìfGf% [fR [fh,đ•Ô,· B

**DSERR\_CONTROLUNAVAIL**

**DSERR\_GENERIC**

**DSERR\_INVALIDPARAM**

**DSERR\_PRIOLEVELNEEDED**

lPan

¶%E,lf`fff`flf<,ìŠ`îf{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,ìŽ©`R,Èf{fŠf... [f€,Í0,Å, ,é B,±,ê,í—¼•û,ìf`fff`flf<,^ftf<f{fŠf... [f€,Å, ,é,±,Æ,đŽ!,·(0dBŽã,,È,Á,Ä,ç,é) B,±  
,êÈŠO,ì Ý`è,Í,Ç,ê,à A•Đ•û,^ftf<f{fŠf... [f€,Å A,à,□•Đ•û,^Žã,,È,Á,Ä,ç  
,é B,½,Æ,!,î A-2173,ìfpf“,í A ¶f`fff`flf<,^ftf<f{fŠf... [f€,Å A%oEf`fff`flf<,^21.73 dBŽã,,È,Á,Ä,ç,é,±,Æ,đÓ-  
j,·,é B“—l,É870,ìfpf“,í A ¶f`fff`flf<,^8.7 dBŽã,,È,Á,Ä,“,è A%oEf`fff`flf<,^ftf<f{fŠf... [f€,Å, ,é,±,Æ,đÓ-  
j,·,é B

-10,000,ìfpf“,í A%oEf`fff`flf<,^3%o¹,Å AfTfEf“fh,^ u ¶“□,ì,Ý v,Å, ,é,±,Æ,đÓ-  
j,·,é B^ê•û A10,000,ìfpf“,í A ¶f`fff`flf<,^3%o¹,Å AfTfEf“fh,^ u%oE“□,ì,Ý v,Å, ,é,±,Æ,đÓ-  
j,·,é Bfpf“ §Eä,ìf{fŠf... [f€ EfRf“fgf [f<,É—Ý Ì,µ,Ä“@ ì,·,é B

ŽQ Æ @IDirectSoundBuffer, **IDirectSoundBuffer::GetPan**, **IDirectSoundBuffer::GetVolume**,  
**IDirectSoundBuffer::SetVolume**

**IDirectSoundBuffer::SetVolume**

HRESULT SetVolume(LONG lVolume);

ƒTƒEƒ“fh Eƒofbƒƒf@,İƒ{ƒŠƒ... [ƒ€„đ•İ X,;é B  
-Œ÷,;é,İDS\_OK AŽ,„s,;é,İŽŸ,İƒGƒ% [ƒR [ƒh,đ•Ō,; B

**DSERR\_CONTROLUNAVAIL**

**DSERR\_GENERIC**

**DSERR\_INVALIDPARAM**

**DSERR\_PRIOLEVELNEEDED**

lVolume

ƒTƒEƒ“fh Eƒofbƒƒf@,É—v< ,<sup>3</sup>,é,é V<K,İƒ{ƒŠƒ... [ƒ€ B'l,İ”ÍÍ,Í0(0dB(dB) Bƒ{ƒŠƒ... [ƒ€•İ X,È,μ)  
,©,ç-10,000 i-100Db BŽÀ Ū,İ<sup>3</sup>%<sup>1</sup> j,Ū,Ä,É,È,é BDirectSound,ÍŒ» Ý,İ • ,đƒTƒ| [ƒg,μ,Ä,Œ,È,Œ B

ƒ{ƒŠƒ... [ƒ€,İ^P^Ê,İ100dB,Ä, ,è A0,<sup>a</sup>ƒXƒgƒŠ [ƒ€,İƒİƒŠƒƒWƒİƒ<,İƒ{ƒŠƒ... [ƒ€,Ä, ,é B

<sup>3</sup>,İ'l,İƒƒƒVƒƒƒ<,Í • ,đ•\,μ A•%,İ'l,ÍŒ, Š,đ•\,μ,Ä,Œ,é BƒƒƒVƒƒƒ<,İŽŪ“x,Í®—Í,É‘İ,μ,Ä‘İ ”,Ä‘İ%ž,μ,Ä,Œ  
,é B10dBŒ, Š,;é,Œ,İƒofbƒƒf@,İƒTƒEƒ“fh,İ”¼<sup>a</sup>,É,È,è A20dBŒ, Š,;é,Œ4<sup>a</sup>,İ1,É,È,é BŒ» Ý,İDirectSound,Í • ,  
đƒTƒ| [ƒg,μ,Ä,Œ,È,Œ B

ƒƒƒ“ §Œä,İƒ{ƒŠƒ... [ƒ€ EƒRƒ“ƒgƒ [ƒ<,É—Ÿ İ,μ,Ä“® İ,;é B

ŽQ Œ @IDirectSoundBuffer, **IDirectSoundBuffer::GetPan**, **IDirectSoundBuffer::GetVolume**,  
**IDirectSoundBuffer::SetPan**

**IDirectSoundBuffer::Stop**

HRESULT Stop();

fTfEf“fh Efofbftf@,Ì Ä ¶,đ’âŽ~,·,é B

-Œ±,·,ê,ÎDS\_OK AŽ,“s,·,ê,ÎŽŸ,ÌfGf%o [fR [fh,đ•Ô,· B

**DSERR\_INVALIDPARAM**

**DSERR\_PRIOLEVELNEEDED**

fZfJf“f fŠ EFTfEf“fh Efofbftf@,É’Î,µ,Ä A

**IDirectSoundBuffer::Stop**,ÍŒ» Ý,Ìfofbftf@,ÌÈ’u,đ A’O%oñ,ÌfTf“fvf< Ä ¶,É’ø,«±,ftf“fvf<,Ö,Æ Ý’è,·,é B,± ,é,Í**IDirectSoundBuffer::Play**f f\fbfh,afobftf@,ÉŒÄ,Ñ o,³,ê,½ ê ‡,É,»Ì Ä ¶,đ’âŽ~,µ,½,Æ,±,ë,©,ç’±,¯,é,Æ,ç,µ ,±,Æ,Ä, ,é B

fAfvfŠfP [fVf‡f“,ª fvf%ofCf}fŠ EFTfEf“fh Efofbftf@,É’Î,µ,Ä A ‘,« ž,Ý—D æ fŒfxf<,đŽ ,Á,Ä,ç ,é,È,ç A,±,Ìf f\fbfh,Ífofbftf@,đ’âŽ~,µ,Ä ACE» Ý,Ìf|fWfVf‡f“,đ,O ifobftf@,ÌŽn,ß j,ÉfŠfZfbfg,·,é•K—v,ª ,é B ,±,ê,Ífofbftf@,Ì æ“ª,©,ç,µ,© Ä ¶,ª s,!,È,çfTfEf“fh EfJ [fh,ªª ¨,đ è,ß,Ä,ç,é,½,ß,Ä, ,é B

,µ,©,µ Afvf%ofCf}fŠ Efofbftf@ ä,Ä **IDirectSoundBuffer::Stop**,ªŒÄ,Ñ o,³,ê AfAfvfŠfP [fVf‡f“,ª ‘,« ž,Ý— D æ ÈŠO,Ì,“?fŒfxf<,đŽ ,Á,Ä,ç,é,È,ç,Ì A,±,Ìf f\fbfh,Í **IDirectSoundBuffer::Play**,ÌŒø%oÈ,đ—Œø,É,·,é,¾,¯,Ä, ,é B fZfJf“f\_fŠ Efofbftf@,ª Ä ¶,³,ê,Ä,ç,È,ç ê ‡,É,Í Afvf%ofCf}fŠ Efofbftf@,đ’âŽ~,·,é,æ,µ,É Ý’è,·,é B ‘¼,Ìfofbftf@,ª,±,±,Ä i,·,é,ç,Í’¼,ÌfAfvfŠfP [fVf‡f“,ª j Ä ¶,³,ê,Ä,ç,é,È,ç A,»è,ç,ªâŽ~,·,é,Û,Äfvf%ofCf} fŠ Efofbftf@,àŽÄ Û,É,Í’âŽ~,µ,È,ç B ,½,Æ,Ìfofbftf@,ª,OdB,ÄfTfEf“fh Eff [f^,đ Ä ¶,µ,Ä,ç ,é ê ‡,Ä, ,Á,Ä,à ^— ,ÌI [fo [fwfbfh,Í Ä”i,³,ê,é,Ì,Ä, ,é,©,ç A,±,Ìf f\fbfh,Äfvf%ofCf} fŠ Efofbftf@,Ä Ä ¶,·,é,±,Æ,Í A—L—p,È,Ì,Ä, ,é B

ŽQ Æ @**IDirectSoundBuffer**, **IDirectSoundBuffer::Play**

**IDirectSoundBuffer::Unlock**

HRESULT Unlock(LPVOID lpvAudioPtr1, DWORD dwAudioBytes1, LPVOID lpvAudioPtr2, DWORD dwAudioBytes2);

fTfEf“fh Efofbftf@,Ìf fbfN,ð%ð•ú,·,é B

-Æ÷,·,ê,ÎDS\_OK AŽ,”s,·,ê,ÎŽŸ,ÌfGf%o [fR [fh,ð•Ô,· B

**DSERR\_INVALIDCALL**

**DSERR\_INVALIDPARAM**

**DSERR\_PRIOLEVELNEEDED**

lpvAudioPtr1

**IDirectSoundBuffer::Lock** f\fbfh,Ì lpvAudioPtr1fpf%of [f^,ĂŽæ“¾,³,ê,é•İ ”,Ö,Ì|fCf“f^ B

dwAudioBytes1

ŽÀ Û,ÉlpvAudioPtr1fpf%of [f^,É ‘,«,± ,Û,ê,½fofCfg ” BIDirectSoundBuffer::Lock f\fbfh,É,æ,Á,Ă•Ô,³,ê,½fofCfg ”,ð%oz,!,é,×,«,Ă,Í,È,¢ B

lpvAudioPtr2

**IDirectSoundBuffer::Lock** f\fbfh,Ì lpvAudioPtr2 fpf%of [f^,ĂŽæ“¾,³,ê,é•İ ”,Ö,Ì|fCf“f^ B

dwAudioBytes2

ŽÀ Û,ÉlpvAudioPtr2 fpf%of [f^,É ‘,«,± ,Û,ê,½fofCfg ” BIDirectSoundBuffer::Lock f\fbfh,É,æ,Á,Ă•Ô,³,ê,½fofCfg ”,ð%oz,!,é,×,«,Ă,Í,È,¢ B

fAfvfŠfP [fVf±f“,Í **IDirectSoundBuffer::Lock** f\fbfh,Ă•Ô,³,ê,½—¼•û,Ì|fCf“f^ lpvAudioPtr1 ,Æ lpvAudioPtr2,ð A ³,µ,·,Í,É,µ,Ă A **IDirectSoundBuffer::Unlock**,É“n,³,È,\_,ê,Î,È,ç,È,¢ B ,Q”Ô–Û,Ì|fCf“f^,Í A,½,Æ,!,OfofCfg,ª,Q”Ô–Û,Ì|fCf“f^,É ‘,«,±,Û,ê,½,Æ,µ,Ă,à•K—v,Ă, ,é B

fAfvfŠfP [fVf±f“,ÍŽÀ Û,É ‘,«,±,Û,ê,½fofCfg,Ì ”,ð AdwAudioBytes1 ,Æ dwAudioBytes2 fpf%of [f^,Ì,Ó,½,Ă,Ì|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**



## 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@,ì ê Š A•ûEü,“,æ,Ñ“® ì,ì ACEÂ•ÊL q,É•K—v,È,·,×,Ä,ì î•ñ,ðŠÜ,ñ,Â,c,é B,±,ì \‘c‘ì,í DirectSound3DBuffer::GetAllParameters,“,æ,Ñ DirectSound3DBuffer::SetAllParametersf f\fbfh,Æ,Æ,à,ÉŽg— p,³,ê,é B

### dwSize

,±,ì \‘c‘ì,ìfofCf’P’Ê,ìfTfCfY B

### vPosition

,R,cfTfEf“fh Efofbftf@,ìE» Ý,ìÊ’u,ðL q,·,é D3DVECTOR \‘c‘ì B

### vVelocity

,R,cfTfEf“fh Efofbftf@,ìE» Ý,ì’-“x,ðL q,·,é D3DVECTOR \‘c‘ì B

### dwInsideConeAngle

“à‘mfTfEf“fh Efvf fWfFfNfVf‡f“ EfR [f“,ìŠp“x B

### dwOutsideConeAngle

ŠO‘mfTfEf“fh Efvf fWfFfNfVf‡f“ EfR [f“,ìŠp“x B

### vConeOrientation

,±,ì,R,cfobftf@fTfEf“fh Efvf fWfFfNfVf‡f“ EfR [f“,ìE» Ý,ì•ûEü,ðL q,·,é D3DVECTOR \‘c‘ì B

### lConeOutsideVolume

ŠO“f{fŠf... [f€,ìR [f“ B

### flMinDistance

Ä ¬<—£ B

### flMaxDistance

Ä•â<—£ B

### dwMode

,R,cfTfEf“fh ^— f, [fh BŽŸ,ì‘l,ÄŽ‘,³,ê,é B

#### DS3DMODE\_DISABLE

3DfTfEf“fh ^— ,ì—

³Eø,É,È,é BfTfEf“fh,ìfŠfXfi [,ì““a,ì‘† S,©,ç•,±,‘,é,æ,²,ÉŠ‘,¶,é B

#### DS3DMODE\_HEADRELATIVE

fTfEf“fhfpf%of [f^(Ê’u A‘¬“x A•ûEü)

,ìfŠfXfi [,ìfpf%of [f^,Æ‘Š‘îŠÖEW,É, ,é B,±

,ìf, [fh,Ä,í AfTfEf“fh,ì â‘îfpf%of [f^,ìfŠfXfi [ Efpf%of [

f^,³,î X,³,ê,½,Æ,«,ÉŽ©“®“I,É X V,³,ê,é,ì,Ä A‘Š‘îfpf%of [f^,ì,î

,í,ç,È,ç,Ü,Ü,Ä, ,é B

#### DS3DMODE\_NORMAL

•W €,ì ^— B,±,ê,³fftfHf<fgf, [fh,É,È,Ä,Ä,ç,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 ACEÂ X,É<L q,·,é,½,ß,É•K—v,È,·,×,Ä,l î•ñ,ðŠÜ,ñ,Å,ç,é B,±  
,l \ç'ì,l IDirectSound3DListener::GetAllParameters , ,æ,Ñ IDirectSound3DListener::SetAllParameters  
f f\fbfh,Æ,Æ,à,ÉŽg—p,³,ê,é B

### dwSize

,±,ì \ç'ì,l ofCfg'P'Ê,lTfCfY B

### vPosition, vVelocity, vOrientFront, , ,æ,Ñ vOrientTop

fŠfXfi [,lÊ'u A'—x A'O•ûCEü,"æ,Ñ ã•ûCEü,»ê,¼,ê,ð<L q,·,é D3DVECTOR \ç'ì B

### flDistanceFactor,flRolloffFactor, , ,æ,ÑflDopplerFactor

,»ê,¼,êCE» 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 \‘ì,ìf ofCf g’P’È,ìTfCfY B

### dwFlags

fofbftf@ EfIfufWfFfNfg”\—Í,ðŽw’è,·,étf%oF B

### DSBCAPS\_CTRL3D

fofbftf@,Í,R,c §Eä,ðŽg—p,·,éfvf%oCf}fŠ Efofbftf@,Á,·é B

### DSBCAPS\_CTRLFREQUENCY

fofbftf@,ÍŽü”g ” §Eä”\—Í,ðŽ ,½,È,,Ä,Í,È,ç,È,ç B

### DSBCAPS\_CTRLPAN

fofbftf@,Ífpf“ §Eä”\—Í,ðŽ ,½,È,,Ä,Í,È,ç,È,ç B

### DSBCAPS\_CTRLVOLUME

fofbftf@,Íf{fŠf... [f€ §Eä”\—Í,ðŽ ,½,È,,Ä,Í,È,ç,È,ç B

### DSBCAPS\_GETCURRENTPOSITION2

#### **IDirectSoundBuffer::GetCurrentPosition**

,ª Ä ¶fJ [f\fc,Ì V,µ,¢“® ì,ðŽg—p,·,é,×,«,Ä,·é,±,Æ,ðŽ,ì,· B DirectX  
,P,ÌDirectSound,Ä,Í A ‘,«,±  
,ÝfJ [f\fc,ì¼Eä,É,·Ä,½ Ä ¶fJ [f\fc,ÍfTfEf“fh EfJ [fh,ªfGf~f...  
fCE [fg,µ,½%o¹,Í AŽÄ Û,ì%o¹,æ,è,à Û—§,Ä,Ä i,ñ,Ä,ç  
,½ BCE» Ý,Ä,Í  
DSBCAPS\_GETCURRENTPOSITION2ftf%oF,ªŽw’è,³,é,è,Í AfAfvfŠfP  
[fVf‡f“,É,æ,é,æ,è ³Sm,È Ä ¶“È’u,ÌŽæ“¾,ª%oÄ”,É,È,Ä,½ B,±  
,ìftf%oF,ªŽw’è,³,é,È,ç ó’Ö,Ä,·é,ì%oß,ç,ì“® ì,ªEÝŠ· «,ì,½,ß,É~ÛŽ ,  
³,é,Ä,ç,é B,±,Ìftf%oF,ª%oç,ç,ð—  
^,ì,é,ì,ÍfTfEf“fh EfJ [fh EfGf~f...fCE [fg,Ö,ì,Ý,Ä,·é,±  
,Æ,É’ ^Ó,·,é,±,Æ B,à,µ DirectSound  
fhf%oCfo,ª,·é,Í ADirectX,ì,·ç,ä,éfo [fWf‡f“,ÌDirectSound,Ä,ì Ä ¶  
fJ [f\fc,Í ³Sm,É,È,é B

### DSBCAPS\_GLOBALFOCUS

fofbftf@,ÍfOf [fofç,ÈfTfEf“fh Efofbftf@,Ä,·é B,±  
,ìftf%oF,ðfZfbfg,·,é,±  
,Æ,É,æ,è A,à,µf† [fU,ª¼,ìfAfvfŠfP [fVf‡f“,ÉftfH [fJfX,ð Ø,è’  
Ö,ì,½,è A V,µ,çfAfvfŠfP [fVf‡f“,ªDirectSound,ðŽg,ª è ‡ A  
DirectSound,ðŽg,Ä,Ä,ç,éfAfvfŠfP [fVf‡f“,ì,»,ìf ofbftf@,ð Ä ¶,µ‘±  
,-,é,±,Æ,ª,«,é B,µ,©,µ AftfH [fJfX,ð DSSCL\_EXCLUSIVE ,·é,ç,Í  
DSSCL\_WRITEPRIMARYftf%oF,ìç²fCEfxfç,ðŽg,ªDirectSound  
fAfvfŠfP [fVf‡f“,É Ø,è’Ö,ì,½ è ‡,Í—áŠO,Ä,·é B,±  
,ì è ‡ A¼,ìfAfvfŠfP [fVf‡f“,©,ç,ìfOf [fofç,È%o¹,Í·,±,ì,È,-  
,È,é B

### DSBCAPS\_LOCHARDWARE

DSBCAPS\_STATIC,ªŽw’è,³,é,È,,Ä,à Af ofbftf@,Íç-  
§“I,Éfn [fhfEfFfA Ef~fLfVf“fo,ðŽg—p,·,é B  
,à,µff ofCfX,ªfn [fhfEfFfA Ef~fLfVf“fo,ðfTf] [fg,µ,Ä,ç,È,ç  
,© A,·é,ç,Í·K—v,Æ,³,é,éfn [fhfEfFfA Ef f,š,ª—p·s%oÄ”\  
,È è ‡,Í A **IDirectSound::CreateSoundBuffer**,ìEÄ,Ñ o,µ,ÍŽ,“s,·,é B  
fAfvfŠfP [fVf‡f“,Íf~fLfVf“fo Ef ffflfc,ª,±,ìf ofbftf@,ì,½,ß,È—  
—p%oÄ”,Ä,·é,±,Æ,ð·Û Ø,·,é·K—v,ª,·é B

**DSBCAPS\_LOCSOFTWARE**

DSBCAPS\_STATIC ,áŽw'è,³,èfn [fhfEfffA EfŠf\ [fX,ª—~p%Ō" \
,Á, ,Á,Á,à Afobftf@,Í,-
§"I,Éf\ftfgfEfffA Ef f,fŠ,ÉŠi"[,³,è Af\ftfgfEfffA Ef~fLfvf"f
O,ðŽg—p,·,é B

**DSBCAPS\_PRIMARYBUFFER**

fobftf@,ªfvf%ofCf}fŠ EftfEf"fh Efofbftf@,Á, ,é,±,Æ,ð\,· B
,à,µ,±,Í¹,ªŽw'è,³,è,È,¢
,È,ç AfZfJf"f fŠ EftfEf"fh Efofbftf@,ª ì,ç,è,é B

**DSBCAPS\_STATIC**

fobftf@,ªfXf^fefBfbfN EftfEf"fh Eff [f^,Ì,½,ß,ÉŽg,í,è,é,±,Æ,ð\
,· B "è"È,È,±
,è,ç,Ìfobftf@,Í,P"x [fh,³,è,Ä A,»,µ,Ä%½"x,à Ä ¶,³,è,é B ,±
,è,ç,Ìfobftf@,Ífn [fhfEfffA Ef f,fŠ,ð—v< ,·,é B

**DSBCAPS\_STICKYFOCUS**

fTfEf"fh Efofbftf@,ÌftfH [fJfX,Ì"® ì,ð·Í,ì,é B ,±
,Ìftf%ofO,ÍDirectSound::CreateSoundBuffer,ÌEÄ,Ñ o,µ,ÁŽw'è,·,é,±
,Æ,ª,Á,«,é B ,±
,Ìftf%ofO,ªfZfbfg,³,è,é,Æ A,à,µf† [fU,ª¼,ÌDirectSound ,ðŽg,Á,Ä,¢
,È,¢fAfvfŠfP [fvf‡f" ,É Ø,è'Ö,ì,Á,à A DirectSound ,ðŽg,Á,Ä,¢
,éfAfvfŠfP [fvf‡f" ,Í,» ,ÌfXfefBfbfL [ EftfH [fJfX Efofbftf@,Á
Ä ¶,µ'±, ,é,±,Æ,ª,Á,«,é B ,±
,Ì ó'Ö,ÁfAfvfŠfP [fvf‡f" ,Ì·W €fobftf@,Í Á%¹,³,è,é,ª AfXfefBf
bfl [ EftfH [fJfX Efofbftf@,Í-Á,è±
, ,é B,½,Æ,ì,Ìf† [fU,ªf [fh , ,é,¢
,ÌfGfNfZf<,Áf^fCfv,·,éŠÖ,ÉftfEf"fhfgf%ofbfn,ð·, ,æ,µ
,ÈŽŽ AfQ [f€"ÈŠÖ,ÌfAfvfŠfP [fvf‡f" A,½,Æ,ì,Ì%of%æ Ä ¶
(ActiveMovie™),È,Ç,Á-ð-§,Á B,µ,©,µ Af† [fU,ª,à,µ¼,Ì
DirectSound fAfvfŠfP [fvf‡f" ,É Ø,è'Ö,ì,è,È,ç A·W €
,ÆfXfefBfbfL [ EftfH [fJfX—
¼·ù,ÌftfEf"fh Efofbftf@,ª,·,x,Ä Á%¹,³,è,é B

**dwBufferBytes**

,±,Ìfobftf@,ÌfofCfg'P^È,ÌftfCfY B

**dwUnlockTransferRate**

ÍDirectSoundBuffer::Unlock,ªEÄ,Ñ o,³,è,½,Æ,« ,Éfobftf@ Ef f,fŠ,Éff [f^,ª" —,³,è,éfE [fg,ð A,P·b-
^,ÌkofCfg,ÁŽw'è,·,é BfnfCfpftfH [f}f"X,ÉfAfvfŠfP [fvf‡f" ,ª ÍDirectSoundBuffer::Unlock,ðŽÄ s,·,é,½,ß,È
—v,·,éŽžŠÖ,ðE"è,·,é,Ì,É A,±,Í¹,ðŽg,µ,±,Æ,ª,Á,« ,é B fvfXfef€f f,fŠ,É"z'u,³,è,Ä,¢
,éf\ftfgfEfffA Efofbftf@,Ì,½,ß,ÌfE [fg,Í A ^— ,ªs—v,È,Ì,Á"ñ í,É , ,¢ B
fn [fhfEfffA Efofbftf@,Ì,½,ß,ÌfE [fg,Í Afobftf@,ªTfEf"fh EfJ [fh,Éf [fh,³,è,é%Ō" \ «,ª , ,é,½,ß A,
æ,è'x, ,È,é%Ō" \ «,ª , ,é B,»,µ,Á" '—'—x,ªEÄ'è,³,è,é è ‡,ª , ,é B

**dwPlayCpuOverhead**

,±,ÌftfEf"fh Efofbftf@,ðf~fLfvf"fo,·,é,Ì,É·K—v,ÈfI [fo [fwfbfh,ðŽà,È ^—
ftfCfNf<,Ìfp [fZf"fe [fw,ÁŽw'è,·,é B fn [fhfEfffA Efofbftf@,É,·,¢,Á,Í A,±
,Ìf f"fo,Ìf~fLfvf"fo,ªTfEf"fh EftfofCfX,É,æ,Á,Ä s,ì,è,é,Ì,Á A,O,Á, ,é B f\ftfgfEfffA Efofbftf@,É,·,¢
,Á,Í A,±,Ìf f"fo,Ìfobftf@ EftfH [f}fbfg,ÆfVfXfef€ Efvf fZfbfT,Ì'—x,É'È'¶,³,è,é B

**DSBCAPS \ 'c'ì,Í ÍDirectSound::CreateSoundBuffer f f\fbfh,É"n,³,è,é DSBUFFERDESC \ 'c'ì,É—pŽ—**

,µ,ÁE©,ç,è,é îñ,ðŠÜ,ñ,Á,¢,Á A'Ç%Ō,Ì îñ,ð,¢,·,Á,©Ž ,Á,Á,¢,é B
'Ç%Ō Á îñ,É,Í Afobftf@ ifn [fhfEfffA , ,é,¢,Íf\ftfgfEfffA j,ÌÈ'u,Æ,¢,-
,Á,©,ÌfRfXfg'P^È ifn [fhfEfffA,É'È'u,µ,Á,¢
,é,È,çfobftf@,ðf [fh,·,éŽžŠÖ Af\ftfgfEfffA,Áfobftf@,ª~fLfvf"fo,³,è,é,È,ç Ä ¶,·,é,Æ,« ,Ì ^—
,ÌfI [fo [fwfbfh,ì,æ,µ,È îñ j,ªŠÜ,Ü,è,é B

**DSBCAPS \ 'c'ì,Ì dwFlags f f"fo,ª DSBUFFERDESC \ 'c'ì,É,æ,Á,ÄŽg,í,è,½" ,¶ftf%ofO,ðŠÜ,ñ,Á,¢,é,±**

,Æ,É' ^Ó,·,é,±,Æ B—B'è,Ì'Š'á,Í DSBCAPS \ 'c'ì,É,·,¢,Ä ADSBCAPS\_LOCHARDWARE , ,é,¢,Í
DSBCAPS\_LOCSOFTWARE ftf%ofO,ªfobftf@f f,fŠ,Ì è Š,É,æ,Á,ÁŽw'è,³,è,é,Æ,¢,µ,±,Æ,Á, ,é B
DSBUFFERDESC \ 'c'ì,Á A,±,è,ç,Ìftf%ofO,Ì'Ç'Ö,Á, è A,»,µ,Áfn [fhfEfffA , ,é,¢

,Íf\ftfgfEfFfA,Ö,Ìfobftf@,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,Ì'á Ø,È'Á'¥,ðŽ,· B ,±,Ì \ '¢'Ì,Í IDirectSound::CreateSoundBuffer  
f f\fbfh,É,æ,Á,ÄŽg,í,ê,é B

### dwSize

,±,Ì \ '¢'Ì,Ìf ofCf g'P'È,ÌfTfCfY B

### dwFlags

V,µ,¢ DirectSoundBuffer fIfufWfFfNfg,ð ì,é,æ,«,ÉŠÜ,Þ"–Í,ðŽ–•È,·,é B ^È%°,Ì,Ð,æ,Á, ,é,¢,Í;· " ,ðŽw'è,·,é,± ,æ B

### DSBCAPS\_CTRL3D

f ofbftf@,Í,R,c §Eä,ðŽg,±f v f% ofCf }fŠ E f ofbftf@,Á, ,é B

### DSBCAPS\_CTRLALL

f ofbftf@,Í,·,×,Ä,Ì §Eä"–Í,ðŽ ,½,È,,Ä,Í,È,ç,È,¢ B

### DSBCAPS\_CTRLDEFAULT

f ofbftf@,Íf ftfHf<f g,ÌfRf"fgf [f< EfIfv fVf±f" ,ðŽ ,Á,×,«,Á, ,é  
B ,±,ê,ÍDSBCAPS\_CTRLPAN A  
DSBCAPS\_CTRLVOLUME,·,æ,ÑDSBCAPS\_CTRLFREQUENCYf tf% ofO,  
ðŽw'è,·,é,±,æ,æ"–,¶,Á, ,é B

### DSBCAPS\_CTRLFREQUENCY

f ofbftf@,ÍŽü" g " §Eä"–Í,ðŽ ,½,È,,Ä,Í,È,ç,È,¢ B

### DSBCAPS\_CTRLPAN

f ofbftf@,Íf pf" §Eä"–Í,ðŽ ,½,È,,Ä,Í,È,ç,È,¢ B

### DSBCAPS\_CTRLVOLUME

f ofbftf@,Íf {fŠf... [f€ §Eä"–Í,ðŽ ,½,È,,Ä,Í,È,ç,È,¢ B

### DSBCAPS\_GETCURRENTPOSITION2

#### IDirectSoundBuffer::GetCurrentPosition

,ª Ä ¶fJ [f<f,Ì V,µ,¢ Ý'è,ðŽg–p,·,é,×,«,Á, ,é,±,æ,ðŽ,· B DirectX  
,P,ÌDirectSound,Á,Í A ' ,«,±  
,ÝfJ [f<f,Ì¼Eä,É, ,Á,½ Ä ¶fJ [f<f,ÌfTfEf"fh EfJ [fh,ªfGf~f...  
fE [fg,µ,½%°,Í AŽÄ Ü,Ì%°,æ,è,à Ü–§,Á,Ä i,ñ,Á,¢  
,½ BE» Ý,Á,Í  
DSBCAPS\_GETCURRENTPOSITION2f tf% ofO,ªŽw'è,³,ê AfAf v fŠfP [f  
Vf±f" ,É,æ,é,æ,è ³Sm,È Ä ¶È'u,ÌŽæ"¾,ª%oÄ" ,É,È,Á,½ B ,±  
,Ìf tf% ofO,ªŽw'è,³,ê,È,¢ ó'Ö,Á, ,é,Ì%oß<Ž,Ì® ì,ªEÝŠ: «,Ì,½,ß,É^ÜŽ ,  
³,ê,Á,¢,é B ,±,Ìf tf% ofO,ª%oε<ž,ð–  
^,!,é,Ì,ÌfTfEf"fh EfJ [fh EfGf~f...fE [fg,Ö,ì,Ý,Á, ,é,±  
,æ,É' ^Ó,·,é,±,æ B ,à,µDirectSound  
fhf% ofCfo,ª, ,é,Í ADirectX,Ì, ,ç,ä,éfo [fWf±f" ,ÌDirectSound,Á,Ì Ä ¶  
fJ [f<f,Í ³Sm,Á, ,é B

### DSBCAPS\_GLOBALFOCUS

f ofbftf@,ÍfOf [f of<,ÉfTfEf"fh E f ofbftf@,Á, ,é B ,±  
,Ìf tf% ofO,ðfZfbfg,·,é,±  
,æ,É,æ,è A,à,µf† [fU,ª¼,Ìf Af v fŠfP [fVf±f" ,Éf tfH [fJfX,ð Ø,è'Ö,!,½,è A  
V,µ,¢ AfAf v fŠfP [fVf±f" ,ªDirectSound,ðŽg,± ê ± A DirectSound ,ðŽg,Á,Á,¢  
,é AfAf v fŠfP [fVf±f" ,Í,» ,Ìf ofbftf@,ð Ä ¶,µ'±, ,é,±,æ,ª,Á,« ,é B  
,µ,©,µ Af tfH [fJfX,ð DSSCL\_EXCLUSIVE , ,é,¢,Í  
DSSCL\_WRITEPRIMARYf tf% ofO,Ì<'²fE fxf<,ðŽg,±DirectSound  
f AfAf v fŠfP [fVf±f" ,É Ø,è'Ö,!,½ ê ±,Í–áŠO,Á, ,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,è,È,,Ä,à Afobftf@,Í-  
§“I,Éfn [fhfEfffA Ef~fLfvf“fO,ðŽg—p,·,é B  
à,µfffofCfX,ªfn [fhfEfffA Ef~fLfvf“fO,ðfTf [fg,µ,Ä,ç,È,ç,© A, ,é,ç  
,Í·K—v,Æ,³,è,éfn [fhfEfffA Ef f,fŠ,ª—~p·s%oÄ”\,È ê ±,Í A  
**IDirectSound::CreateSoundBuffer** ,ÌEÄ,Ñ o,µ,ÌŽ,”s,·,é B  
fAfvfŠfP [fvf±f“,Ìf~fLfvf“fO Efffllf,ª,±,Ìfobftf@,Ì,½,ß,É—~p%oÄ”\  
,Ä, ,é,±,Æ,ð·Û Ø,·,é·K—v,ª, ,é B

**DSBCAPS\_LOCSOFTWARE**

DSBCAPS\_STATIC ,ªŽw'è,³,èfn [fhfEfffA EfŠf\ [fX,ª—~p%oÄ”\  
,Ä, ,Ä,Ä,à Afobftf@,Í-  
§“I,ÉftfEfffA Ef f,fŠ,ÉŠ!“[,³,è Af\ftfgfEfffA Ef~fLfvf“fO,ðŽg—  
p,·,é B

**DSBCAPS\_PRIMARYBUFFER**

fobftf@,ªfvf%ofCf}fŠ EftfEfh Efofobftf@,Ä, ,é,±,Æ,ð·\,· B ,à,µ,±  
,Ì¹,ªŽw'è,³,è,È,ç,ç AfZfJf“f fŠ EftfEfh Efofobftf@,ª ì,ç,è,é B

**DSBCAPS\_STATIC**

fobftf@,ªfXf^fefBfbfN EftfEfh Eft [f^,Ì,½,ß,ÉŽg,í,è,é,±,Æ,ð·\,· B  
~è”È,É,±,è,ç,Ìfobftf@,Í,P“xf [fh,³,è,Ä A,»µ,Ä%o½“x,à Ä ¶,³,è,é B ,±  
,è,ç,Ìfobftf@,Ífn [fhfEfffA Ef f,fŠ,ð—v< ,·,é B

**DSBCAPS\_STICKYFOCUS**

fTfEfh Efofobftf@,ÌftfH [fJfX,Ì“@ ì,ð·Ì,·,é B ,±  
,Ìftf%oF,ª**IDirectSound::CreateSoundBuffer** ,ÌEÄ,Ñ o,µ,ÄŽw'è,·,é,±  
,Æ,ª,Ä,«„é B ,±,Ìftf%oF,ªfZfbfg,³,è,è,Æ A,à,µf† [fU,ª¼,ÌDirectSound  
,ðŽg,Ä,Ä,ç,È,çfAfvfŠfP [fvf±f“,É Ø,è“Ö,·,Ä,à A DirectSound ,ðŽg,Ä,Ä,ç  
,é fAfvfŠfP [fvf±f“,Í,»ÌfXfefBfbfL [ EftfH [fJfX Efofobftf@,Ä Ä ¶,µ'  
±,·,é,±,Æ,ª,Ä,«„é B ,±  
,Ì ó·Ö,ÄfAfvfŠfP [fvf±f“,Ì·W €fobftf@,Í Ä%o¹,³,è,é,ª AfXfefBfbfL [ EftfH [fJfX Efofobftf@,Í-Ä,è,±,·,é B,½,Æ,·,Ìf† [fU,ªf [fh , ,é,ç  
,ÌfGfNfZf,·,Äf^fCfv,·,éŠÖ,ÉfTfEfhfhfgf%ofbfn,ð·,·,æ,µ  
,ÉŽŽ Afq [f€ÈŠÖ,ÌfAfvfŠfP [fvf±f“ A,½,Æ,·,Ì%of%oæ Ä ¶  
(ActiveMovie™),È,ç,Ä—§,Ä B,µ,©,µ Af† [fU,ª,à,µ¼,Ì DirectSound  
fAfvfŠfP [fvf±f“,É Ø,è“Ö,·,é,È,ç A·W €,ÆfXfefBfbfL [ EftfH [fJfX—  
¼·û,ÌfTfEfh Efofobftf@,ª,·,×,Ä Ä%o¹,³,è,é B

**dwBufferBytes**

,±,Ìfobftf@,ÌfofCf'PÈ,ÌTfCfY B,±,Ì¹,Ìfvf%ofCf}fŠ Efofobftf@,ð ì,é,Æ,«Í,O,Ä,È,·,è,Ì,È,ç,È,ç B

**dwReserved**

,±,Ìf f“fo,Í—\—ñ,³,è,Ä,ç,é B Žg—p,Ä,«„È,ç B

**lpwfxFormat**

fobftf@,Ì,½,ß,ÉwaweftfH [f}fbfg,ðŽw'è,µ,Ä,ç,é \“ç“Ì,Ö,Ìf|fCf“f^ B ,±,Ì¹,Ìfvf%ofCf}  
fŠ Efofobftf@,È,çNULL,Ä,È,·,è,Ì,È,ç,È,ç B fAfvfŠfP [fvf±f“,Ìfvf%ofCf}fŠ Efofobftf@,ÌftfH [f}  
fbfg,ðfZfbfg,·,é,½,ß,È **IDirectSoundBuffer::SetFormat** ,ðŽg,µ,±,Æ,ª,Ä,«„é B

**dwFlags** f f“fo,ÄŽg,í,è,é DSBCAPS\_LOCHARDWARE ,Æ DSBCAPS\_LOCSOFTWARE

ftf%oF,ÌfIfvfvf±f“,Ä, ,è A,»µ,Ä·ŠEÝ,É”r¼“L,Ä, ,é B DSBCAPS\_LOCHARDWARE  
,Ìfobftf@,ðfTfEfh EftfEfh [fh,Ìf f,fŠ,É”z'u,·,é B DSBCAPS\_LOCSOFTWARE ,Í%oÄ”\  
,Ä, ,é,È,ç Afobftf@,ðf fCf“fvfXfefE Ef f,fŠ,É”z'u,·,é B

,±,è,ç,Ìftf%oF,ª **DSBCAPS** \“ç“Ì,Ì **dwFlags** f f“fo,Ä,àŽg,í,è,é B,»±,Ä,Í AŽw'è,³,è,½ftf%oF,ª DirectSoundBuffer  
fIfufWfFfNfg,ÌŽÄ Û,Ì ê Š,ðŽ,· B

fvf%ofCf}fŠ Efofobftf@,ð ì,é,Æ,« AfAfvfŠfP [fvf±f“,Ä,Í **dwBufferBytes** f f“fo,ð,O,ÉfZfbfg,·,é B  
DirectSound ,ÌŽg—

p†,Ì“Á”è,ÉfTfEfh EftfEfh [fh,Ä, ,é,Ì,Ä Ä“K,Èfobftf@,Ì“à,«³,ðCE”è,·,é B ì -³,è,½fvf%ofCf}  
fŠ Efofobftf@,Ì“à,«³,ðŽæ“¾,·,é,É,Í A **IDirectSoundBuffer::GetCaps**,ðEÄ,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\b\fh,É,æ,Á,ÄŽg—p,³,ê,é DirectSound fffofCfX,Ì”—Í,ðŽw’è,.,é B*

### dwSize

*,±,Ì \‘c’ì,Ìf ofCf g’P’Ê,ÌfTfCfY B*

### dwFlags

*ffofCfX,Ì”—Í,ðŽw’è,.,é B ^È%°,Ì,Ð,Æ,Â, ,é,¢,Í•j ”,²Žw’è,Â,«é B*

DSCAPS\_CERTIFIED

*,±,Ìfh%ofCfo,ÍMicrosoft,É,æ,Á,ÄŽŽE±,³,ê•Û Ø,³,ê,Ä,¢,é B*

### DSCAPS\_CONTINUOUSRATE

*ffofCfX,ÍdwMinSecondarySampleRate*

*,ÆdwMaxSecondarySampleRate*

*f f“fo’l,ÌŠÔ,Â,.,x,Ä,ÌfTf“fvfŠf“fOfEfl [fg,ðfTf] [fg,.,é B  
^è”É,É,±,ê,ÍŽÀ Û,Ì o—ÍfE [fg,ª—v< ,.,éŽü”g ”,Ì { ^ |  
,P,Ofwf<fc i Hz j ,Ì†,Â, ,é,±,Æ,ðÓ—j,.,é B*

### DSCAPS\_EMULDRIVER

*ffofCfX,É,ÍfCf“fXfg [f<,³,ê,½DirectSound*

*fh%ofCfo,Í,È,¢ B,»,ê,ÍfE fF [fuf tH [f€ EfI [ffBfI<@”\*

*,ð’É,µ,ÄGf~f...fE [fg,³,ê,Ä,¢,é B ŽÀ s”\—Í,Ì’á%°,ª—\z,³,ê,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,ÍfXfefEflfvf%ofCf}fŠ Efofbftf@,ðfTf] [fg,.,é B*

### DSCAPS\_SECONDARY16BIT

fffofCfX,Í16frfbfgfTf“fvfŠf“fO,Åfn [fhEfFfA Ef~fLfvf“fO E  
fZJf“f fŠ EfTfEf“fh Efofbtf@,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%ofZfJf“f\_fŠ EfTfEf“fh  
,ðfTf| [fg,·,é B

**DSCAPS\_SECONDARYSTEREO**

fffofCfX,Ífn [fhEfFfA Ef~fLfvf“fO EfXfefŒfI EfZfJf“f\_fŠ  
EfTfEf“fh,ðfTf| [fg,·,é B

**dwMinSecondarySampleRate** ,·,æ,Ñ **dwMaxSecondarySampleRate**

,±,ÌfffofCfX,Ìfn [fhEfFfA EfZfJf“f\_fŠ Efofbtf@,ÅfTf|  
[fg,³,è,é Å’á E Å ,,ÌfTf“fvfŠf“fOfŒ [fg,ðŽw’è B

**dwPrimaryBuffers**

fTf| [fg,³,è,éfvf%ofCf}fŠ Efofbtf@,Ì ” B ;%õñ,ÌfŠfŠ [fX,Å,Í,P,Å, ,é B

**dwMaxHwMixingAllBuffers**

fn [fhEfFfA,Åf~fLfvf“fO,Å,«,éfofbtf@,Ì ±Ev,Ì ”,ðŽw’è,·,é B ,±,Ìf f“fo,Í **dwMaxHwMixingStaticBuffers**  
,Æ **dwMaxHwMixingStreamingBuffers**,Ì ±Ev,æ,è ,È,Œ B fŠf\ [fX,ÌfgfŒ [fhfIf,³,µ,Í,µ,Î” ¶,·,é B

**dwMaxHwMixingStaticBuffers**

fXf^fefBfbfN EfTfEf“fh Efofbtf@,Ì Å’á ”,ðŽw’è,·,é B

**dwMaxHwMixingStreamingBuffers**

fXfgfŠ [fE EfTfEf“fh Efofbtf@,Ì Å’á ”,ðŽw’è,·,é B

**dwFreeHwMixingAllBuffers**, **dwFreeHwMixingStaticBuffers**, ,·,æ,Ñ **dwFreeHwMixingStreamingBuffers**

Š,,,è“-,Å,ç,è,Å,c,È,ŒffofCfX,Ì Afn [fhEfFfA Ef~fLfvf“fO”-Í,Ì Ý’è B  
fAvfŠfP [fvf±f“ ,Í Afn [fhEfFfA EfŠf\ [fX,³fZfJf“f\_fŠ EfTfEf“fh Efofbtf@,ÌŠ,,,è“-,Å,Ì,½,ß,É~  
p%oÅ”\,Å, ,é,Œ,Œ,»”»f, ,é,½,ß,É A,±,è,ç,Ì’l,ðŽg,µ,±,Æ,³,Å,«,é B “-¶,·,±,è,ç,Ì’l,ð Å’á,Ìf~fLfvf“fO”-  
Í,ðŽw’è, ,é f f“fo,Æ”ãŠr,·,è,Í A,·,Å,ÉŠ,,,è“-,Å,ç,è,Å,c,éŠf\ [fX,ð“Á’è,·,é,±,Æ,³,Å,«,é B

**dwMaxHw3DAllBuffers**, **dwMaxHw3DStaticBuffers**, ,·,æ,Ñ **dwMaxHw3DStreamingBuffers**

fffofCfX,Ífn [fhEfFfA,R,c’èÈ”-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,c,È,ŒffofCfX,Ì Afn [fhEfFfA,R,c’èÈŒ”B”-Í,ÌL q B,±,è,ç,Í,·,×,Å Å %o  
,ÌfŠfŠ [fX,Ì,½,ß,O,Å, ,é B

**dwTotalHwMemBytes**

fXf^fefBfbfN EfTfEf“fh Efofbtf@,ðŠi”[·,éTfEf“fh EfJ [fh ã,Ìf f,fŠ-e-È,ÌfofCf’P’È,ÌfTfCfY B

**dwFreeHwMemBytes**

fTfEf“fh EfJ [fh ã,ÌfTfŠ [f f,fŠ,ÌfofCf’P’È,ÌfTfCfY B

**dwMaxContigFreeHwMemBytes**

fTfEf“fh EfJ [fh ã,ÌfTfŠ [f f,fŠ,Å A Å,à,«,Œ“A±fuf fbfn,ÌfofCf’P’È,ÌfTfCfY B

**dwUnlockTransferRateHwBuffers**

fn [fhEfFfAfXf^fefBfbfN EfTfEf“fh Efofbtf@ iflf“f\ [fhTfEf“fh f,fŠ,É”z’u,³,è,Å,Œ  
,é j,Éff [f^,“”’-³,è,éŒŒ [fg,ð,P·b-^,Ìk

fofCf’g,ÅL q,·,é B,±,ÌfŒ [fg,ÆfofCf’g,Å,Ì”’-—È,Í

**IDirectSoundBuffer::Unlock** f\fbfhŒ,Ñ o,µ,ÌEp±ŽŽŠÔ,ðŒ”è,·,é B

**dwPlayCpuOverheadSwBuffers**

f\ftfgfEfFfA Efofbtf@ if fCf“fvfXfefŒf f,fŠ,É”z’u,µ,Å,c,é j,ðf~fLfvf“fO,·,é,½,ß,É·K—  
v,È ACPU,Ìp [fZf“fe [fW,Ì ^—fi [fo [fwfbfh,Ì’l B,±  
,è,ÌfofXf^fCfv Afvf fZfbfTf^fCfv,·,æ,ÑfNf fbfn’-“x,ÉÈ¶,µ,Å·%o»,·,é B

f fbfn,³,è,Å,Œ,Œ,Œf\ftfgfEfFfA Efofbtf@,Ì”’-fŒ [fg,Í Af [f^,ð,Œ,±,É,à”’-—,·,é·K—v,³,è,ç,½,ß,O,Å, ,é  
B “-—,Éfn [fhEfFfAfofbtf@,Ì Å ¶fI [fo [fwfbfh,Í Af~fLfvf“fO,³fTfEf“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,c,é B Žg—p,Å,«,È,Œ B

**ŽQ Æ @IDirectSound::GetCaps**

•Ô¹

fGf%o [,Í•%o ”¹,Á•³,ê'g,Ý ‡,í,³,ê,é,±,Æ,Í,È,¢ B,±,ì\,Í A,·,×,Ä,ìIDirectSound ,Æ IDirectSoundBuffer  
f f\fbfh,É,æ,è•Ô,³,ê,é'l,Íê——,Á, ,é BCEÄ X,ìf f\fbfh,ì•Ô,·fGf%o [fR [fh,ìfŠfXfg,É,Á,¢  
,Ä,Í A,»,ìf f\fbfh,ìL q,ðŽQ Æ,·,é,±,Æ B

DS\_OK

—v< ,Í ¬CE÷,μŠ@—¹,μ,½ B

DSERR\_ALLOCATED

—v< ,Í—D æfCEfxf<,ì,æ,²,ÈfŠf\ [fX,ª¼,ìCEÄ,Ñ o,μ,É,æ,Á,Ä,·,Á,ÉŽg  
—p'†,Á, ,é,½,βŽ, ”s,μ,½ B

DSERR\_ALREADYINITIALIZED

fIfufWfFfNfg,Í,·,Á,É %oŠú%o»,³,ê,Ä,¢,é B

DSERR\_BADFORMAT

Žw'è,³,ê,½wave,ÍfTf| [fg,³,ê,È,¢ B

DSERR\_BUFFERLOST

fOfbftf@f f,fŠ,ªŽ, ,í,ê,½,½,β AfŠfXfgfA,μ,È,¯,ê,Í,È,ç,È,¢ B

DSERR\_CONTROLUNAVAIL

CEÄ,Ñ o,μ,É,æ,Á,Ä—v< ,·,é §CEä if{fŠf... [f€ Afpf“,È,ç j,Í—~—  
p%oÄ”\,Á,Í,È,¢ B

DSERR\_GENERIC

—cŠm'è,ÈfGf%o [,ª DirectSound fTfufVfXfef€,ì'†,Á<N,±,Á,½ B

DSERR\_INVALIDCALL

,±,ìŠÖ ”,ì,±,ìfIfufWfFfNfg,ìCE» Ý,ì ó'Ô,É,¬,¢,Ä—LCEø,Á,Í,È,¢ B

DSERR\_INVALIDPARAM

—³CEø,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,Á,«,È,¢ B

DSERR\_OTHERAPPHASPRIO

,±,ì'l,Í%oβ<Ž,ì,à,ì,Á, ,èŽg—p,³,ê,È,¢ B

DSERR\_OUTOFMEMORY

DirectSound fTfufVfXfef€,ÍCEÄ,Ñ o,μ,ì—v< ,ðŠ@—  
¹,·,é,½,β,É \ª,Èf f,fŠ,ðŠ,,è“—,Ä,é,±,Æ,ª,Á,«,È,©,Á,½ B

DSERR\_PRIOLEVELNEEDED

CEÄ,Ñ o,μ,ÍŠÖ ”,ª ¬CE÷,·,é,½,β,É•K—v,Æ,·,é—D æfCEfxf<,ðŽ ,Á,Ä,¢  
,È,¢ B

DSERR\_UNINITIALIZED

¼,ìf f\fbfh,ªCEÄ,Ñ o,³,ê,é'Ô,ÉIDirectSound::Initialize  
f f\fbfh,ªCEÄ,Ñ o,³,ê,È,©,Á,½,© A, ,é,¢  
,ÍCEÄ,Ñ o,μ,ª ¬CE÷,μ,È,©,Á,½ B

DSERR\_UNSUPPORTED

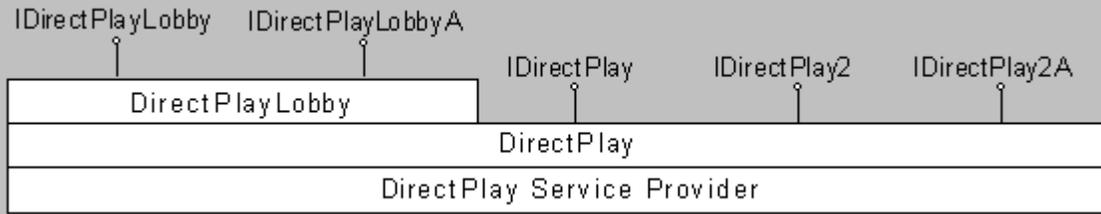
CEÄ,Ñ o,μ,½ŠÖ ”,ì,±,±,Á,ÍfTf| [fg,³,ê,Ä,¢,È,¢ B

**DirectPlay,É,Á,č,Ä**

Microsoft Windows®IfyfE [fefBf“fO EfVfXfef€—p,ÌMicrosoft®  
DirectPlay®fAfvfŠfP [fVf‡f“ Efvf fOf%of~f“fO EfCf“f^ [ftfFfCfX (API)  
,Í AfAfvfŠfP [fVf‡f“,©,ç,ÌÈ MfT [frfX,Ö,ÌfAfNfZfX,ð’P f%»,.é\ftfgfEfFfA EfCf“f^ [ftfFfCfX,Á, ,é  
BDirectPlay,Í Afgf%of“fXf] [fg,âfvf fgfRf< A, ,é,č,ÍfIf“f%ofCf“ EfT [frfX,É`È`¶,µ,È,č`È M•û–  
@,ð AfAfvfŠfP [fVf‡f“,¾,Ä,È, Af fr [ EfT [fo [,É,à`ñ<ÿ,.éfefNfmf fW,Æ,È,Á,Ä,č,é B  
fŠfAf< EfvfEfCf,,½,ç,ªÎ í,·,é,æ,ª,ÈfAfvfŠfP [fVf‡f“ i“Á,ÉfQ [f€ j,Í A,à,Á,Æ<»–j,ð,»,»,é,à,Ì,Á, ,Á,Ä,č  
,č Bfp [f\if< EfRf“fsf... [f^,Í A%ß<Ž,Ì,Ç,ñ,ÈfQ [f€,Ìfvf%ofbfgftfH [f€,æ,è,à—  
D,è,½ Ú‘±fIfvfVf‡f“,ðŽ ,Á,Ä,č,é,Ì,Á, ,é BDirectPlay,Í A,±,è,ç,ÌŠe Ú‘±•û–@,Ì’á,č,É’Î ^,·,é•K—  
v «,ðŽæ,è œ,« A–¾Šm,È`è`È%»³,è,½’È M<@”\,ð’ñ<ÿ,·,é B DirectPlay ,ð—p,č,è,Í A’½—l,È Ú‘±•û–  
@,ðfCf“fvfŠf f“fg,·,é Û,Ì;ŽG,³,ð<C,É,1, A—D,è,½fAfvfŠfP [fVf‡f“,ð ì,è o,·,±,Æ,É’S—Í,ð’ ,@,±  
,Æ,ª,Á,«,é B

## DirectPlayA [fLfefNf`ff

DirectPlay,Í A'P f,È'—Žó M'Ê Mf,ff<,đŽg—p,μ,Ä Af}f<f`fvfEfCf,, E fAfvfŠfP [fVf#f“,ì—  
v< ,É'Î%ž,μ,½ Ú'±API,đfCf“fvfŠf f“fg,μ,Ä,c  
,é BDirectPlayfA [fLfefNf`ff,Í ADirectPlayLobby ADirectPlay ADirectPlayT [frfX Efvf fofCf\_,ì,R,Ä,ìfRf“f|  
[flf“fg,©,ç \ -,³,ê,é BŽŸ,Ì } ,Í A,±,ê,ç,ìfRf“f|  
[flf“fg,Æ A,»,ê,É'Î%ž,·,éfCf“f^ [ftfFfCfX,Æ,ìŠÖEW,đŽ',μ,Ä,c,é B



,±,ìfZfNfVf#f“,Ä,Í A,±,ê,ç,ìfRf“f| [flf“fg,É,Ä,c,Ä,Îê”Ê“I,È îñ,đ à-¾,·,é B

DirectPlayRf“f| [flf“fg

DirectPlayLobbyRf“f| [flf“fg

fT [frfX Efvf fofCf\_

**DirectPlayRf“f| [flf“fg**

DirectPlay,ÍMicrosoft,É,æ,Á,Ä`ñ<ÿ,³,ê AfAvfšfP [fVf‡f“,ì<“ÊfCf“f^ [ftFfCfX,ðŒöšJ,·,é B  
DirectPlayfCf“f^ [ftFfCfX,Í A·;ŽG,³,â A”CÓ,Ì’Ê Mfšf“fN,ðšm—š,·,é,½,ß,É·K—  
v,È“ÁŽê,Èf^fXfN,ð ADirectPlayfT [frfX Efvf fofCf\_,Ì“à”,É%b·Á,·,é B DirectPlay,ð—~—  
p,·,éfAvfšfP [fVf‡f“,Í A’Ê M”}Ì,ÌfpftfH [f}f“fX,Ì,Ý,ð”z—¶,·,ê,Í,æ, A,»,}’Ì,ð’ñ<ÿ,·,éf,ffŒ  
,âflfbfgf [fN A,·,é,c,Íflf“f%ofCf“ Eft [frfX,É,Á,c,Á<C,É,·,é·K—v,Í,È,c B

DirectPlay,Í Af† [fU,ÌfVfXfefŒ ã,ÉfCf“fXfg [f<,³,ê,½,Ç,ñ,È  
DirectPlayfT [frfX Efvf fofCf\_,É,à“@“Í,ÉŒ< ‡,·,é BfAvfšfP [fVf‡f“,Í ADirectPlayIfufWfFfNfg,ÆŒÉY,Œ  
,ÉfAfNfZfX,·,é B DirectPlayIfufWfFfNfg,Í AŽg—p%oÁ””,ÈDirectPlayfT [frfX Efvf fofCf\_,Ì,Đ,Æ,Á,ÆŒÉY,Œ  
,É’È M,µ A’I’ð,³,ê,½fT [frfX Efvf fofCf\_,Í Afgf%of“fXf| [fg,âfvf fgRf<,Æ,â,êŽæ,ê,ð,·,é B

DirectPlay API,Í ACOMfCf“f^ [ftFfCfX,ð’È,µ,ÄfAvfšfP [fVf‡f“,ÉŒöšJ,³,ê,Ä,c,é B  
DirectPlayfo [fWf‡f“3,Á,Í AIDirectPlay2,“,æ,NIDirectPlay2A,Ì,Ó,½,Á,ÌfCf“f^ [ftFfCfX,ª—~—  
p,Á,«,é BIDirectPlay2A,ªANSI·¶Žš—ñ,ðŽg,µ,Ì,É’Í,µ AIDirectPlay2,Á,Í A,·,×,Á,ÌDirectPlay \‘Œ’Ì,ÁUnicode·¶Žš—  
ñ,ðŽg,µ B

**IDirectPlayfCf“f^** [ftFfCfX,Í ADirectPlayfo [fWf‡f“1,Æ2,Á ‘,©,ê,½fAvfšfP [fVf‡f“,Æ,Ì%o°ÊŒÉYŠ· «,Ì,½,ß  
,ÉffftfHf<fg,ÌfCf“f^ [ftFfCfX,Æ,µ,Ä—pÓ,³,ê,Ä,“,è AANSI·¶Žš—ñ,Ì,Ý,ðŽg—p,·,é B

fAvfšfP [fVf‡f“,Í,Đ,Æ,Á,ÌDirectPlayIfufWfFfNfg,ÌfCf“fXf^f“fX,ð ì ¬,µ A,½,Æ,ÌfAvfšfP [fVf‡f“,ª; ”,Ì  
fvfŒfCf,,ðšÇ— ,·,é,Æ,µ,Ä,à A,»,ÌflufWfFfNfg,ð’È,µ,Á,·,×,Á,Ì’È M,ðŽÄ s,·,é BfpftfH [f}  
f“fX,ð’ÛŽ ,·,é,½,ß ADirectPlayIfufWfFfNfg,¾,“,ª¼ Ú,“ŒY,Œ  
,Æ’È M,ð s,µ Bf fbZ [fW,ðŽó M,µ,½Œæ ADirectPlayIfufWfFfNfg,Í Af [fJf<,ÈfAvfšfP [fVf‡f“,ª ì  
¬,µ,½,·,×,Á,ÌfvfŒfCf,,Ì,½,ß,É,»,Ìf fbZ [fW,ð ì,à,µ·K—v,È,ç,Í j; »;µ Af fbZ [fW EfLf...  
[,É’Ç%oÁ,·,é B

,±,Ìfo [fWf‡f“,ÌDirectPlay,Í AfsfA Efc [ EfsfA,ÌfQ [fŒ Efpf%of\_fCfŒ,ðfTf| [fg,·,é B  
,Á,Û,è A,·,×,Á,ÌfvfŒfCf,,Í AfZfbfVf‡f“†,Ì¼,Ì,c,©,È,éfvfŒfCf,,É,Á,âf fbZ [fW,ð’— M,·,é,±,Æ,ª,Á,«,é B  
fZfbfVf‡f“ EfzfXfg,Í AfZfbfVf‡f“,É%oÁ,í,é V,µ,ŒRf“fsf...  
[f^,ð’²”â,µ A V,µ,ŒfvfŒfCf,,ÆOf< [fv,ª ì ¬,³,ê,é,Æ,«,ÉID”Ó †,ðš,,è“—,Á,é BšJ”-  
ŽÖ,Í AfNf%ofCfAf“fg ^fT [fo Ef,ff<,ÁfQ [fŒ,ð YŒv,·,é,±  
,Æ,ª,Á,«,é BfNf%ofCfAf“fg ^fT [fo Ef,ff<,Á,Í A,·,×,Á,Ìf fbZ [fW,ªfzfXfg EfRf“fsf...  
[f^ ã,ÌfT [fo EfvfŒfCf,,É’—  
,ç,é,é B,·,é,ÆfT [fo EfvfŒfCf,,Í A“K Ø,ÈfNf%ofCfAf“fg EfvfŒfCf,,Éf fbZ [fW,ð’]‘—,·,é B «—  
^,Ìfo [fWf‡f“,ÌDirectPlay,Á,Í AfAvfšfP [fVf‡f“ Eft [fo,ðfTf| [fg,·,é—’è,Á, é B

**DirectPlayLobbyRf“f| [f|f“fg**

DirectPlayLobby,Í ADirectPlayfAfvfŠfP [fVf‡f“,ÆÊ M,·,é,½,ß,Ì A`è”Ê“I,ÈfJfXf^f€ Ef fr [ EfVfŠf... [fVf‡f“,Á,·,é B`Ê í AfJfXf^f€ Ef fr [ EfVfŠf... [fVf‡f“,Í A%½Ži—

p,©,Ìf fr [ EfNf%ofCfAf“fg Ef\ftfgfEfffA,ðŠÛ,ñ,Á,c

,é Bf fr [ EfNf%ofCfAf“fg Ef\ftfgfEfffA,Íf† [fU,ÌfRf“fsf...

[f^ ã,À“@ i,µ Af fr [ Eft [fo l,Æ’Ê M,·,é Bf† [fU,Í Af fr [ EfNf%ofCfAf“fg,`žÄ‘,µ,Ä,c

,éft [fU EfCf“f^ [ftfFfCfX,É,æ,Á,Ä A`¼,ÌfvfCfCf,,ðCE@,Ä,¯,ÄfQ [f€ EfZfbfVf‡f“,ÈŽQ%Á,·,é,±

,Æ,ª,Ä,«,é BfvfCfCf,, EfOf< [fv,ªfZfbfVf‡f“,ðŠŽn,·,é,±

,Æ,ðCE^,ß,é,Æ Af fr [ EfNf%ofCfAf“fg,Í,»,é,¼,è,ÌfRf“fsf...

[f^ ã,ÄfAfvfŠfP [fVf‡f“,ðŠŽn,µ AfT [frfX EfVf fofCf\_,Ì‘ð,âfZfbfVf‡f“,Æ,Ì Ú±,Ì,½,ß,É•K—

v,È îñ,ð`ñ`ÿ,·,é B DirectPlayLobby APIŠÖ ”,ð’Ê,µ,Ä Ú±,ª,é AŠŽn%Á”\

,Æ,È,Ä,½DirectPlayfAfvfŠfP [fVf‡f“,Í Af fr [%Á”\

,ÆCEÄ,Ì,é,é B,Û,½ ADirectPlayLobby,Í AfZfbfVf‡f“,Ì i s`†,ÉfAfvfŠfP [fVf‡f“,ªf fr [ EfNf%ofCfAf“fg,Æ’

Ê M,µ,½,è AfAfvfŠfP [fVf‡f“,Ì 1—¹,ðf fr [ EfNf%ofCfAf“fg,É’m,ç,¹,é,½,ß,Ìf f\fbfh,ð—p`Ó,µ,Ä,ç,é B

f fr [ EfNf%ofCfAf“fg,Í AIDirectPlayLobby::EnumLocalApplicationsf f\fbfh,ðŽg—p,µ,Ä Af† [fU,ªž ,Á,Ä,c

,éDirectPlayfAfvfŠfP [fVf‡f“,ð”»’è,·,é,±,Æ,ª,Ä,«,é B,Û,½ ADirectPlayEnumerateŠÖ ”,È,æ,Á,ÄŽg—p%Á”\

,ÈfT [frfX EfVf fofCf\_,ð”»’è,·,é,±,Æ,à,Ä,«,é Bf fr [ EfNf%ofCfAf“fg,Í Af† [fU,ªfZfbfVf‡f“,È%Á,í,é,±

,Æ,ðCE^,ß A•K—

v,ÈfAfvfŠfP [fVf‡f“,ÆfT [frfX EfVf fofCf\_,Ì“Ÿ,ðŠm”F,µ,½CEã AIDirectPlayLobby::RunApplicationf f\fb

fh,ð—p,ç,ÄfAfvfŠfP [fVf‡f“,ÌŠŽn,ÆfZfbfVf‡f“,Ö,Ì Ú±,ðŽÄ s,Ä,«,é B,±

,ÌCEÄ,Ñ o,µ,È,æ,Á,Ä Af fr [ EfNf%ofCfAf“fg,Í AŽÄ s,·,éAfAfvfŠfP [fVf‡f“ AŽg—

p,·,éDirectPlayT [frfX EfVf fofCf\_ AfT [frfX EfVf fofCf\_,ªfZfbfVf‡f“,Æ Ú±,·,é,½,ß,É•K—

v,È îñ iIDirectPlayLobby::CreateAddress,·,æ,ÑIDirectPlayLobby::EnumAddress,ðŽg—

p,µ,Ä j Af fr [ŠÄ««,Ä,Ìf† [fU,Ì-¼‘O,ðŽw’è,·,é B

DirectPlayLobby,ÌŽÄ s%Á”\fAfvfŠfP [fVf‡f“,Ì è Š,ð`Á’è,µ A“K Ø,ÈfRf}

f“fhf%ofCf“ EfXfCfbf’,ÄŠŽn,·,é B,ª,ç,É ADirectPlayLobby,Í A,·,x,Ä,ÌfT [frfX EfVf fofCf\_,Æ Ú± îñ,ðŠi

”[l,µ,Ä,·, B

f fr [ EfNf%ofCfAf“fg,ÆfAfvfŠfP [fVf‡f“,Í AIDirectPlayLobby::SendLobbyMessage,ÆIDirectPlayLobby::Rec

eiveLobbyMessagef f\fbfh,ð—p,ç,Ä’Ê M,·,é,±,Æ,ª,Ä,«,é BIDirectPlayLobby::RunApplication

f f\fbfh,È,æ,Á,Äf fbZ [fW,ðŽó M,·,é,Æ Af fr [ EfNf%ofCfAf“fg,Ì”-

¶,·,éCfxf“fg,ðfZfbfGfAfbfv,·,é BfAfvfŠfP [fVf‡f“,©,çCfxf“fg,ðfZfbfGfAfbfv,·,é,È,Í AIDirectPlayLobby::

SetLobbyMessageEvent f f\fbfh,ðŽg—p,·,é B,±,Ìf f\fbfh,ðŽg,µ,±,Æ,È,æ,è Af fr [,ÌfCfxf“fg,ð’Ì X,·,é,±

,Æ,à,Ä,«,é B

fAfvfŠfP [fVf‡f“,ªf fr [%Á”\,Ä,·,é,½,ß,É,Í AIDirectPlayLobbyfCf“f^ [ftfFfCfX,ð ì ¬,·,éK—v,ª,é BfAfvfŠ

fP [fVf‡f“,Í AIDirectPlayLobby::GetConnectionSettingsf f\fbfh,È,æ,Á,Äf fr [ EfNf%ofCfAf“fg,ª

`ñ`ÿ,µ,½ Ú±fppf%of [f^,ð²,x,é,±,Æ,ª,Ä,«,é B,±

,è,ð’Ì X,·,é,È,Í AIDirectPlayLobby::SetConnectionSettingsf f\fbfh,ðŽg—p,·,é B Ú±

,Ì Ýè,ðŽg,Ä,ÄfZfbfVf‡f“,Æ Ú±,·,é,Æ,«,Í AfAfvfŠfP [fVf‡f“,©,çIDirectPlayLobby::Connect,ðCEÄ,Ñ o,· B,±

,ÌŠôf fr [ EfNf%ofCfAf“fg,Í AfAfvfŠfP [fVf‡f“ŠŽnfvf fZfX,ðŽ,·fvfXfef€ Ef fbZ [fW,ðŽó M,·,é B

fvfCfCf,,ª ì ¬,ª,è,é,Æ,« AfAfvfŠfP [fVf‡f“,Í AfvfCfCf,—

¼ff [f^,ð iIDirectPlayLobby::GetConnectionSettings,È,æ,Á,Ä jŽæ“¾,µ A,»,ÌfvfCfCf,,ÈŠ,,è“-,Ä,È,-

,Ä,Ì,È,ç,È,ç BIDirectPlayLobby::ConnectCEÄ,Ñ o,µ,Í i -CE÷,·,è,Ì j A`È%°,ÌCEÄ,Ñ o,µŽè ‡,ð`ä s,·,é B

- 1 **DirectPlayEnumerate** if fr [,ÌfT [frfX EfVf fofCf\_,ðŽw’è,·,é j
- 2 **DirectPlayCreate** iIDirectPlayLobby::Connect,ÍDirectPlayIfufWfFfNfg,ð ì ¬,·,é)
- 3 **IDirectPlay2::EnumSessions** if fr [,ªfZfbfVf‡f“ îñ,ðŽw’è,·,é,½,ß Af† [fU,ª,»,Ì,ð,Ä,Ä,ð’I,Ô•K—
- 4 **IDirectPlay2::Open** ifZfbfVf‡f“,ÍŽ©“@“I,ÈŠŽn,ª,è,é)

**IDirectPlayLobby::GetConnectionSettings**,ªDPERR\_NOTLOBBIEDfGf%o [,ð•Ô,·,Æ,«,Í Af fr [ EfNf%ofCfAf“fg,ª

fAfvfŠfP [fVf‡f“ŠŽnŽŽ,Ì %Šú%» ^— ,ð s,í,È,©,Ä,½,±,Æ,ðŽ,µ,Ä,ç,é B,±

,Ì è ‡ AfAfvfŠfP [fVf‡f“,Í A•W €“I,È DirectPlay,Ì %Šú%»,ðŽÄ s,·,é,x,«,Ä,·,é B

**fT [frfX Efvf fofCf\_**

fT [frfX Efvf fofCf\_,Í ADirectPlay,ì—v< ,É%ž,¶ A”}·ì,É^È“¶,μ,½^Ê MfT [frfX,ð'ñ<ÿ,·,·,é B  
flf“f%ofCf“ Eft [frfX,ðŠÛ,ð,·,×,Ä,Í'g D,Í A ê—pfn [fhfEfffA,â'Ê M”}·ì,½,½,½,ìfT [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\_,ªŠÛ,Û,ê,Ä,¢,é B

**DirectPlay, IŠT—v**

,±,ìfZfNfVf±f“,É,Í ADirectPlayfRf“f| [flf“fg,É,Â,c,Ä,î`ê”Ê“I,È î•ñ,ªŠÜ,Ü,ê,Ä,c,é BŽŸ,ìfgfsfbfN,É,Â,c,Ä à-  
¾,·,é B

fZfbfVf±f“ŠÇ—

fvfÇfCf,ŠÇ—

fOf< [fvŠÇ—

f fbfZ [fWŠÇ—

ff [f^ŠÇ—

fVfXfef€ Ef fbfZ [fW,ìŽq—p

“Šú

DirectPlayfAfhfÇfX

DirectPlayfo [fWf±f“ 3,Å%½,ª V,µ,È,Á,½,©?

**fZfbfVfzf“ŠÇ—**

DirectPlayfZfbfVfzf“Í A,“EY,ç,É’Ê M,µ,Ä,ç,éfŠf, [fg EfRf“fsf... [f^ ã,ì,ç,-  
.Ä,©,ìfAfvfŠfP [fVfzf“,ìfCf“fXf^f“fX,Ä, ,é B  
fAfvfŠfP [fVfzf“,Í A’Ê Mf`ffflf<,ìfi [fvf“,ÆfNf [fY,ì,½,ß,É A DirectPlay ,ìfZfbfVfzf“ŠÇ— <@”\,ðŽg—  
p,·,é BfAfvfŠfP [fVfzf“,Í A V,µ,çfZfbfVfzf“,ð ì ¬,·,é,©Šù“¶,ìfZfbfVfzf“,ð—  
ñ<“,µ,Ä A Ú± æ,ìfZfbfVfzf“,ðE`è,·,é BfZfbfVfzf“,ð ì ¬,·,éfAfvfŠfP [fVfzf“,Í AfzfXfg,Æ,µ,ÄŽQ Æ,³,é,  
é B fzfXfg,ìfvfçfCf,,ID,ÆfOf< [fvID,ðŠ,,è—  
,Ä AfZfbfVfzf“,ÉŽQ%Ä,·,é V,µ,çfAfvfŠfP [fVfzf“,ð’² @,·,é B

fAfvfŠfP [fVfzf“,Í **AIDirectPlay2::EnumSessions** f\fbfh,ð—  
p,ç Af\fbfgf [fN ã,Ä i s’†,ì,·,×,Ä,ìŠù“¶,ìfZfbfVfzf“,ðŽæ“¾,·,é,±  
,Æ,ª,Ä,«,é B V,µ,çfZfbfVfzf“,ð ì ¬,µ,½,è AŠù“¶,ìfZfbfVfzf“,É Ú±,·,é,É,Í A  
**IDirectPlay2::Open** f\fbfh,ðŽg—p,·,é BfZfbfVfzf“,Í’í%ž,·,é **DPSESSIONDESC2** \ç’ì,É,æ,Ä,Ä,³,é,é B,±  
,ì \ç’ì,É,Í AfAfvfŠfP [fVfzf“EÄ—L,ìl,Æ AfZfbfVfzf“,ì-¼’O,âf\fvfVfzf“,ìfpfXf [fh AŽQ%Ä%Ä”\  
,ÈfvfçfCf,,ì ”,Æ,ç,Ä,½ AfZfbfVfzf“,ì“Ä «,ªŠÜ,Û,è,Ä,ç  
,é BfZfbfVfzf“,ðfi [fvf“,µ,½Eä,Í AfAfvfŠfP [fVfzf“,©,ç**IDirectPlay2::GetCaps** f\fbfh,ðEÄ,Ñ o,µ,Ä A’Ê  
M’-“x,â A’¼,ìflfbfgf [fN,âfT [frfX Efvf fofCf\_,ì“Ä «,ðŽæ“¾,·,é,±,Æ,ª,Ä,«,é B

fZfbfVfzf“,ìE» Ý,ì“Ä «,ðŽæ“¾,·,é,É,Í **AIDirectPlay2::GetSessionDesc** f\fbfh,ðŽg—p,·,é B

fZfbfVfzf“,©,ç”², -,È,,Ä,Í,È,ç,È,ç,Æ,«,Í **AIDirectPlay2::Close** f\fbfh,ð—p,ç,é,±  
,Æ,ª,Ä,«,é BfZfbfVfzf“ EfzfXfg,ªfZfbfVfzf“,©,ç”², -,é ê † A,»,ìfZfbfVfzf“,ª**DPSESSIONDESC2** \ç’ì,ÉDPSE  
SSION\_MIGRATEHOSTftf%ofO,ðŽw`è,µ,ÄŠŽn,³,é,½,à,ì,Ä, ,é,ì AfZfbfVfzf“”†,ì¼,ìfvfçfCf,,ì,ð,Æ,Ä,ªfzfXfg,É,  
È,è ADPSYS\_HOSTfVfXfef€ Ef fbZ [fW,“” s,³,é,é B

**fVfCfCf,,ŠC—**

fAfVfŠfP [fVf+f“,Í ADirectPlay,ÍfVfCfCf,,ŠC— f f\fbfh,đŽg—p,µ,Ä AfZfbfVf+f“+ ,ÍfVfCfCf,,đŠC— ,.é,± ,Æ,ª,Ä,«,é BfVfCfCf,,,Ì Ì Ñ,Æ í œ,É%Á,!,Ä AfAfVfŠfP [fVf+f“,Í AfVfCfCf,,,đ— ñ“,µ,½,èfVfCfCf,,,Ì È M^—Í,đŽæ“¾,.,é,±,Æ,ª,Ä,«,é B

**IDirectPlay2::CreatePlayer**,.,æ,Ñ**IDirectPlay2::DestroyPlayer**f f\fbfh,Í AfZfbfVf+f“+ ,ÍfVfCfCf,,,Ì Ì Ñ,.,æ,Ñ í œ,đ s,µ BfVfCfCf,,ª Ì Ñ,³,è,é,Æ AfAfVfŠfP [fVf+f“,ÍfVfCfCf,,,Ì Ñ Ì,Æ ³Ž@¼ Ì A,.,æ,Ñ,¢,- ,Ä,©,Ì %ŠúfŠf, [fg Eff [f^,đŽw’è,.,é,±,Æ,ª,Ä,«,é i Ú ×,É,Ä,¢,Ä,Íff [f^ŠC—,đŽQ Æ j B DirectPlay,ÍfVfCfCf,,ÉfVfCfCf,,ID,đŠ,,è“-.,Ä,é BfAfVfŠfP [fVf+f“,ÆDirectPlay,Í A,±,Ìf+ [fUID,đ—p,¢ ,Äf fbfZ [fW Efg%oftfBfbfN,Ìœo~H,đœ^è,.,é BDirectPlay,ªµ Ì,â ³Ž@¼ Ì,đŽg,µ,±,Æ,Í,È,¢ ,ª AfAfVfŠfP [fVf+f“,Í A,»,è,ç,đ—p,µ,ÄfVfCfCf,,,đŽ•È,.,é,±,Æ,ª,Ä,«,é B

fAfVfŠfP [fVf+f“,Í **AIDirectPlay2::EnumPlayers**f f\fbfh,đŽg—p,µ,Ä ACE» Ý,ÍfZfbfVf+f“,É,¢ ,é,fVfCfCf,,â A,»,Ì Ñ Ì,Æ ³Ž@¼ Ì,đ”»’è,.,é,± ,Æ,ª,Ä,«,é B’È íAfVfŠfP [fVf+f“,Í **AIDirectPlay2::Open**f f\fbfh,É,æ,Ä,ÄfZfbfVf+f“,đŠJŽn,µ,½’¼œã,É,± ,Ìf f\fbfh,đœÄ,Ñ o,· BfZfbfVf+f“à,Ì,·,×,Ä,ÍfVfCfCf,,,đ—ñ“,.,é,É,Í **AIDirectPlay2::EnumPlayers**f f\fbfh,đ— —p,.,é BfZfbfVf+f“,Ö,ÍfVfCfCf,,,Ì Ú’±¬“x,É,Ä,¢,Ä,Ì î•ñ,ªK— v,ÈfAfVfŠfP [fVf+f“,Ä,Í **AIDirectPlay2::GetPlayerCaps**f f\fbfh,đ—p,¢,é,±,Æ,ª,Ä,«,é B

fVfCfCf,,ÉŠÖ~A•t,¬,ç,è,½-¼’O,đ•İ X,.,é,É,Í**IDirectPlay2::SetPlayerName**f f\fbfh,đŽg—p,.,é B,± ,Ìf f\fbfh,Í AfVfCfCf,,,Ì¼’O,ªİ X,³,è,½,±,Æ,đ’È’m,.,é,½,ß A¼,ÍfVfCfCf,,ÖfVfXfef€ Ef fbfZ [fW,đ— M,.,é BŠefVfCfCf,,,Í **ADPMSG SETPLAYERORGROUPNAME** fVfXfef€ Ef fbfZ [fW,©**IDirectPlay2::GetPlayerName**,É,æ,è V,µ,¢¼’O,đŽæ“¾,.,é,±,Æ,ª,Ä,«,é B

fOf< [fvŠÇ—

fAfvfŠfP [fVf‡f“,Í AfOf< [fvŠÇ— f f\fbfh,É,æ,Á,Ä AfZfbfVf‡f“†,ÉfvfŒfCf,,,ÌfOf< [fv,ð ì ¬,·,é,± ,Æ,ª,Á,«,é B**DirectPlay2::Send** f\fbfh,ð1“xŒÄ,Ñ o,·,Æ A1“x,É,P l,ÌfvfŒfCf,,,É,Í,µ,Ä,Á,Í,È,-

AfOf< [fv,É,Í,µ,Äf fbfZ [fW,ð‘— M,·,é,± ,Æ,ª,Á,«,é B**T** [ftrX Efvf fofCf\_,É,æ,Á,Ä,Í Af fbfZ [fW,ðfOf< [fv,É‘— M i”z M j,µ,½,Û,□ ,ª AfOf< [fv“à,ÌŒÄ•È,ÌfvfŒfCf,,,É‘— M,·,é,æ,è,àŒø—“I,È è ‡,ª, ,é BfOf< [fv,ðŽg—p,·,é,Æ AfvfŒfCf,,,ŠÇ — ,ð’P f%»»,Á,«,é,¾,¯,Ä,È, A’È Mf`ffflf< EfOf“fh• ,ð ß-ñ,·,é,±,Æ,à%Ä”\,Ä, ,é B

**IDirectPlay2::CreateGroup**,Æ**IDirectPlay2::DestroyGroup** f\fbfh,Í AfvfŒfCf,,,ÌfOf< [fv,Ì ì ¬,·,æ,Ñ í œ,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,Á,«,é BDirectPlay,ÍfOf< [fv,ÉfOf< [fvID,ðŠ,,,è“-Ä,é B %óú ó’Ô,Ä,ÍfOf< [fv,Íó,Ä, ,é,ª A

**IDirectPlay2::AddPlayerToGroup**,â**IDirectPlay2::DeletePlayerFromGroup** f\fbfh,É,æ,Á,Ä AfAfvfŠfP [fVf‡f“,©, çfvfŒfCf,,,ÌÇ%Ä,Æ í œ,ð s,□,±,Æ,ª,Á,«,é BfOf< [fv,Ì ì ¬ AfvfŒfCf,,,ÌÇ%Ä A, ,é,ç,Í í œ,Ì<@”\ ,Í AfZfbfVf‡f“,Ì’è<,Ì†,Ä Ý’è,µ,½DPSESSION\_NEWPLAYERSDISABLEDftf%ofo,Ì ó’Ô,É%œ<ç,³,è,é,±,Æ,Í,È,ç B

,·,Ä,É’¶ Ý,·,éfOf< [fv,ð”»’è,·,é,½,ß,É,Í AfAfvfŠfP [fVf‡f“,©,ç**IDirectPlay2::EnumGroups** f\fbfh,ðŽg,□,± ,Æ,ª,Á,«,é BfOf< [fv“à,ÌfvfŒfCf,,,ð-ñ<“,·,é,É,Í A**IDirectPlay2::EnumGroupPlayers** f\fbfh,ðŽg—p,·,é B

fAfvfŠfP [fVf‡f“,Í A**IDirectPlay2::SetGroupName**f f\fbfh,ð—p,ç,ÄfOf< [fv,Ì-¼’O,ð’Í X,·,é,±,Æ,ª,Á,«,é B,± ,ÌŒÄ,Ñ o,µ,É,æ,Á,Ä¼,ÌfvfŒfCf,,,ÉfVfXfef€ Ef fbfZ [fW,ª’È’m,³,è A¼,ÌfvfŒfCf,,,Í A**IDirectPlay2::GetGroup****upName**f f\fbfh,ðŽg—p,µ,Ä V,µ,ç-¼’O,ðŽæ“¾,·,é B

f fbFZ [fWŠÇ—

f fbFZ [fWŠÇ— <@”

,Í AfAfVfŠfP [fVf‡f“É,æ,éfvfŒfCf,,ŠŎ,İf fbFZ [fW,İf< [fefBf“fO,ðŽx%±,·,é BfAfVfŠfP [fVf‡f“,Í AfVf Xfef€,,·,Á,É'è<,µ,Ä,ç,é ”,İf fbFZ [fW,ð æ,« A•K—v,É%ž,¶,Ä”C^Ŏ,İf fbFZ [fW,ð'è<,·,é,± ,Æ,,Á,«,é BfAfVfŠfP [fVf‡f“,Í **DirectPlay2::Sendf** f\fbfh,ðŽg—

p,µ,Ä AfvŒfCf,,âfOf< [fv A,Ü,½,İfZfbfVf‡f““†,İ,·,×,Ä,İfvŒfCf,,Éf fbFZ [fW,ð‘—,é,±,Æ,,Á,«,é B‘— M æ,É,Í A,»,é,¼,ê AfvŒfCf,,İD AfOf< [fvİD A,Ü,½,İDPID\_ALLPLAYERS,ðŽw'è,·,é BDirectPlay,,“—

M,Ä,«,éfbFZ [fW,İ'á,«³,É,Í §ŒÄ,,È,ç BfAfVfŠfP [fVf‡f“,Í **DirectPlay2::GetCaps**,ðŒÄ,Ñ o,µ,Ä A,Đ,Æ, Ä,İfpfPfbfg,Ä‘— M,·,é,±,Æ,,Á,«,é Ä'âfOfCf ”,ðŽæ“¾,·,é,± ,Æ,,Á,«,é B,»,é,æ,è,à'â,«,çf fbFZ [fW,Í A•j ”,İfpfPfbfg,É•Š,,,µ,Ä‘— M,³,é,é B

fvŒfCf,,âfOf< [fv,İfOf [fof< ó'Ŏ,,·,İ X,³,é AfZfbfVf‡f““†,İ¼,İ,·,×,Ä,İfvŒfCf,,É,»,İ'İ X,ð'É'm,µ,È,- ,Ä,İ,È,ç,È,ç é ‡,Í A V,µ,çff [f^,É,Ä,ç,Ä,İf fbFZ [fW,ðfvŒfCf,,É‘—,é,æ,è,à Aff [f^ŠÇ— ŠŎ ”,ð~— p,µ,½,Ü,²,·,·,Ö—,Ä, ,é B Ú ×,É,Ä,ç,Ä,İff [f^ŠÇ—,ðŽQ Æ B

f fbFZ [fW EfLf... [,©,çf fbFZ [fW,ðŽó,~Žæ,é,É,Í A**DirectPlay2::Receivef** f\fbfh,ðŽg—

p,·,é Bf fbFZ [fW,“Ä'è,İfvŒfCf,,É‘—,ç,é,½,à,İ A, ,é,ç,İ“Ä'è,İfvŒfCf,,©,ç'É'm,³,é,½,à,İ,Ä, ,é é ‡ AfAfVf ŠfP [fVf‡f“,Í,±,İf f\fbfh,É,æ,Ä,Ä AfLf... [,İ Ä %,,İf fbFZ [fW,ðŽó,~Žæ,é,©,ç,²,©,ðŽw'è,Ä,«,é B, ,éfvŒfCf,,É'İ,µ,ÄfLf... [,É'u,©,è,Ä,ç,éfbFZ [fW,İ ”,ðŽæ“¾,·,é,É,Í A**DirectPlay2::GetMessageCountf** f\fbfh,ðŽg —p,·,é B

DirectPlay,Í AfZfbfVf‡f““†,Ä<N,«½,·,İ X,ðfvŒfCf,,É'É'm,·,éfvfXfef€ Ef fbFZ [fW,ð ¶ ¬,·,é B,·,×,Ä,İfVf Xfef€ Ef fbFZ [fW,Í ADPID\_SYSMMSG,É,æ,Ä,Ä'è<³,é,é%¼'zfvŒfCf,,©,ç‘—

M,³,é,é BfVfXfef€ Ef fbFZ [fW,Í Af fbFZ [fW,İf^CfV,ðŽ~•É,·,é32frfbfg'l,©,çŽn,Ü,é BfVfXfef€ Ef f bfZ [fW,ð\,·,è ”,İDPSYS\_ÄŽn,Ü,Ä,Ä,·,è A'İ%ž,·,éfbFZ [fW \^ç'İ,ðŠÜ,ñ,Ä,ç,é B,±

,İ \^ç'İ,İf fbFZ [fW,ð%ð“Ç,·,é,½,ß,É•K—v,Ä, ,é BfAfVfŠfP [fVf‡f“,Í

**ADPSESSIONDESC2** \^ç'İ,İftf%fo,ðŽw'è,µ,Ä A ¶ ¬,³,é,éfvfXfef€ Ef fbFZ [fW,ð §ŒÄ,·,é,±,Æ,,Á,«,é B

•É,İfXfŒfbfh,ðŽg—

p,µ,Äf fbFZ [fW,ðŽó,~Žæ,é é ‡ AfAfVfŠfP [fVf‡f“,Í Af fbFZ [fW,İŽó MŽž,ÉfZfbfg,³,é,é“ŠüfCfxf“fg,ð Žw'è,·,é,±,Æ,,Á,«,é B

ff [f^ŠÇ—

«» Ý,ìDirectX™ 3,Á,Í A DirectPlay,ì<@”\
,É,æ,Á,Ä AfAvfŠfP [fVf‡f“,²ff [f^,ðfvfÇfCf,,,âfOf< [fv,ÉŠÖ~A•t,¯,é,±
,Æ,ª,Á,«,é BDirectPlay,³fvfÇfCf,,,ÆfOf< [fv,ð’Ç Ö,µ,Ä,Ç
,é,½,ß AfAvfŠfP [fVf‡f“Ž© g,Í AfvfÇfCf,,,âfOf< [fv î•ñ,ð•ÛŽ ,·,é,½,ß,ìfŠfXfgŠÇ— ,ðŽÀ‘•,·,é•K—
v,ª,É,Ç B,³,Ç,É ADirectPlay,É,æ,Á,Ä AfAvfŠfP [fVf‡f“,Íf [fJf<,·,æ,ÑfŠf, [fg,ìŽi—
p,ì î•ñ,ðŠi”[,Á,«,é Bf [fJf< Eff [f^,Í A,»„ê,ðZfbfg,·,éflufWfFfNfg,¾,¯,ªŽg—p%oÂ”\,Á, ,é B,±
,ê,É’Í,µ,ÄfŠf, [fg Eff [f^,Í AfZfbfVf‡f“+„ì,»„ê,¼,ê,ìfRf“fsf... [f^,É’É’m,³,ê,é B,±
,ìÇ%oÊ AfŠf, [fg Eff [f^,Í,·,×,Ä,ìfŠf, [fg EfRf“fsf... [f^ŠÖ,ì<□—Lf f,fŠ,Æ,È,é B,Ü,è•Í X,³,ê,é,±
,Æ,ª,È, A,·,×,Ä,ìfRf“fsf... [f^,ªAfNfZfX,·,é•K—v,ª, ,éff [f^,ðŠi”[,·,é,Æ,«„Í AfŠf, [fg Eff [f^,ð—
p,·,é,×,«„Á, ,é B¼,ìfRf“fsf... [f^,ÇfAfNfZfX,·,é•K—v,ª,È,Çff [f^,ð•ÛŽ ,·,é,É,Í Af [fJf< Eff [f^,ðŽg,□
,×,«„Á, ,é B

fAvfŠfP [fVf‡f“,Í AIDirectPlay2::SetPlayerData f f\fbfh,ð—p,Ç,Äff [f^,ðfvfÇfCf,,,É Ý’è,·,é,±
,Æ,ª,Á,«,é B“K Ø,Èftf%ofO,ð“n,µ,ÄÇÄ,Ñ o,·,±,Æ,É,æ,è Aff [f^,ªf [fJf<,Á, ,é,©fŠf, [fg,Á, ,é,©,ðŽw’è,·,é,±
,Æ,ª,Á,«,é Bff [f^,ªfŠf, [fg,Á, ,é,Í A•Û Ø•t,«„ìf fbfZ [fW,ðŽg,Á,Äff [f^,ð“”B,·,é,© A—
³•Û Ø,ìf fbfZ [fW,ðŽg,□,©,ðŽw’è,·,é,±
,Æ,à,Á,«,é BfvfÇfCf,,,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,Á,Ç,Á,Í AIDirectPlay2::SetGroupData,ÆIDirectPlay2::GetGroupData f f\fbfh,ðŽg,□,±
,Æ,ª,Á,«,é B

**fVfXfef€ Ef fbfZ [fW,İŽg—p**

**IDirectPlay2::Receive** f\fbfh,ª•Ô,· Afvf€fCf,,ID,âDPID\_SYMSMSG,©,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,ç ,é **BIDirectPlay2::Receive** f\fbfh,É,æ,Ä,Ä•Ô,³,ê,½fofbftf@,İ A”Ä— pf fbfZ [fW **iDPMSG\_GENERIC** j,ÉfLfffXfg,µ,Ä ADPSYS\_fvf€ftfBfNfX,ÄŽn,Ü,éf fbfZ [fW,İ,Đ,Æ,Ä,Æ “TM,µ,ç'l,İdwType—v'f,ð—LCEø,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 vfeftfBfNfX,ÄŽn,Ü,é j“K Ø,È \‘ç'ì,Éfofbftf@,ðfLfffXfg,·,é,×,«,Ä, ,é B

fAfvfŠfP [fVf±f“,İ A`È%°,İfVfXfef€ Ef fbfZ [fW,İ ~— ,ð—p^Ó,µ,È,,Ä,Í,È,ç,È,ç B

**dwType,İ'l**

**f fbfZ [fW \‘ç'ì**

DPSYS\_ADDPLAYERTOGROUP

**DPMSG\_ADDPLAYERTOGROUP**

DPSYS\_CREATEPLAYERORGROUP

**DPMSG\_CREATEPLAYERORGROUP**

**P**

DPSYS\_DELETEPLAYERFROMGROUP

**DPMSG\_DELETEPLAYERFROMGR**

**ROUP**

DPSYS\_DESTROYPLAYERORGROUP

**DPMSG\_DESTROYPLAYERORGR**

**UP**

DPSYS\_HOST

**DPMSG\_HOST**

DPSYS\_SESSIONLOST

**DPMSG\_SESSIONLOST**

DPSYS\_SETPLAYERORGROUPDATA

**DPMSG\_SETPLAYERORGROUPDA**

**TA**

DPSYS\_SETPLAYERORGROUPNAME

**DPMSG\_SETPLAYERORGROUPNA**

**ME**

**IDirectPlayLobby::ReceiveLobbyMessage** f\fbfh,ª•Ô,·f fbfZ [fW,İ,ª

,ç AdwFlagsfppf%of [f^,ÉDPLAD\_SYSTEM,ª Ý²è,³,ê,Ä,ç,é,à,İ,İ AfVfXfef€ Ef fbfZ [fW,Â, ,é B,·,×,Ä,İfVf Xfef€ Ef fbfZ [fW,İdwType,É,æ,Ä,ÄŽ!,³,ê,éf\_fuf<f [fh'l,ÄŽn,Ü,Ä,Ä,ç ,é **BIDirectPlayLobby::ReceiveLobbyMessage**,ª•Ô,·fofbftf@,İ A”Ä— pf fbfZ [fW **iDPLMSG\_GENERIC** j,ÉfLfffXfg,µ,Ä ADPLSYS\_fvf€ftfBfNfX,ÄŽn,Ü,éf fbfZ [fW,İ,Đ,Æ,Ä ,Æ“TM,µ,ç'l,İdwType—v'f,ð—LCEø,É,·,é,±,Æ,ª,Ä,«,é B

“Šú

DirectPlay,Í AfAfvfŠfP [fVf‡f“,ì“Šú,É,Â,ç,Ä,Íê”Ê“I,È•û-@,ð'ñ<ÿ,µ,Ä,ç  
,È,ç B'ñ<ÿ,µ,½ ê ‡,Í AfAfvfŠfP [fVf‡f““Ê MfPf%of\_fCfç,É §CEÀ,ð—^,!,Ä,µ,Û,µ,É^á,ç  
,È,ç B,µ,©,µ AfVfXfefç,É,Í A,±,ê,ç,ìf^fXfN,ðŽx%o‡,·,é,½,ß,É ÝÇv,³,ê,½,ç,,Ä,©,ìfT [frfX,ªŠÛ,Û,ê,Ä,ç  
,é B,½,Æ,!,Í AfAfvfŠfP [fVf‡f“,ªfvfçfçfç,ð ì ¬,µ,½,Æ,«,Í A'Ê'mfCfxf“fg,ðŽw'è,·,é,±  
,Æ,ª,Ä,«,é B,»,è,©,çWin32@,lWaitForSingleObjectŠÖ ”,ðŽg—p,µ,Ä Af fbfZ [fW,ª ^— '†,Ä, ,é,©,Ç,µ  
,©,ð'm,é,±,Æ,ª,Ä,«,é B

**DirectPlayAfhfCFX**

,±,İfZfNfVf±f“,İ îñ,Í ADirectPlayLobbyfNf%oCfAf“fg,İŠJ”ŽÒ,Ì,½,B,Ì,à,Ì,À, ,è A`è”È“İ,ÈfAfvfŠfP [fVf±f“ŠJ”-ŽÒ,É,ÍŠÖEW,Ì,È,¢ îñ,àŠÜ,Ü,è,Ä,¢,é B

DirectPlay,Í Afİfbfgf [fN EfAfhfCFX Eff [f^,ðJfVfZf<%»),,é,±,Æ,ª,Ä,«é B  
DirectPlay,É,Í ADirectPlayZfbfVf±f“,Æ,Ì Ú±,É·K—v,È,·,×,Ä,Ì îñ,ªŠÜ,Ü,è,Ä,¢,é B,±,Ì îñ,Ì-Ú“İ,Í Af† [fU,É îñ,Ì“ü—Í,ð‘£,·f\_fCfAf fO Ef{fbfNfX,Ì·Ž,ð s,ª,æ,ª,ÈfT [fTfX Efvf fofCf\_,ð—p,¹,, AfAfvfŠfP [fVf±f“,©,çfZfbfVf±f“,É Ú±,Ä,«é,æ,ª,É,·,é,±,Æ,É, ,é B’È ífT [fTfX Efvf fofCf\_,Í Af† [fU,©,ç îñ,ð“¼,é,½,ß,Éf\_fCfAf fO Ef{fbfNfX,ð·Ž,·, ,é,ª AŠ@‘S,ÈDirectPlayfAfhfCFX,ðñ<Ÿ,·,é,±,Æ,É,æ,ª,Ä A,±,İf\_fCfAf fO,ð%ñ”ð,·,é,±,Æ,ª,Ä,«é B

DirectPlayfAfhfCFX,İftfH [f}fbfg,Í AfŠf\ [fXCEðŠ·ftf@fCf<CEŽ® iRIFf j,ÉŽ—,Ä,¢,é B,±,è,İ`è~A,İf`fff“fN,Ä \ -³,è,Ä,¢,é B,»,è,¼,è,İf`fff“fN,Í AZŸ,Ì—v‘f,©,ç -,è—š,Ä,Ä,¢,é B

f`fff“fN,ªŠÜ,bff [f^,İf^fCfv,ðŽ,·,fof [fof< Eftfj [fNŽ~·ÈŽq iGUID j  
ff [f^ EftfCY  
ff [f^ EftfB [f<fh

DirectPlay,Ä,Í A`È%°,İf`fff“fNŽ~·ÈŽq,ªè<³,è,Ä,¢,é B

**GUID**

**ff [f^,İf^fCfv**

DPAID\_ComPort

**DPCOMPORTADDRESS** \‘c‘İ BŽŸ,Ì—v‘f,ðŽw’è,·,é B

Žg—p,·,éCOMf [fg i1-4 j  
f{ [fCE [fg i100-256k j  
fXfgfbfv Efrfbfg’ i1-2 j  
fpfŠfefB i0—³,µ A1-Ši ” A2-<ð ” A3-f}  
[fN j  
ftf [ §CEä i0—³,µ A1-xon/xoff A2-RTS A3-DTR A4-RTS/DTR j

DPAID\_Inet

"xxx.xxx.xxx.xxx" ‘Ž®,İIPfAfhfCFX,Ü,½,Í"dplay.mi  
crosoft.com",Ì,æ,ª,ÈfT [fo [-¼,ð·\,· ASCII·¶Žš—ñ B

DPAID\_Phone

“d`b”Ô †,İ ”,İCE...,ð·\,µ,Ä,¢,é ASCII·¶Žš—ñ B

DPAID\_ServiceProvider

,±,İfAfhfCFX,ª İ,ç,è,½fT [fTfX Efvf fofCf\_,İ16f ofCfg,İGUID B,¢,-,Ä,©,İÜ,È,éT [fTfX Efvf fofCf\_,ª““,¶f^fCfv,Ì flfbfgf [fN EfAfhfCFX,ðŽg,ª,±,Æ,ª,Ä,«é,½,ß A,±,İf`fff“fN,Í~³Ž<³,è,é,±,Æ,ª,Ä,«é B

f`fff“fN Ž~·ÈŽq,İ16fofCfg,İGUID ,Ä, ,é B

**DirectPlayfo [fWfzf 3, A%½, a V, μ, È, Á, ½, ©?**

DirectPlayfo [fWfzf 3 API  
,Í A`È'O,Ìfo [fWfzf, ÌDirectPlay, Á ' , ©, è, ½, Ç, ñ, ÈfAfVfŠfP [fVfzf, Æ, àŠ@'S, ÉCEÝŠ: «, a, , é B, Á, Ü, è AfR [fh  
, È%½, Ì, Ì X, à%Á, !, , , È ADirectX 3 SDK, ÌDirectPley, ð—p, Ç, ÁfAfVfŠfP [fVfzf, ð ÄfRf"fpfCf, , , é, ±  
, Æ, a, Á, «, é BDirectX 3 SDK, "ñ<ÿ, , , éDirectPlay, Í A`È'O,Ìfo [fWfzf, ÌDirectPlay, Ì, , ×, Á, ÌAPI, Æ" @ Ì, ðfTf|  
[fg, , , é B

DirectPlay 3, ÌDLL, Ì—¼'O, ÍCefo [fWfzf, Æ`Ù, È, Á, Ä, Ç, é, ½, ß ADirectX  
2`È'O,Ìfo [fWfzf, ÁfRf"fpfCf, , , 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"fpfCf, μ ADplayx.libCf" f| [fg E f%ofCfuf%ofŠ, ÆfŠf" fN, μ, È, -  
, Á, Í, È, Ç, È, Ç B

V, μ, ÇDirectPlay2, , é, Ç, ÍIDirectPlay2AfCf" f^ [ftfFfCfX, ðŽg—  
p, μ, ÁfAfVfŠfP [fVfzf, ðfAfBfVf [fg, μ Af fr [%oÁ" , ÈfAfVfŠfP [fVfzf, ð Ì , , , é, ½, ß, È•K—  
v, ÈfR [fh, ð'Ç%oÁ, , , é, ±, Æ, a A< , , ß, , è, Á, Ç, é B, ±, è, È, æ, Á, Ä AŠO" , Ìf fr [ , , é, Ç, Ìf fr [ EfVf fOf%ofÉ  
, aAfVfŠfP [fVfzf, ðŠJŽn, μ AfZfbfVfzf, Æ Ú±, , , é, ½, ß, È•K—v, È, , ×, Á, Ì îñ, ð'ñ<ÿ, , , é, ±  
, Æ, a, Á, «, é BfAfVfŠfP [fVfzf, Í AfT [frfX EfVf fOfCf\_ , ÌCE`è, âfZfbfVfzf, Ì'I'ð A, » , Ì¼, Ì îñ i" d"b"Ô †, âf  
lfbfG [fN EfAfBfCEfX, È, Ç j, Ìñ<ÿ, Ì, ½, ß, È Af† [fU, È—â, Ç †, Ì, ð, , , é•K—v, a, È, Ç B

DirectPlay, È, Í A, ±, Ì, Ü, ©, Ì V, μ, Ç<@" , a, Ç, , Á, ©'Ç%oÁ, , è, Á, Ç, é B

fCf" f^ [flfbG EfTf| [fg B  
¼ ÚfVfŠfAf< Ú± B  
, æ, è , Ç`À`è «, Æ< x « B  
'ñæ'Í%ž, ð, æ, èfTf| [fg, , , é, ½, ß, È AUnicode, ÌfTf| [fg B  
fzfXfg, ÌÚ s B, à, μfZfbfVfzf, ÌfzfXfg, a fZfbfVfzf, ©, Ç" , , é è † AfzfXfg, Ì Ó±  
, Ì, È, ÌfVfCEfCf, , , È"ñ, , è, é BDirectPlayfo [fWfzf 2, Á, Í AfzfXfg ifl [fÉ EfT [fo j, a fZfbfVfzf, ©, Ç" , , ½ è  
‡ A V, μ, ÇfVfCEfCf, , , ð Ì , , , é, ±, Æ, a, Á, «, È, ©, Á, ½ B  
fAfVfŠfP [fVfzf, Ìf fr [ EfVf fOf%ofÉ, Æ, Ì`È M<@" B, ±, è, È, æ, Á, Ä A %oŠú ó'Ô, È, Á, Ç  
, Á, Ì îñ, ðŽó, `Zæ, Á, ½, è AfQ [fÉ, Ì ó'Ô, ð X V, , , é, ±, Æ, a, Á, «, é B  
1`ä, ÌfRf"fsf... [f^, Ì ä, Á; j " , ÌfAfVfŠfP [fVfzf" EfZfbfVfzf, a fzfXfg, ð—±, ß, è" —Í B  
fŠf, [fg EfRf"fsf... [f^, Ì Ú±, Ì Ø'f, ð"»è, μ A"K Ø, Èf bfbZ [fW, ð ¶ , , , é" —Í B

, Ü, ½ A`È MŠÇ— , Ì, ½, ß, ÌfR [fh, Ì—È, ðCE, , Ç, , , ½, ß AŽÿ, Ì, æ, ð, È<@" , aDirectPlay 3, È'Ç%oÁ, , è, Á, Ç, é B

fAfVfŠfP [fVfzf"CEÄ—L, Ìff [f^, ðDirectPlayfOf< [fVfzf, ÌfVfCEfCf, , ID, ÆŠÖ`A•t, , é<@" B, ±  
, è, È, æ, Á, ÁfAfVfŠfP [fVfzf, Í ADirectPlay, Ì1" , Á, , éfVfCEfCf, , , âfOf< [fv, ÌfŠfXfgŠÇ— fR [fh, ðŠg'É, , , é, ±  
, Æ, a, Á, «, é Bf [fJf< Eff [f^, Æ, Í AfvVfCEfCf, , , ð, , , frfbfGf)fbfv, Ì, æ, ð  
, È Af [fJf< EfAfVfŠfP [fVfzf, , , ¼ ÚŽg—p, , , éff [f^, Á, , é Bf [fJf< Eff [f^, a flfbGf [fN ä, È'—  
M, , è, è, ±, Æ, Ì, È, Ç BfŠf, [fg Eff [f^, Í AfvVfCEfCf, , , é, Ç  
, ÌfOf< [fv, ÈŠÖ`A•t, , Ç, è, é BfŠf, [fg Eff [f^, È%oÁ, , , Ç, è, ½, Ì X, Í ADirectPlay, È, æ, Á, Ä AfZfbfVfzf"†, Ì¼, Ì  
, , ×, Á, ÌfAfVfŠfP [fVfzf, È'È'm, , è, é BfŠf, [fg Eff [f^, Í AfvVfCEfCf, , , Ì'È'u, âCEü, « A'—, , Ì, æ, ð  
, È AfZfbfVfzf"†, Ì, , ×, Á, ÌfAfVfŠfP [fVfzf"ŠÖ, Á<—L, , è, È, Á, Í, È, Ç, È, Ç, à, Ì, Á, , é B, ±  
, Ìff [f^, Ì" B, ÈDirectPlay, ðŽg—p, , , è, Ì AfAfVfŠfP [fVfzf, a îñ, Ì—Žó M, Ì, ½, ß, Ì`È`A, Ìf f\fbfh, ð—p, Ç  
, Áff [f^, ðŠÇ— , , é•K—v, Ì, È, , È, é B  
fAfVfŠfP [fVfzf, a fOf< [fv, È—¼'O, ðŠÖ`A•t, , é<@" B, ±, è, Ìf` [fÉ<ÉZ, È—ð—§, Á B

DirectPlay 3, Ì V<@" , Ì, ð, ç, Ì, Ç, , Á, ©, Ì AfAfVfŠfP [fVfzf, Æ, Ì¼ ÚŠÖEW, a, È, Ç, à, Ì, Á, , é B

f fr [ EfNf%ofCfAf" fg Ef\ftfgfEfFfA, a f fr [%oÁ" , ÈDirectPlayfAfVfŠfP [fVfzf, ÌŠJŽn, â Ú±, ÈŽg—  
p, , éAPI B, Ü, ½ AfZfbfVfzf, ÌŠÖ, ÈfAfVfŠfP [fVfzf, Æf fr [ , a îñ, ðCEðŠ, Á, «, é, æ, ð, È, , éAPI, àŠÜ, Ü, è, Á, Ç  
, é B  
fT [frfX EfVf fOfCf\_ŠJ"—  
fLfbG B"ÆŽ©, ÌfT [frfX EfVf fOfCf\_ ð Ì , , , é, ½, ß, Ì•¶ ' , ÆfTf"fvf<fR [fh, aŠÜ, Ü, è, Á, Ç, é B

, ±, ÌfZfNfVfzf, Á, Í ADirectPlay 3, Ì V, μ, Çf f\fbfh AIDirectPlay2fCf" f^ [ftfFfCfX, È`Ú s, , , é, ½, ß, È•K—  
v, ÈŽè † AfAfBfVf [fg, , è, ½DirectPlay, Ì<@" , ÈfAfNfZfX, , , é•ü—@, È, Á, Ç, Á à—  
¼, , , é B`È%o, ÌfgfsfbfN, aŠÜ, Ü, è, Á, Ç, é B

V, μ, ÇDirectPlay 3f f\fbfh

IDirectPlay2fCf“f^ [ftfEfCfX,Ö,ÿÚ s

**V,μ,ϕDirectPlay 3f f\bfh**

DirectPlayfo [fWf‡f“3,Í A^È%°,Ì V,μ,ϕf f\bfh,δfTf] [fg,·,é B

**IDirectPlay2::SetGroupData**, ,æ,Ñ**IDirectPlay2::GetGroupData**

fAfvfŠfP [fVf‡f“ĈĀ—

L,Ìff [f^,δDirectPlayfOf< [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,ª,Ā,«,é B

**IDirectPlay2::SetGroupName**, ,æ,Ñ**IDirectPlay2::GetGroupName**

–¼‘O,δfOf< [fv,ÉŠÖ~A•t, ,é B

**IDirectPlay2::SetPlayerData**, ,æ,Ñ**IDirectPlay2::GetPlayerData**

fAfvfŠfP [fVf‡f“ĈĀ—

L,Ìff [f^,δDirectPlayfvfĈfCf,,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,ª,Ā,«,é B

**IDirectPlay2::GetSessionDesc**

fZfbfVf‡f“, Ì i s’t,ÉfZfbfVf‡f“, Ì“Á «,ðŽæ“¾,·,é B

**IDirectPlay2fCf“f^ [ftFfCfX,Ö,ÌÚ s**

fAfvfŠfP [fVf‡f“,đIDirectPlay2fCf“f^ [ftFfCfX,ÉÚ s,.,é,É,Í AŽŸ,ÌfXfefbfv,đŽÀ s,.,é•K—v,ª,.,é B

- 1 fAfvfŠfP [fVf‡f“,ªf fr [ EfNf%ofCfAf“fg,©,ç,N“@,ª,³,ê,½,©,Ç,ª,©,đ²,×,é B Ú ×,É,Á,ç, ©,đ»è,.,é BŽg—p%Á“\,Á,.,é,Í A,».,ÌfT [frfX Efvf fofCf\_,đ—ñ“,µ,Á,ç,.,é é ‡,Í **ADirectPlayEnumerate**fR [f<fofbfNŠÖ ”,đ—p,ç,Ä AfT [frfX Efvf fofCf\_,ªŽg—p%Á“\,©,Ç,ª, ©,đ»è,.,é BŽg—p%Á“\,Á,.,é,Í A,».,ÌfT [frfX Efvf fofCf\_,É,Á,ç,.,é **ADirectPlayCreate**ŠÖ ”,đEÄ,Ñ o,· **BDirectPlayEnumerate**fR [f<fofbfNŠÖ ”;ªGf%o [,đ•Ö,µ,½,Æ,«,Í A,».,Ì fT [frfX Efvf fofCf\_,đfVfXfef€ ä,ÁŽÀ s,.,é,±,Æ,Í,Á,«,É,ç,Ì,Á AfT [fU,É•Ž,.,éŠfXfg,É•Ç%Á,µ,É,ç, æ,ª,É,.,é BÉÄ,Ñ o,µ,ª -E÷,.,é,Í **Release**f ffbfh,đŽg— p,µ,ÄDirectPlayIfufWfFfNfg,đ%đ•ú,µ A,».,ÌfT [frfX Efvf fofCf\_,đfŠfXfg,É•Ç%Á,.,é B
- 3

IDirectPlay2 iUnicode j,â**IDirectPlay2A** iANSI jfCf“f^ [ftFfCfX,đŽæ“¾,.,é,É,Í **AIDirectPlay**fCf“f^ [ftFfCfX,Ì**QueryInterface**f ffbfh,đEÄ,Ñ o,· B,±,ê,ç,Ó,½,Á,ÌfCf“f^ [ftFfCfX,Ì—B^è,Ìã,ç,Í A \‘ç‘Í,É,“,“,é•Źš— ñ,Ì“Ç,Ý ‘,«,Ì•û—@,Á,.,é BUnicodefCf“f^ [ftFfCfX,Á,Í **ALPWSTR**EÄ,Ì \‘ç‘Íf f“fo,ÉUnicode•Źš— ñ,“Ç,Ý ‘,«,ª,³,é,é BANSIfCf“f^ [ftFfCfX,Á,Í **ALPSTR**EÄ,Ì \‘ç‘Íf f“fo,ÉANSI•Źš—ñ,“Ç,Ý ‘,«,ª,³,é,é B

- 4 Šù•Ź,ÌIAP,Á V,µ,ç \‘ç‘Ì,đŽg,ª,½,ß,É•K—v,È A,.,×,Á,Ì•İ X,đ s,ª B,½,Æ,!,Í AŽŸ,ÌfR [fh,Ìã,í,è,É A lpDP->SetPlayerName(pidPlayer, lpszFriendlyName, lpszFormalName)

lpDP,ª**IDirectPlay**fCf“f^ [ftFfCfX,Á,.,é,È,ç A^È%o,Ì,æ,ª,É,.,é B  
 DPNAME PlayerName, \*lpPlayerName;  
 PlayerName.dwSize = sizeof(DPNAME);  
 lpPlayerName = &PlayerName;

lpPayerName->lpszShortNameA = lpszFriendlyName;  
 lpPlayerName->lpszLongNameA = lpszFormalName;  
 lpDP2A->SetPlayerName(pidPlayer, lpPlayerName, 0)

lpDP2,Í**IDirectPlay2A**fCf“f^ [ftFfCfX,Á,.,é B fAfvfŠfP [fVf‡f“,ªUnicode•Źš—ñ,đŽg— p,.,é i,µ,½,ª,Á,Ä**IDirectPlay2**fCf“f^ [ftFfCfX,ÌfCf“fXf^f^fX,đ Ì -,.,é j é ‡,Í AŽŸ,Ì,æ,ª,É,.,é B  
 lpPayerName->lpszShortName = lpwszFriendlyName;  
 lpPlayerName->lpszLongName = lpwszFormalName;  
 lpDP2->SetPlayerName(pidPlayer, lpPlayerName, 0)

lpDP2,Í**IDirectPlay2**fCf“f^ [ftFfCfX,Á,.,é B

- 5 ŽŸ,ÌfVfXfef€ Ef fbfZ [fW,đ X V,.,é B  
 DPSYS\_ADDPLAYER,ÍDPSYS\_CREATEPLAYERORGROUP,É•İ X,ª,³,ê,½ B  
 DPSYS\_DELETEPLAYER,ÆDPSYS\_DELETEGROUP,Í A,Đ,Æ,Á,ÍDPSYS\_DESTROYPLAYERORGROUP  
 f fbfZ [fW,É“ ‡,ª,³,ê,½ B  
 DPSYS\_DELETEPLAYERFROMGRP,ÍDPSYS\_DELETEPLAYERFROMGROUP,É•İ X,ª,³,ê,½ B

- 6 fvfEfcf,,âfOf< [fv-¼,ª•İ X,ª,³,ê,½,Æ,« ADPSYS\_SETPLAYERORGROUPNAMEf fbfZ [fW,đ” s,.,é,æ,ª, ÉfAfvfŠfP [fVf‡f“,đ X V,.,é B,Û,½ AfvfEfcf,,âfOf< [fv Eff [f^,ª•İ X,ª,³,ê,½,Æ,«,É,Í ADPSYS\_SETPLAYERORGROUPDATAf fbfZ [fW,đ ¶ -,.,é,æ,ª,É,.,é B

- 7 **DPSESSIONDESC** \‘ç‘Ì,đ**DPSESSIONDESC2** \‘ç‘Í,É X V,µ **ADPCAPS** \‘ç‘Í,É V,µ,çf f“fo,đÇ%Á,.,é B
- 8

IDirectPlay2::EnumSessions AIDirectPlay2::EnumGroups AIDirectPlay2::EnumGroupPlayers A,.,æ,Ñ**IDirectPlay2::EnumPlayers**,ÌfR [f<fofbfNŠÖ ”,đ X V,.,é B

9

**IDirectPlay2::CreatePlayer**f ffbfh,Ö,ÌbEventpf%of [f^,Ì“n,µ•û,đ C ³,.,é B^È•O,Ìfo [fWf‡f“,ÌDirectPlay,Á, Í A,±,Ìfpf%of [f^,ÌlpEvent,Á,.,Á,½ B,±,Ìfo [fWf‡f“,ÌDirectPlay,ÌfCfxf“fg,đ•Ö,ª,³,É,ç B,».,Ìã,í,è AfAfvfŠfP [fVf‡f“,ªfCxf“fg,đ Ì -,µ,È,-

,Ä,Í,È,ç,È,ç B,±  
,ê,É,æ,Ä,ÄfAfVfŠfP [fVf±f“,ì \_“î «,ª•Û,½,ê A,·,×,Ä,ÌfVfÇfCf,,É‘Í,·,é,Ð,Æ,Ä,ÌfCfxf“fg,ð ì ¬,·,é,±  
,Æ,ª,Ä,«,é B

10 fVfÇfCf,,ªfQ [fç,ð`Û í I—¹,µ,½,±,Æ,ðDirectPlay,ÉÇÿ o,³,¹,é•K—v,ª, ,éfAfVfŠfP [fVf±f“,Ä,Í  
ADPSESSIONDESC2 \‘ç‘ì,ÉDPSESSION\_KEEPLIVEftf%ofO,ðfZfbfg,·,é B

11 fZfbfVf±f“,ð ì ¬,·,é Û ADPSESSION\_MIGRATEHOSTftf%ofO,ð Ý’è,·,é,æ,µ  
,ÉfAfVfŠfP [fVf±f“,ð X V,·,é B,±,ê,É,æ,Ä,Ä ACE» Ý,ÌfzXfg,ªfZfbfVf±f“,ð”²,¯,Ä,à A•Ê,ÌfRf“fsf...  
[f^,ªfzXfg,É,È,é,±,Æ,ª,Ä,«,é BfzXfg,ð<N“@,·,é,½,ß,Ì“Á•Ê,ÈfR [fh,ð`è`ç,µ,Ä,ç  
,é ê ±,Í AfZfbfVf±f“,ì ì -Žž,É,±  
,Ìftf%ofO,ðfZfbfg,µ A,³,ç,É ADPSYS\_HOSTfVfXfefç Ef fbfZ [fW,ÌfTf] [fg,ð`Ç%oÁ,·,é,×,«,Ä, ,é BfVfXf  
efç Ef fbfZ [fW,ÌfŠfXfg,É,Ä,ç,Ä,Í A ufVfXfefç Ef fbfZ [fW,Ìžg—p v,ðžQ Æ,³,é,½,ç B

12 IDirectPlay2fCf“f^ [ftFfCfX,Ì V,µ,çf ffbfh,ð,æ,— %oð,µ,Äžg—p,·,é,±  
,Æ B“Á,É AIDirectPlay2::SetPlayerData,ÆIDirectPlay2::GetPlayerData ffbfh,É,Í’ ^Ó,ª•K—v,Ä, ,é BfVfÇf  
Cf,,Ì ó‘Ô,ð`¼,Ì,·,×,Ä,ÌfVfÇfCf,,Éfuf [fhfLfffXfg,·,éfR [fh,Í AIDirectPlay2::Send,ÆIDirectPlay2::Receive  
f ffbfh,ð—p,ç,Ä ‘,«Š,·,é,±,Æ,ª,Ä,«,é,Ä, ,ë,µ B

**DirectPlayCf“f^ [ftFfCfX,İŠT—v**

DirectPlay,Í AfRf“f| [flf“fg EfIfufWfFfNfg Ef,fff< iCOM j,ÉŠi,Ä,ç  
,½fIfufWfFfNfg,ÆfCf“f^ [ftFfCfX,Ä \ -³,ê,Ä,ç,é BCOM,Í AfCf“f^ [ftFfCfX,İ Ä—~—p,É Ä“\_,ð“-  
,Ä,½fIfufWfFfNfgfx [fX EfVfXfef€,İŠi“b,Ä, è AOLEfvf fOf%of~f“fO,İ+ Sf,fff<,Ä, é B,Ü,½ A”C^Ó,İ ”,İ  
fCf“f^ [ftFfCfX,ð \z,·,é,±,Æ,ª,Ä,«,éŽd—l,É,È,Ä,Ä,ç,é B

È‘O,İfo [fWf±f“,İDirectX,Ä,Í ADirectPlayIfufWfFfNfg,İ,½,¾,Đ,Æ,Ä,İfCf“f^ [ftFfCfX AIDirectPlay,¾,-,Ä \  
-³,ê,Ä,ç,½ B ;%ñ ADirectPlay,Í A,æ,è‘½—l,È’Ê M•ü—@,Ö,İ,æ,è—Ç,çfAfNfZfX,ð’ñ<ÿ,·,é V,µ,ç<@”\  
,ªÇ%Á,³,ê AŠg’£,³,ê,Ä,ç,é BUnicode,ÆANSI•İžš—ñ,İfTf|  
[fg Af fr [ EfT [frfX,İ ì - ,ì,½,ß,İfuf fbfN \z,İfTf|  
[fg,È,Ç A V,µ,çfCf“f^ [ftFfCfX,ªDirectPlay,É’Ç%Á,³,ê,½ B

,±,İfZfNfVf±f“,É,Í AÈ%°,İDirectPlay COMfCf“f^ [ftFfCfX,É,Ä,ç,Ä,İè”È“l,È î•ñ,ªŠÜ,Ü,ê,Ä,ç,é B

IDirectPlayCf“f^ [ftFfCfX

IDirectPlay2fCf“f^ [ftFfCfX

IDirectPlayLobbyfCf“f^ [ftFfCfX

**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,Û,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,¢  
,ª V,µ,¢DirectPlayfCf“f^ [ftfFfCfX,ðŽg,ª,±,Æ,ð „ Š,·,é B

**IDirectPlay2fCf“f^ [ftfFfCfX**

DirectPlay,Í AUnicode•Źš—ñf|fCf“f^ iLPWSTR j,ÆANSI•Źš—ñf|fCf“f^ iLPSTR j,ì«—p`ì,Æ,μ,Ä \‘c‘ì,ì•Źš—ñf|fCf“f^,đ’èç,·,é,±,Æ,É,æ,è AUnicode,ÆANSI•Źš—ñ,ì—¼•û,ðfTf| [fg,μ,Ä,ç,é B,Ó,½,Ä,ì•Źš—ñf|fCf“f^,ÍÛ,È,é—¼‘O,ðŽ ,Á,Ä,ç,é B^ê”Ê,É AANSI•Źš—ñf|fCf“f^,Í“A”,ì•Źš,Ä I,í,é BfAfvfŠfP [fVfžf“,Í A,Ç,ì,ç,ìIDirectPlayfCf“f^ [ftfFfCfX,“T’ð,³,ê,é,© iUnicode,ìIDirectPlay2,© AANSI,ìIDirectPlay2A j,É,æ,Á,Ä A \‘c‘ì,©,ç“K Ø,È•Źš—ñ,ð“Ç,Ý ‘,«,μ A,à,σ^ê•û,ð—³Žç,μ,È,-,Ä,Í,È,ç,È,ç B

**IDirectPlayLobbyCf“f^ [ftFfCfX**

ŽŸ, ìfgfsfbfN, É, Í AIDirectPlayLobbyCf“f^ [ftFfCfX, ÉŠÖ, ·, é'Ç%Á î•ñ, ºŠÜ, Ü, ê, Ä, ç, é B

Unicode, ÆANSI, ìDirectPlayLobbyCf“f^ [ftFfCfX

f fr [%oÂ”\fAfvfŠfP [fVf#f“, ì“o~^

**Unicode, ANSI, DirectPlayLobby f^ [ftFfCfX**

DirectPlayLobby, I AUnicode, Zš—ñf|fCf“f^ iLPWSTR j, ANSI, Zš—ñf|fCf“f^ iLPWSTR j, i—  
p‘I, E, μ, Á \‘c‘l, l, Zš—ñf|fCf“f^, ð‘è‘, ., é, ±, E, É, æ, è AUnicode, ANSI, Zš—ñ, l—¼•û, ðfTf| [fg, ., é B, Ó, ½, Â, l, Zš  
—ñ, Í, Û, È, é—¼‘O, ðŽ , Á, Ä, Ç, é B^ê”Ê, É ANSI •Zš—ñf|  
fCf“f^, Í“A”, l, Zš, Ä I, í, é BfAfvfŠfP [fVf‡f“, Í A, Ç, ç, Zš—ñf|fCf“f^ [ftFfCfX, “T‘ð, ³, ê, é, © iUnicode, l, Di  
rectPlay2, © ANSI, l, DirectPlay2A j, É, æ, Á, Ä A \‘c‘l, ©, Ç“ Ø, È, Zš—ñ, ð“Ç, Ý ‘, «, μ A, à, ò, ê, û, ð—³Ž, μ, È, -  
, Á, 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,İfCfWfXfgfŠ,É,¢  
,,Á,©,İ îñ,đ’Ç%0Á,µ,È,,Ä,Í,È,ç,È,¢ B,±,İ,½,B,É A^È%°,İfCfWfXfgfŠ EfL [,“è<“,³,ê,Ä,¢,é B"Application  
Name",Í ADirectPlayLobby,³AfvfŠfP [fVf‡f“,đ—ñ<“,µ,½,Æ,«,É•Ô,³,ê,é AfAfvfŠfP [fVf‡f“,İ¼‘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%ofCf“ EfXfCfbf`  
"Path" ŽÀ s%0A"\,ÈfAfvfŠfP [fVf‡f“,İfpfX  
"CurrentDirectory" fAfvfŠfP [fVf‡f“,đŠJŽn,·,éftfBfCefNfgfŠ,İfpfX

**DirectPlay`f... [fgfŠfAf<**

,±,ìfZfNfVf±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,Ä,¢,Ä AfXfefbfv EfofC EfXfefbfv,É à-¾,µ,½,Ó,½,Ä,Ìf`f... [fgfŠfAf<,ªŠÛ,Û,é,Ä,¢  
,é BLOBBYfTf“fvf<,Í ADirectPlayf fr [,ð—p,¢,ÄfAfvfŠfP [fVf±f“,ð Ú±,.,é•û-@,ð à-¾,µ,Ä,¢  
,é BDIALOGfTf“fvf<,Ä,Í A Ú± î•ñ,ðf† [fU,É-â,¢ ±,í,¹,éf\_fCfAf fO Ef{fbfNfX,ðŽg—  
p,µ,ÄfAfvfŠfP [fVf±f“,ð Ú±,.,é•û-@,ðŽ!,µ,Ä,¢  
,é BfAfvfŠfP [fVf±f“,ð<L q,.,é,Æ,«,Í A,Ç,ç,©,Ìf f\fbfh,É,æ,Ä,ÄfAfvfŠfP [fVf±f“,ðŠJŽn,Ä,«,é,æ,µ,É,µ,È,-  
,Ä,Í,È,ç,È,¢ B

f`f... [fgfŠfAf< 1: f fr [,ðŽq—p,µ,½ Ú± iLOBBY j

f`f... [fgfŠfAf< 2: f fCfAf fO Ef{fbfNfX,ðŽq—p,µ,½ Ú± iDIALOG j

---

**f f,**

,±,ê,ç,Ìf`f... [fgfŠfAf<,ÌfTf“fvf< Eftf@fCf<,ÍC++,Ä ‘,©,ê,Ä,¢,é B,bfRf“fpfCf%,ðŽg—p,µ,Ä,¢  
,é ê ±,Í Afrf“fpfCf<,ð’É,.,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,Æthis|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... [fgfŠfAf< 1: f fr [,ðŽg—p,μ,½ Ú±

IDirectPlayLobbyfCf“f^ [ftfFfCfX,ðŽg—

p,μ,Ä ‘,©,ê,½fAfvfŠfP [fVf‡f“,Í Af† [fU,Žè ì<Æ,Ä Ú± î•ñ,ðf\_fCfAf fO Ef{fbfNfX,É“ü—Í,·,é,±,Æ,È,-  
Ú±,Ä,«,é BLOBBYfTf“fvf<,Í AŽŸ,ìfXfefbfv,Äf fr [,³,ê,½fAfvfŠfP [fVf‡f“,ð ì ¬,·,é•û-@,ð à-¾,·,é B

Step 1: DirectPlayLobbyfIfufWfEfNfg,Ì ì ¬

Step 2: Ú±ŠÄ«„ìŽæ“¾

Step 3: fZfbfVf‡f“L q,Ì Ý’è

Step 4: fZfbfVf‡f“,Ö,ì Ú±

Step 5: fvfEfCf„,Ì ì ¬

**Step 1: DirectPlayLobbyIfufWfFfNfg,ì ì ñ**

DirectPlayf fr [ <@”\, ðŽg, ¼, ½, ß A, Ü, ,  
**DirectPlayLobbyCreate**ŠÖ ”, ðŒÄ, Ñ o, µ, ÄDirectPlayLobbyIfufWfFfNfg, ìfCf“fXf^“fX, ð ì ñ, ·, é B, ±  
, ĪŠÖ ”, Ī5, Ā, Īfpf%of [f^, ðŠÜ, ñ, Ā, Ć, é B’æ1 A’æ3 A’æ4pf%of [f^, Ī A «—^, ĪŠg’£, Ī, ½, ß, É—\—  
ñ, ³, ê, Ā, ”, è A, Ā, Ē, ÉNULL, ð Ý’è, ·, é B’æ2pf%of [f^, É, ĪDirectPlayLobbyIfufWfFfNfg, Īf|  
fCf“f^, ĪfAfhfŒfX, ðŽw’è, ·, é BfIfufWfFfNfg,ª ì ñ, ³, ê, é, Œ A, ±, Īf|fCf“f^, ð—p, Ć  
, ĀfIfufWfFfNfg, ĪĒ’u, ðŽ•Ē, ·, é, ±, Œ,ª, Ā, «, é B’æ5pf%of [f^, à «—^, ĪŠg’£, Ī, ½, ß, É—\—  
ñ, ³, ê, Ā, ”, è A, Ā, Ē, É0, É Ý’è, ·, é B

ŽŸ, ì—á, Ī ADirectPlayLobbyIfufWfFfNfg, ì ì ñ•û—@, Ī, Đ, Œ, Ā, Ā, , é B

```
// ANSI DirectPlayf fr [ EfCf“f^ [ftfFfCfX, ðŽæ“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::GetConnectionSettings f\fbfh,ðŽg—
p,µ,Ä Af fr [,©,ç•Ô,³,ê,é Ú±ŠÂ««İŽæ“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 B¼,İ%½,ç,©,İfGf%o [,ª”-
¶,µ,½,Æ,«,İ AfAfvfŠfP [fVf±f“,İ Af fr [,İŽ,”s,ðŽ!,·fGf%o [,ðñ ,·,é,×,«,Ä, ,é B
^È%º,ì—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“,ª DPERR_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+f“L q,İ Ý’è**

```
fAfvfŠfP [fVf+f“É•K—v,È,·,×,Ä,İftf%ofo,Æ“Á «,ª ³,µ, Ý’è,³,ê,Ä,Ç,é,±
,Æ,ðŠm”F,·,é,É,Í ADPSESSIONDESC2 \‘ç’ì,ð²,×,é,×,«,Ä, ,é B C ³,ª•K—
v,È ê ‡,Í AIDirectPlayLobby::SetConnectionSettings f\fbfh,ðŽg—p,µ,Ä A•İ X,µ,½ Ú± Ý’è,ðL%o¯,·,é B
ŽŸ,ì—á,Ä,Í AfZfbfVf+f“L q,ð \ ¬,µ A Ú±,ð Ý’è,·,é•û—@,ðŽ,µ,Ä,Ç,é B
// Ú±‘O,É•K—v,ÈfZfbfVf+f“L q,ð \ ¬,·,é B
// fQ [fç,ÄŽg—p,³,ê,éftf%ofo,Æ Ä‘âfvfÇfCf,, ”,ðfZfbfg,·,é B
lpConnectionSettings->lpSessionDesc->dwFlags = DPSESSION_MIGRATEHOST |
DPSESSION_KEEPLIVE;
lpConnectionSettings->lpSessionDesc->dwMaxPlayers = MAXPLAYERS;
// C ³,³,ê,½ Ú± Ý’è,ðL%o¯,·,é B
hr = lpDirectPlayLobbyA->SetConnectionSettings(0, 0,
lpConnectionSettings);
if FAILED(hr)
goto FAILURE;
```

**Step 4: fZfbfVfzf“ ,Ö,İ Ú±**

```
fZfbfVfzf“<L q, a 3,µ, Ý'è,3,è,é,Æ AfAfvfŠfP [fVfzf“,Í fZfbfVfzf“,Æ Ú±
,·,é,½,ß,ÉIDirectPlayLobby::Connect f\fbfh,ðŽg—p,·,é,±,Æ,ª,Á,« ,é B,±,İf f\fbfh,ªDP_OK,ð•Ö,¹,Î A,Đ,Æ,Á, ,é,¢
,Í•j ”,İfvfœfCf,,ð ì ¬,·,é,±,Æ,ª,Á,« ,é B,±
,İf f\fbfh,ªDPERR_NOTLOBBIED,ð•Ö,µ,½,Æ,« ,Í Af† [fU,ÍÊ M”}·İ,ðŽè“®,Á‘ð,µ,È,¯,ê,Î,È,ç,È,¢ ifVfXfef€
,ÉfCf“fXfg [f<,³,è,Ä,¢,éT [frfX Efvf fofCf_,ðŽ¯Ê,·,é,É,Í ADirectPlayEnumerateŠÖ ”,ð~—p,·,é,±
,Æ,ª,Á,« ,é j B¼,İ%½,ç,©,İfGf% [,” ¶,µ,½ ê ±,Í AfAfvfŠfP [fVfzf“,Í Af fr [,ªŽ,”s,µ,½,±
,Æ,ðŽ',·fGf% [,ðñ ,·,é,×,« ,Á, ,é B
```

ŽŸ,ì—á,Í AfZfbfVfzf“,Æ,ì Ú±•û—@,ðŽ',µ,Ä,¢,é B

```
// fZfbfVfzf“,É Ú±,·,é BANSI IDirectPlay2Afcf“f^ [ftFfCfX,ð•Ö,· B
hr = lpDirectPlayLobbyA->Connect(0, &lpDirectPlay2A, NULL);
if FAILED(hr)
    goto FAILURE;
```



f`f... [fgfŠfAf< 2: f\_fCfAf fO Ef{fbfNfX,đŽg—p,μ,½ Ú±

f fr [,ªfAfvfŠfP [fVf‡f“,đŠJŽn,μ,È,©,Á,½ ê ‡,Í Af† [fU,ª Ú± î•ñ,đŽè“@,Á“ü—Í,Á,«é,æ,□  
,ÈfR [fh,đŠÛ,ß,Ä,“,×,«,Á, ,é BDIALOGfTf“fvf<,Í A^È%º,ìfXfefbfv,Á AfZfbfVf‡f“,ÉŽè“@,Á Ú±,·,é•û-  
@,Æ A,Đ,Æ,Â^È ã,ìfvfÆfCf,,đ ì ¬,·,é•û-@,đ 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-n<**

Žè“@,Á Ú±,ðŠm—š,·,é,½,ß,ì‘æ^ê·à,Í Af† [fU,ÉfAfvfŠfP [fvf‡f“,ì,½,ß,ì‘Ê M”}‘ì,ì‘I‘ð,ð—v< ,·,é,±,Æ,Á, ,é Bf AfvfŠfP [fvf‡f“,Í **DirectPlayEnumerate**ŠÖ ”,ðŽg—p,µ,Ä Afp [f‘fif< Efrf“fsf... [f^ ã,ÉfCf“fXfg [f<,³,é,Ä,¢ ,éfT [frfX Efvf fofCf\_,ðŽ·Ê,·,é,±,Æ,ª,Ä,« ,é B

ŽŸ,ì—á,Í AfT [frfX Efvf fofCf\_,l-n<“·û-@,ðŽ!,µ,Ä,¢,é B

DirectPlayEnumerate(DirectPlayEnumerateCallback, hWnd);

**DirectPlayEnumerate**ŠÖ ”,ì‘æ1fpf%of [f^,Í ADirectPlay,É,æ,Á,Ä“o~^,³,é,½fT [frfX Efvf fofCf\_,ð— ñ<“,·,éfr [f<fobfNŠÖ ”,Á, ,é BŽŸ,ì—á,Í A,±,ìfR [f<fobfNŠÖ ”,ðfCf“fvfŠf f“fg,·,é·û-@,ì,Ð,Æ,Á,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—ì‘æ,ð ì -,·,é B  
lpGuid = (LPGUID) GlobalAllocPtr(GHND, sizeof(GUID));  
if (lpGuid == NULL)  
goto FAILURE;

// frf“f{ Ef{fbfNfX,ÉGUID,Ö,ìf|fCf“f^,ðŠi”[,·,é B  
\*lpGuid = \*lpSPGuid;  
SendDlgItemMessage(hWnd, IDC\_SPCOMBO, CB\_SETITEMDATA,  
(LPARAM) iIndex, (LPARAM) lpGuid);

FAILURE:  
return (TRUE);  
}

**Step 2: IDirectPlay1IfuFwfFfNfg, Ī ì ñ**

f† [fU,žg—p,·,éT [frfX Efvf fofCf\_,đ'I'đ,·,é,Æ A'I'đ,ÉŠi,Ā,ĉ  
,ĀDirectPlay1IfuFwfFfNfg,đ ì ñ,μ A“K Ø,ÈfT [frfX Efvf fofCf\_,\fOf [fof< Ef†fj [fNŽ~·ÊŽq iGUID j,  
đŽw'è,·,é,±,Æ,ª,Ā,«,é BDirectPlay1IfuFwfFfNfg,Ī ì ñ,É,Ī A**DirectPlayCreateŠÖ** ”,đŽg—p,·,é B,±  
,ĪŠÖ ”,ĪEĀ,Ñ o,μ,É,æ,Ā,Ā ADirectPlay,Ī'I'đ,ª,½fT [frfX Efvf fofCf\_,Ī,½,β,Īf%ofCfuf%ofŠ,đf [fh,μ A**Di**  
**rectPlayCf“f^** [ftfFfCfX,đ•Ô,· B

**IDirectPlayCf“f^** [ftfFfCfX,Ī V,μ,ĉfQ [fĉ,Ī ì ñ,É—p,ĉ,é,±,Æ,ª,Ā,«,é,ª A,æ,è,æ,ĉ•û—  
@,Ī A Ā V,ĪDirectPlayCf“f^ [ftfFfCfX,Ā, ,é**IDirectPlay2,**” ,æ,Ñ**IDirectPlay2A,**đ—~—p,·,é,±,Æ,Ā, ,é B,±  
,é,ĉ,ĪfCf“f^ [ftfFfCfX,É,Ī A'Ĉ%oĀ,ª,½DirectPlay,Ī'S<@”\,ªŠÛ,Û,è,Ā,ĉ  
,é B**IDirectPlay2,ĀIDirectPlay2A**fCf“f^ [ftfFfCfX,đŽæ“¼,·,é,É,Ī A**DirectPlayCreateŠÖ** ”,ª•Ô,·**IDirectPlayCf“f^** [   
ftfFfCfX,Ī**QueryInterface** f\fbfh,đEĀ,Ñ o,· B

ŽŸ,Ī—á,Ā,Ī**IDirectPlayCf“f^** [ftfFfCfX,Ī ì ñ•û—@,đŽ|,μ A**QueryInterface,**đŽg—  
p,μ,Ā**IDirectPlay2A**fCf“f^ [ftfFfCfX,đ ì ñ,μ,Ā,ĉ,é B

HRESULT CreateDirectPlayInterface(LPGUID lpguidServiceProvider,  
LPDIRECTPLAY2A \*lpDirectPlay2A)

```
{  
LPDIRECTPLAY lpDirectPlay1 = NULL;  
LPDIRECTPLAY2A lpDirectPlay2A = NULL;  
HRESULT hr;
```

```
// DirectPlay 1.0fCf“f^ [ftfFfCfX,đŽæ“¼,·,é B  
hr = DirectPlayCreate(lpguidServiceProvider, &lpDirectPlay1, NULL);  
if FAILED(hr)  
    goto FAILURE;
```

```
// ANSI DirectPlay2fCf“f^ [ftfFfCfX,đ ĀE%oi,·,é B  
hr = lpDirectPlay1->QueryInterface(IID_IDirectPlay2A,  
    (LPVOID *) &lpDirectPlay2A);  
if FAILED(hr)  
    goto FAILURE;
```

```
// ì ñ,ª,½fCf“f^ [ftfFfCfX,đ•Ô,· B  
*lpDirectPlay2A = lpDirectPlay2A;
```

```
FAILURE:  
if (lpDirectPlay1)  
    lpDirectPlay1->Release();
```

```
return (hr);  
}
```

### Step 3: fZfbfVfzf“,Ö,İŽQ%Á

```
f† [fU,Šù“¶,İfZfbfVfzf“,ÉŽQ%Á,·,é,É,Í AIDirectPlay2::EnumSessions f\fbfh,đŽg—p,µ,ÄŽg—p%Á”\
,ÈfZfbfVfzf“,đ—
ñ““,µ Af† [fU,É‘I‘đŽ‘,đ‘ñ‘Ÿ‘,·,é B,»,µ,Ä ADOPEN_JOINft%fo,đŽw’è,µ,ÄIDirectPlay2::Open f\fbfh,đĚÄ,Ñ
o,µ A,»,İfZfbfVfzf“,Æ Ú±,·,é BfZfbfVfzf“,đ—
ñ““,·,é‘O,É AfT [frfX Efvf fofCf_,Í Af_CfAf fo Ef{fbfNfX,đ•Ž‘,µ,Äf† [fU,É îñ,ì“ü—Í,đ—
v< ,·,é ê ‡,·,é B
—~—p%Á”\,ÈfZfbfVfzf“,đ—ñ““,·,é•û—@,đŽŸ,ÉŽ‘,· B
```

```
// ±,İŽi—Đ,İfZfbfVfzf“,đĚŸ 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::EnumSessions f\fbfh,İ‘æ3fpf%o [f^,Í A~—p%Á”\,ÈfZfbfVfzf“,đ—
ñ““,·,éfr [f<fofbfNŠÖ ”,Ä,·,é BŽŸ,İ—á,Ä,Í A,±,İfR [f<fofbfNŠÖ ”,đfCf“fvfŠf f“fg,·,é•û—
@,İ,Đ,Æ,Ä,đŽ‘,µ,Ä,ĉ,é B
```

```
BOOL FAR PASCAL EnumSessionsCallback(
    LPCDPSESSIONDESC2 lpSessionDesc, LPDWORD lpdwTimeOut,
    DWORD dwFlags, LPVOID lpContext)
{
    HWND hWnd = lpContext;
    LPGUID lpGuid;
    LONG iIndex;
```

```
// f^fCf€fAfEfg,đ”»‘è,·,é B
if (dwFlags & DPESC_TIMEDOUT)
    return (FALSE); // ÄŽŽ s,µ,È,ĉ B
```

```
// fZfbfVfzf“—¼,đfŠfXfg,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—İ‘æ,đ ì ¬,·,é B
lpGuid = (LPGUID) GlobalAllocPtr(GHND, sizeof(GUID));
if (lpGuid == NULL)
    goto FAILURE;
```

```
// GUID,İf|fCf“f^,đfŠfXfg,ÉŠi”[,·,é B
*lpGuid = lpSessionDesc->guidInstance;
SendDlgItemMessage(hWnd, IDC_SESSIONLIST, LB_SETITEMDATA,
    (WPARAM) iIndex, (LPARAM) lpGuid);
```

```
FAILURE:
    return (TRUE);
}
```

```
f† [fU,Šù“¶,İfZfbfVfzf“,đ‘I‘đ,·,é,Æ AfAfvfŠfP [fvfzf“,Íf† [fU,ÉŠù“¶,İfZfbfVfzf“,Ö,İŽQ%Á,đ<-,·,±,Æ,·,Ä,«,·,é B
Šù“¶,İfZfbfVfzf“,ÉŽQ%Á,·,é•û—@,đˆÈ%°,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“,ì ì ñ**

```
f† [fU,ª V,µ,¢fZfbfVf#f“,ð ì ñ,·,é,É,Í ADPOPEN_CREATEftf%ofO,ðŽw'è,µ,ÄIDirectPlay2::Open f\fbfh,ðCEÄ
,Ñ o,· B,±,±
,Ä,àfT [fxfX Efvf fofCf_,Í AfZfbfVf#f“,ª ì ñ,³,ê,é'O,Éf_CfAf fO Ef{fbfNfX,ð•Ž',µ Af† [fU,É î•ñ,Ì“ü
—Í,ð—v< ;,é ê #,ª, ,é B
```

```
V,µ,¢fZfbfVf#f“,ì ì ñ•û-@,ðŽŸ,ÉŽ',· B
```

```
// V,µ,¢fZfbfVf#f“,ÌfzfXfg,ð-±,ß,é B
ZeroMemory(&sessionDesc, sizeof(DPSESSIONDESC2));
sessionDesc.dwSize = sizeof(DPSESSIONDESC2);
sessionDesc.dwFlags = DPSESSION_MIGRATEHOST | DPSESSION_KEEPAALIVE;
sessionDesc.guidApplication = DPCHAT_GUID;
sessionDesc.dwMaxPlayers = MAXPLAYERS;
sessionDesc.lpszSessionNameA = lpszSessionName;
```

```
hr = lpDirectPlay2A->Open(&sessionDesc, DPOPEN_CREATE);
if FAILED(hr)
    goto OPEN_FAILURE;
```

**Step 5: `fvfCfCf,,İ` ì ñ**

```
fZfbfVf+f“„đ ì ñ A, ,é,¢  
,ÍfZfbfVf+f“„ÉŽQ%Á,µ,½Ĉã AfAvfŠfP [fVf+f“„Í AIDirectPlay2::CreatePlayer f\fbfh,É,æ,Á,Ä,Đ,Æ,Â^È ã,ì  
fvfCfCf,,đ ì ñ,·,é,±,Æ,ª,Á,«„é BŽŸ,ì—á,Á,Í AfvfCfCf,,đ ì ñ,·,é•û-@,ì,Đ,Æ,Á,đŽ',µ,Ä,¢,é B
```

```
// -¼'O \‘c‘İ,đ Ÿ’è,·,é B  
ZeroMemory(&dpName, sizeof(DPNAME));  
dpName.dwSize = sizeof(DPNAME);  
dpName.lpszShortNameA = lpszPlayerName;  
dpName.lpszLongNameA = NULL;
```

```
// ,±,ì-¼'O,ÄfvfCfCf,,đ ì ñ,·,é B  
hr = lpDirectPlay2A->CreatePlayer(&dpidPlayer, &dpName,  
    lpDPInfo->hPlayerEvent, NULL, 0, 0);  
if FAILED(hr)  
    goto CREATEPLAYER_FAILURE;
```

```
fAvfŠfP [fVf+f“„Í AIDirectPlay2::GetCaps,âAIDirectPlay2::GetPlayerCaps f\fbfh,đŽg—p,µ,ÄfvfCfCf,,ì'Ê M”\  
—Í,đ”»’è,·,é,±,Æ,ª,Á,«„é B,Û,½ A¼,ìfvfCfCf,,đĈ©,Á, ,é,É,Í AIDirectPlay2::EnumPlayers f\fbfh,đŽg—  
p,·,é B
```

```
,±,ê,ÄfAvfŠfP [fVf+f“„Í Ú±,³,ê AfvfCfCf,·,é,½,ß,ì €”ö,ªŠ@—1,µ,½ B
```

DirectPlay\$ftf@fæf“fX

ŠÖ ”

## DirectPlayCreate

HRESULT WINAPI DirectPlayCreate(LPGUID lpGUID,  
LPDIRECTPLAY \*lpDP, IUnknown \*pUnkOuter);

DirectPlayIfufWfFfNfg, ÌfCf“fXf^f“fX, ð Ì -, : é B

-Æ÷, ·, ê, ÎDD\_OK AŽ, ”s, ·, ê, ÎŽŸ, ÌfGf%o [’l, Ì, Ç, ·, ê, ©, ð•Ô, · B

### CLASS\_E\_NOAGGREGATION

### DPERR\_EXCEPTION

### DPERR\_INVALIDPARAMS

### DPERR\_UNAVAILABLE

lpGUID

Ì -, ³, ê, éfT [frfX Efvf fofCf, ðŽ, ·, fof [fof< Ef+fj [fNŽ~•ÊŽq iGUID j, Ò, Ìf|fCf“f^ B

lpDP

—LÆø, ÈDirectPlayfCf“f^ [ftfFfCfX, Å %oŠú%o», ³, ê, éf|fCf“f^, Ò, Ìf|fCf“f^ B DirectPlay2 iUnicode•ŸŽš—  
ñ j, â DirectPlay2A iANSI•ŸŽš—ñ jfCf“f^ [ftfFfCfX, ðŽæ“¾, ·, é, ½, ß, É, Í A QueryInterface f\fbfh, ðŽg—  
p, ·, é•K—v, ³, , é B

pUnkOuter

IUnknownfCf“f^ [ftfFfCfX, Ò, Ìf|fCf“f^ B, ±, Ìfpf%of [f^, Í A «—^, ÌCOM W ¬%o»<@”\  
, Æ, ÌÆŸŠ· «, Ì, ½, ß, É’ñ<Ÿ, ³, ê, é BÆ» Ý, Ì DirectPlayCreateŠÖ ”, Í A, ±  
, Ìfpf%of [f^, ÉNULL^ÈŠO, Ì’l, ³Žw’è, ³, ê, Ä, Ç, é, ÆfGf%o [, ð•Ô, · B  
, ±, ÌŠÖ ”, Í DirectPlayIfufWfFfNfg, Ì %oŠú%o», ð s, Ç A ³ í I—, µ, ½ ê ±, Íf|  
fCf“f^, ðfZfbfg, ·, é BfAfvfŠfP [fVf±f“Í A %oŠú%o», Ì’¼’O, É A—~—p%oÂ”  
, ÈfT [frfX Efvf fofCf\_, Ìf^fCfv, ð”»è, ·, é, ½, ß, É DirectPlayEnumerateŠÖ ”, ðÆÄ, Ñ o, ·, ×, «, Ä, , é DirectPlayEnumerateŠÖ ”, Í A DirectPlayCreate, ÌlpGUIDfpf%of [f^, ð Ÿ’è, ·, é j B  
, ±, ÌŠÖ ”, Í A DirectPlayfCf“f^ [ftfFfCfX, Ò, Ìf|fCf“f^, ð•Ô, · BÆ» Ý, ÌDirectX  
3fCf“f^ [ftfFfCfX, Í DirectPlay2, ·, æ, Ñ DirectPlay2A, Ä, , é B, ±  
, ê, Ç, ÌfCf“f^ [ftfFfCfX, ðŽæ“¾, ·, é, É, Í A DirectPlayCreate, É, æ, Ä, Ä•Ô, ³, ê, ½ DirectPlayfCf“f^ [ftfFfCfX, Ì QueryInterface f\fbfh, ðÆÄ, Ñ o, ·•K—v, ³, , é B

ŽQ Æ @ DirectPlayEnumerate

## DirectPlayEnumerate

HRESULT WINAPI DirectPlayEnumerate(  
LPDPENUMDPCALLBACK lpEnumDPCallback, LPVOID lpContext);

*fVfXfef€*,ÉfCf“fXfg [f<,³,ê,Ä,¢,éDirectPlayfT [ftrfX Efvf fofCf\_,ð—ñ<“,·,é B  
-€÷,·,ê,ÏDD\_OK AŽ,“s,·,ê,ÏŽŸ,ÏfGf%o [¹,Ï,¢,,ê,©,ð•Ô,· B

**DPERR\_EXCEPTION**

**DPERR\_GENERIC**

**DPERR\_INVALIDPARAMS**

*lpEnumDPCallback*

*fVfXfef€*,ÉfCf“fXfg [f<,³,ê,Ä,¢  
,éDirectPlayfT [ftrfX Efvf fofCf\_ EfCf“f^ [ftfFfCfX,²,Æ,É€Ä,Ñ o,³,ê,é AEnumDPCallbackŠÖ ”,Ö,Ïf|  
fCf“f^ B

*lpContext*

ŠÖ ”,ª€Ä,Ñ o,³,ê,é,½,Ñ,ÉfR [f<fofbfNŠÖ ”,É“n,³,ê,é AfAfvfŠfP [fVf†f““è<¹,Ï \“c¹,Ö,Ïf|fCf“f^ B

,±,ÏŠÖ ”,Ï AfVfXfef€ÉfCf“fXfg [f<,³,ê,Ä,¢,éT [ftrfX Efvf fofCf\_,È,ç AfVfXfef€,ª—p,·,é,±,Æ,ª,Ä,«È,¢  
,à,Ï,Ä,à—ñ<“,·,é B,½,Æ,¹,Ï AfVfXfef€,Éf,ff€,ªfCf“fXfg [f<,³,ê,Ä,¢,È,,Ä,à A—  
ñ<“,É,ÏTAPIfT [ftrfX Efvf fofCf\_,ªŠÜ,Û,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  
-Ĉ÷,·,ê,İDD\_OK AŽ,”s,·,ê,İŽŸ,İfGf%o [‘l,ì,¢,,ê,©,đ•Ô,· B

### CLASS E\_NOAGGREGATION

### DPERR\_INVALIDPARAMS

### DPERR\_OUTOFMEMORY

lpguidSP

«—^,İ,½,ß,É—\-ñ,<sup>3</sup>,ê,Ä,¢,é BNULL,ÉfZfbfg,µ,Ä,“,©,È,¬,ê,İ,È,ç,È,¢ B

lpDPL

—LĈø,ÈİDirectPlayLobbyfCf“f^ [ftfFfCfX,Ä %Šú%»,<sup>3</sup>,ê,é|fCf“f^,Ö,İf|fCf“f^ B

lpUnk

IUnknownfCf“f^ [ftfFfCfX,Ö,İf|fCf“f^ B,±,İfpf%of [f^,Í «—^,İCOM W -%»«@”\  
,Æ,İĈŸŠ· «,İ,½,ß,É’ñ<Ÿ,<sup>3</sup>,ê,Ä,¢,é BĈ» Ÿ,İDirectPlayLobbyCreateŠÖ ”,Ä,Í A,±  
,İfpf%of [f^,ÉNULL^ÈŠÖ,İ’l,<sup>a</sup>Žw’è,<sup>3</sup>,ê,é,ÆfGf%o [,đ•Ô,· B

lpData

DirectPlayLobbyIfufWfFfNfg,đ ì ¬,·,é,½,ß,É’Ç%oÁff [f^,đ•K—v,Æ,·,é B,±,İfpf%of [f^,Í  
NULL,ÉfZfbfg,µ,Ä,“,©,È,¬,ê,İ,È,ç,È,¢ B

dwDataSize

,±,İfpf%of [f^,Í0,ÉfZfbfg,µ,Ä,“,©,È,¬,ê,İ,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,·,éAfvfšfP [fVf‡f“è\,ìfR [f<fofbfNšÖ ” B

—ñ<,đ'±,¯,é ê ‡,íTRUE A I—,·,é ê ‡,íFALSE,đ•Ö,· B

guidDataType

ff [f^ Ef`fff“fN,ìE^,đ•\,·fOf [fof< Ef†fj [fNž¯•Èžq iGUID j B

dwDataSize

ff [f^f`fff“fN,ìfTfCfY,đfofCfG'P^È,Åžw'è,·,é B

lpData

'è ”ff [f^,Ö,ìf|fCf“f^ B

lpContext

fR [f<fofbfNšÖ ”,É“n,³,ê,éRf“fefLfXfg B

fT [fRfX\_Efvf\_fofCf\_,Í AguidDataTypefpf%of [f^,ìGUID,đ'²,×,Ä AlpData,Åž',³,ê,é'l,đ ^— ,Û,½,Í<L%o¯,µ,È,-  
,Ä,Í,È,ç,È,ç B”Fž¯,Ä,«,È,çguidDataType,ì'l,Í-³ž<,·,é,±,Æ,ª,Ä,«,é B

fR [f<fofbfNšÖ ”,É•Ö,³,ê,é,·,×,Ä,ìf|fCf“f^,Íèžž“l,È,à,ì,Ä, ,è AfR [f<fofbfNšÖ ”“à,Ä,ì,Ý—LÆø,Ä, ,é Bf|  
fCf“f^ îñ,đ•Û“¶,·,é•K—v,ª, ,éAfvfšfP [fVf‡f“ ,Í Aff [f^,đ•Ûž ,·,é f, fš,đšm•Û,µ Aff [f^,đfRfs [µ A V  
,µ,çff [f^,ìf|fCf“f^,đ•Û“¶,µ,È,¯,ê,ì,È,ç,È,ç B,±,ìšÖ ”“à,ìlpData,Íèžž“l,Èf|fCf“f^,Ä, ,é B

### EnumAddressTypeCallback

BOOL WINAPI EnumAddressTypeCallback(  
    REFGUID guidDataType, LPVOID lpContext,  
    DWORD dwFlags);

**IDirectPlayLobby::EnumAddressTypes** f f\fbfh,ÅŽg—p,·,·,é fAfvfšFP [fVfšf“”è`,ìfR [f<fofbfNšÖ ” B  
—ñ“,đ’±,¯,é ê ±,ÍTRUE A I—¹,·,é ê ±,ÍFALSE,đ•Ô,· B

### guidDataType

fAfhfŒfXŽí•Ê,đ•\,·fOf [fof< Ef†fj [fNŽ¯•ÊŽq(GUID) B’è<` İ,Ý,Ö,İf|  
fCf“f^Ží•Ê,Í ADPAID\_Phone ADPAID\_Inet ADPAID\_ComPort,Â, ,é BfAfhfŒfXŽí•Ê,É,Â,Œ  
,Ä,İ Ú ×DirectPlayfAfhfŒfX,đŽQ Æ,³,ê,½,Œ B

### lpContext

fR [f<fofbfNšÖ ”,É“n,³,ê,é fRf“fefLfXfg B

### dwFlags

—\-ñ,³,ê,Ä,Œ,é BŽg—p,µ,Ä,Í,Œ,¯,È,Œ B

## EnumDPCallback

BOOL WINAPI EnumDPCallback(LPGUID lpGUIDSP,  
LPSTR/LPWSTR lpSPName, DWORD dwMajorVersion,  
DWORD dwMinorVersion, LPVOID lpContext);

**DirectPlayEnumerate**ŠÖ ”,ÄŽg—p,·,éAfvfŠfP [fVf‡f“”èç,ìfR [fçofbfNŠÖ ” BUNICODE,“èç,³,ê,é,©,Ç,□  
,©,É,æ,Á,Ä AfR [fçofbfNŠÖ ”,ìfvf fgf^fCfv,ìlpSPName,Í ALPWSTR iUnicode,ì ê ‡ j, ,é,ç  
,ÍLPSTR iANSI,ì ê ‡ j,Æ,µ,Ä’èç,³,ê,é B

—ñç,ð’±,¬,é ê ‡,ÍTRUE A I—,·,é ê ‡,ÍFALSE,ð•Ö,· B

### lpGUIDSP

DirectPlayfT [ftrfX Efvf fofCf\_,)f+fi [fNŽ~•ÊŽq,ìfAfhfÇfX B

### lpSPName

fhf%oCfo,ðŽ,·•¶Žš—ñ,ìfAfhfÇfX BUNICODEfVf“f{fç,“èç,³,ê,é,©,Ç,□  
,©,É,æ,Á,Ä Afpf%of [f^,ÍLPWSTRÇ^ iUnicode j, ,é,ç,ÍLPWSTRÇ^ iANSI j,Æ,È,é B

### dwMajorVersion and dwMinorVersion

fhf%oCfo,ìf fWff [,¬,æ,Ñf}fCfi [ Efo [fWf‡f“”Ô + B

### lpContext

fAfvfŠfP [fVf‡f“”èç,ìfRf“fefLfXfg,Ö,ìf|fCf“f^ B

fR [fçofbfNŠÖ ”,É•Ö,³,ê,é,·,×,Ä,ìf|fCf“f^,íêŽž“L,È,à,ì,Á, ,è AfR [fçofbfNŠÖ ”“à,Á,Ì,Ý—LÇø,Á, ,é B|  
fCf“f^ îñ,ð•Û•¶,·,é•K—v,³, ,éAfvfŠfP [fVf‡f“,Í Af f [f^,ð•ÛŽ ,·,é f, fŠ,ðŠm•Û,µ Af f [f^,ðfRfs [,µ A V  
,µ,çff [f^,ìf|fCf“f^,ð•Û•¶,µ,È,¬,ê,ì,È,ç,È,ç B,±,ìŠÖ ”“à,ìlpGUIDSP AlpSPName AlpData,íêŽž“L,Èf|fCf“f^,Á, ,é B

**EnumLocalApplicationsCallback**

BOOL WINAPI EnumLocalApplicationsCallback(  
LPCDPLAPPINFO lpAppInfo, LPVOID lpContext, DWORD dwFlags);

**IDirectPlayLobby::EnumLocalApplications** f f\fbfh,ÁŽg—p,;éfAfvfŠfP [fVf‡f““è\,ÌfR [f<fofbfNŠÖ ” B

—ñ<“,đ‘±,¯,é ê ‡,ÍTRUE A I—,.,é ê ‡,ÍFALSE,đ•Ô,· B

lpAppInfo

—ñ<“,³,ê,½fAfvfŠfP [fVf‡f““,ì î•ñ,đŠÛ,Ð A“Ç,Ý o,µ ê—p,ÌDPLAPPINFO \‘ç‘ì,Ö,Ìf|fCf“f^ B

lpContext

**IDirectPlayLobby::EnumLocalApplications**CEÄ,Ñ o,µ,©,ç“n,³,ê,éfRf“fefLfXfg,Ö,Ìf|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,Ìf|fCf“f^,ÍêŽž“l,È,à,Ì,Ä, ,è Afr [f<fofbfNŠÖ ”“à,Ä,Ì,Ý—LÆø,Ä, ,é B|  
fCf“f^ î•ñ,đ•Û•¶,·,é•K—v,³, ,éfAfvfŠfP [fVf‡f““,Í Aff [f^,đ•ÛŽ ,·,éf f,fŠ,đŠm•Û,µ Aff [f^,đfRfs [µ A V  
,µ,çff [f^,Ìf|fCf“f^,đ•Û•¶,µ,È,¯,ê,Ì,È,ç,È,ç B,±,ÌŠÖ ”“à,ÌlpAppInfo,ÍêŽž“l,Èf|fCf“f^,Ä, ,é B,Û,½  
AlpAppInfofpf%of [f^,ÁŽ,³,ê,é \‘ç‘ì,Ì‘†,Ìf|fCf“f^ AlpszAppNameA,“,æ,ÑlpszAppName,âêŽž“l,È,à,Ì,Ä, ,é,±  
,Æ,É’ ^Ó,³•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 f\bfh,ÅŽg—  
p,³,ê,éfAfvfŠfP [fVf±f“è`ìfR [f<fofbfNŠÖ ” B

—ñ<“,ð‘±,é ê ±,ÍTRUE A I—,·,é ê ±,ÍFALSE,ð•Ô,· B

dpId

—ñ<“,³,ê,½fvfCEfCf,,Ü,½,ÍfOf< [fv,ÌID B

dwPlayerType

fvfCEfCf,,ÌCE^ BDPPLAYERTYPE\_GROUP,Ü,½,ÍDPPLAYERTYPE\_PLAYER,É,È,é B

lpName

fvfCEfCf,,Ü,½,ÍfOf< [fv,Ì-¼‘O,ðŠÜ,ñ,¾•İ X•s%oÂ”\,ÈDPNAME \‘ç‘İ,Ö,ìf|fCf“f^ B

dwFlags

**IDirectPlay2::EnumGroups**,

**IDirectPlay2::EnumGroupPlayers**,Ü,½,Í**IDirectPlay2::EnumPlayers**f f\bfh,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^,ÍèŽž“I,È,à,Ì,Å, ,è AfR [f<fofbfNŠÖ ”“à,Å,Ì,Ý—LCEø,Å, ,é B|  
fCf“f^ î•ñ,ð•Ů‘¶,·,é•K—v,ª, ,éfAfvfŠfP [fVf±f“,Í Af f [f^,ð•ŮŽ ,·,éf f, fŠ,ðŠm•Ů,µ Aff [f^,ðfRfs [,µ A V  
,µ,çff [f^,ìf|fCf“f^,ð•Ů‘¶,µ,È, ,é,Ì,È,ç,È,ç B,±,ìŠÖ ”“à,ìlpName,ÍèŽž“I,Èf|fCf“f^,Å, ,é B,Ü,½  
AlpNamepf%of [f^,ÅŽ,³,ê,é \‘ç‘İ,ì‘†,ìf|fCf“f^ AlpszShortName / lpszShortNameA, ,æ,ÑlpszLongName /  
lpszLongNameA,àèŽž“I,È,à,Ì,Å, ,é,±,Æ,É’ ^Ó,ª•K—v,Å, ,é B

**EnumSessionsCallback2**

BOOL EnumSessionsCallback2(LPDPSESSIONDESC2 lpThisSD,  
LPDWORD lpdwTimeOut, DWORD dwFlags  
LPVOID lpContext);

**IDirectPlay2::EnumSessions** f f\bfh,žg—p,·,éAfvfšfP [fVf‡f“èç,ìfR [f\fofbfNšÖ ” B

—ñ““,đ‘±,¯,é ê ‡,íTRUE A I—1,·,é ê ‡,íFALSE,đ•Ö,· B

*lpThisSD*

—ñ““,³,ê,½fZfbfVf‡f“,đ•\,·**DPESSIONDESC2** \‘ç‘ì,Ö,ìf|fCf“f^ B—ñ““,³f^fCf€ EfAfEfg,µ,½ ê ‡ A,±  
,ìfpf%of [f^,É,íNULL,³fZfbf,³,é,é B

*lpdwTimeOut*

œ» Ý,ìf^fCf€ EfAfEfg‘l,đšÜ,đ•í ”,Ö,ìf|fCf“f^ B%ž“š,ì,½,ß,ÉfZfbfVf‡f“,ìf^fCf€ EfAfEfg‘l,đ‘,-  
,µ,½,ç ê ‡,í ADPESC\_TIMEDOUTftf%ofO,³•Ö,³,é,½,Æ,«,É,±,ìfpf%of [f^,đfšfZfbf,·,é,±,Æ,³,Á,«,é B

*dwFlags*

’Ê í,í,±,ìftf%ofO,É,í0,³fZfbf,³,é,é B

DPESC\_TIMEDOUT

—ñ““,³f^fCf€ EfAfEfg,µ,½,±,Æ,đž‘,· BlpdwTimeOut  
,đfšfZfbf,µ A—ñ““,đ‘±,¯,é ê ‡,íTRUE A I—  
1,·,é ê ‡,íFALSE,đ•Ö,· B

*lpContext*

fAfvfšfP [fVf‡f“èç,ìfRf“fefLfXfg,ìfAfhfœfX B

fR [f\fofbfNšÖ ”,É•Ö,³,é,é,·,×,Ä,ìf|fCf“f^,íêžž“l,È,à,ì,Á, ,è AfR [f\fofbfNšÖ ”“à,Á,ì,Ý—Lœø,Á, ,é B|  
fCf“f^ îñ,đ•Ü•¶,·,é•K—v,³,éAfvfšfP [fVf‡f“,í Aff [f^,đ•Üž ,·,é f, fš,đšm•Ü,µ Aff [f^,đfRfs [,µ A V  
,µ,çff [f^,ìf|fCf“f^,đ•Ü•¶,µ,È,¯,é,ì,È,ç,È,ç B,±,ìšÖ ”“à,ìlpThisSD,íêžž“l,È,èf|fCf“f^,Á, ,é B  
,Ü,½ AlpThisSDpf%of [f^,Äž‘,³,é,é \‘ç‘ì,ì‘†,ìf|fCf“f^ AlpszSessionName / lpszSessionNameA, ,æ,ñlpszPassword  
/ lpszPasswordA,àêžž“l,È,à,ì,Á, ,é,±,±,Æ,É’ ^ó,³,é,½,ç B

## IDirectPlay2

DirectPlayIfufWfFfNfg,đ ì ¬,µ AfVfXfef€ EfƆefxf<,İ ĩ ”,đ’€ ì,.,é,É,Í AIDirectPlay2fCf“f^ [ftFfCfX,İf f\fbfh,đŽg—p,.,é i IDirectPlay2AfCf“f^ [ftFfCfX,Í AIDirectPlay2A,ªANSI•ŕŽš,đŽg—p,µ AIDirectPlay2,ªUnicode,đŽg—p,.,é,±,Æ,đ æ,¬,İ AIDirectPlay2fCf“f^ [ftFfCfX,Æ“™,Á, ,é j B,±,İfZfNfVf‡f“,Í AIDirectPlay2fCf“f^ [ftFfCfX,İf f\fbfh,İfŠftf@fƆef“fX,Á, ,é B

IDirectPlay2fCf“f^ [ftFfCfX,İf f\fbfh,Í AŽŸ,İfOf< [fv,Éª—D,.,é,±,Æ,ª,Á,«.,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

fvfƆefCf,„ŠÇ— CreatePlayer  
DestroyPlayer  
EnumPlayers  
GetPlayerAddress  
GetPlayerCaps  
GetPlayerName  
SetPlayerName

fZfbfVf‡f“ŠÇ— Close  
EnumSessions  
GetCaps  
GetSessionDesc  
Open  
SetSessionDesc

IDirectPlay2fCf“f^ [ftFfCfX,Í A,.,x,Ä,İCOMfCf“f^ [ftFfCfX,Æ“—  
l AUnknownfCf“f^ [ftFfCfX Ef f\fbfh,đƆep ³,.,é BIUnknownfCf“f^ [ftFfCfX,İŽŸ,ì,R,Â,İf f\fbfh,đfTf [fg,.,é B

AddRef

QueryInterface

Release



**IDirectPlay2::AddPlayerToGroup**

HRESULT AddPlayerToGroup(DPID idGroup, DPID idPlayer);

«»‘¶,ÏfVfŒfCf,,ðŒ»‘¶,ÏfOf< [fv,É’Ç%Á,·,é B  
-Œ÷,·,ê,ÏDD\_OK AŽ,’s,·,ê,ÏŽŸ,ÏfGf%o [’l,Ï,Œ,,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,ð¼,ÏfOf< [fv,É’Ç%Á,·,é±,Œ,Í,Á,«È,Œ,ª AfvfŒfCf,,Í·j ”,ÏfOf< [fv,Ïf f“fo [,É,È,é,±  
,Œ,ª,Á,«é BfvfŒfCf,,ª’Ç%Á,³,ê,é,Œ ADPSYS\_ADDPLAYERTOGROUPfvfXfef€ Ef fbfZ [fW,ª ¶ ¬,³,ê A¼  
,Ï,·,×,Á,ÏfVfŒfCf,,É—,ç,ê,é BfvfXfef€ Ef fbfZ [fW,ÏfŠfXfg,É,Á,Œ,Á,ÏfVfXfef€ Ef fbfZ [fW.ÏŽq—p  
,ðŽQ Œ,³,ê,½,Œ B

ŽQ Œ @**IDirectPlay2::CreateGroup**, **IDirectPlay2::DeletePlayerFromGroup**, **DPMSG\_ADDPLAYERTOGROUP**

**IDirectPlay2::Close**

HRESULT Close();

fI [fvf“,μ,Ä,ç,½fZfbfVf‡f“,ðfNf [fY,·,é B  
-Æ÷,·,ê,ÎDD\_OK AŽ,”s,·,ê,ÎŽŸ,ÏfGf%o [!l,ì,ç,,ê,©,ð•Ô,· B

**DPERR\_INVALIDOBJECT**

**DPERR\_INVALIDPARAMS**

**DPERR\_NOSESSIONS**

,±  
,Ïf f\fbfh,ðÆÄ,Ñ o,·,Æ Af [fJf<,É ì ¬,³,ê,½,·,×,Ä,ÏfvfÇfCf,,,”jŠü,³,ê A‘Î%ž,·,éDPSYS\_DESTROYPLAYER  
ORGROUPfVfXfef€ Ef fbZ [fW,“¼,ÏfZfbfVf‡f“ŠÖEWŽÖ,É’Ê’m,³,ê,é B,μ,©,μ AfOf< [fv,Í”jŠü,³,ê,È,ç ifO  
f< [fv,ð”jŠü,·,é,É,Í A**IDirectPlay2::DestroyGroup**,ðŽg—p,·,é j BfVfXfef€ Ef fbZ [fW,ÏŠfXfg,É,Ä,ç  
,Ä,ÏfVfXfef€ Ef fbZ [fW,ÏŽg—p,ðŽQ Æ,³,ê,½,ç B

ŽQ Æ @**IDirectPlay2::DestroyPlayer**, **DPMSG\_DESTROYPLAYERORGROUP**, **IDirectPlay2::Open**

## IDirectPlay2::CreateGroup

HRESULT CreateGroup(LPDPID lpidGroup,  
LPDPNAME lpGroupName, LPVOID lpData,  
DWORD dwDataSize, DWORD dwFlags);

«» Ý, ðfzfbfVfþf“„É“¶ Ý, „, éfvfœfCf„, Ì— fOf< [fv, ð ì ¬, „, é B  
—œþ, „, é, ÎDD\_OK AŽ, „s, „, é, ÎŽÝ, ðfGf%o [l, ð, „, é, ©, ð•Ô, „ B

**DPERR\_CANTADDPLAYER**

**DPERR\_INVALIDOBJECT**

**DPERR\_INVALIDPARAMS**

**DPERR\_OUTOFMEMORY**

*lpidGroup*

DirectPlayOf< [fvID, Á—„, ß s, „, é, é•Í ”, Ö, ðfCf“f^ B , ±, ðl, ÍDirectPlay, É, æ, Á, Ä’è<^, „, é B

*lpGroupName*

fOf< [fv, ð¼‘O, ðŽ , ÄDPNAME \‘c‘ì, Ö, ðfCf“f^ B NULL, ðfOf< [fv, ^ %oŠú¼, ðŽ , Á, Ä, c, È, c, ±, Æ, ð•\, „ B

*lpData*

fOf< [fvID, ÆŠÖ~A•t, „, éfAfvfŠfP [fvfþf“è<^, ðŠf, [fg Eff [f^ Efuf fbfn, Ö, ðfCf“f^ B  
NULL, ðfOf< [fv, ^ %oŠúff [f^, ðŽ , Á, Ä, c, È, c, ±, Æ, ð•\, „ B , ±, ±  
, ÄŽw’è, „, é, ½ff [f^, Í AIDirectPlay2::SetGroupData, ^œÄ, Ñ o, „, é, é, Æ, «, Æ“—  
l AfzfbfVfþf“t, ð, „, ×, Ä, ðfAfvfŠfP [fvfþf“„É“„, ð, c, é, éfŠf, [fg Eff [f^, Ä, „, é, Æœ©, È, „, é B

*dwDataSize*

lpData, ^Žw, „ff [f^ Efuf fbfn, ðfTfCfY, ðfofCfG’P^È, ÄŽw’è, „, é B

*dwFlags*

—\~ñ, „, é, Ä, c, é BŽg—p, µ, Ä, Í, c, „, È, c B

f fbz [fW, ðfOf< [fv, É‘— M, „, é, ±, Æ, ^, Ä, « ADirectPlay, ^fOf< [fv’t, ðŠfvfœfCf„, Éf fbz [fW, ð“‘—  
, „, é BfAfvfŠfP [fvfþf“„É•Ö, „, é, ½fOf< [fvID, Í Af fbz [fW“‘B, Æff [f^œ< þ, É, „, c  
, ÄfOf< [fv, ðŽ~•È, „, é, ½, B, È—p, c, c, é, é BDirectPlay, É, æ, Á, ÄŠ„, è“—  
, Ä, c, é, ½fvfœfCf„, ID, ÆfOf< [fvID, Í A, Ä, È, ÉfzfbfVfþf“„, ðt, Äftfj [fn, Ä, „, é B, ±  
, ðf f\fbfh, ÍDPSYS\_CREATEPLAYERORGROUPVfXfef€ Ef fbz [fW, ð ¶ ¬, µ A¼, ð, „, ×, Ä, ðfvfœfCf„, É‘  
— M, „, é, é BfvfXfef€ Ef fbz [fW, ðŠfXfg, É, Ä, c, Ä, ðfVfXfef€ Ef fbz [fW, ðŽg—p, ðŽQ Æ, „, é, ½, c B

fAfvfŠfP [fvfþf“„, Í AIDirectPlay2::SetGroupNamef f\fbfh, ðŽg, Á, Ä AfOf< [fv, ð ì ðŽž, É %oŠúfOf< [fv—  
¼, ðŠÖ~A•t, „, é, ±, Æ, ^, Ä, «, é BlpGroupName, ð¼‘O, Í IŠÖ, ^—~p, „, é, ½, ß, ¾, „, É’ñ<Ý, „, é A“à”, Ä, ÍŽg—p, „, é, È, c  
, ð, Ä Afftfj [fn, Ä, „, éK—

v, Í, È, c BfAfvfŠfP [fvfþf“„, Í AIDirectPlay2::SetGroupDataf f\fbfh, É, æ, Á, Ä AfOf< [fv, ð ì ðŽž, É %oŠúff [f  
^, ðŠÖ~A•t, „, é, ±, Æ, ^, Ä, «, é B

ŽQ Æ @DPNAME, DPMSG\_CREATEPLAYERORGROUP, IDirectPlay2::DestroyGroup,

IDirectPlay2::EnumGroups, IDirectPlay2::EnumGroupPlayers, IDirectPlay2::Send, IDirectPlay2::SetGroupData,

IDirectPlay2::SetGroupName

**IDirectPlay2::CreatePlayer**

HRESULT CreatePlayer(LPDPID lpidPlayer,  
LPDPNAME lpPlayerName, HANDLE hEvent,  
LPVOID lpData, DWORD dwDataSize, DWORD dwFlags);

«» Ý, ðfZfbfVfþf“, Éf [fJf< EfvfŒfCf,, ð ì -, , é B  
-Œþ, , é, ÌDD\_OK AŽ, ”s, , é, ÌŽÝ, ÌfGf%o [’l, Ì, Œ, , é, ©, ð•Ô, · B

**DPERR\_CANTADDPLAYER**

**DPERR\_CANTCREATEPLAYER**

**DPERR\_GENERIC**

**DPERR\_INVALIDOBJECT**

**DPERR\_INVALIDPARAMS**

**DPERR\_NOCONNECTION**

*lpidPlayer*

DirectPlayvfŒfCf,, ID, Á-, , ß s, , 3, é, é•Ì ”, Ö, Ìf|fCf“f^ B , ±, Ì’l, ÌDirectPlay, É, æ, Á, Á’è<, 3, é, é B

*lpPlayerName*

fvfŒfCf,, Ì-¼’O, ðŽ , ÁDPNAME \’Œ’Ì, Ö, Ìf|fCf“f^ B NULL, ÌfvfŒfCf,, , a %oŠú-¼ î•ñ, ðŽ , Á, Á, Œ, È, Œ, ±, Œ, ð•\, · B

*hEvent*

, ±  
ÌfvfŒfCf,, , Á, Ìf fbfZ [fWŽó M, µ, ½, Œ, «, ÉDirectPlay, É, æ, Á, Á<N“®, 3, é, é AfAfvfŠfP [fvfþf“, a ¶ -, µ, ½f  
Cxf“fg EfIfufWfFfNfg B

*lpData*

fvfŒfCf,, ID, ÉŠÖ~A•t, -, éfAfvfŠfP [fvfþf“è<, ÌfŠf, [fg Eff [f^ Efuf fbfN, Ö, Ìf|fCf“f^ B  
NULL, ÌfvfŒfCf,, , a %oŠúff [f^, ðŽ , Á, Á, Œ, È, Œ, ±, Œ, ð•\, · B, ±, ±  
, ÁŽw’è, 3, é, ½ff [f^, Ì AIDirectPlay2::SetPlayerData, aŒÄ, Ñ o, 3, é, é, Œ, «, Œ“—  
l AfZfbfVfþf“t, Ì, ·, ×, Á, ÌfAfvfŠfP [fvfþf“, É“”B, 3, é, éfŠf, [fg Eff [f^, Á, , é, ŒŒ©, È, 3, é, é B

*dwDataSize*

lpData, aŽw, ·ff [f^ Efuf fbfN, ÌfTfCfY, ðfofCf’P’È, ÁŽw’è, , é B

*dwFlags*

—\-ñ, 3, é, Á, Œ, é BŽg—p, µ, Á, Í, Œ, -, È, Œ B

, ð, Œ, Á, Ìfvf fZfX, Í•j ”, Ìf [fJf< EfvfŒfCf,, ðŽ , Á, ±  
, Œ, , Á, «, é Bf [fJf< EfvfŒfCf,, Ì ADirectPlayIfufWfFfNfg, ð’È, µ A•j ”, ÌfRf“fsf...  
[f^ ä, ÁŽÄ s’t, Ì”C^Ó, Ì ”, Ìf [fJf< EfvfŒfCf,, , ä AfŠf, [fg, ÌfvfŒfCf,, Œ’Ëb, ·, é, ±  
, Œ, , Á, «, é BfAfvfŠfP [fvfþf“, Ì A•Ô, 3, é, ½fvfŒfCf,, ID, ðŽg—  
p, µ, Á Af fbfZ [fW“”B, äff [f^Œ< ±, ÁŽw’è, , éfvfŒfCf,, ðŽ-•È, , é BDirectPlay, É, æ, Á, ÁŠ,, è“-  
, Á, ç, é, ½fvfŒfCf,, ID, Œfof< [fvID, Ì A, Á, È, ÉfZfbfVfþf“, Ì’t, Áftfj [fN, Á, , é B

fAfvfŠfP [fvfþf“, Ì AIDirectPlay2::SetPlayerNamef ffbfh, ðŽg, Á, Á AfvfŒfCf,, Ì ì -Žž, É %oŠú-  
¼, ðŠÖ~A•t, -, é, ±, Œ, , Á, «, é BlpPlayerName, aŽ, -, -¼’O, Ì lŠÓ, a~—p, , é, ½, B, ¾, -, È’ñ<Ý, 3, é A“à”, Á, ÌŽg—p, 3, é, È, ç  
, ½, B Af†fj [fN, Á, , éK—  
v, Ì, È, ç BfAfvfŠfP [fvfþf“, Ì AIDirectPlay2::SetPlayerDataf ffbfh, É, æ, Á, Á AfvfŒfCf,, Ì ì -Žž, É %oŠúff [f  
^, ðŠÖ~A•t, -, é, ±, Œ, , Á, «, é B

, ±, Ìf ffbfh, a 3 íÉ I—, ·, é, Œ A V, µ, ŒfvfŒfCf,, , a fZfbfVfþf“, É%oÁ“ü, µ, ½, ±  
, Œ, ð’È”m, ·, é, ½, B AfZfbfVfþf“t, Ì’¼, Ì, ·, ×, Á, ÌfvfŒfCf,, , ÉDPSYS\_CREATEPLAYERORGROUPfvfXfefŒ Ef fbfZ  
[fW, a—, ç, é, é BfvfXfefŒ Ef fbfZ [fW, ÌfŠfXfg, É, Á, Œ, Á, ÌfvfXfefŒ Ef fbfZ [fW, ÌŽg—p, ðŽQ Œ, 3, é, ½, ç B

DirectPlayf fbfZ [fW, ÌŽæ“¾, ð•È, ÌfXfŒfbfh, Á s, ofAfvfŠfP [fvfþf“, Á, Ì AhEventfPf%of [f^, ð—p, ç  
, Á“ŠúfCxf“fg, ð’ñ<Ý, ·, é, ±, Œ, , Á, «, é B, ±, ÌfCxf“fg, Ì A, ±  
, ÌfvfŒfCf,, , a f fbfZ [fW, ðŽó, -Žæ, Á, ½, Œ, «, ÉfZfbf, 3, é, é BhEvent, ÁŽ, 3, é, éfCxf“fg, Ì A•j ”, ÌfvfŒfCf,, , ©, çŽg—  
p, ·, é, ±, Œ, , Á, «, é B

ŽQ Œ @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,©,çfvfCfCf,,đ í œ,·,é B*

*-œ÷,·,ê,ÎDD\_OK AŽ,„s,·,ê,ÎŽŸ,ÌfGf%o [l,Ì,ç,,ê,©,đ•Ô,· B*

**DPERR\_INVALIDOBJECT**

**DPERR\_INVALIDPLAYER**

*idGroup*

*fvfCfCf,,<sup>a</sup> í œ,<sup>3</sup>ê,éOf< [fvID B*

*idPlayer*

*fOf< [fv,©,ç í œ,<sup>3</sup>ê,éfvfCfCf,,ÌfvfCfCf,,ID B*

*fvfCfCf,,<sup>a</sup> í œ,<sup>3</sup>ê,é,Æ A•Ī X,đ¼,ÌfvfCfCf,,É'Ê'm,·,é,½,ß,ÉDPSYS\_DELETEPLAYERFROMGROUPfvfXfef€  
Ef fbZ [fW,<sup>a</sup> ¶ ¬,<sup>3</sup>ê,é BfvfXfef€ Ef fbZ [fW,ÌfŠfXfg,É,Ā,ç,Ā,ÌfvfXfef€ Ef fbZ [fW,ÌŽg=  
p,đŽQ Æ,<sup>3</sup>ê,½,ç B*

*ŽQ Æ @IDirectPlay2::AddPlayerToGroup, DPMSG\_DELETEPLAYERFROMGROUP*

**IDirectPlay2::DestroyGroup**

HRESULT DestroyGroup(DPID idGroup);

fZfbfVf#f“©,çfOf< [fv,đ í œ,·,é B ,±,ìfOf< [fv,É‘@,μ,Ä,ç,éID,Í ACE» Ý,ìfZfbfVf#f“,ÌŠÔ A Ä—~—  
p,³,ê,é,±,Æ,Í,È,ç B

-œ÷,·,ê,ÎDD\_OK AŽ,”s,·,ê,ÎŽŸ,ÌfGf%o [‘l,ì,ç,,ê,©,đ•Ô,· B

**DPERR\_INVALIDOBJECT**

**DPERR\_INVALIDPARAMS**

**DPERR\_INVALIDPLAYER**

idGroup

fQ [f€,©,ç í œ,³,ê,éfOf< [fvID B

í œ,·,é‘O,ÉfOf< [fv,đ<ó,É,·,é•K—v,Í,È,ç BfOf< [fv,É‘@,μ,Ä,ç,éœÄ•È,ìfvfœfçf,,Í”jŠü,³,ê,È,ç B,±  
,Ìf f\fbfh,Í AfOf< [fv,É‘@,μ,Ä,ç

,éŠefvfœfçf,,ÉDPSYS\_DELETEPLAYERFROMGROUPfvfXfef€ Ef fbfZ [fW,đ”-

s,μ AŽŸ,ÉDPSYS\_DESTROYPLAYERORGROUPfvfXfef€ Ef fbfZ [fW,đ ¶ ¬,·,é BfvfXfef€ Ef fbfZ [f  
W,ìfŠfXfg,É,Ä,ç,Ä,ÍfvfXfef€ Ef fbfZ [fW,ìŽg—p,đŽQ Æ,³,ê,½,ç B

ŽQ Æ @IDirectPlay2::CreateGroup, DPMSG\_DESTROYPLAYERORGROUP

## IDirectPlay2::DestroyPlayer

HRESULT DestroyPlayer(DPID idPlayer);

fZfbfVf†f“,©,çfvfƎfCf,,đ í œ,·,é B,»,)fvfƎfCf,,^¶,Ä,Ï,·,×,Ä,Ï-¢ ^— f fbZ [fW,Íf fbZ [fW Eflf...  
[,©,ç í œ,³,ê AfvfƎfCf,,Í A·®,µ,Ä,¢  
,½,·,×,Ä,ÏfOf< [fv,©,ç í œ,³,ê,é BƎ» Ý,ÏZfbfVf†f“,ÏŠŎ,Í AfvfƎfCf,,ID,ª Ä—~p,³,ê,é,±,Æ,Í,È,¢ B  
-Ǝ÷,·,ê,ÏDD\_OK AŽ,·s,·,ê,ÏŽŸ,ÏGf%o [¹,Ï,¢,,ê,©,đ•Ŏ,· B

**DPERR\_INVALIDOBJECT**

**DPERR\_INVALIDPLAYER**

idPlayer

fZfbfVf†f“,©,ç í œ,³,ê,éfvfƎfCf,, ID B

,±,Ïf f\fbfh,Í AfvfƎfCf,,ª·®,µ,Ä,¢  
,½fOf< [fv,ÉDPSYS\_DELETEPLAYERFROMGROUPfvfXfef€ Ef fbZ [fW,đ”-  
s,µ AŽŸ,ÉDPSYS\_DESTROYPLAYERORGROUP  
fvfXfef€ Ef fbZ [fW,đ ¶ ¬,·,é BfvfXfef€ Ef fbZ [fW,ÏŠfXfg,É,Ä,¢,Ä,ÍfvfXfef€ Ef fbZ [fW,ÏŽq  
=p,đŽQ Æ,³,ê,½,¢ B

ŽQ Æ @IDirectPlay2::CreatePlayer, **DPMSG\_DESTROYPLAYERORGROUP**

## IDirectPlay2::EnumGroupPlayers

HRESULT EnumGroupPlayers(DPID idGroup,  
LPGUID lpguidInstance,  
LPDPENUMPLAYERSCALLBACK2 lpEnumPlayersCallback2,  
LPVOID lpContext, DWORD dwFlags);

«» Ý, ðZfbfVfþf“, É“¶ Ý, ·, éfOf< [fv, ð, ·, ×, Ä, ðvfœfCf,, ð—ñ“, ·, é B  
—œ÷, ·, é, ÎDD\_OK AŽ, ”s, ·, é, ÎŽÝ, ðfGf%o [‘l, ð, ·, é, ©, ð•Ô, · B

**DPERR\_EXCEPTION**

**DPERR\_INVALIDFLAGS**

**DPERR\_INVALIDOBJECT**

**DPERR\_INVALIDPLAYER**

*idGroup*

*fvfœfCf,,<sup>a</sup>—ñ“,<sup>3</sup>, é, éfOf< [fv, ðfOf< [fvID B*

*lpguidInstance*

ŠÖEW, ·, éDirectPlayZfbfVfþf“, ðfCf“fXf^f“fX BDPENUMPLAYERS\_SESSIONftf%ofo, Žw’è,<sup>3</sup>, é, È, ç, Æ, «, Í A, ±  
, ðpf%of [f^, ðNULL, ÉfZfbfg, µ, È, ·, Ä, Í, È, ç, È, ç B

*lpEnumPlayersCallback2*

*fOf< [fv’†, ðsefvfœfCf,, É, Ä, ç, ÄœÄ, Ñ o,<sup>3</sup>, é, éEnumPlayersCallback2ŠÖ ”, Ö, ðffCf“f^ B*

*lpContext*

*fR [f<fofbfNŠÖ ”, É“n,<sup>3</sup>, é, éfAfvfŠfP [fvfþf““è<, ðRf“fefLfxfg, Ö, ðffCf“f^ B*

*dwFlags*

*fR [f<fofbfNŠÖ ”, ðdwFlagsfpf%of [f^, É“n,<sup>3</sup>, é, éftf%ofo B*

DPENUMPLAYERS\_SESSION

*lpguidInstance, É, æ, Ä, ÄŽ•É,<sup>3</sup>, é, éfZfbfVfþf““à, ðfOf< [fv, ðvfœfCf  
,, ð—ñ“, ·, é B*

’É í, ±, ðf ffbfh, Í AE» Ý, ðZfbfVfþf“, ðf [fJf< EfVfœfCf,, EfŠfxfg, ðŽg—p, µ, Ä—ñ“, ·, é B  
DPENUMPLAYERS\_SESSIONftf%ofo, ðfZfbfVfþf“ EfCf“fXf^f“fXGUID, Æ, Æ, à, ÈŽw’è, ·, é, Æ AfZfbfVfþf“, ðfzfx  
fg, É—ñ“fŠfxfg, ðñ<Ý, ð—v<, ·, é B, ±, ðf ffbfh, Í A**IDirectPlay2::EnumSessions** —ñ“, ð†, ©, çœÄ, Ñ o, ·, ±  
, Æ, Í, Ä, «, È, ç B,<sup>3</sup>, ç, É ADPENUMPLAYERS\_SESSIONftf%ofo, ðŽg—p, ·, é è ± A, ±  
, ðf ffbfh, ðœÄ, Ñ o, µ, Í A**IDirectPlay2::EnumSessions**f ffbfh, ðœÄ, Ñ o, µ, ðœä, ©, Ä**IDirectPlay2::Close**  
, ·, æ, Ñ**IDirectPlay2::Open**f ffbfh, ðœÄ, Ñ o, µ, ð’O, É s, í, È, ¯, é, ð, È, ç, È, ç B

ŽQ Æ @**IDirectPlay2::CreatePlayer**, **IDirectPlay2::DestroyPlayer**, **IDirectPlay2::AddPlayerToGroup**,  
**IDirectPlay2::DeletePlayerFromGroup**

## IDirectPlay2::EnumGroups

HRESULT EnumGroups(LPGUID lpguidInstance,  
LPDPENUMPLAYERSCALLBACK2 lpEnumPlayersCallback2,  
LPVOID lpContext, DWORD dwFlags);

*fgfbfVfzf*, Ā—LĒø, ÈfOf< [fv, ð—ñ<, ·, é B  
—Ē, ·, é, ĪDD\_OK AŽ, ”s, ·, é, ĪŽŸ, ĪfGf%o [’l, Ī, Ą, ·, é, ©, ð•Ô, · B

**DPERR\_INVALIDOBJECT**

**DPERR\_INVALIDPARAMS**

**DPERR\_UNSUPPORTED**

*lpguidInstance*

ŠÖĒW, ·, éDirectPlayfZfbfVfzf, ĪfCf“fXf^f“fX BDPENUMPLAYERS\_SESSIONftf%ofo, ðŽw’è, μ, È, Ą ê ±, Ī A,  
±, Īfpf%of [f^, ðNULL, ÈfZfbfG, μ, È, ·, Ā, Ī, È, Ą, È, Ą B

*lpEnumPlayersCallback2*

fZfbfVfzf, ĪšefOf< [fv, È, Ā, Ą, ĀĒĀ, Ñ o, 3, é, é**EnumPlayersCallback2**ŠÖ ”, Ö, Īf|fCf“f^ B

*lpContext*

fR [f<fofbfNŠÖ ”, È“n, 3, é, éfAfvfŠfP [fvfzf“è<, ĪfRf“fefLXfg, Ö, Īf|fCf“f^ B

*dwFlags*

fR [f<fofbfNŠÖ ”, ĪdwFlagsfpf%of [f^, È“n, 3, é, éftf%of O B

DPENUMPLAYERS\_SESSION

*lpguidInstance*, È, æ, Ā, ĀŽ~•È, 3, é, ½fZfbfVfzf““à, ĪfOf< [fv, ð—  
ñ<, ·, é B

’È Ī, ±, Īf f\fbfh, Ī ĀĒ» Ÿ, ĪfZfbfVfzf, Īf [fJf< EfvfĒfCf,, EfŠfXfg, ðŽg—p, μ, Ā—ñ<, ·, é B  
DPENUMPLAYERS\_SESSIONftf%fo, ðfZfbfVfzf“ EfCf“fXf^f“fXGUID, Ą, Ą, à, ÈŽw’è, ·, é, Ą AfZfbfVfzf“, Īfzfx  
fg, È—ñ<“fŠfXfg, Īñ<Ÿ, ð—v<, ·, é B, ±, Īf f\fbfh, Ī **IDirectPlay2::EnumSessions** —ñ<“, Ī†, ©, ĄĒĀ, Ñ o, ·, ±  
, Ą, Ī, Ā, «, È, Ą B, 3, Ą, È ADPENUMPLAYERS\_SESSIONftf%fo, ðŽg—p, ·, é ê ± A, ±  
, Īf f\fbfh, ĪĒĀ, Ñ o, μ, Ī **IDirectPlay2::EnumSessions**f f\fbfh, ĪĒĀ, Ñ o, μ, ĪĒĀ, Ā, ©, Ā**IDirectPlay2::Close**  
, ·, æ, Ñ**IDirectPlay2::Open** f f\fbfh, ĪĒĀ, Ñ o, μ, Ī’O, È s, Ī, È, —, é, Ī, È, Ą, È, Ą B

ŽQ Ą @**IDirectPlay2::CreateGroup**, **IDirectPlay2::DestroyGroup**, **IDirectPlay2::EnumSessions**



**IDirectPlay2::EnumSessions**

HRESULT EnumSessions(LPDPSESSIONDESC2 lpsd,
DWORD dwTimeout,
LPDPENUMSESSIONSCALLBACK2 lpEnumSessionsCallback2,
LPVOID lpContext, DWORD dwFlags);

,±,Ì DirectPlayfIfufWfFfNfg,Á—LÆØ,ÈfZfbfVf±f“,ð—ñ“,·,é B
—Æ±,·,ê,ÏDD\_OK AŽ,„s,·,ê,ÏŽŸ,ÏfGf%o [‘l,ì,¢,„,ê,©,ð•Ô,· B

- DPERR\_EXCEPTION**
- DPERR\_INVALIDOBJECT**
- DPERR\_INVALIDPARAMS**

lpsd

—ñ“,³,ê,éfZfbfVf±f“,ð•,·**DPSESSIONDESC2** \‘c‘ì,Ö,Ïf|fCf“f^ B,±,ì \‘c‘ì,ÏŠî €fZfbfg,ð—
ž,½,·fZfbfVf±f“,ì,Ÿ,ª—
ñ“,³,ê,é **BDPSESSIONDESC2** \‘c‘ì,ÏguidApplicationf f“fo,É,Í AfAfvfŠfP [fVf±f“,ÉŠÖ`A,·,éfOf [fof< E
f+fj [fNŽ`ÈŽq iGUID j,ðfZfbfg,·,é,© A,·,×,Ä,ÏfAfvfŠfP [fVf±f“,ðŽw`è,·,é,É,ÏNULL,ð Ÿ`è,·,é B
**guidInstancef** f“fo,É,Í AfZfbfVf±f“ EfCf“fXf^fX,ÉÆÁ—
L,ÏGUID,ªª,©,ê,Ï,»),é,ð Aª,©,ç,È,¯,ê,Ï A,·,×,Ä,ÏfZfbfVf±f“,ð“¾,é,½,ß,ÉNULL,ðfZfbfg,·,é BfpfXf [fh,ªK
—v,È ê ± **AlpszPasswordf** f“fo,ð“K Ø,ÈfZfbfg,·,é B

dwTimeout

DirectPlay,ª—ñ“f fbZ [fW,Ö,Ï%ž“š,ð•Ö,Á`S`ì,ÏŽšÖ,ðf~fŠ•b,ÄŽw`è,·,é i—ñ“,ÏŠÖŠu,Á,Í,È,¢ j B,±
,Ïpf%of [f^,É,Ï,ð Ÿ`è,·,é,±,Æ,ð „ §,·,é B,±,ì ê ± AfT [ftrX Efvf fofCf\_,É“K—
,ÈfftfHf<fg,Ï^fCf€fAfEfg,ðDirectPlay,ªEvŽZ,·,é B

lpEnumSessionsCallback2

ŠeDirectPlayfZfbfVf±f“,É%ž“š,µ,ÄÆÄ,Ñ o,³,ê,é**EnumSessionsCallback2ŠÖ** „Ö,Ïf|fCf“f^ B

lpContext

fR [f<fofbfNŠÖ „,É“n,³,ê,éft [fU`è<,ÏfRf“fefLfxfg B

dwFlags

,±,Ïpf%of [f^,ÉÖ,ª Ÿ`è,³,ê,½ ê ± AŽg—p%Ä”,ÈfZfbfVf±f“,¾,¯,ª—
ñ“,³,ê,é **IDPENUMSESSIONS\_AVAILABLE** j B
**DPENUMSESSIONS\_AVAILABLE**
,±,ÏfAfvfŠfP [fVf±f“,ªŽQ%Á,Á,«,é,·,×,Ä,ÏfZfbfVf±f“,ð—ñ“,·,é B

**DPENUMSESSIONS\_ALL**

%Ä“ü,Ä,«,é,©,Ç,□
,©,ÉŠÖ,ì,ç,· A,·,×,Ä,ÏfAfNfefBfu,ÈfZfbfVf±f“,ð—
ñ“,·,é Bfvf€fCf, §ÆÄ,É`B,µ,½fZfbfVf±f“,à A V,µ,¢fvf€fCf
f,,ª—³ÆØ,É,³,ê,½fZfbfVf±f“,à AŽQ%Ä,ª—
³ÆØ,É,È,Á,½fZfbfVf±f“,à—ñ“,³,ê,é B AfAfvfŠfP [fVf±f“,Í,±
,Ï \‘c‘ì,Ï**dwFlagsf** f“fo,ð²,× AfZfbfVf±f“,ª V,µ,¢fAfvfŠfP [f
Vf±f“,ÏŽQ%Ä,ð<—%Ä,·,é,©,Ç,□,©,ð”»`è,·,é,±,Æ,ª,Ä,«,é B

È í,±,Ïf f\fbfh,Í **ADirectPlayCreate** ŠÖ „,ð—p,¢

,ÄDirectPlayfIfufWfFfNfg,ª ì ¬,³,ê,½¼Æä,ÉÆÄ,Ñ o,³,ê,é BfZfbfVf±f“,É Ú±,µ,Ä,¢
,éŠÖ,â AfAfvfŠfP [fVf±f“,ªfZfbfVf±f“,ð ì ¬,µ,½Æä,ÉÆÄ,Ñ o,·,±
,Æ,Í,Ä,«,È,¢ **BDirectPlay2::EnumSessions**,Í AfT [ftrX Efvf fofCf\_,Éflfbfgf [fN ä,É,Ð,Æ,Ä`È ä,ÏzfXfg,Ï
Ÿ—§,ð—v<,µ A,»,é,ç,È—ñ“,ÏŠfNfGfXfg,ð`— M,·,é,Æ“® ì,·,é B%ž“š,ðŽó M,·,é,Æ A—
ñ“,³,ê,éfZfbfVf±f“,ª—p`Ö,³,ê,é BDirectPlay,ª±
,é,ç,Ï%ž“š,ð•Ö,ÄŽšÖ,ÏdwTimeoutpf%of [f^,É,æ,Á,Ä §Æä,³,ê,é B,±,ÏŽšÖ,ª—
^,é,Æ AfR [f<fofbfNŠÖ „,ÉDPESC\_TIMEDOUTftf%ofO,ªÈ`m,³,ê AlpThisSDpf%of [f^,ÉNULL`l,ª“n,³,ê,é B,±
,ÏŽ“\_Ä A—ñ“,ð±,¯,é,É,Í AdwTimeout,É V,µ,¢`l,ðfZfbfg,µ,ÄTRUE,ð•Ô,· B—
ñ“,ð±ž~,·,é,É,Í AFALSE,ð•Ô,· BdwTimeout,É,Í AÖ,ð Ÿ`è,µ,Ä,¯,Æ,æ,¢ B,±
,Ï ê ± ADirectPlay,ªfT [ftrX Efvf fofCf\_,É“K Ø,Èf^fCf€fAfEfg,ðEvŽZ,·,é B

È í,Í AŽQ%Ä,·,é,±,Æ,ª,Ä,«,éfZfbfVf±f“,¾,¯,ª—ñ“,³,ê,é **BDPENUMSESSIONS\_ALL**ftf%ofO,ªŽw`è,³,ê,Ä,¢
,é,Æ A V,µ,¢fvf€fCf,„,ð ì ¬,·,é,±,Æ,ª,Ä,«,È,¢fZfbfVf±f“,à—ñ“,³,ê,é B,±
,Ï ê ± AfAfvfŠfP [fVf±f“,ÏfZfbfVf±f“,ÉŽQ%Ä,Á,«,È,¢,±,Æ,É` ^Ö,µ,È,,Ä,Í,È,ç,È,¢ B

f fr [,afAvfŠfP [fVf‡f“,đŠJŽn,μ,È,©,Á,½,Æ,«,Í AfT [frfX Efvf fofCf\_,Íf† [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\_,ÍCOMf|  
[fg,ì Ý'è,đ-â,ç ‡,í,¹,é A,Û,½f,ff€ EfT [frfX Efvf fofCf\_,Í“d`b”Ô †,đ-  
â,ç ‡,í,¹,é B,Û,½ AfCf“f^ [flfbfg EfT [frfX Efvf fofCf\_,ÍfzfXfg,ìPfAfhfÆfX,ì“ü—Í,đ—v< ,.é B  
fpfXf [fh Efvf fefNfg,ì,©,©,Á,½fZfbfVf‡f“,Á,Í A ³,μ,çfpfXf [fh,“ü—Í,³,ê,é,Û,Å A—ñ<“,Í s,í,ê,È,ç B  
ŽQ Æ @DPSESSIONDESC2, IDirectPlay2::Open

**IDirectPlay2::GetCaps**

HRESULT GetCaps(LPDPCCAPS lpDPCaps,  
DWORD dwFlags);

