

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“® Ī, ., éfAfvfŠfP [fVf‡f“, ĪfpftfH [f}
f“fX, đ AMS-DOS, āfA [fP [fhfQ [f€<@. Ā“® Ī, ., éfAfvfŠfP [fVf‡f“, ĪfpftfH [f}f“fX” ě ĩ, ĩ, à, ĩ, ě, μ, æ, □
, ĀDirectX, đŠJ”, μ, ½ BŠæ<, Ā A•W €%», ³, ě A“K Ø, ě•¶ “%», ³, 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 Ī, ., é, ½, β, ě A, ±, ĪSDK, ĪŠJ”-
, ³, ě, ½, Ī, Ā, ., é B

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

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

fn [fhfEFAŠJ”, Ī, ½, β, ĪfKfCfhf%ofCf“, Ī’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, ,éAfNfZfX,ð'ñ<ÿ,µ AMS-DOSfRf“f\ [f<fx [fX,İfAfvfŠfP [fVf‡f“•Ä,Ý, ,é,ç,Í,»„êÈ ã,İfpftfH [f} f“fX,ð o,³,¹ A,»„µ,Äfp [f\if<fRf“fsf... [f^,É,“; ,éfn [fhfEfFfA<Z pŠv V,İ áŠQ,ðŽæ,è æ,,±,Æ,Ä, ,é B

Microsoft,Í AWindowsfx [fX,İfAfvfŠfP [fVf‡f“É ACE» Ý,»„µ,Ä «—^,İfRf“fsf... [f^fVfXfef€ ã,Ä—p%oÄ”\,Èfn [fhfEfFfA,Ö,İfnfCfpftfH [f}f“fX,ÄfŠfAf<f^fCf€,ÈfAfNfZfX,ð'ñ<ÿ, : ,é,½,ßDirectX,ðŠJ”- ,µ,½ BDirectX,Í AfCf“fXfg [f<,âfRf“ftfBfMf... f€ [fVf‡f“„İ”İŽG,³,ðE,,ç,µ Afn [fhfEfFfA,İ' Š,ð Ä'âEÀŠ^,©,µ,È,ª,ç Afn [fhfEfFfA,ÆfAfvfŠfP [fVf‡f“, Æ,İŠÖ,É^êŠÑ,µ,½fCf“f^ [ftfFfCfX,ð'ñ<ÿ,µ,Ä,ç,é B

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

fpftfH [f}f“fX€ü ã,İ,½,ß“Á•Ê ÝE v,³,ê,½fAfNfZf%of€ [f^fJ [fh fvf%ofOfAf“fhfvf€fC,Æ A'¼,İWindowsfn [fhfEfFfA,â\ftfgefFfA DirectPlay,ðŠÜ,Đ AWindowsfrf<fgfCf“,İÊ 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 [fhfEFAŽÁ"•,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,µ—"_,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%oCfGfGf"fwf" BfXfvf%oCfG,ðfI [fo [fCEfC,¾,¹,é,±,Æ,ð—e"Ö,È,·,é B

•àŠÖ,È,æ,é L'· B -¾,çftfCE [f€,Á,àfXfNfŠ [f""S'ì,ÈftfBfbfg,·,é,æ,µ
,ÉŠg'â,·,é,½,ß Af\ffBfXfvfCEfCf 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 ,Á3žÿCE³(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"è,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,É A3DfQ [f€,É Á'áCEÀ•K—v,Æ,¾,è,é B

¾ k<Z-@,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,ð<—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 «—
^fŠfŠ [fX,¾,è,èDirectX,ì"è<@",Æ,µ,Á AYUVf\ffI,ì"WSJfn [fhfEFAfAfNfZf%oCE [fvf±f",³fTf [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 `èç,ìŽq-p

f}fNf 'è',İŽg—p

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

ˆÈ%º,İ—á,Á,Í A **IDirectDraw2::CreateSurface** f\fbfh,đCE,Á,Ô,½,ß**IDirectDraw2_CreateSurface**}fNf ,đŽg—
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,đ“¾,é,É,Í AŽg—p,µ,½,¢DirectXfRf“f|
[flf“fg,İ“K Ø,Èfwfbf_ftf@fCf<,đŽQ Æ,.,é,±,Æ B

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

,±,ÿZfNfVf‡f“,Á,Í AfRf“f| [flf“fg EfIfufWfFfNfg Ef,fff<(COM)

,Æ ACOM,ÿIfufWfFfNfg,“,æ,ÑfCf“f^ [ftfFfCfX,ÿŽÀ‘,É,Á,¢,Ä<L q,.,é B à-¾,.,éfgfsfbfN,íÈ%º,ÿÈ,è,Á, ,é
B

fRf“f| [flf“fg EfIfufWfFfNfg Ef,fff<

IUnknownfCf“f^ [ftfFfCfX

DirectX COMfCf“f^ [ftfFfCfX

C++,ÆCOM,ÿfCf“f^ [ftfFfCfX

C,Á,ÿCOMfIfufWfFfNfg,Ö,ÿfAfNfZfX

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

fRf“f| [flf“fg EfIfufWfFfNfg Ef,ff<

DirectX SDK,ì`à•”•à,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,³,Ä,«„é BCOMfCf“f^ [ftfFfCfX,ð'È,µ,ÄfIfufWfFfNfgŠÖ,ÄŽó,~“n,µ,³,ê,éfRf}
f“fh,Íf f\fbfh,ÆE¾,i,ê,é B,½,Æ,!,Í AfIfBfXfvf€fCfAf_fvf^,ìE» Ý,ìffBfXfvf€fCf, [fh,ðŽæ“¾,·,é,½,ß A
DirectDrawflfufWfFfNfg,©,çIDirectDraw2::GetDisplayModef f\fbfh,³IDirectDraw2fCf“f^ [ftfFfCfX,ð'È,µ,Ä‘—
,ç,ê,é B

flfufWfFfNfg,Í AŽÀ sŽž,É¼,ìflfufWfFfNfg,ÆfOfCf“fh,Ä,« A¼,ìflfufWfFfNfg,“ñ•Ý,·,éfCf“f^ [ftfFfCfX,ð
ŽÀ‘•,µ,ÄŽg—p,Ä,«„é BflfufWfFfNfg,°OLEfIfufWfFfNfg,Ä, ,è A,»,µ,Ä,»,ìflfufWfFfNfg,³fTf|
[fg,·,éfCf“f^ [ftfFfCfX,³,i,©,ê,Í AfAfvfŠfP [fVf‡f“(Ü,½,Í¼,ìflfufWfFfNfg),Í A Ä %
,ìflfufWfFfNfg,²ŽÀ s,Ä,«„éT [frfX,ðE“è,·,é,±,Æ,“%oÄ”,Ä, ,é B
QueryInterface f\fbfh,Í AOLEfIfufWfFfNfg,·,×,Ä,³Ep ³,·,éf f\fbfh,ì,Ð,Æ,Ä,¾,³, A,±,ê,É,æ,è A, ,éfIfufWfFf
Nfg,³fTf| [fg,·,éfCf“f^ [ftfFfCfX,ðE“è,Ä,«„é B,»,ê,ç,ìfCf“f^ [ftfFfCfX,Ö,ìf|Cf“f^,Í,±
,ìf f\fbfh,Ä ì ¬,·,é B Ú × ñ•,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,Â,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 ÍUnknown fCf“f^ [ftfFfCfX, Ì1•”, Å, , é B

IUnknown::QueryInterface

HRESULT QueryInterface(REFIID riid, LPVOID* obp);

fIfufWfFfNfg,“Á’è,ÌCOMfCf“f^ [ftfFfCfX,ðfTf| [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^ [ftfFfCfX,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^ [ftfFfCfXÆÄ—L,ÌfGf% [‘l,Ì,Ð,Æ,Ä,ð•Ö,· BfCf“f^ [ftfFfCfXÆÄ—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^ [ftfFfCfX,É,Ä,¢ ,Ä,Í AQueryInterface f\fbfh,Í ADirect3D•ŮŽ f, [fh,Ì•Ů’l,ÆDirect3D’¼ Úf, [fh,Ì•Ů’l,Ì,Ç,¿,Ç,©,Ð,Æ,Ä,ð•Ö, · B

riid

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

obp

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

,±,Ìf f\fbfh,ðEÄ,Ō,±,Æ,ÄŽæ“¾,µ,½fCf“f^ [ftfFfCfX,ª•—
 v,É,È,Ä,½ ê ‡ AfAfvfŠfP [fVf‡f“ ,Í AfCf“f^ [ftfFfCfX,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^ [ftfFfCfX,Ì•è•”,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, Ĺ•ê•”, 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 Afff ofCfX,ð\
,·fIfufWfFfNfg,Ö,ì,»»,ê,¼,ê,lfCf“f^ [ftFfCfX,Í A Unknown OLEfCf“f^ [ftFfCfX,©,ç,¼ Ú“± o,³,ê,é B,±
,ê,ç,ÌŠî-{"fIfufWfFfNfg,Ì ì ¬,Í ACOMfIfufWfFfNfg ì ¬,É^ê”Ê,É—p,¢
,ç,ê,éWin32,ÌCoCreateInstanceŠÖ ”,æ,è,Í,Ð,µ,è AŠefIfufWfFfNfg,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 AŠefff ofCfX,É,Ð,Æ,Á,ÌŽâ—v,ÈfIfufWfFfNfg,ð’ñ<Ÿ,·,é B¼,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 [fhEfFfAfpfCfBfg,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^ÈfIfufWfFfNfg ¶ ¬,Ì”\—Í,É%Á,¡ AŽâ—
v,Èfff ofCfXfIfufWfFfNfg,Í AfXfNfŠ [f“„lfTfCfY,â F ” AfI [ffBfIfJ [fh,ªEfF [fufe [fuf<fvf“fZfTfCf
U [,ðŽ ,Á,©,Ç,ª,©,Æ,¢,Á,½ AfIfufWfFfNfg,ª\,·fn [fhEfFfAfff ofCfX,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`è`·,·,é,ª AŽÄ‘·,Í`è`¹, AfXfe [fg,İff [f^,ðfCf“f^ [ftfFfCfX,ÉŠÖ`A,Ä,¯,È,¢,İ,Ä, ,é BC++ ,İŠ ŮŠî-{fNf%ofX,Ä,Í A, ,ç,ä,éf f\fbfh,Í AŠÖ`A,·,éfR [fh,ðŽ ,½,È,¢,Æ,¢,ªÖ- j,Ä A f ~%¼'z,Æ,µ,Ä`è`³,è,é B

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

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

COM fIfufWfFfNfg,ÆC++fIfufWfFfNfg,Æ,İŠÖ,İ,à,ª,D,Æ,Ä,İ—DŽ—“_,Í Af f\fbfh,İ Ä % ,İø ”,ª,»),İfCf“f^ [ftfFfCfX,Ü,½,İfNf%ofX,İ-¼‘O,Ä, ,é,±,Æ,Ä, ,é BC++,Ä,Íthis^ø ”,ÆE¾,í,è,é,à,İ,Ä, ,é BCOMfI fufWfFfNfg,ÆC++fIfufWfFfNfg,İŠ@‘S,ÉfofCfifŠÆÝŠ·,È,½,ß AfRf“fpfCf%,ÍCOMfCf“f^ [ftfFfCfX,ðC+ +Š ŮfNf%ofX,İ,æ,ª,Èµ,¢ A““,¶¶@,Ä, ,é,à,İ,Æ%¼‘è,·,é B,±,İCE%oÈ AfR [fh,İ·jŽG,³,ªEyE,³,è,é,İ,Ä, ,é B,½, Æ,İ,İ AC++ ,Ä^ø ”,İthis,Í A,·,Ä,É%ðŽß,³,è,½fppf%of [f^,Æ,µ,Äµ,í,è,ÄfR [fh%»»,³,è, , AVfe [fuf<,ð`È,µ,½s 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,©,çfCf“f^ [ftfFfCfXf f\fbfh,ðCEÄ,Ô,Æ,«,É AŠo,|,Ä,“,×,«Ž-•,ª,Ó,½,Ä, ,é B

f f\fbfh,Ï Ä %
,Ïfpf%of [f^,Í A,Ä,Ë,Éf f\fbfh,ðCEÄ,Ñ o,·,Ä,É ¶ ¬,ª,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,ª,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<<,ª,é,é Ä %
,Ïfpf%of [f^,ª Af f\fbfh,ðN“@,·,é,½,ß,É A,·,Ä,É ï ¬,ª,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\,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 fbfN“]—
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 AfffBfXfvfœFc EfffofCfX,Ö,Ì¼ ÚfAfNfZfX,ð’ñ<ÿ,.,éf\ftfgEfffA 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,É,È“¶,µ,È,ç“Á’èffBfXfvfœFc EfffofCfX<@”
,Ö,ÌfAfNfZfX,ð’ñ<ÿ,.,é,à,Ì,Ä, ,é B

DirectDraw.Í A,ª,Ü,‘,Ü,ÈffBfXfvfœFc 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,ª,è,½,.,x,Ä,Ìfn [fhEfffA EfAfNfZf%ofœ [fVf‡f“,ðŽg,µ,±,Æ,ª,Ä,«,,é,æ,µ,É, Ýœv,ª,è,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,É,È“¶,µ,½fR [fh,ð•K—
v,Æ,.,éfAfvfŠfP [fVf‡f“,Ä,µ,©,Ä,«,,È,©,Ä,½^È%ò,Ì,æ,µ,È~“—,ð AfffofCfX,É,È“¶,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 fbfN“]—,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—Ì^æ,Ö,Ì“~ŽzfAfNfZfX

DirectDraw,Ì—Ú“Í,Í A—{—
^ AfffBfXfvfœFc Ef f,fŠ,Ö,ÌfffofCfX,É,È“¶,.,éfAfNfZfX,ð AfffofCfX,É,È“¶,µ,È,ç•û—@,Ä’ñ<ÿ,.,é,±,Æ,Ä, ,é
BŽ—ŽÄ ä ADirectDraw,ÌffBfXfvfœFc 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—
{“ÍfffofCfX^È“¶ «,ð”FŽ~ ,.,é,¾,_,Ä,æ,ç Bfuf fbfN“]—,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,éf^fCfv,Ìfn [fhEfffA,ªŽ ,Äfuf fbfN“]—,â F L’.,ì<@”
,ðftf<,É’ø,« o,µ,È,ª,ç A,µ,©,âfn [fhEfffA,Ì“Á’è”~È,É,È“¶,.,é,±,Æ,È, A
ffBfXfvfœFc Ef f,fŠ,ðŠÈ’P,É‘É ì,.,é,±,Æ,ª,Ä,«,,é B

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

DirectDrawA [fLfefNf`ff

DirectDraw,Í AfffBfXfvfCfC Ef f,fŠ,ÆffBfXfvfCfC 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,Î,ê,é B
fAfvfŠfP [fVf‡f“,ÍDirectDraw,Ìfn [fhEfFfA EfAfufXfgf%ofNfVf‡f“ EfCfC,, (HAL)
,ð'Ê,¶ A L'·,âfI [fo [fCfC AfefNfXf`ff Ef}
fbfsf“fO A%øñ“] Af~f%o [fŠf“fO,ðŠÛ,b“Æ“Á,ÈffBfXfvfCfC 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’Y

DirectDraw HAL

DirectDraw HEL

DirectDrawfIfufWfFfNfq.îf^Cfy

• Æfsbf`

3D fT [ftfFX,îTf] [fg

DirectDraw,ÆDirect3D,î“ ±

f, [fhXfffBfXfvfÇfC Ef, [fh

fsNfZf< EftfH [f}fbfq

DirectDraw

DirectDraw,Í AfN [fhfEfffA,Æf\ftfgfEfffA'o•û,ÄŽÄ'•,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,Ä,é,é,© A,»,µ,Ä,Ç,Ì<@”\
,²fn [fhfEfffA,Ä'ñ<ÿ,³,é,Ä,é,é,© AŠÈ'P,É'² ,Ä,«,é BDirectDraw,Í A DirectDraw
fn [fhfEfffA EfAfufXfgf%NfVf±f“ EfÆfCf,.(HAL),Ì-B^è,ÌfNf%ofCfAf“fg,Ä,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,«,È,Ç B

DirectDraw,Í A Ddrawf_fCfif~fbfn EfŠf“fn Ef%ofCfuf%ofŠ (DLL),É,æ,Ä,ÄŽÄ'•,³,é,Ä,é B,±
,Ì32frfbfgDLL,Í A DirectDraw,Ì-v< ,.,é,ç'È<@”\,.,×,Ä,ðŽÄ'•,µ,Ä,é,é B,±,IDL,Í Afpf%of [f^,ðŠ@'S,É-
LÆø%»,.,é,ì,à,ç,è,ñ A Win32@,ÆHAL,Ì16frfbfg”•²,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,Ä 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,ÌfIfufWfFfNfg,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,Í**IDirectDraw2**fCf“f^ [ftfFfCfX,ðŽæ“¼,µ,½Cä Afvf%ofCf}
fŠDirectDrawSurfacefIfufWfFfNfg,ð ì ¬,.,é,½,ß Af,fjf^•%oæ-p,ÌfffbfXfvfÆfC Ef f,fŠ,ð<
,**IDirectDraw2::CreateSurface** ffbfh,ðCÄ,Ñ o,¹,é,æ,²,É,É,é B,Û,½ Afvf%ofCf}
fŠ EFT [ftfFfX,©,çAÆ<fŠfXfg•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 Efofbftf@,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 Efofbftf@ EFT [ftfFfX EftfÆ [fÉ,Ö•%oæ,.,é B,±
,é,ÌfffbfXfvfÆfC Ef f,fŠ,ÍDirectDrawSurfacefIfufWfFfNfg,ÉŠi”l,³,é,Ä,é,éèA,ÌfIfxfNfŠ [f“ Efrfbfgf}
fbfv,ðfobfn Efofbftf@,É“]-.,é,±,Æ,É,æ,éŽÄÆ»,.,é BfAfvfŠfP [fVf±f“,Í A'¼'Ö,É•%oæ,µ,½ftfÆ [fÉ
,ð•Ž',.,é,½,ß,É **AIDirectDrawSurface2::Flip** f\fbfh,ðCÄ,Ñ o, B,±
,Ìf ffbfh,Í AfxfNfŠ [f“ if,fjf^ j,ª ,¼•ùCü,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,ðCÄ,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 Efofbftf@,Í ',ç,±
,ÿ<Ö~.Æ,É,é j Bfvf%ofCf}
fŠ EFT [ftfFfX,ª,«Š',.,ç,é,½Cä AfAfvfŠfP [fVf±f“,Ífobfn Efofbftf@,ÉŽÿ,ÌftfÆ [fÉ
,ð \ ¬,µ**IDirectDrawSurface2::Flip**,ðCÄ,Ñ o,.,È,Ç,Ì ^- ,ð±,¯,é B

Windows 3.1 GDIf,fff<,Ä,ÌfffbfXfvfÆfC Ef f,fŠ,Ìftrfbfgf}fbfv,Ö,ì'¼ ÚfAfNfZfX,ð,.,é,ì,Ä,Í,È,ç,ª A
DirectDraw,É,æ,è,»,ÌfpftfH [f]f“fX,ÍCü ä,.,é BŽÄ,Í AGDI,ÌfpftfH [f]f“fX'á%o,Ì ª-“l,È-
vö,Í Afuf fbfn“]-,ð,Û, fVfXfef€ Ef f,fŠ ä,ÄŽÄ s,µ A,»,ÍCé%oÈ,ðfffbfXfvfÆfC 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,©,¬,èfffbfXfvfÆfC EfAf_fvf^ EfJ [fh ä,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,àCü ä,³,¹,é B

'æŽÖ,Ì DirectDrawfIfufWfFfNfg,Í DirectDrawPalette,Ä, é B•-
fffbfXfvfÆfC EfpfÆfbfg,ÍÈ iffbfXfvfÆfC Efn [fhfEfffA“à,ÉŽ ,½,è,é,½,ß A,D,Æ,Ä,ÌfIfufWfFfNfg,É,
æ,è,»,è,ð•,µ'€ ì,.,é,±,Æ,È,È,é B
IDirectDrawPalettefCf“f^ [ftfFfCfX,Í AfpfÆfbfg,ðfn [fhfEfffA ä,ÄŽÄ'•,.,é B,±
,é,ç,É,æ,èWindowsfpfÆfbfg,ÍfofCfpx,³,è AfQ [fÉ
,²fffbfXfvfÆfC 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

ÄCä,Ì DirectDrawfIfufWfFfNfg,ÍDirectDrawClipper,Ä, é B DirectDraw,Í,±
,ÌfIfufWfFfNfg,ðŽg,Ä,Ä AffbfXfvfÆfC 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, éDirectDrawSurfacefIfufWfFfNfg, 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 [fhEfFfA EfAfufXfgf%NfVfzf“ EfCEfCf,, (HAL)
,Í Afn [fhEfFfA,ÉÈ“µ Afn [fhEfFfACEÁ—L,ÌfR [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,ª’èç,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,ÌfR [fh,¾,¯,©,çŽÄ’•,³,ê AfGf~f...fCE [fVfzf“,Í s,í, Afn [fhEfFfA,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,İf^fCfv

DirectDrawIfufWfFfNfg,İffBfXfvfCfC EftfofCfX,đŽ,· BŞe~_— ffbfXfvfCfC EftfofCfX,É'İ,µ; ”,İ
DirectDrawIfufWfFfNfg,đ ì ¬,·,é,±,Æ,ª,À,«,é B
,»,ê,¼,ê“ÆŽ©,İDirectDrawIfufWfFfNfg,İ A,»,İ¼,·,×,Ä,İDirectDrawIfufWfFfNfg,©,ç“Æ—
§,µ,½fT [ftfFfX AfpfCfbbfg AfNfŞfbfp [,È,Ç,İfIfufWfFfNfg,đ ì ¬,·,é B

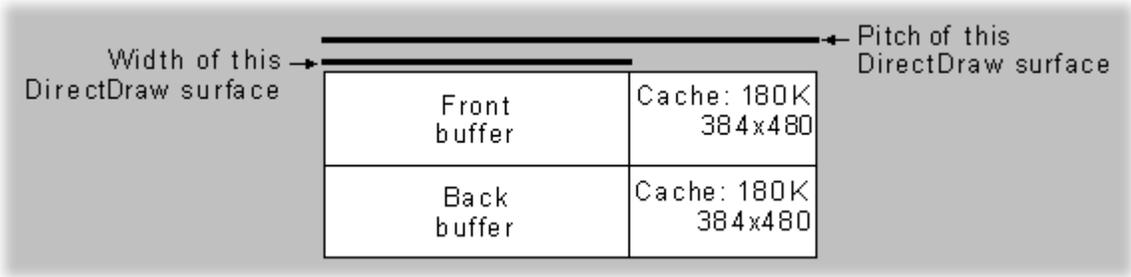
DirectDrawSurfaceIfufWfFfNfg,İ A¼ ÚfAfnfZfX,µ,½,è'€ ì,µ,½,è,À,«,éffBfXfvfCfC Ef f,fŞ,İ'A'±”ª,đ\,
,· B,±,ê,ç,İffBfXfvfCfC Ef f,fŞ,İfAfhfCfX,İ A%ÄŽ<ftfC [f€ Efofbftf@ Ef f,fŞ ifvf%ofCf}
fŞ Eft [ftfFfX j, ,é,ç,İ*s%ÄŽ<fobftf@ ifIfXfNfŞ [f“ Eft [ftfFfX,Ü,½,İfI [fo [fCfC Eft [ftfFfX)
,đŽw,· B*s%ÄŽ<fobftf@,İ'Ê í AffBfXfvfCfC Ef f,fŞ,É í“;·,é B,µ,©,µ Afn [fh ÝCv ã,İ— —
R,©,ç A,Ü,½,İ DirectDraw,ªf\ftfgfEfffA Efgf~f...fC [fvf±f“,đŽÀ s,µ,Ä,ç
,é ê ± AfVfXfef€ Ef f,fŞ ã,É ì ¬,·,é,±,Æ,ª,À,«,é B

DirectDrawPaletteIfufWfFfNfg,İ A16 F,Æ256 F'o·ù,İfCf“ffbfNfX EfpfCfbbfg,đ\,· BfpfCfbbfg,İ A
fefNfXf`ff AfIfXfNfŞ [f“ Eft [ftfFfX AfI [fo [fCfC Eft [ftfFfX,É'İ,µ'ñ<Ÿ,³,é,é B,±
,é,ç,İ,Ç,é,à Afvf%ofCf}fŞ Eft [ftfFfX,Æ“ ,İfpfCfbbfg,đŽ ,½,È,,Æ,ª,æ,ç B

DirectDrawIfufWfFfNfg,İDirectDrawSurface ADirectDrawPalette ADirectDrawClipper,İŞefIfufWfFfNfg,đ ì ¬,·,é
B DirectDrawPalette fIfufWfFfNfg,Æ DirectDrawClipperfIfufWfFfNfg,İ A,»,ê,ª ì—
p,·,éDirectDrawSurface,ÉfA^fbbf,µ,È, ,é,İ,È,ç,È,ç BDirectDrawSurfaceIfufWfFfNfg,İ A
DirectDrawPaletteIfufWfFfNfg,đfA^fbbf,·,é—v< ,đ<”Ü,·,é%Ä”\ «,ª, ,é B'â”ª,İfn [fhEfffA,İ; ”fpfCfbbfg,đf
Tf| [fg,µ,Ä,ç,È,ç,½,ß,Ä A,µ,İ,µ,İ<N,«,é,±,Æ,Æ,µ,Ä' ^Ó,µ,È,,Ä,İ,ç, ,È,ç B

• **Æfsfbf**

ffBfXfvfÆfC Ef f,fŠ,É ‘,«±,Ð,æ,µ,ÈfAfvfŠfP [fVf‡f“,ì ê ‡ Af f,fŠ,ÉŠi”[³,ê,½frfbfgf}fbfv,ÍA±
 ,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”[³,ê,½frfbfgf}fbfv,ìf%ofCf“,ìŽn“_,Æ I“_,Æ,ð•,·f f,fŠ ã,ì“ñfAfhfÆfXŠÖ,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”[³,ê,½frfbfgf}
 fbfv,ìE» Ý,ìf%ofCf“,ìŽn“_,ÆŽY,ìf%ofCf“,ìŽn“_,Æ,ð•,·f f,fŠ ã,ì“ñfAfhfÆfXŠÖ,ì←—£,Á, ,é B
 ,½,Æ,·,ìéE`f f,fŠ,Á,Í AftfBfXfvfÆfC Ef f,fŠ,ìfsfbf“,Í Afrfbfgf}fbfv,ì• fvf%ofX AfLfffbfVf...
 •“•,ðŠÜ,Ð BŽY,ì } ,Í A«éE`f 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“,ìfAfhfÆfX,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 ÚfE`f“f_Šf“fO,·,é,Æ,«,Í A,Á,È,ÉIDirectDrawSurface2::Lock f ffbfh
 (,Ü,½,Í A IDirectDrawSurface2::GetDCf ffbfh),“Ö,·,l,ðŽg—p,·,é B’P f,ÉffBfXfvfÆfC Ef, [fh,ÉŠi,Á,-
 fsfbf“,ð’O’ñ,Æ,µ,Á,Í,È,ç,È,ç B’P,ÉffBfXfvfÆfC Ef, [fh,ÉŠi,Á,-
 fsfbf“,ð’O’ñ,Æ,·,é,Æ AfAfvfŠfP [fVf‡f“,“ffBfXfvfÆfC EfAf_fvf^,É,æ,Á,Á“@,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

feNfXf`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

f~fbfvf}fbfv

DirectDraw,Í Af~fbfvf}fbfv EfefNfXf`ff EfT [ftFfX,ðTf] [fg,·,é B f~fbfvf}
fbfv,ÍfefNfXf`ff,ÍfV [fPf`fX,Á, ,è A,»,è,¼,è,ÍfefNfXf`ff,Í%ð`æ`x,`QŽY`á,,È,é`¬,¶fCf [fW,Á, ,é B
f~fbfvf}fbfv`†,ÍftfBf<f^,ð,©, ,ç,è,½%æ`æfCf [fW,ðfCfxf<,ÆCEÄ,Ñ A,»,Í`á,«,³ÍfCfxf<ŠÖ,Á`ñ æ,İŠÖEW,É, ,
é B ,%ð`æ`x`fCfxf<,Í AŠÍ`aŽÖ,É,ð,çfIfufWfFfNfg,Á—p,ç A
`á%ð`æ`x`fCfxf<,Í AŠÍ`aŽÖ,©,ç,æ,è%ø“,çfIfufWfFfNfg,Á—p,ç,é Bf~fbfvf}
fbfv,Í AfCf`f_Šf`fO,³è,½fefNfXf`ff,Í`iŽç,ðCvü ä,µ ACvŽZ—Ê,ð ß-ñ,·,é,½,ß,ÉŽg—p,·,é B

DirectDraw,Á,Íf~fbfvf}fbfv,Í AfAf^fbf`³,è,½fT [ftFfX,Íf`fF [f“,Æ,µ,Ä^),· B
Ä ,%ð`æ`x,ÍfefNfXf`ff,Íf`fF [f“,Í æ“a,É`u,©,è AfAf^fbf`f f“fg,·,É,í,çŽYfCfxf<,Íf~fbfvf}
fbfv,ðŽ ,Á B,»,ÍfCfxf<,à,Ü,½,³ç,ÉŽYfCfxf<,ðfAf^fbf`f f“fg,Æ,µ,ÄŽ .ç A,»,^µ
,µ,Ä ‡,É A`á%ð`æ`x`fCfxf<,Ü,Ä`±,ç,Ä,ç, B

f~fbfvf}fbfv,Í,PfCfxf<,ð`
,·fT [ftFfX,ð ì ¬,·,é,É,Í AIDirectDraw2::CreateSurface f\fbfh,É`n,·DDSURFACEDESC \`c`ì,ÌDDSCAPS_MIPMAP
ftf%o`O,ðŽw`è,·,é Bf~fbfvf}fbfv,Í,·,×,ÄfefNfXf`ff,Á,à, ,é,½,ß A DDSCAPS_TEXTURE
ftf%o`O,àŽw`è,³è,Á,ç,È, ,è,Í,È,ç,È,ç B IDirectDrawSurface2::AddAttachedSurface f\fbfh
,ðŽg,ç AŠefCfxf<,ðŽ`ø`a,Ä ì ¬,µ,Äf`fF [f“,ð \ ¬,·,é,±
,Æ,^a,Ä,«,é B,µ,©,µIDirectDraw2::CreateSurface f\fbfh,ðŽg,µ,Í A`Sf`fF [f“,ð`è`€ ì,Ä \ ¬,Ä,«,é B

ŽY,Ì—á,Á,Í A fTfCY,^a256`256 A128`128 A64`64 A32`32 A16`16,Ì,T,Ä,Íf~fbfvf}
fbfv EfCfxf<,©,çf`fF [f“,ð \ ¬,·,é è ‡,ðŽ,· B

```
DDSURFACEDESC ddsd;
LPDIRECTDRAW_SURFACE2 lpDDMipMap;
ZeroMemory(&ddsd, sizeof(ddsd));
ddsd.dwSize = sizeof(ddsd);
ddsd.dwFlags = DDSURFACEDESC_DDSURFACECAPS | DDSURFACEDESC_DDSURFACE_MIPMAPCOUNT;
ddsd.dwMipMapCount = 5;
ddsd.ddsCaps.dwCaps = DDSURFACEDESC_DDSURFACE_TEXTURE |
    DDSURFACEDESC_DDSURFACE_MIPMAP | DDSURFACEDESC_DDSURFACE_COMPLEX;
ddsd.dwWidth = 256UL;
ddsd.dwHeight = 256UL;
```

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

f~fbfvf}fbfv EfCfxf<,Ì ”,ð È—^a,·,é,±
,Æ,à,Ä,«,é,^a A,»,Ì è ‡IDirectDraw2::CreateSurface f\fbfh,^afT [ftFfX,Íf`fF [f“,ð ì ¬,·,é B,»,Ì,»,è,¼,è,ÍfT
[ftFfX,Í`OfT [ftFfX,Ì`½`u`^a,Í`á,«,³Ä ì ç,è A%ø`Ä”\,È,©,¬,è,Ì ¬,³,Ü,Ä`±, B• ,Æ ,,³ð È—^a,·,é,±
,Æ,à,Ä,« A,»,Ì è ‡IDirectDraw2::CreateSurface,^a A Ä -fCfxf<,ÍfTfCY,ð1
`1,Æ,·,éŽw`è,µ,½ ”,ÍfCfxf<,ð ì ¬,·,é B

f~fbfvf}fbfv EfT [ftFfX,Íf`fF [f“,Í AIDirectDrawSurface2::GetAttachedSurface f\fbfh,ð—
p,ç DDSCAPS \`c`ì,ÌDDSCAPS_MIPMAP,Æ DDSCAPS_TEXTURE ftf%o`O,ðŽw`è,·,é,±,Æ,É,æ,Á,Ä s,^µ B ŽY,Ì
—á,Í A Ä ,%ð`æ`x,©,ç A`á%ð`æ`x,Ü,Äf~fbfvf}fbfv Ef`fF [f“,ðfgfC [fX,µ,½,à,Ì,Ä, ,é B

```
LPDIRECTDRAW_SURFACE2 lpDDLevel, lpDDNextLevel;
DDSCAPS ddsCaps;
```

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

```

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 AŠÖ`A,.,éfofbfN Efofbftf@ EfefNfXf`ffT [ftfFfX,đŽ ,À BŞefofbfN Efofbftf@ EfefNf
Xf`ffT [ftfFfX,İ Af~fbfvf}fbfv,İ`éf(ƒxf<,ÉfAf^bf`,³,ê,À,ƒ,é B
f`fF [f“,İftf f`fg Efofbftf@,¾,̄,İDDSCAPS_MIPMAP ftf%oO,İfZfbfg,đŽ ,; A,»İ¼,ÍP,È,éfefNfXf`ff Ef}
fbfv,À,é İDDSCAPS_TEXTURE ftf%oO,đŽg,ƒ İ -,³,ê,éfefNfXf`ff Ef}fbfv) B,Đ,Æ,À,İf~fbfvf}
fbfv Ef(ƒxf<,İ AfAf^bf`,³,ê,½fefNfXf`ff Ef}fbfv,đ,Ó,½,ÀŽ ,À,±,Æ,ª,À,«é B,Đ,Æ,À,İf~fbfvf}
fbfv Ef`fF [f“,İŽŸf(ƒxf<,À, éDDSCAPS_MIPMAPfZfbfg A,à,ª
,Đ,Æ,À,İftfŠfbfsf“fO Ef`fF [f“,İfofbfN Efofbftf@,À, éDDSCAPS_BACKBUFFERftf%oO,İfZfbfg,À, ,é BŞef
tŠfbfsf“fO Ef`fF [f“,İfT [ftfFfX,İ A,.,x,À““İftfCfY,À,È,̄,ê,İ,È,ç,È,ƒ B
.±,İ,æ,ª,ÈfT [ftfFfX,İ @—ñ,İ A
IDirectDraw2::CreateSurface f\fbfh,İCEÄ,Ñ o,µ`è%ñ,À,İ \ -,À,«È,ƒ BftfŠfbfsf“fO Ef~fbfvf}fbfv,đ`g,Ÿ—
š,À,é,É,İ A; ‡f~fbfvf}fbfv Ef`fF [f“,đ \ -,µIDirectDrawSurface2::AddAttachedSurface
f\fbfh,É,æ,éfofbfN Efofbftf@,đŽè“@,ÀfAf^bf`,.,é,© A, ,é,ƒ
,İftfŠfbfsf“fO Ef`fF [f“,İfV [fPf“fX,đ İ -,µ,À IDirectDrawSurface2::AddAttachedSurface,É,æ,èf~fbfvf}
fbfv,đ \ -,.,é,±,Æ,È,È,é B

```

Note

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

IDirectDrawSurface2::Flip f\fbfh,İ A—^,;,ç,ê,½f(ƒxf<,©,çf~fbfvf}
fbfv’İ,İ A`áf(ƒxf<,Ü,À A,.,x,À,İf(ƒxf<,đftfŠfbfsf“fO,.,é BftfŠfbfsf“fO æ,İfT [ftfFfX,à`ñ<Ÿ,³,ê,é,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—^,;,ç,ê,½fI [fof%oCfh,Æ`è`v,.,é B,½,Æ,;,İftfŠfbfsf“fOf`fF [f“,İfgfbfvf(ƒxf<,É, ,é,
R”Ö—Ü,İfofbfN Efofbftf@,ªfI [fof%oCfh,Æ,µ,À—^,;,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,ÉŠi”[³,ê,é B
fAfVfŠfP [fVf‡f“,ª **IDirectDrawSurface2::Lock**,Ü,½,İ**IDirectDrawSurface2::GetSurfaceDesc** f\fbfh,đCEÄ,Ñ o,µ,
À)f~fbfvf}fbfv,İfT [ftfFfX EftfXfNfŠfVf^,đŽæ“¾,.,é,Æ,« Afgfbfvf(ƒxf<,đŠÜ,Đf~fbfvf}fbfv,İf(ƒxf< ”,İ
DDSURFACEDESC \ƒ`İ,İ dwMipMapCount f“fo,ªŽ ,À,À,ƒ,é Bf~fbfvf}
fbfv,İfgfbfvf(ƒxf<,ÈŠÖ,İf(ƒxf<,É,À,ƒ,À,İ A dwMipMapCount f“fo,İ A,»İ,İf~fbfvf}
fbfv,©,çf`fF [f“,İ A -f~fbfvf}fbfv,Ü,À,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,Š,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,ÌfIfufWfFfNfg,ð’ñ<ÿ,.,é B,±,ÌfIfufWfFfNfg,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,“%o^”\,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,»,ÌfIfufWfFfNfg,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,Á,ÌfIfufWfFfNfg,ð Ì ¬,µ A,»,ÌfIfufWfFfNfg,É’Î,.,é,Ó,½,Á,ÌfCf“f^ [ftFfCfX,ð“¾,Ä,¢
,é B,µ,½,ª,Á,Á AfIfufWfFfNfg,ÌŽQ ÆfJfEf“fg,Í A **IDirectDraw2::QueryInterface**
f f\fbfh,ÌÆÄ,Ñ o,µÆã,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,»,ÌfIfufWfFfNfg,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,Á 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*ì ”,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

Direct3D fefNfXf`ff,Í“ÆŽ©,ÌfufWfFfNfg^fCfv,Á,Í,È, A DirectDrawSurfaceIfufWfFfNfg,Ì,à,□
,D,Æ,Â,ÌfCf“f^ [ftFfCfX,Á, ,é BŽŸ,Ì—
á,Á,Í ADirectDrawSurfaceIfufWfFfNfg,©,çDirect3DfefNfXf`ff EfCf“f^ [ftFfCfX,ð“¾,Ä,¢,é B

```
LPDIRECTDRAW SURFACE lpDDSurface;  
LPDIRECT3DTEXTURE lpD3DTexture;
```

```
ddres = lpDD->CreateSurface(&ddsd, &lpDDSurface,  
    NULL);
```

```
if (FAILED(ddres))
```

```
·
```

```
·
```

```
ddres = lpDDSurface->QueryInterface(  
    IID_IDirect3DTexture, &lpD3DTexture);
```

```
if (FAILED(ddres))
```

```
·
```

```
·
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ŽQ ÆfJfEf“fg,ÆfXfe [f^fXŽð-½,É,Â,¢,Ä A“~,¶f< [f<,ªDirect3DfefNfXf`ff,É“K—p,³,ê,é(±,ê,ç,Ìf< [f<,Á,¢
,Á,Í A uDirect3Dfhf%ofCfo EfCf“f^ [ftFfCfX v,ðŽQ Æ,·,é,±,Æ) B
,D,Æ,Â,ÌDirectDrawSurfaceIfufWfFfNfg,ðfÆf“f_fŠf“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
,³,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,³,ê,é j B,μ,½,^a,Á,ÄDirectDraw
HEL,Í AfT [ftfFfX,ð3Dfœf“f_Šf“fO,ÉŽg,!,é,±,Æ,ðŽ!,·,½,ß A DDSCAPS 3DDEVICE ftf%ofo,ðfGfNfXf|
 [fg,·,é Bfn [fhfEfffA,ÄfAfNfZf%ofœ [fg,³,ê,½3DffBfXfvfœfC 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}
fŠ EfT [ftfFfX,Ö,Ï’¼ ÚfAfNfZfX,Í,Ä,«,(È,ç B.

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,³,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

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

DDPF_RGB DDPF_ALPHAPIXELS	16	R: 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,ÏftfH [f}fbfg,ðfVfXfef€ Ef f,fŠ ã,É ì ¬,·,é,±
,Æ,^a,Å,«,«,é B3DfAfNfZf%of€ [fVf±f“ EfffBfXfvf€fC EfJ [fh,Ï,½,ß,ÏDirectDrawfffofCfX Efhf%ofCfo,Í Af
fBfXfvf€fC Ef f,fŠ,É¼,ÏftfH [f}fbfg,ð ì ¬,·,é ê ±,^a,é B,»,[□]
,µ,½fhf%ofCfo,Í AfefNfXf`ff,ð ì ¬,Å,«,«,é,±,Æ,ðŽ',·,½,ß DDSCAPS_TEXTURE ftf%ofO,ðfGfNfXf| [fg,·,é B

fIfXfNfŠ [f“ EfT [ftFfX,İftfH [f}fbfg

ŽŸ,İ•,Í A DirectX 3 HEL,³fTf| [fg,·,éIfXfNfŠ [f“ EfVfCE [f“fT [ftFfX,İfsfNfZf< EftfH [f}
 fbfg,đŽ!,µ,Ä,¢,é Bf}fXfN,İ—“Í 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

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

DDPF_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“l,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 AfffBfXfvfCfC Efn [fhEfffA,ð·\,· B
fCf“fXf^f“fX%»»,³,ê,½fftfBfXfvfCfC EfffofCfX,²fn [fhEfffA EfAfNfZf%ofC [fVf±f“,ðŽ ,Â ê ± AfIfuf
WfFfNfg,Ífn [fhEfffA EfAfNfZf%ofC [fVf±f“,ª s,í,ê,é B DirectDrawIfufWfFfNfg,ÍŽOŽi—
p,ÌIfufWfFfNfg,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,µ ê ±,ª, ,é B Windows 95Ž©‘Ì,Í Afff...fAf< Ef,fjf^,ðfTf| [fg,µ,È,¢
,ª AfffBfXfvfCfC EfffofCfX,»,ê,¼,ê,ÉDirectDraw HAL,ð ‘,±,Æ,ª,Â,«,é B Windows
95,ÆGDI,ªFŽ~,·,éfftfBfXfvfCfC EfffofCfX,Í AffftfHf<fg,ÌDirectDrawIfufWfFfNfg,ªfCf“fXf^f“fX%»»,³,ê,é,Æ,
«—p,¢,ç,ê,é,à,Ì,Â, ,è A,»,µ,Â,È,¢fffofCfX,Í A“æ“ñ,ÌfftfBfXfvfCfC EfffofCfX,ÌfOf [fof< Eftfj [fNŽ~•ÈŽq
(GUID),ðŽg,Â,Ä ì ¬,³,ê,½“Æ—§,µ,½,à,µ,D,Æ,Â,ÌDirectDrawIfufWfFfNfg,É,æ,èfAfhfCfX,·,é B,±,Ì
GUID,Í **ADirectDrawEnumerate** ŠÖ ”,ðŽg,Â,ÄŽæ“¼,Â,«,é B

DirectDrawIfufWfFfNfg,Í ì ¬,µ,½fIfufWfFfNfg,·,×,Ä,ðŠÇ— ,µ AffftfHf<fg,ÌfpfCfBfg ifvf%ofCf}
fŠ Eft [ftfFfX,ª8frfbfg/
fsfNfZf< Ef, [fh,Ì ê ± j AffftfHf<fg,ÌJf%o [Efl] Afn [fhEfffA EfffBfXfvfCfC Ef, [fh,ð §Cä,·,
é B,»,µ,Ä,Ç,ÌfŠf\ [fX,ªŠ,,è“—,Ä Ì,Ý,Â,Ç,ÌfŠf\ [fX,ªŽg—p%oÂ”\,©,ð² ,·,·,é B

IDirectDraw2,^a V,μ,É,Á,½,©?

DirectX,^aŽg—p,·,éCOMf,fff,Í A V,μ,¢fCf“f^ [ftFfCfX,Ìñ·ÿ,É,æ,è V,μ,¢@”\,ð’Ç%Á,Á,«,é,Æ,¢,σ“Á’Ÿ
,ð,à,Á,Á,,è A

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

// IDirectDraw2fCf“f^ [ftFfCfX,Ì ì ñ

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,¢,é B,±,Ì ê ± **AIDirectDraw2**

fCf“f^ [ftFfCfX,ð ì ñ,·,é,½,ß,É**IDirectDraw::QueryInterface** f f\fbfh,ð—p,¢,é,±,Æ,É,È,é B,±
,ÌfCf“f^ [ftFfCfX,Í**IDirectDraw2::GetAvailableVidMem** f f\fbfh,ðŠÜ,ñ,Á,¢,é,ª A,±,Ìf f\fbfh,ð**IDirectDraw**
fCf“f^ [ftFfCfX,©,çŽg,·,ª,Æ,·,é,ÆfRf“fpfCf‘†,ÉfGf%o [,” ¶,·,é B

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

fCf“f^ [ftFfCfX,ª ì ñ,³,è,½,Æ,«,É**IDirectDraw2**DrawfCf“f^ [ftFfCfX,É%Á,í,Á,½—B^è,Ìf f\fbfh,Á, ,é
IDirectDraw2::SetDisplayMode,**IDirectDraw2::EnumDisplayModes**,Ì,Ó,½,Á,Ìf f\fbfh,Í
A**IDirectDraw2**,ÉŠÜ,Ü,è,½,Æ,«,É·Ì X EŠg’£,ª,È,³,è,½ j B

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

IDirectDraw2::SetCooperativeLevel f f\fbfh,Æ**IDirectDraw2::SetDisplayMode** f f\fbfh,Æ,Ì·ŠÉÝ ì—

p,Æ,Í,í,,©,É·Ü,È,Á,Á,¢

,é **BIDirectDraw**fCf“f^ [ftFfCfX,ðŽg,¢ AfAfvfŠfP [fVf‡f“,ª **ADDSCCL_EXCLUSIVE**ftf%ofO,ðfZfbfg,μ,Á**Dir**
ectDraw2::SetCooperativeLevel,ðCEÄ,Ñ o,μ,Ä”r¼“I iftf<fXfNfŠ [f“ jf, [fh,ðŽæ“¾ A

IDirectDraw2::SetDisplayMode,ðŽg,Á,Áf, [fh,ð·í,! **ADDSCCL_NORMAL**ftf%ofO,ðfZfbfg,μ**IDirectDraw.Q::SetCoop**

erativeLevel,ðCEÄ,Ñ o,μ,Ä”r¼“If, [fh,ð%ð·ú,μ,½ ê ±,ÉfIfŠfWfif<,ÌffBfXfvf¢fC Ef, [fh,ª·æE³,³,è,È,¢,Ì,Á, ,

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

DirectDrawIfufWfFfNfg,ª í æ,³,è,é,Ü,Á,Í A V,μ,¢ffBfXfvf¢fC Ef, [fh,Ì,Ü,Ü,Æ,È,é B

,μ,©,μ **AIDirectDraw2**fCf“f^ [ftFfCfX,ðŽg,Á,Á,¢,é ê ± AfAfvfŠfP [fVf‡f“,ª—Ì,ÌfXfefbfv,ð“Ÿ

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

V,μ,¢fCf“f^ [ftFfCfX,ÌfŠfŠ [fX,Æ,Æ,à,É A]—^,Ìf f\fbfh,ª,¢,-

,Á,©·í X,³,è,é B,»,Ì,½,ß AfCf“f^ [ftFfCfX Ef f\fbfh,Ì V<¢fo [fWf‡f“ i,½,Æ,!,Í **IDirectDraw**,Æ

IDirectDraw2 j,ð ñ—p,·,é,Æ A—\zŠO,ÌE<%oÈ,ðø,«<N,±

,· B“Á”è,Ìfo [fWf‡f“,ÌfCf“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•Ö,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,Ï 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,ªŽ,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„^aÍ X„³,é,é,Æ A fffBfXfvfCfC Ef f,fŠ,ÉŠi”[„³,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%»„³,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“%„ç„é,é B

GDI,Í A DirectDraw,ŠÇ— ,·,éffBfXfvfCfC Ef f,fŠ ä,ÍftfHf“fg Afuf%ofV A fffofCfX^È“ffrfbfgf} 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...,³,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,ÄffBfXfvfĈfC Ef, [fh,đ•Ī X,·,é,±,Æ,ª,Á,«,«,é B ^ê-‡,ĪffBfXfvfĈfC EfJ [fh,đ<□—L,μ,Á,Ĉ,é,©,-,è A,·,×,Ä,ĪfAfvfŠfP [fVf‡f“,ªf, [fh,đ•Ī X,Á,«,«,é B

ffBfXfvfĈfC Ef, [fh,ĪsfNfZf< [“x,Ī A DirectDrawIfufWfFfNfg,Ō,Ī”r¼“IfAfNfZfX,ªŽæ“¾,Á,«,½ ê ‡,É,¾,- AfAfvfŠfP [fVf‡f“,©,ĈĪ X,Á,«,«,é Bf, [fh,ªĪ X,³,è,é,Æ A,·,×,Ä,Ī DirectDrawSurfaceIfufWfFfNfg,ĪfT [ftfFfX Ef f,fŠ,đŽ,,Ĉ“Ĉ ìs”\,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,Ĉ B

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

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

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

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