DirectPlayIfufWfFfNfg,ì”\—Í,ðŽæ“¾,·,é B  
-Ĉ÷,·,ê,ĪDD\_OK AŽ,”s,·,ê,ĪŽŸ,ĪfGf%o [’l,ð•Ô,· B

**DPERR\_INVALIDOBJECT**

**DPERR\_INVALIDPARAMS**

lpDPCaps

DirectPlayIfufWfFfNfg,ì”\—Í,ðŽó,~Žæ,é**DPCAPS** \’ĉ’Ī,Ö,Īf|fCf“f^ B**IDirectPlay2::GetCaps**,ðŽg—  
p,·,é‘O,É ADPCAPS \’ĉ’Ī,ĪdwSizef f“fo,ð Ý’è,μ,È,,Ä,Ī,È,ç,È,ĉ B

dwFlags

,±,Īfpf%of [f^,É0,ªfZfbfg,³,ê,é,Æ A-³•Ū Ø,Èf fbfZ [fWĈðŠ·,É‘Ī,·,é”\—Í,ªĈvŽZ,³,ê,é B  
DPGETCAPS\_GUARANTEED  
•Ū Ø,³,ê,½f fbfZ [fW”z M,É‘Ī,·,é”\—Í,ðŽæ“¾,·,é B

**IDirectPlay2::GetPlayerCaps**f f\fbfh,ª—vĉ ,³,ê,½fvfĈfCf,,,ì”\—Í,ð•Ô,·,Ī,É‘Ī,μ A,±  
,Īf f\fbfh,ĪĈ» Ý,ĪfZfbfVf±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“CEÄ—  
L,Ïff [f^ Efuf fbfN,ðŽæ“¾,·,é B  
-CE÷,·,é,ÎDD\_OK AŽ,”s,·,é,ÎŽŸ,ÏfGf%o [‘l,Ï,ç,,é,©,ð•Ô,· B

- DPERR\_BUFFERTOOSMALL**
- DPERR\_INVALIDOBJECT**
- DPERR\_INVALIDPARAMS**
- DPERR\_INVALIDPLAYER**

idGroup

ff [f^,ª—v< ,³,ê,½fOf< [fv,ÏfOf< [fvID B

lpData

fAfvfšfP [fVf‡f“CEÄ—L,ÏfOf< [fv Eff [f^,ª ‘,« ž,Û,ê,éfofbftf@,ÏfAfhfEfX Bff [f^,ÏfTfCfY,Ï,Ý,ª•K—  
v,È ê ‡,Í A,±,Ïpf%of [f^,ÉNULL,ðfZfbfg,·,é B,±  
,Ï,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

f f\fbfh,ðCEÄ,Ñ o,·‘O,Éfofbftf@,ÏfTfCfY,Ä %Šú%o»,³,ê,é•Ï ”,Ö,Ïf|fCf“f^ Bf f\fbfh,ª §CEä,ð-  
ß,µ,½CEä A,±  
,Ïpf%of [f^,É,ÏfOf< [fv Eff [f^,ÏfTfCfY,ªfofCfY’PÊ,ÄfZfbfg,³,ê,é Bfofbftf@,ª ¬,³,·,·,é iDPERR\_BUF  
FERTOOSMALL j ê ‡ A,±,Ïpf%of [f^,É,Í A•K—v,Èfofbftf@ EfTfCfY,ª Ý’è,³,ê,é B

dwFlags

,±,Ïpf%of [f^,É0,ðfZfbfg,µ,½ ê ‡,Í Afšf, [fg Eff [f^,ðŽæ“¾,·,é B  
DPGET\_REMOTE  
fšf, [fgª—  
L,³,ê,½ff [f^ EfXfy [fX,©,çCE» Ý,Ïff [f^,ðŽæ“¾,·,é B

**DPGET\_LOCAL**

fAfvfšfP [fVf‡f“,Ïf [fJf<,Èff [f^ EfZfbfg,ðŽæ“¾,·,é B

DirectPlay,Í Af [fJf<,ª,æ,Ñfšf, [fg,Ï,Ó,½,Ä,ÏfAfCfv,ÏfOf< [fv Eff [f^,ð•ÛŽ ,·,é,±  
,Æ,ª,Ä,«,é BfAfvfšfP [fVf‡f“,ÏŽæ“¾,·,éff [f^,ÏfAfCfv,ðŽw’è,µ,È,,Ä,Í,È,ç,È,ç BDPSET\_LOCALftf%ofO,ðŽg,ª  
,Æ ADirectPlayfIfufWfFfNfg,È,æ,Á,Äf [fJf< Eff [f^,ªfZfbfg,³,ê,é B DPSET\_REMOTEftf%ofO,ðŽg,ª  
,Æ AfZfbfVf‡f““†,Ï“C^Ó,ÏfAfvfšfP [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  
-Æ±,·,ê,ÎDD\_OK AŽ, ”s,·,ê,ÎŽŸ,ÏfGf%o [’l,ì,ç,,ê,©,ð•Ô,· B

**DPERR\_BUFFERTOOSMALL**

**DPERR\_INVALIDOBJECT**

**DPERR\_INVALIDPARAMS**

**DPERR\_INVALIDPLAYER**

idGroup  
-¼'O,ð-v< ,·,éOf< [fv,ÏfOf< [fvID B

lpData  
-¼'Of [f^,ª ‘,« ž,Û,ê,éofbftf@,ÏfAfhfÆfX Bff [f^,ÏfTfCfY,¾,¯,ðŽæ“¾,·,é ê ‡,Í A,±  
,Ïpf%of [f^,ÉNULL,ðfZfbfg,·,é B,±,Ï,Æ,« AlpdwDataSize,É,Í Aff [f^,ð•ÛŽ ,·,é,½,ß,É•K—  
v,ËfTfCfY,ª Ý'è,³,ê,é B

lpdwDataSize  
f f\fbfh,ðÆÄ,Ñ o,·'O,Éfobftf@,ÏfTfCfY,Å %šú%»»,³,ê,é,Í ”,Ö,ÏfCf“f^ Bf f\fbfh,ª §Æä,ð-  
ß,µ,½Æä A,±,Ïpf%of [f^,É,Í-  
¼'Of [f^,ÏfTfCfY,ªfOfCfP^Ê,ÅfZfbfg,³,ê,é Bfobftf@,ª ¬,³,·,¬,é iDPERR\_BUFFERTOOSMALL j ê ‡ A  
,±,Ïpf%of [f^,É,Í A•K—v,Ëfobftf@,ÏfTfCfY,ª Ý'è,³,ê,é B

ŠÖ ”,ª §Æä,ð-ß,µ,½Æä AfOf< [fv-¼ff [f^,ð“Ç,Ý o,·,É,Í Af|Cf“f^lpData,ðDPNAME \‘ç‘ì,ÉfLfffXfg,µ,È,-  
,Ä,Í,È,ç,È,ç 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, Ì, È, ç, È, ¢ B

*lpdwCount*

,±, Ìf f\bfh,ª §Œä,ð-ß,·,Æ,« Af fbfZ [fW, Ì ”,ªŠi”[,³,ê,é•Ĭ ” B

ŽQ Æ **@IDirectPlay2::Receive**

## IDirectPlay2::GetPlayerAddress

HRESULT GetPlayerAddress(DPID idPlayer,  
LPVOID lpAddress, LPDWORD lpdwAddressSize);

*DirectPlayAfhfCfX*,<sup>a</sup> ,<sup>é</sup> *DirectPlayAfhfCfX*,<sup>đŽæ“¾</sup>,<sup>·</sup> ,<sup>é</sup> *BDirectPlayAfhfCfX*  
*A“Á”è,İfT İfrfX Efvf fofCf\_*,<sup>đŽg,²fvfCfCf,,İflfbfgf İfN EfAfhfCfX,Å</sup>,<sup>·</sup> ,<sup>é</sup> B  
-<sup>Ĉ</sup>,<sup>·</sup> ,<sup>é</sup>,<sup>İDD\_OK</sup> AŽ,”s,<sup>·</sup> ,<sup>é</sup>,<sup>İŽŸ</sup>,<sup>İfGf%o</sup> [¹,İ,Ĉ,,<sup>·</sup> ,<sup>é</sup>,<sup>đ•Ô</sup>,<sup>·</sup> B

**DPERR\_BUFFERTOOSMALL**

**DPERR\_INVALIDOBJECT**

**DPERR\_INVALIDPARAMS**

**DPERR\_INVALIDPLAYER**

*idPlayer*

*fAfhfCfX*,<sup>đŽæ“¾</sup>,<sup>·</sup> ,<sup>é</sup>*fvfCfCf,,İfvfCfCf,,ID* B

*lpAddress*

*DirectPlayAfhfCfX*,<sup>a</sup> ‘,« ž,Ü,ê,<sup>é</sup>*fofbftf@,Ö,İf|fCf“f^ Bff* [f^,İfTfCfY,<sup>¾</sup>,<sup>·</sup> ,<sup>é</sup> ê ‡,İ A,<sup>±</sup>  
<sup>·</sup>,<sup>İfpf%of</sup> [f^,ÉNULL,<sup>đfZfbfg</sup>,<sup>·</sup> ,<sup>é</sup> B,<sup>±</sup>,İ,Æ,«*lpdwAddressSizefpf%of* [f^,É,İ Af f [f^,đ•Ÿ ,<sup>·</sup> ,<sup>é</sup>,<sup>½</sup>,ß,É•K—  
v,ÉfTfCfY,<sup>a</sup> Ÿ’è,<sup>¾</sup>,<sup>é</sup> B

*lpdwAddressSize*

,<sup>±</sup>,<sup>İf</sup> f\fbfh,<sup>đĈÄ,Ń</sup> o,<sup>·</sup> ,<sup>é</sup>*fofbftf@,İfTfCfY,Å %oŠú%o,<sup>¾</sup>,<sup>é</sup>,<sup>é</sup>İ ”,Ö,İf|fCf“f^ B f f\fbfh,<sup>a</sup> §Ĉä,đ-  
ß,<sup>μ</sup>,<sup>½Ĉä</sup> A,<sup>±</sup>  
<sup>·</sup>,<sup>İfpf%of</sup> [f^,É,İ AfOf< [fv Eff [f^,İfTfCfY,<sup>a</sup>*fofCfg’P^Ê,ÅfZfbfg*,<sup>¾</sup>,<sup>é</sup> B*fofbftf@,*<sup>a</sup> <sup>·</sup>,<sup>¾</sup>,<sup>·</sup> ,<sup>é</sup> iDPERR\_B  
UFFERTOOSMALL j ê ‡ A,<sup>±</sup>,<sup>İfpf%of</sup> [f^,É,İ•K—v,Éfofbftf@,İfTfCfY,<sup>a</sup> Ÿ’è,<sup>¾</sup>,<sup>é</sup> B*

**IDirectPlay2::GetPlayerCaps**

HRESULT GetPlayerCaps(DPID idPlayer,  
LPDPCAPS lpPlayerCaps, DWORD dwFlags);

Žw'è,³,ê,½fvfĀfCf,,ĪĒ» Ý,Ī"Ī—Ī,đŽæ"¼,·,é B

—Ā÷,·,ê,ĪDD\_OK AŽ,"s,·,ê,ĪŽŸ,ĪfGf%o [¹,Ī,Ā,,ê,©,đ•Ō,· B

**DPERR\_INVALIDOBJECT**

**DPERR\_INVALIDPARAMS**

**DPERR\_INVALIDPLAYER**

*idPlayer*

"Ī—Ī,đĀvŽZ,·,éfvfĀfCf,,ĪfvfĀfCf,,ID B

*lpPlayerCaps*

"Ī—Ī,đŽó, Žæ,éDPCAPS \Ā'Ī,Ō,Īf|fCf"f^ BDirectPlay2::GetPlayerCaps ,đŽg—  
p,·,é'Ō,Ē ADPCAPS \Ā'Ī,ĪdwSizef f"fo,đ Ý'è,μ,Ē,,Ā,Ī,Ē,ĉ,Ē,Ā B

*dwFlags*

,±,Īfpf%of [f^,Ē0,đŽw'è,·,é,Ā A-³•Ū Ō,Èf fbfZ [fWĀđŠ·,Ē'Ī,·,é"Ī—Ī,³ĀvŽZ,³,ê,é B

DPGETCAPS\_GUARANTEED

•Ū Ō,³,ê,½f fbfZ [fW"z M,Ē'Ī,·,é"Ī—Ī,đŽæ"¼,·,é B

**IDirectPlay2::GetCaps** f fbfh,³Ā» Ý,ĪfZfbfVf±f"Ī"Ī—Ī,đ•Ō,·,Ī,Ē'Ī,μ A,±,Īf fbfh,Ī A—  
vĀ ,³,ê,½fvfĀfCf,,Ī"Ī—Ī,đ•Ō,· B

ŽQ Ā @DPCAPS, **IDirectPlay2::GetCaps**, **IDirectPlay2::Send**

**IDirectPlay2::GetPlayerData**

HRESULT GetPlayerData(DPID idPlayer,  
LPVOID lpData, LPDWORD lpdwDataSize,  
DWORD dwFlags);

**IDirectPlay2::SetPlayerData**,É,æ,Á,ÄfvfCfCf,,ÉŠÖ`A•t,¯,ç,ê,½ AfAfvfŠfP [fVf†f“CEÄ—  
L,Ïff [f^ Efuf fbfN,ðŽæ“¾,·,é B

-CE÷,·,é,ÎDD\_OK AŽ,”s,·,é,ÎŽŸ,ÏfGf%o [¹,¹,ç,·,é,©,ð•Ô,· B

**DPERR\_BUFFERTOOSMALL**

**DPERR\_INVALIDFLAGS**

**DPERR\_INVALIDOBJECT**

**DPERR\_INVALIDPLAYER**

idPlayer

ff [f^,ðŽæ“¾,·,éfvfCfCf,,ÏfvfCfCf,,ID B

lpData

fAfvfŠfP [fVf†f“CEÄ—L,ÏfvfCfCf,, Eff [f^,ª ‘,« ž,Û,ê,éfofbftf@,Ö,Ïf|Cf“f^ B  
ff [f^,ÏTfCfY,¾,¯,ðŽæ“¾,·,é ê ‡,Í A,±,Ïpf%of [f^,ÉNULL,ðfZfbfg,·,é B,±  
,Ï,Æ,« AlpdwDataSizef%of [f^,É,Í Aff [f^,ð•ÛŽ ,·,é,½,ß,É•K—v,ÈTfCfY,ª Ý’è,³,ê,é B

lpdwDataSize

,±,Ïf f\fbfh,ðCEÄ,Ñ o,·‘O,Éfofbftf@,ÏTfCfY,Ä %oŠú%o»,³,ê,é•Ï ”,Ö,Ïf|Cf“f^ B  
f f\fbfh,ª §CEä,ð-ß,µ,½CEä A,±  
,Ïpf%of [f^,É,Í AfOf< [fv Eff [f^,ÏTfCfY,ªfofCfG’P^Ê,ÄfZfbfg,³,ê,é Bfofbftf@,ª ¬,³,·,¬,é iDPERR\_B  
UFFERTOOSMALL j ê ‡ A,±,Ïpf%of [f^,É,Í•K—v,Èfofbftf@,ÏTfCfY,ª Ý’è,³,ê,é B

dwFlags

,±,Ïpf%of [f^,É0,ðfZfbfg,·,é,Æ AfŠf, [fg Eff [f^,ðŽæ“¾,·,é B

DPGET\_REMOTE

fŠf, [fg,Ä<ª—  
L,³,ê,½ff [f^ EfXfy [fX,©,çCE» Ý,Ïff [f^,ðŽæ“¾,·,é B

DPGET\_LOCAL

,±,ÏfAfvfŠfP [fVf†f“É,æ,éf [fJf<,Èff [f^ EfZfbfg,ðŽæ“¾,·,é B

DirectPlay,Í Af [fJf<,”æ,ÑfŠf, [fg,Ï,Ó,½,Ä,Ïf^Cfv,ÏOf< [fv Eff [f^,ð•ÛŽ ,·,é,±  
,Æ,ª,Ä,«é BfAfvfŠfP [fVf†f“ÏŽæ“¾,·,éff [f^,Ïf^Cfv,ðŽw’è,µ,È,,Ä,Í,È,ç,È,ç BDPSET\_LOCALftf%ofO,ðŽg,ª  
,Æ ADirectPlayIfufWfFfNfg,È,æ,Á,Äf [fJf< Eff [f^,ªfZfbfg,³,ê,é B DPSET\_REMOTEftf%ofO,ðŽg,ª  
,Æ AfZfbfVf†f“†,Ï”C^Ó,ÏfAfvfŠfP [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);

fvfŒfCf,,ÉŠÖ~A•t,¯,ç,ê,½-¼'O,đŽæ“¾,·,é B  
-Œ÷,·,ê,ÎDD\_OK AŽ,“s,·,ê,ÎŽŸ,ÌfGf%o [ˆl,Ì,ç,,ê,©,đ•Ô,· B

**DPERR\_BUFFERTOOSMALL**

**DPERR\_INVALIDOBJECT**

**DPERR\_INVALIDPLAYER**

idPlayer  
-¼'O,đŽæ“¾,·,éfvfŒfCf,,ÌfvfŒfCf,,ID B

lpData  
-¼'Of [f^,^,« ž,Û,ê,éfofbftf@,ÌfAfhfŒfX Bff [f^,ÌfTfCfY,¾,¯,đŽæ“¾,·,é ê ‡,Í A,±  
,Ìfpf%of [f^,ÉNULL,đfZfbfg,·,é B,±,Ì,Æ,« AlpdwDataSizefpf%of [f^,É,Í Aff [f^,đ•ŰŽ ,·,é,½,ß,É•K—  
v,ÈfTfCfY,^ Y'è,³,ê,é B

lpdwDataSize  
,±,Ìf f\fbfh,đŒÄ,Ñ o,·'O,Éfofbftf@,ÌfTfCfY,Å %oŠú%o»,³,ê,é•İ ” B f f\fbfh,^ §Œä,đ-ß,µ,½Œä A,±  
,Ìfpf%of [f^,É,Í AfOf< [fv Eff [f^,ÌfTfCfY,^fofCf'P^È,ÅfZfbfg,³,ê,é Bfofbftf@,^ ¬,³,·,¬,é iDPERR\_B  
UFFERTOOSMALL j ê ‡ A,±,Ìfpf%of [f^,É,Í•K—v,Èfofbftf@,ÌfTfCfY,^ Y'è,³,ê,é B

,±,Ìf f\fbfh,^ §Œä,đ-ß,µ,½Œä AfOf< [fv-¼ff [f^,đ“Ç,Ý o,·,½,ß,É,Í Af|fCf“f^lpData,đDPNAME  
\\ç'Ì,ÉfLffXfg,µ,È,,Ä,Í,È,ç,È,ç B

ŽQ Æ @DPNAME, IDirectPlay2::SetPlayerName

**IDirectPlay2::GetSessionDesc**

HRESULT GetSessionDesc(LPVOID lpData,  
LPDWORD lpdwDataSize);

«» Ýfi [fvf“ ,3,ê,Ä,¢,éfZfbfVf‡f“ ,ì“Á «,ðŽæ“¾, ,é B  
-«±, ,ê,ÏDD\_OK AŽ, ”s, ,ê,ÎŽŸ,ÌfGf%o [’l,ì,¢, ,ê,©,ð•Ô, · B

**DPERR\_BUFFERTOOSMALL**

**DPERR\_INVALIDOBJECT**

**DPERR\_NOCONNECTION**

lpData

fZfbfVf‡f“<L qff [f^, ^ ‘, « ž,Ü,ê,éfobftf@,Ö,ì|fCf“f^ Bff [f^,ÌfTfCfY,¾, -,ðŽæ“¾, ,é ê ‡,Í A,±  
,ìpf%of [f^,ÉNULL,ðfZfbfg, ,é B,±,ì,Æ,« AlpdwDataSizefpf%of [f^,É,Í Aff [f^,ð•ŮŽ , ,é,½,ß,É•K—  
v,ÈfTfCfY, ^ Ý’è,3,ê,é B

lpdwDataSize

,±,Ìf f\fbfh,ð«Ä,Ň o, ·‘O,Éfobftf@,ÌfTfCfY,Á %oŠú%o»,3,ê,é•Ì ”,Ö,ì|fCf“f^ B f f\fbfh, ^ §«ä,ð-  
ß,µ,½«ä A,±  
,ìpf%of [f^,É,Í AfOf< [fv Eff [f^,ÌfTfCfY, ^fOfCf’P^Ê,ÁfZfbfg,3,ê,é Bfobftf@, ^ -,3, , -,é iDPERR\_B  
UFFERTOOSMALL j ê ‡ A,±,ìpf%of [f^,É,Í•K—v,Èfobftf@,ÌfTfCfY, ^ Ý’è,3,ê,é B

,±,Ìf f\fbfh, ^ §«ä,ð-ß,µ,½«ä AfZfbfVf‡f“<L qff [f^,ð“Ç,Ý o, ,½,ß,É,Í Af|fCf“f^lpData,ð**DPSESSIONDESC2**  
 \‘c’ì,ÉfLffXfg,µ,È, ,Ä,Í,È,ç,È,¢ B

ŽQ Æ @**DPSESSIONDESC2**, **IDirectPlay2::EnumSessions**, **IDirectPlay2::Open**

**IDirectPlay2::Initialize**

HRESULT Initialize(LPGUID lpGUID);

, ±, ìf f\fbfh, ÍCOMfvf fgfRf<, Ö, ì'î%ž, ì, ½, ß, É'ñ<Ÿ, ³, ê, é B

**DPERR\_ALREADYINITIALIZED**, ð•Ô, · B

lpGUID

fCf“f^ [ftfFfCfX, ðž•Ê, ·, é, ½, ß, ìfOf [fof< Ef+fj [fNž•Êžq iGUID j, ìfAfhfEfX B

DirectPlayIfufWfFfNfg, Í ì -žž, É %šú%»», ³, ê, é, ½, ß A, ±

, ìf f\fbfh, Í, Â, Ê, É•Ô¹, 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“,İfCf“fXf^f“fX,đŠm—š,·,é B  
-CE÷,·,ê,Î DD\_OK AŽ,”s,·,ê,İŽŸ,İfGf%o [‘l,İ,¢,,ê,©,đ•Ô,· B

- DPERR\_ACTIVEPLAYERS
- DPERR\_ALREADYINITIALIZED
- DPERR\_GENERIC
- DPERR\_INVALIDFLAGS
- DPERR\_INVALIDOBJECT
- DPERR\_INVALIDPARAMS
- DPERR\_UNAVAILABLE
- DPERR\_UNSUPPORTED
- DPERR\_USERCANCEL

lpsd  
ì ¬,Û,½,İŽQ%oÁ,·,éfZfbfVf‡f“,đ•, DPSESSIONDESC2 \‘¢ì,Ö,İf|fCf“f^ B  
dwFlags  
ˆÈ%°,İftf%ofo,İ,¢,,ê,© B

DOPEN\_CREATE  
fQ [f€ EfZfbfVf‡f“,İ V,µ,¢fCf“fXf^f“fX,đ ì ¬,·,é B

DOPEN\_JOIN  
fQ [f€ EfZfbfVf‡f“,İŠù“¶fCf“fXf^f“fX,ÉŽQ%oÁ,·,é B

fAfvfŠfP [fVf‡f“,Í A V,µ,¢fZfbfVf‡f“,đ ì ¬,·,é,© i,»,İfZfbfVf‡f“,É,Í¼,İfŠf, [fg EfAfvfŠfP [fVf‡f“,Ž  
Q%oÁ,·,é j AŠù“¶,İfZfbfVf‡f“,ÉŽQ%oÁ,·,é,±  
,Æ,³,Á,«,é Bf [fJf< EfvfŒfCf,,³ ì ¬,³,ê,é‘O,É AfAfvfŠfP [fVf‡f“,Í**IDirectPlay2::Open**,đŒÄ,Ñ o,³,È,-  
,Á,Í,È,ç,È,¢ BfAfvfŠfP [fVf‡f“,³Šù“¶,İfZfbfVf‡f“,ÉŽQ%oÁ,·,é‘O,É,Í AŽQ%oÁ%oÁ”\,ÈfZfbfVf‡f“,İê—  
,Æ,»),ê,ç,İfZfbfVf‡f“<L q,đŽæ“¾,·,é,½,ß,É IDirectPlay2::EnumSessions,đŽg—p,·,é,×,«,Á,·,é B V,µ,¢fvfŒfCf,,³-  
³Œø,É,³,ê,Á,¢,éfZfbfVf‡f“,ÉŽQ%oÁ,µ,æ,²,Æ,µ,½ ê ‡ A,Û,½,İŽQ%oÁ,Á,«,È,¢ ê ‡ A,·,é,¢  
,İfvfŒfCf,, §ŒÄ,É’B,µ,½ ê ‡ ADPERR\_UNAVAILABLEfGf%o [³•Ô,³,ê,éŒ%oÊ,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,ìf fbfZ [fW,ðŽæ“¾,·,é B  
-CE÷,·,ê,ÎDD\_OK AŽ, ”s,·,ê,ÎŽŸ,ÌfGf%o [’l,ì,ç,,ê,©,ð•Ô,· B

**DPERR\_BUFFERTOOSMALL**

**DPERR\_GENERIC**

**DPERR\_INVALIDOBJECT**

**DPERR\_INVALIDPARAMS**

**DPERR\_INVALIDPLAYER**

**DPERR\_NOMESSAGES**

*lpidFrom*

f f\fbfh,ª §CEä,ð-B,·,Æ,« A’— M’ª,ÌfvfCEfCf,,ID,ªfZfbfg,³,ê,é•Ī ”,Ö,Ìf|fCf“f^ B  
DPRECEIVE\_FROMPLAYERftf%o,ªŽw’è,³,ê,Ä,ç,é ê ÷,Ī A,±  
,ĪĪ ”,ðf f\fbfh,ðCEÄ,Ñ o,·O,ÉfvfCEfCf,,ID,Ä %oŠú%o»,µ,È,,Ä,Ī,È,ç,È,ç B

*lpidTo*

f f\fbfh,ª §CEä,ð-B,·,Æ,« AŽó M’ª,ÌfvfCEfCf,,ID,ªfZfbfg,³,ê,é•Ī ”,Ö,Ìf|  
fCf“f^ BDPRECEIVE\_TOPLAYERftf%o,ªŽw’è,³,ê,Ä,ç,é ê ÷,Ī A,±  
,ĪĪ ”,ðf f\fbfh,ðCEÄ,Ñ o,·O,ÉfvfCEfCf,,ID,Ä %oŠú%o»,µ,È,,Ä,Ī,È,ç,È,ç B

*dwFlags*

È%o,Ī §CEäftf%o,Ì,Ð,Æ,Ä`È ä,Ī’g,Ý ÷,Ī,Ī,ð Ý’è,·,é,±  
,Æ,ª,Ä,«,é BDPRECEIVE\_TOPLAYER,ÆDPRECEIVE\_FROMPLAYER,Ī—¼•û,ðŽw’è,·,é,Æ A Ä %  
,ÉCE©,Ä,©,Ä,½,Û,ª,Ìf fbfZ [fW,ª•Ô,³,ê,é B

**DPRECEIVE\_ALL**

Ä %o,ĪŽg—p%oÄ”\,Èf fbfZ [fW,ð•Ô,· BfftfHf<fg,Ä, ,é B

**DPRECEIVE\_FROMPLAYER**

*lpidFrom*pf%of [f^,ªŽw,·fvfCEfCf,,ID,©,ç’—,ç,ê,½ Ä %  
,Ìf fbfZ [fW,ð•Ô,· BfvfXfef€ Ef fbfZ [fW,Ī AfvfCEfCf,,ID  
DPID\_SYSMMSG,©,ç’—,ç,ê,é

**DPRECEIVE\_PEEK**

¼,Ìftf%o,ĪŽw’è,È%ož,¶,Äf fbfZ [fW,ð•Ô,·,ª Af fbfZ [fW,ðf  
fbfZ [fW Eflf... [,©,ç í œ,µ,È,ç B

**DPRECEIVE\_TOPLAYER**

*lpidTo*pf%of [f^,ªŽw,·fvfCEfCf,,ID,É [,Ä,ç,ê,½ Ä %  
,Ìf fbfZ [fW,ð•Ô,· B

*lpData*

f fbfZ [fW Eff [f^,ª ‘,« ž,Û,è,éfobftf@,Ö,Ìf|fCf“f^ Bff [f^,ÌfTfCfY,¾,\_,ðŽæ“¾,·,é ê ÷,Ī A,±  
,Ìfpf%of [f^,ÉNULL,ðfZfbfg,·,é B,±,Ī,Æ,« AlpdwDataSizefpf%of [f^,É,Ī Af [f^,ð•ŪŽ ,·,é,½,ß,É•K—  
v,ÉfTfCfY,ª Ý’è,³,ê,é Bf fbfZ [fW,ªfvfCEfCf,,ID DPID\_SYSMMSG,©,ç’—  
,ç,ê,½,à,Ī,Ä, ,é,Æ,« AfAfvfŠfP [fvf÷f“,ÌpData,ðDPMSB\_GENERIC \’c’Ī,ÉfLffXfg,µ A ^—  
,ð s,ªO,ÉfvfXfef€ Ef fbfZ [fW,Ìf^Cfv,ð²²,x,é,½,ß AdwTypef f“fo,ðf FFbfN,·,é,x,«Ä, ,é B

*lpdwDataSize*

,±,Ìf f\fbfh,ðCEÄ,Ñ o,·O,Éfobftf@,ÌfTfCfY,Ä %oŠú%o»,³,ê,é•Ī ”,Ö,Ìf|fCf“f^ Bf f\fbfh,ª §CEä,ð-B,  
µ,½CEä A,±  
,Ìfpf%of [f^,É,Ī AfOf< [fv Eff [f^,ÌfTfCfY,ªfOfCf’PÊ,ÄfZfbfg,³,ê,é Bfobftf@,ª -³,·,-,é iDPERR\_B  
UFFERTOOSMALL j ê ÷ A,±,Ìfpf%of [f^,É,Ī•K—v,Éfobftf@,ÌfTfCfY,ª Ý’è,³,ê,é Bflf...  
[.É’u,©,ê,½f fbfZ [fW,Ī ÷ ~,Ī AIDirectPlay2::Receive,ÌCEÄ,Ñ o,µ,Ä—v< ,³,ê,½f f,fŠ,ðŠ,,è“—,Ä,½CEä,Ä, ,Ä,Ä,à A Ä,ÑDPERR\_BUFFERTO  
SMALLfGf%o [,ªÖ,³,ê,é,±,Æ,ª, ,é B ÄP,Ī•û—@,Ī ADPERR\_BUFFERTOOSMALLfGf%o [,ðŽó,Žæ,ç,È,-  
,É,é,Û,Ä Af f,fŠ,ð ÄŠ,,è“—,Ä,µ’±, ,é,±,Æ,Ä, ,é B

fvfCfCf,, ID DPID\_SYSMMSG,©,ç—

M,³,ê,é,·,×,Ä,Ïf fbZ [fW,Í AfzfXfg,É,æ,Ä,Ä ¶ ¬,³,ê,½fVfXfef€ Ef fbZ [fW,Ä, ,é B,±  
,Ï ê ‡ AfVfXfef€ Ef fbZ [fW,ÏpData,ðDPMSG\_GENERIC,ÉfLffXfg,µ,Ä A,»ÏVfXfef€ Ef fbZ [fW,  
º½,Ä, ,é,©,ð“Á’è,·,é,½,B,ÉdwTypef f“fo,ð²,×,é,×,«,Ä, ,é B

,·,×,Ä,ÏfvfCfCf,,Éfuf [fhfLffXfg,µ,½,è AfOf< [fv“à,Ï,·,×,Ä,ÏfvfCfCf,,É—

M,·,é,½,B,ÉfOf< [fv,É“¶,Ä,ç,ê,½f fbZ [fW,Í AfvfCfCf,,ID DPID\_SYSMMSG,É—,ç,ê,Ä,à A— M“□  
,ÏfvfCfCf,,ID,©,ç—,½,à,Ï,Æ,µ,Ä·\

,³,ê,é BfAfVfŠFP [fVf‡f“,Í Af [fJf<,ÈfvfCfCf,,É“¶,Ä,ç,ê,½f fbZ [fW,¾, ,ðŽó, Žæ,é BlpidFrom,ÆlpidTofp  
f%of [f^,“™,µ,ç¹,ðŽ¹,·f fbZ [fW,Í AfvfCfCf,,³Žó M,·,é,±,Æ,³,Ä,«,È,ç B

DPSESSION\_NOMESSAGEIDftf%ofO,³fZfbfVf‡f“,ÉŽw’è,³,ê,Ä,ç,é,Æ AlpidFrom,ÆlpidTofpf%of [f^,Íº½,àÓ—  
j,ðŽ ,½,È,ç B

DirectPlay,Æ,Æ,à,É“© ì,·,é,·,×,Ä,ÏT [frfX Efvf fofCf\_Í Aff [f^,Ï”j¹,ð”ð, ,é,½,B AŠ@‘S «,Ïf`FFbfN,ðŽÀ  
s,·,é B,·,×,Ä,ÏŽó Mf fbZ [fW,ÍEÿ Ø,³,è Aff [f^,Ï”j¹,³Eÿ o,³,ê,½ ê ‡ A,»Ïf [f^,Ï”pŠü i·Û Ø,³,è,Ä,ç  
,È,ç ê ‡ j,Û,½,Í Ä— i·Û Ø,³,è,Ä,ç,é ê ‡ j,³,è,é B

ŽQ Æ @DPMSG\_GENERIC, IDirectPlay2::Send

**IDirectPlay2::Send**

HRESULT Send(DPID idFrom, DPID idTo, DWORD dwFlags, LPVOID lpData, DWORD dwDataSize);

¼, Ìf v f C f C f,, A f O f < [ f v " à, Ìf v f C f C f,, A, Ü, ½, Í, ·, ×, Ä, Ìf 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, Ìf f b f Z [ f W, "DirectPlay, Ì " à " f L f... [, Á' — M' Ò, ç, Ì è ‡, IDP\_OK, ð • Ö, · B, » , è Ê Š O, Í Ž Ÿ, Ì f G f % [ , Ì, ç, , è, ©, ð • Ö, · B

**DPERR\_BUSY**

**DPERR\_INVALIDOBJECT**

**DPERR\_INVALIDPARAMS**

**DPERR\_INVALIDPLAYER**

**DPERR\_SENDTOOBIG**

*idFrom*

' — M' µ, Ìf v f C f C f,, ID B f v f C f C f,, ID, Í A, ±, Ì f R f " f s f... [ f ^, Ì à, Ìf [ f J f <, È f v f C f C f,, Ì, ð, Æ, Ä, É ' Í % ž, µ, Ä, ç, È, Ä, Í, È, ç, 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, Ì, ·, ×, Ä, Ìf 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 % f O, ð Ž g — p, ·, é è ‡, Í A, ±, Ì f p f % f [ f ^, È f v f C f C f,, ID, ð Ÿ ' è, ·, é B

*dwFlags*

f f b f Z [ f W, Ì' — M • û — @, ð Ž', · B, ±, Ì f p f % f [ f ^, È, O, ð f Z f b f g, ·, é, Æ A f f b f Z [ f W, Í • Û Ø, ³, è, A • W € " I, È — D æ ‡ È, Ä' — M, ³, è, é B, ½, ³, ñ, Ìf f b f Z [ f W, ð' —, è, µ, 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, Ì 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, µ, ³ 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 % f O, ð Ž w' è, µ, Ä IDirectPlay2::Send f \ f b f h, ð È Ä, Ñ o, ·, Ü, Ä A, » , Ìf v f C f C f,, ID, Ì f 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, Ì 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, Ì, Ÿ — L E Ø, Ä, , é B f T [ f r f X E f v f f o f C f, Í A • K, , µ, à DPSEND\_OPENSTREAM, Æ DPSEND\_CLOSESTREAM, ð f T f [ f g, ·, é • K — v, Í, È, ç B

**DPSEND\_GUARANTEED**

% Ä " \, Ä, , è, Í • Û Ø • t, «, Ì " 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, È' — M f L f... [ , Ì 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 @, Ì æ " a, È '... M, ³, è, é B

**DPSEND\_OPENSTREAM**

f v f C f C f,, È " ½, Ìf f b f Z [ f W, ð' —, è, µ, Æ, µ, Ä, ç, é, Æ, « A f T [ f r f X E f v f f o f C f, È Ä " K % », Ì f q f " f g, ð Ž', · B

**DPSEND\_CLOSESTREAM**

f v f C f C f,, È' —, è, µ, Æ, µ, Ä, ç, é f f b f Z [ f W, Ì " , a, » , è, Ü, Ç ½, È, - , È, Ä, ½, ±, Æ, ð Ž', · B

*lpData*

' — M, ³, è, é f f [ f ^, Ö, Ì f f C f " f ^ B Ž Ä Ü, È' — M, ·, é f f b f Z [ f W, a, È, ç, Æ, «, Í A, ±, Ì f p f % f [ f ^, ð NULL, È f Z f b f g, ·, é BDPSEND\_OPENSTREAM, â DPSEND\_CLOSESTREAM f t f % 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 ^, Ì', ³ B

f fbfZ [fW,ð'¼,ÌfvfŒfCf,,É'—  
M,·,é,É,Í A`Œ æ,ÌfvfŒfCf,,ID,ðŽw'è,·,é Bf fbfZ [fW,ðfvfŒfCf,,ÌfOf< [fv,É'—  
M,·,é,É,Í AfOf< [fv,ÉŠ,,è'—,Ä,ç,è,½ID,ðŽw'è,·,é Bf fbfZ [fW,ðfZfbfVfþf'“S'ì,É'—  
,é ê ‡,Í ADPID\_ALLPLAYERSfvfŒfCf,,ID,ðŽw'è,·,é **BIDirectDrawSurface2::Lock /**  
**IDirectDrawSurface2::Unlock**,ÌEÄ,Ñ o,µ,ÌŠÖ A,Û,½,Í**IDirectDrawSurface2::GetDC /**  
**IDirectDrawSurface2::ReleaseDC**f f\fbfh,ÌEÄ,Ñ o,µ,ÌŠÖ,Ä,Í AIDirectPlay2::Sendf f\fbfh,ðŽg—p,·,é,±  
,Æ,Í,Ä,«,È,ç B

fvfŒfCf,,Í AŽ©ªŽ© g,Éf fbfZ [fW,ð'— M,·,é,±  
,Æ,Í,Ä,«,È,ç Bf fbfZ [fW,ðŽ©ª,ª Š'®,·,éfOf< [fv,âDPID\_ALLPLAYERS,É'—  
,Ä,Ä,à A,»Ìf fbfZ [fW,ÌRfs [,ðfvfŒfCf,,ªŽó,Žæ,é,±,Æ,Í,È,ç B

DPSESSION\_NOMESSAGEID,ªŽw'è,³,è,Ä,ç,éfZfbfVfþf'“,Ä,Í AfOf< [fv,É'—  
M,µ,½f fbfZ [fW,ðfvfŒfCf,,ªŽó M,·,é,±,Æ,ª%Ä””,Ä, ,é B,±  
,Ì ê ‡,ÍDirectPlayf fbfZ [fWIDfwfbf\_ if fbfZ [fW,Ì'— MŽÖ,ðŽ,· j,ªt%Ä,³,è,È,ç  
,½,ß AfT [frfX Efvf fofCf\_ ,É,æ,Ä,ÄŽ©ªŽ© g,©,ç,Ìf fbfZ [fW,ª æŠÖ,³,è,é,±  
,Æ,Í,È,ç BfAfVfŠfP [fvfþf'“,Í Af fbfZ [fW,Ì'ä—e,ÉŠ,Ä,ç,Ä AŽ©ª,©,ç,Ìf fbfZ [fW,ð”»'è,Ä,«,È,-  
,Ä,Í,È,ç,È,ç B

DPSESSION\_NOMESSAGEID,ªŽw'è,³,è,é,Æ Af fbfZ [fW,Í'— M æ,ÌfRf“fsf...  
[f^ ã,Ìf [fJf<,ÈfvfŒfCf,,Ì,Ð,Æ,Ä,É'—,ç,é,é B

f fbfZ [fW,Í•Û Ø•t,«,Ä,à•Û Ø,È,µ,Ä,à'— M,Ä,«,é BffftfHf<fg,Ä,Í•Û Ø,È,µ,Ä'— M,³,è,é B,±  
,Ì ê ‡ ADirectPlay,Í AŽóŽæ l,Éf fbfZ [fW,ª“Í,ç,½,±,Æ,ðŠm”F,µ,È,ç B•Û Ø•t,«,Ìf fbfZ [fW,ð'—  
M,·,é,É,Í A•Û Ø,È,µ,Ìf fbfZ [fW,æ,è,à A'á2 A3”{,ÌŽŠÖ,ªK—v,Ä, ,é BfAfVfŠfP [fvfþf'“,Í A•Û Ø•t,«,Ìf  
fbfZ [fW,ð'— M,·,é,è%””,ð Ä -ŒÄ,É—},!é,×,«,Ä, ,é B,Û,½fAfVfŠfP [fvfþf'“,Í Af fbfZ [fW,Ì'rŽ,É'í%  
ž,Ä,«,È,,Ä,Í,È,ç,È,ç B

DirectPlay,Æ,Æ,à,É“ i,·,é,·,×,Ä,ÌfT [frfX Efvf fofCf\_ ,Í Aff [f^,Ì”j¹,ð”ð,\_,é,½,ß AŠ©'S «,Ìf`fFfbfN,ðŽÄ  
s,·,é B,·,×,Ä,ÌŽó Mf fbfZ [fW,ÍŒY Ø,³,è Aff [f^,Ì”j¹,ªŒY o,³,è,½ ê ‡ A,»,Ìff [f^,Í”pŠü i•Û Ø,³,è,Ä,ç  
,È,ç ê ‡ j,Û,½,Í Ä'— i•Û Ø,³,è,Ä,ç,é ê ‡ j,³,è,é B

---

f f,  
,±,Ìfo [fWfþf'“,IDirectPlay,Ä,Í ADPSEND\_GUARANTEED,Í AfT [frfX Efvf fofCf\_ ,ªfTf|  
[fg,·,é ê ‡,É,¼,™z M,ð•Û Ø,·,é BfAfVfŠfP [fvfþf'“,Í A**IDirectPlay2::GetCaps**,ðEÄ,Ñ o,µ ADPCAPS\_GUA  
RANTEEDSUPPORTEDftf%fo,ðf`fFfbfN,·,é,±,Æ,É,æ,è A”z M,ª•Û Ø,³,è,Ä,ç,é,©,ç,µ,©,ðŠm”F,Ä,«,é B,±  
,Ìftf%fo,ªfZfbfg,³,è,Ä,ç,È,\_,è,Í ADPSEND\_GUARANTEEDftf%fo,Í—  
ªŽ<,³,è Af fbfZ [fW,Í•Û Ø,³,è,È,ç BŽY,Ìfo [fWfþf'“,IDirectPlay,Ä,Í A•Û Ø,È,µ,ÌfT [frfX Efvf fofCf\_ ä,  
Ä,à”z M,Ì•Û Ø,ðfCf“fvfŠf f“fg,·,é—'è,Ä, ,è A•Û Ø,ÌfTf| [fg,ðŽ',·CAPSftf%fo,Í,Ä,È,É'Ö—j,ðŽ ,Ä,æ,µ  
,É,È,é B  
fAfVfŠfP [fvfþf'“,ª•Û Ø•t,«,Ìf fbfZ [fW”z M,ð“ÆŽ©,ÉfCf“fvfŠf f“fg,·,é ê ‡ ACE^,µ,ADPSEND\_GUARAN  
TEEDftf%fo,ðŽg,Ä,Ä,Í,ç,\_,È,ç BfAfVfŠfP [fvfþf'“,ÌfpftfH [f}  
f“fX,ðfefXfg,·,é,Æ,«,Í AfT [frfX Efvf fofCf\_ ,ª•Û Ø•t,«,Ìf fbfZ [fWÆðŠ',ðfTf| [fg,·,é,©,ç,µ,©,ð'm,é,±  
,Æ,ª d—v,Ä, ,é BfTf| [fg,µ,Ä,ç  
,é ê ‡ AŽY,Ìfo [fWfþf'“,IDirectPlay,ÌŽÄ s'—x,Í ADPSEND\_GUARANTEED,ðŽw'è,µ,Ä,ç  
,é,·,×,Ä,Ì%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“ĈĀ—L,ĭff [f^ Efuf fbfN,đŠÖ`A•t,¯,é B  
-Ĉ±,·,é,ĭDD\_OK AŽ,”s,·,é,ĭŽŸ,ĭfGf%o [!l,đ•Ô,· B

- DPERR\_INVALIDOBJECT**
- DPERR\_INVALIDPARAMS**
- DPERR\_INVALIDPLAYER**

idGroup

ff [f^,đ Ý`è,·,é,fOf< [fv,ĭfOf< [fvID B

lpData

fZfbfg,³,é,éff [f^,Ö,ĭf|fCf“f^ BŠù“¶,ĭfOf< [fv Eff [f^,đfNfŠfA,·,é ê ‡,ĭNULL,đŽw`è,·,é B

dwDataSize

ff [f^ Efofbftf@,ĭfTfCfY B

dwFlags

,±  
,ĭfpf%of [f^,É0,đŽw`è,·,é,Ā AfŠf, [fg EfOf< [fv Eff [f^,afZfbfg,³,é A•Ū Ø,È,µ,ĭf fbfZ [fW,É,æ,Á,  
Ā`Ē`m,³,é,é B

DPSET\_REMOTE

,±,ĭff [f^,ĭ,·,×,Ā,ĭfAfvfŠfP [fVf‡f“,É,æ,Á,ĀŽg—  
p,³,é AfZfbfVf‡f““à,ĭ¼,ĭ,·,×,Ā,ĭfAfvfŠfP [fVf‡f“,É“`B,³,é,é B

DPSET\_LOCAL

,±,ĭff [f^,ĭf [fJf<,ÈŽg—p,ĭ,½,β,¾,¯,É—p`Ó,³,é A“`B,³,é,é,±  
,Ā,ĭ,È,ĉ B

DPSET\_GUARANTEED

i%oĀ”\,Ā, ,é,ĭ j•Ū Ø•t,«f fbfZ [fW,É,æ,Á,Āff [f^,đ“`B,·,é B,±  
,ĭftf%oF0,ĭDPSET\_REMOTE,Ā`è ,ÉŽw`è,µ,È,,Ā,ĭ,È,ĉ,È,ĉ B

DirectPlay,ĭ Af [fJf<“,æ,ŃfŠf, [fg,ĭ,Ó,½,Ā,ĭf^fCfv,ĭfOf< [fv Eff [f^,đ•ŪŽ ,·,é,±  
,Ā,³,Ā,«é Bf [fJf< Eff [f^,ĭ Af [fJf< EfRf“fsf... [f^ ã,ĭfAfvfŠfP [fVf‡f“,É`ĭ,µ,Ā,ĭ,Ý—LĈØ,Ā, ,é Bf  
Šf, [fg Eff [f^,ĭ AfZfbfVf‡f““à,ĭ,·,×,Ā,ĭ¼,ĭfAfvfŠfP [fVf‡f“,É“`B,³,é,é BDPSESSION\_NODATAMESSAGES  
,³Žw`è,³,é,Ā,ĉ  
,É,ĉfZfbfVf‡f“,Ā,ĭ Aff [f^,ĭĭ X,đ`Ē`m,·,é,½,β A,·,×,Ā,ĭ¼,ĭfvfĈfCf,,ÉDPSYS\_SETPLAYERORGROUPDATAf  
VfXfef€ Ef fbfZ [fW,³,—,ĉ,é,é BfŠf\ [fX,Ö,ĭf|fCf“f^,ĭf [fJf< Eff [f^,ÉŠi“[·,é,ĭ,³Ā`S,Ā, ,é Bf [fJf<  
Eff [f^ Efuf fbfN,ĭ **IDPMSG\_DESTROYPLAYERORGROUP** fVfXfef€ Ef fbfZ [fW,³,—  
,ĉ,é,Ā jfOf< [fv,³”jŠü,³,é,æ,µ,Ā,ĉ,é,Ā,«É,à—LĈØ,Ā, ,é,½,β AfAfvfŠfP [fVf‡f“,ĭ,±  
,é,ĉ,ĭfŠf\ [fX,đ%đđ•ú,·,é,±,Ā,³,Ā,«é B fVfXfef€ Ef fbfZ [fW,ĭfŠfXfg,É,Ā,ĉ,Ā,ĭfVfXfef€ Ef fbfZ [fW,ĭŽg  
=p,đŽQ Ā,³,é,½,ĉ B

ŽQ Ā @**IDPMSG\_SETPLAYERORGROUPDATA**, **IDirectPlay2::GetGroupData**, **IDirectPlay2::Send**

## IDirectPlay2::SetGroupName

HRESULT SetGroupName(DPID idGroup,  
LPDPNAME lpGroupName, DWORD dwFlags);

fOf< [fv,ì ì -ŒË,ÉfOf< [fv,ì-¼'O,ðfZfbfg,·,é B DPSESSION\_NODATAMESSAGES ,aŽw'è,³,ê,Ä,Œ  
,È,ŒfZfbfVf‡f“,Ä,Í A-  
¼'O,İ•İ X,ð'É'm,·,é,½,B A'¼,ì,·,×,Ä,İfvfŒfCf,,ÉDPSYS\_SETPLAYERORGROUPNAMEfvfXfef€ Ef fbfZ [fW,  
“—,ç,ê,é BfvfXfef€ Ef fbfZ [fW,İfŠfXfg,É,Ä,Œ,Ä,İfvfXfef€ Ef fbfZ [fW,İŽq—p,ðŽQ Æ,³,ê,½,Œ B  
-Œ÷,·,ê,İDD\_OK AŽ,“s,·,ê,İŽŸ,İfGf%o [¹,ì,Œ,,ê,©,ð•Ô,· B

**DPERR\_INVALIDOBJECT**

**DPERR\_INVALIDPARAMS**

**DPERR\_INVALIDPLAYER**

idGroup

-¼'O,ðfZfbfg,·,éOf< [fv,İfOf< [fvID B

lpGroupName

fOf< [fv,ì-¼'O î•ñ,ðŠÜ,ŒDPNAME \Œ'İ,Ö,İf|fCf“f^ BfOf< [fv,a-¼'O î•ñ,ðŽ ,½,È,Œ ê ê ‡,Í A,±  
,İpf%of [f^,ÉNULL,ðfZfbfg,·,é B

dwFlags

,±,İpf%of [f^,É0,ðŽw'è,·,é,Æ A,·,×,Ä,İfŠf, [fg EfVfXfef€,É•Û Ø,È,µ,İf fbfZ [fW,É,æ,Ä,Ä-  
¼'O,a““,¹,ç,ê,é B

DPSET\_GUARANTEED

i%oÄ”\,Ä, ,ê,İ j•Û Ø•t,«,İf fbfZ [fW,É,æ,Ä,Äff [f^,ð“”B,·,é B

ŽQ Æ @DPNAME, DPMSG\_SETPLAYERORGROUPNAME, IDirectPlay2::GetGroupName, IDirectPlay2::Send

**IDirectPlay2::SetPlayerData**

HRESULT SetPlayerData(DPID idPlayer, LPVOID lpData, DWORD dwDataSize, DWORD dwFlags);

*f v f C f C f,, ID, É f A f v f Š f P [ f v f † f “ C E Á — L, ĩ f f [ f ^ E f u f f b f N, đ Š Ö “ A • t, —, é B  
— C E †, ·, ê, Ĩ D D \_ O K A Ž, ” s, ·, ê, Ĩ Ž Ÿ, ĩ f G f % [ ’ l, ĩ, C, ·, ê, ©, đ • Ô, · B*

**DPERR\_INVALIDFLAGS**

**DPERR\_INVALIDOBJECT**

**DPERR\_INVALIDPLAYER**

*idPlayer*

*ff [ f ^, đ Ý ’ è, ·, é f v f C f C f,, ĩ v f C f C f,, ID B*

*lpData*

*f Z f b f g, 3, ê, é f f [ f ^, ĩ f f C f “ f ^ B Š ù “ ¶, ĩ v f C f C f,, E f f [ f ^, đ f N f Š f A, ·, é ê †, ĩ N U L L, đ Ž w ’ è, ·, é B*

*dwDataSize*

*ff [ f ^ E f o f b f t f @, ĩ T f C f Y B*

*dwFlags*

*, †  
ĩ p f % o f [ f ^, É 0, đ Ž w ’ è, ·, é, Æ A f Š f, [ f g E f v f C f C f,, E f f [ f ^, 3 f Z f b f g, 3, ê A • Ū Ø, È, µ, ĩ f f b f Z [ f W, É, æ, Á, Á “ ” B, 3, ê, é B*

**DPSET\_REMOTE**

*, †, ĩ f f [ f ^, ĩ, ·, ×, Ä, ĩ f A f v f Š f P [ f v f † f “, É, æ, Á, Ä Ž g —  
p, 3, ê A f Z f b f v f † f “ “ à, ĩ, ·, ×, Ä, ĩ “ ¼, ĩ f A f v f Š f P [ f v f † f “, É “ ” B, 3, ê, é B*

**DPSET\_LOCAL**

*, †, ĩ f f [ f ^, ĩ f [ f J f †, È Ž g — p, ĩ, ½, B, ¾, —, É — p “ Ó, 3, ê A “ ” B, 3, ê, é, †  
, Æ, ĩ, È, C B*

**DPSET\_GUARANTEED**

*i % Ä ” \, Ä, ·, ê, ĩ j • Ū Ø • t, † f f b f Z [ f W, É, æ, Á, Ä f f [ f ^, đ “ ” B, ·, é B, †  
ĩ f t f % o f O, ĩ D P S E T \_ R E M O T E, Æ “ ê , È Ž w ’ è, µ, È, Ä, ĩ, È, Ç, È, C B*

*DirectPlay, ĩ A f [ f J f †, ·, æ, Ñ f Š f, [ f g, ĩ, Ó, ½, Ä, ĩ f ^ f C f v, ĩ f O f † [ f v E f f [ f ^, đ • Ū Ž , ·, é, †  
, Æ, 3, Ä, †, é B f [ f J f † E f f [ f ^, ĩ A f [ f J f † E f R f “ f s f ... [ f ^ ã, ĩ f A f v f Š f P [ f v f † f “, É ĩ, µ, Ä, ĩ, Ý — L C Ø, Ä, ·, é B f  
Š f, [ f g E f f [ f ^, ĩ A f Z f b f v f † f “ “ à, ĩ, ·, ×, Ä, ĩ “ ¼, ĩ f A f v f Š f P [ f v f † f “, É “ ”, ·, ç, ê, é B D P S E S S I O N \_ N O D A T A M E S S A G E S  
, 3, Ž w ’ è, 3, ê, Ä, C  
, È, C f Z f b f v f † f “, Ä, ĩ A f f [ f ^, ĩ • X, đ ’ È ’ m, ·, é, ½, B A, ·, ×, Ä, ĩ “ ¼, ĩ v f C f C f,, É D P S Y S \_ S E T P L A Y E R O R G R O U P D A T A f  
V f X f e f € E f f b f Z [ f W, “ —, ç, ê, é B f Š f \ [ f X, Ö, ĩ f f C f “ f ^, ĩ f [ f J f † E f f [ f ^, É Š i ” [ ·, é, ĩ, “ Ä “ S, Ä, ·, é B f [ f J f †  
E f f [ f ^ E f u f f b f N, ĩ **DPMSG\_DESTROYPLAYERORGROUP** f v f X f e f € E f f b f Z [ f W, “ —  
, ç, ê, Ä j f O f † [ f v, 3 ” j Š ü, 3, ê, æ, □, Æ, µ, Ä, C, é, Æ, †, É, à — L C Ø, Ä, ·, é, ½, B A f A f v f Š f P [ f v f † f “, ĩ, †  
, ê, ç, ĩ f Š f \ [ f X, đ % đ • ú, ·, é, †, Æ, 3, Ä, †, é B f v f X f e f € E f f b f Z [ f W, ĩ f Š f X f g, É, Ä, C, Ä, ĩ f v f X f e f € E f f b f Z [ f W, ĩ Ž g  
= p, đ Ž Q Æ, 3, ê, ½, C B*

*Ž Q Æ @ DPMSG\_SETPLAYERORGROUPDATA, IDirectPlay2::GetPlayerData, IDirectPlay2::Send*

**IDirectPlay2::SetPlayerName**

HRESULT SetPlayerName(DPID idPlayer,  
LPDPNAME lpPlayerName, DWORD dwFlags);

*f v f C f C f , , I i - C E a , E f v f C f C f , , I - 1 / 4 ' O , d Y ' e , , e B DPSESSION\_NODATAMESSAGES , a Z w ' e , 3 , e , A , C  
, E , C f Z f b f V f f z f " , A , I A -  
1 / 4 ' O , I I X , d ' E ' m , , e , 1 / 2 , B A ' 1 / 4 , I , , x , A , I f v f C f C f , , E D P S Y S \_ S E T P L A Y E R O R G R O U P N A M E f V f X f e f E f f b f Z [ f W ,  
a " - , C , e , e B f V f X f e f E f f b f Z [ f W , I f S f X f g , E , A , C , A , I f V f X f e f E f f b f Z [ f W , I Z q - p , d Z Q A E , 3 , e , 1 / 2 , C B  
- C E z , , e , I D D \_ O K A Z , " s , , e , I Z Y , I f G f % [ ' l , I , C , , e , C , d o O , . B*

**DPERR\_INVALIDOBJECT**

**DPERR\_INVALIDPLAYER**

*i d P l a y e r  
- 1 / 4 ' O , a Y ' e , , e f v f C f C f , , I f v f C f C f , , I D B*

*l p P l a y e r N a m e  
f v f C f C f , , I - 1 / 4 ' O i n , d S U , p D P N A M E \ ' c ' I , I f A f h f C f X B f v f C f C f , , a - 1 / 4 ' O i n , d Z , 1 / 2 , E , C e z , I A , z  
, I f p % o f [ f ^ , E N U L L , d Y ' e , , e B*

*d w F l a g s  
, z , I f p % o f [ f ^ , E O , d Z w ' e , , e , A A , , x , A , I f S f , [ f g E f V f X f e f E , E U O , E , m , I f f b f Z [ f W , E , a , A , A -  
1 / 4 ' O , a " , , , C , e , e B*

*D P S E T \_ G U A R A N T E E D  
i % o A " \ , A , , e , I j o U O t , « , I f f b f Z [ f W , E , a , A , A f f [ f ^ , d " ' B , , e B*

**@DPNAME, DPMSG\_SETPLAYERORGROUPNAME, IDirectPlay2::GetPlayerName, IDirectPlay2::Send**

**IDirectPlay2::SetSessionDesc**

HRESULT SetSessionDesc(LPDPSESSIONDESC2 lpSessDesc,  
DWORD dwFlags);

,±,İf f\fbfh,ÍE» ÝfTf| [fg,³,ê,Ä,¢,È,¢ B

E» Ý,İfZfbfVf‡f“,ì“Á «,ð•İ X,·,é B,±,İf f\fbfh,Í AfZfbfVf‡f“,İzfXfg,Ä, ,éfRf“fsf...  
[f^ ã,ÄCEÄ,Ñ o,³,ê,½,Æ,«,İ,Ý“@ i,·,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,ÍE» Ýftf%ofo,ÍŽg—p,³,ê,Ä,¢,È,¢ B

ŽQ Æ @DPSESSIONDESC2, IDirectPlay2::GetSessionDesc

## **IDirectPlayLobby**

*fAfvfŠfP [fVf‡f“*, *Í AIDirectPlayLobbyfCf“f^ [ftfFfCfX, Ìf f\fbfh, ðŽg—*  
*p, µ, Ä AfAfvfŠfP [fVf‡f“*, *ÆfAfvfŠfP [fVf‡f“*, *ÉŠÖ`A•t, ¯, ç, ê, ½ff [f^, ð §Œä, ·, é B, ±*  
*, ÌfZfNfVf‡f“*, *Í AIDirectPlayLobbyfCf“f^ [ftfFfCfX Ef f\fbfh, ÌfŠftf@fŒf“fX, Ä, , é BŠT”O, É, Â, ç, Ä, ÌŠT—*  
*v, ÍDirectPlayLobbyfCf“f^ [ftfFfCfX, ðŽQ Æ, ³, ê, ½, ç 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 [fVfŠf“,đfZfbfVfŠf“,É Ú±,·,é B Ú±,É,Í A**IDirectPlayLobby::RunApplication**  
f f\fbfh,Ì†,Áf fr [ EfNf%oCfAf“fg,©,ç’ñ<Ÿ,³,é,é Ú±ff [f^ A,Ü,½,Í**IDirectPlayLobby::SetConnectionSettings**  
,ÌĚÄ,Ñ o,µ,É,æ,Á,Ä Ý’è,³,é,éff [f^,đŽg—p,·,é B

-Ě÷,·,é,ĪDD\_OK AŽ,”s,·,é,ĪŽŸ,ÌfGf%o [’l,Ì,ĉ,,é,©,đ•Ō,· B

**CLASS E\_NOAGGREGATION**

**DPERR\_INVALIDFLAGS**

**DPERR\_INVALIDINTERFACE**

**DPERR\_INVALIDOBJECT**

**DPERR\_INVALIDPARAMS**

**DPERR\_NOTLOBBIED**

**DPERR\_OUTOFMEMORY**

dwFlags

—\-ñ,³,é,Ä,ĉ,é B0,Ä,È,,Ä,Í,È,ĉ,É,ĉ B

lpDP

—LĚø,ÈfCf“f^ [ftfFfCfX,Ä %Šú%o»,³,é,é|fCf“f^,Ō,Ìf|  
fCf“f^ B**IDirectPlay2** i**IDirectPlayLobby**,©,çĚÄ,Ñ o,³,é,é ê ‡ j,Ü,½,Í**IDirectPlay2A** i**IDirectPlayLobbyA**,©,ç  
ĚÄ,Ñ o,³,é,é ê ‡ jfCf“f^ [ftfFfCfX,Ì,ĉ,,é,©,Ä,·,é B

pUnk

IUnknown fCf“f^ [ftfFfCfX,ÌfAfhfĚfX B,±,Ìfpf%of [f^,Í «—^,ÌCOM W -%o»<@”\  
,Ě,ÌĚŸŠ· ,Ä,½,ß,É’ñ<Ÿ,³,é,Ä,ĉ,é BĚ» Ý,Í**IDirectPlayLobby::Connect**,Ä,Í A,±  
,Ìfpf%of [f^,ÉNULL^ÈŠO,Ì’l,Žw’è,³,é,é,ĚfGf%o [,đ•Ō,· B

-Ě÷,·,é,Ě A ³,µ,ĉfT [ffX EfVf fofCf\_,ÉDirectPlayIfufWfFfNfg,đ Ì ¬,µ A ³,µ,ĉfZfbfVfŠf“,đfI [fVf“,·  
,é Bf† [fU,É-â,ĉ ‡,í,¹,Ìf\_fCfAf fO Ef{fbfNfX,đ•Ž},·,é,±,Ě,Í,È,ĉ B,±  
,Ìf f\fbfh,Ž,”s,µ,ÄDPERR\_NOTLOBBIEDfGf%o [,đ•Ō,· ê ‡ AfAfVfŠfP [fVfŠf“,Í’È í,ÌŽè ‡,đŽÄ s,µ A**DirectPlayEnumerate** A**DirectPlayCreate** A**IDirectPlay2::EnumSessions** A**IDirectPlay2::Open**,đĚÄ,Ñ o,³,È,-  
,Ä,Í,È,ĉ,È,ĉ B¼,ÌfGf%o [’l,ÄŽ,”s,·,é ê ‡,Í AfZfbfVfŠf“,Ō,Ì Ú±,É-â’è,³,é,é B

,±,Ìf f\fbfh,đĚÄ,Ñ o,·‘O,É AfAfVfŠfP [fVfŠf“,đŠJŽn,·,é,½,ß,É—p,ĉ,ç,é,é Ú± Ý’è,đ²,×,é,±,Ě,³,Ä,«é B,±  
,Ì,½,ß,È,Í**IDirectPlayLobby::GetConnectionSettings** f f\fbfh,đŽg—p,·,é BfAfVfŠfP [fVfŠf“,Í A,±  
,é,ç,Ì Ý’è,đ•Í X,µ A**IDirectPlayLobby::SetConnectionSettings** f f\fbfh,É,æ,Ä,ÄfZfbf%µ¼,·,±  
,Ě,³,Ä,«,é BDPSESSIONDESC2 \ĉ’Ì,É,Í A“K Ø,ÈfZfbfVfŠf“Ä «,ª Ý’è,³,é,é,æ,ª,É“Á•É,É’ Ÿ,đ•Ÿ,í,È,-  
,Ä,Í,È,ĉ,È,ĉ B“Ä,É AdwFlags AdwMaxPlayers AdwUserf f“fo,É,Í’ Ÿ,ª•K—v,Ä,·,é B

ŽQ Ě @**DirectPlayCreate**

## IDirectPlayLobby::CreateAddress

HRESULT CreateAddress(REFGUID guidSP,  
REFGUID guidDataType, LPCVOID lpData,  
DWORD dwDataSize, LPVOID lpAddress,  
LPDWORD lpdwAddressSize);

—^,!,ç,ê,½fT [frfX Efvf fofCf\_ĈÄ—  
L,ìflfbfgf [fN EfAfhfĈfX,©,ç ADirectPlayfAfhfĈfX,ð ì ¬,·,é BĈ<%Ĉ,ìfAfhfĈfX,É,Í AfT [frfX Efvf  
fofCf\_ÌfOf [fof< Ef+fj [fNŽ~•ĚŽq iGUID j A,“,æ,ÑfT [frfX Efvf fofCf\_,^flfbfgf [fN EfAfhfĈfX,  
Æ,μ,Ä%ðŽß,·,é,±,Æ,^,Ä,«,éff [f^,^ŠÛ,Û,ê,é B

-Ĉ÷,·,é,îDD\_OK AŽ,“s,·,é,îŽÿ,ìfGf% [!l,ì,ç,·,é,©,ð•Ô,· B

### DPERR\_BUFFERTOOSMALL

### DPERR\_INVALIDPARAMS

guidSP

fT [frfX Efvf fofCf\_,ìGUID,Ö,ìf|fCf“f^ iC++,Ä,ìGUID,Ö,ìŽQ Æ,Ä,·é j B

guidDataType

ĈÄ—

L,ìflfbfgf [fN EfAfhfĈfX Ef^fCfv,ðŽ~•Ě,·,éGUID,ìfAfhfĈfX B'è<` Ì,Ý,ìflfbfgf [fN EfAfhfĈfX  
Ef^fCfv,É,Ä,ç,Ä,ìDirectPlayfAfhfĈfX,ðŽQ Æ,³,ê,½,ç iC++,Ä,ìGUID,Ö,ìŽQ Æ,Ä,·é j B

lpData

ĈÄ—L,ìflfbfgf [fN EfAfhfĈfX,ðŠÛ,ðfobftf@,Ö,ìf|fCf“f^ B

dwDataSize

lpData,ìflfbfgf [fN EfAfhfĈfX,ìfTfCY,ðfofCfY'P^Ě,ÄŽw'è,·,é B

lpAddress

¶ ¬,³,ê,½DirectPlayfAfhfĈfX,^ ‘,« ž,Û,ê,éfofobftf@,Ö,ìf|fCf“f^ B

lpdwAddressSize

DirectPlayfAfhfĈfX Efobftf@,ìfTfCY,ðŠÛ,ð•ì ”,Ö,ìf|fCf“f^ BfT [frfX Efvf fofCf\_Í A,±  
,ìf f\fbfh,ðĈÄ,Ñ o,‘O,ÉlpdwAddressSize,ðfofobftf@,ìfTfCY,Ä %ðŠú%»,μ,È,,Ä,Í,È,ç,Ě,ç B

f f\fbfh,^ §Ĉä,ð-ß,·,Æ A,±

,ìfpf%of [f^,É,ìlpAddress,É ‘,« ž,Û,ê,½fofCfY ”,^Ši”[³,ê,é Bfofobftf@,^ ¬,³,·,¬,é iDPERR\_BUFFERTOOSM  
ALL j ê ‡ A,±,ìfpf%of [f^,É,ìDirectPlayfAfhfĈfX,ðŠi”[·,é,½,ß,É•K—v,ÈfTfCY,^fZfbfg,³,ê,é B

ŽQ Æ @IDirectPlayLobby::EnumAddress

**IDirectPlayLobby::EnumAddress**

HRESULT EnumAddress(LPDPEENUMADDRESS lpEnumAddressCallback,  
LPCVOID lpAddress, DWORD dwAddressSize,  
LPVOID lpContext);

DirectPlayfAfhfEfX Efofbftf@,©,çf`fff“fN,ð%øđ Í,·,é B

–Ĉ÷,·,ê,ÎDD\_OK AŽ,”s,·,ê,ÎŽŸ,ÌfGf%o [’l,ì,ç,,ê,©,ð•Ô,· B

**DPERR\_EXCEPTION**

**DPERR\_INVALIDOBJECT**

**DPERR\_INVALIDPARAMS**

lpEnumAddressCallback

DirectPlayfAfhfEfX,Ìšē î·ñf`fff“fN,É,Â,ç,ÄĈÄ,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“feLlXfg 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\_,ªDirectPlayfAfhfŒfX,ð \z,·,é,½,ß,É•K—  
v,Æ,·,é A,·,×,Ä,ÌfAfhfŒfX Ef^fCfv,ð—ñ<“,·,é B

-Œ÷,·,ê,ÎDD\_OK AŽ,“s,·,ê,ÎŽŸ,ÌfGf%o [‘l,ì,Œ,,ê,©,ð•Ô,· B

### DPERR\_EXCEPTION

### DPERR\_INVALIDOBJECT

### DPERR\_INVALIDPARAMS

lpEnumAddressTypeCallback

fT [frfX Efvf fofCf\_,ÌšefAfhfŒfX Ef^fCfv,É,Â,Œ,ÄŒÄ,Ñ o,³,ê,éEnumAddressTypeCallbackŠÖ ”,Ö,Ìf|  
fCf“f^ B fT [frfX Efvf fofCf\_,ªfAfhfŒfX Ef^fCfv,ð,Æ,ç,È,Œ,ç AfR [f<fofbfN,ÍŒÄ,Ñ o,³,ê,È,Œ B

guidSP

fAfhfŒfXf^fCfv,ð—ñ<“,·,éfT [frfX Efvf fofCf\_,ÌGUID,ÌfAfhfŒfX iC++,Ä,ÍGUID,Ö,ÌŽQ Æ,Ä, ,é j B

lpContext

fR [f<fofbfNŠÖ ”,É“n,³,ê,éfRf“fefLXfg 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,ç,éfAfvfŠfP [fVf‡f“„ð—ñ«“,·,é B  
-Æ÷,·,ê,ÎDD\_OK AŽ,”s,·,ê,ÎŽŸ,ÌfGf%o [¹,Ì,ç,,ê,©,ð•Ô,· B

**DPERR\_GENERIC**

**DPERR\_INVALIDINTERFACE**

**DPERR\_INVALIDOBJECT**

**DPERR\_INVALIDPARAMS**

**DPERR\_OUTOFMEMORY**

lpEnumLocalAppCallback  
—ñ«“,³,ê,½ŠefAfvfŠfP [fVf‡f“,É,Â,ç,ÄÆÄ,Ñ o,³,ê,éEnumLocalApplicationsCallback ŠÖ ”,Ö,Ìf|fCf“f^ B

lpContext  
fR [f<fofbfNŠÖ ”,É“n,³,ê,éfRf“fefLfXfg B

dwFlags  
—\—ñ,³,ê,Ä,ç,é B0,Â,È,,Ä,Í,È,ç,È,ç B

ŽQ Æ @**DPLAPPINFO**

**IDirectPlayLobby::GetConnectionSettings**

HRESULT GetConnectionSettings(DWORD dwAppID,  
LPVOID lpData, LPDWORD lpdwDataSize);

f AfvfšfP [fVfšf“,İŠJŽn,â Ú±,É•K—v,È,·,×,Ä,İ î•ñ,ðŠÛ,ðDPLCONNECTION  
`ç`İ,ðŽæ“¾,·,é B•Ô,³,ê,½ff [f^,Í Af fr [ EfNf%ofCfAf“fg,É,æ,Ä,ÄIDirectPlayLobby::RunApplication  
f f\bfh,É“n,³,ê,é,à,İ A,Û,½,ÍIDirectPlayLobby::SetConnectionSettings  
f f\bfh,İCEÄ,Ñ o,µ,Ä Ý’è,³,ê,é,à,İ,Æ““,¶,Ä, ,é B

-CE±,·,é,İDD\_OK AŽ,“s,·,é,İŽŸ,İfGf%o [’l,İ,ç,·,é,©,ð•Ô,· B

DPERR\_BUFFERTOOSMALL

DPERR\_GENERIC

DPERR\_INVALIDINTERFACE

DPERR\_INVALIDOBJECT

DPERR\_INVALIDPARAMS

DPERR\_NOTLOBBIED

DPERR\_OUTOFMEMORY

dwAppID

f fr [ EfNf%ofCfAf“fg,æÄ,Ñ o,· ê ± A Ú± Ý’è,ðŽæ“¾,·,é AfvfšfP [fVfšf“,ðŽ-•È,·,é if fr [ EfN  
f%ofCfAf“fg,Í,ç,·,Ä,©,İ AfvfšfP [fVfšf“,Æ•È M,·,é j B AfvfšfP [fVfšf“,æÄ,Ñ o,·,Æ,«,Í A,±  
,İpf%of [f^,İÖ,Ä,È,-  
,Ä,Í,È,ç,È,ç if AfvfšfP [fVfšf“,Í A,Đ,Æ,Ä,İf fr [ EfNf%ofCfAf“fg,Æ,µ,©•È M,µ,È,ç j B,±  
,İID”Ö †,ÍIDirectPlayLobby::RunApplication,©,çŽæ“¾,³,ê,é B

lpData

Ú± Ý’è,ª ‘,« ž,Û,ê,é ofbf@,Ö,İf|Cf“f^ B ff [f^,İTfCfY,¾,-,ðŽæ“¾,·,é ê ±,Í A,±  
,İpf%of [f^,ÉNULL,ð Ý’è,·,é B,±,İ,Æ,« AlpdwDataSizepf%of [f^,É,Í Af [f^,ð•ÛŽ ,·,é,½,ß,É•K—  
v,È Ä ¬,İTfCfY,ªŠi”[,³,ê,é B

lpdwDataSize

,±,İf f\bfh,ðCEÄ,Ñ o,·“O,É ofbf@,İTfCfY,Ä %oŠú%o»,³,ê,éİ ”,Ö,İf|Cf“f^ Bf f\bfh,ª §CEä,ð-  
ß,µ,½CEä A,±  
,İpf%of [f^,É,İff [f^,İTfCfY,ª ofCfP^È,ÄfZfbfg,³,ê,é B ofbf@,ª ¬,³,·,¬,é iDPERR\_BUFFERTOOSMA  
LL j ê ±,Í A,±,İpf%of [f^,É,Í•K—v,È Ä ¬,İ ofbf@ EfTfCfY,ª Ý’è,³,ê,é B

ŠÖ ”,ª §CEä,ð-

ß,µ,½,Æ,« Af [f^,ð“Ç,Ý o,·,½,ß,É,Í AlpData f“fo,ðLPDPLCONNECTION `ç`İ,ÉfLfffXfg,µ,È,-  
,Ä,Í,È,ç,È,ç B

ŽQ Æ @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,đŽæ“¾,·,é Bf fbfZ [fW,İfLf... [É’~!,ç,ê,é,½,ß A“Ç,Ý o,³,ê,È,ç  
,È,çff [f^,đŽ,·ŠëE⁻,Í,È,ç B

-E±,·,ê,İDD\_OK AŽ,·s,·,ê,İŽŸ,İfGf%o [¹,ì,ç,,ê,©,đ•Ö,· B

DPERR\_APPNOTSTARTED

DPERR\_BUFFERTOOSMALL

DPERR\_GENERIC

DPERR\_INVALIDINTERFACE

DPERR\_INVALIDOBJECT

DPERR\_INVALIDPARAMS

DPERR\_NOMESSAGES

DPERR\_OUTOFMEMORY

dwFlags

—\-ñ,³,ê,Ä,ç,é B0,Ä,È,,Ä,Í,È,ç,È,ç B

dwAppID

f fr [ EfNf%ofCfAf“fg,ªEÄ,Ñ o,· ê ‡ A Ú± Ý’è,đŽæ“¾,·,éfAfvfŠfP [fVf‡f“,đŽ⁻•Ê,·,é if fr [ EfN  
f%ofCfAf“fg,Í,ç,,Ä,©,İfAfvfŠfP [fVf‡f“,Æ’Ê M,·,é j BfAfvfŠfP [fVf‡f“,ªEÄ,Ñ o,·,Æ,«,Í A,±  
,İfpf%of [f^,Í0,Ä,È,-  
,Ä,Í,È,ç,È,ç ifAfvfŠfP [fVf‡f“,Í A,Đ,Æ,Ä,İf fr [ EfNf%ofCfAf“fg,Æ,µ,©’Ê M,µ,È,ç j B,±  
,İID”Ö †,İDirectPlayLobby::RunApplication,©,çŽæ“¾,³,ê,é B

lpdwMessageFlags

•Ö,³,ê,Ä,ç,éf fbfZ [fW,İf^fCfv,đŽ!,·ftf%ofO B

DPLAD\_SYSTEM

fAfvfŠfP [fVf‡f“,ÉfCfxf“fg,đ’Ê’m,·,éfvfXfef€ Ef fbfZ [fW,  
Ä,·,é,±,Æ,đŽ!,· B” ¶,µ,½fCfxf“fg,İŽí—p,đE^è,·,é,É,Í AlpDataf|  
fCf“f^,đDPLMSG\_GENERICfvfXfef€ Ef fbfZ [fW,ÉfLffXf  
g,µ,ÄdwTypef f“fo,đ—LEø,É,µ AfVfXfef€ Ef fbfZ [fW,İŽí  
—p,đ’²,×,é B

lpData

f fbfZ [fW,ª ‘,« ž,Ü,ê,éfofbftf@,Ö,İf|fCf“f^ Bf fbfZ [fW,İfTfCfY,¾,⁻,đŽæ“¾,·,é ê ‡,Í A,±  
,İfpf%of [f^,ÉNULL,đ Ý’è,·,é B,±,İ,Æ,« AlpDwDataSizefpf%of [f^,É,Í Af fbfZ [fW,đ•ÖŽ ,·,é,½,ß,É•K  
—v,È Ä ⁻,İfTfCfY,ªŠi”[,³,ê,é B

lpdwDataSize

,±,İf f\fbfh,đEÄ,Ñ o,·O,Éfofbftf@,İfTfCfY,Ä %oŠú%o»,³,ê,éİ ”,İfAfhfEfX Bf f\fbfh,ª §Eä,đ-  
ß,µ,½Eä A,±  
,İfpf%of [f^,É,İf fbfZ [fW,İfTfCfY,ªfofCfG’P^Ê,ÄfZfbfg,³,ê,é Bfofbftf@,ª ⁻,³,·,⁻,é iDPERR\_BUFFERT  
OOSMALL j ê ‡,Í A,±,İfpf%of [f^,É,Í•K—v,È Ä ⁻,İfofbftf@ EfTfCfY,ª Ý’è,³,ê,é B

ŽQ Æ @IDirectPlayLobby::RunApplication, IDirectPlayLobby::SendLobbyMessage

**IDirectPlayLobby::RunApplication**

HRESULT RunApplication(DWORD dwFlags,  
LPDWORD lpdwAppID, LPDPLCONNECTION lpConn,  
HANDLE hReceiveEvent);

fAfVfŠfP [fVfŠf“,đŠJŽn,µ AfZfbfVfŠf“,Æ,Ì Ú±,É•K—v,È,·,×,Ä,Ì îñ,đ“n,· B,±  
,İf f\fbfh,İf fr [ EfNf%ofCfAf“fg,É,æ,Á,Ä—p,ç,ç,é,é B  
-Æ÷,·,é,İDD\_OK AŽ,”s,·,é,İŽŸ,İfGf%o [‘l,İ,ç,,é,©,đ•Ô,· B

DPERR\_CANTCREATEPROCESS

DPERR\_GENERIC

DPERR\_INVALIDINTERFACE

DPERR\_INVALIDOBJECT

DPERR\_INVALIDPARAMS

DPERR\_OUTOFMEMORY

DPERR\_UNKNOWNAPPLICATION

dwFlags

—\ñ,³,é,Ä,ç,é B0,Ä,È,,Ä,Í,È,ç,È,ç B

lpdwAppId

ŠJŽn,³,é,½fAfVfŠfP [fVfŠf“,đŽ•Ê,·,éID,“š;”[³,é,éİ ”,Ö,İf|  
fCf“f^ Bf fr [ EfNf%ofCfAf“fg,Í AIDirectPlayLobby::SendLobbyMessage,âIDirectPlayLobby::ReceiveLobby  
Messagef f\fbfh,İEÄ,Ñ o,µ,ÄŽg—p,·,é,½,ß,É AfAfVfŠfP [fVfŠf“ID,đ•Ü•¶,µ,Ä,,©,È,,é,Í,È,ç,È,ç B

lpConn

ŠJŽn,·,éAfVfŠfP [fVfŠf“,đŽw’è,µ Af\_fCfAf fO Ef{fbfNfX,đ•Ž’l,,ÉfZfbfVfŠf“ EfCf“fXf^f“fX,É Ú±  
,·,é,½,ß,É•K—v,È,·,×,Ä,Ì îñ,đŠŸ,ñ,¼ ADPLCONNECTION \“ç’ì,Ö,İf|fCf“f^ B

hReceiveEvent

f fr [ Ef fbfZ [fW,“žó M,³,é,é,Æ,«,ÉfZfbf,³,é,é“ŠúfCfxf“fg,đŽw’è,·,é B,±  
,İfCfxf“fg,Í AIDirectPlayLobby::SetLobbyMessageEventf f\fbfh,đ—p,ç,ÄEä,Ä•İ X,·,é,±,Æ,ª,Ä,«,é B

,±,İf f\fbfh,İfAfVfŠfP [fVfŠf“ EfVf fZfX,ª ì ¬,³,é,é,Æ §Eä,đ—  
ß,· Bf fr [ EfNf%ofCfAf“fg,Í AfAfVfŠfP [fVfŠf“,ì ó•Ô,đŽ’,·fVfXfef€ Ef fbfZ [fW,đžó,Žæ,é Bf fr [  
EfNf%ofCfAf“fg,ªfZfbfVfŠf“,İfzfXfg EfAfVfŠfP [fVfŠf“,đŠJŽn,µ,Ä,ç  
,é ê ±,Í ADPLSYS\_SESSIONCREATEDfVfXfef€ Ef fbfZ [fW,đžó M,·,é,Ü,Ä AfZfbfVfŠf“,ÉŽQ%oÁ,·,é¼,İf  
AfVfŠfP [fVfŠf“,İŠJŽn,đ•Ö,Ä,×,«,Ä, ,é BfAfVfŠfP [fVfŠf“,ªfZfbfVfŠf“,ì ì ¬,âfZfbfVfŠf“,Ö,İŽQ%oÁ,ÉŽ,”s,·,é  
,Æ ADPLSYS\_DPLAYCONNECTFAILEDf fbfZ [fW,“”-  
s,³,é,é B,Ü,½ Af fr [ EfNf%ofCfAf“fg,Í AfAfVfŠfP [fVfŠf“,ª Ú± Ý’è,đ“Ç,Ý o,·,ÆDPLSYS\_CONNECTI  
ONSETTINGSREADfVfXfef€ Ef fbfZ [fW,đžó,Žæ,é BfAfVfŠfP [fVfŠf“,ª I—  
l,·,é,ÆDPLSYS\_APPTERMINATEDfVfXfef€ Ef fbfZ [fW,đžó M,·,é B

f fr [ EfNf%ofCfAf“fg,Í ADPLSYS\_CONNECTIONSETTINGSREADfVfXfef€ Ef fbfZ [fW,đžó M,·,éO,ÉID  
irectPlayLobbyfCf“f^ [ftfFfCfX,đ%đ•ú,µ,Ä,Í,ç,~È,ç B,±  
,İf fbfZ [fW,Í 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  
    -Ĉ÷,·,ê,İDD\_OK AŽ,”s,·,ê,İŽŸ,İfGf%o [‘l,İ,ĉ,,ê,©,ð•Ô,· B

- DPERR\_APPNOTSTARTED**
- DPERR\_BUFFERTOOLARGE**
- DPERR\_GENERIC**
- DPERR\_INVALIDINTERFACE**
- DPERR\_INVALIDOBJECT**
- DPERR\_INVALIDPARAMS**
- DPERR\_OUTOFMEMORY**
- DPERR\_TIMEOUT**

dwFlags  
    —\-ñ,<sup>3</sup>,ê,Ä,ĉ,é B0,Â,È,,Ä,Í,È,ĉ,È,ĉ B

dwAppID  
    f fr [ EfNf%ofCfAf“fg,ªĈÄ,Ñ o,· ê ‡ A Ú± Ý’è,ðŽæ“¾,·,éfAfvfŠfP [fVf‡f“,ðŽ-•Ê,·,é if fr [ EfN  
    f%ofCfAf“fg,İ,ĉ,,Ä,©,İfAfvfŠfP [fVf‡f“,Æ’Ê M,·,é j BfAfvfŠfP [fVf‡f“,ªĈÄ,Ñ o,·,Æ,«,Í A,±  
    ,İfpf%of [f^,Í0,Ä,È,-  
    ,Ä,Í,È,ĉ,È,ĉ ifAfvfŠfP [fVf‡f“,Í A,Đ,Æ,Ä,İf fr [ EfNf%ofCfAf“fg,Æ,µ,©’Ê M,µ,È,ĉ j B,±  
    ,İD”Ô †,İ**IDirectPlayLobby::RunApplication**,©,çŽæ“¾,<sup>3</sup>,ê,é B

lpData  
    ‘— M,·,éf fbfZ [fW,ðŠÜ,Đfobftf@,Ö,İ|fCf“f^ B

dwDataSize  
    fobftf@,İfTfCfY,ðfocfg’P^Ê,ÄŽw’è,·,é B

ŽQ Æ @**IDirectPlayLobby::RunApplication**, **IDirectPlayLobby::ReceiveLobbyMessage**

**IDirectPlayLobby::SetConnectionSettings**

HRESULT SetConnectionSettings(DWORD dwFlags,  
DWORD dwAppID, LPDPLCONNECTION lpConn);

fAfvfŠfP [fVf‡f“,İŠJŽn,Æ Ú‘±,É•K—v,È,·,×,Ä,İ î•ñ,đŠŮ,ñ,¼DPLCONNECTION \‘c‘İ,đ•İ X,·,é B  
-Æ÷,·,ê,İDD\_OK AŽ,”s,·,ê,İŽŸ,İfGf%o [‘l,İ,¢,,ê,©,đ•Ô,· B

DPERR\_GENERIC

DPERR\_INVALIDINTERFACE

DPERR\_INVALIDOBJECT

DPERR\_INVALIDPARAMS

DPERR\_OUTOFMEMORY

dwFlags

—\-ñ,³,ê,Ä,¢,é B0,Ä,È,,Ä,Í,È,ç,È,¢ B

dwAppID

f fr [ EfNf%ofCfAf“fg,ªÆÄ,Ñ o,· ê ‡ A Ú‘± Ý’è,đŽæ“¼,·,éfAfvfŠfP [fVf‡f“,đŽ-•Ê,·,é if fr [ EfN  
f%ofCfAf“fg,Í,¢,,Ä,©,İfAfvfŠfP [fVf‡f“,Æ’Ê M,·,é j BfAfvfŠfP [fVf‡f“,ªÆÄ,Ñ o,·,Æ,«,Í A,±  
,İfpf%of [f^,İ0,Ä,È,-  
,Ä,Í,È,ç,È,¢ ifAfvfŠfP [fVf‡f“,Í A,Đ,Æ,Ä,İf fr [ EfNf%ofCfAf“fg,Æ,µ,©’Ê M,µ,È,¢ j B,±  
,İID”Ô †,İDirectPlayLobby::RunApplication ,©,çŽæ“¼,³,ê,é B

lpConn

ŠJŽn,·,éfAfvfŠfP [fVf‡f“,đŽw’è,µ Af\_fCfAf fO Ef{fbfNfX,đ•Ž!,¹,,ÉfZfbfVf‡f“ EfCf“fXf^f“fX,É Ú‘±  
,·,é,½,ß,É•K—v,È,·,×,Ä,İ î•ñ,đŠŮ,ñ,¼ ADPLCONNECTION \‘c‘İ,Ö,İf|fCf“f^ B

ŽQ Æ @IDirectPlayLobby::GetConnectionSettings

**IDirectPlayLobby::SetLobbyMessageEvent**

HRESULT SetLobbyMessageEvent(DWORD dwFlags,  
DWORD dwAppID, HANDLE hReceiveEvent);

f fr [ Ef fbfZ [fW,đŽó,Žæ,é,Æ,«ÉfZfbfg,³,ê,éfCfxf“fg,đ“o^,·,é Bf fbfZ [fW,Æ“Šú,đ,Æ,é•K—v,ª, ,éfAf  
vfŠfP [fVf‡f“,Í A,±,İf f\fbfh,đÆÄ,Ñ o,³,È,.,Ä,Í,È,ç,È,ç Bf fr [ EfNf%ofCfAf“fg,Í A,±  
,İf f\fbfh,È,æ,Ä,Ä**IDirectPlayLobby::RunApplication** f f\fbfh,ìÆÄ,Ñ o,µ,ÄŽw’è,³,ê,½fCfxf“fg,đ•İ X,·,é,±  
,Æ,ª,Ä,«,é B

-Æ÷,·,ê,İDD\_OK AŽ,”s,·,ê,İŽŸ,İfGf%o [¹,ì,ç,.,ê,©,đ•Ô,· B

DPERR\_GENERIC

DPERR\_INVALIDINTERFACE

DPERR\_INVALIDOBJECT

DPERR\_INVALIDPARAMS

DPERR\_OUTOFMEMORY

dwFlags

—\-ñ,³,ê,Ä,ç,é B0,Ä,È,.,Ä,Í,È,ç,È,ç B

dwAppID

f fr [ EfNf%ofCfAf“fg,ªÆÄ,Ñ o,· ê ‡ A Ú± Ý’è,đŽæ“¾,·,éfAfvfŠfP [fVf‡f“,đŽ-Ê,·,é if fr [ EfN  
f%ofCfAf“fg,Í,ç,.,Ä,©,İfAfvfŠfP [fVf‡f“,Æ’Ê M,·,é j BfAfvfŠfP [fVf‡f“,ªÆÄ,Ñ o,·,Æ,«,Í A,±  
,İfpf%of [f^,Í0,Ä,È,-  
,Ä,Í,È,ç,È,ç ifAfvfŠfP [fVf‡f“,Í A,Đ,Æ,Ä,Ä,İf fr [ EfNf%ofCfAf“fg,Æ,µ,©’Ê M,µ,È,ç j B,±  
,İID”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**



## 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**, **IDirectPlay2::GetPlayerCaps** *f\bfbfh, ÌĒÄ, Ñ o, µ, É, æ, Ä, Ä ADirectPlay fIfufWfFfNfg, Ì”—Í, ðŠi”[, , é B—v< , ³, ê, ½”\—Í, °•Û Ø•t, «, ©, » , µ, Ä, È, ©, É, æ, Ä, Ä A, ±, ê, ç, Ì”—Í, Í”Û, È, Ä, Ä, , é B, ±, Ì \‘ç’Ì, Í“Ç, Ý o, µ ê—p, Ä, , é B*

### dwSize

DPCAPS \‘ç’Ì, ÌfTfCfY, ðf of Cf g’P’Ê, ÄŽw’è, , é Bf AfvfŠfP [fvf±f“ , IDPCAPS \‘ç’Ì, ðŽg—p, , , é O, É, ± , Ìf f“fo, ð Ý’è, µ, È, , Ä, Í, È, ç, È, © B, » , µ, Ä, È, © ê ±, ÍfGf%o [, Ä, È, é B

### dwFlags

DirectPlayfIfufWfFfNfg, Ì“Ä «, ð•\, , B

DPCAPS\_GROUPOPTIMIZED

, ±, ÌDirectPlayfIfufWfFfNfg, É Ú‘±  
, ³, ê, ½fT [frfX Ef vf f of Cf \_ , ° AfOf< [fv if}  
f<f fLfffXfg j”z M, ð Ä“K%o», , é, ±, Ä, °, Ä, «, é, ±, Ä, ðŽ’, , B

DPCAPS\_GUARANTEEDOPTIMIZED

, ±, ÌDirectPlayfIfufWfFfNfg, É Ú‘±  
, ³, ê, ½fT [frfX Ef vf f of Cf \_ , ° A•Û Ø•t, «, Ìf fbfZ [fW”z M, ðfT  
f| [fg, , é, ±, Ä, ðŽ’, , B

DPCAPS\_GUARANTEEDSUPPORTED

DirectPlayfIfufWfFfNfg, °•Û Ø•t, «, Ìf fbfZ [fW”z M, ðfTf|  
[fg, µ, Ä, ©, é, ±, Ä, ðŽ’, , BfT [frfX Ef vf f of Cf \_ , °fTf| [fg, µ, Ä, ©  
, é A, , é, ©  
, ÌDirectPlay, °•Û Ø, È, µ, ÌfT [frfX Ef vf f of Cf \_ ã, ÉfCf“fvfŠf f“f  
g, µ, Ä, ©, é, ±, Ä, È, æ, é B

DPCAPS\_ISHOST

ĒÄ, Ñ o, µĒ³, Ìf AfvfŠfP [fvf±f“ , É, æ, Ä, Ä Ì ¬, ³, ê, ½DirectPlayfIfuf  
WfFfNfg, ° AfZfbfVf±f“ EfzfXfg, Ä , é, ±, Ä, ðŽ’, , B

DPCAPS\_KEEPLIVEOPTIMIZED

fT [frfX Ef vf f of Cf \_ , Í AfZfbfVf±f“ , Ö, Ì Ú‘±, °Ž’, í, ê, ½, ±  
, Ä, ðĒÿ o, Ä, «, é B

### dwMaxBufferSize

, ±, ÌfT [frfX Ef vf f of Cf \_ , °PĒÄ, ÌfpfPfbfg, Ä‘—  
M, Ä, «, é Ä‘áfTfCfY B, » , é, æ, è, à‘ã, «, Èf fbfZ [fW, Í, Ð, Ä, ÄÈ 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‘áfvfĒfCf, , ” B

### dwHundredBaud

1•b“¬, ½, è, Ìf of“fh• if{ [ EfĒ [fg j, ð100frfbfg’P’Ê, ÄŽ’, , B, ½, Ä, , , Ì, ±, Ì’l, °24, Ì ê ± A2400f{ [, ðŽ’, µ, Ä, ©  
, é B

### dwLatency

fT [frfX Ef vf f of Cf \_ , Ì , , ’è”½%ožžššÖ, ðf~fš•b, ÄŽw’è, , é BDirectPlay, , , ’è”½%ožžššÖ, ð , , è, Ä, «, È, © ê ± A, ±  
, Ì’l, Í, Ä, , é BfT [frfX Ef vf f of Cf \_ , É, æ, Ä, Ä, Í Af fbfZ [fW EfTfCfY, Ì•½, Ì, ð—

¶,µ AfAvfŠfP [fVf‡f“ŠÔfefXfg,ÉŠî,Ā,¢  
,½ ,“x,É,È,é B”½%žžŠŌ,Í A•Ū Ø•t,«,Ū,½,Í•Ū Ø,È,µ,ì,Ç,ì,ç,Ìf fbZ [fW”z M,ðfAvfŠfP [fVf‡f“,žg—  
p,·,é,©,É,æ,Ā,Ā^Ū,È,é B

**dwMaxLocalPlayers**

fZfbfVf‡f“,ĀTf| [fg,³,é,éf [fJf< EfvfEfCf,,ì Ā‘ā ” B

**dwHeaderLength**

DirectPlayIfufWfFfNfg,É,æ,Ā,ĀfvfEfCf,, Ef fbZ [fW,É•t%Ā,³,é,éfwfbf\_,ìTfCfY,ðf ofCf g’P^Ē,ĀŽ!,· Bf  
wfbf\_ EfTfCfY,ÍŽg—p,µ,Ā,¢,éfT [frfX Efvf fofCf\_,É,æ,Ā,Ā^Ū,È,é B

**dwTimeout**

fT [frfX Efvf fofCf\_ª „ §,·,éf^CfEfAfEfg’l B’Ē iDirectPlay,Í Af fbZ [fW,ì%ž“š,ð’Ò,Ā,Æ,«,É,±  
,ìf^CfEfAfEfg’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,Ì \ -,É,Â,¢,Ä,Ì î•ñ,ðŠÜ,Ð B
```

### dwComPort

```
Žg—p,·,·,éCOMf| [fg,Ì”Ô †,ðŽ!,· B,±,Ìf f“fo,Ì’l,Í1 A2 A3 A,Ü,½,Í4,Ä, ,é B
```

### dwBaudRate

```
COMf| [fg,Ìf{ [,ðŽ!,· B`È%°,Ì’l,Ì,¢,,é,©,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,±,Ìf f“fo,Ì’l,ÍONESTOPBIT AONE5STOPBITS A,Ü,½,ÍTWOSTOPBITS,Ä, ,é B
```

### dwParity

```
COMf| [fg,`Žg—p,·,·,épfŠfefBf`fFfbfN,ðŽ!,· B,±,Ìf f“fo,Ì’l,Í  
NOPARITY AODDPARITY AEVENPARITY A,Ü,½,ÍMARKPARITY,Ä, ,é B
```

### dwFlowControl

```
COMf| [fg,`Žg—p,·,·,éftf [ §Eä,Ì•û-@,ðŽ!,· B`È%°,Ì’l,Ì,¢,,é,©,ðŽg—p,Ä,«,,é B
```

```
DPCPA_DTRFLOW DTR,ðŽg—  
p,µ,½fn [fhfEfFfA Eftf [ §Eä,ðŽ!,· B
```

```
DPCPA_NOFLOW ftf [ §Eä,ð s,í,È,¢,±,Æ,ðŽ!,· B
```

```
DPCPA_RTSDTRFLOW RTS,;,æ,ÑDTR,ðŽg—  
p,µ,½fn [fhfEfFfA Eftf [ §Eä,ðŽ!,· B
```

```
DPCPA_RTSFLOW RTS,ðŽg—p,µ,½fn [fhfEfFfA Eftf [ §Eä,ðŽ!,· B
```

```
DPCPA_XONXOFFFLOW f\ftfgfEfFfA Eftf [ §Eä ixon/xoff j,ðŽ!,· B
```

```
f{ [fE [fg AfXfgfbfv Efrfbfg AfpfŠfefB,ð’è`·,·,é`è ”,Í AWinbase.h,Ä’è`³,é,Ä,¢,é B
```

## DPLAPPINFO

```
typedef struct DPLAPPINFO {
    DWORD dwSize;
    GUID guidApplication;
    union
    {
        LPSTR lpszAppNameA;
        LPWSTR lpszAppName;
    };
} DPLAPPINFO, * LPDPLAPPINFO;
```

*fCfWfXfgfŠ,ÉŠi”[<sup>3</sup>,ê AIDirectPlayLobby::EnumLocalApplicationsfR [f<fofbfNŠÖ ”,É“n,<sup>3</sup>,ê,é AfAfvfŠfP [fVf*  
*‡f“,É,Á,c,Ä,İ î•ñ,ðŠŮ,p B*

### dwSize

DPLAPPINFO \‘c‘î,îTfCfY,ðfofCfP^Ê,ÂŽw‘è,.,é BfAfvfŠfP [fVf‡f“,ÍDPLAPPINFO \‘c‘î,ðŽg—p,.,é‘O,É,±  
,îf f“fo,ð Ý‘è,µ,È,,Ä,Í,È,ç,È,ç B,»„,Ä,È,ç ê ‡,ÍfGf%o [,Æ,È,é B

### guidApplication

fAfvfŠfP [fVf‡f“,îfof [fof< Ef+fj [fNŽ~•ÊŽq iGUID j B

### lpszAppNameA, lpszAppName

fAfvfŠfP [fVf‡f“,î-¼‘O,ðŽ,·ANSI,Ů,½,ÍUnicode•¶Žš—ñ B•¶Žš—ñ,İCE^,ÍŽg—p,µ,Ä,ç  
,éCf“f^ [ftfFfCfX,É,æ,é B

## DPLCONNECTION

```
typedef struct {
    DWORD          dwSize;
    DWORD          dwFlags;
    LPDPSSESSIONDESC2 lpSessionDesc;
    LPDPNAME       lpPlayerName;
    GUID           guidSP;
    LPVOID         lpAddress;
    DWORD          dwAddressSize;
} DPLCONNECTION, *LPDPLCONNECTION;
```

*fAfVfŠfP [fVf‡f“,đfZfbfVf‡f“,É Ú±,·,é,½,β,É•K—v,È îñ,đŠÜ,Đ B*

### dwSize

DPLCONNECTION \‘ċì,ÌTfCfY,đfofCf’PÊ,ĂŽw’è,·,é BfAfVfŠfP [fVf‡f“,ÍDPLCONNECTION \‘ċì,đŽg—p,·,é‘O,É,±,Ìf f“fo,đ Ý’è,μ,È,·,Ă,Í,È,ç,È,ċ B,»„,Ă,È,ċ ê ‡,ÍfGf%o [,Æ,È,é B

### dwFlags

Ú±•û—@,đŽ!,· B

#### DPLCONNECTION\_CREATESESSION

fZfbfVf‡f“<L q,É,μ,½,ª,Ă,Ă V,μ,ċfZfbfVf‡f“,đ ì ¬,·,é B

#### DPLCONNECTION\_JOINSESSION

fZfbfVf‡f“<L q,É,μ,½,ª,Ă,ĂŠù“¶,ÌfZfbfVf‡f“,ÉŽQ%Ă,·,é B

### lpSessionDesc

ì ¬,Ü,½,ÍŽQ%Ă,·,éfZfbfVf‡f“,đ•\,·DPSSESSIONDESC2 \‘ċì,Ö,Ìf|fCf“f^ B

### lpPlayerName

fVf(ƒfCf,, ì ¬ŽŽ,ÉŽg—p,³,ê,é—¼‘O,đŽ!,·DPNAME \‘ċì,Ö,Ìf|fCf“f^ B,±,ê,Í Af fr [,Ă“o^,³,ê,½ l,Ì—¼‘O,É,È,é BfAfVfŠfP [fVf‡f“,Í A,±,Ì—¼‘O,đ—³Ž<,·,é,±,Æ,ª,Ă,«é B

### guidSP

fZfbfVf‡f“,É Ú±,·,é,½,β,ÉŽg—p,·,éfT [frfX EfVf fofCf\_,Ìfof [fof< Ef+fj [fNŽ~•ÉŽq iGUID j B

### lpAddress

fT [frfX EfVf fofCf\_,ªfZfbfVf‡f“,É Ú±,·,é,½,β,É•K—v,È îñ,đŠÜ,ĐDirectPlayfAfhf(ƒfX,Ö,Ìf|fCf“f^ B

### dwAddressSize

fAfhf(ƒfX Eft [f^,ÌTfCfY,đfofCf’PÊ,ĂŽw’è,·,é B

## DPNAME

```
typedef struct {
    DWORD dwSize;
    DWORD dwFlags;
    union {
        LPWSTR lpszShortName;
        LPSTR lpszShortNameA;
    };
    union {
        LPWSTR lpszLongName;
        LPSTR lpszLongNameA;
    };
} DPNAME, FAR *LPDPNAME;
```

*fvfCfCf,,âfOf< [fv,È,Ç,ÌDirectPlayGf“fefBfefB,Ì¼‘O î•ñ,ðŠÛ,Ð B*

### dwSize

*DPNAME \‘c‘ì,ÌfTfCfY,ðfofCfG‘P^Ê,ĂŽw’è,.,é BfAfvfŠfP [fVf#f“,ÍDPNAME \‘c‘ì,ðŽg—p,.;é‘O,É,±,Ìf f“fo,ð Ý’è,µ,È,,Ă,Í,È,ç,È,ç B,»,µ,Ă,È,ç é ‡,ÍfGf%o [,Æ,È,é B*

### dwFlags

*\‘c‘ì,ÉCEĂ—L,Ìftf%ofo BCE» Ý,Í0,Ă, ,é B*

### lpszShortName and lpszLongName

*‘Z,ç–¼‘O ifjfbfNfl [f€ j,Æ’.,ç i ³Ž@,È jfvfCfCf,,–¼,Û,½,ÍfOf< [fv–¼,ðŠÛ,ÐUnicode•¶Žš—ñ,Ö,Ìf| fCf“f^,ÍIDirectPlay2fCf“f^ [ftfFfCfX,ðŽg—p,µ,Ă,ç,é é ‡,Ì,ÝŽg—p,.,é B*

### lpszShortNameA and lpszLongNameA

*‘Z,ç–¼‘O ifjfbfNfl [f€ j,Æ’.,ç i ³Ž@,È jfvfCfCf,,–¼,Û,½,ÍfOf< [fv–¼,ðŠÛ,ÐANSI•¶Žš—ñ,Ö,Ìf| fCf“f^ B,±,Ìf f“fo,ÍIDirectPlay2AfCf“f^ [ftfFfCfX,ðŽg—p,µ,Ă,ç,é é ‡,Ì,ÝŽg—p,.,é B*

**ŽQ 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“i”—Í,É,Â,ç,Ä,ÌL q,ðŠÛ,Ð B  
iDPSESSIONDESC \‘ç’ì,ÍIDirectPlay2fCf“f^ [ftffCfX,Ä,ÍŽg—p,³,ê,È,ç j

### dwSize

DPSESSIONDESC2 \‘ç’ì,ÍfTfCfY,ðfCfY,ðfCfY’PÊ,ÄŽw’è,·,é BfAfVfŠfP [fVfzf“iDPSESSIONDESC2 \‘ç’ì,ðŽg—  
p,·,é’O,É,±,Ìf f“fo,ð Y’è,µ,È,Ä,Í,È,ç,È,ç B,»,µ,Ä,È,ç ê ±,ÍfGf%o [,Æ,È,é B

### dwFlags

È%°,Ìftf%o,Ì’g,Ý ±,í,¹ B

### DPSESSION\_JOINDISABLED

V,µ,çfAfVfŠfP [fVfzf“i,±,ÌfZfbfVfzf“É%°Á,í,é,±  
,Æ,ª,Ä,«,È,ç B DOPEN\_JOINftf%o,Æ,±  
,ÌfZfbfVfzf“ EfCf“fXf^f“fX,ÌfOf [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,±,Ìftf%o,ªŽw’è,³,ê,Ä,ç  
,È,~·,ê,Ì AfZfbfVfzf“ EfVfÆfCf,, ”,Ì §ÆÄ,É’B,·,é,Ü,Ä A V,µ,ç  
fŠf, [fg EfAfVfŠfP [fVfzf“i,ÍfZfbfVfzf“ÉŽQ%°Á,·,é,±  
,Æ,ª,Ä,«,é B

### DPSESSION\_KEEPLIVE

fŠf, [fg EfVfÆfCf,,ªQ [f€,ðÛ í I—¹,µ,½,±  
,Æ,ðŽ@“@I,ÉÇÿ o,·,é B,±  
,ê,ç,ÌfVfÆfCf,,ÌfZfbfVfzf“©,ç í æ,³,ê,é BêŽŽ“I,Éflfbfg [fN,  
Ì<@”\,ªŽ~·,µ,½,±  
,Æ,È,æ,Ä,ÄfVfÆfCf,,ª í æ,³,ê,½ ê ± A,»,ÌfVfÆfCf,,ª-  
ß,Ä,Ä,«,½,Æ,« AfZfbfVfzf“©,ç æŠO,³,ê,½,±  
,Æ,ª,È’m,³,ê,é B Ú,µ,Í AfVfXfef€ Ef fbZ [fW,ÍŽg=  
p,Ì’+,IDPSYS\_SESSIONLOSTfVfXfef€ Ef fbZ [fW,È,Ä,ç  
,Ä,ÌL q,ðŽQ Ä,³,ê,½,ç B,±,Ìftf%o,ªŽw’è,³,ê,Ä,ç  
,È,~·,ê,Ì ADirectPlay,Í,±,Ì<@”\,ðfTf] [fg,µ,È,ç B

### DPSESSION\_MIGRATEHOST

Ç» Ý,ÌfZfXfg,ª I—¹,·,é ê ± A V,µ,çfVfÆfCf,,ÌŽQ%°Á,ð±,~·,é,±  
,Æ,ª,Ä,«,é,æ,ª,È Afzfxfg,ð•È,ÌfRf“fsf... [f^,É’Ú,»,µ,Æ,·,é B,±  
,Ìftf%o,ªŽw’è,³,ê,Ä,ç  
,È,~·,ê,Ì Afzfxfg,ÍÚ“@,¹, A V,µ,çfVfÆfCf,,ð ì ~·,é,±  
,Æ,Í,Ä,«,È,ç B

**DPSESSION\_NEWPLAYERSDISABLED**

V,µ,¢fVfŒfCf,,ðfZfbfVf‡f“É ì ¬,Á,«È,¢,±,Æ,ðŽ!,· B  
fAfVfŠfP [fVf‡f“,±  
,ìfZfbfVf‡f“,É‘Î,µ,Á**IDirectPlay2::CreatePlayer**  
f f\fbfh,ðŒÁ,Ñ o,µ,À,à A•K,,fGf%o [,Æ,È,é B V,µ,¢fAfVfŠfP  
[fVf‡f“,afZfbfVf‡f“,ÉŽQ%oÁ,·,é,±,Æ,à,Á,«È,¢ B,±  
,ìftf%ofo,“Žw’è,³,è,Ä,¢  
,È,¬,è,Î AfZfbfVf‡f“ EfVfŒfCf,, ”,ì §ŒÁ,É’B,·,é,Ü,ÁfVfŒfCf,,  
ð ì ¬,·,é,±,Æ,“Á,«,é B

**DPSESSION\_NODATAMESSAGES**

**IDirectPlay2::SetPlayerData AIDirectPlay2::SetGroupData AIDirect  
Play2::SetPlayerName AIDirectPlay2::SetGroupName**f f\fbfh,É,æ,Á  
,ÄfŠf, [fg EfVfŒfCf,, Eff [f^,âfŠf, [fg EfOf< [fv Eff [f^,“  
İ X,³,è,½,Æ,« AfVfXfef€ Ef fbfZ [fW,ð‘— M,µ,È,¢ B,±  
,ìftf%ofo,“Žw’è,³,è,Ä,¢  
,È,¬,è,Î Af f [f^,İ•İ X,ðŽ!,·f fbfZ [fW,“ ¶ ¬,³,è,é B

**DPSESSION\_NOMESSAGEID**

f fbfZ [fW,İ‘—  
MŽŒ,ÆŽó MŽŒ,ðŽ!,·ff [f^,ðf fbfZ [fW,É•t%oÁ,µ,È,¢ B,±  
,ì îñ,“ d—v,Á,È,¬,è,Î Af fbfZ [fW Efİ [fo [fwfbfh,ð Æ—  
ñ,·,é,±  
,Æ,“Á,«,é B i Ú ×,İ**IDirectPlay2::Receive**f f\fbfh,ðŽQ Æ j,±  
,ìftf%ofo,“Žw’è,³,è,Ä,¢,È,¬,è,Î Af fbfZ [fW,h,c,“t%oÁ,³,è,é B

**guidInstance**

fZfbfVf‡f“ EfCf“fXf^f“fX,İGUID B

**guidApplication**

fZfbfVf‡f“ EfCf“fXf^f“fX,ÄŽÀ s,·,éfAfVfŠfP [fVf‡f“,İGUID B,±  
,è,İf†fj [fN,ÉfAfVfŠfP [fVf‡f“,ðŽ¬•È,·,é,½,ß ADirectPlay,İ“¬,¶fAfVfŠfP [fVf‡f“,ð‘—,ç,¹,Á,¢,é¼¼,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**

,±,ìfZfbfVf‡f“,Á<¬,³,è,é Ä‘âfVfŒfCf,, ” B

**dwCurrentPlayers**

,±,ìfZfbfVf‡f“,İŒ» Ý,İfVfŒfCf,, ” B

**lpszSessionName and lpszPassword**

fZfbfVf‡f“,İ¼‘O,ÆfPfXf [fh,ðŠÜ,ÐUnicode•¶Žš—ñ,Œ,İf|fCf“f^ B,±  
,ìf f“fo,İ**IDirectPlay2**fCf“f^ [ftfFfCfX,ðŽg—p,µ,Á,¢,é è ‡,İ,ÝŽg—p,·,é B

**lpszSessionNameA and lpszPasswordA**

fZfbfVf‡f“,İ¼‘O,ÆfPfXf [fh,ðŠÜ,ÐANSI•¶Žš—ñ,Œ,İf|fCf“f^ B,±  
,ìf f“fo,İ**IDirectPlay2A**fCf“f^ [ftfFfCfX,ðŽg—p,µ,Á,¢,é è ‡,İ,ÝŽg—p,·,é B

**dwReserved1 and dwReserved2**

«—,İ,½,ß,È—\—ñ,³,è,Ä,¢,é B

**dwUser1, dwUser2, dwUser3, and dwUser4**

fZfbfVf‡f“,İ,½,ß,İfAfVfŠfP [fVf‡f“ŒÁ—L,İff [f^ B

ŽQ Æ @**IDirectPlay2::EnumSessions, IDirectPlay2::GetSessionDesc**

*fVfXfef€ Ef fbZ [fW*

**DPLMSG\_GENERIC**

```
typedef struct {  
    DWORD dwType;  
} DPL_GENERIC, *LPDPLMSG_GENERIC;
```

f fr [ EfNf%ofCfAf“fg,ÆfAfvfŠfP [fVf‡f“ŠÔ,Â“n,³,ê,éfVfXfef€ Ef fbfZ [fW,Ì”Ä—p \‘c’Ì B

**dwType**

Žó, Žæ,Á,½fVfXfef€ Ef fbfZ [fW,ÌŽí—p,ðŽ˘•Ê,·,é B

DPLSYS\_APPTERMINATED

**IDirectPlayLobby::RunApplication**,<sup>a</sup> I—

¹,µ AfAfvfŠfP [fVf‡f“,ªŠJŽn,µ,½,±,Æ,ð·\,· B

**DPLSYS\_CONNECTIONSETTINGSREAD**

**IDirectPlayLobby::RunApplication** f fbfh,<sup>a</sup> Ú± Ý’è,ð“Ç,Ý o,µ

AfAfvfŠfP [fVf‡f“,ªŠJŽn,µ,½,±,Æ,ð·\,· B

**DPLSYS\_DPLAYCONNECTFAILED**

**IDirectPlayLobby::RunApplication**,<sup>a</sup> fZfbfVf‡f“,Ö,Ì Ú±

,ÉŽ,”s,µ AfAfvfŠfP [fVf‡f“,ªŠJŽn,µ,½,±,Æ,ð·\,· B

**DPLSYS\_DPLAYCONNECTSUCCEEDED**

**IDirectPlayLobby::RunApplication**,<sup>a</sup> fZfbfVf‡f“,ð ì ¬,µ,Ä¼,ÌfAfvf

ŠfP [fVf‡f“,ðŽQ%oÁ,<sup>3,1</sup> é €”ð,<sup>a</sup> Á,«,½,© AfZfbfVf‡f“,Ö,ÌŽQ%oÁ,<sup>a</sup>

—CE÷,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,b  
B fVfXfef€,Í Afvf€fCf,,³fOf< [fv,É'Ç%Á,Ü,½,Í í œ,³,ê,½,Æ,«,É,±,ê,ç,Ìf fbfZ [fW,ð'— M,·,é B

### dwType

f fbfZ [fW,ðŽ•Ê,·,é B,±  
,Ìf f“fo,ÍDPSYS\_ADDPLAYERTOGROUP,Ü,½,ÍDPSYS\_DELETEPLAYERFROMGROUP,Á, ,é B

### dpIdGroup

fvf€fCf,,³Ç%Á,Ü,½,Í í œ,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 œ,³,ê,éfvf€fCf,,Ìfvf€fCf,,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,Ì î•ñ,ðŠÜ,Ð BfVfXfef€  
,Í Afvf€fCf,,„,æ,ÑfOf< [fv,ªfZfbfVf‡f“,É ì ¬,³,ê,½,Æ,«„É,±,Ìf fbfZ [fW,ð‘— M,.,é B

**dwType**  
f fbfZ [fW,ðŽ•Ê,.,é B,±,Ìf f“fo,É,ÍDPSYS\_CREATEPLAYERORGROUP,ªfZfbfg,³,ê,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**  
fvf€fCf,,ID,ÆfOf< [fvID,Ì,Ç,¿,Ç,ª ì ¬,³,ê,½,©,ðŽ!,· B

**dwCurrentPlayers**  
,»,ÌfZfbfVf‡f“,Á,Ì€» Ý,Ìfvf€fCf,,„,æ,ÑfOf< [fv,Ì ” B,»,Ì,Æ,«'Ç%Á,³,ê,½,à,Ì,àŠÜ,Ð B

**lpData**  
,±,Ìfvf€fCf,,Ü,½,ÍfOf< [fv,ÉŠÖ~A•t,¬,ç,ê,½ AfAfvfŠfP [fvf‡f“€Á—L,ÌfŠf, [fg Eff [f^,Ö,Ìf|Cf“f^ B  
,±,Ìf f“fo [,ªNULL,Ì,Æ,«„Í AfŠf, [fg Eff [f^,Í,È,Ç B

**dwDataSize**  
**lpData** ,É,æ,Á,ĂŽQ Æ,³,ê,éfofbftf@,ðŠÜ,Ðff [f^,ÌfTfCfY B

**dpnName**  
fvf€fCf,,Ü,½,ÍfOf< [fv,Ì-¼‘O,ðŠÜ,Ð \‘ç‘Ì B

ŽQ Æ @IDirectPlay2::CreateGroup, IDirectPlay2::CreatePlayer

**DPMSG\_DELETEPLAYERFROMGROUP**

```
typedef DPMSG_ADDPLAYERTOGROUP    DMSG_DELETEPLAYERFROMGROUP;  
typedef DPMSG_DELETEPLAYERFROMGROUP *LPDPMSG_DELETEPLAYERFROMGROUP;
```

```
DPSYS_DELETEPLAYERFROMGROUP fVfXfef€ Ef fbfZ [fW,ì îñ,ðŠÜ,Ð B ,±,ì \‘c‘ìf f“fo,ì,É,Â,c  
,Ä,ìDPMSG_ADDPLAYERTOGROUP \‘c‘ì,ðŽQ Æ,³,ê,½,c 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 îñ,ðŠÛ,Þ B fVfXfef€  
,Í Afvf€fCf,,âfOf< [fv,ªfZfbfVf‡f“,É í œ,³,ê,½,Æ,«,É,±,ê,ç,Ïf fbfZ [fW,ð— M,·,é B

### dwType

f fbfZ [fW,ðŽ~•Ê,·,é B,±,Ïf f“fo,É,ÍDPSYS\_DESTROYPLAYERORGROUP,ªfZfbfg,³,ê,é B

### dwPlayerType

f fbfZ [fW,ªfvf€fCf,, iDPPLAYERTYPE\_PLAYER j,ÆfOf< [fv iDPPLAYERTYPE\_GROUP j,Ï,Ç,¿,ç,É“K—  
p,³,ê,é,©,ðŽ!,· B

### dpId

fvf€fCf,,ID,ÆfOf< [fvID,Ï,Ç,¿,ç,ª í œ,³,ê,½,©,ðŽ!,· B

### lpLocalData

,±,Ïfvf€fCf,,Û,½,ÍfOf< [fv,ÉŠÖ~A•t,¯,ç,ê,½f [fJf< Eff [f^,Ö,Ïf|fCf“f^ B

### dwLocalDataSize

f [fJf< Eff [f^,ÏfTfCfY B

### lpRemoteData

,±,Ïfvf€fCf,,Û,½,ÍfOf< [fv,ÉŠÖ~A•t,¯,ç,ê,½fŠf, [fg Eff [f^,Ö,Ïf|fCf“f^ B

### dwRemoteDataSize

fŠf, [fg Eff [f^,ÏfTfCfY B

ŽQ Æ @IDirectPlay2::DestroyGroup, IDirectPlay2::DestroyPlayer

**DPMSG\_GENERIC**

```
typedef struct{  
    DWORD dwType;  
} DPMSG_GENERIC, *LPDPMSG_GENERIC;
```

,±,ì \‘c’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,°DPID_SYSMSG,  
É“™,µ,ç,Æ,« j A,Ü,,-  
ç’m,Íf fbfZ [fW Efi [f^,ðDPMSG_GENERIC^,ÉfLfffXfg,µ AŽÿ,ÉdwType,ì’l,ÉŠì,Ã,ç,Ä^ÈÈä,ì ^—  
,ð s,□ Bf fbfZ [fW,ìŽí—p,°CE~è,³,ê,é,Æ A^ÈÈä,ì ^—  
,ì,½,ß,É Af fbfZ [fW,ðŠù’m,ìfVfXfef€ Ef fbfZ [fW,ì,ð,Æ,Â,ÉfLfffXfg,·,é,±,Æ,°,Â,«,é B
```

## DPMSG\_HOST

```
typedef DPMSG_GENERIC DPMSG_HOST;  
typedef DPMSG_HOST *LPDPMSG_HOST;
```

» Ý, ÌfZfbfVfþf“ E<sub>fzfXfg</sub>,<sup>a</sup>fZfbfVfþf“, ð I<sup>-1</sup>, ·, é, Æ, « A, ±, Ìf fbfZ [fW, ÍfzfXfg]C-±, ðEp<sup>3</sup>, ·, éfRf“fsf...  
[f^, Ì ã, Ì, ·, ×, Ä, ÌfvfÆfCf,, É‘— M, <sup>3</sup>, ê, é B

## DPMSG\_SESSIONLOST

```
typedef DPMSG_GENERIC DPMSG_SESSIONLOST;  
typedef DPMSG_SESSIONLOST *LPDPMSG_SESSIONLOST;
```

```
fZfbfVfzf+,"l'¼,l,·,×,Ä,lfvfCfCf,,Ö,l Ú'±,ªŽ,,í,ê,½,Æ,« ADirectPlay,É,æ,Á,Ä,±  
,lf fbfZ [fW,ª ¶ ¬,³,ê,é BfZfbfVfzf“,ªŽ,,í,ê,½Æä,Í AfŠf, [fg EfvfCfCf,,Éf fbfZ [fW,ð'—,é,±  
,Æ,Í,Ä,«,È,¢ B,µ,©,µ AfZfbfVfzf“,ªŽ,,í,ê,½ŽŽ“_,l,·,×,Ä,lf [f^,ª,Ü,¾—LÆø,Á, ,é B,±  
,lf fbfZ [fW,ðŽó, ¯Žæ,Á,½,ç AfAfvfŠfP [fVfzf“,Í'¬,â,©,É•æ•Æ,µ A I—1,·,é,×,«,Á, ,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,Ì îñ,ðšÛ,Ð B

### dwType

f fbfZ [fW,ðŽ~•Ê,·,é B,±,Ìf f“fo,Í,Â,Ë,ÉDPSYS\_SETPLAYERORGROUPDATA,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

ff [f^,ª,İ X,³,ê,½fvf€fCf,,ID, ,é,¢,ÍfOf< [fv ID B

### lpData

ff [f^,ÌfAfvfšfP [fvfšf““Á—Lff [f^ Efuf fbfN,Ö,Ìf|fCf“f^ B

### dwDataSize

lpData ,É,æ,Á,ÄŽQ Æ,³,ê,é,fbftf@,ðšÛ,Ðff [f^,ÌfTfCY B

fVfXfef€,Í AfAfvfšfP [fvfšf“,ªšf, [fg Efvf€fCf,,âfšf, [fg EfOf< [fv,Ìff [f^,ð•İ X,µ,½,Æ,«,É,±  
,Ìf fbfZ [fW,ð— M,·,é BfAfvfšfP [fvfšf“,Í,±,Ìf fbfZ [fW,©,ç,Ìff [f^,ð•Û“¶,·,é•K—v,Í,Ë,-

AIIDirectPlay2::GetGroupData,Û,½,ÍIIDirectPlay2::GetPlayerData f\fbfh,ÉDPGET\_REMOTEftf%ofO,ðŽw’è,µ,Ä€  
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,¢  
,éZfbfvfšf“,Ä,Í A,±,Ìf fbfZ [fW,Í ¶ ¬,³,ê,Ë,¢ B

ŽQ Æ @IIDirectPlay2::GetGroupData, IIDirectPlay2::GetPlayerData, IIDirectPlay2::SetGroupData,  
IIDirectPlay2::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,ðŠÛ,Ð 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,ðŠÛ,Ð \‘¢‘ì 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•Û‘¶,•,é•K—v,Í,Ë,-

**AIDirectPlay2::GetGroupName**,Û,½,Í**AIDirectPlay2::GetPlayerName** 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,Ë,¢ B

ŽQ Æ @**AIDirectPlay2::GetGroupName**, **AIDirectPlay2::GetPlayerName**, **AIDirectPlay2::SetGroupName**,  
**AIDirectPlay2::SetPlayerName**

•Ô¹

fGf%o [ ,Í%o,Ì¹,Á·,³,ê A·i ”,Ì¹,ªg,Ý ‡,i,³,ê,é,±,Æ,Í,È,¢ B,±,ì·,Í A,·,×,Ä,Ì  
IDirectPlay2,ÆIDirectPlayLobbyf f\fbfh,É,æ,Á,Ä·Ô,³,ê,é¹,ðŽ,µ,Ä,¢  
,é B,» ,ê,¼,ê,Ìf f\fbfh,ª·Ô,·fGf%o [¹,ÌfŠfXfg,É,Á,¢,Ä,Í AŠef f\fbfh,Ì à-¾,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^ò,© AŠÔ^á,Á,½fPfXf [fh,ª—^,¹,ç,ê,½ B

DPERR\_ACTIVEPLAYERS

—LÆø,ÈfvfÆfCf,ª,ª“Ÿ,·,é,½,ß A—v< ,³,ê,½ ^—  
,ªŽÀ s,Á,ª,È,¢ B

DPERR\_ALREADYINITIALIZED

,±,ÌfIfufWfFfNfg,Í,·,Á,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@ ,ªª,ª,·,ª,é,½,ß AŠi”[ ,·,é,±,Æ,ª,Á,ª,È,¢ B

DPERR\_BUFFERTOOSMALL

—^,¹,ç,ê,½fofbftf@,Í A—v< ,µ,½ff [f^,ðŽû—  
e,·,é,Ì,É \ª,Èª,ª,³,Á,Í,È,¢ B

DPERR\_BUSY

DirectPlayf fbfZ [fW EfLf... [ ,ª,¢,Á,Ì,¢,Á, ,é B

DPERR\_CANTADDPLAYER

fvfÆfCf,ª,ðZfbfVf‡f“ ,É’Ç%oÁ,Á,ª,È,¢ B

DPERR\_CANTCREATEGROUP

V,µ,¢fOf< [fv,ð ì ¬,Á,ª,È,¢ B

DPERR\_CANTCREATEPLAYER

V,µ,¢fvfÆfCf,ª,ð ì ¬,Á,ª,È,¢ B

DPERR\_CANTCREATEPROCESS

fAfvfŠfP [fVf‡f“ ,ðŽÀ s,Á,ª,È,¢ B

DPERR\_CANTCREATESESSION

V,µ,¢fZfbfVf‡f“ ,ð ì ¬,Á,ª,È,¢ B

DPERR\_CAPSNOTAVAILABLEYET

DirectPlayfIfufWfFfNfg,Ì”—Í,ª,Û,¾Æ”è,³,ê,Ä,¢,È,¢ B,±  
,ÌfGf%o [ ,Í AŽg—p%oÁ”\,Èfof“fh· ,Æ’Ô,çŽžŠÔ,ÌÆ”è,Éf[  
[fŠf“fO,ªK—  
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,ª,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,Á, ,é B

DPERR\_INVALIDINTERFACE

fCf“f^ [ftfFfCfX,lfpf%of [f^,a-3Eø,Á, ,é B

**DPERR\_INVALIDOBJECT**

DirectPlayIfufWfFfNfg,lf|fCf“f^,a-3Eø,Á, ,é B

**DPERR\_INVALIDPARAMS**

ŠÖ ”,É“n,3,ê,½,Đ,Æ,Â^È ã,lfpf%of [f^,a-3Eø,Á, ,é B

**DPERR\_INVALIDPLAYER**

fvfEfCf,,ID,Í A,±,lfQ [f€ EfZfbfVf±f“,Á—  
LCEø,ÈfvfEfCf,,ID,Æ,µ,Ä”FŽ~ ,3,ê,È,¢ B

**DPERR\_NOCAPS**

DirectPlay,“Žg,“,µ,Ä,¢,é’È MfŠf“fN,Í A,±  
,İŠÖ ”,Ä,ÍŽÄ s,Ä,«,È,¢ B

**DPERR\_NOCONNECTION**

’È MfŠf“fN,“Šm—§,3,ê,Ä,¢,È,¢ B

**DPERR\_NOINTERFACE**

,±,lfCf“f^ [ftfFfCfX,ÍfTf| [fg,3,ê,Ä,¢,È,¢ B

**DPERR\_NOMESSAGES**

Žó M,3,ê,½f fbfZ [fW,a,È,¢ B

**DPERR\_NONAMESERVERFOUND**

fl [f€fT [fo ifzfXfg j,“E©,Á,©,ç,È,¢ BfvfEfCf,,ì ì ¬,É,ÍfzfXf  
g,“K—v,Á, ,é B

**DPERR\_NOPLAYERS**

,±,lfZfbfVf±f“,É,Í—LCEø,ÈfvfEfCf,,“a,¢,È,¢ B

**DPERR\_NOSESSIONS**

,±,lfQ [f€,É,ÍŠù“¶,lfZfbfVf±f“,“a,È,¢ B

**DPERR\_NOTLOBBIED**

IDirectPlayLobby::RunApplication,É,æ,Á,ÄfAfvfŠfP [fVf±f“,“ŠJŽn,3,  
ê,È,©,Á,½ ê ± AIDirectPlayLobby::Connect,“Ô,·fGf%o [’l B

**DPERR\_OUTOFMEMORY**

—v< ,3,ê,½ ^— ,đŽÀ s,·,é,ì,É \“a,Èf f,fŠ,“a,È,¢ B

**DPERR\_PLAYERLOST**

fZfbfVf±f“,É Ú±,µ,Ä,¢,½fvfEfCf,,“a,¢,È,È,Á,½ B

**DPERR\_SENDTOOBIG**

IDirectPlay2::Sendf f\fbfh,É“n,3,ê,½f fbfZ [fW Efofbftf@,“<—  
%oÁ,3,ê,Ä,¢,é,æ,è,à’á,«,¢ B

**DPERR\_SESSIONLOST**

fZfbfVf±f“,Ö,ì Ú±,“Ž,“í,ê,½ B

**DPERR\_TIMEOUT**

Žw’è,3,ê,½ŽžŠÖ“à,É ^— ,“ I—1,µ,È,©,Á,½ B

**DPERR\_UNAVAILABLE**

—v< ,3,ê,½ŠÖ ”,ÍE» Ý—LCEø,Á,Í,È,¢ B

**DPERR\_UNKNOWNAPPLICATION**

\*s-¾,ÈfAfvfŠfP [fVf±f“,“Žw’è,3,ê,½ B

**DPERR\_UNSUPPORTED**

,±,İŠÖ ”,ÍE» Ý,lfö [fWf±f“,Á,Í—LCEø,Á,Í,È,¢ B

**DPERR\_USERCANCEL**

IDirectPlay2::Openf f\fbfhEÄ,Ñ o,µ,Ì“r’+ ,Á A Ú±fvf fZfX,“ft  
[fU,É,æ,Á,ÄfLfff“fZf<,3,ê,½ B

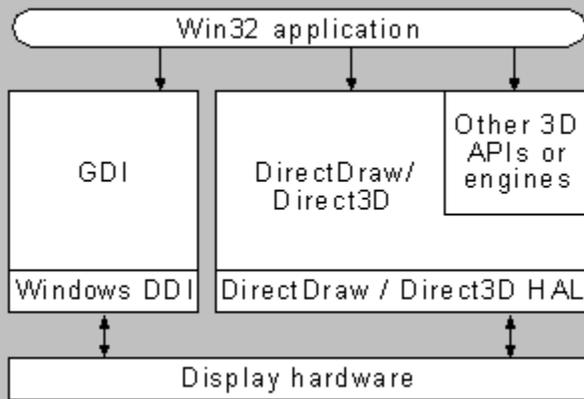
## Direct3D, É, Â, ç, Ä

Microsoft, ĨŠg'£3DfOf%oftfBfbfNfX Ef\vfŠf...

[fVf#f“,É,Í ADirect3D™,“,æ,ÑOpenGL,ĭAfvfŠfP [fVf#f“ Efvf fOf%of~f“fO EfCf“f^ [ftfFfCfX iAPI j,“Š  
Ü,Ü,ê,Ä,ç,é B

ŽŸ,ĭ },Í AWindows,ĭfOf%oftfBfbfNfX EfVfXfef€,Æ AWin32@

API,ÄL q,³,ê,½fAfvfŠfP [fVf#f“ A,»ĭ¼,ĭWindowsfVfXfef€ A,“,æ,Ñfn [fhfEfFfA,Æ,ĭŠÖEW,đŽ!,µ,½,à,ĭ,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,“ñ<Ÿ,·,é AfŠfAf<f^fCf€,ÁfCf“f^f%ofNfefBfu,È3D<Z p,Á,·,é BDirect3D,Í ,‘¬“® ì, ð‘æ^ê,ÉffUfCf““³,è,Á,Ç,é B

Direct3D,Í AŠJ”ŽÖ,“K—  
v,Æ,·,éAPIfT [frfX,ÆfffofCfX”ñÈ“¶ «,ð’ñ<Ÿ,µ Afn [fhfEfffA Efxf“f\_ [É,Íê”È“I,Èfhf%ofCfo Ef,ff<,ð<Ÿ<< ,·,é BDirect3D,È,æ,Á,Ä Afp [f\if< EfRf“fsf... [f^,Ì »“ÇE³,Ì3DfOf%oftfBfbfNŠÂ<<«ð,·,®,ÉfTf [fg,·,é,± ,Æ,“Á,« AfGf“fh Ef† [fU,“fVfXfef€,ÉfnfCfGf“fh,È3DfOf%oftfBfbfNŠÂ<<«ð’Ç%oÁ,·,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< Í,Ÿ,Ì,Û,Æ,ñ,Ç,ÌRf“fsf... [f^ EfVfXfef€ ã,Á%oð“K,È“® ì,·,é B

Direct3D,ÍfŠfAf< Ef^fCf€ 3D  
fof%oftfBfbfNfX EfT [frfX,ÌŠ®‘SfZfbfg,Á,·,è Af\ftfgEfffA Efx [fX,Ì ,‘¬,ÈfÇE“f\_Šf“fo EfpfCfvf%ofC f“ i•İŠ· A Æ→¼ Af%ofXf^ ^—  
j,ã Afn [fhfEfffA EfAfNfZf%ofC [f^,Ö,Ì”¼ Ú“I,ÈfAfNfZfX,ðŽžÀE»,·,é BAPIfT [frfX,É,Í A“ ^è,³,è,½ ,fÇfxf<,È•ŰŽ f, [fhAPI,Æ A’áfÇfxf<,È”¼ Úf, [fhAPI,“è,è ADirect3D,ðŽžg— p,µ,Á3Dfn [fhfEfffA EfAfNfZf%ofC [f^,ÉfAfNfZfX,·,éVfXfef€,ðfTf [fg,·,é BDirect3D,ÌŠ®‘S,ÉfXfP [f%ofuf<,Á Afn [fhfEfffA,Í ADirect3D,È,æ,Á,Á3DfÇE“f\_Šf“fo EfpfCfvf %ofCf“Íê”,Û,½,Í‘S”,ð ,‘¬%o»,·,é,± ,Æ,“Á,«,é BDirect3D,Í AZfobftf@fŠf“fo AfAf“f`fGfCfŠfAfVf“fo AfAf<ftf@ EfufÇE“ffBf“fo Af~fbfv f}fbfv AfGftfFfNfg A ³Šm,Èfp [fX,É,æ,éfefNfXf`ff Ef} fbfsf“fo,È,Ç,Ì A3Dfn [fhfEfffA EfAfNfZf%ofC [f^,ÌŠg’Efof%oftfBfbfNfX”\—Í,ð ¶,©,·,± ,Æ,“Á,«,é BDirect3D,Í”¼,ÌDirectXfefNfmf fW [,ÆŠ®‘S,È“ ‡,³,è,Á,Ç,é,½,ß Afrffl Ef} fbfsf“fo A2D,ÌfI [fo [fÇfC EfvfC [f“,Á,Ì3DfÇE“f\_Šf“fo AfXfvf%ofCfg,Æ,Ç,Á,½Šg’E<@”,à“< Ú,µ,Á,Ç ,é B,± ,è,É,æ,Á,Ä AfCf“f^f%ofNfefBfu,Èf ffbfA Ef^fCfGf<,Á AfV [fÇfÇfX,È2D,Æ3D,Ìfof%oftfBfbfNfX,ðŽžg— p,·,é,±,Æ,“Á,«,é B

Direct3D,ÌfCf“fvfŠf f“fg•û-@,É,Í A•ŰŽ f, [fh,Æ”¼ Úf, [fh,Æ,Ç,µ A,Û,Á,½,^Û,È,é ,Ó,½,Á,Ìf, [fh,“è,é B•ŰŽ f, [fh,Í AfAvfŠfP [fVf‡f““fof%oftfBfbfN Eff [f^,ð•ŰŽ ,·,é ,fÇfxf<API,Á,·,é B”¼ Úf, [fh,Í AfAvfŠfP [fVf‡f““³Ž,“I,ÉŽŽ sfobftf@,Éff [f^,ð o—Í,·,é’áfÇfxf<API,Á,·,é B

,±,Ì Í,Á,Í ADirect3D,Ì”¼ Úf, [fh,Æ•ŰŽ f, [fh,É,Á,Ç,Ä à→¼,·,é,Æ,Æ,à,É ADirect3D,ð’È,µ,Ä—~—p,·,é,± ,Æ,“Á,«,éfn [fhfEfffA EfAfufXfgf%ofNfVf‡f“ i’Š Ű%o» j,ÆfGf~f...fÇE [fVf‡f“É,Á,Ç,Ä,àžæ,èµ,µ B

•ŰŽ f, [fh

”¼ Úf, [fh

fn [fhfEfffA EfAfufXfgf%ofNfVf‡f“ i’Š Ű%o» j,ÆfGf~f...fÇE [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,Í AŠù'¶,ì WindowsfAfvfŠfP [fVf‡f“,Ö,Ì3D<@”\  
,ì'Ç%oÁ,â A V,µ,¢3DfAfvfŠfP [fVf‡f“,ì ì ¬,ð—e^Ö,É s,±,±,Æ,³,Ä,«„é B•ŮŽ f, [fh,É'g,Ý ž,Û,ê,Ä,¢  
,éfWfIf fgfŠ EfGf“fWf“,Í AfL [ftf€ [f€ EfAfjf [fVf‡f“,ì,æ,µ,ÈŠg'£@”\,ðfTf|  
 [fg,µ,Ä,“„è AfIfufWfFfNfg Eff [f^fx [fX,ì ì ¬,âfIfufWfFfNfg,ì“à” \‘c'ì,ÌŠÇ— ,ð•K—  
v,Æ,µ,È,¢ B,Ä,Û,èfAfvfŠfP [fVf‡f“,Í A'è<` Ī,Ý,Ì3D  
fIfufWfFfNfg,ðf [fh,.,éCEÄ,Ñ o,µ,ð1%oñ s,!,Í AAPI,“ñ<Ÿ,·,éŠÈ'P,Èf f\fbfh,ðŽg—  
p,µ,Ä AfŠfAf<f^fCf€ EfV [f“,ìfIfufWfFfNfg,ð“à”,ìfWfIf fgfŠ EfGf“fWf“,ð^ŮŽ~,¹,,.É'€ ì,Ä,«„é,æ,µ,  
,É,È,é B

•ŮŽ f, [fh,Í¼ Úf, [fh,ì ã”,É'g,Ý—  
š,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,Ì¼ Úf, [fh,Í AMicrosoft,ÌáfCfxf<3DAPI,Á, ,é B¼ Úf, [fh,ð—p,c,é,Æ AfQ [f€ ,â,»,Ì¼,ÌfnfC EfpftfH [f}f“fX,Èf} f<f`f fffBfA EfAfvfŠfP [fVf‡f“,ð AWindowsfIfyfC [fefBf“fO EfVfXfef€ ã,ĂŽÀC»,.,é,±,Æ,ª,Ă,«,é B

'¼ Úf, [fh,Í Afn [fhEfFfA<@”\,Ö,ÌfAfNfZfX,ð%Â” ,É,.,éfŠfAf<f^fCf€3DfAfNfZf%ofC [f^,Ì ã,ÉÊu,.,é A”-,cfCfCf,,Á, ,é B,Ü,½ Afn [fhEfFfA,ªñ<ÿ,µ,È,c<@ ”\,É,Á,c,Ă,à A Á ,.Ìf\ftfgEfFfA EfCf“f\_Šf“fO,ðñ<ÿ,.,é ê ‡,ª, ,é B¼ Úf, [fh,Á,Í AŠJ”- ŽÒŽ© g,ÌfCf“f\_Šf“fO<Z p,â€ ìZ p,É \_“î «,ðŽ ,½,¹,é,±,Æ,ª,Ă,«,é B

'¼ Úf, [fh,Æ,Í AáfCfxf<,ĂfAfNfZf%ofC [f^ Efn [fhEfFfA,ÆÊ M,.,é,½,ß,Ì AfffofCfX,ÉÊ“¶,µ,È,c•û- @,Á, ,é B

•ŮŽ f, [fh,Æ^Û,È,è A¼ Úf, [fh,ÍfWfIf fgfŠ EfGf“fWf“,ðñ<ÿ,µ,È,c B,±,Ì,½,ß A¼ Úf, [fh,ð—~— p,.,éfAfvfŠfP [fVf‡f“,Í A“ÆŽ©,ÌIfufWfFfNfg,â%œ-Ê §Cäf< [f`f“,ð—p^Ó,µ,È,- ,Ă,Í,È,ç,È,c B,µ,½,ª,Ă,Ă A¼ Úf, [fh,ðCø—,“I,É—p,c,é,½,ß,É,Í A3DfOf%oftfBfbfN,Ìvf fOf%of~f“fO,É,Á,c ,Ă,Ì \ª,È’mŽ-ªK—v,Ă, ,é B

Direct3D,ÍOLEfRf“f [f]f“fg EfIfufWfFfNfg Ef,fff< iCOM j,ÉŠî,Ă,c,Ă,.,è ADirectDraw,ÆŠ@‘S,É“ ‡,ª,è,Ă,c ,é BMicrosoft,Í A «—^,Ìfo [fWf‡f“,ÌWindows,ÉDirect3D,ð‘g,Ý ž,ð—\è,Á, ,é B Ú,µ,Í ufCf“fgf f fNfVf‡f“: Direct3D,Ì¼ Úf, [fh EfIfufWfFfNfg v,ðŽQ Æ,ª,è,½,c B

**fn [fhfEFFFfA EfAfufXfgf%NfVfzf“(Š Ű%»),ÆfGf~f...fCE [fVfzf“**

Direct3D API,Í A¼,ÌDirectX API,Æ“—

l,É Afn [fhfEFFFfA EfAfufXfgf%NfVfzf“ EfCEfCf,, iHAL j,Ì ã,É‘g,Ý ž,Û,ê,Ä,¢  
,é BHAL,Ífn [fhfEFFFfA,ÌfffofCfX`È‘¶ «,ð%B•Á,·,é BDirect3D HAL,É,æ,Á,ÄfTf|

[fg,³,ê,È,¢“•³,Í Afn [fhfEFFFfA EfGf~f...fCE [fVfzf“ EfCEfCf,, iHEL j,É,æ,Á,Ä•ãŠ®,³,ê,é B Direct3D

HEL,Í Afn [fhfEFFFfA,³ñ<Ý,µ,È,¢<@”\,ðf\ftfgfEFFFfA“l,ÉfGf~f...fCE [fg,·,é B,±

,ê,ç,Ìfn [fhfEFFFfA EfAfufXfgf%NfVfzf“ i’Š Ű%» j,ÆfGf~f...

fCE [fVfzf“,Ì‘g,Ý ‡,i,¹,É,æ,Á,Ä AAPIfT [frfX,³,Ä,È,É~—p,Ä,«,é,æ,µ,É,È,Á,Ä,¢,é B

Direct3D HAL,Í ADirectDraw HAL,âGDIffBfXfvfCEfC Efhf%ofCfo,ÆŠ®‘S,É“ ‡,³,ê,Ä,¢

,é BHAL,Í AMicrosoft,ÌfO%oftfBfbfNAPI,Ö,Ì’P`êfCf“f^ [ftfFfCfX,Æ A3DfAfNfZf%ofCE [f^,Ì“ ^ê,³,ê,½fhf%of  
Cfo Ef,ftf<,ðfn [fhfEFFFfA »i,É’ñ<Ý,·,é Bfn [fhfEFFFfA »i,Í ADirect3D,âDirectDraw AGDI AOpenGL,ð ,‘¬  
%»,,éfhf%ofCfo’P`l,Ì,Ý,ð—

p`Ó,·,ê,Ì,æ,¢ Bfhf%ofCfo,É,æ,Á,Ä Afn [fhfEFFFfA,Í AfWfIf fgfŠ•İŠ·,ðŠÛ,ð3DfO%oftfBfbfNfX,ÌfCEf“f\_fŠf“f

O EfpfCfv A3DfNfŠfbsf“fO Af%ofXf^ ^— ,İ‘S•”,Û,½,Íê•”,ð ,‘¬%»,,é,±,Æ,³,Ä,«,é BDirect3D

HAL,Í ACE» Ý~—p,Ä,«,éOf%oftfBfbfN EfAfNfZf%ofCE [f^,É%oÁ,| A «—,Ì,à,Ì,É,à’Î%ž,Ä,«,é,æ,µ

,É ÝCEv,³,ê,Ä,¢,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 Á,à ,‘¬,ÈŽè’i,ð’ñ·ÿ,·,é BDirectDraw,Í A2DfOf%oftfB f b f N,â3DfOf%oftfB f b f N A,“,æ,Ñ“@%œ,ì,½,ß,ìWindows,ð \ ¬,·,é f G f “ f W f “,Á, ,é BDirectDraw,Í f C f [ f W,Ì·%œ ,Æ^Ú“@,ð”ñ í,É ;‘¬,É s,ç A f X f € [ f Y,È f A f j f [ f V f † f “,ðŽÀœ»,·,é B,±,ì,æ,µ,ÈDirectDraw,ì<@”\ ,É,æ,Á,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 A Š ù ‘ ¶,ì f ^ f C f g f <,ìWindows,Ö,ìÚ A,ð’ZŠúŠÔ,ì,µ,ç,É—e^Ö,É s,µ ,±,Æ,%oÁ”\,Á, ,é B,Û,½ ADirectDraw,Í AMicrosoft,ì,·,×,Ä,ì Á 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 “,Á,à, ,é BDirectDraw,ð—p,ç,ê,ì AWindows

GDI,âDirect3D AActiveMovie™ AOpenGL,É,æ,Á,Ä ¶ ¬,³,ê,½ f C f [ f W,ð,·,®,É—~—p,Á,« ,é B

DirectDraw,Í A f f f B f X f v f C f C E f n [ f h f E f F f A ã,É^É’u,·,é”-,ç f C f C f ,,Á, ,é BDirectDraw,É,æ,Á,Ä A ,‘¬ f u f f b f N “]—

A·âŠ@fXfgfCfbf` AfI [fo [fCfC,È,Ç AWindowsEü,É ÝCv,³,è,½fOf%oftfBfbfN EfAfNfZf%ofC [f^,ì<— Í,È<@”\,ðŠÈ’P,É—~—p,·,é,±,Æ,ª,Á,« ,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,%oÁ”\ ,Á, ,é BDirect3D,Æ“—l,É ADirectDraw,Í A f f f o f C f X,É^É·¶,¹,,É f n [ f h f E f F f A,Æ’È M,·,é·û-@,Á, ,é BMicrosoft,ìMS-DOS@,Á,Í A f ^ [ f Q f b f g,Æ,È,é f f f o f C f X,É f R [ f h,ð †,ì,¹,È,- ,Á,Í,È,ç,È,©,Á,½ B,µ,©,µDirectDraw,Á,Í ADirectDraw,É^î%ž,µ,½,·,×,Ä,ì f n [ f h f E f F f A,É,Á,ç ,Ä A f n f C E f p f t f H [ f } f “ f X,ÈC·%È,ð“%,é,±,Æ,ª,Á,« ,é B

DirectDraw,ÍCOMfx [fX,ìAPI,Á, ,é BMicrosoft,Í A «—^,ìfo [fWf†f“,ìWindows,ÉDirectDraw,ð’g,Ý ž,ð—\’è,Á, ,é B Û,µ,,Í uDirectDraw,É,Á,ç,Ä v,ðŽQ Æ,³,è,½,ç B

## OpenGL

OpenGL,Í AfnfC EfGf“fh,ÈCAD/CAM,Á—p,ç,é,é ,—š,È3D<Z p,Á Af,ffšf“fO AfAfjf [fVfšf“ AfVf~f...  
fE [fVfšf“ A%oÈšw“I,È%æ“æ ^—  
,È,Ç,Ì A3DfCf [fW,ÌfEf“f\_šf“fO,đ s,□ BOpenGL,ÍWindowsNT,Áñ<Ÿ,³,ê AWindows95 ã,Á,à“@ ì,·,é BWi  
ndows95,ÁOpenGL,đ~—p,·,é,É,Í AWin32f [fNfXfe [fVfšf“ ã,ÁWin32 OpenGL,ªŽÀ s,³,ê,Á,ç,é•K—  
v,ª,·,é B«» Ý,ÌOpenGL,Í AOpenGL—  
p,É ÝEν,³,ê,½fNf%ofCfAf“fg Efhf%ofCfo Ef,ffç,É,æ,Á,Ä AOpenGL,ì<@”\,đfTf|  
[fg,µ,½fnfC EfGf“fh,Èfn [fhEfFfA,đ~—p,µ,Á,ç,é B «—  
^,ìfo [fWfšf“ ,Á,Í ADirect3D,đ•âš@,·,éfn [fhEfFfA Ef\šf... [fVfšf“,đñ<Ÿ,µ ADirect3D API,đ’Ê,µ,Ä’á%  
¿šI,È3Dfn [fhEfFfA iOpenGL,ª•K—v,Æ,·,é ,—š,È đE ,đfTf| [fg,µ,½,à,Ì j,đ~—p,Á,« ,é,æ,□,É,·,é—\’è,Á, ,é  
B

**Direct3DfA [fLfefNf`ff**

,±,ì Í,É,Í ADirect3DRf“f| [flf“fg,Æ,»,ì¼,ÌDirectXfRf“f|  
[flf“fg,âflfyfE [fefBf“fO EfVfXfef€ A,“,æ,ÑfVfXfef€ Efn [fhfEfFfA,Æ,ÏÖEW,É,Â,ç  
,Ä,ì‘ ‡“I,È îñ,ªL Ú,³,ê,Ä,ç,é B,±,±,Ä,ÍÈ%°,ÏfgfsfbfN,É,Â,ç,Ä à-¾,·,é B

Direct3D,ÏfrWf±f“

fEf“f fŠf“fO EfGf“fWf“

ŽÀ sfobftf@

•Ï·f,fWf... [f<

Æ-¾f,fWf... [f<

f%ofXf^ ^— f,fWf... [f<

E,ÆftfHfO

fXfe [fg,ÆfXfe [fg EfI [fo [f%ofCfh

Direct3Dftf@fCf< EftfH [f}fbfq

**Direct3D, ĩrfWf†f“**

Direct3D, ĩ A Windows,“@ ĩ, ., éfRf“fsf... [f^ ã, Ā Af [f<fhf fCfh, ÈfQ [f€  
, âfCf“f^f%ofNfefBfu, È3DfOf%oftfBfbfNfX, ðŽÀĈ», ., é, ½, B, È ÝĈv, ³, è, Ā, ĉ  
, é BDirect3D, ĩ AfffofCfX, ÈĒĒ, μ, ½3DftrffI EfffBfXfvfĈfC Efn [fhfEfFfA, Ö, ĩfAfNfZfX, ð AfffofCfX, ÈĒĒ  
‘Ĵ, μ, È, ĉ, ũ-@, Ā, ñ, Ÿ, ., é-ðŠ,, ð’S, Ā, Ā, ĉ, é BfAfVfŠfP [fVf†f“, ĩ AfefNfXf^ff Ef}  
fbfsf“fO, â ³Šm, È“šŽ,“Š%oe AfAf<ftf@ EfufĈf“ffBf“fO, È, Ĉ, , Û, Ĉ, ±  
, ³, è, ½3DfvfŠf~fefBfu, ð•%œ, ., é, Ā, « AfN [fhfEfFfA, ÈĒĒ, μ, ½“Ā•È, Èfvf fV [fWff, ĩĈĀ, Ñ o, μ, ðfCf“fvfŠf f  
“fg, ., é•K—  
v, ĩ, È, ĉ BfvfŠf~fefBfu, ð Ýè, ., é, ¾, -, Ā ADirect3D, ,fn [fhfEfFfA, Ā, ĩ•%œfCf“f^ [ftfFfCfX, Ā, È, é BDirect3D, ĩ  
fofbftf@ŠÇ— fVfXfef€  
, ĩDirectDraw, ĀŠ@‘S, È“ †, ³, è, Ā, , è ADirectDraw, ĩ A3DfĈf“f\_Šf“fO, ĩf^ [fQfbfg, Ā, μ, Ā, à AfefNfXf^ff Ef}  
fbfv, ĩf [fX, Ā, μ, Ā, àž—p, ., é, ±, Ā, , Ā, «, é B, ±, ĩ, ½, ß A, ½, Ā, , ĩ ĩ Af, [fVf†f“ EfrffI Ef}  
fbfsf“fO A2D, ĩfI [fo [fĈfC EfVfĈ [f“, Ā, ĩ3D, ĩfĈf“f\_Šf“fO AfXfvf%ofCfG, È, Ĉ, ðŽÀĈ», ., é, ±, Ā, à, Ā, «, é B

Direct3D, ĩ AfWfIf fgfŠ•ĪŠ A3DfNfŠfbfsf“fO A Ā—  
¾Ĉeø%È, ðŠÛ, ð A•W €“I, Èfn [fhfEfFfA EfAfNfZf%ofĈ [fVf†f“KŠi, ð’ñ•Ÿ, ., é, à, ĩ, Ā, μ, Ā ÝĈv, ³, è, Ā, ĉ  
, é BDirect3D, ð—p, ĉ  
, è, ĩ A Ā“K%o”, ³, è, ½3DfĈf“f\_Šf“fO EfpfCfvf%ofCf“, ĩ, ., ×, Ā, ðf\ftfgfEfFfA“I, ÈfCf“fvfŠf f“fg, ., é, ±  
, Ā, , Ā, «, é B, ±  
, ĩfpfCfvf%ofCf“, ĩrè”, Û, ½, ĩ“S”, ĩ”CÓ, ĩfvf fZfX, ĩ AfN [fhfEfFfA EfAfNfZf%ofĈ [f^, È, æ, Ā, Ā ^— , ., é, ±  
, Ā, , %oĀ”\, Ā, , é B, ±, ĩ, ½, BDirect3DfAfVfŠfP [fVf†f“, ĩ A V, μ, ĉfn [fhfEfFfA, “šJ”, ³, è, ½, Ā, «, È, ĩ A, æ, è—  
D, è, ½fn [fhfEfFfA EfAfNfZf%ofĈ [fVf†f“, ð—~—p, ., é, ±, Ā, , Ā, «, é B

Direct3D, ĩDirectDraw, ĀŠ@‘S, È“ †, ³, è, Ā, ĉ  
, é BDirectDrawfhf%ofCfo, ĩCOMfCf“f^ [ftfFfCfX, Ā, àDirect3D, ĩCOMfCf“f^ [ftfFfCfX, Ā, à A“-, ¶Ši—  
{fIfufWfFfNfg, ÈfAfNfZfX, ., é, ±, Ā, , Ā, «, é B Ū, μ, -  
, ĩ uDirectDraw, ĀDirect3D, ĩ“ † v, ðŽQ Ā, ³, è, ½, ĉ BDirectDraw, ĩ3DfT [ftfFfX, ĩfTf] [fg, È, Ā, ĉ  
, Ā, ĩ A u3DfT [ftfFfX, ĩfTf] [fg v, ðŽQ Ā, ³, è, ½, ĉ B

, ±, ĩZfNfVf†f“, ĩ ĩñ, ĩ½, , ĩ ADirect3D, ĩfCf“fvfŠf f“fg, È, Ā, ĉ, Ā Ū, μ, à¾, μ, Ā, ĉ  
, é B•ŪŽ f, [fh, ĩfCf“f^ [ftfFfCfX, ð—p, ĉ, é è †, ĩ A, ±, ĩ ĩñ, , ¼ Ū“K—p, ³, è, é, ±  
, Ā, ĩ, È, ĉ B, μ, ©, μ A¼ Ūf, [fh, ĩfCf“f^ [ftfFfCfX, ð—~—p, ., é è †, È, ĩ A, ±, è, ĉ, ĩfCf“fvfŠf f“fg, ĩ Ū ×, ð, æ, —  
%oð, μ, Ā, , •K—v, , é B, Ū, ½ A•ŪŽ f, [fh, ð—p, ĉ, é, Ā, «, ĩ AfVfXfef€ EfA [fLfefNf^ff, È, Ā, ĉ, Ā, ĩ—  
~“I, ÈŠi‘b‘mŽ”, , ð, È—š, Ā, Ā, , è, □ B

**fĀf“f\_Šf“fO EfGf“fWf“**

Direct3DfA [fLfefNf`ff,Í A,R,Â,Ì“Æ—Šf,fWf...

[f<,©,ç \ ¬,³,ê,é A%¼z3DfĀf“f\_Šf“fO EfGf“fWf“,ÉŠi,Ã,Ā,ĉ,é B

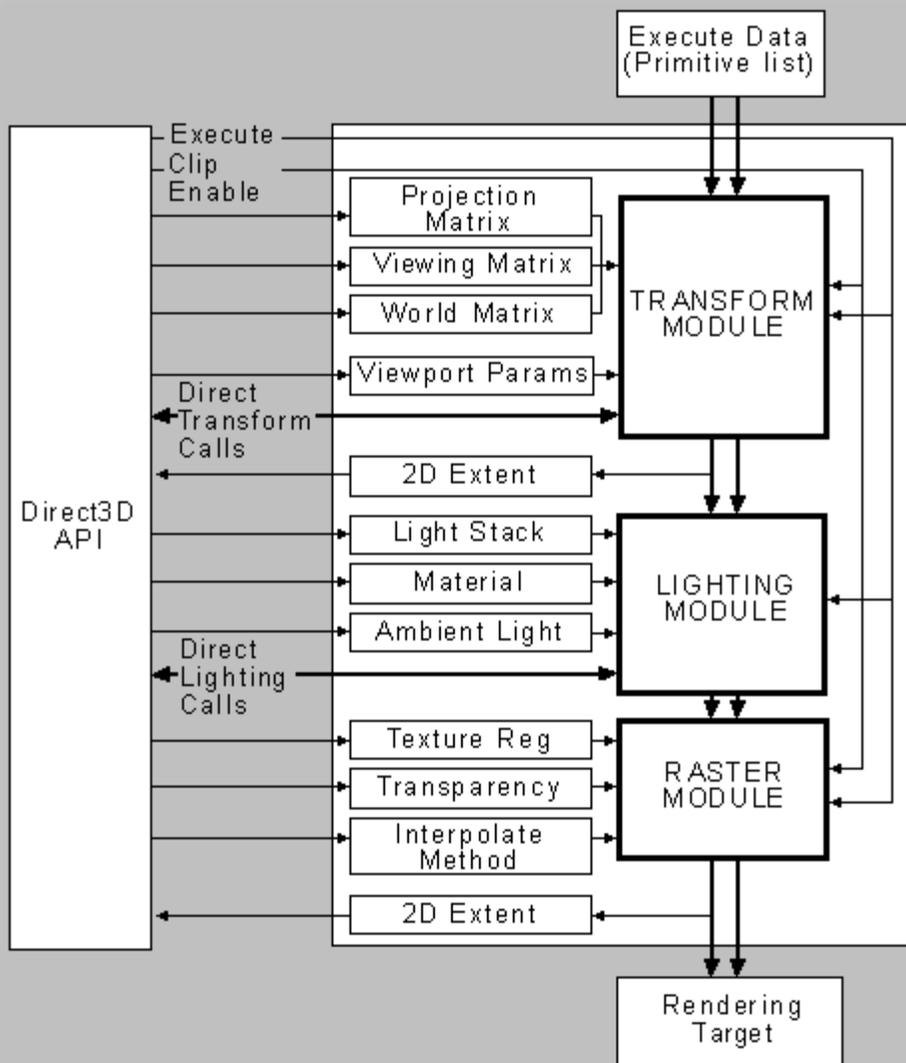
•İ·f,fWf... [f< B,R,Â,İ4 s4—ñ,İ s—ñ,đŽg—p,μ,Ä AfWfIf fgfŠ·İŠ· ^— ,đ s,αf,fWf... [f<,Ä, ,é B s—  
ñ,İ,Đ,Æ,Ä,Íf... [f] [fg·İŠ·,İ,½,ß A,Đ,Æ,Ä,Íf [f<fh Ä·W·İŠ·,İ,½,ß A,Đ,Æ,Ä,ÍŽÈ%œ·İŠ·,İ,½,ß,É—p,ĉ  
,ç,ê,é B,±,İf,fWf... [f<,İ”C^O,İŽÈ%œ,đfTf] [fg,μ A“ŠŽ“Š%œ,â·½ s“Š%œ,É,æ,éfrf... [,đŽÄĀ»,·,é B

Æ—¾f,fWf... [f< B,±,İf,fWf... [f<,İŠđ%½“İ,ÈĀöĀ¹ĀvŽŽ,đ s,ĉ A‘S‘İ,İĀö ĀĒö,İ·ûĀü Af]

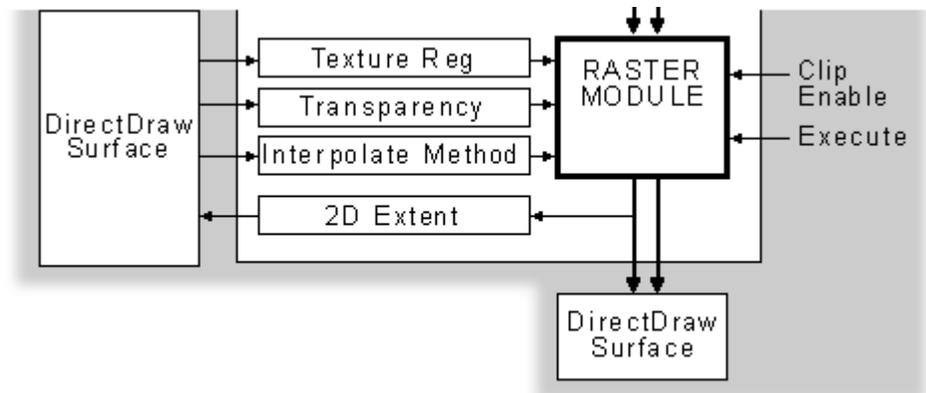
fĀf“fgf%ofCf,âfXf|fbf%ofCf,İĀöĀ¹,đfTf] [fg,·,é B

f%ofXf^ ^— f,fWf... [f< B,±,İf,fWf... [f<,Í AfV [f<,İĀfĀf“f\_Šf“fO,ÉfWfIf fgfŠ Ef,fWf... [f<,Æ Ā—  
¾f,fWf... [f<,İ o—İĀ%œ,đŽg—p,·,é B ¶ ¬,³,ê,½fV [f<,Í AfBfXfVfĀfĀC EfŠfXfg,ÉŠi,Ã,ĉ  
,½ L k%œÄ”,ÈfTfH [f]fbf,Ä, ,è A2D,â3D,İfvfŠf~fefBfu,đfTf] [fg,·,é B

ŽŸ,İ } ,Í AfĀf“f\_Šf“fO EfGf“fWf“,Ì,R,Â,İf,fWf... [f<,ª A,Ç,Ì,æ,α,É¼,İDirect3DfA [fLfefNf`ff,Æ i—  
p,·,é,©,đŽi,μ,Ä,ĉ,é B



f%ofXf^ ^— f,fWf... [f<,Í A%° },ÉŽi,·,æ,α,ÉDirectDraw,É i—  
p,·,é BDirect3D,Í AfĀf“f\_Šf“fO,İf^ [fQfbf,âfefNfXf`ff,İ\ [fX,Æ,μ,Ä ADirectDrawfT [ftfFfX,đŽg—  
p,·,é B



Šef,fWf... [f<,Í Afn [fhEfFfA“I,É ,‘-‰»,·,é,±,Æ,à Af\ftfgfEfFfA“I,ÉfGf~f...fŒ [fg,·,é,±,Æ,à‰‰”,Á, ,é B  
,Ü,½ ADirect3D,É-â,c ‡,í,1,Á AfGf~f...fŒ [fVf‡f“ Ef, [fh,Á“® ì,µ,Ä,Œ,éfRf“f [flf“fg,đŠm,©,ß,é,±  
,Æ,ª,Á,«é B,±,ê,ç,ìf,fWf... [f<,“~Žž,ÉŽg—  
p,³,ê,é,Æ,«,Í ADirect3D,ìŒf“f\_Šf“fO EfpfCvf%ofCf“,đŒ` ¬,·,é B

±,ì,R,Á,ìf,fWf... [f<,Í“®“I,Éf [fh,·,é,±,Æ,ª‰‰”,Á, ,è AfŒf“f\_Šf“fO,³,è,½ftfŒ [fŒŠŎ,Á•ì X,·,é,±  
,Æ,ª,Á,«é B,±,ì,½,ß A V,µ,Œf,fWf...  
[f<,đ ì ¬,µ Afn [fhEfFfA EfAfNfZf%ofŒ [fVf‡f“,â¼,ìŒf“f\_Šf“fOŒ‰‰É,đŽÀŒ»,·,é,±  
,Æ,ª,Á,«é BDirect3D,Žg,µ•ìŠ·f,fWf... [f<,Í,D,Æ,Á,Á, ,éª A Æ-¾f,fWf... [f<,Æf%ofXf^ ^— f,fWf...  
[f<,Í A,Ó,½,Á,©,ç‘I’đ,·,é,±,Æ,ª,Á,«é B,±,ê,É,æ,Á,Á A,½,Æ,ì,Í A Æ-¾f,fWf...  
[f<,đ Ø,è‘Ö,ì,é,¾,¯,Á,æ,èššfAf<,ÈfV [f“,đfŒf“f\_Šf“fO,Á,«é‰‰” «,ª, ,è A“Á,É Æ-  
¾Œ‰‰É,âŒf“f\_Šf“fO,É,·,ç,Á A‘â,«É \_“ì «,đ•Ü,Á,±  
,Æ,ª,Á,«é BISV,ª A“ÆŽ©,ì“ÁŽêŒ‰‰É,đŽÀŒ»,·,éf%ofXf^ ^— f,fWf... [f<,đ<Ÿ<<,·,é,±,Æ,à‰‰”,Á, ,é B

**ŽÀ sfobftf@**

fCef“f\_fŠf“fO EfGf“fWf“,ì,R,À,Ìf,fWf... [f<,Í ADirect3D API,ð—p,c,Ä Ý’è,µ,½ ó’Ô,ð,»,è,¼,è•ÛŽ ,µ,Ä,c ,é B,.,x,Ä,Ì ó’Ô,ª Ý’è,³,è,é,Æ AfCef“f\_fŠf“fO EfGf“fWf“,Í AŽÀ sfobftf@,Æ,µ,Ä’m,c,è,é,éffBfXfvfCefC E fŠfXfg,ð ^— ,Ä,«,è,æ,µ,É,É,é BfAfvfŠfP [fVf‡f“,ŽÀ sfobftf@,ð— ¼Sm,É’ÓŽ’,;é,Ì,Í A¼ Úf, [fh,ì è ‡,¾,\_,Ä, ,é B•ÛŽ f, [fh EfAfvfŠfP [fVf‡f“,Í A,»,è,æ,è,à ,CefCxf<,Ä @ i,.,é B

ŽÀ sfobftf@,Í AŠ@’S,ÉŽ©CEÈ“à•iCE^,Ì A“Æ—§,µ,½ îñ,ÌfpfPfbfg,Ä, ,é BŽÀ sfobftf@,É,Í’,“\_fŠfXfg,ªŠÜ,Ü, è,Ä,“,è A,»,ÌCEÄ,É—½—BfXfgfŠ [fE,ª±, B—½—BfXfgfŠ [fE AfIfyfC [fVf‡f“ EfR [fh ifIfyR [fh j,Æ A,±,ÌfIfyR [fh,ª€ ì,.,éff [f^,©,ç \ -,³,è,Ä,c ,é BDirect3D,ÌfIfyR [fh,Í **AD3DOPCODE**—ñ“CE^,É’è<,³,è,Ä,c,é BŽÀ sfobftf@“à,Ì—½— B,Í **AD3DINSTRUCTION** \‘c’i,ÉŠ”[,³,è,Ä,“,è AfIfyR [fh AŠe—½—Bf [f^ Ef†fjfbfg,ÌTfCfY A,»,ÌCEÄ,É’±, -ŠÖ’Aff [f^ Ef†fjfbfg,Ì ”,ªŠÜ,Ü,è,Ä,c,é B

ŽÀ sfobftf@,ÌftfH [f}fbfg,ð‰° } ,ÉŽ,., B



—½—B,Í A’,“\_Ö,ÌCEðCE,Ì“K—p•û—@,â A’,“\_ÌfCef“f\_fŠf“fO•û—@,ð’è<,µ,Ä,c,é B Ä,â”è“I,É—½— B,Ì,Ð,Æ,Ä,Éfgf%ofCfAf“fof< EfŠfXfg **iD3DOP TRIANGLE** j,ª ,é B,± ,è,Í’,“\_fŠfXfg†,Ì’,“\_ðŽQ Æ,.,éŽOŠpCE’fvfŠf~fefBfu,ÌfŠfXfg,Ä, ,é B—½—BfXfgfŠ [fE ,ÉŠÜ,Ü,è,é,.,x,Ä,ÌfvfŠf~fefBfu,Í’,“\_fŠfXfg†,Ì’,“\_µ,©ŽQ Æ,µ,È,c,½,ß AfvfŠf~fefBfu,Ì’,“\_Ž<\_\_\_\_\_“ä,ÌŠO.”,É, ,é è ‡ A•İŠ•f,fWf... [f<,É,»,Ìfobftf@‘S’i,ð—³Ž<,³,1,é,±,Æ,ÍŠÈ’P,Ä, ,é B

ŽÀ sfobftf@,ÌTfCfY,Ífn [fhEfFfA,É,æ,Ä,ÄCE”è,³,è,é B,± ,ÌTfCfY,ðŽæ“¾,.,é,É,Í **AIDirect3DDevice::GetCapsf** f\fbfh,ðCEÄ,Ñ o,µ **AD3DDEVICEDESC** \‘c’i,ÌdwMaxBufferSizef f“fo,ð’²,x,é Bf\ftfgfEfFfA Efhf%ofCfo,ðŽg—p,µ,Ä,c ,é è ‡ A”è”è“I,É A Ä“K,ÉŽÀ sfobftf@,ÌTfCfY,Í64KfofCfG,Ä, ,é B,±,Ì,Æ,« A Ä,à— LCEø,ÉfZfJf“f\_fŠ EfLfffbfVf...,ª~— p,³,è,é B,µ,©,µ AfAfvfŠfP [fVf‡f“,ªfn [fhEfFfA EfAfNfZf%ofCE [fVf‡f“,ð—~— p,.,é è ‡,Í AŽÀ sfobftf@,ÌTfCfY,ð,à,Ä,Æ -,³,µ Afvf%ofCf}fŠ EfLfffbfVf...,ðŽg,µ,x,«,Ä, ,é B

ŽÀ sfobftf@,ð’€ ì,µ,Ä,c,éŠÖ,Í A Æ—¾f,fWf... [f< A,Ü,½,Í Æ—¾f,fWf... [f<,Æ•İŠ•f,fWf... [f<,Ì—¼•û,ð—³CEø,É,.,é,±,Æ,ª,Ä,«,é B,±,Ì è ‡ A’,“\_fŠfXfg,ð‰ð Í,.,é•û— @,ª’i X,³,è AfCef“f\_fŠf“fO EfpfCfvf%ofCf“,Ìf%ofXf^ ^— ’iŠK,Ä,ì,Ý A•İŠ,â Æ—¾ ^— ,ð,Ü,C,± ,µ,½’,“\_ðŽg,µ,±,Æ,ª,Ä,«,é,æ,µ,É,É,é BŠeŽÀ sfobftf@,Ä,Í A,Ð,Æ,Ä,Ìf^fCfv,Ì’,“\_ îñ,µ,©Žg—p,Ä,«,È,c,± ,Æ,É’ ^Ó,.,é,±,Æ B

ŽÀ sfobftf@,Æ ó’Ô•İ‰»,É‰%Ä,!,Ä ADirect3D,Í,à,µ,Ð,Æ,Ä,ÌCEÄ,Ñ o,µ<@ \,ð”ð,!,Ä,c,é B•İŠ•f,fWf... [f<,à Æ—¾f,fWf... [f<,à Af\_fCfCefNfg,ÉCEÄ,Ñ o,.,±,Æ,ª,Ä,«,é B,±,Ì<@”\ ,Í A•ûCE“ŠE ü,ÌfefXfg,Ä•İŠ•f,fWf... [f<,ðŽg,µ,Æ,«,È,C Af%ofXf^ ^— ,ð•K—v,Æ,µ,È,c è ‡,É•Ö—~,Ä, ,é B

•İŞ·f,fWf... [f<

•İŞ·f,fWf... [f<,É,Í Afrf... [f] [fg Afrf... [fCf“fO s—ñ Af [f<fh s—ñ AŽĚ%oe s—ñ,İ A4,Â,İ•İ X%oÂ”  
,ÈfĈfWfXf^,^, é B,±,ê,ç,İfpp%of [f^,İ,Đ,Æ,Â,^İ X,^,é,é,Æ A V,μ,Ĉ•İŞ· s—ñ,^ĈvŽZ,^,ê A•İŞ·f,fWf...  
[f<,^•ŮŽ ,μ,Â,Ĉ,é s—ñ,É Ÿ’è,^,é B•İŞ· s—ñ,Í A3DfIfufWfFfNfg,İ’“\_ ,İfZfbfg,İ%oñ“]  
,ÆŽĚ%oe,đ’è<,μ Af,fff< Â•W,©,ç2DfEfBf“fhfE,Ö•İŞ·,·,é B

fAfvfŠfP [fVf#f“ ,İ•İŞ· s—ñ,đ’¼ Ú,É Ÿ’è,·,é,±,Æ,à,Â,«é,^ A,Â,«é,¾,“đ,“ ,é,×,« ,Â ,é B Â“K%o»,^,ê,½•İŞ·Ĉv  
ŽZ,đŽg,ĈĈ< #ftfF [fY,Â,Í A•İŞ· s—ñ,İfNf%ofX^,“ ,%o½“x,à s,í,ê,é B,μ,©,μ AfAfvfŠfP [fVf#f“ ,^ s—  
ñ,đŽw’è,·,é,Æ AfNf%ofX^,“ ,İŽÀ s,^—W,°,ç,ê,Â,μ,Ů,^ B

fffBfXfvfĈfC EfŠfXfg,Í A,½,^,ñ,İ^Ů,È,éf^fCfv,İ’“\_ îñ,đfTf| [fg,·,é B

f%ofXf^ ^— ,İ,Ÿ,đfTf| [fg,·,éfn [fhfEfFA,Â,Í AfAfvfŠfP [fVf#f“ ,**ÍD3DTLVERTEX** \‘Ĉ’İ,đŽg—p,·,é,×,« ,Â ,  
é **BD3DTLVERTEX** \‘Ĉ’İ,İ•İŞ·,â Æ—¾ ^— ,đ s,Â,½ĈĚ,İ’“\_ ,đŽ,μ,Â,Ĉ  
,é,½,ß AfXfNfŠ [f“ Â•W,Æ F,đŠŮ,ñ,Â,Ĉ,é Bfn [fhfEfFA,^•İŞ·‘Ĉ İ,đfTf|  
[fg,·,é ê # AfAfvfŠfP [fVf#f“ ,**ÍD3DLVERTEX** \‘Ĉ’İ,đŽg—p,·,é B,±  
,İ \‘Ĉ’İ,Í Aff [f^,Æ AĈĈĈĈ,đf\ftfgfEfFA“L,É ^— ,·,é,Æ,« ,É Ÿ’è,^,é F,İ îñ,đŠŮ,ñ,Â,Ĉ  
,é BfNfŠfbfsf“fO,đ•K—

v,Æ,·,éf,fff< Â•Wff [f^,đfAfvfŠfP [fVf#f“ ,^ñ<Ÿ,·,é,Æ,« **AD3DLVERTEX** \‘Ĉ’İ,É,æ,Â,Â A“K Ø,È’“\_ ,^è<,^,ê  
,é Bfn [fhfEfFA,^ĈĈĈ,đfTf| [fg,·,é ê #,Í AfAfvfŠfP [fVf#f“ ,İP f,**ÉD3DVERTEX** \‘Ĉ’İ,đ—  
p,·,é,İ,æ,Ĉ B,±,İf^fCfv,İ’“\_ ,É,Í AfĈf“f\_Šf“fO,İŠÖ,É•İŞ·,â Æ—¾ ^— ,^“K—p,^,ê,é Bf\ftfgfEfFA EfGf~f...  
fĈ [fVf#f“ Efhf%ofCfo,Í A,±,ê,ç,İ,·,×,Â,İf^fCfv,İ’“\_ îñ,đfTf| [fg,·,é B

•İŞ·f,fWf... [f<,É,Í,Ó,½,Â,İf^fCfv,İf ffbfh,^, é B,Đ,Æ,Â,İ•İŞ·f,fWf... [f<,İ ó’Ů,đ Ÿ’è,·,é,à,İ,Â ,é A,à,^  
,Đ,Æ,Â,Í A•İŞ·f,fWf... [f<,đ’¼ ŮŽg—p,μ,Â A’“\_ fZfbfg,đ’Ĉ İ,·,é,à,İ,Â ,é B•İŞ·f,fWf...  
[f<,İ’¼ ÚĈĚ,Ń o,μ,Í A«ŠE ü,İf{fŠf... [fĈ,đfefXfg,μ,½,è AfxfNfgf< EfZfbfg,đ•İŞ·,·,é,Æ,« ,É•Ö—,Â ,é B  
,±,ê,ç,İ’Ĉ İ,Í AĈ» Ÿ,İ•İŞ· s—ñ,đ—p,Ĉ,Â AfWfIf fgfŠ•İŞ·,đŽÀ s,·,é B,Ů,½ AĈ» Ÿ,İfrf...  
[ ,É,Í,μ,ÂfNfŠfbfsf“fO EfefXfg,đ s,^,±,Æ,à,Â,«é B•İŞ·f,fWf...  
[f<,đ’¼ ÚĈĚ,Ń o,·ŠÖ ”ĈEQ,Í A,·,×,Â **AD3DTRANSFORMDATA** \‘Ĉ’İ,đŽg—p,·,é B

•İŞ·É,Â,Ĉ,Ä,İ’è”È“L,È îñ,Í A•ŮŽ f, [fh,İfrf... [f] [fg,É,Â,Ĉ,Ä à—¾,μ,½fZfNfVf#f“ u•İŠ· v,Â“¾,é,±  
,Æ,^,Â,«é BftfĈ [fĈ“à,Â,İ•İŞ·É,Â,Ĉ,Ä,Í u•İŠ· v,đŽQ Æ,^,ê,½,Ĉ B,Ĉ,·,ç,İfZfNfVf#f“ ,â•ŮŽ f, [fh,İAPI,É,Â,Ĉ  
,Â à—¾,μ,Â,Ĉ,é,^ A•İŞ·,İfA [fLfefNfff,Æ ”Ž@,Í A•ŮŽ f, [fh,Æ’¼ Úf, [fh,İ—¼•Ů,É“K—p,·,é,±  
,Æ,^,Â,«é B•İŞ·,Ä—p,Ĉ,ç,ê,é ”Šw“TmŽ ,İŠT—v,É,Â,Ĉ,Ä,Í u3D•İŠ· v,đŽQ Æ,^,ê,½,Ĉ B

$\mathbb{A}E-\frac{3}{4}f, fWf... [f<$

$\mathbb{A}E-\frac{3}{4}f, fWf... [f<, \hat{I} \text{ ACE} \rangle \hat{Y}, \hat{I} \text{ CE} \delta \text{ CE}^1, \hat{a}fAf\text{"}f\text{r}fGf\text{"}fg \text{ Ef}\% \text{ of } Cfg \text{ A}, \gg, \mu, \hat{A}f\}fef\hat{S}fAf<, \hat{E}, \hat{A}, \text{C}$   
 $, \hat{A}, \hat{I}fXf\wedge fbfn, \delta \cdot \hat{U}\hat{Z} \text{ , } \mu, \hat{A}, \text{C}, \hat{e} \text{ B}$

$\mathbb{A}E-\frac{3}{4}f, fWf... [f<, \delta' \frac{1}{4} \hat{U}\hat{Z}g-p, \cdot, \hat{e} \hat{e} \pm A, \pm, \hat{I}f, fWf... [f< \text{ ID3DLIGHTINGELEMENT } \backslash \text{c}^i \hat{I} j, \hat{E} \text{"} \hat{u}$   
 $\hat{I}, \hat{3}, \hat{e}, \frac{1}{2}ff [f\wedge, \hat{I}\hat{S}e-v\hat{f}, \hat{E}, \hat{I} \text{ A} \cdot \hat{u} \text{ CE} \hat{u} fxfNfgf<, \hat{A} \hat{E} \hat{E} \hat{u} \text{ if} [fCf\text{"}fg\% \text{ of } Cfg, \hat{a}fXf\text{f}fbfgf\% \text{ of } Cfg, \hat{I}, \hat{a}, \text{C}$   
 $, \hat{E} \text{ A} \cdot \hat{C} \hat{S} \hat{I}, \hat{E} \text{ CE} \delta \text{ CE}^1, \hat{I}, \frac{1}{2}, \text{B} j, \hat{a} \hat{S} \hat{U}, \hat{U}, \hat{e}, \hat{A}, \text{C}, \hat{e} \text{ B}$

$fTf [fg, \cdot, \hat{e} \text{ CE} \delta \text{ CE}^1 f, fff<, \hat{I} \text{ Af, fmfNf } \text{ , } \hat{a}, \hat{N} \text{ RGB}, \hat{I}, \hat{O}, \frac{1}{2}, \hat{A}, \hat{A}, \hat{e}$   
**BD3DLIGHTDATA** \text{c}^i \hat{f} f\text{"fo, ID3DLIGHTINGELEMENT } \backslash \text{c}^i \hat{I}, \hat{I} \text{ CE} \hat{a}, \hat{E}, \hat{I} \text{ A}, \hat{A}, \hat{E}, \hat{E} fJf\% [ \text{EftfB } [f<fh, \hat{a} \hat{S}i\text{"}, \hat{3}, \hat{e}, \hat{e}  
**B**

$f, fmfNf \text{ CE} \delta \text{ CE}^1 f, fff< \text{ i} \text{"}\% \text{ of } \text{"fv"} \text{ CE} \delta \text{ CE}^1 f, fff<, \hat{A} \text{ CE} \hat{A}, \hat{I}, \hat{e}, \hat{e}, \pm, \hat{A}, \hat{e}, \hat{a}, \hat{e} j, \hat{I} \text{ A}, \hat{D}, \hat{A}, \hat{A}, \hat{I} \text{ \% A} \text{ \% oe}^1, \delta \text{ CE} v \hat{Z} \hat{Z}, \cdot, \hat{e}, \frac{1}{2}, \text{B}, \hat{E} \text{ A}, \gg, \hat{e}$   
 $, \frac{1}{4}, \hat{e}, \hat{I} \text{ CE} \delta \text{ CE}^1, \hat{I} \text{ of } \text{CE} [-v\hat{f}, \delta \hat{Z}g-p, \cdot, \hat{e} \text{ BRGBCE} \delta \text{ CE}^1 f, fff<, \hat{A}, \hat{I} \text{ A} \text{ F}, \hat{I} \text{ CE} v \hat{Z} \hat{Z}, \hat{I}, \frac{1}{2}, \text{B}, \hat{E} \text{ CE} \delta \text{ CE}^1, \hat{A} f\}fef\hat{S}fAf<, \hat{I} \text{ F}$   
 $v\hat{f}, \delta f\text{f} <, \hat{E} -p, \text{C} \text{ A}, \hat{a}, \hat{e} f\hat{S}fAf<, \hat{E} \text{ CE} \text{ \% } \hat{E}, \delta \text{ } \hat{I} \text{ } \cdot, \hat{e} \text{ B}$

$\text{CE} \delta, \delta' \frac{1}{2} \hat{Z} \hat{E}, \mu, \hat{E}, \text{Cf} \}$   
 $fef\hat{S}fAf<, \hat{A}, \hat{I} \text{ CE} \delta \text{"} x, \delta \hat{S}g \hat{Z} \hat{U}, \mu, \hat{A} \text{ \% } \text{oe}, \delta \cdot \backslash \text{CE} \gg, \cdot, \hat{e} \text{ B} \text{ \% } \text{oe}, \hat{I} \text{"} \hat{I}, \hat{I} \text{ A} \text{0 ifAf\text{"}f\text{r}fGf\text{"}fg \text{ Ef}\% \text{ of } Cfg, \hat{I}, \hat{Y} j, \text{C}, \text{C}1 \text{ iCE} \delta \text{"} x, \hat{a} \hat{A} \hat{a}, \hat{I} \text{ CE}$   
 $\delta j, \hat{A}, \hat{e} \text{ BCE} \delta, \delta' \frac{1}{2} \hat{Z} \hat{E}, \cdot, \hat{e} -v\hat{f}, \delta \hat{Z} \text{ , } \hat{A} f\}fef\hat{S}fAf<, \hat{A}, \hat{I} \text{ AZ}\hat{Y}, \hat{I} \cdot \hat{u} \text{"} \delta \hat{Z} \text{ @}, \hat{E}, \hat{a}, \hat{e} \text{ ACE} \delta, \hat{I} \text{"} \frac{1}{2} \hat{Z} \hat{E}, \hat{A} \hat{S}g \hat{Z} \hat{U}, \hat{I} -$   
 $\frac{1}{4} \cdot \hat{u}, \delta \text{ CE} < \pm, \mu, \hat{A} \text{ \% } \text{oe}, \delta \text{ CE} v \hat{Z} \hat{Z}, \cdot, \hat{e} \text{ B}$

$$shade = \frac{3}{4} (diffuse \times (1 - specular) ) + specular$$

$, \pm, \text{ \% } \text{A} \text{ \% } \text{oe}^1, \hat{I} \text{ ifn } [fhfE fFfA, \hat{I} fJf\% [ \text{E} f\text{f} bfnfAfbfv \text{ E} f\text{e} [fuf<, \hat{E}, \hat{e} \text{ F}, \hat{a} \text{ Af}\text{f}tfgfE fFfA \text{"} \hat{I}, \hat{E} \hat{Z} \hat{A} \text{"}, \hat{3}, \hat{e}, \frac{1}{2} f\text{f} < fbfn$   
 $fAfbfv \text{ E} f\text{e} [fuf<, \hat{E}, \hat{e} \text{ F}, \hat{A}, \hat{a} jf\% \text{ of } \text{"fv"}, \delta, \text{ , } \text{C}, \text{C}, \text{I}, \text{BCE} v \hat{Z} \hat{Z}, \mu, \hat{A}, \text{C}, \text{C} -p, \text{C}, \hat{e}, \hat{a}, \text{C}, \hat{E} \text{ YCE} v, \hat{3}, \hat{e}, \hat{A}, \text{C}, \hat{e} \text{ B}, \pm$   
 $, \hat{I} \text{ CE} v \hat{Z} \hat{Z} \text{ , } \hat{I}, \hat{Y}, \hat{I} f\% \text{ of } \text{"fv"}, \hat{I} \text{ A}, \hat{O}, \frac{1}{2}, \hat{A}, \hat{I} \cdot \text{"} \hat{a}, \hat{E} \cdot \text{"}, \text{ , } \text{C}, \hat{e}, \hat{A}, \text{C}, \hat{e} \text{ BCE} v \hat{Z} \hat{Z}, \hat{3}, \hat{e}, \frac{1}{2} f\% \text{ of } \text{"fv"}, \hat{I} \text{ A} \text{ \%}$   
 $, \hat{I} \hat{3} / 4, \hat{I} \hat{S}g \hat{Z} \hat{U}, \mu, \frac{1}{2} \text{ F}, \hat{I} f\% \text{ of } \text{"fv"}, \hat{A} \text{ A}, \gg, \hat{I} \text{"} \hat{I}, \hat{I} fAf\text{"}f\text{r}fGf\text{"}fg \text{ Ef}Jf\% [ \text{i}\hat{S} \hat{A} \langle \text{CE} \delta \text{ F} j, \text{C}, \text{C} \hat{A}, \hat{a} \hat{A}, \text{C} \text{ F}, \hat{U}, \hat{A}, \hat{A}, \hat{e} \text{ B} \hat{A}$   
 $\text{CE} \hat{a}, \hat{I} \hat{4} \hat{a}, \hat{I} \hat{1}, \hat{E}, \hat{I} \text{ A} \hat{A}, \hat{a} \hat{A}, \text{C} \text{ F}, \text{C}, \text{C} \hat{A}, \hat{a} -\frac{3}{4}, \hat{e}, \text{C} \text{ F}, \hat{I} \text{"} \hat{I}, \hat{I} f\% \text{ of } \text{"fv"}, \hat{a}, \pm, \text{BfCE} f\text{"}f\text{"} \hat{S}f\text{"}fO, \hat{E}, \text{"}, \text{C}$   
 $, \hat{A}, \hat{I} \text{ A} \text{ \% } \text{A} \text{ \% } \text{oe}^1, \hat{I} f\% \text{ of } \text{"fv"}, \hat{I} fTfCfY, \hat{E}, \hat{a}, \hat{A}, \hat{A} fXfP [f\hat{S}f\text{"}fO, \hat{3}, \hat{e} \text{ A} \cdot \text{K} -v, \hat{E} \text{ F}, \delta \hat{Z} \hat{a} \text{"} \frac{3}{4}, \cdot, \hat{e} fCf\text{"}ffbfNfX, \hat{A}, \mu, \hat{A} -p, \text{C}$   
 $, \text{C}, \hat{e}, \hat{e} \text{ B}$

$f\text{p}f\text{b}f\text{N}, \hat{3}, \hat{e}, \frac{1}{2} \text{RGB} fJf\% [ \hat{I} \text{ AZ}\hat{Y}, \hat{I}, \hat{a}, \text{C}, \hat{E} \text{"} \hat{e} \text{"}, \hat{3}, \hat{e}, \hat{A}, \text{C}, \hat{e} \text{ B}$

```
#define RGB_MAKE (red, green, blue) \
    ((red) << 16) | \
    ((green) << 8) | \
    (blue)
```

$, \hat{U}, \frac{1}{2} \text{A} f\text{p}f\text{b}f\text{N}, \hat{3}, \hat{e}, \frac{1}{2} \text{RGBA} fJf\% [ \hat{I} \text{"} \hat{e} \text{"}, \delta \text{"} \hat{E} \text{ \% } \hat{e}, \hat{E} \hat{Z}, \cdot \text{ B}$

```
#define RGBA_MAKE (red, green, blue, alpha) \
    (((alpha) << 24) | \
    ((red) << 16) | \
    ((green) << 8) | \
    (blue))
```

$\text{Direct3D}, \hat{I} \text{ F}, \hat{I} \text{ AZ}\hat{Y}, \hat{I}, \hat{a}, \text{C}, \hat{E} \text{"} \hat{e} \text{"}, \hat{3}, \hat{e}, \hat{A}, \text{C}, \hat{e} \text{ B}$

`typedef unsigned long D3DCOLOR;`

$\text{CE} \delta \text{ CE}^1, \hat{I} f\wedge fCfv, \hat{I} \text{ AD3DLIGHTTYPE } -$   
 $\hat{n} \langle \text{CE} \hat{A}, \hat{I} f\text{"fo, \hat{I}, \hat{D}, \hat{A}, \hat{A} \text{ A}, \cdot, \hat{E}, \hat{I}, \hat{c} \text{ AD3DLIGHT\_DIRECTIONAL AD3DLIGHT\_POINT AD3DLIGHT\_PARALLELPO}$   
 $\text{INT AD3DLIGHT\_SPOT AD3DLIGHT\_GLSPOT}, \hat{I}, \text{C}, \text{ , } \hat{e}, \text{C}, \hat{A}, \hat{E}, \text{ , } \hat{A}, \hat{I}, \hat{E}, \text{C}, \hat{E}, \text{C} \text{ B}, \pm, \hat{I} -$   
 $\hat{n} \langle \text{CE} \hat{A}, \hat{I} \text{ AD3DLIGHT } \backslash \text{c}^i \hat{I}, \hat{I} \text{"} \hat{e} \text{"}, \hat{A}, \hat{e} \text{ B}, \pm$   
 $, \hat{I} \backslash \text{c}^i \hat{I}, \hat{E}, \hat{I} \text{ A} \frac{1}{4}, \hat{E} \text{ D3DCOLORVALUE } \backslash \text{c}^i \hat{I}, \hat{a} \hat{S} \hat{U}, \hat{U}, \hat{e}, \hat{A}, \text{"}, \hat{e} \text{ ACE} \delta \text{ CE}^1, \hat{I} \text{ F}, \delta \hat{Z} w \text{"} \hat{e}, \mu, \hat{A}, \text{C}, \hat{e} \text{ B} \hat{O} \text{ A} - \hat{I} \text{ A} \hat{A}, \hat{I} -$   
 $v\hat{f}, \hat{I}, \hat{I} \text{"} \hat{I}, \hat{I} \text{ A} \hat{e} \text{"}, \hat{E}, \hat{E}, \text{C}, \text{C}1, \hat{U}, \hat{A}, \hat{A}, \hat{e} \text{ B} f\% \text{ of } \text{"fv"} \text{ CE} \delta \text{ CE}^1 f, fff<, \hat{I}, \hat{I} \text{ AZ}\hat{Y}, \hat{I} \text{"} \text{TM} \hat{Z} \text{ @}, \hat{E} \hat{S} \hat{I}, \hat{A}, \text{C}, \hat{A}, \text{C}, \hat{e} \text{ B}$

$$shade = 0.30red + 0.59green + 0.11blue$$

$\hat{S}e -v\hat{f}, \hat{E}, \hat{I}, \text{C}, \text{C}1, \hat{I} \text{"} \hat{I} \hat{S} \hat{O}, \hat{I} \hat{I}, \hat{a} \hat{Z} w \text{"} \hat{e} \text{ \% } \hat{A} \text{"}, \hat{A} \text{ A} \text{ if}_ [fN \text{ Ef}\% \text{ of } Cfg, \hat{I}, \hat{a}, \text{C}, \hat{E} j \text{ A} E-\frac{3}{4} \text{CE} \delta \text{ \% } \hat{E}, \delta \hat{S}g \text{"} \text{E}, \cdot, \hat{e}, \pm$   
 $, \hat{A}, \hat{e}, \hat{A}, \langle, \hat{e} \text{ BD3DLIGHT } \backslash \text{c}^i \hat{I}, \hat{a} \hat{U}\hat{Z} \text{ , } \cdot, \hat{e} \cdot \hat{u} \text{ CE} \hat{u} fxfNfgf<, \hat{I} \text{ Af, fff<, \text{C}, \text{C} \text{ CE} \delta \text{ CE}^1, \hat{U}, \hat{A}, \hat{I} \cdot \hat{u} \text{ CE} \hat{u}, \delta \cdot \backslash, \mu, \hat{A}, \text{C}, \hat{e} \text{ B}, \pm$   
 $, \hat{I} fxfNfgf<, \hat{I} \text{ A} - \text{LE} \hat{u} \text{ CE} \delta \text{ CE}^1, \hat{I}, \frac{1}{2}, \text{B}, \hat{E} \cdot \text{W} \text{ E}, \hat{E} -\text{B}, \hat{3}, \hat{E}, \text{ , } \hat{A}, \hat{I}, \hat{E}, \text{C}, \hat{E}, \text{C} \text{ B} fxfNfgf<, \hat{I}, \cdot, \times, \hat{A} f [f<fh \hat{A} \cdot \text{W}, \hat{A} \hat{Z} w \text{"}, \hat{e} \text{ B}, \pm$

,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%Ê,ðŽ{·,±,Æ,ª,Ä,«,é Bf|  
 fCf“fgf%ofCf,âfXf|fbfgf%ofCf,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,É,é BCEð,ì<,³,İŽÝCE, ŠCEW ”,É,æ,Á,Ä•İ%»,·,é BCEð,ì“—,½,Á,Ä,ç  
 ,é’,“\_,©,çCEøCE¹,Û,Ä,ì<—£,ðd,Æ,·,é,Æ AZÝ,İ•û’ðŽ®,ª —§,·,é B

$$attenuation = attenuation_0 + attenuation_1 \times d + attenuation_2 \times d^2$$

**D3DLIGHT** \‘ç’ì,İžc,è,ìf f“fo idvTheta,“,æ,ÑdvPhi j,Í A,»,ê,¼,ê AfXf|fbfgf%ofCf,Ä—p,ç  
 ,é%øe,ÆCEð ü,İŠp“x,ð’èç“,·,é BCE, CEW ” idvFalloff j,Í AfXf|fbfgf%ofCf,İ%øe,ÆCEð ü,İŠÖ,É“K—p,³,ê,é B

Æ—¾f,fWf... [f<,É,Í A ó’Ô,ð Ý’è,·,é 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“—1,É A Æ—¾f,fWf... [f<,ð’¼ ÚCEÄ,Ñ o,·,±,Æ,à%Ä”,Ä, ,é B,·,×,Ä,Ì Æ—¾f,fWf...  
 [f<ŠÖ ”,İCEÄ,Ñ o,µ,É,Í **AD3DLIGHTDATA** \‘ç’ì,ª—p,ç,ç,ê,é B

f%ofXf^ ^ — f,fWf... [f<

f%ofXf^ ^ — f,fWf... [f<,Í AŽÀ sCEÄ,Ñ o,µ A,·,È,í,¿ AŽÀ sfobftf@,ðfCEf“f\_Šf“fO,·,éCEÄ,Ñ o,µ,ð ^ — ,·,é BŽÀ sfobftf@,l-½—B,Í Af%ofXf^ ^ — f,fWf... [f<,l ó‘Ô,ð Ý’è,·,é B

ŽÀ sfobftf@,Í A Ä %o,É·İŠ·f,fWf... [f<,É,æ,Á,Ä ^ — ,³,é,é B·İŠ·f,fWf... [f<,Í AŠe’,“ \_ îñ,ÉŠİ,Ä,¢ ,Ä·İŠ·,·,é BfNfŠfbfsf“fO,“—LCEø,É,È,è A,»„İÍ Ū,Æ,È,éfrf... [f|

[fg,İfpf%of [f^,É,æ,Á,ÄfNfŠfbfsf“fO îñ,ª ¶ ¬,³,é,é B,±,±,Äfrf... [“à,É’,“\_ª,Đ,Æ,Ä,à,È,¢ è ‡ Afobftf@‘S’İ,ª—³CEø,É,³,é,é,±,Æ,ª ,é BŽŸ,É A Æ—¾f,fWf... [f<,É,æ,Á,Ä’,“\_ª ^ — ,³,é AŽÀ sfobftf@,İŽwŽ’,É,µ,½,ª,Á,Ä F,ª Ý’è,³,é,é B ÄCEä,Éf%ofXf^ ^ — f,fWf... [f<,ª—½—BfXfgfŠ [f€,ð%ø İ,µ A ¶ ¬,³,é,½’,“ \_ îñ,ð—p,¢

.ÄfvfŠf~fefBfu,ðfCEf“f\_Šf“fO,·,é BfAfvfŠfP [fVf‡f“,ª**Direct3DDevice::Executef** f\fbfh,ðCEÄ,Ñ o,·,Æ AfVf Xfef€,Í A’,“\_fŠXfg,ª·İŠ,¾, ¯,ð·K—v,Æ,µ,Ä,¢,é,İ,© A,Ū,½,İ·İŠ·,Æ Æ—¾,ð·K—v,Æ,µ,Ä,¢,é,İ,©,ð”»’è,·,é B,± ,é,ç,l’€ î,ªŠ@—l,µ,½CEä,É—½—BfŠfXfg,ª%øð“Ç,³,é AfCEf“f\_Šf“fO,ª s,í,é,é B

fXfNfŠ [f“ Ä·W,İ”ÍÍ,Í AffofCfX ifXfNfŠ [f“,Ū,½,ÍfEfBf“fhfE j,İ ¶ ä(0,0),©,ç AffofCfX,İ%E%o(· -1, ,ª-1),Ū,Ä,Ä, ,é B [“x,İ”ÍÍ,Ío iž< ‘ä,İftf f“fg j,©,çl ifofbfN j,Ū,Ä,Ä, ,é B,Ó,½,Ä,İŽOŠpCE’,ª,Ó,½,Ä,İ’,“\_ ,ð<—L,µ,Ä,¢,é è ‡ Af%ofXf^ ^ — ,Í A<—L,³,é,½’,“\_İ Ū ü,É%o^,Ä,½fsfNfZf<,ð·i ”%oñfCEf“f\_Šf“fO,·,é,± ,Æ,ª,È,¢,æ,ª,É s,í,é,é Bf%ofXf^f%ofCfU,Í AŽOŠpCE`,İ,R,Ä,İ’,“\_İ·Ä,Ñ ‡,ð”»’è,µ A—È,İŽOŠpCE`,ðŽæ,è æ,- BfCEf“f\_Šf“fO,³,é,éŽOŠpCE`,Í A,»,l’,“\_ªžžCEv%oñ,è,İCEü,«,É·Ä,ñ,Ä,¢,é,à,à,¾, ¯,Ä, ,é B

**F,ÆftHfO**

Direct3D,É,“,é F,Æ,Í A‘,“\_âfefNfXf`ff Af}fefŠfAf< A-Ê A Æ-¾ AfpfCEfbfg,Ì“Á «,ðŽ!,µ,Ä,ç,é B  
,±,ÌfZfNfVf±f“,Á,Í ADirect3D,ÌfpfCEfbfg,Æ A”½ŽËËö,Ì F,Žæ,è“¾,é’l,É,Â,ç,Ä à-¾,·,é B

fpfCEfbfg\_EfGf“fgfŠ

ftfHfO

**fpfCEfbfg EfGf“fgfŠ**

fAfvfŠfP [fVf±f“Í AIDirect3DRM::CreateDeviceFromSurface,ð—p,¢,ÄDirectDrawfT [ftfFfX,ð•`%æ,·,é,±,Æ,ª,Ä,«,é BDirect3DfAfvfŠfP [fVf±f“Í A•s•K—v,È F,ð—³CEø,É,·,é,½,ß ADirectDraw,Ìfvf%ofCf} fŠ EfT [ftfFfX,ÉDiretDrawfpfCEfbfg,ðfAf^fbf`µ,È,,Ä,Í,È,ç,È,¢ B,±,ÌSDK,ÌDirect3DfTf“fvf< EfR [fh,Ä,Í AfEfBf“fhfE,ªWM\_ACTIVATEf fbfZ [fW,ðŽó,~Žæ,é,½,Ñ,É Afvf%ofCf} fŠ EfT [ftfFfX,É'Í,µ,ÄfpfCEfbfg,ðfAf^fbf`µ,Ä,¢,é BDirect3D,ª8frfbfg,ÌDirectDrawfT [ftfFfX,ÌfpfCEfbfg,É'Í,µ,Ä s,Á,½•Ī X,ð'Ç Ö,·,é,É,Í AIDirectDrawPalette::GetEntriesf f\fbfh,ðŽg—p,·,é B

fAfvfŠfP [fVf±f“Í AŽŸ,Ì,R,Â,Ìftf%ofO,ðŽg—p,µ,Ä A,Ç,Ì,æ,µ,ÉfpfCEfbfg EfGf“fgfŠ,ðfVfXfef€Æ,«—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,¢fgf“fgfŠ,Ä, ,é B
- D3DPAL\_RESERVED Žg—p,Ä,«,È,¢fgf“fgfŠ,Ä, ,é B

,±,é,ç,Ìftf%ofO,Í AWin32•W €,ÌPALETTEENTRY \‘‘ì,ÌpeFlagsf f“fo,É Ý'è,·,é ifpfCEfbfg,Ì«—L•û—@,ðŽw'è,·,é,É,Í AD3DRMPALETTEENTRY \‘‘ì,ÌD3DRMPALETTEFLAGS—ñ“CE^f f“fo,ðŽg,µ,±,Æ,ª,Ä,«,é j BRGBfCEf“f\_Šf“fo,É,“,¢,Ä,àf,fmfNf if%of“fv jfCEf“f\_Šf“fo,É,“,¢,Ä,à AfAfvfŠfP [fVf±f“Í,±,é,ç,Ìftf%ofO,ðŽg—p,·,é,±,Æ,ª,Ä,«,é BRGBfCEf“f\_Šf“fo,Ä,Í A“Ç,ÝŽæ,è ê—p,ÌfpfCEfbfg,ð'ñ<Ÿ,µ,½,Æ,µ,Ä,à Af%of“fv EfCEf“f\_Šf“fo,æ,è,à—],Ü,µ,¢CE%oÈ,ð“¼,é,±,Æ,ª,Ä,«,é B

## ftfHfO

ftfHfO,Í AD3DTLVERTEX \‘c’ì,ìspecularf f“fo,ÉŽw’è,³,ê,½ F,ì AfAf<ftf@—v‘f”•,Á, ,é B”½ŽĚĚö,ÍŽÀ Ū,í RGBFJf%o [L,Á, ,é,Æ 1,í,ê,î A”F”,Æ,í”fog”,ìF,ðŽw,µ,Á,ċ,é B

f, fmfNf Æ—¾f, [fh,Á,ìftfHfO,Í A,» ,ì F,ª •,ċ,Æ,« A,Û,½,ÍĚöĚ¹,ª,È,ċ ,Æ,« ,É,¾, ³Šm,É“@ ì, ,é BĚöĚ¹,ª,È,ċ,Æ,« ,É,Í AftfHfO,ª%½ F,Á, ,Á,Ä,à“ ,¶Ě%öÊ,Æ,È,é B

ftfHfO Ef, [fh,É,Í AfŠfjFA AŽw ” A•½•ûŽw ”,ì,R,Á,ìf, [fh,ª, ,é BĚ» ó,Á,Í AfŠfjFA EftfHfO Ef, [fh, ì,Ý,ªfTf| [fg,³,é,Á,ċ,é B

fŠfjFA EftfHfO,ð—p,ċ,é,Æ,« ,Í AftfHfOĚö%Ê,ìŠJŽn“\_,Æ I— 1“\_ ,ðŽw’è, ,é BftfHfOĚö%Ê,ÍŽw’è,³,ê,½ŠJŽn“\_,©,çŽn,Û,è A I—1“\_Á Á’â—§“x,É’B, ,é,Û,Á A”ä— á”I,É’ %öÁ, ,é B

Žw ”ftfHfO Ef, [fh,Í A,í,, ,©,É”FŽ“,Á,« ,é’ö“x,ìftfHfO,©,çŽn,Û,è A Á’â— §“x,Û,ÁŠö%½% ”“I,É’ %öÁ, ,é BŽw ”ftfHfO Ef, [fh,Á,ÍŽÝ,ìĚöŽ®,ª ¬—§, ,é B

$$f = e^{-(density \times z)}$$

•½•ûŽw ”ftfHfO Ef, [fh,Á,Í AŽw ”ftfHfO Ef, [fh,æ,è,à< }‘¬,ÉftfHfOĚö%Ê,ª“ %öÁ, ,é BŽÝ,ìĚöŽ®,ª ¬— §, ,é B

$$f = e^{-(density \times z)^2}$$

,±,ê,ç,ìĚöŽ®,É, ,ċ,Äe,ÍŽ©‘R’î ”,ì’è,ðŽ,µ A,» ,ì’1,Í—ñ2.71828,Á, ,é BftfHfO,Í“§—¾“x,ð\,Šî € ,Á, ,é i ftfHfO,ì’1,ª ¬,³,ċ,Û,Ç AfIfufWfFfNfg,ÍĚ©, ,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 AŽÝ,ì—á,ÉŽ, ,æ,ª ,É AfJf f%o,©,ç0.8,ì<—£,É, ,é’Ê’u,ìftfHfO,ì’1,Í0.6703,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@'t,Ìff [f^,ð%ð Í,·,é BfAfvfŠfP [fVf±f“,Í AfVf Xfef€,Éff [f^,ðfƒf“f\_fŠf“fo,·,é,æ,ª,ÉŽwŽ!,·,é'Ó,É ó'Ô,ðfZfbfgfAfbfv,·,é **BD3DSTATE** \‘ç!É,Í A,± ,ÌfA [fLfefNf‘ff,ðŽ! ‘,·,éŽÝ,Ì,R,Ä,Ì—ñ“ƒ^,ªŠÜ,Ü,è,Ä,ç,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“Ç,ÝŽæ,è ê—p,ðŽ!,·BOOL'l,Ìftf%ofO,ðŽ ,Á,Ä,ç,é B,± ,Ìftf%ofO,“TRUE,Ì ê ± A,»,èÈ ã,Ì•İ X,Í s,í,è,È,ç B

fAfvfŠfP [fVf±f“,Í **AD3DSTATE\_OVERRIDE**f}fNf ,ðŽg—p,μ,Ä A“Ç,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,»,İ“© 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,ç,È,ç,Æ ÄŽÄ 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,·,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,ðÈ%°,ÉŽ!,· ifVfF [ffBf“fo Ef, [fh,Ìfƒf“f\_fŠf“fo EfXfe [fg,Í**AD3DRENDERSTATETYPE**— ñ“ƒ^,Í**AD3DRENDERSTATE\_SHADEMODE**f f“fo,Ä'è<,ª,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\_STATE\_RENDER**fIfyfR [fh,ð^Ä—Ü,ÉŽg— p,·,é **BD3DOP\_STATE\_RENDER**fIfyfR [fh,Í**AD3DOPCODE**—ñ“ƒ^,Ìf f“fo,Ì,Đ,Æ,Ä,Ä,·,é B,Ü,½ **AD3DSHADE\_GOURAUD**,Í**AD3DSHADEMODE**—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 ,É,·,é,½,B,É AfAfvfŠfP [fVf±f“,Í,à,ª1“x**AD3DSTATE\_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,ÌMiscftfHf<f\_É,·,éD3dmacs.h,Ä'è<,ª,è,Ä,ç,é B,± ,è,ç,Ìf}fNf ,É,Ä,ç,Ä,Í A Step 5: ¼ Úf, [fh,Ìfƒf“f\_fŠf“fo EfXfe [fg,Ì Ý'è v,Ä,à à~¾,μ,Ä,ç,é B

**Direct3Dftf@fCf< EftfH [f}fbfg**

Direct3D,Ìftf@fCf< EftfH [f}fbfg,Í Af fbVf...

AfefNfXf`ff AfAfjf [fVf±f“ EfZfbfg Af† [fU'è`fIfufWfFfNfg,ðŠi”[μ AfAfvfŠfP [fVf±f“ŠÔ,ÅŠÈ'P,É 3D îñ,ðŒðŠ·,·,é,±,Æ,%oÂ”\,Á, ,é BfAfjf [fVf±f“ EfZfbfg,ÌfTf|

[fg,É,æ,Á,Ä A'è` Í,Ý,ÌfpfX,ð•Û'¶,μ AfŠfAf<f^fCf€,É Á ¶,·,é,± ,Æ,ª,Ä,«,é B,Û,½ AfCf“fXf^f“fX,ãŠK'w \`c,àTf|

[fg,³,è,Ä,¨,è A,Đ,Æ,Á,Ìftf@fCf<,Ìff [f^,ð,Đ,Æ,Á,ÌfIfufWfFfNfg if fbVf...,È,Ç j,É,μ,©Ši”[μ,Ä,ç ,È,ç ê ±,Ä,à A,».,ÌfIfufWfFfNfg,É'Î,μ,Ä•j ”,ÌŽQ Æ,ðŽ ,Á,±,Æ,%oÂ”\,Á, ,é B

Direct3D,Ìftf@fCf<-¼,É,Í AŠg'£Žq.x,ª•%oÁ,³,è,Ä,ç,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,ÑConvof.exe j,ªŠÛ,Û,è,Ä,ç,é B

Direct3D,Ì•ÛŽ f, [fhAPI,Í ADirect3Dftf@fCf< EftfH [f}fbfg,ðfIfCfefBfu,ÉŽg—

p,μ AfAfvfŠfP [fVf±f“,É'è` Í,Ý,ÌfIfufWfFfNfg,ðf [fh,μ,½,è AfAfvfŠfP [fVf±f“,ªŠfAf<f^fCf€, ,É ¶ ¬,μ,½f fbVf... îñ,ð ‘,« ž,ñ,¾,è,Ä,«,é B

**3Dfvf fOf%~f“fO,İŠİbZ p**

^È%°,İfZfNfVf±f“,Á,Í A3DfOf%ftfBfbfNfX,đ'g,Ý ž,ñ,¼fvf fOf%fc,đ ‘,‘O,É— %ođ,μ,Ä,“,©,È,-  
,Ä,Í,È,ç,È,ç A,ç,,Ä,©,İZ p“l,ÈfRf“fZfVfg,É,Ä,ç,Ä à-¾,·,é B,±,ê,ç,İfZfNfVf±f“,Á,Í A Ä•WÇEn,â•İŠ,É,Ä,ç  
,Ä' ±“l,ÉŽæ,èμ,Ä,Ä,ç,é B,±,±,Ä,Í Af,fff< A Æ-¾ Afrf...  
[,İfpf%of [f^,È,Ç,İ• L,çfA [fLfefNf`ff,İ Ú ×,É,Ä,ç,Ä,Í à-¾,μ,Ä,ç,È,ç B,±,ê,ç,İfgfsfbfN,É,Ä,ç,Ä Ú,μ,-  
,Í A uDirect3D,İ•ŮŽ f, [fh EfIfufWfEfNfg v,đŽQ Æ,³,è,½,ç B

3DfOf%ftfBfbfNfX,É 'È,μ,½ŠJ”ŽÒ,à ADirect3D,İ•ŮŽ f, [fh,É“Á—L,È î•ñ,đ“¾,é,½,ß,É A,±,İfZfNfVf±f“,É-  
Ú,đ'È,μ,Ä,ç,½,¾,«,½,ç B

### 3D $\mathbb{A} \cdot \mathbb{W} \mathbb{C} \mathbb{E} \mathbb{n}$

3DfOf%oftfBfbfNfX,É,Í A ¶Žè  $\mathbb{A} \cdot \mathbb{W} \mathbb{C} \mathbb{E} \mathbb{n}$ ,Æ%oEŽè  $\mathbb{A} \cdot \mathbb{W} \mathbb{C} \mathbb{E} \mathbb{n}$ ,ì2Ží—p,Ì  
ffJf<fg  $\mathbb{A} \cdot \mathbb{W} \mathbb{C} \mathbb{E} \mathbb{n}$ ,<sup>a</sup>,é B,Ç,ç,ç,Ì  $\mathbb{A} \cdot \mathbb{W} \mathbb{C} \mathbb{E} \mathbb{n}$ ,Á,à A <sup>3</sup>•ûCEü,ÌxŽ<sup>2</sup>,Í%oE,ðCEü,« A <sup>3</sup>•ûCEü,ÌyŽ<sup>2</sup>,Í ã,ðCEü,ç,Ä,ç  
,é B <sup>3</sup>•ûCEü,Ìz  $\mathbb{A} \cdot \mathbb{W}$ ,<sup>a</sup>,Ç,ç,ç,ðCEü,ç,Ä,ç  
,é,©,Í A ¶Žè,Û,½,Í%oEŽè,ÌŽw,ð <sup>3</sup>ÌxŽ<sup>2</sup>•ûCEü,ÉCEü, A,»,é,ð <sup>3</sup>ÌyŽ<sup>2</sup>•ûCEü,É%oñ“],<sup>3</sup>,<sup>1</sup>,é,±,Æ,É,æ,Á,Ä'm,é,±  
,Æ,<sup>a</sup>,Ä,«,é B eŽw,ÌŽ,<sup>a</sup>•ûCEü,<sup>a</sup> AŽ©<sup>a</sup>,ðŽw,μ,Ä,ç,Ä,à,»,μ,Ä,È,,Ä,à A,»,Ì  $\mathbb{A} \cdot \mathbb{W} \mathbb{C} \mathbb{E} \mathbb{n}$ ,Á,Ì <sup>3</sup>ÌzŽ<sup>2</sup>,ìCEü,«,Ä, ,é B  
,±,ÌfZfNfVf±f“,Á,Í AfAfvfŠfP [fVf±f“,Á—~p,·,é,±,Æ,<sup>a</sup>,Á,«,é Direct3D  $\mathbb{A} \cdot \mathbb{W} \mathbb{C} \mathbb{E} \mathbb{n}$ ,Æ  $\mathbb{A} \cdot \mathbb{W}$ ,Ìf^fCfv,É,Á,ç,Ä à-  
¾,·,é B

Direct3D,Ì  $\mathbb{A} \cdot \mathbb{W} \mathbb{C} \mathbb{E} \mathbb{n}$

U  $\mathbb{A} \cdot \mathbb{W}$ ,ÆV  $\mathbb{A} \cdot \mathbb{W}$





3D•İŞ•

3DfOf%oftfBfbfNfX,đ'€ ì,.,éfvf fOf%of€,Á,Í AŽŸ,ì ê ‡,ÉfWfIf fgfŠ•İŠ•,đ—p,¢,é,±,Æ,ª,Ä,«,é B

,.éIfufWfFfNfg,Ì A•Ê,ÌIfufWfFfNfg,É'Í,.,éŠ'ÎÊ'u,đ•\«»,.,é ê ‡ B  
 IfufWfFfNfg,Ì%õñ“] A í æ AfTfCfY•İ X,đ s,µ ê ‡ B  
 Ž'“\_ A•ûĚü A“§Ž'“Š%œ,đ•İ X,.,é ê ‡ B

”C’Ó,ì“\_đ'¼,ì“\_É•İŠ•,.,é,É,Í A4 s4—ñ,ì s—ñ,đ—~—p,.,é BŽŸ,ì—á,Á,Í A s—ñ,đ—p,¢,Ä A“(x, y, z)  
 ,đ V,µ,¢“(x', y', z'),É•İŠ•,.,é B

$$[x' \ y' \ z' \ 1] = [x \ y \ z \ 1] \begin{bmatrix} M_{11} & M_{12} & M_{13} & M_{14} \\ M_{21} & M_{22} & M_{23} & M_{24} \\ M_{31} & M_{32} & M_{33} & M_{34} \\ M_{41} & M_{42} & M_{43} & M_{44} \end{bmatrix}$$

,±,ì—á,Á,Í A“(x', y', z'),đ ¶ ¬,.,é,½,β,É A“(x, y, z),Æ s—ñ,É'Í,µ,Ä^È%°,ì'€ ì,ª s,í,é,é B

$$\begin{aligned} x' &= (M_{11} \times x) + (M_{21} \times y) + (M_{31} \times z) + (M_{41} \times 1) \\ y' &= (M_{12} \times x) + (M_{22} \times y) + (M_{32} \times z) + (M_{42} \times 1) \\ z' &= (M_{13} \times x) + (M_{23} \times y) + (M_{33} \times z) + (M_{43} \times 1) \end{aligned}$$

Ä,ä'ê”Ê“İ,É•İŠ•,É,Í A’Ú“® A%õñ“] A,.,æ,ÑfXfP [fŠf“fO,ª,.,é B^ê“x,É•i ”,ì•İŠ•ĚvŽZ,đ s,µ  
 ,É,Í A,».,é,ç,ìĚø%Ê,đ ¶,Ý o,•i ”,ì s—ñ,đ,Đ,Æ,Ä,ì s—ñ,É,Û,Æ,β,é,İ,æ,¢ B,½,Æ,!,Í A,Đ,Æ,Ä,ì s—  
 ñ,đ ì ¬,µ,Ä A“(•Ä,Ñ,ì’Ú“®,Æ%õñ“],đ s,µ,±,Æ,ª,Ä,«,é B

s—ñ,Í A—ñ,đ ‡”Ó,É•Ä,×,ÄŽw'è,.,é B,½,Æ,!,Í AŽŸ,ì s—ñ,đ”z—ñ,Ä•\«»,.,é ê ‡,đ l,!,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',.”z—ñ,ÍŽŸ,ì,æ,µ,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“„Á,Í ADirect3D,đ'Ê,µ,ÄfAfvfŠfP [fVf†f“„©,ç—~—p,Ä,«„é3D•İŠ•,É,Ä,¢,Ä à—¾,.,é B

Ú“®  
%õñ“]  
fXfP [fŠf“fO

•İŠ•,É,Ä,¢,Ä,Í A,±,ìfhfLf...f f“fg,ì'¼,ì”ª,Ä,äŽæ,èµ,Ä,Ä,¢,é B•ŮŽ f, [fh,É,.,éfrf... [f] [fg,É,Ä,¢,Ä à—¾,µ,½fZfNfVf†f“ u•İŠ• v,É,Í A•İŠ•,É,Ä,¢,Ä,ìrê”Ê“İ,È îñ,ªL Ú,ª,é,Ä,¢,é BftfĚ [fĚ•İŠ•,É,Ä,¢,Ä,Í u•İŠ• v,đŽQ Æ,ª,é,½,¢ B,ç,ç,ç,ìfZfNfVf†f“„à•ŮŽ f, [fh,ìAPI,É,Ä,¢,Ä à—¾,µ,Ä,¢,é,ª A•İŠ•,ìfA [fLfefNfVf†f“”Ž®,Í A•ŮŽ f, [fh,Æ'¼ Úf, [fh,ì—¼•û,É“K—p,.,é,±,Æ,ª,Ä,«„é B,ª,ç,É AfZfNfVf†f“ uDirect3DfA [fLfefNfVf†f v,É,Í A•İŠ•f,fWf... [f,É,Ä,¢,Ä à—¾,µ,½ u•İŠ•f,fWf... [f, v,Æ,¢,µfZfNfVf†f“„ªSÜ,Û,é,Ä,¢,é B

Ú

ŽŸ, ÌŠ, í A (x, y, z), ð V, µ, c (x', y', z'), ÉÚ, ·, é B

$$[x' \ y' \ z' \ 1] = [x \ y \ z \ 1] \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ T_x & T_y & T_z & 1 \end{bmatrix}$$

„

„, ±, ìfZfNfVf±f“, Á à-¾, µ, Ä, ç, é•İŠ, í A ¶Žè À•WEn, É, „, é ê ±, ð‘z’è, µ, Ä, ç, é, ½, ß A‘¼, ìfVfXfef€, ÁŽg—  
p, ³, é, é•İŠ s—ñ, Æ, í‘Û, È, é%oÁ”\ «,ª, ,é B

ŽŸ, ì•İŠ, í A“(x, y, z), ðxŽ², ðšî € , Æ, µ, Ä%oñ“, ³,ª A V, µ, ç“(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, Á, í AyŽ², ðšî € , Æ, µ, Ä“\_„ð%oñ“, ³,ª, 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, Á, í AzŽ², ðšî € , Æ, µ, Ä“\_„ð%oñ“, ³,ª, é B

$$[x' \ y' \ z' \ 1] = [x \ y \ z \ 1] \begin{bmatrix} \cos \theta & \sin \theta & 0 & 0 \\ -\sin \theta & \cos \theta & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

ãL, ì s—ñ‘†, ìfMfŠfVff•¶Žš, ìfV [f^ ifÆ j, í A%oñ“]Šp“x, ðf%ofWfAf“, Á•\, µ, ½, à, ì, Á, ,é BŠp“x, í A%oñ“]Ž², É%  
Á, ÄCE“\_„ð’, ß, ½ ê ± AŽžCEvŽü, è, É‘a’è, µ, ½’l,ª—p, ç, ç, é, é B

### ***fXfP [fŠf“fO***

ŽŸ, Ì•İŠ•, Í A“(x, y, z), ðx Ay,“, æ, ÑzŽ²•ûĚü, É”C^Ó, ÌŠ,, ‡, ÅfXfP [fŠf“fO, µ A V, µ, Ğ“(x', y', z'), ð ¶ ¬, ·, é 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, Ì3ŽŸĀ³fIfufWfFfNfg, Í Af fbfVf..., Å \ ¬, ³, ê, Ä, ċ, é Bf fbfVf..., Æ, Í-Ê, Ì W ‡, Å, , è A, », ê, ¼, ê, Ì-Ê, Í'P f, Èf|fŠfSf“, Å•Ā», ³, é, é Bf|fŠfSf“, ÌŠi-{Ā^, ÍŽOŠpĀ, Å, , é B•ŮŽ f, [fhfAfvfŠfP [fVf‡f“, Í, R, Å^È ã, Í, “, ðŽ , Åf|fŠfSf“, ð^µ, ±, ±, Æ, ³, Å, «, é, ³ A, », ê, ċ, ÍVfXfefĚ  
, É, æ, Å, Å AfIfufWfFfNfg, ³Āf“f\_Šf“fO, ³, é, é' O, ÉŽOŠpĀ, É•İŠ, ³, é, é B'¼ Úf, [fhfAfvfŠfP [fVf‡f“, Í AŽOŠpĀ, ðŽg—p, µ, È, , Å, Í, È, ċ, È, ċ B

, ±, ÌfZfNfVf‡f“, Å, Í AfAfvfŠfP [fVf‡f“, ÅDirect3Df|fŠfSf“, ðŽg—p, , é•û-@, É, Å, ċ, Å à-¾, , é B

Šô%½“l ðĀ

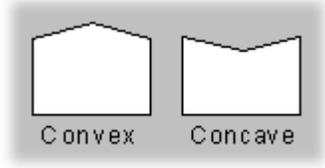
-Ê-@ ü, Æ', “ -@ ü

fVfF [fffBf“fO Ef, [fh

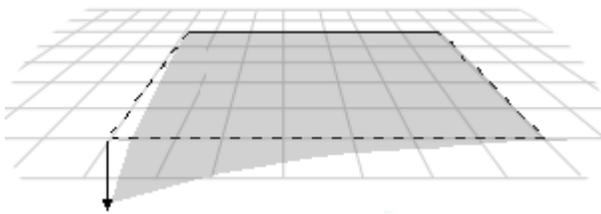
ŽOŠpĀ, î•âŠ@—v'f

**Šd%½“I đCE**

ŽOŠpCE`Í A“Ê ó,©,Â•½-Ê,Â, ,é,Æ,ç,□ AfCEf“f\_Šf“fO,Â—v< ,³,ê,é,Ó,½,Â,Ì đCE ,đ,Â,Ë,É-ž,½,μ,Ä,ç  
 ,é,½,ß A^μ,ç,â,·,çCE`Ìf|ŠfSf“,Â, ,é Bf|fŠfSf“,Ì^Ó,ì,Ó,½,Â,Ì,“\_„đCE<,Ô ü,ª A,Â,Ë,É,»„Ìf|ŠfSf“,Ì“à•”,É, ,é,Æ,«  
 Af|fŠfSf“,Í“Ê ó,Â, ,é,Æ,ç,□ B

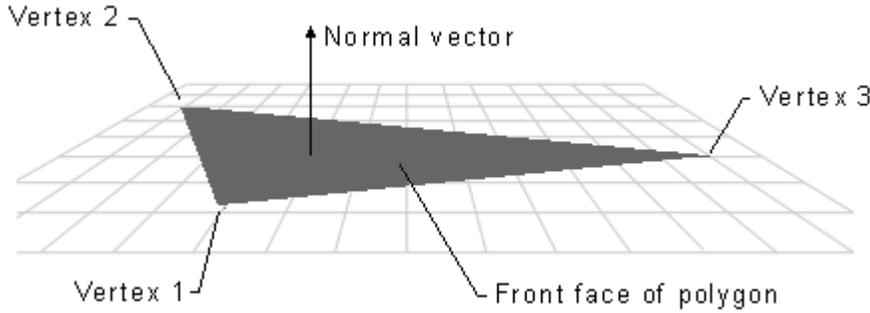


ŽOŠpCE`ì,R,Â,Ì,“\_„Í•½-Ê,đ•\,·,ª A,»„±,É•Ê,Ì,“\_„đ^Ç%Á,·, ,é,±,Æ,É,æ,Á,Ä A—e^Ö,É—§‘Ìf|fŠfSf“,đ ì ¬,·, ,é,±  
 ,Æ,ª,Â,«„é B

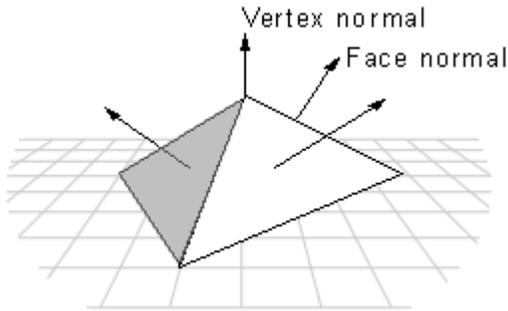


-Ê-@ ü,Æ',“-@ ü

f fbfVf... ä,ì,»ê,¼,ê,ì-Ê,É,Í A ,¼,È-Ê,ðŽ',-@ üxfNfgf<,ª,é B-@ üxfNfgf<,ÛEü,«,Í A',“-ªè<³,ê,Ä,¢  
 ,é ‡ ~,Æ A À•WĈEn,ª%ÉŽè À•WĈEn,Æ ¶Žè À•WĈEn,Û,Ç,ç,Ā, ,é,©,É,æ,Á,ÄĈE`è,³,é,é B-@ üxfNfgf<,ªfrf...  
 [fA,ÉĈEü,©,Á,Ä,¢,é‘ª,ª-Ê,Û,Á, ,é BDirect3D,Á,Í A-Ê,Û,Û,Û,ªŽ< ‘ä,Á, ,é B,Û,½Direct3D,Á,Í A\,©,ç-  
 Ê,ðĈE,½ ê ‡ A•K,ŽžĈEv%õñ,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 AfVfXfefĈ,ªŽ©“@“I,É-Ê-  
 @ ü,ðĈEvŽZ,·,é BfvfXfefĈ,ª-Ê-@ ü,ðŽg—p,·,é,ì,Í Aftf%fbfg EfVfF [ffBf“fO Ef, [fh,Û è ‡,Á, ,é  
 BftfHf“ EfVfF [fffBf“fO Ef, [fh,ÆfOf [ EfVfF [fffBf“fO Ef, [fh,Û è ‡ A,ª,ÑĈEðĈE¹,âfefNfXf’ffĈE  
 ø%Ê,ð §ĈEä,·,é ê ‡,É,Í AfVfXfefĈ,Í,“-@ ü,ðŽg—p,·,é B



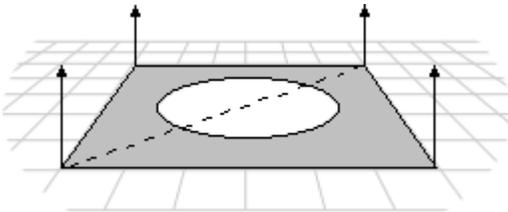
**fVfF [fffBf“fO Ef, [fh**

ftf%fbfg EfVfF [fffBf“fO Ef, [fh,Á,Í AfVfXfef€Í A,Đ,Æ,Á,Ì,“\_ì F,đfvfŠf~fefBfu,Ì¼,Ì-  
 Ê‘S,ì,É,ı »,:é BfOf [ EfVfF [fffBf“fO Ef, [fh,ÆftfHf“ EfVfF [fffBf“fO Ef, [fh,Á,Í A’,“-@ ü,đ-  
 p,ç,Äf|fŠfSf“ EfIfufWfFfNfg,ÌŠOŠİ,đfXf€ [fY,É,μ A,»ÌŠÖ,ÌfXfy [fX,É,Í-  
 × Ú,μ,½’,“-\_ì F,ÆP“x,“}“ü,³,ê,é BftfHf“ EfVfF [fffBf“fO Ef, [fh,Á,Í AfVfXfef€,“  
 Ê,Ìšefsfnfzf<,É“K Ø,ÈfVfF [fffBf“fO¹,đEvŽZ,·,é B

**Note**

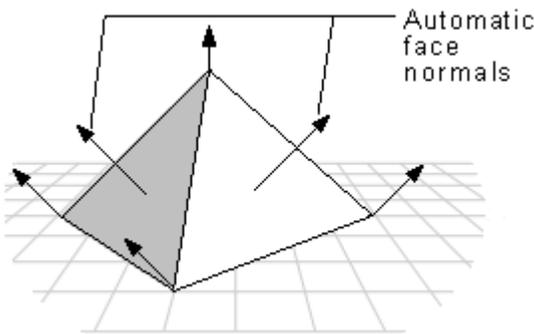
ftfHf“ EfVfF [fffBf“fO Ef, [fh,Í ACE» Ý,ÍfTf| [fg,³,ê,Ä,ç,È,ç B

fOf [ EfVfF [fffBf“fO Ef, [fh,Í AfIfufWfFfNfgŠOŠİ,đfXf€ [fY,É•Ž,μ ACEvŽZ äEø-“I,Á, ,é B,±  
 ,Ì,½,β A¼,ÌfAfvfŠfP [fvf±f“,Í fOf [ EfVfF [fffBf“fO Ef, [fh,đ-~  
 p,·,é B,μ,©,μ AfOf [ EfVfF [fffBf“fO Ef, [fh,Í AftfHf“ EfVfF [fffBf“fO Ef, [fh,Á,Í<N,±  
 ,ç,È,ç ×,©,Èf~fX,đ ¶,¶,é,±,Æ,“ , ,é B,½,Æ,ı,Í A%° } ,ÉŽ,·,æ,μ,É-Ê,ÉŠ@‘S,ÉfXf|fbfgf%ofCfg,““-,½,Ä,Ä,ç  
 ,é ê ± AfOf [ EfVfF [fffBf“fO Ef, [fh,ÆftfHf“ EfVfF [fffBf“fO Ef, [fh,Á,Í‘S,-  
 ^Ü,È,Ä,½E%øÊ,đø,«<N,±,· B



,±,ì ê ± AftfHf“ EfVfF [fffBf“fO Ef, [fh,Á,Í Ašefsfnfzf<,Ì¹,đEvŽZ,μ,ÄfXf|  
 fbfgf%ofCfg,đ•Ž,ı,·,é B’,“-\_ìŠÖ,Éfsfnfzf<,đ’}“ü,·,é fOf [ EfVfF [fffBf“fO Ef, [fh,Á,Í AfXf|  
 fbfgf%ofCfg,đ‘S,-³Ž<,μ,Á,μ,Ü,ç AfXf|fbfgf%ofCfg,“¶ Ý,μ,È,ç,©,Ì,æ,μ,É-Ê,“fEf“f\_Šf“fO,³,ê,é B

ftf%fbfg EfVfF [fffBf“fO Ef, [fh,Á,Í AŽY,Ì,æ,μ,Èfsf%of~fbfh,Í A-Ê,Æ-Ê,“ Ú,μ,Ä,ç  
 ,éÓ ifGfbfW j,“fvff [fv,É•Ž,ı,³,é AfVfXfef€,“Ž@““I,É-Ê-  
 @ ü,đ ¶ - ,·,é B,μ,©,μ AfOf [ EfVfF [fffBf“fO Ef, [fh,âftfHf“ EfVfF [fffBf“fO Ef, [fh,Á,Í A%oA  
 %øe¹,“Ó,Ìžü•Ó,É•đŠ@,³,é A Á I“I,É,ÍÈ-Ê,Á \ - ,³,é,½ŠOŠİ,Æ,È,é B



fOf [ EfVfF [fffBf“fO Ef, [fh,âftfHf“ EfVfF [fffBf“fO Ef, [fh,đ-p,ç,Ä,È-  
 Ê,đ•Ž,μ A,³,ç,Éfvff [fv,É•Ó,đŽ ,Á,½fIfufWfFfNfg,äŠÜ,β,½,ç ê ± AfAfvfŠfP [fvf±f“,Í A•Ó,“K-v,È-  
 Ê,Ì,·,×,Ä,ÌEđ ü,È,Ä,ç,Ä A’,“-@ ü,đ•ı » ,μ,È,·,Ä,Í,È,ç,È,ç B



**ŽOŠpĚ`ì•âŠ®—v'f**

fVfXfef€Í A-Ê,đfĚf“f\_fŠf“fO,·,é Ů AŽOŠpĚ`S'ì,É,»,'ì,“\_ì'Á'¥,đ“K—p,·,é B

F  
”½ŽĚĚõ  
ftfHfO  
fAf<ftf@

ŽOŠpĚ`É%Á,·,ç,ê,½“Á'¥,Í ACE» Ý,ìfVfF [ffBf“fO Ef, [fh,É,æ,Á,Ä'² ®,³,ê,é B

ftf%ofbfg           %½,â•âŠ®,³,ê,É,ĉ B,»,'ì'ä,í,è AŽOŠpĚ`ì Á %  
,ì',“\_ì F,ª-Ê'S'ì,É“K—p,³,ê,é B  
fOf [               ,R,Á,ì',“\_ìŠÔ,ÉfŠfjA•âŠ®,ª s,í,ê,é B  
ftfHf“           Ě» Ý,ì Ą-¾,đ—p,ĉ A-Ê,ìŠefsfNfZf<,É,Á,ĉ  
,Ä',“\_ìfpf%of [f^,ª Ä•]%,  
ç,³,ê,é BftfHf“ EfVfF [ffBf“fO Ef, [fh,ÍĚ» ó,Á,ÍfT  
f| [fg,³,ê,Ä,ĉ,È,ĉ B

F,Ą”½ŽĚĚõ,ì•âŠ®—  
v'f,Í•Ê X,É^µ,í,ê AfJf% [ Ef,fff<,É^È“¶,·,é BRGBfJf% [•ûŽ® **iD3DCOLOR RGB** j,Á,Í AfVfXfef€  
,Í A Ô A—Î A Ä,ì F—v'f,đŽg—p,·,é Bf,fmfNf Ef,ff< **iD3DCOLOR MONO** j,Á,Í AfVfXfef€  
,Í A',“\_ì F,ì Ä,ì—v'f,¾,¯,đŽg—p,·,é B

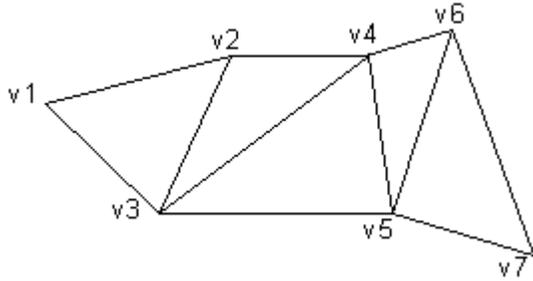
,½,Ą,·,ì A',“\_1,ì F,ì Ô,ì—v'f,ª0.8,Ä A' “\_2,ì Ô,ì—v'f,ª0.4,ì,Ą,« A,±  
,ì,Ô,½,Ä,ì',“\_đĚ<,Ô ü,ì† S,ìfsfNfZf<,ÉfVfXfef€,ªŠ,,è“-,Ä,é Ô,ì—  
v'f,Í AfOf [ EfVfF [ffBf“fO Ef, [fh,ìRGBfJf% [ Ef,fff<,Á,Í0.6,Ä, ,é B

F,ìfAf<ftf@—v'f,Í A“Ą—§,µ,½•âŠ®—v'f,Ą,µ,ÄŽæ,è^µ,í,ê,é B,±  
,ê,Í AfffofCfX Efhf%ofCfo,ª AfefNfXf`ff EfufĚf“ffBf“fO,Û,½,Í“\_ Ê-@,ì A,Ó,½,Ä,ì'Û,È,é•û-  
@,É,æ,Á,Ä“§-¾“x,đfĉf“fvfŠf f“fg,Ä,«,é,½,ß,Ä, ,é B

fAfvfŠfP [fVf±f“,Í ACE» Ý,ìfffofCfX Efhf%ofCfo,ªfTf| [fg,·,é  
•âŠ®ĚŽ®,đŽæ“¾,·,é,½,ß,É **AD3DPRIMCAPS,ldwShadeCapsf** f“fo,đŽQ Ą,·,é,±,Ą,ª,Ä,«,é B

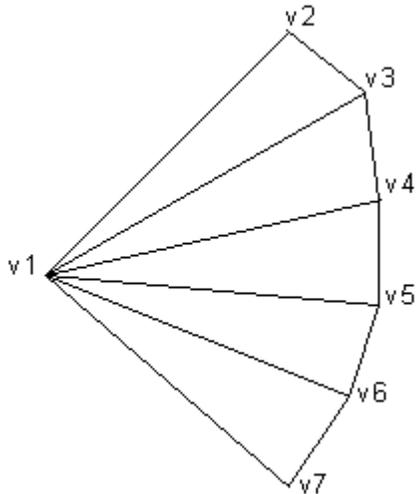
**ŽOŠpĚ, ĭ“WŠJ } ,Æ ĭĚ`**

fT [ftfFX'S`l,đL q,·,é,É,Í AŠeŽOŠpĚ, ĭ',“\_đ,·,×,ÄŽw'è,·,é,ĭ,Ā,Í,È, A“WŠJ } ,â ĭĚ`,đŽg—p,·,é,± ,Æ,ª,Ā,«,é B,½,Æ,;,ĪŽŸ,ĭ,æ,α,È“WŠJ } ,đ'èç',·,é ê ‡ A·K—v,È',“\_Ī7,Ā,¾,¯,Ā, ,é B



fVfXfef€ ,Í A Ā %o,ĪŽOŠpĚ,đ·%oæ,·,é,½,β,É',“\_v0 Av1 Av2,đŽg—p,·,é B2”Ô—  
 Ú,ĪŽOŠpĚ,É,Ív1 Av3 Av2,đ A3”Ô—Ú,ĪŽOŠpĚ,É,Ív3 Av4 Av2,đ—p,č,é B2”Ô—  
 Ú,ĪŽOŠpĚ,ĭ',“\_Ī ‡”Ô,É,È,Ā,Ā,č,È,č,ª A,±,ê,Ī,·,×,Ā,ĪŽOŠpĚ,ªŽžĚv%oñ,è,ĭĚü,«,É·%oæ,³,ê,é,½,β,Ā, ,é B

ĭĚ`,Ī“WŠJ } ,ÆŽ—,Ā,č,é,ª A,·,×,Ā,ĪŽOŠpĚ,ª,Đ,Æ,Ā,ĭ',“\_đçα—L,·,é“\_ªÛ,È,Ā,Ā,č,é B



fVfXfef€ ,Í A',“\_v0 Av1 Av2,đ—p,č,Ā Ā %o,ĪŽOŠpĚ,đ·%oæ,·,é B2”Ô—  
 Ú,ĪŽOŠpĚ,ĭ·%oæ,É,Í A',“\_v0 Av2 Av3,đŽg—p,·,é B

“WŠJ } ,â ĭĚ`,đŽg—p,·,é,É,Í AD3DTRIANGLE \`ç`ĭ,ĭwFlagsf f“fo,Éftf%fo,đŽw'è,·,é B

***fxfNfgf< A', " AfNfH [f^fjIf"***

Direct3D,Á,Í A', " ,ÍÊ'u,ÆEü,« ,ðŽ',µ,Ä,Ç,é BfvfŠf~fefBfu't,İŠe', " ,Í AÊÊ'u,ðŽ',·fxfNfgf< ACEü,« ,ðŽ',·= @üfxfNfgf< AfefNfXf'ff,İ Ä·W A',·,æ,Ñ F,É,æ,Ä,Ä·L q,³,é,é i·ÛŽ f, [fh,Á,Í A,± ,é,ç,İ'l,İ**D3DRMVERTEX** \Ç'İ,ÉŠi"[,³,é,é j B

fNfH [f^fjIf",Í AfxfNfgf<,ð'è<,·,é[x, y, z]'l,É4,Ä,ß,İ-v'f,ð'Ç%Á,·,é B,±,ê,Í A3D%õñ",Ä^è"Ê"İ,É-p,ç,ç,é,Ä,Ç ,é s-ñf f\fbfh,É'ã,í,é,à,İ,Ä, ,é BfNfH [f^fjIf",Í A3D<óŠÖ,İŽ²,Æ A,» ,İŽ²,É%ó^,Ä,½%õñ",ð·,µ,Ä,Ç ,é B,½,Æ,İ,İfNfH [f^fjIf",Í AŽ²(1, 1, 2),Æ1f%oWfAf",İ%õñ",ðŽ',·,±,Æ,ª,Ä,« ,é BfNfH [f^fjIf",Í-ð,É-Ş,Ä îñ,ð·ÛŽ ,µ,Ä,Ç,é,ª A,» ,İ ^%õç,İ ≠ -,Æ·âŠ@,Æ,Ç,ª,Ó,½,Ä,İ'€ ì,ðŽÄ s,·,é,Æ,« ,É"Šö,³,é,é B

fNfH [f^fjIf",İ ± -,Í AfNfH [f^fjIf",ðE< ±,·,é,æ,ª,È,à,İ,Ä, ,é B,Ä,Û,è A,Ó,½,Ä,İfNfH [f^fjIf",İE< ± iq1 o q2 j,Æ,Í A u%õñ"2,É,æ,Ä,ÄŽ²,ðŠî € ,Æ,µ,Ä%õñ",µ,½Eã A%õñ"1,É,æ,Ä,ÄŽ²,ðŠî € ,Æ,µ,Ä%õñ",·,é v,± ,Æ,Ä, ,é B "Šw"İ,É,Í Aq1,Æq2,İ ± -,ðQ = q1 o q2,Æ·<L,·,é B,µ,½,ª ,Ä,ÄQ,Í Aq2,Æq1,ð"K-p,µ,Ä"¼,½1- {,İŽ²,É%ó^,Ä,½%õñ",ðŽ',µ,Ä,Ç,é B

fNfH [f^fjIf"·âŠ@,ðŽg-p,·,é,Æ AfAfvfŠfP [fVf±f",Í A, ,éŽ²,âEü,« ,ç,·Ê,İŽ²,âEü,« ,Ö,İfpfX,ð AfXf€ [fY, ©,Ä ±- "İ,ÉEvŽZ,·,é,±,Æ,ª,Ä,« ,é B

± -,Æ·âŠ@,ð"ŽZ,É-p,ç,é ê ± AfNfH [f^fjIf",Í AfWfIf fgfŠEvŽZ,ð s,ªŠE'P,È·û-@,ð'n·Y,·,é B,±,İ·û- @,Í A^êE©·ŽG,ª,ª,ÉE©,İ,é B,½,Æ,İ,Í A-^,İ,ç,ê,½Eü,« ,É%õñ",·,éEvŽZ,É,Ä,Ç,Ä 1,İ,é B,± ,İ,½,ß,É,Í AŽ²,ðŠî € ,Æ,µ,Är2"x,İ%õñ",ð s,Ä,½Eã AŽ²1,İ%õñ,è,ðr2"x%õñ",³,¹,é,İ,æ,Ç ,Æ,·,é B,µ,©,µ A Ä I'I,ÈfNfH [f^fjIf",Í,İ,©,Ä,Ä,Ç,È,Ç B ± -,ð-p,ç,é,Æ A,Ó,½,Ä,İ%õñ" ,ð'g,Ý ±,İ,¹ ACE%õÊ,Æ,µ,Ä,Ð,Æ,Ä,İfNfH [f^fjIf",ð"¼,é,± ,Æ,ª,Ä,« ,é B,» ,İEã AfXf€ [fY,É^Û s,·,é,½,ß,É ACE³,İfNfH [f^fjIf",©,ç ± -,³,é,½fNfH [f^fjIf",ð·âŠ@,Ö s ,ª,±,Æ,ª,Ä,« ,é B

Direct3D,İ·ÛŽ f, [fh,Í AfNfH [f^fjIf",İ'€ ì,ðŽx%õ±,·,é,ç,·,Ä,©,İŠÖ ",ð-p^Ó,µ,Ä,Ç ,é B,½,Æ,İ,İ**D3DRMQuaternionFromRotation**ŠÖ ",Í A%õñ"Ž²,ð'è<,·,éxfNfgf<,É%õñ"1,ð'Ç%Á,µ **AD3DRMQUATERNION** \Ç'İ,ÄŽ',³,é,éfNfH [f^fjIf",ÉE<%õÊ,ð·Ö,· B,³,ç,É **AD3DRMQuaternionMultiply**ŠÖ ",ÍfNfH [f^fjIf f" ,ð ± -,µ **AD3DRMQuaternionSlerp**ŠÖ ",Í,Ó,½,Ä,İfNfH [f^fjIf",İŠÖ,Ä<...İ,İfŠfjfa·âŠ@,ð s,ª B

·ÛŽ f, [fh EfAfvfŠfP [fVf±f",Ä,Í AfxfNfgf<,âfNfH [f^fjIf",ðµ,ªf^fXfN,ðŠÈ- "º,·,é,½,ß A^Ê%õ°,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“<sup>-</sup>l,É A53frfbfg,ì•,“® ¬ ”“ \_ ,“x,<sup>a</sup>p,¢  
,ç,ê,é BfAfvfŠfP [fVf‡f“,Å,±,ì ,“x,ð•İ X,·,é•K—v,<sup>a</sup>, ,é ê ‡,Í AĈvŽZ,<sup>a</sup>Š®<sup>-1</sup>,μ,½,Æ,«,É53frfbfg,É-ß,<sup>3</sup>,È,-  
,Ä,Í,È,ç,È,¢ B,»,□,μ,È,¢,Æ AffftfHf<fg,ì¹,É^È“¶,·,éfVfXfef€,ìfRf“f| [flf“fg,Í A ^— ,<sup>a</sup>,Ä,«,È,,È,é B

**fpftH [f]f“fX,ì Å“K%»**

3DfOf%oftfBfbfNfX,ð—p,ç,½fŠfAf<f^fCf€ EfAfvfŠfP [fVf‡f“,ð ì ¬,·,éŠJ”ŽÒ,Í,·,×,Ä AfpftH [f] f“fX,ì Å“K%»ÉŠÖ S,ðŽ ,Á,Ä,ç,é B,±,ìfZfNfVf‡f“,Á,Í AfR [fh,©,ç Å ,ìfpftH [f] f“fX,ð“¾,é,½,ß,ìfKfCfhf%ofCf“,ð’ñ<ÿ,·,é B

,±,ìfKfCfhf%ofCf“,ìÈ%°,ìfZfNfVf‡f“,í A,·,×,Ä,ì Direct3D fAfvfŠfP [fVf‡f“,É“K—p,·,é,±,Æ,ª,Å,«é B

ŽÀ sžž.ìfNfŠfbfsf“fO EfefXfq

fvfŠf~fefBfu,ìfofbf` ^—

fefNfXf`ff,ìfTfCY

fqf%ofCfAf“fOf< Eftf%ofO

Direct3DfAfvfŠfP [fVf‡f“,í Af%of“fv Efhf%ofCfo if,fmfNf EfJf%o [ Ef,ff<,ì,½,ß j,ÆRGBfhf%ofCfo,ì,ç ,,é,©,ðŽg—p,·,é,±,Æ,ª,Å,«é BÈ%°,ìfZfNfVf‡f“,Á q,×,ç,é,Ä,ç,éfpftH [f]f“fX,ì Af%of“fv Efhf%ofCfo,É,Ä,ç ,Ä“K—p,ª,é B

f%of“fv EfpftH [f]f“fX,ìfqf“fq

f%of“fv EfefNfXf`ff

Zfofbftf@

fRfs [ Ef, [fh

**ŽÀ sŽž,İfNfŠfbfsf“fO EfefXfg**

fAfvfŠfP [fVf‡f“,İ**Direct3DDevice::Execute**f f\fbfh,đŽg—p,µ,Ä AŽ©“@fNfŠfbfsf“fO,đ—p,¢  
Ä A,Û,½,İfNfŠfbfsf“fO,đ s,ı,,É AfvfŠf~fefBfu,đfCef“f\_Šf“fO,·,é,±,Æ,ª,Ä,«,é B·İŠ·,âf%ofXf^ ^—  
iŠK,Ä,İfNfŠfbfsf“fO EfefXfg,İfvf fZfX,İŽÀ s“x,đ’x,,·,é,½,ß AfNfŠfbfsf“fO,đ s,ı,,É,±,İf f\fbfh,đŽg—  
p,µ,½,Û,ª,ª AfNfŠfbfsf“fO Eftf%ofO,đ Ý’è,µ,½ ê ‡,æ,è,à ,¬,Ä, ,é BŽ©“@fNfŠfbfsf“fO,đ s,ªfAfvfŠfP [f  
Vf‡f“,Ä,İ AfCef“f\_Šf“fO Eft [f^,ªŽ<\_ä,ÉŠ@‘S,ÉŽù,Û,é,±,Æ,đ·Û Ø,µ,È,,Ä,İ,È,ç,È,¢ B,±,ì,½,ß,İ Ä“K,È·ù—  
@,İ A’P f,ÈC< ‡f{Šf... [f€,đf,ff<,É“K—p,µ A,»,é,đ Ä %o,É·İŠ·,·,é,±,Æ,Ä, ,é B,±  
,İ·İŠ·C·%oÈ,đŽQ Æ,·,é,İ Aff [f^‘S‘İ,đ—³Cø,É,·,é,©,Ç,ª,© iff [f^,ª—İæ,İŠO·”,É, ,é ê ‡ j AfNfŠfbfsf“fO,đ s  
,ı,È,¢fo [fWf‡f“,İ**Direct3DDevice::Execute**f f\fbfh,đ—p,¢,é,©,Ç,ª,© i,·,×,Ä,İff [f^,ª—  
İæ“à,É·¶ Ý,·,é ê ‡ j AfNfŠfbfsf“fO Eftf%ofO,đŽg—p,·,é,©,Ç,ª,© iff [f^,İè·”,ª—İæ“à,É, ,é ê ‡ j,đC“è,·,  
é,±,Æ,ª,Ä,«,é B’¼ Úf, [fh,Ä,İ **AD3DSTATUS** \‘c‘İ,İftf%ofO,đ—~—p,µ,Ä A,±,é,ç,İ<@”\  
,đ,Đ,Æ,Ä,İŽÀ sfobftf@’†,É—p^Ó,·,é B,»,µ,Ä**AD3DOPCODE**—  
ñ<“C^,İ**D3DOP BRANCHFORWARD**f f“fo,đŽw’è,µ ACE< ‡f{Šf... [f€,ª—İæŠO,É, ,é,Æ,«,É,İ·İŠ·,đfXfLfbfv,·,é  
,æ,ª,É,·,é BDirect3D,İ·ÛŽ f, [fh,Ä,İ AŽÀ sfobftf@,İŽg—p,đ ,‘-‰o»,·,é,½,ß AŽ©“@“İ,É,±,İ<@”,đ—~—  
p,·,é B

***fvfŠf~fefBfu,lfobf` ^—***

ŽÀ s'†,É Å ,lfŒf“f\_Šf“fO EfpftfH [f}f“fX,ð“¼,é,½,ß,É,Í AfvfŠf~fefBfu,ðfobf` ^—

,µ AfŒf“f\_Šf“fO EfXfe [fg,İ Ĩ X,ð,Å,«é,¾,¯ ,È,-

,·,é B,½,Æ,İ A,Ó,½,Ā,İfefNfXf`ff,ðŽ ,ĀIfufWfFfNfg,<sup>a</sup>, ,é,Æ,« A,Ü,, Å %

,İfefNfXf`ff,ðŽg,□ŽOŠpŒ`ðfOf< [fv%»»,µ A'±,Œ,Ā AfefNfXf`ff,ðĨ X,·,é,½,ß,É•K—

v,ÈŒf“f\_Šf“fO EfXfe [fg,ð Ý'è,·,é B,»,µ,Ā A,Ó,½,Ā,ß,İfefNfXf`ff,ðŽg,□

,·,×,Ā,İŽOŠpŒ`ðfOf< [fv%»»,·,é BDirect3D,ðfTf]

[fg,·,é Å,à'P f,Èfn [fhfEfFfA,Í Afn [fhfEfFfA EfAfufXfgf%ofNfVf±f“ EfŒfCf,, iHAL j,ð'È,µ,Ā AfŒ

f“f\_Šf“fO EfXfe [fg,âfvfŠf~fefBfu,lfobf` ^— ,ð s,□ Bfobf`~½—ß,³Œø—“I,Ā, ,é,Û,Ç AŽÀ s'†,ÉHAL,³Œ  
Ā,Ñ o,<sup>3</sup>,è,é,±,Æ,<sup>a</sup> ,È,,È,é B

**fefNfXf`ff,lfTfCY**

fefNfXf`ff Ef}fbfsf“fO,lfpfH [f}f“fX,Í Af f,fŠ,ì“x,É‘â,«^È‘¶,·,é BfefNfXf`ff,lfLffbfVf...  
EfpfH [f}f“fX,đ Á‘â,É,·,é,½,ß,É,Í A,½,³,ñ,ì•û-@,ª l,!,ç,ê,é B

fefNfXf`ff,đ ¬,³,·,é BfefNfXf`ff,ª ¬,³,ç,Û,Ç ACPU,lfZfJf“f\_Š EfLffbfVf...,É•ÛŽ ,³,é,é%Â”\ «,ª ,,-  
,È,é B

fvfŠf~fefBfu,²,Æ,É^Û,È,éfefNfXf`ff,đŽg—p,µ,È,ç B,Û,½ AŽg—p,·,éfefNfXf`ff,ì †,Éf|  
fŠSf“,đfOf< [fv%»,µ,Ä,“,æ,µ,É,·,é B

,Ä,«,éEÀ,è ³•ûE`,lfefNfXf`ff,đ—p,ç,é B i-@,²256 ~256,lfefNfXf`ff,ª Ä,à ,¬,Ä, ,é B,½,Æ,!,Í A4-  
‡,Í128 ~128,lfefNfXf`ff,đ—p,ç,é ê †,Í A““¶fpfEfbfg,đŽg—p,·,é,æ,µ,É,µ A256 ~256,lfefNfXf`ff1-  
‡,ÉŽû,ß,é,Æ,æ,ç B,±,lfefNfjfbfN,É,æ,Ä,Ä AfefNfXf`ff EfXf fbfsf“fO,ì%ñ ”,đE,ç,·,±,Æ,à,Ä,«,é B‘½,-  
,lfefNfXf`ff,đ•K—v,Æ,µ,È,çAfvfŠP [fvf‡f“,Í A“-R A256 ~256,lfefNfXf`ff,đŽg—  
p,·,é,x,«,Ä,Í,È,ç B,È,°E,ç A‘O q,µ,½,æ,µ,É AfefNfXf`ff,Í,Ä,«,é,¾,¬ ¬,³,—},½,Û,µ,ª,æ,ç,©,ç,Ä, ,é B

**fgf%oCfAf“fof< Eftf%ofo**

**D3DTRIANGLE** \`c`ì,ìwFlagsf f“fo,É,Í AfVfXfef€,“ŽOŠpCE`ì`ê•”,â îCE`ð \ -,·,é Û,É A’,“\_ð Ä—  
p,Ä,«,é,æ,ð,É,·,éftf%ofo,“ Y’è,³,ê,Ä,ç,é B,±,ê,ç,ìftf%ofo,ð—LCEø,ÉŽg,ð  
,Æ A ê ‡,É,à,æ,é,“ A,Í,é,©,É ,‘,É“@,©,·,±,Æ,“Ä,«,é B

fAfvfŠfP [fVf‡f“,ÍŽŸ,ì,Ó,½,Ä,ìftf%ofo,ðŽg—p,μ,Ä Afhf%oCfo,ÉfAfNfZf%ofoCE [fVf‡f“,Ì•û-@,ðŽ! ‘,·,é,±  
,Æ,“Ä,«,é B

**D3DTRIFLAG\_STARTFLAT(len)**

CE» Ý,ìŽOŠpCE`aŽæ,è o,³,ê,é,Æ Afhf%oCfo,à A“WŠJ }  
,â îCE`,©,ç ACEä,É‘±,ŽOŠpCE`ðlen,“Ž!· ”,¾,¯Žæ,è o,·,±  
,Æ,“Ä,«,é B

**D3DTRIFLAG\_ODD,ÆD3DTRIFLAG\_EVEN**

fhf%oCfo,Í AŽOŠpCE`,©,ç,ð,Æ,Ä,ì V,μ,ç“,“\_¾,¯,ð Äf [fh,·,ê,î  
,æ, A¼,ì,Ó,½,Ä,ì’,“\_ÍfCEf“f\_Šf“fo,³,ê,½ Ä V,ìŽOŠpCE`,©,ç Ä  
—~—p,·,é B

**%oÄ”\,ÈCEÀ,è Ä ,,ìpftfH [f}**

f“fX,ð“¾,é,É,Í AfAfvfŠfP [fVf‡f“,©,ç AD3DTRIFLAG\_STARTFLATftf%ofo,Æ AD3DTRIFLAG\_ODDftf%ofo,Û  
,½,ÍD3DTRIFLAG\_EVEN,ì—¼•û,ðŽg—p,·,é B

D3DTRIFLAG\_STARTFLATftf%ofo,ðf`fFfbfN,μ,È,çfhf%oCfo,à ,é,ì,Ä A,±,ìftf%ofo,ðŽg—p,·,é,É,Í’ ^Ó,“K—v,Ä,  
,é B,±,ìftf%ofo,ðf`fFfbfN,μ,È,çfhf%oCfo,ðŽg,ðfAfvfŠfP [fVf‡f“,Ä,Í AfCEf“f\_Šf“fo,³,ê,é,í,,ìf|  
fŠfSf“,“fCEf“f\_Šf“fo,³,ê,È,ç ê ‡,“ ,é B

fAfvfŠfP [fVf‡f“,Í AD3DTRIFLAG\_ODD,âD3DTRIFLAG\_EVENftf%ofo,ð—p,ç,é‘O,É A

D3DTRIFLAG\_STARTftf%ofo,ðŽw’è,μ,È,,Ä,Í,È,ç,È,ç BD3DTRIFLAG\_STARTftf%ofo,ðŽg—  
p,·,é,Æ Afhf%oCfo,Í,·,×,Ä,ìŽOŠp’,“\_ð Äf [fh,·,é BD3DTRIFLAG\_STARTftf%ofo,ðŽw’è,μ,½CEä,ìŽOŠpCE`Í A  
D3DTRIFLAG\_ODD,ÆD3DTRIFLAG\_EVENftf%ofo,ð—p,ç,Ä•Ó,ð◄—L,·,é,±,Æ,“Ä,«,é B

fifofbfO Efo [fWf‡f“,ìSDK,Í AD3DTRIFLAG\_ODD,ÆD3DTRIFLAG\_EVENftf%ofo,ð—LCEø,É,μ,Ä,ç,é B

Ú,μ,,Í uŽOŠpCE`ì“WŠJ },Æ îCE` v,ðŽQ Æ,³,ê,½,ç B

**f%of“fv EfpftfH [f]f“fX,lfqf“fg**

f, fmfNf if%of“fv j Efhf%ofCfo, dŽg—p, ., é ê ‡ AfAvfVŠfP [fVf‡f“ , í A, Á, «, é, è, Æ, Å, „, lfpftfH [f] f“fX, d“¼, é, ½, B, ÉŽŸ, lřefNfjfbfN, d“K—p, ., é, ×, «, Å, , é B

, ., ×, Ä, lřefNfXf`ff, Á“ , lřpfCEfbfg, d“L, ., é B

fpfCEfbfg, l F ”, d, Á, «, é, ¾, ¯ , È, ., é B64 F`È%°, a Á“K, Á, , é B

f}fefŠfAf<, lf%of“fv EfTfCfY, d16`È%°, É, ., é B

, ., ×, Ä, lř}fefŠfAf< ifefNfXf`ff Efnf“fhf<, d œ, j, d“^ê, É, µ AfefNfXf`ff, aJf%o [fŠf“fO, dŽw`è, Å, «, é, æ, □ , É, ., é B, ½, Æ, , l A, ., ×, Ä, lř}fefŠfAf<, d” , µ, Ä A”½ŽÈfppf [ , d“™, µ, •Ů, Å B`½, - , lřAvfVŠfP [fVf‡f“ , Á, í A, D, Æ, Å, lřV [f“ , É, Ó, ½, Å`È ä, lř}fefŠfAf<, í•K—v, È, ç B, D, Æ, Å, íCEö, a”½ŽÈ, µ, Ä, ç , éIfufWfFfNfg, Á, , è A, à, a, D, Æ, Å, í”½ŽÈ, µ, È, çIfufWfFfNfg, Á, , é B

, Á, «, é, è, èfNfXf`ff, d -³, ., é B

•i ”, l -³, ÈfNfXf`ff, í A256 ~256fsfNfZf<, l1-‡, lřefNfXf`ff, É ‡, í, 1, é B

-³, ÈŽOŠpCE` , lřOf [ EfVfF [ffBf“fO Ef, [fh, Å A`a, «, ÈŽOŠpCE` , lřtf%ofbfg EfVfF [ffBf“fO Ef, [ fh, ÅfCEf“f\_Šf“fO, ., é B

, D, Æ, Å`È ä, lřpfCEfbfg, dŽg—p, ., é•K—v, a , éŠJ”ŽÖ, í A, D, Æ, Å, lřpfCEfbfg, d}fXf^ [ EfpfCEfbfg, Æ, µ, Ä— p, ç A`¼, lřpfCEfbfg, lř}fXf^ [ EfpfCEfbfg, lřTfufZfbfg, dŠŮ, p, æ, a, É ÝCEv, ., é, l AfR [fh, d Å“K%o», ., é, ‡ , Æ, a, Å, «, é B

**f%of“fv EfefNfXf`ff**

f%of“fv Efhf%ofCfo,đŽg,ᵐfAfvfŠfP [fVf‡f“,Á,Í AfefNfXf`ff,ì F ”,đĀÀ`è,·,é,×,«,Á, ,é Bf,fmfNf ,ìfefNfXf`ff,Á—p,ç,ç,é,é F,Í AfĒf“f\_fŠf“fO,ì%oß’ò,Á,»),¼,ê“ÆŽ©,ìf<fbfNfAfbfv Efe [fuf<,đ•K—v,Æ,·,é BfV [f“,ìfĒf“f\_fŠf“fO’†,É”ñ í,É‘½,,ì F,đŽg—p,·,éAfvfŠfP [fVf‡f“,ì ê ‡ AfVfXfef€,í,½,-³,ñ,ìf<fbfNfAfbfv Efe [fuf<,đŽQ Æ,μ,È,,Á,Í,È,ç,, AfLfffbfVf...<sup>a</sup> \\*<sup>a</sup>,É“- ,©,È,ç B,Ü,½ AfefNfXf`ff“Žm,Á,È,é,×, F,đ:ᵐ—L,·,é,æ,ᵐ,É,·,é,×,«,Á, ,é B8fıfbfg^È ä,ì F ”,đfTf] [fg,μ,½f%of“fv Efhf%ofCfo,đŽg,ᵐ ê ‡,Á,à AfAfvfŠfP [fVf‡f“,ì,·,×,Á,ìfefNfXf`ff,Í,Đ,Æ,Á,ìpfĒfbfg,É ‡,í ,¹,é,ì,<sup>a</sup>— ‘z“l,Á, ,é B

**Zfobftf@**

f%of“fv Efhf%ofCfo,ðŽg—p,·,éfAfvfŠfP [fvf‡f“,Í AfV [f“,“O,©,çEä,ë,ÖfEf“f\_fŠf“fO,³,ê,é,æ,µ  
,ÉZfobftf@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 AZfobftf@,ð—~p,µ,½fvfŠf~fefBfu,É,Í AŠî €  
,Æ,È,éfXfLfff“f%ofCf“ ä,ÄZfobftf@,É,Ä,ç,Ä,ÌfvfEfXfg,ª s,í,ê,é B‘O,à,Ä,ÄfEf“f\_fŠf“fO,³,ê,½f|  
fŠfSf“,Ì,½,ß,ÉfXfLfff“f%ofCf“,“%B,é,Ä,ç,é ê ‡,Í AfVfXfef€,ªf|fŠfSf“,ð ,‘,©,ÄEø—“I,ÉŽæ,è æ,-  
BZfobftf@fŠf“fO,É,æ,Ä,ÄpftfH [f}f“fX,Í%ü“P,³,ê,é,ª A,±  
,ÌfefNfjfbfN,Í AfV [f“,“%½“x,àfI [fo [fhf [ ,ð•K—v,Æ,·,é,Æ,«,É Ä,àEø%É“I,Ä, ,é BfI [fo [fhf [ ,Æ,Í  
AfXfNfŠ [f“ EfsfNfZfç,ª“%æ,³,ê,é•½,Ì%õñ ”,ðŽ!,· BfI [fo [fhf [ ,ð ³Šm,ÉEvŽZ,·,é,±,Æ,Í ç“i,¾,ª A<ßŽ  
—¹,ðç ,ß,é,±,Æ,Í%Ä“^,Ä, ,é BfI [fo [fhf [ ,Ì•½,Ì,ª,æ,è,à ¬,³,ç  
,Æ,«,Í AZfobftf@fŠf“fO,ðfIf,É,·,é,Æ Ä ,,ÌpftfH [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 AZfobftf@,É,Ä,ç,Ä—  
^,¹,ç,é,½fvfŠf~fefBfu EfŠfXfg,ðfefXfg,·,é,±,Æ,É,æ,Ä,Ä AfAfvfŠfP [fvf‡f“,ÌpftfH [f}f“fX,ðEü ä,·,é,±  
,Æ,ª,Ä,«,é B,±,è,É,æ,è A‘Í%ž,·,é<éE”ÍÍ,ÌŽæ“¾,ª ,‘,¬,É s,í,ê,é,æ,µ,É,È,é B

•ÜŽ f, [fhAPI,Í AZfobftf@,Ì Ä“K%»,ð—  
e‘Ö,É,·,é,½,ß A‘O,©,çEä,ë,ÖŽ©“@“I,ÉfV [f“,ð•Ä,×‘Ö,¹,é B,³,ç,É•ÜŽ f, [fh,Í A, ,e‘ö“x,ÌŽÖšpE`,ðŠÜ,þf fbfVf  
...,É,Ä,ç,Ä,Í AfvfŠf~fefBfu,ÌZfefXfg,à s,µ B

Žw`è,µ,½fhf%ofCfo,ÌfI [fo [fhf [ «”ðŽŽ,·,½,ß,É A,±,ÌSDK,ÌD3dtest.exeAfvfŠfP [fvf‡f“,ð—p,ç  
,ÄftfBfç EfE [fg,ÌfefXfg,ð s,µ,±  
,Æ,ª,Ä,«,é iftBfç EfE [fg EfefXfg,Ä,Í A4,Ä,Ìfgf“flfç,ð A‘O,©,çEä,ë A,Ü,½,ÍEä,ë,©,ç‘O,Ö A‘Íð,³,ê,½ Ý  
è,Ä•%æ,·,é j B

,‘,¬,Èfp [fvfifç EfRf“fsf... [f^,Ä,Í AfvftgfEfFfA“I,ÉfVfXfef€ Ef f,f,Š,ÉfEf“f\_fŠf“fO,µ,½,Ü,µ  
,ª Afrffl Ef f,fŠ,Ö,ÌfEf“f\_fŠf“fO,æ,è,à‘¬,ç,±,Æ,ª ,È,,È,ç B,½,¾,µ,±  
,Ì ê ‡ Af\_fufç Efofbftf@fŠf“fO,âfn [fhEfFfA EfAfNfZf%ofE [f^,Ì‘€ i,ð s,µ,±,Æ,ª,Ä,«,È,ç,Æ,ç  
,çftf fŠfbfg,ª, ,é BfVfXfef€ Ef f,fŠ,É,àfrffl Ef f,fŠ,É,àfEf“f\_fŠf“fO,·,é,±,Æ,ª,Ä,« A,ç,ç,ç,ª ,‘,¬,Ä, ,é,©,  
ðfefXfg,·,éfç [f f“,ðŠÜ,ñ,Ä,ç,é,Í AfAfvfŠfP [fvf‡f“,ÌŽÄ sŽž,ÌfVfXfef€,É Ä“K,ÉfAfvf [f ,ð—~p,·,é,±  
,Æ,ª,Ä,«,é B,±,ÌSDK,ÌDirect3DfTf“fvfç EfR [fh,Í A ãL,Ì•ü-@,ðŽÄE»,µ,Ä,ç,é BfXfs [fh,ðfefXfg,·,é•ü-  
@,Í¼,É,È,ç,½,ß A,±,Ì—¼•ü,ÌŽè ‡,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,fŠ,Ì \“ç,ãŽg—p,³,é,Ä,ç,éOf%oftfBfbfN EfAf\_fvf^,ÌŽí—  
p,É‘È“¶,·,é BD3dtest.exe,Í AfvXfef€ Ef f,fŠ,ÌftrfI Ef f,fŠ,É‘Í,·,éfXfs [fh,ÌfefXfg,ÉŽg—p,·,é,±  
,Æ,Í,Ä,«,éª Af† [fU,Ìfp [fvfifç EfRf“fsf... [f^,ÌpftfH [f}f“fX,ð—\ª,·,é,±,Æ,Í,Ä,«,É,ç B

Direct3D,Ì,·,×,Ä,ÌfTf“fvfç,Í AsystemmemoryfRf}f“fhf%ofCf“ EfIfvVf‡f“,ðŽw`è,·,é,Æ AfVfXfef€ Ef f,fŠ,ð  
—~p,µ,Ä“@ i,·,é B,±,ÌfIfvVf‡f“,ÍfR [fh,ÌŠJ” ä—L—p,Ä, ,é B,±  
,é,É,æ,Ä,Ä AfAfvfŠfP [fvf‡f“,ðŽ,”s ifail j,³,¹,é Ü AfVfXfef€,ð’ãŽ~,¹,,ÉfEf“f\_fŠf“fO,ð‘+f,·,é•ü-@,ð‘m,é,±  
,Æ,ª,Ä,«,é B,½,Æ,,ÌDirectDraw,Í AfVfXfef€ Ef f,fŠ EfT [ftfFfX,ÉWIN16f fbfN,ð,©,¬,é,±  
,Æ,Í,È,ç iWIN16f fbfN,Í AGDI,âUSER,Ö,ÌfAfNfZfX,ðfVfŠfAfç%»,µ AIDirectDrawSurface2::Lock,ÆIDirectDr  
awSurface2::Unlockf ffbfh,ÌEÄ,Ñ o,µ,ÌŠÖ,ÉWindows,ðfVfffbfg Ef\_fEf“,·,é BIDirectDrawSurface2::GetDC,ÆI  
DirectDrawSurface2::ReleaseDC,ÌEÄ,Ñ o,µ,ÌŠÖ,É,Ä,ç,Ä,à“—¹,Ä, ,é j B

**fRfs [ Ef, [fh**

f%of“fv Efhf%ofCfo,ð—p,ç,éfAfvfŠfP [fVf‡f“,Í AD3DTEXTUREBLEND—  
ñ“Œ^,İD3DBLEND\_COPYfefNfXf`ff EfufŒf“ffBf“fO Ef, [fh,ðŽw’è,·,é,Æ AfpftfH [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 [ftfFfX,Æ““ŒfsfNfZfç EftfH [f}fbfg,âfpfŒfbfg,ðŽg,í,È,,Ä,Í,È,ç,È,ç BfRfs [ Ef, [fh,ÍŒð,ð“K—  
p,¹,, A’P f,ÉfsfNfZfç,ðfXfNfŠ [f“,ÉfRfs [·,é B,·,Ä,ÉŒðŒ¹,ðŽ{,µ,½fefNfXf`ff,ð—p,ç,éfV [f“,Ä,Í A,±  
,İfefNfjfbfN,ª-ð,É—§,Ä B

8frfbfg EfJf%o [,İŒðŒ¹,ª,È,çf,fmfNf Ef,ffç,ðŽg,²fAfvfŠfP [fVf‡f“,Í AfRfs [ Ef, [fh,É,æ,Ä,ÄfpftfH [f}  
f}f“fX,ªŒü ä,·,é B,µ,©,µ16frfbfg EfJf%o [,ðŽg—  
p,·,é ê ‡,Í AfefNfXf`ff,ð’² ®,·,é ê ‡,Æ,»,ê,Û,Ç·İ,í,ç,È,çfXfs [fh,É,È,é B16frfbfg EfJf%o [,Ä,Í AfefNfXf`  
`ff,İfTfCfY,ª8frfbfg,İ ê ‡,İ2”{,É,È,è A—]Œv,È•%o%×,ªLfffbfVf...,É,©,©,é,½,ß AfpftfH [f}  
f“fX,İ8frfbfg,İfefNfXf`ff,æ,è,à,í,,©,É’á%º,·,é B,±,İ ê ‡,É,à AfVfXfefŒ,İfpftfH [f}  
f“fX,ðŠm”F,·,é,½,ß,ÉD3dtest.exe,ð—~—p,·,é,±,Æ,ª,Ä,«,é B

•ŮŽ f, [fh,iŠT—v

• ŮŽ f, [fh,É,Â,ċ,Ä

,±,łZfNfVf‡f“,Á,Í ADirect3D,ł•ŮŽ f, [fh,É,Â,ċ,Ä à¾,·,é B•ŮŽ f, [fh,Í Afp [f\fiċ EFRf“fsf...  
[f^ ã,Á3DfOf%oftfBfbfNfX,đŽÀĚ»,·,é,½,ß,ÉMicrosoft,“ñ<Ÿ,·,éf\Ÿf... [fVf‡f“,Á, ,é B3DŠÀ««,đ ì ¬,µ AfŠf  
Afċf^fCfĚ,É ^— ,µ,½,ċ ê ‡,Í ADirect3D,ł•ŮŽ f, [fhAPI,đŽg—p,·,é,x,«„Á, ,é B

Direct3D,ÍDirectDraw,ÆŠ@‘S,É“ ‡,³,ê,Ä,ċ,é BDirectDrawIfufWfFfNfg,Í ADirectDraw,ÆDirect3D,ł—  
¼•û,ì óŌ,đ•ŮŽ ,µ,Ä,ċ,é BfAfvfŠfP [fVf‡f“,Í AIDirectDraw::QueryInterface f\fbfh,đ—p,ċ  
,Ä ADirectDrawIfufWfFfNfg,łIDirect3DfCf“f^ [ftfFfCfX,đŽæ“¾,·,é,±  
,Æ,ª,Ä,«„é BDirect3D,ÆDirectDraw,ł“ ‡,É,Ä,ċ,Ä Ú,µ,-  
,Í A uDirect3Dfhf%ofCfo EfCf“f^ [ftfFfCfX v,đŽQ Æ,³,ê,½,ċ B

• ŮŽ f, [fh,łŠi‘b,É, ,éŠT”O,Í A^È‘O,É3DfOf%oftfBfbfNfX,łfR [fh,đ ‘,ċ,½,±,Æ,ì, ,éŠJ”ŽÒ,É,Æ,Á,Ä,Í“é õ,Ÿ [,ċ  
,à,ł,¾,ë,ª B,µ,©,µ A %o,ß,Á3Dfvf fOf%of~f“fO,đ s,ªŠJ”ŽÒ,Í A ufCf“fgf f\_fNfVf‡f“:  
Direct3D,ł•ŮŽ f, [fh EfIfufWfFfNfg v,Æ u3Dfvf fOf%of~f“fO,łŠi‘b:Z p v,đ \ª,É— %ođ,·,é•K—v,ª, ,é B,±  
,ê,©,ċ3Dfvf fOf%of~f“fO,đŽn,ß,éŠJ”ŽÒ,à AŽn,ß,½,ł,©,è,łŠJ”ŽÒ,à A,±,łSDK,ÉŠŮ,Ů,ê,Ä,ċ  
,éfTf“fvfċ EFR [fh,đ’ ^Ó [“Ĉ,ñ,Ä,ċ  
,½,¾,«„½,ċ BfTf“fvfċ EFR [fh,Í AŽÀ Ů,łfAfvfŠfP [fVf‡f“,É•ŮŽ f, [fh,đŽÀ•,·,é•û-@,đŽ!,µ,Ä,ċ,é B

,±,łZfNfVf‡f“,Í A3D fvf fOf%of~f“fO,Ō,łfCf“fgf f\_fNfVf‡f“,Á, ,é B,±,±,Á,Í AMicrosoft,ł3D  
fOf%oftfBfbfNfX,É‘Í,·,é f\Ÿf... [fVf‡f“,Æ A3 ŽŸĚ³ ã,ł“\_đ‘Ě ì,·,é,½,ß,É•K—v,È A,ċ,,Ä,©,łZ p“I,È—  
\”õ’mŽ ,É,Ä,ċ,Ä à¾,·,é B,±,ê,Í ADirect3D,ł•ŮŽ f, [fh,łfvf fOf%of~f“fO,ł %o•à,É,Ä,ċ,Ä à-  
¾,µ,½,à,ł,Á,Í,Ě,ċ B•ŮŽ f, [fh,łfvf fOf%of~f“fO,É,Ä,ċ,Ä,Í A uDirect3D,ł•ŮŽ f, [fh,łf...  
[fgfŠfAfċ v,đŽQ Æ,³,ê,½,ċ B

**fCf“fgf f\_fNfVf‡f“: Direct3D,Ī•ŮŽ f, [fh EfIfufWfFfNfg**

Direct3D,Ī•ŮŽ f, [fh,Ö,ĪfAfNfZfX,Í A,í,,©,È ”,ĪfIfufWfFfNfg,đ’Ê,μ,Ä s,í,ê,é B^È%°,Ī•,É,± ,ê,ç,ĪfIfufWfFfNfg,đfŠfXfgfAfbfv,μ A,»,,é,¼,ê,É,Â,ç,ÄŠÈ’P,É à–¾,.,é B

**fIfufWfFfNfg**

à–¾

Direct3DRMAnimation

Žã,ÉDirect3DRMFramefIfufWfFfNfg,đŽQ Æ,.,é,Æ ,«„É A,Ç,Ī,æ,□ ,É•ĪŠ•,ÉŽè,đ%Á,!,é,©,đ’èç,.,éfIfufWfFfNfg,Ä, ,é B,± ,ĪfIfufWfFfNfg,Í ADirect3DRMVisual ADirect3DRMLight ADirect3DRMViewportfIfufWfFfNfg,Ī^Ê’ u,âCEü,« AfXfP [f<,đfAfjf [fVf‡f“,.,é,½,ß,ÉŽg ,□,±,Æ,ª,Ä,«é B

Direct3DRMAnimationSet

Direct3DRMAnimationfIfufWfFfNfg,đfOf< [fv%», .,éfIfufWfFfNfg,Ä, ,é B

Direct3DRMDevice

fCEf“f\_Šf“fO,Ī o— Í æ,Ī%ÄŽ<ffBfXfvfCEfC,đŽ!,.fIfufWfFfNfg,Ä, , é B

Direct3DRMFace

f fbfVf... ä,Ī,Đ,Æ,Ä,Īf|fŠfSf“,đ•\ ,.fIfufWfFfNfg,Ä, ,é B

Direct3DRMFrame

,± ,ĪfIfufWfFfNfg,Í AfV [f“,ÉfIfufWfFfNfg,đ”z’u, μ AfrfWf... fAf< EfIfufWfFfNfg,Ī^Ê’u,âCEü,«,đ’èç,.,é B

Direct3DRMLight

,±,ĪfIfufWfFfNfg,Í A5Ží— Đ,ĪCEđCEĪ,Ī,Đ,Æ,Ä,đ’èç,μ AfV [f“,ĪfrfWf... fAf< EfIfufWfFfNfg,đ Ê F,.,é,½,ß,É—p,ç ,ç,ê,é B

Direct3DRMMaterial

,±,ĪfIfufWfFfNfg,Í AfT [ftfFfX,ª,Ç,Ī,æ,□ ,ÉCEđ,đ”½ŽÈ,.,é,©,đ’èç,.,é B

Direct3DRMMesh

f|fŠfSf“,Ī-Ê,ĪfZfbfg,đŠÜ,ĐfIfufWfFfNfg,Ä, ,é B -Ê,â’,“\_ĪfOf< [fv,đ’èç i,.,é,½,ß,ÉŽg,□,± ,Æ,ª,Ä,«é B

Direct3DRMMeshBuilder

,±,ĪfIfufWfFfNfg,É,æ,Ä,Ä Af fbfVf...,É, ,éCEÄ X,Ī’,“\_â-Ê,đ’èç i,.,é,±,Æ,ª,Ä,«é B

Direct3DRMObject

Direct3D,Ī’¼,Ī,.,×,Ä,Ī•ŮŽ f, [fh EfIfufWfFfNfg ,ª—p,ç,éŠĪ-{fNf%oX,Ä, ,é B,.,×,Ä,ĪfIfufWfFfNfg,É,ç’Ê,Ê“Á’Ÿ,đ•ŮŽ ,μ,Ä,ç,é B

Direct3DRMPickedArray

,±,ĪfIfufWfFfNfg,Í A— ^,!,ç,ê,½2D,Ī“\_É’Ī%ž,.,éfrfWf... fAf< EfIfufWfFfNfg,đŽ’•Ê,.,é B

Direct3DRMShadow

%oA%oe,đ’èç,.,éfIfufWfFfNfg,Ä, ,é B

Direct3DRMTexture

F,Ī•t,ç,½fsfNfZf<,ª<éCE’,É•Ä,ñ,¾fIfufWfFfNfg,Ä, ,é B

Direct3DRMUserVisual

fVfXfef€,ªñ<Ÿ,μ,È,ç<@”\ ,đŽÄCE»,.,é,½,ß AfAfvfŠfP [fVf‡f“,ª”èç,.,éfIfuf WfFfNfg,Ä, ,é B

Direct3DRMViewport

,±,ĪfIfufWfFfNfg,Í A3DfV [f“,ª,Ç,Ī,æ,□ ,É2DfEfBf“fhfE,ÉfCEf“f\_Šf“fO,ª,é,é,©,đ’èç,.,é B

Direct3DRMVisual

fV [f“,ÉfCEf“f\_Šf“fO,.,é,± ,Æ,ª,Ä,«é,éfIfufWfFfNfg,Ä, ,é BfrfWf... fAf< EfIfufWfFfNfg,Ī%ÄŽ< ó’Ô,Ä,È,- ,Ä,à,æ,ç B,½,Æ,!,Ī AftfCE [f€,đfrfWf... fAf< EfIfufWfFfNfg,Æ,μ,Ä’Ç%oÄ,.,é,± ,Æ,à,Ä,«é B

Direct3DRMWrap

,±,ÏIfufWfFfNfg,Í A-Ê,âf fbfVf...  
,ÏfefNfXf`ff Â•W,ðœvŽŽ,·,é B

‘½,,ÏIfufWfFfNfg,Í A”z-ñfIfufWfFfNfg,ÆœÄ,Î,ê”z-ñ,ÉfOf< [fv%»»,·,é,±,Æ,ª,Ä,«,é B”z-  
ñfIfufWfFfNfg,É,æ,Ä,Ä AfOf< [fv’S’Ï,É’€ ì,ð“K-p,·,é,±,Æ,ª-eˆÖ,É,È,é B”z-ñfIfufWfFfNfg,ðŽg,ª,±  
,Æ,ª,Ä,«,éCOMfCf“f^ [ftfFfCfX,É,Í AGetElement,ÆGetSize f\fbfh,ªŠÜ,Ü,ê,Ä,ç,é B,±,ê,ç,Ïf f\fbfh,Í A”z-ñ  
-v’f,Ö,ÏfCf“f^,Æ”z-ñ,ÏTfCfY,ðŽó,Žæ,é B”z-ñfCf“f^ [ftfFfCfX,É,Ä,ç,Ä Ú,µ,,Í A uDirect3DRM”z-  
ñfCf“f^ [ftfFfCfX v,ðŽQ Æ,ª,ê,½,ç B

**IFuFwFfNfg,ÆfCf“f^ [ftFfCfX**

IObjectName::QueryInterface, AfIfuFwFfNfg, a, » , ÌfCf“f^ [ftFfCfX, ðfTf| [fg, µ, Ä, Ç, é ê ÷, Ì, Ý A—  
LÆø, ÈfCf“f^ [ftFfCfX, Ö, Ìf|  
fCf“f^, ðŽæ“¾, ·, é B, µ, ½, a, Ä, Ä AIDirect3DRMDevice::QueryInterface, ðÆÄ, Ñ o, µ, ÄIDirect3DRMWinDevicefCf“f^  
[ftFfCfX, ðŽó, Žæ, é, ±, Æ, Í, Ä, «, é, a AIDirect3DRMVisualfCf“f^ [ftFfCfX, ðŽó, Žæ, é, ±, Æ, Í, Ä, «, È, Ç B

**IFuFwFfNfg¼ fTf| [fg, ³, ê, éfCf“f^ [ftFfCfX**

- Direct3DRMAnimation IDirect3DRMAnimation
- Direct3DRMAnimationSet IDirect3DRMAnimationSet
- Direct3DRMDevice IDirect3DRMDevice, IDirect3DRMWinDevice
- Direct3DRMFace IDirect3DRMFace
- Direct3DRMFrame IDirect3DRMFrame, IDirect3DRMVisual
- Direct3DRMLight IDirect3DRMLight
- Direct3DRMMaterial IDirect3DRMMaterial
- Direct3DRMMesh IDirect3DRMMesh, IDirect3DRMVisual
- Direct3DRMMeshBuilder IDirect3DRMMeshBuilder, IDirect3DRMVisual
- Direct3DRMShadow IDirect3DRMShadow, IDirect3DRMVisual
- Direct3DRMTexture IDirect3DRMTexture, IDirect3DRMVisual
- Direct3DRMUserVisual IDirect3DRMUserVisual, IDirect3DRMVisual
- Direct3DRMViewport IDirect3DRMViewport
- Direct3DRMWrap IDirect3DRMWrap

ŽŸ, ÌfTf“fvf< fR [fh, Ä, Í A, Ð, Æ, Ä, ÌDirect3DRMDeviceIfuFwFfNfg, É, Ó, ½, Ä, ÌfCf“f^ [ftFfCfX, ð ¶ ¬, ·, é•û—  
@, ð à—¾, µ, Ä, Ç, é B **IDirect3DRM::CreateObject** f\fbfh, Í A %Šú%» , ³, ê, Ä, Ç  
, È, ÇDirect3DRMDeviceIfuFwFfNfg, ð ¶ ¬, ·, é BIfuFwFfNfg, Ì %Šú%» , Í **AIDirect3DRMDevice::InitFromClip  
perf** f\fbfh, È, æ, Ä, Ä s, í, é, é **BIDirect3DRMDevice::QueryInterface** f\fbfh, ÌÆÄ, Ñ o, µ, Í AIDirect3DRMDeviceIf  
ufWfFfNfg, Ö, Ì, Ó, ½, Ä, Æ, ÌfCf“f^ [ftFfCfX iWM\_PAINT, ·, æ, ÑWM\_ACTIVATEf fbFZ [fw, Ö, Ì%ž“šŽž, É—p, Ç  
, ç, é, é, é**IDirect3DRMWinDevicefCf“f^ [ftFfCfX 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^ [ftFfCfX, “~ê, ÌfIfuFwFfNfg, ðŽQ Æ, µ, Ä, Ç, é, ©, Ç, □  
, ©, ð”»è, ·, é, È, Í A, » , é, ¼, é, ÌfCf“f^ [ftFfCfX, È, Ä, Ç, Ä**QueryInterface** f\fbfh, ðÆÄ, Ñ o, µ A•Ö, ³, ê, éf|  
fCf“f^, Ì¹, ð”šŸr, ·, é Bf|fCf“f^, Ì¹, “™, µ, Ç ê ÷ AfCf“f^ [ftFfCfX, Í“ , ¶IfuFwFfNfg, ðŽQ Æ, µ, Ä, Ç, é B

Direct3D, Ì, ·, ×, Ä, Ì•Ÿ f, [fh EfIfuFwFfNfg, Í A’O q, µ, ½fŠfXfg’†, ÌfCf“f^ [ftFfCfX, È%Ä, AIDirect3DRMO  
**bjectfCf“f^ [ftFfCfX, ÆIUnknownfCf“f^ [ftFfCfX, ðfTf| [fg, µ, Ä, Ç**  
, é B, µ, ©, µ AIDirect3DRMObjectfIfuFwFfNfg, Í”z—ñfIfuFwFfNfg, ð’ñ<Ý, µ, È, Ç B”z—ñfIfuFwFfNfg, Í A•K—  
v, a, È, Ç, ½, Æ AfNf%ofXŽ•ÈŽq iCLSID j, ðŽ , Ä, Ä, Ç  
, È, Ç **BIDirect3DRM::CreateObject** f\fbfh, ÌÆÄ, Ñ o, µ, Ä, Í A”z—ñfIfuFwFfNfg, ð Ì ¬, ·, é, ±  
, Æ, Í, Ä, «, È, Ç B, » , Ì”ã, í, é AŞefCf“f^ [ftFfCfX, È, Ä, Ç, Ä^È%°, Ì ¶ ¬f f\fbfh, ðŽg—p, ·, é B

**”z—ñfCf“f^ [ftFfCfX ¶ ¬f f\fbfh**  
IDirect3DRMDeviceArray **IDirect3DRM::GetDevices**

IDirect3DRMFaceArray **IDirect3DRMMeshBuilder::GetFaces**

IDirect3DRMFrameArray **IDirect3DRMPickedArray::GetPick**

, Û, ½, Í

IDirect3DRMLightArray

IDirect3DRMPickedArray

IDirect3DRMViewportArray

IDirect3DRMVisualArray

IDirect3DRMFrame::GetChildren

IDirect3DRMFrame::GetLights

IDirect3DRMViewport::Pick

IDirect3DRM::CreateFrame

IDirect3DRMFrame::GetVisuals

**fIfufWfFfNfg,ÆŽQ ÆfJfEf“fg**

fIfufWfFfNfg,ª ¶ ¬,³,ê,é,Æ A,Â,Ë,É,»,ÏŽQ ÆfJfEf“fg,ªfCf“fNfŠf f“fg,³,ê,é BfAfvfŠfP [fVf‡f“,ªfIfufWfFfNfg,ÏŽq,ð ì ¬,µ,½,è Af f\fbfh,ªfIfufWfFfNfg,Ö,ÏfCf“f^,ð•Ö,µ,½,è,·,é,½,Ñ,É AfVfXfef€ ,Í,»,ÏfIfufWfFfNfg,ÏŽQ ÆfJfEf“fg,ð‘ %oÁ,³,¹,é BfIfufWfFfNfg,Í AŽQ ÆfJfEf“fg,ª0,É,È,é,Û,À í œ,³,ê,é,± ,Æ,Í,È,¢ B

fAfvfŠfP [fVf‡f“,Í AfV [f“,Ïf< [fgfIfufWfFfNfg,É,Â,¢,Ä,Ì,Ý AŽQ ÆfJfEf“fg,ð•ÛŽ ,·,é•K—v,ª ,é B¼,ÏfIfufWfFfNfg,ÏŽQ ÆfJfEf“fg,Í AŽ©“@“I,ÉfVfXfef€,ªŠÇ— ,·,é BfAfvfŠfP [fVf‡f“,Í A I—¹,·,é“O,ÉfV [f“,âfrf... [f] [fg AfffofCfX,ð%ð•ú,·,é,¾,¯,Å,æ,¢ ifAfvfŠfP [fVf‡f“,ªfrf... [f] [fg,ð%ð•ú,·,é,Æ AfVfXfef€,ÏŽ©“@“I,ÉfJf f%,ÏŽQ ÆfJfEf“fg,ð ^— ,·,é j B— ~“I,É,Í A V,µ,¢frf... [f] [fg,ðfffofCfX,É‘Ç%oÁ,·,é ê ‡,Ì,æ,º,É AfAfvfŠfP [fVf‡f“,ÍfffofCfX,ð%ð•ú,¹,·,Éfrf... [f] [fg,ð%ð•ú,·,é,± ,Æ,ª,À,«,é B,µ,©,µ AfffofCfX,ð%ð•ú,·,é,Æ,«,Í A“—l,Éfrf... [f] [fg,ð%ð•ú,µ,È,·,Ä,Í,È,ç,È,¢ B

ŽqfIfufWfFfNfg,âfrfWf...fAf< EfIfufWfFfNfg,ÏŽQ ÆfJfEf“fg,Í Aftfœ [f€ ,É‘Ç%oÁ,³,ê,é,Æ,«,É‘ ,â,³,ê,é B**IDirect3DRMFrame::AddChild**f f\fbfh,ðŽg—p,µ,Ä A ,é efIfufWfFfNfg,©,ç•È,Ï e,ÉŽqfIfufWfFfNfg,ð“Ú“@,·,é,Æ AfVfXfef€,ÏŽ©“@“I,ÉŽQ ÆfJfEf“fg,ð‘€ ì,·,é B

fAfvfŠfP [fVf‡f“,ªfrfWf... fAf< EfIfufWfFfNfg,ðfV [f“,Éf [fh,µ,½œä,Í AfV [f“,ªfIfufWfFfNfg,ÏŽQ ÆfJfEf“fg,ðŠÇ— ,·,é BfAfvfŠfP [fVf‡f“,É,Æ,Á,Ä,Í AfrfWf...fAf< EfIfufWfFfNfg,Í,à,ºs—v,Æ,È,è A%ð•ú,·,é,± ,Æ,ª,À,«,é B

f%ofbfv,Ï ì ¬,Æ“K— p,Í A,Ç,ÏfIfufWfFfNfg,ÏŽQ ÆfJfEf“fg,à‘ %oÁ,³,¹,È,¢ Bf%ofbfsf“fO,Í A‘P,ÉfefNfXf`ff,Ï À•W,ðœvŽZ,·,é,¾,¯, Ì•Ö—,Éf f\fbfh,É,·,¬,È,¢,½,ß,À, ,é B

**IDirect3DRMfCf“f^ [ftfFfCfX**

fAfvfŠfP [fVf‡f“,Í AIDirect3DRMfCf“f^ [ftfFfCfX,İf f\fbfh,đ—p,¢  
,Ä ADirect3DRMfIfufWfFfNfg,đ ì ¬,µ AfVfXfef€ EfEfxf<,İ•İ ”,đŽg—p,·,é,±,Æ,ª,Å,«,é B,±  
,İfCf“f^ [ftfFfCfX,İf f\fbfh,É,Ä,¢,Ä,Í A uIDirect3DRM v,đŽQ Æ,³,ê,½,¢ B

**IDirect3DRMfCf“f^ [ftfFfCfX,İf f\fbfh,Í A^È%°,İfIfufWfFfNfg,đ ¶ ¬,·,é,±,Æ,ª,Å,«,é B**

fAfjf [fVf‡f“,ÆfAfjf [fVf‡f“ EfZfbfg

fffofCfX

-Ê iface j

ftf€ [f€

%Šú%»,³,ê,Ä,¢,È,c^ê”ÊIfufWfFfNfg

€ö

f}fefŠfAf<

f fbVf...,Æf fbVf... frf<f\_

%A%oe

fefNfXf`ff

f† [fU EfrfWf...fAf<

frf... [f] [fg

f%fbfv

**IDirect3DRMAnimation,ÆIDirect3DRMAnimationSetfCf“f^ [ftfFfCfX**

•ŮŽ f, [fh,ÌfAfjf [fVf‡f“,Í AfL [,ÌfZfbfg,Á'è^,³,ê,é BfL [,Æ,Í AfXfP [fŠf“fO'€ ì ACEü,« A, ,é,¢  
,ÍÊ'u,ÉŠÖ~A•t,¯,ç,ê,½f^fCf€'l,Á, ,é BDirect3DRMAnimationfIfufWfFfNfg,Í Af^fCf€'l,É,æ,Á,Ä,Ç,Ì,æ,ð,É•İŠ· ^—  
,<sup>a</sup> s,í,ê,é,©,ð'è^,·,é,à,Ì,Á, ,é BfAfjf [fVf‡f“,Í ADirect3DRMFramefIfufWfFfNfg ã,Á“@ ì,·,é,æ,ð  
,É Ý'è,·,é,±,Æ,<sup>a</sup>,Á,«é B,±  
,Ì,½,ßDirect3DRMAnimationfIfufWfFfNfg,Í ADirect3DRMVisual ADirect3DRMLight A,·,æ,ÑDirect3DRMViewport  
fIfufWfFfNfg,ÌÊ'u E€ü,«,ÌfAfjf [fVf‡f“,âfXfP [fŠf“fO,ÉŽg—p,·,é,±,Æ,<sup>a</sup>,Á,«é B

**IDirect3DRMAnimation::AddPositionKey A**

**IDirect3DRMAnimation::AddRotateKey AIDirect3DRMAnimation::AddScaleKey** f\fbfh,Í A,»,ê,¼,ê“C^Ó,Ì'P^Ê,Ìf^  
fCf€'l,ð Ý'è,·,é B,½,Æ,Ì,Í AfAfvfŠfP [fVf‡f“,^f^fCf€'199,Ìf|  
fWfVf‡f“ EfL [,ð'Ç%Á,µ,½ ê ‡ Af^fCf€'149,Ì V,µ,¢f|  
fWfVf‡f“ EfL [,Í AfAfjf [fVf‡f“,Ì i0,©,çŽn,Ü,é jŠŽnŽž“\_,Æ Á %o,Ìf|fWfVf‡f“ EfL [,Ì,ç,â,ð  
,Ç+ŠÖ,ÁfCxf“fg,ð ¶ ¬,·,é B

fAfjf [fVf‡f“,Í **AIDirect3DRMAnimation::SetTime** f\fbfh,ÌEÄ,Ñ o,µ,É,æ,Á,Ä §Eä,³,ê,é B,±  
,Ìf f\fbfh,Í AfrfWf...  
fAf< EfIfufWfFfNfg,ð V,µ,ÇÊ'u,ÆEü,«É•İŠ·,µ A Á,à<ß,¢fL [,ÌfXfP [f<,É Ý'è,·,é BfAfjf [fVf‡f“ EfL  
[,ð'Ç%Á,·,é f\fbfh,É,·,¢  
,Ä **AIDirect3DRMAnimation::SetTime**,Ìf^fCf€'l,Í AfAfvfŠfP [fVf‡f“,^,·,Á,É'Ç%Á,µ,½fL [,ÌÊ'u,ÉŠì,Ä,¢  
,½“C^Ó,Ì'Á, ,é B

Direct3DRMAnimationSetfIfufWfFfNfg,Í ADirect3DRMAnimationSetfIfufWfFfNfg,ðfOf< [fv%o»,·,é,±  
,Æ,<sup>a</sup>,Á,«é B,±,ê,É,æ,Á,Ä AfAfjf [fVf‡f“ EfZfbfg't,Ì,·,×,Ä,ÌfAfjf [fVf‡f“,Í“^,¶f^fCf€ Efpf%of [f^,ð<□  
—L,µ A·;ŽG,ÈfAfjf [fVf‡f“,Ì Ä ¶,ªŠÈ—  
“%o»,³,ê,é BfAfvfŠfP [fVf‡f“,Í **AIDirect3DRMAnimationSet::AddAnimation** f\fbfh,ð—p,¢  
,ÄfAfjf [fVf‡f“,ðfAfjf [fVf‡f“ EfZfbfg,É'Ç%Á,·,é,±  
,Æ,<sup>a</sup>,Á,«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,Á,Ä §Eä,³,ê,  
é B

ŠÖ~A î·ñ,É,Á,¢  
,Ä,Í A **IDirect3DRMAnimation** v,·,æ,Ñ **IDirect3DRMAnimationSet** vfCf“f^ [ftfFfCfX,ðŽQ Æ,³,ê,½,¢ B

**IDirect3DRMDevice,ÆIDirect3DRMDeviceArrayfCf“f^ [ftFfCfX**

fCf“f\_Šf“fO,³,ê,½,·,×,Ä,Ì o—ÍE`Ž@,Í A o—ÍfffofCfX,ÆŠÖ`A,µ,Ä,ç,É,-  
,Ä,Í,È,ç,È,ç BfffofCfX EfIfufWfFfNfg,Í AfCf“f\_Šf“fO,Ì o—Í æ,ì%oÄŽ<ffBfXfvfCfC,ð·\,µ,Ä,ç,é B

fCf“f\_Šf“fO,Ì“@ ì,Í AŽw`è,³,ê,½ o—ÍfffofCfX,Ìf^fCfv,É`È‘¶,·,é BfffofCfX,É·j ”,Ìfrf... [f|  
[fg,ð`è<,µ A“`Žž,É·Ž,³,ê,éfv [f“,É`Û,È,éŽ<“\_,ð—^!,é,±,Æ,à,Ä,ç,é B,Û,½ AfffofCfX,Í,ç,-  
,Ä,Ä,àŽw`è,Ä,« A“`¶fV [f“,É·j ”,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 ÚfCf“f\_Šf“fO,·,éfffofCf  
X,ðfTf| [fg,·,é B

ŠÖ`A î·ñ,É,Ä,ç,Ä,Í uIDirect3DRMDevice v,ðŽQ Æ,³,ê,½,ç B

,±,ìfZfNfVf±f“,Ä,Í ADirect3DfCf [fW,ð o—ÍfffofCfX,É·Ž,·,é Û,É—LÆø,ÈfIfvfVf±f“,É,Ä,ç,Ä à-¾,·,é B

fNfIfŠfefB

fJf%o [ Ef,fff<

fEfBf“fhfEŠÇ—

**fNfIfŠfefB**

fV [f“,â,»,ì \ ¬—v‘f,Í AfffofCfX,É,æ,Á,Ä AfŠfAf<,³,ð,³,Ü,’,Ü,É•Í,,ÄfEf“f\_Šf“fO,·,é,±  
,E,ª,Ä,«,é BŠef fbfVf...,Í“ÆŽ©,ÌfNfIfŠfefB,ðŽ ,Á,Ä,¢,é,ª Af fbfVf...,ª—  
p,Á,«,éfNfIfŠfefB,Ì ãEÄ,ÍfffofCfX,ÉˆÈ“¶,·,é B

fAfvfŠfP [fVf±f“,Í AIDirect3DRMDevice::SetQuality,â IDirect3DRMMeshBuilder::SetQuality f\fbfh,ð—p,¢  
,Ä AfffofCfX,ÌfEf“f\_Šf“fO “x,ð•Í X,·,é,±  
,E,ª,Ä,«,é BfffofCfX,ÌfEf“f\_Šf“fO ,“x,ðŽæ“¼,·,é,É,Í AIDirect3DRMDevice::GetQuality,â IDirect3DRMMeshBu  
ilder::GetQuality f\fbfh,ðŽg—p,·,é B



**fEfBf“fhfEŠÇ—**

³,µ,Ć€ ì,ð s,σ,½,ß,É AfIfyfŒ [fefBf“fO EfVfXfef€  
,©,çWM\_MOVE,âWM\_PAINT AWM\_ACTIVATEf fbfZ [fW,ðŽó, Žæ,Á,½,Æ,« AfAfvfŠfP [fVf±f“,Í **AIDirect3  
DRMWinDevice::HandlePaint**,æ,Ń**IDirect3DRMWinDevice::HandleActivate**f f\fbfh,ðŽg—  
p,µ,ÄDirect3D,É'É'm,µ,É,,Ä,Í,É,ç,É,Œ B

ŠÖ`A î•ñ,É,Â,Œ,Ä,Í u**IDirect3DRMWinDevice** v,ðŽQ Æ,³,ê,½,Œ B

**IDirect3DRMFace, AIDirect3DRMFaceArray**  $fCf^f^{\wedge} [ftfFfCfX$

-Ê,Í Af fbfVf... ã,ì,Đ,Æ,Â,Ï|fŠfSf“,đ•\,μ,Ä,¢,é BfAfvfŠfP [fVf‡f“,Í AIDirect3DRMFace::SetColor A  
IDirect3DRMFace::SetColorRGB AIDirect3DRMFace::SetTexture A IDirect3DRMFace::SetMaterial f f\bfh,đŽg—  
p,μ,Ä A-Ê,Ï F,âfefNfXf^ff Af}fefŠfAf<,đ Ý’è,·,é,±,Æ,ª,Ä,«,é B

-  
Ê,Í AIDirect3DRMFace::AddVertex,âIDirect3DRMFace::AddVertexAndNormalIndexed f f\bfh,É,æ,Á,Ä A’,“\_,©,ç  
 \ -,³,ê,é BfAfvfŠfP [fVf‡f“,©,ç-  
Ê,Ï’,“\_„đ“Ç,ÝŽæ,é,É,Í AIDirect3DRMFace::GetVertices,âIDirect3DRMFace::GetVertex f f\bfh,đŽg—p,·,é B  
ŠÖ~A î•ñ,É,Â,¢,Ä,Í IDirect3DRMFace v,đŽQ Æ,³,ê,½,¢ B

**IDirect3DRMFrame,ÆIDirect3DRMFrameArrayCf“f^ [ftFfCfX**

ftfCE [f€ ,Æ ,ç ,□ —pCEê,Í AfIfufWfFfNfg,Ì•— ftfCE [f€ ,ðŽQ Æ ,µ ,Ä ,ç ,é ,± ,Æ ,© ,ç —^ ,Ä ,ç ,  
 ,é B•ÛŽ f, [fh,É,“ , ,éftfCE [f€ ,Ì—ðŠ,,Í AfEfBf“fhfE EfVfXfef€ ,É,“ , ,éEfBf“fhfE,Ì—ðŠ,,ÉŽ—,Ä ,ç  
 ,é BfIfufWfFfNfg,Í A’P,Éf [f<fh<óŠÖ,É’u,© ,ê ,é ,Ì ,Ä ,Í ,È , AŠÖ~A , ,éŽQ ÆftfCE [f€  
 ,Æ ,Ì<óŠÖ“I,ÉfŠfCE [fVf‡f“fVfbfv i‘ŠCEÝŠÖCEW j,ðL q , ,é ,± ,Æ ,É ,æ ,Ä ,ÄfV [f“ ,É”z’u ,<sup>3</sup> ,é ,é BftfCE [f€  
 ,ÍfIfufWfFfNfg,ðfV [f“ ,É”z’u , ,é B,Û ,½ AfIfWf...fAf< EfIfufWfFfNfg,ð^Ž , ,é ,Æ ,« ,É ,Í AftfCE [f€  
 ,© ,ç ^É’u ,âCEü ,« ,ðŽæ“¾ , ,é B

•ÛŽ f, [fh,ÌfV [f“ ,Í A eftfCE [f€ ,ðŽ ,½ ,È ,çftfCE [f€ A ,Ä ,Û ,è AftfCE [f€ŠK’w ,Ìfgfbfv,É , ,éftfCE [f€  
 ,É ,æ ,Ä ,Ä’è< ,<sup>3</sup> ,é ,é B ,± ,ÌftfCE [f€ ,Í Af< [fg EftfCE [f€  
 ,ÆCEÄ ,Í ,é ,é BfV [f“ ,Í A’¼ ,Ì , ,× ,Ä ,ÌfIfufWfFfNfg,Ö ,ÌŽQ ÆftfCE [f€ ,à’è< ,µ ,Ä ,ç ,é B

fV [f“ ,Í A’¼ ,Ì , ,× ,Ä ,ÌfIfufWfFfNfg,É ,Ä ,ç ,ÄŽQ ÆftfCE [f€ ,ð’è< ,µ ,Ä ,ç  
 ,é B’æ1fpf%of [f^ ,ÉNULL ,ðŽw’è ,µ ,Ä **IDirect3DRM::CreateFrameŠÖ** ”,ðCEÄ ,Ñ o ,µ AfV [f“ ,ð Ì ¬ , ,é ,±  
 ,Æ ,<sup>a</sup> ,Ä ,« ,é B

ftfCE [f€ ,ð’è< Ì , ,é ,½ ,ß ,É ,Í ADirect3D,Ì ¶Žè Ä•WCEn,ð— %ð ,µ ,È , ,Ä ,Í ,È ,ç ,È ,ç B Ä•WCEn,É ,Ä ,ç ,Ä Ú ,µ ,  
 ,Í u3D Ä•WCEn v,ðŽQ Æ ,<sup>3</sup> ,é ,½ ,ç B

ŠÖ~A î•ñ ,É ,Ä ,ç ,Ä ,Í uIDirect3DRMFrame v,ðŽQ Æ ,<sup>3</sup> ,é ,½ ,ç B

,± ,ÌfZfNfVf‡f“ ,Ä ,Í AftfCE [f€ ,Æ ,» ,ÌŽg—p—@ ,É ,Ä ,ç ,Ä à—¾ , ,é B

ŠK’w

•İŠ

“@ ,« if, [fVf‡f“ j

fR [f<fofbfNŠÖ ”



•iŠ•

ftfCE [f€ ,îÊ'u,âCEü,«Í A eftfCE [f€ ,©,ç'Š'Í'I,É 1,|,é,±,Æ,à,À,«é B,±,ì ê ‡ A üCE'•iŠ',É,æ,Á,Ä eftfCE [f€ ,©,çŽqftfCE [f€ ,Ö,ì'Š'ÍfxfNfgf<,ðŽæ“¾,µ A eftfCE [f€ ,Ö,ì'Š'ÍfxfNfgf<,ð< ,ß,é B

•iŠ',í4 s4—ñ,ì s—ñ,É,æ,Á,Ä•CE»,<sup>3</sup>,é,é B À•W,ðŽ,.,É,Í A[x, y, z, 1],ì,æ,µ,É—ñ,ì—v'f,ðŽg—p,.,é B

ŽqftfCE [f€ ,É,.,,é À•W,ðvchild,Æ,.,,é,Æ A“-,¶ À•W,ð eftfCE [f€ ,Á•\,·Ž@,Í AŽŸ,ì,æ,µ,É'è<,<sup>3</sup>,é,é B

vparent=vchildTchild

Tchild,Í AŽqftfCE [f€ ,ì•iŠ' s—ñ,Á, ,é B

ŽqftfCE [f€ ,©,çf< [fg EftfCE [f€ ,Ü,Á,ì,·,×,Ä,ì eftfCE [f€ ,ì•iŠ',Í AŽqftfCE [f€

,<sup>a</sup>f [f<fh À•W,ð ¶ ¬,.,é•iŠ',ÆCE<,Ñ•t,¬,ç,ê,Ä,ç,é B,±  
,Íf [f<fh•iŠ',Í AfCEf“f\_fŠf“fO,ì'O,É AŽqftfCE [f€ ã,ìfufWf...fAf< EfIfufWfFfNfg,É'Í,µ,Ä“K—  
p,<sup>3</sup>,é,é BŽqftfCE [f€ ,É'Í,.,é'Š'Í À•W,Í Af,fff< À•W,ÆCEÄ,ì,ê,é,±,Æ,<sup>a</sup>, ,é Bf [f<fh•iŠ',<sup>a</sup> s,í,ê,½ À•W,Í  
Af [f<fh À•W,ÆCEÄ,ì,ê,é B

ftfCE [f€

,ì•iŠ',Í AIDirect3DRMFrame::AddTransform AIDirect3DRMFrame::AddScale AIDirect3DRMFrame::AddRotation

AIDirect3DRMFrame::AddTranslation,ìŠef f\fbfh,É,æ,Á,Ä A'¼ Ú'í X,.,é,±  
,Æ,<sup>a</sup>,Ä,«é B,»,ê,¼,ê,ìf f\fbfh,É,ÍD3DRMCOMBINETYPE—ñ<“CE^,ìf f“fo,ð“n,µ A,Ç,ì,æ,µ  
,ÉfAfvfŠfP [fVf‡f“,”ñ<Ÿ,µ,½ s—ñ,ðCE» Ÿ,ìftfCE [f€ ,ì s—ñ,Æ ‡ ¬,.,é,©,ðŽw'è,.,é B

IDirect3DRMFrame::GetRotation,ÆIDirect3DRMFrame::GetTransformf f\fbfh,Í AftfCE [f€ ,ì%ñ“]Ž<sup>2</sup>,Æ•iŠ' s—  
ñ,ðŽæ“¾,.,é BftfCE [f€ ,ì%ñ“],ð'í X,.,é,É,Í AIDirect3DRMFrame::SetRotationf f\fbfh,ð—~—p,.,é B

f [f<fh À•W,Æf,fff< À•W,ð•iŠ',.,é,É,Í AIDirect3DRMFrame::Transform,ÆIDirect3DRMFrame::InverseTransform  
rmf f\fbfh,ðŽg—p,.,é B

•iŠ',É,Á,ç,Ä,ì' ‡“I,È îñ,Í Afrf... [f] [fg,É,Á,ç,Ä à-¾,µ,½fZfNfVf‡f“ u•iŠ' v,Á“¾,é,±  
,Æ,<sup>a</sup>,Ä,«é B•iŠ'f,fWf... [f<,É,Á,ç,Ä,Í A uDirect3DfA [fLfefNf`ff v,ÉŠÜ,Ü,ê,é u•iŠ'f,fWf...  
\_\_f< vfZfNfVf‡f“ ,ÁŽæ,èµ,Á,Ä,ç,é B•iŠ'CEvŽZ,ìŠT—v,É,Á,ç,Ä,Í A u3D•iŠ' v,ðŽQ Æ,<sup>3</sup>,ê,½,ç B

“@,« if, [fVf‡f“ j

ŠeftfCE [f€,ÍCEÁ—L,ì%õñ“],â‘¬“x,Á“@, B%õñ“],à^Ú“@,à,µ,È,¢ftfCE [f€,Á,í A,±,ê,ç,ì‘@ «,Í0,Á, ,é B,±  
,ê,ç,ì‘@ «,Í AfV [f“,ðfCEf“f\_Šf“fO,µ,ÄfIfufWfFfNfg,ð“@,©,·‘O,ÉŽg—  
p,³,ê A’P f,ÈfAfjf [fVf‡f“,ð ì ¬,·,é,±,Æ,à,Á,«é B

**fR [f<fofbfNŠÖ ”**

ftfCE [f€,Í A,æ,è;ŽG,ÈfAfjf [fVf‡f“,„đŽÀCE»,.,é,½,ß AfR [f<fofbfNŠÖ ”,đfTf] [fg,µ,Ä,¢  
.é BfAfvfŠfP [fVf‡f“,““o~^,µ,½fR [f<fofbfNŠÖ ”,Í Af, [fVf‡f““@ «,“K—p,³,ê,é‘O,ÉftfCE [f€  
,©,çCEÄ,Ñ o,³,ê,é BŠK‘w,É•j ”,İftfCE [f€,ª, ,è A,»„ê,¼,ê,ªfR [f<fofbfNŠÖ ”,ÉŠÖ~A•t, -,ç,ê,Ä,¢  
.é ê ‡,Í AŽqftfCE [f€,İ‘O,É eftfCE [f€,ªCEÄ,Ñ o,³,ê,é B,±,İ,æ,□  
,ÉŠK‘w,Ä,Í AfR [f<fofbfNŠÖ ”,İ,.,x,Ä,ªCEÄ,Ñ o,³,ê,é,Ü,Ä AfCEf“f\_šf“fO,ÍŽÀ s,³,ê,È,¢ B

fR [f<fofbfNŠÖ ”,đ‘Ç%Á,.,é,É,Í AIDirect3DRMFrame::AddMoveCallbackf f\fbfh,đŽg—  
p,.,é BfR [f<fofbfNŠÖ ”,đ í æ,.,é,É,Í AIDirect3DRMFrame::DeleteMoveCallbackf f\fbfh,đŽg—p,.,é B

,±,ê,ç,İfR [f<fofbfNŠÖ ”,đ—p,¢  
.é,Æ Afvf fOf%of€ İ,Ý,İfAfjf [fVf‡f“ EfV [fPf“fX,É V,µ,¢^Ê‘u,âCEü,«„đ Ý‘è,µ,½,è AfV [f“ ä,İ‘¼,İIfu  
fWfFfNfg,İÊ‘u,É,æ,Ä,ÄftrfWf...fAf< EfIfufWfFfNfg,İ“ ì,đ“@“İ,ÉfCf“fvfŠf f“fg,.,é,±,Æ,ª,Ä,«„é B

**IDirect3DRMLight,ÆIDirect3DRMLightArrayCf“f^ [ftFfCfX**

fV [f“,δfŠfAf<,ÉCE©,¹,é,½,ß,É,Í A Æ-¾CEø%Ê,ð—~—p,·,é BfVfXfef€  
,Í AfV [f“,ÌCEðCE¹,É·Í,·,éfIfufWfFfNfg,ÌCEü,«,ÉŠî,Ã,¢  
,Ä A,·,×,Ä,ÌfIfufWfFfNfg,ð Ê F,·,é BfIfufWfFfNfg,Ì F,Í AfCEf“f\_Šf“fO’†,ÉŠeCEðCE¹,Ì%øe<ç,ð l—  
¶,µ,ÄCE^è,³,ê,é B,·,×,Ä,ÌCEðCE¹,Í F,Æ,P“x,ðŽ ,Á,Ä,“è A•Ê X,É•Í%ø»,³,¹,é,±,Æ,ª,Ä,«,é B

fAfVfŠfP [fVf#f“,ÍftfCE [f€,ÉCEð,ðfAf^fbf`,µ AfV [f“,ÉCEðCE¹,ð—^,!,é,±,Æ,ª,Ä,«,é BftfCE [f€  
,ÉfAf^fbf`,³,ê,½CEð,Í AfV [f“ ã,ÌftrWf...fAf< EfIfufWfFfNfg,ð-¾,é,,·,é BftfCE [f€,Í ACEð,ÌÊ’u,ÆCEü,«,Ì—  
¼•û,ð’ñ<ÿ,·,é BCE¾,¢Š,!,ê,Í ACEð,ÍfAf^fbf`,³,ê,½ftfCE [f€,ÌCE“\_,©,ç L,ª,Ä,Ä,¢,-  
BfAfVfŠfP [fVf#f“,Í ACEðCE¹,ªfAf^fbf`,³,ê,½ftfCE [f€,ð“@,©,µ,½,è%øñ“],·,é,±  
,Æ,É,æ,Ä,Ä ACEðCE¹,ÌÚ“@,â•ûCEü“]Š·,ðŠÊ’P,ÉŽÄCE»,·,é,±,Æ,ª,Ä,«,é B

ftrf... [f] [fg,Í,»,ê,¼,ê,ð,Æ,ÄÊ ã,ÌCEðCE¹,ð,à,Á,Ä,¢,é B,µ,©,µ A,ð,Æ,Ä,ÌCEðCE¹,ª,ð,Æ,ÄÊ ã,Ìftrf... [f]  
[fg,É•ÛŽ ,³,ê,é,±,Æ,Í,È,¢ BDirect3DfRf“f] [flf“fg,Ì’ŠCEÝ ì—p,É,Ä,¢,Ä Ú,µ,-  
,Í A ufIfufWfFfNfg,ÌCE< ± « v,ðŽQ Æ,³,ê,½,¢ B

CE» ó,Ä,Í A•ÛŽ f, [fh,Í AfAf“frfGf“fg iŠÄ«CEð j AfffBfCEfNfVf#fif< Afpf%ofCEf< EflfCf“fg Af]  
fCf“fg AfXf|fbfgf%ofCfG,ÌŠŽí—ð,ÌCEðCE¹,ð’ñ<ÿ,µ,Ä,¢,é B

**IDirect3DRMLightfCf“f^ [ftFfCfX,Ìf ffbfh,ÌfŠftf@fCEf“fX,Í A uDirect3DRMLight v,ðŽQ Æ,³,ê,½,¢ B**  
,±,ÌfZfNfVf#f“,Ä,Í ADirect3D,Ä—~—p,·,é,±,Æ,ª,Ä,«,é Æ-¾CEø%Ê,Æ,»,ÌŽg,¢•û,É,Ä,¢,Ä à-¾,·,é B

- fAf“frfGf“fg iŠÄ«CEð j
- fffBfCEfNfVf#fif<
- fpf%ofCEf< EflfCf“fg
- f|fCf“fg
- fXf|fbfgf%ofCfG

**fAf“frfGf“fg iŠÄ«CEö j**

fAf“frfGf“fgCEöCE¹,Í AfIfufWfFfNfg,ìEü,« A^Ê'u AfT [ftfFfX,ì“Á «,È,Ç,ÆŠÖCEW,È,-  
AfV [f“ ã,ì,·,×,Ä,ö Æ,ç,·CEö,Ä,é BfV [f“,ì,·,×,Ä,ì ê Š,ð““¶CEö“x,Ä Æ,ç,·,½,ß AfAf^fbf`³,ê,½ftfCE [f€  
,ìÊ'u,âEü,«,Í d—v,Ä,È,ç B,Đ,Æ,Ä,ìfV [f“,É,Í A·i ”,ìfAf“frfGf“fg Ef%ofCfG,ªCE< ‡,³,ê,Ä,ç,é B

**ffBfCEfNfVf‡fif<**

—LCEüCEöCE¹,ÍCEü,«,ðŽ ,Â,ª A^Ê'u,ÍŽ ,Á,Ä,ç,È,ç BftfCE [f€  
,ÉfAf^fbf`³,ê,é,Æ,·,×,Ä,ÏfufWfFfNfg,ð““P“x,Ä Æ,ç,µ ACEöCE¹,ªfIfufWfFfNfg,©,ç,,Á,Æ—£,ê,½^Ê'u,É, ,é,æ,  
□,ÈCEø%Ê,ð—^,!,é BffBfCEfNfVf‡fif<CEöCE¹,Í A‘¾—z,Ï,æ,□,È%“,—£,ê,½CEöCE¹,ðfVf~f...fCE [fg,·,é,½,ß,É—~—  
p,³,ê,é B

**fpf%ofCf< EflfCf“fg**

fpf%ofCf< Efl

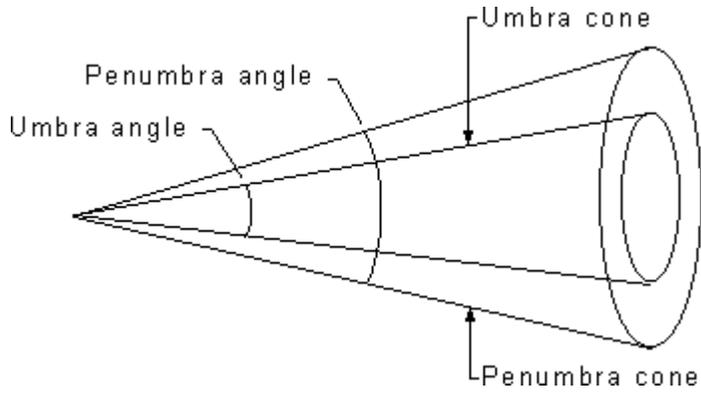
fCf“fgCEðCE¹,Ífpf%ofCf< Efl%ofCf,ÅflfufWfFfNfg,ð Æ,ç,·,ª ACEð,ÌCEü,«ÍCEðCE¹,ÌÊÊ'u,©,çCE'è,³,é,é B,Â,Û,è A  
fpf%ofCf< EflfCf“fgCEðCE¹,É,ÍffBfCefNfVf‡fif<CEðCE¹,Ì,æ,µ,ÉCEü,«ª, ,è A,³,ç,ÉÊÊ'u,àŽ ,Á,Ä,ç  
,é B,½,Æ,,Î Afpf%ofCf< EflfCf“fgCEðCE¹,Ì¼µ,Éf fbfVf...,ª, ,é ê ‡ ACEðCE¹,ÉÊ,µ,Ä,ç,é,Û,µ,Ìf fbfVf...,ª-  
¼,é,,É,é Bfpf%ofCf< EflfCf“fgCEðCE¹,ÌCEf“f\_Šf“fO EflXfs [fh,Í AffBfCefNfVf‡fif<CEðCE¹,Æ“™,Á, ,é B

**f|fCf“fg**

f|fCf“fgEöE¹,Í ACEöE¹,©,ç•úŽĚ ó,ÉCEö,ð•ú,Â BCEö,“-,½,é-Ê,â-@ ü,Ì,»,ê,¼,ê,É,Â,ç  
,Ä A V,µ,ŒEö,ÌfxNfgf<,ðEvŽZ,.,é•K-v,ª, .é,½,ß Afpf%ofEf< Efl  
fCf“fgEöE¹,æ,è,àEvŽŽŽŠÖ,ª,©,©,é B,µ,©,µ A,æ,è ³Šm,È Æ-¾4Eø%Ê,ªŽÀE»,Ä,«é,Ì,Ä AfŠfAf<,È•Ž¹,ª—  
v< ,³,ê,é ê ‡,É—~p,.,é,×,«,Ä, ,é B

**fXf|fbfgf%ofCfg**

fXf|fbfgf%ofCfgCEδCE¹,Í%o~ ó,ÌCEδ,δ ¶ ¬,·,é BCEδ,Í A%o~ ,ì“à•”,É, ,éIfufWfFfNfg,É,ì,Ý“-  
,Ä,ç,é,é B%o~ ,Í,Ó,½,Ä,Ì:P“x,δ ¶ ¬,·,é B’+%o,Ì-¾,é,ç”•ª i-¾•” j,Íf|Cf“fgCEδCE¹,Æ““¶“«„δ,µ AŽü“í,ì”-  
^Ä,ç•ª i^Ä%oe•” j,Í A,»„ìŽü•Ó,Ì^Ä,ç%oe,Æf} [fW,³,é,é B,±  
,ì,Ó,½,Ä,Ì•ª,ìŠp“x,Í AIDirect3DRMLight::GetPenumbra AIDirect3DRMLight::GetUmbra AIDirect3DRMLight::S  
etPenumbra A,·,æ,ÑIDirect3DRMLight::SetUmbra,É,æ,Á,ÄCEÄ X,ÉŽw’è,·,é,±,Æ,ª,Ä,«„é B



**IDirect3DRMMaterial**fCf“f^ [ftfFfCfX

f}fefŠfAf<,Í AfT [ftfFfX,ª,Ç,Ì,æ,º,ÉCEð,ð”½ŽĚ,·,é,©,ð`è<·,·,é Bf}  
fefŠfAf<,É,Í ACEð,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,ÄCE”è,³,ê,é B<“x,Ì¹,Í”½ŽĚ,ÌfnfCf%ofCf%g••ª,Ì“N—¾“x,ðCE”è,·,é B<  
“x,ª5,Ì,Æ,«,Íà‘@“I,ÈŠOŠÌ,É,È,è A,»èÈ ã,Ì¹,Á,Í A,æ,è \_ ,ç,©,ÇŠOŠÌ,Æ,È,é B

fAfvfŠfP [fvf#f“,©,çf}  
fefŠfAf<,Ì•úŽĚ“Á «,ð §CEä,·,é,É,Í A**IDirect3DRMMaterial::GetEmissive**,Æ**IDirect3DRMMaterial::SetEmissive**f f\  
fbfh,ðŽg—  
p,·,é B”½ŽĚ“Á «,Í**IDirect3DRMMaterial::GetSpecular**,Æ**IDirect3DRMMaterial::SetSpecular**f ffbfh,É,æ,Á,Ä A<“  
x,Í**IDirect3DRMMaterial::GetPower**,Æ**IDirect3DRMMaterial::SetPower**f ffbfh,ð—p,ç,Ä §CEä,·,é B

**IDirect3DRMMaterial**fCf“f^ [ftfFfCfX,Ìf ffbfh,ÌfŠftf@fCEf“fX,Í A u**IDirect3DRMMaterial** v,ðŽQ Æ,³,ê,½,ç  
B

**IDirect3DRMMesh,AEIDirect3DRMMeshBuilderfCf^f^ [ftfFfCfX**

f fbfVf...,AE,Í Af|fŠfSf“l-Ê,lfZfbfg,Á \ ¬,³,ê,½frfWf...fAf< EfIfufWfFfNfg,Á,é Bf fbfVf...  
,Í,“\_,lfZfbfg,Æ-Ê,lfZfbfg,ð'è<’,,é i-Ê,Í,“\_,Æf fbfVf...,l-@ ü,É,æ,Á,Ä'è<’,³,é,é j B,c,,Á,©,l-Ê,ÁŽg,í,é,Á,¢  
,é’,“\_,â-@ ü,ð,İ X,.,é,Æ A,»,é,ð<□-L,.,é,.,x,Ä,l-Ê,İŠÖŠ,ª,İ X,³,é,é B

f fbfVf...,Í,“\_,Í Af fbfVf... ä,l-Ê,İÊ'u,ð'è<’,,é B,Ü,½ AfefNfXf`ff Ef}fbfv,İ2D Ä•W,ðÆ'è,.,é,½,ß,É,â-  
p,¢,ç,é,é B

•ÜŽ f, [fh,Á,Í AIDirect3DRMMesh,AEIDirect3DRMMeshBuilder,Ì,Ó,½,Ä,ÌCOMfCf^f^ [ftfFfCfX,ð-~—  
p,µ,Äf fbfVf...,ð'è<’ i,.,é,±,Æ,ª,Ä,«é BIDirect3DRMMeshfCf^f^ [ftfFfCfX,Íñ í,É ,¬,Ä Af, [ftfBf“fO,Ì,æ,µ  
,É•p”É,Éf fbfVf...,ª,İ%»,.,é ê ‡,Í A,±,é,ðŽg—p,.,é,x,«Ä, ,é

**BIDirect3DRMMeshBuilder,Í AIDirect3DRMMeshfCf^f^ [ftfFfCfX,Ì ä•”,É’g,Ý ž,Ü,é,Ä,¢  
,é BIDirect3DRMMeshBuilderfCf^f^ [ftfFfCfX,ÌÆÄ X,Ì-Ê,â’,“\_,ð'è<’ i,.,é Ü,É•Ö—~,Ä, ,é,ª AfVfXfef€  
,Íf(Æf“f\_fŠf“fO,ðŽÀ s,.,é’O,É ADirect3DRMMeshBuilderIfufWfFfNfg,ðDirect3DRMMeshIfufWfFfNfg,É•İŠ,µ,È  
,,Ä,Í,È,ç,È,¢ Bf fbfVf...,ª,S,İ%»,µ,È,¢ A ,é,¢,Í-Ä’½,É•İ%»,µ,È,¢ ê ‡,Í A,±,İ•İŠ,ªfpftfH [f}f^fX,É—  
^,!,é%œ<ç,Í-³Ž<,Ä,«é’ö“x,Ì,à,Ì,Ä, ,é B**

,¢,.,Ä,©,Ì’,“\_,â-Ê,É“¬,¶“Á « if}fefŠfAf<,âfefNfXf`ff j,ðŠ,,é“-Ä,é•K—v,ª ,éfAfvfŠfP [fVf‡f“,Ä,Í  
**AIDirect3DRMMeshfCf^f^ [ftfFfCfX,ð—p,¢,ÄfOf< [fv%»**,.,é,±,Æ,ª,Ä,«é B,Ó,½,Ä,Ì’Ü,È,éfOf< [fv,Ä’,“\_,ð<□—  
L,µ,½,¢ ê ‡ i,½,Æ,!,Í Af fbfVf... ä,Ì-x Ü,µ,½-  
È,Ì F,ªÜ,È,é ê ‡ j,Í A,»,é,¼,é,İfOf< [fv,Ä’,“\_,ð•i »µ,È,-  
,Ä,Í,È,ç,È,¢ **BIDirect3DRMMesh::AddGroupf** f\fbfh,Í A-Ê,Ì W ‡,ÉfOf< [fvŽ•ÊŽq,ðfAftfCf“,.,é B,±  
,İŽ•ÊŽq,Í A,»,ÌÆä,ÌÆÄ,Ñ o,µ,ÄfOf< [fv,ðŽQ Æ,.,é,½,ß,ÉŽg—p,.,é,±,Æ,ª,Ä,«é B

fAfvfŠfP [fVf‡f“,Í AIDirect3DRMMeshBuilder,AEIDirect3DRMMeshfCf^f^ [ftfFfCfX,É,æ,Ä,Ä A,R,Ä^È ä,Ì•-  
È,ðŽ ,Ä-Ê,ð i ¬,.,é,±  
,Æ,ª,Ä,«é B,Ü,½ A,½,Æ,!,Í Af(Æf“f\_fŠf“fO,.,éfn [fhEfffA,ª64,jfOfCfG,Ì §ÆÄ,ðŽ ,Ä,Ä,“è Af fbfVf...  
,İfTfCfY,ª,»,é,æ,è,à’ä,«,¢ ê ‡,É,Í A,±,é,ç,İfCf^f^ [ftfFfCfX,Íf fbfVf...  
,ðŽ©“@“I,É•i ”,İfOfbftf@,É•Š,,.,é B,±,é,ç,İ@”  
,,½,ß,É ADirect3DRMMesh,ÆDirect3DRMMeshBuilder,ÌAPI,ÍDirect3D API,©,ç—£,é,½,à,Ì,È,È,Ä,Ä,¢,é B

f fbfVf...,É’,“\_,â-  
È,ðÆÄ 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,İŠef** f\fbfh,ð—p,¢,é,Æ A-Ê,Ì F,âfefNfXf`ff Af}  
fefŠfAf<,l“Á «,ðÆÄ X,É’è<’,,é,±,Æ,ª,Ä,«é B,±,é,ç,İf fbfVf... ä,Ì,»,é,¼,é,Ì-Ê,È,Ä,¢,Ä Ý’è,.,é,±  
,Æ,à A,.,x,Ä,Ì-Ê,È,Ä,¢,Äl“x,É Ý’è,.,é,±,Æ,ª%»Ä”,Ä, ,é B

f fbfVf...,ðf(Æf“f\_fŠf“fO,.,é,É,Í A,Ü, **IDirect3DRMFrame::AddVisualf** f\fbfh,ðŽg—p,µ,Ä Af fbfVf...  
,ðftf( [fÉ,É’Ç%»Ä,µ,È,,Ä,Í,È,ç,È,¢ Bf fbfVf...,İfCf^fXf^f^fX,ð•i ” ¶ ¬,µ,Ä A,Ð,Æ,Ä,İf fbfVf...  
,ð•i ”,İftf( [fÉ,É’Ç%»Ä,.,é,±,Æ,ª,Ä,«é B

fAfvfŠfP [fVf‡f“,Í **AIDirect3DRMMesh::SetGroupQualityf** f\fbfh,ÌÆÄ,Ñ o,µ,ÄŽw’è,.,é,±  
,Æ,É,æ,è Aftf%fbfg AfOf [ AftfHf“,Ì,R,Ä,Ì%»A%œef, [fh,ðŽg—p,.,é,±  
,Æ,ª,Ä,«é i,½,¾,µ ACE» ó,Ä,İftfHf“ EfVfF [ftfBf“fO Ef, [fh,İfTf] [fg,³,é,Ä,¢,È,¢ j B,±  
,İf f\fbfh,É,Í **AD3DRMRENDERQUALITY**—ñ“Æ^,Ìl,ðŽw’è,.,é BfVfF [ftfBf“fOf, [fh,É,Ä,¢,Ä Ü,µ,Í uf]  
**fŠfSf“ v,ðŽQ Æ,³,é,½,¢ B**

fAfvfŠfP [fVf‡f“,Í A-@ ü i,Ð,Æ,Ä,İfxfNfgf<,Ä,È,,Ä,Í,È,ç,È,¢ j,ð Ý’è,.,é,±  
,Æ,ª,Ä,«é B,Ü,½ **AIDirect3DRMMeshBuilder::GenerateNormalsf** f\fbfh,É,æ,è AŽü’í,Ì-Ê,Ì-Ê-@ ü,ð•½<Ì,µ,Ä-  
@ ü,ðÆvŽZ,.,é,±,Æ,à,Ä,«é B

**Direct3DRMObject**

Direct3DRMObject,Í AfVfXfef€,,.×,Ä,İfIfufWfFfNfg,É,œ'Ê,ÈŠi-{fNf%ofX,Ä, ,é BDirect3DRMObjectfIfufWfFfNfg,Í A,.,×,Ä,İfIfufWfFfNfg,É,œ'Ê,È"Á «,đ"ö,,İ,Ä,¢,é B

Direct3DRMObjectfIfufWfFfNfg,Í ACOMfIfufWfFfNfg,Æ,µ,ÄfCf"fx^f"fx ¶ ¬,ª s,i,é,é BŞefIfufWfFfNfg,Í AUnknownfCf" f^ [ftfFfCfX,É%Á, A^ê"É,Èf f\fbfh,İ•W €fZfbfg,đŠÜ,ñ,Ä,¢,é B

fIfufWfFfNfg,đ ì ¬,.,é,É,Í A,Ü,,**Direct3DRMCreate**ŠÖ " ,đCEÄ,Ñ o,µ ADirect3D,İ•ÜŽ f, [fh EfIfufWfFfNfg,İfCf"fx^f"fx,đ ¶ ¬,µ,È,-

,Ä,İ,È,ç,È,¢ BŽŸ,ÉfAfvššfP [fVf±f",Í AfIfufWfFfNfg,đ ì ¬,.,éCf" f^ [ftfFfCfX,İf f\fbfh,đCEÄ,Ñ o,µ AfIfufWfFfNfg,ÉCEÄ—

L,İfpf%of [f^,đŽw'è,.,é B,½,Æ,İ,İ ADirect3DRMAnimationfIfufWfFfNfg,đ ì ¬,.,é,É,Í**Direct3DRM::CreateAnimation**f f\fbfh,İCEÄ,Ñ o,µ,đ s,µ B ì ¬f f\fbfh,İ V,µ,¢fIfufWfFfNfg,đ ì ¬,µ Afpf%of [f^,Ä"n,³,è,½ff [f^,©,ç A,¢,-

,Ä,©,İfIfufWfFfNfg,İ'® «,đ %Šú%»,µ A,»,İfIfufWfFfNfg,đ•Ö. Bfpf%of [f^,ÄŽw'è,³,è,È,¢'® «,É,İffftfHf<fg,İ'l,đ—^,İ,Ä,;, BfAfvššfP [fVf±f",Í A,±

,İfIfufWfFfNfg,İfCf" f^ [ftfFfCfX,đŽw'è,µ,Ä'® «,đİ X,µ AfIfufWfFfNfg,İŽg—p,đŠŽn,.,é,±,Æ,ª,Ä,«é B

,.,×,Ä,İfIfufWfFfNfg,Í AfAfvššfP [fVf±f""è<,İ32frfbfg,İff [f^,đŠi" [,.,é,±,Æ,ª,Ä,«é B•ÜŽ f, [fh,Ä,Í A,±,İff [f^,%đ İ,³,è,½,è,İ X,³,è,½,è,.,é,±,Æ,İ,È,¢ BfAfvššfP [fVf±f",©,ç,±

,İff [f^,đ"Ç,ŸŽæ,é,É,Í A**Direct3DRMObject::GetAppData** f\fbfh,đŽg—p,.,é Bff [f^,İ '« ž,Ÿ,É,İ A**Direct3DRMObject::SetAppData** f\fbfh,đŽg,µ,±

,Æ,ª,Ä,«é BfAfvššfP [fVf±f",ªŠeDirect3DRMFramefIfufWfFfNfg,İ \^c'İ,đ•ÜŽ ,µ,Ä,¢,è,İ A,±,İff [f^,đŽæ"¾,.,é,İ,İŠÈ'P,Ä, ,é B,½,Æ,İ,İ A**Direct3DRMFrame::GetParent** f\fbfh,đCEÄ,Ñ o,µ,ÄDirect3DRMFramefIfufWfFfNfg,đŽó,~Žæ,é ê ‡ AfAfvššfP [fVf±f",İfvf%ofCfx [fg,È \^c'İ,Ö,İfIfCf" f^,đ—

p,¢ AŽžŠÖ,İ,©,©,éÉŸ ò,đ s,i,.,É—e^Ö,Éff [f^,đŽæ"¾,.,é,±,Æ,ª,Ä,«é B

fAfvššfP [fVf±f",İ \z,đ•â •,.,é,½,ß,É A,Ü,½,İfAfvššfP [fVf±f",İf† [fU EfCf" f^ [ftfFfCfX,İ1•",Æ,µ,Ä A fIfufWfFfNfg,É-¼'Ö,đŠ,,è"—,Ä,½,¢,±,Æ,ª, ,é,¾,è,µ BfIfufWfFfNfg,İ-

¼'Ö,đ Ÿ'è EŽæ"¾,.,é,É,Í A**Direct3DRMObject::SetName**,A**Direct3DRMObject::GetName** f\fbfh,đŽg—p,.,é B

fAfvššfP [fVf±f"CEÄ—L,İff [f^,İŽg,¢•û,İ,à,µ,Đ,Æ,Ä,İ—á,Æ,µ,Ä AfAfvššfP [fVf±f",af fbfVf... ã,İ-È,đfTfufZfbfg,ÉfOf< [fv%»,µ,½,¢ ê ‡ i,½,Æ,İ,İ Aftf f"fg,ÆfobfN,İ W ‡,ÉfOf< [fv%»,.,é ê ‡ j,ª l,ç,è,é B,±,İ,Æ,« A, ,é-È,ª,Ç,ç,ç,İfOf< [fv,É'®,.,©,đ<L%-,.,é,½,ß,É AfAfvššfP [fVf±f""è<,İff [f^,đ—~—p,.,é,±,Æ,ª,Ä,«é B

fAfvššfP [fVf±f",Í AfIfufWfFfNfg,ª"jŠü,³,è,é,Æ,«ÉCEÄ,Ñ o,•ŠÖ " ,đŽw'è,.,é,±,Æ,ª,Ä,«é B,±,İŠÖ " ,ªCEÄ,Ñ o,³,è,½,Æ,« AfAfvššfP [fVf±f",Í AfIfufWfFfNfg,ÉŠÖ~A•t,~ç,è,½f f,š,đ%đ•ú,µ,È,-

,Ä,İ,È,ç,È,¢ BŠÖ " ,đŽw'è,.,é,É,Í A **Direct3DRMObject::AddDestroyCallback** f\fbfh,đŽg—p,.,é BÈ'Ö,É,±,İf f\fbfh,É,æ,Ä,Ä"o^,³,è,½ŠÖ " ,đ í œ,.,é,É,Í A**Direct3DRMObject::DeleteDestroyCallback** f\fbfh,đCEÄ,Ñ o, . B

fR [f<ofbfNŠÖ " ,Í AfIfufWfFfNfg,ª"jŠü,³,è,é,Æ,«¾,~CEÄ,Ñ o,³,è,é B,Ä,Ü,è AfIfufWfFfNfg,İŽQ **ÆfJfEf" f**g,ª0,É'B,µ AfVfXfef€,ªfIfufWfFfNfg,İf f,š,đ%đ•ú,µ,æ,µ,Æ,µ,Ä,¢,é,Æ,«Ä, ,é BfAfvššfP [fVf±f",ªfIfufWfFfNfg,É,Ä,¢,Ä,İ•%Á î•ñ,đ•ÜŽ ,µ,Ä,¢,é ê ‡ A,±,İfR [f<ofbfNŠÖ " ,đ—~—p,µ,Ä Af [f^,đ"jŠü,µ,Ä,æ,¢,±,Æ,đfAfvššfP [fVf±f"Ž© g,É'È'm,.,é,±,Æ,ª,Ä,«é B

ŠÖ~A î•ñ,É,Ä,¢,Ä,Í u**Direct3DRMObject** v,đŽQ Æ,³,è,½,¢ B

**IDirect3DRMPickedArrayCf“f^ [ftfFfCfX**

2D À•W,ðfrf... [f| [fg,É“n,µ AfV [f“ ã,ÌfrfWf...  
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,»,é,©,ç**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,Ì AŠK‘w,ðŒeo,ÄfrfWf...  
fAf< EfIfufWfFfNfg,É“ž‘B,.,éfpfX A,Â,Û,èfrfWf...fAf< EfIfufWfFfNfg,Ì eftfŒ [f€,ìŠK‘wfŠfXfg,Â, ,é BŠ  
K‘w,Ìfgfbfv,É, ,é eftfŒ [f€,Í A”z—ñ,Ì æ“ª,ÉŠi”[,³,ê,é B

**IDirect3DRMShadowfCf“f^ [ftFfCfX**

fAfvfŠfP [fVf‡f“,Í AIDirect3DRM::CreateShadowf f\fbfh,ðCEÄ,Ñ o,·,¾,¯,Á A %Šú%» Ĩ,Ý,ÌŽg—p%Á”\ ,È%A%œ,ð ¶ ¬,·,é,± ,Æ,<sup>a</sup>,Á,«,é BIDirect3DRMShadowfCf“f^ [ftFfCfX,ì“¶ Ý,É,æ,Á,Ä AIDirect3DRM::CreateObjectf f\fbfh,ð—p,¢ ,Ä%A%œ,ð ì ¬,·,éfAfvfŠfP [fVf‡f“,Í A,» ,Ì %Šú%» ,ðIDirect3DRMShadow::Init,ðCEÄ,Ñ o,μ,Á s,□,± ,Æ,<sup>a</sup>,Á,«,é B

**IDirect3DRMTexturefCf“f^ [ftFfCfX**

fefNfXf`ff,Í A F•t,«,ÌfsfNfZf<,³«éCE`É•À,ñ,¾,à,ì,Á, ,é i«éCE`Í•K,,µ,à ³•ûCE`Á,È,,Á,à,æ,ç,ª AfVfXfef€  
,ª Á,àæø—|“I,É“@ ì,·,é,ì,Í ³•ûCE`,ì ê ±,Á, ,é j BfefNfXf`ff,ÍfefNfXf`ff Ef}fbfsf“fO,ì-È,Æ,µ,ÄŽg,ª,±  
,Æ,à,Á,«,é,ª A,±,ì ê ±,Í ³•ûCE`Á,È,,Á,Í,È,ç,È,ç B

**IDirect3DRMTexturefCf“f^ [ftFfCfX,Í AŽÀ Û,ÍDirectDrawSurfaceIfufWfFfNfg,Ö,ÌfCf“f^ [ftFfCfX,Á, ,è A  
“Á•È,ÉDirect3D,ÌfefNfXf`ff EfIfufWfFfNfg,Æ,ç,ª  
,í, ,Á,Í,È,ç BDirect3D,ÌfefNfXf`ff,ÆDirectDraw,ÌfT [ftFfX,ÌŠÖEW,É,Á,ç  
,Á,Í A uDirect3DfefNfXf`ff EfCf“f^ [ftFfCfX v,ðŽQ Æ,³,è,½,ç B**

fAfVfŠfP [fVf±f““Í **AD3DRMIMAGE** \“ç`ì,©,çfefNfXf`ff,ð ì ¬,·,é,½,ß,É **AIDirect3DRM::CreateTexture** f\fbfh,ðŽg,ª,±  
,Æ,ª,Á,«,é B,Û,½ **AIDirect3DRM::CreateTextureFromSurface** f\fbfh,É,æ,Á,ÁDirectDrawfT [ftFfX,©,çfefNfXf`ff,ð ì ¬,·,é,±,Æ,à,Á,«,é B,³,ç,É **AIDirect3DRM::LoadTexture** f\fbfh,ð—p,ç  
,é,Æ Aftf@fCf<,©,çfefNfXf`ff,ðf [fh,·,é,±,Æ,ª,Á,«,é B,±,ì ê ± AfefNfXf`ff,ÍWindows,Ìftrfbfgf}  
fbfv i.bmp j,© Af| [f^fuf< EfsfNfXf}fbfv EftfH [f}fbfg i.ppm j,Á,È,,Á,Í,È,ç,È,ç B

Še-È,ÌfefNfXf`ff À•W,Í A,»“Á’è,ì-È,Éf}fbfsf“fO,³,è,éfefNfXf`ff,ÌfŠ [fWf±f““ð’è`ç,µ,Á,ç  
,é BfAfVfŠfP [fVf±f““Í AfefNfXf`ff À•W,ðEvŽZ,·,é,½,ß,Éf%ofbvf,ð—p,·,é,±,Æ,ª,Á,«,é B Û,µ,-  
,Í uDirect3DRMWrapfCf“f^ [ftFfCfX v,ðŽQ Æ,³,è,½,ç B

,±,ÌfCf“f^ [ftFfCfX,Ìf f\fbfh,ÌfŠftf@fCEf“fX,Í A u**IDirect3DRMTexture** v,ðŽQ Æ,³,è,½,ç B

,±,ÌfZfNfVf±f““Á,Í ADirect3D,ªfTf| [fg,·,éfefNfXf`ff,ÌŽi—ð,ÆŽg,ç•û,ð à-¾,·,é B

fffJ [f<

fefNfXf`ff.Ì E

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 ÚfCEf“f\_fŠf“fO,·,é,±,Æ,ª,Ä,«,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—  
pCEê,Ä, ,é BfffJ [f<,Í Afrf... [f] [fg,Æˆv,μ,½<éCE,ÉfCEf“f\_fŠf“fO,³,ê,é B,±  
,Ì<éCE,Í AfIfvfVf‡f“,Æ,μ,Ä AfffJ [f<,Ì—§ˆË'ü,É,æ,éfXfP [fŠf“fO,ªÄ”\,Ä, ,é  
**BI**Direct3DRMTexture::SetDecalSizef f\fbfh,ðŽg—p,·,é,Æ AftfCE [f€  
,ÉˆÍ,μ,ÄˆŠˆÍ“I,É'è<,³,ê,½<éCE,©,çfffJ [f<,ÌfTfCfY,ð Ý'è,·,é,±  
,Æ,ª,Ä,«,é B ifAfvfŠfP [fVf‡f“,Í ADirect3DRMTexture::GetDecalSizef f\fbfh,É,æ,Ä,ÄfffJ [f<,ÌfTfCfY,ð'm,  
é,±,Æ,ª,Ä,«,é B j,»ÌEã AfffJ [f<,Í•İŠˆ,³,ê A“§Ž<“Š%œ,³,ê,é B

fffJ [f<,ÌCE“\_Í AfAfvfŠfP [fVf‡f“,©,ç Ý'è,·,æ,ÑŽæ“¾,·,é,±,Æ,ª,Ä,«,é B,±  
,ê,É,ÍDirect3DRMTexture::SetDecalOrigin,âDirect3DRMTexture::GetDecalOriginf f\fbfh,ð—p,¢,é BE  
“\_Í AfffJ [f<,Ì ¶ ã<,©,ç,ÌfIfzfZfbfg,Ä•,³,ê,é BffftfHf<fg,ÌCE“\_Í[0, 0]  
,Ä, ,é BfCEf“f\_fŠf“fO,Ì Ů,É,Í AfffJ [f<,ÌCE“\_ÍfTfCE [f€,ÌˆË'ü,É ‡,í,¹,ç,ê,é B

**fefNfXf`ff,İ F**

fefNfXf`ff,İfŒf“f\_fŠf“fO,Ä—p,Œ  
,ç,ê,é F ”,đŽæ“¾ E Ý’è,·,é,É,İ AIDirect3DRMTexture::SetColors,ÆIDirect3DRMTexture::GetColorsf f\fbfh,đ—  
~—p,·,é B

RGBfJf% [ Ef,fff<,đ—p,Œ,éAfvfŠfP [fVf‡f“,Ä,İ A8frfbfg A24frfbfg A32frfbfg,İfefNfXf`ff,đŽg—p,·,é,±  
,Æ,ª,Ä,«,é B,µ,©,µ Af,fmfNf if%of“fv j EfJf% [ Ef,fff<,đ—p,Œ,é ê ‡,É,İ A8frfbfg,İfefNfXf`ff,İ,ÝŽg—  
p,Ä,«,é B

fV [f“,ÉŒö,đ“K—p,·,é,Æ,« A,»ê,¼,ê,İ F,İ%œ,ªŽg—p,³,ê,é BŽg,í,ê,Ä,c,é%œ,İ ”,İ Ý’è,âŽæ“¾,đ s,□  
,É,İ AfAfvfŠfP [fVf‡f“,©,çIDirect3DRMTexture::SetShades,âIDirect3DRMTexture::GetShadesf f\fbfh,đŒÄ,Ñ o  
,· B

Direct3DRMTexturefIfufWfFfNfg,İ AfefNfXf`ff,ªŒf“f\_fŠf“fO,³,ê,éŒ³,Æ,È,érfbfgf}  
fbfv,đ’è<,·,é,½,ß,ÉD3DRMIMAGE \`c’İ,đŽg—  
p,·,é BfAfvfŠfP [fVf‡f“,ªD3DRMIMAGE \`c’İ,đ’ñ<Ÿ,·,é,İ AfŒf“f\_fŠf“fO’†,ÉŠÈ’P,ÉfefNfXf`ff,đ“@,©,µ,½,è•İ  
X,Ä,«,é B

**f~fbfvf}fbfv**

f~fbfvf}fbfv,Æ,Í^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 A**Direct3DRMDevice::SetTextureQuality**f f\bfh,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,^Ê,f}fbfsf“fO,³,ê,½Ĉä,Í AfefNfXf`ff—  
v'f ifefNfZf< j,ª Å IfCf [fW,ĭĈÊ X,ĭfsNfZf<,Æ^ê'v,·,é,±,Æ,Í—  
Å'½,É,Ê,ĉ B Å IfCf [fW'†,ĭfsNfZf<,Í AfefNfZf<,ĭ'á,«,È W †'ĭ,© A,Đ,Æ,Â,ĭfefNfZf<,ĭ -·”ª,É'Š—  
,·,é BfsfNfZf<,ÉfefNfZf<,ĭ'l,đ•áŠ@,·,é•û-@,đŽw'è,·,é,É,Í AfefNfXf`ff EftfBf<f^fŠf“fO,đ-~—p,·,é B

fAfvfŠfP [fvf‡f“,Í AIDirect3DRMDevice::SetTextureQuality f\bfh,ÆD3DRMTEXTUREQUALITY—ñ<“Ĉ^,đŽg  
—p,µ,Ä AfefNfXf`ff EftfBf<f^fŠf“fO Ef, [fh,đŽw'è,·,é,±,Æ,ª,Ä,«,é B

**fefNfXf`ff,İ“§-¾%»**

“§-¾,ÈfefNfXf`ff,ð ¶ ¬,·,é,É,Í IDirect3DRMTexture::SetDecalTransparency f \fbfh,ð~—  
p,·,é BfefNfXf`ff,ð“§-¾%»,·,é¼,İ•û-@,Æ,µ,Ä,Í ADirectDraw,ªTf| [fg,·,éfJf%o [ Efl [ ,ðŽg—p,·,é•û-@,ª, ,é  
BfJf%o [ Efl [ ,Æ,Í Afuf fbfN“‘—,âfI [fo [fÆfC‘€ ì,É,·,é A“‘—Æ³, ,é,ç,Í“‘—  
æ•”ª,ì F,Û,½,Í F,ì”Í,Ä, ,é B,±,ê,ç,İ F,Í A,Ä,É,É ã ‘,«³,ê,é,æ,µ,É,à ACE^,µ,Ä,İ X,³,ê,È,ç,æ,µ,É,àŽw’è,·,é,±  
,Æ,ª,Ä,«,é B

DirectDraw,ÌfJf%o [ Efl [ Eftf| [fg,É,Ä,ç,Ä Ú,µ,,Í A ufJf%o [ Efl [fcf“fQ v,ðŽQ Æ,³,ê,½,ç B

ŠÖ`A îñ,É,Ä,ç,Ä,Í uIDirect3DRMTexture v,ðŽQ Æ,³,ê,½,ç B

**IDirect3DRMUserVisualfCf“f^ [ftFfCfX**

f† [fU EfrfWf...fAf< EflfufWfFfNfg,Í AfV [f“,âfœf“f\_Šf“fO,É’Ç%Á,·,é,±  
,Æ,ª,Á,«,éfAfvfŠfP [fVf‡f“è<,İff [f^,Á, ,é B^ê”Ê“l,É,Í AfJfXf^f}fCfY,ª,è,½fœf“f\_Šf“fO Ef,fWf...

[f<,ªŽg—p,·,é B,½,Æ,ı,İfAfvfŠfP [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,Á,«,é B

f† [fU EfrfWf...fAf< EflfufWfFfNfg,ð ì ¬,·,é,É,Í **IDirect3DRM::CreateUserVisualf** f\fbfh,ðŽg—  
p,·,é B,Û,½ A**IDirect3DRMUserVisual::Initf** f\fbfh,Í Af† [fU EfrfWf...

fAf< EflfufWfFfNfg,İ %Šú%»,ð s,□ B

**IDirect3DRMViewport,AEIDirect3DRMViewportArrayfCf“f^ [ftfFfCfX**

f rf... [f] [fg,Í A3DfV [f“,ª,Ç,Ì,æ,ª,É2DfEfBf“fhfE,ÉfEf“f\_Šf“fO,³,ê,é,©,ð`èç,·,é Bfrf... [f]  
[fg,Í AfIfufWfFfNfg,ªfEf“f\_Šf“fO,³,ê,éffofCfX ã,ì«É`—Ìæ,ð`èç,·,é B

,±,ÌfCf“f^ [ftfFfCfX,Ìf f\fbfh,ÌfŠftf@fEf“fX,Í A u IDirect3DRMViewport v,ðŽQ Æ,³,ê,½,ç B

,±,ÌfZfNfVf±f““Å,Í Afrf... [f] [fg,Æ,»Ì \ ¬—v’f AŽg—p ã,ÌfefNfjfbfN,É,Â,ç,Ä à—¼,·,é B

fJf f%o

Ž< ‘ä

•jŠ.

fsfbfLf“fO

**fJf f%**

f\... [f] [fg,ÍDirct3DRMFrame,ðfJf f%,Æ,µ,ÄŽg—p,·,é BfJf f% EftfCE [f€  
,Í AfCEf“f\_Šf“fO,³,ê,éfV [f“ A•Ž,^Ê'u,“,æ,Ñ•ûCEü,ð'èç,·,é Bfrf... [f] [fg,Í AfJf f% EftfCE [f€  
,ì ³,ìzŽ² ã,É, ,é%oÄŽ<f\ufWfFfNfg,¾,¯,ð AyŽ² ã,ì ³•ûCEü,ÉfCEf“f\_Šf“fO,·,é B

fAfvfŠP [fVf±f“,Í A—^,|,ç,ê,½f\... [f] [fg,ÉfJf f%  
,ðfZfbfg,·,é,½,ß,É A**Direct3DRMViewport::SetCamera** f\fbfh,ð—p,ç,é,±,Æ,ª,Ä,«é B,±,Ìf f\fbfh,Í Afrf... [f]  
[fg,ÌÊ'u A•ûCEü ACEü,«ðfJf f% EftfCE [f€,É Ý'è,·,é BCE» Ý,ÌfJf f%,Ì Ý'è,ðŽæ“¾,·,é,É,Í A  
**Direct3DRMViewport::GetCamera** f\fbfh,ðCEÄ,Ñ o,· B



•iŠ•

3D  $\hat{A} \cdot W, \hat{I} f_{uf} W F F N f g, \delta 2 D f E f B f " f h f E, \acute{E} f \acute{C} f " f \_ f \acute{S} f " f O, \cdot, \acute{e}, \frac{1}{2}, \beta, \acute{E}, \acute{I} A f_{uf} W F F N f g, \delta f_{Jf} \_ f \% E f t f \acute{C} E [f \acute{C} " \acute{a}, \acute{E}, \acute{I} \acute{S}, \mu, \acute{E}, \acute{A}, \acute{I}, \acute{E}, \acute{C}, \acute{E}, \acute{C} B, \gg, \pm, \acute{A} A 4, \acute{A}, \acute{I} - v " f, \delta \acute{Z}, \acute{A} " \acute{Z} \acute{c}, \acute{I} \acute{A} \cdot W [x y z w], \delta \acute{c} \_ , \beta, \acute{e}, \frac{1}{2}, \beta A \acute{Z} \acute{E} \% e s - \acute{n}, \acute{a} - p, \acute{C} \_ , \acute{c}, \acute{e}, \acute{e} B \acute{A} \cdot W [x y z w], \acute{I} A 3 - v " f, \acute{I} \acute{A} \cdot W [x/w y/w z/w], \delta \acute{Z} \acute{a} " \acute{3} 4, \cdot, \acute{e}, \frac{1}{2}, \beta, \acute{E} \acute{Z} g, \acute{I}, \acute{e}, \acute{e} B [x/w y/w], \acute{I} f E f B f " f h f E, \acute{a} \acute{Z} g - p, \cdot, \acute{e} \acute{A} \cdot W, \acute{A}, \acute{e} B, \acute{U}, \frac{1}{2} A z/w, \acute{I} \% e s, \acute{c}, \acute{d} 0, \acute{C}, \acute{c} 1, \acute{I} " \acute{I} \acute{I}, \acute{A} \acute{Z} \acute{I}, \mu A 0, \acute{I} \acute{C} \acute{O} \acute{u} f N f \acute{S} f b f v - \acute{E} A 1, \acute{I} \acute{C} \acute{E} \acute{a} \acute{u} f N f \acute{S} f b f v - \acute{E}, \acute{A}, \acute{E}, \acute{e} B \acute{Z} \acute{E} \% e s - \acute{n}, \acute{I} A " \acute{S} \acute{Z} \cdot \acute{I} \acute{S}, \acute{I} \acute{C} \acute{E} \acute{a}, \acute{E} f_{uf} W F F N f g, \acute{I} f X f P [f \acute{S} f " f O, \acute{A} \acute{E} \acute{U} " \acute{C}, \delta \acute{C} \acute{C} \_ \acute{z}, \mu, \frac{1}{2}, \acute{a}, \acute{I}, \acute{A}, \acute{e} B$

$\acute{Z} \acute{Y}, \acute{I} s - \acute{n}, \acute{a} \acute{Z} \acute{E} \% e s - \acute{n}, \acute{A}, \acute{e} B, \pm, \acute{I} " \acute{T} \acute{M} \acute{Z} \acute{C}, \acute{E}, \acute{r}, \acute{c}, \acute{A} A h, \acute{I} \acute{Z} \acute{C} \_ " \acute{a}, \acute{I} " \frac{1}{4} \acute{a}, \acute{I} \_ , \acute{3} A F, \acute{I} \acute{C} \acute{E} \acute{a} \acute{u} f N f \acute{S} f b f v - \acute{E}, \acute{I} z \acute{A} \cdot W A D, \acute{I} \acute{C} \acute{O} \acute{u} f N f \acute{S} f b f v - \acute{E}, \acute{I} z \acute{A} \cdot W, \delta \acute{Z} \acute{I}, \mu, \acute{A}, \acute{C}, \acute{e} B$

$$P = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & \frac{hF}{D(F-D)} & \frac{h}{D} \\ 0 & 0 & \frac{-hF}{F-D} & 0 \end{bmatrix}$$

Direct 3D,  $\acute{A}, \acute{I} A \acute{Z} \acute{E} \% e s - \acute{n}, \acute{I} 4 - v " f, \acute{E} \cdot \% \acute{O}, \acute{I} \acute{l}, \delta \acute{Y} ' \acute{e}, \cdot, \acute{e}, \pm, \acute{A}, \acute{I}, \acute{A}, \acute{C}, \acute{E}, \acute{C} B$

$\acute{Z} \acute{Y}, \acute{I} s - \acute{n}, \acute{I} A f E f B f " f h f E E f X f P [f \acute{S} f " f O, \delta s, \acute{a} i f X f P [f \acute{C}, \acute{I} f E f B f " f h f E, \acute{I} t f \acute{C} f Y, \acute{A} \acute{E} \acute{U}, \acute{E} \acute{E} \acute{I}, \cdot, \acute{e} j B, \pm, \acute{I} \acute{C} \acute{E} \acute{Z} \acute{C}, \acute{A}, \acute{I} A s, \acute{I} f E f B f " f h f E, \acute{I} f X f P [f \acute{S} f " f O \acute{C} E W " A \acute{O}, \acute{I} f E f B f " f h f E, \acute{I} \acute{C} \acute{E} " \_ , \acute{A}, \acute{e} B$

$$W = \begin{bmatrix} s_x & 0 & 0 & 0 \\ 0 & -s_y & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

$\acute{Z} \acute{Y}, \acute{I} s - \acute{n}, \acute{I} f t f \dots [ s - \acute{n}, \acute{A}, \acute{e} B, \pm, \acute{e}, \acute{I} A \acute{Z} \acute{E} \% e s - \acute{n}, \acute{A} f E f B f " f h f E s - \acute{n}, \acute{I} \acute{z} \acute{A} \acute{C} \acute{E} \acute{3} 4, \acute{c} \acute{S}, \acute{I}, \acute{e}, \acute{I} P, \acute{A} W, \acute{I} \acute{I}, \acute{A}, \acute{e} B$

$$V = P \cdot W = \begin{bmatrix} s_x & 0 & 0 & 0 \\ 0 & -s_y & 0 & 0 \\ \frac{h o_x}{D} & \frac{h o_y}{D} & \frac{h F}{D(F-D)} & \frac{h}{D} \\ 0 & 0 & \frac{-h F}{F-D} & 0 \end{bmatrix}$$

$f X f P [f \acute{S} f " f O \acute{C} E W " \acute{A} \acute{C} \acute{E} " \_ s_x A s_y A o_x A o_y, \acute{I} A [-h -h D], \acute{C}, \acute{c} [h h D], \acute{U}, \acute{A}, \acute{I} f \acute{S} [f W f \acute{z} " \acute{a} f E f B f " f h f E, \acute{I} \_ , \acute{3}, \acute{a} \cdot \acute{E} \acute{3} \acute{S} m, \acute{E} f t f B f b f g, \cdot, \acute{e}, \acute{a}, \acute{a}, \acute{E} \acute{I} \acute{d}, \acute{3}, \acute{e}, \acute{e} B$

$f X f N f \acute{S} [f " \acute{A} \cdot W, \acute{C}, \acute{c} f [f \acute{C} f h \acute{A} \cdot W A, \acute{U}, \frac{1}{2} \acute{c}, \acute{E} f [f \acute{C} f h \acute{A} \cdot W, \acute{C}, \acute{c} f X f N f \acute{S} [f " \acute{A} \cdot W, \acute{E} f x f N f g \acute{C}, \delta \acute{I} \acute{S}, \cdot, \acute{e}, \acute{E}, \acute{I} A \acute{I} \underline{\text{Direct3DRMViewport::Transform, \acute{a} \underline{\text{Direct3DRMViewport::InverseTransform}} f \acute{f} b f h, \delta \acute{Z} g - p, \cdot, \acute{e} B \acute{Z} \acute{Y}, \acute{I} - \acute{a}, \acute{I}, \acute{a}, \acute{a} \acute{E} A f A f v f \acute{S} f P [f V f \acute{z} " \acute{I} A, \pm, \acute{e}, \acute{c}, \acute{I} f \acute{f} b f h, \delta - \sim - p, \mu, \acute{A} f h f \% f b f O, \delta f T f] [f g, \cdot, \acute{e}, \pm, \acute{A}, \acute{a}, \acute{C}, \acute{e} B$

```
/*
 * 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);
```



**fsfbLf“fO**

fsfbLf“fO,Æ,Í Afrf... [f] [fg,lfEfBf“fhfE,Å A2D À•W,©,çfV [f“ ã,lfRfWf...  
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,à&çfIfufWfFfNfg A,Ü,½,ÍfIfufWfFfNfg,Ì d,È,è ‡,lfŠfXfg,ðŽæ“¼,·,é,±,Æ,ª,Å,«,é B

**IDirect3DRMVisual,ÆIDirect3DRMVisualArray fCf“f^ [ftfFfCfX**

frfWf...fAf< EfIfufWfFfNfg,Í AfV [f“ ã,ÉfCf“f\_Šf“fO,·,é,±,Æ,ª,Á,«,éIfufWfFfNfg,Á, ,é BfrfWf...  
fAf< EfIfufWfFfNfg,“%oÂŽ<,É,È,é,Ì,Í A,»),ÌfV [f“,ÌftfC [f€,É’Ç%oÁ,ª,é,½,Æ,«,¾,¯,Á, ,é BfAfvfŠfP [fVf#f“,Í

**AIDirect3DRMFrame::AddVisual** f\fbfh,ð—p,ç,ÄfrfWf...fAf< EfIfufWfFfNfg,ðftfC [f€  
,É’Ç%oÁ,·,é BftfC [f€,Í AfCf“f\_Šf“fO,É”ö,‘ AfrrfWf...fAf< EfIfufWfFfNfg,ÉÊ’u,ÆEü,«,ð’ñ<ÿ,·,é B

frfWf...fAf< EfIfufWfFfNfg,ÌfOf< [fv,ð’€ ì,·,é,É,Í **AIDirect3DRMVisualArray**fCf“f^ [ftfFfCfX,ðŽg—p,µ,È,-  
,Á,Í,È,ç,È,ç **BIDirect3DRMVisual** COMfCf“f^ [ftfFfCfX,Í“Ÿ,·,é,ª Af f\fbfh,ð%½,àŽ ,Á,Á,ç,È,ç B

Á,à`è”Ê“I,ÈfrfWf...

fAf< EfIfufWfFfNfg,Ìf^fCfv,Í ADirect3DRMMeshBuilder,ÆDirect3DRMTexturefIfufWfFfNfg,Á, ,é B

**IDirect3DRMWrapCf“f^ [ftFfCfX**

f%ofbfv,Í A-Ê,âf fbfVf...,ÏfefNfXf`ff À•W,ÏEvŽZ,ÉŽg—p,·,é,±  
,Æ,ª,Á,«,é Bf%ofbfv,ð ì ¬,·,é,É,Í AfAfvfŠfP [fVf‡f“,Í Af%ofbfv,Ï^fCfv,âŽQ Æftf€ [f€ A€  
‘“ A•û€üfxfNfgf< A ãfxfNfgf<,ðŽw’è,µ,È,,Á,Í,È,ç,È,¢ B,Û,½ AfXfP [fŠf“fO€W ”,ÆfefNfXf`ff À•W,Ï€  
‘“\_ ,àŽw’è,·,é•K—v,ª, ,é B

fAfvfŠfP [fVf‡f“,Í AIDirect3DRM::CreateWrap f\fbfh,ð€Ä,Ñ o,µ,ÄIDirect3DRMWrapCf“f^ [ftFfCfX,ð  
¶ ¬,·,é B,±,ÏfCf“f^ [ftFfCfX,É,Í AIDirect3DRMWrap::Apply,ÆIDirect3DRMWrap::ApplyRelative,Ï,Ó,½,Á,Ï“Á  
—L,Èf f\fbfh,ªŠÛ,Û,ê,Ä,¢,é BIDirect3DRMWrap::Apply,Í AfIfufWfFfNfg,Ï’,“\_ ,Éf%ofbfv,ð“K—  
p,·,é BIDirect3DRMWrap::ApplyRelative,Í A“K—p,ª,ê,½f%ofbfv,Ï’,“\_ ,ð•ÏŠ,·,é B

fTf“fvf<,Á,Í A•û€üfxfNfgf< ivfxfNfgf< j,ÍzŽ²,É%o^,¢ A ãfxfNfgf< iufxfNfgf< j,ÍyŽ²,É%o^,Á,Ä,¢,é B€  
‘“\_ ,Í[0, 0, 0],Á, ,é B

**IDirect3DRMWrapCf“f^ [ftFfCfX,Ïf f\fbfh,ÏfŠftf@f€f“fX,Í uIDirect3DRMWrap v,ðŽQ Æ,ª,ê,½,¢ B**  
,±,ÏfZfNfVf‡f“,Á,Í Af%ofbfsf“fO Eftf%ofO,Æ4,Á,Ïf%ofbfsf“fO Ef^fCfv,É,Á,¢,Ä à-¾,·,é B

f%ofbfsf“fO Eftf%ofO

•½-Ê

%o~’€

<...î

fNf f€

f%fbfsf“fO Eftf%fO

D3DRMMAPPINGE^,É,Í AD3DRMMAP\_WRAPUftf%fO,ÆD3DRMMAP\_WRAPVftf%fO,ªŠÜ,Ü,ê,Ä,¢,é B,± ,é,ç,Ìftf%fO,É,æ,Á,Ä Af%ofXf^f%ofCfU,ªfefNfXf`ff À•W,ð%ð Í,·,é•û- @,ªE`è,ª,é Bf%ofXf^f%ofCfU,Í A,Ä,Ë,ÉfefNfXf`ff À•WŠÖ,Ì Á'Z<—£ i,Ä,Ü,è'¼ ü j•âŠ@,·,é B,± ,Ì'¼ ü,ÌfpfX,Æ A—LÆø,Èu,¨,æ,Ñv À•W,Ì'¼,Í Af%fbfsf“fO Eftf%fO,ÌŽg,¢•û,É,æ,Á,Ä`Ü,É,é Bftf%fO,Ì•Đ•û, , é,¢,Í— ¼•û,ªfZfbfg,ª,é,é,Æ A'¼ ü,Í Au,Ü,½,Ív•ûÈü,ÌfefNfXf`ff,Ì•Ó,É%ó,Á,Ä A%o~'E ó,©fh [fifc ó,ÌE` ó,©,Ì,æ,□ ,Éf%ofbfvfAf%ofEf“fh,ª,é,é B

f%fbfsf“fO Eftf%fO,ªfZfbfg,ª,é,Ä,¢,È,¢•½-Êf%fbfsf“fO Ef, [fh,Á,Í Au,Ü,½,Ív À•W,ÄŽw'è,ª,é,½•½- É,É,Í AfefNfXf`ff,ª-³EÀ,Éf^fCfŠf“fO,ª,é,é B,±,Ì ê ÷ A—LÆø,Èu,¨,æ,Ñv À•W'1,Í1.0`È ã,Ä, ,é B“(0.1, 0.1),Æ(0.9, 0.9),ðE<,Ô Á'Z,Ì'¼ ü,Í A“(0.5, 0.5),ð`Ê%oß,·,é B

D3DRENDERSTATE\_WRAPU,Ü,½,ÍD3DRENDERSTATE\_WRAPV,Ì,¢ ,·,é,©,ªfZfbfg,ª,é,½ ê ÷ AfefNfXf`ff,Í%o~Žü1.0,Ì I,í,è,Ì,È,¢ %o~“ªE`É,È,é B1.0`È ã,ÌfefNfXf`ff À•W,Í Af%ofbfv,ª,é,Ä,¢,È,¢”Í“à,Ì,Ý—LÆø,Á, ,é BfefNfXf`ff À•WŠ Ö,Ì Á'Z<—£,Íf%fbfsf“fO Eftf%fO,É,æ,Á,Ä`Ü,É,é BD3DRENDERSTATE\_WRAPU,ªfZfbfg,ª,é,Ä,¢ ,é,Æ,«,Í A“(0.1, 0.1),©,ç(0.9, 0.9),Ü,Ä,Ì Á'Z,Ì'¼ ü,Í A“ i0, 0.5 j,ð`Ê%oß,·,é B

D3DRENDERSTATE\_WRAPU,ÆD3DRENDERSTATE\_WRAPVftf%fO,Ì— ¼•û,ªfZfbfg,ª,é,½,Æ,«,Í AfefNfXf`ff,Í%o~ŠÁ`ì ifh [fifc j ó,É,È,é BfvfXfef€,Í•Á ½,µ,Ä,¢ ,é,½,ß A1.0`È ã,ÌfefNfXf`ff À•W,Í-³Eø,Á, ,é B“(0.1, 0.1),©,ç(0.9, 0.9),Ü,Ä,Ì Á'Z,Ì'¼ ü,Í A“(0, 0) ,ð`Ê%oß,·,é B

-³Eø—Ìæ,É, ,Á,½fefNfXf`ff À•W,ð—LÆø—Ìæ,ÉŽû,ß,½,Æ,µ,Ä,à A,»,Ì,Æ,«,Ì“@ ì,Í•Ü Ø,ª,é,Ä,¢,È,¢ B

è”Ê,ÉfAfvfŠfP [fvf÷f“,Í AfefNfXf`ff,ÌEð ü,ª-Ê,Ì•Ó,Æ`è`v,µ,È,¢ ,Æ,« A%o~'E ó,Éf%ofbfv,·,é,½,ß,Éf%fbfsf“fO Eftf%fO,ðfZfbfg,·,é B,Đ,Æ,Á,Ì-Ê,ÉfefNfXf`ff,Ì'¼•ª`È ã,ªŽg —p,ª,é,é ê ÷,É,Í Af%fbfsf“fO Eftf%fO,Í Ý'è,µ,È,¢ B

•½-Ê

•½-Êf%ofbfv,Á,Í AfefNfXf`ff,Í AfIfufWfFfNfg ã,ÉfXfgfCfbf`<sup>3</sup>,ê,½fSf€,ì,æ,ð,ÉfIfufWfFfNfg,Ì-Ê,É`ê`v,·,é B

ŽŸ,Ì“™Ž@,É,æ,è AfxfNfgf<[xyz],©,ç[u v] À•W,<sup>a</sup>ç,β,ç,é,é B

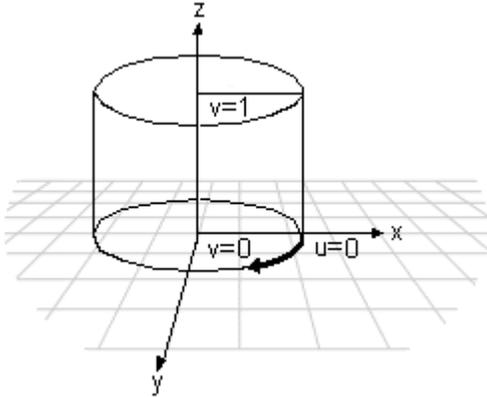
u=sux-ou

v=svy-ov

,±,ê,ç,ÌŒöŽ@,É,·,ç,Ä As,ÍfEfBf“fhfE,ÌfXfP [fŠf“fOŒW ” Ao,ÍfEfBf“fhfE,ÌŒ“\_,ðŽ!,μ,Ä,ç  
,é BfAfvfŠfP [fVf‡f“,Í A1‘g,ÌfXfP [fŠf“fOŒW ”,Æ Au,·,æ,Ñv,<sup>a</sup>—LŒø,È’l,ðŽæ,é,æ,ð,Éx,Æy,ð0,©,ç1,Ì”Í,Éf}  
fbfv,·,é,½,β,ÌfIfzfzfbfg,ðŒ~è,μ,È,,Ä,Í,È,ç,È,ç B

∞

∞ fbfv, Á AfefNfXf`ff, Í∞, ð·i, DŽ†, Ì, æ, ρ, É^μ, í, ê A, » Ì ¶', Í∞E'[, É, Á, È, ¢, Á, Á, ¢  
 , é BfIfufWfFfNfg, Í∞~Žü, Ì'†∞, É"z'u, ¢, é AfIfufWfFfNfg, ÌfT [ftFfX, É ±, í, ¢, ÁfefNfXf`ff, ¢·Í∞` ¢, é, é B  
 ∞° }, Í A∞~∞EfefNfXf`ff Ef}fbfv, É, ", éŠefxfNfgf<, Ì∞∞É, ðŽ', μ, ½, à, Ì, Á, , é B



•üüxfNfgf<, Í∞~∞, ÌŽ, ðŽ', μ A ãxfNfgf<, Í∞~∞, ÌŠO'ϖ, Ìu = 0, Á, , é"\_, ðŽ', · BfVfXfefÉ, Í AfxfNfgf<[x y z]  
 , É'Í, ·, éfefNfXf`ff, Ì[u v] Á·W, ð∞vŽZ, ·, é, ½, B, É AŽŸ, Ì"™Ž@, ðŽg—p, ·, é B

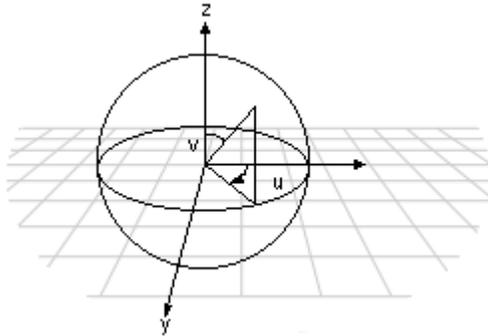
$$u = \frac{s_u}{2\pi} \tan^{-1} \frac{x}{y} - o_y$$

$$v = s_v z - o_v$$

'É í Au, ÍfXfP [fŠf"fo, ¢, é, È, ¢, Ü, Ü, Á, , é Bv, ¢—L∞∞, È'l, ðŽæ, é, æ, ρ, Éz, ð0, ©, ¢1, Ì"Í'Í, Éf}  
 fbfv, μ, Á Av, ÍfXfP [fŠf"fo, ¢·ÍŠ, ¢ s, í, ê, é B

...