```
2 CoCreateInstance,ÄIDirectDraw2::Initialize  $f$   $f\backslash bfh$ ,đŽg,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, μ † 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,İ**DirectDraw** fCf“ f^{\wedge} [f tFfCfX,đŽ·É,· \acute{e} B
lpddfpf%of [f^{\wedge} ,Í AŽæ“ $\%4$, \cdot , \acute{e} , \acute{e} **DirectDrawIfufWfFfNfg**,đŽw,· B CEÄ,Ñ o, μ , \acute{a} \neg CE \ddagger , \cdot , \acute{e} ,Ä A, \pm
İŠÖ ”,Í %Šú%», \cdot , \acute{e} ,Ä,c,È,c f IfufWfFfNfg,đ·Ö,· B

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

$fAfvfŠfP$ [$fVf\ddagger f$ “,đ·Ä,¶,é·O,É A **CoUninitialize** ŠÖ ”,đŽg,Ä,ÄCOM,đ $fVfffbfgf_fEf$ “, μ ,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,ç,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,ÌfT [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,ÌfT [ftFfX,ì ¶ äŠp A,à,ª
,Ð,Æ,Á,ÌfT [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,Ìfn [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,ÉfAf^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
fAf^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

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 ADirectDawClipperfIfufWfFfNfg,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, δ —p,¢,½**DirectDrawClipperIfufWfFfNfg**,Ī ì ñ

```
DirectDrawClipperIfufWfFfNfg,Ī ACOM,Æ,ĪEÝŠ· «,Ī,½,B,ÉfNf%ofX Eftf@fNfgfŠ,ðŠ@‘SfTf|
 [fg,·,é B,³,ç,É A·W €“Ī,È DirectDrawCreateClipper ŠÖ ”,Æ IDirectDraw2::CreateClipper f f\fbfh,ðŽg,±,±
,Æ,É%Á,Ī ACoGetClassObject
ŠÖ ”,ðEÄ,ÑfNf%ofX Eftf@fNfgfŠ,ð“¼,Ä,©,çCoCreateInstanceŠÖ ”,ðEÄ,Ñ o,·,© A, ,é,¢,Ī¼ Ú
CoCreateInstance,ðEÄ,Ñ o,·,±,Æ,É,æ,Á,Ä ADirectDrawClipperIfufWfFfNfg,ð ì ñ,·,é,±,Æ,ª,Ä,«,é B`È%°,Ī—p—
á,Ī 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,ĪEÄ,Ñ o,µ,Ä,Ī A Ä %
,Īpf%of [f^CLSID_DirectDrawClipper,Ī ADirectDrawClipperIfufWfFfNfg EfNf%ofX,ĪfNf%ofXŽ·ÊŽq,Ä, ,é BII
D_IDirectDrawClipperpf%of [f^,Ī AÆ» ÝfTf| [fg,³,é,Ä,¢
,éCf“f^ [ftfFfCfX,ðŽ·Ê,µ AlpClipperpf%of [f^,Ī AŽæ“¼,³,é,½DirectDrawClipperIfufWfFfNfg,ðŽw,· B

fNf%ofX Eftf@fNfgfŠ,Īf fJfYf€,É,æ,Ä,Ä ì ñ,³,é,éDirectDrawClipperIfufWfFfNfg,ðŽg—
p‘O,É %Šú%»,·,é,½,B,É AfAvfŠfP [fVf±f“,Ī IDirectDrawClipper::Initialize f f\fbfh,ðŽg,±,±K—v,ª, ,é B
OUL,Īl,ĪdwFlagpf%of [f^,Ä A,±,Ī ê ‡,Īftf%ofO,ªE» ÝfTf| [fg,³,é,Ä,¢,É,¢,½,ß'l,ĪO,Æ,È,é B—p—á,Ä,Ī A
lpDD,ĪDirectDrawClipperIfufWfFfNfg,ð Š—L,·,éDirectDrawIfufWfFfNfg,Ä, ,é B,µ,©,µ A‘ä,í,è,ÈNULL,Īl,ðŽw`è
,·,é,±,Æ,à,Ä,« A,»,±,·,é,Æ“Æ—š,µ,½ DirectDrawClipperIfufWfFfNfg,ª ì ñ,³,é,é i,±,é,ĪDirectDrawCreateClipper
ŠÖ ”,ðŽg,Ä,ÄDirectDrawClipper,ð ì ñ,·,é,±,Æ,Æ““,Ī,Ä, ,é j B

fAvfŠfP [fVf±f“,ð I—,·,é‘O,ÉCoUninitialize 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,ìfpfEfbfg,ì Ý`è

fpfEfbfg,ì<□—L

fpfEfbfg_Ef^fCfv

DirectDrawPalettefIfufWfFfNfg

DirectDrawPalettefIfufWfFfNfg,Í A16 F,Æ256 F,ÌfpfŒfbfg,ð¼ Ú‘€ ì,Á,«é,æ,µ,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,Á,Ìfe [fuf<,Æ,µ,Ä’¼ Ú‘€ ì,Á,«é BfJf%o [Efe [fuf<,ÍfJf%o [l îê”Ê,É,ÍRGB
ŽOĚ´ F j,Ì”z—ñ,Á, ,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 ,Á,±,Æ,ª,Á,«é B

fAfvfŠfP [fVf‡f“,Í A **IDirectDrawPalette::GetEntries** f f\fbfh,ðŽg,Á,Ä,±
,é,ç,Ìfe [fuf<^,ÌfGf“fgfŠ,ðŽæ“¾,Á,«é B,Û,½ A **IDirectDrawPalette::SetEntries** f f\fbfh,ðŽg,Á,Ä A,±
,é,ç,ÌfGf“fgfŠ,ð•Í X,·,é,±,Æ,à,Á,«é B,±,Ìf f\fbfh,Í A fpfŒfbfg,Ö,Ì•Í X,ª,ç,Ä”Œø,·,é.©Žw`è,·,édwFlags
fpf%of [f^,ðŽ ,Á 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,Á,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,Á, ,é B,±,ê,É,Í**IDirectDrawPalette::SetEntries**
f f\fbfh,ð^è%oñŒÄ,Ñ o,¹,Í,æ,ç B,à,µ,Ð,Æ,Á,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,±,ê,Í **IDirectDrawSurface2::SetPalette** f f\fbfh,ðŽg,Á,Ä s,µ,±,Æ,ª,Á,«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,ê,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,ðfCf“fNf
Šf f“fg,·,é BfT [ftfFfX,ÏŽQ ÆfJfEf“fg,³0,É,È,é,Æ AfT [ftfFfX,ÏfAf^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,Ï“è“x,µ,©fcf“fNfŠf f“fg,³,ê,È,ç B`A‘±
,·,éEÄ,Ñ o,µ,Í AfpfCEfbfg,ÏŽQ ÆfJfEf“fg,É%œ<ç,ð—^,Ï,È,ç,Ï,Ä, ,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.

,Û,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,ìPAL
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,Û,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,·,Û,¤,ª,–],Û,µ,¢ B ,»,ì,Æ,«IDirectDraw2::CreatePalette
f f\fbfh,đŽg,¤ ê ‡,Í A LPPALETTEENTRYE^,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,ĪŽY,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

ŽY,ĪfgfsfbfN,Ī Afvf%oCf}fŠ EfT [ftfFfX,â”Ē“Ē,Ē,ĒWindows,ĪfEfBf“fhfE,đ ĩ ¬ĒoĒ±,ª, ,é,±
,Æ AWindows,ĪfFfXfNfgfbfv,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,ĪŽY,Ī3,Ā,Īf^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<ÖŽ~,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,Ē,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,ĀfAfvfŠfP [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,đfAfvfŠfP [fVf‡f“,ªŽw’è,μ,½ Ī ± A
Windows,Ī¼fAfvfŠfP [fVf‡f“,ª— fPfCEfbfg,đ•— fPfCEfbfg,Éf}fbfv,·,é,±,Æ,đ<ÖŽ~,·,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,·,Ē,ç
,æ,□,Ē,μ,Ā,ç,é B

,Ū,Æ,β,é,Æ A **PALETTEENTRY** \‘c‘Ī,Ē,ĪÈ%°,Ī,æ,□,Ē3,Ā,Īf^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)


```

\^,Á,«,È,¢ B ],Á,Ä”ñ”r¼“I ifEfBf“fhfE jf, [fh,Á,ìWindows Á“IfGf“fgfŠ,Ö,ì Ý’è,Í,·,é,×,«,Á,Í,È,¢ B—B^è,ì
—áŠO,Í A256fGf“fgfŠ,ð,·,×,ÁfŠfZfbfg,·,é ê ‡,Á, ,é BfpfEfBfbfgAfjf [fVf‡f“,Á,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,Á, ,é B,»,ì,æ,µ,È ¬,³,¢fTfufZfbfg,ðfŠfZfbfg,·,é ê ‡,Í A
PC_NOCOLLAPSE,Æ PC_RESERVED ftf%oO,Áf} [fN,³,è,½fGf“fgfŠ,¾,¬,ðfŠfZfbfg,µ,È,-
,Á,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,Á,¢,é B

```

```

LPDIRECTDRAW          lpDD;           // , ,ç,©,¶,ß %oŠú%o»,³,è,Á,¢,é
PALETTEENTRY pPaletteEntry[256]; // , ,ç,©,¶,ß %oŠú%o»,³,è,Á,¢,é
LPDIRECTDRAWPALETTE lpDDPal;         // , ,ç,©,¶,ß %oŠú%o»,³,è,Á,¢,é
int                  index;
HRESULT              ddrval;
PALETTEENTRY        temp;

```

```

// ,¢,,Á,©,ìfGf“fgfŠ,ðfAfjf [fVf‡f“,·,é B,Í,¶,ß,ì16,ì~—p,Á,«,é
// fGf“fgfŠ,ð zŠÁ,³,1,é B,±,è,È,æ,Á,ÁfAfjf [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^,Á,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 ,Á,È,¬,è,Í,È,ç,È,¢
    10, // Á %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, ° 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, Ì•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<@”\,Á Á ,ÌfpftfH [f]f“fX,ª“¾,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,Á,È, A·Á s,µ,ÄfVfXfef€,ÏCPU,Éf^fXfN,ðŽÁ 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”\
,Á, ,é B GDI,Í A,±
,ê,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,É’Í,µ,Ä—LÇø,Æ,È,é B

IDirectDrawSurface2,^{Á%½,ª} V,µ,È,Á,½,©?

DirectX,^{žg,COMf,ff<,Í} A V,µ,¢fCf“f^ [ftFfCfX,ìñ<ÿ,É,æ,è V<@”,^{ªÇ%Á,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,¢fCf“f^ [ftFfCfX,Í **IDirectDraw::QueryInterface** f\fbfh,ðŽg,Á,Á“¾,é,±,Æ,^ªÁ,«^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,¢f 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,¢,é B

ft [ftFfX,] i -

DirectDrawSurfaceIfufWfFfNfg, í AfT [ftFfX ifsfNfZf<f f, fš j, ð^E», ., é BfT [ftFfX, í Ê iftfBfXfvfCfC Ef f, fš, É í““, µ, Ä, Ç, é, á AfBfXfvfCfC Ef f, fš, á Á”i, 3, é, ½ ê ‡, â- ¼Ž, “I, ÉfšfNfGfXfg, 3, é, ½ ê ‡ AfVfXfef€ Ef f, fš, É, à“¶ Ý, ., é, ±, Æ, %oÄ”, Ä, , é Bfn [fhfEfFfA, a—v< , 3, é, ½” —Í, ðfTf] [fg, Ä, «, 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, í Ê í A, D, Æ, Ä, ÌDirectDrawSurfaceIfufWfFfNfg, ð i -, ., é B **DDSCAPS** \“ç, Ì, ÌdwCapsf f“fo, ÌDDSCAPS_FLIP ftf%o, aZfBfg, 3, é, Ä, Ç, é ê ‡ A **IDirectDraw2::CreateSurface** f f\fbfh, í, Ç, ©, ÌDirectDrawSurfaceIfufWfFfNfg, ð i -, ., é B, », é, Ç, í, Ü, Æ, ß, Ä, j #fT [ftFfX, ÆEÄ, Í, ê A, Ü, ½’Ç%oÁ, µ, Ä i -, 3, é, ½fT [ftFfX, í ÄŽ, “IfT [ftFfX, ÆEÄ, Í, é, é B ÄŽ, “IfT [ftFfX, Íf^fbf^, ., é, ±, Æ, a, Ä, «, É, Ç B Ú ×, í A **IDirectDrawSurface2::DeleteAttachedSurface**, ðŽQ Æ, ., é, ±, Æ B

, Ü, ½ Afvf%oCf}fš EfT [ftFfX, æ, é L, ffBfXfvfCfC Ef f, fš EfT [ftFfX, ðŽæ, é, ±, Æ, í, Ä, «, É, Ç B òÈ%o, í A—LÇø, ÈfT [ftFfX i -, ÌfVfifšfI—á, Ä, , é B

fVfifšfI 1

fvf%oCf}fš EfT [ftFfX, í AE» Ýf† [fU, ÉÇE, “, Ä, Ç, éfT [ftFfX, Ä, , é Bfvf%oCf} fš EfT [ftFfX, ð i -, ., é, Æ, «, É, í AGDI, aŽg—p, µ, Ä, Ç , éšÜ“¶, ÌfT [ftFfX, ÉfAfNfZfX, ., é, ½, B ADirectDrawSurfaceIfufWfFfNfg, ð i -, ., 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“““¶ŽYÇ³, 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 i -, ÉšÖEW, ., é**DDSURFACEDESC** \“ç, Ì (òÈ%o, Ìddsd), Ìf f“fo, a ‘, «, ± , Ü, é, é B

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

// , Ç, Ìf f“fo, a—LÇø, ©DirectDraw, É”m, Ç, l, é
ddsd.dwFlags = DDSD_CAPS;

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

fVfifšfI 2

fuf fbfNf”—fn [fhfEfFfA, a \ -, ., éfrfbfgf}fbfv, ÌLfffbfVf... , ÉŽg, í, é, é’P f, ÈfIfXfNfš [f“ EfT [ftFfX, ð i -, µ, Ä, Ý, é B fvf%oCf} fš EfT [ftFfX—ÈšÖ, Ì, ., ×, Ä, ÌfT [ftFfX, Ä, í A , , 3, Æ• , ðÇ, ß, é, K— v, a, , é B, ., é, ÆfIfXfNfš [f“ EfT [ftFfX i -, ÉšÖEW, ., é **DDSURFACEDESC** \“ç, Ì (ddsd below), Ìf f“fo, a ‘, «, ±, Ü, é, é B

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

// , Ç, Ìf f“fo, a—LÇø, ©DirectDraw, É”m, Ç, l, 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, ðfBfXfvfCfC Ef f, fš, É i -, ., é B, µ, ©, µfffBfXfvfCfC Ef f, fš, É“ü, è, «, Ç, È, Ç ê ‡, É, í AfT [ftFfX, ÌfVfXfef€ Ef f, fš, É i -, 3, é, é B, ±, Ì, Æ, «**DDSCAPS** \“ç, Ì, ÌdwCapsf f“fo , É, í AfT [ftFfX, ðfVfXfef€ Ef f, fš, Ä i -, µ, È, , è, Ì, È, Ç, È, Ç ê ‡, É, ÌDDSCAPS_SYSTEMMEMORYftf%o, ð AfBfXfvfCfC Ef f, fš, Ä i -, µ, È, , è, Ì, È, Ç, È, Ç ê ‡, É, ÌDDSCAPS_VIDEOMEMORYftf%o, ð A, », é, ¼, éŽg—

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

DirectDraw,à;· ‡fT [ftFfX,ð ì ¬,·,é,±,Æ,³,Ä,«,é B;í ‡fT [ftFfX,Í A **IDirectDraw2::CreateSurface**
f f\fbfh,ð^è"xCEÄ,Ñ o,·,±,Æ,Ä ì ¬,³,ê,é fT [ftFfX,ÍfZfbfg,Ä, ,é B

IDirectDraw2::CreateSurface,ìCEÄ,Ñ o,μ,ÄDDSCAPS_COMPLEX ftf%o fO,ªfZfbfg,³,ê,Ä,«,é ê ‡ AŽw'è,μ,½-
¾Ž,í fT [ftFfX,ì¼,É,Ð,Æ,Ä^È ã,Ì^ÄŽ,í 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%o fCf}

fŠ EfT [ftFfX,ÆfT [ftFfX EftfŠfbfsf"foŠÄ««,ðCE` ¬,·,é,Ð,Æ,Ä^È ã,ìfobfN 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,ìfobfN Efofbftf@,Æ,Æ,à,Éfvf%o fCf}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%o fCf}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,ìfobfN 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::Unlockf 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,İ,·,×,Ä,İft [ftFfX,²ftfŠfbfsf“fO Eft [ftFfX,Æ,µ,Ä—p,Ä,«é B
ftfŠfbfsf“fO Eft [ftFfX,İ Aftf f“fg Efofbftf@,ÆfofbfN Efofbftf@ŠÖ,ÄfXf fbfv,³,é,éf f, fŠ,İ”CÓ,İ”²,
Ä,·,é B ftfŠfbfsf“fO Eft [ftFfX,Æ,µ,ÄDirectDrawft [ftFfX,ð \z,·,é,±,Æ,İ A]—
^,İEÄ,ç,é,½fy [fWftfŠfbfsf“fO,İ 1,ı,ü,É”ä,×½,İ—“_,²,·,é B

fAfvfŠfP [fVfþf“,²ftfŠfbfsf“fO€ İ,İ—v,·,é **İDirectDrawSurface2::Flip** f\fbfh,ðŽg,µ
,Æ,« AftfŠfbfsf“fO,³,é,éDirectDrawSurface1fufWfFfNfg,ÆŠÖ”A,Ä,·,ç,é,½ft [ftFfX Ef f, fŠ—
İæ,İ Ø,è,Ö,ı,ç,é,é BftfŠfbfsf“fO,³,é,éDirectDrawSurface1fufWfFfNfg,ÉfA f^fbf`,³,é,½ft [ftFfX,É,İ%œç,µ,È,ç
B,½,Æ,ı,İf_fuf<fofbftf@,İ ó”Ö,Ä,İ AfobfN Efofbftf@,É·%œ,·,éfAfvfŠfP [fVfþf“,İ,Ä,È,É”“İDirectDrawSur
face1fufWfFfNfg,ðŽg—p,·,é B

İDirectDrawSurface2::Flip,²fŠfNfGfXfg,³,é,½,Æ,« AfIfufWfFfNfg%°,İft [ftFfX Ef f, fŠ,İ A’P,Éftf f“fg E
fofbftf@,Ö Ø,è,Ö,ı,ç,é,é B

ftf f“fg Efofbftf@,²%ÄŽ,Ä,·,é,İ A,»é,İfvf%ofCf}fŠ Eft [ftFfX,Ä,·,é,©,·,é,ç
İE» Y%ÄŽ,İfi [fo [fEfc,Ä,·,é,½,ß AfobfN Efofbftf@,ðİ Ü,Æ,·,é **İDirectDrawSurface2::Lock**, Ü,½,İ **İDirect
DrawSurface2::Bltf** f\fbfh,ð”A’±,µ,ÄEÄ,Ñ o,·,Æ AZÿ,İ ,¼·üEü,İfŠftfÆfbfVf...,²N,±,é,Ü,Ä,İŠÖŽ,”s,µ A
DDERR_WASSTILLDRAWING,ð”Ö,· B,±

,é,İ Aftf f“fg Efofbftf@,İÈ”Ö,İf f, fŠ,² AfobfN Efofbftf@,É,à,µfA f^fbf`,³,é,Ä,ç,È,ç
,É,à,©,ı,ç,·, A,È,“fn [fhE fFfA,É,æ,è”“— ffbfXfvfÆfc,É·%œ,³,é±,·,é,½,ß,ÉN,±,é B,±
İ ó”Ö,İ AZÿ,İ ,¼·üEü,İfŠftfÆfbfVf...”t,É Ä—Ä,·,é B”
fffbfXfvfÆfc,ð X V,·,éfn [fhE fFfA,² AfŠftfÆfbfVf...
²,Æ,ÉfffbfXfvfÆfc Ef f, fŠ,İ”z’u,ð”Ç,ÿ ž,ÿ¼,µ,Ä,ç,é,©,ç,Ä,·,é B

,±,İ,æ,µ,È”“— “İ,ÈE”“ö,©,ç A%ÄŽ<ft [ftFfX ä,İ **İDirectDrawSurface2::Flip** f f\fbfhEÄ,Ñ o,µ,İ”n“ŠúRf}
f“fh,Æ,È,é BfQ [fE,ð İ,é,Æ,«,İ Af f\fbfh,²EÄ,İ,é,½Eä,ÄfQ [fE,İ,·,×,Ä,İ·s%ÄŽ<—v’f,ðŽÄ s,·,×,«Ä,·,é B,½,
Æ,ı,İ A”ü—İ,äfi [ftfBfi AfQ [fE,İfvfÆfc A,»,µ,ÄfVfXfefE Ef f, fŠ·%œ”€ İ,Š@—
¹,µ,Ä,ç,ç A%ÄŽ<fofbfN Efofbftf@,Ö,İfAfnfZfXŽæ”¼,ð—v,·,é·%œf^fXfN,ð,İ,İ,ß,é,±,Æ,²,Ä,«é B

fAfvfŠfP [fVfþf“,²fEfbf“fhfE,Ä”@,·K—v,²,·,é A,È,“ftfŠfbfsf“fOŠÄ<<,ð—
v,·,é,È,ç AftfŠfbfsf“fOfl [fo [fEfc Eft [ftFfX,İ İ ñ,ðŽŽ,ÿ,é Bfn [fhE fFfA,²fi [fo [fEfc,ðftf]
[fg,µ,Ä,ç,È,·,Ä,à Afy [fW,ðftfŠfbfsf“fO,·,éfvf%ofCf}fŠ Eft [ftFfX,ð İ ñ,·,é,±,Æ,²,Ä,«é B
ft [ftFfX,²fvf%ofCf}fŠ,É,È,è,è,µ,Ä,ç,é,Æ,«ÉGDI,²,»İft [ftFfX,É,Ä,ç,Ä İñ,ðŽ ,Ä,Ä,ç
,È,·,é,İ AGDI,² ‘,«±,ñ,Ä,ç,éfvf%ofCf}fŠ Eft [ftFfX,İ”t g,ð%ÄŽ,É,È,è,µ,Ä,ç
,éfofbftf@,Öfuf fbfN”İ—,·,é,±,Æ,²,Ä,«é Bfuf fbfN”İ—,İ”n“Šú,ÉŽÄ s,³,é,é,½,ß A,±
,İf^fXfN,İŽŽŠÖ,²,©,©,é,Æ,µ,Ä,à,Ü,ñ,İ,ı,·,©,Ä,·,é B,µ,©,µ A
fy [fW,²ftfŠfbfsf“fO,³,é,éEfbf“fhfE,İftfCfY,ÆfXfNfŠ [f“%ð”œ”x,ÉÈ”İ,·,éfuf fbfN”İ—
,İfof“fh· ,Æ,ð,©,È,è Ä”ı,·,é BftfÆ [fEfc [fg,²0fps,ð%œñ,ç,È,ç,©,·,è,İ AGDI,² ³,µ,“@ İ,µ,Ä,ç,é,æ,µ
,ÉE©,ı,é,Ä,·,é,µ B