...  
 l,É ju À•W,³,β,ç,ê,é Bv À•W,Í AfxfNfgf{xyz},ÆzŽ²,ÌŠp“x,©,ç,β,ç,ê,é B,±,Ìf}  
 fbfsf“fO,Á,Í AzŽ² ã,É~c,Ý,ª ¶,¶,é,±,Æ,É’ Ó,ªK—v,Á, ,é B



,±,ê,ÍŽÝ,Ì“ŽŽ@,Á•,³,ê,é B

$$u = \frac{S_u}{2\pi} \tan^{-1} \frac{x}{y} - o_u$$

$$v = \frac{S_v}{\pi} \tan^{-1} \frac{z}{\sqrt{x^2 + y^2 + z^2}} - o_v$$

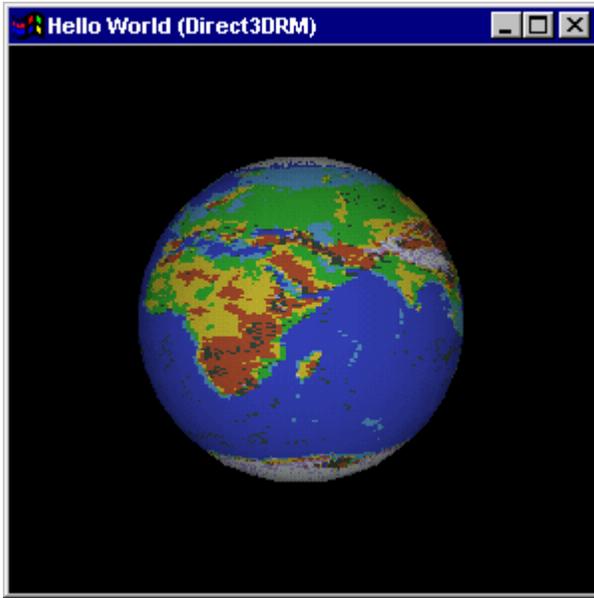
,±,±,Á,Í AfXfP [fŠf“fO,³,ê,Ä,c,È,cu,Æv,Ì”ÍÍ,Í,Á,È,É0,©,ç1,Á, ,é,½,ß AfXfP [fŠf“fOEW ”,ÆfefNfXf`ff,ÌE  
 “\_ ,Í•K—v,Æ,³,ê,È,c,±,Æ,ª½,c B

**fNf f€**

fNf f€ Ef%ofbfv,Í AfefNfXf`ff,³fIfufWfFfNfg ä,É”½ŽĚ,µ,ÄĈ©,,é,æ,²,ÉfefNfXf`ff À•W,ðŠ,,è“-  
,Ä,é BfNf f€ Ef%ofbfv,ÍŽQ ÆftfĈ [f€,ìĚ’u,ðŽæ“¾,µ A”½ŽĚĚfxfNfgf<,ðĈvŽŽZ,·,é,½,ß,Éf fbfVf...,ì,“\_-  
@ ü,ðŽg—p,·,é B,»,ìĈä Af fbfVf...,ðŽæ,èĚ,³%¼‘z,ì<...‘ì,ð—~—  
p,µ,Ä A”½ŽĚĚfxfNfgf<,ìĈð ü,©,çfefNfXf`ff,ìu,“,æ,Ñv À•W,ðĈvŽŽZ,·,é B,±  
,è,É,æ,Á,Ä A<...‘ì,É%½,³f%ofbfv,³,è,Ä,Ĉ,Ä,à Af fbfVf...,É”½ŽĚĈø%Ě,³—^,,ç,è,é B

## Direct3D, Ĩ•ŮŽ f, [fh, ĩf... [fgfŠfAf<

Windowsfx [fX, ĨDirect3D, Ĩ•ŮŽ f, [fh EfAfvfŠfP [fVf‡f“, ð ì ¬, ., é, ½, ß, É, Í A^Û, È, é, Ó, ½, Â, ĨŠÂ««, ð Ý’è, µ, È, -  
, Â, Í, È, ç, È, ç B, Ð, Æ, Â, Í AfffofCfX Afrf... [f] [fg A F%ð’œ“x, Æ, ç, Â, ½WindowsŠÂ««, Â, , è A, à, □  
, Ð, Æ, Â, Í Af, fff< AfefNfXf`ff ACEôCE¹ A^Ê’u, Æ, ç, Â, ½%¼’zŠÂ««, Â, , é B, ±, ĩf...  
[fgfŠfAf<, Â, Í AŠÊ’P, È•ŮŽ f, [fh EfAfvfŠfP [fVf‡f“, ĩ’SfR [fh, ð Ð%ôî, µ, Â, ç, é B%º }  
, ĩ A“® ĩ’t, ĩfAfjf [fVf‡f“, ĩtfCE [f€, ĩ, Ð, Æ, Â, Â, , é B



, ±, ĩf... [fgfŠfAf<, Í A^È%º, ĩfZfNfVf‡f“, É•ª, ¬, ç, è, Ä, ç, é B

Helworld.c, É, Â, ç, Ä

f}fNf 'è<, Æfof [fof•Ī ”

Windows, ĩfZfbfqfAfbfv, Æ %ºŠú%º»

fffofCfX E fhf%ofCfo, ĩ—ñ<“

3DŠÂ««, ĩfZfbfqfAfbfv

fCEf“f fŠf“fo Ef< [fv

fV [f“, ĩ ì ¬

I¬ ^—

**Helworld.c,É,Â,c,Ä**

fAfvfŠfP [fVf‡f“,É3DfOf%ftfBfbfNfX,ð“±“ü,·,é,±,Æ,ÍŠÈ’P,Â,Í,È,c,ª ACE^,µ,Ä•s%oÂ”\,ÈŽdŽ-,Â,Í,È,c B,±  
,ÌfhfLf...f f“fg,É,Í ADirect3D,Ì•ŮŽ f, [fh EfAfvfŠfP [fVf‡f“,Ì ì -,É•K—v,È,·,×,Ä,ÌfR [fh,ªL Ú,³,ê,Ä,c  
,é B,±,Ìf`f... [fgfŠfAf<,ÌfR [fh,ð A,Ð,Æ,Â,Ì.cftf@fCf<,ÉfRfs [.·,ê,Î AfRf“fpfCf<,µ,ÄŽÄ s,·,é,±  
,Æ,ª,Ä,«é i,½,¾,µ AfRf“fpfCf%,ªDirectX SDK,ÌffBfCfNfgfŠ,É, éSphere3.xftf@fCf<,ðCE©,Â,¯,é,±  
,Æ,ª,Ä,« A,³,ç,È AHello.ppm,Æ,c,ª¼’O,ÌfRfbfgf}fbfv ftf@fCf<,ª—pˆÓ,³,ê,Ä,c,é,±,Æ j B,±  
,ÌfTf“fvf<,Â,Í A3DEø%oÈ,ðŽÀCE»,·,éfR [fh,Ì,Û,Æ,ñ,Ç,ÍCEÂ X,ÌŠÖ ”,É•ª,¯,ç,ê,Ä,c,é,½,ß AŽ© g,ÌCEoCE±  
,É%ž,¶,Ä AfVfXfef€,Ìê•”,É ,µ,,Ä•Í X,ð%Á,!,é,±,Æ,ª,Ä,«é B,æ,è•jŽG,ÈDirect3D,Ì<@”\  
,ðfCf“fvfŠf f“fg,·,é,½,ß,É,Í ASDK,ÌfTf“fvf<,ðŽQ Æ,·,é,Æ,æ,c B

,±,ÌfZfNfVf‡f“,Â,Í AŠÈ’P,ÈDirect3D,Ì•ŮŽ f, [fh EfAfvfŠfP [fVf‡f“,ðŠJ”,·,é ä,Ä,Ì-â’è“-É,Â,c,Ä A,c,-  
,Ä,© à-¾,·,é B

fTf“fvf<,Ì §CEÀ

fXf^fefBfbfN Ef%ofCfuf%ofŠ

DirectDraw,ÌfEfBf“fhfE Ef, [fh

## ftf“fvf,ì §ĀÄ

,±,ìf`f... [fgfŠfAf<,É,Í AHelworld.cfTf“fvf< Efr [fh,ŠÜ,Ü,ê,Ä,ĉ  
,é BHelworld.c,Í A<...î,ð ì ¬,µ A,»,ê,ÉfefNfXf`ff,ð“\,è•t, AfEfBf“fhfE“à,Å%õñ“],<sup>3,1</sup>,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,ìffBfĀEfNfgfŠ,ÉfRfs [,<sup>3</sup>,ê,½Shpere3.x,Æ,ĉ,ƒf fbVf... Eftf@fCf<,Æ AHello.ppm,Æ,ĉ,ƒ¼‘O,ìfrfbfgf}  
fbfvftf@fCf<,•K—v,Ä, ,é B

,±,ìTf“fvf<,Í ADirectX SDK,ìê•”,Ä, ,éGlobefTf“fvf<,ÉŠî,Ä,ĉ,Ä,ĉ,é,<sup>a</sup> A à¾,ì,½,ß,É,æ,èŠÈ—%»,<sup>3</sup>,é,Ä,ĉ  
,é BSDK,ÉŠÜ,Ü,ê,é¼,ìDirect3D•ŮŽ f, [fh,ìTf“fvf<,Æ“—l AGlobefTf“fvf<,É,Í ARmmain.cpp,Æ,ĉ  
,ƒftf@fCf<,Æ ”¼,ìwfbf\_ Eftf@fCf<,ìfCf“fNf< [fh,•K—v,Ä, ,Ä,½,<sup>a</sup> AHelworld.c,Ä,Í ARmmain.cpp,ÌŠÖ•A,µ,  
½%õ Ÿ,ðC++,©,ĉC,É ‘,«¼,µ Af\ [fX fR [fh’†,É’g,Ý ž,ñ,Ä,ĉ,é B

,±,ìf`f... [fgfŠfAf<,Ä Đ%õî,µ,Ä,ĉ,éfR [fh,Í A,»,ì,Ü,Ü »•i,ìfR [fh,É“K—p,Ä,«,é,í,¯,Ä,Í,È,ĉ B,±,ìfvf fOf%ofĉ  
,Äf† [fU,<sup>a</sup>,Ä,«,é,±,Æ,Í Afvf fOf%ofĉ,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,ĉ,ìfGf% [ EfFFfbfN,Í È—<sup>a,3</sup>,é,Ä,ĉ,é B,±,ìTf“fvf<,ìÓ } ,Í A%æ—  
Ê,É”Hello, world!” ,ð•Žì,·,é,¾,¯,ì—L¼,Èfvf fOf%ofĉ,Žì,·,Æ,±,è,Æ—DŽ—,µ,Ä, ,è A,Ä,«,é,¾,¯,í,©,è,â,·,-  
A3DfOf%oftfBfbfNfX,ì o—Í,ð s,±,Æ,Ä, ,é B

$fXf^{\wedge}fefBfbfN \quad Ef\%ofCfuf\%ofŠ$

Direct3D, ě•ŮŽ  $f$ , [fh EfAfvfŠfP [fVf‡f“, Í AfXf^fefBfbfN Ef%ofCfuf%ofŠWinmn.lib, ÆD3drm.lib, ōfŠf“fN, ·, é•  
K—v, ^, ,é B

**DirectDraw, ĩfEfBf“fhfE Ef, [fh**

, Û, Æ, ñ, Ç, ·, ×, Ä, ĩDirect3DfAfvfŠfP [fVf‡f“, Í ADirectDraw, ð—p, ç, ÄfXfNfŠ [f“, ÉfOf%oftfBfbfNfX, ð•Ž!, ·, é B, ±, ê, ç, ĩfAfvfŠfP [fVf‡f“, Í ADirectDraw, ĩftf<fXfNfŠ [f“ Ef, [fh i”r¼f, [fh j, Û, ½, ĩfEfBf“fhfE Ef, [fh, ĩ, ç, ·, é, ©, ðŽg—p, ·, é B

ftf<fXfNfŠ [f“ Ef, [fh, É, Í AfpftfH [f}f“fX, â•Ö—, ³, É, ·, ç, Ä, ç, , Ä, ©, ĩ—“\_, , é, , a AfEfBf“fhfE Ef, [fh, Å ‘, ©, ê, ½fR [fh, ĩ, Û, , a AfffobfO, ĩ, ĩ, é, ©, É—e˘Ö, Ä, , é BŠJ”ŽÖ, ĩ¼, , ĩ A Å %o, ĩfEfBf“fhfE Ef, [fh, ÅfR [fh, ð<L q, µ A, Û, Æ, ñ, Ç, ĩfofO, %öü C, ³, ê, ½ŠJ”- , ĩ Å ĩiŠK, Å Aftf<fXfNfŠ [f“ Ef, [fh, É˘Ú s, ·, é•û-@, ðŽæ, é, ¼, é, , B

fNf 'è',ÆfOf [fOf•İ ”

È%ò,İfR [fh,Í AHelworld.cTf“fvf<,İ Å %ò,İ•”•,Å, ,é BHelwold.c,Í A,±,İfAfvfŠfP [fVf±f“„ðrf<fh,.,é,½,ß,É•K  
—v,È—B^ê,İftf@fCf<,Å, ,è A¼,İfwfbf\_ Eftf@fCf<,âf\ [fX Eftf@fCf<,Í•s—v,Å, ,é B

INITGUID,Í A¼,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'è ì,.,éŠJ”ŽÖ,³ŠÖ^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,İŒÄ,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“„Ž,³,è,éDirect3DRMrf... [f] [fg  
    LPDIRECT3DRMFRAME scene; // '¼,İfIfufWfFfNfg,“z'u,³,è,é}fXf^ [ EftfŒ [fŒ  
    LPDIRECT3DRMFRAME camera; // f† [fU,İPOV,ðŽ',.ftfŒ [fŒ
```

```
    GUID DriverGUID[MAX_DRIVERS]; // —LŒø,ÈD3Dfhf%oCfo,İGUID  
    char DriverName[MAX_DRIVERS][50]; // —LŒø,ÈD3Dfhf%oCfo,İ—¼'O  
    int NumDrivers; // —LŒø,ÈD3Dfhf%oCfo,İ ”  
    int CurrDriver; // Œ» ÝŽg,í,è,Ä,ç,éD3Dfhf%oCfo,İ ”
```

```
    BOOL bQuit; // fvf fOf%oŒ,ª I—,µ,æ,²,Æ,µ,Ä,ç,é  
    BOOL bInitialized; // ,.x,Ä,İD3DRMfIfufWfFfNfg,ª %òŠú%ò»,³,è,½  
    BOOL bMinimized; // fEfBf“fhfE,ª Ä —%ò»,³,è,½
```

```
    int BPP; // Œ» Ý,İffBfXfvfŒfC Ef, [fh,İfrfbfg [“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 * lpLightFrame1,
    LPDIRECT3DRMFRAME * lpWorld_frame);
void MakeMyLights(LPDIRECT3DRMFRAME lpScene, LPDIRECT3DRMFRAME lpCamera,
    LPDIRECT3DRMFRAME lpLightFrame1,
    LPDIRECT3DRMLIGHT * lpLight1, LPDIRECT3DRMLIGHT * lpLight2);
void SetMyPositions(LPDIRECT3DRMFRAME lpScene,
    LPDIRECT3DRMFRAME lpCamera, LPDIRECT3DRMFRAME lpLightFrame1,
    LPDIRECT3DRMFRAME lpWorld_frame);
void MakeMyMesh(LPDIRECT3DRMMESHBUILDER * lpSphere3_builder);
void MakeMyWrap(LPDIRECT3DRMMESHBUILDER sphere3_builder,
    LPDIRECT3DRMWRAP * lpWrap);
void AddMyTexture(LPDIRECT3DRMMESHBUILDER lpSphere3_builder,
    LPDIRECT3DRMTEXTURE * lpTex);
static void CleanUp(void);
```

Windows, ĩfZfbfgfAfbfv, Æ %Šú%»

, ±, ĩfZfNfVf‡f“, Á, Í AHelworld.cfTf“fvf< EfR [fh, ÉfCf“fvfŠf f“fg, 3, ê, Ä, ċ, é AWindowsfvf fOf%of€  
, ĩ•W €“I, ĔfZfbfgfAfbfv, Æ %Šú%»ŠÖ ”, É, Â, ċ, Ä à–¾, ., é B

WinMainŠÖ ”

InitAppŠÖ ”

f fCf“ EfEfBf“fhfE Efvf fV [fWff

## WinMainŠÖ ”

```
Helworld.c,ÌWinMainŠÖ ”,É,Í ADirectDraw,âDirect3D,Ì•ŰŽ f, [fh,ð—~—p,·,éAfvfšfP [fVf‡f“,É“Á—  
L,ÈfR [fh,ª ,µ,¾,ŠÜ,Û,é,Ä,ç,é BInitAppŠÖ ”,ÆCleanUpŠÖ ”,ÍWindowsfvf fOf%of€,Ì•W €“I,È•ª,Ä, ,é,ª AHel  
world.c,Ä,Í A,³,ç,É,ç,Ä,©,Ì“Á•È,Èf^fXfN,ðŽÄ s,·,é BDirect3D,É,“,ç,Ä AWinMainŠÖ ”,ª s,ª Ä,à d—v,È ^—  
,Í ARenderLoopŠÖ ”,ÍEÄ,Ñ o,µ,Ä, ,é BRenderLoopŠÖ ”,Í AfAfjf [fVf‡f“,Ì,»„ê,¼,ê,Ìftf€ [f€  
,ð•%æ,·,é,½,ß,É•K—v,Ä, ,é BRenderLoopŠÖ ”,É,Ä,ç,Ä Ú,µ,,Í uf€f“f_šf“fO_Ef< [fv v,ðŽQ Æ,³,é,½,ç B
```

```
////////////////////////////////////  
//  
// WinMain  
// fAfvfšfP [fVf‡f“,ð %šú%»„µ Af fbfZ [fW Ef< [fv,ðšJžn,·,é B  
// f fbfZ [fW Ef< [fv,Í A I—f fbfZ [fW,ðŽó,Žæ,é,Û,ÄfV [f“,ðf€f“f_šf“fO,·,é B  
//  
////////////////////////////////////
```

```
int PASCAL
```

```
WinMain (HINSTANCE this_inst, HINSTANCE prev_inst, LPSTR cmdline,  
int cmdshow)
```

```
{  
MSG msg;  
HACCEL accel = NULL;  
int failcount = 0; // RenderLoop,ªŽ,”s,µ,½%ñ ”
```

```
prev_inst;  
cmdline;
```

```
// fEfBf“fhfE,ð ì ¬,µ Af€f“f_šf“fO,ðšJžn,·,é,½,ß,É•K—v,È,·,×,Ä,ÌfIfufWfFfNfg,ð  
// %šú%»„,·,é B
```

```
if (!InitApp(this_inst, cmdshow))  
return 1;
```

```
while (!myglobs.bQuit) {
```

```
// ^— ,·,éf fbfZ [fW,ª,È,È,é,Û,Ä Af fbfZ [fW EfLf... [,ðšÄŽ<,·,é B
```

```
while (PeekMessage(&msg, NULL, 0, 0, PM_REMOVE)) {  
if (!TranslateAccelerator(msg.hwnd, accel, &msg)) {  
TranslateMessage(&msg);  
DispatchMessage(&msg);  
}  
}
```

```
// fAfvfšfP [fVf‡f“,ª Ä ¬%»„³,é,Ä,“,ç,ª A I—,µ,æ,ª,Æ,à,µ,Ä,“,ç,ª A,©,Ä  
// D3DRM,ª %šú%»„³,é,Ä,ç,ê,Í 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%ñ^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, ĩ %Šú%ŠÖ ”, ĩ A, Ü, Ą, ñ, Ç, ĩ Windows AfvfŠfP [fVf‡f“, Ą—  
l, É AfEfBf“fhfE EfNf%oX, đ“o^, µ Af fCf“ EfAfvfŠfP [fVf‡f“ EfEfBf“fhfE, đ ĩ ¬, ·, é B, »; ĩ ĄĀ ADirect  
Draw, ĄDirect3D, đ—p, Ą, é AfAfvfŠfP [fVf‡f“, É“Ā—L, ĩ ^— , đ s, □ B

InitAppŠÖ ”, ĩ A, Ü, , ĄĄ» Ý, ĩ ffbfXfvfĄfC, ĩ fsNfZf“—, ½, è, ĩ rfbfg ”, đŽæ“¾, ·, é B, ±  
, ĩ l, ĩ AfAfvfŠfP [fVf‡f“, ĄĄf“f\_Šf“fo, ĩ iŽi, đ Ý’è, ·, é Ū, ÉŽg—p, ¾, é B Ū, µ, -  
, ĩ ufĄf“f\_Šf“fo EfXfe [fg, ĩ Ý’è v, đŽQ Ą, ¾, è, ½, Ą B

, »; ĩ ĄĀ A, Ç, ĩ Direct3Dfhf%oCfo, Ą—LĄĄ, Ą, é, ©, đĄĄ’è, µ Ą“K Ø, Èfhf%oCfo, đ’I’đ, ·, é, ½, ß, É Af [fJf’è’, ĩ Enum  
DriversŠÖ ”, đĄĄ, Ñ o, · Bfhf%oCfo, ĩ—ñĄ“, É, Ą, Ą, Ą Ū, µ, , ĩ A ufffofCfX Efhf%oCfo, ĩ—  
ñĄ“ v, đŽQ Ą, ¾, è, ½, Ą B

ŽÝ, É ADirect3DRMCreateŠÖ ”, đĄĄ, Ñ o, µ ĄIDirect3DRMfCf“f^ [ftfFfCfX, đ ĩ ¬, ·, é B, ±  
, ĩ fCf“f^ [ftfFfCfX, ĩ AfV [f“, ĄfJf f%o EftfĄ [fĄ, đ ĩ ¬, µ, ½, è AfJf f%o  
, đfV [f“, É Ý’u, ·, é, ½, ß ĄIDirect3DRM::CreateFrame, ĄIDirect3DRMFrame::SetPosition, đĄĄ, Ñ o, ·, Ą, «, ÉŽg—  
p, ¾, é B

DirectDrawClipperfIfufWfFfNfg, ĩ A3DfV [f“, ĩ%ĀŽ, ·, Ą, đ §ĄĄ, ·, éfNfŠfbfsf“fo fvfĄ [f“, ĩŠÇ—  
, đŠĒ’P, É, ·, é BHelwold.c, Ą, ĩ ĄIDirectDrawClipperfCf“f^ [ftfFfCfX, đ ĩ ¬, ·, é, ½, ß, ÉDirectDrawCreateClipperŠÖ  
”, đĄĄ, Ñ o, µ ĄIDirectDrawClipper::SetHwndf ffbfh, đŽg—  
p, µ, Ą AfNfŠfbfsf“fo ĩñ, đŽæ“¾, ·, éfEfBf“fhfE, ĩfnf“fhfĄ, đ Ý’è, ·, é B

, »; µ, Ą Af [fJf’è’, ĩ CreateDevAndViewŠÖ ”, đĄĄ, Ñ o, µ ADirect3DffofCfX, Ąftrf... [f| [fg, đ ĩ ¬, ·, é B, ±  
, ĩŠÖ ”, É, Ą, Ą, Ą Ū, µ, , ĩ ufffofCfX, Ąftrf... [f| [fg, ĩ ĩ ĩ v, đŽQ Ą, ¾, è, ½, Ą B

Direct3DAfvfŠfP [fVf‡f“, ĄfTf| [fg, ·, é, ·, ×, Ą, ĩ \Ą’ĩ, ĩ %Šú%ŠÖ», ĄŠ@—1, ·, é, Ą A3DfV [f“, đ ×, ©, \ ¬, ·, é, ±  
, Ą, Ą, Ą, «, é, Ą, Ą, É, É, é B, ±, ĩ ^— , ĩ MySceneŠÖ ”, Ą s, Ą, Ą, Ą, é BMySceneŠÖ ”, É, Ą, Ą, Ą Ū, µ, , ĩ ufffofCfX, Ąftrf...  
[f| [fg, ĩ ĩ ĩ v, đŽQ Ą, ¾, è, ½, Ą B

ĄĄĄ, ÉInitAppŠÖ ”, ĩ A•W Ą“I, È %Šú%ŠÖ ”, ĄĄ—l, É AfEfBf“fhfE, ĩ•Ž!, Ą X V, đ s, □ B

```
////////////////////////////////////  
//  
// InitApp  
// fEfBf“fhfE, đ ĩ ¬, µ AfĄf“f_Šf“fo, đŠJŽn, ·, é, ½, ß, É•K—v, È, ·, ×, Ą, ĩ IfufWfFfNfg, đ  
// %Šú%ŠÖ», ·, é B  
//  
////////////////////////////////////
```

```
static BOOL  
InitApp(HINSTANCE this_inst, int cmdshow)  
{  
    HWND win;  
    HDC hdc;  
    WNDCLASS wc;  
    RECT rc;  
  
    // fZfbfgfAfbfv, đ s, Ą 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<Ī ”,đ %Šú%»„,é B

memset(&myglobs, 0, sizeof(myglobs));

// fEfBf“fhfE,đ ì ¬,.,é B

win =
    CreateWindow
    (
        "D3DRM Example", // fEfBf“fhfE EfNf%ofX
        "Hello World (Direct3DRM)", // f^CfGf<fo [
        WS_VISIBLE | WS_OVERLAPPED | WS_CAPTION | WS_SYSMENU |
        WS_MINIMIZEBOX | WS_MAXIMIZEBOX,
        CW_USEDEFAULT, // %Šúx À•W
        CW_USEDEFAULT, // %Šúy À•W
        300, // %Šú,Ī•
        300, // %Šú,Ī „³
        NULL, // efEfBf“fhfE
        NULL, // f fjf... [ Efnf“fhf<
        this_inst, // fvf fOf%of€„ĪfCf“fXf^“fX Efnf“fhf<
        NULL // ì ¬fpf%of [f^
    );
if (!win)
    return FALSE;

// Ą» Ý,ĪffBfXfvfEfC„ĪfsfNfZf<“¬,½,è,Īfrfbfg ”,đ<L%¬,.,é B

hdc = GetDC(win);
myglobs.BPP = GetDeviceCaps(hdc, BITSPIXEL);
ReleaseDC(win, hdc);

// D3Dfhf%ofCfo,đ—ñ<„µ A,D,Æ,Â,đ‘I’đ,.,é B

if (!EnumDrivers(win))
    return FALSE;

// D3DRMfĪfufWfFfNfg„ÆD3DRMfĪfufWfFfNfg,đ ì ¬,.,é B

lpD3DRM = NULL;
Direct3DRMCreate(&lpD3DRM);

// f}fXf^ [ EfV [f“„ĪftfĄ [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));

// DirectDrawClipperfĪfufWfFfNfg,đ ì ¬,µ AfEfBf“fhfE„ÆŠÖ~A•t,¬,é B

DirectDrawCreateClipper(0, &lpDDClipper, NULL);
lpDDClipper->lpVtbl->SetHWND(lpDDClipper, 0, win);

// ‘I’đ,³,è,½D3Dfhf%ofCfo,đ—p,Ą„ÄD3DRMffofCfX,đ ì ¬,.,é B

GetClientRect(win, &rc);
if (!CreateDevAndView(lpDDClipper, myglobs.CurrDriver, rc.right,
    rc.bottom)) {
    return FALSE;
}

```

```
// fÆf“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,Á, ,é BŽÀ Ū,Í A,± ,lfTf“fvf<,lf+ [fU,lf“ü—í,ð’s,Žó, -•t,-,È,cfAfvfšfP [fVf±f“,Æ,È,é B

fEfBf“fhfE Efvf fV [fWff,Í AWM\_DESTROYf fbZ [fW,ðžó, -žæ,é,ÆCleanUpšÖ ”,ðĀ,Ñ o,· B

,Ū,½WM\_ACTIVATEf fbZ [fW,ðžó, -žæ,Á,½,Æ,«,É,Í AfEfBf“fhfE Efvf fV [fWff,ÍDirect3DRMWinDevice,ð Žæ“¾,µ AfAfNfefBfu,ÈfĀf“f\_šf“fO EfEfBf“fhfE,ì F,ð ³,µ,-

•ž,; ,é,½,ß,ÉDirect3DRMWinDevice::HandleActivate f\fbfh,ĪĀ,Ñ o,µ,ð s,□ B“—

l,É AWM\_PAINTf fbZ [fW,É%ž“š,µ,Ā AfEfBf“fhfE Efvf fV [fWff,ÍDirect3DRMWinDevice::HandlePaint f ffbfh,ðĀ,Ñ o,· B

```
////////////////////////////////////
//
// WindowProc
// f fCf“ EfEfBf“fhfE,lf fbZ [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 fbZ [fW,ð ^— ,;é AfEfBf“fhfEĀ—L,ĪD3DRMfEfBf“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 fbZ [fW,ð ^— ,;é AfEfBf“fhfEĀ—L,ĪD3DRMfEfBf“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;
}
```

**ffofCfX Efhf%oCfo,ì—ñ<**

Direct3D,ð—p,·,·,éAfvfŠfP [fVf‡f“,Í A•K, A—LCEø,Èfhf%oCfo,ð—ñ<“,μ A•K—v,È‘€ ì,ð s,□  
,½,ß,É Á“K,Èfhf%oCfo,ð‘I‘ð,μ,È, ¯,ê,Í,È,ç,È,¢ B^È%°,ìfZfNfVf‡f“,Á,Í A,±,ì ^— ,ðŽÀ s,·,éŠÖ ”,É,Â,¢  
,ĂĈĚ X,É à—¾,·,é B

EnumDriversŠÖ ”

enumDeviceFuncfR [f<fofbfNŠÖ ”

BPPToDDBDfwf<fpŠÖ ”

**EnumDriversŠÖ ”**

EnumDriversŠÖ ”,Í AInitAppŠÖ ”,ªAfvfšfP [fVfšf“,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 %o,ÉDirectDrawCreateŠÖ ”,ðEÄ,Ñ o,µ,ÄDirectDrawIfufWfFfNfg,ð ¶ ¬,·,é B±,¢  
,ÄEnumDriversŠÖ ”,Í AQueryInterface f\fbfh,ð—p,¢  
,ÄIDirect3DfCf“f^ [ftfFfCfX,ð ¶ ¬,·,é BCE¾Eê,ÄQueryInterface,ðfCf“fvfšf f“fg,·,é ê ± A‘æ2fpf%of [f  
^,É,Í A iC++,Ä,ìfCf“fvfšf f“fg,ì,æ,ª,É j’è ”,»,ì,à,ì,ð’P,ÉŽw’è,·,é,ì,Ä,Í,È,-  
AfCf“f^ [ftfFfCfX,ìŽ·ÉŽq,ìfAfhfCfX,ð“n,³,È,,Ä,Í,È,ç,È,¢ B

fhf%ofCfo,ì—

ñ<“,Í AIDirect3D::EnumDevices f\fbfh,É,æ,Ä,Ä s,í,ê,é BIDirect3D::EnumDevices f\fbfh,Í Af [fJf<,É’è<’,³,ê  
,½enumDeviceFuncR [f<fofbfNŠÖ ”,ð—~p,·,é B,±,ìfR [f<fofbfNŠÖ ”,É,Ä,¢,Ä Ú,µ,-  
,Í A uenumDeviceFuncR [f<fofbfNŠÖ ” v,ðŽQ Æ,³,ê,½,¢ B

IDirect3D::EnumDevices,ÍDirect3Df f\fbfh,Ä, ,è ADirect3DRMf f\fbfh,Ä,Í,È,¢,±,Æ,É’ Ó,ª·K—v,Ä, ,é B·ÛŽ f,  
[fh,ìAPI,É,Í A—ñ<“,ð s,ªf f\fbfh,Í¶ Ý,µ,È,¢ B,±  
,é,Í A,Ð,Æ,Ä,ìfAfvfšfP [fVfšf“,Ä·ÛŽ f, [fh,Æ’¼ Úf, [fh,ì—¼·û,ðŽg—p,·,é ê ±,ì—ç,¢—á,Ä, ,é B

```
////////////////////////////////////  
//  
// EnumDrivers  
// —LCEø,ÈD3Dfhf%ofCfo,ð—ñ<“,µ A,Ð,Æ,Ä,ð’I’ð,·,é B  
//  
////////////////////////////////////
```

static BOOL

EnumDrivers (HWND win)

```
{  
    LPDIRECTDRAW lpDD;  
    LPDIRECT3D lpD3D;  
    HRESULT rval;  
  
    // DirectDrawIfufWfFfNfg,ð ì ¬,µ Afhf%ofCfo,ì—ñ<“,É—p,¢,éDirect3D  
    // fCf“f^ [ftfFfCfX,ð—â,¢ ±,í,¹,é B  
  
    DirectDrawCreate (NULL, &lpDD, NULL);  
    rval = lpDD->lpVtbl->QueryInterface (lpDD, &IID_IDirect3D,  
        (void**) &lpD3D);  
    if (rval != DD_OK) {  
        lpDD->lpVtbl->Release (lpDD);  
        return FALSE;  
    }  
  
    // enumDeviceFunc,ìfhf%ofCfo‘I’ðfR [fh,ð %oŠú%o»,·,é,½,ß ACurrDriver,É  
    // -1,ð Ý’è,µ Afhf%ofCfo,ð—ñ<“,·,é B  
  
    myglobs.CurrDriver = -1;  
    lpD3D->lpVtbl->EnumDevices (lpD3D, enumDeviceFunc,  
        &myglobs.CurrDriver);  
  
    // ,È,,Æ,à—LCEø,Èfhf%ofCfo,ª,Ð,Æ,Ä,Í, ,é,±,Æ,ð·Û Ø,·,é B  
  
    if (myglobs.NumDrivers == 0) {  
        return FALSE;  
    }  
    lpD3D->lpVtbl->Release (lpD3D);  
    lpDD->lpVtbl->Release (lpDD);  
  
    return TRUE;  
}
```



**enumDeviceFuncR [f<fofbfNŠÖ ”**

enumDeviceFunkŠÖ ”,Í AD3DENUMDEVICESCALLBACK^,ÌFR [f<fofbfNŠÖ ”,Á, ,é BD3DENUMDEVICESCALLBACK^,Ìfwfbf\_ Eftf@fCf<D3dcaps.h,É`è`³,é,Á,¢,é BfVfXfef€,Í,±,ÌŠÖ ”,É AfCf“fXfg [f<³,é,Á,¢,éŠeDirect3Dfhf%ofCfo,ÌŽ`·ÈŽq,Æ-¼‘O A,,æ,Ñfn [fhfEfFfA,ÆfGf~f...f€ [fg,³,é,½fhf%ofCfo,Ì”\— Í,đ’Ê’m,·,é B

fR [f<fofbfNŠÖ ”,Í AD3DDEVICEDESC \‘ç’ì,ÌdcmColorModelf f“fo,đŽg—p,µ,Á AfN [fhfEfFfA,Æ— ñ<“,³,é,½fhf%ofCfo,Ì,Ç,ì,ç,đ’²,×,é,©,đ€`è,·,é B,±,Ìf f“fo,Éfn [fhfEfFfA,ª Ý’è,³,é,Á,¢,é é ê ‡ AŠÖ ”,Ìfn [fhfEfFfA,Ì «”,đ’²,×,é B

ŽÝ,É AfR [f<fofbfNŠÖ ”,Í A—ñ<“,³,é,½fhf%ofCfo,ª€» Ý,ÌfJf% [ Efrfbfg ”,Áf€f“f\_Šf“fo,đ s,ª,±,Æ,ª,Á,«„é,©,Ç,ª,đ”’è,·,é B\*s%oÁ”,È é ‡,ÍD3DENUMRET\_OK,đ•Ö,µ A,»,Ìfhf%ofCfo,ÉŠÖ,·,éŽc,è,Ì ^— ,đfXfLfbfv,µ,Á AŽÝ,Ìfhf%ofCfo,Ì—ñ<“,đ’±,·,é BfR [f<fofbfNŠÖ ”,Í Af [fJf<‘è<,ÌBPPToDDBDŠÖ ”,đ— p,¢ A’Ê’m,³,é,½fJf% [ Efrfbfg ”,Æ AInitAppŠÖ ”,Á,ÌGetDeviceCapsŠÖ ”,Ì€Á,Ñ o,µ,É,æ,Á,ÁŽæ“¼,³,é,½ F %ođ‘æ“x,Æ,đ”ášr,·,é iBPPToDDBD,Íbits-per-pixel to DirectDraw bit-depth,Ì—ª,Á, ,é j BPPToDDBDŠÖ ”,ÌfR [fh,É,Á,¢,Á,Í A uBPPToDDBDfwf<fpŠÖ ” v,đŽQ Æ,³,é,½,¢ B

—ñ<“,³,é,½fhf%ofCfo,É,Á,¢,ÁŠÈ’P,ÈfefXfg,đ s,Á,½€ä,Í AD3DDEVICEDESC \‘ç’ì,Ì¼,Ìf f“fo,đ”’è,·,é BfR [f<fofbfNŠÖ ”,Í Af\ftfgfE fFfA fGf~f...f€ [fVf±f“„æ,è,àfn [fhfEfFfA,đ Af, fmfNf Ef%ofCf,æ,è,àRGBf%ofCf,đ’I’đ,·,é B

```
////////////////////////////////////  
//  
// enumDeviceFunc  
// Žg—p%oÁ”,ÈD3Dfhf%ofCfo,Ì-¼‘O,ÆGUID,đL%o-,·,éfR [f<fofbfNŠÖ ” B  
// fhf%ofCfo,đ’I’đ,µ A*lpContext,É Ý’è,·,é B  
//  
////////////////////////////////////
```

```
static HRESULT  
WINAPI enumDeviceFunc(LPGUID lpGuid, LPSTR lpDeviceDescription,  
    LPSTR lpDeviceName, LPD3DDEVICEDESC lpHWDesc,  
    LPD3DDEVICEDESC lpHELDesc, LPVOID lpContext)  
{  
    static BOOL hardware = FALSE; // €» Ý,ÌŠJŽnfhf%ofCfo,Ífn [fhfEfFfA,Á, ,é  
    static BOOL mono = FALSE; // €» Ý,ÌŠJŽnfhf%ofCfo,Íf, fmfNf €ö€¹,Á, ,é  
    LPD3DDEVICEDESC lpDesc;  
    int *lpStartDriver = (int *)lpContext;  
  
    // ,Ç,ÌffofCfX<L q,đ’²,×,é,©,đ€`è,·,é B  
  
    lpDesc = lpHWDesc->dcmColorModel ? lpHWDesc : lpHELDesc;  
  
    // €» Ý,ÌffBfXfvf€fC,ÌfRfbfg [“x,Á,Í A,±,Ìfhf%ofCfo,ªf€f“f_Šf“fo,đ s,,È,¢ é ‡ A  
    // fhf%ofCfo,đfXfLfbfv,µ,Á—ñ<“,đ’± s,·,é B  
  
    if (!(lpDesc->dwDeviceRenderBitDepth & BPPToDDBD(myglobs.BPP))  
        return D3DENUMRET_OK;  
  
    // ,±,Ìfhf%ofCfo,Ì-¼‘O,ÆGUID,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 €ö€¹,æ,è,àRGB€ö€¹,đ’I’đ,·,é B  
  
    if (*lpStartDriver == -1) {  
        // ,±,é,ª Á %o,Ì—L€ø,Èfhf%ofCfo,Á, ,é B  
  
        *lpStartDriver = myglobs.NumDrivers;  
    }  
}
```

```

    hardware = lpDesc == lpHWDesc ? TRUE : FALSE;
    mono = lpDesc->dcmColorModel & D3DCOLOR_MONO ? TRUE : FALSE;
} else if (lpDesc == lpHWDesc && !hardware) {

    // ,±,Ïfhf%ofCfo,Ífn [fhEfffA,À,è AŠJŽnfhf%ofCfo,Íf\ftfgfEfffA,À,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) {

        // ,±,Ïfhf%ofCfo,ÆŠJŽnfhf%ofCfo,Í““„Źí—b,À,é BŠJŽnfhf%ofCfo,ÍRGBEôCE¹
        // ,¾,À,½,ì,É‘Î,µ A,±,Ïfhf%ofCfo,Íf,fmfNf ,À,é B

        *lpStartDriver = myglobs.NumDrivers;
        hardware = lpDesc == lpHWDesc ? TRUE : FALSE;
        mono = lpDesc->dcmColorModel & D3DCOLOR_MONO ? TRUE : FALSE;
    }
}
myglobs.NumDrivers++;
if (myglobs.NumDrivers == MAX_DRIVERS)
    return (D3DENUMRET_CANCEL);
return (D3DENUMRET_OK);
}

```

**BPPToDDBDwf<fpŠÖ ”**

enumDeviceFuncR [f<fofbfNŠÖ ”,Í ABPPToDDBDwf<fpŠÖ ”,ð—p,¢,Ä AE» Ý,ÏffofCfX,³fTf|  
[fg,.,é F%ð'œ“x,ð A—  
ñ<“,³,ê,½fhf%ofCfo,ÏfJf%o [ Efrfbfg ”,Æ”äŠr,Ä,«,éE`Ž@,É•İŠ·,.,é BenumDeviceFunc,É,Ä,¢,Ä Ú,µ,-  
,Í A uenumDeviceFuncR [f<fofbfNŠÖ ” v,ðŽQ Æ,³,ê,½,¢ B

```
////////////////////////////////////  
//  
// BPPToDDBD  
// fsfNfZf<“,½,è,Ïfrfbfg ”,ðDirectDraw,Ïfrfbfg [“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;  
    }  
}
```

3DŠĀ««ĭfZfbfgfAfbfv

,±,ĭfZfNfVf‡f“,Ā,Ī AHelworld.c,ĭfR [fh,ĭ,ϖ,ζ A3DŠĀ««,đ \z,·,é”•ª,É,Ā,¢,Ā à-  
¾,·,é B`È%º,ĭfZfNfVf‡f“,Ī A,±,Ī ^— ,đŽĀ s,·,é,½,β,Ī,Ó,½,Ā,ĪŠÖ ”,É,Ā,¢,Ā à¾,μ,Ā,¢,é B

fffofCfX,Æfrf... [f| [fg,Ī ĭ ñ  
fĈEf“f\_fŠf“fO EfXfe [fg,Ī Ý`è

,±  
,ê,ç,ĭŠÖ ”,Ī A3DŠĀ««,ÉfIfufWfFfNfg,âftfĈ [f€ ACEđ,đ”z’u,·,é,à,Ī,Ā,Ī,Ē,¢ BfV [f“,Ī ĭ ñ,Ī AMySceneŠÖ ”,  
Æ AMySceneŠÖ ”,ªĈĀ,Ñ o,·ŠÖ ”ĈEQ,É,æ,Ā,ĀŽĀĈ»,³,ê,é B3DŠĀ««,ÉfV [f“,đ Ý`è,·,é•û-@,É,Ā,¢  
,Ā,Ī A ufV [f“,Ī ĭ ñ v,đŽQ Ĉ,³,ê,½,¢ B

**ffofCfX,Æfrf... [f] [fg,ì ì ñ**

Direct3DffofCfX,Æfrf... [f]

[fg,Í AfAvfšfP [fVfšf“,Ì %ú%»„ÏèšÂ,Æ,μ,Ä ì ñ,³,é,é BInitAppšÖ ”,Í ADirectDrawClipperIfufWfFfNfg,đ ¶ ñ,μ,½Ěä ADirectDrawClipperIfufWfFfNfg,Æ‘Ď,³,é,½fhf%ofCfo A,“,æ,ÑfNf%ofCfAf“fg<Ě,Ì j-@,đfpf%of [f^,Æ,μ,Ä ACreateDevAndViewšÖ ”,đĚÄ,Ñ o,· B

CreateDevAndViewšÖ ”,Í A—ñ<“fvf fZfX,Ä‘Ď,³,é,½fhf%ofCfo,đžg—

p,μ,Ä A**IDirect3DRM::CreateDeviceFromClipper** f\fbfh,É,æ,Ä,ÄDirect3DRMffofCfX,đ ì ñ,·,é B,±,Í**IDirect3DRMDevice**fC“f^ [ftFfCfX,Í AffofCfX,Ì· ,“,æ,Ñ ,³,đžæ“¾,·,é**IDirect3DRMDevice::GetWidth**,Æ**IDirect3DRMDevice::GetHeight** f\fbfh,ÌĚÄ,Ñ o,μ,Äžg,í,é,é BCreateDevAndViewšÖ ”,Í AffofCfX,Ì· ,â ,³,ì îñ,đ Žó,žæ,Ä,½Ěä A**IDirect3DRM::CreateViewport** f\fbfh,đĚÄ,Ñ o,μ,Ä**IDirect3DRMViewport**fC“f^ [ftFfCfX,đžæ“¾,·,é B

žŸ,ÉCreateDevAndViewšÖ ”,Í**IDirect3DRMViewport::SetBack** f\fbfh,É,æ,Ä,Äfrf... [f] [fg,ÌĚä·ûNfšfbfv-Ě,đ Ÿ‘è,·,é,Æ Af [fJf<‘è<,ÌSetRenderStatešÖ ”,ĚÄ,Ñ o,³,é,é BSetRenderStatešÖ ”,É,Ä,ĉ,Ä,Í AžŸ,ÌfZfNfVfšf“ ufĚf“f fšf“fO EfXfe [fg,Ì Ÿ‘è v,Ä à¾,·,é B

```
////////////////////////////////////  
//  
// CreateDevAndView  
// žw‘è,³,é,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,é,½D3Dfhf%ofCfo,đ—p,ĉ A,±,ÌfEfBf“fhfE,©,ĉD3DRMffofCfX,đ ì ñ,·,é B

lpD3DRM->lpVtbl->CreateDeviceFromClipper(lpD3DRM, lpDDClipper, &myglobs.DriverGUID[driver], width, height, &myglobs.dev);

// fJf f%o EftfĚ [fĚ,đžg,Ä,ÄD3DRMfrf... [f] [fg,đ ì ñ,·,é B”wĚi,Ì [³,đ‘ä,«Ě ”,É // Ÿ‘è,·,é B·,Æ ,³,Ì,¾,ĉ,½,ĉ² ß,³,é,Ä,ĉ,é,Ì,Ä AffofCfX,©,ĉžæ“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; }

// fĚf“f fšf“fO,Ì·žĉ A“h,è,Ä,Ô,μf, [fh AĚđĚ1,Ì ó‘Ô AfJf%o [ EfVfF [ffBf“fO,Ì îñ,đ // Ÿ‘è,·,é B

if (!SetRenderState()) return FALSE; return TRUE;

}

fCef“f\_Šf“fO EfXfe [fg,İ Ýè

Direct3D,İfXfe [fg Ef]fVf“ ,Á ,é BfAfvfŠfP [fVf‡f“ ,Í A Æ–¼f,fWf... [f< AfCef“f\_Šf“fO Ef,fWf... [f< A, ,æ,Ñ•İŠ•f,fWf... [f< ,İ ó‘Ô,đ Ý’è,µ A,»,é,ç,đ‘È,µ,Äff [f^,đ‘— o, ,é B,±,İŽd‘g,Ý,đ‘ÓŽ– , ,é,± ,Æ,Í A’¼ Úf, [fh,É,Æ,Á,Ä,İ•s%ÅÆ‡,Ä, ,é,ª A•ŪŽ f, [fh,Ä,İ•”•“I,É%B•Ä,³,é,Ä,ç ,é B•ŪŽ f, [fh EfAfvfŠfP [fVf‡f“ ,Í ASetRenderStateŠÖ ”,É,æ,Ä,Ä AfCef“f\_Šf“fO EfXfe [fg,đŠÈ‘P,É Ý è, ,é,±,Æ,ª,Ä,«,«,é B

,Ü, ASetRenderStateŠÖ ”,Í ACEđ,đfIf“ A“h,è,Ä,Ô,µf, [fh,đf\Šfbfh,É,µ AfOf [ EfVfF [ffBf“fO Ef, [f h,đ—p,ç,é,æ,µ,ÉŽw’è,µ,Ä AIDirect3DRMDevice::SetQualityf f\fbfh,İCEÄ,Ñ o,µ,đ s,µ B,± ,İ,Æ,« AfBfU Ef, [fh,âfefNfXf`ff,İ•iŽç,đ•İ X, ,é•K—v,ª ,éAfvfŠfP [fVf‡f“ ,Í AIDirect3DRMDevice::SetDitherf f\fbfh,âIDirect3DRMDevice::SetTextureQualityf f\fbfh,đCEÄ,Ñ o, , ,± ,Æ,ª,Ä,«,«,é B

,±,İŠÖ ”,İŽç,è,İ•”•ª,İswitch•¶,Ä ACE» Ý,İffofCfX,ªfTf] [fg, ,é F%đ‘œ“x,İ‘l,É,æ,Ä,Äfpf%of [f^,đ•İ, AIDirect3DRMDevice::SetShades AIDirect3DRM::SetDefaultTextureColors A, ,æ,ÑIDirect3DRM::SetDefaultTextureShades f\fbfh,đCEÄ,Ñ o,µ,Ä,ç,é B

```
////////////////////////////////////
//
// SetRenderState
// fCef“f_Šf“fO,İ•iŽç,Æ%A%œe î•ñ,đ Ý’è, ,é B
//
////////////////////////////////////
```

BOOL

SetRenderState(void)

{

    HRESULT rval;

    // fCef“f\_Šf“fO,İ•iŽç iCEđCE!,İfgOf< A“h,è,Ä,Ô,µf, [fh A%A%œef, [fh j,đ Ý’è, ,é B

    rval = myglobals.dev->lpVtbl->SetQuality(myglobals.dev, D3DRMLIGHT\_ON | D3DRMFILL\_SOLID | D3DRMSHADE\_GOURAUD);  
    if (rval != D3DRM\_OK) {  
        return FALSE;  
    }

    // ffbfU Ef, [fh,đ•İ X,µ,½,ç ê ‡ A,±,±,ÄSetDither,đCEÄ,Ñ o, B

    // fefNfXf`ff,İ•iŽç,đD3DRMTEXTURE\_NEAREST ifffHf<fg j`ÈŠO,É,µ,½,ç ê ‡ A  
    // ,±,±,ÄSetTextureQuality,đCEÄ,Ñ o, B

    // CE» Ý,İfsfNfZf<–,½,è,İftrfbfg ”,ÉŠİ,Ä,ç,Ä A%A%œef, [fh,đ Ý’è, ,é B

    switch (myglobals.BPP) {

        case 1:

            if (FAILED(myglobals.dev->lpVtbl->SetShades(myglobals.dev, 4)))  
                goto shades\_error;  
            if (FAILED(lpD3DRM->lpVtbl->SetDefaultTextureShades(lpD3DRM, 4)))  
                goto shades\_error;  
            break;

        case 16:

            if (FAILED(myglobals.dev->lpVtbl->SetShades(myglobals.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;
}
```

**fCef“f\_Šf“fO Ef< [fv**

WinMainŠÖ ”,Í AŽŸ,ÌftfCE [f€,đ•%œ,.,é,½,ß ARenderLoopŠÖ ”,đCEÄ,Ñ o,· BRenderLoopŠÖ ”,Í A,¢,-  
,Ä,©,ìP f,È ^— ,đŽÄ s,.,é B

**IDirect3DRMFrame::Move** f\fbfh,đCEÄ,Ñ o,µ AŠK‘w%°,ì,·,×,Ä,ÌftfCE [f€,ì%ñ“],â‘-“x,ì“K—p,đ s,µ B

**IDirect3DRMViewport::Clear** f\fbfh,đCEÄ,Ñ o,µ ACE» Ý,Ìfrf... [f| [fg,đ”wCEi F,ÄfNfŠfA,.,é B

**IDirect3DRMViewport::Render** f\fbfh,đCEÄ,Ñ o,µ ACE» Ý,ÌfV [f“,đfrf... [f| [fg,ÉfCEf“f\_Šf“fO,.,é B

**IDirect3DRMDevice::Update** f\fbfh,đCEÄ,Ñ o,µ AfCEf“f\_Šf“fO,³,ê,½fCf [fW,đfXfNfŠ [f“,ÉfRfs [,.,é  
B

```
////////////////////////////////////  
//  
// RenderLoop  
// frf... [f| [fg,đfNfŠfA,µ,ÄŽŸ,ÌftfCE [f€,đfCEf“f_Šf“fO,µ AfEfBf“fhfE,đ X V,.,é B  
//  
////////////////////////////////////
```

```
static BOOL  
RenderLoop()  
{  
    HRESULT rval;  
  
    // CE» Ý,ÌfV [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,ÉfCEf“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“,ì ì ÷**

3DŠÂ««,ÌfZfbfgfAfbfv ifhf%oCfo,ì'I'ð A3DfffofCfX,Æfrf... [f]  
[fg,ì ì ÷ AfŒf“f\_Šf“fO EfXfe [fg,ì Ý'è,È,Ç j,“Š@—1,·,é,Æ AHelworld.c,Í A,±  
,Ì3DŠÂ««,ÉfIfufWfFfNfg,âftfŒ [f€ AŒö,ð”z'u,·,é,½,ß,ÌŠÖ ”ŒQ,ðŒÄ,Ñ o,· B

MySceneŠÖ ”

MakeMyFrames ŠÖ ”

MakeMyLights ŠÖ ”

SetMyPositions ŠÖ ”

MakeMyMesh ŠÖ ”

MakeMyWrap ŠÖ ”

AddMyTexture ŠÖ ”

## MySceneŠÖ ”

```
Helworld.c,ÌMySceneŠÖ ”,Í ADirectX SDK,Ì,·,×,Ä,ÌDirect3DfTf“fvf<,ÉfCf“fvfŠf f“fg,³,ê,Ä,¢
,é ABuildSceneŠÖ ”,É:Š“-.,é BfAfvfšfP [fVf‡f“,ìIfufWfFfNfg,ðfefNfXf`ff,â Æ-¾4CEø%Ê,Æ,Æ,à,É^Ž!,·.é ^
— ,Í A,·,×,Ä,±,ÌŠÖ ”“à,Ä s,í,ê,é B
```

```
MySceneŠÖ ”,Í A ì ¬,³,ê,éfv [f“,ìŠe“Á «,ð Ý`è,·.é Af [fJf'è`ÌŠÖ ”EQ,ðCEÄ,Ñ o,· B,±
,ê,ç,ÌŠÖ ”,ðÈ%ø,ÉŽ!,· B
```

MakeMyFramesŠÖ ”

MakeMyLightsŠÖ ”

SetMyPositionsŠÖ ”

MakeMyMeshŠÖ ”

MakeMyWrapŠÖ ”

AddMyTextureŠÖ ”

```
,±,ê,ç,ÌŠÖ ”,ªfrfWf...fAf< EfIfufWfFfNfg,ÌfZfbfgfAfbfv,ðŠ@—
¹,·,é,Æ AMySceneŠÖ ”,ÍDirect3DRMFrame::AddVisualf f\fbfh,ðCEÄ,Ñ o,µ AfIfufWfFfNfg,ð3DŠÄ««,Ìworldftf
CE [f€,É'Ç%øÄ,·.é B,»),ÌCEä,Í ì ¬,³,ê,½fCf“f^ [ftfFfCfX,Í·s—
v,É,È,é,½,ß ACEJ,è·Ö,µReleasef f\fbfh,ðCEÄ,Ñ o,µ,Ä A,·,×,Ä,ÌfCf“f^ [ftfFfCfX,ð%ð•ú,·.é,±,Æ,ª,Ä,«.,é B
```

```
////////////////////////////////////
//
// MyScene
// ftfCE [f€ 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}fefšfAf<,ð ì ¬,·.éK—v,ª,é ê ‡ i,½,Æ,Ì ACEð,èP,-Ê,ð ì ¬,·.é ê ‡ j A
// ,±,±,ÄCreateMaterial,ÆSetMaterial,ðCEÄ,Ñ o,· B
```

```
// ,±,ê,ÄfrfWf...fAf< EfIfufWfFfNfg,ª ì ¬,³,ê,½,Ì,Ä Af [f<fh EftfCE [f€,É'Ç%øÄ,·.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;  
}
```



## MakeMyLightsŠÖ ”

MySceneŠÖ ”,ÍMakeMyLightsŠÖ ”,ðĀ,Ñ o,μ AHelworld.c,Ā—p,ĉ,ç,ê,é—  
LĀüĀöĀ¹,âfAf“frfGf“fg Ef%ofCfġ,ð ì ¬,·,é BMakeMyLightsŠÖ ”,ÍIDirect3DRM::CreateLightRGB,ÆIDirect3D  
RMFrame::AddLightf f\fbfh,ðĀ,Ñ o,μ A•ûĀü,ðŽ ,Ā,½–¾,é,ĉĀöĀ¹,ð ¶ ¬,μ A,»ê,ðftfĀ [fĉ  
Ē’Ç%Ā,·,é B,Û,½ A”–  
^Ā,ĉfAf“frfGf“fg Ef%ofCfġ,ð ¶ ¬,μ AfV [f““S`ì,É’Ç%Ā,·,é ifAf“frfGf“fg Ef%ofCfġ,Í A,Ā,Ē,ÉfV [f““S`ì,  
ÉŠÖ~A•t,¬,ç,ê,é j B

```
////////////////////////////////////  
//  
// MakeMyLights  
// fV [f“,ĀŽġ—p,·,éĀöĀ¹,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,Ñ o,µ AHelworld.c,ªŽg,ªftfŒ [fŒ
,İÊ’u,ÆŒü,«,ð Ý’è,·,é BSetMyPositionsŠÖ ”,İ A,±,İ ^—
,ðIDirect3DRMFrame::SetPosition,·,æ,ÑIDirect3DRMFrame::SetOrientationf f\fbfh,İŒÄ,Ñ o,µ,É,æ,Á,ÄŽÀ s,·,é
BIDirect3DRMFrame::SetRotationf f\fbfh,İ A<...‘İ,ªÇ%oÁ,³,ê,éftfŒ [fŒ,É%oñ“],ð Ý’è,·,é B

////////////////////////////////////
//
// SetMyPositions
// ŒöŒ¹ AfJf f% Af [f<fh EftfŒ [fŒ,İÊ’u,ÆŒü,«,ð Ý’è,·,é B
// <...‘İ,İ%oñ“],ð Ý’è,·,é B
//
////////////////////////////////////

void SetMyPositions(LPDIRECT3DRMFRAME lpScene,
    LPDIRECT3DRMFRAME lpCamera, LPDIRECT3DRMFRAME lpLightFrame1,
    LPDIRECT3DRMFRAME lpWorld_frame)
{
    lpLightFrame1->lpVtbl->SetPosition(lpLightFrame1, lpScene,
        D3DVAL(2), D3DVAL(0.0), D3DVAL(22));

    lpCamera->lpVtbl->SetPosition(lpCamera, lpScene,
        D3DVAL(0.0), D3DVAL(0.0), D3DVAL(0.0));
    lpCamera->lpVtbl->SetOrientation(lpCamera, lpScene,
        D3DVAL(0.0), D3DVAL(0.0), D3DVAL(1),
        D3DVAL(0.0), D3DVAL(1), D3DVAL(0.0));

    lpWorld_frame->lpVtbl->SetPosition(lpWorld_frame, lpScene,
        D3DVAL(0.0), D3DVAL(0.0), D3DVAL(15));
    lpWorld_frame->lpVtbl->SetOrientation(lpWorld_frame, lpScene,
        D3DVAL(0.0), D3DVAL(0.0), D3DVAL(1),
        D3DVAL(0.0), D3DVAL(1), D3DVAL(0.0));

    lpWorld_frame->lpVtbl->SetRotation(lpWorld_frame, lpScene,
        D3DVAL(0.0), D3DVAL(0.1), D3DVAL(0.0), D3DVAL(0.05));
}
```

## MakeMyMeshŠÖ ”

```
MySceneŠÖ ”,í AHelworld.c,ÅŽg,í,ê,é<... ó,İf fbVf...
,đf [fh,µ AfZfbfg,·,é,½,ß,ÉMakeMyMeshŠÖ ”,đĀ,Ñ o,· BMekeMyMeshŠÖ ”,íIDirect3DRM::CreateMeshBuil
derf f\fbfh,đĀ,Ñ o,µ,ÄIDirect3DRMMeshBuilderfCf“f^ [ftFfCfX,đ ¶ -,·,é BŽÝ,É AIDirect3DRMMeshBuild
er::Load AIDirect3DRMMeshBuilder::Scale A,»µ,ÄIDirect3DRMMeshBuilder::SetColorRGBf f\fbfh,đĀ,Ñ o,µ
ASphere3.xftf@fCf<,ª Ž,·f fbVf...,đ—pÓ,·,é iSphere3.xftf@fCf<,Í AfTf“fvf< EfR [fh,ªŽg—
p,·,é fffBfA,İ,Đ,Æ,Ä,Æ,µ,ÄDirectX SDK,ÉŽû^³,è,Ä,ĉ,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 EfufĒf“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 ”,ðCEÄ,Ñ o,µ,ÄfefNfXf`ff À•W,ð ì ¬,µ AMakeMyMeshŠÖ ”,af [fh,µ,½<...‘  
Ì,É“K—

p,·,é BMakeMyWrapŠÖ ”,Í A<...‘Ì,ðŠÜ,ð•ûE`«ŠE ü,ðŽæ“¾,·,é,½,ß,ÉIDirect3DRMMeshBuilder::GetBoxf f\fbfh,  
ðCEÄ,Ñ o,µ A,»·ûE`«ŠE ü,ÌfTfCfY,ðIDirect3DRM::CreateWrap f\fbfh,ÌCEÄ,Ñ o,µŽž,ÉŽg—

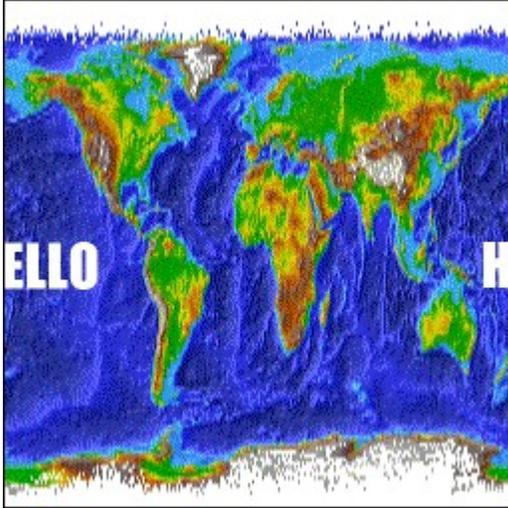
p,·,é BIDirect3DRMWrapf f\fbfh,Í%~‘CE,ÌfefNfXf`ff Ef%öbfv,ð ì ¬,µ AIDirect3DRMWrapCf“f^ [ftfFfCfX  
,ðŽæ“¾,·,é BfefNfXf`ff À•W,ð<...‘Ì,É“K—p,·,é,É,Í AIDirect3DRMWrap::Applyf f\fbfh,ÌCEÄ,Ñ o,µ,ð s,² B

```
////////////////////////////////////  
//  
// MakeMyWrap  
// f%öbfv,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 ”,ðĀ,Ñ o,µ,Ä AfefNfXf`ff,Ìf [fh,â<...‘ì,Ö,ìŠÖ~A•t,¯,ð s,▫ BAddMyTexture  
ŠÖ ”,Í **AIDirect3DRM::LoadTexture** f\fbfh,ð—p,ĉ AHello.ppm,Æ,ĉ,▫¼‘O,Ìfrfbfgf}  
fbfv,ðf [fh,·,é B,»),©,ĉ**IDirect3DRMMeshBuilder::SetTexture**,ðĀ,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 ¼,µ AfefNfXf`ff,É“K—p,·,é B  
//  
////////////////////////////////////  
  
void AddMyTexture(LPDIRECT3DRMMESHBUILDER lpSphere3_builder,  
LPDIRECT3DRMTEXTURE * lpTex)  
{  
    lpD3DRM->lpVtbl->LoadTexture(lpD3DRM, "hello.ppm", lpTex);  
  
    // ffftHf<fg i16 j`ÈŠÖ,ÌfJf% [ ["x,•K—v,È ê ‡ A,±,±,Ä  
    // IDirect3DRMTexture::SetShades,ðĀ,Ñ o,· B  
  
    lpSphere3_builder->lpVtbl->SetTexture(lpSphere3_builder, *lpTex);  
}
```

I-1 ^-

Helworld.c,Í AWM\_DESTROYf fbfZ [fW,ðŽó, Žæ,Á,½,Æ,« A,Ü,½,ÍRenderLoopŠÖ ”,ìĈÄ,Ñ o,μ,É%½“x,©Ž,”s,  
μ,½,Æ,« ACleanUpŠÖ ”,ðĈÄ,Ñ o,· B

```
////////////////////////////////////  
//  
// CleanUp  
// ,·,x,Ä,ÌD3DRMfIfufWfFfNfg,ð%ð•ú,μ AbQuitftf%fo,ðfZfbfg,·,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,ç,Ä

,±,lfZfNfVf±f“,Á,Í AMicrosoft,lfCEfxf<3D API,Ä, ,é¼ Úf, [fh,É,Ä,ç,Ä à-  
¾,.,é BDirect3D,lf¼ Úf, [fh,Í AfQ [fE,â,»,lf¼,lfnfC EfpftfH [f}f“fX,Èf}  
f<f`f fffBfA EfAfvfŠfP [fVf±f“,ð AMicrosoft Windows flfyfCE [fefBf“fO EfVfXfefE ä,É \z,.,éK—  
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,ç•û-  
@,ÄfAfNfZf%ofCE [f^ Efn [fhfEfFfA,Æ¼ ÚÊ M,.,é BDirect3D,lfÜŽ f, [fh,Í A¼ Úf, [fh,Í Ä ä”,É’g,  
Ý—š,Ä,ç,é,Ä,ç,é B

“è”È,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 ,’È,µ,Ä,“,è A,³,ç,É A3DfOf%oftfBfbfNfX,É,Ä,ç,Ä,lf \“a,È’mŽ-,àž ,Ä,Ä,ç,é,©,à,µ,è,È,ç B,»,lf,æ,µ,ÈŠJ”-  
ŽÖ,Ä,à A u3Dfvf fOf%of~f“fO,lfšì’b<Z\_p v,lfê“Ç,.,éK—v,“, ,é B,±,lfZfNfVf±f“,Á,Í AfVfXfefE,ðCEø—  
!“I,É šEä,.,é,½,ß,É’m,Ä,Ä,“,©,È,.,Ä,Í,È,ç,È,ç ADirect3D,lfCf“fvfŠf f“fg,lf Ú ×,É,Ä,ç,Ä à-¾,µ,Ä,ç  
,é BDirect3D,lfA [fLfefNf`ff`S`ì,É,Ä,ç,Ä,Í uDirect3DfA [fLfefNf`ff v,Äžæ,è`µ,Ä,Ä,ç  
,é B uDirect3DfA [fLfefNf`ff v,Í A¼ Úf, [fh,lfŠJ”ŽÖ,É,Æ,Ä,Ä•s%oÄCE±,ÈfhfLf...f f“fg,Ä, ,é B¼ Úf, [f  
h,lfŠT—v,ð’m,è,½,ç è ±,Í A ufCf“fgf f`fNfVf±f“;  
Direct3D,lf¼ Úf, [fh EfIfufWfFfNfg v,ðžQ Æ,³,è,½,ç B,µ,©,µ A¼ Úf, [fh,É,Ä,ç  
,Ä,Í Ä ,lf îñE¹,Í A,“,»,ç, A,±,lfSDK,ÉŠÜ,Ü,è,Ä,ç,éTf“fvf< EfR [fh,Ä, ,è,µ BfTf“fvf<  
fR [fh,É,Í AžÄ Ü,lfAfvfŠfP [fVf±f“,ÄDirect3D,lf¼ Úf, [fh,ð“® ì,³,¹,é•û-@,“ à-¾,³,è,Ä,ç,é B

,±,lfZfNfVf±f“,Í ADirect3D,lf¼ Úf, [fh Efvf fOf%of~f“fO,lf %o•à,ð à-¾,µ,½,à,Ì,Ä,Í,È,ç B,»,lf îñ,É,Ä,ç  
,Ä,Í A uDirect3D,lf¼ Úf, [fh,lf`f... [fgfŠfAf< v,ðžQ Æ,³,è,½,ç B

**fCf“fgf f\_nNfVf#f“: Direct3D, Ĩ¼ Úf, [fh EfIfufWfFfNfg**

Direct3D, Ĩ¼ Úf, [fh, Ĩ AfIfufWfFfNfg, Ĩ Ĩ Ĩ, âff [f^, Ĩ Ý`è AfIfufWfFfNfg“Žm, ĨCE< ‡, ð s, □API, ©, ‡, Ĩ, è—  
 §, Á, Ä, Ç, é BDirect3D, Ĩ•ŮŽ f, [fh, Ĩ A¼ Úf, [fh, Ĩ Á ã”, É’g, Ý—§, Á, ç, è, Ä, Ç  
 , é BfVfXfef€‘S’Ĩ, Ĩ \ Ĩ, â A¼ Úf, [fh, É“Á—L, Ĩ \ Ĩ, É, Ä, Ç  
 , Ä, Ĩ A Direct3DfA [fLfefNf`ff v, ðŽQ Æ, ³, è, ½, Ç B

ŽŸ, Ĩ•, Ĩ A¼ Úf, [fh, Ĩ8, Ä, ĨIfufWfFfNfgCE^ A, »), ĨRf“f]  
 [fIf“fg EfIfufWfFfNfg Ef, fff< iCOM jfCf“f^ [ftfFfCfX A, „, æ, Ñ, »), è, ¼, è, É, Ä, Ç, Ä, Ĩ à—¾, ðŽ’, µ, Ä, Ç, é B

<b>fIfufWfFfNfgCE^</b>	<b>COMfCf“f^ [ftfFfCfX, Æ à—¾</b>
fCf“f^ [ftfFfCfX	<u>IDirect3DfCf“f^ [ftfFfCfX</u>
ffofCfX	COMfCf“f^ [ftfFfCfX fIfufWfFfNfg
fefNfXf`ff	<u>IDirect3DDevicefCf“f^ [ftfFfCfX</u>
f}fefŠfAf<	fn [fhfEfFfA EfffofCfX
CEöCE¹	<u>IDirect3DTexturefCf“f^ [ftfFfCfX</u>
ftf... [f] [fg	fCf [fW, ðŠÜ, ÐDirectDrawfT [ftfFfX
s—ñ	<u>IDirect3DMaterialfCf“f^ [ftfFfCfX</u>
ŽÀ sfofbtf@	F, âfefNfXf`ff, È, Ç, Ĩ AfT [ftfFfX, Ĩ“Á «
	<u>IDirect3DLightfCf“f^ [ftfFfCfX</u>
	CEöCE¹
	<u>IDirect3DViewportfCf“f^ [ftfFfCfX</u>
	•%œ, ., éfXfNfŠ [f“ EfŠ [fWf#f“
	<u>IDirect3DDevicefCf“f^ [ftfFfCfX</u>
	4 s4—ñ, Ĩ•İŠ• s—ñ
	<u>IDirect3DExecuteBufferfCf“f^ [ftfFfCfX</u>
	’, “_ff [f^, ĨfŠfXfg, ÆfCEf“f_Šf“fO•û—@, ĨŽwŽ’

fCEf“f\_Šf“fO, ĨŽÀ sfofbtf@, É, æ, Á, Ä s, Ĩ, è, é B, ±, Ĩfobfbtf@, É, Ĩ A’, “\_Ĩff [f^, ÆfIfyfR [fh, ðŠÜ, Ü, è, Ä, Ç  
 , é BfIfyfR [fh, Ĩ A%ð“Ç, ³, è, é, Æ AfCEf“f\_Šf“fO fGf“fWf”, ÉfCf [fW, ð ¶ Ĩ, ., é, æ, □  
 , ÉŽwŽ’, ., é BŽÀ sfofbtf@ COMfIfufWfFfNfg, É, Ĩ Af|fCf“f^, Æ Afobfbtf@ EftfH [f}fbfg, É, Ä, Ç, Ä, Ĩ à—  
 ¾, ¾, “, ðŠÜ, Ü, è, Ä, Ç, é B, ±, Ĩfobfbtf@, Ĩ“@“Ĩ, ÉŠm•Ů, ³, è AfOf%ftfBfbfNfJ [fh, Ĩf f, fŠ“à, É•ŮŽ , ., é, ±, Æ, ð, Ä, Ç, é B

ŠefIfufWfFfNfg, Ĩ A`È%°, ĨCE`Ž@, Ĩ, Ð, Æ, Ä`È ã, Ĩ’g, Ý ‡, Ĩ, Ĩ, Á—p, Ç, é, Ĩ, ðCEø%È“Ĩ, Ä, , é B  
 COMfIfufWfFfNfg B  
 COMfIfufWfFfNfg’†, Ĩff [f^, ðCEø—|“Ĩ, ÉŠi”[µ, ½ \‘c’Ĩ B, ±  
 , ĨCE`Ž@, Ĩ`è”È“Ĩ, É AŽÀ Ů, ĨCOMfIfufWfFfNfg, ĨfRfs [ Eft [f^, Ä, , é B  
 fnf“fhf< B, ±, Ĩ è ‡ Aff [f^, Ĩfn [fhfEfFfA ã, É•ŮŽ , ³, è Afn [fhfEfFfA, ©, ç’€ Ĩ, ., é, ±, Æ, ð, Ä, Ç, é B

ŽŸ, Ĩ•, Ĩ ADirect3D, ĨŠefIfufWfFfNfg, “¶ Ý, Ä, Ç, éCE`Ž@, ðŽ’, µ, Ä, Ç, é B

	<b>COMfCf“f^ [ftfFfCfX</b>	<b>\‘c’Ĩ</b>	<b>fnf“fhf&lt;</b>
ffofCfX	~		
fefNfXf`ff	~	~	~
f}fefŠfAf<	~	~	~
CEöCE¹	~	~	
ftf... [f] [fg	~		
s—ñ	~	~	~
ŽÀ sfofbtf@	~	~	

**Direct3DIfufWfFfNfgE^**

,±,ìfZfNfVf±f“,Á,Í ADirect3D,ìfIfufWfFfNfgE^,ÆfCf“f^ [ftfFfCfX,É,Á,c,Ä à-  
¾,.,é BfAfvfŠfp [fVf±f“,Í AŽŸ,ì·â,Ü,©,È ± ~,Á ADirect3DfIfufWfFfNfg,ÆfCf“f^ [ftfFfCfX,ð ì ¬,.,é,±  
,Æ,<sup>a</sup>,Á,«,é B

IDirect3DfCf“f^ [ftfFfCfX fIfufWfFfNfg

DeviceIfufWfFfNfg

TextureIfufWfFfNfg

MaterialIfufWfFfNfg

LightIfufWfFfNfg

ViewportIfufWfFfNfg

Execute-bufferfIfufWfFfNfg

**IDirect3DfCf“f^ [ftfFfCfX**

IDirect3DfCf“f^ [ftfFfCfX,Í ADirectDrawIfufWfFfNfg,Ö,ìfCf“f^ [ftfFfCfX,Á, ,é BIDirect3DfCf“f^ [ftfFfCfX,ð ¶ ¬,.,é,É,Í AŽŸ,Ì,æ,²,ÉIDirectDraw2::QueryInterface f\fbfh,ÌEÁ,Ñ o,µ,ð s,² B

```
lpDirectDraw->QueryInterface(  
    IID_IDirect3D, // IDirect3DfCf“f^ [ftfFfCfX,ÌID  
    lpD3D); // Direct3DfIfufWfFfNfg,ÌfAfhfEfx
```

**IDirect3DfCf“f^ [ftfFfCfX,É,æ,Á,ÄŽQ Æ,³,ê,éIfufWfFfNfg,Í Afrf... [f] [fg AEðE¹ Af}**  
*fefŠfAf< A,;,æ,ÑfffofCfX,ÌfŠfXfg,ðŠÜ,ñ,Á,¢*  
*,é BIDirect3D,Ìf f\fbfh,Í A¼,ÌfIfufWfFfNfg,ð ì ¬,µ,½,è ADirect3DfffofCfX,ðE©,Á,¯,é,½,ß,ÉŽg—p,·,é,±*  
*,Æ,ª,Á,«,é B*

## IDirect3DDeviceCf“f^ [ftFfCfX

*IDirect3DDeviceCf“f^ [ftFfCfX,Í ADirectDrawSurfaceIfufWfFfNfg,Ö,ÌfCf“f^ [ftFfCfX,Á, ,é B***IDirect3DDeviceCf“f^ [ftFfCfX,ð ¶ ¬,.,é,É,Í AfobfNfobftf@,ÌIDirectDrawSurface2::QueryInterface** f\fbfh,ÌEÄ,Ñ o,µ, ð s,µ BŽŸ,Ì—

á,Á,Í **AIDirectDraw::CreateSurface**,**AIDirectDrawSurface::GetAttachedSurface** f\fbfh,ðEÄ,Ñ o,µ AfobfN **Efobftf@,ÌfT [ftFfX,ðŽæ“¾,.,é B***IDirectDraw2, AIDirectDrawSurface2fCf“f^ [ftFfCfX,Á,± ,ÌfAfNfVf†f“ðŽÀ s,.,é,É,Í AQueryInterface* f\fbfh,ð—p,ç,Ä V,µ,çfCf“f^ [ftFfCfX,Ö,Ìf|fCf“f^,ð— v< ,.,é B

```
lpDirectDraw->CreateSurface(  
    lpDDSurfDesc, // DDSURFACEDESC \“İ,Ö,Ìf|fCf“f^  
    lpFrontBuffer, // DIRECTDRAWSURFACE \“İ,Ö,Ìf|fCf“f^  
    pUnkOuter); // NULL  
lpFrontBuffer->GetAttachedSurface(  
    &ddscaps, // DDSCAPS \“İ,Ö,Ìf|fCf“f^  
    &lpBackBuffer); // DIRECTDRAWSURFACE \“İ,Ö,Ìf|fCf“f^  
lpBackBuffer->QueryInterface(  
    GUIDforID3DDevice, // IDirect3DDeviceCf“f^ [ftFfCfX,ÌID  
    lpD3DDevice); // DIRECT3DDEVICEIfufWfFfNfg,Ö,Ìf|fCf“f^
```

*fobfNfobftf@,Ì,½,ß,ÌIDirectDrawSurface::QueryInterface* f\fbfh,ÌEÄ,Ñ o,µ,ÁŽw’è,.,é Á %o  
,Ìfpf%of [f^,Í **AIDirect3DDeviceCf“f^ [ftFfCfX,ðŽ,. AfOf [fof< Ef(Efxf<,Á—B^è,ÌŽ•ÊŽq iGUID j,Á, ,  
é B,±,ÌGUID,Í **AIDirect3D::EnumDevices** f\fbfh,ÌEÄ,Ñ o,µ,É,æ,Á,ÁŽæ“¾,.,é,±,Æ,ª,Á,«é BfVfXfef€  
Í **AIDirect3D::EnumDevicesSÖ** ”,ÌEÄ,Ñ o,µ,Ì†,ÁfAfVfŠfP [fvf†f“;”ñ<Ÿ,.;é**D3DENUMDEVICESCALLBACK**  
R [f<ofbfnšÖ ”,ðEÄ,Ñ o,.,Æ,« A,±,ÌGUID,ð<Ÿ<<,.,é B**

Direct3D,ÌffofCfX EfIfufWfFfNfg,Í AfCf“f^ [ftFfCfX EfŠfXfg,É¶ Ý,µ i,.,é,ç  
,Í u’@,µ v j AŽ© g,ÌŽÀ sfobftf@,Æfrf... [f] [fg,ÌfŠfXfg,ðŽ ,Á,Ä,ç,é B,Û,½ AfefNfXf`ff,âf}  
fefŠfAf<,ÌfŠfXfg,àŠÜ,ñ,Á,“è A,»è,ç,ÌfŠfXfg’t,ÌŽŸ,ÌfefNfXf`ff,âf}fefŠfAf<,Ö,Ìf|  
fCf“f^,Æ A’O,ÌffofCfX,Ö,Ìf|fCf“f^,Ì—¼•û,ð•ÛŽ ,µ,Á,ç,é B,±,ÌŠK’w \“ç,É,Á,ç,Ä Ú,µ,-  
,Í **ufIfufWfFfNfg,ÌE< ± < v,ðŽQ** Æ,³,è,½,ç B

**IDirect3DDeviceCf“f^ [ftFfCfX,Ìf f\fbfh,Ífn [fhEfFfA”\—Í,ð’Ê’m,µ Afrf... [f] [fg EfŠfXfg,ÌÛŽ Af}**  
**fefŠfAf<fIfufWfFfNfg,Ì€ ì AŽÀ sfobftf@ EfIfufWfFfNfg,ÌŽÀ s,ð s,µ B**

s—ñ,Ìfnf“fhf<,Æ,µ,Ä,Ì,ŸŽæ“¾,.,é,±,Æ,ª,Á,«é BDirect3D,Ì s—  
ñ,ð ì ¬,.,é,É,Í**IDirect3DDevice::CreateMatrix** f\fbfh,ðEÄ,Ñ o,µ **AIDirect3DDevice::SetMatrix** f\fbfh,É,æ,Á,Ä  
s—ñ,Ì“à—e,ð Ÿ’è,.,é,±,Æ,ª,Á,«é B s—ñ,Ìfnf“fhf<,ÌŽÀ sfobftf@,Á—p,ç,ç,è,é B

**IDirect3DTextureCf“f^ [ftFfCfX**

fefNfXf`ff,Í A F•t,«,ÌfsfNfZf<,³éCE`É•À,ñ,¾,à,ì,Á, ,é iéCE`Í•K,,µ,à ³•ûCE`Á,È,,Á,à,æ,c,ª AfVfXfef€  
,ª Á,àCEø—|“I,É“® ì,.,é,ì,Í ³•ûCE`,ì ê ±,Á, ,é j BfefNfXf`ff,ÍfefNfXf`ff Ef}fbfsf“fO,ì-Ê,Æ,µ,ÄŽg,µ,±  
,Æ,à,Á,«,é,ª A,±,ì ê ±,Í ³•ûCE`Á,È,,Á,Í,È,ç,È,c BRGBfJf% [ Ef,fffc,ð—p,c  
,éfAfvfŠfP [fVf±f“,Á,Í A8 A24 A32ftrfbfg,ÌfefNfXf`ff,ðŽg—p,.,é,±  
,Æ,ª,Á,«,é Bf,fmfNf if%of“fv j EfJf% [ Ef,fffc,Á,Í A8ftrfbfg,ÌfefNfXf`ff,Ì,Ý,ªŽg,.,é B

IDirect3DTextureCf“f^ [ftFfCfX,Í ADirectDrawSurfaceIfufWfFfNfg,Ö,ÌfCf“f^ [ftFfCfX,Á, ,é BIDirect3DText  
urefCf“f^ [ftFfCfX,ð ¶ ¬,.,é,É,Í AIDirectDrawSurface2::QueryInterface f\fbfh,ðŽg—  
p,µ,ÄIID\_IDirect3DTexture,ðŽw`è,.,é BDirect3D,ÌfefNfXf`ff,ÆDirectDraw,ÌfT [ftFfX,ÌŠÖEW,É,Á,ç,Ä Ú,µ,-  
,Í A uDirect3DfefNfXf`ff Efcf“f^ [ftFfCfX v,ðŽQ Æ,³,è,½,c B

ˆÈ%º,ì—á,Á,Í AIDirect3DTextureCf“f^ [ftFfCfX,ì ì ¬•û—  
@,Æ AIDirect3DTexture::GetHandle,.,æ,NIDirect3DTexture::Loadf f\fbfh,ð—p,c,ÄfefNfXf`ff,ðf [fh,.,é•û—  
@,ðŽ,µ,Á,ç,é B

```
lpDDS->QueryInterface(IID_IDirect3DTexture,  
    lpD3DTexture); // DIRECT3DTEXTUREIfufWfFfNfg,Ö,ÌfCf“f^  
lpD3DTexture->GetHandle(  
    lpD3DDevice, // DIRECT3DDEVICEIfufWfFfNfg,Ö,ÌfCf“f^  
    lpTexture); // D3DTEXTUREHANDLE,Ö,ÌfCf“f^  
lpD3DTexture->Load(  
    lpD3DTexture); // DIRECT3DTEXTUREIfufWfFfNfg,Ö,ÌfCf“f^
```

fefNfXf`ff EfIfufWfFfNfg,ÍfCf“f^ [ftFfCfX EfŠfXfg,ÉŠÜ,Ü,è,Ä,.,è AfffofCfX EfŠfXfg`t,ÌŽÝ,ÌfefNfXf`  
ff,Æ AŠÖ~A•t,¬,ç,è,½fffofCfX,Í A—¼•û,ðŽw,·f|Cf“f^,ðŽ ,Á,Á,c,é i,±,ÌŠK`w \`c,É,Á,ç,Ä Ú,µ,-  
,Í uIfufWfFfNfg,ÌCE< ± « v,ðŽQ Æ,³,è,½,c j BfefNfXf`ff Efnf“fhf<,Íf}fefŠfAf<,ãŽÀ sfobftf@,Á—p,c  
,ç,è Afrf... [f]

[fg,Á,ÌZfobftf@,Æ,µ,ÄŽg,í,è,é BfefNfXf`ff,Ìf [fh,ÆfAf`f [fh Afnf“fhf<,ÌŽæ“¾ AfpfCEfbfg•İ%º,ÌŽæ“  
¾,É,Í AIDirect3DTextureCf“f^ [ftFfCfX,ªŽg—p,Á,«,é B

,±,ÌfZfNfVf±f“,Á,Í ADirect3D,ÌfefNfXf`ff,Æ,»,ÌŽg,c•û,ð à-¾,µ,Á,ç,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,^f}fbfsf`fO,³,ê,é-Ì`æ,ð`èç,µ,Ä,ç  
,é BfAfvfŠfP [fVf±f“,Í AfefNfXf`ff À•W,ðE vŽZ,·,é,½,ß,Éf%fbfv,ðŽg,±,±,Æ,ª,Ä,«,é B

fefNfXf`ff À•W,Ì%ð Í,Ì•û-  
@,ðf%ofXf^f%ofCfU,ÉŽw`è,·,é,½,ß,É AfAfvfŠfP [fVf±f“,Í iD3DRENDERSTATETYPE—  
ñ<“E^,©,ç jD3DRENDERSTATE\_WRAPU,âD3DRENDERSTATE\_WRAPVfE f`f`Šf`fO EfXfe [fg,ðŽg—  
p,·,é Bf%ofXf^f%ofCfU,Í A,Ä,É,É À`Z<—£,ÌfefNfXf`ff À•W A,·,É,í,ç¼ ü,ð•âŠ@,·,é B,±  
,Ì¼ ü,ÌpfX,Æ A—  
LCEø,Èu,·,æ,Ñv À•W,Ì¼,Í Af%fbfsf`fO Eftf%ofO,ÌŽg,ç•û,É,æ,Ä,Ä`Û,È,é B`O q,Ìftf%ofO,ì•D•û, ,é,ç,Í—  
¼•û,³fZfbfg,³,ê,é,Æ A¼ ü,Í Au,Û,½,Ív•ûEü,ÌfefNfXf`ff,Ì•Ó,É%o^,Ä,Ä A%o~`CE ó,©fh [fifc ó,ÌE` ó,ðŽ ,Ä,©  
,Ì,æ,±,Éf%fbfvfAf%ofEf“fh,³,ê,é B

f%fbfsf`fO Eftf%ofO,³fZfbfg,³,ê,Ä,ç  
,È,çftf%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—LCEø,Èu,·,æ,Ñv À•W`l,Í1.0`È ã,Ä, ,é B“(0.1, 0.1),Æ(0.9, 0.9)  
,ðEç,Ó À`Z,Ì¼ ü,Í A“(0.5, 0.5),ð`È%oß,·,é B

D3DRENDERSTATE\_WRAPU,Û,½,ÍD3DRENDERSTATE\_WRAPV,Ì,ç  
,,é,©,³fZfbfg,³,ê,½ ê ± AfefNfXf`ff,Ì%~Žü1.0,Ì I,í,è,ì,È,ç  
%o~“`E`É,È,é B1.0`È ã,ÌfefNfXf`ff À•W,Í Af%fbfv,³,ê,Ä,ç,È,ç”ÍÍ“à,ì,Ý—LCEø,Ä, ,é BfefNfXf`ff À•WŠ  
Ó,Ì À`Z<—£,Íf%fbfsf`fO Eftf%ofO,É,æ,Ä,Ä`Û,È,é BD3DRENDERSTATE\_WRAPU,³fZfbfg,³,ê,Ä,ç  
,é,Æ,«,Í A“(0.1, 0.1),©,ç(0.9, 0.9),Û,Ä,Ì À`Z,Ì¼ ü,Í A“ i0, 0.5 j,ð`È%oß,·,é B

D3DRENDERSTATE\_WRAPU,ÆD3DRENDERSTATE\_WRAPVftf%ofO,Ì—  
¼•û,³fZfbfg,³,ê,½,Æ,«,Í AfefNfXf`ff,Ì%~ŠÄ ó ifh [fifc ó j,É,È,é BfVfXfefç,Í•Ä,¶,Ä,ç  
,é,½,ß A1.0`È ã,ÌfefNfXf`ff À•W,Í-³CEø,Ä, ,é B“(0.1, 0.1),©,ç(0.9, 0.9),Û,Ä,Ì À`Z,Ì¼ ü,Í A“(0, 0)  
,ð`È%oß,·,é B

-³CEø-Ì`æ,É, ,Ä,½fefNfXf`ff À•W,ð-LCEø-Ì`æ,ÉŽü,ß,½,Æ,µ,Ä,à A,»,ì,Æ,«,ì“@ ì,Í•Û Ø,³,ê,Ä,ç,È,ç B

^è”È,ÉfAfvfŠfP [fVf±f“,Í AfefNfXf`ff,ÌEð ü,ª-Ê,Ì•Ó,Æ^è`v,µ,È,ç  
,Æ,« A%o~`CE ó,Éf%fbfv,·,é,½,ß,Éf%fbfsf`fO Eftf%ofO,ðfZfbfg,·,é B,D,Æ,Ä,ì-Ê,ÉfefNfXf`ff,Ì¼•“È ã,“K  
—p,³,ê,é ê ±,É,Í Af%fbfsf`fO Eftf%ofO,Í Ý`è,µ,È,ç B

f%fbfsf`fO,É,Ä,ç,Ä Ú,µ,Í A ufCf`fgf f\_NfVf±f`:  
Direct3D,Ì•ÛŽ f, [fh EfIfufWfFfNfg v,Ì uDirect3DRMWrapfCf`f^ [ftfEfCfX v,ðŽQ Æ,³,ê,½,ç 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,ÌŒĀ X,ÌfsfNfZf<,Æ`è`v,·,é,±,Æ,Í—  
Å´½,É,È,Œ B Å IfCf [fW`†,ÌfsfNfZf<,Í AfefNfZf<,Ì`á,«,È W †`Ì,© A,Đ,Æ,Ā,ÌfefNfZf<,Ì -ª”ª,É`Š—  
,·,é BfsfNfZf<,ÉfefNfZf<,Ì`l,đ•áŠ@,·,é•û-@,đŽw'è,·,é,É,Í AfefNfXf`ff EftfBf<f^fŠf“fO,đ~—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,đ—p,Œ,ĀŽw'è,·,é B

D3DRENDERSTATE\_TEXTUREMAPBLENDfŒf“f\_fŠf“fO EfXfe [fg,Ā,Í AfefNfXf`ff EfufŒf“ffBf“fO,Ìf^  
fCfv,đŽw'è,·,é,±,Æ,ª,Ā,«,é BfefNfXf`ff EfufŒf“ffBf“fO,Í AfefNfXf`ff,Ì F,Æ“K—  
p æ,ÌfT [ftfFfX,Ì F,đ ¬,º †,í,¹,é B,±,ÌŽè`i,Í A”¼“§-¾,ÌŠOŠĪ,đŽĀŒ»,·,é ê †,ÉŒø%oĒ“l,Ā,·,é B,µ,©,µ AfefN  
fXf`ff EfufŒf“ffBf“fO,Í A—Šú,µ,È,Œ F,đ ¶ ¬,·,é ê †,ª,·,é B,±,é,đ-h,@,½,B,É,Í Af}fefŠfAf<,Ì F,đ”,-  
,·,é,Ì,ª Ā—Ç,Ì•û-@,Ā,·,é BfefNfXf`ff EfufŒf“ffBf“fO,ÌfIvfVf†f“,Í AD3DTEXTUREBLEND—  
ñ<“Œ^,ÉŽ,³,ê,Ā,Œ,é B

“]—Œ³,Æ“]— æ,Ì F,đ ¬ †,·,é•û—  
@,đŽw'è,·,é,É,Í AD3DRENDERSTATE\_SRCBLEND,ÆD3DRENDERSTATE\_DESTBLENDfŒf“f\_fŠf“fO EfXfe [  
fg,đŽg—p,·,é B ¬ FfIvfVf†f“ i ¬ Fftf@fNf^ l,ÆŒĀ,Ī,ê,é j,Í AD3DBLEND—ñ<“Œ^,ÉŽ,³,ê,Ā,Œ,é B

**f~fbfvf}fbfv**

f~fbfvf}fbfv,Æ,Î^A'±

,μ,½efNfXf`ff,ðŽ|,μ AŠefefNfXf`ff,Í A“`¶fCf [fW,ÉftfBf<f^,ð,©,¯,Ä ™ X,É'á%ð'œ“x,É,μ,½,à,Ì,Å, ,é B  
f~fbfvf}fbfv,Í AÆvŽZ ã'áfRfXfg,ÉfefNfXf`ff,ÌfÆf“f\_Šf“fO ,“x,ð ,,B,éŽè'i,Å, ,é Bf~fbfvf}  
fbfv'†,ÌftfBf<f^,³,ê,½fCf [fW,âfÆfxf<,Í A'O,ÌfÆfxf<,æ,è,à ¬,³,,È,Å,Ä,¢, B

**D3DTEXTUREFILTER**—ñ“Æ^,Ì“K Ø,ÈftfBf<f^ Ef, [fh,ðŽw'è,μ,ÄfefNfXf`ff EftfBf<f^fŠf“fO,ð s,□  
,Æ,« Af~fbfvf}fbfv,ðŽg—p,·,é,±,Æ,³,Å,«é BffofCfX,³,Ç,Ìf^fCfv,Ìf~fbfvf}fbfv,ðfTf| [fg,μ,Å,¢  
,é,©,ð'm,é,É,Í **AD3DPRIMCAPS** \‘¢'í,ÌdwTextureFilterCapsf f“fo,³Ž',μ,Å,¢,éftf%ofO,ðf`fFfbfN,·,é,Î,æ,¢ B

DirectDraw,Å,Ìf~fbfvf}fbfv,Ì ì ¬•û-@,É,Å,¢,Ä Ú,μ,,Í uf~fbfvf}fbfv v,ðŽQ Æ,³,é,½,¢ B

“§-¾%»»,Æ”¼“§-¾%»»

,·,Á,É q,×,½,æ,µ,ÉfefNfXf`ff,ð“§-¾,Û,½,Í”¼“§-¾,É·Ž!,·,é,É,Í AfefNfXf`ff EfufCef“ffBf“fO,ð~—  
p,·,é B,³,ç,É AfAf<ftf@ Ef`fffff<,â iD3DRENDERSTATETYPE—  
ñ<CE^,Ì jD3DRENDERSTATE\_BLENDENABLEfCef“f\_Šf“fO EfXfe [fg,ð—p,ç,é,±,Æ,à,Á,«,é B

“§-¾ A”¼“§-¾,É,·,é,½,ß,Ì,æ,è’¼ Ú“I,ÈfAfvf [f`,Æ,µ,Ä ADirectDraw,^fTf| [fg,·,éfJf% [ EfL [ ,ð~—  
p,·,é·û-@,ª, ,é BfJf% [ EfL [ ,Æ,Í Afuf fbfN“]—,âfI [fo [fCefC‘€ ì,É,“,é A“]‘—E³, ,é,ç,Í“]‘—  
æ”·ª,Ì F,Û,½,Í F,ì”Í,Á, ,é B,±,ê,ç,Ì F,Í A,Â,Ë,É ã ‘,«,³,ê,é,æ,µ,É,à ACE^,µ,Ä·Í X,³,ê,È,ç,æ,µ,É,àŽw`è,·,é,±  
,Æ,ª,Á,«,é B

DirectDraw,ÌfJf% [ EfL [ EfTf| [fg,É,Â,ç,Ä Ú,µ,,Í ufJf% [ EfL [fCf“fO v,ðŽQ Æ,³,ê,½,ç B

## IDirect3DMaterialCf“f^ [ftFFCfX

IDirect3DMaterialCf“f^ [ftFFCfX,đ ¶ ¬,·,é,É,Í AIDirect3D::CreateMaterial f\fbfh,ìCEÄ,Ñ o,µ,đ s,□ BŽŸ,Ì  
—á,Í AIDirect3DMaterialCf“f^ [ftFFCfX,Ì ¶ ¬•û—@,đŽ,µ,Ä,¢  
,é B,»µ,Ä AIDirect3DMaterial::SetMaterial,âIDirect3DMaterial::GetHandle f\fbfh,đ—p,¢ Af}  
fefŠfAf<,Ì Ý'è,Æfnf“fhf<,ÌŽæ“¾,đ s,Ä,Ä,¢,é B

```
lpDirect3D->CreateMaterial(  
    lpDirect3DMaterial, // V,µ,¢f}fefŠfAf<,Ö,Ìf|fCf“f^  
    pUnkOuter); // NULL  
lpDirect3DMaterial->SetMaterial(  
    lpD3DMat); // D3DMATERIAL `¢'Ì,Ö,Ìf|fCf“f^  
lpDirect3DMaterial->GetHandle(  
    lpD3DDevice, // DIRECT3DDEVICE `¢'Ì,Ö,Ìf|fCf“f^  
    lpD3DMat); // D3DMATERIAL `¢'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, ¯,ç,ê,½ffofCfX,Ö,Ìf|fCf“f^,Ì—¼•û,đŽ ,Ä,Ä,¢,é i,±,ÌŠK'w `¢,É,Ä,¢,Ä Ú,µ,-  
Í ufIfufWfFfNfg,ìCE< ‡ « v,đŽQ Æ,³,ê,½,¢ j Bf}  
fefŠfAf<,É,Í F,ŠÜ,Ü,ê,Ä,;è AfefNfXf`ff Efnf“fhf<,đŽ ,Ä,Ä,¢,é ê ‡,à, ,é Bf}  
fefŠfAf<fnf“fhf<,Í AŽÀ sfobftf@,Ì'†,ÄŽg,í,ê,½,è Afrf... [f] [fg,Ì”wEi,đ Ý'è,·,é,½,ß,ÉŽg—  
p,³,ê,é BIDirect3DMaterialCf“f^ [ftFFCfX,đ—p,¢,é,Æ Af}  
fefŠfAf<,ÌŽæ“¾,â Ý'è Afnf“fhf<,ÌŽæ“¾ A F,Ì•Ü'¶,đ s,□,±,Æ,ª,Ä,«é B

## **IDirect3DLight**

IDirect3DLight [ftFfCfX, ð ì -, ., é, É, Í A**IDirect3D::CreateLight** f\fbfh, ðCEÄ, Ñ o, · BŽŸ, Ì—  
á, Í**IDirect3DLight** [ftFfCfX, Ì ì -•û-@, ðŽ, µ, Ä, Ç  
, é B, Ü, ½ A ì -CEä, É, Í**IDirect3DLight::SetLight** f\fbfh, ðCEÄ, Ñ o, µ ACEðCE¹, ð Ý'è, ., é B

```
lpDirect3D->CreateLight(  
    lpDirect3DLight, // V, µ, ÇCEðCE¹, Ö, Ìf|fCf“f^  
    pUnkOuter);      // NULL  
lpDirect3DLight->SetLight(  
    lpLight);        // D3DLIGHT \“Ç'Ì, Ö, Ìf|fCf“f^
```

CEðCE¹f|fufWfFfNfg, ÍfCf“f^ [ftFfCfX EfŠfXfg, Æftr... [f| [fg EfŠfXfg, ÉŠÜ, Ü, ê, Ä, Ç  
, é **BIDirect3DLight** [ftFfCfX, ðŽg—p, µ, Ä ACEðCE¹, ÌŽæ“¾, ä Ý'è, ð s, æ, ±, Æ, ª, Ä, «, é B

**IDirect3DViewport**fCf“f^ [ftfFfCfX

IDirect3DViewportfCf“f^ [ftfFfCfX,Í **AIDirect3D::CreateViewport** f\fbfh,ðCEÄ,Ñ o,μ,Ä ¶ ¬,·,é BŽŸ,ì—  
á,Í **AIDirect3DViewport**fCf“f^ [ftfFfCfX,Ì ì ¬·û-@,ðŽ,μ,Ä,¢,é B,Û,½ A,±,ì—  
á,Í **AIDirect3DDevice::AddViewport** f\fbfh,É,æ,éfrf... [f]

[fg,Ì’Ç%oÁ,Ì,μ,©,½,â **AIDirect3DViewport::SetViewport** **AIDirect3DViewport::SetBackground** **AIDirect3DViewpo**  
**rt::AddLight**f f\fbfh,ð—p,¢,Äfrf... [f] [fg,ðfZfbfgfAfbfv,·,é·û-@,à à-¾,μ,Ä,¢,é B

```
lpDirect3D->CreateViewport (
    lpDirect3DViewport, // V,μ,¢frf... [f] [fg,Ö,Ï|fCf“f^
    pUnkOuter); // NULL
lpD3DDevice->AddViewport (
    lpD3DViewport) // frf... [f] [fg,ðffofCfX,ÉfAf^fbf`,·,é
lpD3DViewport->SetViewport (
    lpData); // fXfNfŠ [f“ à,Ìfrf... [f] [fg,Ì^Ê’u,ð Ý’è,·,é
// D3DVIEWPORT `¢’Ì,Ö,Ï|fCf“f^
lpD3DViewport->SetBackground(
    lphMat); // ”wEi,ÌD3DMATERIALHANDLE `¢’Ì,Ö,Ï|fCf“f^
lpD3DViewport->AddLight (
    lpD3DLight); // ŒöŒ¹fIfufWfFfNfg,Ö,Ï|fCf“f^
```

frf... [f] [fg,ÍfCf“f^ [ftfFfCfX EfŠfXfg,ÆffofCfX EfŠfXfg,ÉŠÛ,Û,è,Ä,¢  
,é BfIfufWfFfNfg,Í AfXfNfŠ [f“ Eff [f^,Æ,Æ,à,ÉŒöŒ¹fŠfXfg,ð·ÛŽ ,μ,Ä,“,è A”wEi,Ìf}  
fefŠfAf<fnf“fhf<,âfefNfXf`ff Efnf“fhf<,ðŽ ,Ä ê ‡,à, é **BIDirect3DViewport**fCf“f^ [ftfFfCfX,ðŽg—  
p,μ,Ä A”wEi,âfrf... [f] [fg,ÌŽæ“¾,Æ Ý’è ACEöŒ¹,Ì’Ç%oÁ,Æ í œ A’,“\_,Ì·İŠ,ð s,μ,±,Æ,ª,Ä,«,é B

**IDirect3DExecuteBufferCf“f^ [ftFfCfX**

ŽÀ sfobftf@,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 sfobftf@,ì à-¾,Í uŽÀ sfobftf@ v,ðŽQ Æ,³,ê,½,¢ B

IDirect3DExecuteBufferCf“f^ [ftFfCfX,ð ì ¬,.,é,É,Í AIDirect3DDevice::CreateExecuteBuffer f\fbfh,ìEÄ,Ñ o,  
μ,ð s,□ B

```
lpD3DDevice->CreateExecuteBuffer(  
    lpDesc,          // DIRECT3DEXECUTEBUFFERDESC \“ì,Ö,Ìf|Cf“f^  
    lplpDirect3DExecuteBuffer, // Direct3DExecuteBufferfIfufWfFfNfg,Ö,Ì  
                                // f|Cf“f^,ðŽó,¬Žæ,é,½,ß,Ö,Ìf|Cf“f^  
    pUnkOuter); // NULL
```

ŽÀ sfobftf@,ÍfIfofCfX EfŠfXfg,ÉŠÜ,Ü,ê,Ä,¢,é BŽÀ Û,Ìfobftf@—  
Ìæ,ðŠm•Û,.,é,É,Í AIDirect3DDevice::CreateExecuteBuffer f\fbfh,ðŽg—p,.,é B,±,Ìfobftf@—  
Ìæ,Í Afn [fhEfFfA EfIfofCfX ã,É‘Ÿ,.,é,±,Æ,à, ,é B

ŽÀ sfobftf@,Í AIDirect3DExecuteBuffer::Lock AIDirect3DExecuteBuffer::Unlock AIDirect3DExecuteBuffer::Set  
ExecuteData f\fbfh,ðŽg—p,.,é,±,Æ,É,æ,Á,Ä A’,“\_,ÆfIfyfR [fh,ðŠÜ,ß,Ö,½,Ä,ÌA‘±,μ,½”z—ñ,Ä—,ß s,³,ê,é B

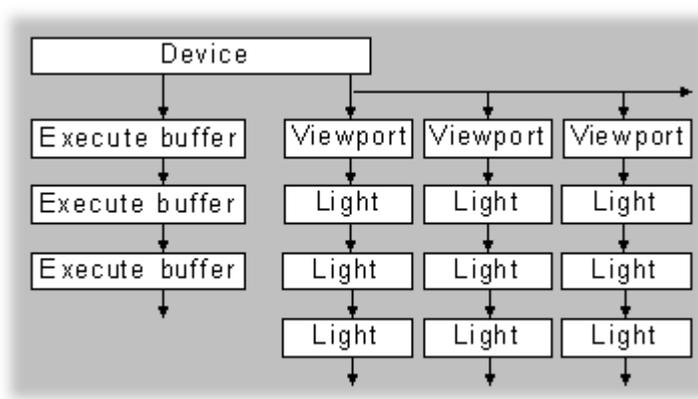
```
lpD3DExBuf->Lock(  
    lpDesc);. // DIRECT3DEXECUTEBUFFERDESC \“ì,Ö,Ìf|Cf“f^  
// .  
// . Store contents through the supplied address  
// .  
lpD3DExBuf->Unlock();  
lpD3DExBuf->SetExecuteData(  
    lpData); // D3DEXECUTEDATA \“ì,Ö,Ìf|Cf“f^
```

,±,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,·fAfhfCEfX,©,ç,ÌŠ‘Ê‘u,ÁŽw‘è,.,é B

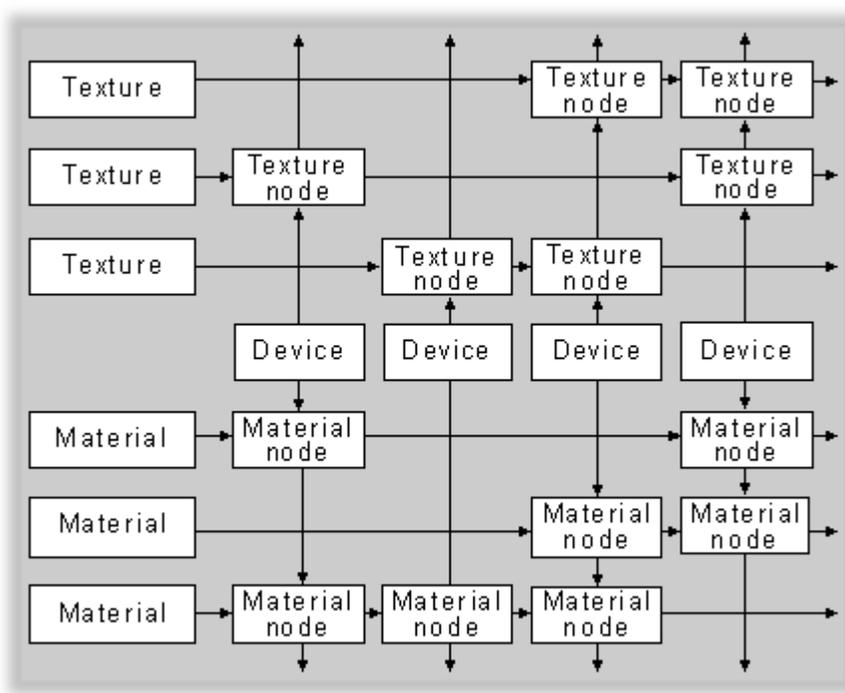
ŽÀ sf [f^,ÌŽæ“¾,â Ý‘è Af fbfN AfAf“f fbfN A Ä“K%» A,“,æ,ÑŽÀ sfobftf@,ìEÿ Ø,ð s,□  
,É,Í AIDirect3DExecuteBufferCf“f^ [ftFfCfX,ðŽg—p,.,é B

Device

Execute buffer, Viewport, Light



Texture, Texture node, Device, Material, Material node



Texture node, Device, Material node

fV [f“iŒÇ—

,·,×,Ä,Ì¼ Úf, [fh EfAfvfŠfP [fVf‡f“,Í AfCef“f\_fŠf“fO,ðŽÀ s,·,é‘O,É**IDirect3DDevice::BeginScene** f\fbfh,ð  
CEÄ,Ñ o,³,È,,Ä,Í,È,ç,È,ç B,Ü,½ AfCef“f\_fŠf“fO,ªŠ@—  
¹,µ,½,Æ,«,É,Í **AIDirect3DDevice::EndScene** f\fbfh,ðCEÄ,Ñ o,·K—v,ª, ,é BfAfvfŠfP [fVf‡f“,Í A ;CEä,Ì3Dfn  
[fhfEfFfA ä,Ä“® ì,³,¹,é,½,ß,É A,±,ê,ç,Ìf f\fbfh,ð ³,µ,Žg—p,µ,È,,Ä,Í,È,ç,È,ç B

fV [f“,Í‘,“\_,Æ·%œfvfŠf~fefBfu iŽOŠpCE` A¼ ü A“\_ j,Ì W ‡ì,Ä, ,é B’,“\_,Í A“®%œ,âfAfjf [fVf‡f“,Ì,  
D,Æ,Ä,ÌftfCE [f€,ð·%œ,·,é,½,ß,ÉŽg—

p,³,ê,é **BIDirect3DDevice::BeginScene** f\fbfh,ÍfV [f“,ÌŽn,Ü,è,ð i,µ,½,ª,Ä,ÄftfCE [f€  
,ÌŠJŽn,à jŽ!,µ **AIDirect3DDevice::EndScene** f\fbfh,ÍfV [f“,ÆftfCE [f€,Ì I—¹,ð’È’m,·,é B,D,Æ,Ä,ÌftfCE [f€  
,Ì·%œ,ÉŽg,í,ê,éŽÀ sfobftf@-½—

ß,Í A1“x,Ì**IDirect3DDevice::BeginScene**,Æ**IDirect3DDevice::EndScene**,ÌCEÄ,Ñ o,µ,ÌŠÔ,É,Ü,Æ,ß,È,,Ä,Í,È,ç,È,ç B

,±,ÌfZfNfVf‡f“,ÍÈ%°,ÌfgfsfbfN,É,Ä,c,Ä à-¾,µ,Ä,c,é B

%A-Ê ÄŽ

2D,Æ3D,Ì:ŠCEÝ i—p

fV [f“ŠÇ— fvf fV [fWff

%A-Ê ÁĹ

3DfAfNfZf%CE [f^,Ì”h ¶fNf%ofX,Á,Í A ]—,ÌZfobftf@,ð—p,¢,½%A-Ê ÁĹ,Í s,í,ê,È,¢ B,± ,é,ç,ÌfAfNfZf%CE [f^,ð ³,µ,fTf]

[fg,·,é,½,ß,É,Í AIDirect3DDevice::BeginScene,ÆIDirect3DDevice::EndScenef f\bfbfh,ðŽg—p,·,é•K—v,ª, ,é B“à”f^ fCfŠf“fO,âf|fŠfSf“ Ef\ [fg,È,Ç A%A-Ê ÁĹ,Ì,½,ß,Ì ”½,Ì<@”,ðfCf“fvfŠf f“fg,µ,½fAfNfZf%CE [f^,à, ,é,ª A,»,é,ç,È,Ì<“É,Ì“Á”ª,ª, ,é B,»,é,Í A%A-Ê ÁĹ,Ì,½,ß,É,Í A,Ð,Æ,Â,ÌftfCE [f€ ,ÌfWfIf fgfŠ Eff [f^fx [fX‘S‘Ì,ÌfRfs [,ð ^— ,µ,È,,Ä,Í,È,ç,È,¢,Æ,¢,±,±,Æ,¾ B

,Ð,Æ,Â,ÌftfCE [f€,ÌfWfIf fgfŠ•İŠ·,ð,·,×,Ä ^—

,·,é,½,ß,É A V,µ,¢fAfNfZf%CE [f^,Ä,ÍfV [f“ EfLfffvf`ff,ðfTf] [fg,·,é•K—v,ª, ,é B,Ä,Û,è V,µ,¢fAfNfZf %CE [f^,Í ACEã,Ì ^— ,Ì,½,ß,É AZÄ sfobftf@,ð%oi,µ,Ä“n,³,ê,éfwfIf fgfŠ î•ñ,ð<L%—,µ,È,- ,Ä,Í,È,ç,È,¢ B%B-Ê,É·Í,·,é ^— ,ª ³ í,É s,í,ê,é,±,Æ,ð•Û Ø,·,é,½,ß A,Ð,Æ,Â,ÌftfCE [f€,È o,³,ê,é,·,×,Ä,Ì`%œ— ½—ß,Í A1%oñ,ÌIDirect3DDevice::BeginScene,ÆIDirect3DDevice::EndSceneCEÄ,Ñ o,µ,ÌŠÖ,É,Û,Æ,ß,È,- ,Ä,Í,È,ç,È,¢ B,Ð,Æ,Â,ÌftfCE [f€

,Ì \ -“†,É A·j ”%oñ,ÌIDirect3DDevice::BeginScene,ÆIDirect3DDevice::EndScenef f\bfbfh,ªCEÄ,Ñ o,³,ê,é,Æ A^Û,È ,éfv [f“,ÌfRf“fefLfxfg,ÄŽÄ s,³,ê,½ŽOŠpCE,Ö A%B,È,½fIfufWfFfNfg,ª—^,!,é ì—p,ðfAfNfZf%CE [f^,ª ³,µ,- %ðCE^,·,é,±,Æ,ª,Ä,«,È,,È,é B

fAfvfŠfP [fvf±f“,Í A,½,Æ,·•É,ÌfRf“fefLfxfg,ÌŽOŠpCE,É%œ<ç,ð— ^,!,é%B,µfT [ftfFx,ª,È,¢ ê ±,Ä,à A·j ”%oñ,É“n,Ä,Ä

IDirect3DDevice::BeginScene,âIDirect3DDevice::EndScenef f\bfbfh,ðCEÄ,Ñ o,µ,Ä,Í,¢

,·,È,¢ BfAfNfZf%CE [f^,É,æ,Ä,Ä,Í A%A-Ê ÁĹ,Ì,½,ß,¾,·,Ä,È,-

A , ,“x,ÈfCEf“f\_Šf“fOCEø%Ê,ðŽÄCE»,·,é,½,ß,ÉfV [f“ EfLfffvf`ff,ð—~p,·,é ê ±,ª, ,é B,½,Æ,!,Í AfV [f“ EfLfffvf`ff,ðfTf] [fg,µ,½fAfNfZf%CE [f^,É,Í A%œ,â”¼“§—¾fIfufWfFfNfg,ðfCEf“f\_Šf“fO,Ä,«,é,à,Ì,ª, ,é,©, à,µ,ê,È,¢ B,±,Ì,æ,±,ÈCEø%Ê,Í AftfCE [f€,ÌfWfIf fgfŠ Eff [f^fx [fX‘S‘Ì,ð ^— ,·,éfAfNfZf%CE [f^,Ì”— Í,É^È“¶,µ,Ä,“,è A·j ”,ÌIDirect3DDevice::BeginScene,ÆIDirect3DDevice::EndScenefRf“fefLfxfg,ª, ,é ê ±,É,Í“® ì,µ ,È,¢ B

## 2D,Æ3D,İ‘ŠŒÝ ì—p

fV [f“ EfLffvf`ff,ðŽÀ s,·,éfAfNfZf%ofŒ [f^,Á,Í AIDirect3DDevice::BeginScene,©,çIDirect3DDevice::EndScene  
nef f\fbfh,Ü,Á,Ì3D,ì·`%oæ‘€ ì,ÌŠŒ,É A2D,ì·`%oæ‘€ ì ifuf fbfN“]‘—,â¼ Ū ‘,« ž,Ý,È,Ç j,ðŠŪ,ß,é,±  
,Æ,ª,Á,«,È,ç ê ‡,ª, ,é B,±,ì §ŒÄ,ðŽ ,ÁfAfNfZf%ofŒ [f^,Í ADirectDraw,ì”\—  
ÍfrfbfgDDCAPS2\_NO2DDURING3DSCENE,É,æ,Á,ĂŽ!,³,ê,é BfAfvfŠfP [fVf‡f“,Í,±  
,Ìfrfbfg,ðf`fFfbfN,µ ADirectDraw,Ìfuf fbfN“]‘—  
,âf fbfN AGetDCF f\fbfh,ÌŒĂ,Ň o,µ,Í AIDirect3DDevice::EndScene,ìŒĂ,Ň o,µ,ª s,í,ê,é,Ü,Á‘Ò,½,È,-  
,Ă,Í,È,ç,È,ç B

fV [f“ŠÇ— fvf fV [fWff

^È%º,lfŠfXfg,É à-¾,.,éfXfefbfv,ð“Ÿ,D,±  
,Æ,É,æ,Á,Ä AfAfvfŠfP [fVf±f“,Í A,.,×,Ä,Ì3DfAfNfZf%ofCE [f^ ifV [f“,lfLffvf`ff,ðŽÀ s,.,é,à,Ì,àŠÜ,p j,Ä  
³Šm,ÉfCEf“f\_Šf“fO,ð s,º,±,Æ,³,Ä,«,é B,±,ê,ç,lfXfefbfv,Í A‘O q,µ,½fZfNfVf±f“,ÄŠT à,³,ê,Ä,ç,é îñ,ð—v—  
ñ,µ,Ä,ç,é B

- 1 ,D,Æ,Ä,lfTfCE [f€  
,l•%ºæfvfŠf~fefBfu,ðŠÜ,ðŽÀ sfobftf@,ðŽÀ s,.,é‘O,É A1“x**IDirect3DDevice::BeginScene** f\fbfh,ðCEÄ,Ñ o,  
µ AŽÀ sCEä,É,Í ÄCEä,É**IDirect3DDevice::EndScene** f\fbfh,ðCEÄ,Ñ o,· B
- 2 DirectDraw,ì”\—Í,ðŽ,·ftrfbfg**DDCAPS2\_NO2DDURING3DSCENE**,ðf`fFfbfN,.,é B,±,lftrfbfg,afZfbfg,³,ê,Ä,ç  
,½,ç **AIDirect3DDevice::BeginScene**,lCEÄ,Ñ o,µ,©,ç**IDirect3DDevice::EndScene**,lCEÄ,Ñ o,µ,Ü,Ä,ÌŠÖ,É AfCEf“f  
\_fŠf“fO EfT [ftfFfX,É‘Í,µ,ÄDirectDraw,lfuf fbfn“]‘—,âf fbfn AGetDcf f\fbfh,ðŽg—p,µ,È,ç,æ,º  
,É,·,é B,±,ê,ç,Ì2D‘€ ì,Í **AIDirect3DDevice::EndScene**,ðCEÄ,Ñ o,µ,½CEä,ÉŽÀ s,.,é,±,Æ,³,Ä,«,é B
- 3 **IDirect3DDevice::Execute** f\fbfh,ª §CEä,ð—  
ß,µ,Ä,à A,D,Æ,Ä,ÌŽÀ sfobftf@,ÉŠÜ,Ü,ê,éfCEf“f\_Šf“fO EfvfŠf~fefBfu,Ì,·,×,Ä,af^ [fQfbfg EfT [ftfFfX  
,ÉfCEf“f\_Šf“fO,³,ê,½,ÆCE©,È,µ,Ä,Í,ç,È,ç BfV [f“ EfLffvf`ff EfJ [fh,Í AfV [f“,Š@—  
l,·,é,Ü,Ä i,Ä,Ü,è **AIDirect3DDevice::EndScene** f\fbfh,ªCEÄ,Ñ o,³,ê,é,Ü,Ä jfCEf“f\_Šf“fO,ð%º,Šú,·,é B

**Direct3D, ¼ Úf, [fh,lf`f... [fgfŠfAf<**

Windowsfx [fX,ÌDirect3D,¼ Úf, [fh EfAfvfŠfP [fVf‡f“,đ ì -,.,é,É,Í ADirectDraw,ÆDirect3DfIfufWfFfNfg ,đ ¶ -,μ AfCEf“f\_Šf“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,¼ Úf, [fh,İfTf“fvf<,İŠî-{-,Æ,μ,Ä—p,¢,ç,è,Ä,¢ ,é BD3dmain.cpp,É,Í AWindowsftfCE [f€f [fN,İ•W €,İ %Šú%» ^—

Af fbZ [fW Ef< [fv,İ Ý’è A,.,æ,Ñf fbZ [fW ^— ,İ,½,ß,İEfBf“fhfE Efvf fV [fWff,İ ì -,ŠÜ,Ü,è,Ä,¢ ,é,ª A,³,ç,É ADirect3D,¼ Úf, [fh EfAfvfŠfP [fVf‡f“,É“Á—L,È ^— ,à,¢,Ä,© s,Ä,Ä,¢ ,é BÈ%°,İfZfNfVf‡f“,Ä,Í A,±,İ ^— ,É,Ä,¢,Ä à¾,.,é B

Step 1: %Šú%»,İŠŽn

Step 2: DirectDraw,.,æ,ÑDirect3DfIfufWfFfNfg,İ ì -

Step 3: fffofCfX ì -fR [f<fobfNŠÖ ”,İfZfbfgfAfbfv

Step 4: frf... [f] [fg,İ %Šú%»

Step 5: ¼ Úf, [fh,İfCEf“f\_Šf“fO EfXfe [fg,İ Ý’è

Step 6: %Šú%»,İŠ®—¹

Step 7: fCEf“f\_Šf“fO Ef< [fv,İŽÀ s

Step 8: I—¹ ^—

,±,İSDK,İ’†,¼ Úf, [fh,İfTf“fvf<,É,Í A,±,±,É,Í<L Ú,³,è,Ä,¢,È,¢fR [fh,ª,¢,Ä,©ŠÜ,Ü,è,Ä,¢,é B“Á,É,± ,İSDK,É,Í AD3DappŠÖ ”,Æ,μ,ÄÆÄ,Ñ o,³,è,éfwf<fpŠÖ ”,İfRfCEfNfVf‡f“,ŠÜ,Ü,è,Ä,.,è A“ÆŽ©,¼ Úf, [fh,İf AfvfŠfP [fVf‡f“,đ<L q,.,é ê ‡,É—đ—š,Ä,Ä, ,è,ª 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,í,Ä,Í,É,¢ Bfwf<fpŠÖ ”,Í Af [fX Eftf@fCf<D3dapp.c ADdcalls.c AD3dcalls.c ATexture.c,.,æ,Ñ Misc.c,ÄfCf“fvfŠf f“fg,³,è,Ä,¢,é Bf\ [fX Eftf@fCf< Stats.cpp ,Í AftfCE [f€ EfCE [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,ª ,É,.,é,½,ß,É AÈ%°,İŠÖ ”,đfCf“fvfŠf f“fg,μ,È,.,Ä,Í,É,ç,È,¢ B

- InitScene
- InitView
- RenderScene
- ReleaseView
- ReleaseScene
- OverrideDefaults

,³,ç,É AfTf“fvf<,ÍSetMouseButtonŠÖ ”,âSetKeyboardCallbackŠÖ ”,đÆÄ,Ñ o,μ Af}fEfX,âfL [f{ [fh,©,ç,İ“ü— ,đŽæ“¾,.,é B

**Step 1: %Šú%»,İŠJŽn**

D3dmain.cpp,İWinMainŠÖ ”,ª s,ª Á %  
,İf^fXfN,İ Af [fJf<,É'è<,³,è,½AppInitŠÖ ”,ðCEÄ,Ñ o,µ AfAfvfšfP [fVf±f“ EfEfBf“fhfE,ð ì ¬,µ AfCEf“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,ðCf“fvfŠf f“fg,µ Af [fJf<'è<,İRenderLoopŠÖ ”,ÆCleanupAndPostQuitŠÖ ”,ðCEÄ,Ñ o,· BAppInitŠÖ ”,İ  
A ^— ,ð•â'«,·,é¼,İŠÖ ”EQ,ðCEÄ,Ñ o,µ A,±,è,ç,İŠÖ ”,İ A,³,ç,É•É,İŠÖ ”EQ,İCEÄ,Ñ o,µ,ð s,ª B,±,İf`f...  
[fgfŠfAf<,İ,Û,Æ,ñ,Ç,İ A %Šú%»ŠÖ ”,İfOf< [fv,É,Ä,Ç,ÄŽæ,èµ,Ä,Ä,Ç,é B  
WindowsfAfvfšfP [fVf±f“,İ•W €“I,È %Šú%» ^—  
,ðŽÄ s,µ AfOf [fof•İ ”,ðffftfHf<fg,İ Ý'è,Ä %Šú%»,µ,½CEã AAppInitŠÖ ”,İInitSceneŠÖ ”,ðCEÄ,Ñ o,· B  
3Dmain.cpp,ðŽg,ªŠefTf“fvf<,İ A,»è,¼,èInitSceneŠÖ ”,ðCf“fvfšf f“fg,µ,È,,Ä,İ,È,ç,È,Ç BOct1.c,İ,æ,ª  
,È'P f,ÈTf“fvf< EfAfvfšfP [fVf±f“,Ä,İ AInitSceneŠÖ ”,İ%½,à¹, ATRUE,ð•Ö,·,¾,¯,Ä, ,é BTunnel.c,È,Ç A,à  
,Ä,Æ•ıŽG,ÈTf“fvf<,ªŽg,ªInitSceneŠÖ ”,İ Af f,fŠ,ðŠm•Û,µ A“\_ð ¶ ¬,µ AfOf [fof•İ ”,ðŽæ“¾,·,é B  
ÄCEã,ÉAppInitŠÖ ”,İ AD3dmain.cpp,ÉCf“fvfšf f“fg,³,è,Ä,Ç  
,éCreateD3DAppŠÖ ”,ðCEÄ,Ñ o,· BCreateD3DAppŠÖ ”,É,æ,Ä,ÄCEÄ,Ñ o,³,è,éŠÖ ”EQ,İ A %Šú%» ^— ,İ½,-  
,İ•ª,ðŽó,¯Ž ,Ä,Ä,Ç,é B



p,μ,ÄfpfCfbfg,δ ì ¬,μ AŽŸ,ÉIDirectDrawSurface::SetPalette f\fbfh,δCEÄ,Ñ o,μ,Ä A,»è,δftf f“fg Eft [ft fFX,ÆfobfN Eft [ftfFX,İfpfCfbfg,Æ,μ,Ä Ý'è,·,é B

,±,±  
,ÄfR [fh,İIDirectDraw::CreateSurface f\fbfh,İCEÄ,Ñ o,μ,δ s,¢ AZfobftf@,δ ì ¬,·,é BIDirectDrawSurface::AddAttachedSurface,É,æ,Ä,ÄZfobftf@,δfobfN Efofbftf@,ÉfAf^fbf^,μ AZfobftf@,^frffl Ef f,fŠ,É, ,é,©,Ç ,μ,©,δ»'è,·,é,½,ß,ÉIDirectDrawSurface::GetSurfaceDescf f\fbfh,δŽg—p,·,é B

ŽŸ,ÉIDirect3DDevicefCf“f^ [ftfFX,δ ¶ ¬,μ A,±,ê,δ—p,¢,ÄfefNfXf`ff EftfH [f}fbfg,δ—  
ñ<“,·,é Bftf“fvf<,İ AfCf“f^ [ftfFX,δ ¶ ¬,·,é,½,ß,ÉIDirectDrawSurface::QueryInterface f\fbfh,δCEÄ,Ñ o,  
μ AIDirect3DDevice::EnumTextureFormats f\fbfh,É,æ,Ä,ÄfefNfXf`ff EftfH [f}fbfg,δ—ñ<“,μ,Ä,¢  
,é BfefNfXf`ff,İ—ñ<“,^Š@—¹,·,é,Æ ACreateD3DApp  
,““,¶ŠÖ ”EQ,δCEÄ,Ñ o,μ AfefNfXf`ff,İf [fh,Æ AfefNfXf`ff Efnf“fhf<,İfŠfXfg,İ ì ¬,δ s,μ B

ffofCfX,İ F%δ'æ“x,Æ A“K Ø,ÈffBfXfvfCfC Ef, [fh,δftfBf<f^,·,éfg [f^f< Efrffl Ef f,fŠ,δŽg—  
p,μ,½CEä,İ AffofCfX ì ¬fR [f<fobfNŠÖ ”,δfZfbfgfAfbfv,·,é B,±,İfR [f<fobfNŠÖ ”,É,Ä,¢,Ä,İ uStep 3:  
ffofCfX ì ¬fR [f<fobfNŠÖ ”,İfZfbfgfAfbfv v,δŽQ Æ,³,è,½,¢ B

ffofCfX ì ¬fR [f<fobfNŠÖ ”,İfZfbfgfAfbfv,^Š@—  
¹,·,é,Æ AD3DAppCreateFromHWNDŠÖ ”,İfAvfŠfP [fVf±f“,İfCf“f\_Šf“fO EfXfe [fg,δ Ý'è,·,é BfCf“f\_Šf  
“fO EfXfe [fg,É,Ä,¢,Ä,İ uStep 5: ¼ Úf, [fh,İfCf“f\_Šf“fO EfXfe [fg,İ Ý'è v,Ä à—¾,μ,Ä,¢,é B

•K—v,ÉDirect3DfIfufWfFfNfg,δ ¶ ¬,μ AfCf“f\_Šf“fO EfXfe [fg,İfZfbfgfAfbfv,δ s,μ,Æ A,¾,¢,½,¢,İ ^—  
,^ I,İ,Ä,½,±  
,Æ,É,È,é BD3DAppCreateFromHWNDŠÖ ”,İ Aftf f“fg Efofbftf@,ÆfobfN Efofbftf@,İ<CE`,δfNf%oCfAf“fg  
—  
İæ‘S‘İ,É Ý'è,·,éf [fJf<ŠÖ ”,δCEÄ,Ñ o,μ AfAvfŠfP [fVf±f“,^ %oŠú%o»,³,è AfCf“f\_Šf“fO,^ŽÄ s,Ä,«,é,±  
,Æ,δŽ!,·ftf%ofo,δ Ý'è,μ,Ä ATRUE,δ•Ö,· B

D3DAppCreateFromHWNDŠÖ ”,İ ÅCEä,İ AfGf%o [ ^— ,δ s,μ”^,Ä, ,é BCEÄ,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”^,Ä,İ AffofCfX,δ”jŠü,·,éfR [f<fobfNŠÖ ”,δCEÄ,Ñ o,· BfAvfŠfP [fVf±f“,^ftf<fXfNfŠ [f“ Ef, [fh,ÄŽ  
Ä s,³,è,Ä,¢  
,é ê ±,İ AffBfXfvfCfC Ef, [fh,Æ<’²fCfxf<,δfŠfZfbfg,·,é B,»,μ,Ä A ¶ ¬,³,è,½,·,×,Ä,İDirect3DfIfufWfFfN  
fg,ÆDirectDrawfIfufWfFfNfg,δ%δ•ú,μ AFALSE,δ•Ö,· B

**Step 3: fffofCfX ì -fR [f<fofbfNŠÖ ”,ìfZfbfgfAfbfv**

D3DAppCreateFromHWNDSÖ ”,ì’æ3fpf%of [f^,Í AAfterDeviceCreatedŠÖ ”,Æ,μ,ÄD3dmain.cpp,ÉfCf“fvfŠf f“fg  
,3,ê,Ä,ç,éfR [f<fofbfNŠÖ ”,ìfAfhfCfX,Ä, ,é BAfterDeviceCreatedŠÖ ”,ÍDirect3Dftrf... [f]  
[fg,ð ì ¬,μ A,»ê,ðD3DAppCreateFromHWNDSÖ ”,É•Ö,· B

Ä %o,ÉIDirect3D::CreateViewport f\fbfh,ðCEÄ,Ñ o,μ,Äftrf... [f]  
[fg,ð ì ¬,μ AIDirect3DDevice::AddViewport,É,æ,Ä,Ä,ç,ì,î,ñ V,μ,çDirect3DffofCfX,Éftrf... [f]  
[fg,ð’ç%oÄ,·,é BD3DVIEWPORT \‘c’ì,ì’†,ìftrf... [f] [fg,ìfTfCfY,ð %oŠú%o»,μ,½CEä Afrf... [f]  
[fg,ð,»ìfTfCfY,É Ý’è,·,é,½,ß,É AIDirect3DViewport::SetViewport f\fbfh,ìCEÄ,Ñ o,μ,ð s,□ B

ŽŸ,É AAfterDeviceCreatedŠÖ ”,ÍInitViewŠÖ ”,ðCEÄ,Ñ o,· BInitViewŠÖ ”,Í AD3dmain.cpp,ª Ä %o  
,ì•ù,ÄCEÄ,Ñ o,·InitSceneŠÖ ”,Æ“—l,É AD3dmain.cpp,ðŽg—p,·,éŠefTf“fvf<,ÄfCf“fvfŠf f“fg,μ,È,-  
,Ä,Í,È,ç,È,ç BInitViewŠÖ ”,ìfCf“fvfŠf f“fg,ì—á,Í uStep 4: frf... [f] [fg,ì %oŠú%o» v,Ä à-¾,³,ê,Ä,ç,é B

InitViewŠÖ ”,ìCEÄ,Ñ o,μ,Æ,ç,,Ä,©,ìf fjf... [ EfAfCfef€  
,ì•ï X,ìCEä ACleanUpAndPostQuitŠÖ ”,ðCEÄ,Ñ o,μ,ÄAfterDeviceCreatedŠÖ ”,Í I—  
¹,·,é BCleanUpAndPostQuitŠÖ ”,É,Ä,ç,Ä,Í uStep 8: I—l ^— v,ðŽQ Æ,³,ê,½,ç B

**Step 4: frf... [f] [fg,ì %Šú%»**

```
D3dmain.cpp,đŽg—p,·,éTf“fvf< EfR [fh,Í A,»ê,¼,ê Afrf... [f]
[fg,ìfZfbfgfAfbfv,ÆŽÀ sfofbtft@,ì ì ñ,đ s,µInitViewŠÖ ”,đfCf“fvfŠf f“fg,µ,È,·,Á,Í,È,ç,È,¢ B,±
,ìfZfNfVf†f“,Á,Í AOct1.cfTf“fvf<,È,·,·,éInitViewŠÖ ”,ìfCf“fvfŠf f“fg,È,Á,¢,Á à¾,·,é B
,Ü,·,InitViewŠÖ ”,Í Af}fefŠfAf<,â}fefŠfAf<,ìfnf“fhf< if}fefŠfAf< Efnf“fhf< j AfefNfXf`ff Efnf“fhf<,đ,¢,-
,Á,© ì ñ,µ %Šú%»·,·,é Bf}fefŠfAf<,đ ì ñ,·,é,È,ÍIDirect3D::CreateMaterial f\fbfh,đŽg—
p,·,·,é B,Ü,¼ AIDirect3DMaterial::SetMaterial f\fbfh,đCEÁ,Ñ o,µ A %Šú%»·,µ,¼,Í,©,è,ìf}
fefŠfAf<,ìff [f^,đ Ý’è,·,é B,±,ìf}fefŠfAf<,đfrf... [f]
[fg,ì”wEi,È Ý’è,·,é,È,Í AIDirect3DMaterial::GetHandle,ÆIDirect3DViewport::SetBackgroundf f\fbfh,đ—p,¢
,é B
,±,è,ÆInitViewŠÖ ”,Í Afrf... [f] [fg,ìfrf... [ Af [f<fh Af}fefŠfAf<,ì“Š%e,ì Ý’è,đ s,Á,¼ Bf}
fefŠfAf<,đ ì ñ,µ A Ý’è,·,é,¼,ß,È AInitViewŠÖ ”,ÍMAKE_MATRIXf}fNf ,đŽg—p,·,·,é BMAKE_MATRIXf}
fNf ,ÍD3dmacs.h,ÁŽÝ,ì,æ,µ,È’è`³,è,Á,¢,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,Á,í,©,éÈ,èMAKE_MATRIX,Í AIDirect3DDevice::CreateMatrix,ÆIDirect3DDevice::SetMatrixf f\fbfh,đfVf“fO
f< EfXfefbvf,ÁCEÁ,Ñ o,·,¾,·,ì·Ö—,Èf}fNf ,Á,·,é B
ŽÝ,ÈInitViewŠÖ ”,Í AŽÀ sfofbtft@,ì ì ñ,ÆfZfbfgfAfbfv,đ s,µ BD3DEXECUTEBUFFERDESC \‘c’ì,ìf f“fo
,đ %Šú%»·,µ,Á,©,ç AIDirect3DDevice::CreateExecuteBuffer f\fbfh,đCEÁ,Ñ o,µ,ÁŽÀ sfofbtft@,đ ì ñ,µ A“à
—e,đ Ý’è,·,é,¼,ßIDirect3DExecuteBuffer::Lockf f\fbfh,È,æ,Á,Áfobtft@,đf fbfN,·,é B
InitViewŠÖ ”,Í AD3dmacs.h,Á`è`³,è,Á,¢,éOP_STATE_TRANSFORM,ÆSTATE_DATA}fNf ,đŽg—
p,µ,ÁŽÀ sfofbtft@,đ Ý’è,·,é B,±,è,ç,ìf}fNf ,È,Á,¢,Á,Í uStep 5:
¼ Úf, [fh,ìfCEf“f fŠf“fO EfXfe [fg,ì Ý’è v,đŽQ Æ,³,è,¼,¢ B,»,ìfZfNfVf†f“,È,Í AŽÀ sfofbtft@,ìÈ ì,È,
Á,¢,Á A,æ,è’¼,·,ì îñ,ªL Ú,³,è,Á,¢,é B
ŽÀ sfofbtft@,²fZfbfgfAfbfv,³,è,é,Æ AInitViewŠÖ ”,ÍIDirect3DExecuteBuffer::Unlockf f\fbfh,đCEÁ,Ñ o,µ,Áfob
tft@,đfAf“f fbfN,µ AIDirect3DExecuteBuffer::SetExecuteDataf f\fbfh,È,æ,Á,Áfobtft@,Éff [f^,đ Ý’è,·,é B
IDirect3DDevice::BeginScene AIDirect3DDevice::Execute AIDirect3DDevice::EndScenef f\fbfh,đ—p,¢
,ÁŽÀ sfofbtft@,đŽÀ s,·,é B,»,ìCEä,Í,±,ìŽÀ sfofbtft@,đŽg—p,·,é,±,Æ,Í,È,¢
,ì,Á AIDirect3DExecuteBuffer::ReleaseŠÖ ”,đCEÁ,Ñ o,·,±,Æ,ª,Á,«é B
,±,±,ÆInitViewŠÖ ”,Í A,Ó,¼,Á,ìf}fefŠfAf<,đfZfbfgfAfbfv,·,é B,±,è,È,Í A`È’O,Éf}
fefŠfAf<,đ Ý’è,µ,¼,Æ,«,Æ“”,¶žè ‡,đ—p,¢,é Bf}fefŠfAf<,ì ì ñ,È,ÍIDirect3D::CreateMaterial f\fbfh,đŽg—
p,µ Af}
fefŠfAf<,ìff [f^,đ Ý’è,·,é,È,Í A iD3DMATERIAL \‘c’ì,ìf f“fo,đ Ý’è,µ,¼CEä,È jIDirect3DMaterial::SetMateri
alf f\fbfh,đCEÁ,Ñ o,· B,³,ç,ÈIDirect3DMaterial::GetHandlef f\fbfh,đ—p,¢,Áf}
fefŠfAf<,Ö,ìfnf“fhf<,đŽæ“¾,·,·,é B,±,ìfnf“fhf<,Í A V,µ,¢f}fefŠfAf<,ÈCEö,đ“—,Á,é,¼,ß AD3DLIGHTSTATETYPE
—ñ“CE^,ìD3DLIGHTSTATE_MATERIAL f“fo,Æ,Æ,à,ÈCEä,ÁŽg—p,³,è,é B
,»,µ,ÆInitViewŠÖ ”,Í A’,“_,ìfZfbfgfAfbfv,đ s,µ B,“@ ñ “_,ì’ì,đD3DVERTEX \‘c’ì,ìD3DVALUEf f“fo,È·ìŠ,
·,é,¼,ß Afr [fh,ìD3DVALPf}fNf ,đ—p,µ,Á,¢,é B,Ü,¼ AŠe’,“_,ì_
@ ùxfNfgf<,ìx Á·W,đ ³<K%»·,·,é,¼,ß AD3DRMVectorNormalizeŠÖ ”,áŽg—p,·,·,é B
’,“_,ìfZfbfgfAfbfv,ªŠ@—
¹,·,é,Æ AInitViewŠÖ ”,ÍÈ,ìŽÀ sfofbtft@,đ ì ñ,µ A’,“_,đfRfs [µ,ÁŽÀ sff [f^,đ Ý’è,·,é B,µ,©,µ A,±
,ìŽz“_,Á,ìŽÀ sfofbtft@,ìŽÀ s,³,è,È,¢ BŽÀ sfofbtft@,ìŽÀ s,Í AfCEf“f_Šf“fO Ef< [fv,ì’†,Á s,í,è,é B
ÁCEä,È AInitViewŠÖ ”,ÍOct1.c,ìCEöE¹,đfZfbfgfAfbfv,·,é BD3DLIGHT \‘c’ì,đ %Šú%»·,µ,¼CEä AIDirect3D::Cr
eateLight AIDirect3DLight::SetLight A,·,æ,ÑIDirect3DViewport::AddLightf f\fbfh,đCEÁ,Ñ o,µ,Áfrf... [f]
[fg,ÈCEöE¹,đ’ç%oÁ,·,é B
```

**Step 5:** ¼ Úf, [fh,ìfĈf“f\_Šf“fO EfXfe [fg,ì Ý’è

```
D3dcalls.c\ [fX Eftf@fCf<,É,,éD3DAppISetRenderStateŠÖ ”,Í AĈ» Ý,ìfrf... [f]
[fg,ìfĈf“f_Šf“fO EfXfe [fg,âĈö,ì ó‘Ô,ð Ý’è,·éŽÀ sfobftf@,ì ì ¬,ÆŽÀ s,ð s,ð BD3DAppCreateFromH
WNDŠÖ ”,Í AD3dapp.c,çD3DAppISetRenderStateŠÖ ”,ðĈÄ,Ñ o,· B“è”É“I,ÉfTf“fvf< EfR [fh,Í A Ý’è,âfŠfZ
fbfg,“K—v,É,É,é,½,Ñ,ÉD3DAppISetRenderStateŠÖ ”,ìĈÄ,Ñ o,μ,ð s,± B,±
,ìfZfNfVf‡f“,Á,Í AD3DAppISetRenderStateŠÖ ”,ð ifGf% [ Ef fFfbfN,ìfR [fh,ð œ,Ĉ,Ä j Đ%ò,·,é B
```

```
D3DAppISetRenderStateŠÖ ”,Í AD3DEXECUTEBUFFERDESC \‘Ĉ‘ì,âD3DEXECUTEDATA \‘Ĉ‘ì,ðŠÜ,ð,Ĉ,-
,Á,Ĉ,ìf [fJf·ì ”,ð Ý’è,μ,½Ĉä AIDirect3DDevice::CreateExecuteBuffer f\fbfh,ðŽg—
p,μ,ÄŽÀ sfobftf@,ð ì ¬,·,é BŽÀ sfobftf@,ª ì ¬,³,è,é,Æ A,»,ì† g,ð Ý’è,·,é,½,ß,ÉIDirect3DExecuteBuffer:
Lock f\fbfh,ðĈÄ,Ñ o,μ,Áfobftf@,ðf fbfn,·,é B
```

```
BOOL D3DAppISetRenderState()
{
D3DEXECUTEBUFFERDESC debDesc;
D3DEXECUTEDATA d3dExData;
LPDIRECT3DEXECUTEBUFFER lpD3DExCmdBuf = NULL;
LPVOID lpBuffer, lpInsStart;
size_t size;

// —v< ,³,è,½fTfCfY,ìŽÀ sfobftf@,ð ì ¬,μ A“à—e,ð Ý’è,Á,«,é,æ,ª,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.lpD3DDevicepf%of [f^,Í ADirect3DDeviceIfufWfFf
Nfg,Ö,ìf|fCf“f^,Á, ,é
BdebDesc·ì ” ID3DEXECUTEBUFFERDESC \‘Ĉ‘ì j,ìlpDataf f“fo,Í AŽÀ sfobftf@“à,ìŽÀ Û,ìff [f^,Ö,ìf]
fCf“f^,Á, ,é B

,³,Ä AD3DAppISetRenderStateŠÖ ”,Í AfĈf“f\_Šf“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,±,è,ç,Ó,½,Ä,ìf}fNf ,Í A,±
,ìSDK,ìD3dmacs.hfwfbf\_ Eftf@fCf<,Á^È%°,ì,æ,ª,É‘è<,³,è,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 ,ìrø ”,ÍD3DINSTRUCTION \‘Ĉ‘ì,ìf f“fo,æ,è ,È,Ĉ,±,Æ,É’ ^Ó,“K—v,Á, ,é BOP\_S
TATE\_RENDERf}fNf ,ìPUTD3DINSTRUCTION,ìæ1fpf%of [f^D3DOP\_STATERENDER,Í AD3DOPCODE—
ñ<Ĉ^†,ìIfIfyR [fh,ì,Đ,Æ,Á,Ä, ,é B2”Ó—Ú,ìfpf%of [f^,ÍD3DRENDERSTATETYPE \‘Ĉ‘ì,Ö,ìf]
fCf“f^,ÆD3DSTATE \‘Ĉ‘ì,ìfTfCfY,ðŽ,μ,Ä,Ĉ,é B

,â,ì,èD3dmacs.h,Á‘è<,³,è,éSTATE\_DATAf}fNf ,Í AfĈf“f\_Šf“fO EfXfe [fg,ð‘€ ì,·,é B,±,ìf}

```

fNf ,ID3DSTATE \^c'ì,Ö,Ìf|fCf" f^,ÆD3DRENDERSTATETYPE—ñ<"(E^,Ì'l,ð•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,½ŽÝ,ÌfR [fh,Á,Í AOP_STATE_RENDER,ÆSTATE_DATAf}fNf ,ðŽg—
p,μ,Ä A14CEÄ,ÌfCf"f_Šf"fO EfXfe [fg,ð Ý'è,μ,Ä,ç
,é Bd3dapprs,Í AD3dapp.hfwfbf_ Eftf@fCf<,Ä'è<',3,è,½D3DAppRenderState \^c'ì,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 ,Í ACEðCE'Ì ó'Ö,ð,R,Ä Ý'è,.,é BOP_EXITf}fNf ,Í AD3DOPCODE
—ñ<"(E^,©,çD3DOP_EXITfIfyfR [fh,ðŽæ,è o,.,½,B,É APUTD3DINSTRUCTIONf}fNf ,ðCEÄ,Ñ 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);

fCf"f_Šf"fO EfXfe [fg,Ì Ý'è,Š@—
',.,é,Æ AD3DAppISetRenderStateŠÖ ",Í AIDirect3DExecuteBuffer::Unlockf f\fbfh,ðCEÄ,Ñ o,μ,ÄŽÄ sfobftf@,ð
fAf"f fbFN,.,é B,Ü,½ AIDirect3DExecuteBuffer::SetExecuteData,É,æ,Ä,ÄŽÄ sf [f^,ð Ý'è,.,é B ÄCEä,É AID
irect3DDevice::BeginScene AIDirect3DDevice::Execute AIDirect3DDevice::EndScene f f\fbfh,ðCEÄ,Ñ o,μ,Ä AfV
[f",ðŠJŽn,μ AŽÄ sfobftf@,ðŽÄ s,μ A Ä,ÑfV [f",ð I—',.,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 sfobftf@,đ I,í,è,Ü,ĂŽÀ s,;é,Æ I—
!,.é BŽŸ,ÉIDirect3DExecuteBuffer::Release f\fbfh,đ“Ç,ñ,Ă AfŠf^ [f“,;é B

lpD3DExCmdBuf->lpVtbl->Release(lpD3DExCmdBuf);
return TRUE;
}
```

**Step 6: %Šú%»,İŠ@—**

WinMainŠÖ ”“à,İAppInitŠÖ ”,©,çĀĀ,Ñ o,³,ê,éCreateD3DAppŠÖ ”,Í ADirect3DfAfvfŠfP [fVf‡f“„İ“y“ä,İ,Û,Æ,ñ,Ç ,đ ì ¬,·,é,ª A,»„ê,Ā İ,í,è,Ā,İ,È,ĉ BD3dmain.cpp,ªĀf“f\_Šf“fO Ef< [fv,đĀĀ,Ñ o,“O,É ACreateD3DAppŠÖ ”, Í,Æ ,µ,İf^fXfN,đŠ@—,µ,È,,Ā,İ,È,ç,È,ĉ B

CreateD3DAppŠÖ ”,Í ĀĒ» Ý,İfĀf“f\_Šf“fO EfXfe [fg,đfAfvfŠfP [fVf‡f“ Ef [fJf<,ÈD3DAppRenderState \ĉİ,ĒRfs [,µ,½ĀĀ AOverrideDefaultsŠÖ ”,đĀĀ,Ñ o,· BOverrideDefaultsŠÖ ”,Í AD3dmain.cpp,đŽg— p,·,é,·,×,Ā,İfAfvfŠfP [fVf‡f“„ªfTf| [fg,µ,È,,Ā,İ,È,ç,È,ĉŠÖ ”,İ,Đ,Æ,Ā,Ā, ,é BOverrideDefaultsŠÖ ”,Ā,İ,Û,Æ,ñ,Ç %½,à s,İ,È,ĉfAfvfŠfP [fVf‡f“„à, ,é B,½,Æ,İ,İOctl.cfTf“fvf<,Í AffftfHf<fg,İf^fCfGf·Źš—ñ,đ"Octagon D3D Example",É'u,«Š·,İ,é,¾,Ā, ,é B

ŽŸ,ÉCreateD3DAppŠÖ ”,Í AD3DAppSetRenderStateŠÖ ”,đĀĀ,Ñ o,· BD3DAppSetRenderStateŠÖ ”,Í A·Ÿ·Ź,³,ê,½f Āf“f\_Šf“fO EfXfe [fg,İ ó·Ō,đf^fFfbfN,µ A i,à,µfĀf“f\_Šf“fO EfXfe [fg,É%½,à Ý'è,³,ê,Ā,ĉ ,È,©,Ā,½,ç jfŠfZfbfg,·,é,© AD3DAppISetRenderStateŠÖ ”,İĀĀ,Ñ o,µ,İ·Ÿ·Ź,·,é,©,đ”è,·,é BD3DAppISetRen derStateŠÖ ”,É,Ā,ĉ,Ā,İ uStep 5: ¼ Ūf, [fh,İfĀf“f\_Šf“fO EfXfe [fg,İ Ý'è v,ĀŽæ,èµ,Ā,Ā,ĉ,é B

fĀf“f\_Šf“fO Ef< [fv,đŠJŽn,·,é‘O,İ ĀĀĀ,İfXfefbfv,Æ,µ,Ā ACreateD3DAppŠÖ ”,ÍReleaseView,ÆInitViewŠÖ ”,İ ĀĀ,Ñ o,µ,đ s,µ B,±,ê,ç,İŠÖ ”,Í AOverrideDefaultsŠÖ ”,Æ“— İ,É AŠefTf“fvf< EfAfvfŠfP [fVf‡f“„ªfCf“fvfŠf f“fg,·,é BReleaseViewŠÖ ”,Í AInitViewŠÖ ”,İĀĀ,Ñ o,µ,Ā ì ¬,³,ê,½fİfufWfFfNfg,đ%đ·ú,·,é,¾,Ā, ,é İInitViewŠÖ ”,İĀĀ,Ñ o,µ,İ2“x-Ū,Ā, ,é B Ā % ,İĀĀ,Ñ o,µ,İ AAfterDeviceCreatedfR [f<fofbfNŠÖ ”,ª s,Ā,Ā,ĉ,é j B,± ,İInitViewŠÖ ”,İ ĀĀĀ,İĀĀ,Ñ o,µ,Ā A İfffofCfX ì -Žž,©,ĉİ X,ª%Ā,İ,ç,è,Ā,ĉ,é ê ‡,İ jfrf... [f] [fg,İ ĀfZfbfgfAfbfv,đ s,ĉ AfTf“fvf<,İŽÀ sfobftf@,đ Ā \z,·,é BInitViewŠÖ ”,É,Ā,ĉ,Ā Ū,µ,,İ uStep 4: frf... [f] [fg,İ %Šú%» v,đŽQ Ā,³,ê,½,ĉ B

,±,è,ĀD3dmain.cpp,İCreateD3DAppŠÖ ”,ª İ—,·,é B,»„ê,¾,Ā,È, ĀAppInitŠÖ ”,İ İ—,Ā,à, ,é B %Šú%» ^— ,Š@—,µ,½,İ,Ā AfR [fh,İfĀf“f\_Šf“fO Ef< [fv,đŠJŽn,Ā,«„é B



**Step 8: I—1 ^—**

•æ<A,Á,«,È,¢fGf%o [,”-

¶,µ,½,è AWM\_QUIT,Ü,½,ÍMENU\_EXITf fbFZ [fW,ðŽó,~Žæ,Á,½,Æ,«,Í AfAvfŠfP [fVf‡f“,ÍCleanupAndPostQuitŠÖ ”,ðĀ,Ñ o,· BCleanupAndPostQuitŠÖ ”,ÍŠÈ’P,ÈfGf%o [ Ef`fFbfN,ð s,¢ReleaseSceneŠÖ ”,ðĀ,Ñ o,· BReleaseSceneŠÖ ”,Í AD3dmain.cpp,ð~—p,·,éTf“fvf< EfAvfŠfP [fVf‡f“,¢Cf“fvfŠf f“fg,µ,È,-,Á,Í,È,ç,È,¢ŠÖ ”,ì,ϖ,¿ A ĀĀã,ì,à,Ì,Á, ,é B,±,Ì,Æ,«fAvfŠfP [fVf‡f“,Í AŽc,Á,Á,¢,éIfufWfFfNfg,ð”jŠü,µ Af f,fŠ,ð%ð•ú,·,é BOct1.c,ì,æ,ϖ,ÈŠÈ’P,ÈfAvfŠfP [fVf‡f“,Á,Í AReleaseSceneŠÖ ”,Í’P,È,éXf^fu,É%ß,¬,È,¢ B

ĀĀã,É ACleanupAndPostQuitŠÖ ”,ÍPostQuitMessageŠÖ ”,ðĀ,Ñ o,µ,Ā AfAvfŠfP [fVf‡f“,ð I—1,·,é B

## Direct3DRMCreate

HRESULT Direct3DRMCreate(LPDIRECT3DRM FAR \* lpD3DRM);

Direct3DRMfIfufWfFfNfg, ÌfCf“fXf^f“fX, ð ì -, ·, é B

-CE÷, ·, é, AEDP\_OK AŽ, ”s, ·, é, AfGf%o [, ð•Ô, · B•Ô'l, Ìê——, É, Â, ç  
, Ä, Í A uDirect3D•ÛŽ f, [fh, Ì•Ô'l v, ðŽQ A, ·, é, ±, A B

lpD3DRM

CEÄ, Ñ o, µ, a -CE÷, µ, ½ ê ‡ A—LCEø, ÈDirect3DRMf|fCf“f^, “ü, éf|fCf“f^, ÌfAfhfCEfX B

ŽQ A @Direct3DRMObject

### D3DRMColorGetAlpha

D3DVALUE D3DRMColorGetAlpha(D3DCOLOR d3drmc);

F, Ìf Af < ftf @ — v' f, ð Ž æ “ ¾ , · , é B

- Æ ÷ , · , é , Æ f Af < ftf @ ' l , ð • Ô , · B Ž , ” s , · , é , Æ 0 , ð • Ô , · B

d3drmc

f Af < ftf @ — v' f, ð Ž æ “ ¾ , · , é F B

Ž Q Æ @ D3DRMColorGetBlue, D3DRMColorGetGreen, D3DRMColorGetRed

### **D3DRMColorGetBlue**

D3DVALUE D3DRMColorGetBlue(D3DCOLOR d3drmc);

F, Ì Â—v'f, ðŽæ“¾, ·, é B

-Æ÷, ·, 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  
-E±, ·, é, Æ—Î F'l, ð•Ô, · BŽ, ”s, ·, é, Æ0, ð•Ô, · B

*d3drmc*

—Î—v'f, ðŽæ“¾, ·, é F B

ŽQ Æ @**D3DRMColorGetAlpha**, **D3DRMColorGetBlue**, **D3DRMColorGetRed**

### D3DRMColorGetRed

D3DVALUE D3DRMColorGetRed(D3DCOLOR d3drmc);

F, Ì Ô—v'f, ðŽæ“¾, ·, é B

-Æ÷, ·, é, Æ Ô F'l, ð•Ô, · BŽ, ”s, ·, é, Æ0, ð•Ô, · B

*d3drmc*

Ô—v'f, ðŽæ“¾, ·, é F B

ŽQ Æ @[D3DRMColorGetAlpha](#), [D3DRMColorGetBlue](#), [D3DRMColorGetGreen](#)

### **D3DRMCreateColorRGB**

D3DCOLOR D3DRMCreateColorRGB(D3DVALUE red, D3DVALUE green,  
D3DVALUE blue);

—^,!,ç,ê,½ Ô A—Î,“,æ,Ñ Â—v'f,©,ç RGB F,đ ì ¬,,:é B

—œ÷,,:é,Æ V,μ,çRGB'l,đ•Ô,· BŽ,”s,,:é,Æ0,đ•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,çRGBA'l,ð•Ô,· BŽ,,"s,.,é,Æ0,ð•Ô,· B

*red, green, blue, alpha*  
RGBA F,Ì \ ¬—v'f B

ŽQ Æ @**D3DRMCreateColorRGB**

### D3DRMFREEFUNCTION

```
typedef VOID (*D3DRMFREEFUNCTION) (LPVOID lpArg);  
typedef D3DRMFREEFUNCTION *LPD3DRMFREEFUNCTION;
```

```
f f, fŠ, đ%đ•ú, ., é B, ±, ĨŠÖ ”, ĨŽÀ'ĭ, ĭfAfvfŠfP [fVf‡f“, Á'èç, ³, ê, é B  
•Ô'l, ĭ, È, ç B
```

```
lpArg  
fAfvfŠfP [fVf‡f“èç, ĭff [f^, ĭfAfhfŒfX B
```

```
•W €Cf%“f^fCf€ Efç [f`f“, Á, ĭs \•ª, È ê ‡ AfAfvfŠfP [fVf‡f“, ĭ A“ÆŽ©, ĭf f, fŠ%đ•úŠÖ ”, đ'èç, ., é, ±  
, Æ,ª, Á, «, é B
```

### D3DRMMALLOCFUNCTION

```
typedef LPVOID (*D3DRMMALLOCFUNCTION) (DWORD dwSize);  
typedef D3DRMMALLOCFUNCTION *LPD3DRMMALLOCFUNCTION;
```

```
f f, fŠ, đŠ,, è“-Ä, é B, ±, ìŠÖ ”, ÌŽÀ‘ì, ÍfAfvfŠfP [fVf‡f“, Ä‘è‘, ³, ê, é B  
-Æ÷, ·, é, Æ AŠ,, è“-Ä, ç, ê, ½f f, fŠ, ÌfAfhfÆfX, ð•Ô, · BŽ, ”s, ·, é, Æ0, ð•Ô, · B
```

```
dwSize  
Š,, è“-Ä, ç, ê, éf 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,đĈvŽŽ,·,é B

•Ô'l,Í,È,ċ B

mat

ŠÖ ”,ª §Ĉä,đ•Ô,·,Æ,« ACEvŽŽ,³,ê,½ s—ñ,ª“ü,éAfhfĈfX B iD3DRMMATRIX4DĈ^,Í”z—ñ,Ä, ,é j

lpquat

D3DRMQUATERNION \‘ċ‘İ,Ö,İf|fCf“f^ B.

### D3DRMQuaternionFromRotation

LPD3DRMQUATERNION D3DRMQuaternionFromRotation(LPD3DRMQUATERNION lpquat,  
LPD3DVECTOR lpv, D3DVALUE theta);

$\check{Z}w'è,^3,ê,½\check{Z}^2,ð'† S,É A\check{Z}w'è,^3,ê,½\check{S}p"x if\%fWfAf""P^Ê j,Ì\%ñ["],ð s,□ B$

$-CE÷,·,é,Æ A'æ1fpf\%of [f^,Æ,μ,Ä"n,^3,ê,½4\check{Z}Ï s—ñ,Ö,Ìf|fCf"f^,ð•Ö,· B\check{Z},"s,·,é,Æ0,ð•Ö,· B$

lpquat

$‘€ iCE\%ñÊ,ð\check{Z}ó,~\check{Z}æ,éD3DRMQUATERNION \‘c'ì B$

lpv

$\%ñ["],Ì\check{Z}^2,ð\check{Z}w'è,·,éD3DVECTOR \‘c'ì,ÌfAfhfCEfX B$

theta

$lpv fpf\%of [f^,É,æ,Á,Ä\check{Z}w'è,^3,ê,½\check{Z}^2,Ì\check{Z}ü,è,ð\%ñ["],·,é\check{S}p"x if\%fWfAf""P^Ê j B$

### 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 \‘c‘İ,Ö,Ìf|fCf“f^,ð•Ô,· BŽ,”s,·,é,Æ0,ð•Ô,· B

lpq

æŽZ,ÌŒ<%oÊ,ðŽó,~Žæ,éD3DRMQUATERNION \‘c‘İ,ÌfAfhfŒfX B

lpa, lpb

Š|,~ ‡,í,¹,éD3DRMQUATERNION \‘c‘İ B

### D3DRMQuaternionSlerp

LPD3DRMQUATERNION D3DRMQuaternionSlerp(LPD3DRMQUATERNION lpq,  
LPD3DRMQUATERNION lpa, LPD3DRMQUATERNION lpb, D3DVALUE alpha);

<...-Ê üE`âšÔ,đŽg—p,μ,Ä,Ó,½,Â,Ì \`C`İ,đ•âš@,·,é B

-CE÷,·,é,Æ A`æ1fpf%of [f^,Æ,μ,Ä“n,³,ê,½ \`C`İ,đ•Ô,· BŽ,”s,·,é,Æ0,đ•Ô,· B

lpq

•âš@,μ,½CE%Ê,đŽó,`Žæ,éD3DRMQUATERNION \`C`İ B

lpa, lpb

•âš@,İšJŽn^Ê`u,Æ I—1^Ê`u,Æ,μ,Ä—p,Ç,ç,ê,éD3DRMQUATERNION \`C`İ B

alpha

lpa,Ælpb,İšÔ,É•âš@,·,é←—£,đŽ!,· A0,©,ç1,İšÔ,İ! B

### D3DRMREALLOCFUNCTION

```
typedef LPVOID (*D3DRMREALLOCFUNCTION) (LPVOID lpArg,  
    DWORD dwSize);  
typedef D3DRMREALLOCFUNCTION *LPD3DRMREALLOCFUNCTION;
```

*f*, *f*, *f*Š, ĺ ĀŠ,, è“–, Ā, đ s, □ B, ±, ĺŠÖ ”, ĺŽÀ‘ì, ĺfAfvfŠfP [fVf‡f““, Ā’è‘, 3, é, é B  
–Ā±, ·, ·, é, Ā A ĀŠ,, è“–, Ā, 3, é, ½f f, fŠ, ĺfAfhfĀfX, đ•Ô, · BŽ, ”s, ·, ·, é, Ā0, đ•Ô, · B

*lpArg*  
fAfvfŠfP [fVf‡f““è‘, ĺff [f^ B

*dwSize*  
ĀŠ,, è“–, Ā, ·, éf f, fŠ, ĺfTfCfY, đfofCfG’P^Ê, ĀŽw’è, ·, é B

•W ĀCf%of“f^fCfĀ Ef< [f`f“, Ā, ĺs \•ª, Ê ê ‡ AfAfvfŠfP [fVf‡f““, ĺ A“ĀŽ©, ĺf f, fŠ ĀŠ,, è“–  
, ĀŠÖ ”, đ’è‘, Ā, «, é B

### D3DRMVectorAdd

```
LPD3DVECTOR D3DRMVectorAdd(LP3DVECTOR lpd, LPD3DVECTOR lps1,  
    LPD3DVECTOR lps2);
```

,Ó,½,Â,ÌfxfNfgf<,ð%ÁŽŽ,·,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*

%oÁŽŽ,ÌŒ<%oÊ,ðŽó,~Žæ,éD3DVECTOR \‘Œ’ì B

*lps1, lps2*

%oÁŽŽ,³,ê,éD3DVECTOR \‘Œ’ì B

### D3DRMVectorCrossProduct

LPD3DVECTOR D3DRMVectorCrossProduct(LPD3DVECTOR lpd, LPD3DVECTOR lps1,  
LPD3DVECTOR lps2);

,Ó,½,Â,ÌfxfNfgf<,ÌŠO Ī,ðŒvŽZ,·,é B

-Œ÷,·,é,Œ A'æ1fpf%of [f^,Œ,µ,Ä“n,³,ê,½fxfNfgf<,ð•Ô,· BŽ,”s,·,é,Œ0,ð•Ô,· B

*lpd*

ŠO Ī,ÌŒ<%oÊ,ðŽó,~Žæ,éD3DVECTOR \‘Œ’Ī B

*lps1, lps2*

ŠO Ī,ªŒvŽZ,³,ê,éD3DVECTOR \‘Œ’Ī B

### D3DRMVectorDotProduct

D3DVALUE D3DRMVectorDotProduct(LPD3DVECTOR lps1, LPD3DVECTOR lps2);

*lps1, lps2*

“à Ī,đ•Ô,· B  
-Ĉ÷,·,é,Æ“à Ī,ĪĈ÷,· BŽ,”s,·,é,Æ0,đ•Ô,· B

*lps1, lps2*

“à Ī,“ĈvŽZ,3,é,éD3DVECTOR \‘Ĉ’Ī B

### D3DRMVectorModulus

D3DVALUE D3DRMVectorModulus(LPD3DVECTOR lpv);

^È%°;ìž@,É,μ,½,ª,Á,ÄfxfNfgf<,Ì·,³,ð•Ô,· B

$$length = \sqrt{x^2 + y^2 + z^2}$$

-Æ÷,·,é,ÉD3DVECTOR \‘c‘ì,É’·,³,ð•Ô,· Bž,”s,·,é,Æ0,ð•Ô,· B

lpv

’,³,ðEvžž,·,éD3DVECTOR \‘c‘ì B

### D3DRMVectorNormalize

LPD3DVECTOR D3DRMVectorNormalize(LPD3DVECTOR lpv);

â'Î'l,¹¹,É,È,é,æ,ð,ÉfxfNfgf<,ðfXfP [fŠf“fO,·,é B

-Æ÷,·,é,Æ A'æ1fpf%of [f^,Æ,µ,Ä“n,³,ê,½fxfNfgf<,ð•Ô,· B,½,Æ,!,Îf[f EfxfNfgf<,“n,³,ê,½ ê ‡,È,Ç A  
fGf%o [,“” ¶,·,é,Æ0,ð•Ô,· B

lpv

fXfP [fŠf“fO'€ ì,ÌE%oÊ,ðŽó,~Žæ,éD3DVECTOR \‘c'Î B

### D3DRMVectorRandom

LPD3DVECTOR D3DRMVectorRandom(LP3DVECTOR lpd);

f%of“f\_f€„ÈfxfNfgf< Eftfjfbfg,đ•Ô,· B

¬E÷,·,é,Æ A'æ1fpf%of [f^,Æ,µ,Ä“n,³,ê,½fxfNfgf<,đ•Ô,· BŽ,”s,·,é,Æ0,đ•Ô,· B

lpd

f%of“f\_f€„ÈfxfNfgf< Eftfjfbfg,đŽó,¬Žæ,éD3DVECTOR \‘c’ì B

### D3DRMVectorReflect

```
LPD3DVECTOR D3DRMVectorReflect(LPD3DVECTOR lpd, LPD3DVECTOR lpRay,  
    LPD3DVECTOR lpNorm);
```

Žw'è,³,ê,½-@ ü,É,Â,¢,Ä ACEð ü,ð"½ŽĚ,·,é B

-CE÷,·,é,Æ A'æ1fpf%of [f^,Æ,μ,Ä“n,³,ê,½fxNfgf<,ð•Ô,· BŽ,"s,·,é,Æ0,ð•Ô,· B

lpd ^— CE<%oÊ,ðŽó,~Žæ,éD3DVECTOR \‘¢‘İ B

lpRay -@ ü,Ä"½ŽĚ,³,ê,éD3DVECTOR \‘¢‘İ B

lpNorm lpRay,ÄŽw'è,³,ê,½CEð ü,ð"½ŽĚ,·,é-@ ü,ðŽ!,· AD3DVECTOR \‘¢‘İ B

### D3DRMVectorRotate

```
LPD3DVECTOR D3DRMVectorRotate(LPD3DVECTOR lpr, LPD3DVECTOR lpv,  
    LPD3DVECTOR lpaxis, D3DVALUE theta);
```

Žw'è,³,ê,½Ž²,đ'† S,ÉfxfNfgf<,đ%oñ“,³,¹,é B

¬Ĉ÷,·,é,Æ A'æ1fpf%of [f^,Æ,μ,Ä“n,³,ê,½fxfNfgf<,đ•Ô,· BŽ,”s,·,é,Æ0,đ•Ô,· B

lpr ^— Ĉ<%oÊ,đŽó,¬Žæ,éD3DVECTOR \‘Ĉ‘î B

lpv —^,!,ç,ê,½Ž²,ì%oñ,è,đ%oñ“,·,éD3DVECTOR \‘Ĉ‘î B

lpaxis %oñ“,ìŽ²,đŽ',·D3DVECTOR \‘Ĉ‘î B

theta f%ofWfAf““P^Ê,Ä,ì%oñ“]Šp“x B

### D3DRMVectorScale

LPD3DVECTOR D3DRMVectorScale(LPD3DVECTOR lpd, LPD3DVECTOR lps,  
D3DVALUE factor);

,R,Â,ÏŽ²,É,Â,c,Ä“”ä—,Ä AfxfNfgf<,ðfXfP [fŠf“fO,·,é B  
-CE÷,·,é,Æ‘æ1fpf%of [f^,Æ,µ,Ä“n,³,ê,½fxfNfgf<,ð•Ô,· BŽ,”s,·,é,Æ0,ð•Ô,· B

lpd ^— CE<%oÊ,ðŽó, Žæ,éD3DVECTOR \‘c‘î B

lps fXfP [fŠf“fO,³,ê,éD3DVECTOR \‘c‘î B

factor kŽÚCEW ” B,±,ì¹,²,ì,Æ,« AfXfP [fŠf“fO,Í s,í,ê,È,c B,±,ì¹,²,ì,Æ,«,Í2”{,É,È,é B

### D3DRMVectorSubtract

LPD3DVECTOR D3DRMVectorSubtract(LPD3DVECTOR lpd, LPD3DVECTOR lps1,  
LPD3DVECTOR lps2);

,Ó,½,Â,ÏfxfNfgf<ŠÔ,ÂÆ,ŽZ,đ s,σ B

-Æ÷,·,é,Æ A'æ1fpf%of [f^,Æ,μ,Ä“n,³,ê,½fxfNfgf<đ•Ô,· BŽ,”s,·,é,Æ0,đ•Ô,· B

lpd ^— Æ<%oÊ,đŽó,Žæ,éD3DVECTOR \‘ç’î B

lps1 lps2 ,^ø,©,ê,éD3DVECTOR \‘ç’î B

lps2 lps1 ,©,ç^ø,D3DVECTOR \‘ç’î B

fR [f<fofbfNŠÖ ”

### D3DRMDEVICEPALETTECALLBACK

```
void (*D3DRMDEVICEPALETTECALLBACK)  
(LPDIRECT3DRMDEVICE lpDirect3DRMDev, LPVOID lpArg, DWORD dwIndex,  
LONG red, LONG green, LONG blue);
```

*lpDirect3DRMDev*    *lpArg*    *dwIndex*    *red*    *green*    *blue*

*lpDirect3DRMDev*  
LPDIRECT3DRMDEVICE

*lpArg*  
LPVOID

*dwIndex*  
DWORD

*red*, *green*, *blue*  
LONG

*red*, *green*, *blue*  
LONG



### D3DRMLOADCALLBACK

```
void (*D3DRMLOADCALLBACK) (LPDIRECT3DRMOBJECT lpObject, REFIID ObjectGuid,  
LPVOID lpArg);
```

**IDirect3DRM::Load** *f\fbfh“à”*,ÁfIfufWfFfNfg,Ìf [fh,ð s,□ B,±  
,ÌfR [f<fofbfNŠÖ ”,İŽÀ‘ì,ÍfAfvfŠfP [fVf‡f“„Á`è`³,é,é B

•Ô¹,Í,È,¢ B

*lpObject*

*f* [fh,³,é,éDirect3DRMObject B

*ObjectGuid*

*f* [fh,³,é,éfIfufWfFfNfg,ÌfOf [fof< Ef†fj [fNŽ⁻•ÊŽq iGUID j B

*lpArg*

*fR* [f<fofbfNŠÖ ”,É“n,³,é,éfAfvfŠfP [fVf‡f“`è`³,Ìff [f^ B

fVfXfef€„ÍfR [f<fofbfNŠÖ ”,ðĀ,Ñ o,· ‡ ~,ðĀ`è,·,é,½,ß A,Ů,ŠK‘w,Ìfgfbfv EfĀfxf<,É, .éfIfufWfFfNfg,ð  
ĀŸ ò,·,é BŽŸ,É A ì ¬,³,é,½ ‡”Ō,ÉfR [f<fofbfNŠÖ ”,ðĀ,Ñ o,· B

ŽQ Æ @**IDirect3DRM::Load**

### D3DRMLOADTEXTURECALLBACK

HRESULT (\*D3DRMLOADTEXTURECALLBACK) (char \*tex\_name, void \*lpArg, LPDIRECT3DRMTEXTURE \*lpD3DRMTexture);

**Load** f\fbfh,ì“à”,Á AfefNfXf`ff Eftf@fCf< i,à,μ,,ÍfŠf\ [fX j,ìŽÀ Û,ì“Ç,Ý ž,Ý,đ s,□ B,± ,ÌfR [f<fofbfNŠÖ ”,ìŽÀ`ì,ÍfAfvfŠfP [fVf‡f“„Á`è`³,é,é B

–CE±,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,Ìê——,É,Á,c ,Ä,Í A uDirect3D•ŮŽ f, [fh,Ì•Ô'l v,đŽQ Æ,·,é,±,Æ B

tex\_name

fefNfXf`ff–¼ B

lpArg

fAfvfŠfP [fVf‡f“CEÁ—L,Ìf [f^ B

lpD3DRMTexture

Direct3DRMTexturefIfufWfFfNfg B

fAfvfŠfP [fVf‡f“„Í AWindowsf\rfbfgf}fbfv i.bmp j,âf [f^fuf< EfsfNfXf}fbfv i.ppm jP6 CE`Ž@`ÈŠÖ,ÌfefNfXf`ff,ÌfTf [fg,đfCf“fvfŠf f“fg,·,é,½,β A,±,ÌfR [f<fofbfNŠÖ ”,đŽg—p,·,é,±,Æ,a,Á,«,é B

fVfXfef€,Í AfR [f<fofbfNŠÖ ”,đCEÄ,Ñ o,· ‡ ~,đCE`è,·,é,½,β A,Û,ŠK`w,Ìfgfbfv EfCEfxf<,É, ,éfIfufWfFfNfg,đCEÝ ò,·,é BŽÝ,É A ì ¬,³,é,½ ‡”Ô,ÉfR [f<fofbfNŠÖ ”,đCEÄ,Ñ o,· B

ŽQ Æ @IDirect3DRM::Load, IDirect3DRMAnimationSet::Load, IDirect3DRMFrame::Load, IDirect3DRMMeshBuilder::Load

### D3DRMOBJECTCALLBACK

```
void (*D3DRMOBJECTCALLBACK) (LPDIRECT3DRMOBJECT lpD3DRMObj,  
    LPVOID lpArg);
```

**IDirect3DRM::EnumerateObjects** *f fbfh, ĪĀ, Ñ o, μ, É%ž“š, ., éIfufWfFfNfg, ð—ñ“; , é B, ±, ĪfR [f<fobfNŠÖ ”, ĪŽÀ‘Ī, ĪfAfvfŠfP [fVf‡f“èç, Ā, , é B*

•Ô‘Ī, Ī, È, ç B

*lpD3DRMObj*

*fIfufWfFfNfg, ð—ñ“; , éIDirect3DRMObjectfCf“f^ [ftFfCfX BfAfvfŠfP [fVf‡f“Ī A—ñ“; , 3, ê, ½šefIfufWfFfNfg, É, Ā, ç, ĀReleasef fbfh, ðĀ, Ñ o, 3, È, , Ā, Ī, È, ç, È, ç B*

*lpArg*

*fR [f<fobfNŠÖ ”, É“n, 3, ê, éfAfvfŠfP [fVf‡f“èç, Īff [f^ B*

*fVfXfefÉ, ĪfR [f<fobfNŠÖ ”, ðĀ, Ñ o, . ‡ ~, ðĀ“è, ., é, ½, β A, Ū, , ŠK‘w, Īfgfbfv EfĀfxf<, É, ., éIfufWfFfNfg, ðĀÿ ð, ., é BŽÿ, É A ì ¬, 3, ê, ½ ‡”Ô, ÉfR [f<fobfNŠÖ ”, ðĀ, Ñ o, . B*

ŽQ Æ @**IDirect3DRM::EnumerateObjects**

### D3DRMUPDATECALLBACK

```
void (*D3DRMUPDATECALLBACK)(LPDIRECT3DRMDEVICE lpobj, LPVOID lpArg,  
    int iRectCount, LPD3DRECT d3dRectUpdate);
```

ffofCfX, \*İ X, 3, ê, ½, Æ, «fAfvfŠfP [fVf‡f“ÉEx , :é B, ±  
, İfR [f<fofbfNŠÖ ”, İŽÀ‘İ, İfAfvfŠfP [fVf‡f“èè, Å, , é B

•Ô‘l, İ, È, ç B

lpobj

fR [f<fofbfNŠÖ ”, ð“K—p, :éDirect3DRMDeviceIfufWfFfNfg B

lpArg

fR [f<fofbfNŠÖ ”, É“n, 3, ê, éfAfvfŠfP [fVf‡f“èè, İff [f^ B

iRectCount

d3dRectUpdatefpf%of [f^, ÉŽw’è, 3, ê, ½èéÈ, İ ” B

d3dRectUpdate

X V, 3, ê, é—İæ, ð, . A, Đ, Æ, Â^È ã, İD3DRECT ‘ç‘İ, İ”z—ñ B À•W, İffofCfX’P^Ê, ÅŽw’è, 3, ê, é B

fVfXfef€, Í AfR [f<fofbfNŠÖ ”, ðÈÄ, Ñ o, . ‡ ~, ðÈ~è, ., é, ½, ß A, Ü, , ŠK‘w, İfgfbfv EfÈfxfç, É, , éfIfufWfFfNf  
g, ðÈÿ ò, ., é BŽÿ, É A ì ¬, 3, ê, ½ ‡”Ô, ÉfR [f<fofbfNŠÖ ”, ðÈÄ, 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† [fU EfrfWf...fAf<fIfufWfFfNfg,đ'ñ<Ÿ,·,éfAfvfŠfP [fVf‡f“,É AŽÀ sfobftf@,đŽÀ s,·,éK—v,<sup>a</sup>,,é,±,Æ,đ'É'm,·,é B,±,İfR [f<fobfNŠÖ ”,İŽÀ'İ,İfAfvfŠfP [fVf‡f“è<,Á, ,é B*

*lpD3DRMUVreasonfpf%of [f^,ÉD3DRMUSERVISUAL\_CANSEE,<sup>a</sup>Žw'è,<sup>3</sup>,ê Af† [fU EfrfWf...  
fAf< EIfufWfFfNfg,<sup>a</sup>frr... [f] [fg“à,Á%oÁŽ< ó'Ö,İ,Æ,«,Í ATRUE,đ•Ö,· B,»<sup>□</sup>  
,Á,È,~,ê,İFALSE,đ•Ö,· BlpD3DRMUVreason fpf%of [f^,ÉD3DRMUSERVISUAL\_RENDER,<sup>a</sup>Žw'è,<sup>3</sup>,ê,Á,¢  
,é,Æ,«,Í AfAfvfŠfP [fVf‡f“è<,İ•Ö'l,Æ,È,é B,±,İ ê ‡ A,Á,È,ÉTRUE,đ•Ö,·,İ,<sup>a</sup>À'S,Á, ,é B*

*lpD3DRMUV  
 Direct3DRMUserVisualfIfufWfFfNfg B*

*lpArg  
 fR [f<fobfNŠÖ ”,É“n,<sup>3</sup>,ê,éfAfvfŠfP [fVf‡f“è<,İff [f^ B*

*lpD3DRMUVreason  
 D3DRMUSERVISUALREASON—ñ<“Ĉ^,İf f“fo,İ,Đ,Æ,Á B*

*D3DRMUSERVISUAL\_CANSEE  
 f† [fU EfrfWf...fAf< EIfufWfFfNfg,<sup>a</sup>frr... [f]  
 [fg“à,Á%oÁŽ< ó'Ö,Á, ,ê,İ AfAfvfŠfP [fVf‡f“ ,ÍTRUE,đ•Ö,· B,  
 ±,İ ê ‡ AfAfvfŠfP [fVf‡f“ ,Í AlpD3DRMview  
 fpf%of [f^,ÁŽw'è,<sup>3</sup>,ê,½ffofCfX,đŽg—p,·,é B*

*D3DRMUSERVISUAL\_RENDER  
 fAfvfŠfP [fVf‡f“ ,Í Af† [fU EfrfWf...  
 fAf< EfGfĈf f“fg,đfĈf“f\_Šf“fO,μ,È,,Á,Í,È,¢,È,¢ B,±  
 ,İ ê ‡ AfAfvfŠfP [fVf‡f“ ,Í AlpD3DRMDevpf%of [f^,ÁŽw'  
 è,<sup>3</sup>,ê,½ffofCfX,đŽg,<sup>□</sup> B*

*lpD3DRMDev  
 Direct3DRMUserVisualfIfufWfFfNfg,đfĈf“f\_Šf“fO,·,é,½,β,ÉŽg,í,ê,éDirect3DRMDevicefIfufWfFfNfg B*

*lpD3DRMview  
 Direct3DRMUserVisual fIfufWfFfNfg,<sup>a</sup>%oÁŽ< ó'Ö,©,Ç,□,©,đĈf“è,·,é,½,β,ÉŽg,í,ê,é Direct3DRMViewport  
 fIfufWfFfNfg B*

*fVfXfef€ ,İfR [f<fobfNŠÖ ”,đĈĀ,Ñ o,· ‡ ~,đĈf“è,·,é,½,β A,Û,ŠK'w,İfgfbfv EfĈfxf<,É, ,éfIfufWfFfNfg,đ  
ĈĀ ò,·,é BŽŸ,É A ì ~,<sup>3</sup>,ê,½ ‡”Ö,ÉfR [f<fobfNŠÖ ”,đĈĀ,Ñ o,· B*

*ŽQ Æ @IDirect3DRMUserVisual::Init*

### **D3DRMWRAPCALLBACK**

```
void (*D3DRMWRAPCALLBACK) (LPD3DVECTOR lpD3DVector,  
    int* lpU, int* lpV, LPD3DVECTOR lpD3DRMVA, LPD3DVECTOR lpD3DRMVB,  
    LPVOID lpArg);
```

,±,̀fR [f<fofbfNŠÖ ”,ÍfTf| [fg,³,ê,Ä,¢,È,¢ B

**IDirect3DRM**”z—ñfCf“f^ [ftfFfCfX

”z—ñfCf“f^ [ftfFfCfX,đ—p,č,é,Æ AfAfvfšfP [fVf±f“,Í AfIfufWfFfNfg,đ”z—  
ñ,ÉfOf< [fv%o»,μ,ÄŠÈ’P,ÉfOf< [fv‘S’Ì,É ^— ,đ“K—p,·,é,±,Æ,ª,Ä,«,é B^È%o,ì”z—ñfCf“f^ [ftfFfCfX,đŽg—  
p,·,é,±,Æ,ª,Ä,«,é B

IDirect3DRMArray

IDirect3DRMDeviceArray

IDirect3DRMFaceArray

IDirect3DRMFrameArray

IDirect3DRMLightArray

IDirect3DRMPickedArray

IDirect3DRMViewportArray

IDirect3DRMVisualArray

## **IDirect3DRMArray**

**IDirect3DRMArray** *Vtbl* [ftFfCfX, íIfufWfFfNfg, ðOf< [fv, ðŒÇ— ,·, é B·Ê í AfAfvfŠfP [fVf‡f“, í, ±, ðCf“f^ [ftFfCfX, ð¼ ÚŽg, í, A, ±, ðCf“f^ [ftFfCfX, ©, ç”h ¶, µ, ½”z—ñIfufWfFfNfg, ð—~—p,·, é B, ±, ðZfNfVf‡f“, í **AIDirect3DRMArray** *Vtbl* [ftFfCfX Ef f\fbfh, ðŒfTf@fEf“fX, Å, é B

**IDirect3DRMArray** *Vtbl* [ftFfCfX, **GetSize** f\fbfh, ðfTf| [fg,·, é B

,·, ×, Å, ðCOMfCf“f^ [ftFfCfX, Æ“—

l **AIDirect3DRMArray** *Vtbl* [ftFfCfX, **Unknown** *Vtbl* [ftFfCfX Ef f\fbfh, ðEp ³,·, é B, ±, ðCf“f^ [ftFfCfX, ŽŸ, ð, R, Å, ðf f\fbfh, ðfTf| [fg,·, é B

## **AddRef**

## **QueryInterface**

## **Release**

**IDirect3DRMArray::GetSize**

DWORD GetSize();

Direct3DRMArray fIfufWfFfNfg, ÌfTfCfY, ð AfIfufWfFfNfg'P^Ê, ÅŽæ“¾, ., é B  
fTfCfY, ð•Ô, · B

## **IDirect3DRMDeviceArray**

fffofCfX EfIfufWfFfNfg,ðfOf< [fv%o»,·,é,É,Í A**IDirect3DRMDeviceArray**Cf“f^ [ftfFfCfX,ìf f\fbfh,ð—  
p,·,é B,±,ìfZfNfVf‡f“,Í A**IDirect3DRMDeviceArray**Cf“f^ [ftfFfCfX Ef f\fbfh,ìfŠftf@fœf“fX,À, ,é BŠT”O,  
É,Â,¢,Ä,ìŠT—v,Í A u**IDirect3DRMDevice,ÆIDirect3DRMDeviceArray**fCf“f^ [ftfFfCfX. v,ðŽQ Æ,·,é,±,Æ B

**IDirect3DRMDeviceArray** fCf“f^ [ftfFfCfX,Í AŽŸ,ìf f\fbfh,ðfTf| [fg,·,é B

### **GetElement**

### **GetSize**

**IDirect3DRMDeviceArray** fCf“f^ [ftfFfCfX,Í A,·,×,Ä,ìCOMfCf“f^ [ftfFfCfX,Æ“—  
l A**IUnknown**fCf“f^ [ftfFfCfX Ef f\fbfh,ðEp ³,·,é B**IUnknown**fCf“f^ [ftfFfCfX,ìŽŸ,ì,R,Â,ìf f\fbfh,ðfTf|  
[fg,·,é B

### **AddRef**

### **QueryInterface**

### **Release**

,³,ç,É A**IDirect3DRMDeviceArray**fCf“f^ [ftfFfCfX,Í A**IDirect3DRMObject**fCf“f^ [ftfFfCfX,©,çŽŸ,ìf f\fbfh,ð  
Ep ³,·,é B

### **AddDestroyCallback**

### **Clone**

### **DeleteDestroyCallback**

### **GetAppData**

### **GetClassName**

### **GetName**

### **SetAppData**

### **SetName**

**IDirect3DRMDeviceArray**IfufWfFfNfg,Í A **IDirect3DRM::GetDevices**  
method f\fbfh,ìCEÄ,Ñ o,μ,É,æ,Á,ÄŽæ“¾,³,ê,é B

**IDirect3DRMDeviceArray::GetElement**

HRESULT GetElement(DWORD index, LPDIRECT3DRMDEVICE \* lplpD3DRMDevice);

Direct3DRMDeviceArrayIfufWfFfNfg, ©, çŽw'è,³,ê,½—v'f,ðŽæ“¾,·,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

index

”z—ñ—v'f B

lplpD3DRMDevice

IDirect3DRMDevice fCf“f^ [ftfFfCfX,Ö,Ï|fCf“f^ B

### **IDirect3DRMDeviceArray::GetSize**

DWORD GetSize();

Direct3DRMDeviceArray fIfufWfFfNfg,ÉŠÛ,Û,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,Ïf f\fbfh,ð—~—p,;é B,± ,ÏfZfNfVf‡f“,Í AIDirect3DRMFaceArrayCf“f^ [ftFfCfX Ef f\fbfh,ÏfŠftf@fœf“fX,Â, ,é BŠT”O,É,Â,¢ ,Â,ÏŠT—v,Í A uIDirect3DRMFace,ÆIDirect3DRMFaceArrayCf“f^ [ftFfCfX v,ðŽQ Æ,.,é,±,Æ B*

**IDirect3DRMFaceArrayCf“f^ [ftFfCfX,Í AŽŸ,Ïf f\fbfh,ðfTf| [fg,.,é B**

### **GetElement**

### **GetSize**

**IDirect3DRMFaceArrayCf“f^ [ftFfCfX,Í A,;,×,Ä,ÏCOMfCf“f^ [ftFfCfX,Æ“—**  
**l A[UnknownfCf“f^ [ftFfCfX Ef f\fbfh,ðœp ³,.,é BIUnknownfCf“f^ [ftFfCfX,Í AŽŸ,ÏR,Â,Ïf f\fbfh,ðfT**  
**f| [fg,.,é B**

### **AddRef**

### **QueryInterface**

### **Release**

**,³,ç,É AIDirect3DRMFaceArrayCf“f^ [ftFfCfX,Í AIDirect3DRMObjectfCf“f^ [ftFfCfX,©,çŽŸ,Ïf f\fbfh,ðœp**  
**³,.,é B**

### **AddDestroyCallback**

### **Clone**

### **DeleteDestroyCallback**

### **GetAppData**

### **GetClassName**

### **GetName**

### **SetAppData**

### **SetName**

**Direct3DRMFaceArrayIfufWfFfNfg,Í**

**IDirect3DRMMeshBuilder::GetFaces** *f\fbfh,ÏœÄ,Ñ o,µ,É,æ,Á,ÄŽæ“¾,³,é,é B*

### **IDirect3DRMFaceArray::GetElement**

HRESULT GetElement(DWORD index, LPDIRECT3DRMFACE \* lplpD3DRMFace);

Direct3DRMFaceArrayIfufWfFfNfg,©,çŽw'è,<sup>3</sup>,ê,<sup>1/2</sup>—v'f,ðŽæ“¾,·,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

*index*

”z—ñ—v'f B

*lplpD3DRMFace*

IDirect3DRMFacefCf“f^ [ftfFfCfX,Ö,Ĵf|fCf“f^ B

### **IDirect3DRMFaceArray::GetSize**

DWORD GetSize();

Direct3DRMFaceArrayIfufWfFfNfg,ÉŠÛ,Û,ê,é—v‘f ”,ðŽæ“¾,·,é B  
—v‘f ”,ð•Ô,· B

## **IDirect3DRMFrameArray**

*ftfE [fE EfIfufWfFfNfg,ðfOf< [fv%o»:,é,É,Í AIDirect3DRMFrameArrayCf“f^ [ftfFfCfX,Ïf f\fbfh,ð—  
p,·,é B,±,ÏfZfNfVf#f“,Í AIDirect3DRMFrameArrayCf“f^ [ftfFfCfX Ef f\fbfh,ÏfŠftf@fEf“fX,Ä, ,é BŠT”O,  
É,Â,ç,Ä,ÏŠT—v,Í A uIDirect3DRMFrame,ÆIDirect3DRMFrameArrayCf“f^ [ftfFfCfX v,ðŽQ Æ,·,é,±,Æ B*

**IDirect3DRMFrameArrayCf“f^ [ftfFfCfX,Í AŽŸ,Ïf f\fbfh,ðfTf| [fg,·,é B**

### **GetElement**

### **GetSize**

**IDirect3DRMFrameArrayCf“f^ [ftfFfCfX,Í A,·,×,Ä,ÏCOMfCf“f^ [ftfFfCfX,Æ—  
l A[UnknownfCf“f^ [ftfFfCfX Ef f\fbfh,ðEp ³,·,é BIUnknownfCf“f^ [ftfFfCfX,Í AŽŸ,Ï,Ä,Ïf f\fbfh,ðfT  
f| [fg,·,é B**

### **AddRef**

### **QueryInterface**

### **Release**

,³,ç,É AIIDirect3DRMFrameArrayCf“f^ [ftfFfCfX,Í AIDirect3DRMObjectCf“f^ [ftfFfCfX,©,çŽŸ,Ïf f\fbfh,ð  
Ep ³,·,é B

### **AddDestroyCallback**

### **Clone**

### **DeleteDestroyCallback**

### **GetAppData**

### **GetClassName**

### **GetName**

### **SetAppData**

### **SetName**

Direct3DRMFrameArrayfIfufWfFfNfg,Í AIDirect3DRMPickedArray::GetPick,Û,½,ÍIDirect3DRMFrame::GetChildre  
nf f\fbfh,ÏEÄ,Ñ o,µ,É,æ,Ä,ÄŽæ“¾,³,ê,é B

**IDirect3DRMFrameArray::GetElement**

HRESULT GetElement(DWORD index, LPDIRECT3DRMFRAME \* lplpD3DRMFrame);

Direct3DRMFrameArrayIfufWfFfNfg,©,çŽw'è,<sup>3</sup>,ê,½—v'f,đŽæ“¾,·,é B

—Ē÷,·,é,ÆD3DRM\_OK AŽ,“s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,Îê——,É,Â,ċ  
,Ä,Í A uDirect3D•ŮŽ f, fh,Ĵ•Ô'l v,đŽQ Æ,·,é,±,Æ B

index

”z—ñ—v'f B

lplpD3DRMFrame

IDirect3DRMFrame fCf“f^ [ftfFfCfX,Ö,Ï|fCf“f^,đŽó,~Žæ,éfAfhfĒfX B

### **IDirect3DRMFrameArray::GetSize**

```
DWORD GetSize();
```

```
Direct3DRMFrameArrayIfufWfFfNfg,ÉŠÛ,Û,ê,Ä,ç,é—v‘f ”,ðŽæ“¾,.,é B  
—v‘f ”,ð•Ô,· B
```

## **IDirect3DRMLightArray**

CE0E1fIfufWfFfNfg,ðfOf< [fv%o»,.,é,É,Í AIDirect3DRMLightArrayCf“f^ [ftFfCfX,Ìf f\fbfh,ð~—p,.,é B,± ,ÌfZfNfVf±f“,Í AIDirect3DRMLightArrayCf“f^ [ftFfCfX Ef f\fbfh,ÌfŠftf@fCEf“fX,Å, ,é BŠT”O,É,Â,c ,Ä,ÌŠT—v,Í A uIDirect3DRMLight,ÆIDirect3DRMLightArrayCf“f^ [ftFfCfX v,ðŽQ Æ,.,é,±,Æ B

IDirect3DRMLightArrayCf“f^ [ftFfCfX,Í AŽŸ,Ìf f\fbfh,ðfTf| [fg,.,é B

### **GetElement**

### **GetSize**

IDirect3DRMLightArrayCf“f^ [ftFfCfX,Í A,.,x,Ä,ÌCOMfCf“f^ [ftFfCfX,Æ“— l A[UnknownfCf“f^ [ftFfCfX Ef f\fbfh,ðEp ³,.,é BIUnknownfCf“f^ [ftFfCfX,ÍŽŸ,Ì,R,Â,Ìf f\fbfh,ðfTf| [fg,.,é B

### **AddRef**

### **QueryInterface**

### **Release**

,³,ç,É AIDirect3DRMLightArrayCf“f^ [ftFfCfX,Í AIDirect3DRMObjectCf“f^ [ftFfCfX,©,çŽŸ,Ìf f\fbfh,ðEp ³,.,é B

### **AddDestroyCallback**

### **Clone**

### **DeleteDestroyCallback**

### **GetAppData**

### **GetClassName**

### **GetName**

### **SetAppData**

### **SetName**

Direct3DRMFrameArrayfIfufWfFfNfg,Í A

**IDirect3DRMFrame::GetLights**f f\fbfh,ÌCEÄ,Ñ o,μ,É,æ,Á,ÄŽæ“¾,³,ê,é B

**IDirect3DRMLightArray::GetElement**

HRESULT GetElement(DWORD index, LPDIRECT3DRMLIGHT \* lplpD3DRMLight);

Direct3DRMLightArray fIfufWfFfNfg,©,çŽw'è,³,ê,½—v'f,đŽæ“¾,·,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

index

”z—ñ—v'f B

lplpD3DRMLight

IDirect3DRMLightfCf“f^ [ftfFfCfX,Ö,Ï|fCf“f^,đŽó,~Žæ,éfAfhfŒfX B

**IDirect3DRMLightArray::GetSize**

DWORD GetSize();

Direct3DRMLightArray fIfufWfFfNfg,ÉŠÜ,Ü,ê,Ä,ç,é—v‘f ”,ðŽæ“¾,·,é B  
—v‘f ”,ð•Ô,· B

## **IDirect3DRMPickedArray**

*fsfbfN EfIfufWfFfNfg,đfOf< [fv%o»,.,é,É,Í AIDirect3DRMPickedArrayCf“f^ [ftFfCfX,İf f\fbfh,đ—  
p,.,é B,±,İfZfNfVf‡f“,Í AIDirect3DRMPickedArrayCf“f^ [ftFfCfX Ef f\fbfh,İfŠftf@fEf“fX,Á, ,é BŠT”O,  
É,Â,¢,Ä,İŠT—v,Í A uIDirect3DRMPickedArrayCf“f^ [ftFfCfX v,đŽQ Æ,.,é,±,Æ B*

**IDirect3DRMPickedArrayCf“f^ [ftFfCfX,Í AŽŸ,İf f\fbfh,đfTf] [fg,.,é B**

### **GetPick**

### **GetSize**

**IDirect3DRMPickedArrayCf“f^ [ftFfCfX,Í A,.,×,Ä,İCOMfCf“f^ [ftFfCfX,Æ—  
l A[UnknownfCf“f^ [ftFfCfX Ef f\fbfh,đEp ³,.,é BIUnknownfCf“f^ [ftFfCfX,İŽŸ,İ,R,Â,İf f\fbfh,đfTf]  
[fg,.,é B**

### **AddRef**

### **QueryInterface**

### **Release**

**,³,ç,É AIDirect3DRMPickedArrayCf“f^ [ftFfCfX,Í AIDirect3DRMObjectCf“f^ [ftFfCfX,©,çŽŸ,İf f\fbfh,đ  
Ep ³,.,é B**

### **AddDestroyCallback**

### **Clone**

### **DeleteDestroyCallback**

### **GetAppData**

### **GetClassName**

### **GetName**

### **SetAppData**

### **SetName**

**Direct3DRMPickedArrayIfufWfFfNfg,Í AIDirect3DRMViewport::Pickf f\fbfh,İĀ,Ň o,μ,É,æ,Á,ÄŽæ“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,ÄEð .,.,éDirect3DRMVisual,ÆDirect3DRMFramefIfufWfFfNfg,ðŽæ“¾,.,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,Î•Ô'l v,ðŽQ Æ,.,é,±,Æ B

*index*

îñ,ðŽæ“¾,.,éfsfbfN,ðŽ•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^,ÎfAfhfEfX B

*lplpFrameArray*

Žw'è,³,ê,½fsfbfN,ÉŠÖ~A•t, -,ç,ê,½Direct3DRMFrameArrayfIfufWfFfNfg,Îf|fCf“f^,ÎfAfhfEfX B

*lpD3DRMPickDesc*

fsfbfN,ÎÊ'u A-  
Ê AŽæ“¾,.,éIfufWfFfNfg,ÎfOf< [fvŽ~ÊŽq,ðŽw'è,.,éD3DRMPICKDESC \¢'Ì,Ö,ÎfAfhfEfX B

ŽQ Æ @IDirect3DRMViewport::Pick

**IDirect3DRMPickedArray::GetSize**

DWORD GetSize();

Direct3DRMPickedArray fIfufWfFfNfg.ÉŠÛ,Û,ê,Ä,ç,é—v‘f ”,ðŽæ“¾,·,é B  
—v‘f ”,ð•Ô,· B

## **IDirect3DRMViewportArray**

*ff...* [f] [fg EfIfufWfFfNfg,đfOf< [fv%o»,·,é,É,Í **AIDirect3DRMViewportArray***fCf“f^ [ftFfCfX,lf f\fbfh,đ*  
—~—p,·,é B,±,lfZfNfVf±f“,Í**IDirect3DRMViewportArray***fCf“f^ [ftFfCfX Ef f\fbfh,lfŠftf@fEf“fX,Á, ,é BŠ*  
T”O,É,Á,ç,Ä,ìŠT—v,Í A u**IDirect3DRMViewport,ÆIDirect3DRMViewportArray***fCf“f^ [ftFfCfX v,đŽQ Æ,·,é,±*  
*,Æ B*

**IDirect3DRMViewportArray***fCf“f^ [ftFfCfX,ÍŽŸ,lf f\fbfh,đfTf| [fg,·,é B*

### **GetElement**

### **GetSize**

**IDirect3DRMViewportArray***fCf“f^ [ftFfCfX,Í A,·,×,Ä,ìCOMfCf“f^ [ftFfCfX,Æ“—1 A**Unknown***  
*fCf“f^ [ftFfCfX Ef f\fbfh,đEp ³,·,é B**Unknown**fCf“f^ [ftFfCfX,ÍŽŸ,ì,R,Á,lf f\fbfh,đfTf| [fg,·,é B*

### **AddRef**

### **QueryInterface**

### **Release**

,³,ç,É **AIDirect3DRMViewportArray**  
*fCf“f^ [ftFfCfX,Í A**IDirect3DRMObject**fCf“f^ [ftFfCfX,©,çŽŸ,lf f\fbfh,đEp ³,·,é B*

### **AddDestroyCallback**

### **Clone**

### **DeleteDestroyCallback**

### **GetAppData**

### **GetClassName**

### **GetName**

### **SetAppData**

### **SetName**

**IDirect3DRMViewportArray***fIfufWfFfNfg,Í A*  
**IDirect3DRM::CreateFrame***f f\fbfh,ìEÄ,Ñ o,μ,É,æ,Á,ÄŽæ“¾,³,ê,é B*

## IDirect3DRMViewportArray::GetElement

HRESULT GetElement(DWORD index, LPDIRECT3DRMVIEWPORT \* lpD3DRMViewport);

Direct3DRMViewportArray fIfufWfFfNfg, ©, ĆŽw'è,³,ê,½—v'f,đŽæ“¾,·,é B

—Ĉ÷,·,é,ÆD3DRM\_OK AŽ, ”s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,Îê——,É,Â,ĉ  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ĵ•Ô'l v,đŽQ Æ,·,é,±,Æ B

index

”z—ñ—v'f B

lpD3DRMViewport

IDirect3DRMViewportfCf“f^ [ftfFfCfX,đŽó,~Žæ,éfAfhfĈfX,Ö,Ïf|fCf“f^ B

### **IDirect3DRMViewportArray::GetSize**

DWORD GetSize();

Direct3DRMViewportArray fIfufWfFfNfg,ÉŠÜ,Ü,ê,Ä,ç,é—v‘f ”,ðŽæ“¾,·,é B  
—v‘f ”,ð•Ô,· B

## **IDirect3DRMVisualArray**

*f\ufWf...fAf< EflufWfFfNfg,ðfOf< [fv%o»,.,é,É,Í AIDirect3DRMVisualArrayCf“f^ [ftFfCfX,Ìf f\fbfh,ð—  
—p,.,é B,±,ÌfZfNfVf±f“,Í AIDirect3DRMVisualArrayCf“f^ [ftFfCfX Ef f\fbfh,ÌfŠftf@fEf“fX,Á,.,é BŠT”  
O,É,Á,¢,Ä,ÌŠT—v,Í A uIDirect3DRMVisual,ÆIDirect3DRMVisualArrayCf“f^ [ftFfCfX v,ðŽQ Æ,.,é,±,Æ B*

### **GetElement**

### **GetSize**

*IDirect3DRMVisualArrayCf“f^ [ftFfCfX,Í A,.,×,Ä,ÌCOMfCf“f^ [ftFfCfX,Æ“—  
l A[UnknownfCf“f^ [ftFfCfX Ef f\fbfh,ðEp ³,.,é BIUnknownfCf“f^ [ftFfCfX,ÌŽÿ,Ì,R,Á,Ìf f\fbfh,ðfTf|  
[fg,.,é B*

### **AddRef**

### **QueryInterface**

### **Release**

*,³,ç,É AIDirect3DRMVisualArrayCf“f^ [ftFfCfX,Í AIDirect3DRMObjectCf“f^ [ftFfCfX,©,çŽÿ,Ìf f\fbfh,ðE  
p ³,.,é B*

### **AddDestroyCallback**

### **Clone**

### **DeleteDestroyCallback**

### **GetAppData**

### **GetClassName**

### **GetName**

### **SetAppData**

### **SetName**

*Direct3DRMVisualArrayfIfufWfFfNfg,Í **IDirect3DRMFrame::GetVisuals**  
method.f f\fbfh,ÌEÄ,Ñ o,µ,É,æ,Á,ÄŽæ“¾,³,ê,é B*

**IDirect3DRMVisualArray::GetElement**

HRESULT GetElement(DWORD index, LPDIRECT3DRMVISUAL \* lpD3DRMVisual);

Direct3DRMVisualArrayIfufWfFfNfg,©,çŽw'è,<sup>3</sup>,ê,½—v'f,đŽæ“¾,·,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

index

”z—ñ—v'f B

lpD3DRMVisual

**IDirect3DRMVisual** fCf“f^ [ftfFfCfX,đŽó,Žæ,éf|fCf“f^ B

### **IDirect3DRMVisualArray::GetSize**

DWORD GetSize();

Direct3DRMVisualArray fIfufWfFfNfg,ÉŠÛ,Û,ê,Ä,ç,é—v'f ",ðŽæ“¾,·,é B  
—v'f ",ð•Ô,· B

## IDirect3DRM

**IDirect3DRM** *fCf“f^ [ftfFfCfX,Í A* IDirect3DRM *fIfufWfFfNfg,ð ì ñ,µ AfVfXfef€ Ef€fxf<,ìĪ ”,ð“€ ì,·,é,½,ß,É—p,ç,ç,ê,é B,±,ĪfZfNfVf#f“ ,Ī A* **IDirect3DRM** *fCf“f^ [ftfFfCfX,Īf f\fbfh,ĪfŠftf@f€f“fX,Å, ,é BŠT”O,É,Ā,ç ,Ā,ĪŠT—v,Ī A u* *IDirect3DRM* *fCf“f^ [ftfFfCfX v,ðŽQ Æ,·,é,±,Æ B*

**IDirect3DRM** *fCf“f^ [ftfFfCfX Ef f\fbfh,Ī A^È%°,ĪfOf< [fv,É\*—D,·,é,±,Æ,^,Ā,« ,é B*

*fAfjf [fvf#f“* [CreateAnimation](#)  
[CreateAnimationSet](#)

*ffofCfX* [CreateDevice](#)  
[CreateDeviceFromClipper](#)  
[CreateDeviceFromD3D](#)  
[CreateDeviceFromSurface](#)  
[GetDevices](#)

*—ñ<“* [EnumerateObjects](#)

*—Ê iftfFfCfX j* [CreateFace](#)

*ftf€ [f€* [CreateFrame](#)

*€ö€¹* [CreateLight](#)  
[CreateLightRGB](#)

*f}fefŠfAf<* [CreateMaterial](#)

*f fbvVf...* [CreateMesh](#)  
[CreateMeshBuilder](#)

*,»,Ī‘¼* [CreateObject](#)  
[CreateUserVisual](#)  
[GetNamedObject](#)  
[Load](#)  
[Tick](#)

*fpfX€ÿ ö* [AddSearchPath](#)  
[GetSearchPath](#)  
[SetSearchPath](#)

*%A%œ* [CreateShadow](#)

*fefNfXf`ff* [CreateTexture](#)  
[CreateTextureFromSurface](#)  
[LoadTexture](#)  
[LoadTextureFromResource](#)  
[SetDefaultTextureColors](#)  
[SetDefaultTextureShades](#)

**frf... [f| [fg** **CreateViewport**

**f%fbfv** **CreateWrap**

**IDirect3DRM** **COM** **“f^** [ftfFfCfX,Í A,·,×,Ä,Ï**COM** **“f^** [ftfFfCfX,Æ“—  
l A**Unknown** **“f^** [ftfFfCfX Ef f\fbfh,ðEp ³,·,é **BIUnknown** **“f^** [ftfFfCfX,ÍŽŸ,ì,R,Ä,Ïf f\fbfh,ðfTf|  
[fg,·,é B

**AddRef**

**QueryInterface**

**Release**

**IDirect3DRM** **COM** **“f^** [ftfFfCfX,Í **ADirect3DRMCreate**, ÌCEÄ,Ñ o,µ,É,æ,Á,Ä ì ¬,³,ê,é B

**IDirect3DRM::AddSearchPath**

HRESULT AddSearchPath(LPCSTR lpPath);

» Ý, ìftf@fCf<Eÿ òfpfX, ì ÅEä, ÉffBfCefNfgfŠ, ìfŠfXfg, ð'Ç%Á, ·, é B  
-E÷, ·, é, ED3DRM\_OK AŽ, ”s, ·, é, AfGf%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

lpPath

» Ý, ìEÿ òfpfX, É'Ç%Á, ·, éfpfX, ðŽw'è, ·, é ANULL, Å I, í, é•¶Žš—ñ, Ö, ìf|fCf“f^ B

Windows, Ä, Í AfpfX, ìfZf~fRf f“ i; j, Å<æ Ø, Ä, ½ffBfCefNfgfŠ, ìfŠfXfg, Ä, È, , Ä, Í, È, ç, È, ç B

ŽQ Æ @IDirect3DRM::SetSearchPath

### **IDirect3DRM::CreateAnimation**

HRESULT CreateAnimation(LPDIRECT3DRMANIMATION \* lpD3DRMAnimation);

Direct3DRMAnimationIfWfFfNfg,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,î•Ô'l v,đŽQ Æ,·,é,±,Æ B

lpD3DRMAnimation

CEÄ,Ñ o,µ,a ¬E÷,µ,½,Æ,«,ÉIDirect3DRMAnimationfCf“f^ [ftFfCfX,đŽó, Žæ,é|fCf“f^,Ö,Ìf|fCf“f^ B

**IDirect3DRM::CreateAnimationSet**

HRESULT CreateAnimationSet (LPDIRECT3DRMANIMATIONSET \* lpD3DRMAnimationSet);

<ó,ìDirect3DRMAnimationSetIfufWffNfg,ð ì -,·,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

lpD3DRMAnimationSet

ĒÄ,Ñ o,μ,a -E÷,μ,½,Æ,«,É uIDirect3DRMAnimationSet v fCf“f^ [ftfFfCfX,ðŽó, Žæ,éf|fCf“f^,Ö,Ĵf|  
fCf“f^ B

**IDirect3DRM::CreateDevice**

```
HRESULT CreateDevice(DWORD dwWidth, DWORD dwHeight,  
    LPDIRECT3DRMDEVICE* lpD3DRMDevice);
```

Windows 3.11, 3.11, 3.11 B

**IDirect3DRM::CreateDeviceFromClipper**

```
HRESULT CreateDeviceFromClipper(LPDIRECTDRAWCLIPPER lpDDClipper,
    LPGUID lpGUID, int width, int height,
    LPDIRECT3DRMDEVICE * lplpD3DRMDevice);
```

Žw'è,³,ê,½DirectDrawClipperfIfufWfFfNfg,ðŽg,Á,ÄDirect3DRM WindowsffofCfX,ð ì ¬,·,é B

¬E±,·,é,ÆD3DRM\_OK AŽ,"s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê—,É,Â,c  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Î•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lpDDClipper

DirectDrawClipper fIfufWfFfNfg,ÎfAfhfÆfX B

lpGUID

fOf [fof< Ef†fj [fNŽ~•ÉŽq iGUID j,ÎfAfhfÆfX B,±,Îfpf%of [f^,É,ÍNULL,ðŽw'è,·,é,±,Æ,ª,Ä,«,é B  
width , height

ì ¬,³,ê,éffofCfX,Î• ,Æ ,³ B

lplpD3DRMDevice

ÆÄ,Ñ o,µ,ª ¬E±,µ,½,Æ,«,ÉIDirect3DRMDevice fCf“f^ [ftfFfCfX,ðŽó,¬Žæ,é|fCf“f^,Ö,Î|fCf“f^ B

lpGUID fpf%of [f^,ÉNULL,ðŽw'è,·,é,Æ AfVfXfef€,ÍffofCfX,Î “\,ð²,×,é B,±

,ê,Í Af† [fU,ª V,µ,¢fn [fhfEfffA,ðfCf“fXfg [f<µ,½,Æ,«,É,à,Â,Ë,É“© ì,·,é,½,ß A¼ Úf, [fh EffofCfX,Î  
ì ¬•û-@,Æ,µ,Ä „ §,³,ê,Ä,c,é B

fVfXfef€,Í A“à•”,ÎffofCfX¬ñ<“,ÌÆÄ,Ñ o,µ,ì†,Á AD3DPRIMCAPS \‘c`ì,©,çŽŸ,Îff%ofO,ðŽg,µ,±  
,Æ,É,æ,Ä,ÄfftfHf<fg,Î Ý'è,ð \ ¬,·,é B

**D3DPCMCAPS\_LESSEQUAL**

**D3DPMISCCAPS\_CULLCCW**

**D3DPRASTERCAPS\_FOGVERTEX**

**D3DPSHADECAPS\_ALPHAFLATSTIPPLED**

**D3DPTADDRESSCAPS\_WRAP**

**D3DPTBLENDCAPS\_COPY**

**D3DPTBLENDCAPS\_MODULATE**

**D3DPTTEXTURECAPS\_PERSPECTIVE**

**D3DPTTEXTURECAPS\_TRANSPARENCY**

**D3DPTFILTERCAPS\_NEAREST**

fn [fhfEfffA EffofCfX,ª©,Â,©,ç,È,¢

,Æ,«,Í Af,fmfNf if%of“fv j,ÎfvtfgfEfFfA Efhf%ofCfo,ªf [fh,³,ê,é B,±,ÎfftfHf<fg Ý'è,ÎfŠfXfg,Éf}

fbf`,µ,È,¢“Á•Ê,È—v< ,ðŽ ,ÂfAvvšfP [fvf†f“,Í AlpGUID,ÉNULL,ðŽw'è,·,é,ª,í,é,ÉffofCfX,ð—ñ<“,·,é,×,«,Ä ,é  
B

### **IDirect3DRM::CreateDeviceFromD3D**

```
HRESULT CreateDeviceFromD3D(LPDIRECT3D lpD3D,  
    LPDIRECT3DDEVICE lpD3DDevice, LPDIRECT3DRMDEVICE * lplpD3DRMDevice);
```

Žw'è,³,ê,½Direct3DIfufWfFfNfg,ðŽg,Á,Ä Direct3DRM WindowsffofCfX,ð ì ¬,·,é B

–Ĉ÷,·,é,ÆD3DRM\_OK AŽ,˝s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,îê——,É,Á,ĉ  
,Ä,Í A uDirect3D•ŮŽ f, [fh,î•Ô'l v,ðŽQ Æ,·,é,±,Æ B

*lpD3D*

Direct3DfCf“fXf^f“fX B

*lpD3DDevice*

Direct3DffofCfX EfIfufWfFfNfg B

*lplpD3DRMDevice*

ĈÄ,Ñ o,μ,ª –Ĉ÷,μ,½,Æ,«,ÉIDirect3DRMDevicefCf“f^ [ftfFfCfX,Ö,Ï|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 [ftFfX,©,ç AfĈf“f\_Šf“fO,É—p,Ĉ,éWindowsffofCfX,đ ì ¬,·,é B  
 -Ĉ÷,·,é,ĀD3DRM\_OK AŽ,”s,·,é,ĀfGf%o [,đ•Ô,· B•Ô'l,Îê——,É,Ā,Ĉ  
 ,Ā,Í A uDirect3D•ŮŽ f, [fh,Ī•Ô'l v,đŽQ Ā,·,é,±,Ā B

lpGUID

Žw'è,·,éffofCfX Efhf%oCfo,ĪfOf [fof< Ef+fj [fNŽ~•ĒŽq iGUID j,ĪfAfhfĈfX B,±  
 ,Īfpf%of [f^,ĒNULL,³Žw'è,³,ê,é,Ā AffftHf<fg,ĪffofCfX Efhf%oCfo,³Žg—p,³,ê,é B

lpDD

DirectDrawFT [ftFfX,ĪĈ³,É,Ē,éDirectDrawIfufWfFfNfg B

lpDDSBck

fobfN Efofbftf@,đ•\,·DirectDrawSurfaceIfufWfFfNfg B

lplpD3DRMDevice

ĈĀ,Ñ o,μ,ª -Ĉ÷,μ,½,Ā,«,ÉIDirect3DRMDevicefCf“f^ [ftFfCfX,đŽó,~Žæ,é|fCf“f^,Ö,Īf|fCf“f^ B

**IDirect3DRM::CreateFace**

HRESULT CreateFace(LPDIRECT3DRMFACE \* lpLpd3drmFace);

IDirect3DRMFace fCf“f^ [ftfFfCfX, ÌfCf“fXf^f“fX, ð ì ¬, ·, é B

¬E÷, ·, 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

lpLpd3drmFace

ĚÄ, Ñ o, µ, a ¬E÷, µ, ½, Æ, «, ÉIDirect3DRMFace fCf“f^ [ftfFfCfX, ðŽó, Žæ, éf|fCf“f^, Ö, Ìf|fCf“f^ B

### IDirect3DRM::CreateFrame

```
HRESULT CreateFrame(LPDIRECT3DRMFRAME lpD3DRMFrame,  
LPDIRECT3DRMFRAME* lplpD3DRMFrame);
```

Žw'è,³,ê,½ eftfCE [f€,É V,μ,¢ŽqftfCE [f€,đ ì ¬,·,é B

¬CE÷,·,é,ÆD3DRM\_OK AŽ,»s,·,é,ÆfGf%o [ ,đ•Ô,· B•Ô'l,Îê——,É,Á,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Î•Ô'l v,đŽQ Æ,·,é,±,Æ B

lpD3DRMFrame

V,μ,¢ftfCE [f€,Ì eftfCE [f€ B

lplpD3DRMFrame

CEÄ,Ñ o,μ,ª ¬CE÷,μ,½,Æ,«,ÉIDirect3DRMFramefCf“f^ [ftfFfCfX,đŽó,¬Žæ,éf|fCf“f^,Ö,Ìf|fCf“f^ B

ŽqftfCE [f€,Í eftfCE [f€,ì“® ì‘® «,đCEp ³,·,é B,½,Æ,!,Î eftfCE [f€,ªŽw'è,³,ê,½‘¬“x,Á“®,¢,Ä,¢  
,é ê ‡ AŽqftfCE [f€,à“¬,¶“¬x,Á“®, B,Û,½ A eftfCE [f€,ª%oñ“],μ,Ä,¢,ê,Í AŽqftfCE [f€,à eftfCE [f€,ÌCE  
‘¬,đ'† S,Æ,μ,Ä%oñ“],·,é B eftfCE [f€,đŽ ,½,È,¢ftfCE [f€

,ÍV [f“,ÆCEÄ,Î,ê,é BfV [f“,đ ì ¬,·,é,É,Í A eftfCE [f€,Æ,μ,ÄNULL

,đŽw'è,·,ê,Î,æ,¢ BfAfvfŠfP [fVf‡f“,Í A e,đŽ ,½,È,¢ftfCE [f€,đ ì,Á,½CEã,É AIDirect3DRMFrame::AddChild

methodf f\fbfh,đ—p,¢,Ä,»,ÌftfCE [f€,đ eftfCE [f€,ÉŠÖˆA•t,¬,é,±,Æ,ª,Ä,«,é B

ŽQ Æ @IDirect3DRMFrame::AddChild

## IDirect3DRM::CreateLight

```
HRESULT CreateLight(D3DRMLIGHTTYPE d3drmltLightType,  
    D3DCOLOR cColor, LPDIRECT3DRMLIGHT* lplpD3DRMLight);
```

Žw'è,³,ê,½f^fCfv,Æ F,Â V,μ,¢EðE¹,ð ì ¬,·,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,î•Ô'l v,ðŽQ Æ,·,é,±,Æ B

*d3drmltLightType*

**D3DRMLIGHTTYPE**—ñ<“E^,Â—^!,ç,ê,éEðE¹,îf^fCfv,ì,Ð,Æ,Â B

*cColor*

Eð,ì F B

*lplpD3DRMLight*

EÄ,Ñ o,μ,a ¬E÷,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,¢EðE¹,ð ì ¬,·,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,î•Ô'l v,ðŽQ Æ,·,é,±,Æ B

*ltLightType*

**D3DRMLIGHTTYPE**—ñ<“E^,Â—^!,ç,ê,éEðE¹,îf^fCfv,ì,Ð,Æ,Â B

*vRed, vGreen, vBlue*

Eð,ì F B

*lplpD3DRMLight*

EÄ,Ñ o,μ,a ¬E÷,μ,½,Æ,«,ÉIDirect3DRMLightfCf“f^ [ftfFfCfX,ðŽó,¬Žæ,é|fCf“f^,Ö,î|fCf“f^ B

### IDirect3DRM::CreateMaterial

```
HRESULT CreateMaterial(D3DVALUE vPower,  
    LPDIRECT3DRMMATERIAL * lpD3DRMMaterial);
```

Žw'è,³,ê,½"½ŽĚ"Á «,Åf}fefŠfAf<,ð ì ¬,·,é B

¬Ĉ÷,·,é,ÆD3DRM\_OK AŽ,"s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,îê——,É,Á,ĉ  
,Ä,Í A uDirect3D•ŮŽ f, [fh,î•Ô'l v,ðŽQ Æ,·,é,±,Æ B

vPower

"½ŽĚ,înfCf%ofCf g•"•,î'N¬¼"x B,±,î'l,É5,ðŽw'è,·,é,Æ AfĈf"f\_fŠf"fO,³,ê,½•\-Ê,Íà'®,î,æ,□  
,ÈŠOŠÍ,É,È,è A,»,"è È ã,î'l,Á,Í,à,Á,Æ \_ç,©,ĉŠOŠÍ,Æ,È,é B

lpD3DRMMaterial

ĈÄ,Ñ o,µ,ª ¬Ĉ÷,µ,½,Æ,«,ÉIDirect3DRMMaterialfCf"f^ [ftfFfCfX,ðŽó,¬Žæ,éf|fCf"f^,Ö,îf|fCf"f^ B

## IDirect3DRM::CreateMesh

```
HRESULT CreateMesh(LPDIRECT3DRMMESH* lpD3DRMMesh);
```

```
-Ê,đŽ ,½,È,¢ V,µ,¢f fbVf... EflfufWfFfNfg,đ ì ¬,·,é Bf fbVf...,Íftf¢ [f¢  
,É%Á,!,ç,ê,é,Û,Ä·Ž!,³,ê,È,¢ B
```

```
-¢÷,·,é,ÆD3DRM_OK AŽ,»s,·,é,ÆfGf%o [,đ·Ô,· B·Ô'l,Îê——,É,Á,¢  
,Ä,Í A uDirect3D·ÛŽ f, [fh,Î·Ô'l v,đŽQ Æ,·,é,±,Æ B
```

```
lpD3DRMMesh
```

```
¢Ä,Ñ o,µ,ª -¢÷,µ,½,Æ,«,ÉIDirect3DRMMeshfCf“f^ [ftfFfCfX,đŽó,~Žæ,éf|fCf“f^,Ö,Îf|fCf“f^ B
```

**IDirect3DRM::CreateMeshBuilder**

HRESULT CreateMeshBuilder(LPDIRECT3DRMMESHBUILDER\* lpD3DRMMeshBuilder);

V,μ,ϕf fbfVf... ì ñIfufWfFfNfg,ð ì ñ,·,é B

¬E÷,·,é,ÆD3DRM\_OK AŽ, ”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,ϕ  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ĵ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lpD3DRMMeshBuilder

ĈÄ,Ñ o,μ,a ¬E÷,μ,½,Æ,«,ÉIDirect3DRMMeshBuilderfCf“f^ [ftfFfCfX,Ö,Ï|fCf“f^,ðŽó, Žæ,éAfhfĈfX B

**IDirect3DRM::CreateObject**

HRESULT CreateObject(REFCLSID rclsid, LPUNKNOWN pUnkOuter,  
REFIID riid, LPVOID FAR\* ppv);

‰Šú‰»<sup>3</sup>,ê,Ä,¢,È,¢ V,µ,¢fIfufWfFfNfg,ð ì ¬,·,é B

-¢÷,·,é,ÆD3DRM\_OK AŽ, ”s,·,é,ÆfGf‰ [ ,ð•Ô,· B•Ô'l,Îê——,É,Ä,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Î•Ô'l v,ðŽQ Æ,·,é,±,Æ B

rclsid

V,µ,¢fIfufWfFfNfg,ÎfNf‰ofXŽ<sup>-</sup>•ÊŽq B

pUnkOuter

COM W ¬‰»«@”\,É‘Î‰ž,·,é B

riid

ì ¬,<sup>3</sup>,é,éIfufWfFfNfg,ÎfCf“f^ [ftfFfCfXŽ<sup>-</sup>•ÊŽq B

ppv

f f\fbfh,<sup>a</sup> §¢ä,ð-ß,µ,½,Æ,«,ÉfIfufWfFfNfg,ðŽó, <sup>-</sup>Žæ,é|fCf“f^,Ö,Î|fCf“f^ B

,±,Îf f\fbfh,É,æ,è ì ¬,<sup>3</sup>,é,½fIfufWfFfNfg,Í AfAfvfŠfP [fVf‡f“,É,æ,Ä,Ä ‰Šú‰»<sup>3</sup>,ê,È,-  
,Ä,Í,È,¢,È,¢ iDirect3DRMfCf“f^ [ftfFfCfX,Î¼,Ì ì ¬f f\fbfh,Í AŽ©“@“l,ÉfIfufWfFfNfg,ð ‰Šú‰»,·,é j B  
V,µ,¢fIfufWfFfNfg,ð ‰Šú‰»,·,é,É,Í AInitf f\fbfh,ðŽg—  
p,·,é BInitf f\fbfh,Î¢Ä,Ň o,µ,Í AfIfufWfFfNfg,É,Ä,¢,Ä1‰ñ,Ì,Ý s,□ B

fAfvfŠfP [fVf‡f“,Í A,±,Îf f\fbfh,ð—p,¢,ÄDirect3DRMfIfufWfFfNfg,Ì W ‡ì,ðfCf“fvfŠf f“fg,Ä,«,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<,ÆCEðCE¹,ð—p,¢ AŽw'è,³,ê,½•½-Ê,É“Š%œ,³,¹,Ä%A%œ,ð ì ¬,·,é B%A%œ,Í AfrfWf...  
fAf<,ðŠÜ,ḐftfCE [f€,É'Ç%ŌÁ,³,ê,éṛfWf...fAf<,Ä, ,é B

-CE÷,·,é,ÆD3DRM\_OK AŽ, ”s,·,é,ÆfGf% [ ,ð•Ô,· B•Ô'l,Îê——,É,Ä,¢  
,Ä,Í A uDirect3D•ŪŽ f, [fh,Î•Ô'l v,ðŽQ Æ,·,é,±,Æ B

*lpVisual*  
%œA%œ,ÏCE³,É,È,é Direct3DRMVisual fIfufWfFfNfg B

*lpLight*  
CEðCE¹,Æ,È,éIDirect3DRMLightfCf“f^ [ftfFfCfX B

*px, py, pz*  
%œA%œ,“Š%œ,³,ê,é•½-Ê B

*nx, ny, nz*  
%œA%œ,“Š%œ,³,ê,é•½-Ê,Ï-@ ü B

*lpShadow*  
CEÄ,Ñ o,µ,ª -CE÷,µ,½,Æ,« A%A%œṛfWf...fAf<,Ö—LCEø,Èf|fCf“f^,Ä %œŠú%œ»,³,ê,é|fCf“f^,Ö,Ï|fCf“f^ B

### IDirect3DRM::CreateTexture

```
HRESULT CreateTexture(LPD3DRMIMAGE lpImage,  
LPDIRECT3DRMTEXTURE* lplpD3DRMTexture);
```

*f f, fŠ ä, İfCf [fW, ©, çfefNfXf`ff, ð ì ¬, ·, é B*

*¬E÷, ·, é, ÆD3DRM\_OK AŽ, ”s, ·, é, ÆfGf%o [ , ð•Ö, · B•Ö'l, İê——, É, Á, Ç  
, Ä, Í A uDirect3D•ÜŽ f, [fh, İ•Ö'l v, ðŽQ Æ, ·, é, ±, Æ B*

*lpImage*

*fefNfXf`ff, İf\ [fX, ð•, ·D3DRMIMAGE \`Ç'İ B*

*lplpD3DRMTexture*

*ÆÄ, Ñ o, µ, ª ¬E÷, µ, ½, Æ, «, ÉIDirect3DRMTexturefCf“f^ [ftfFfCfX, ðŽó, ~Žæ, éf|fCf“f^, Ö, İf|fCf“f^ B*

*fefNfXf`ff, ªfÆf“f\_Šf“fO, ³, é, é, ½, Ñ ADirect3DRM, İfobftf@, ÉfRfs [ , ³, é, ½f f, fŠ, Á, Í, È, -*

*AfCf [fW, ÉŠÖ~A•t, ¯, ç, é, ½f f, fŠ, ª—p, Ç, ç, é, é B, ±*

*, İ, ½, ßfCf [fW, Í AfÆf“f\_Šf“fO, İf^ [fQfbfg, Æ, µ, Ä, àfefNfXf`ff, Æ, µ, Ä, àŽg—p, ·, é, ±, Æ, ª, Á, «, é B*

### **IDirect3DRM::CreateTextureFromSurface**

```
HRESULT CreateTextureFromSurface(LPDIRECTDRAW_SURFACE lpDDS,  
    LPDIRECT3DRM_TEXTURE * lplpD3DRMTexture);
```

Žw'è,³,ê,½ DirectDrawT [ftFfX,©,çfefNfXf`ff,ð ì ¬,;é B

¬Ē÷,·,é,ĒD3DRM\_OK AŽ,»s,·,é,ĒfGf%o [,ð•Ô,· B•Ô'l,îê——,É,Ā,ĉ  
,Ä,Ī A uDirect3D•ŮŽ f, [fh,Ī•Ô'l v,ðŽQ Ē,·,é,±,Ē B

lpDDS

fefNfXf`ff,ðŠÜ,ÐDirectDrawSurfaceIfufWfFfNfg B

lplpD3DRMTexture

ĒĀ,Ñ o,μ,ª ¬Ē÷,μ,½,Ē,«,ÉIDirect3DRMTexturefCf“f^ [ftFfCfX,Ö,Īf|Cf“f^,ðŽó,¬Žæ,éfAfhfĒfX B

### IDirect3DRM::CreateUserVisual

```
HRESULT CreateUserVisual(D3DRMUSERVISUALCALLBACK fn,  
    LPVOID lpArg, LPDIRECT3DRMUSERVISUAL * lpD3DRMUV);
```

```
fAfvfŠfP [fVf‡f“èç,İfıfWf...fAfç EfIfufWfFfNfg,đ ì ¬,·,é B ì -Œã AfıfWf...  
fAfç EfIfufWfFfNfg,đfV [f“,É’Ç%Á,µ AfAfvfŠfP [fVf‡f“èç,İfnf“fhf%,đ—p,ç,ÄfŒf“f_Šf“fO,Á,«,é B  
-Œ÷,·,é,ŒD3DRM_OK AŽ,”s,·,é,ŒfGf%o [,đ•Ô,· B•Ô'l,İê—,É,Â,ç  
,Ä,Í A uDirect3D•ŮŽ f, [fh,İ•Ô'l v,đŽQ Œ,·,é,±,Œ B
```

```
fn  
fAfvfŠfP [fVf‡f“èç,İD3DRMUSERVISUALCALLBACKfR [fçfobfNŠÖ ” B
```

```
lpArg  
fR [fçfobfNŠÖ ”,É“n,³,ê,é AfAfvfŠfP [fVf‡f“èç,İf [f^ B
```

```
lpD3DRMUV  
ŒÄ,Ň o,µ,ª -Œ÷,µ,½,Œ,«,ÉIDirect3DRMUserVisualfCf“f^ [ftfFfCfX,đŽó,Žæ,éf|fCf“f^,Ö,İ|fCf“f^ B
```

## IDirect3DRM::CreateViewport

```
HRESULT CreateViewport(LPDIRECT3DRMDEVICE lpDev,  
    LPDIRECT3DRMFRAME lpCamera, DWORD dwXPos,  
    DWORD dwYPos, DWORD dwWidth, DWORD dwHeight,  
    LPDIRECT3DRMVIEWPORT* lplpD3DRMViewport);
```

*fffofCfX* *ã, ì (dwXPos, dwYPos), ©, ç (dwXPos + dwWidth, dwYPos + dwHeight), Éfrf... [f]*  
*[fg, ð ì ¬, ·, é B Ê'u, ÍfffofCfX À·W, Å·\, ³, ê, é B*

*¬CE÷, ·, é, ÆD3DRM\_OK AŽ, ”s, ·, é, ÆfGf%o [ , ð·Ö, · B·Ö'l, Ìê——, É, Â, ç*  
*, Ä, Í A uDirect3D·ÜŽ f, [fh, Ì·Ö'l v, ðŽQ Æ, ·, é, ±, Æ B*

*lpDev*

*frf... [f] [fg,ª ì ¬,³,ê,éfffofCfX B*

*lpCamera*

*frf... [ , Ì Ê'u, Æ·ûCEü, ð·L q, ·, éftfCE [f€ , Ö, Ìf|fCf“f^ B*

*dwXPos, dwYPos, dwWidth, , ”, æ, Ñ dwHeight*

*frf... [ , Ì Ê'u, ÆfTfCfY, ðfffofCfX À·W, ÅŽ', · B*

*lplpD3DRMViewport*

*CEÄ, Ñ o, µ,ª ¬CE÷, µ, ½, Æ, «, ÉIDirect3DRMViewportfCf“f^ [ftfFfCfX, ðŽó, ¬Žæ, éf|fCf“f^ , Ö, Ìf|fCf“f^ B*

*frf... [f] [fg, Í AfJf f%o, ðŠÜ, ÞfV [f“ ã, ÉfIfufWfFfNfg, ð”z'u, ·, é Bfrf... [ , Ì·ûCEü, Æ ãxfNfgf€, ÍfJf f%o*  
*, ©, çŽæ“¾,³,ê, é 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,đŠ,,è“—,Ä,é,½,ß,ÉŽg—p,·,é%ofbfv<@”\,đ ì ¬,·,é Bf%ofbfv,ìCE“\_ ,ÍxfNfgf<  
[ox oy oz] AzŽ²,Í [dx dy dz] AyŽ²,Í [ux uy uz] ,Ä—^,!,ç,ê,é B2DfxNfgf< [ou ov] ,Æ [su sv] ,Í Af%ofbfv,ìCE%oÊ,É“K  
—p,³,ê,éfefNfXf`ff,ìCE“\_ ,Æ kŽÚCEW ”,đŽ!,· B

—CE÷,·,é,ÆD3DRM\_OK AŽ,“s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,Îê——,É,Â,ç  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Î•Ô'l v,đŽQ Æ,·,é,±,Æ B

type

**D3DRMWRAPTYPE**—ñ<“CE^f f“fo,ì,Đ,Æ,Â B

lpRef

f%ofbfv,ì,½,B,ìŽQ ÆftfCE [f€,Ö,Ìf|fCf“f^ B

ox, oy, oz

f%ofbfv,ìCE“\_ B

dx, dy, dz

f%ofbfv,ìzŽ² B

ux, uy, uz

f%ofbfv,ìyŽ² B

ou, ov

fefNfXf`ff,ìCE“\_ B

su, sv

fefNfXf`ff,ì kŽÚCEW ” B

lpD3DRMWrap

CEÄ,Ñ o,µ,ª ¬CE÷,µ,½,Æ,«,ÉIDirect3DRMWrapfCf“f^ [ftfFfCfX,đŽó,~Žæ,é|fCf“f^,Ö,Ìf|fCf“f^ B

ŽQ Æ @IDirect3DRMWrap

## IDirect3DRM::EnumerateObjects

HRESULT EnumerateObjects(D3DRMOBJECTCALLBACK func, LPVOID lpArg);

*fAfNfefBfu*, ÈDirect3DRMfIfufWfFfNfg, Ì, » , ê, ¼, ê, É, Â, ¢  
, Ä Afuncpf%of [f^, ÄŽ!, ³, ê, éfR [f<fofbfNŠÖ ”, ðÆÄ, Ñ o, · B

-Æ÷, ·, é, ÆD3DRM\_OK AŽ, ”s, ·, é, ÆfGf%o [, ð•Ô, · B•Ô'l, Ìê——, É, Â, ¢  
, Ä, Í A uDirect3D•ÛŽ f, [fh, Ì•Ô'l v, ðŽQ Æ, ·, é, ±, Æ B

*func*

ŠeDIRECT3DRMOBJECTfIfufWfFfNfg, É, Â, ¢  
, Ä AfAvfŠfP [fVf‡f“èç, Ìø ”, Æ, Æ, à, ÉÆÄ, Ñ o, ³, ê, é AfAvfŠfP [fVf‡f“èç, ÌD3DRMOBJECTCALLBAC  
KfR [f<fofbfNŠÖ ” B

*lpArg*

fR [f<fofbfNŠÖ ”, É“n, ³, ê, é AfAvfŠfP [fVf‡f“èç, Ìff [f^ B

**IDirect3DRM::GetDevices**

HRESULT GetDevices(LPDIRECT3DRMDEVICEARRAY\* lpDevArray);

HRESULT GetDevices(LPDIRECT3DRMDEVICEARRAY\* lpDevArray);

HRESULT GetDevices(LPDIRECT3DRMDEVICEARRAY\* lpDevArray);

lpDevArray

HRESULT GetDevices(LPDIRECT3DRMDEVICEARRAY\* lpDevArray);

**IDirect3DRM::GetNamedObject**

```
HRESULT GetNamedObject(const char * lpName,  
    LPDIRECT3DRMOBJECT* lplpD3DRMObject);
```

–¼‘O,đŽw’è,μ,Ä A^ê’v,·,éDirect3DRMObject,đŽæ“¾,·,é B

–Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,đ•Ö,· B•Ö’l,Îê——,É,Á,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Î•Ö’l v,đŽQ Æ,·,é,±,Æ B

*lpName*

ŒŸ ð,·,éfIfufWfFfNfg,Î–¼‘O B

*lplpD3DRMObject*

ŒÄ,Ñ o,μ,<sup>a</sup> –Œ÷,μ,½,Æ,«,É A^ê’v,μ,½Direct3DRMObject,Îf|fCf“f^,Ö,Îf|fCf“f^ B

**IDirect3DRM::GetSearchPath**

HRESULT GetSearchPath(DWORD \* lpdwSize, LPSTR lpszPath);

«» Ý, ðfTf@fCf<EÏ ðfPfX, ð•Ô, · B

-E±, ·, é, ED3DRM\_OK AŽ, ”s, ·, é, AfGf%o [ , ð•Ô, · B•Ô'l, Îê——, É, Â, ç  
, Ä, Í A uDirect3D•ÛŽ f, [fh, Î•Ô'l v, ðŽQ E, ·, é, ±, E B

lpdwSize

fPfX, Ì—v'f ”, Ö, ðf|fCf“f^ B, ±, ðfPf%of [f^, ÉNULL, ðŽw'è, ·, é, ±, E, Í, Â, «, È, ç B

lpszPath

EÏ ðfPfX, ðŽ!, · ANULL, Â I, í, é•¶Žš—ñ B, ±  
, ðfPf%of [f^, ÉNULL, ðŽw'è, ·, é, E AlpdwSizefPf%of [f^, É, æ, Á, ÄŽ!, ³, ê, é ê Š, É•K—v, È•¶Žš—  
ñ, ðfTfCfY, ð•Ô, · B

ŽQ E @IDirect3DRM::SetSearchPath



## 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,Û,½,Í32frfbfg,Ìfrfbfg ”,ðŽ ,Â,±,Æ,ª,Â,«,é B,Û,½ AfefNfXf`ff,ÍWindowsfrfbfg}  
fbfv i.bmp j,©f| [f^fuf< EfsfNfXf}fbfv i.ppm jP6Ĉ`Ž®,Ì,ç,,ê,©,Â,È,,Ä,Í,È,ç,È,ç B  
-Ĉ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,ç  
,Ä,Í A uDirect3D•ÛŽ f, [fh,Î•Ô'l v,ðŽQ Æ,·,é,±,Æ B

*lpFileName*

.bmp,Û,½,Í.ppmftf@fCf<,Ì-¼'O,ðŽw'è,·,é B

*lpD3DRMTexture*

ĈÄ,Ñ 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 * lpD3DRMTexture);
```

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,Á,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,î•Ô'l v,ðŽQ Æ,·,é,±,Æ B

rs

fŠf\ [fX,îfnf“fhf< B

lpD3DRMTexture

ŒÄ,Ñ o,µ,ª –Œ÷,µ,½,Æ,«,É A—LŒø,ÈDirect3DRMTexture|fCf“f^,Ö,îf|fCf“f^ B

**IDirect3DRM::SetDefaultTextureColors**

HRESULT SetDefaultTextureColors(DWORD dwColors);

Direct3DRMTextureIfufWffNfg,ÅŽg—p,³,ê,éfftfHf<fg,ì F,ð Ý'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,Î•Ô'l v,ðŽQ Æ,·,é,±,Æ B

dwColors

F,ì ” B

,±  
,Ìf f\fbfh,Í AIDirect3DRM::CreateTexturef f\fbfh,ì'O,ÉCEÄ,Ñ o,³,ê,½,Æ,«É,ì,ÝfefNfXf`ff,ì F,É”½%of,³,é,é B  
,·,Ä,É ì ¬,³,ê,½fefNfXf`ff,É'Î,µ,Ä,ÍCEø%Ê,ª,Ê,¢ B

**IDirect3DRM::SetDefaultTextureShades**

HRESULT SetDefaultTextureShades(DWORD dwShades);

Direct3DRMTextureIfufWffNfg, ĀŽg—p, 3, ê, éffftfHf<fg, Ì%A%œ, ð Ý'è, ·, é B

–E÷, ·, é, ÆD3DRM\_OK AŽ, ”s, ·, é, ÆfGf%o [, ð•Ô, · B•Ô'l, Îê——, É, Ā, ç  
, Ā, Í A uDirect3D•ŮŽ f, [fh, Ī•Ô'l v, ðŽQ Æ, ·, é, ±, Æ B

dwShades

%oA%œ, Ī ” B

, ±

, Īf f\fbfh, Í AIDirect3DRM::CreateTexturef f\fbfh, Ī' O, ÉEÄ, Ñ o, 3, ê, ½, Æ, «, É, Ī, ÝfefNfXf`ff, Ì%A%œ, É”½%of, 3, ê,  
é B, ·, Ā, É ì ¬, 3, ê, ½fefNfXf`ff, É' Ī, μ, Ā, ÍEø%Ê, a, È, ç B

**IDirect3DRM::SetSearchPath**

HRESULT SetSearchPath(LPCSTR lpPath);

ftf@fCf·ŒŸ ðfpfX,ð Ý'è,·,é B

-Œ÷,·,é,ŒD3DRM\_OK AŽ, ”s,·,é,ŒfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,Œ  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ī•Ô'l v,ðŽQ Œ,·,é,±,Œ B

lpPath

ŒŸ ðfpfX,Œ,µ,Ä Ý'è,·,éfpfX,ðŽ,· ANULL,Â I,í,é•Źš—ñ B

fftfHf<fg,ĪŒŸ ðfpfX,ÍŠÂ«•Ī ”D3DPATH,Ī'l,©,çŽæ,è o,³,é,é B,±,ĪŠÂ«•Ī ”,ª Ý'è,³,é,Ä,Œ  
,È,Œ ê ‡ ACEŸ ðfpfX,Ī'ó,É,È,é Bftf@fCf<,ðfI [fvf“,·,é,Œ,« AfVfXfef€  
,Ī,Ů,,fJfŒf“fgffBfŒfNfgfŠ,ð'T,µ AŽŸ,ÉŒŸ ðfpfX†,Ī,·,×,Ä,ĪffBfŒfNfgfŠ,ðf`fFfbfN,·,é B

ŽQ Œ @IDirect3DRM::GetSearchPath

**IDirect3DRM::Tick**

HRESULT Tick(D3DVALUE d3dvalTick);

Direct3DRM fVfXfef€ Efn [fgfr [fg,đ s,□ B,±,İf f\fbfh,ªCEÄ,Ñ o,³,ê,é,Æ A,·,×,Ä,İ%oÂ“@ftfCE [f€ ,İÊ’u,ÍCE» Ý,İ“® ì‘® «,É,µ,½,ª,Á,Ä X V,³,ê AfV [f“;ªCE» Ý,İffofCfX,ÉfCEf“f\_Šf“fO,³,ê,é B,Û,½ AŠÖ~A, µ,½fR [f·fobfNŠÖ ”,ª“K Ø,È,Æ,«,ÉCEÄ,Ñ o,³,ê,é B,±,İf f\fbfh,Í AfCEf“f\_Šf“fO EfTfCfNf€,ªŠ@—<sup>1</sup>,µ,½,Æ,«,É §CEä,đ•Ô,· B

-CE±,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,İê——,É,Â,c ,Ä,Í A uDirect3D•ÛŽ f, [fh,İ•Ô'l v,đŽQ Æ,·,é,±,Æ B

d3dvalTick

**IDirect3DRMFrame::SetRotation,ÆIDirect3DRMFrame::SetVelocity**f f\fbfh,İ¬“x,“,æ,Ñ%oñ“]fXfefbfv B

fV [f“,İfCEf“f\_Šf“fO,É \_“î «,đŽ ,½,¹,é,½,ß A'¼ Úf, [fh,İ'¼,İf f\fbfh,đ—p,c,Ä,± ,İf f\fbfh,đfCf“fvfŠf f“fg,·,é,±,Æ,à,Ä,«,é B

## IDirect3DRMAnimation

fAfvfŠfP [fVf‡f“,Í IDirect3DRMAnimationCf“f^ [ftFfCfX,İf f\fbfh,ð—~p,µ,Ä A^Ê'u ACEü,« AfrfWf...  
fAf< EfIfufWfFfNfg,İfXfP [fŠf“fO ACEðCE¹ Afrf... [f] [fg,İfA]f [fVf‡f“,ð s,±,±,Æ,ª,Ä,«é B,±  
,İfZfNfVf‡f“,Í A IDirect3DRMAnimationCf“f^ [ftFfCfX Ef f\fbfh,İfŠftf@fCEf“fX,Ä, ,é BŠT”O,É,Ä,¢  
,Ä,İŠT—v,Í A u IDirect3DRMAnimation,Æ IDirect3DRMAnimationSetCf“f^ [ftFfCfX v,ðŽQ Æ,·,é,±,Æ B

IDirect3DRMAnimationCf“f^ [ftFfCfX,İf f\fbfh,İÊ%°,İfOf< [fv,Éª—p,·,é,±,Æ,ª,Ä,«é B

fL [ AddPositionKey

AddRotateKey

AddScaleKey

DeleteKey

,»,İ¼

SetFrame

SetTime

fIfvfVf‡f“

GetOptions

SetOptions

IDirect3DRMAnimationCf“f^ [ftFfCfX,Í A,·,×,Ä,İCOMfCf“f^ [ftFfCfX,Æ“—  
l A UnknownCf“f^ [ftFfCfX Ef f\fbfh,ðCEp ³,·,é B UnknownCf“f^ [ftFfCfX,İŽŸ,İ,R,Ä,İf f\fbfh,ðTf]  
 [fg,·,é B

AddRef

QueryInterface

Release

,³,ç,É IDirect3DRMAnimationCf“f^ [ftFfCfX,Í A  IDirect3DRMObjectCf“f^ [ftFfCfX,©,çŽŸ,İf f\fbfh,ðCEp ³,  
,é B

AddDestroyCallback

Clone

DeleteDestroyCallback

GetAppData

GetClassName

GetName

SetAppData

SetName

IDirect3DRMAnimationfIfufWfFfNfg,Í A  IDirect3DRM::CreateAnimation f\fbfh,İCEÄ,Ñ o,µ,É,æ,Ä,ÄŽæ“¼,Ä,«é  
B

### **IDirect3DRMAnimation::AddPositionKey**

HRESULT AddPositionKey(D3DVALUE rvTime, D3DVALUE rvX,  
D3DVALUE rvY, D3DVALUE rvZ);

*fAfjf* [fVf#f“ ,É^Ê’ufl [,ð%oÁ,|,é B

-Œ÷, ,é,ÆD3DRM\_OK AŽ, ”s, ,é,ÆfGf%o [,ð•Ô,· B•Ô’l,îê——,É,Á,Œ  
,Ä,Í A uDirect3D•ŮŽ f, [fh,î•Ô’l v,ðŽQ Æ, ,é,±,Æ B

*rvTime*

*fAfjf* [fVf#f“ ,î’†,Ä^Ê’ufl [,ð Ý’è, ,é,Æ,« ,îŽžŠÔ B0,ðŒ“\_,Æ, ,é”C^Ó,î’P^Ê,îŽžŠÔ,ðŽw’è, ,é,±  
,Æ,ª,Ä,« ,é B ÄŒâ,îfl [,îrvTime,î’l,ª99,î,Æ,« ArvTime,ª49,Ä, ,éfl [,ªfAfjf [fVf#f“ ,î,ç,â,ª,Œ†ŠÔ,Ä, ,é B

*rvX, rvY, rvZ*

^Ê’u B

,±,îf f\fbfh,É,æ,Á,Ä^Ů“@•İŠ,ª s,î,ê,é,æ,ª,É,È,é B•İŠ,ðŠŮ,ð s—ñŒvŽZ,É,Á,Œ,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%oñ“]fL [,đ'Ç%oÁ ,. ,é B

-E÷ ,. ,é ,ÆD3DRM\_OK AŽ ,”s ,. ,é ,ÆfGf%o [,đ•Ô ,. B•Ô'l ,Îê—— ,É ,Â ,ç  
,Ä ,Í A uDirect3D•ŮŽ f , [fh ,Ī•Ô'l v ,đŽQ Æ ,. ,é ,± ,Æ B

rvTime

fAfjf [fVf†f“ ,Ī'† ,Ä%oñ“]fL [,đ Ÿ'è ,. ,é ,Æ ,ĪŽžŠÔ B0 ,đŠĭ € ,Æ ,. ,é”C^Ó ,Ī'P^Ê ,ĪŽžŠÔ ,đŽw'è ,. ,é ,±  
,Æ ,<sup>a</sup> ,Ä ,« ,é B ĀEä ,ĪfL [,ĪrvTime ,Ī'l ,<sup>a</sup>99 ,Ī ,Æ ,« ArvTime ,<sup>a</sup>49 ,Ä , ,é fL [,<sup>a</sup>fAfjf [fVf†f“ ,Ī ,ĭ ,â ,<sup>a</sup> ,Ç'†ŠÔ ,Ä , ,é B

rqQuat

%oñ“] ,đ•\ ,4ŽŸE<sup>3</sup> s—ñ B

,± ,Īf f\fbfh ,É ,æ ,Á ,Ä A%oñ“]•ĪŠ ,<sup>a</sup>“K—p ,<sup>3</sup> ,é ,é B•ĪŠ ,đŠŮ ,<sup>a</sup> s—ñE vŽZ ,É ,Â ,ç ,Ä ,Í A u3D•ĪŠ v ,đŽQ 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

-Æ÷,;é,ÆD3DRM\_OK AŽ,;s,;é,ÆfGf%o [,ð•Ô,; B•Ô'l,îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,î•Ô'l v,ðŽQ Æ,;é,±,Æ B

rvTime

fAfjf [fVf#f“,î'†,ÄfXfP [f< EfL [,ð<L%—,;é,Æ,«,îŽžŠÔ B0,ðÆ  
“\_„Æ,;é”C^Ô,î'P^Ê,îŽžŠÔ,ðŽw'è,Ä,«„é B ÄÆã,îfL [,îrvTime,î'l,^99,î,Æ,« ArvTime,^49,Ä, ,éfL [,^fAfjf [fV  
f#f“,î,ç,â,²,Ç'†ŠÔ,Ä, ,é B

rvX, rvY, rvZ

kŽŮÆW ” B.

,±,îf f\fbfh,É,æ,Ä,Ä A kŽŮ•îŠ,“K—p,³,ê,é B•îŠ,ðŠŮ,Ð s—ñÆvŽŽ,É,Â,¢,Ä,Í A u3D•îŠ: v,ðŽQ Æ,;é,±  
,Æ B

ŽQ Æ @IDirect3DRMAnimation::DeleteKey

### **IDirect3DRMAnimation::DeleteKey**

HRESULT DeleteKey(D3DVALUE rvTime);

fL [,δfAfjf [fVf‡f“,©,ς í œ,·,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

rvTime

fAfjf [fVf‡f“,©,ς í œ,³,ê,éfL [,ðŽ-•Ê,·,éŽžŠÔ B

**IDirect3DRMAnimation::GetOptions**

D3DRMANIMATIONOPTIONS GetOptions();

fAfjf [fVf‡f“ EfIfvfVf‡f“,đŽæ“¾,·,é B

fAfjf [fVf‡f“ EfIfvfVf‡f“,đŽ!,·D3DRMANIMATIONOPTIONSĈ^,İ!,đ•Ō,· B

ŽQ Æ @IDirect3DRMAnimation::SetOptions

### **IDirect3DRMAnimation::SetFrame**

HRESULT SetFrame(LPDIRECT3DRMFRAME lpD3DRMFrame);

*lpD3DRMFrame* [fVf#f“;Éftf€ [f€,đ Ý'è,·,é B

-€±,·,é,ÆD3DRM\_OK AŽ,“s,·,é,ÆfGf%o [;đ•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,İ•Ô'l v,đŽQ Æ,·,é,±,Æ B

*lpD3DRMFrame*

*lpD3DRMFrame* [fVf#f“;É Ý'è,·,éftf€ [f€,đŽw'è,·,é•İ ”,ÎfAfhf€fX B

### **IDirect3DRMAnimation::SetOptions**

HRESULT SetOptions(D3DRMANIMATIONOPTIONS d3drmanimFlags);

*fAfjf* [fVfzf“ EfIfvfVfzf“,đ Ý’è,.,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

*d3drmanimFlags*

*fAfjf* [fVfzf“ EfIfvfVfzf“Žw’è,.,éD3DRMANIMATIONOPTIONSĈ^,Î’l,ÎfAfhfĈfX B

ŽQ Æ @IDirect3DRMAnimation::GetOptions

### IDirect3DRMAnimation::SetTime

HRESULT SetTime (D3DVALUE rvTime);

*fAfjf* [fVf†f“ ,ÉCE» Ý,ìžžšŌ,đ Ý’è, ,é B

-CE÷, ,é,ÆD3DRM\_OK AŽ, ”s, ,é,ÆfGf%o [,đ•Ō, · B•Ō’l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ī•Ō’l v,đŽQ Æ, ,é,±,Æ B

*rvTime*

*fAfjf* [fVf†f“ ,É Ý’è, ,é V,μ,¢CE» Ý,ìžžšŌ B0,đCE’“ ,Æ, ,é”C^Ó,Ì’P^Ê,ìžžšŌ,đŽw’è, ,é,±  
,Æ, ^Ä,« ,é B ĀCEã,ĪfL [,ĪrvTime,Ī’l,^99,Ī,Æ,« ArvTime,^49,Ä, ,éfL [,^fAfjf [fVf†f“ ,Ī,ĭ,â,□,Ç’+šŌ,Ä, ,é B

## IDirect3DRMAnimationSet

*fAfvfŠfP [fVf±f“ ,Í ADirect3DRMAnimationfIfufWfFfNfg,đfOf< [fv%o» ,·,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%oÁ Af [fh A AddAnimation*  
*í œ*

*DeleteAnimation*

*Load*

*ŽžŠÔ SetTime*

*IDirect3DRMAnimationSetfCf“f^ [ftfFfCfX,Í A,·,×,Ä,İCOMfCf“f^ [ftfFfCfX,Æ“— l AİUnknownfCf“f^ [ftfFfCfX Ef f\fbfh,đEp ³,·,é BIUnknownfCf“f^ [ftfFfCfX,ÍŽŸ,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,Ñ o,µ,É,æ,Ä,ÄŽæ“¼, Ä,« ,é B*

**IDirect3DRMAnimationSet::AddAnimation**

HRESULT AddAnimation(LPDIRECT3DRMANIMATION lpD3DRMAnimation);

fAfff [fVf+f“ ,δfAfff [fVf+f“ EfZfbfg,É'Ç%Á,·,é B  
-E÷,·,é,ÆD3DRM\_OK AŽ,“s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,ç  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ĵ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lpD3DRMAnimation

fAfff [fVf+f“ EfZfbfg,É'Ç%Á,·,éDirect3DRMAnimationIfufWfFfNfg B

### **IDirect3DRMAnimationSet::DeleteAnimation**

HRESULT DeleteAnimation(LPDIRECT3DRMANIMATION lpD3DRMAnimation);

fAfjf [fVf†f“ ,δfAfjf [fVf†f“ EfZfbfg,©,ç í œ,·,é B

-E÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,ç  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ĵ•Ô'l v,δŽQ Æ,·,é,±,Æ B

lpD3DRMAnimation

fAfjf [fVf†f“ EfZfbfg,©,ç í œ,<sup>3</sup>,ê,éDirect3DRMAnimationIfufWfFfNfg B

### IDirect3DRMAnimationSet::Load

```
HRESULT Load(LPVOID lpvObjSource, LPVOID lpvObjID,  
             D3DRMLOADOPTIONS d3drmLOFlags,  
             D3DRMLOADTEXTURECALLBACK d3drmLoadTextureProc, LPVOID lpArgLTP,  
             LPDIRECT3DRMFRAME lpParentFrame);
```

```
fAfjf [fVfzf“ EfZfbfg,df [fh,·,é B  
      -Œ±,·,é,ŒD3DRM_OK AŽ,“s,·,é,ŒfGf%o [·,đ·Ō,· B·Ō'l,Îê——,É,Â,Œ  
      ,Ä,Í A uDirect3D·ŪŽ f, [fh,Î·Ō'l v,đŽQ Œ,·,é,±,Œ B
```

```
lpvObjSource  
fIfufWfFfNfg,af [fh,³,ê,éf\ [fX,Ō,Îf|  
fCf“f^ Bd3drmLOFlagsfpf%of [f^,ªŽ',·f\ [fX Eftf%oŌ,É,æ,Á,Ä Aftf@fCf< AfŠf\ [fX Af f,Œ Euf  
fbfN A,Ū,½,ÎfXfgfŠ [f€,đŽw'è,·,é B
```

```
lpvObjID  
f [fh,·,éIfufWfFfNfg,ì¼'Ō,Ū,½,ÎÊ'u,Ō,Îf|fCf“f^ B,±  
·,Îpf%of [f^,Í Ad3drmLOFlagsfpf%of [f^,ªŽ',·Ž·ÊŽqftf%oŌ,É,æ,Á,Ä%đŽB,³,ê,é BD3DRMLOAD_BYPOSI  
TIONftf%oŌ,đŽw'è,µ,½ ê ± A,±,Îpf%of [f^,Í Aftf@fCf<,l'±,ÎIfufWfFfNfg,Ì ± ~,đŽ',·DWORD'l,Ō,Îf|  
fCf“f^,Ä,·,é B,±,Îpf%of [f^,É,ÍNULL,đŽw'è,·,é,±,Œ,à,Ä,«,é B
```

```
d3drmLOFlags  
f [fh EfIfvfVfzf“,đŽ',·D3DRMLOADOPTIONSŒ^,Î'l B
```

```
d3drmLoadTextureProc  
D3DRMLOADTEXTURECALLBACKfR [f<fofbfNŠŌ ” B,±,ê,Í A“Á·Ê,ÈftfH [f}fbfg,đ·K—  
v,Œ,·,éIfufWfFfNfg,ª—p,Œ,éfefNfXf`ff,đ“Ç,Ý o,·,Œ,«,ÉŒÄ,Ŧ o,³,ê,é B,±  
·,Îpf%of [f^,É,ÍNULL,đŽw'è,·,é,±,Œ,ª,Ä,«,é B
```

```
lpArgLTP  
D3DRMLOADTEXTURECALLBACKfR [f<fofbfNŠŌ ”,É“n,³,ê,é AfAfvfŠfP [fVfzf“è<,Ìff [f^ B
```

```
lpParentFrame  
eftfŒ [f€,ÎfAfhfŒfX B,±,Îpf%of [f^,Í AfAfjf [fVfzf“fZfbfg,ÌftfŒ [f€,ª A eftfŒ [f€,  
·,đNULL,Œ,µ,Ä ì ¬,³,ê,Ä,µ,Ū,ª,Ä,±,Œ,đ-hŽ~,·,é B
```

```
ffftfHf<fg,Ä,Í A,±,Îf f\fbfh,ÍlpvObjSourcefpf%of [f^,ÄŽw'è,³,ê,éftf@fCf<,Ì Ä %o  
·,ÎfAfjf [fVfzf“ EfZfbfg,df [fh,·,é B
```

### **IDirect3DRMAnimationSet::SetTime**

HRESULT SetTime(D3DVALUE rvTime);

*fAfjf* [fVf†f“;ìE» Ý;ìŽžšŦ,đ Ý'è,·,é B

-E÷,·,é,ÆD3DRM\_OK AŽ,“s,·,é,ÆfGf%o [,đ•Ŧ,· B•Ŧ'l,îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŦŽ f, [fh,î•Ŧ'l v,đŽQ Æ,·,é,±,Æ B

*rvTime*

V,µ,¢ŽžšŦ

## IDirect3DRMDevice

*fAfVfŠfP [fVf±f“,Æ o—ÍfffofCfX,Ì‘ŠÉY’Ê M,Ì,½,B,ÉIDirect3DRMDevicefCf“f^ [ftFfCfX,Ìf f\fbfh,ðŽg— p,·,é B,±,ÌfZfNfVf±f“,Í AIDirect3DRMDevicefCf“f^ [ftFfCfX Ef f\fbfh,ÌfŠftf@fEf“fX,Á,·,é BŠT”O,É,Á,¢ ,Á,ÌŠT—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,Á,«,«,é B*

*fOfbftf@ EfJfEf“fg* [GetBufferCount](#)  
[SetBufferCount](#)

*fJf%o [ Ef,ff<* [GetColorModel](#)

*ffBfUfŠf“fO* [GetDither](#)  
[SetDither](#)

*%oŠú%o»* [Init](#)  
[InitFromClipper](#)  
[InitFromD3D](#)

*,»,Ì¼* [GetDirect3DDevice](#)  
[GetHeight](#)  
[GetTrianglesDrawn](#)  
[GetViewports](#)  
[GetWidth](#)  
[GetWireframeOptions](#)  
[Update](#)

*’Ê’m* [AddUpdateCallback](#)  
[DeleteUpdateCallback](#)

*fEf“f\_fŠf“fO,Ì·iŽ¿* [GetQuality](#)  
[SetQuality](#)

*%oA%oe* [GetShades](#)  
[SetShades](#)

*fefNfXf`ff,Ì·iŽ¿* [GetTextureQuality](#)  
[SetTextureQuality](#)

*IDirect3DRMDevicefCf“f^ [ftFfCfX,Í A,·,x,Ä,ÌCOMfCf“f^ [ftFfCfX,Æ“— l A|UnknownfCf“f^ [ftFfCfX Ef f\fbfh,ðEp ³,·,é BIUnknownfCf“f^ [ftFfCfX,ÍŽY,Ì,R,Á,Ìf f\fbfh,ðfTf| [fg,·,é B*

[AddRef](#)

[QueryInterface](#)

[Release](#)

*,³,ç,É AIDirect3DRMDevicefCf“f^ [ftFfCfX,Í AIDirect3DRMObjectfCf“f^ [ftFfCfX,©,çŽY,Ìf f\fbfh,ðEp ³,·, é B*

AddDestroyCallback

Clone

DeleteDestroyCallback

GetAppData

GetClassName

GetName

SetAppData

SetName

Direct3DRMDeviceIfuFwFfNfg,Í AIDirect3DRM::CreateDevice f\fbfh,ÏCEÄ,Ñ o,μ,É,æ,Á,ÄŽæ“¾,³,ê,é B

### **IDirect3DRMDevice::AddUpdateCallback**

HRESULT AddUpdateCallback(D3DRMUPDATECALLBACK d3drmUpdateProc, LPVOID arg);

ffofCfX,³İ X,³,ê,½,Æ,«ÉfAfvfŠfP [fVf‡f“,É’Ê’m,·,éfR [f<fofbfNŠÖ ”,đ’Ç%oÁ,·,é BfAfvfŠfP [fVf‡f“,³**IDirect3DRMDevice::Update**,đĀ,Ñ o,·,Æ AfVfXfef€,Í,±,İfR [f<fofbfNŠÖ ”,đĀ,Ñ o,· B

-Ā,·,·,é,ÆD3DRM\_OK AŽ,“s,·,é,ÆfGf%o [,đ•Ô,· B•Ô’l,İê——,É,Á,ĉ  
,Ä,İ A uDirect3D•ŮŽ f, [fh,İ•Ô’l v,đŽQ Æ,·,é,±,Æ B

d3drmUpdateProc

fAfvfŠfP [fVf‡f““èĉ,İ**D3DRMUPDATECALLBACK**fR [f<fofbfNŠÖ ”,İfAfhfĀfX B

arg

X VfR [f<fofbfNŠÖ ”,É“n,³,ê,éfAfvfŠfP [fVf‡f““èĉ,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,³,ê,½ X VfR [f<fofbfNŠÖ ",đ í æ,·,é B

-Æ÷,·,é,ÆD3DRM\_OK AŽ,"s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,Îê——,É,Á,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Î•Ô'l v,đŽQ Æ,·,é,±,Æ B

d3drmUpdateProc

fAfvfŠfP [fVf±f""è<,D3DRMUPDATECALLBACKfR [f<fofbfNŠÖ ",ÎfAfhfÆfX B

arg

X VfR [f<fofbfNŠÖ ",É“n,³,ê,éfvf%oCfx [fg,Èff [f^ B

ŽQ Æ @IDirect3DRMDevice::AddUpdateCallback, IDirect3DRMDevice::Update, D3DRMUPDATECALLBACK

**IDirect3DRMDevice::GetBufferCount**

DWORD GetBufferCount();

**IDirect3DRMDevice::SetBufferCount** f\fbfh,É,æ,Á,Ä Ý'è,³,ê,½'l,ðŽæ“¾,·,é B

fobftf@,ì ”,ð•Ô,· B1,ÍfVf“fOf< Efofbftf@ A2,Í2 dfobftf@ A^È%°3 d A4 d,Æ,È,é B

**IDirect3DRMDevice::GetColorModel**

D3DCOLORMODEL GetColorModel ();

ffofCfX, ìfJf% [ Ef, fff<, ðŽæ“¾, ·, é B

Direct3D fJf% [ Ef, fff< iRGB , , é, ¢, Íf, fmfNf j, ðŽ!, · D3DCOLORMODEL—ñ<“E^, ©, ç'l, ð•Ô, · B

ŽQ Æ @fJf% [ Ef, fff<

### **IDirect3DRMDevice::GetDirect3DDevice**

HRESULT GetDirect3DDevice(LPDIRECT3DDEVICE \* lpD3DDevice);

'¼ Úf, [fh,ÏffofCfX,Ö,Ï|fCf“f^,ðŽæ“¾,·,é B

-Æ±,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf% [,ð•Ô,· B•Ô'l,Îê——,É,Â,ç  
,Ä,Í A uDirect3D•ÛŽ f, [fh,Ï•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lpD3DDevice

'¼ Úf, [fh,ÏffofCfX EflufWfFfNfg,Ö,Ï|fCf“f^,Ä %Šú%»»,³,é,é|fCf“f^,ÏfAfhfÆfX B

**IDirect3DRMDevice::GetDither**

BOOL GetDither();

ffofCfX, ìffBfU Eftf%oO, ðŽæ“¾, ·, é B

ffBfU Eftf%oO, ^fZfbfg, ^, ê, Ä, Ç, é ê ‡, ÍTRUE A, » , □, Ä, È, Ç, Æ, «, ÍFALSE, ð•Ô, · B

ŽQ Æ @IDirect3DRMDevice::SetDither

## **IDirect3DRMDevice::GetHeight**

DWORD GetHeight ();

*ffofCfX,î ,,³,ðfsfNfZf<P^Ê,ÅŽæ“¾,·,é B*

*,,³,ð•Ô,· B*

## IDirect3DRMDevice::GetTrianglesDrawn

```
DWORD GetTrianglesDrawn();
```

fffofCfX,ì ì -Žž,©,çfffofCfX,É•,©,ê,½f|fŠfSf“,ì ”,đžæ“¾,·,é B

f|fŠfSf“,ì ”,đ•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‘α,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();

ffofCfX, ìfĒf“f\_fŠf“fO•iŽ; ,đŽæ“%4, ·, é B

D3DRMRENDERQUALITYĒ^, ĀŽ!, 3, ê, é—ñ<“Ē^f f“fo, ì, D, Ā, Ā^È ã, đ•Ô, · B

ŽQ Æ @IDirect3DRMDevice::SetQuality

## **IDirect3DRMDevice::GetShades**

DWORD GetShades ( ) ;

%A%e,ì ",đŽæ“¾,·,é B,±,ì ",Í AŽg—p,³,ê,Ä,č,é F ",Á·\Œ»,³,ê,é B

%A%e,ì ",đ•Ô,· B

ŽQ Æ @**IDirect3DRMDevice::SetShades**

## **IDirect3DRMDevice::GetTextureQuality**

D3DRMTEXTUREQUALITY GetTextureQuality();

fffofCfX,ìE» Ý,ìfNfXf`ff•iŽ;fpf%of [f^,đŽæ“¾,·,é BfefNfXf`ff,ì•iŽ;í ARGBfffofCfX,É,ì,Ý“K—  
p,³,ê,é B

**D3DRMTEXTUREQUALITY**—ñ“E^f f“fo,ì,Đ,Æ,Â,đ•Ô,· B

ŽQ Æ @**IDirect3DRMDevice::SetTextureQuality**

### IDirect3DRMDevice::GetViewports

HRESULT GetViewports(LPDIRECT3DRMVIEWPORTARRAY\* lpViewports);

fffofCfX, ðrf... [f| [fg, ðŽ', · Direct3DRMViewportArrayIfufWfFfNfg, ð \z, ·, é B

-E÷, ·, é, ED3DRM\_OK AŽ, ”s, ·, é, AfGf%o [ , ð•Ô, · B•Ô'l, Îê——, É, Â, ç  
, Ä, Í A uDirect3D•ÜŽ f, [fh, Î•Ô'l v, ðŽQ Æ, ·, é, ±, Æ B

lpViewports

EA, Ñ o, µ, a -E÷, µ, ½, Æ, «, É A—LCEø, ÈDirect3DRMViewportArrayIfufWfFfNfg, Ä, “ü, éf|fCf“f^, Ö, ðf|  
fCf“f^ B

### **IDirect3DRMDevice::GetWidth**

DWORD GetWidth();

fffofCfX, ì• ,ðfsfNfZf<, ÅŽæ“¾, :é B, ±, ìf 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“,đŽæ“¾,·,é B

^È%°,l,lfrrfbfgOR,ª•Œ,³,ê,é B

D3DRMWIREFRAME\_CULL

—-Ê,lfŒ [f€,Í·%œ,³,ê,È,Œ B

**D3DRMWIREFRAME\_HIDDENLINE**

f fCf,, [ftfŒ [f€

,ÅfŒf“f\_fŠf“fO,³,ê,½ ü,ª A‘O-

Ê,lfIfufWfFfNfg,É,æ,Á,Ä%B,³,ê,é B

**IDirect3DRMDevice::Init**

HRESULT Init(ULONG width, ULONG height);

Windows 3.11, 3.11x, 95, 98, 2000, XP, Vista, 7, 8, 10, 11

### IDirect3DRMDevice::InitFromClipper

```
HRESULT InitFromClipper(LPDIRECTDRAWCLIPPER lpDDClipper,  
    LPGUID lpGUID, int width, int height);
```

Žw'è,³,ê,½ DirectDrawClipperIfufWfFfNfg,©,çffofCfX,đ %Šú%».,,é B

-Ē÷,.,é,ĒD3DRM\_OK AŽ,"s,.,é,ĒfGf%o [,đ•Ô,· B•Ô'l,îê——,É,Ā,ĉ  
,Ā,Ī A uDirect3D•ŮŽ f, [fh,Ī•Ô'l v,đŽQ Ē,.,é,±,Ē B

lpDDClipper

%Šú%»ff [f^,Ē,μ,Ā—p,ĉ,ç,ê,éDirectDrawClipperIfufWfFfNfg,ĪfAfhfĒfX B

lpGUID

fCf“f^ [ftfFfCfXŽ¯•ĒŽq,Ē,μ,ĀŽg—p,³,ê,éfOf [fof< Ef†fj [fNŽ¯•ĒŽq iGUID j B

width, height

fffofCfX,Ī• ,Ē ,³ B

**IDirect3DRMDevice::InitFromD3D**

HRESULT InitFromD3D(LPDIRECT3D lpD3D, LPDIRECT3DDEVICE lpD3DDIMDev);

Direct3D'¼ Úf, [fh EflfufWfFfNfg,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%o [,ð•Ô,: B•Ô'l,îê——,É,Á,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Î•Ô'l v,ðŽQ Æ,:é,±,Æ B

lpD3D

•ŮŽ f, [fh EfffofCfX,ð %Šú%»,:é,½,ß,ÉŽg,□Direct3'¼ Úf, [fh EflfufWfFfNfg,Ö,î|fCf“f^ B

lpD3DIMDev

•ŮŽ f, [fh EfffofCfX,ð %Šú%»,:é,½,ß,ÉŽg,□'¼ Úf, [fh EfffofCfX B

**IDirect3DRMDevice::SetBufferCount**

HRESULT SetBufferCount(DWORD dwCount);

fAfvfŠfP [fVf‡f“,É,æ,Á,ÄŒ» ÝŽg—p,³,ê,Ä,č,éfobftf@,Ì ”,đ Ý’è,·,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,Ī•Ô’l v,đŽQ Œ,·,é,±,Œ B

dwCount

fobftf@,Ì ”,đŽw’è,·,é B1,ÍfVf“fOf< Efobftf@ A2,Í2 dfobftf@ A^È%°3 d A4 d,Œ,È,é B BfftfHf<f  
g,Í1,Ä, ,è AfVf“fOf< Efobftf@ EfEfBf“fhfE,Ī ^— ,đ s,□ B

2 dfobftf@,â3 dfobftf@,đŽg—p,·,éfAfvfŠfP [fVf‡f“,Í AfVfXfef€,Žg—p’†,Īfobftf@,Ì ”,đ’Ê’m,·,é,½,ß,±  
,Īf ffbfh,đŽg—p,μ,È,,Ä,Í,È,ç,È,č B,±,ê,É,æ,Á,ÄfVfXfef€,Í AŠeftfŒ [f€,É,Â,č  
,ÄfNfŠfA,“,æ,Ň X V,·,×,«EfEfBf“fhfE,Ī ”,đŒvŽZ,·,é,±,Œ,ª,Ä,«é B

ŽQ Œ @IDirect3DRMDevice::GetBufferCount

**IDirect3DRMDevice::SetDither**

HRESULT SetDither(BOOL bDither);

fffofCfX, ðffBfU Eftf%fo, ð Ý'è, ,é B

-E÷, ,é, ED3DRM\_OK AŽ, ”s, ,é, AfGf%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

bDither

fffofCfX, ð V, µ, çffBfU Ef, [fh BfftfHf<fg, ÍTRUE, Ä, ,é B

ŽQ Æ @IDirect3DRMDevice::GetDither

**IDirect3DRMDevice::SetQuality**

HRESULT SetQuality (D3DRMRENDERQUALITY rqQuality);

fffofCfX,lfŒf“f\_Šf“fO•iŽç,đ Ý'è,·,é B

-Œ÷,·,é,ŒD3DRM\_OK AŽ,“s,·,é,ŒfGf%o [,đ•Ô,· B•Ô'l,Îê——,É,Â,ç  
,Ä,Í A uDirect3D•ŮŽ f, [fh,İ•Ó'l v,đŽQ Œ,·,é,±,Œ B

rqQuality

D3DRMRENDERQUALITYŒ^,É,æ,Á,Ä•\,³,ê,é—ñ“Œ^f f“fo BffftfHf<fg,Ì Ý'è,ÍD3DRMRENDER\_FLAT,Â, ,é  
B

fŒf“f\_Šf“fO•iŽç,Í AfffofCfX,lfŒf“f\_Šf“fO EfT [ftfFfX ã,ÄŽÀ s,³,ê,éŒfŒf“f\_Šf“fO,İ•iŽç,Ì Á'â'l,Â, ,é B  
Šef fbfVf...,Í“ŒŽ©,İ•iŽç,đŽ ,Ä,ª Af fbfVf...,É—LŒø,È Á ,•iŽç,Œ,Í AfffofCfX,É—LŒø,È•iŽç,Œ“¯,Œ,Á, ,é  
B^Ů,È,Á,½fffofCfX,É,Í A^Ů,È,Á,½•iŽç,đŽw'è,·,é,±,Œ,ª,Ä,«é B,½,Œ,!,Í AfvfŒftrf...  
[,Ì,½,B,ÌfffofCfX,Íê”È,È•iŽç,ªá,ç,ª A Ä I“I,È•Ž',É—p,ç,ç,ê,éfffofCfX,Í A,à,Á,Œ ,,ç•iŽç,Ì,à,Ì,Á, ,é B

ŽQ Œ @IDirect3DRMDevice::GetQuality

### **IDirect3DRMDevice::SetShades**

HRESULT SetShades (DWORD ulShades);

%oA%oe,ì"x ‡,¢,đ Ý'è,·,é B,±,ì " ,Í AŽg—p,³,ê,Ä,¢,é F ",Á•\Œ»,³,ê,é B

-Œ±,·,é,ÆD3DRM\_OK AŽ,"s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Ä,¢  
,Ä,Í A Direct3D•ŮŽ f, [fh,İ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

ulShades

V,µ,¢%oA%oe,ì"x ‡,¢ B,±,ìfpf%of [f^,Í2,ì—Ý æ,Ä,È,,Ä,Í,È,ç,È,¢ BffftfHf<fg,Í32,Ä, ,é B

ŽQ Æ @IDirect3DRMDevice::GetShades

## **IDirect3DRMDevice::SetTextureQuality**

HRESULT SetTextureQuality(D3DRMTEXTUREQUALITY tqTextureQuality);

fffofCfX,lfefNfXf`ff•iŽi,đ Ý'è,•,é B

-E÷,•,é,ED3DRM\_OK AŽ,"s,•,é,ÆfGf%o [,đ•Ô,• B•Ô'l,Îê——,É,Â,ç  
,Ă,Í A uDirect3D•ŮŽ f, [fh,İ•Ó'l v,đŽQ Æ,•,é,±,Æ B

tqTextureQuality

D3DRMTEXTUREQUALITY—ñ<“E^,lf f“fo,ì,Đ,Æ,Â BffftfHf<fg,ÍD3DRMTEXTURE\_NEAREST,Ă,•,é B

ŽQ Æ @IDirect3DRMDevice::GetTextureQuality

## **IDirect3DRMDevice::Update**

HRESULT Update ();

ffBfXfvfCfC,ÉfCf“f\_Šf“fO,³,ê,½fCf [fW,đ•j »,.é B,Û,½ AfffofCfX Ehf%oCfo,Éfn [fgfr [fgŠÖ ”,đ  
'ñ<Ÿ,.é B

-CÉ÷,.é,ÆD3DRM\_OK AŽ,”s,.é,ÆfGf%o [ ,đ•Ô:. B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Î•Ô'l v,đŽQ Æ,.é,±,Æ B

,±,Ïf f\fbfh,ªCÄ,Ñ o,³,ê,é,½,Ñ,É AfVfXfef€  
,ÍfAfvfŠfP [fVf#f““è` ,D3DRMUPDATECALLBACKfR [f<fofbfNŠÖ ”,đCÄ,Ñ 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... ä, Ì, Ð, Æ, Â, Ìf|fŠfSf“, ÆEÝ, ç, É, â, èžæ, è, ·, é, ½, ß, ÉIDirect3DRMFacefCf“f^ [ftfFfCfX, Ìf f\fbfh, ðŽg—p, ·, é B, ±, ÌfZfNfVf‡f“Í AIDirect3DRMFacefCf“f^ [ftfFfCfX Ef f\fbfh, ÌfŠftf@fÆf“fX, Â, ·, é BŠT”O, É, Â, ç, Ä, ÌŠT—v, Í AIDirect3DRMFace, ÆIDirect3DRMFaceArrayfCf“f^ [ftfFfCfX, ðŽQ Æ, ·, é, ±, Æ B*

**IDirect3DRMFacefCf“f^ [ftfFfCfX Ef f\fbfh, Í A`È%°, ÌfOf< [fv, É•ª—p, ·, é, ±, Æ,ª, Â, «, é B**

**F**                    **GetColor**  
                      **SetColor**  
                      **SetColorRGB**

**f}fefŠfAf<**            **GetMaterial**  
                          **SetMaterial**

**fefNfXf`ff**            **GetTexture**  
                          **GetTextureCoordinateIndex**  
                          **GetTextureCoordinates**  
                          **GetTextureTopology**  
                          **SetTexture**  
                          **SetTextureCoordinates**  
                          **SetTextureTopology**

**’, “, \_ , Æ—@ ü**        **AddVertex**  
                          **AddVertexAndNormalIndexed**  
                          **GetNormal**  
                          **GetVertex**  
                          **GetVertexCount**  
                          **GetVertexIndex**  
                          **GetVertices**

**IDirect3DRMFacefCf“f^ [ftfFfCfX, Í A, ·, ×, Ä, ÌCOMfCf“f^ [ftfFfCfX, Æ“—**  
**l A[UnknownfCf“f^ [ftfFfCfX Ef f\fbfh, ðÆp³, ·, é BIUnknownfCf“f^ [ftfFfCfX, ÍŽŸ, Ì, R, Â, Ìf f\fbfh, ðfTf|**  
**[fg, ·, é B**

**AddRef**  
**QueryInterface**  
**Release**

**,³, ç, É AIDirect3DRMFacefCf“f^ [ftfFfCfX, Í AIDirect3DRMObjectfCf“f^ [ftfFfCfX, ©, çŽŸ, Ìf f\fbfh, ðÆp³, ·, é**  
**B**

**AddDestroyCallback**  
**Clone**  
**DeleteDestroyCallback**  
**GetAppData**  
**GetClassName**  
**GetName**  
**SetAppData**  
**SetName**

Direct3DRMFaceIfufWfFfNfg,Í **AIDirect3DRM::CreateFace** f\bfh,ìCEÁ,Ñ o,μ,É,æ,Á,Žæ“¼,³,ê,é B

### IDirect3DRMFace::AddVertex

HRESULT AddVertex(D3DVALUE x, D3DVALUE y, D3DVALUE z);

Direct3DRMFaceIfufWfFfNfg,É'“\_δ'Ç%Á,·,é B

-E÷,·,é,ÆD3DRM\_OK AŽ,“s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,ç  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ĵ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

x, y, z

V,μ,ç,“\_Ê'u,Ĵx Ay Az Â•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',“\_ ,ÏCf“ffbfNfX,Æ-@ ü,ÏCf“ffbfNfX,ðŽg—p,·,é B-Ê A',“\_ A-  
@ ü,Í ADirect3DRMMeshBuilderIfufWfFfNfg,Ï1•”,Ä,È,,Ä,Í,È,ç,È,ç B  
-Æ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,ç  
,Ä,Í A uDirect3D•ÜŽ f. [fh,Ï•Ô'l v,ðŽQ Æ,·,é,±,Æ B

vertex, normal

'Ç%Á,·,é',“\_ ,Æ-@ ü,ÏCf“ffbfNfX B

**IDirect3DRMFace::GetColor**

D3DCOLOR GetColor();

Direct3DRMFaceIfuWfFfNfg, Ì F, ðŽæ“¾, ·, é B

F, ð•Ô, · B

ŽQ Æ @IDirect3DRMFace::SetColor

### **IDirect3DRMFace::GetMaterial**

HRESULT GetMaterial(LPDIRECT3DRMMATERIAL\* lpMaterial);

Direct3DRMFaceIfuWfFfNfg, ð}fefŠfAf<, ðŽæ“¼, ·, é B

-E÷, ·, é, ED3DRM\_OK AŽ, ”s, ·, é, AfGf%o [, ð•Ô, · B•Ô'l, Îê——, É, Â, ç  
, Ä, Í A uDirect3D•ŮŽ f, [fh, Ĩ•Ó'l v, ðŽQ Æ, ·, é, ±, Æ B

lpMaterial

-Ê, Ê“K—p, ³, ê, Ä, ç, éDirect3DRMMaterialIfuWfFfNfg, Ö, ð|fCf“f^, ðŽó, ~Žæ, é•Ī ”, Ö, ð|fCf“f^ B

ŽQ Æ @IDirect3DRMFace::SetMaterial

### **IDirect3DRMFace::GetNormal**

HRESULT GetNormal (D3DVECTOR \*lpNormal);

Direct3DRMFaceIfuWfFfNfg, Ì-@ ü, ðŽæ“¾, ·, é B

-E÷, ·, é, ED3DRM\_OK AŽ, ”s, ·, é, AfGf%o [, ð•Ô, · B•Ô'l, Îê——, É, Â, ç  
, Ä, Í A uDirect3D•ÜŽ f, [fh, Î•Ô'l v, ðŽQ Æ, ·, é, ±, Æ B

lpNormal

-Ê, Ì-@ üfxfNfgfç, ðŽó, -Žæ, éD3DVECTOR \ç'Ì B

### **IDirect3DRMFace::GetTexture**

HRESULT GetTexture(LPDIRECT3DRMTEXTURE\* lpTexture);

Direct3DRMFaceIfuWfFfNfg,É“K—p,<sup>3</sup>,ê,½fefNfXf`ff,đŽæ“¾,·,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

*lpTexture*

—Ê,É“K—p,<sup>3</sup>,ê,½fefNfXf`ff,Ö,Ïf|fCf“f^,đŽó, Žæ,é•Ī ” B

ŽQ Æ @IDirect3DRMFace::SetTexture

### **IDirect3DRMFace::GetTextureCoordinateIndex**

```
int GetTextureCoordinateIndex(DWORD dwIndex);
```

-Ê,Ïf fbfVf...,É, ,é,“\_ÏfCf“ffbfNfX,ðfefNfXf`ff À•W,ĂŽæ“¾, ,é B,±  
,ÏfCf“ffbfNfX,Í AdwIndexpf%of [f^,ĂŽw’è,³,ê,½fCf“ffbfNfX,É’Í%ž, ,é B

fCf“ffbfNfX,ð•Ô,· B

dwIndex

-Ê,É, ,é,“\_ÏfCf“ffbfNfX B

### **IDirect3DRMFace::GetTextureCoordinates**

HRESULT GetTextureCoordinates(DWORD index, D3DVALUE \*lpU,  
D3DVALUE \*lpV);

Direct3DRMFaceIfufWfFfNfg'†,ì',“\_̀,ìfefNfXf`ff À•W,ðŽæ“%4,.,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*

’,“\_̀,ìfCf“ffbfNfX B

*lpU, lpV*

’,“\_̀,ìfefNfXf`ff À•W,ðŽó,Žæ,é•î ” B

**IDirect3DRMFace::GetTextureTopology**

HRESULT GetTextureTopology(BOOL \*lpU, BOOL \*lpV);

Direct3DRMFaceIfufWfFfNfg,ÌfefNfXf`ff^Ê‘Š,đŽæ“¼,·,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,Ī•Ô'l v,đŽQ Æ,·,é,±,Æ B

lpU, lpV

-Ê,Ì%o~'E%f%ofbfv Eftf%ofO,É,µ,½,a,Á,Ä A Ý'è,Û,½,ÍfNfŠfA,³,ê,é•Ī ”,ÌfAfhfEfx 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

-Æ÷,·,é,ÆD3DRM\_OK AŽ,“s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,îê——,É,Á,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,î•Ô'l v,ðŽQ Æ,·,é,±,Æ B

*index*

'“\_„îÊ'u,Æ-@ ü,ðŽæ“¾,·,é B

*lpPosition, lpNormal*

'“\_„îÊ'u,Æ-@ ü,ðŽó,~Žæ,éD3DVECTOR \‘ç'î B

### **IDirect3DRMFace::GetVertexCount**

```
int GetVertexCount();
```

```
Direct3DRMFaceIfuWfFfNfg,ì,“_ì” ,ðŽæ“¾,·,é B  
,“_ì” ,ð•Ô,· B
```

### IDirect3DRMFace::GetVertexIndex

```
int GetVertexIndex (DWORD dwIndex);
```

```
-Ë,Ïf fbfVf...,É,é,“_ÏCf“ffbfNfX,ðŽæ“¾,·,é B,±  
,ÏCf“ffbfNfX,ÍdwIndexfpf%of [f^,ĂŽw'è,³,ê,½fCf“ffbfNfX,É'Î%ž,·,é B  
fCf“ffbfNfX,ð•Ô,· B
```

dwIndex

```
-Ë,É, ,é,“_ÏCf“ffbfNfX B
```

### IDirect3DRMFace::GetVertices

```
HRESULT GetVertices(DWORD *lpdwVertexCount, D3DVECTOR *lpPosition,  
D3DVECTOR *lpNormal);
```

Direct3DRMFaceIfufWfFfNfg'†,ì,»),ê,¼,ê,ì',“\_É,Á,¢,Ä A^Ê'u,Æ-@ üfxfNfgf<,ðŽæ“¼,·,é B

-Æ÷,·,é,ÆD3DRM\_OK AŽ,“s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,îê——,É,Á,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,î•Ô'l v,ðŽQ Æ,·,é,±,Æ B

*lpdwVertexCount*

'“\_î ”,ðŽó,~Žæ,é•İ ” B,±,îpf%of [f^,ÉNULL,ðŽw'è,·,é,±,Æ,Í,Á,«,È,¢ B

*lpPosition, lpNormal*

'“\_îÊ'u,Æ-@ üfxfNfgf<,ðŽó,~Žæ,éD3DVECTOR \‘¢‘î,î”z—ñ,Ö,îf|fCf“f^ B—¼•û,Æ,àNULL,î ê ‡ A,±  
,îf f\fbfh,îlpdwVertexCountfpf%of [f^,É,“\_î ”,ðŠi”[,·,é B

### **IDirect3DRMFace::SetColor**

HRESULT SetColor(D3DCOLOR color);

Direct3DRMFaceIfuWfFfNfg, Ì F, ð Ý'è, ,é B

-E÷, ,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

color

Ý'è, ,é F B

ŽQ Æ @IDirect3DRMFace::GetColor

### **IDirect3DRMFace::SetColorRGB**

HRESULT SetColorRGB(D3DVALUE red, D3DVALUE green, D3DVALUE blue);

Direct3DRMFaceIfufWfFfNfg, Ì F, ðR, G, B'l, Â Ý'è, ·, é B

-E±, ·, é, ÆD3DRM\_OK AŽ, ”s, ·, é, ÆfGf%o [, ð•Ô, · B•Ô'l, Îê——, É, Â, ç  
, Ä, Í A uDirect3D•ÛŽ f, [fh, Î•Ô'l v, ðŽQ Æ, ·, é, ±, Æ B

*red, green, blue*

Ô A—Î A Â, Ì F—v'f B

**IDirect3DRMFace::SetMaterial**

HRESULT SetMaterial(LPDIRECT3DRMMATERIAL lpD3DRMMaterial);

Direct3DRMFaceIfuWfFfNfg,Éf}fefŠfAf<,ðfZfbfg,·,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,Ī•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lpD3DRMMaterial

f}fefŠfAf<,ĪfAfhfŒfX B

ŽQ Æ @IDirect3DRMFace::GetMaterial

### **IDirect3DRMFace::SetTexture**

HRESULT SetTexture(LPDIRECT3DRMTEXTURE lpD3DRMTexture);

Direct3DRMFaceIfuWfFfNfg,ÉfefNfXf`ff,ðfZfbfg,·,é B

-E÷,·,é,ÆD3DRM\_OK AŽ,"s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,ç  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ī•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lpD3DRMTexture  
fefNfXf`ff B

ŽQ Æ @IDirect3DRMFace::GetTexture

**IDirect3DRMFace::SetTextureCoordinates**

HRESULT SetTextureCoordinates(DWORD vertex, D3DVALUE u, D3DVALUE v);

Direct3DRMFaceIfufWfFfNfg't,Ì',“\_̀ìfefNfXf`ff À•W,ð Ý'è,·,é B

-E÷,·,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

vertex

Ý'è,·,é',“\_̀ìfCf“fffbfNfX B,½,Æ,|,Î A-Ê,ªŽOŠpE`ì,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);

Direct3DRMFaceIfuWfFfNfg,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,Œ  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ĵ•Ô'l v,đŽQ Æ,·,é,±,Æ B

cylU, cylV

fefNfXf`ff,^u,Æv,Ĵ,ç,ç,ĴŽŸŒ³,Â%~'Œ^Ê‘Š,đŽ ,Á,Ä,Œ,é,©,đŽ',· B

ŽQ Æ @IDirect3DRMFace::GetTextureTopology

## IDirect3DRMFrame

*fAfVfŠfP [fVf‡f“Í Aftf€ [f€ ifIfufWfFfNfg,İftf€ [f€,İŽQ Æ j,ÆEÝ,¢  
,É,â,èŽæ,è,·,é,½,ß,ÉIDirect3DRMFramefCf“f^ [ftfFfCfX,İf f\fbfh,đŽg—p,·,é B,±  
,İfZfNfVf‡f“Í AIDirect3DRMFramefCf“f^ [ftfFfCfX Ef f\fbfh,İfŠftf@f€f“fX,Â, ,é BŠT”O,É,Â,¢,Ä,İŠT—  
v,Í A uIDirect3DRMFrame,ÆIDirect3DRMFrameArrayfCf“f^ [ftfFfCfX v,đŽQ Æ,·,é,±,Æ B*

*IDirect3DRMFramefCf“f^ [ftfFfCfX Ef f\fbfh,Í A`È%°,İfOf< [fv,É•ª—b,·,é,±,Æ,ª,Â,«,é B*

*”w€i*                    [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](#)

*€đ€¹*                [AddLight](#)  
                          [DeleteLight](#)  
                          [GetLights](#)

*f [fh*                [Load](#)

*f}fefŠfAf·f,ff·*    [GetMaterialMode](#)  
                          [SetMaterialMode](#)

*^Ê’u,Æ^Ú“®*        [AddMoveCallback](#)  
                          [AddRotation](#)  
                          [AddScale](#)  
                          [AddTranslation](#)  
                          [DeleteMoveCallback](#)

GetOrientation

GetPosition

GetRotation

GetVelocity

LookAt

Move

SetOrientation

SetPosition

SetRotation

SetVelocity

•³—p

GetSortMode

GetZbufferMode

SetSortMode

SetZbufferMode

fefNfXf`ff

GetTexture

GetTextureTopology

SetTexture

SetTextureTopology

•iš·

AddTransform

GetTransform

InverseTransform

Transform

fxfWf...

fAf< EfIfufWf

FfNfg

AddVisual

DeleteVisual

GetVisuals

IDirect3DRMFramefCf“f^ [ftFfCfX,Í A,·,×,Ä,ÌCOMfCf“f^ [ftFfCfX,E“—

l A|UnknownfCf“f^ [ftFfCfX Ef f\fbfh,ðEp ³,;é BIUnknownfCf“f^ [ftFfCfX,ÍŽÿ,ì,R,Â,ìf f\fbfh,ðfTf|  
[fg,·,é B

AddRef

QueryInterface

Release

,³,ç,É AIDirect3DRMFramefCf“f^ [ftFfCfX,Í A|Direct3DRMObjectfCf“f^ [ftFfCfX,©,çŽÿ,ìf f\fbfh,ðEp ³,;  
é B

AddDestroyCallback

Clone

DeleteDestroyCallback

GetAppData

GetClassName

GetName

SetAppData

**SetName**

Direct3DRMFramefIfufWfFfNfg,Í **AIDirect3DRM::CreateFramef** f\fbfh,ìCEÄ,Ñ o,μ,É,æ,Á,ÄŽæ<sup>34</sup>,<sup>3</sup>,ê,é B

### IDirect3DRMFrame::AddChild

HRESULT AddChild(LPDIRECT3DRMFRAME lpD3DRMFrameChild);

ftfCE [f€ŠK'w,ÉŽqftfCE [f€,đ'Ç%Á,·,é B  
-CE÷,·,é,ÆD3DRM\_OK AŽ, "s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,Îê——,É,Â,ç  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ī•Ô'l v,đŽQ Æ,·,é,±,Æ B

lpD3DRMFrameChild  
ŽqftfCE [f€,Æ,μ,Ä'Ç%Á,·,éDirect3DRMFrameIfufWfFfNfg B

ŽqftfCE [f€,Æ,μ,Ä'Ç%Á,·,éftfCE [f€,ª,·,Ä,É e,đŽ ,Á,Ä,ç,é ê ÷ A,±,Īf f\fbfh,Í A V,μ,ç eftfCE [f€  
,É'Ç%Á,·,é'O,É^È'O,Ī eftfCE [f€,đŽæ,è æ, B

IfufWfFfNfg•ĪŠ,đ~ŮŽ ,·,é,½,ß AAddChildf f\fbfh,đŽg—  
p,·,é'O,ÉIDirect3DRMFrame::GetTransform f\fbfh,đCEÄ,Ñ o,μ AfIfufWfFfNfg,Ī•ĪŠ· s—ñ,đŽæ“¾,·,é,×,«,Ä, ,é  
B,»,ª,·,é,Ī AftfCE [f€,đ'Ç%Á,μ,½CEä,à•ĪŠ,·,đ•t,·,ç,ê,é B

## IDirect3DRMFrame::AddLight

HRESULT AddLight(LPDIRECT3DRMLIGHT lpD3DRMLight);

ftfĈ [fĈ,ÉĈĉĈĈ¹,đ'Ĉ%ŌÁ,·,é B

-Ĉ÷,·,é,ĈD3DRM\_OK AŽ,"s,·,é,ĈfGf% [,đ•Ō,· B•Ō'l,Îĉ——,É,Ĉ,Ĉ  
,Ĉ,Ĉ A uDirect3D•ŪŽ f, [fh,Ĉ•Ō'l v,đŽQ Ĉ,·,é,±,Ĉ B

lpD3DRMLight

ftfĈ [fĈ,É'Ĉ%ŌÁ,·,éDirect3DRMLightfIfufWfFfNfg,đŽ!,·Ĉ "ĈfAfhfĈfX 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`ìff [f^ B

ŽQ Æ @IDirect3DRMFrame::Move,

IDirect3DRMFrame::DeleteMoveCallback

**IDirect3DRMFrame::AddRotation**

HRESULT AddRotation(D3DRMCOMBINETYPE rctCombine, D3DVALUE rvX, D3DVALUE rvY, D3DVALUE rvZ, D3DVALUE rvTheta);

rvTheta, f%ofWfAf““PÊ, ĀŽ' , μ, ½%ñ“]Šp“x B

–CE÷, , é, ED3DRM\_OK AŽ, ”s, , é, AfGf% [ , ð•Ô, : B•Ô'l, Îê—, É, Â, ģ, Ä, Í A uDirect3D•ŮŽ f, [fh, Î•Ô'l v, ðŽQ Æ, , , é, ±, Æ B

rctCombine

V, μ, ģ%ñ“], ðCE» Ý, ðCE» Ý, ðftfCE [f€•İŠ, Æ ‡ -, , , é•û-@, ðŽ', : AD3DRMCOMBINETYPE— ñ“CE^, İf f“fo B

rvX, rvY, rvZ

%ñ“]Ž² B

rvTheta

f%ofWfAf““PÊ, ĀŽ' , μ, ½%ñ“]Šp“x B

Žw'è, ³, ê, ½%ñ“], Í A, ±, İDirect3DRMFramefCf“f^ [ftfFfCfX, É, æ, Á, ĀŽ-•Ê, ³, ê, éftfCE [f€, İ•İŠ· s— ñ, ¾, -, ð•İ X, , , é B, ±, İf f\fbfh, Í AfCEf“f\_Šf“fO, İf^fCf~f“fO, ², Æ, É s—

ñ, ð•İ X, , éIDirect3DRMFrame::SetRotation, Æ, Í^Û, È, è AftfCE [f€ ã, İfIfufWfFfNfg, İ•İ X, Í1%ñ, İ, 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,ÄftfE [f€,lf [fJf<iš·,ðfXfP [fŠf“fo,·,é B

-E÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð·Ô,· B·Ô'l,îê——,É,Á,¢  
,Ä,Í A uDirect3D·ŮŽ f, [fh,î·Ô'l v,ðŽQ Æ,·,é,±,Æ B

rctCombine

V,µ,¢ kŽÚ,ðE» Ý,îftfE [f€·iš·,Æ ‡ -,·,é·û-@,ðŽ!,· AD3DRMCOMBINETYPE—ñ“E^,lf f“fo B

rvX, rvY, rvZ

x Ay Az·ûEü,î kŽÚEw ”,ð'è\,·,é B

Žw'è,³,ê,½·iš·,Í A,±,îIDirect3DRMFramefCf“f^ [ftfFfCfX,É,æ,Á,ÄŽ·Ê,³,ê,éftfE [f€,î·iš· s—ñ,¾,¯,ð·í X,·,é B

ŽQ Æ @3D·iš·

**IDirect3DRMFrame::AddTransform**

```
HRESULT AddTransform(D3DRMCOMBINETYPE rctCombine,
    D3DRMMATRIX4D rmMatrix);
```

*rctCombine* pf%of [f^,l',É ],¢ Aftf¢ [f€,lf [fJf< À•W,ðfAftfBf“•İŠ•,•é B  
-¢÷,•é,ÆD3DRM\_OK AŽ,”s,•é,ÆfGf%o [,ð•Ô,• B•Ô'l,İê—,É,Á,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,İ•Ô'l v,ðŽQ Æ,•é,±,Æ B

*rctCombine*  
V,µ,¢•İŠ•,ð¢» Ý,İ•İŠ•,Æ ‡ ¬,•é•û-@,ðŽ!,• AD3DRMCOMBINETYPE—ñ<“¢^,İf f“fo B

*rmMatrix*  
‡ ¬,³,ê,é•İŠ• s—ñ,ð'è`•,éD3DRMMATRIX4D”z—ñ,İf f“fo B

•İŠ•,É,Í4 s4—ñ,İ s—ñ,ðŽw'è,•é,ª AfAftfBf“•İŠ•,ð~—p,•é,½,ß A Å¢ã,İ—ñ,Í[0 0 0 1],İ“]’u s—ñ,Å,È,-  
,Ä,Í,È,ç,È,¢ B

Žw'è,³,ê,½•İŠ•,Í A,±,İDirect3DRMFramefCf“f^ [ftfFfCfX,É,æ,Á,ÄŽ~•Ê,³,ê,éftf¢ [f€,İ•İŠ• s—ñ,¾,¬,ð•İ X,•é B  
ŽQ Æ @3D•İŠ•

**IDirect3DRMFrame::AddTranslation**

HRESULT AddTranslation(D3DRMCOMBINETYPE rctCombine, D3DVALUE rvX,  
D3DVALUE rvY, D3DVALUE rvZ);

(rvX, rvY, rvZ), É, æ, é, ĩŠ, ðftfĈ [fĈ, ĩf [fJfĈ À•WĈEn, É'Ç%Á, , é B

-ĈÉ, , , é, ĈD3DRM\_OK AŽ, ”s, , é, ĈfGf% [ , ð•Ô, : B•Ô'l, ĩĉ—, É, Ĉ, Ĉ  
, Ä, ĩ A uDirect3D•ŮŽ f, [fh, ĩ•Ô'l v, ðŽQ Ĉ, , , é, ±, Ĉ B

rctCombine

V, µ, Ĉ•ĩŠ, ðĈ» Ý, ĩ•ĩŠ, Ĉ ± -, , , é•ŭ-@, ðŽ!, • AD3DRMCOMBINETYPE—ñĈ“Ĉ^, ĩf f“fo B

rvX, rvY, rvZ

x Ay Az•ŭĈü, ĩĉĉ'u•ĩ X, ðĉèĈ, , , é B

Žw'è, ³, é, ½•ĩŠ, ĩ A, ±, ĩDirect3DRMFramefĈf“f^ [ftfFfĈfX, É, æ, Á, ÄŽ-•Ĉ, ³, é, éftfĈ [fĈ, ĩ•ĩŠ s—ñ, ¼, -, ð•ĩ X, , , é B

ŽQ Ĉ @3D•ĩŠ.

**IDirect3DRMFrame::AddVisual**

HRESULT AddVisual(LPDIRECT3DRMVISUAL lpD3DRMVisual);

ftfCE [f€,ÉfrfWf...fAf< EfIfufWfFfNfg,đ'Ç%Á,·,é B  
-CE÷,·,é,ÆD3DRM\_OK AŽ,"s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,Îê——,É,Â,ç  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ī•Ó'l v,đŽQ Æ,·,é,±,Æ B

lpD3DRMVisual  
ftfCE [f€,É'Ç%Á,·,éDirect3DRMVisualfIfufWfFfNfg,đŽ',·Ī " B

frfWf...fAf< EfIfufWfFfNfg,Í Af fbfVf...,ÆfefNfXf`ff,đšÜ,Đ BftfCE [f€,ÉfrfWf...  
fAf< EfIfufWfFfNfg,ªÇ%Á,³,ê,é,Æ AftfCE [f€,ªfrf...  
[,É'¶ Ý,·,ê,ÎfIfufWfFfNfg,Í%ÁŽ< ó'Ô,Æ,È,é BfrfWf...fAf< EfIfufWfFfNfg,ÍftfCE [f€,©,çŽQ Æ,³,ê,é B

### IDirect3DRMFrame::DeleteChild

HRESULT DeleteChild(LPDIRECT3DRMFRAME lpChild);

ftfCE [f€,đŠK'w,©,ç í œ,·,é BftfCE [f€,žQ Æ,³,ê,Ä,ç,È,¯,ê,Î A,·,×,Ä,İžqftfCE [f€ ACEöCE¹ Af fbVf...  
,Æ,Æ,à,É"jŠü,³,ê,é B

-CE÷,·,é,ÆD3DRM\_OK AŽ,"s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,İê——,É,Ä,ç  
,Ä,Í A uDirect3D•ŮŽ f, [fh,İ•Ô'l v,đŽQ Æ,·,é,±,Æ B

lpChild

ŽqftfCE [f€,Æ,µ,ÄŽg,í,ê,Ä,ç,éDirect3DRMFramefIfufWfFfNfg,đŽ!,•İ " B

ŽQ Æ @ŠK'w



**IDirect3DRMFrame::DeleteMoveCallback**

```
HRESULT DeleteMoveCallback(D3DRMFRAMEMOVECALLBACK d3drmFMC,  
    VOID * lpArg);
```

“Á•Ê,È˘Ú“® ^— ,đŽÄ s,µ,½fR [f<fofbfNŠÖ ”,đ í œ,·,é B

-œ÷,·,é,ÆD3DRM\_OK AŽ,“s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,îê——,É,Á,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,î•Ô'l v,đŽQ 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);

ftfĀ [fĀ,©,çfrfWf...fAf< EflfufWfFfNfg,đ í œ,·,é BfrfWf...fAf< EflfufWfFfNfg,ªŽQ Ā,³,ê,Ā,ĉ  
,Ē,¯,ê,Î”jŠü,·,é B

-Ā÷,·,é,ĀD3DRM\_OK AŽ, ”s,·,é,ĀfGf%∞ [,đ•Ô,· B•Ô'l,Îê——,É,Ā,ĉ  
,Ā,Ī A uDirect3D•ŮŽ f, [fh,Ī•Ô'l v,đŽQ Ā,·,é,±,Ā B

lpD3DRMVisual

í œ,·,éDirect3DRMVisualfIfufWfFfNfg,đŽ!,·Ī ”,ĪfĀhfĀfX B

**IDirect3DRMFrame::GetChildren**

HRESULT GetChildren(LPDIRECT3DRMFRAMEARRAY\* lpChildren);

Direct3DRMFrameArrayIfufWfFfNfg, ìĈ`Ž®, ĀŽqftfĈ [fĈ, ìfŠfXfg, đŽæ“¾, ·, é B

–Ĉ÷, ·, é, ĀD3DRM\_OK AŽ, ”s, ·, é, ĀfGf%o [, đ•Ô, · B•Ô'l, Îê——, É, Ā, ĸ  
, Ā, Í A uDirect3D•ŮŽ f, [fh, Ī•Ô'l v, đŽQ Ā, ·, é, ±, Ā B

lpChildren

ĈĀ, Ñ o, μ, a –Ĉ÷, μ, ½, Ā, «, É A—LĈø, ÈDirect3DRMFrameArray|fCf“f^, “ü, éf|fCf“f^, ìfAfhfĈfX B

ŽQ Ā @Direct3DRMFrameArray, ŠK'w

**IDirect3DRMFrame::GetColor**

D3DCOLOR GetColor();

ftfŒ [f€‚ì F,đŽæ“¾,·,é B

Direct3DRMFramefIfufWfFfNfg,ì F,đ•Ô,· B

ŽQ Æ @IDirect3DRMFrame::SetColor

### **IDirect3DRMFrame::GetLights**

HRESULT GetLights(LPDIRECT3DRMLIGHTARRAY\* lpLights);

Direct3DRMLightArrayIfufWfFfNfg, ìCE`Ž@, ÅftfCE [f€, ìCEõCE!fŠfXfg, ðŽæ“¼, ·, é B

-CE÷, ·, é, ÆD3DRM\_OK AŽ, ”s, ·, é, ÆfGf%o [, ð•Ô, · B•Ô'l, Îê——, É, Â, ç, Ä, Í A u  
Direct3D•ÛŽ f, [fh, Î•Ô'l v, ðŽQ Æ, ·, é, ±, Æ B

*lpLights*

CEÄ, Ñ o, µ, a -CE÷, µ, ½, Æ, «, É A—LCEø, ÈDirect3DRMLightArrayf|fCf“f^, “ü, éf|fCf“f^, ÌfAfhfCEfX B

ŽQ Æ @IDirect3DRMLightArray

## **IDirect3DRMFrame::GetMaterialMode**

D3DRMMATERIALMODE GetMaterialMode();

ftfE [fE,lf}fefŠfAf<f, [fh,đŽæ“¾,·,é B

E» Ý,lf}fefŠfAf<f, [fh,đŽ!,·D3DRMMATERIALMODE—ñ<“E^f f“fo,Ì,Đ,Æ,Â,đ•Ô,· B

ŽQ Æ @IDirect3DRMFrame::SetMaterialMode

**IDirect3DRMFrame::GetOrientation**

HRESULT GetOrientation(LPDIRECT3DRMFRAME lpRef, LPD3DVECTOR lprvDir, LPD3DVECTOR lprvUp);

ftfCE [f€, ìEü, «, ðŽæ“¾, , é B, ±, ì•ûEü, Í AŽw'è, ³, ê, ½ŽQ ÆftfCE [f€, ©, ç, Š'Î“l, É•\, ³, ê, é B  
-CE÷, , é, ÆD3DRM\_OK AŽ, ”s, , é, ÆfGf%o [, ð•Ô, : B•Ô'l, Îê——, É, Â, ç  
, Ä, Í A uDirect3D•ÛŽ f, [fh, ì•Ô'l v, ðŽQ Æ, , é, ±, Æ B

lpRef  
ŽQ Æ, Æ, µ, Ä—p, ç, ç, éDirect3DRMFramefIfufWfFfNfg, ðŽ!, •İ ” B

lprvDir, lprvUp  
ftfCE [f€, ìzŽ², ÆyŽ², ì•ûEü, ðŽó, Žæ, éD3DVECTOR \ç'î B

ŽQ Æ @IDirect3DRMFrame::SetOrientation

### IDirect3DRMFrame::GetParent

```
HRESULT GetParent(LPDIRECT3DRMFRAME* lpParent);
```

» Ý, ðftf [f€, ð e f t f [f€, ð Ž æ “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•ÜŽ f, [fh, Î•Ó'l v, ðŽQ Æ, ·, é, ±, Æ B

lpParent

ftf [f€, ð e, ðŽ, ·Direct3DRMFramefIfufWfFfNfg, Ö, ð|fCf“f^, ðŽó, ~Žæ, éf|  
fCf“f^, ðfAfhfCEfX BCE» Ý, ðftf [f€, ð e f t f [f€, ð ê ‡ A, ±, ð|fCf“f^, É, ÍNULL, ð Ý'è, ³, ê, é B

### IDirect3DRMFrame::GetPosition

HRESULT GetPosition(LPDIRECT3DRMFRAME lpRef, LPD3DVECTOR lprvPos);

Žw'è,³,ê,½ŽQ AftfĀ [fĀ,©,ç,Ì AftfĀ [fĀ,ÌŠ'ÎÊ'u,ðŽæ“¾,·,é i,½,Ā,Ī,Ī A,±,Īf f\bfbh,ĪftfĀ [fĀ  
,ĪŽQ A,©,ç,Ī←—Ł,ðŽæ“¾,·,é j B←—Ł,Ī A^êŽŸĀ³,ĪTfCfY,Ā,μ,Ā,Ā,Ī,È,-  
AfxfNfgf<,Ā,μ,ĀlprvPosfpf%of [f^,ÉŠi”[,³,ê,é B

-Ā±,·,é,ĀD3DRM\_OK AŽ,“s,·,é,ĀfGf%o [,ð•Ô',· B•Ô'l,Îê—,É,Ā,Ā  
,Ā,Ī A uDirect3D•ŮŽ f. [fh,Ī•Ô'l v,ðŽQ A,·,é,±,Ā B

lpRef

ŽQ A,Ā,μ,Ā—p,Ā,ç,ç,éDirect3DRMFramefIfufWfFfNfg,ðŽ',·Ī ” B

lprvPos

ftfĀ [fĀ,ÎÊ'u,ðŽó,~Žæ,éD3DVECTOR \‘Ā'Ī B

ŽQ A @IDirect3DRMFrame::SetPosition

### **IDirect3DRMFrame::GetRotation**

HRESULT GetRotation(LPDIRECT3DRMFRAME lpRef, LPD3DVECTOR lprvAxis, LPD3DVALUE lprvTheta);

ftfCE [f€,ì%õñ“],đŽæ“¾,·,é B%õñ“],Í AŽw`è,³,ê,½ŽQ ÆftfCE [f€,©,ç‘Š‘Í“l,É•\,³,ê,é B  
-CE÷,·,é,ÆD3DRM\_OK AŽ,“s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,Îê——,É,Á,ç  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Î•Ô'l v,đŽQ Æ,·,é,±,Æ B

lpRef  
ŽQ Æ,Æ,µ,Ä—p,ç,ç,é,éDirect3DRMFramefIfufWfFfNfg,đŽ!,·•İ ” B

lprvAxis  
ftfCE [f€,ì%õñ“]Ž²,đŽó,~Žæ,éD3DVECTOR \‘ç‘İ B

lprvTheta  
ftfCE [f€,ì%õñ“],đf%ofWfAf““P^Ê,ÄŽó,~Žæ,é•İ ” B

ŽQ Æ @IDirect3DRMFrame::SetRotation, •İŠ

### IDirect3DRMFrame::GetScene

```
HRESULT GetScene (LPDIRECT3DRMFRAME* lpRoot);
```

Žw'è,³,ê,½ftfĀ [fĀ,ðŠŮ,ðŠK'w,îfĀ [fg EftfĀ [fĀ,ðŽæ“¼,·,é B

-Ā÷,·,é,ĀD3DRM\_OK AŽ,“s,·,é,ĀfGf%o [,ð•Ō,· B•Ō'l,Îê——,É,Ā,ĉ  
,Ā,Ī A uDirect3D•ŮŽ f, [fh,Ī•Ō'l v,ðŽQ Ā,·,é,±,Ā B

lpRoot

fV [f“,Ī Ā ãêftfĀ [fĀ,ðŽ',·Direct3DRMFramefIfufWfFfNfg,ðŽó,Žæ,éf|fCf“f^,Ō,Īf|fCf“f^ B

## **IDirect3DRMFrame::GetSceneBackground**

D3DCOLOR GetSceneBackground();

*fV* [f“,l”wEi F,đŽæ“¾,.é B

F,đ•Ô,. B

## **IDirect3DRMFrame::GetSceneBackgroundDepth**

```
HRESULT GetSceneBackgroundDepth(  
    LPDIRECTDRAW_SURFACE * lpDDSsurface);
```

*lpDDSsurface* [f“ ,lE» Ý,ì”wEi [“xfobftf@,đŽæ“¾,.,é B

-E÷,.,é,ED3DRM\_OK AŽ,”s,.,é,ÆfGf%o [,đ•Ô,· B•Ô'l,îê——,É,Á,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,î•Ô'l v,đŽQ Æ,.,é,±,Æ B

*lpDDSsurface*

E» Ý,ì”wEi [“xfobftf@,đŽ!,·DirectDrawfT [ftfFfX,îfAfhfEfX,“ü,éf|fCf“f^,îfAfhfEfX B

ŽQ Æ @**IDirect3DRMFrame::SetSceneBackgroundDepth**

## **IDirect3DRMFrame::GetSceneFogColor**

D3DCOLOR GetSceneFogColor();

*fV* [f“ , ìftfHfO, ì F, ðŽæ“¾, ·, é B

*ftfHfO, ì F, ð•Ô, · B*

### **IDirect3DRMFrame::GetSceneFogEnable**

BOOL GetSceneFogEnable();

±, ìfV [f“ , Å ACE» ÝftfHfO,ª—LCEø, Å, , é, ©, Ç, □, ©, ð•Ô, · B  
ftfHfO,ª—LCEø, Å, , ê, ÎTRUE A, » , □, Å, È, ¯, ê, ÎFALSE, ð•Ô, · B

### **IDirect3DRMFrame::GetSceneFogMode**

D3DRMFOGMODE GetSceneFogMode();

, ±, ìfV [f“, ìE» Ý, ìftfHfO Ef, [fh, ð•Ô, · B

E» Ý, ìftfHfO Ef, [fh, ðŽ, · **D3DRMFOGMODE**—ñ<“E^, ìf f“fo, ì, D, Æ, Â, ð•Ô, · B

### IDirect3DRMFrame::GetSceneFogParams

```
HRESULT GetSceneFogParams(D3DVALUE * lprvStart, D3DVALUE * lprvEnd,  
    D3DVALUE * lprvDensity);
```

```
,±,ìfV [f“,ìE» Ý,ìftfHfO Efpf%of [f^,ðŽæ“%4,.,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,î•Ô'l v,ðŽQ Æ,.,é,±,Æ B
```

```
lprvStart, lprvEnd, lprvDensity  
ftfHfO,ìŽn“_ A I“_ A-š“x,ì'l,ðŽó,~Žæ,é•Ī ” B
```

### **IDirect3DRMFrame::GetSortMode**

D3DRMSORTMODE GetSortMode();

ŽqftfĒ [fĒ,đ ^— ,:é,½,ß,ÉŽg,í,ê,é<sup>a</sup>—Đf, [fh,đŽæ“¾, :é B  
•<sup>a</sup>—Đf, [fh,đŽ!,D3DRMSORTMODE—ñ“Ē^,Īf f“fo,đ•Ō,· B

ŽQ Æ @IDirect3DRMFrame::SetSortMode

### **IDirect3DRMFrame::GetTexture**

HRESULT GetTexture(LPDIRECT3DRMTEXTURE\* lpTexture);

Žw'è,³,ê,½ftfĈ [f€,̀ìfefNfXf`ff,ðŽæ“¾,·,é B

-Ĉ÷,·,é,ÆD3DRM\_OK AŽ,“s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,ĉ  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ĭ•Ó'l v,ðŽQ Æ,·,é,±,Æ B

lpTexture

ftfĈ [f€,̀ìfefNfXf`ff,ðŽì,·Direct3DRMTextureIfufWfFfNfg,ðŽó,~Žæ,éf|fCf“f^,Ö,Ìf|fCf“f^ B

ŽQ Æ @IDirect3DRMFrame::SetTexture

### **IDirect3DRMFrame::GetTextureTopology**

HRESULT GetTextureTopology(BOOL \* lpbWrap\_u, BOOL \* lpbWrap\_v);

Žw'è,³,ê,½ftfĈ [fĚ ã,ìfIfufWfFfNfg,Éf}fbfv,³,ê,é,Ā,«,ì AfefNfXf`ff,ìÊ'Š'Á «,ðŽæ"¼,·,é B

-Ĉ÷,·,é,ĀD3DRM\_OK AŽ,"s,·,é,ĀfGf%o [,ð•Ô,· B•Ô'l,Ìê——,É,Ā,ĉ  
,Ā,Í A uDirect3D•ŮŽ f, [fh,Ī•Ô'l v,ðŽQ Ā,·,é,±,Ā B

lpbWrap\_u, lpbWrap\_v

Ĉ%oÊ,ðŽó,~Žæ,é•Ī " BfefNfXf`ff,³u•ûĈü,âv•ûĈü,Éf}fbfv,³,ê,é,Ā,« A,»,ê,¼,ê,Ī•Ī ",ÉTRUE,ª Ý'è,³,ê,é B

ŽQ Ā @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, ç  
, 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!, •, Ì, 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 ÆftfĀ [fĀ,É'Ī,·,é AftfĀ [fĀ,Ī'Š'Ī'¬“x,đŽæ“¼,·,é B

¬Ā÷,·,é,ÆD3DRM\_OK AŽ,“s,·,é,ÆfGf%o [,đ•Ō,· B•Ō'l,Īê——,É,Ā,ĉ  
,Ā,Ī A uDirect3D•ŪŽ f, [fh,Ī•Ō'l v,đŽQ Æ,·,é,±,Æ B

*lpRef*

ŽQ Æ,Æ,μ,Ā—p,ĉ,ĉ,ê,éDirect3DRMFramefIfufWfFfNfg,đŽ!,·Ī ” B

*lprvVel*

ftfĀ [fĀ,Ī'¬“x,đŽó,¬Žæ,éD3DVECTOR \‘ĉ'Ī,ĪAfhfĀfX B

*fRotVel*

êŽŸĀ³,Ī'¬“x,đŽæ“¼,·,é ê ‡IfufWfFfNfg,Ī%oñ“]’¬“x,ª l—¶,É“ü,ê,ĉ,ê,é,©,Ĉ,ª,©,đŽ!,·ftf%ofO B,±  
,Īfpf%of [f^,ÉTRUE,đŽw'è,·,é,ÆfIfufWfFfNfg,Ī%oñ“]’¬“x,ªĀvŽŽ,ÉŠŪ,ß,ĉ,ê,é B

ŽQ Æ @**IDirect3DRMFrame::SetVelocity**

### IDirect3DRMFrame::GetVisuals

HRESULT GetVisuals(LPDIRECT3DRMVISUALARRAY\* lpVisuals);

ftfE [fE ã, ìfrfWf...fAf<, ìfŠfXfg, ðŽæ“¾, ·, é B

-E÷, ·, é, ED3DRM\_OK AŽ, ”s, ·, é, AfGf%o [, ð•Ô, · B•Ô'l, Îê——, É, Â, ç  
, Ä, Í A uDirect3D•ÜŽ f, [fh, Î•Ô'l v, ðŽQ Æ, ·, é, ±, Æ B

lpVisuals

EA, Ñ o, µ, a -E÷, µ, ½, Æ, «, É A—LCEø, ÈDirect3DRMVisualArray f|fCf“f^, Å %oŠú%o», ³, ê, éf|  
fCf“f^, ìfAfhfCEfX B

**IDirect3DRMFrame::GetZbufferMode**

D3DRMZBUFFERMODE GetZbufferMode();

Zfofbftf@ Ef, [fh,đŽæ“%4,;é B,·,È,í,ç AZfofbftf@fŠf“fo,ª—LŒø,©³Œø,©,đŽ!,· B

D3DRMZBUFFERMODE—ñ“Œ^,Ïf “fo,Ï,Đ,Æ,Â,đ•Œ,· B

ŽQ Æ @IDirect3DRMFrame::SetZbufferMode

**IDirect3DRMFrame::InverseTransform**

HRESULT InverseTransform(D3DVECTOR \*lprvDst, D3DVECTOR \*lprvSrc);

*lprvSrc* f p f % f [ f ^, a Ž, · f x f N f g f <, δ f [ f < f h À · W, ©, ç f, f f f < À · W, É · Ĩ Š ·, μ A Ę < % Ń É, δ lprvDst f p f % f [ f ^, É · Ô, · B

- Ę ÷, ·, é, Ą D3DRM\_OK A Ž, ” s, ·, é, Ą f G f % [, ð · Ô, · B · Ô ' l, Ĩ ě —, É, Ā, ç  
, Ā, Ĩ A u Direct3D · Ů Ž f, [ f h, Ĩ · Ô ' l v, ð Ž Q Ą, ·, é, ±, Ą B

*lprvDst*  
· Ĩ Š · Ę < % Ń É, ð Ž ó, Ž æ, é D3DVECTOR \ ' ç ' Ĩ B

*lprvSrc*  
· Ĩ Š ·, Ĩ f \ [ f X, Ą, É, é D3DVECTOR \ ' ç ' Ĩ B

Ž Q Ą @ IDirect3DRMFrame::Transform, 3D · Ĩ Š

## IDirect3DRMFrame::Load

```
HRESULT Load(LPVOID lpvObjSource, LPVOID lpvObjID,  
             D3DRMLOADOPTIONS d3drmLOFlags,  
             D3DRMLOADTEXTURECALLBACK d3drmLoadTextureProc, LPVOID lpArgLTP);
```

Direct3DRMFrameIfufWfFfNfg,đf [fh,·,é B

–Œ±,·,é,ÆD3DRM\_OK AŽ,“s,·,é,ÆfGf%o [ ,đ•Ô,· B•Ô'l,îê——,É,Â,Œ  
,Ä,Í A uDirect3D•ŮŽ f, [fh,î•Ô'l v,đŽQ Æ,·,é,±,Æ B

lpvObjSource

fIfufWfFfNfg,af [fh,³,ê,é\ [fX Bd3drmLOFlagsfpf%of [f^,ªŽ',·f\ [fX Eftf%ofO,É,æ,Á,Ä Aftf@fCf<  
AfŠf\ [fX Af f, fŠ Efuf fbfn A,Ü,½,ÍfXfgfŠ [f€,đŽw'è,·,é B

lpvObjID

f [fh,·,éIfufWfFfNfg,î¼'O,Ü,½,ÍÊ'u B,±  
,îfpf%of [f^,îd3drmLOFlagsfpf%of [f^,ªŽ',·Ž-ÊŽqftf%ofO,É,æ,Á,Ä%đŽB,³,ê,é BD3DRMLOAD\_BYPOSITIO  
Nftf%ofO,đŽw'è,µ,½ ê ± A,±,îfpf%of [f^,Íftf@fCf<,î†,îIfufWfFfNfg,î ± ~,đŽ',·DWORD'l,Ō,îf|  
fCf“f^,Ä,·,é B,±,îfpf%of [f^,É,ÍNULL,đŽw'è,·,é,±,Æ,à,Ä,«,é B

d3drmLOFlags

f [fh EfIfvfVf±f“,đŽ',·D3DRMLOADOPTIONS(Œ^,î'l B

d3drmLoadTextureProc

**D3DRMLOADTEXTURECALLBACK** fR [f<f ofbfNŠÖ ” B,±,ê,Í A“Á•Ê,ÈftfH [f}fbfG,đ•K—  
v,Æ,·,éIfufWfFfNfg,ª—p,Œ,éfefNfXf ff,đ“Œ,Ý o,·,Æ,«,ÉŒÄ,Ñ o,³,ê,é B,±  
,îfpf%of [f^,É,É,ÍNULL,đŽw'è,·,é,±,Æ,ª,Ä,«,é B

lpArgLTP

**D3DRMLOADTEXTURECALLBACK** fR [f<f ofbfNŠÖ ”,É“n,³,ê,é AfAfvfŠfP [fVf±f““è<,îff [f^ B

ffftfHf<fg,Á,Í A,±,îf f\fbfh,Í lpvObjSource fpf%of [f^,ÁŽw'è,³,ê,½ftf@fCf<,î†,î Á %o  
,îftfŒ [f€ŠK'w,đf [fh,·,é B,±,îf f\fbfh,đŒÄ,Ñ o,·ftfŒ [f€,Í A V,µ,ŒftfŒ [f€ŠK'w,î e,É,È,é B

**IDirect3DRMFrame::LookAt**

HRESULT LookAt(LPDIRECT3DRMFRAME lpTarget, LPDIRECT3DRMFRAME lpRef,  
D3DRMFRAMECONSTRAINT rfcConstraint);

Žw'è,3,ê,½ŽQ ÆftfĀ [fĀ,Æ"ăšr,μ,Ă AftfĀ [fĀ,đ-Ú•WftfĀ [fĀ,ÉĀü, A—^,!,ç,ê,½ đĀ ,Ă%õñ"]  
,đf fbfn,·,é B

-Ā±,·,é,ĀD3DRM\_OK AŽ,"s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,Îê—,É,Ă,Ā  
,Ă,Í A uDirect3D•ŮŽ f, [fh,Ī•Ô'l v,đŽQ Æ,·,é,±,Æ B

lpTarget, lpRef

-Ů•W,·,æ,ŃŽQ Æ,Æ,μ,Ă—p,Ā,ç,é,éDirect3DRMFramefIfufWfFfNfng,đŽ!,·Ī " B

rfcConstraint

%õñ"]Ž²,đŽw'è,·,éD3DRMFRAMECONSTRAINT—ñ"Ā^,Īf f"fo B

### IDirect3DRMFrame::Move

HRESULT Move(D3DVALUE delta);

—^,!,ç,ê,½ŠK'w'†,Ì,·,×,Ä,ÏftfE [fE,É%oñ“],Æ'¬“x,ð“K—p,·,é B

¬E÷,·,é,ÆD3DRM\_OK AŽ,“s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,ç  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ï•Ô'l v,ðŽQ Æ,·,é,±,Æ B

*delta*

•Ï X,·,é'¬“x,Æ%oñ“],Ï—Ê B

## **IDirect3DRMFrame::SetColor**

HRESULT SetColor(D3DCOLOR rcColor);

*ftf*€ [f€,ì F,đ Ý'è,·,é **D3DRMMATERIALMODE**—  
ñ<“€^,°D3DRMMATERIAL\_FROMFRAME,ì,Æ,« Aftf€ [f€ ä,ìf fbVf...,É,±,ì F,°Žg—p,³ê,é B  
-€÷,·,é,ÆD3DRM\_OK AŽ,°s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,îê——,É,Á,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,î•Ô'l v,đŽQ Æ,·,é,±,Æ B

*rcColor*

*ftf*€ [f€,ì V,µ,¢ F B

ŽQ Æ @**IDirect3DRMFrame::GetColor**, **IDirect3DRMFrame::SetMaterialMode**

### **IDirect3DRMFrame::SetColorRGB**

```
HRESULT SetColorRGB(D3DVALUE rvRed, D3DVALUE rvGreen,  
                    D3DVALUE rvBlue);
```

*ftf*€ [f€,ì F,ð Ý'è,.,é BD3DRMMATERIALMODE—  
ñ<“€^,°D3DRMMATERIAL\_FROMFRAME,ì,Æ,« Aftf€ [f€ ã,ìf fbVf...,É,±,ì F,°Žg—p,³,é,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,î•Ô'l v,ðŽQ Æ,.,é,±,Æ B

*rvRed, rvGreen, rvBlue*  
*ftf*€ [f€,ì V,µ,¢ F BŞe F—v'f,í0,©,ç1,î°í'í,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\_Šf“fO,³,è,éfrfWf...fAf<,lf}fefŠfAf< î•ñ,lf\ [fX,đ€~è,·,é B

-€÷,·,é,ÆD3DRM\_OK AŽ,“s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,Îê——,É,Â,¢,Ä,Í A uDirect3D•ŮŽ f, [fh,Î•Ô'l v,đŽQ Æ,·,é,±,Æ B

rmmMode

D3DRMMATERIALMODE—ñ<€^f f“fo [,ì,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);

ftfĀ [fĀ,đ•À,×,é Bz•ûĀü,ª•ûĀüfxfNfgf<[rvDx, rvDy, rvDz],É%o^,Ā Ay•ûĀü,ªfxfNfgf<[rvUx, rvUy, rvUz],É•À,Ô,æ,□  
,É,·,é B

-ĀĀ,·,é,ĀD3DRM\_OK AŽ,·s,·,é,ĀfGf%o [,đ•Ô,· B•Ô'l,ÎĀ—,É,Ā,Ā  
,Ā,Í A uDirect3D•ŮŽ f, [fh,Î•Ô'l v,đŽQ Ā,·,é,±,Ā B

lpRef

ŽQ Ā,Ā,µ,Ā—p,Ā,Ā,é,éDirect3DRMFrame fIfufWfFfNfg,đŽ,·•Ī ” B

rvDx, rvDy, rvDz

ftfĀ [fĀ,Ī V,µ,ĀzŽ² B

rvUx, rvUy, rvUz

ftfĀ [fĀ,Ī V,µ,ĀyŽ² B

ffftfHf<fg,Ā,Í AftfĀ [fĀ,Ī•ûĀüfxfNfgf<[0, 0, 1],Ā ãfxfNfgf<[0, 1, 0],đŽ ,Ā,Ā,Ā,é B

[rvUx, rvUy, rvUz],ª[rvDx, rvDy, rvDz]

,Ā•½ s,Ē Ē Ą,Í AD3DRMERR\_BADVALUEfGf%o [l,ª•Ô,ª,é B,»„ĒÈŠO,Ī Ē Ą,Í A“n,ª,é,½[rvUx, rvUy,  
rvUz]fxfNfgf<ª[rvDx, rvDy, rvDz],Ē ,¼,Ē•½-Ē ã,Ē“Š%oe,ª,é,é B

ŽQ Ā @IDirect3DRMFrame::GetOrientation

### **IDirect3DRMFrame::SetPosition**

HRESULT SetPosition(LPDIRECT3DRMFRAME lpRef, D3DVALUE rvX, D3DVALUE rvY,  
D3DVALUE rvZ);

ŽQ AftfCE [f€,©,ç,İftfCE [f€,İŠİÊ'u,đ Ý'è,;é BftfCE [f€,Í AŽQ AftfCE [f€,©,ç,İ—£,[rvX,rvY,rvZ]  
,İ ê Š,É”z'u,³,ê,é B eftfCE [f€,İ†,ÉŽqftfCE [f€,ª ì ¬,³,ê,é,Æ,«,Í A eftfCE [f€,İ[0,0,0],İÊ'u,É'u,©,ê,é B

—CE±,;é,ÆD3DRM\_OK AŽ, ”s,;é,ÆfGf%o [,đ•Ô,· B•Ô'l,İê—,É,Â,ç  
,Ä,Í A uDirect3D•ŮŽ f, [fh,İ•Ô'l v,đŽQ A,·,é,±,Æ B

*lpRef*

ŽQ A,Æ,μ,Ä—p,ç,ç,é,éDirect3DRMFramefIfufWfFfNfg,đŽ!,·İ ”,İfAfhfCEfX B

*rvX,rvY,rvZ*

ftfCE [f€,İ V,μ,çÊ'u B

ŽQ A @IDirect3DRMFrame::GetPosition

**IDirect3DRMFrame::SetRotation**

HRESULT SetRotation(LPDIRECT3DRMFRAME lpRef, D3DVALUE rvX, D3DVALUE rvY, D3DVALUE rvZ, D3DVALUE rvTheta);

ftfE [fE, l%õñ“]Ž², Æ%õñ“]Šp“x, ð Ý'è, ., é B, ±, l Ý'è, IDirect3DRM::Tick, Û, ½, l IDirect3DRMFrame::Move f\fbfh, ³EÄ, Ñ o, ³, é, é, ½, Ñ, È“K—p, ³, é, é B•üEüfxfNfgf<[rvX, rvY, rvZ] , l AŽQ ÆftfE [fE, Ä'è`³, é, é B

-E÷, ., é, ÆD3DRM\_OK AŽ, ”s, ., é, ÆfGf%o [, ð•Ô, . B•Ô'l, l^ê——, É, Ä, c , Ä, l A uDirect3D•ÛŽ f, [fh, l•Ô'l v, ðŽQ Æ, ., é, ±, Æ B

lpRef ŽQ Æ, Æ, µ, Ä—p, c, ç, é, éDirect3DRMFramefIfufWfFfNfg, ðŽ', ., l ” B

rvX, rvY, rvZ %õñ“]Ž², Æ, È, éfxfNfgf< B

rvTheta f%oWfAf““P^Ê, l%õñ“]Šp“x B

ftfE [fE ã, lIfufWfFfNfg, ð1%õñ, µ, ©•l X, µ, È, cIDirect3DRMFrame::AddRotation f\fbfh, Æ^Û, È, è A, ± , l f\fbfh, l AŽw'è, ³, é, ½%õñ“, ], É, æ, Ä, ÄfE f“f\_Šf“fO, l f^fCf~f“fO, ², Æ, É•lŠ. s—ñ, ð•l X, ., é B

ŽQ Æ @IDirect3DRMFrame::AddRotation, IDirect3DRMFrame::GetRotation

## **IDirect3DRMFrame::SetSceneBackground**

HRESULT SetSceneBackground(D3DCOLOR rcColor);

*fV* [f“,”wEi F,đfZfbfg,·,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,Î•Ô'l v,đŽQ Æ,·,é,±,Æ B

*rcColor*

”wEi,Î V,µ,¢ F B

## IDirect3DRMFrame::SetSceneBackgroundDepth

HRESULT SetSceneBackgroundDepth(LPDIRECTDRAWSURFACE lpImage);

fV [f“,”wEi [“xfobftf@,đŽw’è,·,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,Ī•Ô’l v,đŽQ Æ,·,é,±,Æ B

lpImage

fV [f“,” V,µ,¢”wEi [“x,đŠi”[,·,éDirectDrawfT [ftfFfX B

fCf [fW,Ī [“x,Í16,Ä,È,,Ä,Í,È,ç,È,¢ BfCf [fW,Æftrf... [f] [fg,ĪfTfCfY,ªÛ,È,Ä,Ä,¢  
,é ê ‡ A,Ů,, AfCf [fW,ªfXfP [fŠf“fO,³,ê,é B”wEi [“xfobftf@,ĪfAfjf [fVf‡f“Ä Ä ,,ĪfpftfH [f}  
f“fX,đ“¾,é,½,ß,É,Í AfCf [fW,ĪfTfCfY,ªftrf... [f] [fg,Æ“¯,¶,Ä,È,,Ä,Í,È,ç,È,¢ B,±,ê,É,æ,Ä,Ä A  
—]ª,ÈfI [fo [fwfbfh,È,µ,É A [“xfobftf@,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*“,Ì”wEifCf [*f*W,ðŽw’è,·,é B

-E÷,·,é,ÆD3DRM\_OK AŽ, ”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,ç  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ï•Ô'l v,ðŽQ Æ,·,é,±,Æ B

*lpTexture*

V,µ,ç”wEifV [*f*“,ðŠŮ,ÏDirect3DRMTexturefIfufWfFfNfg B

*fCf* [*f*W,ÌfTfCfY,â F ”,ªfrf... [*f*] [*f*g,Æ^Û,È,Á,Ä,ç,é,Æ A,Û,, AfCf [*f*W,ªfXfP [*f*Šf“fO,³,ê,é,© A“K“-  
,È F ”,É•İŠ·,³,ê,é B”wEi,İfAfjf [*f*Vf±f“„Á Á „,İfpftfH [*f*]  
*f*“fX,ð“¾,é,½,ß,É,Í AfCf [*f*W,ÌfTfCfY,Æ F ”,ªfrf... [*f*] [*f*g,Æ“¯,¶,Ä,È,,Ä,Í,È,ç,È,ç B,±,ê,É,æ,Á,Ä A  
—]ª,Èfi [*f*o [*f*wfbfh,È,µ,É A”wEi,ðfCf [*f*W Ef f, fŠ,©,ç'¼ ÚfEƒ“f\_fŠf“fO,·,é,±,Æ,ª,Ä,«é B

### **IDirect3DRMFrame::SetSceneBackgroundRGB**

```
HRESULT SetSceneBackgroundRGB(D3DVALUE rvRed, D3DVALUE rvGreen,  
    D3DVALUE rvBlue);
```

*rvRed, rvGreen, rvBlue*

Direct3DRM\_OK AŽ, "s, ,é,ÆfGf%o [,δ•Ô,· B•Ô'l,îê——,É,Â,¢  
Ä,Í A uDirect3D•ŮŽ f, [fh,î•Ô'l v,ðŽQ Æ,·,é,±,Æ B

*rvRed, rvGreen, rvBlue*  
"wEi,î V,µ,¢ F B

### **IDirect3DRMFrame::SetSceneFogColor**

HRESULT SetSceneFogColor(D3DCOLOR rcColor);

*fV* [f“ , ÌftfHfO, Ì F, ð Ý'è, ·, é B

-Æ÷, ·, é, ÆD3DRM\_OK AŽ, ”s, ·, é, ÆfGf%o [ , ð•Ô, · B•Ô'l, Ìê——, É, Â, ç  
, Ä, Í A uDirect3D•ŮŽ f, [fh, Ì•Ô'l v, ðŽQ Æ, ·, é, ±, Æ B

*rcColor*

*ftfHfO, Ì V, µ, ç F B*

## IDirect3DRMFrame::SetSceneFogEnable

HRESULT SetSceneFogEnable(BOOL bEnable);

*ftfHfO*, ð—LÆø, Û, ½, Í—³Æø, É, ·, é B

—Æ÷, ·, é, ÆD3DRM\_OK AŽ, ”s, ·, é, ÆfGf%o [, ð•Ô, · B•Ô'l, Îê——, É, Â, Ç  
, Ä, Í A uDirect3D•ÛŽ f, fh, Î•Ô'l v, ðŽQ Æ, ·, é, ±, Æ B

*bEnable*

*ftfHfO*, Ì V, µ, Ç ó'Ô B

### **IDirect3DRMFrame::SetSceneFogMode**

HRESULT SetSceneFogMode (D3DRMFOGMODE rfMode) ;

*ftfHfO Ef, [fh,đ Ý'è,·,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*

*rfMode*

*V,μ,¢ftfHfO Ef, [fh,đŽ!,·D3DRMFOGMODE—ñ«(E^,Ĵ f“fo,Ĵ,Đ,Æ,Â B*

ŽQ Æ @IDirect3DRMFrame::SetSceneFogParams

## **IDirect3DRMFrame::SetSceneFogParams**

HRESULT SetSceneFogParams(D3DVALUE rvStart, D3DVALUE rvEnd,  
D3DVALUE rvDensity);

,±,ìfV [f“,ìE» Ý,ìftfHfO Efpf%of [f^,ð Ý'è,·,é B

-E÷,·,é,ÆD3DRM\_OK AŽ,»s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,îê——,É,Á,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,î•Ô'l v,ðŽQ Æ,·,é,±,Æ B

rvStart, rvEnd

fŠfjfAftfHfO Ef, [fh,Á,ì AftfHfO,ìŠJŽn,Æ I—'Ê'u B,±,ê,ç,ì Ý'è,Í A Á %  
,ÉftfHfOCEø%ôÊ,«E»,ê,éJf f%o,©,ç,ì←—£,Æ AftfHfO,ª Á'â-š“x,É'B,·,é←—£,ðE^è,·,é B

rvDensity

Žw ”ftfHfO Ef, [fh,Á,ìftfHfO,ì-š“x B,±,ìl,Í,O,©,ç,P,Ü,Á,ì”Í,Á,È,,Ä,Í,È,ç,È,¢ B

ŽQ Æ @D3DRMFogMode, **IDirect3DRMFrame::SetSceneFogMode**

### **IDirect3DRMFrame::SetSortMode**

HRESULT SetSortMode (D3DRMSORTMODE d3drmSM);

ŽqftfCE [f€,đ ^— ,:é,½,ß,ÉŽg,í,ê,é<sup>a</sup>—Đf, [fh,đfZfbfg,:é B,±,lf f\fbfh,Í A%B—Ê œ<Ž,lfAf<fSfŠfYf€ ,đ•Í X,:é,½,ß,É—p,¢,é,±,Æ,<sup>a</sup>Ä,«é B

—CE÷,:é,ÆD3DRM\_OK AŽ,“s,:é,ÆfGf% [,đ•Ô,: B•Ô'l,Îê—,É,Â,¢ ,Ä,Í A uDirect3D•ŮŽ f, [fh,Í•Ô'l v,đŽQ Æ,:é,±,Æ B

d3drmSM

•<sup>a</sup>—Đf, [fh,đŽw'è,:éD3DRMSORTMODE— ñ“CE^,lf f“fo,İ,Đ,Æ,Â BftftfHf<fg'l,ÍD3DRMSORT\_FROMPARENT,Â, ,é B

ŽQ Æ **IDirect3DRMFrame::GetSortMode**

**IDirect3DRMFrame::SetTexture**

HRESULT SetTexture(LPDIRECT3DRMTEXTURE lpD3DRMTexture);

ftfE [fE,lfefNfXf`ff,đ Y'è,·,é B

-E÷,·,é,ED3DRM\_OK AŽ, ”s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,Îê—,É,Â,c  
 ,Ä,Í A uDirect3D•ŮŽ f, [fh,İ•Ó'l v,đŽQ Æ,·,é,±,Æ B

lpD3DRMTexture

Žg—p,³,ê,éDirect3DRMTexturefIfufWfFfNfg,đŽ!,·İ ” B

**D3DRMMATERIALMODE**—

ñ<“E^,³D3DRMMATERIAL\_FROMFRAME,İ,Æ,« AfefNfXf`ff,ÍftfE [fE ã,lf fbfVf...,İ,½,ß,ÉŽg—  
 p,³,ê,é BftfE [fE,lfefNfXf`ff,đ-³Eø,É,·,é,É,Í AfefNfXf`ff,ÉNULL,đŽw'è,·,é B

ŽQ Æ @**IDirect3DRMFrame::GetTexture**, **IDirect3DRMFrame::SetMaterialMode**

**IDirect3DRMFrame::SetTextureTopology**

HRESULT SetTextureTopology(BOOL bWrap\_u, BOOL bWrap\_v);

ftfE [fE ã, ìfIufWfFfNfg, ì AfefNfXf`ff À•W, ìÊ“Š“Á «, ð'è<, ·, é B

-E÷, ·, é, ED3DRM\_OK AŽ, ”s, ·, é, AfGf%o [, ð•Ô, · B•Ô'l, ìê——, É, Â, ç  
, Ä, Í A uDirect3D•ŮŽ f, [fh, Ì•Ô'l v, ðŽQ Æ, ·, é, ±, Æ B

bWrap\_u, bWrap\_v

Ý'è, ·, é'l, ðŽ'l, ·êø ” B, ••ûEü, Ü, ½, Í, -•ûEü, ÉfefNfXf`ff, ðf}fbfv, ·, é, Æ, « A'Í%ž, ·, éêø ”, ÉTRUE, ð 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 [fĚ,Ì AŽQ ÆftfĈ [fĚ  
,©,ç,ÌŠ'Î'~“x,đ Ý'è,·,é B**IDirect3DRM::Tick**,Ü,½,Í**IDirect3DRMFrame::Move**f f\fbfh,ÌĈÄ,Ñ o,μ,ª -Ĉ÷,·,é,½,Ñ  
AftfĈ [fĚ,ÍfxfNfgf<[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,Î^ê——,É,Â,ĉ  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ì•Ô'l v,đŽQ Æ,·,é,±,Æ B

lpRef  
ŽQ Æ,Æ,μ,Ä—p,ĉ,ç,ê,éDirect3DRMFramefIfufWfFfNfg,đŽ',·•Ī ” B  
rvX, rvY, ,“,æ,Ñ rvZ  
ftfĈ [fĚ,Ì V,μ,ĉ'~“x B

fRotVel  
^êŽŸĈ³,Ì'~“x,đ Ý'è,·,é ê ± AfIfufWfFfNfg,Ì%oñ“]~“x,đ l—¶,É“ü,ê,é,©,ç,ª,©,đŽw'è,·,éftf%oO B,±  
,Ìfpf%of [f^,ªTRUE,Ì,Æ,« AfIfufWfFfNfg,Ì%oñ“]~“x,ªĈvŽZ,ÉŠŮ,ß,ç,ê,é B

ŽQ Æ @**IDirect3DRMFrame::GetVelocity**

**IDirect3DRMFrame::SetZbufferMode**

HRESULT SetZbufferMode(D3DRMZBUFFERMODE d3drmZBM);

Zfofbftf@ Ef, [fh,đ Ý'è,·,é B,·,È,í,¿ AZfofbftf@fŠf“fo,đ—LŒø,Û,½,Í³Œø,É,·,é B

-Œ÷,·,é,ŒD3DRM\_OK AŽ,“s,·,é,ŒfGf%o [,đ•Ô,· B•Ô'l,Îê——,É,Â,Œ  
,Ä,Í A uDirect3D•ŮŽ f, [fh,İ•Ô'l v,đŽQ Œ,·,é,±,Œ B

d3drmZBM

Zfofbftf@ Ef, [fh,đŽw'è,·,éD3DRMZBUFFERMODE—  
ñ“Œ^,İf f“fo,İ,Đ,Œ,Â BffftfHf<fg'l,ÍD3DRMZBUFFER\_FROMPARENT,Â, ,é B

ŽQ Œ @IDirect3DRMFrame::GetZbufferMode

### **IDirect3DRMFrame::Transform**

HRESULT Transform(D3DVECTOR \*lpd3dVDst, D3DVECTOR \*lpd3dVSrc);

*lpd3dVSrc* p f % f [ f ^ , a ž , · f x f N f g f < , ð f , f f f < À · W , © , ç f [ f < f h À · W , É · Ĩ Š · , µ A Ć < % o Ê , ð l p d 3 d V D s t f p f % o f [ f ^ , É · Ô , · B

- Ć ÷ , · , é , Ā D 3 D R M \_ O K A ž , ” s , · , é , Ā f G f % o [ , ð · Ô , · B · Ô ' l , Ĩ ê — , É , Ā , Ć , Ā , Ĩ A u Direct3D · Ů ž f , [ f h , Ĩ · Ô ' l v , ð ž Q Ā , · , é , ± , Ā B

*lpd3dVDst*

· Ĩ Š · ^ — , Ĩ Ć < % o Ê , ð ž ó , ž æ , é D 3 D V E C T O R \ ' Ć ' Ĩ B

*lpd3dVSrc*

· Ĩ Š · ^ — , 3 , ê , é D 3 D V E C T O R \ ' Ć ' Ĩ B

ž Q Ā @ IDirect3DRMFrame::InverseTransform, 3D · Ĩ Š ·

## IDirect3DRMLight

*fAfvfŠfP [fvf‡f“Í ACEöCE¹,ÆCEÝ,¢,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@fCEf“fX,Â,·,é BŠT”O,É,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·ª—D,·,é,±,Æ,ª,Â,«,é B*

*CE, Š*                    [GetConstantAttenuation](#)  
[GetLinearAttenuation](#)  
[GetQuadraticAttenuation](#)  
[SetConstantAttenuation](#)  
[SetLinearAttenuation](#)  
[SetQuadraticAttenuation](#)

*F*                        [GetColor](#)  
[SetColor](#)  
[SetColorRGB](#)

*—LCEø”ÍÍ*            [GetEnableFrame](#)  
[SetEnableFrame](#)

*CEöCE¹f^fCfv*        [GetType](#)  
[SetType](#)

*—¾“x*                    [GetRange](#)  
[SetRange](#)

*fXf|*                     [GetPenumbra](#)  
*fbfgCEöCE¹ EfIfvfV*  
*f‡f“*                     [GetUmbra](#)  
[SetPenumbra](#)  
[SetUmbra](#)

*IDirect3DRMLightfCf“f^ [ftfFfCfX,Í A,·,×,Â,ÌCOMfCf“f^ [ftfFfCfX,Æ“— l AUnknownfCf“f^ [ftfFfCfX Ef f\fbfh,ðEp 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,ðEp ³,·,é B*

[AddDestroyCallback](#)  
[Clone](#)  
[DeleteDestroyCallback](#)  
[GetAppData](#)  
[GetClassName](#)  
[GetName](#)  
[SetAppData](#)

## SetName

Direct3DRMLightfIfufWfFfNfg,Í ADirect3DRM::CreateLight,¨,æ,ÑDirect3DRM::CreateLightRGBf f\fbfh,ÌEÄ,  
Ñ o,μ,É,æ,Á,ÄŽæ“%4,³,ê,é B

**IDirect3DRMLight::GetColor**

D3DCOLOR GetColor();

«» Ý, ÌDirect3DRMLightIfufWffNfg, Ì F, ðŽæ“¾, ., é B  
F, ð•Ô, . B

ŽQ Æ @IDirect3DRMLight::SetColor

### **IDirect3DRMLight::GetConstantAttenuation**

D3DVALUE GetConstantAttenuation();

Direct3DRMLight IfufWfFfNfg, Š'è ",đŽæ“¾,·,é B

Æ, Š'è ",đ•Ô,· B

Æ, Š'è ",ì'l,í”½”ä—á“l,ÉCEö“x,É%œ<¿,đ—^,!,é B,½,Æ,!,î ACE, Š'è ",²,ì,Æ,« ACEö,ì“x,í”¼•ª,É'á%°,·,é B

ŽQ Æ @**IDirect3DRMLight::SetConstantAttenuation**

### **IDirect3DRMLight::GetEnableFrame**

HRESULT GetEnableFrame(LPDIRECT3DRMFRAME \* lpEnableFrame);

CE0E1,đ Ý'è,·,é,ì,É—LCE0,ÈftfCE [f€ ,đŽæ“¾,·,é B

-CE÷,·,é,ÆD3DRM\_OK AŽ, ”s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,Îê——,É,Â,ç  
,Ä,Í A uDirect3D•ŮŽ f, [fh,İ•Ô'l v,đŽQ Æ,·,é,±,Æ B

lpEnableFrame

CE» Ý,İDirect3DRMFramefIfufWfFfNfg,ì—LCE0,ÈftfCE [f€ ,đŽó,~Žæ,éf|fCf“f^,Ö,İf|fCf“f^ B

ŽQ Æ @IDirect3DRMLight::SetEnableFrame

**IDirect3DRMLight::GetLinearAttenuation**

D3DVALUE GetLinearAttenuation();

CE0CE1,11ŽYCE, ŠCEW ",đŽæ“¾,·,é B

1ŽYCE, ŠCEW ",đ•Ô,· B

ŽQ Æ @IDirect3DRMLight::SetLinearAttenuation

### **IDirect3DRMLight::GetPenumbra**

D3DVALUE GetPenumbra();

fXf|fbfgf%ofCfg,îÃ%oe”,îŠp“x,ðŽæ“¾,·,é B

^Ã%oe”,îl,ð•Ô,· B

ŽQ Æ @IDirect3DRMLight::SetPenumbra

### **IDirect3DRMLight::GetQuadraticAttenuation**

D3DVALUE GetQuadraticAttenuation();

CE0CE1, l2ZŸCE, ŠCEW ", đŽæ“¾, ·, é B

2ZŸCE, ŠCEW ", đ•Ô, · B

ŽQ Æ @**IDirect3DRMLight::SetQuadraticAttenuation**

## **IDirect3DRMLight::GetRange**

D3DVALUE GetRange();

«» Ý, ìDirect3DRMLightIfufWffNfg, ì”ÍÍ, ðŽæ“¾, ·, é B

”ÍÍ, ðŽ!, ·, !, ð•Ô, · B

ŽQ Æ @**IDirect3DRMLight::SetRange**

**IDirect3DRMLight::GetType**

D3DRMLIGHTTYPE GetType();

Žw'è,³,ê,½,ÌĈĉĈ¹,Īf^fCfv,đŽæ“¾,·,é B

D3DRMLIGHTTYPE—ñ<Ĉ^,Īf f“fo,Ī,Đ,Æ,Â,đ•Ô,· B

ŽQ Æ @IDirect3DRMLight::SetType

## **IDirect3DRMLight::GetUmbra**

D3DVALUE GetUmbra();

Direct3DRMLightIfufWfFfNfg, Ì¼”, ÌŠp“x, ðŽæ¼, ·, é B

¼”, ÌŠp“x, ð•Ô, · B

ŽQ Æ @IDirect3DRMLight::SetUmbra

## **IDirect3DRMLight::SetColor**

HRESULT SetColor(D3DCOLOR rcColor);

Žw'è,³,ê,½ĀĀĀ,Ī F,đ Ý'è,·,é B

-Ā±,·,é,ĀD3DRM\_OK AŽ,"s,·,é,ĀfGf%o [,đ•Ō,· B•Ō'l,Īĕ——,É,Ā,ĉ  
,Ā,Ī A uDirect3D•ŪŽ f, [fh,Ī•Ō'l v,đŽQ Ā,·,é,±,Ā B

*rcColor*

ĀĀĀ,Ī V,μ,ĉ F B

ŽQ Ā @IDirect3DRMLight::GetColor



**IDirect3DRMLight::SetConstantAttenuation**

HRESULT SetConstantAttenuation(D3DVALUE rvAtt);

CEđCE¹,İCE, ŠCEW " ,đ Ý'è, ·,é B

-CE÷, ·,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

rvAtt

V,µ,¢CE, ŠCEW " B

CE, Š'è " ,İ'l,İ"½"ä"l,ÉCEđ<"x,É%œ<ç,đ—^,İ,é B,½,Æ,İ,İ ACE, Š'è " ,²,İ,Æ,« ACEđ,İ<"x,İ"¼•ª,É'á%º, ·,é B

ŽQ Æ @IDirect3DRMLight::GetConstantAttenuation

### **IDirect3DRMLight::SetEnableFrame**

HRESULT SetEnableFrame(LPDIRECT3DRMFFRAME lpEnableFrame);

CEdCE1, Ì—LCEøftfCE [f€, ð Ý'è, ·, é B

-CE÷, ·, é, AED3DRM\_OK AŽ, ”s, ·, é, AefGf%o [, ð•Ô, · B•Ô'l, Îê——, É, Â, ç  
, Ä, Í A uDirect3D•ÜŽ f, [fh, Î•Ô'l v, ðŽQ A€, ·, é, ±, A€ B

lpEnableFrame

CEdCE1, Ì—LCEøftfCE [f€, Ö, Ìff|Cf“f^ B, ±, ÌftfCE [f€, É, Í eftfCE [f€, A€“—l, ÌCEdCE1, A€, È, é B

ŽQ A€ @IDirect3DRMLight::GetEnableFrame

### **IDirect3DRMLight::SetLinearAttenuation**

HRESULT SetLinearAttenuation(D3DVALUE rvAtt);

ŠCEW " ,đ Ý'è , : ,é B

-CE÷ , : ,é , ED3DRM\_OK AŽ , "s , : ,é , AEfGf% [ , đ • Ô , : B • Ô ' l , Î ě — , É , Â , ģ  
, Ä , Í A u Direct3D • Ů Ž f , [fh , Ĩ • Ó ' l v , đ Ž Q AE , : , é , ± , AE B

rvAtt

V , μ , cCE , ŠCEW " B

ŽQ AE @ IDirect3DRMLight::GetLinearAttenuation

**IDirect3DRMLight::SetPenumbra**

HRESULT SetPenumbra(D3DVALUE rvAngle);

~ ,l^A%oe”,lšp“x,dfZfbfg,·,é B

-E÷,·,é,ED3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,l^ê——,É,Â,ç  
,Ä,Í A uDirect3D•ŮŽ f, [fh,l•Ô'l v,ðŽQ Æ,·,é,±,Æ B

rvAngle

V,μ,ç^A%oe”,lšp“x B,±,lšp“x,l^A•”,lšp“x,æ,è‘â,«,ç,© A“™,μ,,È,,Ä,Í,ç,¯,È,ç B^A%oe”,lšp“x,ð-  
¾•”,lšp“x,æ,è,à -γ,³ Ý‘è,μ,½ ê ‡ A^A%oe”,l-¾•”,Æ“¯,¶lšp“x,É,È,é BfftfHf<fg'l,Í0.5f%ofWfAf“,Ä, ,é B

ŽQ Æ @IDirect3DRMLight::GetPenumbra

### **IDirect3DRMLight::SetQuadraticAttenuation**

HRESULT SetQuadraticAttenuation(D3DVALUE rvAtt);

ŠCEW " ,đ Ý'è ,:é B

-CE± ,:é,ÆD3DRM\_OK AŽ, "s ,:é,ÆfGf%o [ ,đ•Ô ,: B•Ô'l,Îê——,É,Â,c  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ī•Ó'l v,đŽQ Æ, : ,é,±,Æ B

rvAtt

V,μ,cCE, ŠCEW " B

ŽQ Æ @IDirect3DRMLight::GetQuadraticAttenuation

## **IDirect3DRMLight::SetRange**

HRESULT SetRange (D3DVALUE rvRange) ;

CEõCE¹, Ì"ÍÍ, ðfZfbfg, ·, é B CEõCE¹, Í A"ÍÍ, Ì†, É, , éfIfufWfFfNfg, É, Ì, ÝCEø%Ê, ð—^, !, , é B

-CE÷, ·, é, ÆD3DRM\_OK AŽ, "s, ·, é, ÆfGf%o [, ð•Ô, · B•Ô'l, Ìê——, É, Â, ç  
, Ä, Í A uDirect3D•ŮŽ f, [fh, Ì•Ô'l v, ðŽQ Æ, ·, é, ±, Æ B

*rvRange*

V, µ, ç"ÍÍ BfftfHf<fg'l, Í256, Å, , é B

ŽQ Æ @IDirect3DRMLight::GetRange

## **IDirect3DRMLight::SetType**

HRESULT SetType(D3DRMLIGHTTYPE d3drmtType);

CE^fCfv,đİ X,·,é B

-CE^,·,é,ED3DRM\_OK AŽ,·s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,Îê——,É,Â,ç  
,Ä,Í A uDirect3D•ŮŽ f, [fh,İ•Ó'l v,đŽQ Æ,·,é,±,Æ B

d3drmtType

V,μ,CE^fCfv,đD3DRMLIGHTTYPE—ñ<CE^,Îf f“fo,İ,Đ,Æ,Â,Äžw'è,·,é B

ŽQ Æ @IDirect3DRMLight::GetType

**IDirect3DRMLight::SetUmbra**

HRESULT SetUmbra (D3DVALUE rvAngle);

%~ ,l-¼”,İŞp“x,đ Ý’è,·,é B

-E÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,đ•Ô,· B•Ô’l,Îê——,É,Â,ç  
,Ä,Í A uDirect3D•ŮŽ f, [fh,İ•Ô’l v,đŽQ Æ,·,é,±,Æ B

rvAngle

V,µ,ç-¼”,İŞp“x B,±,İŞp“x,Í A^Ä%oe”,İŞp“x,æ,è,à - ,³,ç,© A“™,µ,,È,,Ä,Í,ç, -,È,ç B-  
¼”,İŞp“x,đ^Ä%oe”,İŞp“x,æ,è,â,«, Ý’è,µ,½ ê ‡ A-  
¼”,Í^Ä%oe”,Æ“ ,İŞp“x,Æ,È,é BfftfHf<fg’l,Í0.4%ofWfAf“,Ä, ,é B

ŽQ Æ @IDirect3DRMLight::GetUmbra



**IDirect3DRMMaterial::GetEmissive**

HRESULT GetEmissive(D3DVALUE \*lpr, D3DVALUE \*lpg, D3DVALUE \*lpb);

f}fefŠfAf<,ì•úŽĚ“Á «,ì Ý'è,đŽæ“¾,·,é B,±,ì“Á «,ì Ý'è,Í A F,ÆfIfufWfFfNfg,“ŽU,·,éĈö,ì<“x,đŽ!,· B  
-Ĉ÷,·,é,ÆD3DRM\_OK AŽ,“s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,Îê——,É,Â,ĉ  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ī•Ô'l v,đŽQ Æ,·,é,±,Æ B

lpr, lpg, lpb

f f\fbfh,<sup>a</sup> §Ĉä,đ•Ô,·,Æ,« A•úŽĚ,ì Ô A—Î A Â,ì F—v'f,đŽó,Žæ,éfAfhfĈfX B

ŽQ Æ @IDirect3DRMMaterial::SetEmissive

**IDirect3DRMMaterial::GetPower**

D3DVALUE GetPower();

Žw'è,³,ê,½f}fefŠfAf<,Å,Ì”½ŽĚŽw ”,Ìfpf\_\_\_\_[,ðŽæ“¾,·,é B

”½ŽĚŽw ”,Ìfpf [ ,ðŽ!,·1,ð•Ô,· B

ŽQ Æ @IDirect3DRMMaterial::SetPower

### **IDirect3DRMMaterial::GetSpecular**

HRESULT GetSpecular(D3DVALUE \*lpr, D3DVALUE \*lpg, D3DVALUE \*lpb);

f}fefŠfAf<,ì”½ŽĚfnfCf%ofCfG,ì F,đŽæ“¾,·,é B

-Ĉ÷,·,é,ĀD3DRM\_OK AŽ,”s,·,é,ĀfGf%o [,đ•Ô,· B•Ô'l,îê——,É,Ā,ĉ  
,Ā,Í A uDirect3D•ŮŽ f, [fh,î•Ô'l v,đŽQ Ā,·,é,±,Ā B

lpr, lpg, lpb

f f\fbfh,<sup>a</sup> §Ĉä,đ•Ô,·,Ā,« A”½ŽĚfnfCf%ofCfG,ì Ô A—Ī A Ā,ì F—v‘f,đŽó,~Žæ,éfAfhfĈfX B

ŽQ Ā @IDirect3DRMMaterial::SetSpecular

**IDirect3DRMMaterial::SetEmissive**

HRESULT SetEmissive(D3DVALUE r, D3DVALUE g, D3DVALUE b);

f}fefŠfAf<,ì•úŽĚ“Á «,đ Ý'è,·,é B

-Ĉ÷,·,é,ĀD3DRM\_OK AŽ,“s,·,é,ĀfGf%o [,đ•Ô,· B•Ô'l,Îĕ——,É,Ā,ĉ  
,Ā,Í A uDirect3D•ŮŽ f, [fh,Ī•Ó'l v,đŽQ ĀE,·,é,±,Ā B

r, g, b  
•úŽĚ,ì F,ì Ô A—Î A Ā—v'f B

ŽQ ĀE @IDirect3DRMMaterial::GetEmissive

### **IDirect3DRMMaterial::SetPower**

HRESULT SetPower(D3DVALUE rvPower);

f}fefŠfAf< ,ì”½žžžw ”,đ Ý’è, :é B

-E±, :é, ED3DRM\_OK Až, ”s, :é, AfGf%o [,đ•Ô, : B•Ô’l, Îê——, É, Â, ģ  
, Ä, Í A uDirect3D•Ůž f, [fh, Ĩ•Ó’l v,đžQ Æ, :é, ±, Æ B

rvPower

V, μ, ģ”½žžžw ” B

žQ Æ @IDirect3DRMMaterial::GetPower

### **IDirect3DRMMaterial::SetSpecular**

HRESULT SetSpecular(D3DVALUE r, D3DVALUE g, D3DVALUE b);

f}fefŠfAf<,ì”½ŽĚfnfCf%ofCfG,ì F,đ Ý'è,·,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,Î•Ô'l v,đŽQ Æ,·,é,±,Æ B

r, g, b  
”½ŽĚfnfCf%ofCfG,ì F,ì Ô A—Î A Â,ìŠe—v'f B

ŽQ Æ @IDirect3DRMMaterial::GetSpecular

## IDirect3DRMMesh

*fAfVfŠfP [fVf‡f“ ,Í Af fbVfVf... ,İfOf< [fv,ÆEY,¢ ,É,â,èŽæ,è,·,é,½,ß,ÉIDirect3DRMMeshfCf“f^ [ftfFfCfX,İf f\fbfh,đŽg—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,đ ŽQ Æ,·,é,±,Æ B*

**F** [GetGroupColor](#)  
[SetGroupColor](#)  
[SetGroupColorRGB](#)

**İ -,Æ İñ** [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](#)

**,“\_ ,İÊ’u** [GetVertices](#)  
[SetVertices](#)

**IDirect3DRMMeshfCf“f^ [ftfFfCfX,Í A,·,×,Ä,İCOMfCf“f^ [ftfFfCfX,Æ“—  
l A|UnknownfCf“f^ [ftfFfCfX Ef f\fbfh,đÆp ³,·,é BIUnknownfCf“f^ [ftfFfCfX,İŽŸ,İ,R,Â,İf f\fbfh,đfTf|  
[fg,·,é B**

[AddRef](#)

[QueryInterface](#)

[Release](#)

**,³,ç,É AIDirect3DRMMeshfCf“f^ [ftfFfCfX,ÍIDirect3DRMObjectfCf“f^ [ftfFfCfX,©,çŽŸ,İf f\fbfh,đÆp ³,·,é B**

[AddDestroyCallback](#)

[Clone](#)

[DeleteDestroyCallback](#)

[GetAppData](#)

[GetClassName](#)

[GetName](#)

[SetAppData](#)

**SetName**

Direct3DRMFramefIfufWfFfNfg,Í **AIDirect3DRM::CreateMesh** f\fbfh,ìCEÄ,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,Á,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ì•Ô'l v,ðŽQ Æ,;é,±,Æ B

vCount, fCount

fOf< [fv,ÉŠÜ,Ü,ê,é’,“\_,Æ-Ê,Ì ” B

vPerFace

,;×,Ä,Ì-Ê,““„¶ ”,ì’ “\_,ðŽ ,Ä ê † A-Ê“-½,è,ì’,“\_Ì ” BfOf< [fv’†,Ì-Ê,“Ž ,Ä’,“\_Ì ”,“è’è,Ä,È,¢,Æ,«Í A,±  
,Ìpf%of [f^,É0,ðŽw’è,µ,È,,Ä,Í,È,ç,È,¢ B

fData

-Êff [f^,ÌfAfhfÆfX BvPerFacepf%of [f^,É'l,“ Ý’è,¾,è,Ä,¢,é ê † A,±,Ìff [f^,Í’P,É AfOf< [fv,Ì’,“\_”z—  
ñ,Ô,ÌfCf“fffbfNfX EfŠfXfg,Ä,;é BvPerFace,“0,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,“0,Ä AfOf< [fv,ð \ ¬,;é-  
Ê,“ŽÖŠp(È),ÆŽÌŠp(È),Ä,;é ê † Aff [f^,ÌŽŸ,Ì,æ,µ,È,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,“ §Æä,ð•Ô,;é,Æ,« AfOf< [fv,ÌŽ-ÊŽq,ðŽó,~Žæ,é’İ ”,Ö,Ìf|fCf“f^ B

V,µ,‘Ç%Ä,¾,è,½fOf< [fv,É,Í A^È%°,ÌfftfHf<fg,Ì“Á «,“^,!,ç,è,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•ŮĚ”ÍÍ,đŽæ“¾,·,é B•ŮĚ”ÍÍ,Í A,»„ê,¼,ê,İŽŸĚ³,İf,ff< Ä•W,İ Ä -'l,Æ Ä ‘â'l,đŽ!,· B

-Ě÷,·,é,ÆD3DRM\_OK AŽ,“s,·,é,ÆfGf%o [,đ•Ů,· B•Ů'l,İê——,É,Ä,ĉ  
,Ä,Í A uDirect3D•ŮŽ f, [fh,İ•Ů'l v,đŽQ Æ,·,é,±,Æ B

lpD3DRMBox

•ŮĚ”ÍÍ,İ Ä•W,đŽó,Žæ,éD3DRMBOX \‘ĉ'İ B

### IDirect3DRMMesh::GetGroup

```
HRESULT GetGroup(D3DRMGROUPINDEX id, unsigned *vCount,  
                unsigned *fCount, unsigned *vPerFace, DWORD *fDataSize,  
                unsigned *fData);
```

Žw'è,³,è,½fOf< [fv,ÉŠÖ~A•t,¯,ç,è,Ä,ç,éff [f^,ðŽæ“¾,·,é B

–E±,·,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,ÍDirect3DRMMesh::AddGroup,ðŽg—p,µ,Ä ¶ ¬,³,è,½,à,ì,Â,È,,Ä,Í,È,ç,È,ç B

vCount, fCount

f f\fbfh,ª §Eä,ð•Ô,·,Æ,« AfOf< [fv,Ì,“\_ì ”,Æ–Ê,ì ”,ðŽó,¯Žæ,é•Ī ”,ìfAfhfCFX B,±  
,è,ç,ìfpf%of [f^,É,ÍNULL,ðŽw'è,·,é,±,Æ,ª,Â,«,é B

vPerFace

f f\fbfh,ª §Eä,ð•Ô,·,Æ,« A–Ê“–,½,è,ì,“\_ì ”,ðŽó,¯Žæ,é•Ī ”,ìfAfhfCFX B,±  
,è,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!,·Ī ”,ìfAfhfCFX B,±  
,ìfpf%of [f^,ÉNULL,ðŽw'è,·,é,±,Æ,Í,Â,«,É,ç B

fData

f f\fbfh,ª §Eä,ð•Ô,·,Æ,« AfOf< [fv,Ì–Êff [f^,ðŠi”[,·,éfofbftf@,ìfAfhfCFX B,±  
,ìff [f^,ÍEŽ@,Í AÍDirect3DRMMesh::AddGroup f\fbfh,ìEÄ,Ñ o,µ,ÄŽw'è,µ,½,à,ì,Æ“¬,¶,Â, ,é B,±  
,ìfpf%of [f^,ªNULL,ì,Æ,« A•K—v,Èfofbftf@,ìTfCY,ªfDataSizefpf%of [f^,É•Ô,³,è,é B

### **IDirect3DRMMesh::GetGroupColor**

D3DCOLOR GetGroupColor(D3DRMGROUPINDEX id);

*fOf* < [fv, Ì F, ðŽæ“¾, ., é B

¬E±, µ, ½ ê ‡ A F, ðŽ!, ·D3DCOLOR'l, ð•Ô, · B, » , □, Å, È, Ç ê ‡, Í0, ð•Ô, · B

*id*

*fOf* < [fv, ÌŽ¯ •ÊŽq B, ±, ÌŽ¯ •ÊŽq, IDirect3DRMMesh::AddGroup, ðŽg, Á, Ä ¶ ¬, ³, ê, ½, à, Ì, Å, È, , Ä, Í, È, Ç, È, Ç B

ŽQ Æ @IDirect3DRMMesh::SetGroupColor, IDirect3DRMMesh::SetGroupColorRGB

### **IDirect3DRMMesh::GetGroupCount**

```
unsigned GetGroupCount();
```

Žw'è,³,ê,½Direct3DRMMeshIfufWfFfNfg,ÌfOf< [fv,Ì ",ðŽæ“¾,·,é B

-Œ÷,µ,½ ê ‡,ÍfOf< [fv,Ì ",ð•Ô,· B,»»,□,Á,È,¯,ê,Î0,ð•Ô,· B

**IDirect3DRMMesh::GetGroupMapping**

D3DRMMAPPING GetGroupMapping(D3DRMGROUPINDEX id);

Direct3DRMMeshIfufWfFfNfg't,ifOf< [fv,É'Î,μ,Ä A,Ç,Ì,æ,ϖ,ÉfefNfXf`ff,af}fbfv,³,ê,é,©,ðŽæ“¾,·,é B  
-E÷,·,é,Æ AfOf< [fv,Ö,ÌfefNfXf`ff,Ìf}fbfv•û-  
@,ðŽ!,·D3DRMMAPPING!l,Ì,Ð,Æ,Ä,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,Ä,È,,Ä,Í,È,Ç,È,Ç B

ŽQ Æ @IDirect3DRMMesh::SetGroupMapping

### **IDirect3DRMMesh::GetGroupMaterial**

```
HRESULT GetGroupMaterial(D3DRMGROUPINDEX id,  
    LPDIRECT3DRMMATERIAL *returnPtr);
```

Direct3DRMMeshOf< [fv,ÉŠÖ~A•t,¯,ç,ê,½f}fefŠfAf<Ö,Ïf|fCf“f^,ðŽæ“¾,·,é B

–Æ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Ïê——,É,Á,ç  
,Ä,Í A uDirect3D•ÛŽ f, [fh,Ï•Ô'l v,ðŽQ Æ,·,é,±,Æ B

id

fOf< [fv,ÏŽ~•ÊŽq B,±,ÏŽ~•ÊŽq,ÍIDirect3DRMMesh::AddGroup,ðŽg,Á,Ä ¶ ï,³,ê,½,à,Ï,Á,È,,Ä,Í,È,ç,È,ç B

returnPtr

f f\fbfh,ª §Æä,ð–ß,·,Æ,« AfOf< [fv,ÏIDirect3DRMMaterialfCf“f^ [ftfFfCfX,ðŽó,~Žæ,é•Ï ”,Ö,Ïf|fCf“f^,Ö,Ïf|  
fCf“f^ B

### ŽQ Æ @IDirect3DRMMesh::SetGroupMaterial

### **IDirect3DRMMesh::GetGroupQuality**

D3DRMRENDERQUALITY GetGroupQuality(D3DRMGROUPINDEX id);

Žw'è,<sup>3</sup>,ê,½fOf< [fv,ìfĒf“f\_šf“fO•iŽ<sub>i</sub>,đŽæ“¾,·,é B

-Ē÷,·,é,ÆD3DRMRENDERQUALITY,ĂŽ<sub>i</sub>,<sup>3</sup>,ê,é—ñ<“Ē^,ì'1,đ•Ō,· BŽ,”s,·,é,Æ0,đ•Ō,· B,±  
ê,ç,ì'1,É,Í AfIfufWfFfNfg,ÌfVfF [ffBf“fO Ef, [fh,â Æ-¾f, [fh A“h,è,Ā,Ō,μf, [fh,“šÜ,Ü,ê,Ă,Ĉ,é B

id

fOf< [fv,ìŽ<sup>-</sup>•ÊŽq B,±,ìŽ<sup>-</sup>•ÊŽq,ÍIDirect3DRMMesh::AddGroup,đŽg,Á,Ă ¶ ¬,<sup>3</sup>,ê,½,à,ì,Ă,È,,Ă,Í,È,ç,È,Ĉ B

ŽQ Æ @IDirect3DRMMesh::SetGroupQuality

### **IDirect3DRMMesh::GetGroupTexture**

```
HRESULT GetGroupTexture(D3DRMGROUPINDEX id,  
    LPDIRECT3DRMTEXTURE *returnPtr);
```

*fOf* < [fv,ÉŠÖ~A•t,¯,ç,ê,½fefNfXf`ff,Ö,Ìf|fCf“f^,ðŽæ“¾,·,é B

–Æ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Ìê——,É,Á,ç  
,Ä,Í A uDirect3D•ÛŽ f, [fh,Ì•Ô'l v,ðŽQ Æ,·,é,±,Æ B

*id*

*fOf* < [fv,ÌŽ¯•ÊŽq B,±,ÌŽ¯•ÊŽq,ÍIDirect3DRMMesh::AddGroup,ðŽg,Á,Ä ¶ Ì,³,ê,½,à,Ì,Á,È,,Ä,Í,È,ç,È,ç B

*returnPtr*

f f\fbfh,<sup>a</sup> §Æä,ð•Ô,·,Æ,« AfOf < [fv,ÌDirect3DRMTexturefCf“f^ [ftfFfCfX,ðŽó,Žæ,é•Ì ”,Ö,Ìf|fCf“f^,Ö,Ìf|  
fCf“f^ B

ŽQ Æ @**IDirect3DRMMesh::SetGroupTexture**

**IDirect3DRMMesh::GetVertices**

HRESULT GetVertices(D3DRMGROUPINDEX id, DWORD index, DWORD count, D3DRMVERTEX \*returnPtr);

Žw'è,³,ê,½fOf< [fv,Ì',“\_Ê'u,ðŽæ“¾,.,é B  
-Œ÷,.,é,ÆD3DRM\_OK AŽ,“s,.,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Ìê——,É,Á,Œ  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ì•Ô'l v,ðŽQ Æ,.,é,±,Æ B

id fOf< [fv,ÌŽ•ÊŽq B,±,ÌŽ•ÊŽq,ÍIDirect3DRMMesh::AddGroup,ðŽg,Á,Ä ¶ Ñ,³,ê,½,à,Ì,Á,È,,Ä,Í,È,ç,È,Œ B

index ',“\_Ê'u,ðŽæ“¾,.,éŽn“\_ðŽ!,·D3DRMVERTEX \‘ç'Ì,Ì”z—ñ,ÌfCf“ffbfNfX B

count indexpf%of [f^,Ž!,·fCf“ffbfNfX,É'±,Œ,ÄŽæ“¾,.,é AD3DRMVERTEX \‘ç'Ì i',“\_ j,Ì ” B,±  
,Ìfpf%of [f^,ÉNULL,ðŽw'è,.,é,±,Æ,Í,Á,«,È,Œ B

returnPtr f f\fbfh,ª §Œä,ð•Ô,.,Æ,«,É',“\_Ê'u,ðŽó,Žæ,éD3DRMVERTEX \‘ç'Ì,Ì”z—ñ B,±  
,Ìfpf%of [f^,ÉNULL,ðŽw'è,.,é,Æ A•K—v,ÈD3DRMVERTEX \‘ç'Ì,Ì ”,ðcountpf%of [f^,ÉŠi”[,.,é B

ŽQ Æ @IDirect3DRMMesh::SetVertices

### Direct3DRMMesh::Scale

HRESULT Scale(D3DVALUE sx, D3DVALUE sy, D3DVALUE sz);

$f, \text{fff} \leftarrow \hat{A} \cdot W, \hat{I} x \hat{Z}^2 \text{ Ay} \hat{Z}^2 \text{ Az} \hat{Z}^2, \hat{E} \hat{I}, \mu \text{ A} \text{---}$   
^,!,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,ç  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Î•Ô'l v,ðŽQ Æ,·,é,±,Æ B

sx, sy, sz

$x \hat{Z}^2 \text{ Ay} \hat{Z}^2 \text{ Az} \hat{Z}^2, \hat{E} \% \hat{\wedge}, \hat{A}, \hat{A} \text{---p},^3, \hat{e}, \hat{e} \text{ kŽÚŒW } ” \text{ B}$

**IDirect3DRMMesh::SetGroupColor**

HRESULT SetGroupColor(D3DRMGROUPINDEX id, D3DCOLOR value);

Direct3DRMMeshIfufWfFfNfg't, ðfOf< [fv, ð F, ð Ý'è, ., é B

-E÷, ., é, ED3DRM\_OK AŽ, "s, ., é, AfGf%o [, ð•Ô, . B•Ô'l, Îê——, É, Â, Ç  
, Ä, Í A uDirect3D•ÜŽ f, [fh, Î•Ô'l v, ðŽQ Æ, ., é, ±, Æ B

id

fOf< [fv, ðŽ<sup>-</sup>•ÊŽq B, ±, ðŽ<sup>-</sup>•ÊŽq, IDirect3DRMMesh::AddGroup, ðŽg, Á, Ä ¶ ¬, <sup>3</sup>, ê, ½, à, Ì, Â, È, , Ä, Í, È, Ç, È, Ç B

value

fOf< [fv, ð F B

ŽQ Æ @IDirect3DRMMesh::GetGroupColor, IDirect3DRMMesh::SetGroupColorRGB

**IDirect3DRMMesh::SetGroupColorRGB**

HRESULT SetGroupColorRGB(D3DRMGROUPINDEX id, D3DVALUE red, D3DVALUE green, D3DVALUE blue);

RGB'l,đŽg—p,μ,Ä ADirect3DRMMeshIfufWfFfNfg't,İfOf< [fv,İ F,đ Ý'è,;é 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

id

fOf< [fv,İŽ•ÊŽq B,±,İŽ•ÊŽq,İDirect3DRMMesh::AddGroup,đŽg,Á,Ä ¶ -;3,ê,½,à,İ,Á,È,,Ä,İ,È,ç,È,¢ B  
red, green, blue  
fOf< [fv,İ F,İ Ô A—İ A Â,İŠe—v'f B

ŽQ Æ @IDirect3DRMMesh::GetGroupColor, IDirect3DRMMesh::SetGroupColor

### **IDirect3DRMMesh::SetGroupMapping**

HRESULT SetGroupMapping(D3DRMGROUPINDEX id, D3DRMMAPPING value);

Direct3DRMMeshIfufWfFfNfg't, ðfOf< [fv,Éf}fbfsf“fO,ð Ý'è,·,é Bf}fbfsf“fO,Í A,Ç,Ì,æ,²,ÉfefNfXf`ff,ª-Ê,Éf}fbfv,³,ê,é,©,ðŒ^è,·,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

*id*

fOf< [fv,ÌŽ⁻•ÊŽq B,±,ÌŽ⁻•ÊŽq,ÍDirect3DRMMesh::AddGroup,ðŽg,Á,Ä ¶ ¬,³,ê,½,à,Ì,Á,È,,Ä,Í,È,Ç,È,Œ B

*value*

fOf< [fv,Ìf}fbfsf“fO,ðŽw'è,·,éD3DRMMAPPINGŒ^,Ìl B

### **ŽQ Æ @IDirect3DRMMesh::GetGroupMapping**

**IDirect3DRMMesh::SetGroupMaterial**

HRESULT SetGroupMaterial(D3DRMGROUPINDEX id, LPDIRECT3DRMMATERIAL value);

Direct3DRMMeshIfufWfFfNfg't, ðfOf< [fv,Éf}fefŠfAf<,ðŠÖ~A•t,¯,é B

-E±,·,é,ÆD3DRM\_OK AŽ,„s,·,é,ÆfGf%o [,ð•Ö,· B•Ö'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ÜŽ f, [fh,Î•Ö'l v,ðŽQ Æ,·,é,±,Æ B

id

fOf< [fv,îŽ~•ÊŽq B,±,îŽ~•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,ÏfAfhfÇfX B

ŽQ Æ @IDirect3DRMMesh::GetGroupMaterial

**IDirect3DRMMesh::SetGroupQuality**

HRESULT SetGroupQuality(D3DRMGROUPINDEX id, D3DRMRENDERQUALITY value);

Žw'è,³,ê,½fOf< [fv,ìfœf“f\_šf“fO•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

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

D3DRMRENDERQUALITY(œ^,Â•\,³,ê,é—ñ<“œ^,Ì'l B,±  
,ê,ç,Ì'l,É,Í AfIfufWfFfNfg,ÌfVfF [ffBf“fO Ef, [fh,â Æ-¾f, [fh A“h,è,Â,Ô,µf, [fh,ªŠÜ,Ü,ê,Ä,¢,é B

žQ Æ @IDirect3DRMMesh::GetGroupQuality

### **IDirect3DRMMesh::SetGroupTexture**

HRESULT SetGroupTexture(D3DRMGROUPINDEX id, LPDIRECT3DTEXTURE value);

Direct3DRMMeshIfufWfFfNfg't, ðfOf< [fv,ÉfefNfXf`ff,ðŠÖ~A•t,¯,é B

-Æ±,·,é,ÆD3DRM\_OK AŽ,„s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Î•Ô'l v,ðŽQ Æ,·,é,±,Æ B

id

fOf< [fv,ìŽ~•ÊŽq B,±,ìŽ~•ÊŽq,ÍDirect3DRMMesh::AddGroup,ðŽg,Á,Ä ¶ ¬,³,ê,½,à,ì,Á,È,,Ä,Í,È,¢,È,¢ B

value

Direct3DRMMeshIfufWfFfNfg,ÉŠÖ~A•t,¯,éIDirect3DRMTexturefCf“f^ [ftfFfCfX,ÌfAfhfÆfX B

ŽQ Æ @IDirect3DRMMesh::GetGroupTexture

**IDirect3DRMMesh::SetVertices**

HRESULT SetVertices(D3DRMGROUPINDEX id, unsigned index, unsigned count, D3DRMVERTEX \*values);

Žw'è,³,ê,½fOf< [fv,ì',“\_ìÊ'u,ð Ý'è,·,é B

-Æ÷,·,é,ÆD3DRM\_OK AŽ,“s,·,é,Æfgf%o [,ð•Ô,· B•Ô'l,îê——,É,Á,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,î•Ô'l v,ðŽQ Æ,·,é,±,Æ B

id

fOf< [fv,ìŽ•ÊŽq B,±,ìŽ•ÊŽq,ÍDirect3DRMMesh::AddGroup,ðŽg,Á,Ä ¶ ñ,³,ê,½,à,ì,Á,È,,Ä,Í,È,ç,È,¢ B

index

'“\_Ê'u,ð Ý'è,·,éŽn“\_ðŽ!,· Avaluesfpf%of [f^,ì”z—ñ,Ö,ìfCf“ffbfNfX B

count

index fpf%of [f^,Ž!,·fCf“ffbfNfX,É'±,¢,Ä Ý'è,·,é A',“\_ì ” B

values

Ý'è,·,é',“\_Ê'u,ðŽ!,•D3DRMVERTEX \‘‘ì,ì”z—ñ B

'“\_îñ,ÍfOf< [fv,²,Æ,ÉŽ ,Á B,Ó,½,Á,ìÙ,È,Á,½fOf< [fvšÔ,Á',“\_ð«—L,·,é•K—v,ª,·,é ê ± i,½,Æ,,Í Af fbf  
Vf... ã,ì—× Ú,µ,½—Ê,ì F,ªÙ,È,é,Æ,« j A—¼•û,ìfOf< [fv,Á',“\_ðfRfs [,µ,È,,Ä,Í,È,ç,È,¢ B

ŽQ Æ @IDirect3DRMMesh::GetVertices

**IDirect3DRMMesh::Translate**

HRESULT Translate(D3DVALUE tx, D3DVALUE ty, D3DVALUE tz);

Direct3DRMMeshIfufWfFfNfg't,ì'“\_ìÊ'u,É AŽw'è,³,è,½fIftfZfbfg,ð'Ç%Á,·,é B

-E÷,·,é,ÆD3DRM\_OK AŽ,"s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,ç  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ĭ•Ó'l v,ðŽQ Æ,·,é,±,Æ B

tx, ty, tz  
Še'“\_Ê'u,ìx À•W Ay À•W Az À•W,É'Ç%Á,³,è,éfIftfZfbfg B

## IDirect3DRMMeshBuilder

*fAfvfŠfP [fVf‡f“Í Af fbfVf...fIfufWfFfNfg,ÆÉÝ,¢*  
*,É,â,èŽæ,è,·,é,½,ß,ÉIDirect3DRMMeshBuilderfCf“f^ [ftfFfCfX,İf f\fbfh,ðŽg—p,·,é B,±*  
*,İfZfNfVf‡f“Í AIDirect3DRMMeshBuilderfCf“f^ [ftfFfCfX Ef f\fbfh,İfŠftf@fÆf“fX,Å, ,é BŠT”O,É,Â,¢*  
*,Ä,İŠT—v,Í A uIDirect3DRMMesh,ÆIDirect3DRMMeshBuilderfCf“f^ [ftfFfCfX v,ðŽQ Æ,·,é,±,Æ B*

IDirect3DRMMeshBuilderfCf“f^ [ftfFfCfX Ef f\fbfh,Í A^È%°,İfOf< [fv,É•<sup>a</sup>—D,·,é,±,Æ,<sup>a</sup>,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

,»,İ¼ AddFrame  
AddMeshBuilder  
ReserveSpace  
Save  
Scale  
SetMaterial  
Translate

-@ ü AddNormal  
GenerateNormals  
SetNormal

%“‹B GetPerspective  
SetPerspective

fÆf“f\_Šf“fO•iŽ; GetQuality  
SetQuality

fefNfXf`ff GetTextureCoordinates  
SetTexture  
SetTextureCoordinates

**SetTextureTopology**

, “

**AddVertex**

**GetVertexColor**

**GetVertexCount**

**GetVertices**

**SetVertex**

**SetVertexColor**

**SetVertexColorRGB**

**IDirect3DRMMeshBuilder** fCf“f^ [ftFfCfX,Í A,·,×,Ä,ÌCOMfCf“f^ [ftFfCfX,Æ“—  
l A|UnknownfCf“f^ [ftFfCfX Ef f\fbfh,ðEp ³,·,é BIUnknownfCf“f^ [ftFfCfX,ÍŽŸ,ì,R,Â,ìf f\fbfh,ðfTf|  
[fg,·,é B

**AddRef**

**QueryInterface**

**Release**

,³,ç,É A**IDirect3DRMMeshBuilder**fCf“f^ [ftFfCfX,Í**IDirect3DRMObject**fCf“f^ [ftFfCfX,©,çŽŸ,ìf f\fbfh,ðEp  
³,·,é B

**AddDestroyCallback**

**Clone**

**DeleteDestroyCallback**

**GetAppData**

**GetClassName**

**GetName**

**SetAppData**

**SetName**

Direct3DRMMeshBuilderfIfufWfFfNfg,Í A**IDirect3DRM::CreateMeshBuilder**f f\fbfh,ìCEÄ,Ñ o,μ,É,æ,Á,ÄŽæ“¾,³,ê  
,é B

**IDirect3DRMMeshBuilder::AddFace**

HRESULT AddFace (LPDIRECT3DRMFACE lpD3DRMFace);

-Ê,δDirect3DRMMeshBuilderIfufWfFfNfg,É'Ç%Á,·,é B

-E÷,·,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

lpD3DRMFace

'Ç%Á,·,é-Ê,ÏfAfhfÆfX B

,D,Æ,Â,Ï-Ê,Í A1"x,É,D,Æ,Â,Ïf fbVf...,É,µ,©'¶ Ý,·,é,±,Æ,Í,Â,«,È,ç B

### IDirect3DRMMeshBuilder::AddFaces

```
HRESULT AddFaces(DWORD dwVertexCount, D3DVECTOR * lpD3DVertices,  
                DWORD normalCount, D3DVECTOR *lpNormals, DWORD *lpFaceData,  
                LPDIRECT3DRMFACEARRAY* lpD3DRMFaceArray);
```

• ; „, Ì-Ê, ðDirect3DRMMeshBuilderfIfufWfFfNfg, É'Ç%Á, ·, é B

-É±, ·, 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

dwVertexCount  
' „, Ì ” B

lpD3DVertices  
' „, ÌÊ'u, ðŠi”[ , ·, é **D3DVECTOR** \ 'ç'ì, ì”z—ñ, Ìfx [fX EfAfhfÇfX, Ö, Ìf|fCf“f^ B

normalCount  
-@ ü, Ì ” B

lpNormals  
-@ ü, ÌÊ'u, ðŠi”[ , ·, é **D3DVECTOR** \ 'ç'ì, ì”z—ñ, Ìfx [fX EfAfhfÇfX, Ö, Ìf|fCf“f^ B

lpFaceData  
, » , ê, ¼, ê, Ì-Ê, É, Â, ç, Ä A' „\_”z—ñ, Ö, ÌfCf“ffbfNfX, É'±, -  
' „, Ì ”, ðŠÜ, ðfpf%of [f^ BnormalCount, °0, Ä, È, Ç ê ‡ A, ±, Ìfpf%of [f^, É, Í, ' „, Ì ”, ð Ý'è, µ, È, -  
, Ä, Í, È, Ç, È, Ç B, » , µ, Ä' „, Ì ”, ÌÆã, É, Í A, » , Ì ”, ¾, -fCf“ffbfNfX, ÌfyfA, °±, BfyfA, Ì Ä %o, Í, „\_”z—  
ñ, Ö, ÌfCf“ffbfNfX A2”Ö-Ú, Í-@ ü”z—  
ñ, Ö, ÌfCf“ffbfNfX, ðŽ', · BfCf“ffbfNfX, ÌfŠfXfg, Ì ÄÆã, É, Í0, ð Ý'è, µ, È, , Ä, Í, È, Ç, È, Ç B

lpD3DRMFaceArray  
V, ½, É ì - , ³, ê, ½-Ê, Ö, Ìf|fCf“f^, ðŠi”[ , ·, é AIDirect3DRMFaceArrayfCf“f^ [ftfFfCfX, Ö, Ìf|  
fCf“f^, ÌfAfhfÇfX B

**IDirect3DRMMeshBuilder::AddFrame**

HRESULT AddFrame (LPDIRECT3DRMFRAME lpD3DRMFrame);

ftfCE [f€, ìfRf“fef“fc, ðDirect3DRMMeshBuilderfIfufWfFfNfg, É'Ç%Á, ·, é B  
-CE÷, ·, 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

lpD3DRMFrame

ftfCE [f€, ìfAfhfCEfX B, ±, ìftfCE [f€, ìfRf“fef“fc, ”Ç%Á, ³, ê, é B  
, ±, ì ^— , ð s, Á, Ä, à ACE³ftfCE [f€, ³, Ì X, Ů, ½, ÍŽQ Æ, ³, ê, é, ±, Æ, Í, È, ç B

### **IDirect3DRMMeshBuilder::AddMesh**

HRESULT AddMesh (LPDIRECT3DRMMESH lpD3DRMMesh);

f fbfVf...,đDirect3DRMMeshBuilderIfufWffNfg,É'Ç%Á,·,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

lpD3DRMMesh

'Ç%Á,·,é fbfVf...,ĪfAfhfÆfX B

**IDirect3DRMMeshBuilder::AddMeshBuilder**

HRESULT AddMeshBuilder(LPDIRECT3DRMMESHBUILDER lpD3DRMMeshBuild);

Direct3DRMMeshBuilderIfuWfFfNfg, ÌfRf“fef“fc, ð A¼, ÌDirect3DRMMeshBuilderIfuWfFfNfg, É'Ç%Á, ·, 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, Î•Ô'l v, ðŽQ Æ, ·, é, ±, Æ B

lpD3DRMMeshBuild

Direct3DRMMeshBuilderIfuWfFfNfg, ÌfAfhfÆfX B, ±, ÌIfuWfFfNfg, ÌfRf“fef“fc, ¸Ç%Á, ³, ê, é B

, ±, Ì ^— , ð s, Á, Ä, à A, à, Æ, ÌDirect3DRMMeshBuilderIfuWfFfNfg, ¸İ X, Ů, ½, ÍŽQ Æ, ³, ê, é, ±, Æ, Í, È, ¢ B

### **IDirect3DRMMeshBuilder::AddNormal**

```
int AddNormal(D3DVALUE x, D3DVALUE y, D3DVALUE z);
```

```
-@ ü,ðDirect3DRMMeshBuilderIfufWfFfNfg,É'Ç%Á,·,é B
```

```
-@ ü,ìfCf“ffbfNfX,ð•Ô,· B
```

*x, y, z*

```
V,µ,¢-@ ü,ì•ûEü,ðŽ!,·x Ay Az,ìŠe—v‘f B
```

### IDirect3DRMMeshBuilder::AddVertex

```
int AddVertex(D3DVALUE x, D3DVALUE y, D3DVALUE z);
```

```
' , “_ , δDirect3DRMMeshBuilderIfufWfFfNfg, É'Ç%Á, , é B
```

```
' , “_ , ÌfCf“fffbfNfX, δ•Ô, · B
```

x, y, z

```
V, μ, Ç, “_ , ÌÊ'u, δŽ!, ·x Ay Az, ÌŠe—v'f B
```

### IDirect3DRMMeshBuilder::CreateFace

HRESULT CreateFace(LPDIRECT3DRMFACE\* lpD3DRMFace);

’, “\_ , δŽ , ½, È, Ç-Ê, ð V, μ, ì ¬, μ ADirect3DRMMeshBuilderIfufWfFfNfg, É’Ç%Á, ·, é B

¬Ç÷, ·, 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

lpD3DRMFace

ì ¬, ³, ê, ½-Ê, Ö, Ì|fCf“f^, ðŠi”[, ·, éIDirect3DRMFacefCf“f^ [ftfFfCfX, Ö, Ì|fCf“f^, ÌfAfhfÇfX B

### **IDirect3DRMMeshBuilder::CreateMesh**

HRESULT CreateMesh(LPDIRECT3DRMMESH\* lpD3DRMMesh);

Direct3DRMMeshBuilderIfufWfFfNfg, ©, ç V, μ, €f fbfVf..., ð ì ¬, ·, 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, Ĩ•Ô'l v, ðŽQ Æ, ·, é, ±, Æ B

lpD3DRMMesh

IDirect3DRMMeshfCf“f^ [ftfFfCfX, Ö, ìf|fCf“f^, ðŽó, Žæ, éfAfhf€fX B

**IDirect3DRMMeshBuilder::GenerateNormals**

HRESULT GenerateNormals();

Direct3DRMMeshBuilderIfufWfFfNfg,đ ^— ,μ A',“\_@ ü,đ ¶ ¬,·,é B',“\_@ ü,Í AŠe',“\_É Ú,·,é-Ê-  
@ ü,İ½<İ,Ä, ,é B

¬E÷,·,é,ÆD3DRM\_OK AŽ,“s,·,é,ÆfGf%o [,đ•Ö,· B•Ö'l,İê——,É,Ä,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,İ•Ö'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<éCE”ÍÍ,đŽæ“¼,·,é B<éCE”ÍÍ,Í A,»„ê,¼,ê,ìŽŸCE³,ìf,ff< À•W,ì Á →  
l,Æ Á‘â’l,đŽ,· B

–CE÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,đ•Ô,· B•Ô’l,îê——,É,Á,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,î•Ô’l v,đŽQ Æ,·,é,±,Æ B

lpD3DRMBox

<éCE”ÍÍ,đŽó,–Žæ,éD3DRMBOX \‘¢’î B

**IDirect3DRMMeshBuilder::GetColorSource**

D3DRMCOLORSOURCE GetColorSource();

Direct3DRMMeshBuilderIfufWfFfNfg, ÌfJf% [ Ef\ [fX, đŽæ“¾, ·, é BfJf% [ Ef\ [fX, Í-Ê, Â, à', “, \_, Â, à, æ, ¢ B

D3DRMCOLORSOURCE—ñ“E^f f“fo, Ì, Đ, Æ, Â, đ•Ô, · B

ŽQ Æ @IDirect3DRMMeshBuilder::SetColorSource

### **IDirect3DRMMeshBuilder::GetFaceCount**

```
int GetFaceCount ();
```

```
Direct3DRMMeshBuilderIfuWfFfNfg'†,l-Ê,l ",đŽæ“¾,·,é B
```

```
-Ê,l ",đ•Ô,· B
```

### **IDirect3DRMMeshBuilder::GetFaces**

HRESULT GetFaces (LPDIRECT3DRMFACEARRAY\* lpD3DRMFaceArray);

Direct3DRMMeshBuilderIfufWfFfNfg, Ì-Ê, 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, Î•Ô'l v, ðŽQ Æ, ·, é, ±, Æ B

lpD3DRMFaceArray

-Ê, ÌfAfhfÆfX, ðŽó, Žæ, éIDirect3DRMFaceArrayfCf“f^ [ftfFfCfX, Ö, Ìf|fCf“f^, ÌfAfhfÆfX B

### **IDirect3DRMMeshBuilder::GetPerspective**

```
BOOL GetPerspective();
```

```
Direct3DRMMeshBuilderfIfufWfFfNfg, Å A%“<ß•â ³,a—LŒø,É,È,Á,Ä,¢,é,©,Ç,□,©,ðŽæ“¾,·,·,é B  
%“<ß•â ³,a—LŒø,Á,ê,ÎTRUE A,»,□,Á,È,¯,ê,ÎFALSE,ð•Ô,· B
```

**IDirect3DRMMeshBuilder::GetQuality**

D3DRMRENDERQUALITY GetQuality();

Direct3DRMMeshBuilderIfuWfFfNfg,IfEf“f\_Šf“fO•iŽç,đŽæ“¾,·,é B

f fbfVf...,IfEf“f\_Šf“fO•iŽç,đŽç,·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);

Direct3DRMMeshBuilderIfufWfFfNfg'†,İŽw`è,³,ê,½ A',“\_İfefNfXf`ff À•W,ðŽæ“¾,·,é B

-Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,İê——,É,Â,Œ  
,Ä,Í A uDirect3D•ŮŽ 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 À•W,ðŽó,~Žæ,é•İ ” B

ŽQ Æ **IDirect3DRMMeshBuilder::SetTextureCoordinates**

**IDirect3DRMMeshBuilder::GetVertexColor**

D3DCOLOR GetVertexColor(DWORD index);

Direct3DRMMeshBuilderfIfufWfFfNfg'†,İŽw'è,<sup>3</sup>,ê,½',“\_„İ F,ðŽæ“¾,·,é B  
F,ð•Ô,· B

*index*  
,“\_„İfCf“ffbfNfX B

ŽQ Æ **IDirect3DRMMeshBuilder::SetVertexColor**

## **IDirect3DRMMeshBuilder::GetVertexCount**

```
int GetVertexCount();
```

Direct3DRMMeshBuilderIfuWfFfNfg'†,ì,“\_ì ”,đŽæ“¼,·,é B

,“\_ì ”,đ•Ô,· B

### IDirect3DRMMeshBuilder::GetVertices

```
HRESULT GetVertices(DWORD *vcount, D3DVECTOR *vertices,  
    DWORD *ncount, D3DVECTOR *normals, DWORD *face_data_size,  
    DWORD *face_data);
```

```
Direct3DRMMeshBuilder IfufWfFfNfg,Ì,“_ A-@ ü A-Êff [f^,ðŽæ“¾,·,é B
```

```
    -E±,·,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
```

*vcount*

```
    ,“_ ,Ì ”,ðŽó,~Žæ,é•Î ”,ÌfAfhf(EfX B
```

*vertices*

```
    Direct3DRMMeshBuilderIfufWfFfNfg,Ì,“_ ,ðŽó,~Žæ,éD3DVECTOR \‘c‘ì,ì”z—ñ B
```

*ncount*

```
    -@ ü,Ì ”,ðŽó,~Žæ,é•Î ” B
```

*normals*

```
    Direct3DRMMeshBuilderIfufWfFfNfg,Ì-@ ü,ðŽó,~Žæ,éD3DVECTOR \‘c‘ì,ì”z—ñ B
```

*face\_data\_size*

```
    face_data_sizepf%of [f^,ªŽ,·fobftf@,ÌfTfCfY,ðŽw'è,·,é•Î ” B,±,ÌfTfCfY,ÍDWORD'ÌP^Ê,Â—^,!,ç,ê,é B,±  
    ,Ìfpf%of [f^,ÉNULL,ðŽw'è,·,é,±,Æ,Í,Â,« ,É,¢ B
```

*face\_data*

```
    Direct3DRMMeshBuilderIfufWfFfNfg,Ì-Êff [f^ B,±,Ìff [f^,Í ANULL,Â I,í,é,Æ,¢,±,±  
    ,Æ,ð æ,~ ,Í AIDirect3DRMMeshBuilder::AddFaces f f\bfh,ÂŽw'è,·,é,à,Ì,Æ“~ ,¶(E`Ž@,Â ,é B,±  
    ,Ìfpf%of [f^,ªNULL,Ì,Æ,« A-Êfobftf@,ªK—v,Æ,·,éTfCfY,ªface_data_sizepf%of [f^,É•Ô,³,ê,é B
```

### IDirect3DRMMeshBuilder::Load

```
HRESULT Load(LPVOID lpvObjSource, LPVOID lpvObjID,  
             D3DRMLOADOPTIONS d3drmLOFlags,  
             D3DRMLOADTEXTURECALLBACK d3drmLoadTextureProc, LPVOID lpvArg);
```

Direct3DRMMeshBuilderIfuFwFfNfg,df [fh,·,é B

-E±,·,é,ED3DRM\_OK AŽ,”s,·,é,ÆfGf%o [ ,ð•Ô,· B•Ô'l,Îê——,É,Â,c  
 ,Ä,Í A uDirect3D•ŮŽ f, [fh,Î•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lpvObjSource

f [fh,·,éIfuFwFfNfg,Î\ [fX Bd3drmLOFlagsfpf%of [f^,Ž',·f\ [fX Eftf%ofO,É,æ,Á,Ä Aftf@fCf< Af  
 Šf\ [fX Af f,Š EfuF fbfn A,Ů,½,ÍfXfgfŠ [f€,ðŽw'è,·,é B

lpvObjID

f [fh,·,éIfuFwFfNfg,Î-¼'O,Ů,½,ÍÊ'u B,±  
 ,Îfpf%of [f^,Íd3drmLOFlagsfpf%of [f^,Ž',·Ž•ÊŽqftf%ofO,É,æ,Á,Ä%ðŽB,³,é,é BD3DRMLOAD\_BYPOSITIO  
 Nftf%ofO,ðŽw'è,µ,½ ê ± A,±,Îfpf%of [f^,Íftf@fCf<,Î†,ÎIfuFwFfNfg,Î ± ~,ðŽ',·DWORD'l,Ů,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(É,Î)l B

d3drmLoadTextureProc

**D3DRMLOADTEXTURECALLBACK**fR [f<f ofbfNŠÖ ” B,±,é,Í A“Á•Ê,ÈftfH [f}fbfg,ð•K—  
 v,Æ,·,éIfuFwFfNfg,ª—p,c,éfefNfXf ff,ð“Ç,Ý o,·,Æ,« ,ÉÉÄ,Ň o,³,é,é B,±  
 ,Îfpf%of [f^,É,ÎNULL,ðŽw'è,·,é,±,Æ,ª,Ä,« ,é B

lpvArg

**D3DRMLOADTEXTURECALLBACK**fR [f<f ofbfNŠÖ ”,É“n,³,é,é AfAfvfŠfP [fvf±f“è\,Îff [f^ B

ffftfHf<fg,Ä,Í A,±,Îf f\fbfh,ÎlpvObjSourcefpf%of [f^,ÄŽw'è,³,é,½f\ [fX,©,ç Ä %o,Îf fbvf...  
 ,ðf [fh,·,é B

### IDirect3DRMMeshBuilder::ReserveSpace

```
HRESULT ReserveSpace(DWORD vertexCount, DWORD normalCount,  
    DWORD faceCount);
```

' ; " \_ A-@ ü A-Ê,Ì ", ðŽw'è,µ,Ä ADirect3DRMMeshBuilderIfufWfFfNfg'†,É—Ïæ,ðŠm•Û,·,é B,±  
,ê,Ê,æ,Á,Ä AfVfXfef€,,æ,èEø—"I,Éf f,fŠ,ðŽg,!,é,æ,ϱ,É,È,é B

-E±,·,é,ÆD3DRM\_OK AŽ,"s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Ïê——,É,Â,c  
,Ä,Í A uDirect3D•ÛŽ f, [fh,Ï•Ô'l v,ðŽQ Æ,·,é,±,Æ B

*vertexCount, normalCount, faceCount*

' ; " \_ A-@ ü A-Ê,Ì,½,ß,ÉŠ,,è“-,Ä,é—Ïæ,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•Ů,· B•Ů'l,îê——,É,Á,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,î•Ů'l v,đŽQ Æ,·,é,±,Æ B

lpFilename

ì ¬,³,ê,éftf@fCf<-¼‘O,Ö,îf|fCf“f^ Bftf@fCf<-¼,ìŠg’£Žq,Í.X,Á,È,,Ä,Í,È,ç,È,¢ B

d3drmXOFFFormat

**D3DRMXOFFORMAT**—ñ,“Œ^,ìD3DRMXOF\_TEXT'l B

d3drmSOContents

•Ů‘¶f1fvfVf‡f“,đ•,·**D3DRMSAVEOPTIONS**(Œ^,ì'l B

### IDirect3DRMMeshBuilder::Scale

HRESULT Scale(D3DVALUE sx, D3DVALUE sy, D3DVALUE sz);

$f, f f \left( \sqrt{x^2 + y^2 + z^2} \right)$   
^, !, ç, ê, ½ kŽÚŒW ”, É, æ, Á, Ä ADirect3DRMMeshBuilderIfufWfFfNfg, ðfXfP [fŠf“fO, ·, é B

-Œ÷, ·, é, ED3DRM\_OK AŽ, ”s, ·, é, AfGf%o [, ð•Ô, · B•Ô'l, îê——, É, Á, ç  
, Ä, Í A uDirect3D•ŮŽ f, [fh, Ľ•Ô'l v, ðŽQ Œ, ·, é, ±, Œ B

sx, sy, sz  
 $x^2 + y^2 + z^2$  AžŽ² AzŽ², É%o^, Á, Ä“K—p, ³, ê, é kŽÚŒW ” B

### **IDirect3DRMMeshBuilder::SetColor**

HRESULT SetColor(D3DCOLOR color);

Direct3DRMMeshBuilderIfufWfFfNfg,î,·,×,Ä,î-Ê,É AŽw'è,<sup>3</sup>,ê,½ F,đ Ý'è,·,é B

-E÷,·,é,ÆD3DRM\_OK AŽ,"s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, fh,î•Ô'l v,đŽQ Æ,·,é,±,Æ B

*color*

-Ê,î F B

**IDirect3DRMMeshBuilder::SetColorRGB**

HRESULT SetColorRGB(D3DVALUE red, D3DVALUE green, D3DVALUE blue);

Direct3DRMMeshBuilderfIfufWfFfNfg,Ì,·,×,Ä,Ì-Ê,É AŽw'è,<sup>3</sup>,ê,½ F,đ Ý'è,·,é B

-E÷,·,é,ÆD3DRM\_OK AŽ,"s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Î•Ô'l v,đŽQ Æ,·,é,±,Æ B

*red, green, blue*

Ý'è,·,é F,Ì Ô A—Î A Â,Ìše—v'f B

**IDirect3DRMMeshBuilder::SetColorSource**

HRESULT SetColorSource(D3DRMCOLORSOURCE source);

Direct3DRMMeshBuilderIfufWfFfNfg,ÏfJf% [ Ef\ [fX,ð Ý'è,·,é B

-E÷,·,é,ÆD3DRM\_OK AŽ,"s,·,é,ÆfGf% [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ĵ•Ó'l v,ðŽQ Æ,·,é,±,Æ B

source

V,µ,Žg—p,·,éfJf% [ Ef\ [fX,ðŽl,·D3DRMCOLORSOURCE—ñ“CE^,Ïf f“fo B

ŽQ Æ @IDirect3DRMMeshBuilder::GetColorSource

**IDirect3DRMMeshBuilder::SetMaterial**

HRESULT SetMaterial(LPDIRECT3DRMMATERIAL lpIDirect3DRMmaterial);

Direct3DRMMeshBuilderIfuWfFfNfg, Ì, ·, ×, Ä, Ì-Ê, Êf}fefŠfAf<, ð Ý'è, ·, é B

-E÷, ·, é, ED3DRM\_OK AŽ, ”s, ·, é, AfGf%o [, ð•Ô, · B•Ô'l, Îê——, É, Â, ç  
, Ä, Í A uDirect3D•ŮŽ f, [fh, Ì•Ô'l v, ðŽQ Æ, ·, é, ±, Æ B

lpIDirect3DRMmaterial

Direct3DRMMeshBuilderIfuWfFfNfg, ÌIDirect3DRMMaterialfCf“f^ [ftfFfCfX B

**IDirect3DRMMeshBuilder::SetNormal**

HRESULT SetNormal(DWORD index, D3DVALUE x, D3DVALUE y, D3DVALUE z);

Direct3DRMMeshBuilderfIfufWfFfNfg,ÅŽw'è,³,ê,½',“\_,-@ üfxfNfgfç,ð Ý'è,·,é B

-E÷,·,é,ÆD3DRM\_OK AŽ,“s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,ç  
,Ä,Í A uDirect3D•ÜŽ f, [fh,Î•Ô'l v,ðŽQ Æ,·,é,±,Æ B

index

Ý'è,·,é-@ ü,ÏCf“fffbfNfX B

x, y, z

Žw'è,µ,½-@ ü,ÉŠ,,è“-Ä,éfxfNfgfç,Ïx Ay Az,ÏŠe—v'f B

### IDirect3DRMMeshBuilder::SetPerspective

HRESULT SetPerspective(BOOL perspective);

Direct3DRMMeshBuilderIfufWfFfNfg,Ì A%“«ß•â ³fefNfXf`ff Ef}fbfsf“fO,ð—LÆø,Û,½,Í³Æø,É,·,é B

¬Æ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ÛŽ f, [fh,Î•Ô'l v,ðŽQ Æ,·,é,±,Æ B

*perspective*

f fbfVf...,ÌfefNfXf`ff Ef}fbfsf“fO,É%“«ß•â ³,ð“K—p,·,é ê ‡,ÍTRUE A,»²,Â,È,¯,ê,ÎFALSE,ðŽw'è,·,é B

**IDirect3DRMMeshBuilder::SetQuality**

HRESULT SetQuality(D3DRMRENDERQUALITY quality);

Direct3DRMMeshBuilderIfufWfFfNfg, ðfEf“f\_Šf“fO•iŽç, ð Ý'è, , é B

-E÷, , é, ÆD3DRM\_OK AŽ, ”s, , é, ÆfGf%o [, ð•Ô, · B•Ô'l, Îê——, É, Â, ç  
, Ä, Í A uDirect3D•ŮŽ f, [fh, Ĩ•Ô'l v, ðŽQ Æ, , é, ±, Æ B

quality

V, µ, Žg—p, , éfEf“f\_Šf“fO•iŽç, ðŽ', · AD3DRMRENDERQUALITY—ñ«E^, ðf f“fo B

ŽQ Æ @IDirect3DRMMeshBuilder::GetQuality

### **IDirect3DRMMeshBuilder::SetTexture**

HRESULT SetTexture(LPDIRECT3DRMTEXTURE lpD3DRMTexture);

Direct3DRMMeshBuilderIfuWfFfNfg, Ì, ·, ×, Ä, Ì-Ê, ÌfNfXf`ff, ð Ý'è, ·, é B

-E÷, ·, é, ÆD3DRM\_OK AŽ, ”s, ·, é, ÆfGf% [, ð•Ô, · B•Ô'l, Îê——, É, Â, ç  
, Ä, Í A uDirect3D•ÛŽ 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);

Direct3DRMMeshBuilderfIfufWfFfNfg,žw'è,³,ê,½',“\_̀İfefNfXf`ff À•W,đ Ý'è,·,é B

-E÷,·,é,ÆD3DRM\_OK AŽ,“s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,İê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,İ•Ô'l v,đŽQ Æ,·,é,±,Æ B

index

Ý'è,·,é',“\_̀İfCf“fffbfNfX B

u, v

Žw'è,³,ê,½f fbfVf...',“\_̀,ÉŠ,,è“-,Ä,éfefNfXf`ff À•W B

ŽQ Æ @IDirect3DRMMeshBuilder::GetTextureCoordinates

## IDirect3DRMMeshBuilder::SetTextureTopology

HRESULT SetTextureTopology(BOOL cylU, BOOL cylV);

Direct3DRMMeshBuilderIfuWfFfNfg,lfefNfXf`ff^Ê'Š,đ Ý'è,·,é B

-Ĉ÷,·,é,ÆD3DRM\_OK AŽ,"s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,Îê——,É,Â,ĉ  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ī•Ó'l v,đŽQ Æ,·,é,±,Æ B

cylU, cylV

uŽŸĈ³,ÆvŽŸĈ³,ÎÊ'Šftf%fo BuŽŸĈ³,Ů,½,ÍvŽŸĈ³,É%~'ĈÊ'Š,đŽ ,½,¹,é ê ‡,ÍTRUE A,»,"  
,Ä,È,¯,ê,ÎFALSE,đŽw'è,·,é B

**IDirect3DRMMeshBuilder::SetVertex**

HRESULT SetVertex(DWORD index, D3DVALUE x, D3DVALUE y, D3DVALUE z);

Direct3DRMMeshBuilderfIfufWfFfNfg,ìŽw'è,³,ê,½',“\_ ,îÊ'u,ð Ý'è,·,é B

-E÷,·,é,ÆD3DRM\_OK AŽ, ”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, fh,î•Ô'l v,ðŽQ Æ,·,é,±,Æ B

index

Ý'è,·,é',“\_ ,îfCf“fffbfNfX B

x, y, z

Žw'è,³,ê,½',“\_ ,ÉŠ,,è“-,Ä,éÊ'u,ìx 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  
-E÷,·,é,ÆD3DRM\_OK AŽ, ”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,ĭ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

*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,Œ  
,Ä,Í A uDirect3D•ŮŽ f, [fh,î•Ô'l v,ðŽQ Æ,·,é,±,Æ B

*index*

Ý'è,·,é',“\_ÌfCf“fffbfNfX B

*red, green, blue*

'“\_ÉŠ,,è“-,Ä,é F,î Ô A—Î A Â,îŠe—v'f B

**IDirect3DRMMeshBuilder::Translate**

HRESULT Translate(D3DVALUE tx, D3DVALUE ty, D3DVALUE tz);

Direct3DRMMeshBuilderfIfufWfFfNfg,ì,“\_ìÊ'u,É AŽw'è,³,ê,½fIfzfzfbfg,đ'Ç%Á,·,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, ffh,î•Ô'l v,đŽQ Æ,·,é,±,Æ B

tx, ty, tz  
Še',“\_Ê'u,ìx Ay Az Ä•W,»,ê,¼,ê,É'Ç%Á,³,ê,éfIfzfzfbfg B

## IDirect3DRMObject

*fAfvfŠfP [fvfzf“ÍDirect3DRMfIfufWfFfNfg,İfX [fp [ EfNf%ofX,Æ,â,èŽæ,è,·,é,½,ß AIDirect3DRMObjectCf  
“f^ [ftfFfCfX,İf f\fbfh,ðŽg—p,·,é B,±  
,İfZfNfVfzf“ÍDirect3DRMObjectCf“f^ [ftfFfCfX Ef f\fbfh,İfŠtf@fCf“fX,Â, ,é BŠT”O,É,Â,c,Ä,İŠT—  
v,İ A uIDirect3DRMObjectCf“f^ [ftfFfCfX v,ðŽQ Æ,·,é,±,Æ B*

*IDirect3DRMObjectCf“f^ [ftfFfCfX Ef f\fbfh,İ A^È%°,İfOf< [fv,É•ª—D,·,é,±,Æ,ª,Â,«,«é B*

*fAfvfŠfP [fvfzf“CEÄ— GetAppData  
L,İff [f^*

SetAppData

*•i » Clone*

*—¼‘O GetClassName*

GetName

SetName

*’É’m AddDestroyCallback*

DeleteDestroyCallback

*IDirect3DRMObjectCf“f^ [ftfFfCfX,İ A,·,×,Ä,İCOMfCf“f^ [ftfFfCfX,Æ“—  
l A|UnknownfCf“f^ [ftfFfCfX Ef f\fbfh,ðCep ³,·,é BIUnknownfCf“f^ [ftfFfCfX,İŽÿ,İ,R,Â,İf f\fbfh,ðfTf|  
[fg,·,é B*

AddRef

QueryInterface

Release

*Direct3DRMObjectfIfufWfFfNfg,İ A“K Ø,ÈQueryInterface f\fbfh,ðCEÄ,Ñ o,·,±*

*,Æ,É,æ,è A,C,İDirect3DRMfIfufWfFfNfg,©,ç,Â,àŽæ“¾,·,é,±*

*,Æ,ª,Â,«,«é B,·,×,Ä,İDirect3DRMfIfufWfFfNfg,İ AIDirect3DRMObjectCf“f^ [ftfFfCfX Ef f\fbfh,ðCep ³,·,é  
B*

**IDirect3DRMObject::AddDestroyCallback**

HRESULT AddDestroyCallback(D3DRMOBJECTCALLBACK lpCallback,  
LPVOID lpArg);

*fIfufWfFfNfg, "jŠü, 3, ê, é, Æ, «, ÉCEÄ, Ñ o, 3, ê, éŠÖ " , ð"o~^, ·, é B*

*-CE÷, ·, é, ÆD3DRM\_OK AŽ, "s, ·, é, ÆfGf%o [, ð•Ö, · B•Ö'l, Îê——, É, Á, ç  
, Ä, Í A uDirect3D•ÜŽ f, [fh, Î•Ö'l v, ðŽQ Æ, ·, é, ±, Æ B*

*lpCallback*

*fIfufWfFfNfg, "jŠü, 3, ê, é, Æ, «, ÉCEÄ, Ñ o, 3, ê, é Af† [fU'èç, ÎfR [fçfobfNŠÖ " B*

*lpArg*

*fR [fçfobfNŠÖ " , É"n, 3, ê, é AfAvfŠfP [fVf‡f""èç, Îff [f^ B, ±  
, ŠÖ " , ÍfIfufWfFfNfg, "jŠü, 3, ê, ½CEä, ÉCEÄ, Ñ o, 3, ê, é, ½, ß A^ø " , Æ, µ, ÄfIfufWfFfNfg, ð"n, µ, Ä, Í, È, ç, È, ç B*

**IDirect3DRMObject::Clone**

HRESULT Clone(LPUNKNOWN pUnkOuter, REFIID riid, LPVOID \*ppvObj);

*fIfufWfFfNfg,İ•i* »đ ì ¬,•,é B

¬Ē÷,•,é,ĒD3DRM\_OK AŽ,•s,•,é,ĒfGf%o [,đ•Ô,• B•Ô'l,İ•ê—,É,Ā,ĉ  
,Ä,İ A uDirect3D•ŮŽ f, [fh,İ•Ô'l v,đŽQ Ē,•,é,±,Ē B

*pUnkOuter*

COM W ¬%o»«@”\,É‘İ%ož,•,é,½,ß,É‘¶ Ý,•,épf%of [f^ B

*riid*

•i »•,éIfufWfFfNfg,İŽ•ÊŽq B

*ppvObj*

f f\fbfh,<sup>a</sup> §Ēä,đ•Ô,•,Ē,« AfIfufWfFfNfg,İ•i »•,đŠi”[,•,éAfhfĒfX 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

-Æ÷,·,é,ÆD3DRM\_OK AŽ, ”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Á,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Î•Ô'l v,ðŽQ Æ,·,é,±,Æ B

d3drmObjProc

fIfufWfFfNfg, ”jŠü,³,ê,é,Æ,«,ÉÆÄ,Ñ o,³,ê,é Af† [fU'è`,ÌD3DRMOBJECTCALLBACKfR [f<fofbfNŠÖ ”  
B

lpArg

fR [f<fofbfNŠÖ ”,É“n,³,ê,é AfAfvfŠfP [fVf‡f““è`,Ìff [f^,ÌfAfhfÆfX B

**IDirect3DRMObject::GetAppData**

DWORD GetAppData ();

*fIfufWfFfNfg,©,ç AfAvfŠfP [fVf‡f“ĈĀ—L,ì32frfbfg Eff [f^,đŽæ“¾,·,é BffftfHf<fg'l,Í0,Ā, ,é B  
fAvfŠfP [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);

HRESULT GetClassName(LPDWORD lpdwSize, LPSTR lpName);

HRESULT GetClassName(LPDWORD lpdwSize, LPSTR lpName);

lpdwSize

lpdwSize

lpName

lpName

**IDirect3DRMObject::GetName**

HRESULT GetName(LPDWORD lpdwSize, LPSTR lpName);

*lpdwSize*

*lpName*

*lpdwSize*

*lpName*

*lpName*

*lpdwSize*

**IDirect3DRMObject::SetName**

## **IDirect3DRMObject::SetAppData**

HRESULT SetAppData(DWORD ulData);

*fIfufWfFfNfg,ÉfAfvfŠfP [fVf‡f“ĈĀ—L,ì32frfbfg Eff [f^,ð Ý'è,·,é B*

*-Ĉ÷,·,é,ĀD3DRM\_OK AŽ, ”s,·,é,ĀfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Ā,ĉ  
 ,Ā,Í A uDirect3D•ŮŽ f, [fh,Ī•Ô'l v,ðŽQ Ā,·,é,±,Ā B*

*ulData*

*fIfufWfFfNfg,ÉŠi”[<sup>3</sup>,ê,é† [fU'èç,ìff [f^ B*

ŽQ Ā @IDirect3DRMObject::GetAppData

## **IDirect3DRMObject::SetName**

HRESULT SetName(const char \* lpName);

*lpName*

–E±,·,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

*lpName*

fIfufWfFfNfg,Î¼'O,ðŽ!,·f† [fU'èç,Îff [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,đĚÄ,Ň o,·,Æ,«,Í A,± ,İ %Šú%»,Í•s—v,Ä, ,é B %Šú%»,“K— v,È,İ,Í AIDirect3DRM::CreateObjectf f\fbfh,đĚÄ,Ň o,μ,Ä%A%œ,đ ¶ ¬,·,é ê ‡,¼,\_,Ä, ,é B

,±,İfZfNfVf‡f“,ÍIDirect3DRMShadowfCf“f^ [ftFfCfX Ef f\fbfh,İfŠftf@fĚf“fX,Ä, ,é BŠT”O,É,Ä,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,đĚp ³,·,é BIUnknownfCf“f^ [ftFfCfX,ÍŽŸ,İ,R,Ä,İf f\fbfh,đfTf] [fg,·,é B

**AddRef**

**QueryInterface**

**Release**

,³,ĉ,É AIDirect3DRMShadowfCf“f^ [ftFfCfX,Í AIDirect3DRMObjectfCf“f^ [ftFfCfX,©,ĉŽŸ,İf f\fbfh,đĚp ³,·,é B

**AddDestroyCallback**

**Clone**

**DeleteDestroyCallback**

**GetAppData**

**GetClassName**

**GetName**

**SetAppData**

**SetName**

Direct3DRMShadowfIfufWfFfNfg,Í AIDirect3DRM::CreateShadowf f\fbfh,İĚÄ,Ň o,μ,É,æ,Ä,Žæ“¼,³,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

–Ĉ÷,.,é,ĀD3DRM\_OK AŽ,”s,.,é,ĀfGf%o [,đ•Ô,· B•Ô'l,Îê——,É,Ā,ĉ  
,Ā,Ī A uDirect3D•ŮŽ f. [fh,Ī•Ô'l v,đŽQ Ā,.,é,±,Ā B

*lpD3DRMVisual*

%oA%oe•t,.,éDirect3DRMVisualIfufWfFfNfg B

*lpD3DRMLight*

%oA%oe,ĪĈ³,É,È,éĈðĈ¹,đ'ñ<Ÿ,.,éDirect3DRMLightIfufWfFfNfg B

*px, py, pz*

%oA%oe,•t,.,ç,ê,é•½–Ē ã,Ī“\_Ī Ā•W B

*nx, ny, nz*

%oA%oe,•t,.,ç,ê,é•½–Ē ã,Ī–@ üfxfnfgfç,Ī Ā•W B

## **IDirect3DRMTexture**

*fAfvfŠfP [fVf‡f“Í AfefNfXf`ff,ÆŒÝ,¢*  
*,É,â,èŽæ,è,·,é,½,β,ÉIDirect3DRMTexturefCf“f^ [ftfFfCfX,İf f\fbfh,ðŽg—p,·,é BfefNfXf`ff,Í«éŒ,İfsfNfZf“z*  
*—ñ,Â,·,é B,±,İfZfNfVf‡f“Í AIDirect3DRMTexturefCf“f^ [ftfFfCfX Ef f\fbfh,İfŠftf@fŒf“fX,Â,·,é BŠT”O,*  
*É,Â,¢,Ä,İŠT—v,Í A uIDirect3DRMTexturefCf“f^ [ftfFfCfX v,ðŽQ Æ,·,é,±,Æ B*

**IDirect3DRMTexturefCf“f^ [ftfFfCfX Ef f\fbfh,Í A`È%°,İfOf< [fv,É•ª—D,·,é,±,Æ,ª,Â,«,é B**

**F** **GetColors**  
**SetColors**

**ffJ [f<** **GetDecalOrigin**  
**GetDecalScale**  
**GetDecalSize**  
**GetDecalTransparency**  
**GetDecalTransparentColor**  
**SetDecalOrigin**  
**SetDecalScale**  
**SetDecalSize**  
**SetDecalTransparency**  
**SetDecalTransparentColor**

**fCf [fW** **GetImage**

**%oŠú%o»** **InitFromFile**  
**InitFromResource**  
**InitFromSurface**

**fŒf“f\_f%o [PÊ’m** **Changed**

**%oA%oe** **GetShades**  
**SetShades**

**IDirect3DRMTexturefCf“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 AIDirect3DRMTexturefCf“f^ [ftfFfCfX,Í AIDirect3DRMObjectfCf“f^ [ftfFfCfX,©,çŽŸ,İf f\fbfh,ðŒp ³,**  
**·,é B**

**AddDestroyCallback**

**Clone**

**DeleteDestroyCallback**

**GetAppData**

**GetClassName**

**GetName**

**SetAppData**

**SetName**

Direct3DRMTextureIfufWfFfNfg,í **ADirect3DRM::CreateTexturef** f\bfh,ìEÄ,Ñ o,μ,É,æ,Á,ÄŽæ“¾,Á,«,é B

**IDirect3DRMTexture::Changed**

HRESULT Changed(BOOL bPixels, BOOL bPalette);

fAfvfŠfP [fVf±f“,afefNfXf`ff,ìfsfNfZf<,âpfœfbfg,ð•İ X,μ,½,±,Æ,ðfœf“f\_f%o [‚É'Ê'm,·,é B

-œ÷,·,é,ÆD3DRM\_OK AŽ,“s,·,é,ÆfGf%o [‚ð•Ô,· B•Ô'l,İê——,É,Â,¢  
,Ä,İ A uDirect3D•ŮŽ f, [fh,İ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

bPixels

fsfNfZf<,a•İ X,<sup>3</sup>,ê,½,Æ,«,ÍTRUE,ð Ý'è,·,é B

bPalette

fpfœfbfg,a•İ X,<sup>3</sup>,ê,½,Æ,«,ÍTRUE,ð Ý'è,·,é B

**IDirect3DRMTexture::GetColors**

DWORD GetColors();

efNfXf`ff,lfef`f\_fŠf`fO,ÅŽg,í,ê,é Å‘â F ”,ðŽæ“¾,.,é B  
F ”,ð•Ô,· B

,±,lf f\fbfh,Í AfefNfXf`ff,ì ì ¬,ÉŽg,í,ê,½fCf [fW,ì F ”,Å,Í,È, A,±  
,ê,Û,Å,ÉfefNfXf`ff,É Ý’è,³,ê,½ F,ì ”,ð•Ô,· B,μ,½,ª,Á,Ä A’É í•Ô,³,ê,é F,ì ”,Í AIDirect3DRMTexture::SetColor  
rsf f\fbfh,Å-  
¾Ž,“I,ÉfefNfXf`ff,ì F,ð•İ X,μ,È,œÈÀ,è AIDirect3DRM::SetDefaultTextureColors f\fbfh,ðÈÄ,Ñ o,μ,Ä Ý’è,μ,  
½ F,Æ““,¶,Ä, ,é B

ŽQ Æ @IDirect3DRMTexture::SetColors

### **IDirect3DRMTexture::GetDecalOrigin**

HRESULT GetDecalOrigin(LONG \* lpIX, LONG \* lpIY);

ffj [f<, ÌE» Ý, ÌE“ \_ , ðŽæ“¾4, ·, é B

-E±, ·, é, ED3DRM\_OK AŽ, ”s, ·, é, AfGf%o [ , ð•Ô, · B•Ô'l, Îê——, É, Â, c  
, Ä, Í A uDirect3D•ŮŽ f, [fh, Ì•Ô'l v, ðŽQ AE, ·, é, ±, AE B

lpIX, lpIY

f f\fbfh,ª §Eä, ð•Ô, ·, AE, « AfffJ [f<, ÌE“ \_ , ðŽó, Žæ, é•İ ” B

ŽQ AE @**IDirect3DRMTexture::SetDecalOrigin**

**IDirect3DRMTexture::GetDecalScale**

DWORD GetDecalScale();

Žw'è,³,ê,½ffJ\_lf<,lfXfP [fŠf“fO“Á «,đŽæ“¾,·,é B

-E÷,·,é,ÆfXfP [fŠf“fO“Á «,đ•Ô,· BŽ,“s,·,é,Æ-,P,đ•Ô,· B

ŽQ Æ **IDirect3DRMTexture::SetDecalScale**

### **IDirect3DRMTexture::GetDecalSize**

HRESULT GetDecalSize(D3DVALUE \*lprvWidth, D3DVALUE \*lprvHeight);

*lprvWidth, lprvHeight*

*lprvWidth, lprvHeight*  
f f\fbfh,ª §Œä,ð•Ô,.,Æ,«,ÉffJ [f<,l• ,Æ ,3,ðŽó,Žæ,é•l ” B

*lprvWidth, lprvHeight*

f f\fbfh,ª §Œä,ð•Ô,.,Æ,«,ÉffJ [f<,l• ,Æ ,3,ðŽó,Žæ,é•l ” B

ŽQ Æ @**IDirect3DRMTexture::SetDecalSize**

## **IDirect3DRMTexture::GetDecalTransparency**

BOOL GetDecalTransparency();

*fffj* [f, ì“§-¾“x“Á «, ðŽæ“¾, ·, é B

*fffj* [f, 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, ì¹, ð•Ô, · B

ŽQ Æ @IDirect3DRMTexture::SetDecalTransparentColor

### **IDirect3DRMTexture::GetImage**

```
D3DRMIMAGE * GetImage();
```

efNfXf`ff,ì ì ¬,É—p,ç,ç,ê,½fCf [fW,ìfAfhfÇfX,ð•Ö,· B

Ç» Ý,ìefNfXf`ff,ì ì ¬,É—p,ç,ç,ê,½D3DRMIMAGE \ç'ì,Ö,ìf|fCf“f^,ð•Ö,· B

**IDirect3DRMTexture::GetShades**

DWORD GetShades ();

efNfXf`ff,đfEf“f\_Šf“fO,·,é Ū A,»„ê,¼,ê,Ì F,ĀŽg,í,ê,é%A%œ,Ì ”,đŽæ“¾,·,é B  
%A%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

-E÷,·,é,ÆD3DRM\_OK AŽ,„s,·,é,ÆfGf% [,ð•Ô,· B•Ô'l,Îê——,É,Â,ç  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ī•Ô'l v,ðŽQ Æ,·,é,±,Æ B

filename

%Šú%» î•ñ,ðŽæ,è o,·ftf@fCf,ðŽw'è,·,é•ŮŽš—ñ B

%Šú%»,·,éfefNfXf`ff,Í AIDirect3DRM::CreateObject,ð—p,ç,Ä ì ¬,µ,Ä,¬,©,È,,Ä,Í,È,ç,È,ç B

ŽQ Æ @IDirect3DRMTexture::InitFromResource, IDirect3DRMTexture::InitFromSurface

### **IDirect3DRMTexture::InitFromResource**

HRESULT InitFromResource(HRSRC rs);

Žw'è,³,ê,½fŠf\ [fX,©,çDirect3DRMTextureIfufWffNfg,đ %Šú%»,·,é B

-E÷,·,é,ÆD3DRM\_OK AŽ,"s,·,é,ÆfGf% [,đ•Ô,· B•Ô'l,Îê——,É,Â,ç  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ī•Ů'l v,đŽQ Æ,·,é,±,Æ B

rs

fŠf\ [fX,Īfnf“fhf,đŽw'è,·,é B

ŽQ Æ @IDirect3DRMTexture::InitFromFile, IDirect3DRMTexture::InitFromSurface

### **IDirect3DRMTexture::InitFromSurface**

HRESULT InitFromSurface(LPDIRECTDRAWSURFACE lpDDS);

Žw'è,³,ê,½DirectDrawfT [ftFfX,Ìf [f^,ðŽg—p,μ,ÄfefNfXf`ff,ð %Šú%»,·,é B

-E÷,·,é,ÆD3DRM\_OK AŽ,"s,·,é,ÆfGf% [,ð•Ô,· B•Ô'l,Îê——,É,Â,ç  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ī•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);

efNfXf`ff,lfEf“f\_fŠf“fO,ÉŽg—p,·,é Å‘â F ”,đ Ý’è,·,é B,±,İf f\bfh,ª•K—  
v,È,İ,İ Af%of“fv EfJf%o [ Ef,fff<,¾,¯,Å, ,é B

–E÷,·,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

ulColors

F ” BffftfHf<fg’l,Í8,Å, ,é B

ŽQ Æ @IDirect3DRMTexture::GetColors

### **IDirect3DRMTexture::SetDecalOrigin**

HRESULT SetDecalOrigin(LONG lX, LONG lY);

*fffj* [f<, ìCE´“\_ , ð AfffJ [f<, ì ¶ ã , © , ç , ì f l f t f Z f b f g , Æ , µ , Ä Ý è , · , é B

-CE÷ , · , é , Æ D 3 D R M \_ O K A Ž , ” s , · , é , Æ f G f % [ , ð • Ô , · B • Ô ' l , ì ê — , É , Â , ç , Ä , Í A u Direct3D•ÜŽ f , [fh, ì•Ó' l v , ð Ž Q Æ , · , é , ± , Æ B

*lX, lY*

V , µ , ç CE´“\_ , ð f f f J [f< Ä • W , Ä Ž w ' è , · , é B f f f t f H f < f g , ì CE´“\_ , ì [ 0 , 0 ] , Ä , · , é B

fCE´“f\_fŠf“fO, Æ , « , É , Í AfffJ [f<, ì CE´“\_ , ì , » , ì f t f CE [f€, ì Ê ' u , É f } f b f v , ³ , é , é B , ½ , Æ , , ì A V Ž š , ì f f f J [f<, ì CE´“\_ , ì f f f J [f<, ì ' + % » , É A % ° CE ü , « , ì - ì ó , ì CE´“\_ , ì ' ê • Ó , ì ' + % » , É f Z f b f g , ³ , é , é B

ŽQ Æ @ IDirect3DRMTexture::GetDecalOrigin

### **IDirect3DRMTexture::SetDecalScale**

HRESULT SetDecalScale(DWORD dwScale);

*ffj* [f<,l kZÚ“Á «,đfZfbfg,·,é B

-E÷,·,é,ED3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,Îê——,É,Â,ç  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Î•Ô'l v,đŽQ Æ,·,é,±,Æ B

*dwScale*

,±,Îfpf%o [f^,ÉTRUE,đŽw'è,·,é,Æ A [“x,đ l—

¶,É“ü,ê,Äffj [f<,đfXfP [fŠf“fO,·,é BFALSE,đŽw'è,·,é,Æ A [“x îñ,Í-3Ž<,3,ê,é BfftfHf<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,ç,é,Æ,« AŽg—p,³,ê,éfffJ [f<,ìfTfCfY,ð Ý’è,·,é B

-Æ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,Îê——,É,Ä,ç  
,Ä,Í A uDirect3D•ÜŽ f, [fh,Î•Ô'l v,ðŽQ Æ,·,é,±,Æ B

rvWidth, rvHeight

fffJ [f<,Ì V,µ,ç• ,Æ ,,³,ðf,fff< Ä•W,ÄŽw’è,·,é BffftfHf<fg,ìfTfCfY,Í[1, 1],Ä, ,é B

ŽQ Æ @IDirect3DRMTexture::GetDecalSize

## **IDirect3DRMTexture::SetDecalTransparency**

HRESULT SetDecalTransparency(BOOL bTransp);

*fffj* [f<, Ì“§-¾“x“Á «, ðfZfbfg, ·, é B

-E÷, ·, é, ED3DRM\_OK AŽ, ”s, ·, é, AfGf%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

*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* [fç,É“§-¾ F,đ Ý'è,·,é B

-E÷,·,é,ÆD3DRM\_OK AŽ, ”s,·,é,ÆfGf%o [ ,đ•Ô,· B•Ô'l,Îê——,É,Â,ç  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ī•Ó'l v,đŽQ Æ,·,é,±,Æ B

*rcTransp*

V,µ,ç“§-¾ F BffftfHf<fg,Ī“§-¾ F,Í •,Â, ,é B

ŽQ Æ @**IDirect3DRMTexture::GetDecalTransparentColor**

**IDirect3DRMTexture::SetShades**

HRESULT SetShades (DWORD ulShades);

fEf“f\_fŠf“fOŽž,ÉfefNfXf`ff,ìŠe F,ÅŽg—p,³,ê,é%A%œ,ì Å‘â,ì ”,ð Ý’è,·,é B

fEf“f\_fŠf“fO,ì,Æ,« AfefNfXf`ff,ì%A%œ,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,ff<,¾,¯,Å, ,é B

—Æ÷,·,é,ÆD3DRM\_OK AŽ, ”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô’l,ìê——,É,Å,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,ì•Ô’l v,ðŽQ Æ,·,é,±,Æ B

ulShades

%oA%œ,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 ADirect3DRMUserVisualIfufWfFfNfg,đ %oŠú%o»,·,é,½,ß,ÉIDirect3DRMUserVisualfCf“f^ [f tfFfCfX,Ìf f\fbfh,đŽg—

p,·,é BfAfvfŠfP [fVf‡f“,a**IDirect3DRM::CreateUserVisual** f\fbfh,đCEÄ,Ñ o,·,Æ,«,Í A,±,Ì %oŠú%o»,Í•s—v,Ä, ,é B %oŠú%o»,ª•K—v,È,Ì,Í A **IDirect3DRM::CreateObject** f\fbfh,đCEÄ,Ñ o,µ,ÄfWfWf...

fAf< EfIfufWfFfNfg,đ ¶ ¬,·,é ê ‡,¾, ,Ä, ,é B,±

,ÌfZfNfVf‡f“,Í A**IDirect3DRMUserVisual**fCf“f^ [ftfFfCfX Ef f\fbfh,ÌfŠftf@fEf“fX,Ä, ,é BŠT”O,É,Ä,¢ ,Ä,ÌŠT—v,Í A**IDirect3DRMUserVisual**fCf“f^ [ftfFfCfX,đŽQ Æ,·,é,±,Æ B

**IDirect3DRMUserVisual**fCf“f^ [ftfFfCfX,Í**Init** f\fbfh,đfTf| [fg,·,é B

**IDirect3DRMUserVisual**fCf“f^ [ftfFfCfX,Í A,·,×,Ä,ÌCOMfCf“f^ [ftfFfCfX,Æ“—

l A**Unknown**fCf“f^ [ftfFfCfX Ef f\fbfh,đCEp ³,·,é **BIUnknown**fCf“f^ [ftfFfCfX,ÍŽŸ,ì,R,Ä,Ìf f\fbfh,đfTf| [fg,·,é B

**AddRef**

**QueryInterface**

**Release**

,³,ç,É A**IDirect3DRMUserVisual**fCf“f^ [ftfFfCfX,Í A**IDirect3DRMObject**fCf“f^ [ftfFfCfX,©,çŽŸ,Ìf f\fbfh,đCEp ³,·,é B

**AddDestroyCallback**

**Clone**

**DeleteDestroyCallback**

**GetAppData**

**GetClassName**

**GetName**

**SetAppData**

**SetName**

Direct3DRMUserVisualIfufWfFfNfg,Í A**IDirect3DRM::CreateUserVisual** f\fbfh,ÌCEÄ,Ñ o,µ,É,æ,Ä,ÄŽæ“¾,³,ê,é B

**IDirect3DRMUserVisual::Init**

HRESULT Init(D3DRMUSERVISUALCALLBACK d3drmUVProc, void \* lpArg);

Direct3DRMUserVisualIfufWfFfNfg,đ %Šú%».,é B

¬E÷,.,é,ÆD3DRM\_OK AŽ,„s,.,é,ÆfGf% [ ,đ•Ô,· B•Ô'l,Îê—,É,Â,¢  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ī•Ô'l v,đŽQ Æ,.,é,±,Æ B

d3drmUVProc

fAfvfŠfP [fVf‡f“èè,İD3DRMUSERVISUALCALLBACK fR [f<fofbfNŠÖ ” B

lpArg

fR [f<fofbfNŠÖ ”,É“n,³,ê,éfAfvfŠfP [fVf‡f“èè,İff [f^,Ö,İffCf“f^ B

fAfvfŠfP [fVf‡f“,İDirect3DRM::CreateUserVisualf f\fbfh,đEÄ,Ñ o,µ Af† [fU EfrfWf...

fAf< EfIfufWfFfNfg,İ ì ¬,Æ %Šú%»„đ“Žž,É s,±,Æ,ª,Ä,«é BIDirect3DRMUserVisual::Init,đEÄ,Ñ o,•K—  
v,ª,é,İ,Í AIDirect3DRM::CreateObjectf f\fbfh,É,æ,Ä,Äf† [fU EfrfWf...

fAf< EfIfufWfFfNfg,đ ì ¬,µ,½ ê ±,¾,¬,Ä, ,é B

## IDirect3DRMViewport

*fAfvfŠfP [fVf‡f“Í Afrf... [f| [fg EfIfufWfFfNfg,ÆEÝ,¢*  
*,É,â,èŽæ,è,·,é,½,ß,ÉIDirect3DRMViewportfCf“f^ [ftfFfCfX,İf f\fbfh,ðŽg—p,·,é B,±*  
*,İfZfNfVf‡f“ÍIDirect3DRMViewportfCf“f^ [ftfFfCfX Ef f\fbfh,İfŠftf@fCf“fX,Ä, ,é BŠT”O,É,Â,¢,Ä,İŠT—*  
*v,Í A uIDirect3DRMViewport,ÆIDirect3DRMViewportArrayfCf“f^ [ftfFfCfX v,ðŽQ Æ,·,é,±,Æ B*

**IDirect3DRMViewportfCf“f^ [ftfFfCfX Ef f\fbfh,Í A`È%º,İfOf< [fv,É•ª—D,·,é,±,Æ,ª,Ä,«,é B**

**fJf f%o** [GetCamera](#)  
[SetCamera](#)

**fNfŠfbfsf“fO EfvfC [f“** [GetBack](#)  
[GetFront](#)  
[GetPlane](#)  
[SetBack](#)  
[SetFront](#)  
[SetPlane](#)

**fTfCfY** [GetHeight](#)  
[GetWidth](#)

**frf... [,İftfB [f<fh** [GetField](#)  
[SetField](#)

**%Šú%»** [Init](#)

**,»,İ¼** [Clear](#)  
[Configure](#)  
[ForceUpdate](#)  
[GetDevice](#)  
[GetDirect3DViewport](#)  
[Pick](#)  
[Render](#)

**fİftfZfbfg** [GetX](#)  
[GetY](#)

**ŽÈ%ºef^fCfv** [GetProjection](#)  
[SetProjection](#)

**fXfP [fŠf“fO** [GetUniformScaling](#)  
[SetUniformScaling](#)

**•İŠ·** [InverseTransform](#)  
[Transform](#)

**IDirect3DRMViewportfCf“f^ [ftfFfCfX,Í A,·,x,Ä,İCOMfCf“f^ [ftfFfCfX,Æ“—**  
**İUnknownfCf“f^ [ftfFfCfX Ef f\fbfh,ðEp ³,·,é BIUnknownfCf“f^ [ftfFfCfX,ÍŽÿ,İ,R,Ä,İf f\fbfh,ðfTf]**  
**[fg,·,é B**

**AddRef**

**QueryInterface**

**Release**

,<sup>3</sup>,ç,É AIDirect3DRMViewportfCf“f^ [ftfFfCfX,ÍDirect3DRMObjectfCf“f^ [ftfFfCfX,©,çŽŸ,Ìf f\fbfh,ðEp <sup>3</sup>,·,  
é B

**AddDestroyCallback**

**Clone**

**DeleteDestroyCallback**

**GetAppData**

**GetClassName**

**GetName**

**SetAppData**

**SetName**

Direct3DRMViewportIfufWfFfNfg,Í AIDirect3DRM::CreateViewportf f\fbfh,ÌEÄ,Ñ o,μ,É,æ,Á,ÄŽæ“¾,<sup>3</sup>,ê,é B

## IDirect3DRMViewport::Clear

HRESULT Clear();

«» Ý, ð" wEi F, Å Ažw'è, 3, ê, ½frf... [f] [fg, ðfNfŠfA, ·, é B

-E÷, ·, é, ED3DRM\_OK Až, "s, ·, é, AfGf%o [, ð•Ô, · B•Ô'l, Îê——, É, Å, ç  
, Ä, Í A uDirect3D•ŮŽ f, [fh, Î•Ô'l v, ðŽQ Æ, ·, é, ±, Æ B

### IDirect3DRMViewport::Configure

HRESULT Configure(LONG lX, LONG lY, DWORD dwWidth, DWORD dwHeight);

frf... [f] [fg, ìE'“\_, ÆfTfCfY, ð Ä Ý'è, , é B

-E÷, , é, ÆD3DRM\_OK AŽ, ”s, , é, ÆfGf%o [ , ð•Ô, · B•Ô'l, Îê——, É, Â, Ç  
, Ä, Í A uDirect3D•ÜŽ f, [fh, Î•Ô'l v, ðŽQ Æ, , é, ±, Æ B

lX, lY

frf... [f] [fg, ì V, µ, Ç^Ê'u B

dwWidth, dwHeight

frf... [f] [fg, ì V, µ, Ç• , Æ , , 3 B

lX + dwWidth, \*fff of CfX, ì• , æ, è'â, «, Ç ê ÷ A lY + dwHeight, \*fff of CfX, ì , , 3, æ, è'â, «, Ç ê ÷ A, , é, Ç  
, ì lX A lY AdwWidth AdwHeight, ì, Ç, , , é, ©, °0^Ê%°, Â, , é ê ÷ A, ±, ìf f\fbfh, ÍD3DRMERR\_BADVALUE, ð•Ô, · B

**IDirect3DRMViewport::ForceUpdate**

HRESULT ForceUpdate(DWORD dwX1, DWORD dwY1, DWORD dwX2,  
DWORD dwY2);

*f*... [*f*] [*fg*,*l*—*l*æ,ð< §“*l*,É X V,·,é BŽw’è,<sup>3</sup>,ê,<sup>1/2</sup>—  
*l*æ,Í AŽŸ%õñ,ìIDirect3DRMDevice::Update*f* f\fbfh,ìEÄ,Ñ o,µ,ÅfXfNfŠ [f“,ÉfRfs [<sup>3</sup>,é,é B

—E÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô’l,îê——,É,Â,c  
,Ä,Í A uDirect3D•ŮŽ f, [fh,î•Ô’l v,ðŽQ Æ,·,é,±,Æ B

*dwX1, dwY1*

X V—*l*æ,ì ¶ ã<÷,ì À•W B

*dwX2, dwY2*

X V—*l*æ,ì%E%o<÷,ì À•W B

*fVfXfef€*,Í AŽw’è,<sup>3</sup>,ê,<sup>1/2</sup><éE`æ,è,à‘â,«ÈfŠ [fWf±f“ð X V,·,é,±,Æ,<sup>a</sup>,é B ê ±,É,æ,Á,Ä,Í AfEfBf“fhfE‘S’ì,<sup>a</sup>  
X V,<sup>3</sup>,é,é,±,Æ,à, ,é B

## **IDirect3DRMViewport::GetBack**

D3DVALUE GetBack();

*fif...* [f] [fg, ìEâ•ûfNfŠfbfv-Ê, ìÊ'u, ðŽæ“¾, •é B  
Ê'u, ðŽ', •1, ð•Ô, • B

ŽQ Æ @**IDirect3DRMViewport::SetBack**, Žç—ü

## **IDirect3DRMViewport::GetCamera**

HRESULT GetCamera(LPDIRECT3DRMFRAME \*lpCamera);

frf... [f] [fg,lfJf f%o,đŽæ“¾,·,é B

-E÷,·,é,ÆD3DRM\_OK AŽ,“s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,Îê——,É,Â,ç  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ī•Ô'l v,đŽQ Æ,·,é,±,Æ B

lpCamera

fJf f%o,đ•\,·Direct3DRMFramefIfufWfFfNfg,“ü,é•Ī ”,Ö,lf|fCf“f^ B

ŽQ Æ @IDirect3DRMViewport::SetCamera, fJf f%o

### **IDirect3DRMViewport::GetDevice**

HRESULT GetDevice(LPDIRECT3DRMDEVICE \*lpD3DRMDevice);

if... [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,ç  
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ī•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lpD3DRMDevice

Direct3DRMDeviceIfufWfFfNfg,“ü,é•Ī ” B

### IDirect3DRMViewport::GetDirect3DViewport

```
HRESULT GetDirect3DViewport(LPDIRECT3DVIEWPORT * lplpD3DViewport);
```

«» Ý, ÌDirect3DRMViewport, É'Î%ž, ·, éDirect3Df r f... [f| [fg, ðžæ“¾, ·, é B  
-É÷, ·, 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

lplpD3DViewport

Direct3DViewportfIfufWfFfNfg, Ö, Ìf|fCf“f^, a“ü, éf|fCf“f^ B

### **IDirect3DRMViewport::GetField**

D3DVALUE GetField();

frf... [f] [fg,lfvf... [ EftfB [f<fh,đŽæ“¾,·,é B  
frf... [,lfvfB [f<fh,đŽ',·'1,đ•Ô,· B

ŽQ Æ @IDirect3DRMViewport::SetField, Ž<\_\_ä

## **IDirect3DRMViewport::GetFront**

D3DVALUE GetFront();

frf... [f] [fg,î'O•ûfNfŠfbfv-Ê,îÊ'u,đŽæ“¾,·,é B

^Ê'u,đŽ',·l,đ•Ô,· B

ŽQ Æ @IDirect3DRMViewport::SetFront, Ž< \_\_\_\_\_ä

## **IDirect3DRMViewport::GetHeight**

DWORD GetHeight ();

*frf...* [f] [fg,ì ,³,ðfsfNfZf<P^Ê,ÂŽæ“¾,·,é B

,³,ðfsfNfZf<P^Ê,Â•Ô,· B

### **IDirect3DRMViewport::GetPlane**

```
HRESULT GetPlane(D3DVALUE *lpd3dvLeft, D3DVALUE *lpd3dvRight,  
                D3DVALUE *lpd3dvBottom, D3DVALUE *lpd3dvTop);
```

'O•ûfNfŠfbfv-Ê ã,İfrrf... [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,İfrrf... [f] [fg,İfTfCfY,ðŽó,-Žæ,é•İ ”,İfAfhfŒfX B

ŽQ Æ @**IDirect3DRMViewport::SetPlane**

## **IDirect3DRMViewport::GetProjection**

D3DRMPROJECTIONTYPE GetProjection();

frf... [f] [fg, ðžĚ%œf^fCfv, ðžæ“¼, ·, é Bfrf... [f] [fg, É, Í A•½ s“Š%œ, Æ“ŠŽ, “Š%œ, Ì, Ç, ĭ, Ç, Ā, à—p, Ć, é, ±, Æ, ª, Ā, «, é B

**D3DRMPROJECTIONTYPE**—ñ““Ĉ^, Ìf f“fo, Ì, Đ, Æ, Ā, ð•Ô, · B

ŽQ Æ @**IDirect3DRMViewport::SetProjection**

### **IDirect3DRMViewport::GetUniformScaling**

BOOL GetUniformScaling();

ffEBff“fhfE,lfTfCfY,æ,è‘â,«È\Ž|f{fŠf... [f€δfXfP [fŠf“fO,·,é,½,ß,É—p,ç,é,é A kŽÚ“Á «,đŽæ“¾,·,é B  
frf... [f| [fg,“è‘è,Ì”ä—,ÁfXfP [fŠf“fO,³,é,é ê ‡,ÍTRUE A,»„,Á,È,¯,ê,ÎFALSE,ð•Ô,· B

ŽQ Æ @**IDirect3DRMViewport::SetUniformScaling**

## **IDirect3DRMViewport::GetWidth**

DWORD GetWidth();

*frf...* [f] [fg,ì• ,ðfsfNfZf<P^Ê,ÅŽæ“¾,·,é B

- ,ðfsfNfZf<P^Ê,Å•Ô,· B

## **IDirect3DRMViewport::GetX**

LONG GetX();

fffofCfX ã,ìfrf... [f| [fgŽn“\_ìx À•WfIfzfZfbfg,đŽæ“¾,·,é B  
xfIfzfZfbfg,đ•Ô,· B

## **IDirect3DRMViewport::GetY**

LONG GetY();

fffofCfX,ì ã,ìfrf... [f| [fgŽn“\_,ÿ À•WfIfzfZfbfg,đŽæ“¾,·,é B  
yfIfzfZfbfg,đ•Ô,· B

## IDirect3DRMViewport::Init

```
HRESULT Init(LPDIRECT3DRMDEVICE lpD3DRMDevice,  
            LPDIRECT3DRMFRAME lpD3DRMFramefJf f%, DWORD xpos, DWORD ypos,  
            DWORD width, DWORD height);
```

Direct3DRMViewportIfufWfFfNfg,đ %Šú%»»,·,é B

–Ĉ±,·,é,ÆD3DRM\_OK AŽ,»s,·,é,ÆfGf% [·,đ·Ô,· B·Ô'l,Îê——,É,Â,c  
,Ä,Í A uDirect3D·ŮŽ f, [fh,Î·Ô'l v,đŽQ Æ,·,é,±,Æ B

lpD3DRMDevice

,±,Îrf... [f] [fg,ÉŠÖ~A·t,¯,ç,ê,½DirectD3DRMDeviceIfufWfFfNfg B

lpD3DRMFramefJf f%

,±,Îrf... [f] [fg,ÉŠÖ~A·t,¯,ç,ê,½fJf f% EftfĈ [f€ B

xpos, ypos

rf... [f] [fg,Î ¶ ā±,Ìx À·W,·,æ,Ñy À·W B

width, height

rf... [f] [fg,Î· ,Æ ,³ B

### IDirect3DRMViewport::InverseTransform

HRESULT InverseTransform(D3DVECTOR \* lprvDst, D3DRMVECTOR4D \* lprvSrc);

*lprvSrc* f p f % f [ f ^, a Ž, · f x f N f g f <, d f [ f < f h À · W, ©, ç f, f f f < À · W, É · Ĩ Š ·, μ A E < % o Ê, d l p r v D s t f p f % o f [ f ^, É · Ô, · B  
- E ÷, ·, é, A E D 3 D R M \_ O K A Ž, ” s, ·, é, A e f G f % [ , d · Ô, · B · Ô ' l, Ĩ ê —, É, Â, ç  
, Ä, Ĩ A u Direct3D · Ů Ž f, [ f h, Ĩ · Ô ' l v, d Ž Q A E, ·, é, ±, A B

*lprvDst*

f f \ f b f h, a § E ä, d · Ô, ·, A E, «, É ^ — E < % o Ê, d Ž ó, Ž æ, é D3DVECTOR \ ' ç ' Ĩ B

*lprvSrc*

· Ĩ Š ·, 3, é, é D3DRMVECTOR4D \ ' ç ' Ĩ B

**IDirect3DRMViewport::Pick**

```
HRESULT Pick(LONG lX, LONG lY,  
             LPDIRECT3DRMPICKEDARRAY* lpVisuals);
```

[“x,É,æ,Á,Ä•ª—p,³,ê,½fIfufWfFfNfg iŠÖ`A,ª,ê,Î-Ê,à j,ÌfŠfXfg,ðŒ©,Á,¯ o,· BŽæ“¾,µ,½”z—  
ñ,É,Í Af< [fg,©,çfIfufWfFfNfg,ðŠÛ,ÞftfŒ [f€,É“ž’B,·,é,Û,Á,ÌŠK‘wfpfX,ªŠi”[³,é,é B

-Œ±,·,é,ÆD3DRM\_OK AŽ,“s,·,é,ÆfGf%o [,ð•Ô,· B•Ô’l,Îê——,É,Á,c  
,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*

*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,Ì|fCf“f^ B

## IDirect3DRMViewport::Render

```
HRESULT Render(LPDIRECT3DRMFRAME lpD3DRMFrame);
```

```
ftfCE [f€ŠK'w,đ AŽw'è,³,ê,½frf... [f] [fg,ÉfCEf"f_Šf"fO,·,é BŽw'è,³,ê,½ftfCE [f€ ä,½frfWf...  
fAf<,Æ A,»,ì%º,ìŠK'w,ìftfCE [f€,¾,¯,³fCEf"f_Šf"fO,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•ŮŽ f, [fh,î•Ô'l v,đŽQ Æ,·,é,±,Æ B
```

```
lpD3DRMFrame
```

```
fCEf"f_Šf"fO,·,éftfCE [f€ŠK'w,đŽ!,·Direct3DRMFramefIfufWfFfNfg,đŽ!,·İ " ,Ö,ìf|fCf"f^ B
```



## **IDirect3DRMViewport::SetCamera**

HRESULT SetCamera(LPDIRECT3DRMFRAME lpCamera);

*fJf f%oftfCE [f€,đfrf... [f| [fg,É Ý'è,·,é B*

*-Œ÷,·,é,ÆD3DRM\_OK AŽ, "s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,Îê——,É,Â,ç  
 ,Ă,Í A uDirect3D•ŮŽ f, [fh,İ•Ó'l v,đŽQ Œ,·,é,±,Œ B*

*lpCamera*

*fJf f%o,đŽ!,·Direct3DRMFramefIfufWfFfNfg,đŽw,·•İ " B  
,±,İf f\fbfh,Í Afrf... [f| [fg,ÎÊ'u A•ûŒü ŒŒü,«,đŽw'è,³,ê,½fJf f%o EftfCE [f€,Œ“¯,¶,É Ý'è,·,é Bfrf...  
 [Í AfJf f%o EftfCE [f€,İ ³,ÏžŽ²•ûŒü,É%ˆ,Á,Ă A ³,ÏyŽ²,İ ã•ûŒü,ÉŒü,¯,ç,ê,é B*

*ŽQ Œ @IDirect3DRMViewport::GetCamera, fJf f%o*

### **IDirect3DRMViewport::SetField**

HRESULT SetField(D3DVALUE rvField);

*rvField*... [f] [fg,Éf<sub>r</sub>f... [,lftfB [f<fh,ð Ý'è,·,é B

-E±,·,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

*rvField*

*rvField*... [l V,µ,çftfB [f<fh BffftfHf<fg'l,Í0.5,Â, ,é B,±,Î'l,É0^È%°,ðŽw'è,·,é,Æ A,±  
,l f\fbfh,ÍD3DRMERR\_BADVALUEfGf%o [,ð•Ô,· B

ŽQ Æ @IDirect3DRMViewport::GetField, Ž< \_\_\_\_\_ä

## IDirect3DRMViewport::SetFront

HRESULT SetFront (D3DVALUE rvFront);

*rvFront* [f] [fg, ĩ'Ō•ũfNfŠfbfv-Ê, ĩ'Ê'u, ð Ý'è, , é B

-Ĉ±, , é, ĀD3DRM\_OK AŽ, ”s, , é, ĀfGf% [ , ð•Ō, · B•Ō'l, ĩ'ê——, É, Ā, ĉ  
, Ā, Ī A uDirect3D•ŪŽ f, [fh, ĩ•Ō'l v, ðŽQ Ā, , é, ±, Ā B

*rvFront*

'Ō•ũfNfŠfbfv-Ê, ĩ V, μ, ĉ'Ê'u B

fftfHf<fg'l, Ī1.0, Ā, , é B0`È%°, Ī'l, a“n, 3, ê, é, Ā A, ±, Īf f\fbfh, ĪD3DRMERR\_BADVALUEfGf% [ , ð•Ō, · B

ŽQ Ā @IDirect3DRMViewport::GetFront, Ž< \_\_\_\_\_'ä

### **IDirect3DRMViewport::SetPlane**

HRESULT SetPlane(D3DVALUE rvLeft, D3DVALUE rvRight, D3DVALUE rvBottom, D3DVALUE rvTop);

*fJf f%o, lzŽ<sup>2</sup>, É'Í, :érf...* [f] [fg, ìfTfCfY, ð'O•ûfNfŠfbfv-É, É Ý'è, :é B

-Æ÷, :é, ÆD3DRM\_OK AŽ, "s, :é, ÆfGf%o [, ð•Ô, : B•Ô'l, Ìê—, É, Á, ¢  
, Ä, Í A uDirect3D•ŮŽ f, [fh, Ì•Ô'l v, ðŽQ Æ, :é, ±, Æ B

*rvLeft, rvRight, rvBottom, rvTop*

*frf...* [f] [fg, Ì Á -, Ìx Á•W A Á'á, Ìx Á•W A Á -, Ìy Á•W A Á'á, Ìy Á•W B

'†%o, É'<sup>2</sup> ®,<sup>3</sup>, ê, ½frf... [f] [fg, ðŽw'è, :é **IDirect3DRMViewport::SetField** f\fbfh, Æ^Û, È, è A, ±  
, Ìf f\fbfh, É, æ, Á, Ä A"ÇÓ, Ì"ä—', Æ^È'u, Ìfrf... [f] [fg, ðŽw'è, :é, ±, Æ, <sup>a</sup>, Á, «, é B, ½, Æ, Ì, Í A<sup>a</sup>—£  
, µ, ½Ž< 'ä, ð \z, µ, Á A%oE-Ů, â ¶-Ů, ÌfXfefÆfI Efrf... [, ðfCf"fvfŠf f"fg, :é, ±, Æ, <sup>a</sup>, Á, «, é B

ŽQ Æ @**IDirect3DRMViewport::GetPlane**, **IDirect3DRMViewport::SetField**

### **IDirect3DRMViewport::SetProjection**

HRESULT SetProjection(D3DRMPROJECTIONTYPE rptType);

*rptType* [f] [fg,ÉŽĚ%ef^fCfv,đ Ý'è,.,é B

—ĎE±,.,é,ĎD3DRM\_OK AŽ,„s,.,é,ĎfGf%o [,đ•Ô,· B•Ô'l,Îê——,É,Ď,Ď,Ď,Ď AĎDirect3D•ŮŽ f, [fh,Ď•Ô'lĎ  
đŽQ Ď,.,é,±,Ď B

*rptType*

D3DRMPROJECTIONTYPE—ñĎ“Ď^,Ďf f“fo,Ď,Ď,Ď,Ď B

ŽQ Ď @IDirect3DRMViewport::GetProjection

### **IDirect3DRMViewport::SetUniformScaling**

HRESULT SetUniformScaling(BOOL bScale);

•Ž|f{fŠf... [f€,đfEfBf“fhfE,İfTfCfY,æ,è,à‘â,«,fXfP [fŠf“fO,·,é,Æ,«,É—p,ç,ç,é,é A kŽÚ“Á «,đ Ý’è,·,é B  
-Œ÷,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,đ•Ô,· B•Ô’l,İê—,É,Â,ç,Ä,Í AçDirect3D•ŪŽ f. [fh,İ•Ô’İf  
,đŽQ Æ,·,é,±,Æ B

bScale

V,μ,ç kŽÚ“Á « B,±,İfpf%of [f^,ÉTRUE,đŽw’è,·,é,Æ A ...•½•ûŒü,Æ ,¼•ûŒü,É““, kŽÚŒEW ”,aŽg—  
p,³,ê,é B,»„,Ä,È,̄,ê,İ A•Ž|f{fŠf... [f€,đfEfBf“fhfE,É^ê’v,³,¹,é,½,ß A^Û,È,é kŽÚŒEW ”,a—p,ç  
,ç,ê,é BfftfHf<fg,İ Ý’è,İTRUE,Ä, ,é B

’Ê í,±,İf f\fbfh,Í Af of“ffBf“fO,đfTf| [fg,·,é,½,ß,ÉIDirect3DRMViewport::SetPlane f\fbfh,Æ,Æ,à,ÉŽg—  
p,³,ê,é B

ŽQ Æ @IDirect3DRMViewport::GetUniformScaling

### IDirect3DRMViewport::Transform

```
HRESULT Transform(D3DRMVECTOR4D * lprvDst, D3DVECTOR * lprvSrc);
```

*lprvSrc* is a pointer to a D3DVECTOR structure. *lprvDst* is a pointer to a D3DRMVECTOR4D structure.