DirectDrawIfufWfFfNfg,ðfCf“fXf^f“fX%œ”,·,é”Ö,É AGDI,İ AZ© g,İ·Ž’,ÉfffbfXfvfÆfc Ef f, fŠ,ð,·,Ä,ÉŽg,Ä,
Ä,ç,é Bfvf%ofCf}fŠ Eft [ftFfX,ðfCf“fXf^f“fX%œ”,·,é,½,ß,É
DirectDraw,ðEÄ,Ñ o,·,Æ,« A,»İft [ftFfX,İf f, fŠAfhfÆfX,İ AGDI,²E» ŸŽg,Ä,Ä,ç,é,à,İ,Æ”“İ,Ä,·,é B

fofbfN Efofbftf@,Ä,ı, þft [ftFfX,ð İ ñ,·,é è þ,İ AGDI,İ A,Ü,·,fvf%ofCf}
fŠ Eft [ftFfX,İ,½,ß,İfffbfXfvfÆfc Ef f, fŠ,ðŽv,· BGDİ,İDirectDraw,æ,èEÄ,ç
,½,ß ADirectDraw,İ”@ İ,ð”m,é,±
,Æ,²,Ä,«É,ç B,µ,½,²,Ä,ÄGDI,İ A,½,Æ,ı,ftfŠfbfsf“fO,³,é·s%ÄŽ<fofbfN Efofbftf@,É,È,Ä,½,Æ,µ,Ä,à A,±
İft [ftFfX,ð”€ İ,µ,±,·,é B

¼,İfAfvfŠfP [fVfþf“,İ A’SfXfNfŠ [f“·ð·ç,µ”ä,ÈEfbf“fhfE,ð İ ñ,·,é,±,Æ,©,ç ^—
,ðŽn,ß,é BfAfvfŠfP [fVfþf“,²fAfnfefBfu,Ä A,©,ÄftfH [fJfX,ðŽ ,Ä,©,·,è A
GDİ,İfofbftf@,İRfS [,ð ‘,«±,Ü,È,ç BGDİ,²Rf”fgf [fç,·,é,à,İ,İ Ä·%œ,ð”K—v,Æ,µ,È,ç,©,ç,Ä,·,é B

¼,İfVfiŠfi,Ä,İ AGDI,İfİfŠfwfifç,Èft [ftFfX,İ İñ,µ,©Ž ,½,·, ACE» Ÿfvf%ofCf}
fŠ Eft [ftFfX,È,İ,©fofbfN Efofbftf@,È,İ,©,Æ,ç,µ İñ,ðŽ ,½,È,ç,±,Æ,ðŽv,ç o,µ,Ä,Ü,µ,ç B
GDİfXfNfŠ [f“·s—v,È,ç A ä q,İfefNfjfbfN,Žg,ı,é BGDİ,²K—v,Ä,·,é,İ AZÿ,É,°
,éfefNfjfbfN,ðŽŽ,µ,Ä,ÿ,é,±,Æ,²,Ä,«é B

- 1 fofbfN Efofbftf@,ð,Ö,½,ÄŽ ,Äfvf%ofCf}fŠ Eft [ftFfX,ð İ ñ,·,é B
- 2 %Šúfvf%ofCf}fŠ Eft [ftFfX(GDİft [ftFfX),ð”ŠÖfofbfN Efofbftf@,Éfuf fbfN”İ—,·,é B
- 3 GDİ,ð”Ö,İ è Š,É”u,ç,Ä %ŠúRfs [,ð%ÄŽ<%œ”,·,é,½,ß AlpDDSurfaceTargetOverride
fpf%of [f^,ðNULL,ÉfZfbfg,µ,Äft [ftFfX,ðftfŠfbfsf“fO,·,é B

,±,ê,ð s,î AGDIfofbftf@,©,ç'†ŠÓfofbftf@,ÖfRfs [,ª,À,« A,»ìfofbftf@ ä,Åf† [fU,ÉÉ©,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%øð•ú, ·, ·é•K—v,ª, È, ¢
, È, àŠÖ, í, ç, · A DirectDrawSurfaceIfufWfFfNfg, ÆŠÖ~A, Æ, ¯, ç, è, ½fT [ftfFX Ef f, fŠ,ª%øð•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%øð•ú, µ, ½, è, µ, ½ ê ± AfT [ftfFX, ÌŽ, ·, í, è, é B

IDirectDrawSurface2::Restore f f\fbfh

, Ì ÁŽ, ·, 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,ðfŠfNfGfXfg,·,é,½,ß,É

IDirectDrawSurface2::GetPixelFormat

f f\fbfh,ðCEÄ,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,ð\,· ê ‡ ADDPF_YUV ftf%oO,àfZfbfg,³,ê A dwYUVBitCount,ÆdwYBits A dwUBits A
dwVBits AdwYUVAAlphaBitsf f“fo,³fsfNfZf<,©,ç îñ,ð`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,ð`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,ð, ,ç,í,µ A,à,ª,Đ,Æ,Ä,Í Afn [fhfEfFfA,İfI [fo [fCEfC”\—İ,ð, ,ç,í,· 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,ê,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,ê,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,é,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,é,é B

,ç,,Á,©,Ìfn [fhEfffA,Í AYUVfsfNfZf< Eff [f^,Ì,½,B,Ì Fæ,¾,“]‘—,ðfTf] [fg,·,é B YUVff [f^,ÍÊ ì,Ífrrffl,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,é,é BfT [ftfFX,³pfCfbfg%»³,é,½ftfH [f}fbfg,Á, ,é ê ± A fJf% [EfL [,Í AfCf“fffbfNfX,Û,½,ÍfCf“fffbfNfX^æ,Æ,µ,ÁŽw’è,³,é,é BfT [ftfFX,ÌfsfNfZf< EftfH [f}fbfg,³YUV ftfH [f}fbfg,ðL q,·,éFOURCCfR [fh,É,æ,èŽw’è,³,é,Á,ç,é ê ± AYUV fJf% [EfL [,Í A **DDCOLORKEY** ‘ç’ì.

,ÌdwColorSpaceLowValue f“fo,ÆdwColorSpaceHighValue f“fo’o’û,Ì%o°Ê³fofCfg,ÁŽw’è,³,é,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,é,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 [fCfCZfI [f_ [

fI [fo [fCfCZfI [f_ [,Í AfI [fo [fCfC,°EY,¢,ÉfNfŠfbfsf“fO,µ ‡,µ ‡”Ô,ðE”è,·,é B,±
,é,É,æ,èDirectDraw%°,lfn [fhfEfFFA EfXfvf%ofCfG EfVfXfef€ŽĀ“•,°%oĀ”\
,É,È,é BfI [fo [fCfC,Í A¼,ÌfXfNfŠ [f“ EfRf“f [flf“fg,·,×,Ā,Ì ãĒ,ÉĒĒ’u,·,é,à,Ì,Æ%¼’è,³,é,é B“]‘—
æfJf%o [EfL [,Í Afvf%ofCf}
fŠ EfT [ftfFfX,ÌfRfbfg,É,¾, ¯%oe<ç,³,é,é,×,«,Ā A¼,ÌfI [fo [fCfC,ÉŽŒ,ç,é,½fI [fo [fCfC,É%oe<ç,³,é,é,×,«,Ā,È
,¢ B“]‘—E³fJf%o [EfL [,Í AZfI [f_Žw’è,Ì—L³,É,æ,ç,,fI [fo [fCfC,É ì—
p,·,é BŽw’è,³,é,½ZfI [f_,ðŽ ,½,È,¢fI [fo [fCfC,Í Afvf%ofCf}fŠ EfT [ftfFfX ã,Ì““,¶—
Īæ,ÉfI [fo [fCfC,³,é,é,Æ A—Šú,µ,È,¢ U,é•,¢,ð,·,é BZfI [f_ [,ÌŽw’è,³,é,Ā,¢,È,¢fI [fo [fCfC,Í A
ZfI [f_ [0,Æ,Ý,È,³,é,é BZfI [f_,Ì”ÍÍ,Í Afvf%ofCf}fŠ EfT [ftfFfX Ā ãĒ,Ā, ,é0,©,ç AŠĪ“ŽŒ,É Ā,à<B,¢ĒĒ’u,
Ì40%,Ü,Ā,Ā, ,é BZfI [f_2,ÌfI [fo [fCfC,Í AZfI [f_1,ÌfI [fo [fCfC,ð•¢,¢
%oB,· B““,¶ZfI [f_,ðŽ ,ĀfI [fo [fCfC,Í¶ Ý,µ,È,¢ 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,ÈŠÓ 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·,ªoÂ”
,Á,È,¯,ê,Ì,È,ç,È,Œ,Œ B,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,Ü,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 [fhfEfffA,ð,à,ÁfffBfXfvf€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

dwSVBCaps	dwVSBCaps	dwSSBCaps
dwSVBCKeYCaps	dwVSBCKeYCaps	dwSSBCKeYCaps
dwSVBFXCaps	dwVSBFXCaps	dwSSBFXCaps
dwSVBRops	dwVSBRops	dwSSBRops

—ªEêSVB,Í AfVfXfef€ Ef f,fŠ,©,çfffBfXfvf€fC Ef f,fŠ,Ö,Ìfuf fbfN“]‘—,ÉŠÖEW,·,é”\—Í‘l,ðŽ‘,· B
VSB,Í AfffBfXfvf€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,©,çfffBfXfvf€fCf f,fŠ,Ö,Ìfuf
fbfN“]‘—,ÉŠÖEW,·,éfffBfXfvf€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—
L(Eø,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 [fhfEfffA Efuf fbfN“]‘—,É,æ,Á,ÄŽg,í,ê,Ä,ç,éVfXfef€ Ef f,fŠ EfT [ftfFX,ªf fbfN,³,ê,Ä,ç
,È,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<Ÿ,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 f\fbfh,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,ìÈÄ,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 f\fbfh,ÉŠ,,è“-Ä,ç,ê,½fpf%of [f^,ð`i 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 f\fbfh,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,ϖ,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•,ϕ,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,Ä,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 B‘æŽO,Ìfpf%of [f^,Í,Â,Ë,ÉNULL,ÉfZfbfg,³,ê,Ä,Ç,é,ª A,±,ê,Í «—^,ÌŠg’£
,É”ö,!,é,½,ß,Ä, ,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,Ä,Ç,é B

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

Step 2: fAfvfŠfP [fVf±f“ì U,é•,ç,İĈE”è

```
ffBfXfvfĈfC,ì%òð“æ“x,ðĭ X,·,é‘O,É,Í A Á‘áĈÈIDirectDraw2::SetCooperativeLevel
f f\fbfh,ĭpf%of [f^dwFlags ,É, ,éDDSCL_EXCLUSIVE,Æ DDSCL_FULLSCREEN
ftf%ofO,ðŽw’è,μ,È,̄,ê,Ī,È,ç,È,ç B,±
,ê,É,æ,è AfAfvfŠfP [fVf±f“,“ffBfXfvfĈfC EfffofCfX,ðŠ@‘S,ÉfRf“fgf [f<,Á,«,é,æ,μ
,É,É,è A”¼AfAfvfŠfP [fVf±f“,ĭffBfXfvfĈfC EfffofCfX,ð<—L,Á,«,É,É,é B%Á,ĭ,Á DDSCL_FULLSCREEN
ftf%ofO,Ī AfAfvfŠfP [fVf±f“,ð”r¼“Ī iftf<fXfNfŠ [f“ jf, [fh,ÉfZfbfg,·,é B,·,é,ÆfAfvfŠfP [fVf±f“,ĭffXf
Nfgfbfv,ç,Á,Ī,ç,É L,ª,è A,Û,½,»,ĭfAfvfŠfP [fVf±f“,¾,̄,ªfXfNfŠ [f“,É ‘,«,±,ð,±,Æ,ª,Á,«,é,æ,μ
,É,É,é B,»,ĭ ó‘Ō,Á,à AffXfNfgfbfv,Ī,Û,¾—~p%Á”\,Á, ,é i,½,Æ,ĭ,Ī A”r¼“Īf, [fh,Á“@,-
fAfvfŠfP [fVf±f“,É,̄,ç,ĀffXfNfgfbfv,ðĈ©,é,É,Ī ADDEX1,ðfXf^ [fg,³,¹ A ALT + TAB,ð%Ÿ,¹,Ī,æ,ç j B
```

ŽŸ,Ī—á,Á,Ī IDirectDraw2::SetCooperativeLevel ,ĪŽg,ç•û,ð à-¾,μ,Á,ç,é B

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

ddrval = lpDD->SetCooperativeLevel(hwnd, DDSCL_EXCLUSIVE |
    DDSCL_FULLSCREEN);
if(ddrval == DD_OK)
{
    // ”r¼“Īf, [fh,Ī ¬Ĉ÷,μ,½.
}
else
{
    // ”r¼“Īf, [fh,ĪŽ,“s,μ,½
    // ,μ,©,μ AfAfvfŠfP [fVf±f“,Ī,Û,¾“@,ç,Á,ç,é
}
```

IDirectDraw2::SetCooperativeLevel,ª

```
DD_OK,ðŌ,³,È,ç ê ê ‡,Á,à AfAfvfŠfP [fVf±f“,Ī± s,Á,«,é B,μ,©,μ AfAfvfŠfP [fVf±f“,”r¼“Īf, [fh,É,È,̄,ê
,Ī A—v< ,³,ê,éfpftfH [f}f“fX,ðŽÀĈE»,Á,«,É,ç%Á”\ «,ª, ,é B,±,Ī 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 ‡ 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,Ī,È,ç,È,ç B,½,Æ,ĭ,Ī A^è”Ê•ŪĈè
(GP)^á”½,ª,N,±,èGDI,ªfobfN Efofbtf@,ÉftfŠfbsf“fO,³,è,Á,ç,é,Æ Af† [fU,Ī Windows,ĭfXfNfŠ [f“,ðŽæ,è-ß,·,±
,Æ,ª,Á,«,É,ç B,±,è,ð-h,®,½,ß DirectDraw,Ī A,»,ĭfEfBf“fhfE,É‘—
,ç,è,½f fbfZ [fW,ðfgf%obfv,·,éfofbfNfOf%ofEf“fh Efvf fZfX,ð’ñ<Ÿ,μ,Á,ç
,é Bfgf%obfv,μ,½f fbfZ [fW,ðŽg,ç A DirectDraw,ĭfAfvfŠfP [fVf±f“,ª,ç,Á I—¹,μ,½,©Ĉ”è,·,é B,±,Ī<@”
,É,Ī §ĈÁ,ª,ç,Á,©, ,é B,Û, fAfvfŠfP [fVf±f“,Ī,½,ß,ĭf fbfZ [fW,ðŽæ“¾,μ,Á,ç
,éEfBf“fhfE Efnf“fhf<,ðŽw’è,μ,È,̄,ê,Ī,È,ç,È,ç B,Á,Û,è AfEfBf“fhfE,ð,à,μ
,ð,Æ,Á ì ¬,·,é ê ‡ AŽw’è,·,éEfBf“fhfE,ĪSmžÁ,ÉfAfNfefBfu,Á,È,·,Á,Ī,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,Á,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,½ĈĚ,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 -,:³,ê,Ā,Ĉ,é  
  
ddrval = lpDD->SetDisplayMode(640, 480, 8);  
if(ddrval == DD_OK)  
{  
    // ffbfXfvfCfC Ef, [fh,İ•İ X,İ -Ĉ±,μ,½  
}  
else  
{  
    // ffbfXfvfCfC Ef, [fh,İ•İ X,Ā,«,È,©,Ā,½  
    // f, [fh,ªfTf| [fg,³,ê,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,Ĉ,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, -,ê,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 iftfƒfXfNfŠ [f“ jf, [fh,ÉfZfbfg,·,é,½,βIDirectDraw2::SetCooperativeLevel f ffbfh,đžg,Ă,Ă,ƒ
,é,ì,Ă AfT [ftfFfXŠÖ,ĂftfŠfbfsf“fO,·,éft [ftfFfX,đ ì ¬,·,é,±
,Æ,ª,Ă,«,é Bf, [fh,đDDSCAL_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—vƒ ,ì'èƒ
    fT [ftfFfX ì ¬

```

fT [ftfFfX—vƒ ,ì'èƒ

```

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

```

```

// fofbfN Efofbftf@,đ,Đ,Æ,Ăž ,Ăfvf%ofoCf}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 ffbfhƒĂ,Ń o,μ,Ă—Lƒø,Ă,È,ƒf f“foGf%o [,ª•Ô,Ă,Ă,±,È,ƒ,æ,µ,È,·,é,½,β,Ă, ,é i dwSizef f“fo,Í A
DDSURFACEDESC \‘c‘ì,ì «—,Ìšg'£,Ì,½,β,È—p^Ó,ª,é,½,à,ì,Ă, ,é j B

```

```

dwFlagsf f“fo,Í A DDSURFACEDESC \‘c‘ì,Ì,Ç,Ìf f“fo,É—Lƒø,È î•ª,ª•Ô,ª,é,é,©ƒ“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,ì,È,éftf%ofo,đž,μ,Ă,ƒ,é B,±,Ì ê ±,Í Afvf%ofoCf}
fŠ EfT [ftfFfX(DDSCAPS_PRIMARYSURFACE),ÆftfŠfbfsf“fO EfT [ftfFfX
(DDSCAPS_FLIP) A; ±fT [ftfFfX (DDSCAPS_COMPLEX),đžw'è,μ,Ă,ƒ,é B

```

```

ĂƒĂ,é A,±,ì—á,Ă,ÍfofbfN Efofbftf@,đ,Đ,Æ,Ăžw'è,μ,Ă,ƒ
,é BfofbfN Efofbftf@,Í A”wƒEi,ÆfXfvf%ofoCf,ªž Ā Ū,É ‘,«,±,Ū,È,é ê Š,Ă, ,é B,»,μ,ĂfofbfN Efofbftf@,Í
Afvf%ofoCf}fŠ EfT [ftfFfX,ÉftfŠfbfsf“fO,ª,é,é B DDEX1,ì—á,Ă,ÍfofbfN Efofbftf@,Ì ”,Ì,ÉfZfbfg,ª,é,Ă,ƒ
,é,ª A ffbfXfvfƒfC Ef f,fŠ,ª,·,©,¬,è,ƒ,ª,Ă,Ă,à ì ¬,·,é,±
,Æ,ª,Ă,«,é BfofbfN Efofbftf@,ÉŠÖ,·,é,ª,ç,É Ū,μ,ƒ î•Ń,Í A ufqfŠfvfƒ Efofbftf@fŠf“fo v,đžQ Ą,·,é,±
,Æ B.

```

```

fT [ftfFfX Ef f,fŠ,ÍfBfXfvfƒfC Ef f,fŠ,É,àfvfXfefƒ Ef f,fŠ,É,à'u,±,Æ,ª,Ă,«,é B
DirectDraw,Í AfAfvfŠfP [fvf±f“,ªftfBfXfvfƒfC Ef f,fŠŠÖ,Ă“@,·,Æ,«,ÍfvfXfefƒ Ef f,fŠ,đžg,µ
(½,Æ,ª,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 AfVfXfefƒ Ef f,fŠ,¾,¬,đžg,µ,©ffBfXfvfƒfC Ef f,fŠ,¾,¬,đžg,µ
,©,đžw'è,Ă,«,é iDDSCAPS_VIDEOMEMORY,đžw'è,μ,½,È,àŠÖ,í,ç,,fT [ftfFfX ì ¬,É [ª,Èf f,fŠ,đ—
p,Ă,«,È,ƒ ê ±,Í AIDirectDraw2::CreateSurface,ª DDERR_OUTOFVIDEOMEMORYfGf%o [,ª•Ô,é j B

```

fT [ftfFfX,ì ì ¬

```

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

```

```

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

```

```

}
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, Ì|fCf“f^, Æ, È, é B

fvf%ofCf}fŠ EfT [ftFfX, Ö, Ì|fCf“f^, ðŽæ“¾, μ, ½, ç AŽŸ, Ì—á, ÁŽ!, ·È, è AfobfN Efofbtf@, Ì|
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, Ì|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, Ì|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,ÅŽ!,·Ê,è è,çfobfN Efofbftf@,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 Efofbftf@,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 Efofbftf@ Ef fbZ [fW,Ü,½,ÍfobfN Efofbftf@ 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 Efofbftf@ 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 Efofbftf@,É ‘,«,±
,Ü,è,é,Æ,ç,ª,±,Æ,É’ ~Ó,·,é,±,Æ B

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

Step 7: `ftfŠfbfsf“fO EfT [ftFfX`

`fT [ftFfX Ef f, fŠ, f fbfN%ø æ, 3, ê, ½Eä, Ä AfobfN Efobftf@, 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, è, ½fobfN Efobftf@, æ, ðŽ!, µ, Ä, ç, é B
IDirectDrawSurface2::Flip, æÄ, Í, è, é, æ Aftf f“fg EfT [ftFfX, æfobfN EfT [ftFfX, æðŠ, 3, è, é ifT [ftFfX
, Ö, ÌffCf“f^, æ, í X, 3, è, é, ¾, -, Ä AŽÄ Ü, Éff [f^, æÜ“@, ·, é, í, -, Ä, Í, È, ç j BftfŠfbfsf“fO, æ -æ÷, µ
DD_OK, æ, Ö, 3, è, é, æ AfAvfŠfP [fvf±f“, Íwhile< [fv, ©, ç”2, -, é B

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

Note

IDirectDrawSurface2::Flip, ðæÄ, 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, ·, Ü, 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`FfbfN,.,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

Step 2: `ppfCbfg,İ` Ý'è

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

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

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

```
IDirectDrawSurface2::SetPalette,đĀ,Ñ o,·,±,Ē,É,æ,Ā,Ā A DirectDrawPaletteIfufWfFfNfg,İ  
DirectDrawSurfaceIfufWfFfNfg,ÉŠÖ`A,Ā, ,ç,è,é BppfCbfg,İ X,ªK—v,È,Ē,«,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,Ē, ,è¼,É,à•û—@,ª, ,é B j
```

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

DirectDrawPaletetfIfufWfFfNfg,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,Ð,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 **DDLodBitmap**,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,đ•Ž!,·,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”—İ,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,ê,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 = DDS_DCAPS | DDS_DHEIGHT | DDS_DWIDTH;
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,“**DDSCAPS** \‘c‘ì,ÉfZfbfg,³,é,é,±,Æ,É,æ,Á,ÄŽ!,³,é,é,æ,²,É Afobftf@,ì ,³,Æ%
i• ,ðfZfbfg,·,é B
fT [ftFfX,ìfIfTfXfNfŠ [f“ EfvfŒ [f“ Efobftf@,É,È,é B ,³,Æ• ,í,»,é,¼,ê A480,Æ640,É
DDSURFACEDESC \‘c‘ì“à,ÁfZfbfg,³,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,¹,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,³,Ä,«,é B ffbfXfvfŒfC Ef f,fš,Éfrfbfgf}fbfv,ð•Û“¶,·,é,±
,Æ,³,Ä,«,é Bftrfbfgf}fbfv EfAfjf [fVf±f“,ðŽg,²,Æ,«,É,±,ê,Í,æ,è d—
v,Æ,È,é B,µ,©,µfIfTfXfNfŠ [f“ Efobftf@,É DDSURFACEDESC,ðŽw’è,µ,½ ê ‡ Afrfbfgf}
fbfv’S”•ð•ÛŽ ,·,é,ì,É [“Èf f,fš,³,È,¢ ê ‡ AfT [ftFfX,ð ì -,·,é Û,ÉŽ,”s,µ ADDERR_OUTOFVIDEOMEM
ORYfGf% [,“Ö,³,é,é B

Step 2: `if (ftfXfNfŠ [f“ EfT [ftFfX, ðfrfbfgf}fbfv, ðf [fh`

, Ó, ½, Â, ðfrfbfgf}fbfv, ðf [fh, ·, é, ½, B, É A InitSurfaces ŠÖ ”, ðŽg—p, ·, é B
Frntback.bmpftf@fCf<, ©, çfT [ftFfX, Öfrfbfgf}fbfv, ðf [fh, ·, é, ½, B, É A InitSurfaces ŠÖ ”, ðŽg—p, ·, é B
InitSurfaces ŠÖ ”, Í A—¼•û, ðfrfbfgf}fbfv, ðf [fh, ·, é, ½, B, É Ddutil.cpp, É, , é DDCopyBitmap ŠÖ ”, ðŽg—
p, ·, é BŽÿ, ð—á, ðŽQ Æ, ·, é, ±, Æ B

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

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

```
DDCopyBitmap(lpDDOne, hbm, 0, 0, 640, 480);  
DDCopyBitmap(lpDDTwo, hbm, 0, 480, 640, 480);  
DeleteObject(hbm);
```

```
return TRUE;
```

Microsoft Paint, â, Û, ©, ðfhf [fAfvfŠfP [fVf†f“ , Â
Frntback.bmpftf@fCf<, ð† g, ðŒ©, ½ ê ‡ A^ê•û, ^, à, ð^ê•û, É d, È, é, Ó, ½, Â, ðfrfbfgf}fbfv, ^, ð—
§, Â, ±, Æ, ^, i, ©, é, ¾, è, ð B DDCopyBitmap ŠÖ ”, Í A, », ðfrfbfgf}fbfv, ðf [f“ , ^, ‡, í, ¾, éf
fCf“fg, ð, Ó, ½, Â, É•^, ^, é B, ¾, ç, É A1”Ô—Û, ðfrfbfgf}fbfv, ð1”Ô—
Û, ðfrfbfgf}fbfv, ðf [f“ EfT [ftFfX, Éf [fh, ·, é B(lpDDOne), Û, ½ A2”Ô—Û, ðfrfbfgf}fbfv, Í A2”Ô—
Û, ðfrfbfgf}fbfv, ðf [f“ EfT [ftFfX, Éf [fh, ·, é B(lpDDTwo)

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,é,½,ß,İftf%ofO,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,ß,ÉĚÄ,Ñ o,³,é,é B rcRect fpf%of [f^,Í RECT \‘ċ‘İ,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,Û,Á,İ—İæ,““]’—
,³,é,é B ÁĚä,İfpf%of [f^,Í FALSE (Û,½,Í 0),É Y’è,³,é A“Á•Ě,È“]’—ftf%ofO,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,ß,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,ß AfIfBfXfvfĚfĚ Ef f,fŠ,©,çffBfXfvfĚfĚ Ef f,fŠ,Ö“]’—,³,¹,é,·,×,Á,İffbFfXfvfĚfĚĚ ì,İ,½,ß,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%ofO,đ—v< ,·,é ê ‡,Í A **IDirectDrawSurface2::Blt**,đŽg,í,È,Ě,ê,İ,È,ç,È,č B

fIfTfXfNfŠ [f“ EfT [ftfFfX,đofbfN Efofbftf@,Éf [fh,μ,½Ěä AfofbfN Efofbftf@,Æfvf%ofCf]
fŠ EfT [ftfFfX,Í‘O,İf`f... [fgfŠfAf<,ÁŽ],μ,½,İ,Æ,Û,Æ,ñ,Ç“—,¶•û—@,ÁftfŠfbfsf“fO,³,é,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•”,ðfofbfN Efofbtf@,ÉfRfs [,·,é A,Á,Ü,è AŠÈ’P,Èfrfbfgf}
fbfv EfAfjf [fVf‡f“,ð İ ¬,·,é,½,ß,É A **IDirectDrawSurface2::BltFast** f f\fbfh,ðŽg—p,·,é B

DDEX4,ÁŽg,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,©,çfofbfN 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 ”,ðCE©,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%»»,ÁŽg,í,ê,é F'Ì Ý'è,ð,·,é BfVfXfef€,"fn [fhfEfFA“‘—”\—
Í,ðŽ ,Á,Æ,« A«É,ÌfsfNfZf<,Í AfJf% [Efl [,Æ,µ,ÁfZfbfg,³,ê,½'Ì,ð œ,¢
,Á AfT [ftfFX ã,Ì"ñ«É'fXfvf%ofCf<,ð ì ¬,µ,È,ª,ç“‘—,³,ê,é B DDEX4,ÁfJf% [Efl [,ð Ý'è,µ,Á,¢
,é.”ª,ÌŽÿ,Ì'È,è,Á ,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,ÁfJf% [Efl [,ð'I'ð,·,é B i ·,ÌRGB'Ì,(0,0,0),Á ,é j B **DDSetColorKey**ŠÖ ”,Í A **DDColorMatch**
ŠÖ ”,ðEÄ,Ñ,¾,· B i,Ç,¿,ç,à ADdutil.cpp,É, ,é j **DDColorMatch**ŠÖ ”,Í A
lpDDOneT [ftfFX,É"z'u,³,ê,½frfbfgf}fbfv ã,Ì(0,0),ÌfsfNfZf<,ÌE» Ý,ÌfJf% [¹,ðŠi”[µ AŽw'è,µ,½
RGB'Ì,ðŽæ,Á,Á(0,0),Ì'È'u,ÌfsfNfZf<,É,»Ì F,ðfZfbfg,·,é B ÁEä,É A—~p%»Ä”,ÉfsfNfZf<—
^,Ìfrfbfg ”,Á,»»,ÌfJf% [¹,Ì,ðf}fXfN,·,é B,±,ê,ª I,í,é,Æ AŽn,ß,Ì F,Í(0,0)
,Ì'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,ê,é B
IDirectDrawSurface2::SetColorKey,Ö,ÌEÄ,Ñ,¾,µ,É,æ,Á,ÁfJf% [Efl [,ð Ý'è,·,é B

DDSetColorKey,Æ**DDColorMatch**,Á A CLR_INVALID,ðŽQ Æ,µ,Á,¢,é,±,Æ,É<C,Á,¢,½,©,à,µ,è,È,¢ B iDDEX4,Ì
DDSetColorKey,ðEÄ,Ñ o,·,Æ,«,É AfJf% [Efl [,Æ,µ,ÁCLR_INVALID,ð“n,· ê ‡ Afrfbfgf}fbfv,Ì ¶ ãŠp,Ì
(0,0)fsfNfZf<,ª AfJf% [Efl [,Æ,µ,ÁŽg,í,ê,é B DDEX4,Ìfrfbfgf}fbfv,“n,³,ê,½ ê ‡ A(0,0)
,ÌfsfNfZf<,Ì F,ª AfOfE [,Ì%œ,Æ,È,é,±,Æ~Ó-ì,·,é,í,¯,Á,Í,È,¢ B DDEX4,ÌTf“fvf<,Á A(0,0)
,ÌfsfNfZf<,ðfJf% [Efl [,Æ,µ,ÁŽg,ª·ù-@,ð— %ð,µ,½,¯,è,Í Afrfbfgf}
fbfvftf@fCf<All.bmp,ðfhf [fCf“fOfAfvfŠfP [fVf‡f“ÁŠJ,« A(0,0),ÌfsfNfZf<,ð ·,É·Ì X,µ,Á,Ý,é,±,Æ B
j,»è,Í AŽÿ,ÌDDEX4 **DDSetColorKey**,ðEÄ,Ñ o,· s,Á s,í,é,é B

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

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

Step 2: ŠÈ'P,ÈfAfjf [fVf#f“,ì ì ñ

DDEX4,Ìftf“fvf“,Á,Í A All.bmpftf@fCf<,ÉŠÜ,Ü,ê,é Ô,¢—Ö,ðŽg,Á,½ŠÈ'P,ÈfAfjf [fVf#f“,ð ì ñ,·,é,½,ß,É
updateFrameŠÖ ”,ðŽg,Á,Ä,¢,é B,»,ÌfAfjf [fVf#f“,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,µ
,©,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,ðfÌftfXfNfŠ [f“ Eft [ftfFfX(lpDDSOne),©,çfobfN Efofbftf@,Ö“]‘—,µ A, ,ç,©,¶,ß
,Ç,ÌfsfNfZf<,ð“\$%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

fÌftfXfNfŠ [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“\$%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“\$%ß,ì,½,ß,ÌfJf% [Efl [i,±
,Ì ê ±lpDDSOne,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,µ,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 Af`f... [fgfŠfAf<4(DDEX4),Ā%đ à,³,ê,^{1/2}fTf“fvf<,ì C ³,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,³,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_lfg

Step 1: fpfCEfbfg EfGf“fgfŠ,İf [fh

```
DDEX5,İŽŸ,İfR [fh,İ AfpfCEfbfg EfGf“fgfŠ,É AAll.bmpftf@fCf<,İCEã”¼•”•ª i Ô,¢—  
Ö,İ,đŠŮ,Ɓ•”•ª j,İ,İ,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 [ftfFX,đf fbfN,µ ACEã”¼•”•ª,đfXfLfff“,·,é ifg [f%ofX EfGfŠfA j  
// CE,Ä,©,Ä,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,İ 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,İ,İ,İ,·,×,Ä,đ0,ÉfŠfZfbfg,·,é BfİftXfNfŠ [f“ Efofbftf@,İ AfJf% [ EfCf“ffbfNfX’l,Žg,í,é,é ê ± A,»ê,ç,  
İ F,Šm’è,³,é,éO,Éf fbfN,³,é,é B
```

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

```
ñ,İJf% [ EfCf“ffbfNfX’l,İ Afrfbfgf}fbfv EfT [ftfFX,“z’u,³,é,é f, fŠ,İ”z’u ê Š,É,æ,èCE^è,·,é B,±  
,İ”z’u ê Š,İ A DDSURFACEDESC \‘ç’İ,İlpSurfacef f“fo,É,æ,Ä,ÄCE^è,³,é,é B,»ê,İfRfbfgf}fbfv,İ480—ñ0E...  
(y ‘lPitch + 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“ffbfNfX’l,İ”z’u ê Š,İ1,ÉfZfbfg,·,é B’ly( srow),İ A lPitch’l 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“ffbfNfX’l,İ 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,·,ªf [fe [fg,³,é,é B,±  
,é,ªtrue,©,Ç,µ,©,đf fFfbfN,·,é,½,ß,É,İ A”z—ñ,©,ç”ddsd.lPitch”,đŽæ,è æ,« Afvf fOf%ofE,đ ÄfRf“fpfCf<,µ,½, ,  
Æ“®,©,·,Æ,«,É%½,ªN,±,é,©,đ— %òð,·,é,±,Æ B (y lPitch,ÄŠ|,ŽZ,đ,µ,È,¢,Æ Ö,¢—Ö,İŽæ“¾,³,é,È,¢  
,µ”wEi,ÄCE©,ç,é,é F,¾,·,ªfCf“ffbfNfX,³,é A ,Æ,Äf [fe [fg,³,é,é)  
,³,ç,É Ů,µ,¢ îñ,İ A u•,Æfsfbf` v,đŽQ Æ,·,é,±,Æ B
```

Step 2: `fpfEfBfg,İf lfe lfg`

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

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

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

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

DirectDrawPalette::GetEntries f f\fbfh,Í A Ä %,İ s,Ä

```
DirectDrawPalette,©,çfpfEfBfg'l,đ“¾,é BfpfEfBfg EfGf“fgfŠ'l,Í Ape,đf|fCf“f^,Æ,.,é•İ ”,É“ü,è Af f\fbfh,Í  
DD_OK,đ•Ô,µ A ^— ,“±,¯,ç,ê,é B,»),İŠÖ AfJf% [ EfCf“ffbfNfX,³1,ÉfZfbfg,³,ê,Ä,ç,é,©,Ç,²  
,© A torusColors,đf`fFbfN,µ‘±,¯,é BfZfbfg,³,ê,Ä,ç,é ê ‡ AfpfEfBfg EfGf“fgfŠ,İ Ö A—  
Í A Ä,İ'l,Í Af [fe [fg i zŠÄ j,³,ê,é B
```

```
f} [fN,³,ê,½,.,×,Ä,İfpfEfBfg EfGf“fgfŠ,af [fe [fg,³,ê,½Eä A
```

```
DirectDrawPalettefİfufWfFfNfg,İfGf“fgfŠ,đ•İ X,.,é,½,ß,ÉDirectDrawPalette::SetEntriesf f\fbfh,đEÄ,Ñ o,· B,±  
,İ•İ X,Í Afvf%ofCf}fŠ EfT [ftFfX,Ö,İfpfEfBfgfZfbfg,“—LÆø,É,È,é,Æ,.,@,É, ,ç,İ,é,é B
```

```
,±,é,ª I,İ,é,Æ A‘±,ç,ÄfT [ftFfX,ÍDDEX5,đftfŠfbfsf“fO,.,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,·,éfVfXfef€,É½,,Ì'O'ñ 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 [fhfEFA]—Í,ÌE~è

fffBfXfvfCefC Ef f,š,Ö,Ìfrfbgf}bfv,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@,ÍCEðŠ,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,ð•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
,©,ðCE“è,·,é,½,ß AfobfN Efofbftf@,Ä**IDirectDrawSurface2::GetFlipStatus**,ðCEÄ,Ñ o,·ŠÖ ”,ð ì ¬,·,×,«Ä, é B

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

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

// ‘O,İftfŠfbfsf“fO,ª I—,µ,½,İ,ð‘Ö,Ä
// fAfvfŠfP [fvf‡f“,Í,±,±,Ä A‘¼,İf^fXfN,ðŽÄ s,Ä,«„é

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

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

fJf% [EftfBf<,đŽÀE»,.é,½,ß,ÉIDirectDrawSurface2::Blt f\fbfh,đŽg,±

•Ž!,³,¹,½,¢<º'Ê F,İfJf% [EftfBf<,đŽÀE»,.é,½,ß,ÉIDirectDrawSurface2::Blt f\fbfh,đŽg,±
,Æ,ª,À,«é B,½,Æ,İ AfAfvfŠfP [fVf†f“,ªŽ!,.é<º'Ê F,ª Â,İ ê ‡ A Â F,À Â %o,ÉfT [ftFfX,đ-
,,ß,é,½,ß,ÉDDBLT_COLORFILL ftf%ofo,Æ<º,ÉIDirectDrawSurface2::Blt,đŽg,± B,·,é,Æ A,»İ ã,É%½,À,à ‘,«,±
,p,±,Æ,ª,À,«é B<º'Ê F,À,·,İ,â,-,,ß,é,±,Æ,ª,À,«é,İ,À AfT [ftFfX,Ö Â -,İ F ”,đ ‘,©,È, -,ê,İ,¢, -,È,¢
,¾, -,À, ,é B

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

DDBLTFX ddbltfx;

```
ddbltfx.dwSize = sizeof(ddbltfx);  
ddbltfx.dwFillColor = 0;  
ddrval = lpDDSPimary->Blt(  
    NULL,          // “]— æ  
    NULL, NULL,    // “]—Æ³éÆ`  
    DDBLT_COLORFILL, &ddbltfx);
```

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

ffBfXfvfCefC Efn [fhfEfffA]—Í,ÏE~è

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

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

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

fffBfXfvfCfC Ef f,fŠ,©,çfffBfXfvfCfC Ef f,fŠ,Ö,İ“]—

,Í AfVfXfef€ Ef f,fŠ,©,çfffBfXfvfCfC Ef f,fŠ,Ö,İ“]—,æ,è,à,Í,é,©,É€ø—“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 BfffBfXfvfCfC EfAf_fvf^f f,fŠ,Éfrfbfgf}

fbfv,ðŠi”[,·,é,½,ß,É—p,Å,«,éf f,fŠ,İ’â,«³,ðĈ^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<ÿ,·,é

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

fŠ EfffBfXfvfCfC Efhf%oCfo EftfHf<f_,ðŠJ,« A,»,İĈä ^è”ÊftfHf<f_,ðŠJ,,±

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

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

pf f,fŠ,İ ‡Ĉv,Í A’Ç%oÅ,³,ê,½fT [ftFfX,ªŽg,Å,½ª,İf f,fŠªĈE,,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,□ BŽÝ,Ì— á,Á,Í AfgfŠfvf< Efofbftf@fŠf“fO EfXfL [f€,đ %šú‰»,·,é•û-@,đŽ!,μ,Ä,¢,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)
{
    // ‘æˆ,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‘æˆ,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‰Áˆ\ «,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,³•Ô,³,é,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 ± AfAvfŠfP [fVf±f“ I—¹Žž,ÉDirectDraw,ª%ð•ú,·,é B

“Á’è,ÌDirectDrawIfufWfFfNfg,É,æ,Á,Ä Š—L,³,ê,½DirectDrawClipperIfufWfFfNfg,ð ì ¬,·,é,½,ß,É,Í A
IDirectDraw2::CreateClipper f f\fbfh,ðŽg,±,±,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 ”,İ,½,ß,İfAfvfŠfP [fVf‡f“,Å’èç,·,éfR [f<fofbfNŠÖ ” B

—ñ<“,ð’±,¯,é ê ‡,ÍDDENUMRET_OK,ð•Ô,µ AŽ~,ß,é ê ‡,ÍDDENUMRET_CANCEL,ð•Ô,· B

lpGUID

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

lpDriverDescription

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

lpDriverName

fhf%oCfo-¼,ðŽ!,·•¶Žš—ñ,İfAfhfŒfX B

lpContext

ŠÖ ”,ªŒÄ,Ñ o,³,ê,é,²,Æ,ÉfR [f<fofbfNŠÖ ”,É“n,³,ê,éfAfvfŠfP [fVf‡f“,Å’èç,µ,½ ‘ç’ì,Ö,İf|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 \‘ç’ì, 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, è, 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 AfffBfXfvfçfC 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«—Lfçfxf<,ð”r¼“Ifçfxf<,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 f\fbfh,^a —Ā,·,μ,½ ê †•Ô,³,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,^aĀ,« **AIDirectDrawSurface2::Blt** **AIDirectDrawSurface2::BltBatch** **AIDirectDrawSurface2::UpdateOverlay**,ì ^
— ’†,É Žg—p,Ā,«,é B

“Ā’è,ìDirectDraw,É Š—L,³,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,¿ 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,Ïf|fCf“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,^a -Ĉ÷,μ,½ ê ‡ A—LĈø,ÈDirectDrawSurface|fCf“f^,É,æ,Á,Ä %oŠú%o»,³ê,éfT [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 AfIfŠfWfifœ,ÏfIfufWfFfNfg,Æ,Û,Á,½,-
“¬,¶,æ,□,ÉŽg—

p,Á,«;é B Áœã,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^Á-Û“l,É ì ¬,³,ê,½fT [ftfFfX,Í•j »;Á,«;È,œ B

IDirectDraw2::EnumDisplayModes

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

DirectDrawIfuFwFfNfg,É,æ,Á,Ä'ñ<ÿ,³,ê,½fT [ftFfX,ÆÉÝŠ. «,ª, ,é,Æfn [fhfEfFfA,ªFž̄,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% [,ð•Ö,· B

DDERR_INVALIDOBJECT

DDERR_INVALIDPARAMS

dwFlags

DDEDM_REFRESHRATES

˘Û,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
,©,ðÆ˘è,·,éžž,È AfŠftfEfBfVf...fE [fg,ª 1—
¶,É“ü,ê,ç,ê,é,©,Ç,ª,©,ðžw'è,·,é B

lpDDSurfaceDesc

—~—p,Á,«,éf, [fh,ðf`fFfbfN,·,é**DDSDURFACEDESC** \‘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,È,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,ÍDDSDURFACEDESC \‘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, LPVOID 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%ofO,“fZfbfg,³,ê,é ê ‡ A,±,Ìf f\fbfh,ÍŠî € ,É ‡,□fT [ftFfX,ð~èŽŽ“I,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,□fT [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 EftfŠfbsf“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,«éffBfXfvfCfC Ef f,fŠ,ì —e—Ê,ÆffBfXfvfCfC Ef, [fh,ìC» Ý,ìó,«e—Ê,ðŽæ“¾,·,é B
¬C÷,·,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,ÐDDSCAPS \‘ç‘ì,Ö,ìf|fCf“f^ B

lpdwTotal

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

lpdwFree

C» Ý,ìfVfXfvfCfCf 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,ç B

ŽŸ,ìC++,ì—á,Á,Í AfefNfXf`ff Ef}fbfv EfT [ftfFX,Á—p,Á,«éffBfXfvfCfC Ef f,fŠ,ì —e—
Ê,Æó,«e—Ê,ðC`è,·,é **IDirectDraw2::GetAvailableVidMem**,ðŽg,Á,Á,ç,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 ffbfh,Í A» Ý,ìffBfXfvfCfC Ef f,fŠ,ì ó•Ö,ìfXfifbfbfvfVf±fbfg,ð’ñ•Ÿ,·,é BffBfXfvfCfC Ef f,fŠ,ìó,
ó,«e—Ê,Í AfT [ftfFX,ì ì ¬,Æ%ð•ú,ì ‡”Ö,È,Ç,æ,Á,Á•ì,í,é B,µ,½,¾,Á,Á Aó,«f f,fŠ,ì—Ê,ì,·,·,Ü,©,È”»’f Ð
—ç,Æ,µ,ÄŽg,²,×,«,Á, ,é B,¾,ç,É A“Á’è,ìffBfXfvfCfC EfAf_fvf^ EfJ [fh,Í A,Ó,½,Á,ÌÛ,È,éf f,fŠf^fCfv,ðç
æ•Ê,Á,«È,ç B,½,Æ,ì,Í A
Zfobfbtf@,ÆfefNfXf`ff,ðŠi”[,·,é,ì,É AfBfXfvfCfC Ef f,fŠ,ì““•”,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,«éffBfXfvfCfC 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,ðC`è,·,é•O,É AfAfVfŠfP [fVf±f““CÁ’è,µ,½fŠf\ [fX iftf f“fg Efofbtf@,ÆfofbfN Efofbtf@ AZfobfbtf
f@,ì,æ,²,È j,ð %o,ß,È”z’u,·,é,ì,¾ Á—Ç,ì•û—@,Á, ,é B

,±,ìf ffbfh,Í A **IDirectDraw2**fCf“f^ [ftfCfX,ì Vç”\,Á, ,è A **IDirectDraw**fCf“f^ [ftfCfX,É,ÌŽÀ’•,¾,ê,Á,ç
,È,ç B

IDirectDraw2::GetCaps

HRESULT GetCaps(LPDDCAPS lpDDDriverCaps, LPDDCAPS lpDDHELCaps);

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

¬E÷,·,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 \‘C‘ì,Ö,ìf|fcf“f^ B

lpDDHELCaps

HEL,ì”\—Í,ðŽæ“¾,·,éDDCAPS \‘C‘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(LPWORD lpNumCodes, LPDWORD lpCodes);

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

¬E÷,·,ê,ÏDD_OK AŽ,”s,·,ê,ÏŽÿ,ÏGf%o [,ð•Ö,· B

DDERR_INVALIDOBJECT

DDERR_INVALIDPARAMS

lpNumCodes

lpCodes,ÄŽ!,³,ê,é”z—ñ,ÏGf“fgfŠ ” BfGf“fgfŠ ”,ª ¬,³,·,¬,Ä,·,×,Ä,ÏfR [fh,ªŽû”[,Ä,«,È,¢ ê ‡,É,Í A lpNumCodes,É,Í—v< ,³,ê,½¹,ªZfbfg,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,ϖfT [ftFfX Ef f,fŠ,ð\ ,·DirectDrawSurfaceIfufWfFfNfg,ðŽæ“¾,·,é B

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

DDERR_INVALIDOBJECT

DDERR_INVALIDPARAMS

DDERR_NOTFOUND

lplpGDIDDSurface

GDI,Ìfvf%ofCf}fŠ EfT [ftFfX,ðfRf“fgf [f<,μ,Ä,ϕ,éDirectDrawSurfaceIfufWfFfNfg,Ö,Ìf|fCf“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 A6000,ª•Ô,é B

-Œ÷,·,ê,î DD_OK AŽ,"s,·,ê,îŽŸ,ìfGf%o [,đ•Ô,· 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, Ì DD_OK AŽ, ”s, ., ê, Ì ŽŸ, Ì fGf% [, ð•Ô, . B

DDERR_INVALIDOBJECT

DDERR_INVALIDPARAMS

lpbIsInVB

, '¼<A ü, Ì ó'Ô, ðŽæ“¼, ., é•Ì ”, Ì f|fCf“f^ B, ±, Ì fpf%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

-Œ÷,·,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,ÏfAfhfŒfX 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,ÉŒÄ,Î,ê,Ä,Œ
,È,Œ 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,Œ
½DirectDrawIfufWfFfNfg,Ï ì ñ v,đŽQ Æ,·,é,±,Æ B

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

IUnknown::Release

IDirectDraw2::RestoreDisplayMode

HRESULT RestoreDisplayMode ();

f v f % o f C f } f Š E f T [f t f f X , ð f f B f X f v f C f C E f f o f C f X E f n [f h f E f f A , ð A

IDirectDraw2::SetDisplayMode,³CEÁ,Î,ê,é^È^O,É•œE³,:é B”r¼“IfCEfxf<,Á,ÏfAfNfZfX,µ,½Eã,É,Í•K—v,È ^— ,Á, ,
é B

-CE÷,·,ê,Î DD_OK AŽ,”s,·,ê,ÎŽŸ,ÏfGf%o [,ð•Ô,· B

DDERR_GENERIC

DDERR_INVALIDOBJECT

DDERR_INVALIDPARAMS

DDERR_LOCKEDSURFACES

DDERR_NOEXCLUSIVEMODE

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

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

IDirectDraw2::SetCooperativeLevel

HRESULT SetCooperativeLevel (HWND hWnd, DWORD dwFlags);

fAfVfŠfP [fVf‡f“,É“® 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„éEfEfBf“fhfE Efnf“fhf< B

dwFlags

ŽŸ„İftf%ofO„İ’l„l„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“® İ i„½„Æ„ı„İftfŠfbfsf“fO j„đ“E İ„,·„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„,“
„Æ„,·„é BDDSCL_EXCLUSIVEftf%ofO„Ü„½„İDDSCL_NORMALftf%ofO„Í„Ç„ç„ç„©„Đ„Æ„Ä„“fZfbfg„³„è„È„,“ê„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„Í f„ [fhXf„ [fh„đ—ñ<“„ı„È„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„Í f„ [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\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•••,Á, ,é**DDSCAPS** \‘c‘ì,ìDDSCAPS_MODEXftf%oO,ÁŽ,³,ê,é B

IDirectDraw2::SetCooperativeLevel ,Í AfAvfšP [fVf‡f“,ª DirectDraw,ðf}fˆfvfˆ EfEfBf“fhfE,ÁŽg,±,±,Æ,ª,Á,«,é,æ,±,É ADDSCL_NORMALf, [fh,ðŽw’è,µ,½ Û,È,àEfBf“fhfE Efnf“fhfˆ,ð—vˆ ,µ,È,¢ BfEfBf“fhfE Efnf“fhfˆ,ÉNULL,ð“n,¹,Í A,·,×,Á,ìfEfBf“fhfE,Í Afm [f}fˆ,ÈWindowsf, [fh,Á“Žž,ÉDirectDraw,ÁŽg,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,Á,¢,é B,Á,Û,èAvfšP [fVf‡f“,ª §ÆáfÆfxfˆ,ðfZfbfg,·,é,½,ß,É A,±,ê,ç,ìfCf“f^ [ftfFfCfX,ì **IDirectDraw**fo [fWf‡f“,ðŽg,± ê ‡,Í AÆ³,ìffBfXfvfÆfCf, [fh,Í A **IDirectDraw::RestoreDisplayMode** *f\bfbfh,ðŽg,±,±,Æ,É,æ,Á,ÄšXfgA,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•ï 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 **IDirectDraw2**fCf“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,é,O,É”r¼“IfCfxfAfnfZfX,ðfZfbfg,·,é,½,ß,ÉŽg—p,·,é B¼,lfAfvfřfP [fvfřf^,ª Afvf%ofCf}

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

fř Eft [ftfFfX EfIfufWfFfnfg,Í AfřfXfgfA,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,Æ**IDirectDraw::SetCooperativeLevel**,İřÔ,İ ‘řCÉÝ ì—

p,ÍDirectDraw2,Ä,İ,»»,Æ^Ü,É,é B,Ä,Ü,èfAfvfřfP [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 ê ± 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,lfBfXfvfCfC Ef, [fh,İ·æCE³,Í A”r¼“If, [fh,ª%ð æ,³,é,½,žž,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 üŠúŠÔ,đŽg,Á,Ä“Šú,đŽæ,é•û-@,đ•ñ<Ÿ,·,é B
-Œ÷,·,ê,Î DD_OK AŽ,”s,·,ê,ÎŽŸ,ÌfGf%o [,đ•Ô,· B

DDERR_INVALIDOBJECT

DDERR_INVALIDPARAMS

DDERR_UNSUPPORTED

DDERR_WASSTILLDRAWING

dwFlags

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

DDWAITVB_BLOCKBEGIN

, ¼A üŠúŠÔ,ÌŠJŽnŽž,©,ç•Ô,· 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 üŠúŠÔ,ª I,í,è A•Ž!,đŠJŽn,µ,½,Æ,«,É•Ô,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, fŠ”z’u **Initialize**

fNfŠfbfv EfŠfXfg **GetClipList**
IsClipListChanged
SetClipList
SetHWND

fnf“fhf< **GetHWND**

IDirectDrawClipper*fCf“f^ [ftfFfCfX,Í A,·,×,Ä,ÌCOMfCf“f^ [ftfFfCfX,Ì,æ,□,É=
IUnknownfCf“f^ [ftfFfCfX Ef f\fbfh,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,½NfŠfbfv EfŠfXfg,ìfRfs [,ðŽæ“¼,·,é BfNfŠfbfv EfŠfXfg,ðf  
NfŠfbfv“fO,·,ééE`,ð“n,·,±,Æ,È,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 \`c`ì,Ö,ìf|fCf“f^ B
```