The function transforms the vector in *lprvSrc* by the current viewport's projection and view matrices, and stores the result in *lprvDst*.

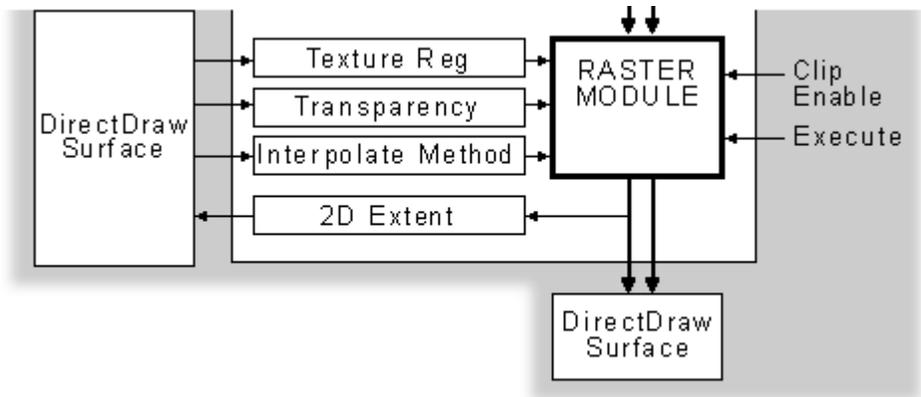
*lprvDst*

is a pointer to a D3DRMVECTOR4D structure.

*lprvSrc*

is a pointer to a D3DVECTOR structure.

The function returns S\_OK if successful, or an HRESULT error code if not.



## **IDirect3DRMWinDevice**

*fAfvfŠfP [fVf‡f“Í AfEfBf“fhfE Efvf fV [fWff,ÁfEfBf“fhfE Ef fbfZ [fW,É%ž“š,·,é,½,ß,ÉIDirect3DRM WinDeviceCf“f^ [ftfFfCfX,İf f\fbfh,đŽg—p,·,é B,± ,İfZfNfVf‡f“ÍIDirect3DRMWinDeviceCf“f^ [ftfFfCfX Ef f\fbfh,İfŠftf@fEf“fX,Á, ,é BŠT”O,É,Á,č,Ä,İŠT— v,Í A ufEfBf“fhfEŠÇ— v,đŽQ Æ,·,é,±,Æ B*

**IDirect3DRMWinDeviceCf“f^ [ftfFfCfX Ef f\fbfh,Í A`È%°,İfOf< [fv,É•ª—p,·,é,±,Æ,ª,Á,«,é B**

### **HandleActivate**

### **HandlePaint**

**IDirect3DRMWinDeviceCf“f^ [ftfFfCfX,Í A,·,×,Ä,İCOMfCf“f^ [ftfFfCfX,Æ“—l AIUnknown Cf“f^ [ftfFfCfX Ef f\fbfh,đEp ³,·,é BIUnknownCf“f^ [ftfFfCfX,ÍŽŸ,İ,R,Á,İf f\fbfh,đfTf| [fg,·,é B**

### **AddRef**

### **QueryInterface**

### **Release**

**Direct3DRMWinDeviceIfufWfFfNfg,Í AIID\_IDirect3DRMWinDevice,đŽw’è,µ,Ä**IDirect3DRM::QueryInterface** f\fb fhEÄ,Ň o,·,© **AIDirect3DRM::CreateDeviceFromD3D**,İ,æ,ª,Èf f\fbfh,đŽg— p,·,é,İŽæ“¾,Á,«,é BDirect3DRMWinDeviceIfufWfFfNfg,İf 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, ÈfEf“f\_Šf“fO EfEfBf“fhfE, Á F, ð ³, µ, ·Û, Â, ±, Æ, ª, Á, «, é B  
-É±, ·, é, ED3DRM\_OK AŽ, ”s, ·, é, ÆfGf%o [, ð·Ô, · B·Ô'l, îê——, É, Á, ç, Ä, Í AcDirect3D·ÛŽ f, [fh, ð·Ô'lE  
, ðŽQ Æ, ·, é, ±, Æ B

wParam  
f bfZ [fW ^— fvf fV [fWff, É“n, ³, ê, é AWM\_ACTIVATE, IWPARAMfpf%of [f^ B

## IDirect3DRMWinDevice::HandlePaint

HRESULT HandlePaint(HDC hDC);

Windows, IWM\_PAINT f fbZ [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 ã.É ì ¬,³,ê,½frf... [f] [fg,İŠO‘b,ì—İæ,ð Ä•%œæ, ,é,±  
,Æ,ª, ,é,½,ß AfEfBf“fhfE“à,ìfAvfšfP [fVf±f“—İæ,ð Ä•%œæ, ,é‘O,É•K,,CEÄ,Ñ o,•K—v,ª, ,é B

¬CE±, ,é,ÆD3DRM\_OK AŽ, ”s, ,é,ÆfGf%o [,ð•Ô,· B•Ô’l,İê——,É,Â,c  
,Ä,Í A uDirect3D•ŮŽ f, [fh,İ•Ô’l v,ðžQ Æ, ,é,±,Æ B

hDC

fffofCfX EfRf“fefLfXfg iDC j,ìfnf“fhf< B

## **IDirect3DRMWrap**

*fAfvfŠfP [fVf‡f“;Í Af%fbfv EfIfufWfFfNfg,Æ,â,èŽæ,è,·,é,½,ß,ÉIDirect3DRMWrapCf“f^ [ftFfCfX,Ìf f\fb fh,ðŽg—p,·,é B,±,ÌfZfNfVf‡f“;ÍIDirect3DRMWrapCf“f^ [ftFfCfX Ef f\fbfh,ÌfŠftf@fEf“fX,Á, ,é BŠT”O,É ,Á,ç,Á,ÌŠT—v,Í A uIDirect3DRMWrapCf“f^ [ftFfCfX v,ðŽQ Æ,·,é,±,Æ B*

**IDirect3DRMWrapCf“f^ [ftFfCfX Ef f\fbfh,Í A`È%°,ÌfOf< [fv,É•ª—p,·,é,±,Æ,ª,Á,«„é B**

*%Šú%»*

**Init**

*f%fbfv*

**Apply**

**ApplyRelative**

**IDirect3DRMWrapCf“f^ [ftFfCfX,Í A,·,×,Ä,ÌCOMfCf“f^ [ftFfCfX,Æ“—  
l A[UnknownfCf“f^ [ftFfCfX Ef f\fbfh,ðEp ³,·,é BIUnknownfCf“f^ [ftFfCfX,ÍŽŸ,Ì,R,Á,Ìf f\fbfh,ðfTf|  
[fg,·,é B**

**AddRef**

**QueryInterface**

**Release**

*,³,ç,É AIDirect3DRMWrapCf“f^ [ftFfCfX,ÍIDirect3DRMObjectCf“f^ [ftFfCfX,©,çŽŸ,Ìf f\fbfh,ðEp ³,·,é B*

**AddDestroyCallback**

**Clone**

**DeleteDestroyCallback**

**GetAppData**

**GetClassName**

**GetName**

**SetAppData**

**SetName**

**Direct3DRMWrapIfufWfFfNfg,Í AIDirect3DRM::CreateWrap f\fbfh,ÌEÄ,Ñ o,μ,É,æ,Á,ÄŽæ“¾,³,é,é B**

**IDirect3DRMWrap::Apply**

HRESULT Apply(LPDIRECT3DRMOBJECT lpObject);

Direct3DRMWrapIfufWfFfNfg,đ,»ì o—Í æIfufWfFfNfg,É“K—p,·,é B^ê”Ê,É o—Í æIfufWfFfNfg,Í A-Ê,Û,½,Íf fbVf...,Ä, ,é B

-Æ±,·,é,ÆD3DRM\_OK AŽ,”s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,îê——,É,Á,¢  
,Ä,Í A uDirect3D•ÛŽ f, [fh,î•Ô'l v,đŽQ Æ,·,é,±,Æ B

lpObject

o—Í æIfufWfFfNfg,ìfAfhfÆfX B

ŽQ Æ @IDirect3DRM::CreateWrap

## **IDirect3DRMWrap::ApplyRelative**

```
HRESULT ApplyRelative(LPDIRECT3DRMFRAME frame,  
    LPDIRECT3DRMOBJECT mesh);
```

```
flufWfFfNfg,ì,“_Éf%bfv,ð Ý’è,·,é B Á %o,ÉŠe’“_Éftf€ [f€  
,İf [f<fh•İŠ·,ð s,¢ AŽŸ,Éf%bfv,İŽQ Æftf€ [f€,İ<tf [f<fh•İŠ·,ð Ý’è,·,é B  
    -€±,·,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
```

*frame*

```
f%bfbsf“fO,·,éflufWfFfNfg,ðŠÜ,ðDirect3DRMFrameflufWfFfNfg B
```

*mesh*

```
“K—p,·,éDirect3DRMWrapflufWfFfNfg 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,ĀD3DRM\_OK AŽ, ”s,·,é,ĀfGf%o [,đ•Ō,· B•Ō'l,îê—,É,Ā,ĉ,Ā,Ā,Ā AĉDirect3D•ŪŽ f. [fh,î•Ō'lĒ  
,đŽQ Ā,·,é,±,Ā B

d3drmw

**D3DRMWRAPTYPE**—ñĈ^,îf f“fo,î,Đ,Ā,Ā B

lpd3drmfRef

,±,îDirect3DRMWrapIfufWfFfNfg,îŽQ ĀftfĈ [fĈ,đŽ!,·Direct3DRMFramefIfufWfFfNfg,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,Ñ sv

fefNfXf`ff,î kŽÚĈEW ” B

ŽQ Ā @IDirect3DRM::CreateWrap



## D3DRMBOX

```
typedef struct _D3DRMBOX {
    D3DVECTOR min, max;
} D3DRMBOX;
typedef D3DRMBOX *LPD3DRMBOX;
```

IDirect3DRMMesh::GetBox, IDirect3DRMMeshBuilder::GetBox f\fbfh, ÅŽæ“¼, ·, é«E”Íí, ð’è\, ·, é B

**min, #max**  
«E”Íí, ð’è\, ·, é’l B, ±, ê, ç, Ì’l, ID3DVECTOR \“í, 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,ðçL q,·,é B*  
**IDirect3DRMTexture::GetImage**,Í A,±,ÍfCf [fW,ÌfAfhfCfX,ð•Ö,· B

**width**,·,æ,Ñheight

*fsfNfZf<P^É,Ä,ÌfCf [fW,Ì,·,Æ,·,³ B*

**aspectx**,·,æ,Ñaspecty

*”ñ ³•ûC`fsfNfZf<,ÌfAfxfyfNfg”ä B*

**depth**

*fsfNfZf<“-½,è,Ìfrfbfg ” B*

**rgb**

*,±,Ìf f“fo,³FALSE,Ì ê ± AfsfNfZf<,ÍpfCfbbfg,ÌfCf“ffbfNfX,ðŽ!,· B,±  
Ìf f“fo,³TRUE,Ì,Æ,«,Í AfsfNfZf<,ÍfR [fh%»³,ê,½RGB¹,Ä, ,é B*

**bytes\_per\_line**

*1f%ofCf““-½,è,ÌfofCfg ” B,±,Ì¹,Í4,Ì”{ ”,Ä, ,é B*

**buffer1**

*fCf“f\_Šf“fo,³ s,í,ê,éf f,Š i Ä %,Ìfofbftf@ j,ÌfAfhfCfX B*

**buffer2**

*2 dfobftf@fŠf“fo,Ì2”Ö-  
Ú,ÌfCf“f\_Šf“fo Efofbftf@ Bfvf“fof< Efofbftf@fŠf“fo,Ì,Æ,«,ÍNULL,ð Ý’è,·,é B*

**red\_mask, #green\_mask, #blue\_mask, #alpha\_mask**

*rgb,³TRUE,Ì,Æ,« A,±,ê,ç,Ìf f“fo,ÍfsfNfZf<,Ì Ö A—Í A Ä•³,Ìf}fXfN,Ä, ,é  
Brgb,³FALSE,Ì,Æ,«,Í AfpfCfbbfg’t,Ä d—v,È Ö A—Í A Ä,ÌŠe—v’ffrbbfg,Ìf}fXfN,Ä, ,é B,½,Æ,!,Í½,Ì  
SVGAfffbfXfvfCfC,Ä,Í AŽg—p,·,é Ö A—Í A Ä,Ì“x ±,Í64,Ä, ,é,½,ß A,·,×,Ä,Ìf}  
fXfN,Í0xfc,ÉfZfbbfg,³,é,é B*

**palette\_size**

*fpfCfbbfg EfGf“fgfŠ,Ì ” B*

**palette**

*rgb,³FALSE,Ì ê ± A,±,Ìf f“fo,ÍfpfCfbbfg EfGf“fgfŠ,ðŽ!,·**D3DRMPALETTEENTRY** \‘ç’Ì,ÌfAfhfCfX,Ä, ,é  
B*

ŽQ Æ @**IDirect3DRM::CreateTexture, IDirect3DRMTexture::GetImage**

## D3DRMLOADMEMORY

```
typedef struct _D3DRMLOADMEMORY {
    LPVOID lpMemory;
    DWORD  dSize;
} D3DRMLOADMEMORY, *LPD3DRMLOADMEMORY;
```

*fAfvfŠfP [fVf‡f“; **D3DRMLOAD\_FROMMEMORY**, đŽw’è, μ, Ä**IDirect3DRM::Load** f \fbfh i, Ü, ½, Í¼, Ì**Load** f \fbfh j, đĀ, Ñ o, μ, ½, Æ, «, Éf [fh, ³, ê, éfŠf \ [fX, đŽ, · B*

### lpMemory

*f [fh, ³, ê, éf f, fŠ Efuf fbfn B*

### dSize

*f [fh, ³, ê, éf f, fŠ Efuf fbfn, ìTfCfY, đfofCf g’P^Ê, ĀŽ, · B*

ŽQ Æ @**IDirect3DRM::Load**, **IDirect3DRMAnimationSet::Load**, **IDirect3DRMFrame::Load**, **IDirect3DRMMeshBuilder::Load**, **D3DRMLOADOPTIONS**, **D3DRMLOADRESOURCE**



## D3DRMPALETTEENTRY

```
typedef struct _D3DRMPALETTEENTRY {
    unsigned char red;
    unsigned char green;
    unsigned char blue;
    unsigned char flags;
} D3DRMPALETTEENTRY;
typedef D3DRMPALETTEENTRY *LPD3DRMPALETTEENTRY;
```

**D3DRMIMAGE** \C'Ī,ĀŽg—p,³,ê,é fJf% [ EfpfĈfbfg,ð<L q,·,é B,±  
,Ī \C'Ī,Ī **AD3DRMIMAGE** \C'Ī,Īrgbf f“fo,ÉFALSE,Žw'è,³,ê,Ā,Ĉ,é,Ā,«,Ī,Ý—~—p,³,ê,é iTRUE,Žw'è,³,ê,Ā,Ĉ  
,é,Ā,«,Ī ARGB'l,ª—p,Ĉ,ç,é,é j B

### red, #green, #blue

fpfĈfbfg,ð'è<`,·,éĈ' F—v'f,ð'è<`,·,é'l B0,©,ç255,Ī"ĪĪ,Ī'l,ðŽw'è,·,é,±,Ā,ª,Ā,«,é B

### flags

fĈf“f\_fŠf“fOŽž,ÉfpfĈfbfg,ª,Ĉ,Ī,ª,ª,ÉŽg—p,³,ê,é,©,ð'è<`,·,é'l B,±,Ī'l,Ī**D3DRMPALETTEFLAGS**—  
ñ<Ĉ^,Īf f“fo,Ī,Đ,Ā,Ā,Ā, ,é B

ŽQ Ā @**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< [fvŽ̄•ÊŽq,δSi”[,·,é B

### ulFaceIdx

Žæ“¼,³,ê,½fIfufWfFfNfg,ì-Ê,ìfCf“fffbfNfX B

### lGroupIdx

Žæ“¼,³,ê,½fIfufWfFfNfg,ìfOf< [fvŽ̄•ÊŽq B

### vPosition

Žæ“¼,³,ê,½fIfufWfFfNfg,ÎÊ’u,δŽ’,·l B,±,ìl,ÍD3DVECTOR \‘c’ì,Á, ,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%õñ“],ð·L q,·,é B,Û,½ ADirect3D,ì ”ŠwŠÖ ”,ì,ç,-,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;
```

[IDirect3DRMViewport::Transform](#)  $f \backslash f b f h, \acute{E}, \acute{a}, \acute{e} \cdot \acute{I} \acute{S} \cdot, \acute{I} \text{ o} \text{---}$   
 $\acute{I} \acute{a}, \acute{E}, \mu, \acute{A} \acute{A}, \acute{,} \acute{a}, \acute{N} \text{IDirect3DRMViewport::InverseTransform}$   $f \backslash f b f h, \acute{E}, \acute{a}, \acute{e} \cdot \acute{I} \acute{S} \cdot, \acute{I} f \backslash [f X, \acute{E}, \mu, \acute{A} \acute{Z} g \text{---} p, ^3, \acute{e}, \acute{e} \text{ B}$

$x, \#y, \#z, \#w$

[D3DVALUE](#)  $\acute{E} \wedge, \acute{I} \acute{l} \text{ B} \cdot \acute{I} \acute{S} \cdot \acute{E} \wedge \% \acute{o} \acute{E}, \acute{a} \acute{u}, \acute{e} \text{ B}$

$\acute{Z} \acute{Q} \acute{E} \text{ @IDirect3DRMViewport::Transform, IDirect3DRMViewport::InverseTransform}$

## D3DRMVERTEX

```
typedef struct _D3DRMVERTEX{
    D3DVECTOR position;
    D3DVECTOR normal;
    D3DVALUE tu, tv;
    D3DCOLOR color;
} D3DRMVERTEX;
```

Direct3DRMMeshIfufWfFfNfg't,ì',“\_„ðL q,·,é B

### position

'“\_„ìÊ'u B

### normal

'“\_„ì-@ üfxfNfgf< B

### tu ,;æ,Ñ #tv

'“\_„ì ...½,“,æ,Ñ ,¼fefNfXfff À•W B

### color

'“\_„ì F B

ŽQ Æ @IDirect3DRMMesh::GetVertices, IDirect3DRMMesh::SetVertices

—ñ“E^

## D3DRMCOLORSOURCE

```
typedef enum _D3DRMCOLORSOURCE{
    D3DRMCOLOR_FROMFACE,
    D3DRMCOLOR_FROMVERTEX
} D3DRMCOLORSOURCE;
```

Direct3DRMMeshBuilderIfufWfFfNfg,lfJf% [ Ef\ [fX,đL q,·,é BfJf% [ Ef\ [fX,đ Y'è,·,é,É,Í **AIDirect3DRMMeshBuilder::SetColorSource**,đŽg—  
p,·,é BfJf% [ Ef\ [fX,đŽæ“%4,·,é,É,Í **AIDirect3DRMMeshBuilder::GetColorSource**f f\fbfh,đŽg—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 AftfCE [f€,ìCE» Ý,ì s—ñ,ð'u,«Š·,|,é B

### D3DRMCOMBINE\_BEFORE

—^,|,ç,ê,½ s—ñ,ÆftfCE [f€,ìCE» Ý,ì s—ñ,Ì Ī,ð< ,ß,é BCEvŽZ,É,¨,ç,Ä,Í A—^,|,ç,ê,½ s—ñ,³CE» Ý,ì s—ñ,æ,è,à æ,ÉŽw'è,³,é,é B

### D3DRMCOMBINE\_AFTER

—^,|,ç,ê,½ s—ñ,ÆftfCE [f€,ìCE» Ý,ì s—ñ,Ì Ī,ð< ,ß,é BCEvŽZ,É,¨,ç,Ä,Í A—^,|,ç,ê,½ s—ñ,³CE» Ý,ì s—ñ,ÌCEä,ÉŽw'è,³,é,é B

s—ñ,Ì æŽZ,Í%oÂŠ·,Ä,Í,È,ç,½,ß A—^,|,ç,ê,½ s—ñ,ÆCE» Ý,ì s—ñ,ðŠ|,¯ ‡,í,¹,é ‡ ~,Í d—v,Ä, ,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

### D3DRMFILL\_POINTS

“\_ì,Ý,ð“h,è,Â,Ô,· B Ä ¬,ì“h,è,Â,Ô,μf, [fh B

### D3DRMFILL\_WIREFRAME

f fCf,, [ftfœ [f€,ð“h,é B

### D3DRMFILL\_SOLID

—§‘ìfIfufWfFfNfg,ð“h,é B

### D3DRMFILL\_MASK

f}fXfN,ðŽg—p,μ,Ä“h,é B

### D3DRMFILL\_MAX

“h,è,Â,Ô,μf, [fh,ì Ä‘â’l B

ŽQ Æ @D3DRMLIGHTMODE, D3DRMSHADEMODE, D3DRMRENDERQUALITY

**D3DRMFOGMODE**

```
typedef enum _D3DRMFOGMODE{
    D3DRMFOG_LINEAR,
    D3DRMFOG_EXPONENTIAL,
    D3DRMFOG_EXPONENTIALSQUARED
} D3DRMFOGMODE;
```

*f*  $f = \frac{end - z}{end - start}$

**D3DRMFOG\_LINEAR**

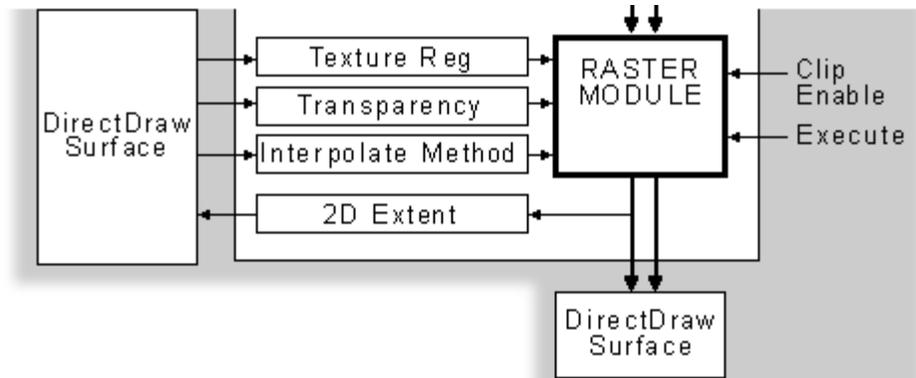
*f*  $f = \frac{end - z}{end - start}$

$$f = \frac{end - z}{end - start}$$

*f*  $f = \frac{end - z}{end - start}$

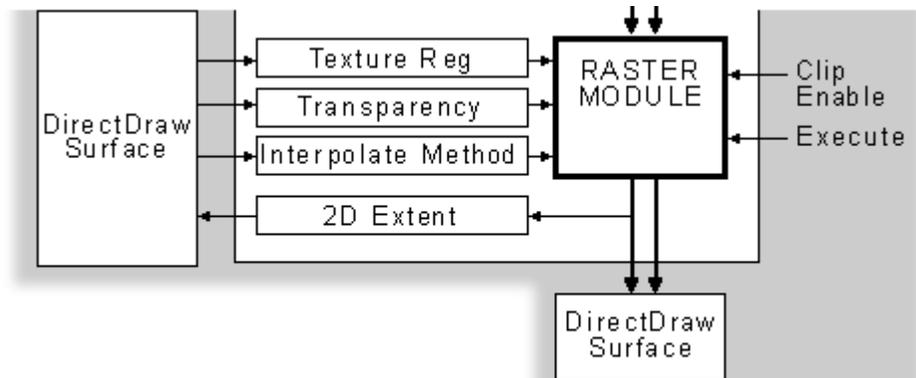
**D3DRMFOG\_EXPONENTIAL**

*f*  $f = \frac{end - z}{end - start}$



**D3DRMFOG\_EXPONENTIALSQUARED**

*f*  $f = \frac{end - z}{end - start}$



*f*  $f = \frac{end - z}{end - start}$

*f*  $f = \frac{end - z}{end - start}$

*f*  $f = \frac{end - z}{end - start}$

## D3DRMFRAMECONSTRAINT

```
typedef enum _D3DRMFRAMECONSTRAINT {
    D3DRMCONSTRAIN_Z,
    D3DRMCONSTRAIN_Y,
    D3DRMCONSTRAIN_X
} D3DRMFRAMECONSTRAINT;
```

Direct3DRMFrameIfufWfFfNfg,đ•Ž!,·,é,Æ,«,É< §“I,É%õñ“,·,éŽ²,đ<L q,·,é B,±,Ì—  
ñ<“E^,ÍDirect3DRMFrame::LookAt f\fbfh,É,æ,Á,ĂŽg—p,³,ê,é B

### D3DRMCONSTRAIN\_Z

x,“,æ,Ñy%õñ“,Ì,ÝŽg—p,·,é B

### D3DRMCONSTRAIN\_Y

x,“,æ,Ñz%õñ“,Ì,ÝŽg—p,·,é B

### D3DRMCONSTRAIN\_X

y,“,æ,Ñz%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

### D3DRMLIGHT\_OFF

if !t, A, ,e B

### D3DRMLIGHT\_ON

if " , A, ,e B

### D3DRMLIGHT\_MASK

f}fXfN, Žg—p, ., e B

### D3DRMLIGHT\_MAX

f, [fh, l A'a'l B

ŽQ A @D3DRMEILLMODE, D3DRMSHADEMODE, D3DRMRENDERQUALITY

## D3DRMLIGHTTYPE

```
typedef enum _D3DRMLIGHTTYPE{
    D3DRMLIGHT_AMBIENT,
    D3DRMLIGHT_POINT,
    D3DRMLIGHT_SPOT,
    D3DRMLIGHT_DIRECTIONAL,
    D3DRMLIGHT_PARALLELPPOINT
} D3DRMLIGHTTYPE;
```

**IDirect3DRM::CreateLight** *f\fbfh, ÌEÄ, Ñ o, µ, Å AÆðE¹f^fCfv, ð'è', ., é B*

### D3DRMLIGHT\_AMBIENT

*fAf"frfGf"fgEðE¹ B*

### D3DRMLIGHT\_POINT

*f|fCf"fg EðE¹ B*

### D3DRMLIGHT\_SPOT

*fXf|fbfgf%ofCfgEðE¹ B*

### D3DRMLIGHT\_DIRECTIONAL

*—LEüEðE¹ B*

### D3DRMLIGHT\_PARALLELPPOINT

*fpf%ofEf< Ef|fCf"fgEðE¹ B*

## D3DRMMATERIALMODE

```
typedef enum _D3DRMMATERIALMODE{
    D3DRMMATERIAL_FROMMESH,
    D3DRMMATERIAL_FROMPARENT,
    D3DRMMATERIAL_FROMFRAME
} D3DRMMATERIALMODE;
```

*f*}fefŠfAf<f, [fh,đŽ!,· B,±  
,İE^,İ IDirect3DRMFrame::GetMaterialMode f\fbfh,É,æ,Á,ÄŽæ“¾,³,ê IDirect3DRMFrame::SetMaterialMode  
f f\fbfh,É,æ,Á,Ä Ý’è,³,ê,é B

## D3DRMMATERIAL\_FROMMESH

*f*}fefŠfAf< îñ,ÍfrrWf...fAf< EfIfufWfFfNfg if fbfVf... j,»,ì,à,ì,©,çŽæ“¾,³,ê,é B,±,ê,ÍfftfHf<fg Ý’è,Á,  
,é B

## D3DRMMATERIAL\_FROMPARENT

*f*}fefŠfAf< îñ,Í A F,âfefNfXf`ff îñ,Æ,Æ,à,É eftfE [f€,©,çEp ³,³,ê,é B

## D3DRMMATERIAL\_FROMFRAME

*f*}fefŠfAf< îñ,ÍftfE [f€,©,çŽæ“¾,³,ê AfrfWf...fAf< EfIfufWfFfNfg,ª•ŮŽ ,µ,Ä,¢  
,½^È‘O,İ îñ,đfI [fo [f%ofCfh,·,é B

ŽQ Æ @IDirect3DRMFrame::GetMaterialMode,IDirect3DRMFrame::SetMaterialMode

## D3DRMPALETTEFLAGS

```
typedef enum _D3DRMPALETTEFLAGS {  
    D3DRMPALETTE_FREE,  
    D3DRMPALETTE_READONLY,  
    D3DRMPALETTE_RESERVED  
} D3DRMPALETTEFLAGS;
```

**D3DRMPALETTEENTRY** \c'ì,À,ì F,ìŽg—p•û-@,đ'èç',;é B

### D3DRMPALETTE\_FREE

fĈf“f\_f%o [,í,±,ìfGf“fgfŠ,đŽ©—R,ÉŽg—p,Á,«,é B

### D3DRMPALETTE\_READONLY

ĈÁ'è,³,ê,Á,ç,é,ª AfĈf“f\_f%o [,ªŽg,±,±,Æ,ª,Á,«,é B

### D3DRMPALETTE\_RESERVED

fĈf“f\_f%o [,ªŽg,±,±,Æ,í,Á,«,È,ç B

ŽQ Æ @**D3DRMPALETTEENTRY**

## D3DRMPROJECTIONTYPE

```
typedef enum _D3DRMPROJECTIONTYPE{
    D3DRMPROJECT_PERSPECTIVE,
    D3DRMPROJECT_ORTHOGRAPHIC
} D3DRMPROJECTIONTYPE;
```

Direct3DRMViewport *fIfufWfFfNfg, ĀŽg—p, 3, ê, éŽĚ%œf^fCfv, đ'è` , , é B, ±, Ì—*  
ñ“Œ^, Í A **IDirect3DRMViewport::GetProjection**, Æ **IDirect3DRMViewport::SetProjection** *f\fbfh, É, æ, Á, Ä—p, Œ*  
*, 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,İfVfF [ffBf“fO Ef, [fh AĖĖĖ¹f, [fh A“h,è,Ā,Ô,µf, [fh,đĖ< ‡,·,é B

### D3DRMSHADEMODE, D3DRMLIGHTMODE, D3DRMFILLMODE

fVfF [ffBf“fO AĖĖĖ¹ A“h,è,Ā,Ô,µf, [fh,đŽ,· B

### D3DRMRENDER\_WIREFRAME

•Ó,İ,Ý,đ•Ž,·,é B

### D3DRMRENDER\_UNLITFLAT

ĖĖĖ¹,Ē,µ,İftf%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,Ā,ĉ,Ē,ĉ B

ŽQ Ā @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 Ć^,ì'è` ,ĂŽg,í,ê,é—ñ«“Ć^,ì,Đ,Æ,Â B

ŽQ Æ @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,Ä—p,ç,ê,éfefNfXf`ff•iŽç,ðL q,·,é B*

### D3DRMTEXTURE\_NEAREST

*fefNfXf`ff ã,Ì Ä,àß,çfsfNfZfç,ðI'ð,·,é B*

### D3DRMTEXTURE\_LINEAR

*Ä,àß,ç4,Ä,ÌfsfNfZfç,ð üE`É•ãŠ®,·,é B*

### D3DRMTEXTURE\_MIPNEAREST

*D3DRMTEXTURE\_NEAREST,ÉŽ—,Ä,ç,é,ª AfefNfXf`ff,Ìã,í,è,É“K Ø,Èf~fbfvf}fbfv,ðŽg—p,·,é B*

### D3DRMTEXTURE\_MIPLINEAR

*D3DRMTEXTURE\_LINEAR,ÉŽ—,Ä,ç,é,ª AfefNfXf`ff,Ìã,í,è,É“K Ø,Èf~fbfvf}fbfv,ðŽg—p,·,é B*

### D3DRMTEXTURE\_LINEARMIPNEAREST

*D3DRMTEXTURE\_MIPNEAREST,ÉŽ—,Ä,ç,é,ª A Ä,àß,ç,Ó,½,Ä,Ìf~fbfvf}fbfvŠÔ,ð•ãŠ®,·,é B*

### D3DRMTEXTURE\_LINEARMIPLINEAR

*D3DRMTEXTURE\_MIPLINEAR,ÉŽ—,Ä,ç,é,ª A Ä,àß,ç,Ó,½,Ä,Ìf~fbfvf}fbfvŠÔ,ð•ãŠ®,·,é B*

### D3DRMUSERVISUALREASON

```
typedef enum _D3DRMUSERVISUALREASON {
    D3DRMUSERVISUAL_CANSEE,
    D3DRMUSERVISUAL_RENDER
} D3DRMUSERVISUALREASON;
```

*fVfXfef€*, **D3DRMUSERVISUALCALLBACK** *fR [f<fofbfNŠÖ ”,šCEÄ,Ň o,μ,½— —R,š'è<’,·,é B*

### D3DRMUSERVISUAL\_CANSEE

*f† [fU EfrfWf...fAf<fIfufWfFfNfg,^frf... [f] [fg ã,Ä%oÄŽ< ó‘Ô,Ä, ,ê,Î AfR [f<fofbfNŠÖ ”,ÍTRUE,š•Ô,*  
*³,È,,Ä,Í,È,ç,È,ç B*

### D3DRMUSERVISUAL\_RENDER

*fR [f<fofbfNŠÖ ”,Íf† [fU EfrfWf...fAf< EfIfufWfFfNfg,šfCEf“f\_šf“fO,μ,È,,Ä,Í,È,ç,È,ç 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'èç',·,é B,Ü,½**IDirect3DRMWrap::Init** f\fbfh,ìCEÄ,Ñ o,μ,ì†,Å ADirect3DRMWrapfIfufWfFfNfg,ð %Šú%»,·,é,½,B,É,±,Ì— ñ“CE^,ðŽg—p,·,é,±,Æ,ª,Ä,«,é B

### D3DRMWRAP\_FLAT

•½-Êf%fbfv B

### D3DRMWRAP\_CYLINDER

%o~'Ef%fbfv B

### D3DRMWRAP\_SPHERE

<...îf%fbfv B

### D3DRMWRAP\_CHROME

f%fbfv,Í AfefNfXf`ff,ªIfufWfFfNfg ã,Ä”½ŽÈ,³,ê,é,æ,µ,ÉfefNfXf`ff À•W,ðŠ,,è“-,Ä,é B

ŽQ Æ @**IDirect3DRM::CreateWrap**, **IDirect3DRMWrap::Init**, IDirect3DRMWrapCf“f^ [ftFfCfX

### 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<,ÍfofCfifŠ EftfH [f}fbfg,Å, ,é B,±,ê,ÍfHfHf<fg Ý'è,Å, ,é B

### D3DRMXOF\_COMPRESSED

«» Ý,ÍfTf| [fg,³,ê,Å,c,È,c 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,c B

ŽQ Æ @**IDirect3DRMMeshBuilder::Save**

## D3DRMZBUFFERMODE

```
typedef enum _D3DRMZBUFFERMODE {
    D3DRMZBUFFER_FROMPARENT,
    D3DRMZBUFFER_ENABLE,
    D3DRMZBUFFER_DISABLE
} D3DRMZBUFFERMODE;
```

Zfofbftf@,³—LÆø,©,Ç,²,©,ðŽ,· B

### D3DRMZBUFFER\_FROMPARENT

ftfÆ [f€,Í eftfÆ [f€,©,çZfofbftf@,Ì Ý'è,ðÆp ³,·,é B,±,ê,ÍfftfHf<fg Ý'è,Å, ,é B

### D3DRMZBUFFER\_ENABLE

Zfofbftf@,Í—LÆø,Å, ,é B

### D3DRMZBUFFER\_DISABLE

Zfofbftf@,Í³Æø,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 [fVfzf“, Ì Ä ¶•û-  
@,ð'è< , ,é'l,ðŽw'è, ,é B Direct3DRMAnimation::GetOptions,âDirect3DRMAnimation::SetOptions,Ä—p,ç,ç,è,é B
```

### D3DRMANIMATION\_CLOSED

```
fAfjf [fVfzf“, ÌCEJ,è•Ô,µ Ä ¶,³,è A I“_É'B,.,é,ÆŠJŽn“_É-  
ß,Á,Äf< [fv,.,é B•Ä,¶,ç,è,½fAfjf [fVfzf“,Ä,Í AfAfjf [fVfzf“, Ì ÄÆã, ÌfL [,Í Ä %  
, ÌfL [, ÌCEJ,è•Ô,µ,Ä,È,.,Ä,Í,È,ç,È,ç B,±, ÌCEJ,è•Ô,µfL [,ð—  
p,µ,Ä Af< [fv,.,é fAfjf [fVfzf“,É,“,é ÄÆã,Æ Ä %o, ÌfL [ŠÔ, ÌŽžŠÔ, Ì ,³,è,é B
```

### D3DRMANIMATION\_LINEARPOSITION

```
fAfjf [fVfzf“, ÌÊ'u, Í üCE,É Ý'è,³,è,é B
```

### D3DRMANIMATION\_OPEN

```
fAfjf [fVfzf“, Ì1%õñ,¾, Ä ¶,³,è A'âŽ~, ,é B
```

### D3DRMANIMATION\_POSITION

```
fAfjf [fVfzf“, 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,è,é B
```

### D3DRMANIMATION\_SCALEANDROTATION

```
fAfjf [fVfzf“, 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,è,é B
```

### D3DRMANIMATION\_SPLINEPOSITION

```
fAfjf [fVfzf“, ÌÊ'u, ÌfXfvf%oCf“,Ä Ý'è,³,è,é B
```

## D3DRMCOLOMODEL

typedef D3DCOLOMODEL D3DRMCOLOMODEL;

fffofCfX,^fCf“fvfŠf f“fg,·,éJf% [ Ef,ff<,đŽ!,· B Ú ×,É,Â,č,Ä,ÍD3DCOLOMODEL—ñ<“E^,đŽQ Æ,·,é,±,Æ B

ŽQ Æ @D3DCOLOMODEL

## D3DRMLOADOPTIONS

```
typedef DWORD D3DRMLOADOPTIONS;  
#define D3DRMLOAD_FROMFILE 0x00L  
#define D3DRMLOAD_FROMRESOURCE 0x01L  
#define D3DRMLOAD_FROMMEMORY 0x02L  
#define D3DRMLOAD_FROMSTREAM 0x03L  
#define D3DRMLOAD_BYNAME 0x10L  
#define D3DRMLOAD_BYPOSITION 0x20L  
#define D3DRMLOAD_BYGUID 0x30L  
#define D3DRMLOAD_FIRST 0x40L  
#define D3DRMLOAD_INSTANCEBYREFERENCE 0x100L  
#define D3DRMLOAD_INSTANCEBYCOPYING 0x200L
```

### IDirect3DRM::Load A

IDirect3DRMAnimationSet::Load AIDirect3DRMFrame::Load A, ,æ,ÑIDirect3DRMMeshBuilder::Load f\fbfh,İfI fVfVf†f“,δ’èç, ,é B,±,è,ç,İfI fVfVf†f“,İ AfI fufWfFfNfg,δf [fh,³,è,é•û-@,δ•İ X, ,é B

### f\ [fX Eftf%ofO

#### D3DRMLOAD\_FROMFILE

ftf@fCf<,©,çf [fh, ,é B,±,è,İffftfHf<fg Ý’è,Ä, ,é B

#### D3DRMLOAD\_FROMRESOURCE

fŠf\ [fX,©,çf [fh, ,é B,± ,İftf%ofO,δŽw’è,µ,½ è ‡ ALoadf f\fbfh,İCEÄ,Ñ o,µ,İlpvObjSourcefpf%of [f^,İ AD3DRMLOADRESOURCE E \‘c’İ,δŽw,³,È, ,Ä,İ,È,ç,È,ç B

#### D3DRMLOAD\_FROMMEMORY

f f, fŠ,©,çf [fh, ,é B,±,İftf%ofO,δŽw’è,µ,½ è ‡ ALoadf f\fbfh,İCEÄ,Ñ o,µ,İlpvObjSource fpf%of [f^,İ AD3DRMLOADMEMORY \‘c’İ,δŽw,³,È, ,Ä,İ,È,ç,È,ç B

#### D3DRMLOAD\_FROMSTREAM

fXfgfŠ [fE,©,çf [fh, ,é B

### Ž•Êžqftf%ofO

#### D3DRMLOAD\_BYNAME

Žw’è,³,è,½-¼‘O,δŽg—p,µ,ÄfI fufWfFfNfg,δf [fh, ,é B

#### D3DRMLOAD\_BYPOSITION

^!,ç,è,½ A0,©,çŽn,Ü,éÊ’u,É AfXf^f“fh EfAf f“,İfI fufWfFfNfg,δf [fh, ,é i,Ä,Ü,è Aftf@fCf<†,İn”Ö- Ü,İfI fufWfFfNfg,δf [fh, ,é j BfXf^f“fh EfAf f“,İfI fufWfFfNfg,İ¼,İfI fufWfFfNfg,δŠÜ,µ,± ,Æ,³,Ä,«,é,ª A¼,İfI fufWfFfNfg,ÉŠÜ,Ü,é,è,±,Æ,İ,È,ç B

#### D3DRMLOAD\_BYGUID

Žw’è,³,è,½fOf [fof< Eftfj [fNŽ•Êžq iGUID j,δŽg—p,µ,ÄfI fufWfFfNfg,δf [fh, ,é B

#### D3DRMLOAD\_FIRST

,±,è,İffftfHf<fg Ý’è,Ä, ,é B—

^!,ç,è,½f^fCfv,İfXf^f“fh EfAf f“,İfI fufWfFfNfg,δf [fh, ,é i,½,Æ,;,İ AfAfvfŠfP [fVf†f“,IDirect3DRMMeshBuilder::Load,δCEÄ,Ñ o,· è ‡,İf fbVf...

,δf [fh, ,é j BfXf^f“fh EfAf f“,İfI fufWfFfNfg,İ¼,İfI fufWfFfNfg,δŠÜ,µ,± ,Æ,³,Ä,«,é,ª A¼,İfI fufWfFfNfg,ÉŠÜ,Ü,é,è,±,Æ,İ,È,ç B

### fCf“fXf^f“fX Eftf%ofO

#### D3DRMLOAD\_INSTANCEBYREFERENCE

Žw’è,³,è,½-¼‘O,Æ“—,¼‘O,İfI fufWfFfNfg,“¶ Ý, ,é,©,Ç,ª

,©,δf^fFfbfN, ,é B¶ Ý, ,é è ‡ A V,µ,çfI fufWfFfNfg,δ ì -, ,é’ä,í,è,É A,»,İfI fufWfFfNfg,İfCf“fXf^f“f X,δŽg—p, ,é B

#### D3DRMLOAD\_INSTANCEBYCOPYING

Žw’è,³,è,½-¼‘O,Æ“—,¼‘O,İfI fufWfFfNfg,“¶ Ý, ,é,©,Ç,ª

,©,δf^fFfbfN, ,é B¶ Ý, ,é è ‡ A V,µ,çfI fufWfFfNfg,δ ì -, ,é’ä,í,è,É A,»,İfI fufWfFfNfg,δfRfs [, ,é B

ŠeLoadf f\fbfh,İ AlpvObjSourcefpf%of [f^,δŽg—

p,µ,ÄfI fufWfFfNfg,İf [fX,δŽw’è,µ AlpvObjIDfpf%of [f^,É,æ,Ä,ÄfI fufWfFfNfg,δŽ•Ê, ,é BfVfXfefE ,İf [fX Eftf%ofO,İ’İ’ð,ÉŠİ,Ä,ç,ÄlpvObjSourcefpf%of [f^,δ%øðŽB, ,é B,»,µ,Ä AŽ•Êžqftf%ofO,İ’İ’ð,ÉŠİ,Ä,ç ,ÄlpvObjIDfpf%of [f^,İ“à—e,δ%øðŽB, ,é B

fCf“fXf^f“fX Eftf%ofO,Í Afpf%of [f^,Ì%đŽß•û-  
@,É,Í%½,à•Í X,đ%Á,!,È,¢ BD3DRMLOAD\_INSTANCEBYREFERENCEftf%ofO,đ—p,¢  
,é,Æ A V,µ,¢fIfufWfFfNfg,đ ì ¬,·,é,±,Æ,È,“¬,¶ftf@fCf<,đ2%ñf [fh,·,é,±,Æ,ª,Á,«,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%Ê,đ“¾,é,±,Æ,ª,Á,«,é Bf [f\_,Í A“~ê,IfIfufWfFfNfg,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;
```

```
efNfXf`ff,ÌfOf< [fv,Ö,Ìf}fbfsf“fO•û–  
@,ð'è<`,,é'l IDirect3DRMMesh::GetGroupMapping,âIDirect3DRMMesh::SetGroupMapping f\fbfh,É,æ,Á,Ä—  
p,ç,ç,é,é B
```

## D3DRMMAPPINGFLAG

**D3DRMMAPPING**,ÆÆ^,ææ“,¶ B

## D3DRMMAP\_WRAPU

u•ûÆü,ÉfefNfXf`ff,ðf%ofbfv,.,é B

## D3DRMMAP\_WRAPV

v•ûÆü,ÉfefNfXf`ff,ðf%ofbfv,.,é B

## D3DRMMAP\_PERSPCORRECT

fefNfXf`ff Ef%ofbfsf“fO,Í%o“·ß•â ³,³,é,é B

D3DRMMAP\_WRAPU,ÆD3DRMMAP\_WRAPVftf%ofO,Í Af%ofXf^f%ofCfU,³fefNfXf`ff À•W,ð%oðŽß,.,é•û–  
@,ðÆ^è,.,é Bf%ofXf^f%ofCfU,Í,Ä,Ë,É AfefNfXf`ff À•W,Ä Ä,à'Z,ç<—£ A,Ä,Û,è'¼ ü,ð•âŠ@,.,é B,±  
,Í'¼ ü,ÌfpfX,Æ Au,“,æ,Ñv Ä•W,Ì—LÆø'l,Í Af%ofbfsf“fO Eftf%ofO,ÌŽg,ç•û,É,æ,Á,Ä^Û,È,é B^ê•û,Û,½,Í—  
¼•û,Ìftf%ofO,³fZfbfg,³,é,é,Æ A'¼ ü,Íu,Û,½,Ív•ûÆü,ÌfefNfXf`ff,Ì•Ö,ðf%ofbfv EfAf%ofEf“fh,.,é B,±  
,Ì ê ‡ AfefNfXf`ff,Í%o~'Æ ó,©fh [fifc ä,ÌÈ·Š,ðŽ ,Ä,Ä,ç,é,©,Ì,æ,²,ÉÆ©,!,é B Ú ×,É,Ä,ç  
,Ä,Í uDirect3DRMWrapfCf“f^ [ftFfCfX v,ðŽQ Æ,.,é,±,Æ B

ŽQ Æ @Direct3DRMWrapfCf“f^ [ftFfCfX, **IDirect3DRMMesh::GetGroupMapping,**  
**IDirect3DRMMesh::SetGroupMapping**

## D3DRMMATRIX4D

```
typedef D3DVALUE D3DRMMATRIX4D[4][4];
```

• ĪŠ·,đ s—ñ,Æ,μ,Ä·\,· B s—ñfGf“fgfŠ,Í AD3DRMMATRIX4D[row][column],©,ç \ ¬,³,ê,é B

ŽQ Æ @IDirect3DRMFrame::AddTransform, IDirect3DRMFrame::GetTransform

## D3DRMSAVEOPTIONS

```
typedef DWORD D3DRMSAVEOPTIONS;  
#define D3DRMXOFSAVE_NORMALS 1  
#define D3DRMXOFSAVE_TEXTURECOORDINATES 2  
#define D3DRMXOFSAVE_MATERIALS 4  
#define D3DRMXOFSAVE_TEXTURENAMES 8  
#define D3DRMXOFSAVE_ALL 15  
#define D3DRMXOFSAVE_TEMPLATES 16
```

**IDirect3DRMMeshBuilder::Save** *f\bfbh,lfIfvfVf#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<,lfef“fvfœ [fg,ð•Û‘¶,.,é BfftfHf<fg,Á,lfef“fvfœ [fg,Í•Û‘¶,³,è,È,ç B*

•Ô¹

Direct3D•ŮŽ f, [fh,ĪfRf“f] [flf“fg EfIfufWfFfNfg Ef,ff< iCOM j  
fCf“f^ [ftfFfCfX Ef f\fbfh,Ī AŽŸ,Ī¹,ð•Ō,· B

**D3DRM\_OK**

¬Œ÷ B

**D3DRMERR\_BADALLOC**

f f,fŠ•s‘« B

**D3DRMERR\_BADDEVICE**

ffofCfX,ĪfŒf“f\_%o [,ŒŒŸŠ· «,ª,È,Œ B

**D3DRMERR\_BADFILE**

ff [f^ftf@fCf<,ª•s ³ B

**D3DRMERR\_BADMAJORVERSION**

DLL,Īf fWff [ Efo [fWf‡f“,ª•s ³ B

**D3DRMERR\_BADMINORVERSION**

DLL,Īf}fCfi [ Efo [fWf‡f“,ª•s ³ B

**D3DRMERR\_BADOBJECT**

ˆø ”,É,ĪfIfufWfFfNfg,ª•K—v B

**D3DRMERR\_BADTYPE**

•s ³,ÈŒ^,Īˆø ”,ª“n,³,ê,½ B

**D3DRMERR\_BADVALUE**

•s ³,È¹,Īˆø ”,ª“n,³,ê,½ B

**D3DRMERR\_FACEUSED**

—Ê,Īf fbfVf... ã,ÅŽg—p Ī,Ÿ,Å, ,é B

**D3DRMERR\_FILENOTFOUND**

ftf@fCf<,ðŠJ,,±,Œ,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,©,Œ,È,Œ B

**D3DRMERR\_UNABLETOEXECUTE**

fvf fV [fWff,ðŽÀ s,Å,«,È,Œ B

### D3DDivide

D3DDivide(a, b) (float)((double) (a) / (double) (b))

$a^b$

$\frac{a}{b}$

$a^b$

$\frac{a}{b}$

$\frac{a}{b}$  @D3DMultiply

### D3DMultiply

D3DMultiply(a, b) ((a) \* (b))

æŽZ,đ s,σ B

2'l,î Ī,đ•Ô,· B

$a^b$

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 →<sup>a</sup>l,đ F,Ì'l,É•İŠ·,·,é B

RGB →<sup>a</sup>l,đD3DCOLOR'l,É•İŠ·,·,é B

*r, g, b*

F,Ì Ô(red) A—Î(green),·,æ,Ñ Â(blue),İ—v'f B,±,ê,ç,Ì'l,Í A0,©,ç1,İ”Í'Í,İ•,“® ñ ”“\_CE^,Â, ,é B

ŽQ Æ @D3DRGBA

### D3DRGBA

```
D3DRGBA(r, g, b, a) \  
  (((long)((a) * 255)) << 24) | (((long)((r) * 255)) << 16) |  
  (((long)((g) * 255)) << 8) | (long)((b) * 255))
```

RGBA →<sup>a</sup>l,đ F,î'l,É•İŠ•,•,é B

RGBA →<sup>a</sup>l,đD3DCOLOR'l,É•İŠ•,•,é B

*r, g, b, a*

F,î Ô(red) A—î(green) A Â(blue),•,æ,ÑfAf<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%øð œ,ð,±,İf}fNf ,Å s,±,±,Æ,ª,Å,«„é B

•Ô'1,Í,È,¢ B

type

fI [fo [f%ofCfh,İ ó'Ô B,±,İfpf%of [f^,İD3DTRANSFORMSTATETYPE AD3DLIGHTSTATETYPE A  
D3DRENDERSTATETYPE œ^,İf f“fo,İ,Đ,Æ,Å,Å, ,é B

,½,Æ,İ,İ ASTATE\_DATAf}fNf (DirectX SDK,İfTf“fvf<fR [fh,İMisc/D3dmacs.hftf@fCf<,Å'è<')

,ðŽg,¢ AD3DSTATE\_OVERRIDE,ÅD3DRENDERSTATE\_SHADEMODOE,İfœf“f\_Šf“fo,İ ó'Ô,İf fbfN,Æ%øð œ,ð s  
,ª B

// -¾“xf, [fh,ðf fbfN

STATE\_DATA(D3DSTATE\_OVERRIDE(D3DRENDERSTATE\_SHADEMODOE), TRUE, lpBuffer);

// fŠ [fhfIf“fŠ [„Å,È,¢,Æ,« A-¾“xf, [fh,ðŽÀ s,µf fbfN%øð œ,·,é

STATE\_DATA(D3DSTATE\_OVERRIDE(D3DRENDERSTATE\_SHADEMODOE), FALSE, lpBuffer);

fœf“f\_Šf“fo,İ ó'Ô,İfI [fo [f%ofCfh,É,Å,¢

,Å,İ Ú ×,Í A ufXfe [fg,ÆfXfe [fg EfI [fo [f%ofCfh v,ðŽQ Æ,·,é,±,Æ B

## **D3DVAL**

D3DVAL(val) ((float) val)

**D3DVALUE**( $\epsilon^{\wedge}$ ,  $\dot{I}^{\prime}$ ,  $\acute{E}$ ,  $\dot{I}\dot{S}$ ,  $\cdot$ ,  $\acute{e}$  B

$\cdot\dot{I}\dot{S}\cdot\mathcal{E}\grave{a}$ ,  $\dot{I}^{\prime}$ ,  $\delta\cdot\acute{O}$ ,  $\cdot$  B

*val*

$\cdot\dot{I}\dot{S}\cdot^3$ ,  $\acute{e}$ ,  $\acute{e}^{\prime}$  B

ŽQ Æ @**D3DVALP**

**D3DVALP**

D3DVALP (val, prec) ((float)val)

,“x,ø•İŠ·,;é B

•İŠ·Ĉĕã,î¹,ø•Ô,· B

val

•İŠ·,³,é,é¹ B

prec

-³Ĉø B

D3DVALf}fNf ,î ,“x,Í A¹,î ñ ”•”•,É·Î,µ16frfbfg,Å, ,é B

ŽQ Æ @D3DVAL

**RGB\_GETBLUE**

RGB\_GETBLUE(rgb) ((rgb) & 0xff)

**D3DCOLOR** 'l,©,ç Â ñª,ðžæ,è o,· B

Â ñª,ðžÔ,· B

*rgb*

Â ñª,ðžæ,è o,· F,ÌD3DCOLOR'l B

## RGB\_GETGREEN

```
RGB_GETGREEN(rgb)    (((rgb) >> 8) & 0xff)
```

**D3DCOLOR**'l,©,ç—î ñª,ðžæ,è o,· B

—î ñª,ð•Ô,· B

*rgb*

—î ñª,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)))

RGB\_MAKE(r, g, b)

RGB\_MAKE(r, g, b)

RGB\_MAKE(r, g, b)

## RGB\_TORGBA

RGB\_TORGBA(rgb) ((D3DCOLOR) ((rgb) | 0xff000000))

RGB →',©,çRGBA F,đ ì -,·,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, ÌD3DCOLOR'l,æ,èfAf<ftf@ -ᵃ,ðŽæ,è o,· B  
fAf<ftf@ -ᵃ¹l,ð•Ô,· B

*rgb*  
fAf<ftf@ -ᵃ,ðŽæ,è o,· F,ÌD3DCOLOR'1 B

## RGBA\_GETBLUE

RGB\_GETBLUE(rgb) ((rgb) & 0xff)

RGBA, 3DCOLOR'l,æ,è Â -•ª,ðžæ,è o,· B

Â -•ª'1,ð•Ô,· B

*rgb*

Â -•ª,ðžæ,è o,· F, 3DCOLOR'l B

## RGBA\_GETGREEN

```
RGB_GETGREEN(rgb)    (((rgb) >> 8) & 0xff)
```

```
RGBA, 1D3DCOLOR'l,æ,è—Î  -•ª,ðŽæ,è o,· B
```

```
—Î  -•ª'l,ð•Ô,· B
```

*rgb*

```
—Î  -•ª,ðŽæ,è o,· F,1D3DCOLOR'l B
```

## RGBA\_GETRED

```
RGB_GETRED(rgb)    (((rgb) >> 16) & 0xff)
```

```
RGBA, 3DCOLOR'l,æ,è Ô -•ª,ðžæ,è o,· B
```

```
Ô -•ª'1,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@ ¬•ª¹,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@ ¬•ª¹ B

## RGBA\_SETALPHA

`RGBA_SETALPHA(rgba, x) ((x) << 24) | ((rgba) & 0x00ffffff)`

`RGBA, D3DCOLOR, ÉfAf<ftf@ -•ª, ð Ý'è, ·, é B`

`fAf<ftf@ -•ª¹,ª Ý'è,³,ê,½RGBA F, ð•Ô, · B`

*rgba*

`fAf<ftf@ -•ª¹,ª Ý'è,³,ê,éRGBA F B`

*x*

`Ý'è, ·, éfAf<ftf@ -•ª¹ B`

## RGBA\_TORGB

RGBA\_TORGB(rgba) ((D3DCOLOR) ((rgba) & 0xffffffff))

RGBA, D3DCOLOR -<sup>a</sup>l, ©, çfAf<ftf@ -<sup>a</sup>, ð æ, ç, Ä ARGB, D3DCOLOR 'l, ð ì -, ., é B

RGB F, ð•Ô, · B

*rgba*

RGB F, É•İŠ, ., éRGBA F B

ŽQ Æ @RGB\_TORGBA

fR [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  
 fAvfŠfP [fVf‡f“,Í A`È%°,ì'l,ì,¢,,ê,©,ð•Ö,· B  
 D3DENUMRET_CANCEL  
 —ñ<“,ð'†Ž~,.,é B
```

### D3DENUMRET\_OK

```
—ñ<“,ðEp'±,.,é B
```

lpGuid

```
fOf [fof< Ef†fj [fNŽ~•ÊŽq(GUID),Ö,ìf|fCf“f^ B
```

lpDeviceDescription

```
ffofCfX,ì' ŽB,Ö,ìf|fCf“f^ B
```

lpDeviceName

```
ffofCfX—¼,Ö,ìf|fCf“f^ B
```

lpD3DHWDeviceDesc

```
Direct3DffofCfX Efn [fhfEfFA î•ñ,ìD3DDEVICEDESC \`¢'ì,Ö,ìf|fCf“f^ B
```

lpD3DHELDeviceDesc

```
Direct3DffofCfX EfGf~f...fE [fVf‡f“ î•ñ,ìD3DDEVICEDESC \`¢'ì,Ö,ìf|fCf“f^ B
```

lpUserArg

```
,±,ìfR [f<fofbfNŠÖ ”,É“n,3,ê,éAvfŠfP [fVf‡f“`è`ff [f^,Ö,ìf|fCf“f^ B
```

```
fR [f<fofbfNŠÖ ”,ðEÄ,Ñ o,· ‡ ~,ðE~è,.,é,Æ,« AfVfXfef€,Í Ä %o
```

```
,É Ä,à ,,¢ŠK'w,ìfIfufWfFfNfg,ðEÝ õ,µ,Ä AZÝ,É,»,ê,ç,ª ì ¬,3,ê,½ ‡ ~,ÄfR [f<fofbfNŠÖ ”,ðEÄ,Ñ o,· B
```

### D3DENUMTEXTUREFORMATSCALLBACK

```
typedef HRESULT (WINAPI* LPD3DENUMTEXTUREFORMATSCALLBACK)  
(LPDDDSURFACEDESC lpDdsd, LPVOID lpUserArg);
```

*lpDdsd*     *lpUserArg*

*lpUserArg*

*lpUserArg*

*lpUserArg*

### D3DVALIDATECALLBACK

```
typedef HRESULT (WINAPI* LPD3DVALIDATECALLBACK)  
(LPVOID lpUserArg, DWORD dwOffset);
```

```
fAfvfŠfP [fVf‡f“;^ AIDirect3DExecuteBuffer::Validatef f\bfh,ðCEÄ,Ñ o,·,Æ,«,É—  
^,¡,ç,ê,éfAfvfŠfP [fVf‡f““è`fR [f<fofbfNŠÖ ”,Ä, ,é B,±  
,İf f\bfh,Æ,Í AfGf%o [,ðCEŸ o,µ,½,Æ,«,ÉŽÀ sfobftf@,İf`fFbfN,âfobftf@,İfİftfZfbfg,ð•Ö,·ffofbfO 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€,³Gf%o [,ðCEŸ o,µ,½ŽÀ sfobftf@,İfİftfZfbfg B
```

```
fR [f<fofbfNŠÖ ”,ðCEÄ,Ñ o,· ‡ ~,ðCE`è,·,é,Æ,« AfVfXfef€,Í Ä %o  
,É Ä,à ,,çŠK`w,İfİfufWfFfNfg,ðCEŸ ð,µ,Ä AŽŸ,É,»,ê,ç,^ à Ì -,³,ê,½ ‡ ~,ÄfR [f<fofbfNŠÖ ”,ðCEÄ,Ñ o,· B
```

## IDirect3D

**IDirect3D** fCf“f^ [ftfFfCfX, ìf f\fbfh, ðŽg, □, Æ A Direct3D fufWfFfNfg, ð ì ¬, μ, ½, è AŠÂ«« Ý’è, μ, ½, è, , é, ±, Æ, , Æ, Â, «, é B, ±, ì ß, Â, Í A **IDirect3D** fCf“f^ [ftfFfCfX, ìf f\fbfh, È, Â, Ç, Ä à¬¼, , é BŠT—ª, È, Â, Ç, Ä, Í A IDirect3D fCf“f^ [ftfFfCfX v, ðŽQ Æ, , é, ±, Æ B

**IDirect3D** fCf“f^ [ftfFfCfX, ìf f\fbfh, Í AŽŸ, ìfOf< [fv, ©, Ç, È, é B

¶ ¬

CreateLight

CreateMaterial

CreateViewport

—ñ<“

EnumDevices

%Šú%»

FindDevice

Initialize

**IDirect3D** fCf“f^ [ftfFfCfX, Í A, , ×, Ä, ì COM fCf“f^ [ftfFfCfX, ì, æ, □, È A IUnknown fCf“f^ [ftfFfCfX Ef f\fbfh, ðEp ³, , é B **IUnknown** fCf“f^ [ftfFfCfX, ªTf| [fg, , éf f\fbfh, Í AŽŸ, ì’È, è B

AddRef

QueryInterface

Release

## IDirect3D::CreateLight

```
HRESULT CreateLight(LPDIRECT3DLIGHT* lplpDirect3DLight,  
    IUnknown* pUnkOuter);
```

Direct3DLight fIfufWfFfNfg,đŠ,,è“-Ä,é B,±,ÌfIfufWfFfNfg,Í AIDirect3DViewport::AddLight f\fbfh,đŽg,□  
,ÆfIf... [f] [fg,ÆE< ‡,·,é,±,Æ,ª,Ä,«,é B

-E±,·,ê,ÎD3D\_OK AŽ,”s,·,ê,Î AŽŸ,Ì'l,Ì,¢,,ê,©,đ•Ô,· B

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

*lplpDirect3DLight*

-E±,·,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,B,Ì,à,Ì,Ä, ,é

**IDirect3D::CreateLight** f\fbfh,Í,±,Ìfpf%of [f^,ªNULL^ÈŠO,Ì,Æ,«fGf%o [,đ•Ô,· B

**IDirect3D::CreateMaterial**

```
HRESULT CreateMaterial(LPDIRECT3DMATERIAL* lpDirect3DMaterial,  
    IUnknown* pUnkOuter);
```

Direct3DMaterialIfufWfFfNfg,đŠ,,è“-,Ä,é B

-Ĉ÷,·,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

lpDirect3DMaterial

ĈÄ,Ñ o,µ,É -Ĉ÷,·,ê,Î AIDirect3DMaterial fCf“f^ [ftFfCfX,Ö,îf|fCf“f^,îfAfhfĈfX B

pUnkOuter

,±,îfpf%of [f^,Í ACOM'S'İ,đ «— AŠg'£,·,é,½,ß,î,à,î,Ä, ,é BIDirect3D::CreateMaterial f\fbfh,Í A,±  
,îfpf%of [f^,^NULL^ÈŠO,î,Æ,«fGf%o [,đ•Ô,· B

## IDirect3D::CreateViewport

```
HRESULT CreateViewport(LPDIRECT3DVIEWPORT* lpD3DViewport,  
    IUnknown* pUnkOuter);
```

Direct3DViewport fIfufWfFfNfg,đ ¶ -,.,é B,±,Ìrf... [f] [fg,Í AIDirect3DDevice::AddViewport f\fbfh,Āžg—  
p,³,é,éDirect3DffofCfXfIfufWfFfNfg,ÆÆ< ‡,³,é,é B

-Æ÷,.,é,ÍD3D\_OK AŽ,”s,.,é,Í AŽŸ,Ì'l,Ì,¢,,é,©,đ•Ô,· B

DDERR\_INVALIDOBJECT

DDERR\_INVALIDPARAMS

lpD3DViewport

ÆĀ,Ñ o,μ,É -Æ÷,.,é,Í AIDirect3DViewport fCf“f^ [ftFfCfX,Ö,Ìf|fCf“f^,ÌfAfhfÆfX B

pUnkOuter

,±,Ìfpf%of [f^,Í ACOM‘S‘ì,đ «—^ AŠg‘E,.,é,½,β,Ì,à,Ì,Ā, ,é BIDirect3D::CreateViewport f\fbfh,Í A,±  
,Ìfpf%of [f^,³NULL^ÈŠO,Ì,Æ,«fGf%o [,đ•Ô,· B

**IDirect3D::EnumDevices**

HRESULT EnumDevices(LPD3DENUMDEVICESCALLBACK lpEnumDevicesCallback,  
LPVOID lpUserArg);

ffVfXfef€ÉfCf“fXfg [f<,³,ê,Ä,¢,éDirect3DfffofCfX Efhf%ofCfo,·,×,Ä,ð—ñ<“,·,é B  
-€÷,·,ê,ÎD3D\_OK AŽ,”s,·,ê,Î AŽŸ,Ì¹,Ì,¢,,ê,©,ð•Ô,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

lpEnumDevicesCallback

€Ÿ o,³,ê,é,½,Ñ,É€Ä,Ñ o,³,ê,é—ñ<“ ^— ,**ÎD3DENUMDEVICESCALLBACK** fR [f<fofbfNŠÖ ”,Ö,Ìf|  
fCf“f^ B

lpUserArg

fR [f<fofbfNŠÖ ”,É“n,·fAfvfŠfP [fVf‡f“è`ff [f^,Ö,Ìf|fCf“f^ B

**IDirect3D::FindDevice**

HRESULT FindDevice(LPD3DFINDDEVICESEARCH lpD3DFDS,  
LPD3DFINDDEVICERESULT lpD3DFDR);

Žw'è,³,ê,½ «Žč,ìffofCfX,ðEÿ o,µ A,»,Ì îñ,ðŽæ“¾,·,é B

-E÷,·,ê,ÌD3D\_OK,³Ô,³,ê,é B•Ô'l,É,Â,ç,Ä,Í A uDirect3D'¼ Úf, [fh,ì•Ó'l v,ðŽQ Æ,·,é,±,Æ B

lpD3DFDS

Žæ“¾,·,éffofCfX,ðŽ!,·**D3DFINDDEVICESEARCH** \‘ç‘ì,ìf|fCf“f^ B

lpD3DFDR

Eÿ oŽž,ÉffofCfX,ðŽ!,·**D3DFINDDEVICERESULT** \‘ç‘ì,ìf|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,]f f\fbfh,ðŽg,□,Æ A Direct3DfIfufWfFfNfg,ì”\—  
Í,ð%ñ•æ,μ,½,è Ý’è,μ,½,è,·,é,±,Æ,ª,Ä,«,é B,±,Ì ß,Ä,Í A IDirect3DDevice fCf“f^ [ftFfCfX,]f f\fbfh,É,Ä,c,Ä à-  
¾,·,é BŠT—ª,É,Ä,c,Ä,Í A uIDirect3DDevice fCf“f^ [ftFfCfX v,ðŽQ Æ,·,é,±,Æ B

IDirect3DDevice fCf“f^ [ftFfCfX,]f f\fbfh,Í A ŽÝ,ÌfOf< [fv,©,ç,È,é B

ŽÀ s CreateExecuteBuffer  
Execute

îñ EnumTextureFormats  
GetCaps  
GetDirect3D  
GetPickRecords  
GetStats

”z—ñ CreateMatrix  
DeleteMatrix  
GetMatrix  
SetMatrix

,»,ì¼ Initialize  
Pick  
SwapTextureHandles

fV [f“ BeginScene  
EndScene

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,ªTf| [fg,·,éf f\fbfh,Í A ŽÝ,ì’È,è B

AddRef

QueryInterface

Release

Direct3DDevicefIfufWfFfNfg,Í A3D%æ—  
È,Æ,μ,Ä ¶ ¬,³,è,½DirectDrawSurfacefIfufWfFfNfg,©,ç IDirect3DDevice::QueryInterface  
f f\fbfh,ð“K Ø,ÉÆÄ,Ñ o,·,±,Æ,ÄŽæ“¾,³,é,é B

**IDirect3DDevice::AddViewport**

HRESULT AddViewport(LPDIRECT3DVIEWPORT lpDirect3DViewport);

Žw'è,³,ê,½ftrf... [f] [fg,ð AfffofCfX,É”z'u,³,ê,½ftrf... [f] [fg EfIfufWfFfNfg,ÏfŠfXfg,É'Ç%Á,·,é B  
-Œ÷,·,ê,ÎD3D\_OK AŽ,”s,·,ê,Î AŽŸ,Ï'l,Ï,ç,,ê,©,ð•Ö,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

*lpDirect3DViewport*

Direct3DdevicefIfufWfFfNfg,É”z'u,³,ê,½IDirect3DViewportfCf“f^ [ftfFfCfX,Ö,Ïf|fCf“f^ B

**IDirect3DDevice::BeginScene**

HRESULT BeginScene();

fV [f“,đŠJŽn,·,é B

-Ĉ÷,·,é,ĀD3D\_OK,đ•Ô,· B

fAfvfŠfP [fVf÷f“,Í•K,, AfĈf“f\_Šf“fO,ÌŽÀ s‘O,É,±,Ìf f\fbfh,đĈĀ,Ñ o,·,±,Ā B,Û,½ AfĈf“f\_Šf“fO I—  
‘Žž,É,Í A IDirect3DDevice::EndScene,đĈĀ,Ñ o,·,±,Ā B

ŽQ Ā @IDirect3DDevice::EndScene

**IDirect3DDevice::CreateExecuteBuffer**

```
HRESULT CreateExecuteBuffer(LPDIRECT3DEXECUTEBUFFERDESC lpDesc,
    LPDIRECT3DEXECUTEBUFFER* lplpDirect3DExecuteBuffer,
    IUnknown* pUnkOuter);
```

•Ž,fŠfXfg,ÉŽÀ sfobftf@,đš,,è“-,Ä,é B,±  
,İfŠfXfg,Í Afn [fhfEfffA,İDMA,É,æ,èVRAM,É“Ç,Ý ž,Ü,é,é B’;“\_İfCf“fffbfNfX,đŽ .Âfobftf@“à,İ,.,×,Ä,İff  
fbfXfvfÇfC EfvfŠf~fefBfu,Í A,».,é,ç,İ’;“\_đ“-¶fobftf@“à,ÉŽ ,½,È,-,é,İ,È,ç,È,Ç B  
-Ç÷,.,é,İD3D\_OK AŽ,”s,.,é,İ AŽŸ,İ’l,İ,Ç,.,é,©,đ•Ö,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

*lpDesc*

¶ - , 3, é, ½Direct3DExecuteBufferIfufWfFfNfg, đŽ!, **D3DEXECUTEBUFFERDESC** \‘ç’İ, Ö, İf|fCf“f^ B, ±  
, İfobftf@, İfTfCY, “, «, è, , fIfufWfFfNfg, “ ¶ - , 3, é, È, Ç, Æ, «, É, Í ACEÄ, Ñ o, µ, ÉŽ, ”s, ;, é B

*lplpDirect3DExecuteBuffer*

V, µ, ÇDirect3DExecuteBufferIfufWfFfNfg, Ö, İf|fCf“f^, Ö, İf|fCf“f^ B

*pUnkOuter*

, ±, İfpf%of [f^, Í ACOM‘S‘İ, đ «—^ AŠg’£, ·, é, ½, ß, İ, à, İ, Ä, , é BIDirect3DDevice::CreateExecuteBuffer f\fbfh, Í  
A, ±, İfpf%of [f^, “NULL~ÈŠO, İ, Æ, «fGf%o [, đ•Ö, · B

**D3DEXECUTEBUFFERDESC** \‘ç’İ, Í A ¶ - , 3, é, ½ŽÀ sfobftf@, đçL q, ·, é B , È, , Æ, àfAfvfŠfP [fVf±f“, Í A•K  
—v, Æ, 3, é, éfTfCY, đŽw’è, µ, È, -, é, İ, È, ç, È, Ç BfAfvfŠfP [fVf±f“, “—

Íf f“fo, İDEBCAPS\_VIDEO\_MEMORY, đŽw’è, ·, é, Æ ADirect3D, Í Afrffl Ef f, fŠ, ÉŽÀ sfobftf@, đ•Ÿ , µ, æ, □  
, Æ, ·, é B

fAfvfŠfP [fVf±f“, **İDirect3DExecuteBuffer::Lock** f\fbfh, đŽg, □, Æ Af f, fŠ, İ^Ú“@, đ—v< , ·, é, ±, Æ, “, Ä, «, é B, ±  
, İf f\fbfh, “-ß, Ä, ½, Æ, « Af f [f^, “fVfXfef€ Ef f, fŠ, Ü, ½, İfrrfI Ef f, fŠ, İ, Ç, ç, Ç, ©, É, , é, ©, đ\  
, **D3DEXECUTEBUFFERDESC** \‘ç’İ, İ \ - , É ±, í, 1, ç, é, é B

**IDirect3DDevice::CreateMatrix**

HRESULT CreateMatrix(LPD3DMATRIXHANDLE lpD3DMatHandle);

s—ñ,ð ì ¬,·,é B

-E÷,·,ê,ÎD3D\_OK AŽ,”s,·,ê,Î AŽŸ,Ì¹,ð•Ô,· B

**DDERR\_INVALIDPARAMS**

lpD3DMatHandle

ì ¬,³,ê,½ s—ñ,Ìfnf“fhf<·Ī ”,Ö,Ìf|fCf“f^ Bfofbftf@,ÌTfCfY,“«,è,,É s—ñ,ð ¶ ¬,Á,«,È,¢,Æ,«,Í A,±  
,ìEÄ,Ñ o,µ,ÉŽ,”s,·,é B

ŽQ Æ @**IDirect3DDevice::DeleteMatrix** A **IDirect3DDevice::SetMatrix**

### **IDirect3DDevice::DeleteMatrix**

HRESULT DeleteMatrix(D3DMATRIXHANDLE d3dMatHandle);

—ñ, ð í œ, ±, ð —  
ñ, ð í A IDirect3DDevice::CreateMatrix f \fbfh, Á ì -, ³, ê, ½, à, ì, Á, È, -, ê, Í, È, ç, È, ¢ B  
-œ±, ·, ê, ÌD3D\_OK AŽ, ”s, ·, ê, Í AŽŸ, ì'l, ð•Ô, · B

### **DDERR\_INVALIDPARAMS**

*d3dMatHandle*

í œ, ³, ê, é s—ñ, ð í fhf< B

ŽQ Æ @ IDirect3DDevice::CreateMatrix A IDirect3DDevice::SetMatrix

**IDirect3DDevice::DeleteViewport**

HRESULT DeleteViewport(LPDIRECT3DVIEWPORT lpDirect3DViewport);

ffofCfX,ÉŠÖ^A,μ,½frf... [f] [fg EfIfufWfFfNfg,ÏfŠfXfg,©,ç AŽw'è,³,ê,½frf... [f] [fg,đ í œ,·,é B  
-Æ÷,·,ê,ÎD3D\_OK AŽ,„s,·,ê,Î AŽŸ,Ï'l,Ï,ç,,ê,©,đ•Ô,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

lpDirect3DViewport

Direct3DDeviceIfufWfFfNfg,©,ç Ø,è—£,·Direct3DViewportfIfufWfFfNfg,Ö,Ï|fCf“f^ B

**IDirect3DDevice::EndScene**

HRESULT EndScene ();

**IDirect3DDevice::BeginScene** f f\fbfh, ìCEÄ, Ñ o, µ, É, æ, èŠJŽn, ³, ê, ½fV [f“, ð I—¹, ·, é B  
-E÷, ·, ê, ÎD3D\_OK, ¸•Ô, é B

ŽQ Æ @IDirect3DDevice::BeginScene

## IDirect3DDevice::EnumTextureFormats

```
HRESULT EnumTextureFormats (
    LPD3DENUMTEXTUREFORMATSCALLBACK lp3dEnumTextureProc,
    LPVOID lpArg);
```

«» Ý, ìfhf%ofCfo, 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**

*lp3dEnumTextureProc*

—ñ<“ ^—

, Æ, µ, ÄŠefefNfXf`ffÆ^, ÅÆÄ, Ñ o, 3, ê, éD3DENUMTEXTUREFORMATSCALLBACKfR [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@,đŽÄ s,·,é B

-Œ÷,·,ê,ÎD3D\_OK AŽ,”s,·,ê,Î AŽŸ,Ì'l,đ•Ô,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

lpDirect3DExecuteBuffer

ŽÄ s,³,ê,éŽÄ sfobftf@,Ö,Ìf|fCf“f^ B

lpDirect3DViewport

•Ž!,³,ê,éŽÄ sfobftf@,Ì•İŠ·fRf“fefLFXfg,đL q,·,éDirect3DViewportfIfufWfFfNfg,Ö,Ìf|fCf“f^ B

dwFlags

fofbftf@,ÌfIfufWfFfNfg,đfNfŠfbfsf“fO,·,é,©,đŽw'è,·,éftf%ofO B,±,Ìfpf%of [f^,Í AŽŸ,Ì'l,ì,ç,,ê,©,Ä, ,é B

D3DEXECUTE\_CLIPPED

frf... [f| [fg,ÌŠO,É, ,évfŠf~fefBfu,đfNfŠfbfsf“fO,·,é B

D3DEXECUTE\_UNCLIPPED

frf... [f| [fg,Ì†,É,·,×,Ä,ÌvfŠf~fefBfu,đŠŮ,p(fNfŠfbfsf“fO,μ,È,ç) B

ŽQ Æ @**D3DEXECUTEDATA** **AD3DINSTRUCTION** **AIDirect3DExecuteBuffer::Validate**

**IDirect3DDevice::GetCaps**

HRESULT GetCaps(LPD3DDEVICEDESC lpD3DHWDevDesc,  
LPD3DDEVICEDESC lpD3DHELDevDesc);

Direct3DDeviceIfuFWfFfNfg,Ì î•ñ,ðŽæ“¾,·,·,é B

-Œ÷,·,ê,ÎD3D\_OK AŽ,”s,·,ê,Î AŽŸ,Ì'l,Ì,ç,,ê,©,ð•Ô,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

lpD3DHWDevDesc

fffofCfX,Ìfn [fhfEfffA î•ñ,ðŠÛ,ðD3DDEVICEDESC \ç'ì,Ö,Ìf|fCf“f^ B

lpD3DHELDevDesc

—^,|,ç,ê,Ä,ç,éf\ftfgfEfffA,ÌfGf~f...fŒ [fVf#f“ î•ñ,ðŠÛ,ðD3DDEVICEDESC \ç'ì,Ö,Ìf|fCf“f^ B

,±,Ìf f\fbfh,Í AfffBfXfvfŒfC,ÌfffofCfX î•ñ,ÍŽæ“¾,µ,È,ç B,±

,Ì î•ñ,ðŽæ“¾,·,·,é,É,Í AIDirectDraw2::GetCaps f\fbfh,ðŽg—p,·,·,é B

### Direct3DDevice::GetDirect3D

HRESULT GetDirect3D(LPDIRECT3D\* lpD3D);

«» Ý, ÌDirect3D fCf“f^ [ftfFfCfX, ðŽæ“¾, ·, é B

-E÷, ·, ê, ID3D\_OK, ð•Ô, µ A, »), Ì¼, Ì, Æ, «, ÍfGf%o [, Â, , é B•Ô'l, É, Â, ¢, Ä, Í A uDirect3D  
¼ Úf, [fh, Ì•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);

—ñfnf“fhf<,©,ç s—ñ,ðŽæ“¾,·,é B,±,Ì s—ñfnf“fhf<,Í AIDirect3DDevice::CreateMatrix  
f f\fbfh,É,æ,è ì ¬,³,ê,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**

lpD3DMatHandle

Žæ“¾,·,é s—ñ•İ ”,Ö,Ìf|fCf“f^ B

lpD3DMatrix

f f\fbfh,ª•Ô,· s—ñ,ðŠÛ,ÐD3DMATRIX \ç‘ì,Ö,Ìf|fCf“f^ B

ŽQ Æ @IDirect3DDevice::CreateMatrix AIDirect3DDevice::DeleteMatrix AIDirect3DDevice::SetMatrix

**IDirect3DDevice::GetPickRecords**

```
HRESULT GetPickRecords(LPDWORD lpCount,  
    LPD3DPICKRECORD lpD3DPickRec);
```

ffofCfXfĈfR [fh,đŽæ“¾,·,é B

-Ĉ÷,·,ê,ÎD3D\_OK,đ•Ô,· B

lpCount

Žæ“¾,·,éD3DPICKRECORD \‘ĉ‘î,î ”,“ü,é•Ī ”,Ö,Ï|fCf“f^ B

lpD3DPickRec

f f\fbfh,ª•Ô,·D3DPICKRECORD \‘ĉ‘î,î”z—ñ,Ö,Ï|fCf“f^ B

^ê”Ê“I,ÈfAfvfŠfP [fVf‡f“,Í A,±,Ïf f\fbfh,đ,Q%ñĈĈ,Ñ o,· B Å %o,ÏĈĈ,Ñ o,µ,Å,Í A,Q”Ô-

Ú,Ïpf%of [f^,É,ÍNULL,đ Ý’è,µ,P”Ô-

Ú,Ïpf%of [f^,ÉD3DPICKRECORD \‘ĉ‘î,îĈ ”,đŽæ“¾,·,é BfAfvfŠfP [fVf‡f“,Í A,±,Ï \‘ĉ‘î—p,É•K—

v,Èf f,fŠ,đŠm•Û,µ A,Q”Ô-Ú,Ïpf%of [f^—p,É V,½,Éf f,fŠ,đŠm•Û,µ,Ä A Ä“x,±,Ïf f\fbfh,đĈĈ,Ñ o,· B

**IDirect3DDevice::GetStats**

HRESULT GetStats(LPD3DSTATS lpD3DStats);

ffofCfX,ì î•ñ,ðŽæ“¾,·,é B

-Æ÷,·,ê,ÎD3D\_OK AŽ,”s,·,ê,Î AŽŸ,Ì'l,Ì,ç,,ê,©,ð•Ô,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

lpD3DStats

î•ñ,ðŽ,·**D3DSTATS** \‘ç‘Ï,Ö,Ì|fCf“f^ B

## IDirect3DDevice::Initialize

```
HRESULT Initialize(LPDIRECT3D lpd3d, LPGUID lpGUID,  
    LPD3DDEVICEDESC lp3ddvdesc);
```

ffofCfX,đ %Šú%»,.é B

-E÷,.ê,İD3D\_OK,đ•Ô,μ A,»,İ¼,İ,Æ,«,ÍfGf% [,Á, ,é B•Ô'l,É,Á,¢,Ä,Í A uDirect3D  
'¼ Úf, [fh,İ•Ô'l v,đŽQ Æ,.é,±,Æ B

lpd3d

%Šú%»,.éDirect3D ffofCfX,Ö,İf|fCf“f^ B

lpGUID

fCf“f^ [ftfFfCfXŽ~•ÊŽq,Á, ,éOf [fof< Ef+fj [fNŽ~•ÊŽq(GUID),Ö,İf|fCf“f^ B

lp3ddvdesc

%Šú%»,.éDirect3DDevicefIfufWfFfNfg,đŽ!,•D3DDEVICEDESC \‘İ,Ö,İf|fCf“f^ B

**IDirect3DDevice::NextViewport**

```
HRESULT NextViewport(LPDIRECT3DVIEWPORT lpDirect3DViewport,
    LPDIRECT3DVIEWPORT* lplpDirect3DViewport, DWORD dwFlags);
```

*ffofCfX,ÉŠÖ~A,µ,½frf... [f] [fg,ð—ñ<“,·,é B*  
*-Œ÷,·,ê,ÍD3D\_OK AŽ,”s,·,ê,Î AŽŸ,Ì'l,Ì,ç,,ê,©,ð•Ô,· B*

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

*lpDirect3DViewport*

*Direct3DDeviceIfufWfFfNfg,ÉŠÖ~A,µ,½frf... [f] [fg,ÌfŠfXfg,Ì'†,Ìfrf... [f] [fg,Ö,Ìf|fCf“f^ B*

*lplpDirect3DViewport*

*Direct3DDeviceIfufWfFfNfg,ÉŠÖ~A,µ,½frf... [f] [fg,ÌfŠfXfg,Ì'†,ÌŽŸ,Ìfrf... [f] [fg,Ö,Ìf|fCf“f^ B*

*dwFlags*

*frf... [f] [fg,ÌfŠfXfg,æ,èŽæ“¾,·,éfrf... [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 ÅŒä,Ì €-Ú,ðŽæ“¾ B*

**IDirect3DDevice::Pick**

```
HRESULT Pick(LPDIRECT3DEXECUTEBUFFER lpDirect3DExecuteBuffer,
            LPDIRECT3DVIEWPORT lpDirect3DViewport, DWORD dwFlags,
            LPD3DRECT lpRect);
```

```
fEf“f_fŠf“fO,đ s,i,ŽÀ sfobftf@,đŽÀ s,μ AlpRectpf%of [f^,ĂŽw'è,³,ê,½<éE`à,É, ,éfvfŠf~fefBfu,Ö,İfIftf
Zfbfg,İzfI [f_ [ EfŠfXfg,đ•Ö,• B
```

```
Direct3DExecuteBuffer fIfufWfFfNfg,³f fbfN,³,ê,Ă,¢,é,Æ,«,Í A,±,İCEĂ,Ñ o,μ,İŽ,”s,•,é B
-CE÷,•,ê,İD3D_OK AŽ,”s,•,ê,İ AŽŸ,İ'l,İ,¢,,ê,©,đ•Ö,• B
```

**D3DERR\_EXECUTE\_LOCKED**

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

```
lpDirect3DExecuteBuffer
Žæ“¾,³,ê,½,šfI [f_ [fŠfXfg,©,ç,İŽÀ sfobftf@,Ö,İf|fCf“f^ B
```

```
lpDirect3DViewport
Direct3DDevicefIfufWfFfNfg,É”z'u,³,ê,½f rf... [f| [fgfŠfXfg,İ't,İrf... [f| [fg,Ö,İf|fCf“f^ B
```

```
dwFlags
,±,İf f\fbfh,İ,½,ß,ÉE» Ý`è<³,ê,Ă,¢,éftf%oO,Í,È,¢ B
```

```
lpRect
Žæ,è o,³,ê,éfffofCfX À•W—İæ,đŽ!,•D3DRECT \`¢'İ,Ö,İf|fCf“f^ B
```

```
lpRectpf%of [f^,ĂŽw'è,³,ê,½ \`¢'İ,İx1,Æx2f f“fo,“™,μ, Ay1,Æy2f f“fo,“™,μ,¢
,Æ,« AfsfNfZf<,¾,Žæ,è o,³,ê,é B À•W,İfffofCfX EfsfNfZf<,ĂŽw'è,³,ê,é B
```

```
,•,×,Ă,İDirect3DExecuteBufferfIfufWfFfNfg,Í A,±
,İf f\fbfh,đ -CE÷,³,¹,é,½,ßDirect3DDevicefIfufWfFfNfg,ÉŠÖ~A•t, -,È, -,ê,İ,È,ç,È,¢ B
```

ŽQ Æ @**IDirect3DDevice::GetPickRecords**

### **IDirect3DDevice::SetMatrix**

```
HRESULT SetMatrix(D3DMATRIXHANDLE d3dMatHandle,  
LPD3DMATRIX lpD3DMatrix);
```

—  
f f\bfh,À i -,μ,½,à,ì,À,È,¯,ê,Î,È,ç,È,ç B **IDirect3DDevice::CreateMatrix**

—  
-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|Cf“f^ B

—  
ñ,Ìfnf“fhf<,ðŠÛ,þŽÀ sfobftf@“à,ð•İŠ·,·,é **IDirect3DDevice::SetMatrix**f f\bfh,ÍŽÀ sfobftf@,ðf fbN Af f  
bfN%øð œ,¹,·,È,±,Ì”z—ñ,ð•İ X,À,«,é B

ŽQ Æ @**IDirect3DDevice::CreateMatrix** A **IDirect3DDevice::GetMatrix** A **IDirect3DDevice::DeleteMatrix**

### IDirect3DDevice::SwapTextureHandles

```
HRESULT SwapTextureHandles(LPDIRECT3DTEXTURE lpD3DTexture1,  
    LPDIRECT3DTEXTURE lpD3DTexture2);
```

,Ó,½,Â,ÌfNfXf`ffnf`fhf<,ðŒðŠ·,·,é B

-Œ÷,·,ê,ÎD3D\_OK,ð•Ô,· B

lpD3DTexture1,·,æ,Ñ lpD3DTexture2

f f\fbfh,<sup>a</sup>-ß,Â,½,Æ,« AŒðŠ·,<sup>3</sup>ê,éefNfXf`ff,Ìfnf`fhf<,Ö,Ì|fCf`f^ B

,±

,Ìf f\fbfh,Í AÊ íAfvfŠfP [fVf±f`<sup>a</sup>fufWfFfNfg,Ì W ±'ì,ì†,Â,·,×,Ä,ÌfNfXf`ff,ð•ì X,·,é,Æ,«Žg,í,ê,é B

## **IDirect3DExecuteBuffer**

**IDirect3DExecuteBuffer** fCf“f^ [ftfFfCfX, ìf f\fbfh, ðŽg, □  
, Æ A Direct3DŽÀ sfobftf@, ìfZfbfgfAfbfv, â §Eä, ð s, □, ±, Æ, ª, Å, «, é B, ±, ì ß, Í A, ±  
, ìfCf“f^ [ftfFfCfX, ìf f\fbfh, É, Å, ç, Ä à-¾, ·, é BŠT—ª, É, Å, ç  
, Å, Í A u|Direct3DExecuteBufferfCf“f^ [ftfFfCfX v, ðŽQ Æ, ·, é, ±, Æ B

**IDirect3DExecuteBuffer** fCf“f^ [ftfFfCfX, ìf f\fbfh, Í AŽŸ, ìfOf< [fv, ©, ç, È, é B

ff [f^, ìŽÀ s **GetExecuteData**  
**SetExecuteData**

f fbfN, Æ%ð œ **Lock**  
**Unlock**

,», ì¼ **Initialize**  
**Optimize**  
**Validate**

**IDirect3DExecuteBuffer** fCf“f^ [ftfFfCfX, Í A, ·, ×, Ä, ì COM fCf“f^ [ftfFfCfX, Æ““, ¶, A Unknown  
fCf“f^ [ftfFfCfX Ef f\fbfh, ðEp ¾, ·, é B **Unknown** fCf“f^ [ftfFfCfX, ªTf| [fg, ·, éf f\fbfh, Í AŽŸ, ìÊ, è B

**AddRef**

**QueryInterface**

**Release**

**IDirect3DExecuteBuffer::GetExecuteData**

HRESULT GetExecuteData(LPD3DEXECUTEDATA lpData);

Direct3DExecuteBufferIfufWfFfNfg, ÌŽÀ sf [f^, Ì ó'Ô, ðŽæ“¾, ;, é BŽÀ sf [f^, Í ADirect3DExecuteBufferIfufWfFfNfg, ÌL q, ÉŽg—p, ³, ê, é B

-Ĉ÷, ., ê, ÎD3D\_OK AŽ,”s, ., ê, Í AŽŸ, Ì'l, Ì, ċ, , ê, ©, ð•Ô, · B

**D3DERR\_EXECUTE\_LOCKED**

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

lpData

Direct3DExecuteBufferIfufWfFfNfg, ÌĈ» Ý, ÌŽÀ sf [f^, Ì ó'Ô, ^ Ý'è, ³, ê, ½**D3DEXECUTEDATA** \‘ĉ'Ì, Ö, Ìf| fCf“f^ B

Direct3DExecuteBufferIfufWfFfNfg, ^f fbfN, ³, ê, Ä, ċ, é, Æ, «, Í A, ±, ÌĈÄ, 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 ¶ ÑŽŽ,É %Šú%»»,³,ê,é,½,ßDDERR\_ALREADYINITIALIZED,ð•Ô,· B

lpDirect3DDevice

Direct3D fIfufWfFfNfg,ðŽ',·fffofCfX,Ö,ìf|fCf“f^ B

lpDesc

¶ Ñ,³,ê,½Direct3DExecuteBufferfIfufWfFfNfg,ðL q,·,éD3DEXECUTEBUFFERDESC \“İ,Ö,ìf|  
fCf“f^ Bfobftf@,ìfTfCfY,ª“«è,È,¢,Æ,«,Í ACEÄ,Ñ o,µ,ÍŽ,”s,·,é B

**IDirect3DExecuteBuffer::Lock**

HRESULT Lock(LPD3DEXECUTEBUFFERDESC lpDesc);

ŽÀ sfobftf@,ÏRf}f“fh,Ö,Ïf|fCf“f^,ðŽæ“¾,·,é B  
-Æ÷,·,ê,ÎD3D\_OK AŽ,”s,·,ê,Î AŽŸ,Ï!l,Ï,ç,,ê,©,ð•Ö,· B

**D3DERR\_EXECUTE\_LOCKED**

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

**DDERR\_WASSTILLDRAWING**

lpDesc

**D3DEXECUTEBUFFERDESC** \‘ç‘ì,Ö,Ïf|

fCf“f^ Bf f\fbfh,•Ö,Á,½,Æ,«lpDataf f“fo,É,Í AfAvfšfP [fVf‡f“,•AfNfZfX,·,éŽž“\_,Ïff [f^,Ö,Ïf|

fCf“f^,• Ý’è,¾,é,é B,±,Ïff [f^,Í AfVfXfef€

,âfrffI Ef f,fš,É“¶ Ý,µ AdwCapsf f“fo,É,æ,èŽ!,¾,é,é BfAvfšfP [fVf‡f“,Í AIDirect3DExecuteBuffer::Lo

ckf f\fbfh,ðŽg,²,ÆDirect3D,•fVfXfef€,âfrffI Ef f,fššÖ,Á,Ïff [f^“]‘—,ð—v< ,Á,«,é B

Direct3DExecuteBufferIfufWfFfNfg,•f fbfN,¾,ê,Ä,ç,é,Æ A,±

,ÏEÄ,Ñ o,µ,ÏŽ,”s,·,é B,½,Æ,!,Î A“¼,ÏfXf(Éfbfh,•fobftf@,ðfAfNfZfX’t,¾,Á,½,è A,±,Ïfobftf@,É”-

¶,µ,½**IDirect3DDevice::Execute**f f\fbfh,•Ü,¾š@—¹,µ,Ä,ç,È,ç,Æ,«,É<N,±,é B

ŽQ Æ @**IDirect3DExecuteBuffer::Unlock**

### **IDirect3DExecuteBuffer::Optimize**

HRESULT Optimize();

Ⓔ» ÝfTf| [fg,µ,Ä,ç,È,ç 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, é, é B

-Ĉ÷, ., ê, ĨD3D\_OK AŽ,"s, ., ê, Ĩ AŽŸ, Ĩ'l, Ĩ, Ĉ, ., ê, ©, đ•Ô, . B

**D3DERR\_EXECUTE\_LOCKED**

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

*lpData*

ŽÀ sfobftf@, ĨfĈfCfAfEfg, đŽ', **D3DEXECUTEDATA** \Ĉ'Ĩ, Ö, Ĩf|fCf" f^ B

Direct3DExecuteBufferIfufWfFfNfg, af fbfn, 3, é, Ä, Ĉ, é, Ĉ, «, Í A, ±, ĨĈÄ, Ñ o, μ, ĨŽ,"s, ., é B

ŽQ Æ @**IDirect3DExecuteBuffer::GetExecuteData**

**IDirect3DExecuteBuffer::Unlock**

HRESULT Unlock();

ŽÀ sfofbftf@,ÌfRf}f“fh,Ö,Ïf|fCf“f^,ð%øð•ú,·,é B,½,¾,µ,±,Ïf|  
fCf“f^,Í Afofbftf@,ð**IDirect3DDevice::Execute**f f\fbfh,Áf fbfN,µ,½,à,Ì,À,È,¯,ê,Î,È,ç,È,ç B

-œ÷,·,ê,ÎD3D\_OK AŽ,”s,·,ê,Î AŽŸ,Ì'l,Ì,ç,,ê,©,ð•Ô,· B

**D3DERR\_EXECUTE\_NOT\_LOCKED**

**DDERR\_INVALIDOBJECT**

ŽQ Æ **@IDirect3DExecuteBuffer::Lock**

**IDirect3DExecuteBuffer::Validate**

```
HRESULT Validate(LPDWORD lpdwOffset, LPD3DVALIDATECALLBACK lpFunc,  
                LPVOID lpUserArg, DWORD dwReserved);
```

«» Ý AŽÄ•,³,ê,Ä,¢,È,¢ B

## **IDirect3DLight**

**IDirect3DLight** fCf“f^ [ftFfCfX,lf f\fbfh,đŽg,±,Æ ACEõCE¹ î•ñ,ìŽæ“¾,â Ý’è,đ s,±,±,Æ,ª,Á,«,é B,± ,ì ß,Á,Í AIDirect3DlightfCf“f^ [ftFfCfX,lf f\fbfh,É,Á,¢,Ä à¾,·,é BŠT—ª,É,Á,¢ ,Á,Í A uIDirect3DLightfCf“f^ [ftFfCfX v,đŽQ Æ,·,é,±,Æ B

**IDirect3DLight** fCf“f^ [ftFfCfX,lf f\fbfh,Í AŽŸ,ìfOf< [fv,©,ç,È,é B

Žæ“¾,Æ Ý’è

**GetLight**

**SetLight**

‰Šú‰»

**Initialize**

**IDirect3DLight** fCf“f^ [ftFfCfX,Í A,·,×,Ä,ì COM fCf“f^ [ftFfCfX,ì,æ,±,É A **IUnknown** fCf“f^ [ftFfCfX Ef f\fbfh,đEp ³,·,é B **IUnknown** fCf“f^ [ftFfCfX,ªTf| [fg,·,éf f\fbfh,Í AŽŸ,ìÊ,è B

**AddRef**

**QueryInterface**

**Release**

**IDirect3DLight::GetLight**

HRESULT GetLight(LPD3DLIGHT lpLight);

Direct3DLightIfufWfFfNfg, ÌÈðÈ¹ î·ñ, ðŽæ“¾, ·, é B

-È÷, ·, ê, ÌD3D\_OK AŽ, ”s, ·, ê, Î AŽŸ, Ì¹, Ì, ·, ê, ©, ð·Ö, · B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

*lpLight*

È» Ý, ÌÈðÈ¹ff [f^, ^ Ý'è, ³, ê, ½**D3DLIGHT** \c¹, Ö, Ìf|fCf“f^ B

ŽQ Æ @**IDirect3DLight::SetLight**

### **IDirect3DLight::Initialize**

```
HRESULT Initialize(LPDIRECT3D lpDirect3D);
```

```
, ±, ìf f\fbfh, í ACOMfvf fgRf<, ìêšÑ «, ð•Û, Â, ½, ß, ì, à, ì, Â, , é B
```

```
Direct3DLightfIfufWfFfNfg, ð ¶ -Žž, É %oŠú%», ., é, ½, ß ADDERR_ALREADYINITIALIZED, °Ö, é B
```

```
lpDirect3D
```

```
Direct3DfIfufWfFfNfg, ðŽ, ì, ·Direct3D \‘ç‘ì, Ö, ìf|fCf“f^ B
```

## **IDirect3DLight::SetLight**

HRESULT SetLight(LPD3DLIGHT lpLight);

Direct3DLightIfufWfFfNfg, ÌÈðÈ¹ î·ñ, ð Ý'è, ·, é B

-È÷, ·, ê, ÌD3D\_OK AŽ, ”s, ·, ê, Î AŽÝ, Ì¹, Ì, ç, ·, ê, ©, ð·Ö, · B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

*lpLight*

È» Ý, ÌÈðÈ¹ff [f^, ð Ý'è, ·, é, ½, ß, ÉŽg—p, ³, ê, éD3DLIGHT \‘ç‘Ì, Ö, Ìf|fCf“f^ B

ŽQ Æ @**IDirect3DLight::GetLight**

## **IDirect3DMaterial**

**IDirect3DMaterial** fCf“f^ [ftFfCfX Ef f\fbfh,ðŽg,²,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^ [ftFfCfX,É,Á,¢,Ä à¾,·,é BŠT—ª,É,Á,¢,Ä,Í A uIDirect3DMaterialfCf“f^ [ftFfCfX v,ðŽQ Æ,·,é,±,Æ B

**IDirect3DMaterial** fCf“f^ [ftFfCfX,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^ [ftFfCfX,Í A,·,×,Ä,ì COM fCf“f^ [ftFfCfX,ì,æ,²,É A IUnknown  
fCf“f^ [ftFfCfX Ef f\fbfh,ðEp ³,·,é B **IUnknown** fCf“f^ [ftFfCfX,ªTf| [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,ÌDirect3D  
APIEÄ,Ñ o,µ,Å Af}fefŠfAf<,İŽQ Æ,İ,½,B,ÉŽg—p,³,é,é Bf}fefŠfAf<,Í A1“x,É,Đ,Æ,Ä,İffofCfX,ÅŽg—  
p,Ä,«,é B

ffofCfX,“jŠü,³,é,½,Æ,« Af}fefŠfAf<,İffofCfX,©,ç Ø,è—E,³,é,é B

—E÷,·,é,İD3D\_OK,đ•Ö,µ A,»,İ¼,İ,Æ,«,Í **ADDERR\_INVALIDOBJECT**•Ö,· B

*lpDirect3DDevice*

Žg—p,³,é,Ä,ç,é}fefŠfAf<,ÌDirect3DDevicefIfufWfFfNfg,Ö,İf|fCf“f^ B

*lpHandle*

Direct3DMaterialIfufWfFfNfg,É‘İ%ž,·,é}fefŠfAf<,lfnf“fhf<,ª Ý’è,³,é,é•İ ”,Ö,İf|fCf“f^ B

**IDirect3DMaterial::GetMaterial**

HRESULT GetMaterial(LPD3DMATERIAL lpMat);

Direct3DMaterialIfuWfFfNfg,lf}fefŠfAf< Efl [f^,đŽæ“¾,·,é B  
-E÷,·,ê,ÎD3D\_OK AŽ,”s,·,ê,Î AŽŸ,Ì'l,Ì,ç,,ê,©,đ•Ô,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

lpMat

E» Ÿ,lf}fefŠfAf<,l“Á «,^ Ÿ'è,³,ê,éD3DMATERIAL \‘ç'ì,Ö,Ìf|fCf“f^ B

ŽQ Æ @**IDirect3DMaterial::SetMaterial**

**IDirect3DMaterial::Initialize**

HRESULT Initialize(LPDIRECT3D lpDirect3D);

, ±, ìf f\fbfh, í ACOMfvf fgRf<, ìêšÑ «, ð•Û, Â, ½, ß, ì, à, ì, Â, , é B

Direct3DMaterialfIfufWfFfNfg, ð ¶ -Žž, É %šú%», ., é, ½, ß ADDERR\_ALREADYINITIALIZED, \*•Ô, é B

lpDirect3D

Direct3DfIfufWfFfNfg, ðž, ì, .Direct3D \‘ç‘ì, Ò, ìf|fCf“f^ B

**IDirect3DMaterial::Reserve**

HRESULT Reserve ();

«» Ý AŽĀ•,³,ê,Ā,¢,È,¢ B

**IDirect3DMaterial::SetMaterial**

HRESULT SetMaterial(LPD3DMATERIAL lpMat);

Direct3DMaterialIfuWfFfNfg,lf}fefŠfAf< Eff [f^,đ Ý'è,.,é B  
-Æ÷,.,ê,ÎD3D\_OK AŽ,„s,.,ê,Î AŽŸ,Ì'l,Ì,ç,,ê,©,đ•Ô,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

lpMat

f}fefŠfAf<Á «,ª Ý'è,³,ê,éD3DMATERIAL \‘ç‘ì,Ö,Ìf|fCf“f^ B

ŽQ Æ @**IDirect3DMaterial::GetMaterial**

**IDirect3DMaterial::Unreserve**

HRESULT Unreserve();

«» Ý AŽÄ•,³,ê,Ä,ç,È,ç B

**IDirect3DTexture**

**IDirect3DTexture** fCf“f^ [ftFfCfX,lf f\fbfh,đŽg,ϖ,Æ AfefNfXf`ff,ÌŽæ“¾,â“Á «,Ì Ý’è,đ s,ϖ,±,Æ,a,Á,«,é B,± ,Ì ß,Á,Í AIDirect3DtexturefCf“f^ [ftFfCfX,lf f\fbfh,É,Á,¢,Ä à¾,.,é BŠT—ª,É,Á,¢ ,Ä,Í A u|Direct3DTexturefCf“f^ [ftFfCfX v,đŽQ Æ,.,é,±,Æ B

**IDirect3DTexture** fCf“f^ [ftFfCfX,lf f\fbfh,Í AŽŸ,ÌfOf< [fv,©,ç,È,é B

f n f“ f h f< **GetHandle**

%oŠú%o» **Initialize**

f [fh **Load**  
**Unload**

f p f Æ f b f g î ñ **PaletteChanged**

**IDirect3DTexture** fCf“f^ [ftFfCfX,Í A,.,×,Ä,Ì COM fCf“f^ [ftFfCfX,Ì,æ,ϖ,É A Unknown fCf“f^ [ftFfCfX Ef f\fbfh,đEp ³,.,é B **Unknown** fCf“f^ [ftFfCfX,²fTf| [fg,.,éf f\fbfh,Í AŽŸ,Ì’È,è B

**AddRef**

**QueryInterface**

**Release**

Direct3DTextureIfufWfFfNfg,đŽæ“¾,.,é,É,Í AfefNfXf`fff}  
fbfv,Æ,µ,Ä ¶ ¬,³,ê,½DirectDrawSurfaceIfufWfFfNfg,©,ç|**IDirect3D::QueryInterface** f\fbfh,đEÄ,Ñ o,· B

## **IDirect3DTexture::GetHandle**

```
HRESULT GetHandle(LPDIRECT3DDEVICE lpDirect3DDevice,  
    LPD3DTEXTUREHANDLE lpHandle);
```

Direct3DTextureIfufWfFfNfg, ðefNfXf`ff, ðnf`fhf<, ðŽæ“¾, ·, é B, ±, ðnf`fhf<, Í A, ·, ×, Ä, ðDirect3D  
APIEÄ, Ñ o, µ, Å AfefNfXf`ff, ðŽQ Æ, ÉŽg—p, ¾, é, é B

–œ÷, ·, ê, ðD3D\_OK AŽ, ”s, ·, ê, Í AŽŸ, ð’l, ð, ·, ê, ©, ð•Ô, · B

### **D3DERR\_BADOBJECT**

### **DDERR\_INVALIDPARAMS**

*lpDirect3DDevice*

*f* [fh, ¾, ê, Ä, œ, éfefNfXf`ff, ðDirect3DDeviceIfufWfFfNfg, Ö, ðf|fCf“f^ B

*lpHandle*

Direct3DTextureIfufWfFfNfg, É‘Î%ž, ·, éfefNfXf`ff, ðnf`fhf<, a Ý’è, ¾, ê, é•Í ”, Ö, ðf|fCf“f^ B

### **IDirect3DTexture::Initialize**

```
HRESULT Initialize(LPDIRECT3DDEVICE lpD3DDevice,  
    LPDIRECTDRAW SURFACE lpDDSsurface);
```

, ±, ìf f\fbfh, í ACOMfvf fgRf<, ÌêŠÑ «, ð•Û, Â, ½, ß, ì, à, Ì, Â, , é B

Direct3DTexturefIfufWfFfNfg, ð ¶ -Žž, É %oŠú%o», , é, ½, ß ADDERR\_ALREADYINITIALIZED, \*Ô, é B

*lpDirect3D*

Direct3DfIfufWfFfNfg, ðŽ!, ·Direct3D \‘¢Ì, Ö, Ìf|fCf“f^ B

*lpDDSsurface*

, ±, ÌfIfufWfFfNfg ã, ÌDirectDraw, Ö, Ìf|fCf“f^ B

## **IDirect3DTexture::Load**

HRESULT Load(LPDIRECT3DTEXTURE lpD3DTexture);

DDSCAPS\_ALLOCONLOAD ftf%fo,É,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,ç B

-Æ÷,·,ê,Î AD3D\_OK,ð•Ô,µ A,»,ì¼,Ì,Æ,«,ÍfGf%o [,Ä, ,é B•Ô'l,É,Ä,ç,Ä,Í A uDirect3D  
¼ Ūf, [fh,ì•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 [ftFFX ã,ÏpfŒfbfg,ªİ X,³,ê,½,±,Æ,ðfhf%ofCfo,É'Ê'm,·,é B

-Œ÷,·,ê,Î AD3D\_OK,ð•Ô,µ A,»,"¼,Ï,Æ,«,"ÍGf% [,Á, ,é B•Ô'l,É,Â,ç,Ä,Í A uDirect3D  
¼ Ūf, [fh,Ï•Ô'l v,ðŽQ Æ,·,é,±,Æ B

dwStart

•İ X,³,ê,½ æª,ÏpfŒfbfg,ÏCf“ffbfNfX B

dwCount

•İ X,³,ê,½fpfŒfbfg,ÏŒÂ ” B

,±,Ïf f\fbfh,Í AfAfvfŠfP [fVf‡f“,ªfrfflIfNfŠfbfv,Ï Ä ¶,âpfŒfbfg,Ï•İ X,ð—v< ,·,é,Ï,É“Á,É•Ö—,Á, ,é B

## **IDirect3DTexture::Unload**

HRESULT Unload();

«» Ý, ìf efNfXf`ff, ðfAf“f [fh, ·, é B

-E÷, ·, 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, Ì•Ô'l v, ðŽQ Æ, ·, é, ±, Æ B

ŽQ Æ @IDirect3DTexture::Load

## IDirect3DViewport

**IDirect3DViewport** fCf“f^ [ftFfCfX,lf f\fbfh,đŽg,□,Æ Afrf... [f] [fg,ÌŽæ“¾,âfvf fpfefB,Ì Ý’è,đ s,□,± ,E,ª,Á,«,é B,±,Ì ß,Á,Í A IDirect3DViewport fCf“f^ [ftFfCfX,lf f\fbfh,É,Á,¢,Ä à-¾,·,é BŠT—ª,É,Á,¢ ,Á,Í A u IDirect3DViewport fCf“f^ [ftFfCfX v,đŽQ Æ,·,é,±,Æ B

**IDirect3DViewport** fCf“f^ [ftFfCfX,lf f\fbfh,Í AŽŸ,ÌfOf< [fv,©,ç,È,é B

”wEi **GetBackground**  
**GetBackgroundDepth**  
**SetBackground**  
**SetBackgroundDepth**

%Šú%» **Initialize**

ŒôŒ¹ **AddLight**  
**DeleteLight**  
**LightElements**  
**NextLight**

f} **Clear**  
fefŠfAf<,Æfrf...  
[f] [fg  
**GetViewport**  
**SetViewport**

•İŠ• **TransformVertices**

**IDirect3DViewport** fCf“f^ [ftFfCfX,Í A,·,×,Ä,Ì COM fCf“f^ [ftFfCfX,Ì,æ,□,É A Unknown  
fCf“f^ [ftFfCfX Ef f\fbfh,đŒp ³,·,é B **IUnknown** fCf“f^ [ftFfCfX,ªTf| [fg,·,éf f\fbfh,Í AŽŸ,Ì’È,è B

**AddRef**  
**QueryInterface**  
**Release**

**IDirect3DViewport::AddLight**

HRESULT AddLight(LPDIRECT3DLIGHT lpDirect3DLight);

*lpDirect3DLight* [in] A pointer to a *Direct3DLight* structure that describes the light to be added to the viewport.

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

*lpDirect3DLight*

A pointer to a *Direct3DLight* structure that describes the light to be added to the viewport.

**IDirect3DViewport::Clear**

HRESULT Clear(DWORD dwCount, LPD3DRECT lpRects, DWORD dwFlags);

» Ý,ì”wEif}fefŠfAf<,ìfrrf... [f] [fg,âfrrf... [f] [fg ã,ì<éE”ÍÍ,ð Á<Ž,.,é B  
-E÷,.,ê,ÎD3D\_OK AŽ,”s,.,ê,Î AŽŸ,Ì’l,Ì,ç,,ê,©,ð•Ô,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

*dwCount*

lpRectsfpf%of [f^,ÉŽw’è,³,ê,é<éE`ì ” B

*lpRects*

**D3DRECT** \‘ç’ì,ì”z—ñ,Ö,ì|fCf“f^ B

*dwFlags*

Á<Ž,ì’Î Û,ðŽ!,.ftf%ofo BfE f“f\_Šf“fo’Î Û AZf ofbftf@,Û,½,Í,»,Ì—¼•û B

**D3DCLEAR\_TARGET** ”wEif}fefŠfAf<( Ý’è,³,ê,Ä,ç,é,Æ,«)  
,ìfE f“f\_Šf“fo’Î Û B

**D3DCLEAR\_ZBUFFER** Zf ofbftf@,© A,»,±,É Ý’è,³,ê,Ä,ç  
,éE» Ý,ì”wEi [“x( Ý’è,³,ê,Ä,ç,é,Æ,«) B

**IDirect3DViewport::DeleteLight**

HRESULT DeleteLight(LPDIRECT3DLIGHT lpDirect3DLight);

fr... [f] [fg,ÉŠÖ^A,μ,½Direct3DLightIfufWfFfNfg,ÌfŠfXfg,©,ç AŽw'è,³,ê,½EöE¹,đ í œ,·,é B  
-E÷,·,ê,ÎD3D\_OK AŽ,„s,·,ê,Î AŽŸ,Ì¹,Ì,ç,,ê,©,đ•Ô,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

*lpDirect3DLight*

Direct3DDeviceIfufWfFfNfg,©,ç Ø,è—£,· ADirect3DLightIfufWfFfNfg,Ö,Ìf|fCf“f^ B

**IDirect3DViewport::GetBackground**

HRESULT GetBackground(LPD3DMATERIALHANDLE lphMat, LPBOOL lpValid);

frf... [f] [fg,ÉŠÖ~A,μ,½€» Ý,Ì”w€i,©,çf}fefŠfAf<,Ìfnf“fhf<,ðŽæ“¾,·,é B  
-€÷,·,ê,ÎD3D\_OK AŽ,”s,·,ê,Î AŽŸ,Ì!l,Ì,ç,,ê,©,ð•Ö,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

*lphMat*

”w€i,Æ,μ,ÄŽg—p,³,ê,Ä,ç,éf}fefŠfAf<,Ìfnf“fhf<,Ö,Ìf|fCf“f^ B

*lpValid*

”w€i,ªfrf... [f] [fg,ÉŠÖ~A,μ,Ä,ç,é,±,Æ,ðŽ!,·,½,ß,É Ý’è,³,ê,é•Ī ”,Ö,Ìf|fCf“f^ B,±  
,Ìfpf%of [f^,ªFALSE,Ì,Æ,« Afrf... [f] [fg,ÉŠÖ~A,·,é”w€i,Í,È,ç 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“¼,·,é B  
-Œ÷,·,ê,ÎD3D\_OK AŽ,”s,·,ê,Î AŽŸ,Ì’l,Ì,ç,,ê,©,ð·Ô,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

lpDDSsurface

”wŒi [“x,ð·\,·DirectDrawSurfacefIfufWfFfNfg,Ö,Ìf|fCf“f^,Ö,Ìf|fCf“f^ B

lpValid

frf... [f] [fg,ÉŠÖ~A·t,¯,ç,ê,½”wŒi [“x,ª,È,ç,Æ,«FALSE,ª Ý’è,³,ê,é·İ ”,Ö,Ìf|fCf“f^ B

ŽQ Æ @IDirect3DViewport::SetBackgroundDepth

### **IDirect3DViewport::GetViewport**

HRESULT GetViewport(LPD3DVIEWPORT lpData);

frf... [f] [fg,lf... [f] [fg EfWfXf^,đŽæ“¾,·,é B  
-Æ÷,·,ê,ÎD3D\_OK AŽ,”s,·,ê,Î AŽŸ,Ìl,Ì,ç,,ê,©,đ•Ô,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

lpData

frf... [f] [fg,đŽæ“¾,·,éD3DVIEWPORT \‘ç‘İ,Ö,lf|fCf“f^ B

ŽQ Æ @**IDirect3DViewport::SetViewport**

### **IDirect3DViewport::Initialize**

```
HRESULT Initialize(LPDIRECT3D lpDirect3D);
```

```
, ±, ìf f\fbfh, í ACOMfvf fgRf<, ìêšÑ «, ð•Û, Â, ½, ß, ì, à, ì, Â, , é B
```

```
Direct3DViewportfIfufWfFfNfg, ð ¶ -žž, É %oŠú%o», ·, é, ½, ß ADDERR ALREADYINITIALIZED, ¢•Ô, é B
```

```
lpDirect3D
```

```
Direct3DfIfufWfFfNfg, ðž, ·Direct3D \`¢`ì, Ö, ìf|fCf“f^ B
```

### **IDirect3DViewport::LightElements**

```
HRESULT LightElements(DWORD dwElementCount, LPD3DLIGHTDATA lpData);
```

«» Ý AŽÄ‘,³,ê,Ä,ç,È,ç B

**IDirect3DViewport::NextLight**

HRESULT NextLight(LPDIRECT3DLIGHT lpDirect3DLight,  
LPDIRECT3DLIGHT\* lplpDirect3DLight, DWORD dwFlags);

fff... [f] [fg,ÉŠÖ~A,µ,½Direct3DLightIfufWfFfNfg,ð—ñ<“,;é B  
-Œ÷,.,ê,ÎD3D\_OK AŽ,”s,.,ê,Î AŽŸ,Ì¹,Ì,ç,,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,ðŠÛ,ðf|fCf“f^,Ö,Ìf|fCf“f^ B—  
v< ,³,ê,éŒðŒ¹,Î AdwFlagspf%of [f^,ĂŽw’è,³,ê,é B

*dwFlags*

ŒðŒ¹fŠfXfg,©,çŽæ“¾,.,éŒðŒ¹,ðŽw’è,.,éftf%ofO BfftfHf<fg,Æ,µ,Ă 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 ĂĚã,Ì €-Ú B

**IDirect3DViewport::SetBackground**

HRESULT SetBackground(D3DMATERIALHANDLE hMat);

frf... [f] [fg,ÉŠÖ^A,μ,½”wŒi,đ Ý’è,·,é B

-Œ÷,·,ê,ÎD3D\_OK AŽ,”s,·,ê,Î AŽŸ,Ì’l,Ì,ç,,ê,©,đ•Ô,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

*hMat*

”wŒi,Æ,μ,ĂŽg—p,³,ê,éf}fefŠfAf<,̀̀fnf“fhf< B

ŽQ Æ @**IDirect3DViewport::GetBackground**

### **IDirect3DViewport::SetBackgroundDepth**

HRESULT SetBackgroundDepth (LPDIRECTDRAWSURFACE lpDDSurface);

frf... [f] [fg,î”wEi [“x,đ Ý’è,,:é B

-E÷,,:ê,ÎD3D\_OK AŽ,”s,,:ê,Î AŽŸ,Ï’l,Ï,ç,,ê,©,đ•Ô,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

lpDDSurface

”wEi [“x,đ•\,·DirectDrawSurfacefIfufWfFfNfg,Ö,Ïf|fCf“f^ B

**IDirect3DViewport::Clear** f\fbfh,“EÄ,Î,ê AD3DCLEAR\_ZBUFFERftf%fo,“Žw’è,³,ê,Ä,ç  
,é,Æ,« AŽw’è,³,ê,½ [“x,“Zfobftf@,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);

frf... [f] [fg,lfrrf... [f] [fg EfEfWfXf^,đ Ý'è,·,é B  
-E÷,·,ê,ÎD3D\_OK AŽ,„s,·,ê,Î AŽŸ,Ï'l,Ï,ç,,ê,©,đ•Ô,· B

**DDERR\_INVALIDOBJECT**

**DDERR\_INVALIDPARAMS**

lpData

V<Kfrf... [f] [fg,đŽ,·**D3DVIEWPORT** \‘ç'Ï,Ö,Ïf|fCf“f^ B

ŽQ Æ @**IDirect3DViewport::GetViewport**

**IDirect3DViewport::TransformVertices**

```
HRESULT TransformVertices(DWORD dwVertexCount,
    LPD3DTRANSFORMDATA lpData, DWORD dwFlags, LPDWORD lpOffscreen);
```

•iš· s—ñ,É,æ,è',“\_fZfbfg,ð•iš·,·,é B  
-Œ÷,·,ê,İD3D\_OK AŽ,”s,·,ê,İ AŽÿ,İ'l,İ,ç,,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, BD3DTRANSFORMDATA \c'İ,Ö,İf|fCf“f^ B
```

```
dwFlags  
^È%°,İftf%ofo,İ“à,Đ,Æ,Â B,±,ê,ç,İftf%ofo,İŽg,ç•ü,É,Â,ç,Ä,Í ACEã q,İ à-¾,ðŽQ Æ,·,é,±,Æ B
```

**D3DTRANSFORM\_CLIPPED**  
**D3DTRANSFORM\_UNCLIPPED**

```
lpOffscreen  
•İŠ·Œã A',“_ ,afXfNfŠ [f“ŠO,İ,Æ,« A0ÈŠO,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',“_ ,Ž< “ã,İ'†,É, ,ê,İ A',“_ ,İ•İŠ·,É  
Œ» Ý,İ•İŠ· s—  
ñ,ðŽg,ª B',“_ ,afNfŠfbfsf“fo,³,ê,é,Æ,«,Í Ait,İ'†,İD3DLVERTEX \c'İ,É'İ%ž,·,é”ª,ª“ü,é B,»,İ'¼,İ,Æ,«,Í AfXfNf  
Š [f“ À•W,ª Ý'è,³,ê,é B•İŠ·,³,ê,½' À•W,İfNfŠfbfsf“foŒð“_ ,İ Ait,É•Ô,é B,à,µit,ª0ÈŠO,İ,Æ,«,Í A',“_ ,afXfNfŠ  
[f“ŠO,Äfrf... [f|  
[fg,É,©,ç,È,ç BD3DTRANSFORMDATA \c'İ,İdrExtentf f“fo,à A•İŠ·Œã,İ',“_ ,İ2D<éŒ”ÍÍ,É Ý'è,³,ê,é B
```

```
itfpf%of [f^,ªD3DTRANSFORM_UNCLIPPED,İ,Æ,« A,±,İf f\fbfh,İ',“_ ,İ•İŠ·,ÉŒ» Ý,İ•İŠ· s—ñ,ðŽg,ª B,±  
,İ ê ‡ AfVfXfef€,İŽ< “ã,İ'†,É•İŠ·Œã,İ À•W,ª ,é,Æ%¼'è,·,é  
BD3DTRANSFORMDATA \c'İ,İdrExtentf f“fo•İŠ·Œã,İ À•W,İkéŒ”ÍÍ,É Ý'è,³,ê,é B
```

```
D3DTRANSFORMDATA \c'İ,İdwClipf f“fo,Í A•İŠ·f,fWf... [f<,ªfrf... [ ,İ'ã,«,³,ð l—¶,µfNfŠfbfsf“fo,ªK—  
v,©,ç,ª,©Œ”è,·,é,±,Æ,ð •,¯,é B•İŠ·‘O,É “x,Èf\ftgfEfFA,Ä A<éŒ,ã<... ,İ”ÍÍ,ªfrf... [ ,İ'ã,«,³,Ä \ª,Ä, ,é,©%½“  
x,àefXfg,·,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
```



## D3DBRANCH

```
typedef struct _D3DBRANCH {
    DWORD dwMask;
    DWORD dwValue;
    BOOL bNegate;
    DWORD dwOffset;
} D3DBRANCH, *LPD3DBRANCH;
```

ŽÀ sfobftf@,l'†,É, ,é ðE •t,«,l-½-ß,ðŽÀ s,.,é B,±,ì \‘c‘ì,Í A•Šò \‘c‘ì,Á, ,é B

### dwMask

•Šò,ì,½,ß,ìf rfbfgf}fXfN B,±,ìf}fXfN,Í A~— Ì-½-ß,É,æ,èfhf%ofCfo ó‘Ôf}  
fXfN,ÆE< ‡,Á,«,é BE<%oÊ,ªdwValuef f“fo,ÁŽw’è,³,ê,½’l,É“™,µ,-  
AbNegatef f“fo,“FALSE,ì ê ‡ A•Šò,.,é B

Žg—p%oÁ”\,Èèfhf%ofCfo ó‘Ôf}fXfN,ìfŠfXfg,Í AD3DSTATUS \‘c‘ì,ìdwStatus f f“fo,ðŽQ Æ,.,é,±,Æ B

### dwValue

dwMaskf f“fo,ÁŽ,³,ê,½-½-ß,Æ”äŠr,.,éAfvfŠfP [fVf‡f“è<,l’l B

### bNegate

TRUE,Á A”äŠrE<%oÊ,ì”½“] B

### dwOffset

•Šò æ,Ö,ìfIfzfZfbfg B I—l,ì,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** \c'î,ĂŽg,afJf%o [l,ð'è',,é B

**dvR, dvG, dvB, dvA**

F,î—v'f,Ă, ,é Ô A—î A Â AfAf<ftf@,ðŽw'è',,é**D3DVALUE**Ĉ^,îl 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,ÏffofCfX,É,Â,Ç,Ä,Ï ðñ,ª Ý'è,³,ê,é B,±  
,Ï \ç'Ï,Ï AIDirect3DDevice::GetCaps™,Ïf f\fbfh,Å«» Ý,ÏffofCfX,ð-â,ç ±,í,¹,é,½,B,ÉŽg,í,ê,é B

### dwSize

,±,Ï \ç'Ï,Ïf ofCf g'P'Ê,Ïf TfCfY B

### dwFlags

,±,Ï \ç'Ï,Ï—LÇØ,Èff [f^,ª Ý'è,³,ê,Ä,Ç,é f“fo,ðŽ-•Ê,·,éftf%oO B

D3DDD\_BCLIPPING

**bClipping** f“fo,ª—LÇØ B

D3DDD\_COLORMODEL

**dcmColorModel** f“fo,ª—LÇØ B

D3DDD\_DEVCAPS

**dwDevCaps** f“fo,ª—LÇØ B

D3DDD\_LIGHTINGCAPS

**dlcLightingCaps** f“fo,ª—LÇØ B

D3DDD\_LINECAPS

**dpcLineCaps** f“fo,ª—LÇØ B

D3DDD\_MAXBUFFERSIZE

**dwMaxBufferSize** f“fo,ª—LÇØ B

D3DDD\_MAXVERTEXCOUNT

**dwMaxVertexCount** f“fo,ª—LÇØ B

D3DDD\_TRANSFORMCAPS

**dtcTransformCaps** f“fo,ª—LÇØ B

D3DDD\_TRICAPS

**dpcTriCaps** f“fo,ª—LÇØ B

### dcmColorModel

ffofCfX,ÏfJf% [ Ef,ffç,ðŽw'è,µ,Ä,Ç,é D3DCOLORMODEL—ñç“Ç^f f“fo,Ï,Ð,Æ,Ä B

### dwDevCaps

ffofCfX,Ï”\—Ï,ðŽ-•Ê,·,éftf%oO B

D3DDEVCAPS\_EXECUTESYSTEMMEM

ORY

fVxfef€ Ef f,fŠ,ðŽÀ sfobftf@,ÉŽg—p%oÄ”\ B

D3DDEVCAPS\_EXECUTEVIDEOMEMORY

frffI Ef f,fŠ,ðŽÀ sfobftf@,ÉŽg—p%oÄ”\ B

D3DDEVCAPS\_FLOATTLVERTEX

·İŠ·Ĉĕã,İ'“\_ff [f^,đ•,“@ - ”“\_·ĂŽæ“¾ B

**3DDEVCAPS\_SORTDECREASINGZ**

[“x,İĈĕ, ·ûĈĕü,Éf\ [fg,³,ê,½ff [f^,³·K—v B

**D3DDEVCAPS\_SORTEXACT**

,-š,Éf\ [fg,³,ê,½ff [f^,³·K—v B

**D3DDEVCAPS\_SORTINCREASINGZ**

Z' %oÁ·ûĈĕü,Éf\ [fg,³,ê,½ff [f^,³·K—v B

**D3DDEVCAPS\_TEXTURESYSTEMMEMORY**

fVfXfefĕ Ef f,fŠ,©,çfefNfXf`ff,đŽæ“¾%oÁ”\ B

**D3DDEVCAPS\_TEXTUREVIDEOMEMORY**

fffofCfXf f,fŠ,©,çfefNfXf`ff,đŽæ“¾%oÁ”\ B

**D3DDEVCAPS\_TLVERTEXSYSTEMMEMORY**

'“\_·đ·İŠ·,µ,½,è-¾,é,,·,é,½,ß AfVfXfefĕ Ef f,fŠ,đfofbftf@,ÉŽg—p%oÁ”\ B

**D3DDEVCAPS\_TLVERTEXVIDEOMEMORY**

'“\_·đ·İŠ·,µ,½,è-¾,é,,·,é,½,ß AfrfffI Ef f,fŠ,đfofbftf@,ÉŽg—p%oÁ”\ B

**d3dTransformCaps**

fffofCfX,İ·İŠ·”—İ,đŽw'è,·,éD3DTRANSFORMCAPS \‘ĉ'İ,İf f“fo,İ,Đ,Æ,Ā B

**d3dClipping**

fffofCfX,³DfNfŠfbsf“fo,đŽÀ s%oÁ”\,Ā, ,ê,İ ATRUE,Æ,È,é B

**d3dLightingCaps**

fffofCfX,İĈĕĕĕ”—İ,đŽw'è,·,éD3DLIGHTINGCAPS \‘ĉ'İ,İf f“fo,İ,Đ,Æ,Ā B

**d3dpcLineCaps=d3dpcTriCaps**

ü,ãŽOŠpĈĕ,đ·%oæ,·,é,½,ß AfffofCfX,İfTf| [fg î·ñ,đ'èĉ',·,éD3DPRIMCAPS \‘ĉ'İ B

**d3dDeviceRenderBitDepth**

fffofCfX,İfĈĕf“f\_Šf“fo Efrfbfg [“x BŽŸ,İDirectDrawfrfbfg [“x'è ”DDBD\_8 ADDBD\_16 ADDBD\_24 ADDBD\_32,İ“à,Đ,Æ,ĀĒ ã,đ Ý'è,Ā,«,é B

**d3dDeviceZBufferBitDepth**

fffofCfX,İZfofbftf@,İfRfbfg [“x BŽŸ,İDirectDrawfrfbfg [“x'è ”DDBD\_8 ADDBD\_16 ADDBD\_24 ADDBD\_32,İ“à,Đ,Æ,ĀĒ ã,đ Ý'è,Ā,«,é B

**d3dMaxBufferSize**

,±,İffffofCfX,İŽÀ sfofbftf@,İ Ā'ãfTfCfY B,±,İf f“fo,³0,İ,Æ,«,Í AfAfvfŠfP [fVf±f“,Í,Ç,İ,æ,□,ÈfTfCfY,Ā,ãŽg—p%oÁ”\,Ā, ,é B

**d3dMaxVertexCount**

,±,İffffofCfX,İ Ā'ã',“\_ ” B

ŽQ Æ @D3DCOLORMODEL AD3DFINDEVICERESULT AD3DLIGHTINGCAPS AD3DPRIMCAPS AD3DTRANSFORMCAPS



## 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, B Aff [f^, dZw'è, :é B, ±, ìf f\fbfh, aEÄ, Î, ê•İŠ, a I—  
1, ., é, Æ, « AdwInstructionOffset f“fo, ĀŽw'è, 3, ê, 1/2'l, ĀŽn, Ü, é-1/2—ßfŠfXfg, %ođ Í, 3, ê, Ā•Ž, 3, é, é B*

### dwSize

*, ±, ì \‘ç'ì, ìfofCfg'P^Ê, ìTfCfY B*

### dwVertexOffset

*, “\_fŠfXfg, ìfIfzfzfbfg B*

### dwVertexCount

*ŽÀ s, ., é, “\_ ” B*

### dwInstructionOffset

*ŽÀ s-1/2—ßfŠfXfg, ìfIfzfzfbfg B*

### dwInstructionLength

*ŽÀ s-1/2—ß, Ì, 3 B*

### dwHVertexOffset

*fAfvfŠfP [fVf‡f“, aNfŠfbfsf“fO, đ•K—v, Æ, ., éfXfNfŠ [f“ Ā•Wff [f^, Ā—^, |, ç, é, é, Æ, «, ÉŽg—  
p, 3, é, é“Žç, Ì, “\_ ìfIfzfzfbfg B*

### dsStatus

*•İŠ. I—ĀãŽg—p, 3, é, éfXfNfŠ [f““Í'í, đŠi”[., é'l B, ±, Ì'l, Í AD3DSTATUS \‘ç'ì, Ā, , é B*

ŽQ Æ @D3DSTATUS

### D3DFINDDEVICERESULT

```
typedef struct _D3DFINDDEVICERESULT {
    DWORD        dwSize;
    GUID         guid;
    D3DDEVICEDESC ddHwDesc;
    D3DDEVICEDESC ddSwDesc;
} D3DFINDDEVICERESULT, *LPD3DFINDDEVICERESULT;
```

*fAfvfŠfP [fVf#f“,Direct3D::FindDevice f\fbfh,ðEÄ,Ñ o,µ AŽæ“¾,·,éffofCfX,ðŽ·Ê,·,é B*

#### dwSize

*,±,ì \‘‘ì,ìfofCfY’PˆÊ,ìfTfCfY B*

#### guid

*ŒŸ o,³,ê,½ffofCfX,ìfOf [fof< Ef+fj [fNŽ·ÊŽq(GUID) B*

#### ddHwDesc=ddSwDesc

*ŒŸ o,³,ê,½fn [fhEfFfA,Æf\ftfgEfFfA,ìffofCfX,ðŽ!,D3DDEVICEDESC \‘‘ì 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“;“EŸ o,μ,½,ƒffofCfX,Ì“Á «,đŽ,· B,±*  
*,İ \‘c‘İ,İ AIDirect3D::FindDevice f\fbfh,đEÁ,Ň o,·,½,β,ÉŽg,í,é,é B*

### dwSize

*,±,İ \‘c‘İ,Ìf ofCf g’PˆÈ,ÌfTfCfY B*

### dwFlags

*fAfvfŠfP [fVf‡f“;“EŸ o,μ,½,ƒffofCfXE^,đ‘è‘,·,éftf%o B,±*  
*,İf f“fo,É,İ AŽŸ,İ‘l,İ“à,Đ,Æ,ÁˆÈ ā,ª Ý‘è,Á,«,é B*

### D3DFDS\_ALPHACMPCAPS

*,±*  
*,İ \‘c‘İ,ÌdpcPrimCapsf f“fo,Æ,μ,ĂŽw‘è,³,é,½D3DPRIMCAPS \‘c‘*  
*Ì,ÌdwAlphaCmpCapsf f“fo,Æˆè‘v,·,é B*

### D3DFDS\_COLORMODEL

*,±*  
*,İ \‘c‘İ,ÌdcmColorModelf f“fo,ĂŽw‘è,³,é,½fJf%o [ Ef,ff<,Æˆè‘v*  
*,·,é B*

### D3DFDS\_DSTBLENDCAPS

*,±*  
*,İ \‘c‘İ,ÌdpcPrimCapsf f“fo,Æ,μ,ĂŽw‘è,³,é,½D3DPRIMCAPS \‘c‘*  
*Ì,ÌdwDestBlendCapsf f“fo,Æˆè‘v,·,é B*

### D3DFDS\_GUID

*,±*  
*,İ \‘c‘İ,Ìguidf f“fo,ĂŽw‘è,³,é,½fOf [f of< Eftfj [fNŽˆ•ÉŽq(G*  
*UID),Æˆè‘v,·,é B*

### D3DFDS\_HARDWARE

*,±,İ \‘c‘İ,ÌbHardwaref f“fo,É—^,!,ç,é,Ă,ƒ*  
*,éfn [fhfEfFfA,©f\ftfgfEfffA,ÌŽæ“¾“à—e,Æˆè‘v,·,é B*

### D3DFDS\_LINES

*D3DDEVICEDESC \‘c‘İ,ÌdpcLineCapsf f“fo,ĂŽw‘è,³,é,½*  
*D3DPRIMCAPS \‘c‘İ,Æˆè‘v,·,é B*

### D3DFDS\_MISCCAPS

*,±*  
*,İ \‘c‘İ,ÌdpcPrimCapsf f“fo,Æ,μ,ĂŽw‘è,³,é,½D3DPRIMCAPS \‘c‘*  
*Ì,ÌdwMiscCapsf f“fo,Æˆè‘v,·,é B*

### D3DFDS\_RASTERCAPS

*,±*  
*,İ \‘c‘İ,ÌdpcPrimCapsf f“fo,Æ,μ,ĂŽw‘è,³,é,½D3DPRIMCAPS \‘c‘*  
*Ì,ÌdwRasterCapsf f“fo,Æˆè‘v,·,é B*

### D3DFDS\_SHADECAPS

*,±,İ \‘c‘İ,ÌdpcPrimCaps*  
*f f“fo,Æ,μ,ĂŽw‘è,³,é,½D3DPRIMCAPS \‘c‘İ,ÌdwShadeCapsf f“f*  
*o,Æˆè‘v,·,é B*

### D3DFDS\_SRCBLENDCAPS

*,±*

,ì \‘ç‘ì,ìdpcPrimCaps f“fo,Æ,μ,ÄŽw’è,³,ê,½D3DPRIMCAPS \‘ç‘  
ì,ìdwSrcBlendCaps f“fo,Æ^ê’v,·,é B

**D3DFDS\_TEXTUREBLENDCAPS**

,±  
,ì \‘ç‘ì,ìdpcPrimCaps f“fo,Æ,μ,ÄŽw’è,³,ê,½D3DPRIMCAPS \‘ç‘  
ì,ìdwTextureBlendCaps f“fo,Æ^ê’v,·,é B

**D3DFDS\_TEXTURECAPS**

,±,ì \‘ç‘ì,ìdpcPrimCaps f“fo,Æ,μ,ÄŽw’è,³,ê,½  
D3DPRIMCAPS \‘ç‘ì,ìdwTextureCaps f“fo,Æ^ê’v,·,é B

**D3DFDS\_TEXTUREFILTERCAPS**

,±,ì \‘ç‘ì,ìdpcPrimCaps f“fo,Æ,μ,ÄŽw’è,³,ê,½dwTextureCaps  
\‘ç‘ì,ìdwTextureFilterCaps f“fo,Æ^ê’v,·,é B

**D3DFDS\_TRIANGLES**

D3DDEVICEDESC \‘ç‘ì,ìdwTextureFilterCaps f“fo,ÄŽw’è,³,ê,½  
D3DPRIMCAPS \‘ç‘ì,Æ^ê’v,·,é B

**D3DFDS\_ZCMPCAPS**

,±  
,ì \‘ç‘ì,ìdpcPrimCaps f“fo,Æ,μ,ÄŽw’è,³,ê,½D3DPRIMCAPS \‘ç‘  
ì,ìdwZCmpCaps f“fo,Æ^ê’v,·,é B

**bHardware**

Žæ“¾,·,éffofCfX,ª Afñ [fhfEfFfA,©f\ftfgfEfFfA,ì,Ç,ç,Å, ,é,©,ðŽw’è,·,éftf%oO B,±  
,ìf f“fo,ªTRUE,ì,Æ,«,Í Afñ [fhfEfFfA,ìf%ofXf^,ðŽæ“¾,·,é B,»,μ,Ä Afñ [fhfEfFfA EfAfNfZf%oCE [fV  
f±f“ ,ð s,□ B,±,ìftf%oO,ðŽg—  
p,·,éfAvfšP [fVf±f“ ,Í AdwFlags f“fo,ÉD3DFDS\_HARDWAREftrfbfg,ð Ý’è,·,é,±,Æ B

**dcmColorModel**

f%of“fv,âRGBfJf%o [ Ef,ffç,ÄŽæ“¾,·,éffofCfX,ðŽw’è,·,éD3DCOLORMODEL—ñç“CE^f f“fo,ì,Ð,Æ,Â B

**guid**

Œÿ o,·,éffofCfX,ìfOf [fofç Ef†fj [fNŽ·ÊŽq(GUID) B

**dwCaps**

”\—Í,ìftf%oO B

**dpcPrimCaps**

,»,ê,¼,ê,ìfvfšf~fefBfuCE^,ì,½,ß,ìffofCfX,ì”\—Í,ðŽ!,·D3DPRIMCAPS \‘ç‘ì,ðŽw’è,·,é B

ŽQ Æ @D3DFINDDEVICERESULT

## D3DHVERTEX

```
typedef struct _D3DHVERTEX {
    DWORD          dwFlags;
    union {
        D3DVALUE  hx;
        D3DVALUE  dvHX;
    };
    union {
        D3DVALUE  hy;
        D3DVALUE  dvHY;
    };
    union {
        D3DVALUE  hz;
        D3DVALUE  dvHZ;
    };
} D3DHVERTEX, *LPD3DHVERTEX;
```

*fAfvfŠfP [fVf±f“ ,ÉfNfŠfbfsf“fo,;é,½,ß,É•K—v,ÈfXfNfŠ [f“ À•W,ª—^!,ç,ê,é,Æ,« AŽg—  
p,³,ê,é“ŽŸ’,“\_ ,đ’èç’, ,é B,±,l \‘ç’l,Í AD3DTRANSFORMDATA \‘ç’l,îê” ,Á, ,é B*

### dwFlags

*“ŽŸ’,“\_ ,îfNfŠfbfsf“fo ó‘Ô,đ’èç’, ,éftf%fo B,±  
,îf f“fo,Í AD3DTRANSFORMDATA \‘ç’l,îdwClipf f“fo,îftf%fo,đ,Đ,Æ,Â^È ã Ý’è,Á,« ,é B*

### dvHX A dvHY A dvHZ

*“ŽŸ’ À•W,Ö,îŠ ,đŽw’è, ,éD3DVALUEĈ^,îl B,±,ê,ç,î À•W,Í A’,“\_ ,đŽ’, B*

### D3DINSTRUCTION

```
typedef struct _D3DINSTRUCTION {
    BYTE bOpcode;
    BYTE bSize;
    WORD wCount;
} D3DINSTRUCTION, *LPD3DINSTRUCTION;
```

ŽÀ sfobftf@'†,ì-½—ß,ð'è<,:é BffBfXfvfƉfC EfŠfXfg,Í A%oÂ•Ī'·-½—ß,ìfŠfXfg,æ,è ì -γ,³,ê,é B,»,ê,¼,ê,ì-½—ß,Í A<α'Ê,È-½—ßfwfbf\_,ĂŽn,Û,è A,»,ì-½—ß,ìpf%of [f^,α±, B

#### bOpcode

**D3DOPCODE** —ñ<“Ɖ^,ìf f“fo,Æ,μ,ĂŽw'è,³,ê,éƉf“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

Ÿ'è,·,é-½—ßff [f^ ” B,±,ìf f“fo,Í AŽOŠpƉ`,ìf fbVf...,Ă,Ă,«,Ă,Ɖ,éŽOŠpƉ`,ì,æ,α,È AŽ—,½-½—ß,ð,Û,Æ,ß,éŽž,ÉŽg,í,ê,é B





## D3DLIGHTDATA

```
typedef struct _D3DLIGHTDATA {
    DWORD          dwSize;
    LPD3DLIGHTINGELEMENT lpIn;
    DWORD          dwInSize;
    LPD3DTLVERTEX  lpOut;
    DWORD          dwOutSize;
} D3DLIGHTDATA, *LPD3DLIGHTDATA;
```

**IDirect3DViewport::LightElements** f\fbfh,Ö,ìCEÄ,Ñ o,μ,É,“,¯,éCEøCE¹'n“\_,Æ F,ðŽ!,· B

### dwSize

,±,ì \‘‘ì,ìf of Cf g’PˆÊ,ìfTfCfY B

### lpIn

“ü—Í’n“\_,Æ—@ üfxfNfgfç,ðŽw’è,·,éD3DLIGHTINGELEMENT \‘‘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,É’ñ<Ÿ,³,ê,é B

### lpOut

o—Í F,ðŽw’è,·,éD3DTLVERTEX \‘‘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,É’ñ<Ÿ,³,ê,é B

## D3DLIGHTINGCAPS

```
typedef struct _D3DLIGHTINGCAPS {  
    DWORD dwSize;  
    DWORD dwCaps;  
    DWORD dwLightingModel;  
    DWORD dwNumLights;  
} D3DLIGHTINGCAPS, *LPD3DLIGHTINGCAPS;
```

*ffofCfX, ìEöE¹\—Í, ðŽ!, · B, ±, ì \‘ç‘ì, Í AD3DDEVICEDESC \‘ç‘ì, ìf f“fo, Å, , é B*

### dwSize

*, ±, ì \‘ç‘ì, ìf of Cf g’ PˆÊ, ìf Tf Cf Y B*

### dwCaps

*EöE¹f, fWf... [f<, ì”\—Í, ðŽ!, ·ftf%ofO BŽŸ, ìftf%ofO, a’è<³, é, Å, ç, é B*

#### D3DLIGHTCAPS\_DIRECTIONAL

*—LCEüEö, ðfTf| [fg, ·, é B*

#### D3DLIGHTCAPS\_GLSPOT

*Open-GL fXf^fCf<, ìfXf|fbfgf%ofCf g, ðfTf| [fg, ·, é B*

#### D3DLIGHTCAPS\_PARALLELPOINT

*fpf%ofCf< E|fCf“fgEö, ðfTf| [fg, ·, é B*

#### D3DLIGHTCAPS\_POINT

*f|fCf“fgEöE¹, ðfTf| [fg, ·, é B*

#### D3DLIGHTCAPS\_SPOT

*fXf|fbfgf%ofCf g, ðfTf| [fg, ·, é B*

### dwLightingModel

*EöE¹f, fff<, a ARGB, ©f, fmfNf , Å, , é, ©, ð’è<, ·, éftf%ofO BŽŸ, ìftf%ofO, a’è<³, é, é B*

#### D3DLIGHTINGMODEL\_MONO

*f, fmfNf EöE¹f, fff< B*

#### D3DLIGHTINGMODEL\_RGB

*RGBEöE¹f, fff< B*

### dwNumLights

*Žg—p, Å, «, éEöE¹ ” B*

## D3DLIGHTINGELEMENT

```
typedef struct _D3DLIGHTINGELEMENT {
    D3DVECTOR dvPosition;
    D3DVECTOR dvNormal;
} D3DLIGHTINGELEMENT, *LPD3DLIGHTINGELEMENT;
```

*f,fff«óŠÔ“à,ì Æ-¾Ê'u,ðŽ',. B,±,ì \c'í,í AD3DLIGHTDATA \c'í,íê”,Á, ,é B*

### dvPosition

*f,fff«óŠÔ,Á,ì Æ-¾Ê'u,ðŽw'è,.,é'l B,±,ì'l,í AD3DVECTOR \c'í,Á, ,é B*

### dvNormal

*-@ üfxfNfgf<,ðŽw'è,.,é'l B,±,ì'l,í AD3DVECTOR \c'í,Á, ,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“ĈĖ^,Ā,ĪD3DOP\_LINEfIfyfR [fh,Ī,½,ß,Ī¼ ü,đŽ|,· B

**wV1wV2**  
,“ĪfCf“ffbfNfX B

•`%œ,³,ê,é ü ”,æ,è1,Ā ,È,ĉ A~A‘±,μ,½’,“ĪfŠfXfg,đŽg,Ā,Ā ü,Í•`%œ,³,ê,é B

### D3DLINEPATTERN

```
typedef struct _D3DLINEPATTERN {  
    WORD wRepeatFactor;  
    WORD wLinePattern;  
} D3DLINEPATTERN;
```

'¼ üfpf^ [f“,đŽ,· B,±,ê,ç,Ì'l,Í AD3DRENDERSTATETYPE—  
ñ“Œ^,Ä,İD3DRENDERSTATE LINEPATTERNfŒf“f\_Šf“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“,Ìrfbfg ” B

#### wLinePattern

f%ofCf“ Efpf^ [f“,đŽw’è,·,érfbfg B,½,Æ,,Î A’1100110011001100,Í Afhfbfg Ef%ofCf“,đ ¶ ¬,·,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,ç,È,ç Æ-¾,³,ê,½',“\_„đ'èç',·,é( F,Æ“™,İf,fff< Ä•W) Bfn [fhfEfFfA,³•İŠ·,µ,½',“\_„đŽg—  
p,·,é,Æ,« AfAfvfŠfP [fVf‡f“„,Í A,±,İ \‘ç‘İ,đŽg,□ B,±  
,İ \‘ç‘İ,É,Í Af\ftfgfEfFfA,İEöE¹,É,æ,è Ý'è,³,ê,½ff [f^,Æ F,³ŠÜ,Ü,ê,é B

### dvX, dvY, dvZ

’,“\_„İ“ŽŸ Ä•W,đŽw'è,·,éD3DVALUE(Ĉ^,İ¹ B

### dwReserved

—\—ñ İ,Ý B0,Ä,È,¯,ê,İ,È,ç,È,ç B

### dcColor=dcSpecular

’,“\_„İ F,Æ“Š‰œ,đŽw'è,·,éD3DCOLOR(Ĉ^,İ¹ B

### dvTU=dvTV

’,“\_„İfefNfXf`ff Ä•W,đŽw'è,·,éD3DVALUE(Ĉ^,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**, **IDirect3DMaterial::SetMaterial** f\fbfh, ĩĀ, Ñ o, μ, ĩf} fefŠfAf<, ĩ“Á «, đŽw’è, ., é B

### dwSize

, ±, ĩ \‘c’ĭ, ĩfofCfƒP’Ē, ĩfTfCfY B

### dcvDiffuse A dcvAmbient A dcvSpecular A dcvEmissive

, », é, ¼, ê Af} fefŠfAf<, ĩŠgŽU F A•rĭ F A“Š%oe F A•úŽĚ F, đŽw’è, ., é’l B, ±, é, ĉ, ĩ’l, ĩ **D3DCOLORVALUE** \‘c’ĭ, Ā, , é B

### dvPower

“Š%oe, ĩfnfCf%ofCfƒ, ĩ, ³, đŽw’è, ., é **D3DVALUE** Ā, ĩ’l B

### hTexture

fefNfXf`ff Ef}fbfv, ĩfnf“fhf< B

### dwRampSize

F, ĩEXŽĭ, ĩ’á, «, ³ B’P F, ĩ(EXŽĭ)fhf%ofCfo, Ā, ĩ A”wĀi, ÉŽw’è, ³, é, ½f} fefŠfAf<, ĩ, ½, ß, É A, ±, ĩ’l, ĩ’Ē%°, Ā, Ē, , é, ĩ, Ē, ĉ, Ē, ĉ B, », ĩ’¼, ĩ, Ā, « A”wĀi, ĩ•Žĭ, ³, é, Ē, ĉ B, ±, ĩ“@, «, ĩ A”wĀi, ÉŽw’è, ³, é, ½fefNfXf`ff, ³ **dwRampSize** f“fo, ³ĭĒ ā, Āf} fefŠfAf<, đĀ< ±, μ, Ā, ĉ, é, Ā, «, É, à•, é, é B

fefNfXf`ff, ĩfnf“fhf<, đŽæ“¾, ., é, É, ĩ Afhf%ofCfo, ĩfefNfXf`ff, đf [fh, ., é B, ±, é, ĩ AfffofCfX, Éf [fh, ³, é, é, Ā, «, É, ĩ, ÝŽg, ĩ, é, é B

ŽQ Ā @ **IDirect3DMaterial::GetMaterial** **IDirect3DMaterial::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**,  $\text{f}\backslash\text{fbfh}, \text{l}, \frac{1}{2}, \text{f}, \text{l}$  s—ñ, ðŽ', · B

Direct3D, Å A“Š‰oe s—ñ, Ì\_44—v'f, Í•‰o ”, ð Ý'è, Å, «, È, ¢ BfAfvfŠfP [fVf#f“, Å, ±, Ì'Ê'u, É•‰o ”, ðŽg, ¢•K—v, a, , é  
ê ‡ A, », Ì'ã, í, è, È-1, Å“Š‰oe s—ñ'S'Ì, ð kŽÚ, ·, é B

ŽQ Æ @**IDirect3DDevice::GetMatrix** **AIDirect3DDevice::SetMatrix**

## D3DMATRIXLOAD

```
typedef struct _D3DMATRIXLOAD {
    D3DMATRIXHANDLE hDestMatrix;
    D3DMATRIXHANDLE hSrcMatrix;
} D3DMATRIXLOAD, *LPD3DMATRIXLOAD;
```

**D3DOPCODE**— $\tilde{n}$ “ $\mathbb{E}^{\wedge}$ , **D3DOP\_MATRIXLOAD**  $fIfyfR$  [fh,  $\frac{1}{2}$ , B,  $fIfyf\%f$ “fh Eff [f $^{\wedge}$ ,  $\delta\tilde{Z}$ , · B

**hDestMatrix** □ **hSrcMatrix**

“]— æ,  $\mathbb{E}$ “]— $\mathbb{E}^3$ ,  $\tilde{l}$  s— $\tilde{n}$ ,  $\tilde{l}fnf$ “fhf< B

$\tilde{Z}Q$   $\mathbb{E}$  @**D3DOPCODE**

## D3DMATRIXMULTIPLY

```
typedef struct _D3DMATRIXMULTIPLY {
    D3DMATRIXHANDLE hDestMatrix;
    D3DMATRIXHANDLE hSrcMatrix1;
    D3DMATRIXHANDLE hSrcMatrix2;
} D3DMATRIXMULTIPLY, *LPD3DMATRIXMULTIPLY;
```

**D3DOPCODE**— $\tilde{n}$ “ $\mathbb{C}^{\wedge}$ ,  $\hat{\mathbb{D}}3DOP\_MATRIXMULTIPLY$   $fIfyfR$  [fh,  $\hat{\mathbb{I}}$ ,  $\frac{1}{2}$ ,  $\beta$ ,  $\hat{\mathbb{I}}fIfyf\%of$ “ fh Eff [f $\wedge$ ,  $\delta\hat{\mathbb{Z}}$ ],  $\cdot$  B

### hDestMatrix

$\mathbb{C}v\hat{\mathbb{Z}}\mathbb{C}\%o\hat{\mathbb{E}}, \delta\hat{\mathbb{S}}i$  [.,  $\acute{e}$  s— $\tilde{n}$ ,  $\hat{\mathbb{I}}fnf$ “fhf $\langle$  B

### hSrcMatrix1 $\square$ hSrcMatrix2

1” $\hat{\mathbb{O}}-\hat{\mathbb{U}}, \mathbb{A}2$ ” $\hat{\mathbb{O}}-\hat{\mathbb{U}}, \hat{\mathbb{I}}\mathbb{C}v\hat{\mathbb{Z}}\hat{\mathbb{I}}$   $\hat{\mathbb{U}}, \hat{\mathbb{I}}$  s— $\tilde{n}$ ,  $\hat{\mathbb{I}}fnf$ “fhf $\langle$  B

$\hat{\mathbb{Z}}Q \mathbb{A} \hat{\mathbb{E}} @\underline{\hat{\mathbb{D}}3DOPCODE}$

## D3DPICKRECORD

```
typedef struct _D3DPICKRECORD {
    BYTE    bOpcode;
    BYTE    bPad;
    DWORD   dwOffset;
    D3DVALUE dvZ;
} D3DPICKRECORD, *LPD3DPICKRECORD;
```

**IDirect3DDevice::GetPickRecords** f\fbfh—p,É AŽÀ sfobftf@,ì'I'ðfvfŠf~fefBfu,É,Â,ç,Ä,ì î•ñ,ð•Ô,· B

### bOpcode

'I'ðfvfŠf~fefBfu,ìIfyfR [fh B

### bPad

PadfofCfg B

### dwOffset

ÉY o,³,ê,½'I'ðfvfŠf~fefBfu,ìŽÀ sfobftf@,ì æ“³,©,ç,ìIfIfZfbfg B

### dvZ

'I'ðfvfŠf~fefBfu,ì [“x B

'I'ðfvfŠf~fefBfu,ìx Ay À•W,Í A'I'ðfĀfR [fh,Å ¶ -,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“Ē^,ìD3DOP\_POINTfIfyfR [fh,ìfIfyf%of“fh E f [f^,ðŽ!,. B

**wCount**  
,“\_ì ” B

**wFirst**  
À %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;
```

,»,é,¼,ê,ÌfvfŠf~fefBfu(Ě^,Ì”—Í,ð’è`.,.é BfffofCfX,Ì ¶ -Žž,âfffofCfX,Ì”\—Í,ðŽæ“¾,.,é,Æ,«,ÉŽg—p,³,é,é B,±  
,Ì \‘Ĭ,Í AD3DDEVICEDESC \‘Ĭ,Ì’†,Ì,ĉ,.,Â,©,Ìf f“fo,ð’è`.,.é B

### dwSize

,±,Ì \‘Ĭ,Ìf ofCf g’P’È,ÌfTfCfY B

### dwMiscCaps

,±,ÌfvfŠf~fefBfu,Ì ‘Ĭ,È”—Í B,±,Ìf f“fo,É,Í AŽŸ,Ì’l,Ì,Đ,Æ,Â^È ã,ð Ý’è,Â,«,é B

#### D3DPMISCCAPS\_CONFORMANT

fffofCfX,Í AOpenGL•W €É €¶,Ä,ĉ,é B

#### D3DPMISCCAPS\_CULLCCW

fffofCfX,Í AD3DRENDERSTATE\_CULLMODE ó’Ô,Â’Ī,ð,μ,½ ¶%õñ,è  
,ðfTf| [fg,.,é(ŽOŠpĚ^,ÌfvfŠf~fefBfu,Ì ê ±,Ì,Ý) BD3DCULL—  
ñ“Ě^,ÌD3DCULL\_CCWf f“fo,É’Ī%ž,.,é B

#### D3DPMISCCAPS\_CULLCW

fffofCfX,Í AD3DRENDERSTATE\_CULLMODE ó’Ô,Â’Ī,ð,μ,½%E%õñ,  
è,ÌŽOŠpĚ^,ðfTf|  
[fg,.,é(ŽOŠpĚ^,ÌfvfŠf~fefBfu,Ì ê ±,Ì,Ý) BD3DCULL—  
ñ“Ě^,ÌD3DCULL\_CCWf f“fo,É’Ī%ž,.,é B

#### D3DPMISCCAPS\_CULLNONE

fffofCfX,Í A’Ī,ð,μ,Ä,ĉ,éŽOŠpĚ^,ðŽÀ s,Â,«,É,ĉ BD3DCULL—  
ñ“Ě^,ÌD3DCULL\_NONEf f“fo,É’Ī%ž,.,é B

#### D3DPMISCCAPS\_LINEPATTERNREP

fffofCfX,Í AD3DLINEPATTERN \‘Ĭ,ÌwRepeatFactorf f“fo,É1^È  
ã,Ì’l,ðŽg—p,Â,«,é(¼ ü•%æ,ÌfvfŠf~fefBfu,Ì ê ±,Ì,Ý) B

#### D3DPMISCCAPS\_MASKPLANES

fffofCfX,Í A F,Ìf rfbfgf}fXfN,ðŽÀ s,Â,«,é B

#### D3DPMISCCAPS\_MASKZ

fffofCfX,Í AfsfNfZf< ^— ,Ăzfofbftf@,Ì C ³,ð%Â”\  
,Æ,μ,½,è•s%Â”\,Æ,μ,½,è,.,é B

### dwRasterCaps

f%oXf^•%æ,Ì”—Í ĩñ B,±,Ìf f“fo,É,Í AŽŸ,Ì’l,ð,Đ,Æ,Â^È ã Ý’è,Â,«,é B

#### D3DPRASTERCAPS\_DITHER

fffofCfX,Í A F,Ì ÄĚ»—Í,ð—Ĉ,.,.é,½,B,ÉfffbfU^Ž,Ä,«,é B

#### D3DPRASTERCAPS\_FOGTABLE

fffofCfX,Í AfsfNfZf<,Ì [³,ðŽw,·ftfHfO’l,ð•İŠ,.,.éŽæ“¾fe [fuf<,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’,,é B

**D3DPRASTERCAPS\_PAT**

fhf%ofCfo,Í Afpf^ [f“•%œ,ð ^—  
 ,Ä,«,é B(D3DRENDERSTATE\_LINEPATTERN,â  
 D3DRENDERSTATE\_STIPPLEPATTERNfEf“f\_Šf“fO ó’Ô,İ,Đ,Æ,Ä,Ä,  
 İ ü•,â”h,è,Ä,Ô,µ)fvfŠf~fefBfu—p,É Æ%oi,³,ê,é B

**D3DPRASTERCAPS\_ROP2**

fffofCfX,Í AR2\_COPYPEN^ÈŠÖ,İf%ofXf^ ^— ,ðfTf| [fg,Ä,«,é B

**D3DPRASTERCAPS\_STIPPLE**

fffofCfX,Í A”¼“š-¾,ðfVf~f...fE [fg,·,éf|fŠfSf“,ð“\_•,Ä,«,é B

**D3DPRASTERCAPS\_SUBPIXEL**

fffofCfX,Í A^ê”Ô·B,ç ® ”E^,İfsfNfZf< Ä•W,Ä,È,-  
 AZ A F AfefNfXf`ff,İff [f^,İfTfufsfNfZf<”z’u,Ä ^— ,·,é B,±  
 ,é,Í AZ,İfufŠ [fh ü,ð”ð,·,é,İ,ð •,·,é( F,İfWfbf^,ÆfsfNfZf<,İfefNf  
 Xf`ff’l,à) B,±,é,ç,Í A—LÆø,Æ,µ,½,è-³Eø,Æ,µ,½,è,Ä,«,É,ç  
 (fffofCfX,Í AfTfufsfNfZf<”z’u,ðŽÄ s,µ,½,è A,µ,É,ç,Ä,½,è,·,é) B,  
 ±,İfufbf,Í AfEf“f\_Šf“fO,İŽç,ðE”è,·,é,±  
 ,Æ,İ,Ä,«,éDirect3DfNf%ofCfAf“fg,É”ñ<Ÿ,³,ê,é B

**D3DPRASTERCAPS\_SUBPIXELX**

fffofCfX,Í AXŽ²,É%o^,Ä,½fTfufsfNfZf<”z’u,Ä ,è A ® ”E^,İYŽ²,İ’  
 - ,ü,ð İ,Ý ä,°,½,à,İ,Ä ,é BfTfufsfNfZf<”z’u,É,Ä,ç  
 ,Ä,İ Ú ×,Í AD3DPRASTERCAPS\_SUBPIXEL,ðŽQ Æ,·,é,±,Æ B

**D3DPRASTERCAPS\_XOR**

fffofCfX,Í”r¼“T— ~a ^— (XOR),ðfTf| [fg,·,é B,±  
 ,İfTf%oF,ª Y’è,³,ê, AD3DPRIM\_RASTER\_ROP2,ª Y’è,³,ê,Ä,ç  
 ,é ê ‡,Í A”r¼“T— ~a ^— ,ªfTf| [fg,³,è,Ä,ç,È,·,é,İ,È,ç,È,ç B

**D3DPRASTERCAPS\_ZTEST**

fffofCfX,İZfefXfg ^— ,ðŽÄ s,Ä,«,é B,±  
 ,é,Í ACEø%È“İ,ÉfvfŠf~fefBfu,ðfEf“f\_Šf“fO,µ AfEf“f\_Šf“fO,³,è  
 ,½,ç,İ,æ,µ,ÈZfsfNfZf<,Ä,à•Ž’,·,é B

**dwZCmpCaps**

fhf%ofCfo,ªŽÄ s%oÄ”,ÈŠÖ ”,ð”äŠr,·,éZfofbftf@ B,±,İf f“fo,Í AZŸ,İ’l,ð,Đ,Æ,Ä^È ä Y’è,Ä,«,é B

**D3DPCMPCAPS\_ALWAYS**

,Ä,È,ÉZfefXfg,ð’È,· B

**D3DPCMPCAPS\_EQUAL**

V<K,İZ,ªE» Ý,İZ,Æ“TM,µ,ç ê ‡ AZfefXfg,ð’È,· B

**D3DPCMPCAPS\_GREATER**

V<K,İZ,ªE» Ý,İZ,æ,è’â,«,ç ê ‡ AZfefXfg,ð’È,· B

**D3DPCMPCAPS\_GREATEREQUAL**

V<K,İZ,ªE» Ý,İZ,æ,è’â,«,ç,©“TM,µ,ç ê ‡ AZfefXfg,ð’È,· B

**D3DPCMPCAPS\_LESS**

V<K,İZ,ªE» Ý,İZ,æ,è ¬,³,ç ê ‡ AZfefXfg,ð’È,· B

**D3DPCMPCAPS\_LESSEQUAL**

V<K,İZ,ªE» Ý,İZ,æ,è ¬,³,ç,©“TM,µ,ç ê ‡ AZfefXfg,ð’È,· B

**D3DPCMPCAPS\_NEVER**

,Ä,È,ÉZfefXfg,ðŽ”,s,·,é B

**D3DPCMPCAPS\_NOTEQUAL**

V<K,İZ,ªE» Ý,İZ,Æ“TM,µ,,È,ç ê ‡ AZfefXfg,ð’È,· B

**dwSrcBlendCaps**

f\ [fX,ÌfufŒf“ffBf“fO îñ B,±  
,Ìf f“fo,Í AŽŸ,ì,ò,Đ,Æ,ÂÈ ã Ý'è,Â,«,é(RGBA'l,Ìf\ [fX,ÆffXfefBfl [fVf±f“,Í A,»,è,¼,ès,Æd,Â•\,·) B

**D3DPBLENDCAPS\_BOTHINVSRCALPHA**

f\ [fX,ÌfufŒf“ffBf“fOEW ”(1-As, 1-As, 1-As, 1-As)  
,ÆffXfefBfl [fVf±f“,ÌfufŒf“ffBf“fOEW ”(As, As, As,  
As) BffXfefBfl [fVf±f“,ÌfufŒf“ffBf“fO,Ì'ð,Í A-³Œø,Æ,È,é B

**D3DPBLENDCAPS\_BOTHSRCALPHA**

f\ [fX,ÌfufŒf“ffBf“fOEW ”(As, As, As, As)  
,ÆffXfefBfl [fVf±f“,ÌfufŒf“ffBf“fOEW ”(1-As, 1-As, 1-As, 1-  
As) BffXfefBfl [fVf±f“,ÌfufŒf“ffBf“fO,Ì'ð,Í A-³Œø,Æ,È,é B

**D3DPBLENDCAPS\_DESTALPHA**

fufŒf“ffBf“fOEW ”(Ad, Ad, Ad, Ad) B

**D3DPBLENDCAPS\_DESTCOLOR**

fufŒf“ffBf“fOEW ”(Rd, Gd, Bd, Ad) B

**D3DPBLENDCAPS\_INVDESTALPHA**

fufŒf“ffBf“fOEW ”(1-Ad, 1-Ad, 1-Ad, 1-Ad) B

**D3DPBLENDCAPS\_INVDESTCOLOR**

fufŒf“ffBf“fOEW ”(1-Rd, 1-Gd, 1-Bd, 1-Ad) B

**D3DPBLENDCAPS\_INVSRCALPHA**

fufŒf“ffBf“fOEW ”(1-As, 1-As, 1-As, 1-As) B

**D3DPBLENDCAPS\_INVSRCOLOR**

fufŒf“ffBf“fOEW ”(1-Rd, 1-Gd, 1-Bd, 1-Ad) B

**D3DPBLENDCAPS\_ONE**

fufŒf“ffBf“fOEW ”(1, 1, 1, 1) B

**D3DPBLENDCAPS\_SRCALPHA**

fufŒf“ffBf“fOEW ”(As, As, As, As) B

**D3DPBLENDCAPS\_SRCALPHASAT**

fufŒf“ffBf“fOEW ”(f, f, f, 1) Af = min(As, 1-Ad) B

**D3DPBLENDCAPS\_SRCOLOR**

fufŒf“ffBf“fOEW ”(Rs, Gs, Bs, As) B

**D3DPBLENDCAPS\_ZERO**

fufŒf“ffBf“fOEW ”(0, 0, 0, 0) B

**dwDestBlendCaps**

ffXfefBfl [fVf±f“ ñ ± îñ B,±,Ìf f“fo,Í AdwSrcBlendCapsf f“fo,Â'èç,³,è,½”—Í îñ,Æ“-,¶,Â, ,é B

**dwAlphaCmpCaps**

fh%ofCfo,²ŽÀ s%oÂ”\,ÈŠÖ ”,ð”aŠr,·,éfAf<ftf@ EfefXfg B,±,Ìf f“fo,Í AdwZCmpCapsf f“fo,Â'èç,³,è,½”  
—Í îñ,Æ“-,¶,Â, ,é B

**dwShadeCaps**

ffofCfX,²ŽÀ s,Â,«,éfVFF [ffBf“fO ^— B^è”I,É AffofCfX,ª—^,!,ç,è,½fRf}  
f“fh(D3DOP\_TRIANGLE,Ì,æ,ò,È),ðŽÀ s,Â,«,é ê ±,Í AD3DSHADE\_FLATf, [fh(D3DSHADEMODE—  
ñ,“Œ^,ÂŽw'è,³,è,é,æ,ò,È),ðfTf| [fg,·,é B,±  
,Ìftf%ofO,Í AfOf [ EfVFF [ffBf“fO,ÆftfHf“ EfVFF [ffBf“fO,ðfTf|  
[fg,·,éfhf%ofCfo,â A,R,Â,ÌfJf%o [ ¶ -f, [fh,É,»,è,¼,èfTf| [fg,³,è,éAf<ftf@ EfJf%o [ EfRf“f|  
[lf“fg,ðŽw'è,·,é BfAf<ftf@—v'f,ª—^,!,ç,è,½f, [fh,ÂfTf|  
[fg,³,è,È,ç ê ± A,»,Ìf, [fh,Â ¶ -f,³,è,½ F,ÌfAf<ftf@'l,Í•K,255,É,È,é B,±  
,Ì ”l,ª AfAf<ftf@,Ì Á'á'l(fAf<ftf@,ª Áç),Â, ,é B  
ŽŌšpŒ,Ì F AfufCf%ofCfg“Š%oe AftfHfO AfAf<ftf@ -ª,É,Í,»,è,¼,è AffofCfX Efhf%ofCfo,ªfAvfŠfP  
[fVf±f“,É'È'm,·,é”—Íftf%ofO,ª, ,é B  
±  
,Ìftf%ofO,Í AfVFF [ffBf“fO Ef, [fh AfJf%o [ Ef,fff< A,»,µ,Ä ñ ±,â“\_·,³,è,é F,ÌfAf<ftf@ -ª,Â X  
V,³,è,é B Ú ×,Í A uf|fŠfSf“ v,ðŽQ Æ,·,é,±,Æ B

,±,İf f“fo,Í AŽŸ,Ìl,đ,Đ,Æ,Â^È ã Ý'è,Á,«,é B

D3DPSHADECAPS\_ALPHAFLATBLEND

D3DPSHADECAPS\_ALPHAFLATSTIPPLE

D

fffofCfX,Í A“§%øß“l,É,»,ê,¼,ê ñ ‡,â“\_•,³,ê,½•½—  
Ê(D3DSHADEMODE—ñ“Ĉ^,İD3DSHADE\_FLAT),İfAf<ftf@ ñ•ª,đfTf|  
[fg,Á,«,é B,±,ê,ç,İf, [fh,Á A,Đ,Æ,Â,Ì—  
v'f,İ,½,ß,İfAf<ftf@ F ñ•ª,Í A—v'f,İ Á %ø,İ',“\_İ F,İl•”ª,Æ,µ,Ä—  
^,!,ç,ê,é B

D3DPSHADECAPS\_ALPHAGOURAUBLEND

D3DPSHADECAPS\_ALPHAGOURAUDSTIPPLED

fffofCfX,Í A“§%øß“l,É,»,ê,¼,ê ñ ‡,â“\_•,³,ê,½fOf [(D3DSHADE  
MODE—ñ“Ĉ^,İD3DSHADE\_GOURAUD),İfAf<ftf@ ñ•ª,đfTf|  
[fg,Á,«,é B,±,ê,ç,İf, [fh,Á,Í AfAf<ftf@ F ñ•ª,Í',“\_É,½,!,ç,ê A  
¼,İ F ñ•ª,Æ,Æ,à,É ‘,« ž,Û,ê,é B

D3DPSHADECAPS\_ALPHAPHONGBLEND

D3DPSHADECAPS\_ALPHAPHONGSTIPPLED

fffofCfX,Í A“§%øß“l,É,»,ê,¼,ê ñ ‡,â“\_•,³,ê,½ftfHf“(D3DSHADEM  
ODE—ñ“Ĉ^,İD3DSHADE\_PHONG),İfAf<ftf@ ñ•ª,đfTf|  
[fg,Á,«,é B,±,ê,ç,İf, [fh,Á A',“\_fPf%of [f^,Í Ô A—  
İ A Á,İ F ñ•ª,İ“K%ž,·,éĈöĈ¹Ĉø%øÊ,ªfsfNfZf<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,Á,«,é B,±  
,ê,ç,İf, [fh,Á,Í A,Đ,Æ,Â,Ì—v'f,İ F ñ•ª,Í A—v'f,İ Á %  
,İ',“\_İ F,Æ,µ,Ä—  
^,!,ç,ê,é Bf,fmfNf ĈöĈ¹f, [fh,Á A F,İ Á ñ•ª,¾,ª, ‘,«Š,!,ç,ê,é  
BRGBĈöĈ¹f, [fh,Á,Í A Ô A—İ A Á ñ•ª,ª, ‘,«Š,!,ç,ê,é B

D3DPSHADECAPS\_COLORGOURAUMONO

D3DPSHADECAPS\_COLORGOURAURGB

fffofCfX,Í AD3DCOLOR\_MONO,ÆD3DCOLOR\_RGBfJf%o [f, [fh  
,İfOf [EfVfF [ffBf“fo,İ F•t,ªfTf| [fg,Á,«,é B,±  
,ê,ç,İf, [fh,Á A,Đ,Æ,Â,Ì—v'f,İ,½,ß,İfAf<ftf@ F ñ•ª,Í',“\_É,½,!,ç,ê  
A¼,İ F ñ•ª,Æ,Æ,à,É½—  
Ê,đ“n,Á,Ä ‘,« ž,Û,ê,é Bf,fmfNf ĈöĈ¹f, [fh,Á A F,İ Á ñ•ª,¾,ª,  
,İ A ‘,«Š,!,ç,ê,é BRGBĈöĈ¹f, [fh,Á,Í A Ô A—  
İ A Á ñ•ª,İ ‘,«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,Á,«,é B,±  
,ê,ç,İf, [fh,Á A',“\_fPf%of [f^,İfsfNfZf<P^Ê,É Ä•)%  
¿,³,ê,é BĈöĈ¹Ĉø%øÊ,Í ARGBf, [fh,İ Ô A—  
İ A Á,İ F ñ•ª,Á“K%ž,³,ê,é BftfHf“ EfVfF [ffBf“fo,ÍĈ» Ýftf  
| [fg,³,ê,Ä,ç,È,ç B