lpClipList

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

lpdwSize

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

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

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

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

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

```
,±,é,ç,Ì \`c`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\fbfh,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,ÌfGf%o [,đ•Ô,· B

DDERR_INVALIDOBJECT

DDERR_INVALIDPARAMS

lphWnd

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

DirectDrawClipperIfufWfFfNfg,ÆŠÖ~A,Ä,¯,ç,ê,½fEfBf“fhfE Efnf“fhf<,Ìf|fCf“f^ B

ŽQ Æ @**IDirectDrawClipper::SetHWnd**

IDirectDrawClipper::Initialize

HRESULT Initialize(LPDIRECTDRAW lpDD, DWORD dwFlags);

DirectDrawClipperIfufWfFfNfg, aCoCreateInstance OLE ŠÖ ”, đŽg, Á, Ä ì ¬, ³, ê, ½ ê ±, Ì %Šú%» , đ s, □ B

¬Ā÷, ·, ê, Ĩ DD_OK AŽ, ”s, ·, ê, ĨŽŸ, ĨfGf% [, đ•Ō, · B

DDERR_ALREADYINITIALIZED

DDERR_INVALIDPARAMS

lpDD

DirectDrawIfufWfFfNfg, Ĩ DirectDraw \c‘Ĭ, ĨfCf“f^ B, ±, Ĩpf%of [f^, aNULL, ÉfZfbfg, ³, ê, é, Ā A“Ā—
š, μ, ½DirectDrawClipperIfufWfFfNfg, a ì ¬, ³, ê, é B(**DirectDrawCreateClipper**ŠÖ ”, đ Žg, □, Ĭ, Ā“™, μ, Ć)

dwFlags

, ±, Ĩpf%of [f^, ĬĀ» Ý—ĆŽg—p, Ē, Ĭ, Ā A0, ÉfZfbfg, μ, Ä, ”, ·, ±, Ā B

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

, Ē, μ, ½, a, Á, Ä’ñ<Ÿ, ³, ê, é B, ·, Ä, ÉDirectDrawCreateClipper, Ū, ½, Ĭ**IDirectDraw2::CreateClipper**f f\fbfh, aDirectDrawClip
per, đ ì ¬, ·, é, ½, β, ÉŽg, í, ê, ½ ê ±, É, Ĭ A, ±, Ĩf f\fbfh, ĨfGf% [, Ā, Ē, è A DDERR_ALREADYINITIALIZED, đ•Ō, · B

IDirectDrawClipper::Initialize, ĀCoCreateInstance, ĨŽg—p, Ē, Ā, Ć, Ä, Ĭ Ú ×, Ĭ A uCoCreateInstance, đ—p, Ć

½DirectDrawClipperIfufWfFfNfg, Ĭ 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

¬E÷,·,ê,Î DD_OK AŽ,"s,·,ê,ÎŽÿ,ÌfGf%o [,ð•Ô,· B

DDERR_INVALIDOBJECT

DDERR_INVALIDPARAMS

lpbChanged

E%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 æ,·,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 æ,³,ê,é B

dwFlags

,±,Īfpf%of [f^,ĪŒ» 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•%æ,Ī AfNfŠfbfvf“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,ÉfZfbfg,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
IunknownfCf“f^ [ftfFfCfX,ÍŽŸ,ĭ³,Ä,ĭf f\fbfh,đfTf| [fg,µ,Ä,¢,é B

AddRef

QueryInterface

Release

IDirectDrawPalette::GetCaps

HRESULT GetCaps(LPDWORD lpdwCaps);

HRESULT GetCaps(LPDWORD lpdwCaps);

DD_OK DDERR_INVALIDOBJECT DDERR_INVALIDPARAMS

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,İpfŒfbfg'l,đ“¾,é B
-Œ÷,.,ê,İ DD_OK AŽ,”s,.,ê,İŽŸ,İfGf%o [,đ•Ō,· B

DDERR_INVALIDOBJECT

DDERR_INVALIDPARAMS

DDERR_NOTPALETTIZED

dwFlags

,±,İpf%of [f^,ÍŒ» Ý-ŒŽg—p B0,ÉfZfbfg,µ,Ä,.,±,Œ B

dwBase

fGf“fgfŠ,İŠJŽnfCf“ffbfNfX B

dwNumEntries

lpEntries,ÉŽw'è,³,ê,½fAfhfŒfX,É“K%ž,µ,½pfŒfbfg EfGf“fgfŠ,İ ” B,»,ê,¼,ê,İpfŒfbfg 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,Ä i,±
,ê,ç,İpf%of [f^,Í A**IDirectDrawPalette::SetEntries**,É,æ,Ä,Ä%ÄŽ<,Œ,È,é j B

lpEntries

pfŒfbfg EfGf“fgfŠ,İfAfhfŒfX B

DDPCAPS_8BITENTRIESfif%ofO,³fZfbfg,³,ê,½ ê ‡ AfpfŒfbfg EfGf“fgfŠ,Í,PfofCf-g-^,Ä, ,é B,»,ê~ÈŠO,Í4fo
fCf-g-^,Œ,È,é BšeftfB [f<fh,Í FŽw'è,Ä, ,é B

ŽQ Œ @**IDirectDrawPalette::SetEntries**

IDirectDrawPalette::Initialize

HRESULT Initialize(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^ [ftfFfCfX, Ìf f\fbfh, ðŽg—p, μ A DirectDrawSurface fIfufWfFfNfg, ð ì ¬, μ, ÄfVfXfef€ EfƒEfxf<, Ä“@ ì, ·, é B , ±, Ì B, Í, ±, ÌfCf“f^ [ftfFfCfX Ef f\fbfh, É, Ä, ƒ , Ä, ÌfŠftf@fƒEf“fX, Ä, , é B ŠT”O, ÌŠT—v, Í A uDirectDrawSurface fIfufWfFfNfg v, ðŽQ Æ, ·, é, ±, Æ B

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

f f, fŠ, ÌŠ,, è“—, Ä

Initialize

IsLost

Restore

fT [ftfFfX, ÌfAf^fbf`

AddAttachedSurface

DeleteAttachedSurface

EnumAttachedSurfaces

GetAttachedSurface

fuf fbfN“]‘—

Blt

BltBatch

BltFast

fJf%° [EfL [

GetColorKey

SetColorKey

ffofCfX EfRf“fefLXfg

GetDC

ReleaseDC

fT [ftfFfX EftfŠfbfsf“fO

Flip

fT [ftfFfX Ef fbfN

Lock

PageLock

PageUnlock

Unlock

,», Ì¼

GetDDInterface

fI [fo [fƒEfC

AddOverlayDirtyRect

EnumOverlayZOrders

GetOverlayPosition

SetOverlayPosition

UpdateOverlay

UpdateOverlayDisplay

UpdateOverlayZOrder

ó‘Ô

GetBltStatus

GetFlipStatus

fT [ftfFfX”\—Í

GetCaps

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

fT [ftFfX L 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 (LPDIRECTDRAW_SURFACE2 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 Efobf@,Ö,ÌfAf^fbf^,%oÂ”\,Â, ,é B
 Ž©“@“I,É¼,ÌfAf^fbf^,ð Ø*(fif^fbf^),·,éAfAf^fbf^,à, ,é B ,½,Æ,·,Ì3D
 Zfobf@,²fAf^fbf^,Â,«,é,Ì,Ìê“x,É,Ð,Æ,Â,ÌfobfN Efobf@,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^fCfv,ÌftfŠfbfsf“fO EfT [ftFfX,É,ÍfAf^fbf^,Â,«,È,¢
 ,ª A`Û,È,éf^fCfv,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,ª“f^fCfv,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,ÍfT [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,ìŸfXfg,đ
ì ¬,·,é B

—Ā÷,·,ê,Ī DD_OK AŽ,”s,·,ê,ĪŽŸ,ìfGf%o [,đ•Ō,· B

DDERR_INVALIDOBJECT

DDERR_INVALIDPARAMS

DDERR_INVALIDSURFACETYPE

DDERR_UNSUPPORTED

lpRect

X V,·,é•K—v,ª, ,é RECT \‘ċ‘Ī,Ō,ìf|fCf“f^ B

,±,ìf f\fbfh,ĪfI [fo [fĀfC,đf\ftfgfEfffA,ÅŽÀ‘•,·,é,Ā,«,ì,½,ß,ÉŽg—p,³,ê,é B
fn [fhfEfffA,ªfI [fo [fĀfC,đfTf| [fg,·,é ê ‡,É,Ī•K—v,È,ċ 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*, *İ* *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*, *İ* *f* *T* [*f* *t* *F* *f* *X* *ä*, *İ* *ĉ* *Ĉ*, *İ* *¶* *ä*, *”*, *æ*, *Ń* *%* *E* *%* *0*, *İ* *Ê* *’* *u*, *đ* *’* *è* *’* *μ*, *½* *RECT* *’* *ĉ* *’* *İ*, *İ* *f* *|* *f* *C* *f* *“* *f* *^* *B*

lpDDSrcSurface

f *u* *f* *b* *f* *N* *“* *”* *—* *Ĉ* *·* *İ*, *İ* *“* *”* *—* *Ĉ* *³*, *Ä*, *·* *é* *DirectDraw* *f* *T* [*f* *t* *F* *f* *X*, *İ* *f* *A* *f* *h* *f* *C* *e* *f* *X* *B*

lpSrcRect

f *u* *f* *b* *f* *N* *“* *”* *—*, *³*, *ê*, *é* *“* *”* *—* *Ĉ* *³* *f* *T* [*f* *t* *F* *f* *X* *ä*, *İ* *ĉ* *Ĉ*, *İ* *¶* *ä*, *”*, *æ*, *Ń* *%* *E* *%* *0*, *İ* *ê* *Š*, *đ* *’* *è* *’* *μ*, *½* *RECT* *’* *ĉ* *’* *İ*, *İ* *f* *|* *f* *C* *f* *“* *f* *^* *B*

dwFlags

DDBLT_ALPHADEST

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

DDBLT_ALPHADESTCONSTOVERRIDE

·, *±*, *İ* *f* *u* *f* *b* *f* *N* *“* *”* *—*, *İ* *“* *”* *—* *æ* *f* *T* [*f* *t* *F* *f* *X*, *İ* *f* *A* *f* *ĉ* *f* *t* *@* *E* *f* *ˆ* *f* *f* *f* *l* *f* *ĉ*, *Æ*, *μ*, *Ä*
DDBLTFX *’* *ĉ* *’* *İ*, *İ* *dwAlphaDestConst* *f* *f* *“* *f* *o*, *đ* *Ž* *g* *—* *p*, *·*, *é* *B*

DDBLT_ALPHADESTNEG

f *A* *f* *ĉ* *f* *t* *@* *’* *İ*, *İ* *’* *%* *Á*, *É*, *Ä*, *ê* *“* *”* *—* *æ* *f* *T* [*f* *t* *F* *f* *X*, *“* *§* *—* *¾* *%* *»*, *·*, *é*, *±*, *Æ*, *đ* *•* **
·, *·* *i* *0*, *İ* *s* *“* *§* *—* *¾* *j* *B*

DDBLT_ALPHADESTSURFACEOVERRIDE

“ *”* *—* *æ*, *İ* *f* *A* *f* *ĉ* *f* *t* *@* *E* *f* *ˆ* *f* *f* *f* *l* *f* *ĉ*, *Æ*, *μ*, *Ä* *A* *DDBLTFX*
’ *ĉ* *’* *İ*, *İ* *lpDDSAAlphaDest* *f* *f* *“* *f* *o*, *đ* *Ž* *g* *—* *p*, *·*, *é* *B*

DDBLT_ALPHAEDGEBLEND

f *J* *f* *%* *0* [*·* *E* *L* [*·* *İ* *F*, *đ* *%* *0* *Ž* *æ*, *é* *%* *æ* *’* *æ*, *İ* *f* *G* *f* *b* *f* *W*, *İ* *f* *A* *f* *ĉ* *f* *t* *@* *E* *f* *ˆ* *f* *f* *f* *l* *f* *ĉ*,
Æ, *μ*, *Ä* *DDBLTFX* *’* *ĉ* *’* *İ*, *İ* *dwAlphaEdgeBlend* *f* *f* *“* *f* *o*, *đ* *Ž* *g* *—* *p*, *·*, *é* *B*

DDBLT_ALPHASRC

f *s* *f* *N* *f* *Z* *f* *ĉ* *E* *f* *t* *H* [*f*] *f* *b* *f* *g*, *Ä*, *İ* *f* *A* *f* *ĉ* *f* *t* *@* *î* *•* *ñ*, *©* *A*, *±*, *İ* *f* *u* *f* *b* *f* *N* *“* *”* *—*
·, *İ* *f* *A* *f* *ĉ* *f* *t* *@* *E* *f* *ˆ* *f* *f* *f* *l* *f* *ĉ*, *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-,ß,é RGB F,Æ,μ,Ä DDBLTFX
\‘c‘ì,ìdwFillColor f f“fo,ðŽg—p,·,é B

DDBLT_DDFX

,±,Ìfuf fbfn“]—,ÉŽg—p,·,éCEø%oÉ,ðŽw’è,·,é,½,ß,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,ß,ÉDDBLTFX \‘c‘ì,ìdwDDROPS f f“fo,ðŽg—p,·,é B

DDBLT_DEPTHFILL

“]— æZfobftf@ EfT [ftFFfX ā,ì“]— æ<éE`ð-
,,ß,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““,¶,Ä,·,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,^Ä,«<,é,©,·,é,¢,Í¼,ÌfGf%o [,“” ¶Žÿ“æ A,½,¾,¿,É-
ß,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 fAfhfÆfX B

±,ìf f\fbfh,í“Šú, ,é,ç,í”ñ“Šú,ìfuf fbfN“]’—
,đ AffBfXfvfÆfC Ef f,fŠ,©,çffBfXfvfÆfC Ef f,fŠ,Ö AffBfXfvfÆfC Ef f,fŠ,©,çfVfXfef€ Ef f,fŠ,
Ö AfVfXfef€ Ef f,fŠ,©,çffBfXfvfÆfC Ef f,fŠ,Ö AfVfXfef€ Ef f,fŠ,©,çfVfXfef€ Ef f,fŠ,Ö A,ì,ç
,,ê,©,Ä 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,É,é ê ‡ A”CÖ,ìŠg‘â,Ü,½,Í k ¬,ªŽÀ s,³,é,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%fo,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, 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

ŽÀ 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);

“]—E³fJf% [Efl [, ,é,¢,Í“]—æfJf% [Efl [,ðŽg—p,µ A“]—E³fRfs [Efuf fbfN“]—, ,é,¢
Í“§%ßCE^fuf fbfN“]—,ðŽÀ s, ,é B,±,İf f\fbfh,İfn [fhfEfFA,“ñ“Šúfuf fbfN“]—,ðfTf
[fg, ,é ê ð A í,É”ñ“Šúfuf fbfN“]—,ðŽŽ,Ý,é B

-CE÷, ,é,Î DD_OK AŽ,”s, ,é,İŽÝ,İfGf% [,ð•Ô,· B

DDERR_EXCEPTION

DDERR_GENERIC

DDERR_INVALIDOBJECT

DDERR_INVALIDPARAMS

DDERR_INVALIDRECT

DDERR_NOBLTHW

DDERR_SURFACEBUSY

DDERR_SURFACELOST

DDERR_UNSUPPORTED

dwX and dwY

“]—æfT [ftfFX ã,Éfuf fbfN“]—, ,é,~ À•W,“,æ,Ñ,™ À•W B

lpDDSrcSurface

fuf fbfN“]—€ İ,İ“]—E³ DirectDraw fT [ftfFX,İf|fCf“f^ B

lpSrcRect

fuf fbfN“]—,³,é,é“]—E³fT [ftfFX ã,İ,éCE,İ ¶ ã,“,æ,Ñ%E%°,İ À•W,ð’è, ,é RECT \“É,İ,İf|fCf“f^ B

dwTrans

“]—f^fCfv B

DDBLTFAST_DESTCOLOR

KEY

“]—
æ,İfJf% [Efl [,ðŽg—
p, ,é“§%ßCE^fuf fbfN“]—
,ðŽw’è, ,é B

DDBLTFAST_NOCOLORKE

Y

“§%ß,À,È,¢É İ,İRfs [Efuf fbfN“]—,ðŽw’è, ,é B

DDBLTFAST_SRCCOLORKEY

“]—E³,İfJf% [Efl [,ðŽg—p, ,é“§%ßCE^fuf fbfN“]—
,ðŽw’è, ,é B

DDBLTFAST_WAIT

fuf fbfN“]—,³fW [,İ ê ð A
DDERR_WASSTILLDRAWING•Ô’l,ð, ,@,É,Í•Ô,³, ,É’Ò,À B,»,µ,Äfuf
fbfN“]—,İ €”ò,³,À,«,é,©, ,é,¢,Í¼,İfGf% [,“” ¶ŽÝ’æ A,½,¾,ç,É—
ß,é B

,±

,İf f\fbfh,İftfBfXfvfEfC Ef f,š EfT [ftfFX ã,İ,Ý,À“@ İ,µ Afuf fbfN“]—’†,İftfšbfsf“fO,À,«,È,¢ B
IDirectDrawSurface2::BltFast,İ\ftfgfEfFAŽÀ’•,İ **IDirectDrawSurface2::Bltf** f\fbfh,æ,è,à10fp [fZf“fg’-,¢ B
,µ,©,µ AfffBfXfvfEfC Efn [fhfEfFA,³Žg—p,³,é,À,¢,é ê ð,É,Í A—¼ŽÒ,İŠÓ,ÄfXfs [fh,İ ·Ü,İ,É,¢ B

’É İ AIDirectDrawSurface2::BltFast,İfuf fbfN“]—ŽÀ s’†,İ ê ð A,à,µ,,İfuf fbfN“]—
,ðfZfbfgfAfbfv,À,«,È,©,Á,½ ê ð AfGf% [,ð•Ô,µ,À,½,¾,ç,É—ß,é BDDBLT_WAIT ftf%oF,O,İ,±
,İ“@ İ,ð’İ X,µ Afuf fbfN“]—,ð €”òŠ@—1, ,é,©É,İfGf% [,“” ¶, ,é,Ü,À Af f\fbfh,ð’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 p%o 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,È,ç B

lpDDSAttachedSurface

f f f^f b f^,³,ê,é DirectDraw f T [f t f F f X,Ï f A f h f œ f X B ,±,Ï p p%o 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“Í,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“Í,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,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“fg 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,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“fg 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,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 f T [f t f F f X,ð f`f F [f“,ç,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•û,Ï f T [f t f F f X,Í È“O,Ï
ó“Ó,È-ß,é B

ŽQ Æ @**IDirectDrawSurface2::Flip**

IDirectDrawSurface2::EnumAttachedSurfaces