D3DPSHADECAPS\_FOGFLAT

D3DPSHADECAPS\_FOGGOURAUD

D3DPSHADECAPS\_FOGPHONG

fffofCfX,Í A½—Ê AfOf [AftfHf“f, [fh,ÁftfHfO,đfTf|  
[fg,Á,«,é BftfHf“ EfVfF [ffBf“fo,Í AĈ» Ýftf| [fg,³,ê,Ä,ç  
,È,ç B

D3DPSHADECAPS\_SPECULARFLATMONO

D3DPSHADECAPS\_SPECULARFLATRGB

ffofCfX,Í AD3DCOLOR\_MONO,ÆD3DCOLOR\_RGBfJf% [f, [fh  
,½-ÊfVfF [fffBf“fO,ÌfnfCf%ofCfG“Š%oe,ðfTf] [fg,Å,«,é B

**D3DPSHADECAPS\_SPECULARGOURAUDMONO**

**D3DPSHADECAPS\_SPECULARGOURAURGB**

ffofCfX,Í AD3DCOLOR\_MONO,ÆD3DCOLOR\_RGBfJf% [f, [fh  
,ÌfOf [ EfVfF [fffBf“fO,ÌfnfCf%ofCfG“Š%oe,ðfTf] [fg,Å,«,é B

**D3DPSHADECAPS\_SPECULARPHONGMONO**

**D3DPSHADECAPS\_SPECULARPHONGRGB**

ffofCfX,Í AD3DCOLOR\_MONO,ÆD3DCOLOR\_RGBfJf% [f, [fh  
,ÌftHf“ EfVfF [fffBf“fO,ÌfnfCf%ofCfG“Š%oe,ðfTf] [fg,Å,«,é B

**dwTextureCaps**

↪ ‡fefNfXf`ff Ef}fbfsf“fO îñ B,±,Ìf f“fo,Í AŽŸ,Ì'l,ð,Đ,Æ,ÂÈ ã Ý'è,Å,«,é B

**D3DPTTEXTURECAPS\_ALPHA**

D3DTEX\_DECAL,ÆD3DTEX\_MODULATEfefNfXf`ffftfBf<f^ [f, [f  
h,ÌRGBAfefNfXf`ff,ðfTf] [fg,·,é B,±,Ì<@”,<sup>a</sup> Ý'è,<sup>3</sup>,é,Å,¢  
,È,¢ ê ‡ ARGBfefNfXf`ff,Ì,Ý,<sup>a</sup> A,±,é,¢,Ìf, [fh,ÅfTf]  
[fg,<sup>3</sup>,é B,±,Ìftf%ofO,Ì Ý'è,ð-Ž<,·,é,Æ AfAf<ftf@,ÌŽg—p%oÂ”\  
,D3DTEX\_DECAL\_MASK AD3DTEX\_DECAL\_ALPHA AD3DTEX\_  
MODULATE\_ALPHAftfBf<f^f, [fh,ÅfTf] [fg,<sup>3</sup>,é,é B

**D3DPTTEXTURECAPS\_BORDER**

«ŠE ü,È%o^,Å,ÄfefNfXf`ff Ef}fbfsf“fO,ðfTf] [fg,·,é B

**D3DPTTEXTURECAPS\_PERSPECTIVE**

“§Ž<“Š%oe,<sup>a</sup>fTf] [fg,<sup>3</sup>,é,é B

**D3DPTTEXTURECAPS\_POW2**

,±,Ìftf%ofO,<sup>a</sup> Ý'è,<sup>3</sup>,é,½ ê ‡ Af~fbfvf}  
fbfv,Å,È,¢fefNfXf`ff,Í A2 æ,ÄŽw'è,<sup>3</sup>,é,½• ,Æ ,,<sup>3</sup>,ðŽ ,½,È,-,ê,Ì,È,  
ç,È,¢(f~fbfvf}  
fbfv EfefNfXf`ff,Í A•K,<sup>2</sup> æŽŸ€<sup>3</sup>,Å,È,-,ê,Ì,È,ç,È,¢) B

**D3DPTTEXTURECAPS\_SQUAREONLY**

fefNfXf`ff,Í A,·,×,Ä<€E',Å,È,-,ê,Ì,È,ç,È,¢ B

**D3DPTTEXTURECAPS\_TRANSPARENCY**

“§%oßfefNfXf`ff,<sup>a</sup>fTf] [fg,<sup>3</sup>,é,é(€» Ý,Ì“§%oß F,Å,È,¢,±  
,ê,ç,ÌfefNfXf`ffs,Ì,Ý•%oæ,<sup>3</sup>,é,é) B

**dwTextureFilterCaps**

fefNfXf`ff,Ìf}fbfsf“fO îñ B,±,Ìf f“fo,Í AŽŸ,Ì'l,ð,Đ,Æ,ÂÈ ã Ý'è,Å,«,é B

**D3DPTFILTERCAPS\_LINEAR**

fsfNfZf<,ðŽæ,èŠ<sup>a</sup>,fefNfZf<,Ì2 ~2—Ìæ,É d,Ý•t,-<sup>3</sup>,é,½•½<Ì'l B,±  
,ê,Í AŠg'â,Æ k -,Ì—¼•û,ÄŽg—p,<sup>3</sup>,é,é BŠg'â,© k -,<sup>a</sup>fTf]  
[fg,<sup>3</sup>,é,Å,¢,é,Æ,«,Í A—¼•û,<sup>a</sup>fTf] [fg,<sup>3</sup>,é,Å,¢,È,-,ê,Ì,È,ç,È,¢ B

**D3DPTFILTERCAPS\_LINEARMIPLINEAR**

D3DPRIM\_TEX\_MIP\_LINEAR,Æ“—1,¾,<sup>a</sup> A,Ó,½,Å,Ì<ßŽ—f~fbfvf}  
fbfv,ð ‘,«Š•,é B

**D3DPTFILTERCAPS\_LINEARMIPEAREST**

D3DPRIM\_TEX\_MIP\_NEAREST,Æ“—1,¾,<sup>a</sup> A,Ó,½,Å,Ì<ßŽ—f~fbfvf}  
fbfv,ð ‘,«Š•,é B

**D3DPTFILTERCAPS\_MIPLINEAR**

D3DPRIM\_TEX\_LINEAR,Æ“—1,¾,<sup>a</sup> A'I'ðfefNfZf<,É'î%ož,·,éf~fbfvf}  
fbfv,ðŽg—p,·,é B

**D3DPTFILTERCAPS\_MIPNEAREST**

D3DPRIM\_TEX\_NEAREST,Æ“—  
1,¾,<sup>a</sup> A'I'ðfefNfZf<,É'î%ož,·,éf~fbfvf}fbfv,ðŽg—p,·,é B

**D3DPTFILTERCAPS\_NEAREST**



## D3DPROCESSVERTICES

```
typedef struct _D3DPROCESSVERTICES {
    DWORD dwFlags;
    WORD wStart;
    WORD wDest;
    DWORD dwCount;
    DWORD dwReserved;
} D3DPROCESSVERTICES, *LPD3DPROCESSVERTICES;
```

’, “\_ îñ, ìfhf%ofCfo, É, æ, é ^ — •û-@, ðŽ!, · B, ±, ê, Í AD3DOPCODE—  
ñ“Œ^, Ì†, ÌD3DOP\_PROCESSVERTICESfIfyfR [fh, ÄŽg—p, ³, ê, é B

### dwFlags

fhf%ofCfo, É, æ, é’, “\_ Ì ^ — •û-@, ðŽw’è, ·, éŽÿ, Ìftf%ofO, ð A, Ð, Æ, Â^È ã Ý’è, ·, é B

#### D3DPROCESSVERTICES\_COPY

’, “\_ îñ, Í Afhf%ofCfo, É Ä—~—  
p, ³, ê, é BŽÄ sfobftf@, Ì†, Ì’, “\_ îñ, a Ä—~—  
p, ³, ê, é, Æ Afhf%ofCfo, Ì’, “\_ ð ^ — ·, é•K—v, a, È, -  
È, è A, » ÌŒ, %öÈ A ^ — ‘-“x, %öüP, ³, ê, é B

#### D3DPROCESSVERTICES\_NOCOLOR

’, “\_ Ì F•t, ³, ê, È, ç B

#### D3DPROCESSVERTICES\_OPMASK

D3DPROCESSVERTICES\_NOCOLOR, â

D3DPROCESSVERTICES\_UPDATEEXTENTS, ÌŽÄ s, ÂdwFlagsf f“f  
o, Ì’¼, Ìftf%ofO, Ìfifbfgf}fXfN, ðŽw’è, ·, é B

#### D3DPROCESSVERTICES\_TRANSFORM

’, “\_ Ì, ÌŠ, ³, ê, é B

#### D3DPROCESSVERTICES\_TRANSFORMLIGHT

’, “\_ Ì, ÌŠ, ³, ê Æ—¾Œø%öÈ, à—^, |, ç, è, é B

#### D3DPROCESSVERTICES\_UPDATEEXTENTS

X V, ³, ê, ½•ÌŠ•Œã, Ì’, “\_ Ì”ÍÍ B, ±  
Ì îñ, ÌD3DSTATUS \‘ç‘Ì, ÌdrExtentf f“fo, È•Ô, é B

### wStart

f\ [fX, Ì Ä %o, Ì’, “\_ ÌfCf“fffbfNfX B

### wDest

f [fJf< Efobftf@, Ì Ä %o, Ì’, “\_ ÌfCf“fffbfNfX B

### dwCount

^ — , ³, ê, é’, “\_ ” B

### dwReserved

—\ñ Ì, Ý B0, Ä, È, ^, è, 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;
```

<éE`,'è` B

### IX1 =IY1

<éE`,' ã<÷,ì À•W B

### IX2 =IY2

<éE`,'%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“Ĉ^,Ā,ĭD3DOP\_SPANfIfyfR [fh—  
p,É A’,“\_ĭfXfpf“,đ’è<’,:é BfXfpf“,Ī A“™,μ,ϕy’l,đŽ ,Ā’,“\_đĈ<,ñ,Ā’ĕ,ç,ê,é-Ê,Ā, ,é By’l,ª•Ī,í,é,Æ A V,μ,ϕfXfp  
f“,ª ĭ,ç,ê,é B

### wCount

fXfpf“,Ī ” B

### wFirst

Ā %o,Ī’,“\_ĭfCf“ffbfNfX 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 —

—  
p, ĩf Ćf“f\_fŠf“fO ó‘Ô, ĀŽw’è, 3, ê, é B, ±, ĩ \‘ĉ‘ĭ, ĩ Ā %o, ĩf f“fo, ĩ AŠÖ~A, μ, ½—ñĉ“Ć^, Ā, , é B2”Ô—  
Ú, ĩf f“fo, ĩ A, » ĩĆ^, ĩ, ½, β, ĩ’l, Ā, , é B

**dtstTransformStateType** **A dlstLightStateType** **A drstRenderStateType**

fĆf“f\_fŠf“fO ó‘Ô, ĀŽw’è, 3, ê, é D3DTRANSFORMSTATETYPE AD3DLIGHTSTATETYPE AD3DRENDERSTA  
TETYPE —ñĉ“Ć^, ĩf f“fo, ĩ, Đ, Ā, Ā B

**dvArg**

, ±, ĩ \‘ĉ‘ĭ, ĩ Ā %o, ĩf f“fo, ĀŽw’è, 3, ê, ½Ć^, ĩ’l B

ŽQ Ā @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\fbfh,É,æ,èŽg—p,³,ê,é“ Ćv î•ñ,đŠŮ,Đ B*

**dwSize**

*,±,İ \‘‘ì,ìf ofCf g’PˆÊ,ìfTfCfY B*

**dwTrianglesDrawn, dwLinesDrawn, dwPointsDrawn, dwSpansDrawn**

*ff ofCfX,İ ¶ -ˆÈĈEã•%oæ,³,ê,½ŽOŠpĈE` A ü A“\_ AfXfpf“,ì ” B*

**dwVerticesProcessed**

*ff ofCfX,İ ¶ -ˆÈĈEã ^— ,³,ê,½’,“\_ ,ì ” 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 \c'í,í AD3DEXECUTEDATA \c'ì,ìê·,âD3DOPCODE —  
ñ<“Ě^,ì'†,ìD3DOP\_SETSTATUSfIfyfR [fh,ĀŽg—p,³,ê,é B

### dwFlags

fXfe [f^fX A”Íí A,Û,½,í,»»,ì—¼•û,Ā, ,é,±,Ā,ðŽw'è,·,éŽÝ,ìftf%fo,ì,Đ,Ā,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”Íí,ð Ý'è B

#### D3DSETSTATUS\_ALL

fXfe [f^fX,Ā”Íí,ì—¼•û,ð Ý'è B

### dwStatus

fNfšfbfsf“fo Eftf%fo B,±,ìf f“fo,í AŽÝ,ìftf%fo,ì,Đ,Ā,Ā^È ã,ð Ý'è,·,é B

#### D3DSTATUS\_CLIPINTERSECTION

·,·,×,Ā,ìCLIPINTERSECTIONftf%fo,ì'g,Ý ‡,í,¹ B

#### D3DSTATUS\_CLIPUNIONALL

·,·,×,Ā,ìCLIPUNIONftf%fo,ì'g,Ý ‡,í,¹ B

#### D3DSTATUS\_DEFAULT

D3DSTATUS\_CLIPINTERSECTION,Ā  
D3DSTATUS\_ZNOTVISIBLEftf%fo,ì'g,Ý ‡,í,¹ B,±  
,ì¹,ª AffftfHf<fg,Ā, ,é B

#### D3DSTATUS\_ZNOTVISIBLE

#### fNfšfbfvĚđ ·ftf%fo

#### D3DSTATUS\_CLIPINTERSECTIONBACK

Ž< ‘ä,ìĚä•ûfNfšfbfv—Ě,ì’ ,“\_,ìfNfšfbfsf“fo Eftf%fo,ì`—  
Ī,ð,Ā,é B

#### D3DSTATUS\_CLIPINTERSECTIONBOTTOM

Ž< ‘ä,ì%°,ì’ ,“\_,ìfNfšfbfsf“fo Eftf%fo,ì`— Ī,ð,Ā,é B

#### D3DSTATUS\_CLIPINTERSECTIONFRONT

Ž< ‘ä,ì'O•ûfNfšfbfv—Ě,ì’ ,“\_,ìfNfšfbfsf“fo Eftf%fo,ì`—  
Ī,ð,Ā,é B

#### D3DSTATUS\_CLIPINTERSECTIONGEN0 `D3DSTATUS\_CLIPINTERSECTIONGEN5

fAfvfšfP [fVf‡f“è<,ìfNfšfbfv—Ě,ì`— Ī,ð,Ā,é B

#### D3DSTATUS\_CLIPINTERSECTIONLEFT

Ž< ‘ä,ì ¶“²,ì’ ,“\_,ìfNfšfbfsf“fo Eftf%fo,ì`— Ī,ð,Ā,é B

#### D3DSTATUS\_CLIPINTERSECTIONRIGHT

Ž< ‘ä,ì%°E“²,ì’ ,“\_,ìfNfšfbfsf“fo Eftf%fo,ì`— Ī,ð,Ā,é B

#### D3DSTATUS\_CLIPINTERSECTIONTOP

Ž< ‘ä,ì ã,ì’ ,“\_,ìfNfšfbfsf“fo Eftf%fo,ì`— Ī,ð,Ā,é B

#### fNfšfbfvĚ< ‡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%oF*

**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%E“¬-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’,“\_„,»,ì“à,ÉŠÜ,Ð<éC’,ð’è<,·,é**D3DRECT** \‘ç’î B,½,Æ,!,î **AD3DPROCESSVERTICES**  
 \‘ç’î,ì’‡,Ä Ý’è,³,ê,é**D3DPROCESSVERTICES\_UPDATEEXTENTS**f<sub>t</sub>f%oF,ðŽæ“¾,·,é**D3DOP\_PROCESSVERTIC**  
**ESIfIfyR** [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<éC’,ì’ä,«,³,í AŠeŽÀ s,Ä’ ‘ä,·,é,ªŽû k,µ,È,ç **BD3DOP\_SE**  
**TSTATUSIfIfyR** [fh,É,æ,èfŠfZfbfg,Ä,«,é B

ŽQ Æ @**D3DEXECUTEDATA** A**D3DOPCODE** A**D3DRECT**

## D3DTEXTURELOAD

```
typedef struct _D3DTEXTURELOAD {
    D3DTEXTUREHANDLE hDestTexture;
    D3DTEXTUREHANDLE hSrcTexture;
} D3DTEXTURELOAD, *LPD3DTEXTURELOAD;
```

**D3DOPCODE**—ñ“Ĉ^,ì†,ìD3DOP\_TEXTURELOADfIfyfR [fh,ìIfyf%of“fh Eff [f^,ðŽw’è,·,é B

### hDestTexture

“]‘— æfefNfXf`ff,ìfnf“fhf< B

### hSrcTexture

“]‘—Ĉ³fefNfXf`ff,ìfnf“fhf< B  
fefNfXf`ff,Í AhDestTexture,ÆhSrcTexturef f“fo,““¯,¶‘â,«,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** \c'ì,ì•İŠ,â Æ-¾,İ',"\_(fJf%o [,İfXfNfŠ [f" Å•W),ð'èç',,é B

**dvSX, dvSY, dvSZ**

fXfNfŠ [f" Å•W,Å',,"\_ðŽw'è,.,éD3DVALUEĈ^,İ'1 B

**dvRHW**

D3DVALUEĈ^,İ'1 B,±,İ'1,Í A,P,ðZŽ²,É%ˆ,Á,½Ĉ'\_"\_©,çfIfufWfFfNfg,Ö,İ<—Ł,ÅŠ,,Á,½'1,Å, ,é B

**dcColor** □ **dcSpecular**

,,"\_İ F,Æ"Š%œ,ðŽw'è,.,éD3DCOLORĈ^,İ'1 B

**dvTU** □ **dvTV**

,,"\_İfefNfXf`ffŽw'è,.,éD3DVALUEĈ^,İ'1 B

ŽQ Æ @D3DLIGHTDATA

## D3DTRANSFORMCAPS

```
typedef struct _D3DTransformCaps {  
    DWORD dwSize;  
    DWORD dwCaps;  
} D3DTRANSFORMCAPS, *LPD3DTRANSFORMCAPS;
```

fffofCfX,İ•İŠ•”\—Í,đŽw’è,·,é B,±,İ \‘‘İ,Í AD3DDEVICEDESC \‘‘İ,İˆ•”,Å, ,é B

### dwSize

,±,İ \‘‘İ,İfofCfg’PˆÊ,İfTfCfY B

### dwCaps

•İŠ•’†,İfVfXfef€,<sup>a</sup>fNfŠfbfsf“fO,·,é,©,Ç,¤,©,đŽw’è,·,éftf%ofO B,±  
İf f“fo,İ A0,Û,½,İŽŸ,İftf%ofO,<sup>a</sup> Ý’è,Å,«,é B

**D3DTRANSFORMCAPS\_CLIP** fVfXfef€  
,İ•İŠ•’†,ÉfNfŠfbfsf“fO,·,é B

## D3DTRANSFORMDATA

```
typedef struct _D3DTRANSFORMDATA {
    DWORD          dwSize;
    LPVOID          lpIn;
    DWORD          dwInSize;
    LPVOID          lpOut;
    DWORD          dwOutSize;
    LPD3DHVERTEX   lpHOut;
    DWORD          dwClip;
    DWORD          dwClipIntersection;
    DWORD          dwClipUnion;
    D3DRECT        drExtent;
} D3DTRANSFORMDATA, *LPD3DTRANSFORMDATA;
```

**IDirect3DViewport::TransformVertices** *f\fbfh—p,î•İŠ• î•ñ,đŽ ,Â B*

**dwSize**

*,±,İ \‘ç‘ì,ìf ofCf g’P’È,ìfTfCfY B*

**lpIn**

*•İŠ•,³,ê,é,“\_„Ö,ìf|fCf“f^ B,±,ê,Í AD3DLVERTEX \‘ç‘ì,Â, ,é B*

**dwInSize**

*•İŠ•,³,ê,é,“\_„İŠÖŠu B*

**lpOut**

*•İŠ•,³,ê,½’,“\_„Ö,ìf|fCf“f^ B*

**dwOutSize**

*o—Í’,“\_„İŠÖŠu B*

**lpHOut**

*đŽ;•İŠ•,³,ê,½’,“\_„đŠÜ,Đ’l,Ö,ìf|fCf“f^ B,±,ì’l,Í AD3DHVERTEX \‘ç‘ì,Â, ,é B*

**wClip**

*,“\_„,³,Ç,ì,æ,±,ÉfNfŠfbfsf“fO,³,ê,é,©,đŽw’è,·éftf%ofO B,±,İf f“fo,É,Í AŽŸ,ì’l,đ,Đ,Æ,Â^È ã Ý’è,·,é B*

**D3DCLIP\_BACK**

*Ž< ‘ä,ì”w—Ê,É,æ,èfNfŠfbfsf“fO,³,ê,é B*

**D3DCLIP\_BOTTOM**

*Ž< ‘ä,ì’è—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\_GEN0 through D3DCLIP\_GEN5**

*fAfVfŠfP [fVf‡f“è<,ìfNfŠfbfv—Ê B*

**D3DCLIP\_LEFT**

*Ž< ‘ä,ì ¶“—Ê,É,æ,èfNfŠfbfsf“fO,³,ê,é B*

**D3DCLIP\_RIGHT**

*Ž< ‘ä,ì‰E“—Ê,É,æ,èfNfŠfbfsf“fO,³,ê,é B*

**D3DCLIP\_TOP**

*Ž< ‘ä,ì ã’è—Ê,É,æ,èfNfŠfbfsf“fO,³,ê,é B*

**dwClipIntersection**

*fNfŠfbfsf“fO Eftf%ofO,ìÈđ ·,đŽ!,·ftf%ofO B,±,İf f“fo,É,Í AŽŸ,ì’l,đ,Đ,Æ,Â^È ã Ý’è,·,é B*

**D3DSTATUS\_CLIPINTERSECTIONBACK**

*Ž< ‘ä,ìÈä•âfNfŠfbfv—Ê,ì’,“\_„ìfNfŠfbfsf“fO Eftf%ofO,ì’—  
İ,đ,Æ,é B*

**D3DSTATUS\_CLIPINTERSECTIONBOTTOM**

*Ž< ‘ä,ì‰°,ì’,“\_„ìfNfŠfbfsf“fO Eftf%ofO,ì’— 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 ¶'ı,ì',“\_ìfNfŠfbfsf“fO Eftf%ofo,ì~— İ,ð,Æ,é B

**D3DSTATUS\_CLIPINTERSECTIONRIGHT**

Ž< 'ä,ì%o'ı,ì',“\_ìfNfŠfbfsf“fO Eftf%ofo,ì~— İ,ð,Æ,é B

**D3DSTATUS\_CLIPINTERSECTIONTOP**

Ž< 'ä,ì ä,ì',“\_ìfNfŠfbfsf“fO Eftf%ofo,ì~— İ,ð,Æ,é B

**dwClipUnion**

fNfŠfbfsf“fO Eftf%ofo,ìE< ‡,ðŽ!,·ftf%ofo B,±,ìf f“fo,É,Í AŽŸ,ì'l,ð,Đ,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·Ā,ì',“\_ì”íí,ðĀè^è,·,é'l B,±,ì \‘ç'İ,Í AfWfIf fgfŠ·İŠ·Ā,ìfXfNfŠ [f“”íí,ì·İŠ·f,fWf...  
[f<,É,æ,èfZfbfg,<sup>3</sup>,é,é BfNfŠfbfsf“fO,<sup>3</sup>,é,é,½,ß A,±,ì”íí,İŽ< ‘ä“ä”,ì',“\_¾,¯,ðŠŪ,Đ B,±  
ì'l,İ**D3DRECT** \‘ç'İ,Ā, ,é B

Še“ü—Í',“\_Í AfWfIf fgfŠ Ef,ff<<óŠŌ,Ā,ì[x y z] Ā·W,Ā—

^,!,ç,è,½,R,Ā,ìfxfNfgf<',“\_Ā, ,é BdwInSizef f“fo,Í AŠe',“\_ª A—

áŠOf [f^,ðfCf“f%oCf“,ĀŠi”[·,·,é,½,ß,ìfAfvfŠfP [fVf‡f“,ð<-%oĀ,·,é',“\_ŠŌ,ð^Ū“®,·,é—Ē,ð—^!,é B

•İŠ·f,fWf... [f<,É,æ,è ¶ ^,³,é,½',“\_Í A16ftrfbfg ,“x'l,Æ,μ,ĀŠi”[<sup>3</sup>,é,é BfNfŠfbfsf“fO,Í A—

^,!,ç,è,½·İŠ·Ā,ì',“\_ðfNfŠfbfsf“fO,·,éŽ< ‘äfvfĀ [f“\_İ·İŠŪ“T—

~a,Ā Ý'è,<sup>3</sup>,é,½ ® ”ftrfbfg EftfB [f<fh,Æ,μ,Ā^μ,í,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,İŽOŠpE,İŠİ-{\CE^,đŽw'è,.,é BŽOŠpE,Í AŠİ-{"I,ÈfCEf"f\_Šf"fO—v'f,Ä,.,é B  
ŠÖ^A îñ,Í AD3DOPCODE—ñ<“CE^,İD3DOP\_TRIANGLEf f“fo,đŽQ Æ,.,é,±,Æ B

**wV1 A wV2 A wV3**  
ŽOŠpE,đŽw'è,.,é,“\_ B

**wFlags**  
Žg—p%Ä”\,ÈŽOŠpE,İfGfbfW,đ'èç,.,éftf%o(,±,İ îñ,Í Af fCf,,ftfE [f€ Ef, [fh,Ä,İ,Ý—LCEØ) B,±  
İf f“fo,É,Í AŽY,İ'l,đ,Đ,Æ,Ä^È ã Ý'è,.,é B

**fGfbfW Eftf%o**

**D3DTRIFLAG\_EDGEENABLE1**  
fGfbfWv1—v2,đ'èç,.,é B

**D3DTRIFLAG\_EDGEENABLE2**  
fGfbfWv2—v3,đ'èç,.,é B

**D3DTRIFLAG\_EDGEENABLE3**  
fGfbfWv3—v1,đ'èç,.,é B

**D3DTRIFLAG\_EDGEENABLETRIANGLE**  
,,×,Ä,İfGfbfW,đ'èç,.,é B

**“WŠJ },Æ îCE`ftf%o**

**D3DTRIFLAG\_EVEN**  
CE» Ý,İŽOŠpE,İv1—v2fGfbfW,Í A'¼'O,İŽOŠpE,İv3—  
v1fGfbfW,É ‡,í,¹,ç,é,é Bv1,Í'¼'O,İv1,É Av2,Í'¼'O,İv3,Æ,È,é B

**D3DTRIFLAG\_ODD**  
CE» Ý,İŽOŠpE,İv1—v2fGfbfW,Í A'¼'O,İŽOŠpE,İv2—  
v3fGfbfW,É ‡,í,¹,ç,é,é Bv1,Í'¼'O,İv3,É Av2,Í'¼'O,İv2,Æ,È,é B

**D3DTRIFLAG\_START**  
“WŠJ },â îCE,đŠŽn,µ,Ä A,R,Ä,İ',“\_đf [fh,.,é B

**D3DTRIFLAG\_STARTFLAT(len)**  
,±  
İŽOŠpE,^ Ø,è”²,©,é,½,Æ,« A,»,İCEä,İŽOŠpE,İŽw'è,³,é,½ ”,đ Ø,è  
”², B,±,İ',³,Í A0,æ,è'â,«,30,æ,è -³,ç B

,±,İ \`c'İ,Í A,.,×,Ä,İŽOŠpE,đ“h,è,Ä,Ô,.,½,ß,É'¼ ÚŽg—p,Ä,«.,é B•½—  
ÈfVfF [ffBf“fO,Ä A F,Æ“Š%oe -•,Í Ä %  
İ',“\_©,çŽæ“¾,.,é B,R,Ä,İ',“\_fCf“ffbfNfX,İv1 Av2 Av3,Í AŽÀ sfobftf@,İŠŽn,İ',“\_šfXfg,İ't,İ',“\_fCf“ffbfNfX,Ä,.,é B

Žg—p%Ä”\,ÈfGfbfW,Í Af fCf,,ftfE [f€ Ef, [fh,Ä%ÄŽ< ó'Ô,Ä,.,é BfAfvfšfP [fVf‡f“,”f fCf,,ftfE [f€  
,İŽOŠpE,đ'èç,.,é,Æ,« A2%ñfGfbfW,đ•,.,İ,đ”đ,\_,é,½,ß A—×,è ‡,µ,ç,ç,ç,©,İfGfbfW,Žg—p%Ä”\,Æ,È,é B

The D3DTRIFLAG\_ODD,ÆD3DTRIFLAG\_EVENftf%ofO,Í A'Ê í,ÌŽOŠpCE`,ì“WŠJ }  
,© îCE`,ì†,ÌŽOŠpCE`,ìÊ'u,ðŽQ Æ,.,é BŽOŠpCE`,ì“WŠJ },\*5,Â,ÌŽOŠpCE`,ì ê ‡ AŽŸ,Ìftf%ofO,Â“WŠJ }  
,ðCE“è,Â,«,é B

D3DTRIFLAG\_START  
D3DTRIFLAG\_ODD  
D3DTRIFLAG\_EVEN  
D3DTRIFLAG\_ODD  
D3DTRIFLAG\_EVEN

“—l,É AŽŸ,Ìftf%ofO,Â5,Â,ÌŽOŠpCE`,ì îCE`,ðCE“è,Â,«,é B

D3DTRIFLAG\_START  
D3DTRIFLAG\_EVEN  
D3DTRIFLAG\_EVEN  
D3DTRIFLAG\_EVEN  
D3DTRIFLAG\_EVEN

ŽŸ,Ìftf%ofO,Â A5,Â,ÌŽOŠpCE`,ì•½-ÊŽOŠpCE`,ì îCE`,ðCE“è,Â,«,é B

D3DTRIFLAG\_STARTFLAT(4)  
D3DTRIFLAG\_EVEN  
D3DTRIFLAG\_EVEN  
D3DTRIFLAG\_EVEN  
D3DTRIFLAG\_EVEN

ŽQ Æ @ŽOŠpCE`,ì“WŠJ },Æ îCE`

## D3DVECTOR

```
typedef struct _D3DVECTOR {
    union {
        D3DVALUE x;
        D3DVALUE dvX;
    };
    union {
        D3DVALUE y;
        D3DVALUE dvY;
    };
    union {
        D3DVALUE z;
        D3DVALUE dvZ;
    };
} D3DVECTOR, *LPD3DVECTOR;
```

Direct3D, IDirect3DRM f "fo, \ 'ç' Ì, ÌfxfNfgf<, ð'è'è', ·, é B

**dvX A dvY A dvZ**

fxfNfgf<, ðŽw'è, ·, é D3DVALUE (è^, Ì'1 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%oe,đ,μ,È,Ç’,“\_,đ’èç’,·,é( ³K•ûĈëüfxfNfgr<,Â,İf,ff< Â•W) B

ŠÖ~A î•ñ,É,Â,ç,Ä,Í AD3DOPCODE—ñc“ĈE^,İ’†,İD3DOP\_TRIANGLEf f“fo,đŽQ Æ,·,é,±,Æ B

**dvX A dvY A dvZ**

İŽç,È Â•W,Â’,“\_,đŽw’è,·,éD3DVALUEĈE^,İ’l B

**dvNX A dvNY A ,·,æ,Ñ dvNZ**

³K Â•W,Â’,“\_,đŽw’è,·,éD3DVALUE ĈE^,İ’l B

**dvTU □ dvTV**

,“\_,İfefNfXf`ff,đŽw’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“—ÿæ,ð'èç,.,é B3Df{fŠf... [f€  
,Í AIDirect3DViewport::GetViewport,ÆIDirect3DViewport::SetViewport f f\fbfh,Å“ŠŽË,³,é,é B

frf... [f] [fg,³Í X,³,é,é,Æ Afhf%ofCfo,Í V,µ,Ç•İŠ. s—ñ,ð \z,.,é B

frf... [f] [fg,Ì Å•W,Æ”z—ñ,Í AffofCfX,Ì ¶ ā,©,ç,İ‘Š‘Í’l,Å, ,é B

### dwSize

,±,Ì \‘ç’ì,Ìf ofCf g’P’È,ÌfTfCfY B

### dwX □ dwY

frf... [f] [fg,Ì ¶ ā÷,Ì Å•W B

### dwWidth □ dwHeight

frf... [f] [fg,Ì”z—ñ B

### dvScaleX □ dvScaleY

fXfNfŠ [f“ ,ÉçİŽç,ÈfXfP [f<”ä,ðŽw’è,.,éD3DVALUEÇ^,Ì’l B

### dvMaxX A dvMaxY A dvMinZ A dvMaxZ

x Ay Az,ÌçİŽç Å•W,Ì Å‘â’l,Æ Å -’l,ðŽw’è,.,éD3DVALUEÇ^,Ì’l B

ŽQ Æ @D3DVALUE A IDirect3DViewport::GetViewport A IDirect3DViewport::SetViewport

—ñ“Ĉ^



## 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** —  $\tilde{n} \langle \text{E}^\wedge, \text{I}^\dagger, \text{I} \rangle$  **D3DRENDERSTATE\_ZFUNC**, **D3DRENDERSTATE\_ALPHAFUNC**  
'l, ð, ½, ß, É, f, T, f | [fg, ³, ê, ½] "äŠrŠÖ " , ð'è'è', : , é B

**D3DCMP\_NEVER**  
, Ä, È, É, f, e, f, X, f, g, Í, Ž, "s, ., : , é B

**D3DCMP\_LESS**  
V, μ, Ç, f, s, f, N, f, Z, f, < 'l, ^a ACE» Ý, ð, f, s, f, N, f, Z, f, < 'l, æ, è - , ³, Ç, Æ, «, É%øž, ¶, é B

**D3DCMP\_EQUAL**  
V, μ, Ç, f, s, f, N, f, Z, f, < 'l, ^a ACE» Ý, ð, f, s, f, N, f, Z, f, < 'l, Æ™, μ, Ç, Æ, «, É%øž, ¶, é B

**D3DCMP\_LESSEQUAL**  
V, μ, Ç, f, s, f, N, f, Z, f, < 'l, ^a ACE» Ý, ð, f, s, f, N, f, Z, f, < 'l, È%ø, ð, Æ, «, É%øž, ¶, é B

**D3DCMP\_GREATER**  
V, μ, Ç, f, s, f, N, f, Z, f, < 'l, ^a ACE» Ý, ð, f, s, f, N, f, Z, f, < 'l, æ, è 'ä, «, Ç, Æ, «, É%øž, ¶, é B

**D3DCMP\_NOTEQUAL**  
V, μ, Ç, f, s, f, N, f, Z, f, < 'l, ^a ACE» Ý, ð, f, s, f, N, f, Z, f, < 'l, Æ™, μ, , È, Ç, Æ, «, É%øž, ¶, é B

**D3DCMP\_GREATEREQUAL**  
V, μ, Ç, f, s, f, N, f, Z, f, < 'l, ^a ACE» Ý, ð, f, s, f, N, f, Z, f, < 'l, È ã, ð, Æ, «, É%øž, ¶, é B

**D3DCMP\_ALWAYS**  
, Ä, È, É, f, e, f, X, f, g, ð, Ž, Ä 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<,Á A’,“\_ F,ì Á,ì'1,Í A’,“\_,\fP“x,ð'è<`,·,é,½,ß,ÉŽg—p,³,é,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\_Šf“fO, : , é, Æ, «, Ì-Ê, Ì Ø, è"2, «•û-@, ð'èc', : , é B

### D3DCULL\_NONE

Ø, è"2, «, Í, µ, È, c 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,ðŽw'è,·,é'è ”,ð Ý'è,;é B,±,ê,ç,Ì'l,Í AD3DRENDERSTATETYPE—  
ñ<“E^,Ì'†,ÍD3DRENDERSTATE\_FILLMODEf(€f“f\_Šf“fO ó'Ô,ì,½,ß,ÉŽg—p,³,ê,é B

## D3DFILL\_POINT

“\_„Â“h,è,Â,Ô,· B

## D3DFILL\_WIREFRAME

f fCf„ [ftf€ [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;
```

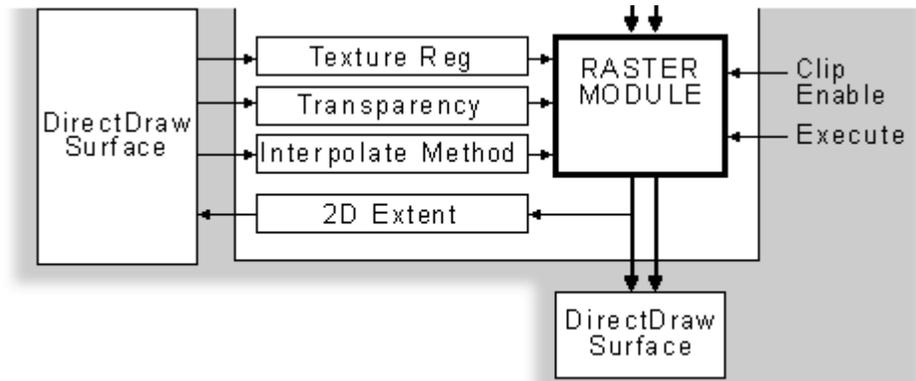
ftfHfO Ef, [fh,đŽw'è,·,é'è ",đ Ý'è,·,é B,±,ê,ç,ì'l,Í AD3DRENDERSTATETYPE—  
 ñ<“Œ^,ì†,ìD3DRENDERSTATE\_FOGTABLEMODEfŒf“f\_Šf“fO ó‘Ô,ì,½,ß,ÉŽg—p,³,é,é B

**D3DFOG\_NONE**

ftfHfOŒø%Œ,Í,È,ç B

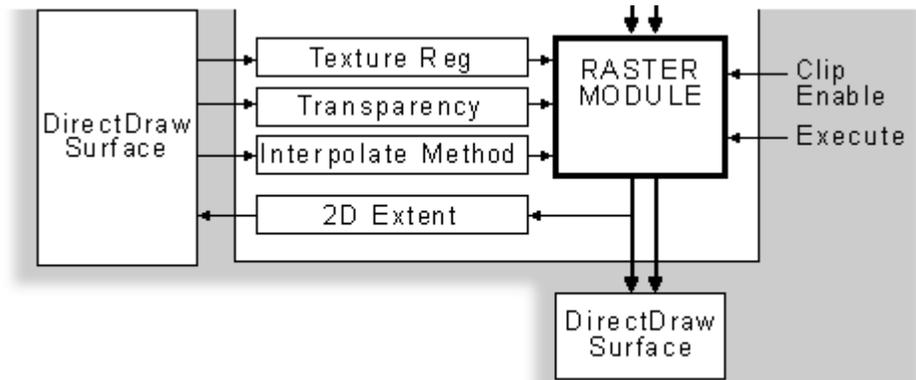
**D3DFOG\_EXP**

ŽŸ,ì•û'öŽ@,ì'í ",Á AftfHfOŒø%Œ,“ ,· B



**D3DFOG\_EXP2**

ŽŸ,ì•û'öŽ@,ì'í "2 æ,Á AftfHfOŒø%Œ,“ ,· B



**D3DFOG\_LINEAR**

ŽŸ,ì•û'öŽ@,ìŽn“\_E I“\_ìŠÔ,Á üŒ',É AftfHfOŒø%Œ,“ ,· B

$$f = \frac{end - z}{end - start}$$

,±,ê,Í AŒ» ÝfTf [fg,³,ê,Ä,ç,é—B^è,ìftfHfO Ef, [fh,Á, ,é B  
 ftfHfO,Í A“s—¾“x,đ•,·Šì Œ,Á, ,é B,±,ì ê ‡ AftfHfO,ì'l,“ ¬,³,ç,Ù,Ç AfIfufWfFfNfg,“Œ@,!,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** *fIfyFR* [fh—p, ìCEõCE¹ ó‘Ô, ð’è‘, ·, é B, ±, ê, Í **AD3DSTATE** \‘c‘ì, ì^è•, Å, , éCE^, ð—ñ‘, ·, é B

### D3DLIGHTSTATE\_MATERIAL

ÅCEã, ì F, Æf%ofXf^%o», ÌŠÔ, ì¹, ì“x ‡, Ç, ðŽZ o, ·, é, ½, ßŽg—p, µ, Å A Æ—¼, “—, Å, ç, é, éf} fefŠfAf<, ð’è‘, ·, é BffftfHf<fg’l, ÍNULL, Å, , é B

### D3DLIGHTSTATE\_AMBIENT

F, ÆCE» Ý, ìCEõCE¹, ì“x ‡, Ç, ð Ý’è, ·, é BfAfvfŠfP [fVf‡f“, a, ±, ì¹, ðŽw’è, µ, ½, Æ, «, Í Afpf%of [f^, Æ, µ, ÅCEõCE¹, ðŽw’è, µ, È, Ç BffftfHf<fg’l, Í0, Å, , é B

### D3DLIGHTSTATE\_COLORMODEL

**D3DCOLORMODEL**—ñ‘CE^, ìf f“fo, ì, D, Æ, Å BffftfHf<fg’l, ÍD3DCOLOR\_RGB, Å, , é B

### D3DLIGHTSTATE\_FOGMODE

**D3DFOGMODE**—ñ‘CE^, ìf f“fo, ì, D, Æ, Å BffftfHf<fg’l, ÍD3DFOG\_NONE, Å, , é B

### D3DLIGHTSTATE\_FOGSTART

ftfHfO, ÌŠJŽn¹, ð’è‘, ·, é BffftfHf<fg’l, Í1.0, Å, , é B

### D3DLIGHTSTATE\_FOGEND

ftfHfO, Ì I—¹¹, ð’è‘, ·, é BffftfHf<fg’l, Í100.0, Å, , é B

### D3DLIGHTSTATE\_FOGDENSITY

ftfHfO, É Ý’è, ·, é [“x, ð’è‘, ·, é BffftfHf<fg’l, Í1.0, Å, , é B

ŽQ Æ @**D3DOPCODE** □ **D3DSTATE**

## D3DLIGHTTYPE

```
typedef enum _D3DLIGHTTYPE {
    D3DLIGHT_POINT           = 1,
    D3DLIGHT_SPOT           = 2,
    D3DLIGHT_DIRECTIONAL    = 3,
    D3DLIGHT_PARALLELPOINT  = 4,
    D3DLIGHT_GLSPOT        = 5,
} D3DLIGHTTYPE;
```

enum D3DLIGHTTYPE { D3DLIGHT\_POINT = 1, D3DLIGHT\_SPOT = 2, D3DLIGHT\_DIRECTIONAL = 3, D3DLIGHT\_PARALLELPOINT = 4, D3DLIGHT\_GLSPOT = 5 }

## D3DLIGHT\_POINT

enum D3DLIGHT\_POINT { D3DLIGHT\_POINT = 1 }

## D3DLIGHT\_SPOT

enum D3DLIGHT\_SPOT { D3DLIGHT\_SPOT = 2 }

## D3DLIGHT\_DIRECTIONAL

enum D3DLIGHT\_DIRECTIONAL { D3DLIGHT\_DIRECTIONAL = 3 }

## D3DLIGHT\_PARALLELPOINT

enum D3DLIGHT\_PARALLELPOINT { D3DLIGHT\_PARALLELPOINT = 4 }

## D3DLIGHT\_GLSPOT

enum D3DLIGHT\_GLSPOT { D3DLIGHT\_GLSPOT = 5 }

enum D3DLIGHTTYPE { D3DLIGHT\_POINT = 1, D3DLIGHT\_SPOT = 2, D3DLIGHT\_DIRECTIONAL = 3, D3DLIGHT\_PARALLELPOINT = 4, D3DLIGHT\_GLSPOT = 5 }

### 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;
```

ŽÀ sfobftf@,İfIfyfR [fh,ðŠÜ,D B

#### D3DOP\_POINT

fĈf“f\_f% [,É“\_„ð—,é BfIfyf%of“fh Eff [f^,Í AD3DPOINT \‘ċ’İ,Ăžw’è,³,ê,é B

#### D3DOP\_LINE

fĈf“f\_f% [,É ü„ð—,é BfIfyf%of“fh Eff [f^,Í AD3DLINE \‘ċ’İ,Ăžw’è,³,ê,é B

#### D3DOP\_TRIANGLE

fĈf“f\_f% [,ÉŽOŠpĈE\„ð—,é BfIfyf%of“fh Eff [f^,ÍID3DTRIANGLE \‘ċ’İ,Ăžw’è,³,ê,é B

#### D3DOP\_MATRIXLOAD

fĈf“f\_fŠf“fO EfGf“fWf“„Éff [f^“]—  
,,éfgfŠfK [,Ā,È,é BfIfyf%of“fh Eff [f^,ÍID3DMATRIXLOAD \‘ċ’İ,Ăžw’è,³,ê,é B

#### D3DOP\_MATRIXMULTIPLY

fĈf“f\_fŠf“fO EfGf“fWf“„Éff [f^“]—  
,,éfgfŠfK [,Ā,È,é BfIfyf%of“fh Eff [f^,ÍID3DMATRIXMULTIPLY \‘ċ’İ,Ăžw’è,³,ê,é B

#### D3DOP\_STATETRANSFORM

•İŠ·f,fWf... [f←  
p,İfĈf“f\_fŠf“fO EfGf“fWf“„É A“à•” ó‘Ŏ•İ ”,İl,ð Ý’è,·,é BfIfyf%of“fh Eff [f^,Í A•İ ”,Ā, ,éfg [fNf“,Ā  
V,μ,Ĉ’l,Ā, ,é Bfg [fNf“,Í A“à•” ó‘Ŏ•İ ”,ðŽ!,· B,±,İ•İ ””l,É,Í A V,μ,Ĉ’l,ª Ý’è,³,ê,é B,±,ê,ç,İ•İ ”,É,Ā,Ĉ  
,Ā,İ Ú ×,Í AD3DSTATE \‘ċ’İ,ĀD3DTRANSFORMSTATETYPE—ñċ“ĈE^,ðŽQ Ā,·,é,±,Ā B

#### D3DOP\_STATELIGHT

ĈEöĈE¹f,fWf... [f←  
p,İfĈf“f\_fŠf“fO EfGf“fWf“„É“à•” ó‘Ŏ•İ ”,İl,ð Ý’è,·,é BfIfyf%of“fh Eff [f^,Í A•İ ”,Ā, ,éfg [fNf“,Ā  
V,μ,Ĉ’l,Ā, ,é Bfg [fNf“,Í A“à•” ó‘Ŏ•İ ”,ðŽ!,· B,±,İ•İ ””l,É,Í A V,μ,Ĉ’l,ª Ý’è,³,ê,é B,±,ê,ç,İ•İ ”,É,Ā,Ĉ  
,Ā,İ Ú ×,Í AD3DSTATE \‘ċ’İ,ĀD3DLIGHTSTATETYPE—ñċ“ĈE^,ðŽQ Ā,·,é,±,Ā B

#### D3DOP\_STATERENDER

fĈf“f\_fŠf“fO EfGf“fWf“„Éff [f^“]—  
p,İfĈf“f\_fŠf“fO EfGf“fWf“„É“à•” ó‘Ŏ•İ ”,İl,ð Ý’è,·,é BfIfyf%of“fh Eff [f^,Í A•İ ”,Ā, ,éfg [fNf“,Ā  
V,μ,Ĉ’l,Ā, ,é Bfg [fNf“,Í A“à•” ó‘Ŏ•İ ”,ðŽ!,· B,±,İ•İ ””l,É,Í A V,μ,Ĉ’l,ª Ý’è,³,ê,é B,±,ê,ç,İ•İ ”,É,Ā,Ĉ  
,Ā,İ Ú ×,Í AD3DSTATE \‘ċ’İ,ĀD3DRENDERSTATETYPE—ñċ“ĈE^,ðŽQ Ā,·,é,±,Ā B

#### D3DOP\_PROCESSVERTICES

’,“\_„İĈEöĈE¹,Ā•İŠ·,ð Ý’è,·,é BfIfyf%of“fh Eff [f^,Í AD3DPROCESSVERTICES \‘ċ’İ,Ăžw’è,³,ê,é B

#### D3DOP\_TEXTURELOAD

fĈf“f\_fŠf“fO EfGf“fWf“„Éff [f^,ð“]—  
,,éfgfŠfK [,Ā,È,é BfIfyf%of“fh Eff [f^,Í AD3DTEXTURELOAD \‘ċ’İ,Ăžw’è,³,ê,é B

#### D3DOP\_EXIT

“ž”B,μ,½fŠfXfg,İ I—¹,É“ž”B,μ,½ž—,ðŽ!,· B

#### D3DOP\_BRANCHFORWARD

ŽÀ sfobftf@,İ•Šò,ð%Ā”\,Ā,·,é B Ú ×,Í AD3DBRANCH \‘ċ’İ,ðŽQ Ā,·,é,±,Ā B

#### D3DOP\_SPAN

““,¶Y'l,ì“\_ìfŠfXfg,©,çfXfpf“,đ'£,é B Ú ×,Í AD3DSPAN \‘ç'ì,đŽQ Æ,·,é,±,Æ B

**D3DOP\_SETSTATUS**

ŽÀ sfobftf@,ì ó'Ô,đfŠfZfbfg,·,é B Ú ×,Í AD3DSTATUS \‘ç'ì,đŽQ 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,đŽ ,Â B,Đ,Æ,Â,ìfIfyfR [fh,Í A,»,ìĚã,É'±, -,Ä,ç,,Â,©,ìfIfyf%of“fh,đŽ ,Â,±  
,Æ,ª,Â,«,é BfVfXfef€,Í AŠefIfyf%of“fh,ÂŠÖ`A,·,éfIfyfR [fh,đŠÈ'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`pf^ [f“,ì01,©,ç30,ð È—ª
    D3DRENDERSTATE_STIPPLEPATTERN31 = 95,
} D3DRENDERSTATETYPE;
```

**D3DOP\_STATE\_RENDERER** If y f R [f h—p, Ì f C e f “ f \_ f Š f “ f O ó ‘ Ô , ð Ý ‘ è , . , é B , ± , Ì — ñ “ C E ^ , Í A D 3 D S T A T E \ ‘ C ‘ Ì , Ì Ê • ” . Á ,  
 , é B Ž Ÿ , Ì L q , É L Ú , ³ , ê , ½ ‘ l , Í A , ± , Ì \ ‘ C ‘ Ì , Ì 2 ” Ô — Ú , Ì f f “ f o , É Ý ‘ è , ³ , ê , 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 , Á , , 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 , Á , , é B

### D3DRENDERSTATE\_TEXTUREADDRESS

**D3DTEXTUREADDRESS** — ñ “ C E ^ , Ì f f “ f o , Ì , ð , É , Á 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 , Á , , é B

### D3DRENDERSTATE\_TEXTUREPERSPECTIVE

T R U E , Ì , É , « A “ § Ž < C ³ B f f f t f H f < f g ‘ l , Í F A L S E , Á , , é B

### D3DRENDERSTATE\_WRAPU

T R U E , Ì , É , « A u • û C ü , É ‘ É , è • t , , é B f f f t f H f < f g ‘ l , Í F A L S E , Á , , é B

### D3DRENDERSTATE\_WRAPV

TRUE, ĭ, Ā, « Av•ûĈEü, É'Ě, è•t, ¯, é BffftfHf<fg'l, ĪFALSE, Ā, , é B

**D3DRENDERSTATE\_ZENABLE**

TRUE, ĭ, Ā, « AZfofbftf@, Ī"ãŠrfeFXfg, ð%Ā" \, É, ., é BffftfHf<fg'l, ĪFALSE, Ā, , é B

**D3DRENDERSTATE\_FILLMODE**

**D3DFILLMODE**—ñ«ĈĀ, ĭf f"fo, ĭ, Đ, Ā, Ā BffftfHf<fg'l, ĪD3DFILL\_SOLID, Ā, , é B

**D3DRENDERSTATE\_SHADEMODE**

**D3DSHADEMODE**—ñ«ĈĀ, ĭf f"fo, ĭ, Đ, Ā, Ā BffftfHf<fg'l, ĪD3DSHADE\_GOURAUD, Ā, , é B

**D3DRENDERSTATE\_LINEPATTERN**

**D3DLINEPATTERN** \ĉ'ĭ, Ā, , é BffftfHf<fg'l, ĪwRepeatPattern—p, É0, Ā AwLinePattern—p, É0, Ā, , é B

**D3DRENDERSTATE\_MONOENABLE**

TRUE, ĭ, Ā, « Af, fmfnf EfĈf"f\_Šf"fo, ð%Ā" \, Ā, ., é BffftfHf<fg'l, ĪFALSE, Ā, , é BfffofCfX, RGBfĈf"f\_Šf"fo, ðfTf| [fg, µ, Ā, Ĉ, È, Ĉ, Ā, « ATRUE, Ā, , é BfAfvfŠfP [fVf±f", Ī AffofCfX, RGBfĈf"f\_Šf"fo, ðfTf| [fg, µ, Ā, Ĉ, é, ©, ð**D3DDEVICEDESC** \ĉ'ĭ, ĪdcmColorModelf f"fo, ðŽg—p, µ, Ā<sup>2</sup>, ×, é, ±, Ā, Ā, «, é

**D3DRENDERSTATE\_ROP2**

TRUE, ĭ, Ā, « f, fmfnf EfĈf"f\_Šf"fo, ð%Ā" \, Ā, ., é BffftfHf<fg'l, ĪFALSE, Ā, , é BfffofCfX, RGBfĈf"f\_Šf"fo, ðfTf| [fg, µ, Ā, Ĉ, È, Ĉ, Ā, « ATRUE, Ā, , é BfAfvfŠfP [fVf±f", Ī AfTf| [fg, 3, é, ĉ'Ĉ%Āf%ofXf^ ^—, ĭ, Đ, Ā, Ā BffftfHf<fg'l, Ī AR2\_COPYPEN, Ā, , é BfAfvfŠfP [fVf±f", Ī AfTf| [fg, 3, é, ĉ'Ĉ%Āf%ofXf^ ^—, ðĈ"è, ., é**D3DPRIMCAPS** \ĉ'ĭ, ĪdwRasterCapsf f"fo, ĪD3DPRASTERCAPS\_ROP2ftf%fo, Žg—p, Ā, «, é B

**D3DRENDERSTATE\_PLANEMASK**

ULONGĈĀ, ĭ•— fvfĈ [f" f}fXfN BffftfHf<fg'l, Ī A0, Ā, , é B

**D3DRENDERSTATE\_ZWRITEENABLE**

TRUE, ĭ, Ā, « AZ 'ĉ, « ž, Ÿ, ð%Ā" \, Ā, ., é BffftfHf<fg'l, Ī ATRUE, Ā, , é B, ±, ĭf f"fo, Ī AfAfvfŠfP [fVf±f", ÉfVfXfēf€, " V, µ, ĈZ', ĀZfofbftf@, ð X V, ., é, ĭ, ð-h, @Ž-, ðĉ-%Ā, ., é B

**D3DRENDERSTATE\_ALPHATESTENABLE**

fAf<ftf@ EfefXfg, ð%Ā" \, Ā, ., é, ½, bTRUE BffftfHf<fg'l, Ī AFALSE, Ā, , é B, ±, ĭf f"fo, Ī AfAfvfŠfP [fVf±f", ÉfAf<ftf@'l, ĪŠĭ € , Ā, É, éfsfNfZfĉ, ĪŽó, Žæ, è, âŽó, Žæ, è, "Ū, Ī"ãŽ~, ðĉ-%Ā, ., é B

**D3DRENDERSTATE\_LASTPIXEL**

TRUE, ĭ, Ā, « A ü, ĭ ĀĈã, ĭfsfNfZfĉ, ð•%œ, ., é, ĭ, ðŽ~, B, é BffftfHf<fg'l, Ī ATRUE, Ā, , é B

**D3DRENDERSTATE\_TEXTUREMAG**

**D3DTEXTUREFILTER**—ñ«ĈĀ, ĭf f"fo, ĭ, Đ, Ā, Ā BffftfHf<fg'l, Ī AD3DFILTER\_NEAREST, Ā, , é B

**D3DRENDERSTATE\_TEXTUREMIN**

**D3DTEXTUREFILTER**—ñ«ĈĀ, ĭf f"fo, ĭ, Đ, Ā, Ā BffftfHf<fg'l, Ī AD3DFILTER\_NEAREST, Ā, , é B

**D3DRENDERSTATE\_SRCBLEND**

**D3DBLEND**—ñ«ĈĀ, ĭf f"fo, ĭ, Đ, Ā, Ā BffftfHf<fg'l, ĪD3DBLEND\_ONE, Ā, , é B

**D3DRENDERSTATE\_DESTBLEND**

**D3DBLEND**—ñ«ĈĀ, ĭf f"fo, ĭ, Đ, Ā, Ā BffftfHf<fg'l, ĪD3DBLEND\_ZERO, Ā, , é B

**D3DRENDERSTATE\_TEXTUREMAPBLEND**

**D3DTEXTUREBLEND**—ñ«ĈĀ, ĭf f"fo, ĭ, Đ, Ā, Ā BffftfHf<fg'l, ĪD3DTBLEND\_MODULATE, Ā, , é B

**D3DRENDERSTATE\_CULLMODE**

**D3DCULL**—ñ«ĈĀ, ĭf f"fo, ĭ, Đ, Ā, Ā BffftfHf<fg'l, ĪD3DCULL\_CCW, Ā, , é Bf<ftfgfEfFfA, ĭfĈf"f\_Šf"fo, Ī AĈĀ"è, ĭ Ø, è"2, « ± ~, ðŽ , ĭ A Ø, è"2, «f, [fh, ĭ•Ī X, ĪfTf| [fg, µ, È, Ĉ B

**D3DRENDERSTATE\_ZFUNC**

**D3DCMPFUNC**—ñ«ĈĀ, ĭf f"fo, ĭ, Đ, Ā, Ā BffftfHf<fg'l, ĪD3DCMP\_LESSEQUAL, Ā, , é B, ±, ĭf f"fo, Ī AfAfvfŠfP [fVf±f", Éfĭf f%o, ©, ĉ, ĭĉ—É, ðŠĭ € , Ā, ., éfsfNfZfĉ, ĪŽó, Žæ, è, âŽó, Žæ, è, "Ū, ðĉ-%Ā, ., é B

**D3DRENDERSTATE\_ALPHAREF**

fAf<ftf@ EfefXfg, %Ā" \, É, Ā, « AfefXfg, 3, è, éfsfNfZfĉ, É'Ī, ., éŽQ ĀfAf<ftf@'l, ðŽw"è, ., é'l B, ±, ĭ'l, ĪĈĀ, ĪD3DFIXED, Ā, , é BffftfHf<fg'l, Ī0, Ā, , é B

**D3DRENDERSTATE\_ALPHAFUNC**

**D3DCMPFUNC**—ñ«ĈĀ, ĭf f"fo, ĭ, Đ, Ā, Ā BffftfHf<fg'l, Ī AD3DCMP\_ALWAYS, Ā, , é B, ±, ĭf f"fo, Ī AfAfvfŠfP [fVf±f", ÉfAf<ftf@'l, ðŠĭ € , Ā, ., éfsfNfZfĉ, ĪŽó, Žæ, è, âŽó, Žæ, è, "Ū, ðĉ-%Ā, ., é B

**D3DRENDERSTATE\_DITHERENABLE**

TRUE, ĭ, Ā, « fffBfUfŠf"fo, ð%Ā" \, Ā, ., é BffftfHf<fg'l, ĪFALSE, Ā, , é B

**D3DRENDERSTATE\_BLENDENABLE**

TRUE,Ì,Æ,«fAf<ftf@,Ì ñ ‡,ð%Å”\,Æ,·,é BffftfHf<fg’l,ÍFALSE,Å, ,é B

**D3DRENDERSTATE\_FOGENABLE**

TRUE,Ì,Æ,«ftfHfO,ð%Å”\,Æ,·,é BffftfHf<fg’l,ÍFALSE,Å, ,é B

**D3DRENDERSTATE\_SPECULARENABLE**

TRUE,Ì,Æ,«“§%uß,ð%Å”\,Æ,·,é BffftfHf<fg’l,ÍTRUE,Å, ,é B

**D3DRENDERSTATE\_ZVISIBLE**

TRUE,Ì,Æ,«ZCEÿ ,ð%Å”\,Æ,·,é BffftfHf<fg’l,ÍFALSE,Å, ,é BZCEÿ ,Æ,Í A·%œ,·,é|  
fŠfSf“,ðCE©,Å,¯,é,½,ßZfofbftf@,É’Í,μ,ÄfefXfg,³,ê,é A,·,×,Ä,Ì|  
fŠfSf“,ÌfOf< [fv,ÌfXfNfŠ [f“óŠÔ,É·,©,ê,é|fŠfSf“,Å,Ì Ø,è”²,«Z,Ì,±,Æ,Å, ,é B

**D3DRENDERSTATE\_SUBPIXEL**

TRUE,Ì,Æ,«ftfufsfNfZf<,Ìù ³,ð%Å”\,Æ,·,é BffftfHf<fg’l,ÍFALSE,Å, ,é B

**D3DRENDERSTATE\_SUBPIXELX**

TRUE,Ì,Æ,«X,¾,¯,Ìù ³,ð%Å”\,Æ,·,é BffftfHf<fg’l,ÍFALSE,Å, ,é B

**D3DRENDERSTATE\_STIPPLEDALPHA**

TRUE,Ì,Æ,«“·,³,ê,½fAf<ftf@,ð%Å”\,Æ,·,é BffftfHf<fg’l,ÍFALSE,Å, ,é B

**D3DRENDERSTATE\_FOGCOLOR**

**D3DCOLOR**CE^,Ìl BffftfHf<fg’l,Í0,Å, ,é B

**D3DRENDERSTATE\_FOGTABLEMODE**

**D3DFOGMODE**—ñ“CE^,Ìf f“fo,Ì,Ð,Æ,Å BffftfHf<fg’l,ÍD3DFOG\_NONE,Å, ,é B

**D3DRENDERSTATE\_FOGTABLESTART**

ftfHfO Efe [fuf<,ÌŠJŽn B,±,ê,Í üCE`ftfHfO Ef, [fh,Ì,½,ßŠJŽn,³,ê,½ftfHfOCEø%Ê,ÌÊ’u,Å, ,é B

**D3DRENDERSTATE\_FOGTABLEEND**

ftfHfO Efe [fuf<,Ì I—1 B,±,ê,Í A üCE`ftfHfO Ef, [fh,Ì Å’â—§“x,É“ž’B,μ,½ftfHfOCEø%Ê,ÌÊ’u,Å, ,é B

**D3DRENDERSTATE\_FOGTABLEDENSITY**

üCE`ftfHfO Ef, [fh,Ì Å’âftfHfO—§“x,ð Ý’è,·,é B,±,Ìl,Ì’Í,Í A0,©,ç1,Å, ,é B

**D3DRENDERSTATE\_STIPPLEENABLE**

fffofCfX Efhf%ofCfo,Ö,Ì“·,ð%Å”\,Æ,·,é B“·,³,ê,½fAf<ftf@,“%Å”\,È,Æ,« ACE» Ý,Ì“·`fpf^ [f“,ð-  
³CEø,Æ,μ,È,¯,ê,Ì,È,ç,È,ç B

**D3DRENDERSTATE\_STIPPLEPATTERN00`D3DRENDERSTATE\_STIPPLEPATTERN31**

“·`fpf^ [f“ B,»,ê,¾,ê,ÌfCEf“f\_fŠf“fo ó’Ô,Í A“·`fpf^ [f“,Ì³—£ ü,É“K%ž,³,ê,é B

ŽQ Æ @D3DOPCODE AD3DSTATE

## D3DSHADEMODE

```
typedef enum _D3DSHADEMODE {
    D3DSHADE_FLAT      = 1,
    D3DSHADE_GOURAUD  = 2,
    D3DSHADE_PHONG    = 3,
} D3DSHADEMODE;
```

**D3DRENDERSTATETYPE**— $\tilde{n}^{\wedge}$ CE $\wedge$ , D3DRENDERSTATE\_SHADEMODE fCEf“f\_Šf“fO ó‘Ô—p,ÉfTf|  
[fg,<sup>3</sup>,ê,éfVfF [ffBf“fO Ef, [fh,ðŽw`è,·,é B

### D3DSHADE\_FLAT

•½-ÊfVfF [ffBf“fO Ef, [fh BŽOŠpCE`ì Å %o,ì’“\_ì F,Í A•\Ê,ì F,ðCE`è,·,é,½,B,ÉŽg—p,<sup>3</sup>,ê,é B

### D3DSHADE\_GOURAUD

fOf [ EfVfF [ffBf“fO Ef, [fh B•\Ê,ì F,Í AŽOŠpCE`ì,R,Â,ì’“\_ŠÔ,Â ‘,« ž,Û,ê,½ üCE`É,æ,èCE`è,<sup>3</sup>,ê,é B

### D3DSHADE\_PHONG

ftfHf“ EfVfF [ffBf“fO Ef, [fh B,±,ìf, [fh,Í ACE» ÝfTf| [fg,<sup>3</sup>,ê,Ä,ç,È,ç 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* [fg,<sup>3</sup>,ê,éfefNfXf`ff ~ ‡f, [fh,ð'è'è',·,é B,±,ì—ñ'“CE^,Í AD3DRENDERSTATETYPE—  
ñ'“CE^,ÍD3DRENDERSTATE\_TEXTUREMAPBLENDfCEf“f\_Šf“fO ó'Ô,É,æ,èŽg—p,<sup>3</sup>,ê,é B

### D3DTBLEND\_DECAL

*ffJ* [f< BfefNfXf`ff ~ ‡f, [fh,<sup>a</sup>fTf] [fg,<sup>3</sup>,ê,é B,±  
,ìf, [fh,Á,Í AfefNfXf`ff,ìRGB,ÆfAf<ftf@'l,Í AfefNfXf`ff,ÁŽg—p,<sup>3</sup>,ê,Á,ç,È,ç F,ð'uŠ',·,é B

### D3DTBLEND\_MODULATE

•í'² BfefNfXf`ff ~ ‡f, [fh,<sup>a</sup>fTf] [fg,<sup>3</sup>,ê,é B,±,ìf, [fh,Á,Í AfefNfXf`ff,ìRGB'l,Í AfefNfXf`ff,ÁŽg—  
p,<sup>3</sup>,ê,Á,ç,È,çRGB'l,ðEJ,è'Ô,· BfefNfXf`ff,ìfAf<ftf@'l,Í AfefNfXf`ff,ÁŽg—p,<sup>3</sup>,ê,Á,ç  
,È,ç F,ìfAf<ftf@'l,ð'uŠ',·,é B

### D3DTBLEND\_DECALALPHA

*ffJ* [f< EfAf<ftf@ BfefNfXf`ff ~ ‡f, [fh,<sup>a</sup>fTf] [fg,<sup>3</sup>,ê,é B,±  
,ìf, [fh,Á,Í AfefNfXf`ff,ìRGB,ÆfAf<ftf@'l,Í AŽŸ,ì•ù'òŽ@,ÁfefNfXf`ff,ÁŽg—p,<sup>3</sup>,ê,Á,ç  
,È,ç F,Á ~ ‡,<sup>3</sup>,ê,é B

$$C = (1 - A_t) C_o + A_t C_t$$

,±,ì•ù'òŽ@,Á AC,Í F AA,ìfAf<ftf@ At,ìfefNfXf`ff Ao,ÍCE³,ìfIfufWfFfNfg( ~ ‡'O,ì),ð'· B  
D3DTBLEND\_DECALALPHAf, [fh,Á AfefNfXf`ff,ìfAf<ftf@'l,Í AfefNfXf`ff,ÁŽg—p,<sup>3</sup>,ê,Á,ç  
,È,ç F,ìfAf<ftf@'l,ð'uŠ',·,é B

### D3DTBLEND\_MODULATEALPHA

•í'²fAf<ftf@,ìfefNfXf`ff ~ ‡f, [fh,<sup>a</sup>fTf] [fg,<sup>3</sup>,ê,é B,±  
,ìf, [fh,Á AfefNfXf`ff,ìRGB'l,Í ARGB'l,ð' ,â,µ AfefNfXf`ff,ìfAf<ftf@'l,à' ,â,· B

### D3DTBLEND\_DECALMASK

*ffJ* [f< Ef}fXfN,ìfefNfXf`ff ~ ‡f, [fh,<sup>a</sup>fTf] [fg,<sup>3</sup>,ê,é B

### D3DTBLEND\_MODULATEMASK

•í'²}fXfN,ìfefNfXf`ff ~ ‡f, [fh,<sup>a</sup>fTf] [fg,<sup>3</sup>,ê,é B

### D3DTBLEND\_COPY

•žÉfefNfXf`ff ~ ‡f, [fh,<sup>a</sup>fTf] [fg,<sup>3</sup>,ê,é B

•í'²,Í ACEðCE¹,ÆfefNfXf`ff,ì ì—  
p,Æ'Š æ,·,é B F,Í AO'È ãì'È%ò,ì'l,ÁŽw'è',ê,é B,»,µ,Á AfefNfXf`ff,âf\ [fX,æ,è'P"x,ì'á,ç F,É ‡,í,¹,Ä A^è  
,É ¶ ~,³,ê,½CEÁ X,ì F,ð'ì'²,·,é B,»,ì ~ª,ìf\ [fX,ì,Đ,Æ,Á,ªªª(1),ì,Æ,« A'P"x,ì'á,ç F ~ªª,ÍE, ,µ,È,ç B“—  
l,É AfIfufWfFfNfg,É'ì%ž,·,éfefNfXf`ff,ª Aªª(1 A1 A1)  
,ì,Æ,« AfefNfXf`ff,ì F,Í A^ŸŽ ,³,ê A'ì X,³,ê,È,ç B



### D3DTRANSFORMSTATETYPE

```
typedef enum _D3DTRANSFORMSTATETYPE {
    D3DTRANSFORMSTATE_WORLD          = 1,
    D3DTRANSFORMSTATE_VIEW           = 2,
    D3DTRANSFORMSTATE_PROJECTION     = 3,
} D3DTRANSFORMSTATETYPE;
```

**D3DOPCODE** — `enum D3DOP_STATE_TRANSFORM` [fhp, É.š. ó.Ô, đžw'è, ,é B, ±, Ĩ—  
ñ<“Ē^, Ĩ D3DSTATE \‘c‘Ĩ, Ĩê”, Ā, ,é B

**D3DTRANSFORMSTATE\_WORLD**

**D3DTRANSFORMSTATE\_VIEW**

**D3DTRANSFORMSTATE\_PROJECTION**

•š. , ,éf [f<fh Afrf... [ A“Š%oe, Ĩ”z—ñ, đ'è<, ,é BfftfHf<fg'l, Ĩ ANULL, Ā, ,é(“~ê, Ĩ”z—ñ) B

ŽQ Æ @D3DOPCODE A D3DRENDERSTATETYPE

»,i¼,iE^

## **D3DCOLOR**

```
typedef DWORD D3DCOLOR, D3DCOLOR, *LPD3DCOLOR;
```

```
, ±, ì¸¸, í AŠî-{"I, È Direct3D, ì F¸¸, Å, , é B
```

```
ŽQ Æ @D3DRGB A D3DRGBA
```

## D3DVALUE

```
typedef float D3DVALUE, *LPD3DVALUE;
```

```
, ±, ìE^, í AŠî-{"I, ÈDirect3D, ì• "ff [f^E^, Å, , é B
```

•Ô'l

fGf%o [,Í•%o ”l,Â•\,³,ê A'g,Ý ‡,i,³,ê,é,±,Æ,Í,È,ç BŽŸ,É A,·,×,Ä,ÏDirect3Df f\fbfh,É,æ,è•Ô,³,ê,é'l,Ïê——  
,đŽ',· BĈÊ X,Ïf f\fbfh,Ï•Ô'l,É,Â,ç,Ä,Í AŠef f\fbfh,ÏkL q,đŽQ 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, ϕ îñ**

«» Ý, ÌMicrosoft® DirectInput™, Í AfWfþfCfXfefBfbfN, Î, ©, è, Á, È, f}fEfX, ·, æ, ÑfL [f{ [fh“ü—ÍffofCfX, àfTf] [fg, μ, Á, ϕ, é Bf}fEfX, ·, æ, ÑfL [f{ [fh, É‘Í, ·, éAPI, Í ACOM, ÌIfufWfFfNfg, ·, æ, ÑfCf“f^ [ftfF [fX, ð—p, ϕ, é B DirectInput, Í Af}fEfX, ·, æ, ÑfL [f{ [fh Eff [f^, É‘Í, μ, Á·W €Win32 API, æ, è, à , ‘-, ÈfAfNfZfX, Á, «, é B

Windows 95, É‘g, Ý ž, Ü, ê, ½DirectInput

1.0, É, æ, Á, Á AfffWf^f< EfWfþfCfXfefBfbfN EfffofCfX, Ö, ÌfAfNfZfX, “%Á”\, É, È, Á, ½ B, ± , è, ÌJoyGetPosEx, È, Ç, Ì, ϕ, ·, Á, ©, ÌAPI AfLffšfufϕ [fVfþf“— pfAfVfϕfbfg(joy.cpl) A, ·, æ, ÑffWf^f< EfWfþfCfXfefBfbfN EfffofCfX, ÌfTf] [fg, ð%Á”\ , Á, μ, ½VJOYD.VXD, ðšî—{, Á, ·, éfhf%oCfo Ef, fff<, ©, ç \ -, ³, è, Á, ϕ, é B

fo [fWfþf“ 1.0, Ìfšš [fX^È—^ ADirectX SDK, ÉŠÖ, μ, Á Á, à%ü—Ç, Ì—v< , “½, ©, Á, ½“\_, Ì, D, Á, Á, Í Af} fEfX, ·, æ, ÑfL [f{ [fh Eff [f^, Ö, ÌfAfNfZfX, ð, ±, è, Ü, Á, ÌWindows, æ, è, à, ³, ç, É , “-%», ·, é, Á, ϕ, ρ, ±, Á, Á, , Á, ½ B, » , è , “-{fo [fWfþf“, ÌDirectInput, “-Ü·W, Á, μ, ½, ±, Á, Á, , é BDirectInput 3.0, É, æ, è Af} fEfX, ·, æ, ÑfL [f{ [fh Eff [f^, É‘Í, μ, Á, ³, ç, É , ‘-, ÈfAfNfZfX, “%Á”\, É, È, é BDirectInput 1.0 , Á, ÍÜ, È, è ADirectInput 3.0, Ìf} fEfX, ·, æ, ÑfL [f{ [fh, É‘Í, ·, éAPI, Í ACOMfIfufWfFfNfg, ·, æ, ÑfCf“f^ [ftfFfCfX, ðŽg—p, μ, Á, ϕ, é B

DirectInput, Ì «—, Ìfo [fWfþf“, Á, Í AfWfþfCfXfefBfbfN EfffofCfX, É‘Í, μ, ÁCOM, “t%Á, ³, è, é, ± , Á, É, È, é BftfH [fX ftfB [fhfobfN, ðfTf] [fg, ·, éfWfþfCfXfefBfbfN EfffofCfX, É‘Í, μ, Á, Í A DirectInput, Á, à, » , ÌfTf] [fg, “t%Á, ³, è, é B”Á—p“ü—ÍffofCfX(“Á’è, ÌDirectInputfCf“f^ [ftfFfCfX, É, æ, è’¼ ÚfTf] [fg, ³, è, Á, ϕ, È, ϕffofCfX), ðfTf] [fg, ·, é<@”\, à·t%Á, ³, è, é B

## DirectInputŠT—v

Windows DirectX SDK ,É,æ,è A ,“x,ÈfRf“fsf... [f^fQ [f€,ð ì ¬,·,é,±,Æ,ª,Â,«,é BDirectInput,Í A“ü—  
ÍfffofCfX Eff [f^,Ö,Ì ,‘¬,Å•Ö—~,ÈfAfNfZfX,ð%oÂ^,Æ,·,éDirectX SDKfRf“f] [flf“fg,Â, ,é B

—{ Í,Ì-Ú“Í,Í Afo [fWf‡f“3.0,ìDirectInput  
fAfvfŠfP [fVf‡f“ Efvf fOf%of~f“fO EfCf“f^ [ftfFfCfX,“,æ,ÑCOMfCf“f^ [ftfFfCfX,É,Â,ç,Ä à-¾,·,é,±  
,Æ,Â, ,é B,±,±,Ä,Íf}fEfX,“,æ,ÑfL [f{ [fh“ü—Í,ìfTf] [fg,É•K—v,ÈAPI,ÆCOMfCf“f^ [ftfFfCfX,É,Â,ç  
,Ä,Ì,Ý à-¾,µ ADirectInput 1.0,É,Â,ç,Ä,Í G,ê,È,ç B

**DirectInput,É,æ,éfWf‡fCfXfefBfbfN,ÌfTf| [fg**

DirectInput

API,Í AfAfif fO,“,æ,ÑffWf^f< EfWf‡fCfXfefBfbfN,É‘Î,µ,Ä ,‘¬,©,Â ® ‡ «,Ì, ,éfAfnfZfX,ð’ñ<ÿ,·,é B,± ,ÌAPI,Í A Microsoft Win32® f\ftfgfEFAŠJ”fLfbfg (SDK),ÌfWf‡fCfXfefBfbfNAPI,Æ,Ì ® ‡ «,ð‘ÛŽ ,µ,Ä,¢ ,é,ª Af^fCfX Efhf%ofCfo Ef,ffif<,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<“,ÌfWf‡fCfXfefBfbfN,Ì Ý’è,âÈ‘O Ý’è,³,ê,½fWf‡fCfXfefBfbfN,ÌLfffŠfufŒ [fVf‡f“ îñ,ðfŒf WfXfgfŠ,ÉŠi”[.,é B

–{ B,Ä,Í AfWf‡fCfXfefBfbfN,ðfTf| [fg,·,éDirectInputŠÖ ”,Æf fbfZ [fW,“,æ,Ñ \‘c‘Î,É,Ä,¢,Ä à–¾,µ A Win32fWf‡fCfXfefBfbfNAPI,©,ç,İ X“\_ð–¾,ç,©,É,·,é BDirectInput API,Í Af^fbf^fXfNfŠ [f“,âf^fufŒfbfg Af%ofCgfyf“,Æ,¢,Ä,½ â‘Î À•WŒn“à,ÄÈ‘u,ð‘Ç Ō,·,é‘¼,İâ •“ü– ÍffofCfX,É,à“K—p,³,ê,é B<@”\Šg’Œ ,É,æ,è Af%of\_ [ Efyf\_f< Aftf%ofCfg Ef^ [fN Afo [f^ffif< EfŠfAfŠfefB EfwfbfhfMfA,È,Ç‘¼,ÌffofCfX,É ‘Î,·,éfTf| [fg,à’ñ<ÿ,³,ê,é BŠeffofCfX,Í Ä‘â6–{,Ì%o^“®Ž² AZ<“\_fnfbfg,“,æ,Ñ32ŒÄ,Ìf{f^f“,ð—p,¢,é,± ,Æ,ª,Ä,«,é B

DirectInputŠÖ ”,ð—p,¢,Ä AfWf‡fCfXfefBfbfN,“,æ,ÑfWf‡fCfXfefBfbfN Efhf%ofCfo,Ì”\— Í,ðŠ^,©,µ,½fAfvfŠfP [fVf‡f“,ðffUfCf“,·,é,± ,Æ,ª,Ä,«,é B,Û,½ AÈ‘u,“,æ,Ñf{f^f“ îñ,ðfWf‡fCfXfefBfbfN,©,çŽæ“¾,·,é,±,Æ,ª,Ä,«,é B

,±,Ì B,Ä,ÍDirectInputRf“f| [flf“fg,ª’ñ<ÿ,·,éfWf‡fCfXfefBfbfN EfTf| [fg,É,Ä,¢,Ä,Ì îñ,ð‘µ,□ B

fWf‡fCfXfefBfbfN,Ì<@”

fWf‡fCfXfefBfbfN,ÌLfffŠfufŒ [fVf‡f“,“,æ,ÑfefXfg

fWf‡fCfXfefBfbfN,ÌÈ‘u

**fWf#CfXfefBfbfN,ì@”**

DirectInputT [frfX,Í AfIfyfE [fefBf“fO EfVfXfef€N“@Žž,Éf [fh,<sup>3</sup>,é,é BDirectInput,ÍfAfif fO,;æ,ÑffWf  
^f<,lfWf#CfXfefBfbfN,ðfTf| [fg,·,é BfAfif fO EfWf#CfXfefBfbfN,Í A,æ,èfŠfAf<f^fCf€,É%ž“š,ð•K—  
v,Æ,µ AfIfWf^f< EfWf#CfXfefBfbfN,æ,è,à‘â,«,È•%×,ðfVfXfef€,É—  
^,|,é BDirectInputT [frfX,Í A^Û,È,é \ ¬,ÍfAfif fO EfWf#CfXfefBfbfN,ð•j ”“~Žž,Éf,fjf^,·,é,±  
,Æ,<sup>a</sup>,Á,«,é B,»,ì \ ¬,Í A Á‘â4-{,Ì%“@Žž,ð‘Ç Ö,µ Á‘â4,Á,Íf{f^f“,ð—p,¢  
,éfAfif fO EfWf#CfXfefBfbfN2Šî,©,ç A2-{,Ì%“@Žž,ð‘Ç Ö,µ Á‘â4,Á,Íf{f^f“,ð—p,¢  
,éfAfif fO EfWf#CfXfefBfbfN4Šî,Û,Á,Ì‘ÍÍ,É“n,é B,Û,½ffWf^f< EfWf#CfXfefBfbfN,É,Á,¢  
,Á,Í“~Žž,É Á‘â16Šîf,fjf^,Á,«,é B1Šî, ,½,è A%“@Žž,Í Á‘â6-{ Af{f^f“,Í Á‘â32EÁ,Û,Á,Á, ,é B

fWf#CfXfefBfbfN,<sup>a</sup>Ç Ö,·,éŠe%“@Žž,É,Í i“@”ÍÍ,<sup>a</sup>, ,é B i“@”ÍÍ,Æ,Í AfWf#CfXfefBfbfN,Ìnf“fhf<,ðfjf...  
[fg%of<,Û,½,Í Áž~ ó‘Ò,ÌÈ‘u,©,ç“@,©,1,é“è”Ô—£,è,½“\_,Û,Á,Ì<—£,Á, ,é B

fWf#CfXfefBfbfN Ehf%ofCfo,Í Á‘â16,Ìf~fjf%ofCfo,ðfTf|  
[fg,µ AŠef~fjf%ofCfo,Í,Ð,Æ,Á,lfWf#CfXfefBfbfN,ðfTf| [fg,·,é BjoyGetNumDevsŠÖ ”,ð—p,¢,é,±  
,Æ,È,æ,è AfWf#CfXfefBfbfN Ehf%ofCfo,<sup>a</sup>fTf| [fg,·,éfWf#CfXfefBfbfN ”,ð‘²,×,é,±,Æ,<sup>a</sup>,Á,«,é B,±  
,ÌŠÖ ”,Ífhf%ofCfo,<sup>a</sup>fTf| [fg%Á”  
,ÉfWf#CfXfefBfbfN ”,ðžw’è,·,é•, †,È,µ @ ”,ð•Ô,· BfWf#CfXfefBfbfN,<sup>a</sup>fTf| [fg,<sup>3</sup>,è,Ä,¢  
,È,¢ è †,Í0,ð•Ô,· B

fAfvfŠfP [fVf#f“,Í AjoyGetPosExŠÖ ”,ð—p,¢,é,±,Æ,É,æ,è AfRf“fsf... [f^,ÉfWf#CfXfefBfbfN,<sup>a</sup> Ú‘±  
,<sup>3</sup>,è,Á,¢,é,©,Ç,©,<sup>2</sup>,×,é,±,Æ,<sup>a</sup>,Á,«,é B,±,ÌŠÖ ”,Í Ažw’è,<sup>3</sup>,è,½ffofCfX,<sup>a</sup> Ú‘±,<sup>3</sup>,è,Á,¢  
,è,ÌJOYERR\_NOERROR A,»,¤,Á,È,\_,è,ÌJOYERR\_UNPLUGGED,ð•Ô,· B

ŠefWf#CfXfefBfbfN,É,Í AfAfvfŠfP [fVf#f“,©,ç—~—p%Á”,È<@”\,<sup>a</sup>,¢,,Á,©‘¶ Ý,·,é B,»,ì<@”  
,Í AjoyGetDevCapsŠÖ ”,ð—p,¢,Á‘²,×,é,±,Æ,<sup>a</sup>,Á,«,é B,±,ÌŠÖ ”,Í AfWf#CfXfefBfbfN,Ì—  
L€ø,È%“@Žž,â Á•W€n,Ì Á ¬‘1,“,æ,Ñ Á‘â‘1 AfWf#CfXfefBfbfN ã,Íf{f^f“ ”,Æ,¢  
,Á,½fWf#CfXfefBfbfN,ì@”\,ðJOYCAPS \‘ç‘Ì,É‘ã“ü,·,é B

---

· ~Ó

joyGetNumDevs,Ì•Ô‘1,Í AfVfXfef€,É Ú‘±,<sup>3</sup>,è,½fWf#CfXfefBfbfN ”,Á,Í,È, AfVfXfef€,<sup>a</sup>fTf|  
[fg,·,éfWf#CfXfefBfbfN ”,ðž’,· B

---

fWf#fCfXfefBfbfN,lfLfffŠfufŒ [fVf#f“,;æ,ÑfefXfg

ÿ“@”ÍÍ,âf{f^f“,È,Ç AfWf#fCfXfefBfbfN,lfLfffŠfufŒ [fVf#f“,;æ,ÑfefXfg,ð,·,é,½,ß,É AMicrosoft Windows®  
95,lfRf“fgf [f<fpflf<,É,lfWf#fCfXfefBfbfN EfAfvfŠfP [fVf#f“,ª,·,é Bf† [fU,Í A,±  
,lfAfvfŠfP [fVf#f“,©,çÈ%°,lfWf#fCfXfefBfbfN,ð‘I’ð,Â,«,é B

ˆê”Ê“I,ÈfWf#fCfXfefBfbfN

OEMfWf#fCfXfefBfbfN

fJfXf^f€ EfWf#fCfXfefBfbfN

,±,lfAfvfŠfP [fVf#f“,É,æ,è AŠefWf#fCfXfefBfbfN,É‘Í,µ,Ä A Ä‘â6-

{,l%o^“@Ž² A32,lf{f^f“,;æ,ÑŽ<“\_fnfbfg,lfLfffŠfufŒ [fVf#f“,;æ,Ñf

,Æ,È,é BfLfffŠfufŒ [fVf#f“ îñ,lfŒfWfXfgfŠ,ÉŠ”[³,è,é,Ì,Â A ÄfLfffŠfufŒ [fVf#f“,·,é,±,Æ,È,-

fWf#fCfXfefBfbfN,ð•Ê,Ì,à,Ì,ÉŽæ,è‘Ö,!,é,±

,Æ,ª,Â,«,é Bf† [fU,ª V,½,ÈfWf#fCfXfefBfbfN,ðfLfffŠfufŒ [fVf#f“,µ,½,èfŠfXfg,©,ç‘I’ð,µ,½,è,·,é,Æ AfLff

fŠfufŒ [fVf#f“—pfAfvfŠfP [fVf#f“,Í‘I’ð,³,è,½fWf#fCfXfefBfbfN,;æ,ÑfLfffŠfufŒ [fVf#f“ îñ,É,Â,ç

,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,ç,é,±

,Æ,È,æ,è A“Á’è,lfWf#fCfXfefBfbfN,É‘Í,µ A%oeç,Ì,·,éŒfWfXfgfŠ•İ X îñ,ð’Ê’m,·,é,±,Æ,ª,Â,«,é B

**fWf#fCfXfefBfbfN,îÊ'u**

joyGetPosExŠÖ ",ð—p,ç,é,±,Æ,É,æ,è A^Ê'u,;,æ,Ñf{f^f" î•ñ,ðfWf#fCfXfefBfbfN,©,çŽæ“¾,·,é,±,Æ,ª,À,«,é B,±,İŠÖ ",Í A^Ê'u,İx Ay Az À•W,ðŠÜ,ß,ÄWin32 API,İĈfWf#fCfXfefBfbfNŠÖ ",©,ç•Ö,³,é,éÊ'u î•ñ,ðŽæ“¾,·,é,±,Æ,ª,À,«,é B,Û,½joyGetPosExŠÖ ",É,æ,è A^È%°,İ î•ñ,ÖfAfNfZfX,À,«,é B

4 A5 A6”Ô–Ú,İŽ² ir Au,;,æ,Ñv j,İ óÔ

f%of\_ [ î•ñ

Ž<“\_fnfbfg

À‘ã32ÆĀ,İf{f^f“,İ óÔ î•ñ

fLfffŠfufÆ [fVf#f“³,ê,Ā,ç,È,ç(“¾,ç,ê,½,Û,Û,Ì)fWf#fCfXfefBfbfN,İff [f^

'è<³,ê,Ā,ç,é¹,Ì”ÍĪ,Ā•]‰z,³,ê,½ff [f^

'† S,É, ,é•]‰zff [f^

fWf#fCfXfefBfbfN,İfjf... [fgf%of<Ê'uŽüĪ,İfffbfhf] [f“,ðŠÜ,B,½•]‰zff [f^

**DirectInput,É,æ,éfL** [f{ [fh,¨,æ,Ñf}fEfX,ÌfTf| [fg

,±,ì ß,Ä,ÍDirectInputfRf“f| [flf“fg,ª”ñ<ÿ,·,éfL [f{ [fh,¨,æ,Ñf}fEfX,ÌfTf| [fg,É,Ä,ç,Ä à¾,·,é B

DirectInput flfufWfFfNfg

DirectInputDeviceflfufWfFfNfg

f}fEfX EfffofCfX,©,ç,ìff [f^Žæ“¾

fL [f{ [fh EfffofCfX,©,ç,ìff [f^Žæ“¾

fL [f{ [fh EfXfLfff“fR [fh

“ú–{CEêfL [f{ [fh

**DirectInput fIfufWfFfNfg**

**DirectInput**fIfufWfFfNfg, **DirectInput**fTfufVfXfef€, δ\*, · BfAfvfŠfP [fVf±f“, **DirectInputCreate**  
API, δCEÄ, Ñ o, μ, Ä**DirectInput**fIfufWfFfNfg, δ ì ¬, ·, é B **DirectInputCreate**  
API, í A**DirectInput**fCf“f^ [ftfFfCfX, δ•Ô, · B

**DirectInput**fCf“f^ [ftfFfCfX, Ö, ì|fCf“f^, “¾, ç, ê, é, Æ A**DirectInput**, “@ ì%oÄ”, È“ü—ÍffofCfX, ð—ñ<“, ·, é, ±  
, Æ, ^, Ä, «, é B“ü—ÍffofCfX, **DirectInput::EnumDevices** f\fbfh, É, æ, è—ñ<“, ^, é, é B

**DirectInputDevice fIfufWfFfNfg**

**DirectInputDevice**fIfufWfFfNfg,Í Af}fEfX,âfL {f{ [fh,»,ì¼,ì“ü—ÍffofCfX,ð\ ,· BfAfvfŠfP [fVf‡f“,Í**IDirectInput::CreateDevice** f\fbfh,ðEÄ,Ñ o,μ,Ä**DirectInputDevice**fIfufWfFfNfg,ð ì ¬, ·,é B **IDirectInput::CreateDevice** f\fbfh,Í **AIDirectInputDevice**fCf“f^ [ftfFfCfX,ð•Ô,· B

IDirectInput::CreateDevice,ì‘æ^ê,ìfpf%of [f^,ÍfCf“fXf^f“fXGUID,Ä 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,Ä,¢ ,é,Ó,½,Â,ÌfCf“fXf^f“fXGUID,ª ,é BGUID\_SysMouse,“,æ,ÑGUID\_SysKeyboard,Ä, ,è A,»,è,¼,êf† [fU,ÌŽâf} fEfX AŽâfL {f{ [fh,ð\,· B

f}fEfX EfffOfCfX,©,ç,İff [f^Žæ“¾

f}fEfX EfffOfCfX,©,ç,İff [f^,đŽæ“¾,.,é,É,Í Ac\_dfdIMouseff [f^ EftfH {f} fbfG,ÄIDirectInputDevice::SetDataFormat,đCEÄ,Ñ o. Bf} fEfX EfffOfCfX,©,ç,Ö,³,é,éff [f^,Í AfXfNfŠ [f“ Ä•W,Ä,Í,È,f}fEfX,“Ú“@,µ,½f+fjfbfg ”,đŠi,É,µ,Ä,ç,é B,± ,é,ç,İf}fEfX Eft+fjfbfg,İf}fEfX Efn [fhfEfFfA(f~fbfL [,Æ,àCEÄ,Í,é,é),©,ç,Ö,³,é,éŽÄ Ü,İ,İ,đŠi,É,µ,Ä,ç ,é BDirectInput,Í,»},İff [f^,đ C ³ A%oÄ H,.,é,±,Æ,Í,È,ç Bf}fEfX Eff [f^,đ,»,İ,Ü,Ü•Ö,.,¾,Ä, ,é B

f}fEfX,©,ç,Ö,³,é,éff [f^,Í,Š,İff [f^ A âİff [f^,İ,ç,.,é,Ä,à,æ,ç Bf} fEfX,Í,Š,İ“İ,ÈffOfCfX,È,İ,Ä AffftfHf<fg,Ä,Í,Š,İff [f^,•Ö,³,é,é Bf} fEfX EfffOfCfX,İŽ²f, [fh,Í A•Ö,³,é,éff [f^,“Š,İ,Ä, ,é,© âİ,Ä, ,é,©,đŽw’è,.,é B,± ,é,İIDirectInputDevice::SetPropertyf ffbfh,đ%oi,µ,Ä,İ X%oÄ”,ÈffOfCfX Efvf fpfefB,Ä, ,é BŽ²f, [fh,đ âİ,È fZfbfg,.,é,É,Í AREFGUIDfPf%of [f^,đDIPROP\_AXISMODE,È,µ,ÄIDirectInputDevice::SetProperty,đCEÄ,Ñ o. B,»,µ,Ä A DIPROPDWORD \‘ç,İ,İdwDataftfB [f<fh,đDIPROPAXISMODE\_ABS,ÈfZfbfg,.,é B

f}fEfX EfffOfCfX,É,Í,.,éŽ²f, [fh,“Š,İ,ÈfZfbfg,³,é,Ä,ç,é,Æ,« AZ² Ä•W,Í“Ä’,İŽ²,É,»,Ä,ÄffOfCfX,“Ú“@,µ,½f} fEfXf+fjfbfg ”,đ•, B•%o,İ,İ,Í Af}fEfX,“xŽ²,É,»,Ä,Ä ¶ü,Ö AyŽ²,É,»,Ä,Ä äü,Ö A, ,é,ç ,İzŽ²,É,»,Ä,ÄEäü,Ö“Ú“@,µ,½,±,Æ,đŽ!, B ³,İ,İ Af}fEfX,“xŽ²,É,»,Ä,Ä%eü,Ö AyŽ²,É,»,Ä,Ä%oü,Ö A, ,é,ç ,İzŽ²,É,»,Ä,Ä•Öü,Ö“Ú“@,µ,½,±,Æ,đŽ!, B

’ Ó,.,x,«È,İ,Í Af}fEfX,É,Í âİÊ’u,Æ,ç,µ l,•ü,“¶ Ý,µ,È,ç,Æ,ç,µ“Ä, ,é B,»İE%oÈ A âİ Ä•W, İDirectInput,©,ç“¾,ç,é,½,.,x,Ä,İ,Š,İ“Ú“@,đP,É ±Ev,µ,½,à,İ,Æ,È,é B,±,é,Í âİ Ä•W,İ ”İ,È,ÍÖ—,³,É,ç,± ,Æ,đŽ!,µ,Ä,.,é Af}fEfX Eff[fCf“f^,İfXfNfŠ [f“ Ä•W,Æ,Í—ŠÖEW,Ä, ,é BfAfvfŠfP [fvf+f“ ,Í A âİ Ä•W,đ- çm,İE“—,É,Í,.,é,Š,İ Ä•W,Ä, ,é,Æ,µ,Ä,µ,µ B ½,Æ,.,İ AfAfvfŠfP [fvf+f“,İffOfCfX,İ”FŽ—¼Eä,É,»,İ,Æ,«,İ âİÊ’u,đL^,µ A,»,é,đ u%o¼’zE ‘\_ v,Æ,µ,Ä•ÜŽ ,.,é,±,Æ,Ä,«é B,»,µ,Ä^È ~,İ,»,±,©,çf}fEfX,“Ú“@,µ,½,Š,İ<—f ,đEvŽZ,.,é,½,ß,È AIDirectInputDevice::GetDeviceState, ,é,ç ,İIDirectInputDevice::GetDeviceData,đ%oi,µ,ÄffOfCfX,©,çŽæ“¾,³,é,é âİ Ä•W,©,ç%o¼’zE“—,Æ,İ ,.,đ,Æ,é,(± ,é,đŽY,İIDirectInputDevice::Unacquire,Ü,Ä‘±, ,é) B f ^,È,Š,İffOfCfX(f}fEfX,È,ç) ,É,., ,é âİ Ä•W,Í A^È•Ö,ÈL^,³,é,½^È’u,Æ,İ”äŠr,đ s,µ,Æ,«É,¾,^Ö—,³, ,é B

f}fEfX,İE» Ý,İ óÖ,đŽæ“¾,.,é,½,ß,È,Í Af} fCf“f^,đDIMOUSESTATE \‘ç,İ,ÖfZfbfg,µ,ÄIDirectInputDevice::GetDeviceState,đCEÄ,Ñ o. Bf}fEfX,İ óÖ,É,İf} fEfX,İÊ’u,äŞeff{f^f“,İ óÖ,Æ,ç,Ä,½ îñ,³, ,é B

f}fEfX,©,çfOfbftf@ Eff [f^,đŽæ“¾,.,é,É,Í ADIDEVICEOBJECTDATA \‘ç,İ,İ”z—ñ,đ İ ,µ Af}fCf“f^,.,æ,Ñ”z —ñ,İfTfCfY,đŠÜ,đ•İ ”,đIDirectInputDevice::GetDeviceData,Ö“n,³,È, ,é,İ,È,ç,È,ç B“ü—ÍÖ,ç s—ñ,Éff [f^,³,È, È,é,ç, ,é,ç,İ”z—ñ,²,»,Ü,Ä,Ä,µ,Ü,µ,Ü,Ä ADirectInput,Í Ä,àCEÄ,çf}fEfX Eff [f^,©,ç”z—ñ,È“ü,È,Ä,ç, B IDirectInputDevice::GetDeviceData,©,ç,Ö,³,é,éffTfCfY,İ ”,İŽæ Ü,ÈŽg—p,³,é,Ä,ç,é”z—ñ—vf ”,Ä, ,é Bf} fEfX,©,çfOfbftf@ Eff [f^,đŽæ“¾,.,é Ü A’Pê,İDIDEVICEOBJECTDATA \‘ç,İ,È—^,!,ç,é,éff [f^,İf} fEfX ä,İP^èfIfufWfFfNfg,İ óÖ,ÈŠÖ,.,é,İ X—,Ä, ,é B,½,Æ,.,İ A“TCE^I,Èf} fEfX,È,İÄ,Ä,İfIfufWfFfNfg A,.,É,İ,ç“ü—Íf [fX,“¶ Ý,.,é BxŽ² AyŽ² Af{f^f“0 Af{f^f“1,Ä, ,é Bf† [fU,“f{f ^f“0,đ%oY,µf}fEfX,đŽ!,ß•üEü,È“Ú“@,.,é,Æ A IDirectInputDevice::GetDeviceData,È“n,³,é,ÉDIDEVICEOBJECTDATA \‘ç,İ,İ”z—ñ,È,É,Í,Ä,İ—vf,“ä“ü,³,é,Ä,ç ,é Bf{f^f“0,“%oY,³,é,½,±,Æ,đŽ!,—vf AxŽ²•üEü,İ•İ%o»,³, Ä,½,±,Æ,đŽ!,—vf A,.,æ,ÑyŽ²•üEü,İ•İ%o»,³, Ä,½,± ,Æ,đŽ!,—vf,Ä, ,é B

IDirectInputDevice::GetDeviceData,İCEÄ,Ñ o,µ,İCEä AfAfvfŠfP [fvf+f“,Í A, ,ç,©,¶,ß’èç,³,é,Ä,ç ,é,è ”,ÆDIDEVICEOBJECTDATA \‘ç,İ,İdwOfsftfB [f<fh,Æ,đ”äŠr,.,é,±,Æ,È,æ,è”z—ñ’†,İ— vf,Ä,ç,İfIfufWfFfNfg,đŽQ Æ,µ,Ä,ç,é,ç,đ’m,é,±,Æ,Ä,«é B”äŠr,È—p,ç,é,è ”,Í ADIMOFBS\_BUTTON0 A DIMOFBS\_BUTTON1 ADIMOFBS\_BUTTON2 A DIMOFBS\_BUTTON3 ADIMOFBS\_X ADIMOFBS\_Y A,.,æ,ÑDIMOFBS\_Z,Ä, ,é B,±,é,ç,İ,è ”,Í A DIMOUSESTATE \‘ç,İ,Ä,İ,İ,İfIfZfbfg,đŽQ Æ,.,é B,±,é,ç,İ,è ”,đ—p,ç ,Ä,Ä ADIDEVICEOBJECTDATA \‘ç,İ,İff [f^,“f}fEfX ä,İ,ç,İfIfufWfFfNfg,đŽQ Æ,µ,Ä,ç,é,ç,đ ³Sm,È’m,é,± ,Æ,³,Ä,«é B,»,İfIfufWfFfNfg,È,İ,.,éŽÄff [f^,Í \‘ç,İ,İdwDataftfB [f<fh,È“¶ Ý,.,é Bf{f^f“ EIfufWfFfNfg,È, Ä,ç,Ä,İdwData,İ%o^ÈfOfCfG,¾,^—,Ä—LÖ,Ä, ,é B,±,İfOfCfG,İ äÊ’rfbfg,Í A,»,İf{f^f“,“%oY,³,é,é,ÆfZfbfg,³,é A—f ,³,é,é,ÆfNfŠfA,³,é B

ScrawlTf“fvf< EfAfvfŠfP [fvf+f“,Í AfOfbftf@ Eff [f^,đŽü W,µIDirectInputDevice::GetDeviceData,©,çŽæ“¾, µ,½ îñ,đ ^— ,.,é,ü—@,İ,Đ,Æ,Ä,đŽ!,µ,½,à,İ,Ä, ,éj

ff [f^,“IDirectInputDevice::GetDeviceData,©,çŽæ“¾,³,é,Ä,ç,é ê ±,İ,Ý AZŽ •t,«,İf}fEfX Eff [f^,“—p%oÄ”\ ,Æ,È,é B

fAfvfŠfP [fvf+f“,Í AfffOfCfX,đ”FŽ—,µ,Äff [f^,đŽæ“¾,.,é,Ö,É Af} fEfX EfffOfCfX,İ,İ²fCfxf<,đfZfbfg,µ,È, ,é,İ,È,ç,È,ç,İ,½,ß,È,Í A•K—

v,È'²f(ƒxf<,ðŽ),·ftf%oO,ðfZfbfg,μ,ÄIDirectInputDevice::SetCooperativeLevel,ðCEÄ,Ñ o,· BWindows  
95ŠÄ«%o°,Ä,Í Af}fEfX EfffofCfX,É'Í,μ,Ä`E%o°,Í'²f(ƒxf<,²fTf| [fg,³,è,Ä,ç,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'²f(ƒxf<,Íf}  
fEfX EfffofCfX,É'Í,μ,ÄfTf| [fg,³,è,Ä,ç,É,ç BSe'²f(ƒxf<,ÏÖ-;ÉŠÖ,·,é Ú ×,È îñ,É,Ä,ç,Ä,Í A,±  
,é,ç,Ï'²CE^è ”,É,Ä,ç,Ä,ÏL q,ðŽQ Æ,·,é,±,Æ B

DirectX,Ï «~fo [fWf±f“,Ä,Í AWindows NT ã,ÄDirectInput,²fTf| [fg,³,è,é,æ,α,É,È,é B,¾,ª AWindows NT,Ä,Íf}  
fEfX EfffofCfX,É'Í,μ,ÄDISCL\_FOREGROUND | DISCL\_EXCLUSIVE,μ,©fTf| [fg,³,è,È,ç Bf}  
fEfX Efhhf%oCfo,ÏfTf| [fgf(ƒxf<,É,æ,Ä,Ä,Í AWindows 95 ã,ÏDirectInput,Ä,àDISCL\_FOREGROUND |  
DISCL\_EXCLUSIVE,¾,~,ÏfTf| [fg,ÉCEÄ`è,³,è,é%oÄ”\ «,ª, ,é B,μ,½,ª,Ä,Ä A, ,é,¾,~,·,×,Ä,Ïvf%ofbfgftfH [f€  
,“,æ,Ñf}fEfX Efhhf%oCfo ã,ÄfAfvfŠfP [fVf±f“,ðŽÄ s,·,é·K-v,ª, ,é è ±,É,Í,±,Ï'²f(ƒxf<,ð-p,ç,é,×,«Ä, ,é A  
,Û,½Windows NT`%ož,ÏINPUT.DLLfvf(ƒfŠfŠ [fX Efo [fWf±f“(DirectX 3.0 SDK,ÏExtrasffBf(ƒNfgfŠ,É, ,é),ð-  
p,ç,½efXfg,ªK-v,Ä, ,é BWindows NTfo [fWf±f“,ÏDirectInput(“,æ,Ñf}fEfX Efhhf%oCfo,²fTf| [fg,³,è,Ä,ç  
,É,çWindows 95fo [fWf±f“,ÏDirectInput),ÏWindows  
95fo [fWf±f“,æ,è,à”É,ÉDIERR\_INPUTLOST,ð`É'm,·,é,Ï,Ä A,±,é,ç,ÏfP [fX,ð `u,·,é,æ,α  
,ÉfAfvfŠfP [fVf±f“,ð ‘,©,È,~,é,Ï,È,ç,È,ç B

**IDirectInputDevice::GetDeviceData**,Û,½,Í**IDirectInputDevice::GetDeviceState**,É,æ,èf}  
fEfX EfffofCfX,©,çff [f^,ðŽæ“¾,·,é‘O,É A**IDirectInputDevice::Acquire**,ðCEÄ,Ñ o,μ,ÄfffofCfX,ð”FŽ~,μ,Ä,“,©,È  
,~,é,Ï,È,ç,È,ç BfAfvfŠfP [fVf±f“,ª”f,³,è,½,è”ü-  
ÍftfH [fJfX,ðŽ,Ä,½,è,·,é,Æ,«,É,Í A**IDirectInputDevice::Unacquire**,ðCEÄ,Ñ o,μ,ÄfAfvfŠfP [fVf±f“,©,çf}  
fEfX EfffofCfX,ð%ð•ú,·,é,±,Æ,ª „ §,³,è,é BfAfvfŠfP [fVf±f“ Ef fjf... [, ,é,ç,ÏVfXfef€ Ef fjf...  
[,ª”I`ð,³,è,é,© A,Û,½,ÍfEfBf“fhfE,²fŠTfCfY, ,é,ç  
,ÍÚ“@,³,è,é è ±,à AfffofCfX,ð%ð•ú,μ,È,~,é,Ï,È,ç,È,ç BfAfvfŠfP [fVf±f“,Ï”f,ª%ð æ,³,è,½,èfAfvfŠfP [fVf±  
f“,ª”ü-  
ÍftfH [fJfX,ð Ä“xŠl“¾,μ,½,è,·,é,Æ,«,É,Í AfAfvfŠfP [fVf±f“,Í**IDirectInputDevice::Acquire**,ðCEÄ,Ñ o,μ,Äf}  
fEfX EfffofCfX,ð”FŽ~,μ’¼,·K-v,ª, ,é B

fAfvfŠfP [fVf±f“,ª**DISCL\_FOREGROUND**f, [fh,Äf}fEfX,ðŽg-p,μ,Ä,ç  
,é è ± A**IDirectInputDevice::GetDeviceData**,Û,½,Í  
**IDirectInputDevice::GetDeviceState**,©,ç,ÏDIERR\_INPUTLOST·Ô’l,ðf`fffbfN,·,é,±  
,Æ,ª „ §,³,è,é BfAfvfŠfP [fVf±f“,²ftfH [fJfX,ðŽ,ª Û ADirectInput,ÏŽ“@“I,Éf}  
fEfX,ð%ð•ú,·,é,½,ß A**DIERR\_INPUTLOST·Ô’l,ðŽó,~Žæ,Ä,½ è ±fAfvfŠfP [fVf±f“,Íf}  
fEfX EfffofCfX,Ï”FŽ~,ð Ä“x s,α,×,«,Ä, ,é B,μ,©,μ A,ç,Ï,æ,α,Èf^fCfv,ÏfGf%o [,ª” ¶,μ,½ Û,Ä,à-  
³ ðCE ,ÉDirectInputfffofCfX,ð”FŽ~,μ’¼,³,¹,é,æ,α,ÈfAfvfŠfP [fVf±f“,ð ‘,ç  
,Ä,Ï,È,ç,È,ç B”FŽ~,Ä,«,È,çfffofCfX,ð”FŽ~,μ,æ,α,Æ,μ,Ä-³CEÄf< [fv,ÉŠ×,é%oÄ”\ «,ª, ,é,©,ç,Ä, ,é B  
fAfvfŠfP [fVf±f“,ª**DISCL\_NONEXCLUSIVE**f, [fh,Äf}fEfX,ÉfAfNfZfX,μ,Ä,ç,é è ± Af}  
fEfX Eff [f^,ÍDirectInput(Eo-R,ÆWindowsf}fEfX Ef fbfZ [fW(Eo-R,Ï-  
¼•û,©,çŽæ“¾,³,è,é BfAfvfŠfP [fVf±f“,ª**DISCL\_EXCLUSIVE**f, [fh,Äf}fEfX,ÉfAfNfZfX,μ,Ä,ç,é è ± Af}  
fEfX Eff [f^,ÍDirectInput,ð%ð,μ,Ä,Ï,ÏŽæ“¾%oÄ”\,Æ,È,é BWindowsf}fEfX Ef fbfZ [fW,É,ÏŽg-  
p,Ä,«,éff [f^,ªŠÛ,Û,è,È,ç B**

ScrawlTf“fvf<fAfvfŠfP [fVf±f“,Í Af}fEfX EfffofCfX,ð”FŽ~,“,æ,Ñ%ð•ú,·,é“K Ø,È•û-@,Ï-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} fbfg,ÀEÄ,Ñ o,³,È,\_,é,Ì,È,ç,È,ç BDirectInput,Í AfCf“f^ [fifVf‡fif< EfL [f{ [fh ã,É“¶ Ý,.,é“Ç%ÁfL [,Ì,©,è, Á,È,Šg“EfL [f{ [fh ã,İŞefL [,É“Í,µ,Ä,à“è ”,ð“è<,µ,Ä,ç,é B,Û,Æ,ñ,Ç,Ì ê ‡ A,± ,é,ç,İ“è ”,İŽÀ Û,É,İPCŠg“EfXfLfff“fR [fh,Ä, ,é B,±,é,ç,İfL [“è ”,İDIK\_,ÄŽn,Û,è Adinput.h,Ä“è<,³,é,Ä,ç ,é BNECFL [f{ [fh,İPCŠg“EfL [f{ [fh,Æ,Í“Û,È,éXfLfff“fR [fh,ðfTf] [fg,µ,Ä,ç ,é,Ì,Ä ADirectInput,İNECFL [fXfLfff“fR [fh,ð%Ä“”,È,©,\_,èPCŠg“EfXfLfff“fR [fh,É,İŠ,.,µ,Ä,ç ,é B,æ,è Û ×,È îñ,È,Ä,ç,Ä,Í AfL [ff [fh EffXfLfff“fR [fh,ðŽQ Æ,Ì,±,Æ B

fL [f{ [fh,İCE» Ý,Ì ó“Ô,ðŽæ“¾,.,é,½,ß,É,Í A256fofCfG,Ì \“ç“İ,ð éCE¾,µ A,»„İf| fCf“f^,ð**IDirectInputDevice::GetDeviceState** f f\fbfh,Ö“n,³,È,\_,é,Ì,È,ç,È,ç B

**IDirectInputDevice::GetDeviceState** f f\fbfh,İWindows,İGetKeyboardStateŠÖ ”,Æ“—,Ì,İ@“\

,ð%Ö,½,· BfffofCfX,Ì ó“Ö,Í,±,İ256fofCfG,İ”z— ñ,ÉŠi”[,³,è AŞefofCfG,Í,Ð,Æ,Ä,İfL [,Ì ó“Ö,É“İ%ž,.,é B,½,Æ,.,Í ADIK\_ENTER“Ö— Û,İfofCfG,Ì ã“Èfrfbfg,³fZfbfg,³,é,Ä,ç,é ê ‡ AEnterfL [,“%Ÿ,³,é,Ä,ç ,é B,µ,©,µGetKeyboardState,Æ,Í“Û,È,è ADirectInput,İfofCfG,Ì ã“Èfrfbfg,µ,©Žg— p,µ,È,ç B ã“Èfrfbfg,³fZfbfg,³,é,Ä,ç,é ê ‡ A,»„İfL [,“%Ÿ,³,é,Ä,ç,é,±,Æ,ðŽ,· B,»„, Ä,È,\_,é,Í AfL [,İ%Ÿ,³,é,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,ðŠÛ,b·İ ”,ð**IDirectInputDevice::GetDeviceData**,É“n,³,È,\_,é,Ì,È,ç,È,ç B“ü—Í“Ö,ç s— ñ,Éff [f^,³,È,\_,é,ç,İ”z—ñ,.,Û,Ä,Ä,µ,Û,µ,Û,Ä ADirectInput,Í Ä,àEÄ,çfL [f{ [fh Eff [f^,©,ç”z— ñ,É“ü,è,Ä,ç, B **IDirectInputDevice::GetDeviceData**,©,ç“Ö,³,é,éTfCfY·İ ”,İŽÀ Û,ÉŽg—p,³,é,Ä,ç,é”z—ñ— v“f ”,Ä, ,é BfL [f{ [fh,©,çfofbftf@ Eff [f^,ðŽæ“¾,.,é Û A”P“è,İ**IDIDeviceObjectData** \“ç“İ,É— ^,!,ç,é,éff [f^,İfL [f{ [fh ã,İP“èfIfufWfFfNfg,Ì ó“Ö,ÉŠÖ,.,é“İ X“—,Ä, ,é BfL [f{ [fh ã,İŞefL [,Û,½,İf{f^f “,İfIfufWfFfNfg,ð·,· Bf† [fU,“ÖA”fL [,ð%Ÿ,µ,Ä—É,µ A“±,ç,ÄÖR”fL [,ð%Ÿ,.,Æ A **IDirectInputDevice::GetDeviceData**,Ö“n,³,é,½,İ**IDIDeviceObjectData** \“ç“İ,İ”z—ñ,É,İ,Ä,Ì— v“f,““ü,³,é,é B“A”fL [,“%Ÿ,³,é,½,±,Æ,ðŽ,·—v“f A“ÖA”fL [,“—É,³,é,½,±,Æ,ðŽ,·—v“f A,.,æ,Ñ ÖR”fL [,“%Ÿ,³,é,½,±,Æ,ðŽ,·—v“f,Ä, ,é B

**IDirectInputDevice::GetDeviceData**,İCEÄ,Ñ o,µ,İCEä AfAfVfŠfP [fVf‡f“Í A, ,ç,©,¶,ß“è<,³,é,Ä,ç ,é,İK\_\*”è ”,Æ**IDIDeviceObjectData** \“ç“İ,İdwOfstfB [f<fh,ð“äŠr,µ,Ä A”z—ñ“†,Ì— v“f,³,ç,İfIfufWfFfNfg[,Û,½,İfL ],ðŽQ Æ,µ,Ä,ç,é,ç,ð“m,é,±,Æ,Ä,ç,é B,Û,½**DIK\_\***”è ”,ð—p,ç ,Ä **ADIDeviceObjectData** \“ç“İ,İff [f^,afL [f{ [fh ã,İ,ç,İfIfufWfFfNfg,ðŽQ Æ,µ,Ä,ç,é,ç,ð ³Šm,É“m,é,± ,Æ,Ä,ç,«é BfIfufWfFfNfg,İŽÄff [f^,Í \“ç“İ,İdwDataftfB [f<fh,É“¶ Ý,·,é BfL [f{ [fh ã,İfL [,Ì,æ,µ ,Éf{f^f“fIfufWfFfNfg,É,Ä,ç,Ä,İdwData,İ%“ÉfofCfG,¾,\_,“—L“Ó,Ä, ,é B,± ,İfofCfG,Ì ã“Èfrfbfg,Í AfL [,“%Ÿ,³,é,é,ÆfZfbfg,³,é AfL [,“—É,³,é,é,ÆfNfŠfA,³,é,é B

ff [f^,“**IDirectInputDevice::GetDeviceData**,.,æ,èŽæ“¾,³,é,Ä,ç,é ê ‡,Ì,Ý AŽž ·t,«,İfL [f{ [fh Eff [f^,“— 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,Ìç“²fCEfxf<,ðfZfbfg,µ ,È,\_,é,Ì,È,ç,È,ç,ç,.,Ì,½,ß,É,Í A·K— v,Éç“²fCEfxf<,ðŽ,·,ftf%ofo,ðfZfbfg,µ,Ä**IDirectInputDevice::SetCooperativeLevel**,ðCEÄ,Ñ o,· BWindows 95ŠÄ«%”,Ä,Í AfL [f{ [fh EfffofCfX,É“Í,µ,Ä“È%”,Ìç“²fCEfxf<,²fTf] [fg,³,é,Ä,ç,é B **DISCL\_BACKGROUND | DISCL\_NONEXCLUSIVE ADISCL\_FOREGROUND | DISCL\_NONEXCLUSIVE**,Ä, ,é BDirectInput 3.0,Ä,İ**DISCL\_BACKGROUND | DISCL\_EXCLUSIVE ADISCL\_FOREGROUND | DISCL\_EXCLUSIVE**,ç“²fCEfxf<,İfL [f{ [fh EfffofCfX,É“Í,µ,ÄfTf] [fg,³,é,Ä,ç,é,ç B,± ,é,Í AfL [f{ [fh Eff [f^,³,Ä,È,ÉDirectInput,ÆWindowsf fbfZ [fW,Æ,ð“È,µ,ÄŽó M,³,é,é,±,Æ,ð“Ó— j,·,é BŞeç“²fCEfxf<,İ“Ó—,ÉŠÖ,·,é Û ×,È îñ,È,Ä,ç,Ä,Í A,±,é,ç,Ìç“²CEA“è ”,É,Ä,ç,Ä,ÌçL q,ðŽQ Æ,·,é,±,Æ B

DirectX,Ì «—fo [fWf‡f“,Ä,Í AWindows NT ã,ÄDirectInput,²fTf] [fg,³,é,é,æ,µ,É,È,é B,¾,“ AWindows NT,Ä,İfL [f{ [fh EfffofCfX,É“Í,µ,Ä**DISCL\_FOREGROUND | DISCL\_NONEXCLUSIVE**,µ,©fTf] [fg,³,é,È,ç BfAfVfŠfP [fVf‡f“,ðWindows NT,ÄŽÄ s,.,éK—v,“ ,é ê ‡ AfL [f{ [fh,Ö,İfAfNfZfX,É,Í,± ,Ìç“²fCEfxf<,ðŽq,±,±,Æ,È,È,é BfL [f{ [fhfhf%ofoCfo,İfTf] [fgfCEfxf<,É,æ,Ä,Ä,Í AWindows 95 ã,İDirectInput,Ä,Ä**DISCL\_FOREGROUND | DISCL\_NONEXCLUSIVE**,¾,\_,İfTf] [fg,ÉCEÄ“è,³,é,é%Ä“” «,., ,é B,µ,½,“Ä,Ä A, ,é,¾,\_,·,×,Ä,İfVf%ofofbfgftfH [fç ,.,æ,ÑfL [f{ [fhfhf%ofoCfo ã,ÄfAfVfŠfP [fVf‡f“,ðŽÄ s,·,éK—v,“ ,é ê ‡ A,±,Ìç“²fCEfxf<,ð—p,ç,é,×,«Ä, ,é B

**IDirectInputDevice::GetDeviceData**,Û,½,İ**IDirectInputDevice::GetDeviceState**,.,æ,èfL [f{ [fh EfffofCfX,©,çff [f^,ðŽæ“¾,.,é“O,É **AIDirectInputDevice::Acquire**,ðCEÄ,Ñ o,µ,ÄfffofCfX,ð“F Ž“,µ,Ä,\_,ç,È,\_,é,Ì,È,ç,È,ç BfAfVfŠfP [fVf‡f“,“+“f,³,é,½,è“ü—

ÍftfH [fJfX,đŽ,,Á,½,è,·,é,Æ,«,É,Í AIDirectInputDevice::Unacquire,đĀ,Ñ o,μ,ÄfAfvfŠfP [fVf‡f“,©,çfL [f{ [ fh EfffofCfX,đ%đ•ú,·,é,±,Æ,ª „ §,³,ê,é BfAfvfŠfP [fVf‡f“ Ef fjf... [, ,é,ĉ,ÍfVfXfefĉ Ef fjf... [ ,ªI•đ,³,ê,é,© A,Û,½,ÍfEfBf“fhfE,ªfŠfTfCfY, ,é,ĉ ,ÍŪ“@,³,ê,é ê ‡,à AfffofCfX,đ%đ•ú,μ,È,¯,ê,Í,È,ç,È,ĉ BfAfvfŠfP [fVf‡f“,ì†f,ª%đ æ,³,ê,½,èfAfvfŠfP [fVf‡f“,ª“ü— ÍftfH [fJfX,đ Ä“xŠl“¾,μ,½,è,·,é,Æ,«,É,Í AfAfvfŠfP [fVf‡f“,ÍDirectInputDevice::Acquire,đĀ,Ñ o,μ,ÄfL [f{ [fh EfffofCfX,đ”FŽ¯,μ¼,•K—v,ª, ,é B

fAfvfŠfP [fVf‡f“,ªDISCL\_FOREGROUNDf, [fh,ÄfL [f{ [fh,đŽg—p,μ,Ä,ĉ ,é ê ‡ AIDirectInputDevice::GetDeviceData,Û,½,Í IDirectInputDevice::GetDeviceState. ,©,ç,ÌDIERR\_INPUTLOST•Ô¹l,đf`fFfbfN,·,é,± ,Æ,ª „ §,³,ê,é BfAfvfŠfP [fVf‡f“,ªftfH [fJfX,đŽ,ª Û ADirectInput,ÍŽ“@“I,ÉfL [f{ [fh,đ%đ•ú,·,é,½,ß AD IERR\_INPUTLOST•Ô¹l,đŽó,¯Žæ,Á,½ ê ‡fAfvfŠfP [fVf‡f“,ÍfL [f{ [fh EfffofCfX,ì”FŽ¯,đ Ä“x s,ª,x,«,Á, ,é B,μ,©,μ A,Ç,ì,æ,ª,Èf^fCfv,ìfGf%o [,ªª ¶,μ,½ Û,Á,à³ đĀ ,ÉDirectInputffofCfX,đ”FŽ¯,μ¼,³,¹,é,æ,ª ,ÈfAfvfŠfP [fVf‡f“,đ ‘,ĉ,Ä,Í,È,ç,È,ĉ B”FŽ¯,Á,«,È,ĉffofCfX,đ”FŽ¯,μ,æ,ª,Æ,μ,Á-³Āfĉ [fv,ÉŠx,é%Ä”\ «,ª, ,é ,©,ç,Á, ,é B

**fL [f{ [fh EfXfLfff“fR [fh**

fL [f{ [fh,É,Í AfAfVfŠfP [fVf‡f““q,Á' ^Ó,µ,Ä,“©,È,¯,ê,Î,È,ç,È,Ç“\_„a,ç,,Á,©, ,é B•¯—  
“I,ÈfL [f{ [fh EfÇfCfAfEfg,É ‡,í,1,Äf† [fU,afL [,ÌŠ„,è“—,Ä,ð Á Y'è,Á,«„é,æ,□  
,ÈfAfVfŠfP [fVf‡f“„ð ì ¬,·,é,±,Æ,ª „ §,³,ê,é,Ì,Á, ,é B

,±,Ì,±,Æ,ð à-¾,·,é,½,ß AfL [f{ [fh,ÌŠî-{fÇfCfAfEfg,ðUS PCSŠg'£fL [f{ [fh,Æ,·,é B, ,éfL [,“¶ Ý,µ,È,ç,Æ,ç  
,q,Æ,«„Í A,»„ÌfL [,ÍUS PCSŠg'£fL [f{ [fh,É,Í¶ Ý,·,é,ª à-¾,µ,Ä,ç,éfL [f{ [fh,É,Í¶ Ý,µ,È,ç,±,Æ,ðÓ-  
j,·,é B, ,éfL [,“Ç%Á,³,ê,½,ÆZ,³,ê,é,Æ,« A,»„ÌfL [,ÍUS PCSŠg'£fL [f{ [fh,É,Í¶ Ý,µ,È,ç,ª à-¾,µ,Ä,ç  
,éfL [f{ [fh,É,Í¶ Ý,·,é,±,Æ,ðÓ-j,·,é B

,·,×,Ä,ÌPCŠg'£fL [f{ [fh,ª V,½,ÈWindowsfL [(DIK\_LWIN ADIK\_RWIN A,“æ,ÑDIK\_APPS j,ðfTf) [fg,µ,Ä,ç  
,é,í,¯,Ä,Í,È,ç B,±,ê,ç,ÌfL [,ª•— “I,É—~p%Á”\,©,Ç,µ,©,ð'm,é•û-@,Í,È,ç B

DIK\_PAUSEfL [fR [fh,Í¶ Ý,µ,È,ç,Æ,ç,µ,±,Æ,É' ^Ó,ð—v,·,é BPCŠg'£fL [f{ [fh,ÍDIK\_PAUSE,Æ,ç  
,qfXfLfff“fR [fh,ð ¶ ¬,·,é,Ì,Á,Í,È,-

ADIK\_LCONTROL,“æ,ÑDIK\_NUMLOCKfXfLfff“fR [fh,Ì'g,Ý ‡,í,1,ÁÒPause”,ð ¶ ¬,µ,Ä,ç,é B

f%ofbfvfgfbfv, ,é,ç,Í,»„Ì¼,Ì ¬Ç^fRf“fsf... [f^,Í Aftf<fZfbfg,ÌfL [f{ [fh,ðŽÀ‘,µ,Ä,ç,È,ç,±,Æ,ª,æ,, ,é B,©,í,è,  
É,ç,,Á,©,ÌfL [ i“TÇE^“I,É,Ífef“fL [ j,Í¼,ÌfL [,Æ<“É,É,È,Á,Ä,“„è A•â •“I,Èf, [fh EfL [,É,æ,è‘I‘ð,³,ê,é B,±  
,Ìf, [fh EfL [Ž©‘Ì,ÌfXfLfff“fR [fh,ð ¶ ¬,µ,È,ç B

fL [f{ [fh,ÌfTfuf^fCfv,ªPC XT, ,é,ç,ÍPCATfL [f{ [fh,Ì ê ‡ AŽÿ,ÌfL [,Í—~—  
p,Ä,«„È,ç BDIK\_F11 ADIK\_F12,“æ,Ñ,·,×,Ä,ÌŠg'£fL [(DIK\_\*'l,ª0x80^È ã) B,»„Ì ã APC  
XTfL [f{ [fh,É,ÍDIK\_SYSRQ,ª¶ Ý,µ,È,ç B

“ú-{ÇêfL [f{ [fh A“Á,ÉNEC

PC-98fL [f{ [fh,É,Í AUSfL [f{ [fh,Æ,ÍŽÄŽç“I,É^Ù,È,éfL [fZfbfg,ªŠÜ,Ü,ê,é B Ú ×,É,Ä,ç,Ä,Í“ú-  
{ÇêfL [f{ [fh,ðŽQ Æ,·,é,±,Æ B

“ú–{ŒêfL [f{ [fh

“ú–{ŒêfL [f{ [fh,ÆUSfL [f{ [fh,Æ,İŠÔ,É,ÍŽÀŽ;“I,È˙Š˙á,“Ų Ÿ,˙,é B^È%°,İ\,Á,Í AŠef^fCfv,İ“ú–  
 {ŒêfL [f{ [fh,Á—~—p%oÁ”\,È•t%oÁfL [,ðfŠfXfgfAfbfv,µ,Ä,Œ,é B,Û,½USfL [f{ [fh,Á—~—p%oÁ”\,Á,Í, ,é,ª,Œ,-  
 ,Á,©,İ“ú–{ŒêfL [f{ [fh,É,Í“Ų Ÿ,µ,È,ŒfL [,àfŠfXfgfAfbfv,˙,é B

,Û,½ ANEC PC-98fL [f{ [fh,Á,ÍDIK\_CAPSLOCK,˙,æ,ÑDIK\_KANAF [,ªfvfbfVf... Ef{f^f“,Á,Í,È,-  
 fgfOf< Ef{f^f“,É,È,Á,Ä,Œ,é,à,İ,ª, ,é,±,Æ,É’ ^Ó,˙,é,±,Æ B,±,ê,Œ,Í A Á %o,É%oŸ,³,ê,é,Æ%oŸ,³,ê,½,Æ,Œ  
 ,mfCxf“fg,ð Ų ¬,µ AŽŸ,É%oŸ,³,ê,é,Æ—£,³,ê,½,Æ,Œ,ŒfCxf“fg,ð Ų ¬,˙,é B

fL [f{ [fh	•t%oÁfL [	“Ų Ÿ,µ,È,ŒfL [
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%fbfvfgfbfvfL [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@fEf“fX

*fifnf*

## 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 ×,ÍDirectInputff [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)
```

```
flfufWfFfNfgf^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,Á,ÌDirectInput ‡ ~”Ô †,ð%ñ,è ž,Ý,ð l—¶,μ,Ä”äŠr,·,é B

```
dwSequence1  
    ”äŠr,·,é Á %o,ì ‡ ~”Ô † B
```

```
cmp  
    ŽŸ,ì”äŠr%o%ŽŽžq,ì,Đ,Æ,Á B "==" A "!=" A "<" A ">" A "<=" A ">=" B
```

```
dwSequence2  
    ”äŠr,·,é“ñ”Ô—Ú,ì ‡ ~”Ô † B
```

### •Ô¹

‘æ^êpf%of [f^,Æ‘æ^ñpf%of [f^,Æ,ì ‡ ~ŠÖEW,ª A‘æ^ñpf%of [f^,ÁŽw’è,μ,½”äŠr%  
%ŽŽžq,Æ^ê^v,μ,½ è ‡ A0,Á,È,¢¹,ð•Ô,· B

### —á

ŽŸ,ì—á,ÍdwSequence1,ªdwSequence2,æ,èŽŽžEn—ñ“I,É æ s,·,é,©,ðf`fFfbfN,·,é B

```
if (DISEQUENCE_COMPARE(dwSequence1, <, dwSequence2)) {  
    ...  
}
```

ŽŸ,ì—á,ÍdwSequence1,ªdwSequence2,æ,èŽŽžEn—ñ“I,ÉCEã±,Û,½,Í“~Žž,Á, ,é,©,ðf`fFfbfN,·,é B

```
if (DISEQUENCE_COMPARE(dwSequence1, >=, dwSequence2)) {  
    ...  
}
```

## GET\_DIDEVICE\_SUBTYPE

```
BYTE GET_DIDEVICE_SUBTYPE(  
    DWORD dwDevType)
```

*ffofCfX, ìTfuf^Cfv EfR [fh, ðffofCfX Ef^fCfv<L qfR [fh, ©, ç'Š o, ·, é BfTfuf^Cfv EfR [fh, Ì%ðŽß, Íff  
ofCfX, ìfvf%ofCf}fŠ Ef^fCfv, É'É'¶, ·, é B Ú ×, ÍDirectInputffofCfX Ef^fCfv<L qfR [fh, ðŽQ Æ, ·, é, ±, Æ B*

*dwDevType*

*DirectInputffofCfX Ef^fCfv<L qfR [fh B*

## GET\_DIDEVICE\_TYPE

BYTE GET\_DIDEVICE\_TYPE(  
    DWORD dwDevType)

ffofCfX Ef^fCfvfR [fh,đffofCfX Ef^fCfv<L qfR [fh,©,ç'Š o,;é B Ú ×,íDirectInputffofCfX Ef^fCfv<L  
qfR [fh,đŽQ Æ,·,é,±,Æ B

dwDevType

DirectInputffofCfX 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,ç,é BfJfXf^f€ Efvf fpfefB,ðŽÀ'•,µ,½,çfxf"f\_ [,Í AGUID,ð—p,ç ,é,±,Æ B

ŠÖ ”



## joyConfigChanged

```
MMRESULT joyConfigChanged(  
    DWORD dwFlags);
```

fWfXfgfŠ,É V,½,ÉfWf‡fCfXfefBfbfN,Ì Ý'è,ª, ,é,±,Æ,ðfWf‡fCfXfefBfbfN Efhf%ofCfo,É'Ê'm,·,é B  
±,İŠÖ ",Í Af† [fU,ªfWf‡fCfXfefBfbfN,İLfffŠfufŒ [fVf‡f", ,é,¢,Í ÄLfffŠfufŒ [fVf‡f",ð s,ª  
,Æ,« A,Û,½,Í•Ê,İfWf‡fCfXfefBfbfN EftfofCfX,ªI'ð,³,ê,é,Æ,«,É AfRf"fgf [f<fpflf<,É, ,éfWf‡fCfXfefBfbfN  
EfffŠfufŒ [fVf‡f",İvf fpfefB,©,çĀÄ,Ñ o,³,ê,é B

OEM,İfWf‡fCfXfefBfbfN EfffŠfufŒ [fVf‡f" EfAfvfŠfP [fVf‡f",İ,æ,ª  
,É AfAfvfŠfP [fVf‡f",ªfWf‡fCfXfefBfbfN,İfpftfH [f}f"fx,ðfJfXf^f}fCfY,·,é,æ,ª,É ÝŒv,³,ê,Ä,¢  
,é ê ‡ AŒ» Ý'I'ð,³,ê,Ä,¢,éfWf‡fCfXfefBfbfN,É'Í,·,éfŒfWfXfgfŠ,İJOYSTICK USER'l,ªİ X,³,ê,½,±,Æ,ð A,±  
,İŠÖ ",ð—p,¢,ÄfWf‡fCfXfefBfbfNfhf%ofCfo,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

•Œ'l

-Œ÷,·,ê,Î JOYERR\_NOERROR AŽ,"s,·,ê,ÎŽŸ,İfGf%o [,ð•Œ,· B

JOYERR\_NOCANDO

JOYERR\_REGISTRYNOTVALID

## joyGetDevCaps

```
MMRESULT joyGetDevCaps(  
    UINT uJoyID,  
    LPJOYCAPS pjc,  
    UINT cbjc);
```

fffofCfX, iŽ , Â<@\, ðfWf‡fCfXfefBfbfN, É Æ%öi, ·, é B

, ±, iŠÖ ”, ð—p, ç, Ä Afhf%oCfo, a fTf| [fg, ·, éfWf‡fCfXfefBfbfN EfffofCfX ”, ð'm, é, ±, Æ, a, Ä, «, é B

uJoyID

Æ%öi, 3, é, éfWf‡fCfXfefBfbfN, iŽ~·ÊŽq BJOYSTICKID1, Ü, ½, ÍJOYSTICKID2, Ä, , é B

pjc

fWf‡fCfXfefBfbfN<@\, ðŠÜ, bJOYCAPS \‘ç‘ì, ìfAfhfÇfX B

cbjc

JOYCAPS \‘ç‘ì, ìfTfCfY, ðfofCfg ”, ÄŽ!, · B

•Ô¹

–Ç÷, ·, é, î JOYERR\_NOERROR AŽ, ”s, ·, é, îŽÿ, ìfGf%o [, ð•Ô, · B

MMSYSERR\_INVALIDPARAM

MMSYSERR\_NODRIVER

JOYERR\_REGISTRYNOTVALID

ŽQ Æ @JOYCAPS, joyGetNumDevs

## joyGetNumDevs

UINT joyGetNumDevs (VOID) ;

WfXfBfN fhf%ofCfo,^Tf| [fg,μ,Ä,č,éWfXfBfN ”,đfhf%ofCfo,©,čŽæ“¾,·,é B

Žw'è,³,ê,½WfXfBfN,^Rf“fsf... [f^,É•— “I,É Ú‘±,³,ê,Ä,č,é,©,č,²,×,é,É,Í A joyGetPosExšÖ ”,đ  
—p,č,é B

## •Ŏ'l

fhf%ofCfo,^Tf| [fg,·,éWfXfBfN ”,đ•Ŏ,· Bfhf%ofCfo,^Ŏ Ÿ,μ,È,¯,ê,î0,đ•Ŏ,· B

ŽQ Æ @ joyGetDevCaps

**joyGetPosEx**

MMRESULT joyGetPosEx(UINT uJoyID, LPJOYINFOEX pji);

^Ê'u,;,æ,Ñf{f^f“ óÔ,ðfWf‡fCfXfefBfbfN,©,çŽæ“¾,·,é B

,±,İŠÖ ”,ðĀ,Ñ o,·O,É AJOYINFOEX \‘c‘ì,ìdwFlags—  
v‘f,É,Đ,Æ,Â^È ã,ìftf%ofO,ðfZfbfg,μ,Ā AfAfvfŠfP [fVf‡f“,^ Æ%öi,·,é €-Ú,ðŽw‘è,μ,È,\_,ê,Î,È,ç,È,ĉ B

,±,İŠÖ ”,É,æ,è Af%of\_ [fyf\_fĉ AŽĉ“\_fnfbfg A‘½ ”,ìf{f^f“,ðŽ ,ĀffofCfX,Æ,ĉ  
,Ā,½Šg‘ĒffofCfX,;,æ,Ñ Ā^â6Ž²,ð—p,ĉ,½ Ā·WĒn,Ö,ìfAfNfZfX,“%Ā”\,Æ,È,é B

uJoyID  
Æ%öi,³,ê,éfWf‡fCfXfefBfbfN,İŽ^·ÊŽq B

pji  
fWf‡fCfXfefBfbfN,İŠg‘Ē^Ê‘u î·ñ,;,æ,Ñf{f^f“ óÔ,ðŠÛ,þJOYINFOEX \‘c‘ì,ìfAfhfĒfX B

**•Ô¹**

- Ē÷,·,ê,Î JOYERR\_NOERROR AŽ,“s,·,ê,İŽÿ,ìGf%o [,ð·Ô,· B
- JOYERR\_UNPLUGGED
- MMSYSERR\_BADDEVICEID
- MMSYSERR\_INVALIDPARAM
- MMSYSERR\_NODRIVER

ŽQ Æ @JOYINFOEX

fR [f<fofbfNŠÖ ”

## DIEnumDeviceObjectsProc

```
BOOL CALLBACK DIEnumDeviceObjectsProc(  
    LPCDIDEVICEOBJECTINSTANCE lpddoi,  
    LPVOID pvRef);
```

IDirectInputDevice::EnumObjects f fbfh, Å—p, ç, è, éfR [f<fofbfNŠÖ ” B

lpddoi

—ñ<“, 3, è, Ä, ç, éfIfufWfFfNfg, ð<L q, ., éDIDEVICEOBJECTINSTANCE \‘ç‘ì, ìfAfhfçfX B

pvRef

IDirectInputDevice::EnumObjectsŠÖ ”, É, ;, ç, Ä—^, !, ç, è, Ä, ç, é AfAfvfŠfP [fVf±f“, É, æ, è‘è<“, 3, è, ½‘l, ðŽw‘è, ., é B

## •Ô’l

DIENUM\_CONTINUE

—ñ<“, ðçp‘±, ., é

DIENUM\_STOP

—ñ<“, ð’†Ž~, ., é

## DIEnumDevicesProc

```
BOOL CALLBACK DIEnumDevicesProc(  
    LPDIDEVICEINSTANCE lpddi,  
    LPVOID pvRef  
);
```

IDirectInput::EnumDevices f\bfh,Å—p,ç,ê,éfR [f<fofbfNŠÖ ” B

lpddi

—ñ<“,3,ê,Ä,ç,éffofCfX,ð<L q,;éDIDEVICEINSTANCE \‘İ,İfAfhfœfX B

pvRef

IDirectInput::EnumDevicesŠÖ ”,Ä—^,!,ç,ê,½ AfAfvfŠfP [fVf‡f“”è<,İff [f^,İfAfhfœfX B

## •Ö¹

DIENUM\_CONTINUE

—ñ<“,ðœp‘±,;é

DIENUM\_STOP

—ñ<“,ð†Z~,;é

## IClassFactory

**IClassFactory** fCf“f^ [ftfFfCfX,ÍOLEfTf] [fg,É•K—v,Æ,³,ê,é B Ú ×,È îñ,É,Â,ç,Ä,ÍOLEf}ff...  
fAf<,đŽQ Æ,·,é,±,Æ BDirectInput,đ—p,ç  
,éfAfvfŠfP [fVf‡f“,ì,Û,Æ,ñ,Ç,Í AOLEfNf%ofXftf@fNfgfŠ,Æ¼ Ú’Ê M,·,é•K—v,Í,È,ç B

## **IClassFactory::AddRef**

```
HRESULT AddRef(  
    LPCLASSFACTORY lpClassFactory);
```

*fCf“f^ [ftfFfCfX,É'Î,·,éŽQ ÆfJfEf“fg,ðfCf“fNfŠf f“fg,·,é BOLEf}fjf...  
fAf<,İUnknown::AddRef,ðŽQ Æ,·,é,±,Æ B*

## **•Ô¹**

*fIfufWfFfNfgŽQ ÆfJfEf“fg,ð•Ô,· B*

## **IClassFactory::CreateInstance**

```
HRESULT CreateInstance(  
    LPCLASSFACTORY lpClassFactory,  
    LPUNKNOWN punkOuter,  
    REFIID riid,  
    LPVOID * ppvOut);
```

V,½,ÈDirectInputIfufWfFfNfg,ðŽw'è,³,ê,½fCf“f^ [ftFfCfX,Ä ì ¬,·,é BOLEf}fjf...  
fAf<,ÌIClassFactory::CreateInstance,ðŽQ Æ,·,é,±,Æ B V,½,È ì ¬,³,ê,½fIfufWfFfNfg,Ì,Û,¼ %Šú%»,³,ê,Ä,Ç,È,Ç  
,±,Æ,É' Ó B

*punkOuter*

OLE W ¬%»«@”\,ª-Ç'm,Ì §Eä,Ö,Ìf|fCf“f^ A,Û,½,ÍfCf“f^ [ftFfCfX,ª W ¬%»»,³,ê,Ä,Ç  
,È,Ç ê ‡,ÍO B,Û,Æ,ñ,Ç,ÌEÄ,Ñ o,µ'²,Í0,ð“n,· B

*riid*

•K—v,ÈfCf“f^ [ftFfCfX B,±,Ìfpf%of [f^,Í—LÆø,ÈfCf“f^ [ftFfCfXŽ~•ÈŽq,ðŽw,µŽ!,·K—v,ª, ,é B

*ppvOut*

³ íŽÄ s,³,ê,é ê ‡ A ì ¬,³,ê,½fCf“f^ [ftFfCfX,Ö,Ìf|fCf“f^,ð,Ç,±,É•Ö,·,©,ðŽw,µŽ!,· B

•Ö¹

COMFGf%o [fR [fh,ð•Ö,· B`È%°,ÌfGf%o [fR [fh,Í•Ö,³,ê,éfR [fh,Ì,·,×,Ä,Æ,ÍEÄ,Ç,È,Ç B  
S\_OK: ‘€ ì,Í ³ í I—¹,µ,½ B  
E\_INVALIDARG: ppvOutfpf%of [f^,Í—LÆø,Èf|fCf“f^,Ä,È,Ç B  
CLASS\_E\_NOAGGREGATION: W ¬%»«@”\,ªfTf| [fg,³,ê,Ä,Ç,È,Ç B  
E\_OUTOFMEMORY: f f, fŠ,ªs'«,µ,Ä,Ç,é B  
E\_NOINTERFACE: Žw'è,³,ê,½fCf“f^ [ftFfCfX,ÍfTf| [fg,³,ê,Ä,Ç,È,Ç B

## **IClassFactory::LockServer**

```
HRESULT LockServer(  
    LPCLASSFACTORY lpClassFactory,  
    BOOL fLock);
```

DLL f bfN EfJfEf“fg,đfCf“fNfŠf f“fg,Ü,½,ÍffNfŠf f“fg,·,é BDLL f bfN EfJfEf“fg,³0,Á,È,¢ ê ‡,Í Af f, fŠ, ©, ç í æ,³,ê,È,¢ BOLEf}fjf...fAf<,lIClassFactory::LockServer,đŽQ Æ,·,é,±,Æ B

fLock

TRUE,Á, ,é ê ‡ Af f bfN EfJfEf“fg,đfCf“fNfŠf f“fg,·,é B  
FALSE,Á, ,é ê ‡ Af f bfN EfJfEf“fg,đffNfŠf f“fg,·,é B

•Ô¹

COMfGf%o [fR [fh,đ•Ô,· B^È%°,lfGf%o [fR [fh,Í•Ô,³,ê,éfR [fh,ì,·,×,Ä,Æ,ÍCEÀ,ç,È,¢ B  
S\_OK: ‘€ ì,Í ³ í I—¹,µ,½ B  
E\_OUTOFMEMORY: f f, fŠ,³•s‘«,µ,Ä,¢,é B

## **IClassFactory::QueryInterface**

```
HRESULT QueryInterface(  
    LPCLASSFACTORY lpClassFactory,  
    REFIID riid,  
    LPVOID * ppvObj);
```

*fIfufWfFfNfg ã,Ì¼,ÌfCf“f^ [ftfFfCfX,ÉfNf%fCfAf“fg EfAfNfZfX,ð—^,é BOLEf}fjf...  
fAf<,ÌIUnknown::QueryInterface,ðŽQ Æ,·,é,±,Æ B*

*riid*

*•K—v,ÈfCf“f^ [ftfFfCfXIID B*

*ppvObj*

*“¼,ç,ê,é,fCf“f^ [ftfFfCfX,Ö,Ìf|fCf“f^,ðŽó,~Žæ,é B*

*•Ô¹*

*COMfGf%o [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,°0,É,È,é ê ‡ A,»Ì  
fIfufWfFfNfg,Íf f,fŠ,©,ç%ð•ú,³,ê,é BOLEf}fjf...fAf<,ìIUnknown::Release,ðŽQ Æ,·,é,±,Æ B
```

## **•Ô’l**

```
fIfufWfFfNfgŽQ ÆfJfEf“fg,ð•Ô,· B
```

## **IDirectInput**

**DirectInput** IfufWfFfNfg, IDirectInput TfufVfXfef€, δ•\, μ A'P^ê“ü—ÍffofCfX, δ•\ , ·**DirectInputDevice** IfufWfFfNfg, ð ì ¬, ·, é B





## IDirectInput::EnumDevices

```
HRESULT EnumDevices(  
    LPDIRECTINPUT lpDirectInput,  
    DWORD dwDevType,  
    LPDIENUMCALLBACK lpCallback,  
    LPVOID pvRef,  
    DWORD dwFlags);
```

*fRf“fsf... [f^,ÉŒ» Ý Ú±,³,ê,Ä,ĉ,é,© A, ,é,ĉ,Í Ú±%oÄ”\,ÈffofCfX,ð—  
ñĉ“,·,é B,½,Æ,!,Īftf%oCfG EfXfefBfbfN,ðVfXfefE,ÉfCf“fXfg [f<,μ,½,ªŒ»Žž“\_,Ä,ÍfRf“fsf... [f^,É Ú±,μ,Ä,ĉ  
,È,ĉ,Æ,ĉ,Ä,½ ê ±,ª, ,é,½,ß A Ú±,³,ê,Ä,ĉ,éffofCfX,¾,¯,ð—ñĉ“,·,é,©fCf“fXfg [f<,³,ê,Ä,ĉ,éffofCfX,·,×,Ä,ð—  
ñĉ“,·,é,©,ðŽ,·,ftf%oF,ðdwFlagsf%of [f^,ÉfZfbfg,·,é Bftf%oF **DIEDFL\_ATTACHEDONLY**,ªfZfbfg,³,ê,Ä,ĉ,É,ĉ  
,Æ AfCf“fXfg [f<,³,ê,Ä,ĉ,éffofCfX,·,×,Ä,ª—ñĉ“,³,é,é B—ñĉ“,·,éffofCfX,Īf^fCfv,ðftfBf<f^,Æ,μ,Ä“n,·,±  
,Æ,à,Ä,«é B*

*fAfVfŠfP [fVf±f““èĉ“,·,éfR [f<fofbfNŠÖ ”,Í AlpCallbackf%of [f^,ĪDirectInput::EnumDevices,Ö“n,³,ê,é B,  
±,ĪŠÖ ”,Í A—  
ñĉ“,³,ê,½ffofCfX,·,×,Ä,É,Ī,μ,ÄŒÄ,Ñ o,³,é,é BfR [f<fofbfN,Ä,Í AffofCfX Ef^fCfv,Æ,»ĪfjfbfNf [fĉ A,ª,æ  
,Ñ »\*iGUID,Æ,»ĪfjfbfNf [fĉ,ª AŠeffofCfX,É—^,!,ĉ,é,é B’P”ê,Ī“ü—  
ĪffofCfX,É; ”,ĪDirectInputffofCfX Ef^fCfv,Īĉ“\,ª, ,é ê ±,Í AfTf|  
[fg,·,éŠeffofCfX Ef^fCfv,É,Ī,μ,Ä’l,ªÖ,³,é,é i,½,Æ,Ī,Ī A“à‘ f}fEfX,ð,à,ÄfL [f{ [fh,Í AfL [f{ [fh,ª,æ,Ñf}  
fEfX,Æ,μ,Ä—ñĉ“,³,é,é B,μ,©,μ A »\*iGUID,ĪŠeffofCfX,É,Ī,μ,Ä“~ê,Ä, ,é j B*

*±,ĪfŠfŠ [fX,ĪDirectInput,Ä,Í Af}fEfX,ª,æ,ÑfL [f{ [fh EffofCfX,Ī,Ý,ª—ñĉ“,³,ê,Ä,ĉ,é B*

*lpDirectInput  
±,Īf f“fo,ªŒÄ,Ñ o,³,ê,½DirectInputfufWfFfNfg,ðŽw,μŽ!,· B*

*dwDevType  
ffofCfX Ef^fCfv EftfBf<f^ B0,Ä, ,é ê ±,Í A,·,×,Ä,ĪffofCfX Ef^fCfv,ª—ñĉ“,³,ê,é B,»ª  
,Ä,È,ĉ ê ±,ĪDIDEVTYPE\_\*l,Æ,È,è A—ñĉ“,³,ê,éffofCfX Ef^fCfv,ðŽ!,· B±,ĪfŠfŠ [fX,ĪDirectInput,Ä,Í Af}  
fEfX EffofCfX,ª,æ,ÑfL [f{ [fh,¾,¯,ª—ñĉ“,³,ê,é B*

*lpCallback  
ŠeDirectInputffofCfX,ĪĉL q,Æ,Æ,à,ÉŒÄ,Ñ o,³,ê,é AfAfVfŠfP [fVf±f““èĉĉR [f<fofbfNŠÖ ”,ðŽw,μŽ!,· B*

**BOOL CALLBACK DIEnumDevicesProc(LPDIDEVICEINSTANCE lpddi,  
LPVOID pvRef)**

*lpddi  
±,ĪffofCfX EfCf“fXf^f“fX,ðĉL q,·,é \ĉ“Ī,ðŽw,μŽ!,· B*

*pvRef  
**EnumDevices**,É—^,!,ĉ,é,é AfAfVfŠfP [fVf±f““èĉff [f^,ðŽw,μŽ!,· B*

*pvRef  
ŒÄ,Ñ o,³,ê,é,½,Ñ,É—ñĉ“fR [f<fofbfN,Ö“n,³,ê,é ŒŒÄ,Ñ o,μª  
,É,æ,è“èĉ,³,ê,½32ftrfbfg EfRf“fefLfxfg,ðŽw,μŽ!,· B*

*dwFlags  
Œ» Ýĉĉ“,³,ê,Ä,ĉ,éftf%oF,ĪŽŸ,Ī,Đ,Æ,Ä,¾,¯,Ä, ,é B  
**DIEDFL\_ATTACHEDONLY**-Œ» Ý Ú±,³,ê,Ä,ĉ,éffofCfX,Ī,Ý,ð—ñĉ“,·,é B*

## •Ö¹

*COMfGf%o [fR [fh,ð•Ö,· BÈ%o,ĪfGf%o [fR [fh,Ī•Ö,³,é,éfR [fh,Ī,·,×,Ä,Æ,ÍŒÄ,ĉ,È,ĉ B  
**DI\_OK = S\_OK**: ‘ĉ Ī,Ī ³ í I—,μ,½ BfR [f<fofbfN,ª“r’Ī,Ä—ñĉ“,ðŽž~μ,½ ê ± A—ñĉ“,Ī ³ í I—  
¹,μ,½,ÆŒŒ,È,³,ê,é,±,Æ,É’ Ö B  
**DIERR\_INVALIDPARAM = E\_INVALIDARG**: flf%of [f^,É—³Œø,Èftf%oF,ª, ,Ä,½,© A, ,é,ĉ  
,ĪfR [f<fofbfN,ª—³Œø,ÈfXfe [f^fX EfR [fh,ð•Ö,μ,½ B*

## IDirectInput::GetDeviceStatus

```
HRESULT GetDeviceStatus(  
    LPDIRECTINPUT lpDirectInput,  
    REFGUID rguidInstance);
```

Účel: Získání stavu připojeného zařízení. Pokud je zařízení připojeno, vrátí hodnotu S\_OK. Pokud není připojeno, vrátí hodnotu DIERR\_GENERIC. Pokud je zařízení připojeno, ale není v režimu čekání, vrátí hodnotu DIERR\_INVALIDPARAM. Pokud je zařízení připojeno, ale není v režimu čekání, vrátí hodnotu DIERR\_INVALIDPARAM.

lpDirectInput

Účel: Adresa paměti, ve které se nachází objekt IDirectInput.

rguidInstance

Účel: Účíslo zařízení, které je připojeno.

## •••

COMFgf%o [fR [fh,đ•Ô,• B`È%°,ÌfGf%o [fR [fh,Í•Ô,³,ê,éfR [fh,Ì,•,×,Ä,Æ,ÍEÀ,ç,È,ç B

DI\_OK = S\_OK: ffofCfX,Í Ú'±,³,ê,Ä,ç,é B

DI\_NOTATTACHED = S\_FALSE: ffofCfX,Í Ú'±,³,ê,Ä,ç,È,ç B

DIERR\_GENERIC = E\_FAIL: ffofCfX,ª Ú'±,³,ê,Ä,ç,é,©,đDirectInput,ÍŠm'è,Á,«,È,©,Á,½ B

DIERR\_INVALIDPARAM = E\_INVALIDARG: ffofCfX,Í'¶ Ý,µ,È,ç B

## IDirectInput::Initialize

```
HRESULT Initialize(  
    LPDIRECTINPUT lpDirectInput,  
    HINSTANCE hinst,  
    DWORD dwVersion);
```

DirectInputIfufWfFfNfg,đ %Šú%»,·,é BDirectInputIfufWfFfNfg EfffofCfX,<sup>a</sup> ì ¬,<sup>3</sup>ê,é,ÆDirectInputCreatef f\ fbfh,<sup>a</sup>Ž©“@“I,É %Šú%»,đ s,²,½,ß A'Ê í,ÍAfvfŠfP [fVf‡f“,©,ç,±,İŠÖ ”,đĀ,Ñ o,•K—v,İ,È,ç B

*hinst*

DirectInputIfufWfFfNfg,đ ì ¬,μ,Ä,ç,éAfvfŠfP [fVf‡f“,Ü,½,ÍDLL,ÌCf“fXf^f“fX Efnf“fhfç B

*dwVersion*

Žg—p,<sup>3</sup>ê,½dinput.hfwfbf\_ftf@fCfç,Ìfo [fWf‡f“”Ô † B,±,ì¹,ÍDIRECTINPUT\_VERSION,Ä,È,¬,ê,İ,È,ç,È,ç B

DirectInput,İ,±,ì¹,đ—p,ç

,Ä A,ç,Ìfo [fWf‡f“,İDirectInput,É'İ,μ,ÄAfvfŠfP [fVf‡f“,Ü,½,ÍDLL,<sup>a</sup> ÝĀv,<sup>3</sup>ê,½,Ì,©,đŠm'è,·,é B

•Ô¹

COMfGf% [fR [fh,đ•Ô,· B`È%°,ÌfGf% [fR [fh,İ•Ô,<sup>3</sup>ê,é,·,×,Ä,ÌfR [fh,Æ,ÍĀ,ç,È,ç B

**DI\_OK = S\_OK:** ffofCfX,Í Ú'±,<sup>3</sup>ê,Ä,ç,é B

**DIERR\_OLDDIRECTINPUTVERSION:** DirectInput,Ìfo [fWf‡f“,³Ā,ç B

**DIERR\_BETADIRECTINPUTVERSION:** fTf|

[fgŠO,Ä, ,éDirectInputfx [f^ Efo [fWf‡f“,É'İ,μ,ÄAfvfŠfP [fVf‡f“,³ ;©,ê,Ä,ç,½ B

**IDirectInput::QueryInterface**

```
HRESULT QueryInterface(
    LPDIRECTINPUT lpDirectInput,
    REFIID riid,
    LPVOID FAR* ppvObj);
```

**IDirectInput**,<sup>a</sup>Ĉep<sup>3</sup>,·,·éIUnknownfCf“f^ [ftFfCfX,îrê” BfAfvfŠfP [fVf‡f“,ažg—p,μ,æ,ϖ,Æ,μ,Ä,ϕ ,éfCf“f^ [ftFfCfX,đ,»],îIfufWfFfNfg,<sup>a</sup>fTf] [fg,μ,Ä,ϕ,é,©,ϕ,ϖ,©—â,ϕ ‡,í,í,é,½,β,É—p,ϕ,é B—â,ϕ ‡,í,í,½“Á’è,ìCOMfCf“f^ [ftFfCfX,đfIfufWfFfNfg,<sup>a</sup>fTf] [fg,μ,Ä,ϕ ,é ê ‡ AfAfvfŠfP [fVf‡f“,Í,»],îfCf“f^ [ftFfCfX,đ’¼,ç,Éžg—p,μžn,β,é,±,Æ,<sup>a</sup>Ä,«,é B•K—v,ÈfCf“f^ [ftFfCfX,<sup>a</sup>fTf] [fg,<sup>3</sup>ê,Ä,ϕ,é ê ‡ AfAfvfŠfP [fVf‡f“,ìppvObjfpf%of [f^,Éf] fCf“f^,<sup>a</sup>Ô,<sup>3</sup>ê,é BfAfvfŠfP [fVf‡f“,a,»],îfCf“f^ [ftFfCfX,đžg—p,μ,È,ϕ,© A, ,é,ϕ,Ížg—p,đ I—<sup>1</sup>,μ,½ ê ‡,Í ARelease,ðĈÄ,Ñ o,μ,ÄfCf“f^ [ftFfCfX,đ%đ•ú,μ,È, ,ê,Í,È,ç,È,ϕ B,±,îf f“fo,É,æ,è AŠù“¶], ,é,ϕ ,Í «—^,î<@”\,Æ Ö“È AŠ± Ä,·,é,±,Æ,È,**DirectInput**IfufWfFfNfg,đŠg’£,Ä,«,é B Ú ×,É,Ä,ϕ,Ä,Í AOLEf}fjf... fAf<,ìIUnknown::QueryInterface,đžQ Æ,·,é,±,Æ B

lpDirectInput  
·,±,îf f“fo,<sup>a</sup>ĈÄ,Ñ o,<sup>3</sup>ê,½DirectInputfIfufWfFfNfg,đžw,μž!,· B

riid  
•K—v,ÈfCf“f^ [ftFfCfX,đž·È,·,éfCf“f^ [ftFfCfXž·Èžq(IID),đžw,μž!,· B

ppvObj  
—â,ϕ ‡,í,í,<sup>a</sup> 3 í,ÉžÀ s,<sup>3</sup>ê,é ê ‡•Ô,<sup>3</sup>ê,éfCf“f^ [ftFfCfX E|fCf“f^,<sup>a</sup>“ü,<sup>3</sup>ê,é^È’u,đžw,μž!,· B

- Ô’1  
DI\_OK  
DIERR\_INVALIDPARAM  
DIERR\_NOINTERFACE

## IDirectInput::Release

```
DWORD Release(  
    LPDIRECTINPUT lpDirectInput);
```

**IDirectInput**,<sup>3</sup>Ep<sup>3</sup>,<sup>3</sup>éIUnknownfCf“f^ [ftfFfCfX,îrê•” BŠÖ~A,î, ,éCOMfIfufWfFfNfg,îŽQ ÆfJfEf“fg,ðE,,ç,·,½,ß,É—p,ç,ç,ê,é BfIfufWfFfNfg,<sup>a</sup> Å %  
,É ì ¬,<sup>3</sup>ê,é,Æ,« AŽQ ÆfJfEf“fg,Í1,ÉfZfbfg,<sup>3</sup>ê,é BAddRef,<sup>a</sup>Ā,Ñ o,<sup>3</sup>ê,é,½,Ñ,ÉŽQ ÆfJfEf“fg,ÍfCf“fNfŠf f  
“fg,<sup>3</sup>ê ARelease,<sup>a</sup>Ā,Ñ o,<sup>3</sup>ê,é,½,Ñ,ÉŽQ ÆfJfEf“fg,ÍffNfŠf f“fg,<sup>3</sup>ê,é BŽQ ÆfJfEf“fg,<sup>a</sup>0,É,È,é,Æ A,»),IfIfu  
fWfFfNfg,Í%ð•ú,<sup>3</sup>ê,é B Ú ×,É,Ā,ç,Ā,Ī AOLEf}fjf...fAf<,ì IUnknown::QueryInterface,ðŽQ Æ,·,é,±,Æ B

*lpDirectInput*

,±,Ìf f“fo,<sup>a</sup>Ā,Ñ o,<sup>3</sup>ê,é,½DirectInputfIfufWfFfNfg,ðŽw,µŽ!,· B

## •Ô¹

V,½,ÈŽQ ÆfJfEf“fg,ðŠÜ,ÐDWORD B,±,î•Ô¹,ÍffofbfO—p“r,É,¾,Žg—p,<sup>3</sup>ê,é,±,Æ,É’ ^Ó B

## IDirectInput::RunControlPanel

```
HRESULT RunControlPanel(  
    LPDIRECTINPUT lpDirectInput,  
    HWND hwndOwner,  
    DWORD dwFlags);
```

*f† [fU,ª V,½,È“ü—*  
*ÍfffofCfX,ðfCf“fXfg [f<,µ,½,èfZfbfgfAfbfv,ð C ³,µ,½,è,Ä,«,é,æ,º AWindows,ÌDirectInputfRf“fgf [f<fpflf<,ð*  
*ŽÀ s,·,é,½,ß,É—p,¢,ç,ê,é BfT [fhfp [fefB,ÌfRf“fgf [f<fpflf<,ÍŽÀ s,µ,È,¢ B*

*lpDirectInput*  
*,±,Ìf f“fo,ªEÄ,Ñ o,³,è,½DirectInputfIfufWfFfNfg,ðŽw,µŽ!,· B*

*hwndOwner*  
*Eä±,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*  
*E»Žž“\_,Ä,Íftf%fo,Í‘è`³,è,Ä,¢,È,¢ B,±,Ìfpf%of [f^,Í0,Ä,È,¯,é,Î,È,ç,È,¢ B*

## •Ô¹

*COMfGf%o [fR [fh,ð·Ô,· B`È%o°,ÌfGf%o [fR [fh,Í·Ô,³,è,éfR [fh,Ì,·,×,Ä,Æ,ÍEÄ,ç,È,¢ B*  
**DI\_OK = S\_OK:** *fffofCfX,Í Ú‘±,³,è,Ä,¢,é B*

## IDirectInputDevice

IDirectInputDevice fCf“f^ [ftfFfCfX,Í A“ü—ÍffofCfX,ìfCf“fXf^f“fX,©,çff [f^,đŽæ“¼,·,é,½,ß,É—p,ç,é B

## IDirectInputDevice::Acquire

```
HRESULT Acquire(  
    LPDIRECTINPUTDEVICE lpDirectInputDevice);
```

“ü—

ÍffofCfX,Ö,ÌfAfNfZfX,ðŽæ“¾,·,é BGetDeviceState,Û,½,ÍGetDeviceData,ðĀ,Ñ o,·‘O,É AffofCfX,ð”FŽ,μ,Ä,“  
,©,È,\_,ê,Î,È,ç,È,ç BffofCfX”FŽ,É,ÍŽQ ÆfJfEf“fg,“¶ Ý,¹, AffofCfX,“ñ“x”FŽ,³,ê,Äê“x%ð•ú,³,ê,½ ê ‡ A  
ffofCfX,Í%ð•ú,³,ê,½ ó‘Ô,È,È,é B

lpDirectInputDevice

,±,Ìf f“fo,³Ā,Ñ o,³,ê,½DirectInputffofCfX EfIfufWfFfNfg,ðŽw,μŽ!,· B

## •Ô¹

COMfGf%o [fR [fh,ð•Ô,· B^È%°,ÌfGf%o [fR [fh,Í A•Ô,³,ê,éfR [fh,Ì,·,×,Ä,Æ,ÍĀ,ç,È,ç B

DI\_OK = S\_OK: ‘€ ì,Í ³ í I—¹,μ,½ B

S\_FALSE: fffofCfX,Í,·,Ä,É”FŽ,³,ê,Ä,ç,é B,±,Ì¹,Í ³ ífR [fh,Ä, ,é,±,Æ,É’ ^Ó,·,é,±,Æ B

DIERR\_INPUTLOST: fffofCfX,Ö,ÌfAfNfZfX,²—^,|,ç,ê,Ä,ç,È,ç B

DIERR\_INVALIDPARAM = E\_INVALIDARG: fffofCfX,Í‘I’ð,³,ê,½ff [f^ EftfH [f}fbfgĀŽ®,Ä,Í,È,ç B



## IDirectInputDevice::GetCapabilities

```
HRESULT GetCapabilities(  
    LPDIRECTINPUTDEVICE lpDirectInputDevice,  
    LPDIDEVCAPS lpDIDevCaps);
```

“ü—ÍffofCfX, ì îñ, ðŽæ“¾, ·, é B

*lpDirectInputDevice*

, ±, ìf f“fo, ðÄ, Ñ o, ¾, ê, ½DirectInputffofCfX EfIfufWfFfNfg, ðŽw, μŽì, · B

*lpDIDevCaps*

, ±, ìŠÖ ”, ð ð•Ö, ·**DIDEVCAPS** \‘c‘ì, ðŽw, μŽì, · B, ±

, ìf f\fbfh, ðÄ, Ñ o, ·‘O, È A \‘c‘ì, ìfTfCfY, ðdwSizeftfB [f<fh, ÄŽw’è, μ, Ä, ¨, ©, È, ¯, ê, Ì, È, Ç, È, Ç B

ŽQ Æ @DIDEVCAPS

## •Ö¹

COMfGf%o [fR [fh, ð•Ö, · B`È%o°, ìfGf%o [fR [fh, Ì•Ö, ¾, ê, éfR [fh, Ì, ·, ×, Ä, Æ, ÍÄÈ, Ç, È, Ç B

**DI\_OK = S\_OK**: ‘€ ì, Ì ³ í I—¹, μ, ½ B

**DIERR\_INVALIDPARAM = E\_INVALIDARG**: lpDIDevCapsfpf%of [f^, ð—LÆø, Èf|fCf“f^, Ä, Ì, È, Ç 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<|’?f(Éfxf<,ð ASetDataFormat,Éff [f^ EftfH [f] fbf,ð,»,ê,¼,êfZfbfg,µ AAquire,ÄffofCfX,ð”Fž̄,µ,Ä,“,©,È,̄,ê,Î,È,ç,È,¢ B

lpDirectInputDevice
,±,İf f“fo,“EÄ,Ñ o,³,ê,½DirectInputffofCfX EfIfufWfFfNfg,ðžw,µž!,· B

cbObjectData
**DIDEVICEOBJECTDATA** \‘c‘İ,İfTfCfY,ðfocfg,Äž!,µ,½,à,İ B

rgdod
fobftf@ Eff [f^,ðžó,žæ,é,½,ß,İDIDEVICEOBJECTDATA \‘c‘İ,İ”z—ñ B\*pdwInOut—v‘f,Ä \ -,³,ê,Ä,¢
,È,̄,ê,Î,È,ç,È,¢ B

,±,İpf%of [f^,“NULL,İ ê ‡ Afobftf@ Eff [f^,İ,Ç,±,É,àš!“[,³,ê,È,¢,“ 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 ” BCEÄ,Ñ o,µEä,İžÄ Ū,É“¾,ç,ê,½—v‘f ” B

fl
ff [f^žæ“¾,ì·û—@,ð §Eä,·,éftf%ofO B0, ,é,¢,ÍÈ%°,İftf%ofO,Ä, ,é B

**DIGDD\_PEEK:** fobftf@,©,ç €—Ú,ð í œ,µ,È,¢ BCEä‘±
,İGetDeviceData,İ““,¶ff [f^,ð“Ç,Ýžæ,é B’É í,İ Aff [f^,İ“Ç,Ýžæ,ç,ê,½Eäfobftf@,©,ç í œ,³,ê,é B

**•Ö’l**

**DI\_OK = S\_OK:** ,·,×,Ä,İff [f^,İ ³ í,Éžæ“¾,³,ê,½ Bff [f^,žæ“¾,³,ê,½,© A,Ū,½,Ç,ê,®,ç,¢,İ—
É,İff [f^,žæ“¾,³,ê,½,©,ð’m,é,½,ß,É AfAvfšfP [fVf‡f“,\*\*pdwInOut,İ o—İ’l,ðf fFfbfN,·,é•K—v,“,é,±
,Æ,É’ °Ö B,±,İl,“0,İ,Æ,«,Í Afobftf@,“ó,Ä, ,é,±,Æ,ðž!,· B

**DI\_BUFFEROVERFLOW = S\_FALSE:**
ff [f^,İ ³ í,Éžæ“¾,³,ê,½,“ AffofCfX,İfobftf@ EftfCfY,“ \““Ä,È,©,Ä,½,½,ßff [f^,“,¢,,Ä,©ž,í,é,½ B,±
,İ ê ‡ Afobftf@ Eff [f^,İžæ“¾%ñ ”,ð‘ ,ä,·,© AffofCfX Efobftf@,İfTfCfY,ð‘ä,«, -
,µ,È,̄,ê,Î,È,ç,È,¢ B,±,İ•Ö’l,İfobftf@,“fl [fo [ftf [µ,½EäİDirectInputDevice::GetDeviceData,ð Ä %o
,ÉEÄ,Ñ o,·,Æ,«,¾,̄•Ö’l,³,ê,é B,±,İfR [fh,İ ³ ifXfe [f^fX EfR [fh,Ä, ,é,±,Æ,É’ °Ö B

**DIERR\_NOTACQUIRED:** fffofCfX,“Fž̄,³,ê,Ä,¢,È,¢ B

**DIERR\_INPUTLOST:**
ffofCfX,Ö,İfAfNfZfX,“+‘f,³,ê,½ BfAvfšfP [fVf‡f“,İffofCfX,ð Ä”Fž̄,µ,È,̄,ê,Î,È,ç,È,¢ B

**DIERR\_INVALIDPARAM = E\_INVALIDARG:** –³Eø,Èfpf%of [f^,“¶ Ý,µ,½ B

**—á**

žŸ,İ—á,Ä,İ A10EÄ,İfobftf@ Eff [f^—
v‘f,ð“Ç,Ýžæ,è A“Ç,Ýžæ,èEäffofCfX Efobftf@,©,ç,»,ê,ç,ð í œ,·,é B

```
DIDEVICEOBJECTDATA rgdod[10];
DWORD dwItems = 10;
hres = IDirectInputDevice_GetDeviceData (
    pdid,
    sizeof (DIDEVICEOBJECTDATA),
    rgdod,
    &dwItems,
    0);
if (SUCCEEDED(hres)) {
    // fobftf@,İ ³ í,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 ”,³•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 AfffofCfX Efofbftf@,©,çff [f^,ð í œ,μ,È,ç,æ,□
,É,·,é,Æ AfffofCfX Efofbftf@,Ì-v‘f ”,ð-â,ç ‡,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 [³,²N,±,Á,½
        // ,·,×,Ä,Ìff [f^,³ ³ í,ÉfLfffvf`ff,³ê,½,í, -,Á,Í,È,ç
    }
}

rgdod,ÉNULL,ð“n,μ €-Ú,ð‘S,-v< ,μ,È,ç,Æ Afobftf@,Ìfi [fo [ftf [³,²N,±,Á,½,©,ç,□,©-
â,ç ‡,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 [³,²N,±,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,ªĀ,Ñ o,³,ê,½DirectInputfffofCfX EfIfufWfFfNfg,ðžw,μž̄,· B

pdidi

fffofCfX,ìž̄•Ê î•ñ,ðžó,žæ,é B,±,ìf f\fbfh,ðĀ,Ñ o,·‘O,É AĀ,Ñ o,μ‘□  
,**DIDEVICEINSTANCE** \‘c‘ì,ìdwSizeftfB [f<fh,ð %šú%»,μ,È,̄,ê,î,È,ç,È,ç B

•Ô¹

COMfGf%o [fR [fh,ð•Ô,· B^È%°,ìfGf%o [fR [fh,í•Ô,³,ê,éfR [fh,ì,·,×,Ä,Æ,ÍĀ,ç,È,ç B

**DI\_OK = S\_OK**: ‘€ ì,í ³ í,É I—¹,μ,½ B

**DIERR\_INVALIDPARAM = E\_INVALIDARG**: ,D,Æ,Â^È ã,ìfpf%of [f^,ª-³Āø,Ā, ,Ā,½ B

## IDirectInputDevice::GetDeviceState

```
HRESULT GetDeviceState(  
    LPDIRECTINPUTDEVICE lpDirectInputDevice,  
    DWORD cbData,  
    LPVOID lpvData);
```

DirectInputffofCfX, ©, Ć Žžff [f^, đžæ“¾, ·, é B

ffofCfX Eff [f^žæ“¾, Ì‘O, É ASetCooperativeLevel, Éĉ‘?fĈfxfĉ, đ ASetDataFormat, Éff [f^ EftfH [f}  
fbfg, đ, » , ê, ¼, êfZfbfg, μ AAcquire, ĀffofCfX, đ”Fž̄ , μ, Ā, “, ©, È, “, ê, Ì, È, ĉ, È, Ć B

lpDirectInputDevice

, ±, Īf f“fo, “ĈĀ, Ñ o, ³, ê, ½DirectInputffofCfX EfIfufWfFfNfg, đžw, μž‘, · B

cbData

lpvData, É, æ, èžw, μž‘, ³, ê, éofbftf@, ĩTfCfY, đfofCfG, Āž‘, μ, ½, à, Ì B

lpvData

ffofCfX, ÌĈ» Ý, Ì ó‘Ō, đžó, “žæ, é \‘ĉ‘ì, đžw, μž‘, · Bff [f^, ĩftfH [f}fbfg, Ì A, , ĉ, ©, ¶,  
IDirectInputDevice::SetDataFormat, đĈĀ, Ñ o, ·, ±, Ā, ĀĈ^, ß, ĉ, è, é B

## •Ō‘l

COMfGf%o [fR [fh, đ•Ō, · B^È%o, ĪfGf%o [fR [fh, Ì•Ō, ³, ê, éfR [fh, Ì, ·, ×, Ā, Ā, ÌĈĀ, ĉ, È, Ć B  
DI\_OK = S\_OK: ‘Ĉ ì, Ì ³ ì, È I—, μ, ½ B

E\_PENDING:

ffofCfX, É, Ì, Ū, ¾ff [f^, “¶ Ý, μ, È, Ć BffofCfX, Ì‘†, É, Ì(½, Ā, ‘, ‘, ĪUSBfWf†fCfXfefBfbfN) AffofCfX, “fIf“, É,  
È, éžž , ĀffofCfX, “ff [f^, đ‘— M, μžn, ß, éžž , ÌšŌ, É‘Ō, ĉžžšŌ, đ—v, ·, é, à, Ì, “, , é B, ±,  
, ĪfEftfH [fĈfAfbfvžžšŌ‘† AGetDeviceState, ÌĈ\_PENDING, đ•Ō, · Bff [f^, “~—p%oĀ”  
, É, È, é, Ā AfCxf“fg’Ē’mfnf“fhfĉ, ÉfVfOfifĉ, “—, ĉ, è, é B

DIERR\_NOTACQUIRED: fffofCfX, “”Fž̄ , ³, ê, Ā, ĉ, È, Ć B

DIERR\_INPUTLOST:

ffofCfX, Ō, ĪfAfNfZfX, “†‘f, ³, ê, ½ BfAvfšfP [fvf†f“, ĪffofCfX, đ Ā”Fž̄ , μ, È, “, ê, Ì, È, ĉ, È, Ć B

DIERR\_INVALIDPARAM= E\_INVALIDARG: lpvDatafpf%of [f^, “—LĈø, Èf|fCf“f^, Ā, È, Ć

, © A‘O%oñ, ĪSetDataFormat(ĈĀ, Ñ o, μ, ĀfZfbfg, ³, ê, ½ff [f^fTfCfY, ĀcbDatafpf%of [f^, Ā, “è‘v, μ, È, Ć 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,“CEÄ,Ñ o,³,ê,½DirectInputffofCfX EfIfufWfFfNfg,ðŽw,μŽ,· B*

*pdidoi*

*fIfufWfFfNfg,ÉŠÖ,·,é î•ñ,ðŽó,~Žæ,é B,±,İf f\fbfh,ðCEÄ,Ñ o,·‘O,É ACEÄ,Ñ o,μ‘  
İ,İDIDEVICEOBJECTINSTANCE \‘ç‘İ,İdwSizeftfB [f<fh,ð %Šú%»,μ,È,¯,ê,Î,È,ç,È,ç B*

*dwObj*

*fvf fpfefB,³fAfNfZfX,³,ê,éIfufWfFfNfg,ðŽ~·Ê,·,é B*

*dwHow*

*dwObj,İ%ðŽß•û-@,ðŽ~·Ê,·,é B*

ŽQ Æ @DIPROPHEADER

•Ô¹

*COMfGf%o [fR [fh,ð•Ô,· B^È%°,İfGf%o [fR [fh,Í—á Ø“l,Ä, ,é,Æ^Ó }  
³,ê,Ä,“,è A•Ô,³,ê,éfR [fh,İ,·,×,Ä,Æ,ÍCEÄ,ç,È,ç B*

*DI\_OK = S\_OK: ‘ç İ,İ ³ İ,È l—¹,μ,½ B*

*DIERR\_INVALIDPARAM = E\_INVALIDARG: ~³CEø,Èfpf%of [f^,“¶ Ý,·,é B*

*DIERR\_OBJECTNOTFOUND: Žw’è,³,ê,½fIfufWfFfNfg,“¶ Ý,μ,È,ç B*

## IDirectInputDevice::GetProperty

```
HRESULT GetProperty(  
    LPDIRECTINPUTDEVICE lpDirectInputDevice,  
    REFGUID rguidProp,  
    LPDIPROPHEADER pdiph);
```

“ü—ÍffofCfX,ÉŠÖ,·,é îñ,đŽæ“¼,·,é B,¢,-  
,Á,©,İfvf fpfefB,ÍDirectInputDevice::SetProperty f\fbfh,İĀ,Ñ o,μ,ÁZfbfg,³,é,é B,»„ēÈŠÖ,Í“Ç,Ý o,μ ē—  
p,Á, ,é BDirectInputDevice::SetProperty f\fbfh,İZfbfg%Ā”\,Éfvf fpfefB,İfŠfXfg,đŽQ Ā,·,é,±,Ā B

lpDirectInputDevice

,±,İf f“fo,³Ā,Ñ o,³,é,½DirectInputffofCfX EfIfufWfFfNfg,đŽw,μŽ!,· B

rguidProp

Žæ“¼,³,é,éfvf fpfefB,İŽ·ĒŽq B, ,ç,©,¶,B'èç',³,é,Ā,¢  
,éDIPROP\_\*!l,Đ,Ā,Ā,© Afvf fpfefB,đŽ·Ē,·,éGUID,Ö,İf|fCf“f^(C++,đŽq—p,·,é ē ±,İŽQ Ā) B  
Ē%°,İfvf fpfefB,“ü—ÍffofCfX,É'İ,μ,Ā, ,ç,©,¶,B'èç',³,é,Ā,¢,é B

**DIPROP\_AXISMODE**

**DIPROP\_BUFFERSIZE**

**DIPROP\_GRANULARITY**

**DIPROP\_RANGE**

,±,é,ç,İfvf fpfefB,»„ē,¼,é,İ Ú ×,É,Ā,¢,Ā,Í A \c'ì,·,æ,Ñ'è ”,İ B,ĀĀĀ X,İfvf fpfefB,İL q,đŽQ Ā,·,é,±  
,Ā B

pdiph

fvf fpfefB,ÉÈ¶,·,é \c'ì,İDIPROPHEADER·”,đŽw,μŽ!,· B

## •Ŏ!1

COMfGf%o [fR [fh,đ·Ŏ,· BÈ%°,İfGf%o [fR [fh,Í·Ŏ,³,é,éfR [fh,Ì,·,×,Ā,Ā,ÍĀĀ,ç,È,¢ B

**DI\_OK = S\_OK:** ‘€ ì,Í ³ í,É I—1,μ,½ B

**DIERR\_INVALIDPARAM = E\_INVALIDARG:** pdiphpf%of [f^,³—LĀø,Èf|fCf“f^,Ā,È,¢

,© AdwHowftfB [f<fh,³—³Āø,© A, ,é,¢,ÍdwHow,³DIPH\_DEVICE,ÉfZfbfg,³,é,Ā,¢

,È,³,çdwObjftfB [f<fh,³,Ā,È,¢ B

**DIERR\_OBJECTNOTFOUND:** Žw'è,³,é,½fIfufWfFfNfg,³¶ Ý,μ,È,¢ B

**DIERR\_UNSUPPORTED = E\_NOTIMPL:** fffofCfX,Ü,½,İfIfufWfFfNfg,³fvf fpfefB,đfTf [fg,μ,Ā,ç,È,¢ B

—á

È%°,İĀĀĀĀĀfR [fh,İê·”,Í ADIPROP\_BUFFERSIZEfvf fpfefB,İ'l,İŽæ“¼·ü—@,đŽ!,μ,Ā,¢,é B

DIPROPDWORD dipdw;

HRESULT hres;

dipdw.diph.dwSize = sizeof(DIPROPDWORD);

dipdw.diph.dwHeaderSize = sizeof(DIPROPHEADER);

dipdw.diph.dwObj = 0; // fffofCfX,İfvf fpfefB

dipdw.diph.dwHow = DIPH\_DEVICE;

hres = IDirectInputDevice\_GetProperty(pdid, DIPROP\_BUFFERSIZE, &dipdw.diph);

if (SUCCEEDED(hres)) {

// dipdw.dwData,Éfvf fpfefB,İ'l,“ü,é

}

## IDirectInputDevice::EnumObjects

```
HRESULT EnumObjects(  
    LPDIRECTINPUTDEVICE lpDirectInputDevice,  
    LPDIENUMDEVICEOBJECTSCALLBACK lpCallback,  
    LPVOID pvRef,  
    DWORD fl);
```

“ü—ÍfffofCfX,É,;,c,Ä—~—p%oÄ”\,È“ü—Íf\ [fX(Ž² Af{f^f“,È,Ç),ð—ñ<“,;é B

*lpDirectInputDevice*

,±,Ïf f“fo,“EÄ,Ñ o,³,ê,½DirectInputfffofCfX 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’Í,;éŽQ Æff [f^(fRf“fefLfxfg) B

*fl*

—ñ<“,³,ê,éfIfufWfFfNfg,Ïf^fCfv,ðŽw’è,·,éftf%ofo Bff [f^ EftfH [f}fbfg Ef^fCfv,Ï’g,Ý ‡,í,¹,Å, ,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%o°,ÏfGf%o [fR [fh,Í•Ö,³,ê,éFR [fh,Ï,·,×,Ä,Æ,ÍEÀ,Ç,È,Ç B  
**DI\_OK = S\_OK:** ‘€ ì,Í ³ í,É I—¹,μ,½ BfR [f<fofbfN,“r’†,Ä—ñ<“,ð’†Ž~,μ,½ ê ‡ A—ñ<“,Í ³ í I—  
¹,μ,½,ÆE©,È,³,ê,é,±,Æ,É’ ^Ó B  
**DIERR\_INVALIDPARAM = E\_INVALIDARG:** flpf%of [f^,É—³Eø,Èftf%ofo,ª, ,Á,½,© A, ,é,Ç  
ÍfR [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,³,ê,È,©,Á,½ ê ± AfIfufWfFfNfg,Í ó'Ô,ªs'è,Á, ,é,ÆÆ©,È,³,é,é B'±  
, ,Á,»,lfIfufWfFfNfg,đŽg—p,.,é,È,Í Ä"x %Šú%»,l•K—v,ª, ,é,±,Æ,É' ^Ó B

**IDirectInput::CreateDevice** f\fbfh,ÍffofCfX,đ ì ¬,.,é,ÆŽ©"@"I,É,»,ê,đ %Šú%»,.,é,½,ß A'Ê í,ÍfAfvfŠfP [fVf±f"  
f±f",©,ç,±,İŠÖ ",đÆÄ,Ñ o,•K—v,Í,È,ç B

## lpDirectInputDevice

,±,lf f"fo,ªÆÄ,Ñ o,³,ê,½DirectInputffofCfX EfIfufWfFfNfg,đŽw,μŽl,· B

### hinst

DirectInputDeviceIfufWfFfNfg,đ ì ¬,μ,Ä,ç  
,éfAfvfŠfP [fVf±f",Ü,½,ÍDLL,lfCf"fXf^f"fX Efnf"fhf< BDirectInput,Í A,±,l'l,đ—p,ç,ÄfAfvfŠfP [fVf±f"  
,é,ç,ÍDLL,ªF Ø,³,ê,Ä,ç,é,©,ç,ª,©,đ'm,é B

### dwVersion

Žg—p,³,ê,½dinput.hfwfbf\_ftf@fCf<,lfo [fWf±f""Ô † B,±,l'l,ÍDIRECTINPUT\_VERSION,Á,È,¬,ê,Í,È,ç,È,ç B

DirectInput,Í,±,l'l,đ—p,ç

,Ä A,ç,lfo [fWf±f",lDirectInput,É'Í,μ,ÄfAfvfŠfP [fVf±f",Ü,½,ÍDLL,ª ÝÆv,³,ê,½,l,©,đŠm'è,.,é B

### rguid

fCf"f^ [ftfFfCfX,ÉŠÖ~A,l, ,éffofCfX,lCf"fXf^f"fX,đŽ~•Ê,.,é **IDirectInput::EnumDevices** f\fbfh,đ—p,ç  
,Ä AfVfXfef€,ª,ç,lCf"fXf^f"fXGUID,đfTf| [fg,μ,Ä,ç,é,©,đ'm,é,±,Æ,ª,Ä,ª,«é B

## •Ô'l

COMfGf%o [fR [fh,đ•Ô,· B^È%°,lfGf%o [fR [fh,Í•Ô,³,ê,éfR [fh,l,·,×,Ä,Æ,ÍÆÄ,ç,È,ç B

**DI\_OK = S\_OK**: fffofCfX,Í Ú'±,³,ê,Ä,ç,é B

**DIERR\_OLDDIRECTINPUTVERSION**: DirectInput,lfo [fWf±f",ªÆÄ,ç B

**DIERR\_BETADIRECTINPUTVERSION**: fTf|

[fgŠÖ,Á, ,éDirectInputx [f^ Efo [fWf±f",É'Í,μ,ÄfAfvfŠfP [fVf±f",ª ' ,©,ê,Ä,ç,½ B

**S\_FALSE**: fffofCfX,Írguid,É"n,³,ê,½fCf"fXf^f"fXGUID,Á,·,Á,É %Šú%»,³,ê,Ä,ç,½ B

**DIERR\_ACQUIRED**: fffofCfX,Í"ŽŽ~ ,³,ê,Ä,ç,é,ª %Šú%»,Ä,ª,«È,©,Á,½ B

## IDirectInputDevice::QueryInterface

```
HRESULT QueryInterface(  
    LPDIRECTINPUTDEVICE lpDirectInputDevice,  
    REFIID riid,  
    LPVOID FAR* ppvObj);
```

**IDirectInputDevice**,<sup>a</sup>Ep<sup>3</sup>,<sup>·</sup>éIUnknownfCf“f^ [ftFfCfX,Îê” BfAfvfŠfP [fVf‡f“,<sup>a</sup>Žg—p,μ,æ,α,Æ,μ,Ä,¢  
,éfCf“f^ [ftFfCfX,đ,»],İfufWfFfNfg,<sup>a</sup>fTf] [fg,μ,Ä,¢,é,©,Ç,α,©—â,¢ ‡,í,1,é,½,ß,É—p,¢,é B—  
â,¢ ‡,í,1,½“Á’è,ÌCOMfCf“f^ [ftFfCfX,đfufWfFfNfg,<sup>a</sup>fTf] [fg,μ,Ä,¢  
,é ê ‡ AfAfvfŠfP [fVf‡f“,Í,»],İfCf“f^ [ftFfCfX,đ’¼,¿,ÉŽg—p,μŽn,ß,é,±,Æ,<sup>a</sup>Ä,«é B•K—  
v,ÈfCf“f^ [ftFfCfX,<sup>a</sup>fTf] [fg,<sup>3</sup>ê,Ä,¢,é ê ‡ AfAfvfŠfP [fVf‡f“,İppvObjpf%of [f^,Éf]  
fCf“f^,<sup>a</sup>Ô,<sup>3</sup>ê,é BfAfvfŠfP [fVf‡f“,<sup>a</sup>,»],İfCf“f^ [ftFfCfX,đŽg—p,μ,È,¢,© A, ,é,¢,ÍŽg—p,đ I—  
1,μ,½ ê ‡,Í ARelease,đĀ,Ñ o,μ,ÄfCf“f^ [ftFfCfX,đ%đ•ú,μ,È, ,ê,Í,È,ç,È,¢ B,±,İf f“fo,É,æ,è AŠù“¶], ,é,¢  
,Í «—,İ<@”\,Æ Ö“È AŠ± Ä,·,é,±,Æ,È,DirectInputIfufWfFfNfg,đŠg’£,Ä,«é B Ú ×,É,Ä,¢,Ä,Í AOLEf}fjf...  
fAf<,İIUnknown::QueryInterface,đŽQ Æ,·,é,±,Æ B

lpDirectInputDevice

,±,İf f“fo,<sup>a</sup>Ā,Ñ o,<sup>3</sup>ê,½DirectInputffofCfX EfIfufWfFfNfg,đŽw,μŽ!,· B

riid

•K—v,ÈfCf“f^ [ftFfCfX,đŽ•Ê,·,éfCf“f^ [ftFfCfXID(IID),đŽw,μŽ!],· B

ppvObj

—â,¢ ‡,í,1,<sup>a</sup> 3 í,ÉŽÄ s,<sup>3</sup>ê,½ ê ‡•Ô,<sup>3</sup>ê,éfCf“f^ [ftFfCfX Ef|fCf“f^,<sup>a</sup>“ü,<sup>3</sup>ê,éÊ’u,đŽw,μŽ!],· B

•Ô’1

DI\_OK

DIERR\_INVALIDPARAM

DIERR\_NOINTERFACE

**IDirectInputDevice::Release**

DWORD Release(LPDIRECTINPUTDEVICE lpDirectInputDevice);

**IDirectInputDevice**,<sup>a</sup>Ep<sup>3</sup>,·,éIUnknownfCf“f^ [ftfFfCfX,îê” BŠÖ~A,Ì, ,éCOMfIfufWfFfNfg,ÌŽQ ÆfJfEf“fg,ðE  
,,ç,·,½,ß,É—p,ç,ç,ê,é BfIfufWfFfNfg,<sup>a</sup> Å %  
,É ì ¬,<sup>3</sup>,ê,é,Æ,« AŽQ ÆfJfEf“fg,Í,ÉZfbfg,<sup>3</sup>,ê,é BAddRef,<sup>a</sup>Ā,Ñ o,<sup>3</sup>,ê,é,½,Ñ,ÉŽQ ÆfJfEf“fg,ÍfCf“fnfŠf f  
“fg,<sup>3</sup>,ê ARelease,<sup>a</sup>Ā,Ñ o,<sup>3</sup>,ê,é,½,Ñ,ÉŽQ ÆfJfEf“fg,ÍffNfŠf f“fg,<sup>3</sup>,ê,é BŽQ ÆfJfEf“fg,<sup>0</sup>,É,È,é,Æ A,»,ÌfIfu  
fWfFfNfg,Í%ð·ú,<sup>3</sup>,ê,é B Ú ×,É,Ā,ç,Ā,Í AOLEf}fjf...fAf<,ì IUnknown::QueryInterface,ðŽQ Æ,·,é,±,Æ B

lpDirectInputDevice

,±,Ìf f“fo,<sup>a</sup>Ā,Ñ o,<sup>3</sup>,ê,½DirectInputffofCfX EfIfufWfFfNfg,ðŽw,μŽ!,· B

**•Ô¹**

V,½,ÈŽQ ÆfJfEf“fg,ðŠÜ,ÐDWORD B,±,Ì•Ô¹,Ífffofbfo—p“r,É,¾, Žg—p,<sup>3</sup>,ê,é,±,Æ,É’ ^Ó B

## IDirectInputDevice::RunControlPanel

```
HRESULT RunControlPanel(  
    LPDIRECTINPUTDEVICE lpDirectInputDevice,  
    HWND hwndOwner,  
    DWORD dwFlags);
```

fffofCfX,ÉŠÖ~A,Ä, -,ç,ê,½fRf“fgf [f<fpflf<,ðŽÀ s,·,é BfffofCfX,ÉŠÖ~A,Ä, -,ç,ê,½fRf“fgf [f<fpflf<,“¶ Ý,μ  
,È,ç ê ‡ AffftfHf<fg,İfffofCfX EfRf“fgf [f<fpflf<,“N“@,³,ê,é B

*lpDirectInputDevice*

,±,İf f“fo,“EÄ,Ñ o,³,ê,½DirectInputfffofCfX EfIfufWfFfNfg,ðŽw,μŽ!,· B

*hwndOwner*

Eä±,İUI,É·Î,·,é efEfBf“fhfE,Æ,μ,Ä—p,ç

,ç,ê,éEfEfBf“fhfE Efnf“fhf<,ðŽ·Ê,·,é BNULL,Í efEfBf“fhfE,“¶ Ý,μ,È,ç,±,Æ,ðŽ!,· B

*dwFlags*

E»Žž“\_,Ä,Íftf%fo,Í'è<,³,ê,Ä,ç,È,ç B,±,İfpf%of [f^,Í0,Ä,È, -,ê,Î,È,ç,È,ç B

•Ö¹

COMfGf%o [fR [fh,ð•Ö,· B^È%°,İfGf%o [fR [fh,Í•Ö,³,ê,éfR [fh,Ì,·,×,Ä,Æ,ÍEÄ,ç,È,ç B

DI\_OK = S\_OK: ‘€ ì,Í ³ í,É I—¹,μ,½ B

## IDirectInputDevice::SetCooperativeLevel

```
HRESULT SetCooperativeLevel(  
    LPDIRECTINPUTDEVICE lpDirectInputDevice,  
    HWND hwnd,  
    DWORD dwFlags);
```

ffofCfX, ÌfCf“fXf^f“fX, É‘Î, µ, Ä‘²fCfxf<, ðŠm—  
§, ;é B<’²fCfxf<, Í AfffofCfX, ÌfCf“fXf^f“fX, “¼, ÌfCf“fXf^f“fX, âfVfXfef€ , Ì‘¼, Ì‘”ª, Æ, Ç, Ì, æ, µ, É‘ŠÉÝ ì—  
p, ·, é, ©, ðC“è, ·, é B

fVfXfef€ Ef}fEfX, “r‘¼f, [fh, Å”FŽ¯, ³, ê, Ä, c, é ê ‡ AfffofCfX, “%ð·ú, ³, ê, é, Ü, Åf}  
fEfX EfJ [f^<, aXfNfŠ [f“ , ©, çC©, , Ì, È, È, é, ±, Æ, É’ Ó B

**IDirectInputDevice::Acquire**, ÅfffofCfX, ð”FŽ¯, ·, é‘O, É A, ±, Ìf f\fbfh, ðCÄ, Ñ o, ³, È, ¯, ê, Ì, È, ç, È, C B

hwnd

ffofCfX, ÆŠÖ~A, ·, éEfBf“fhfE B DISCL\_FOREGROUNDftf%o, “n, ³, ê, Ä, c, é ê ‡ A, ±  
 , Ìpf%of [f^, ÍNULL^ÈŠO, Å, È, ¯, ê, Ì, È, ç, È, C B, ±  
 , ÌfEfBf“fhfE, ÌfgfbfvfCfxf<, Å, È, ¯, ê, Ì, È, ç, È, C BDirectInputffofCfX, É, ¯, c, ÄAfNfefBfu, Å, , éŠÖ, ÉfEfBf“fhfE,  
 ð•Å, ¶, é, ÆfGf%o [ , È, È, é B

dwFlags

ffofCfX, ÆŠÖ~A, ·, é<’²fCfxf<, ðL q, ·, éftf%o B  
DISCL\_\*ftf%o, É, Å, c, Ä, Í•Ê“r•¶ “%o», ³, ê, Ä, c, é B

•Ö¹

COMfGf%o [fR [fh, ð•Ö, · B^È%°, ÌfGf%o [fR [fh, Í•Ö, ³, ê, éfR [fh, Ì, ·, ×, Ä, Æ, ÍCÄ, ç, È, c B  
DI\_OK = S\_OK: ‘€ ì, Í ³ í, É I—¹, µ, ½ B  
DIERR\_INVALIDPARAM = E\_INVALIDARG: hwndfpf%of [f^, É-³CØ, ÈfEfBf“fhfE Efnf“fhf<, , é, c, Í-  
³CØ, Èftf%o, Ü, ½, Ìftf%o, Ì‘g, Ý ‡, í, ¹, “n, ³, ê, ½ B

## IDirectInputDevice::SetDataFormat

```
HRESULT SetDataFormat(  
    LPDIRECTINPUTDEVICE lpDirectInputDevice,  
    LPCDDIDATAFORMAT lpdf);
```

DirectInputffofCfX,É'Í,·,éff [f^ EftfH [f]fbfg,ðfZfbfg,·,é Bff [f^ EftfH [f]  
fbfg,ÍffofCfX,™FŽ~³,ê,é'O,ÉfZfbfg,·,é•K—v,ª, ,é Bff [f^ EftfH [f]  
fbfg,ÍfZfbfg,Í,½,¾^ê"x,¾,¯,Á,È,¯,ê,Í,È,ç,È,ç Bff [f^ EftfH [f]fbfg,ÍffofCfX,™FŽ~³,ê,Á,ç,éŠÔ,Í•Í X,·,é,±  
,Æ,ª,Á,«,È,ç Bff [f^ EftfH [f]fbfg,ÍfZfbfg,ÉŽ,™s,·,é,Æ Aff [f^ EftfH [f]  
fbfg îñ,Í,·,×,ĂŽ,·,í,ê,é B,»),Í,½,ßffofCfX,™FŽ~³,ê,é'O,É—LÆø,Èff [f^ EftfH [f]  
fbfg,ðfZfbfg,µ,Á,·,©,È,¯,ê,Í,È,ç,È,ç BfAfvfŠfP [fVf‡f“ ,Í'Ê í A, ,ç,©,¶,ß'èç³,ê,Á,ç,éff [f^ EftfH [f]fbfg,Á,  
,éc\_dfDIMouse,Û,½,Í c\_dfDIKeyboard,Ì,ç,·,é,©,ð—p,ç,é B

*lpDirectInputDevice*

,±,Ìf f“fo,ªEÁ,Ñ o,³,ê,½DirectInputffofCfX EflfufWfFfNfg,ðŽw,µŽ!,· B

*lpdf*

DirectInputDevice,ª•Ô,·ff [f^ EftfH [f]fbfg,ðçL q,·,é \‘ç'Ì,ðŽw,µŽ!,· B

## •Ô'1

COMfGf%o [fh,ð•Ô,· B^È%o,ÌfGf%o [fh,ÍŽÀ—á,ðŽ!,·,±,Æ,ð´Ó }

,µ,Á,·,è A•Ô,³,ê,éfR [fh,Ì,·,×,Á,Æ,ÍEÁ,ç,È,ç B

**DI\_OK = S\_OK:** ‘€ ì,Í ³ í,È I—¹,µ,½ B

**DIERR\_INVALIDPARAM = E\_INVALIDARG:** *lpdffpf%of* [f^,Í—LÆø,Èff|fCf“f^,Á,Í,È,ç B

**DIERR\_ACQUIRED:** *ffofCfX,™FŽ~³,ê,Á,ç,éŠÔ,Íff* [f^ EftfH [f]fbfg,ð•Í X,·,é,±,Æ,ª,Á,«,È,ç B

## IDirectInputDevice::SetEventNotification

```
HRESULT SetEventNotification(  
    LPDIRECTINPUTDEVICE lpDirectInputDevice,  
    HANDLE Event);
```

ffofCfX ó'Ô,îĭ XŽž,ÉfZfbfg,³,é,éfCfxf“fg,ðŽw'è,·,é BfCfxf“fg'Ê'm,ðfIfT,É,·,é,½,β,É,à—p,ç,ç,é,é B

IDirectInputDeviceIfufWfFfNfg,ª,·,Á,É'Í'ð,μ,Ä,ç  
,éfCfxf“fg,É'Í,μCloseHandle,ðCEÄ,Ñ o,·,ÆfGf%o [ ,É,È,é B,»,½,β AfCfxf“fg Efnf“fhf<,ð·Ä,¶,é'Ó,É AhEventf  
pf%of [f^,ðNULL,ÉfZfbfg,μ,ÄIDirectInputDevice::SetEventNotification,ðCEÄ,Ñ o,³,É,·,é,½,β,É,ç,É,ç B

ffofCfX,“FŽ~ ,³,é,Ä,ç,éŠÖ,ÍfCfxf“fg'Ê'mfnf“fhf<,ð·ĭ X,·,é,±,Æ,Í,Ä,«,È,ç B

ŠÖ ”,ª ³ í,ÉŽÀ s,³,é,½ ê ± AfAvfŠfP [fVf±f“,Í A'¼,ÌWin32fCfxf“fg Efnf“fhf<,Æ—l,ĭ·û—  
@,ÁfCfxf“fg Efnf“fhf<,ð—p,ç,é,±,Æ,ª,Ä,«,é BŽg—p@,ĭ—á,ð`È%°,ÉŽ!,· BWin32fEfFfCfGŠÖ ”,ð—p,ç  
,é Ū,ĭ ĩñ,É,Ä,ç,Ä,Í AWin32 SDK,·,æ,ÑŠÖ`A,ĭf}fj...fAf<,ðŽQ Æ,·,é,±,Æ B

lpDirectInputDevice

,±,ĭf f“fo,ªCEÄ,Ñ o,³,é,½DirectInputffofCfX EfIfufWfFfNfg,ðŽw,μŽ!,· B

hEvent

ffofCfX ó'Ô,îĭ XŽž,ÉfZfbfg,³,é,éfCfxf“fg,Ö,ĭfnf“fhf< BDirectInput,ÍffofCfX,ĭ ó'Ô,ª'ĭ%o,·,é,Æ,«,Éfnf“fh  
f<,ðSetEvent,·,é B

Žè“@fŠfZfbfg EfCfxf“fg,ĭfnf“fhf<,ð ĩ -,·,é,É,Í A CreateEventŠÖ ”,ð—p,ç  
,é BfCfxf“fg,ðŽ“@fŠfZfbfg EfCfxf“fg,Æ,μ,Ä ĩ -,μ,½ ê ± AfEfFfCfGŽžŠÖ,ð%oβ,·,é,ÆOS,ªŽ“@“Í,ÉfC  
fxf“fg,ðfŠfZfbfg,·,é BfCfxf“fg,ðŽè“@fŠfZfbfg EfCfxf“fg,Æ,μ,Ä ĩ -,μ,½ ê ± AResetEvent,ðCEÄ,Ñ o,μ,  
ÁfŠfZfbfg,·,é,ĭ,ĭfAvfŠfP [fVf±f“,ĭ—  
ðŠ,,Æ,È,é BDirectInput,ÍfCfxf“fg'Ê'mfnf“fhf<,ð“¾,é,½,β,ÉResetEvent,ðCEÄ,Ñ o,·,±  
,Æ,Í,μ,È,ç B,Ū,Æ,ñ,Ç,ĭfAvfŠfP [fVf±f“,Á,ÍfCfxf“fg,ðŽ“@fŠfZfbfg EfCfxf“fg,Æ,μ,Ä ĩ -,·,é B

hEvent,ªNULL,ĭ ê ± A'Ê'm,Í·s%oÄ”\,Æ,È,é B

## ·Ô'ĭ

COMfGf%o [fR [fh,ð·Ô,· B`È%°,ĭfGf%o [fR [fh,Í·Ô,³,é,éfR [fh,ĭ,·,×,Ä,Æ,ÍCEÄ,ç,È,ç B  
DI\_OK = S\_OK: ‘€ ĩ,ĭ ³ í,É ĩ—,μ,½ B

DIERR\_ACQUIRED: IDirectInputDeviceIfufWfFfNfg,Í'FŽ~ ,³,é,Ä,ç

,é BIDirectInputDevice::Unacquire,ðCEÄ,Ñ o,μ,Ä A'Ê'm ó'Ô,îĭ X'Ó,ÉffofCfX,ð%oð·ú,μ,È,·,é,ĭ,È,ç,È,ç B

DIERR\_HANDLEEXISTS:

IDirectInputDeviceIfufWfFfNfg,É,Í AfCfxf“fg'Ê'mfnf“fhf<,ª,·,Á,É'¶ Ý,·,é BDirectInput,Á,Í A,Đ,Æ,Ä,İDire  
ctInputDeviceIfufWfFfNfg,É'Í,μfTf [fg,³,é,éfCfxf“fg'Ê'mfnf“fhf<,Í,Đ,Æ,Ä,¾,·,Ä, ,é B