```
HRESULT EnumAttachedSurfaces(LPVOID lpContext,  
    LPDDENUMSURFACESCALLBACK lpEnumSurfacesCallback);
```

Žw'è,³,ê,½fT [ftFfX,ÉfAf^fbf`³,ê,Ä,č,é,·,×,Ä,ìfT [ftFfX,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 [ftFfX-^,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,ÌfI [fo [fĚfC EfT [ftfFfX,đ—ñ<“,·,é B ftf f“fg,©,çfofbfN,Ö A, ,é,ĉ
,ÍfofbfN,©,çftf f“fg,Ö A,È,Ç—ñ<“,·,é † ~,đŽw'è,Á,«é B

-Ě±,·,ê,Î DD_OK AŽ,”s,·,ê,ÎŽŸ,ÌfGf%o [,đ•Ô,· B

DDERR_INVALIDOBJECT

DDERR_INVALIDPARAMS

dwFlags

ˆÈ%°,Ìftf%ofo,Ì,±,ç,ç,ç,©,Đ,Æ,Â,Ì'l,đŽæ,é B

DDENUMOVERLAYZ_BACKTOFRONT

fofbfN,©,çftf f“fg,ÖĚü,©,ĉfI [fo [fĚfC,đ—ñ<“,·,é B

DDENUMOVERLAYZ_FRONTTOBACK

ftf f“fg,©,çfofbfN,ÖĚü,©,ĉfI [fo [fĚfC,đ—ñ<“,·,é B

lpContext

ŠefI [fo [fĚfC EfT [ftfFfX,ÌfR [f<fofbfNŠÖ ”,É“n,³,ê,éft† [fU'è`fRf“fefLfXfg,Ö,Ìf|fCf“f^ B

lpfnCallback

,±,ÌfT [ftfFfX ä,ÉfI [fo [fĚfC,³,ê,½fT [ftfFfX-ˆ,ÉĚÄ,Ñ o,³,ê,é,Ì **fnCallback** ŠÖ ”,Ìf|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 AfffBfXfvfCfC 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

,½ffBfXfvfCfC 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 * lpDDAttachedSurface);
```

Žw'è,³,ê,½" —Í,ǎŽ ,Â AfAf^fbf`³,ê,½fT [ftFfX,ǎŽæ"¾,;é B

-Œ÷,;,ê,Í DD_OK AŽ,"s,;,ê,ÍŽŸ,ÌfGf%o [,ð•Ó,· B

DDERR_INVALIDOBJECT

DDERR_INVALIDPARAMS

DDERR_NOTFOUND

DDERR_SURFACELOST

lpDDSCaps

fT [ftFfX,Ìfn [fhfEfFfA" —Í,ǎŽ ,Â **DDSCAPS** \`ç'ì,ÌfAfhfŒfX B

lpDDAttachedSurface

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© ‡,²" —Í,ǎŽ ,Á,½ DirectDraw
fT [ftFfX,Ö,Ìf|Cf" 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 AZfofbf@,É,æ,é,R,çfy [fW EftfŠfbfsf"fo,ÌfTf] [fg,É•K—v,È,à,ì,È,Ç,Á, ,é B—
v< ,³,ê,½" —Í,ÉŒ© ‡,²fT [ftFfX,³,Ð,Æ,Â^É ãfAf^fbf`³,ê,Ä,ç,é,Æ A,±,Ìf f\fbfh,ÍŽ,"s,;,é B,±
,ì ê ‡ AfAfvfŠfP [fVf‡f",ÍfAf^fbf`³,ê,Ä,ç
,éfT [ftFfX,ǎ"¾,é,½,ß,É**IDirectDrawSurface2::EnumAttachedSurfaces**f f\fbfh,ǎŽg—p,µ,È,¯,ê,Í,È,ç,È,ç B

IDirectDrawSurface2::GetBltStatus

HRESULT GetBltStatus(DWORD dwFlags);

fuf fbfN“]’—fn [fhfEfffA, Ì ó‘Ô, ðŽæ“¾, ·, é B

*fuf fbfN“]’—fn [fhfEfffA, “¶ Ý, ·, é, È, Ç DD_OK, ð•Ô, · Afuf fbfN“]’—fn [fhfEfffA, “¶rfW [, È, Ç
DDERR_WASSTILLDRAWING Afuf fbfN“]’—fn [fhfEfffA, “¶ Ý, µ, È, Ç, È, Ç
DDERR_NOBLTHW AŽ, ”s, ·, ê, 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 [ftfFfX, ÉŠÖ, í, éfuf fbfN“]’—, ð, ½, ¾, ç, ÉŽÀ s, Å, «, é, ©, Ç, ¢
, ©, ð-â, Ç ‡, í, 1 Afuf fbfN“]’—, ðŠ®—1, Å, «, é ê ‡DD_OK, ð•Ô, · B*

DDGBS_ISBLTDONE

*fuf fbfN“]’—, “ s, í, ê, ½, ©, Ç, ¢, ©, ð-â, Ç ‡, í, 1 A, ±
, ÌfT [ftfFfX, Ì ÅÆã, Ìfuf fbfN“]’—, “Š®—1, µ, Å, Ç, é, È, Ç, DD_OK
, ð•Ô, · B*

IDirectDrawSurface2::GetCaps

HRESULT GetCaps(LPDDSCAPS lpDDSCaps);

ft [ftfFX,ì]—Í,ðŽæ“¾,·,é B ,±,ê,ç,ì”—Í,ÍffBfXfvfÆfC EfffofCfX,ì”—Í,Æ,Í-ŠÖÆW,Å,à,æ,ç B
-Æ÷,·,ê,Î DD_OK AŽ,”s,·,ê,ÎŽŸ,ÌfGf%o [,ð•Ô,· B

DDERR_INVALIDOBJECT

DDERR_INVALIDPARAMS

lpDDSCaps

ft [ftfFX,ìfn [fhfEfffA]—Í,“ü,é **DDSCAPS** \‘ç‘Ì,ÌfAfhfÆfX B

IDirectDrawSurface2::GetClipper

HRESULT GetClipper(LPDIRECTDRAWCLIPPER FAR * lpDDClipper);

±, ðT [ftfFX, ÆŠÖ~A, Æ, ¯, ç, ê, ½ DirectDrawClipper fIfufWfFfNfg, ðŽæ“¾, ·, é B
-Æ÷, ·, ê, Î DD_OK AŽ, ”s, ·, ê, ÎŽŸ, ðfGf%o [·, ð•Ô, · B

DDERR_INVALIDOBJECT

DDERR_INVALIDPARAMS

DDERR_NOCLIPPERATTACHED

lpDDClipper

fT [ftfFX, ÆŠÖ~A, Æ, ¯, ç, ê, ½ DirectDrawClipper fIfufWfFfNfg, Ö, ðf|Cf“f^, ðfAfhfÆfX 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<óŠŌ, 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<óŠŌ, 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<óŠŌ, 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<óŠŌ, 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 [,ð•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,ĉ,Đ,Æ,Â,đŽw'è,·,é B

DDGFS_CANFLIP

,±,İfT [ftfFfX,đ,½,¾,ĉ,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 ÄĈâ,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€ EfpfÇfbfg,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,Î DD_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 \‘ç‘İ,İf|fCf“f^ B

lpDDSurfaceDesc

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

,±,İf f\fbfh,ÍfRf“f| [flf“fg EfIfufWfFfNfg Ef,ffç iCOM jfvf fgfRfç,ÉŠİ,Ä,«ñçÿ,³,ê,é B
DirectDrawSurface flufWfFfNfg,Í ì ¬,³,ê,½,Æ,«É %Šú%»,³,ê,é,İ,Å A,±,İf f\fbfh,Í 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•”•”•” 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“Í, ÈfAfvfZfX, 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, Ê, Â, Ç, Ä, Ì î·ñ, ðŽw’è, ·, é **DDSURFACEDESC** \‘c‘ì, Ö, ð|fCf“f^ B

dwFlags

DDLOCK_EVENT

IDirectDrawSurface2::Lock,^a—v< ,³, ê, ½fT [ftFfX Ef f, fŠ, ð|fCf“f^, ð•Ö, ·, ±, Æ, %oÂ”\ , Ê, Æ, «, ÊfCfxf“fg, ðì“@, ·, éftf%ofo BfCfxf“fg Efnf“fhf<, **IDirectDrawSurface2::Lock** , Ê“n,³, ê, Â, Ç, é ê ‡ AfZfbfg,³, ê, é B, ± , ðf^fCfv, ðf fbfN,^afT [ftFfX ã, Ê·i ”, ·, é, Æ, « AfCfxf“fg, ÍFIFO ‡, Â^ø, «N, ±, ³, 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,³, È, ·, é, Ì, È, Ç, È, Ç, ±, Æ, ð•\, ·ftf%ofo B <éE, “Žw’è,³, ê, È, Ç ê ‡ A^è”Ö ã, ðfT [ftFfX, Ö, ð|fCf“f^, ð•Ö,³, ê, é B ffftfHf<fg, Â, Ì, ± , ðf%ofo, ðŽw’è, ·, é B

DDLOCK_WAIT

’Ê í Afuf fbfN“]’— ^— ,^aftrfW [ó•Ö, Ì, ½, ßf fbfN, ð“¾, Ç, ê, È, Ç ê ‡ Af f\fbfh, Í¼, ç, Ê 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•Ê, ðfGf%o [, “”- ¶, ·, é, Ü, Â**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::Unlockf f\fbfh, ðEÄ, Ñ o, ·, Ü, Â AfAfvfŠfP [fVf±f“, ðfT [ftFfX Ef f, fŠ, ÊfAfNfZfX, ·, é, ±, Æ, “, Â, «, é B **IDirectDrawSurface2::Unlock**f f\fbfhEÄ, Ñ o, µCEã, Í AfT [ftFfX Ef f, fŠ, Ö, ð|fCf“f^, Ì-³CEø, Ê, È, é B

fAfvfŠfP [fVf±f“, Í Af fbfN,³, ê, ½fT [ftFfX, ð—Ïæ, Afuf fbfN“]’—, ·, é, ±, Æ, Í, Â, «, È, Ç B f fbfN,³, 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”Ê, 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, Á, Ä, à—Ç, Ç ê ‡ A DDLOCK_WAIT ftf%ofo, ðŽg—p, ·, é B

fT [ftFfX,Ö,İfAfNfZfX'†,ÉffBfXfvfĚfC Ef f,fŠ,Ž,í,ê,é,İ,đ-h,®,½,ß A DirectDraw ,Í
IDirectDrawSurface2::Lock,,æ,Ñ **IDirectDrawSurface2::Unlock**€ İ,İŠÖ,É A Win16 f fbfN,đ•ŮŽ ,μ,Ä,ĉ,é B
Win16 f fbfN,Í GDI ,ÆUSER,İfAfNfZfXŽÄ s,É,©,ı,é d'â,È•"ª,Ä, ,è A,±
,İfefNfjfbfN,É,æ,èffBfXfvfĚfC Ef f,fŠ,Ö,İ'¼ ÚfAfNfZfX,"%oÂ"\,É,È,Ä,Ä,ĉ
,é B,»İfAfNfZfX'†,É,İ'¼,İfAfvfŠfP [fVf‡f“,Íf, [fh•İ X,ª,Ä,«È,ĉ
,ª AWindows,İ“ İ,Ž~,Ů,Ä,Ä,μ,Ů,□ B,»,İ,½,ß A **IDirectDrawSurface2::Lock**/**IDirectDrawSurface2::Unlock**,©,ç
IDirectDrawSurface2::GetDC/**IDirectDrawSurface2::ReleaseDC**,İŠúŠÖ,Í,Ä,«,éĚÀ,è'Z,,·,é,×,«Ä, ,é B,±
,İŠúŠÖ AWindows,ªŽ~,Ů,Ä,Ä,μ,Ů,□,½,ß AGUIfffofbfK,İŽg—p,ª,Ä,«È,È,é B

ŽQ Æ @**IDirectDrawSurface2::Unlock** A **IDirectDrawSurface2::GetDC** A **IDirectDrawSurface2::ReleaseDC**

IDirectDrawSurface2::PageLock

HRESULT PageLock(DWORD dwFlags);

f_CfCfNfg Ef f,fŠ EfAfNfZfX (DMA) “]—,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,ªEÄ,Ñ o,³,ê,½,Æ,«ffNfŠf f“fg,³,ê,é B

fJfEf“fg,ª0,É’B,µ,½ŽŽ Af f,fŠ,ªf fbfn,ð%ð œ,µ AfVfXfef€ Ef f,fŠ EfT [ftFfX,ðfIfyf€ [fefBf“fO E fVfXfef€,ªfy [fWf“fO’î Û,Æ,Ä,«é,æ,ª,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^,íE» Ý-čŽg—p B0,ÉfZfbfg,µ,Ä,.,±,Æ B

f fbfN EfJfEf“fg,Í,»ê,¼,ê,lfT [ftFfX,É,Ä,ç
,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,ç 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,ç,È,ç 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%o [,đ•Ö,· B

DDERR_GENERIC

DDERR_IMPLICITLYCREATED

DDERR_INCOMPATIBLEPRIMARY

DDERR_INVALIDOBJECT

DDERR_INVALIDPARAMS

DDERR_NOEXCLUSIVEMODE

DDERR_OUTOFMEMORY

DDERR_UNSUPPORTED

DDERR_WRONGMODE

ffBfXfvfÆfC EfJ [fh,İf, [fh•İ XŽž,â AfAfvfŠfP [fVf‡f“,°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,İ 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 ì,ç,ê,½fT [ftfFfX,đfŠfXfgfA,·,éŽž,Ý,İfGf%o [,Æ,È,é B

IDirectDrawSurface2::Restore,İDirectDrawSurface2::AddAttachedSurface f\fbfh,đŽg—p,µ,Ä ì ¬,³,ê,½-
¾Ž!“İ,ÈfA^fbf”,Ü,Ä,İŽ©“®“İ,ÈfŠfXfgfA,µ,È,ç i ,±,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(LPDIRECTDRAWCLIPPER lpDDClipper);

DirectDrawClipper *fIfufWfFfNfg*, *đ* DirectDrawSurface *fIfufWfFfNfg*, *ÉfAf^fbf`*, *·*, *é* B

-*Ĉ*, *·*, *é*, *Ĥ* DD_OK *A* *Ž*, *·*, *é*, *Ĥ* *Ÿ*, *Ĥ* *Gf%* [*đ*, *Ō*, *·* B

DDERR_INVALIDOBJECT

DDERR_INVALIDPARAMS

DDERR_INVALIDSURFACETYPE

DDERR_NOCLIPPERATTACHED

lpDDClipper

DirectDrawSurface *fIfufWfFfNfg*, *ÉfAf^fbf`*, *·*, *é* DirectDrawClipper *fIfufWfFfNfg*, *đ*, *μ*, *Ä*, *Ĉ*, *é* DirectDrawClipper
`*Ĉ* *Ĥ*, *Ĥ* *fCf`f^* B, *à*, *μ*, *±*, *Ĥ* *pf%*of [*f^*, *a* *f* *l* *·*, *É*, *Ĉ*, *Ĥ* A *Ĉ*» *Ÿ*, *Ĥ* DirectDrawClipper *fIfufWfFfNfg*, *đff^fbf`*, *·*, *é*, *±*,
Æ, *đ* *Ō*-*·*, *é* B

±, *Ĥ* *f* *f* *b* *f* *h*, *Ĥ* *Ž* *ā*, *É* *f* *T* [*ftfFfX*, *a* *Ä* *%*, *Ĥ* *f* *T* [*ftfFfX*, *Ĥ* *ā*, *É* *f* *I* [*fo* [*fĈfC*, *3*, *é*, *é*, *Ĉ* A, *é*, *Ĉ*, *Ĥ* *f* *u* *f* *b* *f* *N*“]—
3, *é*, *é*, *½*, *β*, *É* *Ž* *g*—*p*, *3*, *é* A, *·*, *Ĉ*, *ā*, *é* *f* *T* [*ftfFfX* *ā*, *Ä* *Ž* *g*—*p*, *Ä*, «*é* B DirectDrawClipper
fIfufWfFfNfg, *a* *f* *A* *f* *^* *f* *b* *f* *`*, *3*, *é* A, » *μ*, *Ä* *f* *N* *f* *Š* *f* *b* *f* *v* *E* *f* *Š* *f* *X* *f* *g*, *a*, » *é*, *Æ* *Ĉ* *·*, *Ĥ*, *Ĉ*, *é*, *½* *Ĉ* *ā* A DirectDrawClipper
fIfufWfFfNfg, *Ĥ* **IDirectDrawSurface2::Blt** A **IDirectDrawSurface2::BltBatch** A, *·*, *æ*, *Ÿ*
IDirectDrawSurface2::UpdateOverlay *^*— *Ĥ*, *Ĥ*, *½*, *β*, *É* *Ž* *g*—*p*, *3*, *é*, *é* B, *±*, *Ĥ* *f* *f* *b* *f* *h*, *Ĥ* DirectDrawSurface
fIfufWfFfNfg, *Ĥ* *Ĉ*» *Ÿ*, *Ĥ* DirectDrawClipper *fIfufWfFfNfg*, *đff^fbf`*, *·*, *é*, *±*, *Æ*, *a*, *Ä*, «*é* B

±, *Ĥ* *f* *f* *b* *f* *h*, *a*“*Ĉ*, *Ĥ* DirectDrawClipper *fIfufWfFfNfg*, *É* *Ĥ*, *μ*, *Ä*“*Ĉ* *é* *f* *T* [*ftfFfX* *ā*, *Ä* *^* *A* *±*
μ, *Ä* *”%ā* *Ĉ* *Ĉ*, *Ÿ* *o*, *3*, *½* *é* *±*, *Ä*, *à* A *f* *u* *f* *u* *f* *W* *f* *F* *f* *N* *f* *g*, *Ĥ* *Ž* *Q* *Æ* *f* *J* *E* *f*“*f* *g*, *Ĥ*, *P*, *μ*, *Ĉ* *’* *%* *ā*, *μ*, *É*, *Ĉ* B
d *·*, *·*, *é* *Ĉ*, *Ÿ* *o*, *μ*, *Ĥ* A *f* *u* *f* *u* *f* *W* *f* *F* *f* *N* *f* *g*, *Ĥ* *Ž* *Q* *Æ* *f* *J* *E* *f*“*f* *g*, *É* *%* *e* *Ĉ*, *đ*—*^*, *Ĥ*, *Ĉ* B

Ž *Q* *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,Í,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|fçf" 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,± ,İfpfŒfbfg,đŽg—p,·,é B fpfŒfbfg•Í X,İfŠftfŒfbfVf... Ef^fCf~f“fO,ÉŠÖŒW,È,‘, Á,É s,í,ê,é B

-Œ÷,·,ê,Í DD_OK AŽ,”s,·,ê,İŽŸ,İfGf%o [,đ•Ó,· B

DDERR_GENERIC

DDERR_INVALIDOBJECT

DDERR_INVALIDPARAMS

DDERR_INVALIDSURFACETYPE

DDERR_NOEXCLUSIVEMODE

DDERR_NOPALETTEATTACHED

DDERR_NOPALETTEHW

DDERR_NOT8BITCOLOR

DDERR_SURFACELOST

DDERR_UNSUPPORTED

lpDDPalette

DirectDrawPalette \“‘İ,İf|fCf“f^ B

,±,İf f\fbfh,“~“êfT [ftfFfX ã,Á~A‘±

,μ,Ä ”%ñŒÄ,Ñ o,³,ê,½ ê ‡,Á,à AfpfŒfbfg,İŽQ ÆfJfEf“fg,Í,P,Â‘ %Á,·,é,¾,¯,Á, ,é B d·i,·,éŒÄ,Ñ o,μ,İfp fŒfbfg,İŽQ ÆfJfEf“fg,É%œ<¿,đ—^,‘,É,Œ B

ŽQ Æ @IDirectDrawSurface2::GetPalette AIDirectDraw2::CreatePalette

IDirectDrawSurface2::Unlock

HRESULT Unlock(LPVOID lpSurfaceData);

DirectDraw,É'¼ ÚfT [ftfFfX'€ ì,ª I—¹,µ,½,±,Æ,ð'm,ç,¹,é B
-€÷,·,ê,Î DD_OK AŽ,„s,·,ê,ÎŽŸ,ÌfGf%o [,ð•Ô,· B

DDERR_GENERIC

DDERR_INVALIDOBJECT

DDERR_INVALIDPARAMS

DDERR_INVALIDRECT

DDERR_NOTLOCKED

DDERR_SURFACELOST

lpSurfaceData

IDirectDrawSurface2::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, ĹžŠo'« «,đ'uŠ·,Ü,½,Í C ³,·,é B ,±,ê,ç,Ĺft [ftFfX,Í DDSCAPS_OVERLAY
'lfZfbfg,đŽ ,Á,Á,ç,È,.,Á,Í,È,ç,È,ç B*

-C±,·,ê,Ĺ DD_OK AŽ,·s,·,ê,ĹŽŸ,ĹfGf%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—Ĺæ,Ĺ ,,³,đ'èç',·,é RECT \‘ç'Ĺ,Ĺf|fCf“f^ B

lpDDDestSurface

fI [fo [fCfC,³,ê,Ä,ç,é DirectDraw fT [ftFfX,Ĺf|fCf“f^ B

lpDestRect

*fI [fo [fCfC,³ s,í,ê,é“]— æfT [ftFfX,Ĺ ä,É,· A,™· ,·,æ,Ñ—Ĺæ,Ĺ ,,³,đ'èç',·,é RECT \‘ç'Ĺ,Ĺf|
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,Ĺ,È,ç,È,ç—
Ĺæ,đ%Á,!,é B*

DDOVER_ALPHADEST

*fsfNfZf< EftfH [f}fbfg,Á,ĹfAf<ftf@ î·ñ, ,é,ç,ĹfAf<ftf@ Ef`ffflf< Eft [ftFfX,đ A,±
,ĹfI [fo [fCfC,Ĺ“]— æfAf<ftf@ Ef`ffflf<,Æ,μ,ÁfT [ftFfX,ÉfAf^fbf',·,é,½,ß,ÉŽg—
p,·,é B*

DDOVER_ALPHADESTCONSTOVERRIDE

*,±,ĹfI [fo [fCfC,Ĺ“]— æfAf<ftf@ Ef`ffflf<,Æ,μ,ÁDDOVERLAYFX \‘ç'Ĺ,Ĺ
dwAlphaDestConst f f“fo,đŽg—p,·,é B*