E\_INVALIDARG: fCfxf“fg Efnf“fhf<,Á,Í,È,ç B

—á

fnf“fhf<,ªE»Žž“\_ÁfZfbfg,³,é,Ä,ç,é,ç,ç,ª Afuf fbfLf“fO,¹,,Éf fFfbfN,·,é B

```
dwResult = WaitForSingleObject(hEvent, 0);  
if (dwResult == WAIT_OBJECT_0) {  
    // fCfxf“fg,ªfZfbfg,³,é,½  
    // fCfxf“fg,ªŽ“@fŠfZfbfg,Æ,μ,Ä ĩ -,³,é,½ ê ± A  
    // ,»,é,à,Ū,½fŠfZfbfg,³,é,é  
}
```

ŽŸ,ĭ—á,Á,Í AfCfxf“fg,ªfZfbfg,³,é,é,Ū,Á—³ §CEÄ,Éfuf fbfLf“fO,μ,Ä,ç,é B,±,ĭŽè—  
@,ÍCE~,μ,Ä ,, §,Ä,«,È,ç BfEfFfCfGŽžŠÖ,ª%oβ,·,é,Ū,Ä AfXfCfEfbfh,ªfVfXfef€(“Á,ÉWindowsf fbfZ [fW)  
,É'Í,μ,Ä%ož“ž,μ,È,ç,ç,Ä, ,é B

```
dwResult = WaitForSingleObject(hEvent, INFINITE);  
if (dwResult == WAIT_OBJECT_0) {  
    // fCfxf“fg,ªfZfbfg,³,é,½
```

```

    // fCfxf"fg,Ž"®fŠfZfbfg,Æ,μ,Ä ì ¬,³,ê,½ ê ‡ A
    // „,ê,à,Û,½fŠfZfbfg,³,ê,é
}

f fbZ [fW Efx [fX,ÄfCfxf"fg,ð,Ó,½,Ä—p,ç,Ä,ç,éAfvfŠfP [fVf‡f“,ì"TE^"I,Èf fbZ [fW Efc [fv,Žÿ,ì
—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:
        // fCfxf"fg1,³fZfbfg,³,ê,½
        // fCfxf"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:
        // fCfxf"fg2,³fZfbfg,³,ê,½
        // fCfxf"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 fbZ [fW,ðŽó,¬Žæ,Á,½
        // f fbZ [fW,ª,È,È,é,Û,Ä ^— ,ð s,ç
        while(PeekMessage(&msg, NULL, 0, 0, PM_REMOVE)){
            if (msg.message == WM_QUIT) {
                goto exitapp;
            }
            TranslateMessage(&msg);
            DispatchMessage(&msg);
        }
        break;

    default:
        // —Šú,μ,È,çfGf% [
        Panic();
        break;
    }
}

f fbZ [fW Efx [fX,Ä,È,çAfvfŠfP [fVf‡f“,ÄfCfxf"fg,ð,Ó,½,Ä—p,ç,Ä,ç
,é ê ‡,ì"TE^"I,ÈfAfvfŠfP [fVf‡f“ Efc [fv,Žÿ,ì—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:
        // fCfxf"fg1,³fZfbfg,³,ê,½
        // fCfxf"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,³Ž©“@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,È,,È,é,Û,Ä ^— ,ð s,ª
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€,ìfif€ [f€,ð€^,ß,é
// fQ [f€,³fAfCfhf< ó‘Ô,Ì ê ‡ AZÿ,ìfEfFfCfg,É‘Î,µ,Ä
// “ü—Í,âf fbfZ [fW,ð-³ §€Ä,É‘Ò,ç‘±,¬,é,æ,ªŽwŽ|,·,é
if (!DoGame()) {
    dwWait = INFINITE;
}
break;
}
}

```

## IDirectInputDevice::SetProperty

```
HRESULT SetProperty(  
    LPDIRECTINPUTDEVICE lpDirectInputDevice,  
    REFGUID rguid,  
    LPCDIPROPHEADER pdiph);
```

ffofCfX, k““@, ð'è'è', ., évf f p p f e f B, ð f Z f b f g, ., é B f Z f b f g % Å ^, È f v f f p p f e f B, É, Í “ü—  
Í f o f b f t f @ E f T f C f Y, â Ž 2 f, [ f h, È, Ç, a, , é B, ±  
, è, ç, Ì f v f f p p f e f B, Ì Ç » Ý ' 1, Í A I D i r e c t I n p u t D e v i c e : : G e t P r o p e r t y f f \ f b f h, Ì Ç Ä, Ñ o, µ, Å Ž æ “ ¾, Ä, «, , é B

*lpDirectInputDevice*

, ±, Ì f f “ f o, a Ç Ä, Ñ o, 3, è, ½ D i r e c t I n p u t f f o f C f X E f I f u f W f F f N f g, ð Ž w, µ Ž !, . B

*rguidProp*

f Z f b f g, 3, è, é v f f p p f e f B, Ì Ž - • È Ž q B, , ç, ©, ¶, ß ' è ' è ' 3, è, Ä, Ç, é D I P R O P \_ \* ' 1, Ì, , è, © A, , é, Ç  
, Ì f v f f p p f e f B, ð Ž - • È, ., é G U I D, Ö, Ì f | f C f “ f ^ ( C + +, Ì è ±, Í Ž Q Æ ) B  
^ È % °, Ì f v f f p p f e f B, a “ ü — Í f f o f C f X, É ' Í, µ, Ä, , ç, ©, ¶, ß ' è ' è ' 3, è, Ä, Ç, é B

**DIPROP\_AXISMODE**

**DIPROP\_BUFFERSIZE**

, ±, è, ç, Ì f v f f p p f e f B, » , è, ¼, è, Ì Ú ×, É, Ä, Ç, Ä, Í A \ ' ç ' Ì, , æ, Ñ ' è " , Ì ß, Å Ç Ä X, Ì f v f f p p f e f B < L q, ð Ž Q Æ, ., é, ±  
, Æ B

*pdiph*

f v f f p p f e f B, É ^ È ' ¶, ., é \ ' ç ' Ì, Ì D I P R O P H E A D E R - ”, ð Ž w, µ Ž !, . B

• Ö ' 1

C O M f G f % [ f R [ f h, ð • Ö, . B ^ È % °, Ì f G f % [ f R [ f h, Í • Ö, 3, è, é f R [ f h, Ì, ., ×, Ä, Æ, Í Ç Ä, ç, È, Ç B

**DI\_OK = S\_OK:** ‘ € Ì, Í 3 í, É I — 1, µ, ½ B

**DI\_PROPNOEFFECT = S\_FALSE:** ‘ € Ì, Í 3 í, É I — 1, µ, ½, a—

3 Ç Ø, Ä, , é B, ½, Æ, !, Ì A Ž 2, a “ ¶ Ý, µ, È, Ç f f o f C f X, Ä Ž 2 f, [ f h, ð • Ì X, ., é, Æ, ±, Ì ' 1, ð • Ö, . B

**DIERR\_INVALIDPARAM = E\_INVALIDARG:** *pdiph* f p f % o f [ f ^, a — L Ç Ø, È f | f C f “ f ^, Ä, È, Ç

, © *AdwHow* t f B [ f < f h, a — 3 Ç Ø, © A, , é, Ç, Í *dwHow*, a **DIPH\_DEVICE**, É f Z f b f g, 3, è, Ä, Ç

, È, a, ç *dwObj* t f B [ f < f h, a 0, Ä, È, Ç B

**DIERR\_OBJECTNOTFOUND:** Ž w ' è, 3, è, ½ f I f u f W f F f N f g, a “ ¶ Ý, µ, È, Ç B

**DIERR\_UNSUPPORTED = E\_NOTIMPL:** *f* f o f C f X, Ü, ½, Ì f I f u f W f F f N f g, a f v f f p p f e f B, ð f T f | [ f g, µ, Ä, Ç, È, Ç B

## IDirectInputDevice::Unacquire

```
HRESULT Unacquire(  
LPDIRECTINPUTDEVICE lpDirectInputDevice);
```

*ffofCfX,Ö,ÏAfNfZfX,ð%ð•ú,·,é B*

*lpDirectInputDevice*

*,±,Ïf f“fo,“EÄ,Ñ o,³,ê,½DirectInputffofCfX EfIfufWfFfNfg,ðŽw,μŽ!,· B*

### •Ô¹

*COMfGf% [fR [fh,ð•Ô,· B^È%°,ÏfGf% [fR [fh,Í•Ô,³,ê,éfR [fh,Ï,·,×,Ä,Æ,ÍEÀ,ç,È,ç B*

*DI\_OK = S\_OK: ‘€ ì,Í ³ í,É I—¹,μ,½ B*

*S\_FALSE: fIfufWfFfNfg,ÍE» Ý”FŽ,³,ê,Ä,ç,È,ç B^È‘O,É“ü—Í,ðŽ,Á,½,½,ß,Á, ,é%oÂ”\ «,ª, ,é B,±*

*,ê,Í ³ ífR [fh,Ä, ,é,±,Æ,É’ ^Ó B*



## DIDATAFORMAT

```
typedef struct {
    DWORD dwSize;
    DWORD dwObjSize;
    DWORD dwFlags;
    DWORD dwDataSize;
    DWORD dwNumObjs;
    LPDIOBJECTDATAFORMAT rgodf;
} DIDATAFORMAT;
```

**IDirectInputDevice::SetDataFormat** *f\fbfh, a AfffofCfX, Ìff [f^ EftfH [f]fbfg, ðfZfbfg, ·, é, Ì, È—p, Ç, é B'È í, ÌfAfvfŠfP [fVf‡f“; DIDATAFORMAT \‘c’ì, ð ì ¬, ·, é•K—v, Í, È, A, , ç, ©, ¶, ßfOf [fof<, Æ, µ, Ä’è<, ³, ê, Ä, Ç, éff [f^ A\_c\_dfDIMouse, , é, Ç, Íc\_dfDIKeyboard, Ì, Ç, , , ê, ©, ð—p, Ç, é, ±, Æ, ª, Ä, «, é B*

### dwSize

**DIOBJECTDATAFORMAT** \‘c’ì, ÌfTfCfY B

### dwObjSize

**DIDATAOBJECTFORMAT** \‘c’ì, ÌfTfCfY B

### dwFlags

*ff [f^ EftfH [f]fbfg, Ì¼, Ì’® «, ðL q, ·, éftf%ofo B  
^È%°, Ìftf%fo, ª’è<, ³, ê, Ä, Ç, é B*

**DIDF\_RELAXIS:** Ž², ð’Š’í, [fh, ÈfZfbfg, ·, é B, ±, Ìftf%fo, ðff [f^ EftfH [f]fbfg, ÄfZfbfg, ·, é, ±, Æ, Í A  
**IDirectInputDevice::SetProperty**, ð%oi, µ, ÄŽè ìÆ, ÄŽ²f, [fhfvf fpfefB, ðfZfbfg, ·, é, ±, Æ, Æ“™, Ä, , é B, ±, Ìftf%fo, ð**DIDF\_ABSAXIS**, Æ’g, Ý ‡, í, ¹, é, ±, Æ, Í, Ä, «, È, Ç B

**DIDF\_ABSAXIS:** Ž², ð á’í, [fh, ÈfZfbfg, ·, é B, ±, Ìftf%fo, ðff [f^ EftfH [f]fbfg, ÄfZfbfg, ·, é, ±, Æ, Í A  
**IDirectInputDevice::SetProperty**, ð%oi, µ, ÄŽè ìÆ, ÄŽ²f, [fhfvf fpfefB, ðfZfbfg, ·, é, ±, Æ, Æ“™, Ä, , é B, ±, Ìftf%fo, ð**DIDF\_RELAXIS**, Æ’g, Ý ‡, í, ¹, é, ±, Æ, Í, Ä, «, È, Ç B

### dwDataSize

*fffofCfX, ª•Ô, ·fffofCfX Eff [f^, ÌfTfCfY B, ±, Ì, ¹, Í, Ì”{ ”, Ä, È, ¬, é, Ì, È, ç, , AfIfufWfFfNfgfŠfXfg, ÄŽw’è, ³, ê, Ä, Ç, éIfufWfFfNfg, ·, x, Ä, È, Ä, Ç, ÄdwOfs’l, ð%oz, , Ä, Ç, È, ¬, é, Ì, È, ç, È, Ç B*

### dwNumObjs

*rgodf”z—ñ, È, ¬, ·, éIfufWfFfNfg ” B*

### rgodf

**DIOBJECTDATAFORMAT** \‘c’ì, Ì”z—ñ, Ö, ÌffCf“f^, Ä A, » , é, ¼, é, Ì \‘c’ì, Í, , éIfufWfFfNfg Eff [f^, ªfffofCfX Eff [f^, È, ¬, ç, Ä, Ç, Ì, æ, ª, È’È’m, ³, é, é, x, «, ©, ðL q, µ, Ä, Ç, é B“™, ¶ é Š, È, Ó, ½, Ä, Ì’Û, È, é îñ, ª’u, ©, é, Ä, Ç, é, © A, Û, ½, Í’è, Ì îñ, ªf— Š, È’u, ©, é, Ä, Ç, é, Æ Argodf, ÌfGf%o [, Æ, È, é B

### —á

*È%°, Ì éÇ¼, Ä, Í A2Ž² i á’í Ä•W, Ä’È’m, ³, é, é j, , æ, Ñ, Ó, ½, Ä, Ìf{f^f“, ð—~—p, ·, éfAfvfŠfP [fVf‡f“, Ä—p, Ç, ç, é, éff [f^ EftfH [f]fbfg, ðfZfbfg, µ, Ä, Ç, é B*

*// fAfvfŠfP [fVf‡f“, ÌÈ%°, Ì \‘c’ì, ð—p, Ç, 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; // •È, Ìf{f^f“
    BYTE bPadding[2]; // fTfCfY, ªdword, Ì”{ ”, Ä, È, ¬, é, Ì, È, ç, È, Ç
```

```
} MYDATA;
```

*// ,», µ, Ä^È%°, Ìff [f^ EftfH [f]fbfg, ð—p, Ç, é, ±, Æ, ª, Ä, «, é*

```
DIOBJECTDATAFORMAT rgodf[] = {
    { &GUID_XAxis, FIELD_OFFSET(MYDATA, lX), 0, DIDFT_AXIS |
  DIDFT_ANYINSTANCE, },
    { &GUID_YAxis, FIELD_OFFSET(MYDATA, lY), 0, DIDFT_AXIS |
  DIDFT_ANYINSTANCE, },
```

```

    { &GUID_Button, FIELD_OFFSET(MYDATA, bButtonA), 0, DIDFT_BUTTON |
DIDFT_ANYINSTANCE, },
    { &GUID_Button, FIELD_OFFSET(MYDATA, bButtonB), 0, DIDFT_BUTTON |
DIDFT_ANYINSTANCE, },
};
#define numObjects (sizeof(rgodf) / sizeof(rgodf[0]))

DIDATAFORMAT df = {
    sizeof(DIDATAFORMAT), // ,±,ì \`ç`ì
    sizeof(DIOBJECTDATAFORMAT), // flfufWfFfNfg Eff [f^ EftfH [f}fbfg,ìfTfCfY
    DIDF_ABSAXIS, // â'ÏŽ² Å•W
    sizeof(MYDATA), // fffofCfX Eff [f^fTfCfY
    numObjects, // flfufWfFfNfg "
    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,ç,ê AfffofCfX,lfvf fpfefB,ð•Ô,· B*

### dwSize

*\`ç`ì,lfTfCfY,ðfofCfg,ÅŽw'è,·,é B IDirectInputDevice::GetCapabilities,ðCEÄ,Ñ o,·'O,É %Šú%»»,µ,È,¯,ê,Î,È,ç,È, ç B*

### dwDevType

*fffofCfX Ef^fCfvŽw'èŽq B,±,İftfB [f<fh,ìL q,É,Ä,ç ,Ä,Í ADirectInputfffofCfX Ef^fCfvL qfR [fh,ðŽQ Æ,·,é,±,Æ B*

### dwFlags

*fffofCfX,ÉŠÖ`A,·,éftf%oFO B`È%o°,İftf%oFO,ª`è<`³,ê,Ä,ç,é B*

**DIDC\_ATTACHED:** *fffofCfX,Í·— “I,É Ú±,³,ê,Ä,ç,é B*

**DIDC\_POLLEDDEVICE:** *fffofCfX,ÍŠ,,è ž,Ýà“@CE^,Ä,Í,È,f| [fŠf“fOCE^,Ä,·,é Bff [f^,ð“¾,é,½,B,É,ÍfAfvfŠfP [fVfžf“;ª—*

*¾Ž“I,ÉIDirectInputDevice::GetDeviceState,ðCEÄ,Ñ o,³,È,¯,ê,Î,È,ç,È,ç B fofbftf@fŠf“fO,“,æ,ÑfCfxf“fg'Ê'm,ÍCE ø%oÈ,ª,È,ç B*

### dwAxes

*fffofCfX ä,Ä—~—p%oÄ”\,ÈŽ²,Ì ”,ðŽw'è,·,é B*

### dwButtons

*fffofCfX ä,Ä—~—p%oÄ”\,Èf{f^f“;Ì ”,ðŽw'è,·,é B*

### dwPOVs

*fffofCfX ä,Ä—~—p%oÄ”\,ÈŽ<“\_fRf“fgf [f%o,Ì ”,ðŽw'è,·,é B IDirectInputfo [fWfžf“3.0,Ä,Í—~—p,³,ê,È,ç 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,ÌfffofCfX EfCf“fXf^f“fX,ÉŠÖ,·,é î•ñ,ð•Ô,· B

### dwSize

\‘¢’ì,ÌfTfCfY,ðfofCfg ”,ĂŽ!,· B

### guidInstance

ˆêÓ“I,ÈŽˉ•ÊŽq,Ă AftfofCfX,ÌfCf“fXf^f“fX,ðŽˉ•Ê,·,é BfAfvfŠfP [fVf±f“,Í,±  
,ÌfCf“fXf^f“fXGUID,ð Ý’èftf@fCf<,É•Û‘ł,µ ACEã,É—~—p,Ă,«,é BfCf“fXf^f“fXGUID,Íf}fVf“ŒĂ—L,Ă, ,è  
A, ,éf}fVf“,©,ç“¾,ç,ê,½fCf“fXf^f“fXGUID,Í•Ê,Ìf}fVf“,ÌfCf“fXf^f“fXGUID,Æ,Í—ŠÖŒW,Ă, ,é B

### guidProduct

»•i,ðŽˉ•Ê,·,éˆêÓ“I,ÈŽˉ•ÊŽq B,±,ÌŽˉ•ÊŽq,ÌfffofCfX,Ì »‘¢%oiŽĐ,“è,ß,é B

### dwDevType

fffofCfX Ef^fCfvŽw’èŽq B,±,ÌftfB [f<fh,ÌkL q,É,Ă,¢  
,Ă,Í A**DirectInputfffofCfX Ef^fCfvL qfR [fh,ðŽQ** Æ,·,é,±,Æ B

### tszProductName[MAX\_PATH]

»•i,ÌfjfbfNfl [f€ B,½,Æ,·,Í A”Frobozz Industries SuperStick 5X” B

### tszInstanceName[MAX\_PATH]

fCf“fXf^f“fX,ÌfjfbfNfl [f€ B,½,Æ,·,Í 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,é Afobftf@ EfffofCfX îñ,»,ì,à,ì,ð•Ô,· B

### dwOfs

ff [f^,^É'm,³,ê,éIfufWfFfNfg,ÌE» Ý,Ìff [f^ EftfH [f]  
fbfg,Ö,ÌfIfZfbfg BCE¾,çŠ,.,é,Æ A**IDirectInputDevice::GetDeviceState**  
,ð%î,µ,Äff [f^,^¾,ç,ê,½,Æ,«**dwData**,^Ši"³,ê,½ ê Š,Á, ,é B  
, ,ç,©,¶,ß'èç',³,ê,Ä,ç,éff [f^ EftfH [f]fbfg,É'Í,µ AdwOfsftfB [f<fh,ÍŽÝ,ì,æ,µ,É,È,é B  
fffofCfX,^f}fEfX,Æ,µ,ÄfAfNfZfX,³,ê,Ä,ç,é ê ± **ADIMOFES** \*¹,ì,Ð,Æ,Á B  
fffofCfX,^fL [f{ [fh,Æ,µ,ÄfAfNfZfX,³,ê,Ä,ç,é ê ± **ADIK** \*¹,ì,Ð,Æ,Á B  
fJfXf^f€ff [f^ EftfH [f]fbfg,^fZfbfg,³,ê,Ä,ç,é ê ± AfJfXf^f€ff [f^ EftfH [f]  
fbfg,É'Í,.,éŠ'îIfIfZfbfg B

### dwData

fffofCfX,©,ç"¾,ç,ê,½ff [f^ B,±,Ìff [f^,ÌftfH [f]  
fbfg,ÍfffofCfX,Ìf^fCfv,É'È'¶,.,é,^ A,Ç,ñ,È ê ±,É,àff [f^,Í,»,ì,Ü,Ü,ÌE'Ž@,Á'É'm,³,ê,é B

#### DIDFT\_AXIS:

fffofCfX,^Š'ÍŽ²f, [fh,Á, ,é ê ± A'Š'ÍŽ²%^^@,^É'm,³,ê,é BfffofCfX,^ â'ÍŽ²f, [fh,Á, ,é ê ± A â'ÍŽ² À·  
W,^É'm,³,ê,é B

#### DIDFT\_BUTTON: dwData,Ì%°ÊfCfG,ì,Ý,^Ó—

;,ðŽ ,Á Bf{f^f",^%Ý,³,ê,é,Æ%°ÊfCfG,ì ãÊfrfbfg,^fZfbfg,³,ê Af{f^f",^—£,³,ê,é,ÆfNfŠfA,³,ê,é B

### dwTimeStamp

f~fŠ·b'P'É,Á"@,fefBfbfN EfJfEf"f^,Á A,±,ê,É ±,ì,¹,ÄfCxf"fG,^ ¶ ¬,³,ê,é BCE» Ý,ÌfVfXfef€  
,ÌfefBfbfN EfJfEf"f^,Í A **GetTickCount**fVfXfef€ŠÖ ",ðCE,Ñ o,µ,Ä"¾,é B,±,ì¹,Í,.,æ,»50"ú,Á^ê ,.,é,±  
,Æ,É' Ó B

### dwSequence

,±,ÌfCxf"fG,ÌDirectInput ± ~"Ô † B,.,×,Ä,ÌDirectInputfCxf"fG,É,Í' %Á,.,é ± ~"Ô †,^Š,,è"—,Ä,ç,ê,Ä,ç  
,é B,±,ê,É,æ,è AÜ,È,éfffofCfX,©,ç,ÌfCxf"fG,ðŽŽEn—ñ"¹,Éf\ [fg,Á,«,é B,±,ì¹,Í,é ,.,é,ÆE³,É—  
ß,é,ì,Á A,Ó,½,Á,ì ± ~"Ô †,ð"äŠr,.,é Ü,É,Í' ^Ó,ð—v,.,é B **DISEQUENCE\_COMPARE**f}fNf ,ð—p,ç,Ä,±  
,ì"äŠr,ð^Á'S,ÉŽÄ s,.,é,±,Æ,^,Á,«,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,ç,é AfffofCfX ã,ì“Á’è,ìfIfufWfFfNfg(Ž² Af{f^f“,È,Ç)  
,ÉŠÖ,·,é îñ,ðfR [f<fofbfNŠÖ ”,É•Ö,· B

### dwSize

\‘ç’ì,ìfTfCfY,ðfofCfg ”,ĂŽ!,· B,±,ì \‘ç’ì,É,“,ç,Ă‘Ă—,ÈftfB [f<fh ”,ð’m,é,½,ß,É AfAfvfŠfP [fVf‡f“,ª,±  
,ì’l,ðfFfbfN,·,é,±,Æ,ª, ,é BDirectInput 3.0,É,Ă,ç,Ă,Í A,±,ì’l,Ísizeof(DIDEVICEOBJECTINSTANCE)  
,Æ,È,é B «—^fo [fWf‡f“,ìDirectInput,Ă,Í,æ,è‘à,«,È’l,ð•Ö,·%oĂ” \«,à, ,é B

### guidType

fIfufWfFfNfg,ìf^fCfv,ðŽ!,·Ž•ÊŽq B,±,ìftfB [f<fh,ÍfIfvVf‡f“,Ă, ,é B‘¶ Ý,·,é ê ±,í‘È%°,ì’l,ì,□  
,ç,ì,ð,Æ,Ă,Ă, ,é B

**GUID\_XAxis:** fRf“fgf [f%o,ì ...½Ž² B,½,Æ,!,,ìf}fEfX,ì ...½Ú“@,ðŽ!,·,±,Æ,à, ,é B

**GUID\_YAxis:** fRf“fgf [f%o,ì ,¼Ž² B,½,Æ,!,,ìf}fEfX,ì ,¼Ú“@,ðŽ!,·,±,Æ,à, ,é B

**GUID\_ZAxis:** fRf“fgf [f%o,ì‘OĚã,ìŽ² B,½,Æ,!,,ìf}fEfX,ìZ—Ö,ì%ñ“],ðŽ!,·,±,Æ,à, ,é B

**GUID\_Button:** f}fEfX,ìf{f^f“ B

**GUID\_Key:** fL [f{ [fh,ìfL [ B

¼,ìfIfufWfFfNfg Ef^fCfv,à ;Ěã’èç’,³,é,é%oĂ” \«,ª, ,é(½,Æ,!,,Í AGUID\_Fire AGUID\_Throttle AGUID\_SteeringWheel j B

### dwOfs

,±,ìfIfufWfFfNfg,ª’È’m,·,éff [f^,ð Ă,àĚø—!,æ,“¾,ç,é,é Aff [f^ EftfH [f}

fbfg“à,Ă,ìfIfzfzfbfg BfJfXf^fĚff [f^ EftfH [f}fbfg,ð \z,·,éfAfvfŠfP [fVf‡f“,É’Î,µ,Ă,¾,—L’Ó,Ă, ,é B,  
Ù,Æ,ñ,ç,ìfAfvfŠfP [fVf‡f“,Ă,Í,±,ì’l,ÍŽg—p,³,é,È,ç B

### dwType

fIfufWfFfNfg,ðçL q,·,éfffofCfX Ef^fCfvŽw’èŽq BfIfufWfFfNfg Ef^fCfv(Ž² Af{f^f“,È,Ç)

,ðçL q,·,é**DIDFT\_\*ftf%o**fO,ì’g,Ý ±,i,1,Ă A ãÊfofCfg,É,ìfIfufWfFfNfg EfCf“f^f“fX”Ó †,“ü,é BfIfufWfFfNfg EfCf“fXf^f“fX”Ó †,ð’Š o,·,é,É,ì**DIDFT\_GETINSTANCE**f}fNf ,ð—p,ç,é B

### dwFlags

Ě»Žž“\_„Ă,ìftf%ofo,Í%o½,à’èç’,³,é,Ă,ç,È,ç B

### tszName[MAX\_PATH]

fIfufWfFfNfg,ì¼ Ì B,½,Æ,!,,Í”X-Axis” ,â “Right Shift” B

## DIMOUSESTATE

```
typedef struct {  
    LONG lX;  
    LONG lY;  
    LONG lZ;  
    BYTE rgbButtons[4];  
} DIMOUSESTATE;
```

**IDirectInputDevice::GetDeviceState** *f\fbfh,É,æ,è—p,ç,ç,ê Af}fEfX EfffofCfX, ,é,ç,Íf}  
fEfX,Æ,µ,ÄfAfNfZfX,<sup>3</sup>ê,é”ñf}fEfX EfffofCfX,Ì ó‘Ô,ð•Ô,· Bc\_dfDIMouseff [f^ EftfH [f}  
fbfg,ð“n,µ,Ä**IDirectInputDevice::SetDataFormat**,ðCEÄ,Ñ o,µ Af}  
fEfX EfXf^fCfç,ÍfAfNfZfX,<sup>a</sup>,Ä,«,é,æ,µfffofCfX,ð €”ð,µ,Ä,“,©,È,¯,ê,Î,È,ç,È,ç B  
f}fEfX,Í‘Š‘ÎŽ<sup>2</sup>fffofCfX,Ä, ,é,½,ß Af}fEfX,ÎŽ<sup>2</sup>,Ì â‘ÎŽ<sup>2</sup>Ê‘u,Í‘P,É‘Š‘Î‘Ú“@,ì—ÝCEv,Ä, ,é,±  
,Æ,É’ ^Ó B,»,ÌCE%Ê A¼,Ì â‘ÎŽ<sup>2</sup>Ê‘u,Æ”äŠr,·,é,Æ,«,ð æ,ç,Ä A â‘ÎŽ<sup>2</sup>Ê‘u,Ì‘l,Ì-<sup>3</sup>Ó-ì,Ä, ,é B*

### IX

*f}fEfX,ÌxŽ<sup>2</sup>,ÉŠÖ,·,é î•ñ BfffofCfX,<sup>a</sup>‘Š‘ÎŽ<sup>2</sup>f, [fh,Ä, ,é ê ± Af}  
fEfX,ÌxŽ<sup>2</sup>•ûCEü,Ì‘ÎÊ BfffofCfX,<sup>a</sup> â‘ÎŽ<sup>2</sup>f, [fh,Ä, ,é ê ± Af}fEfX,ÌxŽ<sup>2</sup>•ûCEü,Ì â‘ÎÊ‘u B*

### IY

*f}fEfX,ÌyŽ<sup>2</sup>,ÉŠÖ,·,é î•ñ BfffofCfX,<sup>a</sup>‘Š‘ÎŽ<sup>2</sup>f, [fh,Ä, ,é ê ± Af}  
fEfX,ÌyŽ<sup>2</sup>•ûCEü,Ì‘ÎÊ BfffofCfX,<sup>a</sup> â‘ÎŽ<sup>2</sup>f, [fh,Ä, ,é ê ± Af}fEfX,Ìy•ûCEü,Ì â‘ÎÊ‘u B*

### IZ

*f}fEfX,ÌzŽ<sup>2</sup>,ÉŠÖ,·,é î•ñ BfffofCfX,<sup>a</sup>‘Š‘ÎŽ<sup>2</sup>f, [fh,Ä, ,é ê ± Af}  
fEfX,ÌzŽ<sup>2</sup>•ûCEü,Ì‘ÎÊ BfffofCfX,<sup>a</sup> â‘ÎŽ<sup>2</sup>f, [fh,Ä, ,é ê ± Af}fEfX,ÌzŽ<sup>2</sup>•ûCEü,Ì â‘ÎÊ‘u B  
f}fEfX,ÉzŽ<sup>2</sup>,<sup>a</sup>,È,¯,ê,Î A,±,Ì‘l,Í0,Æ,È,é B*

### rgbButtons[4]

*f{f^f“,Ì ó‘Ô,Ì”z—ñ B‘Š“-,·,éf{f^f“,“%Ÿ,<sup>3</sup>ê,Ä,ç,é ê ± A ãÊftrfbfg,<sup>a</sup>fZfbfg,<sup>3</sup>,é,é B*

## DIOBJECTDATAFORMAT

```
typedef struct {
    const GUID * pguid;
    DWORD dwOfs;
    DWORD dwType;
    DWORD dwFlags;
} DIOBJECTDATAFORMAT;
```

**IDirectInputDevice::SetDataFormat** *f\fbfh, a AfffofCfX“à, ìP`êfIfufWfFfNfg, É‘î, µ, Äff [f^ EftfH [f] fbf, ðfZfbfg, ·, é, ì, È—p, ç, é Bff [f^ EftfH [f] fbf, Ì; ”, ÌDIOBJECTDATAFORMAT \‘ç‘ì, ©, ç \ ¬, ³, é AŠefIfufWfFfNfg(Ž² Af{f^f“„È, Ç) , É‘î, µ, Ä, Ð, Æ, Ä, Ì \‘ç‘ì, “—, Ä, ç, é, é B, ±, é, ç, Ì \‘ç‘ì, Ì”z— ñ, Ì AIDirectInputDevice::SetDataFormat, É“n, ³, é, éDIDATAFORMAT \‘ç‘ì, aŽ , Ä B’È í, ÌfAfvfŠfP [fVf‡f“„DIOB JECTDATAFORMAT \‘ç‘ì, Ì”z—ñ, ð ì ¬, ·, é•K—v, Ì, È, A, ±, Ì \‘ç‘ì, É‘î, µ Ý’è, a, , ç, ©, ¶, ß’èç, ³, é, Ä, ç , éç\_dfdIMouse, Û, ½, Ì ç\_dfdIKeyboard, Ì, ç, , , é, ©, ð—p, ç, é B*

### pguid

Ž² Af{f^f“„, é, ç, Ì¼, Ì“ü—Íf\ [fX, É‘î, ·, éŽ·ÉŽq Bff [f^ EftfH [f] fbf, ð—vç , ·, é Û, É, ± , ÌftfB [f<fh, ðNULL, ÉfZfbfg, ·, é, Æ A, Ç, Ì, æ, ð, Éf^fCfv, ÌfIfufWfFfNfg, Ä, à, ç, ç, Æ, ç, ðÖ—j, È, É, é B

### dwOfs

“ü—Íf\ [fX, É‘î, ·, éff [f^, aŠi”], ³, é, éff [f^ EfpfPfbfg“à, Ä, ÌftfZfbfg, Ä AŽ², Ì, æ, ð , ÈDWORDfTfCfY, Ìff [f^, É, Ä, ç, Ä, Ì4, Ì”{ ”, Ä, È, —, é, Ì, È, ç, È, ç B, à, µ, - , Ì Af{f^f“„, É‘î, µ, Ä•Ä, ×, ç, é, ½fofCfg EfAf%ofCf“f f“fg, Ì¹ B

### dwType

fIfufWfFfNfg, ðçL q, ·, éfffofCfX Ef^fCfvŽw’èŽq B, ±, é, Ì AfIfufWfFfNfg^fCfv(Ž² Af{f^f“„È, Ç) , ðçL q, ·, éDIDFT\_\*ftf%ofO, Ìg, Ý ‡, Ì, 1, Ä A ãÊfofCfg, É, ÌfIfufWfFfNfg EfCf“f^f“fX”Ö †, a“ü, é Bff [f^ E ftfH [f] fbf, ð—vç , ·, é Û, É A”C”Ó, ÌfCf“fXf^f“fX, a—e, ³, é, é, ± , Æ, ðŽ’, ·, ½, ß, È AfCf“fXf^f“fX”•a, ðDIDFT\_ANYINSTANCE, ÉfZfbfg, ·, é, ±, Æ, a, Ä, «, é B

### dwFlags

Ç»Žž“—, Ä, Ìftf%ofO, Ì%½, à’èç, ³, é, Ä, ç, È, ç B, ±, ÌftfB [f<fh, Ì0, Ä, È, —, é, Ì, È, ç, È, ç B

### —á

Žÿ, ÌfIfufWfFfNfg Eff [f^ EftfH [f] fbf, Žw’è, Ä, Ì ADirectInput, a Ä %o, Ì—p%Ä”\ , ÈŽ², ð¹’ð, µ A¹, ðfffofCfX Eff [f^, Æ, µ, ÄfIfufWfFfNfg4, ÈDWORD, Ä’È’m, ·, é B

```
DIOBJECTDATAFORMAT dfAnyAxis = {
    0, // f fCf<fhfJ [fh
    4, // fIfufWfFfNfg
    DIDFT_AXIS | DIDFT_ANYINSTANCE, // Ç, ÌŽ², Ä, à, ©, Û, Ì, È, ç
    0, // 0, Ä, È, —, é, Ì, È, ç, È, ç
};
```

Žÿ, ÌfIfufWfFfNfg Eff [f^ EftfH [f] fbf, Žw’è, Ä, Ì AfffofCfX, ÌXŽ², ðfffofCfX Eff [f^, Æ, µ, ÄfIfufWfFfNfg12, ÈDWORD, ÄŠi”], ·, é BfffofCfX, É; j ”, Ì XŽ², a“¶ Ý, ·, é ê ‡ A Ä %o, É—p%Ä”\, È, à, Ì, a”¹’ð, ³, é, é B

```
DIOBJECTDATAFORMAT dfAnyXAxis = {
    &GUID_XAxis, // xŽ², Ä, È, —, é, Ì, È, ç, È, ç
    12, // fIfufWfFfNfg
    DIDFT_AXIS | DIDFT_ANYINSTANCE, // Ç, ÌXŽ², Ä, à, ©, Û, Ì, È, ç
    0, // 0, Ä, È, —, é, Ì, È, ç, È, ç
};
```

Žÿ, ÌfIfufWfFfNfg Eff [f^ EftfH [f] fbf, Žw’è, Ä, Ì ADirectInput, a Ä %o, Ì—p%Ä”\ , Èf{f^f“„, ð¹’ð, µ A, »), Ì¹, ÌBYTE, Ì ãÊfrfbfg, ðfffofCfX Eff [f^, Æ, µ, ÄfIfufWfFfNfg16, È’È’m, ·, é B

```
DIOBJECTDATAFORMAT dfAnyButton = {
    0, // f fCf<fhfJ [fh
    16, // fIfufWfFfNfg
    DIDFT_BUTTON | DIDFT_ANYINSTANCE, // Ç, Ìf{f^f“„, Ä, à, ©, Û, Ì, È, ç
    0, // 0, Ä, È, —, é, Ì, È, ç, È, ç
};
```



## DIPROPDWORD

```
typedef struct {
    DIPROPHEADER diph;
    DWORD dwData;
} DIPROPDWORD;
```

DWORD *fvf* *fpfefB*, *Ö*, *ìfAfNfZfX*, *É*—*p*, *ç*, *ç*, *ê*, *é*”*Ä*—*p* \‘*ç*’*ì* B

### diph

^*È*%*°*, *ì*, *æ*, *±*, *É* %*Š*ú%*»*, *µ*, *Ä*, *˙*, *©*, *È*, *ˉ*, *ê*, *î*, *È*, *ç*, *È*, *ç* B

**dwSize** = (DIPROPDWORD), *ìfTfCfY* B

**dwHeaderSize** = (DIPROPHEADER), *ìfTfCfY* B

**dwObj** = *fIfufWfFfNfgŽ*ˉ•*ÊŽ*q B

**dwHow** = *dwObj*, *ì%øŽ*ß•*û*—*@* B

### dwData

SetProperty, *Ä*, *í* *A*, *±*, *ì* \‘*ç*’*ì*, *É*, *í*, *±*, *ìfvf* *fpfefB*, *ÉfZfbfg*, *³*, *ê*, *é*’*l*, *š*Ü, *Ü*, *ê*, *é* GetProperty, *Ä*, *í* *A*, *±*, *ì* \‘*ç*’*ì*, *ìfvf* *fpfefB*, *ì*’*l*, *øŽ*ó, *ˉŽ*æ, *é* B

## DIPROPHEADER

```
typedef struct {  
    DWORD dwSize;  
    DWORD dwHeaderSize;  
    DWORD dwObj;  
    DWORD dwHow;  
} DIPROPHEADER;
```

, ·, ×, Ä, Ì, fvf fpfefB \ 'ç' Ì, Ì æ' u, É, é, é" Ä—p \ 'ç' Ì B

### dwSize

ŠÜ, ñ, Ä, ç, é \ 'ç' Ì, Ì fTfCY B

### dwHeaderSize

DIPROPHEADER \ 'ç' Ì, Ì fTfCY B

### dwObj

fvf fpfefB, <sup>3</sup> fAfNfZfX, <sup>3</sup> é, é fIfufWfFfNfg, ðŽ<sup>-</sup> · Ê, ·, é B

dwHowtfB [f<fh, <sup>3</sup> DIPH\_DEVICE, Ä, ·, é ê ‡, Í0 B

dwHowtfB [f<fh, <sup>3</sup> DIPH\_BYOFFSET, Ä, ·, é ê ‡ Afvf fpfefB, <sup>3</sup> fAfNfZfX, <sup>3</sup> é, æ, □, Æ, μ, Ä, ç, é fIfufWfFfNfg, Ì Ç» Ý, Ì ff [f^ EftfH [f}fbfg, Ö, Ì fIftfZfbfg B

dwHowtfB [f<fh, <sup>3</sup> DIPH\_BYID, Ä, ·, é ê ‡ A'O%ñ, Ì IDirectInputDevice::EnumObjects, Ì Ç Ä, Ñ o, μ, ©, ç · Ö, <sup>3</sup> é, <sup>1</sup>/<sub>2</sub> D IDEVICEOBJECTINSTANCE, Ì dwTypetfB [f<fh, É · Ö, <sup>3</sup> é, é fIfufWfFfNfg Ef^fCfv, Ü, <sup>1</sup>/<sub>2</sub>, Í Cf" fXf^f" fXŽ<sup>-</sup> · Ê Žq B

### dwHow

dwObj, Ì %ðŽß · û-@, ðŽw'è, ·, é B

## DIPROP RANGE

```
typedef struct {
    DIPROPHEADER diph;
    LONG lMin;
    LONG lMax;
} DIPROP RANGE;
```

**DIPROP RANGE** *vf f p f e f B*,<sup>a</sup> AŽ<sup>2</sup>,È,Ç,ìfIfufWfFfNfg,ì"íí,ìfZfbfg,âžæ“¾,É—p,ç,é BffofCfX,ì"íí,<sup>a-</sup>  
<sup>3</sup> §Ā,Ā, ,é ê ‡ A'Ê'm,<sup>3</sup>ê,é"íí, **lMin** = DIPROP RANGE\_NOMIN, ",æ, Ñ **lMax** =  
DIPROP RANGE\_NOMAX,Æ,È,é B"íí,<sup>a-3</sup> §Ā,Ā, ,éffofCfX,Ā,í%ñ,è ž,Ý,<sup>a</sup> s,í,ê,é,±,Æ,É' ^Ó B

## diph

^È%°,ì,æ,±,É %Šú%»»,μ,Ā, ",©,È, ",ê,Ī,È,ç,È,ç B

**dwSize** = (DIPROP RANGE),ìfTfCfY B

**dwHeaderSize** = (DIPROP HEADER),ìfTfCfY B

**dwObj** = fIfufWfFfNfgŽ~•Êžq B

**dwHow** = dwObj,ì%đžž•û-@ B

## lMin

"íí,ì%°Ā B

## lMax

"íí,ì ãĀ 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,ÍÈ‘O,Ìfo [fWf‡f“,Ìwindows,Á,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

»‘cŽÒŽ¯•ÊŽq B

### wPid

»•iŽ¯•ÊŽq B

### szPname

fWf‡fCfXfefBfbfN,Ì »•i-¼,³ŠÜ,Ü,ê,é ANULL,Á I,í,é¶Žš—ñ B

### wXmin AwXmax

x À•W’l,Ì Á -’l,;,æ,Ñ Á‘â’l B

### wYmin AwYmax

y À•W’l,Ì Á -’l,;,æ,Ñ Á‘â’l B

### wZmin AwZmax

z À•W’l,Ì Á -’l,;,æ,Ñ Á‘â’l B

### wNumButtons

fWf‡fCfXfefBfbfN,Ìf{f^f“ ” B

### wPeriodMin AwPeriodMax

fAfvfŠfP [fVf‡f“,³fWf‡fCfXfefBfbfN,ð•ß““,μ,½,Æ,«,ÉfTf| [fg,³,ê,éf| [fŠf“fOŽüŠú,Ì Á -’l,;,æ,Ñ Á‘â’l B

### wRmin AwRmax

f%of\_ [’l,Ì Á -’l,;,æ,Ñ Á‘â’l Bf%of\_ [,Í4”Ô-Ú,Ì%o^“@Ž²,Á, ,é B

### wUmin AwUmax

u À•W(5”Ô-Ú,ÌŽ²)’l,Ì Á -’l,;,æ,Ñ Á‘â’l B

### wVmin AwVmax

v À•W(6”Ô-Ú,ÌŽ²)’l,Ì Á -’l,;,æ,Ñ Á‘â’l B

### wCaps

fWf‡fCfXfefBfbfN,Ì<@”\ BÈ%°,Ìftf%ofo,Í AfWf‡fCfXfefBfbfN,³Ž ,ç“¾,éEÁ X,Ì<@”\,ð’è’,·,é B

JOYCAPS\_HASPOV

fWf‡fCfXfefBfbfN,ÍŽ<“\_ îñ,ðŽ ,Á B

**JOYCAPS\_HASR**

*fWf#fCfXfefBfbfN,Íf%of\_ [(4"Ô-Ú,ÌŽ?) î•ñ,ðŽ ,Â B*

**JOYCAPS\_HASU**

*fWf#fCfXfefBfbfN,Íu À•W(5"Ô-Ú,ÌŽ?) î•ñ,ðŽ ,Â B*

**JOYCAPS\_HASV**

*fWf#fCfXfefBfbfN,Ív À•W(6"Ô-Ú,ÌŽ?) 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,Ñ‰E j B*

**JOYCAPS\_POVCTS**

*fWf#fCfXfefBfbfN,ÌŽ<“\_,Í·A±“I,È•ûÊŠp,ðfTf| [fg,·,é B*

**wMaxAxes**

*fWf#fCfXfefBfbfN,ªfTf| [fg,·,éŽ²,ì Á·â ” B*

**wNumAxes**

*fWf#fCfXfefBfbfN,É,æ,èE» ÝŽg—p,³,ê,Ä,¢,éŽ² ” B*

**wMaxButtons**

*fWf#fCfXfefBfbfN,ªfTf| [fg,·,éf{f^f“,ì Á·â ” B*

**szRegKey**

*fWf#fCfXfefBfbfN,É·Î,·,éfŒfWfXfgfŠ EfL [,ðŠÜ,Ð ANULL,Â I,í,é•¶Žš—ñ B*

**szOEMVxD**

*fWf#fCfXfefBfbfNfhf%oCfoOEM,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,ÎÊ'u AŽ<“\_„ÎÊ'u,„æ,Ñf{f^f“„,Ì ó‘Ô,ÉŠÖ,„,éŠg’E îñ B*

### dwSize

*,±,Ì \‘c‘ì,ÌfTfCfY,ðfofCfg ”,ĂŽ!,· B*

### dwFlags

*,±,Ì \‘c‘ì,ÉŠ!“[„,3,ê,½ îñ,ª—LÆø,Ă, ,é,©,ðŽ!,·ftf%ofOì—LÆø,È îñ,ðŠÛ,Û,È,¢—  
v‘f,Í0,ÉfZfbfg,³,é,é;ˆÈ%°„,Ìftf%ofO,“è<³,ê,Ă,¢,é B*

### JOY\_RETURNALL

*JOY\_RETURNRAWDATA,ð æ,,·,×,Ă,ÌJOY\_RETURN‘l,ðfZfbfg,·,é,±  
,Æ,Æ““™,Ă, ,é;*

### JOY\_RETURNBUTTONS

*dwButtons—  
v‘f,É,Í AŠefWf#fCfXfefBfbfN,Ìf{f^f“„,Ì ó‘Ô,ÉŠÖ,„,é—  
LÆø,È îñ,“ŠÛ,Û,ê,é B*

### JOY\_RETURNCENTERED

*ŠeŽ²,ÌİÊ,Ì‘+%ø’l,ÉfWf#fCfXfefBfbfN,Ìfjf... [fgf%of<^Ê‘u,ð‘u, B*

### JOY\_RETURNPOV

*dwPOV—v‘f,É,Í A—ÉŽU“l,È‘PÊ,ð—p,¢  
,ĂŽ!,³,ê,éŽ<“\_fRf“fgf [f<,ÉŠÖ,„,é—LÆø,È îñ,“ŠÛ,Û,ê,é B*

### JOY\_RETURNPOVCTS

*The dwPOV—  
v‘f,É,Í A“±“l,Ă100ª,Ìl“x,ð‘PÊ,Æ,µ,ĂŽ!,³,ê,éŽ<“\_fRf“fgf [f<,  
ÉŠÖ,„,é—LÆø,È îñ,“ŠÛ,Û,ê,é B*

### JOY\_RETURNR

*The dwRpos—v‘f,É,Í A—LÆø,Èf%of\_ [fyf\_f< îñ,“ŠÛ,Û,ê,é B,±  
,ê,Í4”Ô—Û,ÌŽ²,“¶ Ý,·,é,±,Æ,ðŽ!,·;*

### JOY\_RETURNRAWDATA

*fLfffŠfufÆ [fVf#f“„,³,ê,Ă,¢,È,¢fWf#fCfXfefBfbfN,ÌŽwŽ‘l,ª,±  
,Ì \‘c‘ì,ÉŠ!“[„,³,ê,Ă,¢,é,±,Æ,ðŽ!,·;*

### JOY\_RETURNU

*dwUpos—v‘f,É,Í AfWf#fCfXfefBfbfN,Ì5”Ô—Û,ÌŽ²,“Žg—p%øĂ”\,Ă, ,é,  
Î A,±,ÌŽ²,ÉŠÖ,„,é—LÆø,Èff [f^,“ŠÛ,Û,ê,é B,»„,µ  
,Ă,È,¢ ê ±,Í0,ª,“Ô,³,ê,é B*

### JOY\_RETURNV

*dwVpos—v‘f,É,Í AfWf#fCfXfefBfbfN,Ì6”Ô—Û,ÌŽ²,“Žg—p%øĂ”\,Ă, ,é,  
Î A,±,ÌŽ²,ÉŠÖ,„,é—LÆø,Èff [f^,“ŠÛ,Û,ê,é B,»„,µ  
,Ă,È,¢ ê ±,Í0,ª,“Ô,³,ê,é B*

### JOY\_RETURNX

**dwXpos**—v'f,É,Í AfWf‡fCfXfefBfbfN,Ìx À•W,ÉŠÖ,·,é—  
LÆø,Èff [f^,ªŠÜ,Û,ê,é B

**JOY\_RETURNY**

**dwYpos**—v'f,É,Í AfWf‡fCfXfefBfbfN,ÿ À•W,ÉŠÖ,·,é—  
LÆø,Èff [f^,ªŠÜ,Û,ê,é B

**JOY\_RETURNZ**

**dwZpos**—v'f,É,Í AfWf‡fCfXfefBfbfN,ÿ À•W,ÉŠÖ,·,é—  
LÆø,Èff [f^,ªŠÜ,Û,ê,é B

**JOY\_USEDEADZONE**

fWf‡fCfXfefBfbfN,Ìfj... [fgf%of<Ê'u,Ì"Í,đŠg'£,µ A,±  
,Ì"Í,đfffbhf] [f",ÆÆÄ,Ô BfWf‡fCfXfefBfbfNfhf%ofCfo,Ífffbhf  
f] [f""à,Ì,·,×,Ä,ÌÊ'u,É'Í,µ,Ä'è ""l,đ•Ö,· B

È%º,Ìftf%o,Í AfWf‡fCfXfefBfbfN,đLfffšfuÆ [fVf‡f",·,é,½,ß,Ìff [f^,đ'ñ<ÿ,µ AfJfXf^f€ EfLfffšfu  
fÆ [fVf‡f" EfAfvfšfP [fVf‡f",đ'Í Û,Æ,·,é,à,Ì,Ä, é B

**JOY\_CAL\_READ3**

x Ay Az À•W,đ"Ç,Ý ž,Ý A,»,Ì,Û,Û,Ì'l,đdwXpos AdwYpos AdwZ  
pos—v'f,É,»,ê,¼,êŠi"[·,é B

**JOY\_CAL\_READ4**

f%of\_ [ îñ,·,æ,Ñx Ay Az À•W,đ"Ç,Ý ž,Ý A,»,Ì,Û,Û,Ì'l,đdwRpo  
s AdwXpos AdwYpos AdwZpos—v'f,É,»,ê,¼,êŠi"[·,é B

**JOY\_CAL\_READ5**

f%of\_ [ îñ,·,æ,Ñx Ay Az Au À•W,đ"Ç,Ý ž,Ý A,»,Ì,Û,Û,Ì'l,đdw  
Rpos AdwXpos AdwYpos AdwZpos AdwUpos—  
v'f,É,»,ê,¼,êŠi"[·,é B

**JOY\_CAL\_READ6**

fWf‡fCfXfefBfbfNf~fjfhf%ofCfo,ª¶ Ý,µ îñ,đ'ñ<ÿ,µ,Ä,¢  
,é ê ‡,Í AvŽ²ff [f^,đ,»,Ì,Û,Û"Ç,Ý ž,Ð B,»,ª,Ä,È,¯,ê,Ì0,đ•Ö,· B

**JOY\_CAL\_READALWAYS**

fhf%ofCfo,ªffofCfX,đÆÿ'm,µ,È,¢ ê ‡,Ä, ,Ä,Ä,à AfWf‡fCfXfefBf  
bfN,Ìf| [fg,đ"Ç,Ý ž,Ð B

**JOY\_CAL\_READONLY**

fWf‡fCfXfefBfbfNf~fjfhf%ofCfo,ª¶ Ý,µff [f^,đ'ñ<ÿ,·,é ê ‡,Íf%of  
\_ [ îñ,đ"Ç,Ý ž,Ý A,»,Ì,Û,Û,Ì'l,đdwRpos—v'f,ÉŠi"[·,é B,»,ª  
,Ä,È,¯,ê,Ì0,đ•Ö,· B

**JOY\_CAL\_READUONLY**

fWf‡fCfXfefBfbfNf~fjfhf%ofCfo,ª¶ Ý,µff [f^,đ'ñ<ÿ,·,é ê ‡,Íu Ä  
•W,đ"Ç,Ý ž,Ý A,»,Ì,Û,Û,Ì'l,đdwUpos—v'f,ÉŠi"[·,é B,»,ª  
,Ä,È,¯,ê,Ì0,đ•Ö,· B

**JOY\_CAL\_READVONLY**

fWf‡fCfXfefBfbfNf~fjfhf%ofCfo,ª¶ Ý,µff [f^,đ'ñ<ÿ,·,é ê ‡,Ív Ä  
•W,đ"Ç,Ý ž,Ý A,»,Ì,Û,Û,Ì'l,đdwVpos—v'f,ÉŠi"[·,é B,»,ª  
,Ä,È,¯,ê,Ì0,đ•Ö,· B

**JOY\_CAL\_READXONLY**

x À•W,đ"Ç,Ý ž,Ý A,»,Ì,Û,Û,Ì'l,đdwXpos—v'f,ÉŠi"[·,é B

**JOY\_CAL\_READXYONLY**

x Ay À•W,đ"Ç,Ý ž,Ý A,»,Ì,Û,Û,Ì'l,đdwXpos AdwYpos—  
v'f,É,»,ê,¼,êŠi"[·,é B

**JOY\_CAL\_READYONLY**

y À•W,đ"Ç,Ý ž,Ý A,»,Ì,Û,Û,Ì'l,đdwYpos—v'f,ÉŠi"[·,é B

**JOY\_CAL\_READZONLY**

z À•W,đ"Ç,Ý ž,Ý A,»,Ì,Û,Û,Ì'l,đdwZpos—v'f,ÉŠi"[·,é B

**dwXpos AdwYpos AdwZpos**

,»,ê,¼,ê ACE» Ý,Ìx À•W Ay À•W Az À•W B

**dwRpos**

fWf#fCfXfefBfbfN,Ì4”Ô-Ú,ÌŽ²,À, ,éf%of\_ [,ÌE» Ý,ÌÈ’u B

**dwUpos AdwVpos**

,»,ê,¼,ê A5”Ô-Ú A6”Ô-Ú,ÌŽ²,ÌÈ’u B

**dwButtons**

32,ÌfWf#fCfXfefBfbfNf{f^f“,ÌE» Ý,Ì óÔ B,±,ì—  
v’f,Ì’l,ÌJOY\_BUTTONnflags,Ì”C”Ó,Ì’g,Ý ±,í,¹,ÉfZfbfg,³,é,é B,±,±,Àn,Í1,©,ç32,Ü,À,Ì’l,À, ,éj,»,ê,¼,ê,Ì’l,Í%Ý,³,é,  
À,ç,éf{f^f“,É”Š“-.,,é B

**dwButtonNumber**

E» Ý%Ý,³,é,À,ç,éf{f^f“—v’f B

**dwPOV**

E» Ý,ÌŽ“\_fRf“fgf [f<,ÌÈ’u B,±,ì—v’f,É’Í,.,é’l,Í0,©,ç35,900,Ü,À,Ì”Í’“à,É, ,é B,±  
,é,ç,Ì’l,Í AŠeŽ“Šp,ð“x’P’È,À•\,μ100”{,μ,½,à,ì,À, ,é B

**dwReserved1 AdwReserved2**

—\-ñ,³,é,À,ç,é,½,ßŽg—p,μ,È,ç B

**dwSize**—v’f,Ì’l,Í A **joyGetPosEx**ŠÖ ”,É“n,³,é,é Û,É,Í A,±,ì—v’f,Ì \“ç’Ì,É’Í,.,éfo [fWf#f“”Ô †,ðŽ-È,.,é,½,ß,É,à  
—p,ç,ç,é,é B

Ž<“\_fRf“fgf [f<,ðŽ ,ÀffofCfX,Ì,Û,Æ,ñ,ç,Í A5,À,ÌÈ’u,μ,©Ž ,½,È,ç B  
JOY\_RETURNPOVftf%fo,²fZfbfg,³,é,é,À,ç,é,Æ,« A,±,é,ç,ÌÈ’u,ÍÈ%°,ÌJOY\_POV’è ”,ð—p,ç,À’È’m,³,é,é;

Ž<“\_ÉŠÖ,.,éÈ’u

, ŽB

JOY\_POVBACKWARD

Ž<“\_fnfbfg,³Eã,è“²,É, ,é B’18,000,Í180.00“x,Ì•ûEü,ð•\  
,i

JOY\_POVCENTERED

Ž<“\_fnfbfg,Ífjf... [fgf%of<È’u,É, ,é B’1-1,Í AŽ<“\_fn  
fbfg,³Šp“x,ð”È’m,μ,À,ç,È,ç,±,Æ,ð”Ó-ì,.,é B

JOY\_POVFORWARD

Ž<“\_fnfbfg,Í’O“²,É, ,é B’10,Í0.00“x,Ì•ûEü,ð•\, B

JOY\_POVLEFT

Ž<“\_fnfbfg,Í ¶“²,É, ,é B’127,000,Í270.00“x,Ì•ûEü,ð•\  
,. B

JOY\_POVRIGHT

Ž<“\_fnfbfg,Í%E“²,É, ,é B’19,000,Í90.00“x,Ì•ûEü,ð•\  
,. B

Windows 95,ÌffftfHf<fg,ÌfWf#fCfXfefBfbfNfhf%ofCfo,À,Í ACE»ŽŽ“\_,À,Í,±,é,ç,Ì5 ,À,Ì—EŽU“L,È•ûEü,²fTf|  
[fg,³,é,À,ç,é B’è<³,é,½Ž<“\_’l,μ,©fAfvfŠfP [fVf#f“,À—p,ç,é,±,Æ,³,À,«,É,ç ê ±JOY\_RETURNPOVftf%fo,ð  
—p,ç,È, ,é,Ì,È,ç,È,ç,¼,Ì’l,ÌŠp“x,ðfAfvfŠfP [fVf#f“,À—p,ç,é,±,Æ,³,À,«,é ê ±—p%À”\  
,À, ,é,Ì’A’±“L,Èff [f^,ðJOY\_RETURNPOVCTSftf%fo,ð—p,ç,ÀŽæ“¾,μ,È, ,é,Ì,È,ç,È,ç  
j,Ü,½JOY\_RETURNPOVCTSftf%fo,Í AJOY\_RETURNPOVftf%fo,Æ,Æ,à,È—p,ç,ç,é,éJOY\_POV’è ”,àfTf|  
[fg,μ,À,ç,é B

ŽQ Æ @joyGetPosEx

fOf [fof•i ”

## c\_dfDIKeyboard

, ,ç,©,¶,ß'è<,³,ê,Ä,ç,éDIDATAFORMAT \`c`ì,Å AfL [f{ [fh EfffofCfX,ð<L q,·,é B,±  
,ÏIfufWfFfNfg,ÍDINPUT.LIBf%ofCfuf%fŠftf@fCf<,Å—^,|,ç,ê,Ä,ç,é B

,±,ì \`c`ì,Ö,Ïf|

fCf“f^,ÍIDirectInputDevice::SetDataFormat,Ö“n,³,ê A,»ÏfffofCfX,ªfL [f{ [fhE`Ž®,ÅfAfNfZfX,³,ê,é,±  
,Æ,ðŽ',· B

## c\_dfDIMouse

, ,ç,©,¶,ß'è<³,ê,Ä,ç,éDIDATAFORMAT \ 'ç'ì,Å Af}fEfX EfffofCfX,ð<L q,·,é B,±  
,ÌIfufWfFfNfg,ÍDINPUT.LIBf%ofCfuf%ofŠftf@fCfç,Å—^,|,ç,ê,Ä,ç,é B

,±,ì \ 'ç'ì,Ö,Ìf|fCf“f^,ÍIDirectInputDevice::SetDataFormat,Ö“n,³,ê A,»,ÌfffofCfX,³f}fEfXE`Ž@,ÅAfNfZfX,³,ê,é,±  
,Æ,ðŽ',· B

## GUID\_SysKeyboard

, ,ç,©,¶,ß'è',³,ê,Ä,ç,éDirectInput,ìfCf“fXf^f“fXGUID,Å AfftfHf<fg,ìfVfXfef€fL [f{ [fh,ð,Â,Ë,ÉŽQ Æ,.,é B,± ,Ï'Í,Í AfVfXfef€fL [f{ [fh,É'Í,.,éCf“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,ç,éDirectInput,ìfCf“fXf^f“fXGUID,Å AfftfHf<fg,ìfVfXfef€f}fEfX,ð,Â,Ë,ÉŽQ Æ,·,é B,±  
,Ï'Í,Í AfVfXfef€f}fEfX,É'Í,·,éCf“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,ç,éfvf fpfefB,Ä Až²ff [f^f, [fh,lfZfbfg, ,é,ç,ÍŽæ“¼,É—p,ç,ç,ê,é B,±  
,İ Ý'è,Í A“Á'è,lfIfufWfFfNfg,É'Í,µ,Ä,Æ,ç,ø,æ,è,ÍffofCfX'S'Í,É“K—  
p,³,ê,é,İ,Ä AdwHowftfB [f<fh,ÍDIPH\_DEVICE,Ä,È,¯,ê,İ,È,ç,È,ç B

,±,lfvf fpfefB,ÍDIPROPDWORD \‘ç'İ,ð—p,ç  
,é BDIPROPDWORD \‘ç'İ,İpdiphftfB [f<fh,ÍDIPROPHEADER \‘ç'İ,Ö,lf|  
fCf“f^,Ä,È,¯,ê,İ,È,ç,È,ç BdwDataftfB [f<fh,ÍŽ²f, [fh,ðŠŮ,Đ,© A, ,é,ç,ÍŽó, ¯Žæ,é,±,Æ,É,È,é B

**DIPROPHEADER** \‘ç'İ,İdwObjftfB [f<fh,Í0,Ä,È,¯,ê,İ,È,ç,, A,±,ê,Í,±  
,lfvf fpfefB Ý'è,“Á'è,lfIfufWfFfNfg,Ä,Í,È,ffofCfX'S'Í,É“K—p,³,ê,é,±  
,Æ,ðŽ',· BdwSizeftfB [f<fh,È,ÍDIPROPDWORD \‘ç'İ,lfTfCfY,ðfZfbfg,µ,È,¯,ê,İ,È,ç,È,ç B

**DIPROPDWORD** \‘ç'İ,İdwDataftfB [f<fh,Í^È%º,İ'l,İ,Đ,Æ,Ä B

**DIPROPAXISMODE\_ABS:** â'Í À•W,Äž²Ê'u,ð'Ê'm,·,é Bž²Ú“®,ÍŽžŠÔ,É,Ä,ç,Ä—Ýçv,³,ê,é B

**DIPROPAXISMODE\_REL:** ž²Ê'u,ð'Š'Í À•W,Ä'Ê'm,·,é Bž²Ú“®,Í A'O%ñž²Ê'u,ð—  
v< ,µ,½,Æ,«,Æ,İ ,Æ,µ,Ä'Ê'm,³,ê,é B

**DIPROP\_BUFFERSIZE**

, ,ç,©,¶,ß'èç',³,è,Ä,ç,éfvf fpfefB,Ä AfffofCfX“ü—Ífofbftf@fTfCfY,ìfZfbfg,ãžæ“¾,É—p,ç,ç,é,é B

,±,ì Ý'è,Í A“Á'è,ÌfIfufWfFfNfg,É'í,µ,Ä,Æ,ç,ç,æ,è,ÍfffofCfX'S'ì,É“K—  
p,³,è,é,ì,Ä AdwHowftfB [f<fh,ÍDIPH\_DEVICE,Ä,È,¯,è,ì,È,ç,È,ç B

,±,ìfvf fpfefB,ÍDIPROPDWORD \ç'ì,ð—p,ç  
,é BDIPROPDWORD \ç'ì,ìpdiphftfB [f<fh,ÍDIPROPHEADER \ç'ì,Ö,ìf|  
fCf“f^,Ä,È,¯,è,ì,È,ç,È,ç BdwDataftfB [f<fh,Ífofbftf@fTfCfY,ðŠÛ,p,© A, ,é,ç,Ížó,¯žæ,é,±,Æ,É,È,é B

**DIPROPHEADER** \ç'ì,ìdwObjftfB [f<fh,Í0,Ä,È,¯,è,ì,È,ç,, A,±,è,í,±  
,ìfvf fpfefB Ý'è,“Á'è,ÌfIfufWfFfNfg,Ä,Í,È,fffofCfX'S'ì,É“K—p,³,è,é,±  
,Æ,ðž',· BdwSizeftfB [f<fh,É,ÍDIPROPDWORD \ç'ì,ìTfCfY,ðfZfbfg,µ,È,¯,è,ì,È,ç,È,ç B

fAvfŠfP [fvf±f“,³fffofCfX,©,çfofbftf@ Eff [f^,ð“Ç,Ý,Æ,ç,È,ç ê ±,É,Í ADIPROPDWORD \ç'ì,ìdwDataftf  
B [f<fh,°0,ÉfZfbfg,³,è,é B,Û,½,Í A—p,ç,éfofbftf@,ÌfTfCfY,ðž',·,½,ß,É0`ÈŠO,ì'l,à,Æ,è,ç,é B

fofbftf@fTfCfY,ðfZfbfg,·,é Û,É AdwData,³ž',·fofbftf@fTfCfY,³fffofCfX,ÄfTf|  
[fg,·,é,É,Í'á,«,·,¯,é ê ± A,Æ,è,ç,é Á'á,ìfofbftf@fTfCfY,ÉfZfbfg,³,è,é B•K—  
v,Èfofbftf@fTfCfY,³fZfbfg,³,è,½,©,ð'm,é,É,Í Afobftf@fTfCfYfvf fpfefB,ðžæ“¾,µ A,»,ÌEç%oÈ,ðfZfbfg,µ,æ  
,ç,Æ,µ,½'l,Æ”äŠr,µ,È,¯,è,ì,È,ç,È,ç B

**DIPROP\_GRANULARITY**

, ,ç,©,¶,ß'èç',³,ê,½fvf fpfefB,Å AfIfufWfFfNfg,Ì Å ¬'P^Ê,ðŽæ“¾,·,é B

,±,ìfvf fpfefB,ÍDIPROPDWORD \‘ç'ì,ð—p,ç

,é BDIPROPDWORD \‘ç'ì,ìpdiphftfB [f<fh,ÍDIPROPHEADER \‘ç'ì,Ö,ìf|  
fCf“f^,Å,È,¯,ê,Ì,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'í,·,éŽ¯•ÊŽq,Å,È,¯,ê,Ì,È,ç,È,ç  
BdwSizeftfB [f<fh,È,ÍDIPROPDWORD \‘ç'ì,ìfTfCfY,ðfZfbfg,μ,È,¯,ê,Ì,È,ç,È,ç B

Å ¬'P^Ê,Ì'í,Í AfIfufWfFfNfg,ªÚ“@,ð'Ê'm,Å,«,é Å ¬,ì<—ε,Å, ,é B,Û,Æ,ñ,Ç,ìŽ²fIfufWfFfNfg,ì Å ¬'P^Ê,Í  
1,Å, ,è A"ÇÓ,Ì'l,ð,Æ,è,ç,é,±,Æ,ðÓ—j,·,é B,±,ê,æ,è,à'â,«,ç Å ¬'P^Ê,ðŽ ,ÅŽ²,à, ,é B,½,Æ,!,Í Af}fEfX ã,ÌZ-  
%oñ“]—ÖŽ²,ì Å ¬'P^Ê,Í20,Å A'Ê'm,³,ê,éÊ'u·ì%o»,Í,·,×,Å20,ì“{ ”,Å, ,é,±,Æ,ðÓ-  
j,·,é BÈ¾,çŠ·,!,é,Æ Af† [fU,ªZ-%oñ“]—Ö,ð,â,Á,,è%oñ“,·,é,Æ AffofCfX,ÍÊ'u0 A20,»,μ,Ä40,Æ,ç,α,æ,α  
,É'Ê'm,·,é B

,±,ê,Í“Ç,Ý o,μ ê—p,ìfvf fpfefB,Å, ,é B

**DIPROP\_RANGE**

, ,ç,©,¶,ß'èç,³,ê,Ä,ç,éfvf fpfefB,Å AfIfufWfFfNfg,©,ç'Ê'm,³,ê,é'l,ì"íí,ðŽæ"¼,.,é B

,±,ìfvf fpfefB,íDIPROP\_RANGE \ç'ì,ð—p,ç

,é BDIPROP\_RANGE \ç'ì,ìpdiptftB [f<fh,íDIPROPHEADER \ç'ì,Ö,ìf|fCf"f^,Å,È,¯,ê,í,È,ç,È,ç B

**DIPROPHEADER** \ç'ì,ìdwObjftftB [f<fh,í"íí,"Žæ"¼,³,ê,éIfufWfFfNfg,É'í,.,éŽ•ÊŽq,Å,È,¯,ê,í,È,ç,È,ç BdwSize  
ftftB [f<fh,É,íDIPROP\_RANGE \ç'ì,ìTfCfY,ðfZfbfg,µ,È,¯,ê,í,È,ç,È,ç B

,±,ê,í"Ç,Ý o,µ ê—p,ìfvf fpfefB,Å, ,é B

## DISCL\_BACKGROUND

**SetCooperativeLevel**,  $\text{Ö, } \hat{\text{I}}\text{f}\text{p}\text{f}\% \text{of}$  [f^, \hat{A} AfobfNfOf%ofEf“fh EfAfNfZfX, \hat{K}-v, \hat{A}, , \hat{e}, \pm, \hat{A}, \hat{e}, \hat{Z}, \hat{I}, \cdot BfobfNfOf%ofEf“fh EfAfNfZfX, \hat{A}-\hat{A}, \hat{I}, \hat{C}, \hat{e}, \hat{e}, \hat{A} A\hat{S}\hat{O}\hat{A}, \hat{I}, , \hat{e}\text{fE}\text{fB}\text{f}“\text{f}\text{h}\text{fE}, \hat{A}\text{f}\text{A}\text{f}\text{N}\text{f}\text{e}\text{f}\text{B}\text{f}\text{u} \text{E}\text{f}\text{E}\text{f}\text{B}\text{f}“\text{f}\text{h}\text{fE}, \hat{A}, \hat{E}, \hat{C}, \hat{A}, \hat{e}, \hat{a}\hat{S}\hat{U}, \text{B}\text{f}\text{f}\text{f}\text{of}\text{C}\text{f}\text{X}, \hat{I}, \hat{C}, \hat{A}, \hat{A}, \hat{a}”\text{F}\hat{Z}”\% \hat{A}”\hat{A}, \hat{A}, , \hat{e} B

**DISCL\_FOREGROUND**,  $\hat{A}\text{DISCL\_BACKGROUND}$ ,  $\hat{\text{I}}, \hat{\text{C}}, \hat{\text{e}}, \hat{\text{C}}$

,, \hat{e}, \hat{C}, \hat{A}\text{DirectInputDevice}::\text{SetCooperativeLevel}, \hat{E}“n, \hat{3}, \hat{e}, \hat{E}, \hat{I}, \hat{e}, \hat{I}, \hat{E}, \hat{C}, \hat{E}, \hat{C} B—\hat{1}/\hat{4}\hat{u}, \hat{d}“n, \hat{\mu}, \hat{1}/\hat{2}, \hat{e}, \hat{C}, \hat{e}, \hat{a}“n, \hat{3}, \hat{E}, \hat{C} \hat{e} \hat{\ddagger}, \hat{\text{I}}\text{f}\text{G}\text{f}\% \text{of}, \hat{A}, \hat{E}, \hat{e} \text{BCE}»fo [fWf\hat{\ddagger}f“\hat{\text{I}}\text{DirectInput}, \hat{A}, \hat{I}”\hat{r}“\hat{1}/\hat{4}\hat{I}, \hat{E}\text{fobfNfOf%ofEf“fh EfAfNfZfX, \hat{3}\hat{e}, \hat{3}, \hat{e}, \hat{A}, \hat{C}, \hat{E}, \hat{C}, \hat{\pm}, \hat{A}, \hat{E}’ \hat{O} B

**DISCL\_EXCLUSIVE**

**SetCooperativeLevel**,Ö,İfpp%of [f^,Å A”r¼“IfAfNfZfX,ª•K—v,Å, ,é,±,Æ,ðŽ!,· B”r¼“IfAfNfZfX,ª—  
^,¡,ç,ê,é,Æ AfffofCfX,İ¼,İfCf“fXf^f“fX,Í A”FŽ—,³,ê,Å,ç  
,éfffofCfX,Ö,İ”r¼“IfAfNfZfX,Í“¾,ç,ê,È,ç B,µ,©,µ A¼,İfAfvfŠfP [fVf‡f“;”r¼“IfAfNfZfX,ð¾,Å,ç  
,é ê ‡,Å, ,Å,Å,à AfffofCfX,Ö,İ”r¼“I,ÈfAfNfZfX,Í,Å,È,É<-,³,ê,Å,ç,é,±,Æ,É’ ^Ó,·,é,±,Æ( u”r¼“I v,Æ,ç  
,⊞CEê,Í,±,±,Å,ÍCEê,Å,½CE¾,ç%ñ,µ,Å, ,é,ª ADirectDraw,É,“,—é—pŽ—,İŠ”O,Æ”äŠr,·,é,½,B,ÉŽæ,è ã,°,ç,ê,Å,ç,é) B

**WM\_ENTERSIZEMOVE**,“æ,Ñ **WM\_ENTERMENULOOP** fbfZ [fW,ðŽó, Žæ,Å,½ Ū,É Af}fEfX, ,é,ç  
,ÍfL [f{ [fh EfffofCfX,ð”r¼f, [fh,Å”FŽ—,·,éfAfvfŠfP [fVf‡f“,ÍfffofCfX,ð%ð•ú,·,é,±,Æ,ð<,-  
,, §,·,é B,³,à,È,ç,Æ Af† [fU,Íf fjf... [‘€ ì,âfEfBf“fhfE,İ”U“® EfŠfTfCfY,ª,Å,«,È,,È,é B

**DISCL\_EXCLUSIVE**,Æ**DISCL\_NONEXCLUSIVE**,ì,⊞,ç,ì,ç,,ê,©,ð**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,Å,İ”r¼“IfAfNfZfX,É,ÍftfHfAfOf%ofEf“fh EfAf  
NfZfX,ª•K—v,Æ,È,é B

## DISCL\_FOREGROUND

**SetCooperativeLevel**,  $\tilde{O}$ ,  $\tilde{I}$   $f$   $\wedge$ ,  $\hat{A}$   $A$   $f$   $t$   $H$   $f$   $A$   $f$   $O$   $f$   $\%o$   $f$   $E$   $f$   $“$   $f$   $h$   $E$   $f$   $A$   $f$   $N$   $f$   $Z$   $f$   $X$ ,  $^3$   $\bullet$   $K$   $—$   $v$ ,  $\hat{A}$ ,  $,$   $\acute{e}$ ,  $\pm$   
 $,$   $\mathcal{A}$ ,  $\delta$   $\check{Z}$ ,  $\cdot$   $B$   $f$   $t$   $H$   $f$   $A$   $f$   $O$   $f$   $\%o$   $f$   $E$   $f$   $“$   $f$   $h$   $E$   $f$   $A$   $f$   $N$   $f$   $Z$   $f$   $X$ ,  $^3$   $—$   $\wedge$ ,  $,$   $\zeta$ ,  $\hat{e}$ ,  $\acute{e}$ ,  $\mathcal{A}$   $A$   $\check{S}$   $\check{O}$   $\hat{A}$ ,  $\tilde{I}$ ,  $,$   $\acute{e}$   $f$   $E$   $f$   $B$   $f$   $“$   $f$   $h$   $f$   $E$ ,  $^3$   $f$   $t$   $H$   $f$   $A$   $f$   $O$   $f$   $\%o$   $f$   $E$   $f$   $“$   $f$   $h$ ,  $\hat{A}$   $f$   $A$   $f$   $N$   $f$   $e$   
 $f$   $B$   $f$   $u$ ,  $\hat{A}$ ,  $\hat{E}$ ,  $,$   $\hat{E}$ ,  $\acute{e}$ ,  $\mathcal{A}$   $f$   $f$   $f$   $o$   $f$   $C$   $f$   $X$ ,  $\hat{I}$   $\check{Z}$   $\textcircled{R}$   $“$   $\hat{I}$ ,  $\acute{E}$   $\%o$   $\delta$   $\bullet$   $\acute{u}$ ,  $^3$ ,  $\hat{e}$ ,  $\acute{e}$   $B$

**DISCL\_FOREGROUND**,  $\mathcal{A}$  **DISCL\_BACKGROUND**,  $\tilde{I}$ ,  $\square$ ,  $\hat{c}$ ,  $\Phi$   
 $,$ ,  $,$   $\hat{e}$ ,  $\textcircled{C}$ ,  $^3$  **DirectInputDevice::SetCooperativeLevel**,  $\acute{E}$   $“$   $n$ ,  $^3$ ,  $\hat{e}$ ,  $\hat{E}$ ,  $—$ ,  $\hat{e}$ ,  $\hat{I}$ ,  $\hat{E}$ ,  $\zeta$ ,  $\hat{E}$ ,  $\Phi$   $B$   $—$   $\frac{1}{4}$   $\bullet$   $\hat{u}$ ,  $\delta$   $“$   $n$ ,  $\mu$ ,  $\frac{1}{2}$ ,  $\hat{e}$ ,  $\Phi$   
 $,$ ,  $,$   $\hat{e}$ ,  $\hat{a}$   $“$   $n$ ,  $^3$ ,  $\hat{E}$ ,  $\Phi$   $\hat{e}$   $\ddagger$ ,  $\hat{I}$   $f$   $G$   $f$   $\%o$   $[$ ,  $\mathcal{A}$ ,  $\hat{E}$ ,  $\acute{e}$   $B$

**DISCL\_NONEXCLUSIVE**

**SetCooperativeLevel**,  $\text{Ö, } \text{Ïp}f\%of$  [f^, Å A"ñ"r¼"I fAfNfZfX, a•K—v, Å, , é, ±, Æ, ðŽ!, · BffofCfX, Ö, ÌfAfNfZfX, Í A"~è, ÌffofCfX, ÉfAfNfZfX, µ, Ä, ç, é¼, ÌfAvfŠfP [fVf±f“, ÉŠ± Å, µ, È, ç B

**DISCL\_EXCLUSIVE**, Æ**DISCL\_NONEXCLUSIVE**, Ì, ç, ç, ç  
,, è, ©, **IDirectInputDevice::SetCooperativeLevel**, É“n, ³, è, È, -, è, Î, È, ç, È, ç B—¼•û, ð“n, µ, ½, è, ç  
,, è, à“n, ³, È, ç è ±, ÌfGf%o [, Æ, È, é B

**JOYINFOEXfL [f{ [fh EfffofCfX'è ”**

fL [f{ [fh EfffofCfX'è ”,ídinpu.h,É'è\,³,é,Ä,;è AfL [f{ [fh EfffofCfX,ìff [f^fppfPfbfg(256fofCfg,ì”z—  
 ñ)“à,Ä,ìfIfZfbfg,ð\,µ,Ä,ç,é BŞefIfZfbfg,ì'l,Í AŽw'è,³,é,½ff [f^,“Ši”l,³,é,Ä,ç,é”z—ñ—  
 v'f,ì:Š'îÉ'u,ðŽ·É,.,é B,».,ìfIfZfbfg,ìÉ'u,É, ,éff [f^,Í AfL [f{ [fh,ìfL [,É'í%ž,µ,Ä,ç,é B^è”É,É A,±  
 ,é,ç,ì'l,ÍDIDEVICEOBJECTDATA ADIOBJECTDATAFORMAT A, ,é,ç  
 ,ÍDIDEVICEOBJECTINSTANCE \‘c'ì,ìdwOfsf f“fo,ÄŽg—p,³,é,é B,Û,½ A—v'f,ðŽw'è,µ,Ä”z—  
 ñ,ÉfAfNfZfX,.,é Û,ì“YŽš,Æ,µ,Ä,à—p,ç,ç,é,é B

^è”É“l,ÈfL [f{ [fh EfffofCfX'è ”,ð^È%°,ÉŽ,· i , ‡ j B

<b>DIK_ESCAPE</b>	EscfL [
<b>DIK_1</b>	1 fL [
<b>DIK_2</b>	2 fL [
<b>DIK_3</b>	3 fL [
<b>DIK_4</b>	4 fL [
<b>DIK_5</b>	5 fL [
<b>DIK_6</b>	6 fL [
<b>DIK_7</b>	7 fL [
<b>DIK_8</b>	8 fL [
<b>DIK_9</b>	9 fL [
<b>DIK_0</b>	0 fL [
<b>DIK_MINUS</b>	f fCf“fL [f{ [fh,ì - fL [
<b>DIK_EQUALS</b>	= fL [
<b>DIK_BACK</b>	BackspacefL [
<b>DIK_TAB</b>	TabfL [
<b>DIK_Q</b>	Q fL [
<b>DIK_W</b>	W fL [
<b>DIK_E</b>	E fL [
<b>DIK_R</b>	R fL [
<b>DIK_T</b>	T fL [
<b>DIK_Y</b>	Y fL [
<b>DIK_U</b>	U fL [
<b>DIK_I</b>	I fL [
<b>DIK_O</b>	O fL [
<b>DIK_P</b>	P fL [
<b>DIK_LBRACKET</b>	[ fL [
<b>DIK_RBRACKET</b>	] fL [
<b>DIK_RETURN</b>	f fCf“fL [f{ [fh,ì Enter fL [
<b>DIK_LCONTROL</b>	¶CtrlfL [
<b>DIK_A</b>	A fL [
<b>DIK_S</b>	S fL [
<b>DIK_D</b>	D fL [
<b>DIK_F</b>	F fL [
<b>DIK_G</b>	G fL [
<b>DIK_H</b>	H fL [
<b>DIK_J</b>	J fL [
<b>DIK_K</b>	K fL [
<b>DIK_L</b>	L fL [
<b>DIK_SEMICOLON</b>	; fL [
<b>DIK_APOSTROPHE</b>	fAf fXfgf ftfB [ (') fL [
<b>DIK_GRAVE</b>	accent grave ( ` ) fL [
<b>DIK_LSHIFT</b>	¶ShiftfL [
<b>DIK_BACKSLASH</b>	\ fL [
<b>DIK_Z</b>	Z fL [
<b>DIK_X</b>	X fL [
<b>DIK_C</b>	C fL [
<b>DIK_V</b>	V fL [
<b>DIK_B</b>	B fL [
<b>DIK_N</b>	N fL [
<b>DIK_M</b>	M fL [
<b>DIK_COMMA</b>	, fL [

<b>DIK_PERIOD</b>	<i>f fCf“fL [f{ [fh,î . fL [</i>
<b>DIK_SLASH</b>	<i>f fCf“fL [f{ [fh,î / fL [</i>
<b>DIK_RSHIFT</b>	<i>%oEShiftfL [</i>
<b>DIK_MULTIPLY</b>	<i>fef“fL [,î * fL [</i>
<b>DIK_LMENU</b>	<i>¶Alt fL [</i>
<b>DIK_SPACE</b>	<i>fXfy [fXfo [</i>
<b>DIK_CAPITAL</b>	<i>Caps LockfL [</i>
<b>DIK_F1</b>	<i>F1 fL [</i>
<b>DIK_F2</b>	<i>F2 fL [</i>
<b>DIK_F3</b>	<i>F3 fL [</i>
<b>DIK_F4</b>	<i>F4 fL [</i>
<b>DIK_F5</b>	<i>F5 fL [</i>
<b>DIK_F6</b>	<i>F6 fL [</i>
<b>DIK_F7</b>	<i>F7 fL [</i>
<b>DIK_F8</b>	<i>F8 fL [</i>
<b>DIK_F9</b>	<i>F9 fL [</i>
<b>DIK_F10</b>	<i>F10fL [</i>
<b>DIK_NUMLOCK</b>	<i>Num LockfL [</i>
<b>DIK_SCROLL</b>	<i>Scroll LockfL [</i>
<b>DIK_NUMPAD7</b>	<i>fef“fL [,î7fL [</i>
<b>DIK_NUMPAD8</b>	<i>fef“fL [,î8 fL [</i>
<b>DIK_NUMPAD9</b>	<i>fef“fL [,î9 fL [</i>
<b>DIK_SUBTRACT</b>	<i>fef“fL [,î - fL [</i>
<b>DIK_NUMPAD4</b>	<i>fef“fL [,î4 fL [</i>
<b>DIK_NUMPAD5</b>	<i>fef“fL [,î5 fL [</i>
<b>DIK_NUMPAD6</b>	<i>fef“fL [,î6 fL [</i>
<b>DIK_ADD</b>	<i>fef“fL [,î + fL [</i>
<b>DIK_NUMPAD1</b>	<i>fef“fL [,î1 fL [</i>
<b>DIK_NUMPAD2</b>	<i>fef“fL [,î2 fL [</i>
<b>DIK_NUMPAD3</b>	<i>fef“fL [,î3 fL [</i>
<b>DIK_NUMPAD0</b>	<i>fef“fL [,î0 fL [</i>
<b>DIK_DECIMAL</b>	<i>fef“fL [,î . fL [</i>
<b>DIK_F11</b>	<i>F11fL [</i>
<b>DIK_F12</b>	<i>F12fL [</i>
<b>DIK_NUMPADENTER</b>	<i>fef“fL [,îEnterfL [</i>
<b>DIK_RCONTROL</b>	<i>%oECtrlfL [</i>
<b>DIK_DIVIDE</b>	<i>fef“fL [,î / fL [</i>
<b>DIK_SYSRQ</b>	<i>SysRqfL [</i>
<b>DIK_RMENU</b>	<i>%oEAlt fL [</i>
<b>DIK_HOME</b>	<i>HomefL [</i>
<b>DIK_UP</b>	<i>ã-îó fL [</i>
<b>DIK_PRIOR</b>	<i>PgUpfL [</i>
<b>DIK_LEFT</b>	<i>¶-îó fL [</i>
<b>DIK_RIGHT</b>	<i>%oE-îó fL [</i>
<b>DIK_END</b>	<i>EndfL [</i>
<b>DIK_DOWN</b>	<i>%o-îó fL [</i>
<b>DIK_NEXT</b>	<i>PgDnfL [</i>
<b>DIK_INSERT</b>	<i>InsertfL [</i>
<b>DIK_DELETE</b>	<i>DeletfL [</i>
<b>DIK_LWIN</b>	<i>¶WindowsfL [</i>
<b>DIK_RWIN</b>	<i>%oEWindowsfL [</i>
<b>DIK_APPS</b>	<i>AppMenufL [</i>

f)EfX EfffofCfX`è ”

**DIMOFS\_BUTTON0**

**DIMOUSESTATE** \`c`i,`i` æ“a,É`i,`.,é{f}fEfXf{f^f“0,`i` ó`Ô,`i`fIftfZfbfg B,±  
,`i`l,`í` **ADIDEVICEOBJECTDATA** \`c`i,`i`dwOfsftfB [f<fh,Æ,μ,Ä•Ô,³,ê Aff [f^,^f}fEfXf{f^f“0,É“K—p,³,ê,é,±  
,Æ,ðŽ,`., B

**DIMOFS\_BUTTON1**

**DIMOUSESTATE** \`c`i,`i` æ“a,É`i,`.,é{f}fEfXf{f^f“1,`i` ó`Ô,`i`fIftfZfbfg B,±  
,`i`l,`í` **ADIDEVICEOBJECTDATA** \`c`i,`i`dwOfsftfB [f<fh,Æ,μ,Ä•Ô,³,ê Aff [f^,^f}fEfXf{f^f“1,É“K—p,³,ê,é,±  
,Æ,ðŽ,`., B

**DIMOFS\_BUTTON2**

**DIMOUSESTATE** \`c`i,`i` æ“a,É`i,`.,é{f}fEfXf{f^f“2,`i` ó`Ô,`i`fIftfZfbfg B,±  
,`i`l,`í` **ADIDEVICEOBJECTDATA** \`c`i,`i`dwOfsftfB [f<fh,Æ,μ,Ä•Ô,³,ê Aff [f^,^f}fEfXf{f^f“2,É“K—p,³,ê,é,±  
,Æ,ðŽ,`., B

**DIMOFS\_BUTTON3**

**DIMOUSESTATE** \`c`i,`i` æ“a,É`i,`.,é{f}fEfXf{f^f“3,`i` ó`Ô,`i`fIftfZfbfg B,±  
,`i`l,`í` **ADIDEVICEOBJECTDATA** \`c`i,`i`dwOfsftfB [f<fh,Æ,μ,Ä•Ô,³,ê Aff [f^,^f}fEfXf{f^f“3,É“K—p,³,ê,é,±  
,Æ,ðŽ,`., B

**DIMOFS\_X**

**DIMOUSESTATE** \`c`i,`i` æ“a,É`i,`.,é{f}fEfX,`i`x•ûEü,`i`Ê`u,`i`fIftfZfbfg B,±  
,`i`l,`í` **ADIDEVICEOBJECTDATA** \`c`i,`i`dwOfsftfB [f<fh,Æ,μ,Ä•Ô,³,ê Aff [f^,^f}fEfX,`i`x•ûEü,`i`Ê`u,É“K—  
p,³,ê,é,±,Æ,ðŽ,`., B

**DIMOFS\_Y**

**DIMOUSESTATE** \`c`i,`i` æ“a,É`i,`.,é{f}fEfX,`i`y•ûEü,`i`Ê`u,`i`fIftfZfbfg B,±  
,`i`l,`í` **ADIDEVICEOBJECTDATA** \`c`i,`i`dwOfsftfB [f<fh,Æ,μ,Ä•Ô,³,ê Aff [f^,^f}fEfX,`i`y•ûEü,`i`Ê`u,É“K—  
p,³,ê,é,±,Æ,ðŽ,`., B

**DIMOFS\_Z**

**DIMOUSESTATE** \`c`i,`i` æ“a,É`i,`.,é{f}fEfX,`i`z•ûEü,`i`Ê`u,`i`fIftfZfbfg B,±  
,`i`l,`í` **ADIDEVICEOBJECTDATA** \`c`i,`i`dwOfsftfB [f<fh,Æ,μ,Ä•Ô,³,ê Aff [f^,^f}fEfX,`i`z•ûEü,`i`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,Á—p,c  
.ç,ê,é BfffofCfX Ef^fCfv<L qfR [fh,Ì Å%°Êf ofCf g,ÍfffofCfX Ef^fCfv,ðŽw’è,·,é B

**DIDEVTYPE\_MOUSE:** f}fEfX, ,é,c,Íf}fEfX,É—bŽ—,µ,½fffofCfX(fgf%ofbfNf{ [f<,È,Ç) B  
**DIDEVTYPE\_KEYBOARD:** fL [f{ [fh, ,é,c,ÍfL [f{ [fh,É—bŽ—,µ,½fffofCfX B

%°Ê,©,ç2”Ô—Ú,Ìf ofCf g,ÍfffofCfX,ÌfTfuf^fCfv,ðŽw’è,·,é B

f}fEfXf^fCfv,ÌfffofCfX,É,Â,c,Ä,Í AŽÿ,ÌfTfuf^fCfv,°è`³,ê,Ä,c,é:

**DIDEVTYPE\_MOUSE\_UNKNOWN:** fTfuf^fCfv,ðŠm’è,Â,«,È,c B

**DIDEVTYPE\_MOUSE\_TRADITIONAL:** ““ “I,Èf}fEfX B

**DIDEVTYPE\_MOUSE\_FINGERSTICK:** ftfBf“fK [fXfefBfbfN B

**DIDEVTYPE\_MOUSE\_TOUCHPAD:** fffofCfX,Íf^fbf`fpfbfh,Â, ,é B

**DIDEVTYPE\_MOUSE\_TRACKBALL:** fffofCfX,Ífgf%ofbfNf{ [f<,Â, ,é B

fL [f{ [fh^fCfv,ÌfffofCfX,É,Â,c,Ä,Í AŽÿ,ÌfTfuf^fCfv,°è`³,ê,Ä,c,é:

**DIDEVTYPE\_KEYBOARD\_PCXT:** IBM PC/XT 83fL [fL [f{ [fh B

**DIDEVTYPE\_KEYBOARD\_OLIVETTI:** flfŠfxfbfefB102fL [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—{ŒêNEC PC98fL [f{ [fh B

**DIDEVTYPE\_KEYBOARD\_NEC98LAPTOP:** “ú—{ŒêNEC PC98f%ofbfvfgfbfvfL [f{ [fh B

**DIDEVTYPE\_KEYBOARD\_NEC98106:** “ú—{ŒêNEC PC98 106fL [fL [f{ [fh B

**DIDEVTYPE\_KEYBOARD\_JAPAN106:** “ú—{Œê106fL [fL [f{ [fh B

**DIDEVTYPE\_KEYBOARD\_JAPANAX:** “ú—{ŒêAXfL [f{ [fh B

**DIDEVTYPE\_KEYBOARD\_J3100:** “ú—{ŒêJ3100fL [f{ [fh B

**DirectInputff [f^ EftfH [f]fbfg Ef^fCfv**

DirectInputff [f^ EftfH [f]  
fbfg Ef^fCfv,ÍffofCfX,É,,"é'P'êfIfufWfFfNfg,ì® «,ðL q,.,é BfffofCfX,É,,"éfIfufWfFfNfg,ÍŽ² Af{f^f"  
,,é,ç,í¼,ì"ü—Í\ [fX,Æ,È,è,è,é B

**DIDFT\_ALL**

,±,Ìftf%oO,ÍIDirectInputDevice::EnumObjects,É'Í,μ,Ä,ì,Ý—  
LCEø,Æ,È,é B,.,×,Ä,ÌfIfufWfFfNfg,Íf^fCfv,ÉŠÖ,í,ç,,—ñ<“,³,è,é B,±,Ìftf%oO,ð¼,Ìftf%oO,Æ'g,Ý ±,í,¹,é,±  
,Æ,ª,Ä,«,È,ç B

**DIDFT\_RELAXIS**

fIfufWfFfNfg,ÍŠ'ÍŽ²,Ä, ,é B'Š'ÍŽ²,Æ,Í A'O%ñ'Ê'm,³,è,½^Ê'u,©,ç,ì' •ª—Ê,Æ,μ,Äff [f^,ð'Ê'm,.,é,à,ì,Ä, ,é B'  
Š'ÍŽ²,í'è"É,Í,É,Í—³ §CEÄ,ì"ÍÍ,ðfTf| [fg,μ,Ä,ç,é BŽ²,Í'A±"I,È ""l,ð'Ê'm,.,é•K—  
v,ª,È,ç B,½,Æ,,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,Í,,ìŽ²,Ì Ä -'P'Ê,ð'Ê'm,.,é B  
'Š'ÍŽ²fffofCfX,É,Í â'Í Ä•W,ª,¶ Ý,μ,È,ç B,P,μ,è A'Ê'm,³,è,é â'Í Ä•W,Í'P,É AfffofCfX,ªFŽ-³,è,Ä,ç  
,éŠÖ,È,,»,ÌfffofCfX,É,æ,è'Ê'm,³,è,é'Š'Í Ä•W,ì ±CEv,Ä, ,é BCE%oÊ,Æ,μ,Ä A'S'ÍŽ²fIfufWfFfNfg,©,çª¼,ç,è,½  
â'Í Ä•W,Í A¼,ì â'Í Ä•W,Æ"äŠr,³,è,é è ±,ì,ÝÓ-ì,ðŽ ,Ä B,½,Æ,,ì Af{f^f“,ª%Ý,³,è,Ä,ç  
,é,Æ,«,ÉfAvfŠfP [fVf±f“ª â'Í'P'ì,ðL^μ Af{f^f“,ª—L,³,è,é,Æ,,è,ðŽæª¼,.,é,Æ%¼'è,.,é B,±  
,ì,Ó,½,Ä,ì'1,ì ,ð,Æ,é,±,Æ,È,æ,é AfAvfŠfP [fVf±f“,Í Af{f^f“,ª%Ý,³,è,½^Ê'u,Æ—L,³,è,½^Ê'u,Æ,ÌŠÖ,ì<—L  
,ðCEvŽZ,.,é,±,Æ,ª,Ä,«,é B  
'Š'ÍŽ² ä,Ä â'Í'P'ì,ìCE“\_,ðfZfbfg,μ,½,èŽæª¼,μ,½,è,.,é,±,Æ,Í•s%oÄ"  
,È,ì,Ä AfAvfŠfP [fVf±f“,ÍfffofCfX,ð"FŽ ,μ,½¼CEä,É â'Í'Ê'u,ðL^.,é,×,«,Ä, ,é B,±,ì'1,Í%¼'zCE  
'\_,Æ,È,é B,,èÈ ~,ìCEÄ,Ñ o,μ,É,Ä,ç,Ä,Í,.,×,Ä A,±,ìCE“\_,ðŠì,É â'Í'Ê'u,ª l—¶,³,è,é B

**DIDFT\_ABSAXIS**

fIfufWfFfNfg,Í â'ÍŽ²,Ä, ,é B â'ÍŽ²,Æ,Í A â'Í'Ê'u,Æ,μ,Äff [f^,ð'Ê'm,.,é,à,ì,Ä, ,é B  
â'ÍŽ²,í'è"É,Í,É,Í—LCEÄ,ì"ÍÍ,ðfTf| [fg,μ,Ä,ç,é B  
Ž²,Í'A±"I,È ""l,ð'Ê'm,.,é•K—v,ª,È,ç B,½,Æ,,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,Í,,ìŽ²,Ì Ä -'P'Ê,ð'Ê'm,.,é B

**DIDFT\_AXIS**

,±,Ìftf%oO,ÍIDirectInputDevice::EnumObjects,É'Í,μ,Ä,ì,Ý—LCEø,Æ,È,é B,.,×,Ä,ìŽ²,Í A â'Í'I E'Š'Í'I,ÉŠÖ,í,ç,,  
—ñ<“,³,è,é B

**DIDFT\_PSHBUTTON**

fIfufWfFfNfg,ÍfvfbfVf...f{f^f“,Ä, ,é BfvfbfVf...f{f^f“,Í Af† [fU,ª%Ý,μ,Ä,ç,é,Æ,«,Í%ª,ª,Ä,Ä,ç  
,é,Æ'Ê'm,³,è Af† [fU,ª—L,.,Æ ä,ª,Ä,Ä,ç,é,Æ'Ê'm,³,è,é B

**DIDFT\_TGLBUTTON**

fIfufWfFfNfg,ÍfgfOf{f^f“,Ä, ,é BfgfOf{f^f“,Íf† [fU,ª%Ý,μ,Ä,ç,é,Æ,«,É,Í%ª,ª,Ä,Ä,ç  
,é,Æ'Ê'm,³,è AŽÝ,Éf† [fU,ªf{f^f“,ð%Ý,.,Ü,Ä,Í A%Ý,³,è,Ä,ç,é,Æ'Ê'm,³,è±,.,é B

**DIDFT\_BUTTON**

fIfufWfFfNfg,ÍfvfbfVf...f{f^f“,©fgfOf{f^f“,Ä, ,é B

•Ô¹

fGf%o [ ,Í•%o,Ì¹,Ä•\,³,ê A'g,Ý ‡,í,¹,é,±,Æ,Í,È,¢ B,±,Ì•\,Ä,Í A,·,×,Ä,ÌDirectInputŠÖ ”,É,æ,è•Ô,³,ê,±,éfGf%o [ ,ð—  
ñ<“,µ,Ä, ,é BŠeŠÖ ”,³•Ô,µ,±,éfGf%o [fR [fh,ÌfŠfXfg,É,Ä,¢,Ä,Í ACEÄ X,ÌŠÖ ”,Ì' Žß,ðŽQ Æ,·,é,±,Æ B

**JOYERR\_NOCANDO**

fWf‡fCfXfefBfbfNfhf%oCfo,ÍfEfWfXfgfŠ,©,ç,ÌfffofCfX îñ,ð X V  
,Ä,«,È,¢ B

**JOYERR\_NOERROR**

—v< ,Í ³ í I—¹,µ,½ B

**JOYERR\_REGISTRYNOTVALID**

fEfWfXfgfŠ,Ì,D,Æ,Ä^È ä,ÌfWf‡fCfXfefBfbfNfGf“fgfŠ,É—  
³Eø,Èff [f^,³ŠÜ,Ü,é,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,³—³Eø,Ä, ,éi

**MMSYSERR\_INVALIDPARAM**

—³Eø,Èfpf%of [f^,³“n,³,ê,½ B

**MMSYSERR\_NODRIVER**

fWf‡fCfXfefBfbfNfhf%oCfo,³“¶ Ý,µ,È,¢ B

**DirectSetup ,É,Â,ç,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,đfCf“fXfg [f<,Ä,«,é BDirectX  
3,Í•ŽG,Èfvf f\_fNfg,È,Ì,Ä AfCf“fXfg [f<,à•İŽG,È ì<Æ,ð—v,·,é B,µ,½,a,Ä,ÄDirectX  
3,đŽè ì<Æ,ÄfCf“fXfg [f<,·,é,×,«,Ä,Í,È,ç B

,³,ç,É ADirectSetup,đŽg—p,·,é,±,Æ,Ä ADirectPlayLobbyfIfufWfFfNfg,ð—p,ç,éfvfŠfP [fVf‡f“ ,É•K—  
v,ÈfEfWfXfgfŠ î•ñ,đŽ©“@“I,ÈfCf“fXfg [f<,Ä,«,é B,±  
,İfEfWfXfgfŠ î•ñ,Í ADirectPlayLobbyfIfufWfFfNfg,afAfvfŠfP [fVf‡f“ ,ð<N“@,·,é Û,É•K—v,Æ,È,é B

DirectSetup,Í,R,Ä,ÌAPIŠÖ ”,đ”ö,!,Ä,ç,é,ª A,»,ì,□,çfAfvfŠfP [fVf‡f“ŠJ”ŽÒ,É,Æ,Ä,Ä—L%ov,È,Ì,Í,Ó,½,Ä,¾,¯,Ä, ,é  
B,»,êÈŠO,Ì,Đ,Æ,Ä ADirectXDeviceDriverSetup,Í ADirectXfffofCfX Efhf%ofCfo,đfCf“fXfg [f<,µ,æ,□  
,Æ,·,é l,½,ß,Ì,à,Ì,Ä A,±,İf}fj...fAf<,Ä,ÍE¾<y,µ,È,ç B

**DirectSetup, ĨŠT—v**

,±, ĨZfNfVf±f“, Ā, Ĩ ADirectSetup, ĨRf“f| [flf“fg, ĒŠÖ, ·, é^ê”Ē“l, Ē Ĩ•ñ, ð q, ×, é B

EDirectXSetupŠÖ ”, Ĩžq—p

EDirectXfAfvfŠfP [fVf±f“, ĨfCf“fXfg [f< €”ð

EAutoPlay, Ĩ%oÒ“®

**DirectXSetupŠÖ ”,İŽg—p**

DirectX,ÉÊ•¶,·,éAfvfŠfP [fVf‡f“,;„æ,ÑfQ [f€,Í A,»„ìfVfXfef€ EfRf“f|  
[flf“fg,ð A’Ê í,İfAfvfŠfP [fVf‡f“,İfCf“fXfg [f<,É%Á,İ,ÄfCf“fXfg [f<,·,é B,±  
,İfCf“fXfg [f<,É,Í**DirectXSetup**APIŠÖ ”,ð—p,ç,é B,±  
,İŠÖ ”,Í ADirectX,İfCf“fXfg [f<’,ÉffBfXfvfÇfC,;„æ,ÑfI [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,ÄŠefAfvfŠfP [fVf‡f“,É’ñ<Ÿ,³,ê,Ä,ç  
,é BDirectSetup,İ éÇ¾•¶,ÍDsetup.h,É, ,é B

**DirectXSetup**,ðŽg—p,·,éAfvfŠfP [fVf‡f“,Í A\Redist\Directx\ffBfÇfNfgfŠ,ì“à—e,Ì,Ÿ,Ä,È,-  
ARedist\ffBfÇfNfgfŠ,İ’S“à—e,ð”z•z,µ,È,̄,ê,İ,È,ç,È,ç **BDirectXSetup**,É,æ,èDirectDraw®,Æ,ç  
,Á,½’P”ê,İDirectXfRf“f| [flf“fg,ðfCf“fXfg [f<,Ä,«„é,ª A,±,ê,Í „ š,Ä,«„È,ç B,È,°,È,çDirectXfRf“f|  
[flf“fg,ÍŠÇŸÊ“¶ «„,Ì, ,é ŸÇv,É,È,Ä,Ä,ç,é,Ì,Ä AfffBfXfNfXfy [fX,İ ß—ñ,É,Ì,È,ç,È,ç,©,ç,Ä, ,é BDirectXfRf“  
f| [flf“fg,ð,P,Ä,¾,—p,ç,é ê ‡,Ä,à AfvfŠfP [fVf‡f“,ÍDirectX’S’ì,ì@”\,ð”z•z,µ,È,̄,ê,İ,È,ç,È,ç B

**DirectX fAfvfŠfP [fVf‡f“,İfCf“fXfg [f< €”ö**

fAfvfŠfP [fVf‡f“,ÆDirectXftf@fCf<,đf† [fU,İfVfXfef€,ÉfCf“fXfg [f<.,é €”ö,đ,µ,½,ç A’±  
,̄,ÄfZfbfgfAfbfv Efvf fOf%of€,đ ì ¬,.,é•K—v,³, ,é BfZfbfgfAfbfv Efvf fOf%of€  
,Í AfAfvfŠfP [fVf‡f“,É•K—v,Èftf@fCf<,İfŠfXfgfAfbfv A•K—v,ÈffBfXfN—e—  
È,İĈ~è A“K Ø,ÈDirectX,İfCf“fXfg [f<,İ3,Ä,İ ì<Æ,đ s,□ B,»,µ,Ä”z•z”}‘İ,ÉffBfĈfNfgfŠ,đ ì ¬,µ AfAfvfŠfP  
[fVf‡f“,İ’Sftf@fCf<,,æ,Ñ•%oÁ,³,ê,½DirectXfRf“f [flf“fg,đ,±,İffBfĈfNfgfŠ,É’u, BŽŸ,É,±  
.ê,ç,İfXfefbfv,đ à~¾,.,é B

fZfbfgfAfbfv Efvf fOf%of€,İ ì ¬

fAfvfŠfP [fVf‡f“ EfffBfĈfNfgfŠ,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  
€fNfgfŠ,É, ,éDinstall,Æ,ç,ç,¼,¼,¼,ìfZfbfgfAfbfv Efvf fOf%of€,É,Í ARockem,Æ,ç,çTf“fvf< Efvf fOf%of€  
,ð‘ð,³,è,½ffBf€fNfgfŠ,ÉfCf“fXfg [f<,·,é•û—@,ì à—¾,³, ,é B,Ü,½**DirectXSetup**ŠÖ ”,ðžg—p,·,é•í“l,È•û—@,ì à—  
¾,à, ,é B

È%°,ìfXfefbfv,Ä,Í Af† [fU,ìfRf“fsf... [f^,Ä“® ì,·,é,æ,µ,ÉDinstall.cfvf fOf%of€,ð C ³,·,é•û—@,ðŽ!,· B

1 fGffBf^,ÄDinstall.c,ðŠJ, B

2 ft [fU,ìfvfXfef€ ä,ÉfCf“fXfg [f<,µ,½,çfAfvfŠfP [fvf‡f“,ìftf@fCf< EfŠfXfg,ð‘ñ<ÿ,·,é,±,Æ Bft† [fU,ì  
—p“r,É, ,µ,æ,µ,ÉDinstall.cftf@fCf<,É, ,éfŠfXfg,ð C ³,·,é,É,Í AÓcopy\_listÖ,ð€ÿ ò,µ A,±  
,ì \ç‘l,È“¶ Ý,·,éftf@fCf< EfŠfXfg,ðft† [fU—p,ìftf@fCf< EfŠfXfg,É•Í X,·,é B

Dinstall,ìffftHf<fg EfffBf€fNfgfŠ,Éftf@fCf<,ðfCf“fXfg [f<,·,é BfAfvfŠfP [fvf‡f“,ìftf@fCf<,ðfTfuffB  
f€fNfgfŠ,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 \“à,Èfn [fhffBfXfN,ì<ó,«—e—È,ª,  
,é,©,Ç,µ,©,ð”»è,Ä,«È,ç B,½,¾,µ Af† [fU,ì,à,ÄfR [fh,ð“ü—Í,·,é,ì,±,ì<@”,ð•t%oÄ,·,é,±,Æ,ª,Ä,«é B,±  
,ìfR [fh,ð“ü—Í,·,é é Š,ÍDinstall.cftf@fCf<,É2%oÖ Š , ,éª A,»,±,ÍOIND\_DISK\_MSGÖ,ð€ÿ ò,·,é,ì‘T,·,±  
,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,ÑDirectXffBf€fNfgfŠ,Ö,ìfpfX,ðŽw’è,·,é B“Á,É— —R,ª,È,ç€Ä,è A,±  
,è,ç,ìf\_cCfif~fbfNfŠ“fNf%ofCuf%ofŠ A, ,æ,Ñ,±,ìffBf€fNfgfŠ,ÍZÄ s—  
p(fRf“fpfCf<€Ä)Dinstall,Æ““¶ffBf€fNfgfŠ,É,È, ,é,ì,È,ç,È,ç B,±  
,è,ç,ì,·,×,Ä,ìftf@fCf<, ,æ,ÑffBf€fNfgfŠ,æ““¶ffBf€fNfgfŠ,É‘¶ Ý,·,é é ‡ AlpszRootPathfpf%of [f^,ì‘l,Í  
NULL,Ä,æ,ç B,±,è,É,æ,è AfAfvfŠfP [fvf‡f“,ìf< [fg,©,çRf“fpfNfgffBfXfN, ,é,ç  
,ìftf fbfs [ffBfXfN ä,Öftf@fCf<,“Ü“@,·,é Ü,ÉfpfX,ª•í,Í,Ä,à ADirectXSetup,Í ³ í,É<@”,·,é,±  
,Æ,ª,Ä,«é B

,½,Æ, ,ì ADinstall.exe ADsetup\*.dll, ,æ,ÑDirectxffBf€fNfgfŠ,ª AfefXfg’iŠK,ìŠÖ,ÍD:\Funstuff,Æ,ç  
,µfAfvfŠfP [fvf‡f“ EfffBf€fNfgfŠ,É, ,é,Æ%o¼’è,·,é B,»,µ,Ä Aftf@fCf<,ðfRf“fpfNfgffBfXfN ä,É Ä,«  
t, ,é Ü,É A,»,è,ç,ìftf@fCf<,ðf< [fg,É’u, ,Æ%o¼’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€,ç<@”  
,·,é B,È,°,È,ç,Í ADsetup\*.dll, ,æ,ÑDirectxffBf€fNfgfŠ,Ö,ìfpfX,ÍfJfEf“fg EfffBf€fNfgfŠ,É‘¶ Ý,·,é,©,ç,Ä,  
,é B

Dinstall.exe,ª, ,éffBf€fNfgfŠ“ÈŠÖ,ì é Š,ÉDsetup\*.dllftf@fCf<, ,æ,ÑDirectxffBf€fNfgfŠ,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,È, ,é,ì,È,ç,È,ç B,³,ç,É ALoadLibrary, ,æ,ÑGetProcAddress,Æ,ç  
,µWin32Ö,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,Ä€“è,³,è,é BfAfvfŠfP [fvf‡f“,ì¼ ì, ,æ,ÑfOf%oftfBfbfNfX,ð•Ž!,·,é,É,Í A,±  
,ìfŠf\ [fX Eftf@fCf<,É‘í,µ,Ä^È%°,ì•Í X,ð s,µ B

1 fGffBf^,ÄDinstall.rc,ðŠJ, B

2 ftf@fCf<,ÉŠÜ,Ü,è,é,·,×,Ä,ÍÓRockemÖ,ð€ÿ ò,µ ACEÄ 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 BCEÄ 1,ìfBfbfgf}fbfv Eftf@fCf<,É,±,è,ç,ì¼ ì,ð,Ä, ,é,© A, ,é,ç  
,Í€Ä 1,ìfBfbfgf}fbfv,ì¼ ì,É ‡,µ,æ,µ,ÉfŠf\ [fX Eftf@fCf<,Ä,ì¼ ì,ð•Í X,·,é,±,Æ,ª,Ä,«é B

4 ŽÄ s—pDinstall,É‘l,·,éAfCfRf“,ÍfŠf\ [fX Eftf@fCf<,É, ,ç  
,Ä,ÍSetup.ico,Æ€Ä,Í,è ASETUP\_ICON,ÄŽw’è,³,è,é BCEÄ 1,ìfAfCfRf“ Eftf@fCf<,ì—  
¼ ì,ðSetup.ico,Æ,·,é,© A, ,é,ç,Í€Ä 1,ìfAfCfRf“ Eftf@fCf<,ì¼ ì,É, ,µ,æ,µ,ÉfŠf\ [fX Eftf@fCf<,É, ,ç, ,é—  
¼ ì,ð•Í X,·,é,±,Æ,ª,Ä,«é B

5 fIfvfVf‡f“,Æ,µ,Ä ACEÄ 1,ìfAfvfŠfP [fvf‡f“,ðfCf“fXfg [f<,·,éffftHf<fgffBf€fNfgfŠ,ð•Í X,·,é,±,  
,Æ,ª,Ä,«é B,±,è,ð s,µ,É,Í AÓIDS\_DEFAULT\_GAME\_DIRÖ(fšf\ [fX Eftf@fCf<,Ä,Í2%oÖ Š‘¶ Ý,·,é)

,ðĚŸ ò,μ AfftfHf<fg EfffBfĚfNfgfŠ,ÏfpfX,ð•Ī X,·,é B

ĚÂ 1,ÏfAfvfŠfP [fVf±f“,Ï—p“r,É, ,ϱ,æ,ϱ,É ADinstall.c,“,æ,ÑDinstall.rcftf@fCf<,ð C <sup>3</sup>,μ,½Ěã A,»,ê,ç,ðŽÀ s—  
pDinstall.exe,ÖfRf“fpfCf<,·,é,±,Æ,ª,Å,«é B,±,ÏŽÀ sftf@fCf<,Ï¼ Ì,ð•Ī X,·,é,±,Æ,à,Å,«é(½,Æ,Ï,ÏSetup.exe) B

**fAfvšfP [fVfzf“ EffBfĀfNfgš,İfZfbfgfAfbfv**

Ā 1,İfAfvšfP [fVfzf“ ,đRf“fpfNfgffBfXfN, ,é,Ā  
,İftf fbfs [ffBfXfN,É“Ū,‘O,É AfZfbfgfAfbfv Efvf fOf%ofĀ  
,İfefXfg,İ,½,B,İfAfvšfP [fVfzf“ EffBfĀfNfgš,đ İ ¬,µ,Ä,“-  
BfAfvšfP [fVfzf“ EffBfĀfNfgš,É,İ,·,×,Ä,İfAfvšfP [fVfzf“ Eftf@fCfĀ AfZfbfgfAfbfv Efvf fOf%of  
Ā ADirectXftf@fCfĀ,“,æ,Ñhf%ofCfo,“ŠŪ,Ū,ê,é,±,Æ,É,È,é B

fAfvšfP [fVfzf“ EffBfĀfNfgš,đfZfbfgfAfbfv,·,é,½,B,É AŽŸ,İfXfefbfv,đŽÀ s,·,é,±,Æ B

- 1 Ā 1,İfAfvšfP [fVfzf“ Eftf@fCfĀ,·,×,Ä,đŠŪ,ĐffBfĀfNfgš,đ İ ¬,·,é B•K—v,Ä, ,ê,İfTfuffBfĀfNfgš  
,đ İ ¬,µ A“K Ø,ÈfAfvšfP [fVfzf“ Eftf@fCfĀ,đfTfuffBfĀfNfgš,É“u,·,æ,±,É,·,é B
- 2 İ ¬,µ,½ŽÀ s—pfZfbfgfAfbfv Eftf@fCfĀ,đfAfvšfP [fVfzf“ EffBfĀfNfgš,İfĀ [fg,ÖfRfs [,·,é B
- 3 MS-DOSfvf f“fvfg,Ä AxcopyfRf}f“fh,đ—p,Ā,Ä ADirectX 3  
fRf“fpfNfgffBfXfN ä,İRedistffBfĀfNfgš,đ AfAfvšfP [fVfzf“ EffBfĀfNfgš,İfĀ [fg,ÖfRfs [,·,é  
B,½,Æ,İ,İ AfAfvšfP [fVfzf“,İfĀ [fgffBfĀfNfgš,“D:Fungame,ÆE:fhf%ofCfu,“CD-ROMfhf%ofCfu,Ä, ,é ê  
‡ AŽŸ,İ,æ,±,Éf^fCfv,·,é B

**xcopy /s e:\redist\\*. \* d:\fungame**

---

’ ^Ó @ @DirectXSetupšÖ ”,“,æ,ÑDxsetup.exeftf@fCfĀ,“ 3 í,É“@ İ,·,é,½,B,É,İ ADirectX 3  
SDK ä,É“z“u,³,ê,½RedistffBfĀfNfgš,İ“S“à—  
e,“fAfvšfP [fVfzf“ EffBfĀfNfgš,İfĀ [fg,É,È,¬,ê,İ,È,ç,È,Ā B

---

“K Ø,Èftf@fCfĀ,·,×,Ä,đfĀ [fgfAfvšfP [fVfzf“ EffBfĀfNfgš,ÖfRfs [,·,é,Æ A`È%°,İ,æ,±,É,È,é B

fhf%ofCfu D: ,İf{šf... [fĀf%ofxfĀ,İ SYSTEM  
ffBfĀfNfgš,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 EfffBfĀfNfgfŠ,É, ,éAutorun.infftf@fCf<,đĀ 1,İfAfvfŠfP [fVf‡f“ EfffBf  
ĀfNfgfŠ,İf< [fg,ÖfRfs [,·,é B,±,İfefLfXfgftf@fCf<,É,Í^È%°,İ,æ,µ,È î•ñ,ªŠÜ,Û,ê,é B

[autorun]  
OPEN=SETUP.EXE

fAfvfŠfP [fVf‡f“,İfZfbfgfAfbfv Efvf fOf%ofĒ-¼,ªSetup.exe,Ā, ,ê,Î A,±,İftf@fCf<,đ•İ X,·,é•K—  
v,İ,È,ĉ B,»„êÈŠÖ,İ ê ‡,İ A,±,İftf@fCf<,đ•Ö W,µ AĀ 1,İfZfbfgfAfbfv Efvf fOf%ofĒ-  
¼,đ“ü,ê,È,¯,ê,Î,È,ç,È,ĉ BAutorun.infftf@fCf<,ÉŠÖ,·,é Ú ×,È î•ñ,É,Ā,ĉ,Ā,Í AAutorun.infftf@fCf<,đŽQ ĀE,·,é,±  
,Ā B

DirectSetup fŠftf@fÆf“fX

ŠÖ ”

## DirectXRegisterApplication

```
int WINAPI DirectXRegisterApplication(HWND hWnd,  
    LPDIRECTXREGISTERAPP lpDXRegApp);
```

```
ISVFQ [f€,đDirectPlayLobby,đ—p,¢,Ä“® ì,;éAfvfŠfP [fVf‡f“,Æ,μ,Ä“o~^,·,é B
```

```
    3 í,ÉŽÀ s,3,ê,ê,ÎTRUE ,đ A,»,»,Ä,È,_,ê,ÎFALSE,đ•Ô,· BFALSE,đ•Ô,·,Æ,«GetLastError,Æ,¢  
    ,»Win32,ìŠÖ ”,đŽg—p,·,é,ÆŠg’£fGf% [ î•ñ,đ“¾,é,±,Æ,ª,Ä,«,é B
```

*hWnd*

```
    efEfBf“fhfE,ìfnf“fhf< B,±,ìfpf%of [f^,ªNULL,É,È,Á,Ä,¢,é,Æ AfffXfnfgfbfv,ª efEfBf“fhfE,Æ,È,é B
```

*lpDXRegApp*

```
    fÆfWfXfgfŠ EfGf“fgfŠ,đŠÜ,»DIRECTXREGISTERAPP \“‘ì,ìfAfhfÆfX B
```

## DirectXSetup

int WINAPI DirectXSetup(HWND hWnd, LPSTR lpszRootPath,  
DWORD dwFlags);

,D,Æ,Â,Û,½,Í,»„êÈ ã,ÌDirectXfRf“f [flf“fg,ðfCf“fXfg [f<,·,é B

³ í,ÉŽÀ s,³,ê,ê,ÎSUCCESS,ð•Ô,µ A,»,µ,Â,È,¯,ê,ÎfGf%o [,ð•Ô,· B•Ô'lFR [fh,ÎfŠfXfg,É,Â,¢  
,Ä,Í A•Ô'l,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•Źš—ñ,ÌfAfhfÆfX B,±,Ì•Źš—  
ñ,Í ADsetup.dllftf@fCf<,ðŠÛ,ÐffBfÆfNfgfŠ,Ö,Ìftf<fpfX,ðŽw'è,µ,È,¯,ê,Í,È,ç,È,¢  
(‘È í,ÍRedist) BfJfÆf“fg EfffBfÆfNfgfŠ,ÉDsetup.dll,·,æ,ÑDirectxfffBfÆfNfgfŠ,ªŠÛ,Û,ê,Ä,¢,é,ì,ªŠm,©,Ä, ,ê,Î  
A,±,Ìfpf%of [f^,ÎNULL,Ä, ,é B

dwFlags

,Ç,ÌDirectXfRf“f  
[flf“fg,ªfCf“fXfg [f<,³,ê,é,©,ðŽl,· A,D,Æ,Â,Û,½,Í,»„êÈ 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\_DDRAWDRW**

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,µ 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  
—È,ª, ,é,±,Æ,ðŠm”F,·,é,±,Æ B,±,ê,Í“K Ø,Èftf@fCf<,ðfZfbfgfAfbfv,·,é,½,ß,ÉDirectX,ª•K—v,Æ,·,é Ä‘â,Ì—e—Ê,Ä,  
,é,(½,¾,µf† [fU,ÌfVfXfef€,ÉDirectXftf@fCf<,ª,·,Ä,É‘Ź Ý,·,é ê ð,Ís—v) B



## DIRECTXREGISTERAPP

```
typedef struct _DIRECTXREGISTERAPP {
```

```
    DWORD dwSize;  
    DWORD dwFlags;  
    LPSTR lpszApplicationName;  
    LPGUID lpGUID;  
    LPSTR lpszFilename;  
    LPSTR lpszCommandLine;  
    LPSTR lpszPath;  
    LPSTR lpszCurrentDirectory;
```

```
} DIRECTXREGISTERAPP, *PDIRECTXREGISTERAPP, *LPDIRECTXREGISTERAPP;
```

DirectPlayLobby, Å“@ ì, ., éfAfvfŠfP [fVf‡f“, É•K—v, ÈfŒfWfXfGfŠ EfGf“fgfŠ, ðŽ , Å B

### dwSize

‡“ì, ìfTfCfY B

### dwFlags

«—^, ÌŽg—p, Ì, ½, ß, É—\—ñ, ³, ê, Ä, Ç, é B

### lpszApplicationName

fAfvfŠfP [fVf‡f“, Ì—¼ ì B

### lpGUID

fAfvfŠfP [fVf‡f“, ìfOf [fof< Ef+fj [fNŽ—ÊŽq(GUID) B

### lpszFilename

ŒÄ, Ñ o, ³, ê, éŽÄ sftf@fCf<, Ì—¼ ì B

### lpszCommandLine

ŽÄ sftf@fCf<, É‘Î, ;, éfRf}f“fhf%fCf“, Ä, Ì`ø ” B

### lpszPath

ŽÄ sftf@fCf<, ìpfX B

### lpszCurrentDirectory

fJfŒf“fg EffBfŒfNfgfŠ, ðŽ, · B Ê í, ÌlpszPath ,Æ“—, ¶ B

•Ô¹

**DirectXSetup**ŠÖ ”,íÈ%°,ì¹,ð•Ô,· B

**DSETUPERR\_BADSOURCESIZE**

*ftf@fCf<fTfCfY,ðCEÿ Ø,Á,«È,©,Á,½,© ACEè,è,Á, ,Á,½ B*

**DSETUPERR\_BADSOURCETIME**

*ftf@fCf<,ì“ú•t,“,æ,ÑŽž ,ðCEÿ Ø,Á,«È,©,Á,½,© ACEè,è,Á, ,Á,½ B*

**DSETUPERR\_BADWINDOWSVERSION**

*DirectX,Í,±,ìfo [fWf‡f“,ìWindows,ðfTf] [fg,µ,Ä,ç,È,ç B*

**DSETUPERR\_CANTFINDDIR**

*fZfbfgfAfbfv Efvf fOf%f€ ,ª ìÆffBfçfNfgfŠ,ð•T,µ o,¹,È,©,Á,½ B*

**DSETUPERR\_CANTFINDINF**

*•K—v,È .inf ftf@fCf<,ð•T,µ o,¹,È,©,Á,½ B*

**DSETUPERR\_INTERNAL**

*“à•”fGf%o [,ªN,±,Á,½ B*

**DSETUPERR\_NOCOPY**

*ftf@fCf<,ìfo [fWf‡f“,ðCEÿ Ø,Á,«È,©,Á,½,© ACEè,è,Á, ,Á,½ B*

**DSETUPERR\_NOTPREINSTALLEDONNT**

*fVfXfefç,ìWindows NT,ìfo [fWf‡f“,É,ìDirectX 3fRf“f] [flf“fg,ªè ØfCf“fXfg [f<,³,è,Ä,ç,È,ç B*

**DSETUPERR\_OUTOFDISKSPACE**

*fCf“fXfg [f<¹,ÉfZfbfgfAfbfv Efvf fOf%f€,ªffBfXfN —e—È,ðŽg,ç%oÈ,½,µ,½ B*

**DSETUPERR\_SOURCEFILENOTFOUND**

*•K—v,Èf\ [fXftf@fCf<,ì,ç,ì,ð,Æ,Á,ð•T,µ o,¹,È,©,Á,½ B*

**DSETUPERR\_UNKNOWNOS**

*fTf] [fg,³,è,Ä,ç,È,çfo [fWf‡f“,ìOS,Á, ,é B*

**DSETUPERR\_USERHITCANCEL**

*fAfvfŠfP [fVf‡f“,ªŠ@‘S,ÉfCf“fXfg [f<,³,è,é‘O,É ACancel f{f^f“,ª%ÿ,³,è,½ B*

**SUCCESS**

*fZfbfgfAfbfv,ì ³ í I—¹ B ÄçN“®,ì•K—v,ª,È, ,è,Í A0,ª•Ô,³,è,é B  
fZfbfgfAfbfv,ì ³ í I—¹ B ÄçN“®,ì•K—v,ª, ,è,Í A1,ª•Ô,³,è,é B*

## AutoPlay,É,Á,ç,Ä

Microsoft® AutoPlay,ÍMicrosoft Windows® fIfyf€ [fefBf“fO EfVfXfef€,Îê<@”\  
.Á, ,é BAutoPlay,Í AWindowsfvf%fbfgftfH [f€—p,É ÝEv,³,ê,½ »i,ðfCf“fXfg [f< A \ -,.,é,Ì,É•K—v,ÈŽè±  
,«,ðŽ©“@%».,,é,à,Ì,Á AfRf“fpfNfg EfffBfXfN(CD),Á”z•z,³,ê,Á,ç,é BAutoPlay,Í“ü,Á,Ä,ç  
,éffBfXfN,ðWindows,““@ ì,µ,Á,ç,éRf“fsf... [f^,ÌCD-  
ROMfhf%ofCfu,É’}“ü,.,é,Æ AAutoPlay,ÍffBfXfN ã,ÌAfvfŠfP [fVf±f“,ðŽ©“@“L,É<N“@,µ A‘I’ð,³,ê,½ »i,ðfCf“  
fXfg [f< A \ -,.,æ,ÑŽÀ s,.,é B

Autoplay,ð—p,ç,Ä AMS-DOS® fIfyf€ [fefBf“fO EfVfXfef€ AWindows 3.0 AWindows 3.1 AWindows  
95,Ü,½,ÍWindows NT®,Ì,ç,.,é,©,ðfx [fX,É,µ,Ä“@ ì,.,éCD-  
ROMfAfvfŠfP [fVf±f“,ð AWindows ã,ÁfCf“fXfg [f<.,æ,ÑŽÀ s,.,é,±,Æ,³,Á,«,é B,»,ÌCD-ROM »i,ÉMicrosoft  
Windows 95,Ìf fS,ð•Ž,³,¹,½,ç ê ±,É,Í AAutoPlay,ð—p,ç,é,±,Æ,³•K—v,É,È,é B

---

## ’ ˆÓ

MS-DOS AWindows 95ˆÈ‘O,Ìfo [fWf±f“,ÌWindows A,.,æ,ÑWindows NT  
fo [fWf±f“3.51,.,æ,Ñ,»,éÈ‘O,Ì,à,Ì,ÍAutoPlay,ðfTf| [fg,µ,Á,ç,È,ç B,µ,©,µAutoPlay,ðCD,É%Á,!,Ä,à A,±  
,é,ç,ÌfIfyf€ [fefBf“fO EfVfXfef€,““@ ì,µ,Á,ç,éRf“fsf... [f^,Ì“@ ì,Í—W,°,ç,ê,½,è%e<ç,ðŽó,¯,½,è,µ,È,ç B

**AutoPlay, Ì“® ì,É,Â,ç,Ä**

AutoPlay, Ì“® ì, ÍŽŸ,É, , °,é,R,Â,Ì ðŒ ,ð•K—v,Æ,·,é B

Windows 95, ,æ,ÑWindows NT, Ì32frfbfgCD-ROMfffofCfX Efhf%ofCfo, ÌfZfbfg B,±  
,é,ç, ÌfffofCfX Efhf%ofCfo, Í Af† [fU, °CD, ðCD-ROMfhf%ofCfu, É‘}“ü, µ, ½, ±, Æ, ðŒŸ’m, ·, é i, ½, ¾, µMS-DOS, ,  
é, ç, ÍÈ‘O, Ìfo [fWf‡f“, ÌWindows, ÌfffofCfX Efhf%ofCfo, ÍŒŸ’m, ð s, í, È, ç j B

CD ä, ÌAutorun.infftf@fCf< B Windows 95, ,é, ç, ÍWindows NT, “® ì, ·, éfRf“fsf... [f^, ÌCD-  
ROMfhf%ofCfu, ÉffBfXfN, ð‘}“ü, ·, é, Æ AfVfXfef€, Í¼, ç, ÉffBfXfN, ÉPC, Ìftf@fCf<fVfXfef€, “¶ Ÿ, ·, é, ©, Ç, □  
, ©, ðf`fFfbfN, ·, é B¶ Ÿ, ·, é ê ‡, É, Í AfVfXfef€, ÍAutorun.inf, Æ, ç, □¼ Ì, Ìftf@fCf<, ð‘T, · B, ±  
, Ìftf@fCf<, ÍAutoPlay, “ŽÀ s, ·, éfAfvfŠfP [fVf‡f“, ðŽw’è, µ A, ³, ç, É¼, Ì î•ñ, ð, à•Û—L, ·, é, ±, Æ, “, Ä, «, é B, ±  
, Ìftf@fCf<, Ì Ú ×, È, Ä, ç, Ä, Í AÄutorun.infftf@fCf<, ðŽQ Æ, ·, é, ±, Æ B

CD ä, ÌfXf^ [fgfAfbfv EfAfvfŠfP [fVf‡f“ BAutorun.infftf@fCf<, ÄŽw’è, ·, é, ÌffBfXfN ä, Ì”CÓ, ÌfAfvfŠfP  
[fVf‡f“, ðN“®, Ä, «, é, “ A`è”È“l, É, ÍN“®, Û, ½, ÌfCf“fXfg [f<<@”\  
, ðŽÀ s, ·, é B V, ½, É Ì, Ä, ½fXf^ [fgfAfbfv EfAfvfŠfP [fVf‡f“, ðŽg, □  
, Æ A »•i, ÌfCf“fXfg [f< AfAf“fCf“fXfg [f<, ,æ, ÑŽÀ sfvf fZfX, ð §Œä, ·, é, ±, Æ, “, Ä, «, é B

**Autorun.inf**

Autorun.inf [fg EffBfEfNfgfŠ,É,éfefLfXfgftf@fCf<,Á, ,é B,± ,lftf@fCf<,É,Í AfffBfXfN,Á,lfx^ [fgfAfbfv EfAfvfŠfP [fvf±f“ iffBfXfN,đCD-ROMfhf%ofCfu,É’“ü,·,é,ÆŽ©“@“I,É“@ i,·,éAfvfŠfP [fvf±f“ j,Í-¼ Ì,â AWindowsf† [fU EfCf“f^ [ftfFfCfX,É,“c,ÄAutoPlay“@ i%oÂ”,ÈCD,Á, ,é,± ,Æ,đŽ’,·fAfcRf“,³SÜ,Û,ê,é B,Û,½Autorun.inf@fCf<,É,Í AfVf± [fgfJfbfg Ef fjf... [É%oÁ,½,cflfvfVf±f“,Íf fjf... [fRf}f“fh,àŠÜ,Û,ê,Ä,c,é B,±,lfVf± [fgfJfbfg Ef fjf... [Í ACD-ROMfAfcRf“,đf}fEfX,Á%EFNfŠfbfN,·,é,Æ•Ž’,³,é,é B

Autorun.inf@fCf<,É,Í Á’á,Á,à3 s,lfefLfXfg,³SÜ,Û,ê AfXf^ [fgfAfbfv EfAfvfŠfP [fvf±f“,“æ,ÑfAfcRf“,đŽ-•É,·,é B^É%o,É—á,đŽ’,· B

[autorun]
open=filename.exe
icon=filename.ico

[autorun] fZfNfVf±f“,Í A,»ê,É’±, s,đAutoPlayfRf}f“fh,Æ,µ,ÄŽ-•É,·,é B [autorun]
fZfNfVf±f“,Í,·,×,Ä,ÍAutorun.inf@fCf<,É•K—v,Á, ,é B openfRf}
f“fh,ÍfXf^ [fgfAfbfv EfAfvfŠfP [fvf±f“,lfpfX,“æ,Ñf@fCf<-¼,đŽw’è,µ A iconfRf}
f“fh,ÍfAfcRf“ îñ,đŠÜ,đf@fCf<,đŽw’è,·,é B

Autorun.inf@fCf<,É ARISCfvf fZfbfT ã,Ä“@ i,µ,Ä,c,éWindows NT 4.0,ÍfA [fLfefNf`ff“Á—
L,ÍfZfNfVf±f“,đŠÜ,ß,é,±,Æ,à,Ä,«é B,»ì,½,ß,É,Í A,»è,¼,ê,Íf^fCfv,Ífvf fZfbfT EfA [fLfefNf`ff,É, ,í,¹,Ä A,
»,ÍfA [fLfefNf`ff,ÄŽÀ s,µ,½,cfXf^ [fgfAfbfv EfAfvfŠfP [fvf±f“,lftf@fCf<-
¼,đŠÜ,ðAutorun.inf@fCf<,ÉfZfNfVf±f“,đ%oÁ,|,é Bx86fA [fLfefNf`ff,É,Í A•W € [autorun] s,ð—p,c
,é BMIPsfA [fLfefNf`ff ã,ÄfAfvfŠfP [fvf±f“,đŽÀ s,·,é ê ±,É,Í [autorun.mips]
AAlphafA [fLfefNf`ff ã,ÍfAfvfŠfP [fvf±f“,É,Í [autorun.alpha] APowerPCfA [fLfefNf`ff,É,Í [autorun.ppc]
,ð—p,c,é BfRf“fsf...
[f^ EfA [fLfefNf`ff,É,æ,è,Û,È,éfXf^ [fgfAfbfv EfAfvfŠfP [fvf±f“,đŽÀ s,·,éAutorun.inf@fCf<,Ì ì Ñ
@,Ì—á,đ A^É%o,ÉŽ’,· B

[autorun]
open=filename.exe
icon=filename.ico

[autorun.mips]
open=filenam2.exe
icon=filename.ico

[autorun.alpha]
open=filenam3.exe
icon=filename.ico

[autorun.ppc]
open=filenam4.exe
icon=filename.ico

fVfFf,Í Á %o,ÉfA [fLfefNf`ffÄ—
L,ÍfZfNfVf±f“,đf`fFfbfN,·,é BfZfNfVf±f“,đ©©,Ä,¯,ç,é,È,©,Á,½ ê ±,Í A [autorun] fZfNfVf±f“,Ì îñ,ð—~—
p,·,é BfZfNfVf±f“,đ©©,Ä,¯,é,ÆfVfFf<,Í¼,ÍfZfNfVf±f“,ð,·,×,Ä-³Ž<,µ,Ä,µ,Û,ð
,Í,Ä A,»è,¼,ê,ÍfZfNfVf±f“,³fA [fLfefNf`ff,Ì,·,×,Ä,Ì îñ,đŽ ,Á,Ä,c,é,±,Æ,đŠm”F,·,é•K—v,a, ,é B

**AutoPlayfAfvfŠfP [fVf±f“,ð ‘, ã,Ä,İfAfhfofCfX**

,±,İfZfNfVf±f“,Ä,ÍAutoPlayfAfvfŠfP [fVf±f“,ð ‘, ã,Ä•K—v,È^È%°,İfAfhfofCfX,É,Ä,¢,Ä à-¼,.,é B

fXf^ [fgfAfbfv EfAfvfŠfP [fVf±f“,İfL [fvf“

fobfNfOf%fEf“fh,Ä,İf [fh

fn [fhffBfXfN<óŠÓ,İ B-ñ

fEfWfXfgfŠ,İŽg—p

NoDriveTypeAutoRun'l,İfZfbfg

**fXf^ [fgAfbfv EfAfvfŠfP [fVf‡f“,İfI [fvf“**

AutoPlayCD,đfhf%ofCfu,É}“ü,.,é,Æ,.,@,É AfXf^ [fgAfbfv EfAfvfŠfP [fVf‡f“,ª—š,č ã,ª,é B,±  
,é,É,Í AAutorun.infftf@fCf<,İopenfRf}

f“fh,É A ,‘,Éf [fh,Ä,«é ¬CE^,İfXf^ [fgAfbfv EfAfvfŠfP [fVf‡f“,đŽw’è,.,é B,»İfAfvfŠfP [fVf‡f“,É,Í  
AŽÀ s,.,éf^fCf<gf<,İ•Ž,âfLfff“fZf< Ef{f^f“,È,Ç,đ”ö,!,Ä,; B

**fofbfNfOf%ofEf“fh,Ä,İf [fh**

fXf^ [fgfAfbfv EfAfvfŠfP [fVf‡f“,<sup>a</sup> A ^— ,đ'±,¯,Ä,c,c,©,Ç,□,©,đf\_fCfAf fO Ef{fbfNfX,Ä•,-  
,Æ Af† [fU,İÊ íOK,đfNfŠfbfN,·,é B,±,Ì,Æ,« Af† [fU,<sup>a</sup>f{f^f“,đ%öÿ,·,Ü,Ä,İžžŠÖ,đ—~—  
p,µ,Ä AfofbfNfOf%ofEf“fh,ÄfXf^ [fgfAfbfv EfAfvfŠfP [fVf‡f“,İf [fh,đŽn,ß,é•ÊfXfÆfbfh,đ<N“@,³,¹,Ä,·,-  
,Æ AžžŠÖ,đ—LÆø,É—~—p,Ä,«,é B,±,ê,É,æ,è AfAfvfŠfP [fVf‡f“,İf [fhžžŠÖ,<sup>a</sup>,©,È,è'Z k,³,ê,é B

**fn [fhfffBfXfN<óŠÖ,ì ß-ñ**

fn [fhfffBfXfN—ìæ,É,íÆÀ,è,ª, ,é B,±,±,Á,Ífn [fhfffBfXfN,ð ß-ñ,·,é,½,ß,ìfAfhfofCfX,ð,c,,Á,©<“,°,é B

fC“fXfg [f<—pAfvfŠfP [fVf‡f“,ðŽÀ s,¹, ACD,©,ç’¼ ÚfAfvfŠfP [fVf‡f“,ðŽÀ s,·,é B

fAfvfŠfP [fVf‡f“,ªfn [fhfffBfXfNfhf%ofCfu,ð•K—v,Æ,·,é ê ‡,í AŽÀ s,É•K—v,È<@”\fRf“f]

[flf“fg,ì,Ý,ðfCf“fXfg [f<,·,é B,³,ç,É A,±,ê,ç,ìfRf“f]

[flf“fg,ðfn [fhfffBfXfN,©,çfAf“fCf“fXfg [f<,·,é•û-@,à €”ð,µ,Ä,·,-

BfAfvfŠfP [fVf‡f“,ìfAf“fCf“fXfg [f<,ÉŠÖ,·,é Ú ×,È îñ,É,Á,c,Ä,í Af}fCfNf f\ftfg Win32  
f\ftfgfEfFfAŠJ”fLfbfg (SDK),É“Y•t,³,ê,Ä,c,éf}fjf...fAf<,ðŽQ Æ,·,é,±,Æ B

fAfvfŠfP [fVf‡f“,ªfn [fhfffBfXfNfhf%ofCfu,ðff [f^LfffbfVf...,Æ,µ,Ä~—p,·,é•K—v,ª, ,é ê ‡ Af^fCfg  
f<,Ü,½,ífQ [f€,ì l—

¹Žž,ÉfLfffbfVf...“à,ìff [f^,ð Á<Ž,·,éIfvfVf‡f“,ìf\ftfg,ðfXf^ [fgfAfbfv EfAfvfŠfP [fVf‡f““à,É—  
p^Ó,µ,Ä,·, B

**fCfWfXfgfŠ,İžg—p**

fCfWfXfgfŠ,İ A %Šú%» îñ(.ini).,æ,ÑfRf“ftfBfMf...fC [fVf‡f“ Eftf@fCf<,É“Ö,í,éWindows,İ<@”\,Á, ,é Bf CefWfXfgfŠ,đ€ ì,.,éAPI,ÉŠÖ,.,é îñ,É,Á,¢,Á,Í AWin32 SDK,É“Y•t,³,é,Á,¢,é}fj...fAf<,đŽQ A,.,é,±,Æ B

»i,ª %Šú%» îñ,đ“o^,µ,Ä,¢,é,Æ A,»İ îñ,İfCfWfXfgfŠ,ÉŠi”[,³,é ACĚã,©,çŽæ,è o,.,±,Æ,ª%Ä”\ ,É,È,é BfAfVfŠfP [fVf‡f“,İfCfWfXfgfŠ’†,İ îñ,đCĚ,Á A »i,đCf“fXfg [f<,.,é•K—v,ª, ,é,©,Ç,µ,©,đCĚ,ß,é,± ,Æ,ª,Á,«é B »i,İfCfWfXfgfŠfGf“fgfŠ,ª¶ Ý,µ,È,¢ é ‡,Í i,Á,Ü,è »i,ªŽg,í,é,é Á % ,İ,Æ,« j AfZfbfgfAfbfv,İfİfvfVf‡f“,đê— .,éf\_CfAf fOf{fbfNfX,đ•Ž,³,¹,é B »i,ªfCfWfXfgfŠ,É“o^ İ,Ý,İ ê ‡ A »i,İ,.,Á,ÉfCf“fXfg [f<,³,é,Á,¢ ,é,½,ß AfZfbfgfAfbfvİfvfVf‡f“,đ È—ª,Á,«é B

fVfXfefCfCfWfXfgfŠ,đİ X,.,é,Æ Aftf fbfs [fffBfXfN,©,çAutorun.inf@fCf<,đ“Ç,Ý ž,Ü,¹,é,±,Æ,ª%Ä”\ ,Æ,È,é Bftf fbfs [fffBfXfN,ÁAutoPlay,đ“® ì,³,¹,Á,àÖ—,İ,È,¢ ,ª AAutorun.inf@fCf<,đCD,É Á,«t,¯,é“O,İfffofbfO,É,İ—đ—§,Á BAutoPlay,ÍCD,Á,¾,¯“ê”z•z,.,é—\’è,Á, ,é BA utoPlay,đftf fbfs [fffBfXfN,Á“® ì,.,é,æ,µ,É,.,é,É,Í AŽŸ,İŽè‘±,«,đŽÁ s,.,é,±,Æ B

- 1 fCfWfXfgfŠfGffBf^ (Regedit.exe) ,É, ¨,¢ ,Á u•Ö W(E) v,đfNfŠfbfN,µ A,»İĚã,Á uĚŸ ð(F) v,đfNfŠfbfN,.,é B
- 2 ĚŸ ðf\_CfAf fO,Á^È%º,ÉŽ,·ĚĚ,đf^fCfv,µ uŽŸ,đĚŸ ð(F) v,đfNfŠfbfN,.,é B

**NoDriveTypeAutoRun**

- 3 u•Ö W(E) v,đfNfŠfbfN,µ A,»İĚã 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  
 Ě Ěã,Á A”C^Ó,İfhf%fcfu Ěã,ÁAutoPlay,ª%Ö“®,.,é B,µ,©,µ Aftf fbfs [fffBfXfN Ě,ÉfCf“fXfg [f<,³,é,Á,¢ ,é,Æ,«,Í AAutoPlay,đŽè ìÆ,Á<N“®,µ,È,¯,é,İ,È,ç,È,¢ B,±,é,đ s,µ ,É,Í Aftf fbfs [fffBfXfNfAfCfRf“,đf\_fuf<fNfŠfbfN, ,é,¢,Íf} fEX,Á%EfNfŠfbfN,µ A,»İĚãAutoPlay,đfNfŠfbfN,.,é B
- 5 Autorun.inf,İfefXfg,ªŠ@—¹,µ,½Ěã ANoDriveTypeAutoRun,İ¹,đ0000 95 00 00 00,ÉfŠfZfbfg,.,é B

**d—vž— €**

ftf fbfs [fffBfXfN,ÁAutoPlay,đ“® ì,³,¹,é,Æ AfRf“fsf... [f^fEfBf<fX,đŠÈ’P,É—%º,,³,¹,é,± ,Æ,ª,Á,«,Á,µ,Ü,µ B”ê”z•z,³,é,Á,¢,éftf fbfs [fffBfXfN,ÉAutorun.inf@fCf<,ª“ü,Á,Á,¢ ,½,ç AfEfBf<fX,İ¶ Ý,đ<^,µ•K—v,ª, ,é B

NoDriveTypeAutoRun’l,ÉŠÖ,.,é Ú ×,È îñ,É,Á,¢,Á,Í ANoDriveTypeAutoRun’l,İfZfbfg,đŽQ A,.,é,±,Æ B

**NoDriveTypeAutoRun'1,İfZfbfg**

fCfWfXfgfŠ,É, ,éNoDriveTypeAutoRun'1,Í Af^fCfvREG\_BINARY,İ4fofCfg',İfofCfifŠff [f^,İ'l,Ä, ,é B,± ,İ'l,İ Ä %o,İfofCfg,Í AAutoPlay İ^E,©,ç æŠO,³,é,éŽİ X,İfhf%ofCfu,ð^\,· B,±,İfofCfg,İ %Šú Ý'è,İ0x95,Ä A,± ,é,İ'FZ~,³,é,È,çf^fCfv,İfhf%ofCfu,Ä, ,éDRIVE\_UNKNOWN ADRIVE\_REMOVEABLE,,æ,ÑDRIVE\_FIXED,İf ffbfB fAf^fCfv,ðAutoPlay“K—p'İ Ü,©,ç æŠO,·,é B,Ü,½AutoPlay,İ“@ İ,Éftf fbfs [ffBfXfNfhf%ofCfu,ð—~— p,·,é,É,Í 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,ç,ç,©,ð s,²·K—v,ª, ,é BfCfWfXfgfŠ'1,İ·İ X-@,ÉŠÖ,,é î·ñ,É,Ä,ç ,Ä,Í AfCfWfXfgfŠ,İŽq—p,ðŽQ Æ,·,é,±,Æ Bfrfbfg Afrfbfgf}fXfN'è ”,,æ,Ñfhf%ofCfu,ÉŠÖ,,éŠÈ'P,È' ŽB,İ^\ ,İŽY,İ'É,è,Ä, ,é B

<b>frfbfg”Ö †</b>	<b>frfbfgf}fXfN'è ”</b>	<b>' ŽB</b>
0 ( Ä%°°Êfrfbfg)	DRIVE_UNKNOWN	”FZ~,³,é,È,çfhf%ofCfuf^fCfv B
1	DRIVE_NO_ROOT_DIR	f< [fgffBfCfNfgfŠ,ª¶¶ Ý,µ,È,ç 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,ç B
4	DRIVE_REMOTE	flfbfgf [fnfhf%ofCfu B
5	DRIVE_CDROM	CD-ROMfhf%ofCfu B
6	DRIVE_RAMDISK	RAMffBfXfN B
7 ( Ä ãÊfrfbfg)		«—^,İ—~—p,İ,½,ß,É— \ñ,³,é,Ä,ç,é B

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**' Ö**

Windows NT,É,Ä,ç,Ä,Í A·İ X,ð—LCEø,É,·,é‘O,ÉWindows Explorer,ð Ä·N“@,µ,È,,é,İ,È,ç,È,ç B

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**AutoPlay,İ—} §**

```
CD,ð'}“ü,.,é Û,ÉSHIFTfL [,ð%ÿ,3,!,é,Æ AfffBfXfN ã,ÌAutorun.infftf@fCf<,%øđ Í EŽÀ s,3,é,é,ì,ðŽè ì<Æ,Á—}
§,Á,«.,é BWindows NTfo [fWf‡f“4.0,;æ,ÑWindows 95,ÁInternet Explorerfo [fWf‡f“4.0,ð—p,¢,Á,¢
,é†† [fU,Í AŽ©“®“I,ÉAutoPlay,ð—} §,.,é,±,Æ,ª,Á,«.,é B,±,İ<@“\
,Í AfXf^ [fgfAfbfv EfAfvfŠfP [fVf‡f“,Ì†,Áf† [fU,ÉAutorun.infftf@fCf<,Ì“ü,Á,Á,¢,éffBfXfN,ð'}“ü,3,1,é•K—
v,ª,.,é,Æ,«.,È,Ç,ÉŽg,□ B,±
,Ì ê ‡ AfXf^ [fgfAfbfv EfAfvfŠfP [fVf‡f“ŽÀ s’†,É•ÊfAfvfŠfP [fVf‡f“,ðŽÀ s,3,1,éAutoplay<@“\,Ís—v,Á, ,
é BfXf^ [fgfAfbfv EfAfvfŠfP [fVf‡f“,ªftHfAfOf%ofEf“fh,É, ,é,Æ,«AutoPlay,ð—}
§,.,é,É,Í A`È%°,ÌfR [fh,ðfZfbfgfAfbfv %øŠú%ø»fR [fh,É%øÁ,,!,é B
```

```
uMessage - RegisterWindowMessage(TEXT("QueryCancelAutoPlay"));
```

```
,»,µ,Ä`È%°,ÌfR [fh,ðfZfbfgfAfbfv EfEfBf“fhfE Efvf fV [fWff,É%øÁ,,!,é B
```

```
if(msg == uMessage)
```

```
{
    // return 1 to cancel AutoPlay
    // return 0 to allow AutoPlay
    return 1L;
}
```

**MS-DOS AfvfŠfP [fVfzf“ìAutoPlay**

,Û,½ AAutoPlay,ð—p,¢,Ä AMS-DOSfx [fX,ìfAfvfŠfP [fVfzf“,ðWindows MS-DOSfZfbVfzf“,ÄfCf“fXfg [f< A \ ¬,“,æ,ÑŽÀ s,Å,«,é BMS-DOSfx [fX,ìŠefAfvfŠfP [fVfzf“,É‘Î,µ“ÆŽ©,ìfAfcRf“ AConfig.sysftf@fCf<“,æ,ÑAutoexec.batftf@fCf<,ð Ý’è,·,é,±,Æ,ª,Ä,«,é B

Windows,ÍMS-

DOSfAfvfŠfP [fVfzf“,ì,½,ß,ì ³,µ,¢ Ý’èftf@fCf<,ð ì ¬,·,é B;Û,½fXf^ [fgfAfbfv EfAfvfŠfP [fVfzf“,ÍMS-DOSfAfvfŠfP [fVfzf“,ðEfBf“fhfE“à,ÄN“@,Ä,«,é,æ,º,É,·,é BfXf^ [fgfAfbfv EfAfvfŠfP [fVfzf“,Í•K—v,É%ž,¶,Ä,» ,ìMS-DOSfAfvfŠfP [fVfzf“,ì ÄN“@,ðWindows,ÉŽwŽ!,Ä,« AfAfvfŠfP [fVfzf“,ªÄ,¶,é,Æ’¼,¿,ÉWindows,Ö §Eä,ð•Ô,·,±,Æ,ª,Ä,«,é B

fŠftf@fœf“fX

fRf)f“fh

**defaulticon**

defaulticon=path\iconname.ico

fAfCfRf“ î•ñ,ðŽ ,Âftf@fCf<,Ö,ÌCD ā,ì â’ÍfpfX,ðŽw’è,·,é B,±  
,ÌfAfCfRf“,ÍWindowsf† [fU EfCf“f^ [ftfFfCfX,É,“,ç,ÄAutoPlay“® i%oÂ”\,ÈCD,ð•\,· B

path\iconname.ico

fAfCfRf“ î•ñ,ì, ,éftf@fCf<,ì â’ÍfpfX,“,æ,Ñftf@fCf<-¼ Bbmp Aexe, ,é,ç,Ídllftf@fCf<,ðŽw’è,·,é,±  
,Æ,à,Â,«,é Bftf@fCf<,É•; ”,ÌfAfCfRf“,“ŠÜ,Ü,é,é ê ‡ AŽg—pftf@fCf<‘□  
,ÂfAfCfRf“,ÌfŠf\ [fX”Ô †(fCf“fffbfNfX),ðŽw’è,·,é B

**icon** ,“,æ,Ñ **defaulticon** fRf}f“fh,“Autorun.infftf@fCf<,É, ,é ê ‡ AAutoPlay,Í**defaulticon**fRf}  
f“fh,ÄŽw’è,³,é,½fAfCfRf“,ðŽg—p,·,é B

fhf%oCfu,ÉAutoPlay“® i%oÂ”\,ÈCD,ª,È,ç ê ‡ AfVfXfef€,Ífhf%oCfu,Ì•Ž!,ÉffftfHf<fg,ÌfAfCfRf“,ð—p,ç,é B

ŽQ Æ @**icon**

**icon**

icon=filename.ico

Windowsft [fU EfCf“f^ [ftFfCfX,É,“,ÄAutoPlay“® i%oÂ”\,ÈCD,ð•\  
;·fAfCfRf“,ì î•ñ,ðŽ ,Äftf@fCf<,ðŽw’è,·,é B,±,ÌfRf}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,ç B

*filename.ico*

fAfCfRf“ î•ñ,ðŠÛ,ðftf@fCf<,ì-¼ ì B,Û,½.bmp A.exe, ,é,ç,Í.dllftf@fCf<,ðŽw’è,·,é,±  
,Æ,à,Ä,«,é Bftf@fCf<,É•i ”,ÌfAfCfRf“,ªŠÛ,Û,ê,é ê ± A—p,ç  
,éftf@fCf<,ÄfAfCfRf“,ÌfŠf\ [fX”Ô †(fCf“ffbfNfX),ðŽw’è,·,é,±,Æ B  
fhf%oCfu,ªAutoPlay“® i%oÂ”\,ÈCD,ðŠÛ,Û,È,ç ê ± AfVfXfef€,Ífhf%oCfu,Ì•Ž’,ÉffftfHf<fg,ÌfAfCfRf“,ð—p,ç  
,é B  
ŽŸ,ì—á,Ä,Í ACD,ð•\,·,Q”Ô—Ú,ÌfAfCfRf“,ªftf@fCf<,ÄŽw’è,³,ê,Ä,ç,é B Ä %o  
,ÌfAfCfRf“,ÌfCf“ffbfNfX,Í0,ÉfZfbfg,³,ê,Ä,ç,é B

icon=filename.exe 1

ŽQ Æ @defaulticon

**open**

open=dir\filename.exe

CD-ROMfhf%ofCfu,ÉCD,ð'ü,µ,½,Æ,« AAutoPlay,žÀ 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,ê,½fAfvfŠfP [fVf‡f“,ðN“@,·,é BpfX,“Žw'è,³,è,Ä,¢,È,¢ ê ‡ AWindows,ÍCD ä,ìf< [fgffBfÆfNfgfŠ,Äftf@fCf<,ðÆÿ 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%ofCf“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 Aft [fU,©,ç,ì%ož“š,ð,»,ì ê,Äžó,~žæ,ê,é BfXf^ [fgfAfbfv EfAfvfŠfP [fVf‡f“,ì Ú ×,É,Ä,¢,Ä,Í AfXf^ [fgfAfbfv EfAfvfŠfP [fVf‡f“,ìfL [fvf“,ðžQ Æ,·,é,±,Æ B

**shell**

shell=verb

fVf‡ [fgfJfbfg Ef fjf... [,ÏfftfHf<fgfGf“fgfŠ,ð AŽw’è,³,ê,½fJfXf^f€fRf}f“fh,É•Ī X,·,é B

verb

fJfXf^f€fRf}f“fh,Ī È—³E` BfJfXf^f€fRf}f“fh,ÍAutorun.inf@fCf<,Á’è`³,ê,Ä,¢,È,¯,ê,Ī,È,ç,È,¢ B  
AutoPlay,ÍAutoPlay“@ ì%oÂ”,ÈffBfXfN,ÏfftfHf<fgf fjf... [ €-Ú,Ä, ,é B

f† [fU,³CD,ð\,·fAfCfRf“,ðf\_fuf<fNfŠfbfN,·,é,Æ Averb,ÁŽ¹,³,ê,éRf}f“fh,³ŽÀ s,³,ê,é B

ŽQ Æ shellverb

**shell\verb**

shell\verb\command=filename.exe  
shell\verb=Menu Item Name

fAfCfRf“,ìfVf‡ [fgfJfbfg Ef fjf... [ÉŽ!,³,ê,Ä,¢,éfJfXf^f€fRf}f“fh,ðŽw’è,·,é B,Û,₁ s-Ú,Ä AfRf}  
f“fh,ðŽÄ s,·,éŽÄ s%oÄ”\ftf@fCf<,ðŽw’è,·,é B2”Ô-Ú,Ì s,ÄfVf‡ [fgfJfbfg Ef fjf...  
[,ÌfJfXf^f€fGf“fgfŠ,ðŽw’è,·,é B

**verb**

fRf}f“fh,ì È—“E` B,±,ìpf%of [f^,íŽÄ s%oÄ”\ftf@fCf<-¼,Æf fjf... [ €-Ú,ðfRf}f“fh,ÉŠÖ~A,Ä,¯,é B,±  
,ìpf%of [f^,É,ífuf%of“fN,ðŠÜ,Ð,±,Æ,Í,Ä,«,É,¢ B Autorun.infftf@fCf<,AMenu Item Name,ð È—  
ª,µ,È,¢EÀ,è Averb,ífVf‡ [fgfJfbfg Ef fjf... [É•Ž!,³,ê,È,¢ B

**filename.exe**

fJfXf^f€fRf}f“fh,ðŽÄ s,·,éfAfvfŠfP [fVf‡f“,ìftf@fCf<-¼ B

**Menu Item Name**

‘â -•¶Žš,·,æ,ÑfXfy [fX,ðŠÜ,Ðf fjf... [ €-ÚfefLfXfg Bf fjf... [ €-Ú’†,ì1•¶Žš,ì‘O,ÉfAf“fpfTf“fh•¶Žš(&  
,ð,Ä,¯,é,±,Æ,É,æ,è A,»),íf fjf... [ €-Ú,ífVf‡ [fgfJfbfgfL [,àfZfbfg,Ä,«,é B

Windows† [fU EfCf“f^ [ftfFfCfX,Ä,Í 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,Í,»,ÌffBfXfN,ífAfCfRf“,ífVf‡ [fgfJfbfg  
Ef fjf... [É AAutoPlay,ðŽ@“@“I,É•t%oÄ,·,é B  
,Û,½AutoPlay,ªfftfHf<fg,Ä<N“@,³,ê,é,æ,ªfZfbfg,·,é BfAfCfRf“,ðf\_fuf<fNfŠfbfN,·,é,Æ Aopen fRf}  
f“fh,ÄŽw’è,³,ê,Ä,¢,é,à,ì,ª,·,×,Ä<N“@,³,ê,é B

fRf}f“fhReadMe,ð »•i,ífVf‡ [fgfJfbfg Ef fjf...

[É•t%oÄ,µ A•¶Žš gMÓ,ðfVf‡ [fgfJfbfgfL [É,·,é ê ‡,É,Í A`È%o°,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**

fn [fhfEfffA EfAfufXfgf%oNfVf#f“ EfCfCf,, BfffofCfXCEÅ—  
L,İŽÀ‘,©,çAfvfšfP [fVf#f“,đ•ÛEì,·,é Afn [fhfEfffA,âfffofCfX Efhf%oCfo,İf fJjYf€  
,É,æ,è \ ¬,³,ê,é BfAfvfšfP [fVf#f“,©,ç—v< ³,ê,½<@”\,đE» Ý,İfn [fhfEfffA,žÀ‘,µ,Ä,ç  
,È,ç ê ‡ A,»,İ<@”\,İf\ftfgEfffA,afGf~f...fE [fg,·,é B

**HEL**

fn [fhfEfffA EfGf~f...fE [fVf#f“ EfCfCf,, Bfn [fhfEfffA,afTf] [fg,µ,È,ç<@”\  
,İf\ftfgEfffA Efx [fX,É,æ,éfGf~f...fE [fVf#f“,đ'ñ<ÿ,·,é B

**Zfofbftf@ iz-buffer j**

fV [f“ ã,İšfsfNfZf<,İ [“x,đši”[,µ,½fofbftf@ BZ'l,İ ¬,³,çfsfNfZf<,ÍZ'l,İ'ã,«çfsfNfZf<,đ ã ‘,«,·,é B

**fAf^fbf` iattach j**

•j „,lDirectDrawSurfaceIfufWfFfNfg,ð AZfofbftf@,É,æ,é3Dfy [fW EftfŠfbfsf“fO,Á•K—v,Æ,³,ê,é,æ,µ  
É,•i ‡ \c`l,É Ú±,.,é±,Æ BfAf^fbf,Í'o•úEü“l,Á,Í,È, A,Ü,½fT [ftfFfX,ð,»,éŽ© g,ÉfAf^fbf,.,é±  
Æ,Í,Á,«,È,¢ B ifVfXfef€ Ef f, fŠ,Á jfGf~f...f€ [fg,³,ê,½fT [ftfFfX,Í AfGf~f...  
f€ [fVf~f,Á,È,¢fT [ftfFfX,É,ÍfAf^fbf,Á,«,È,¢ B•D•ú,ÍfT [ftfFfX,³fefNfXf`ff Ef}  
fbfv,Á,È,¢EÁ,è A,Ó,½,Á,ÍfT [ftfFfX,Í“„,¶fTfCfY,Á,È,.,Á,Í,È,ç,È,¢ 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,l—p—@,l,Ð,Æ,Á BfsfNfZf<,l“K—  
p”Í,ÉŠ,Á,¢,ÁfGfbfW,ð ¬ F,.,é±,Æ,É,æ,è AfGfCfŠfAfVf“fO,ðE, ,³,¹,é•ú—@,Á, ,é B

**fAf<ftf@ EfJf%o [ EfRf“f [lff“fg ialpha color component j**

•s“§—¾“x,ðŽ,.,¹,ðŠÜ,Ð32frfbfg,l F \ —v“f B,±,l ê ‡ AfsfNfZf<,²,Æ,l F—  
v“f i,½,Æ,!,ÍARGB j,É,»,é,¼,ê,ÍfAf<ftf@ i•s“§—¾“x j¹,³•%oÁ,³,ê,Á,¢,é B“ê”É“l,Á,Í,È,¢,ª A“Á•É,É—  
p“Ó,³,ê,½fAf<ftf@ EfT [ftfFfX,ÉfsfNfZf<,²,Æ,ÍfAf<ftf@¹,ð,Ü,Æ,ß,Á•ÜŽ ,µ,Á,¢,é ê ‡,à, ,é B

**fAf<ftf@ Efffffl< ialpha channel j**

fsfNfZf<,²,Æ,É F—v“f i,½,Æ,!,ÍARGB j,l¹,Æ,Æ,à,É—p“Ó,³,ê,½  
fCf [fW,Ís“§—¾“x,ð`è<,.,é¹ B,Ü,½,Í“Æ—§,µ,½fAf<ftf@ EfT [ftfFfX,ÉŠi”[³,é,½ AfsfNfZf<“—,½,è,Ì•s“  
¾“x¹ B,Ü,½,Í AfT [ftfFfX“S¹,Í•s“§—¾“x¹ B

**fAf<ftf@’è ” ialpha constant j**

fT [ftfFfX“S¹,É“K—p,³,ê,é•s“§—¾“x ifAf<ftf@¹ j B

**^Å%oe” ipenumbra j**

fXf|fbfgf%ofCfgeð%o~ Žü“Í,Ì”-^Å,¢•”ª B-¾“•,ðŽæ,è“Í,Ý AŽü•Ó,Ì,Ä,¢%oe,ðf} [fW,.,é B  
ŽQ Æ @-¾“” AfXf|fbfgf%ofCfge

**fAf“frfGf“fg iambient j**

fV [f“ ã,ÍfufWfFfNfg,ÌEü,« A“Ê’u AfT [ftfFfX,Ì“Á «,ÉŠÖ,í,ç,., AfV [f““S¹,ð Æ,ç,·€ðE¹ Bfv [f“l  
.,.,x,Á,Ì ê Š,ð“„¶Eð“x,Á Æ,ç,.,½,ß AfAf^fbf,³,ê,½fTf€ [f€,ÌÊ’u,âEü,«,Í d—  
v,Á,È,¢ B,Ð,Æ,Á,ÍfV [f“Á,Í A•i ”,ÍfAf“frfGf“fgEðE¹,ªE< ‡,³,ê,Á,¢,é B

**FóŠÖ icolor space j**

F,ðGf“fR [fh,µ,½,è,èŽ,µ,½,è,.,é A,¢,.,Á,©,Ì“Ü,È,éf f|fbfh,Ì,¢  
.,,è,©,ðŽw,· B Á,à`è”É“l,ÉfJf%o [ EfXfy [fX,Íf^fCfv,Í ARGB,ÆYUV,Ì,Ó,½,Á,Á, ,é B

**FóŠÖ•İŠ icolor-space conversion j**

Ð,Æ,Á,ÍfJf%o [ EfXfy [fX,©,ç¼,ÍfJf%o [ EfXfy [fX,É F,ð•İŠ,.,éZ p BfrfFI Ef\ [fX,ÌYUVfJf%o [,  
©,çffBfXfvfEfC,İRGBfJf%o [,Ó,İ•İŠ,ª“TE“l,Á, ,é B

**fI [ffBfI EfXfgfŠ [f€ ialudio stream j**

gf~fLfvf“fO,³,ê,½ A,Ü,½,Íf~fLfvf“fO,³,ê,é%oÁ” «,l, ,é hfTfEf“fh Eff [f^ BDirectSound,Í A Ä ¶¹,İŠ  
efZJf“f\_Š EfTfEf“fh Efobftf@,©,çfI [ffBfI EfXfgfŠ [f€,ðf~fLfvf“fO,µ ACE%oÊ,ðfvf%ofCf}  
fŠ EfTfEf“fh Efobftf@,É o—Í,.,é Bfvf%ofCf}  
fŠ EfTfEf“fh Efobftf@,Í AfTfEf“fh Efn [fhEfFfA,ÉfI [ftfBfI Eff [f^,ð<Ÿ<<,.,é B

**fI [fo [fhf [ ioverdraw j**

fXfNfŠ [f“ EfsfNfZf<,ª•%oæ,³,ê,é•½<l%oñ ” B

**fI [fo [f€fC EfT [ftfFfX ioverlay surface j**

f f, fŠ ã,İŠT“O“l,È,é€E—Ïæ BŠi”[³,ê,Á,¢,éfcf [fW îñ,Í A“l— æfvf%ofCf}  
fŠ EfT [ftfFfX,ÍfCf [fW îñ,ðfJfo [,.,é BfI [fo [f€fC,Í A¼,Ì,.,x,Á,ÍfXfNfŠ [f“—v“f,Ífgfbfv,É, ,é,  
Æ’z’è,³,ê,Á,¢,é B

**fI [fo [f€fCZfI [f\_ [ ioverlay z-order j**

fI [fo [f€fC,ªfNfŠfbfsf“fO,³,ê,é ‡“Ó,ðE~è,.,é B,±,è,É,æ,è AfN [fhEfFfA EfXfvf%ofCfge EfVfXfef€  
,”DirectDraw,Ì,à,Æ,ÁŽÁ’•,³,é é B

**fIftfXfNfŠ [f“ EfT [ftfFfX ioff-screen surface j**

f f, fŠ ã,İŠT“O“l,È,é€E—Ïæ B“è”É“l,É A•Ž!‘O,ÉfobfNfobftf@,Öfuf fbn“l—,³,ê,éfrfbfgf}  
fbfv,ðŠi”[.,é,½,ß,É—p,ç,ç,é,é B’É í AfXfvf%ofCfge,ðŠi”[.,é,Ì,É—~p,³,ê,é B

**fIyfR [fh iopcode j**

ŽÀ sfobftf@,l,“„,l%oð Í•ú—@,âfVfXfef€ ó“Ó,Ì,İ X•ú—@,ð`è<,µ,½-½—ßfR [fh B

,©

**fJf f%** icamera j

•Ž'Ě'u,Æ•ûĈÛ,đ'è',,é,½,ß Afrf... [f] [fg,<sup>a</sup>—p,ĉ,éDirect3DRMFramefIfufWfFfNfg Bfrf... [f]  
[fg,Í AfJf f% EftfĈ [fĉ,Ī ³,ĪzŽ² ã,Ě, ,é%oĀŽ<fIfufWfFfNfg,¾,¯,đ AyŽ² ã,Ī ³•ûĈÛ,ÉfĈf“f\_Šf“fO,·,é  
B

**fJf% [ EfL [ icolor key j**

“š-¾Ĉø%oĚ,â”¼“š-¾Ĉø%oĚ,Ī,½,ß,É—p,ĉ,ç,é,é F,đŽ',μ,½'l B,½,Æ,,Īfn [fhfEfffA,ĪfufŠfbfg<@”\,đŽg—  
p,·,é ê ‡ AfJf% [ EfL [,Æ,μ,Ā Y'è,³,é,½ F,đ œ,ĉĈĚ—ĪæfsfNfZf<,·,×,Ā,³fuf fbfn“]‘—,³,é,é B,±  
,é,Ě,æ,Ā,Ā AĉĈĚ,Ā,Ě,ĉfXfvf%ofCfg,<sup>a</sup>fT [ftfFX ã,Ě ĩ ¬,³,é,é B

**fJf% [ Efe [fuf< icolor table j**

n F,ĪfJf% [l,Ī”z—ñ i'Ě í,ĪRGBŽOĈ' F j B

**fJfĈf“fg EfvfĈfC Ef|fWfVf‡f“ icurrent play position j**

DirectSoundfobftf@“à,Ī AfTfEf“fh,<sup>a</sup> Ā ¶,³,é,éĚ'u B

**fJfĈf“fg Ef%ofCfg Ef|fWfVf‡f“ icurrent write position j**

DirectSoundfobftf@,Ī†,Ā A^Ā'S,Éff [f^,đ•Ī X,·,é,±,Æ,<sup>a</sup>Ā,«,éĚ'u B

**fNfH [f^fjIf“ iquaternion j**

fxnfngf<,đ'è',,é A[x, y, z]l,Ī4”Ô—Ú,Ī—v'f BfnfH [f^fjIf“,Ī A3D%oñ“],Ā^è”Ī,É—~—p,³,é,Ā,ĉ,½ s—  
ñf f\fbfh,ĚŽæ,Ā,Ā'ã,í,é,à,Ī,Ā, ,é B

**fNfŠfbfp iclipper j**

DirectDrawClipperfIfufWfFfNfg B

**fNfŠfbfv EfŠfXfg iclip list j**

fT [ftfFX,Ī%oĀŽ<—  
Īæ,đŽ',·ĉĈĚ,ĪfŠfXfg B,·,Ā,ÉfEfBf“fhfE Efnf“fhf<,³DirectDrawClipperfIfufWfFfNfg,ÉĈ<,Ñ,Ā,¯,ç,é,Ā,ĉ  
,é,Æ,«,Ī AfNfŠfbfv EfŠfXfg,đ Y'è,·,é,±,Æ,Ī,Ā,«,Ě,ĉ B

**fOf< [fv igroup j**

DirectPlayfZfbfVf‡f“É,“,ĉ,Ā A,Đ,Æ,Ā,ĪfZfbfg,Æ,μ,Ā,Û,Æ,ß,ç,é,éfvfĈ [f,,Ī W ‡ B

**Ĉã•ûfNfŠfbfv-Ě iback clipping plane j**

Ž< 'ã,Ī%oœ s,«,ĪĈĀŠĚ B,±,Ī æ,É, ,éfIfufWfFfNfg,ĪfĈf“f\_Šf“fO,³,é,Ě,ĉ B

ŽQ Æ @‘O•ûfNfŠfbfv-Ě

**fT [frfX Efvf fofCf\_ iservice provider j**

DirectPlay, a~—

p,.,é AfIbfbgf [fN'Ê M,ð s,af\_fCfif~fbfN EfŠf“fN Ef%oCfuf%oŠ BfT [frfX Efvf fofCf\_,Í Af f bFZ [fW,ì—Žó M,É•K—v,Èflfbfgf [fNCEÁ—L,ÌfR [fh,ð”ò,ì,Á,ç,é BfIf“f%oCf“ EfT [frfX,àŠÜ,ß,½, ,ç, ä,é'g D,Í A“Á%o»,³,è,½fn [fhEfFFA,â'Ê M”]’ì,ì,½,ß,ÌfT [frfX Efvf fofCf\_,ð<ÿ<<,.,é,±,Æ,ª,Á,«,é B

**fT [ftfFX isurface j**

Ž<ŠofCf [fW,ð•ŮŽ ,;éf f,fŠ B,μ,ì,μ,ÌffBfXfvfEfC Ef f,fŠ,ðŽw,.;ª AfVfXfef€ Ef f,fŠ,Á, ,Á,À,à,æ ,ç B

ŽQ Æ @.; ‡fT [ftfFX AfIfXfNfŠ [f“ EfT [ftfFX AfI [fo [fEfC EfT [ftfFX Afvf%oCf} fŠ EfT [ftfFX

**fTfEf“fh Efofbftf@ isound buffer j**

DirectSoundfI [ffBfI Eff [f^,ðŠi”[.,éf f,fŠ BfTfEf“fh Efofbftf@,Ífvf%oCf}fŠ,À,àfZfJf“f\_fŠ,À,à,æ,- A,Ü,½ AfXf^fefBfbfN,À,àfXfgfŠ [f€,Á,à,æ,ç B

**ŽQ ÆfJfEf“fg ireference count j**

fRf“f]

[flf“fg EfIfufWfFfNfg Ef,ff< iCOM jfIfufWfFfNfg,ðfRf“fgf [f<,.,é,½,ß,ÌfJfEf“f^ BfIfufWfFfNfg,ª ì -³,è,é,Æ AŽQ ÆfJfEf“fg,Í,É Ý'è,³,è,é BfCf“f^ [ftfFfCfX,ªfIfufWfFfNfg,ÉE<,Ñ,Á,¯,ç,é,é,½,Ñ,ÉŽQ ÆfJfEf“fg,ÍfCf“fNfŠf f“fg,³,è A,»], Û'± ,ª Ø'f,³,è,é,Æ AŽQ ÆfJfEf“fg,ÌfNfŠf f“fg,³,è,é BŽQ ÆfJfEf“fg,ª0,É,È,Á,½,Æ,« AfIfufWfFfNfg,Í”jŠü, ³,è A,»],ÌfIfufWfFfNfg,Ö,Ì,.,x,Á,ÌfCf“f^ [ftfFfCfX,Í-³Eø,Æ,È,é B

**fV [f“ iscene j**

%o¼zŠÁ<<<,ð \ -.,éfIfufWfFfNfg'S'ì,ÌfZfbfg B%oÄŽ<fIfufWfFfNfg AfTfEf“fh ACEð Aftf€ [f€ ,ðŠÜ,Ð BDirect3D,Á,Í Af< [fg Eftf€ [f€,ÉŠÜ,Ü,è,éfIfufWfFfNfg,ÌfZfbfg,ðŽw,· B

ŽQ Æ @f< [fg Eftf€ [f€

**Ž< ‘ä iviewing frustrum j**

fRf... [f] [fg,ÌfJf f%o,É'ì,μ,Á'Š'ì“L,É”z'u,³,è,½fV [f“,ì—š'ì BŽ< ‘ä,ì't,É, ,éfIfufWfFfNfg,Í%oÄŽ< ó'Ô,Á, , é B“šŽ<“Š%oe,Á,Í A'O'ûfNfŠfbfv-È,ÆEä'ûfNfŠfbfv- È,ÌŠÖ,Ì%o¼z“L,Èfsf%of~fbfhE^,ðŽw,· B•½ s“Š%oe,É,“,ç,Á,Í—š•ù'ì,É,È,é B

**ŽÀ sfobftf@ iexecute buffer j**

3DfV [f“,ð<L q,.;é AŠ@'S,ÉŽ<EÈ“à•iE^,Ì A“Æ—š,μ,½ îñpfpfbfg BŽÀ sfobftf@,É,Í ACEä,É-½— BfXfgfŠ [f€,ª±,,' ,\_“\_ÌfŠfXfg,ªŠÜ,Ü,è,Á,ç,é B-½—BfXfgfŠ [f€ ,Í AfIfyf€ [fVf‡f“fR [fh ifIfyFR [fh j,Æ A,±,ÌfIfyFR [fh,ª€ ì,.,éff [f^,ç \ -³,è,Á,ç,é B

**L'· istretching j**

~Ü,È,éfTfCY,Ì“— æ,ÉfCf [fW,ðfufŠfbfg,.,é,±,Æ B,±,ì'€ ì,ð¼ ÚfTf] [fg,.,éfn [fhEfFFA,à, ,é B

**fXf^fefBfbfN EfTfEf“fh Efofbftf@ istatic sound buffer j**

Š@'S,ÉfTfEf“fh,ðŠi”[μ,Á,ç,é f,fŠ BfTfEf“fh'S'ì,ð”è“x,Éfobftf@,É ‘,«±,ß,é,½,ß A•Ö—,Á, ,é B

**fXfefBfbfL [ EftfH [fJfX isticky focus j**

DirectSound,É,“,ç,Á AfI [fi [ EfAfvfŠfP [fVf‡f“,“ü—ÍftfH [fJfX,ðŽ ,Á,Á,ç,È,ç ,Æ,«,Á,àfTfEf“fh,ð Ä ¶,Á,«,é”\—

Í B,½,Æ,ì,Í ADirectSoundfAfvfŠfP [fVf‡f“,Í Aft [fU [,ª¼,ÌfAfvfŠfP [fVf‡f“,ð“@,ç,μ,Á,ç ,é,Æ,«,Á,à AfTfEf“fh Efofbftf@,ð Ä ¶,μ'±,¯,é,±,Æ,ª,Á,«,é B

**fXfgf%oCfh EfAf%oCf“f f“fg istride alignment j**

DirectX,Á,Í AfXfgf%oCfh,Æ,Í A, ,éf%oXf^ Ef%oCf“,ÆŽÿ,Ìf%oXf^ Ef%oCf“,Æ,ÌŠÖ,ÌfIfZfbfg,ðŽw,· BfXfgf%oCfh EfAf%oCf“f f“fg,Í AftfBfXfvfEfC Ef f,fŠ EfT [ftfFX,ðfZfbfgfAfbfv,.,é Ü,Ì d— v,È ÝE—v'f,Æ,È,é é ‡,ª, ,é B

**fXfgfŠ [f€ EfTfEf“fh Efofbftf@ istreaming sound buffer j**

’,çfTfEf“fh,ð Ä ¶,.,é,±

,Æ,ª,Á,«,é A -³,ÈfTfEf“fh Efofbftf@ BfAfvfŠfP [fVf‡f“,Í AfI [ffBfI Eff [f^,ð Ä ¶,μ,È,ª,ç“@“I,Éf ofbftf@,Éf [fh,.,é B,½,Æ,ì,ÍfAfvfŠfP [fVf‡f“,Í A3•b,ÌfI [ffBfI Eff [f^,ð•ŮŽ ,Á,«,éfofbftf@,ð2ª,ÌfT fEf“fh,ð Ä ¶,.,é,½,ß,ÉŽg—p,.,é,±

,Æ,ª,Á,«,é BfXfgfŠ [f€ Efofbftf@,Í AfXf^fefBfbfN Efofbftf@,æ,è,à,Í,é,ç,É ,È,çf f,fŠ,μ,ç•K— v,Æ,μ,È,ç B

**fXf|fbfgf%oCfg ispotlight j**

%o~ ó,ÌEð,ð•ú,ÁEðE¹ B%o~ ,ì't,É, ,éfIfufWfFfNfg,¾,¯,ª Æ,ç,³,è,é B%o~ ,Í,Ó,½,Á,Ì•P“x,ð ¶ -.,é B't+%o,Ì-¾,é,ç“ª i-¾“” j,Íf|Cf“fgEðE¹,Æ“¶,«,ð,μ AŽü“Ì,Ì”~Á,ç“ª i“Á%oe” j,Í AŽü•Ó,Ì^Á,ç%oe,Æf}

[fW,<sup>3</sup>,ê,é B

**fZfJf“f\_fŠ EfTfEf“fh Efofbftf@ issecondary sound buffer j**

fI [ffBfi Ef f,fŠ,É,;ç  
,Ä AfAfvfŠfP [fVf‡f“,ð’Ê,µ,Ä Ä ¶,<sup>3</sup>,ê,éĈÊ X,İfTfEf“fh,đŠi”[µ,½•”<sup>a</sup> BfTfEf“fh,Í A1%oñ,İfCxf“fg,Æ,µ  
,Ä Ä ¶,.,é,±,Æ,à Afç [fv EfTfEf“fh,Æ,µ,ÄĈJ,è•Ô,µ Ä ¶,.,é,±  
,Æ,à,Ä,«,é B,Û,½ AfZfJf“f\_fŠ Efofbftf@,Í A—  
LĈø,ÈfTfEf“fh Efofbftf@ Ef f,fŠ,æ,è’,çfTfEf“fh,ð Ä ¶,.,é,±,Æ,à%Ä”,Ä, ,é B,±  
,İfobftf@,Í A Ä ¶,µ,æ,µ,Æ,µ,Ä,ç,éfTfEf“fh,İê•”<sup>a</sup>,đŠi”[.,éfLf... [,Æ,µ,Ä,İ-đŠ,,đŽ ,Á,Ä,ç,é B

**fZfbfVf‡f“ isession j**

DirectPlay,Ä ACEÝ,ç,É’Ê M,µ,Ä,ç,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,İĈĈŞE B’O•ûfNfŠfbfv-Ê,æ,è,àfJf f%o,É<ß,Ĉ^Ê’u,É, ,éfIfufWfFfNfg,İfĈf“f\_fŠf“fO,<sup>3</sup>,ê,È,ç B’  
O•ûfNfŠfbfv-Ê,İ ,,<sup>3</sup>,Í Afrf... [,İftfB [fçfh,ð’èç,.,é B  
ŽQ Æ @Ĉä•ûfNfŠfbfv-Ê



,í

**”z—ñfIfufWFFNfg iarray object j**

,D,Æ,Ä,Ì”z—ñ,Ë,Û,Æ,ß,ç,ê,½fIfufWFFNfg,ÌfOf< [fv B”z—  
ñfIfufWFFNfg,Ë,æ,èfOf< [fv’S’Ì,ð,æ,èŠÈ’P,É’€ ì,Ä,«é B”z—ñfIfufWFFNfg,ð—  
p,Ä,«éCOM,ÌfCf“f^ [ftfFfX,É,Í AGetElementf f\fbfh,ÆGetSizef f\fbfh,^—p’Ó,³,ê,Ä,ç,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

**fobfN Efofbftf@ iback buffer j**

fvf%ofCf}fŠ Eft [ftfFfX,³€» Ý,ì%ÄŽ<fCf [fW,ð•Ž,ì,µ,Ä,ç,éŠÖ,É Afrfbfgf}  
fbfv,»,ì¼,ÌfCf [fW,ð•,«,±,ñ,Ä,·,é A\*s%ÄŽ<ft [ftfFfX B

• **iwidth j**

f f, fŠ,ÉŠi”[³,ê,½frfbfgf}fbfv“à,Ä A ,éf%ofCf“,ÌŽn“\_Æ,»,Ìf%ofCf“,Ì I“\_Æ,ðŽ,·,Ó,½,Ä,Ì<—£ B,±,ì<—£  
,Ìf f, fŠ ã,Ìfrfbfgf}fbfv,Ì• ,µ,©•,³, A<éCf f, fŠ,É,Ç,Æ’á,Ä,Äfrfbfgf}fbfv,ÌŽÝ,Ì ü,ÌŽn“\_Ü,Ä’B,·,é,Ì,É•K  
—v,É•á<f f, fŠ,ðŠÜ,Û,È,ç B

**fpf%ofCf< E|fCf“fg iparallel point j**

fpf%ofCf< E|f%ofCf,ÄfIfufWFFNfg,ð Æ,ç,·€ö€¹,¾,ª A€ö,Ì€ü,«,Ífpf%ofCf< E|f  
fCf“fg€ö€¹,Ì’È’u,©,ç€”è,³,ê,é B,½,Æ,ì,Í Afpf%ofCf< E|fCf“fg€ö€¹,Ì—¼ª,Éf fbfVf...,ª ,é ê ± A€ö  
€¹,É—È,µ,Ä,ç,é,Û,ª,Ìf fbfVf...,ª¾,é,É,é B

**fpfCfBfg ipalette j**

fIfufWFFNfg,âfAfvfŠfP [fvf±f“,³Ž—  
p,·,é F,ÌfZfbfg BDirectX,Ä,Í ADirectDrawPalettefIfufWFFNfg,ðŽw,· B

**fpfCfBfg Efcf“ffbfNfX ipalette index j**

F,ð’I’ð,·,é,½,ß,È—p,ç,ç,ê,é AfpfCfBfg Efe [fuf<”z—ñ,Ö,Ì ® ”fCf“ffbfNfX B

**fpf [ ipower j**

‘f p,Ì”½ŽÈ“Ä «,Ä AfXfyfLf...f%o [ EfnfCf%ofCf,ì’N—¾“x,ð€”è,·,é’l B,±  
,ì’l,5,Ì,Æ,«,Ìá@“I,ÈŠOŠÌ,É,È,è A,»,èÈ ã,Ì,Æ,«,Ì,à,Ä,Æ \_ç,©,»,ª,ÈŠOŠÌ,É,È,é B

**”½ŽÈ“Ä « ispecular property j**

€ö€¹,Ì”½ŽÈ,É’í%öž,µ,½€ö,éfIfufWFFNfg ã,Ì€ö“\_ª,ç,Ì,æ,ª  
,É•Äž,³,ê,é,©,ð€”è,·,é A’f p,Ì“Ä « B”½ŽÈ“Ä «,Ì A’f p,ª,ç,ª€ö,ð”½ŽÈ,·,é,©€”è,·,é,Ó,½,Ä,Ì“Ä «,Ì,ª  
,ç,Ì,ð,Æ,Ä,Ä, é B  
ŽQ Æ @úŽÈ“Ä «

**fpf“l ipan value j**

¶%oE,ÌfI [ffBfI Ef ffflf<,Ì’Š’í%o’—È B100ª,ÌlffVfxf<P’È,Ä•,³,é,é B

**frf... [f| lfg iviewport j**

3DfV [f“,ª,ç,Ì,æ,ª  
,É2DfEfBf“fhfE,ÉfCf“f\_šf“fo,³,ê,é,©,ð’è<,µ,½<éC` B,½,½fIfufWFFNfg,³fCf“f\_šf“fo,³,ê,é AfffofCfX  
ã,Ì—Ì’æ,à’è<,·,é B

**fsfbLf“fo ipick j**

frf... [f| [fg,Ä,Ì2D Ä•W,ÌfV [f“,ÄfrfWf...fAf< E|fufWFFNfg,ð’T ò,·,é,±,Æ B

**fsfbf` ipitch j**

f f, fŠ,ÉŠi”[³,ê,½frfbfgf}fbfv“à,Ä A ,é ü,ÌŽn“\_ÆŽÝ,Ì ü,ÌŽn“\_Æ,ðŽ,·,Ó,½,Ä,Ì<—  
£ BDirectDraw,Ä,Í A,·,×,Ä,ÌffBfXfvfCfC Ef f, fŠ,ª,ð,Æ,Ä,Ì ü€fuf fbN,Æ,µ,Ä”z’u,³,ê,é,Æ,Ì€Ä,ç,È,ç  
,Ì,Ä Af f, fŠ Efsfbf,Æf f, fŠ• ,Ìá,ç,Í d—v,Ä, é B,½,Æ,ì,Í<éC,Ìf f, fŠ,Ä,Í AftfBfXfvfCfC Ef f, fŠ,Ì  
fsfbf,É,Í Afrfbfgf}fbfv• ,É%oÄ,|fLffbfVf...,Ì’è”,ªŠÜ,Û,È,é ê ±ª,·,é B  
ŽQ Æ @\_

• **±fT [ftfFfX icomplex surface j**

DirectDrawSurfacefIfufWFFNfg,Ä Af< [fg Eft [ftfFfX,ÉfAf^fbf`³,ê,é,à,Ì,ð,Û,Æ,ß,ÄŽw,·€è B•j ±fT [ftf  
FfX V’ç,Ì,Í Af< [fg,ª”jŠü,³,ê,é,Æ,«,É,Ì,Ý”jŠü,·,é,±,Æ,ª,Ä,«,é B

**ftfŠfbfsf“fo Eft [ftfFfX iflipping surface j**

ftfŠfbfsf“fo%oÄ”,Èf f, fŠ B

ŽQ Æ @ftfŠfbfv

**ftfŠfbfv iflip j**

fobfN Efofbftf@,Æftf f“fg Efofbftf@,ÌfAfhfCfX,ð€ðŠ,·,éfvf fZfX BŽÄ Û,É,ÍfobfN Efofbftf@,Ìf  
Cf [fW,ªftf f“fg Efofbftf@,É€ðŠ,³,ê A,»,è,É,æ,Ä,ÄfCf [fW,ª•Ž,³,ê,é B

**ftf€ [f€ iframe j**

fV [f“ ã,Ä,ÌfIfufWFFNfg,Ì”z’u,Ì€³,É,È,é A”ñ•Ž,Ì’g BfIfufWFFNfg,Í AŠÖ~A,µ,½ŽQ Æftf€ [f€

,É,Î,·,éóŠÖ“İŠÖEW,đŽw'è,·,é,±,Æ,É,æ,Á,Ä AfV [f“ ä,É”z'u,³,ê,é BfrfWf...  
fAf< EfIfufWfFfNfg,Í A,» ,İĚ'u,âCEü,«,đftfCE [fÉ  
,©,çŽæ“¾,·,é B,Û,½ A“@%œ,âAfjf [fVf‡f““†,İ,Đ,Æ,Â,İfCf [fW,âftfCE [fÉ,©,çŽæ“¾,³,ê,é B

**ftf f“fg Efofbftf@ ifront buffer j**

ftfŠfbfsf“fO Ef`fF [f“,İ Å %o,İfofbftf@ B'½,,İ ê ‡ A%oÅŽ< ó'Ô,İfvf%oCf}  
fŠ EfT [ftfFfX,đŽw,· B,» ,□,Å,È,ç,Æ,«,Í AfefNfXf`ff,İftfŠfbfsf“fO Ef`fF [f“,İ,æ,□  
,É A3DfGf“fWf“,afefNfXf`ff,đŽæ“¾,·,éT [ftfFfX,İ,±,Æ,Â, ,é B,±,İ ê ‡,İfvf%oCf}  
fŠ EfT [ftfFfX,Å,İ,È,-  
A·Ž,İ,à,³,ê,È,ç BftfŠfbfsf“fO EfI [fo [fCEfC EfT [ftfFfX,Å,İftf f“fg Efofbftf@,İ·Ž,İ,³,ê,é,ª A,±  
,ê,İ'P,Éfvf%oCf}fŠ EfT [ftfFfX,ÉfI [fo [fCEfC,³,ê,½fT [ftfFfX,É,·,-,È,ç B  
ŽQ Æ @fvf%oCf}fŠ EfT [ftfFfX

**fufŠfbfg iblit j**

fufbfgfuf fbfN“]— B

**fufCEf“ffBf“fOCEW ” iblend factor j**

fefNfXf`ff EfufCEf“ffBf“fO,É,·,ç,Ä AŠe F—v'f,ª,ç,İ,æ,□,É ¬ F,³,ê,é,©,đŽ',·CEW ” B

**fufCEf“ffBf“fO Ef, [fh iblend mode j**

fefNfXf`ff,ª,ç,İ,æ,□,Éf}fbfv æ,İfT [ftfFfX,İ F,Æ ¬ F,³,ê,é,©,đCE”è,·,éAf<fSfŠfYfÉ B

**fvf%oCf}fŠ EfT [ftfFfX iprimary surface j**

f,fj^ [ ä,É·Ž,³,ê,éCf [fW,đŠÛ,ñ,¾f f,fŠ—İæ BDirectX,Å,Í Afvf%oCf}fŠ EfT [ftfFfX,İfvf%oCf}  
fŠDirectDrawSurfacefIfufWfFfNfg,É,æ,Á,Ä·,³,ê,é B

**fvf%oCf}fŠ EfTfEf“fh Efofbftf@ iprimary sound buffer j**

fQ [fÉ†,Åf† [fU [,İŽ,·,É·,±  
,,é%o¹,đŽ ,Åfobftf@ B”è”É,É,İfZfJf“fh Efofbftf@,©,ç,İfTfEf“fh,đf~fLfvf“fO,·,é,İ,É—p,ç  
,é,ª AfJfXf^fÉ Ef~fLfvf“fO,â,» ,İ¼,İ“Á·È,È“@ i,đ s,□,½,ß Af\_fCfCEfNfg,ÉfAfNfZfX,·,é,±,Æ,à,Ä,«,é B

**fvfCEfCf,, iplayer j**

DirectPlayZfbfVf‡f“,İŽQ%oÅŽÒ BŠefvfCEfCf,,Í AfvfCEfCf,,ŠÖ,İf fbfZ [fWCEđŠ,đ%oÅ”  
,É,·,éfvfCEfCf,,ID,ÉŠÖ”A,Ä,·,ç,ê,é B

**fvfCEfCf,,ID iplayer ID j**

DirectPlayZfbfVf‡f“,İŠeŽQ%oÅŽÒ,ÉŠÖ”A,Ä,·,ç,ê,é†fj [fN,ÈŽ·ÈŽq BfvfCEfCf,,İ i -Žž,ÉŠ,,è—  
,Ä,ç,ê,é BfAfvfŠfP [fVf‡f“,İfvfCEfCf,,ID,đŽg—p,µ,Ä AfvfCEfCf,,ŠÖ,Äf fbfZ [fW,đCEđŠ,·,é,±  
,Æ,ª,Ä,«,é BzfXfg,É,İ,Ä,È,ÉDPID\_SYMSGfvfCEfCf,,ID,“Š,,è—,Ä,ç,ê,é B

**fy [fW EftfŠfbfsf“fO ipage flipping j**

ŽQ Æ @ftfŠfbfv

**fzfXfg ihost j**

DirectPlay,É,·,ç,Ä AID,ªDPID\_SYMSG,Ä, ,é%o¼’zfvfCEfCf,, [ BfvfXfefÉ Ef fbfZ [fW,â AfZfbfVf‡f“†,  
İ,·,×,Ä,İfvfCEfCf,, [ ,É’È’m,³,ê,é fbfZ [fW,Í AfzfXfg,É,æ,Á,Ä ^— ,³,ê,é B

**f|fCf“fg ipoint j**

CE“\_,©,ç‘S·ûCEü·İ“™,ÉCEđ,đ·ú,ÅCEđCE¹ B

**•úŽÈ Ý”è iemissive setting j**

ŽQ Æ @·úŽÈ“Á «

**•úŽÈ“Á « iemissive property j**

f p,İ“Á «,İ,Đ,Æ,Ä B’f p,ªCEđ,đ·úŽÈ,·,é,©,ç,□  
,©,đŽ',· B·úŽÈ“Á «,Í A’f p,İCEđ,İ”½ŽÈ,İ,µ,©,½,đCE”è,·,é,Ó,½,Ä,İ“Á «,İ,□,ç,İ,Đ,Æ,Ä,Ä, ,é B  
ŽQ Æ @”½ŽÈ“Á «

**-@ üfxfNfgf< inormal vector j**

-É,İCEü,«,đ’èç,·,é AfT [ftfFfX,©,ç ,¼,É,İ,Ñ,é%oÈ·ó,İCEđ ü B

,Ü

**f}fefŠfAf< imaterial j**

-Ê,ª,Ç,Ì,æ,µ,ÉCEð,ð”½ŽĚ,·,é,©,ðCE^è,·,é“Á « B'f D,É,Í A•úŽĚ“Á « iCEð,ð•úŽĚ,·,é,©,Ç,µ  
,© j,Æ”½ŽĚ“Á «,Ì,Ó,½,Â,Î \ ¬—v'f,ª, ,é B”½ŽĚ,Ì-¾,é,³,Í A<“x,Ì Ý'è,É,æ,Á,ĂCE^è,³,é,é B

**f~fLfVf“fO imixing j**

DirectSound,É,·,ç,Ā A Ā ¶†,ÌfTfEf“fh Efofbftf@,ð ‡ ¬,µ ACE<%Ē,ðfvf%oCf}  
fŠ EfTfEf“fh Efofbftf@,É ‘,«,±,ðfvf fZfX BfTfEf“fh Efn [fhfEfFfA,ÉfI [fffBfI Eff [f^,ð o—  
Í,·,é B ^— ŽžŠŌ,ªŽĀ—p,É'İ,|,é,©,ð l,|,È,¯,ê,Î Af~fLfVf“fO,³,è“¾,éfofbftf@,Ì ”,É §CEĀ,Í,È,ç B

**f~fbfvf}fbfv imipmap j**

~A'±,µ,½fefNfXf`ff BŠefefNfXf`ff,Í A“¬,¶fCf [fW,ÉftfBf<f^,ð,©,¯,Ā ™ X,É'á%ð'æ“x,É,µ,½,à,Ì,Ā, ,é  
B%ĀŽ<fIfufWfFfNfg,ªŠí“ŽŌ,Ì<B,,É, ,é,Æ,«,É,Í ,%ð'æ“xfCf [fW,ª—p,ç  
,ç,è AfIfufWfFfNfg,ª%“‘,·,©,é i,»,µ,Ā ¬,³,,È,é j,É,µ,½,ª,Ā,Ā A,æ,è'á%ð'æ“x,ÌfCf [fW,ª—p,ç,ç,é,é B

**-¾“ iumbra j**

fXf|fbfgf%oCf,Ì%~ ó,ÌCEō,Ā A'+%o,Ì-¾,é,ç•”ª Bf|fCf“fgCEðCE¹,Æ“¬,¶“® i,ð,·,é,±,Æ,à, ,é B  
ŽQ Æ @^Ā%oe” AfXf|fbfgf%oCf

**f fbvVf... imesh j**

'P f,Èf|fŠfSf“,Ā•(CE»,³,è,é-Ê,ÌfZfbfg B

**-Ê iface j**

f fbvVf...†,Ì,D,Æ,Ā,Ìf|fŠfSf“ B

**f, [fhX iMode X j**

fXf^f“f\_ [fhVGaf, [fh13,ªñ<Ÿ,·,éfnfCfufŠfbfh,ÈfffBfXfvfCEfC Ef, [fh B,±  
,Ìf, [fh,Ā,Í AVGAfAf\_vf^,ÌEGAf}f<f'fvf< EfrffI EfvyfCE [f“ EfVfXfef€,É,æ,Ā,Ā iMode 13,ĀŽg—  
p,Ā,«,é64K,Ì,©,i,è,É j256K,Ü,Ā,ÌfffBfXfvfCEfC Ef f,Š,ðŽg,µ,±,Æ,ª,Ā,«,é B

**f,fff< Ā•W imodel coordinates j**

ŽqftfCE [f€,É'İ,·,é'Š'Ī Ā•W B

ŽQ Æ @f [f<fh Ā•W

,â

—LCEü idirectional j

$f \in \mathbb{R}^n$ ,  $\hat{E} f A f^{\wedge} f b f^{\wedge}$ ,  $\mathbb{R}^3$ ,  $\hat{e} \in \mathbb{C} \delta \mathbb{C}^1$ ,  $\mathbb{R}^4$ ,  $\mathbb{A}$ ,  $\cdot$ ,  $\times$ ,  $\hat{A}$ ,  $\hat{I} f I f u f W f F f N f g$ ,  $\delta$ ,  $\bar{\cdot}$ ,  $\mathbb{P}$ ,  $x$ ,  $\hat{A}$ ,  $\mathbb{E}$ ,  $\zeta$ ,  $\mu$ ,  $\mathbb{A} \in \delta \mathbb{C}^1$ ,  $\hat{a} f I f u f W f F f N f g$ ,  $\odot$ ,  $\zeta$ ,  $\mathbb{C} \hat{A} \%$ ,  $\hat{I} \hat{E} u$ ,  $\hat{E}$ ,  $\cdot$ ,  $\hat{e}$ ,  $\hat{a}$ ,  $\mathbb{R}$ ,  $\hat{E} \mathbb{C} \emptyset \%$ ,  $\hat{E}$ ,  $\delta$ ,  $\wedge$ ,  $\hat{e}$ ,  $\mathbb{B}$  —LCEüCEöCE<sup>1</sup>,  $\hat{I} \hat{E} \hat{u}$ ,  $\langle, \hat{\delta} \hat{Z}$ ,  $\hat{A}$ ,  $\hat{a} \hat{E} u$ ,  $\hat{\delta} \hat{Z}$ ,  $\frac{1}{2}$ ,  $\hat{A} \hat{e}$ ,  $\hat{E}$ ,  $\hat{A} \frac{1}{4}$ ,  $z$ ,  $\hat{l}$ ,  $\hat{a}$ ,  $\mathbb{R}$ ,  $\hat{E} \%$ ,  $-\hat{E}$ ,  $\hat{e}$ ,  $\frac{1}{2} \mathbb{C} \delta \mathbb{C}^1$ ,  $\hat{\delta} f V f \sim f \dots f \in \mathbb{C}$  [ $f g$ ,  $\cdot$ ,  $\hat{e}$ ,  $\frac{1}{2}$ ,  $\mathbb{B}$ ,  $\hat{E}$ ,  $\mathbb{C}$ ,  $\zeta$ ,  $\hat{e}$ ,  $\hat{e}$ ,  $\mathbb{B}$ ]

—LCEøftfCE [f€ ienable frame j

$\mathbb{C} \delta \mathbb{C}^1$ ,  $\hat{\delta} \mathbb{K}$ ,  $\mathbb{R}$ ,  $\cdot$ ,  $\hat{e}$ ,  $\pm$ ,  $\mathbb{A}$ ,  $\hat{a}$ ,  $\hat{A}$ ,  $\langle, \hat{e} f t f \in \mathbb{C}$  [ $f \in \mathbb{B}$ ]

.ç

**f%ofbfv iwrap j**

-Ê,âf fbVf...,ÏfefNfXf`ff À•W,ÏEvŽZ,É—p,ç,éfvf fV [fWff BŠî-  
{“I,Èf%ofbfsf“fO Ef^fCfv,É,Í Aftf%ofbfg A%o~'CE A<...‘Í AfNf f€,ª, ,é B

**f< [fg EftfCE [f€ iroot frame j**

Direct3D,É,“,ç,Ä A eftfCE [f€,ðŽ ,½,È,çftfCE [f€ BftfCE [f€ŠK‘w,Ïfgbfv,É, ,éftfCE [f€ Bf< [fg EftfCE  
[f€,Í AfV [f“,ð \ -,.,éIfufWfFfNfg‘S‘Ï,ÏfZfbfg,ðŠÛ,ñ,Ä,ç,é B  
ŽQ Æ @fV [f“

**fCEfCfef“fV ilatency j**

fTfEf“fh Efobftf@,ª Ä ¶,ª,ê,Ä,©,ç AfXfs [fJ,ªŽÀ Û,ÉfTfEf“fh,ð-Ä,ç,.,Û,Ä,Ï‘x%  
„ŽžŠÔ BDirectSoundf~fLft,ÏfCEfCfef“fV,Í A^è”Ê,É20f~fŠ•b,Ä, ,é B

**f fr [ EfNf%ofCfAf“fg ilobby client j**

f† [fU,ÏfRf“fsf... [f^,ÉŠÖ~A,Ä,“,ç,ê,½f fr [ŠÇ—  
f< [f`f“ BfAfvfŠfP [fVf‡f“,Ïf%ofEf“f` Af† [fU [ EfCf“f^ [ftFfCfX,ÏfAfbfvff [fg Af fr [ EfT  
[fo,Æ,Ï‘È M,ðŠÛ,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,ÏfAfvfŠfP [fVf‡f“,É Ú±  
,µ,½f† [fU [,ÉŠÖ,.,é,.,x,Ä,Ï îñ,ð² @,.,é B

,i

f [f<fh Å•W iworld coordinates j  
f< [fg Eftfœ [fœ,É•Î,•,é•Š•Î Å•W B  
ŽQ Æ @f,fff< Å•W