DDOVER_ALPHADESTNEG

fAf<ftf@'Ĺ,Ĺ' %oÁ,É,Á,ê“]— æfT [ftFfX,“§—¾%o»,·,é,±,Æ,đ·\,· i0,Í·s“§—¾ j B

DDOVER_ALPHADESTSURFACEOVERRIDE

*,±,ĹfI [fo [fCfC,Ĺ“]— æfAf<ftf@ Ef`ffflf<,Æ,μ,ÁDDOVERLAYFX \‘ç'Ĺ,Ĺ
lpDDSAlphaDest f f“fo,đŽg—p,·,é B*

DDOVER_ALPHAEDGEBLEND

*fJf%o [EfL [F,Æ<<,đ Ú,·,é%oæ'œ,ĹfGfbfW,ĹfAf<ftf@ Ef`ffflf<,Æ,μ,ÁDDOVERLAYFX
\‘ç'Ĺ,Ĺ dwAlphaEdgeBlend f f“fo,đŽg—p,·,é B*

DDOVER_ALPHASRC

*fsfNfZf< EftfH [f}fbfg,Á,ĹfAf<ftf@ î·ñ, ,é,ç,ĹfAf<ftf@ Ef`ffflf< Eft [ftFfX,đ A,±
,ĹfI [fo [fCfC,Ĺ“]— 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%o°,Ìftf%ofO,Ì,ð,·,ð,Æ,Â,Ì'l,ðŽæ,é B

DDOVERZ_INSERTINBACKOF

,±,ÌfI [fo [fCfC,ðfI [fo [fCfC Ef`fF [f“,ÌŽQ ÆfI [fo [fCfC,ÌCĚä,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,ð,Æ,ÂCĚä•û,É^Ú“@,·,é B

DDOVERZ_MOVEFORWARD

,±,ÌfI [fo [fCfC,ðfI [fo [fCfC Ef`fF [f“,Ì,ð,Æ,Â'O•û,É^Ú“@,·,é B

DDOVERZ_SENDBACK

,±,ÌfI [fo [fCfC,ðfI [fo [fCfC Ef`fF [f“,ÌCĚä•û,É^Ú“@,·,é B

DDOVERZ_SENDTOFRONT

,±,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,ÄŽg—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 DirectDrawSurfaceIfufWfFfNfg,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 [ftFfX 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·”, Ä, È, çf%oFXf^ ^— i ROPs j, ðŽw’è,·,é,½,ß,ÉDDBLTFX \‘c‘ì, ì dwDDROPS f f“fo, ðŽg—p,·,é B

DDBLT_KEYDEST

fuf fbfN“]’— æfT [ftFfX, ÆCE<, Ñ·t,¯, ç,é,½fJf% [EfL [, ðŽg—p,·,é B

DDBLT_KEYDESTOVERRIDE

fuf fbfN“]’— æfT [ftFfX, ìfJf% [EfL [, Æ,μ,Ä ADDBLTFX \‘c‘ì, ì dckDestColorkey f f“fo, ðŽg—p,·,é B

DDBLT_KEYSRC

fuf fbfN“]’— CE³fT [ftFfX, ÆCE<, Ñ·t,¯, ç,é,½fJf% [EfL [, ðŽg—p,·,é B

DDBLT_KEYSRCOVERRIDE

îñCE³fT [ftFfX, 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 [ftFfX, 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 [ftFfX, ÊfAf^fbf`³,é,½Zfobftf@, ðŽg—p,μ,Ä Zfobftf@ Efuf fbfN“]’—, ð s,² 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@, ÊŽg—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@, ÊŽg—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@, ÊŽg—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@, ÊŽg—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

Ž² ä, ÄfT [ftFFX,ð%õñ“],.é B,±,İfuf fbfN“]—,ÍfT [ftFFX,ð ä,©,ç%°,É“ŽÊ,.é B

DDBLTFX_NOTEARING

,±,İfuf fbfN“]—,É,“,ĀfefBfAfŠf“fO,ð”ð,–,é,æ,µ,É l—¶,é B

DDBLTFX_ROTATE180

,±,İfuf fbfN“]—,İŠŎ,ÉfT [ftFFX,ðŽžCEv%õñ,è,Å180“x%õñ“],^{3,1}é B

DDBLTFX_ROTATE270

,±,İfuf fbfN“]—,İŠŎ,ÉfT [ftFFX,ðŽžCEv%õñ,è,Å270“x%õñ“],^{3,1}é B

DDBLTFX_ROTATE90

,±,İfuf fbfN“]—,İŠŎ,ÉfT [ftFFX,ðŽžCEv%õñ,è,Å90“x%õñ“],^{3,1}é B

DDBLTFX_ZBUFFERBASEDEST

*,±,İfuf fbfN“]—,İŠŎ,É A”äŠr,;é’O,İfuf fbfN“]—Ĉ³,š’l,“,æ,Ñ,šfuf fbfN“]—
.,éfuf fbfN“]— æ,š’l,ì,»,è,¼,é,ÉdwZBufferBaseDest f f“fo,ð%Å,!,é B*

DDBLTFX_ZBUFFERRANGE

*,±,İfuf fbfN“]—,İŠŎ,Éfuf fbfN“]—
Ĉ³fT [ftFFX,©,ç; »µ,½frfbfg,İĈÅŠE,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 Å’áĈÅŠE B

dwZBufferHigh

Zfobftf@,Ì Å ,ĈÅŠE B

dwZBufferBaseDest

Zfobftf@,İfuf fbfN“]— æŠ’è’l B

dwZDestConstBitDepth

fuf fbfN“]— æ,š’è ”,İfrfbfg [“x B

dwZDestConst

fuf fbfN“]— æZfobftf@,Æ,µ,ÄŽg—p,³è,é’è ” B

lpDDSZBufferDest

fuf fbfN“]— æZfobftf@,Æ,µ,ÄŽg—p,³è,éfT [ftFFX B

dwZSrcConstBitDepth

fuf fbfN“]—Ĉ³,š’è ”,İfrfbfg [“x B

dwZSrcConst

fuf fbfN“]—Ĉ³Zfobftf@,Æ,µ,ÄŽg—p,³è,é’è ” B

DDSZBufferSrc

fuf fbfN“]—Ĉ³Zfobftf@,Æ,µ,ÄŽg—p,³è,éfT [ftFFX B

dwAlphaEdgeBlendBitDepth

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

dwAlphaEdgeBlend

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

dwReserved

«—,Ì,½,ß,É—\—ñ,³è,Ä,ç,é B

dwAlphaDestConstBitDepth

fuf fbfN“]— æfAf<ftf@’è ”,İfrfbfg [“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 ”,ìrfrfbfg [“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    dwSVBCKeyCaps;
    DWORD    dwSVBFXCaps;
    DWORD    dwSVBRops[DD_ROP_SPACE];
    DWORD    dwVSBCaps;
    DWORD    dwVSBCKeyCaps;
    DWORD    dwVSBFXCaps;
    DWORD    dwVSBRops[DD_ROP_SPACE];
    DWORD    dwSSBCaps;
    DWORD    dwSSBCKeyCaps;

    DWORD    dwSSBCFXCaps;
    DWORD    dwSSBRops[DD_ROP_SPACE];
    DWORD    dwReserved4;
    DWORD    dwReserved5;
    DWORD    dwReserved6;
} 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,Á<L q,³,ê,½fT [ftFfX,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|f<,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_fC
EfAfNfZfX,³ñ ì,É`x,C%Ô”\ «,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% [EftBf<,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,³VfXfef€ Ef f,fŠ,É, ,é,ç
,ìVfXfef€ Ef f,fŠ,ç,fuf 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 [CfC,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

DDCAPS_COLORKEYHWASSIST

fJf% [EfL [,^fn [fhEfFfA,É,æ,èfTf] [fg,^,è,Ä,ç,é,±,Æ,ð\,· B

DDCAPS_GDI

ffBfXfvfçFc Efn [fhEfFfA,^GDI,Æç—L,^,è,é,±,Æ,ð\,· B

DDCAPS_NOHARDWARE

fn [fhEfFfA EfTf] [fg,^,è,ç,±,Æ,ð\,· B

DDCAPS_OVERLAY

ffBfXfvfçFc Efn [fhEfFfA,^fI [fo [fçFc,ðfTf] [fg,·,é,±,Æ,ð\,· B

DDCAPS_OVERLAYCANTCLIP

ffBfXfvfçFc Efn [fhEfFfA,^fI [fo [fçFc,ðfTf] [fg,·,é,^ AfNfŠfbfSf“fO,Í,Ä,«,È,ç,±,Æ,ð\,· B

DDCAPS_OVERLAYFOURCC

fI [fo [fçFc Efn [fhEfFfA,^fI [fo [fçFc ^— ,İŠÔ A FçóŠÔ·İŠ,^,Ä,«,é,±,Æ,ð\,· B

DDCAPS_OVERLAYSTRETCH

fI [fo [fçFc Efn [fhEfFfA,É L,·,İ”—Í,^, ,é,±,Æ,ð\,· B

DDCAPS_PALETTE

DirectDraw,^fvf%çf}fŠ EfT [ftFfX,¾,^,Ä,È, A^¼,İfT [ftFfX,É,à DirectDrawPalette fIfufWfFfNfg,ð İ ^,µ,Ä AfTf] [fg,Ä,«,é,±,Æ,ðŽ!,· B

DDCAPS_PALETTEVSYNC

DirectDraw,^VSYNC,É“Šú,µ,ÄfPfçfbfg,ð X V,Ä,«,é,±,Æ,ð\,· B

DDCAPS_READSCANLINE

ffBfXfvfçFc Efn [fhEfFfA,^fXfLfff“f%çf”“Ç,ÝŽæ,è,^%Ä”\,Ä, ,é,±,Æ,ð\,· B

DDCAPS_STEREOVIEW

ffBfXfvfçFc Efn [fhEfFfA,^fXfçfçfI EfrfWf±f””\—Í,ðŽ ,Á,Ä,ç,é,±,Æ,ð\,· B

DDCAPS_VBI

ffBfXfvfçFc Efn [fhEfFfA,^vfuf%çf“fNŠ,,è ž,Ý,ð ¶ ^,Ä,«,é,±,Æ,ð\,· B

DDCAPS_ZBLTS

fuf fbfN“’—‘É İ,É,“,ç,ÄZfofbftf@,İŽg—p,ðfTf] [fg,·,é B

DDCAPS_ZOVERLAYS

d,È,è,ð §çä,·,éfI [fo [fçFc,š’l,Æ,µ,ÄIDirectDrawSurface2::UpdateOverlayZOrderf f\fbf h,İŽg—p,ðfTf] [fg,·,é B

dwCaps2

,»,İfhf%çfo“Á’è”\—Í,İ Ú ×,ð\,·ftf%çfo B

DDCAPS2_CERTIFIED

ffBfXfvfçFc Efn [fhEfFfA,^·Û Ø,^,è,Ä,ç,é,±,Æ,ð\,· B

DDCAPS2_NO2DDURING3DSCENE

IDirect3DDevice::BeginScenef f\fbfhçÄ,Ñ o,µ,Æ
IDirect3DDevice::EndScenef f\fbfhçÄ,Ñ o,µ,Æ,İŠÔ,É Direct3D,^Žg—p,µ,Ä,ç
,é,·,×,Ä,İfT [ftFfX ä,Ä AIDirectDrawSurface2::Blt,·,æ,ÑIDirectDrawSurface2::Lock,İ,æ,ç,È
2D ^— ,ðŽÄ s,Ä,«,È,ç,±,Æ,ð\,· B

dwCKeyCaps

fJf% [EfL [”\—Í,ð\,·ftf%çfo B

DDCKEYCAPS_DESTBLT

fJf% [EfL [,É,æ,é“§%ççf^fuf fbfN“’—,ðfTf] [fg,·,é B fJf% [EfL [,ÍRGB F,İfuf fbfN“’— æfT [ftFfX,Á’uŠ·%Ä”\,Èfrfbfg,ðŽ!,· B

DDCKEYCAPS_DESTBLTCLRSACE

FçóŠÔ,É,æ,é“§%ççf^fuf fbfN“’—,ðfTf] [fg,·,é B FçóŠÔ,ÍRGB F,İfuf fbfN“’— æfT [ftFfX,Á’uŠ·%Ä”\,Èfrfbfg,ðŽ!,· B

DDCKEYCAPS_DESTBLTCLRSACEYUV

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,é,éfuf fbfN“— æfT [ftfFfX,Á'uŠ·%oÁ”\,Èfrfbfg B

DDCKEYCAPS_DESTOVERLAYCLRSRSPACE

RGB F,lfuf fbfN“— æfJf%o [EfL [,Æ,µ,Ä F<óŠŌ,ðfTf| [fg,·,é B

DDCKEYCAPS_DESTOVERLAYCLRSRSPACEYUV

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,é,éfuf fbfN“— æfT [ftfFfX,Á'uŠ·%oÁ”\,Èfrfbfg B

DDCKEYCAPS_NOCOSTOVERLAY

fi [fo [fŒfC,ÁfJf%o [EfL [,ðŽg—p,·,é,±,Æ,É'í,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_SRCBLTCLRSRSPACE

RGB FfT [ftfFfX,lfuf fbfN“—Œ³ F<óŠŌ,É,æ,é“§%ßŒ^fuf fbfN“—,ðfTf| [fg,·,é B

DDCKEYCAPS_SRCBLTCLRSRSPACEYUV

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_SRCOVERLAYCLRSRSPACE

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_SRCOVERLAYCLRSRSPACEYUV

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,Á s,í,é,é B

DDFXCAPS_BLTARITHSTRETCHYN

fsfNfZf<,đ,Q æ,É,µ,ĀŠg'â,·,éfefNfjfbfN,Ā,Ī,È,-
Afuf fbfN["]—'€ ì,ĪŠŌ,ÉŠg'â,µ,Ā AfT [ftfFfX,đ k ¬,·,é%ŽZ ^— ,đŽg—p,·,é B,±
,ê,Ī,™Ž² i ,¼,É j,É%Ā,Ā s,í,ê A ® ""{ i'1, '2, Ī,æ,µ,É j,ĀŠg'â,·,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" C^Ó,Ī%ñ["],đfTf| [fg,·,é B

DDFXCAPS_BLTROTATION90

fuf fbfN["]—'€ ì†,É,X,O"x,Ī%ñ["],đfTf| [fg,·,é B

DDFXCAPS_BLTSHRINKX

,ž² i ...½ j,É%Ā,Ā AfT [ftfFfX,đ" C^Ó,É k ¬,·,é,±,Æ,đfTf| [fg,·,é B,±
,Īftf%oF,O,Īfuf fbfN["]—'€ ì,Ī,Ý,É—LÆø,Ā, ,é B

DDFXCAPS_BLTSHRINKXN

,ž² 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

,™Ž² i ,¼ j,É%Ā,Ā AfT [ftfFfX,đ" C^Ó,É k ¬,·,é,±,Æ,đfTf| [fg,·,é B,±
,Īftf%oF,O,Īfuf fbfN["]—'€ ì,Ī,Ý,É—LÆø,Ā, ,é B

DDFXCAPS_BLTSHRINKYN

,™Ž² 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

,ž² i ...½ j,É%Ā,Ā AfT [ftfFfX,đ" C^Ó,ÉŠg'â,·,é,±,Æ,đfTf| [fg,·,é B,±
,Īftf%oF,O,Īfuf fbfN["]—'€ ì,Ī,Ý,É—LÆø,Ā, ,é B

DDFXCAPS_BLTSTRETCHXN

,ž² i ...½ j,É%Ā,Ā AfT [ftfFfX,đ ® ""{ i'1, '2, Ī,æ,µ,É j,ĀŠg'â,·,é,±,Æ,đfTf|
[fg,·,é B,±,Īftf%oF,O,Īfuf fbfN["]—'€ ì,Ī,Ý,É—LÆø,Ā, ,é B

DDFXCAPS_BLTSTRETCHY

,™Ž² i ,¼ j,É%Ā,Ā AfT [ftfFfX,đ" C^Ó,ÉŠg'â,·,é,±,Æ,đfTf| [fg,·,é B,±
,Īftf%oF,O,Īfuf fbfN["]—'€ ì,Ī,Ý,É—LÆø,Ā, ,é B

DDFXCAPS_BLTSTRETCHYN

,™Ž² i ,¼ j,É%Ā,Ā AfT [ftfFfX,Ī ® ""{ i'1, '2, Ī,æ,µ,É j,ĀŠg'â,·,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'â,·,éfefNfjfbfN,Ā,Ī,È,-
Afuf fbfN["]—'€ ì,ĪŠŌ,ÉŠg'â,µ AfT [ftfFfX,đ k ¬,·,é%ŽZ ^— ,đŽg—
p,·,é B,™Ž² i ,¼ j,É%Ā,Ā s,í,ê,é B

DDFXCAPS_OVERLAYARITHSTRETCHYN

fsfNfZf<,đ,Q æ,É,µ,ĀŠg'â,·,éfefNfjfbfN,Ā,Ī,È,-
Afuf fbfN["]—'€ ì,ĪŠŌ,ÉŠg'â,µ AfT [ftfFfX,đ k ¬,·,é%ŽZ ^— ,đŽg—
p,·,é B,™Ž² i ,¼ j,É%Ā,Ā s,í,ê A ® ""{ i'1, '2, Ī,æ,µ,É j,ĪŠg'â,ª 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

,ž² i ...½ j,É%Ā,Ā AfT [ftfFfX,đ" C^Ó,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 -,·,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 -,·,é,±,Æ,ð,³,È,ç B

DDFXCAPS_OVERLAYSHRINKYN

,™Ž2 i ,¼ j,É%o^,Á,ÄfT [ftFfX,Ì ® ""ª,Ïê 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 -,·,é,±,Æ,ð,³,È,ç B

DDFXCAPS_OVERLAYSTRETCHX

,~Ž2 i ...½ j,É%o^,Á,ÄfT [ftFfX,ð"Ó,ÉŠg'á,·,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 -,·,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'á,·,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 -,·,é,±,Æ,ð,³,È,ç B

DDFXCAPS_OVERLAYSTRETCHY

,™Ž2 i ,¼ j,É%o^,Á,ÄfT [ftFfX,ð"Ó,ÉŠg'á,·,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 -,·,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'á,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 -,·,é,±,Æ,ð,³,È,ç B

dwFXAlphaCaps

fhf%oFCfo"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' %oÁ,·,é,É,Ä,è,Ä"s"š-¾,É,È,é B fAf<ftf@ îñ,Ì ["x,É,©,í,ç,, A,O,ª,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' %oÁ,·,é,É,Ä,è,Ä"s"š-¾,É,È,é B fAf<ftf@ îñ,Ì ["x,É,©,í,ç,, A,O,ª,Ä,È,ÉŠ@'S,É"s"š-¾,È'l,Ä, ,é B ,±,Ïftf%oFO,Í DDSCAPS_ALPHA,ªfZfbfg,³,è,½ è ‡,ÉÆÄ,èŽg,µ,±,Æ,ª,«,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' %oÁ,·,é,É,Ä,è,Ä"s"š-¾,É,È,é B fAf<ftf@ îñ,Ì ["x,É,©,í,ç,, A,O,ª,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<,^a AfAf<ftf@'l,ì' %oÁ,É,Â,ê,Ä“§-¾,É,È,é,±,Æ,ð·,· B
fAf<ftf@ Ef`ffflf< Eft [f^,ì [“x,Í,P A,Q A,S A, ,é,¢,Í,W,Á, ,é B
fAf<ftf@ îñ,ì [“x,É,©,í,ç,, A,O,^a,Á,Ë,ËŠ@‘S,É•s“§-¾,È'l,Á, ,é B,±,ìftf%ofo,ÍDDCAPS_
ALPHASURFACES,^afZfbfg,³,é,½ ê ‡,ÉCEÀ,èfZfbfg,·,é,±,Æ,^a,Á,«,^a é B
fuf fbfN“]’—€ ì,ì,½,ß,ÉŽg—p,³,é,é B

DDFXALPHACAPS_OVERLAYALPHAEDGEBLEND

fuf fbfN“]’—
€³fJf%o [Efl [,ìfT [ftfFfX,ìfGfbfWŽü,è,ìfAf<ftf@ Efuf€f“ffBf“fo,ðfTf]
[fg,·,é BfI [fo [f€fC,ì,½,ß,ÉŽg—p,³,é,é B

DDFXALPHACAPS_OVERLAYALPHAIXELS

fsfNfZf< EftfH [f}fbfg,ÁfAf<ftf@ îñ,ðfTf] [fg,·,é B fsfNfZf< EftfH [f}
fbfg,Á,ìfAf<ftf@ îñ,ìfRfbfg [“x,Í,P A,Q A,S A, ,é,¢,Í,W,Á, ,é B
fAf<ftf@'l,ì' %oÁ,·,é,É,Â,ê,Ä“§-¾,É,È,é B
fAf<ftf@ îñ,ì [“x,É,©,í,ç,, A,O,^a,Á,Ë,ËŠ@‘S,É•s“§-¾,È'l,Á, ,é B fI [fo [f€fC,ì,½,ß,ÉŽg—
p,³,é,é B

DDFXALPHACAPS_OVERLAYALPHAIXELSNEG

fsfNfZf< EftfH [f}fbfg,ÁfAf<ftf@ îñ,ðfTf] [fg,·,é B fsfNfZf< EftfH [f}
fbfg,Á,ìfAf<ftf@ îñ,ìfRfbfg [“x,Í,P A,Q A,S A, ,é,¢,Í,W,Á, ,é B
fAf<ftf@'l,ì' %oÁ,·,é,É,Â,ê,Ä“§-¾,É,È,é B
fAf<ftf@ îñ,ì [“x,É,©,í,ç,, A,O,^a,Á,Ë,ËŠ@‘S,É•s“§-¾,È'l,Á, ,é B,±,ìftf%ofo,ÍDDCAPS_
ALPHAIXELS,^afZfbfg,³,é,½ ê ‡,ÉCEÀ,èŽg,±,±,Æ,^a,Á,«,^a é B fI [fo [f€fC,ì,½,ß,ÉŽg—
p,³,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,Á, ,é B
fAf<ftf@'l,ì' %oÁ,·,é,É,Â,ê,Ä“§-¾,É,È,é B
fAf<ftf@ îñ,ì [“x,É,©,í,ç,, A,O,^a,Á,Ë,ËŠ@‘S,É•s“§-¾,È'l,Á, ,é B fI [fo [f€fC,ì,½,ß,ÉŽg—
p,³,é,é B

DDFXALPHACAPS_OVERLAYALPHASURFACESNEG

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

dwPalCaps

fPf€fbfg”\—Í,ð·,·ftf%ofo B

DDPCAPS_1BIT

fCf“fffbfNfX,^aPfRfbfg,Á, ,é,±,Æ,ð·,· B fJf%o [Efe [fuf<,É2,Á,ì €-Ú,^a, ,é B

DDPCAPS_2BIT

fCf“fffbfNfX,^aQfRfbfg,Á, ,é,±,Æ,ð·,· B fJf%o [Efe [fuf<,É4,Á,ì €-Ú,^a, ,é B

DDPCAPS_4BIT

fCf“fffbfNfX,^aSfRfbfg,Á, ,é,±,Æ,ð·,· B fJf%o [Efe [fuf<,É16,ì €-Ú,^a, ,é B

DDPCAPS_8BIT

fCf“fffbfNfX,^aWfRfbfg,Á, ,é,±,Æ,ð·,· B fJf%o [Efe [fuf<,É256,ì €-Ú,^a, ,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,^afsfNfZf< i bpp j-^,É,WfRfbfg,Á, ,é ê ‡,É—
L€ø,Á, ,é B,»,è,¼,è,ì F €-Ú,^a,PfofCfG,Á, ,è Afuf fbfN“]’— æfT [ftfFfX ã,ì,W bpp
fPf€fbfg,ìfCf“fffbfNfX,Á, ,é B

DDPCAPS_ALLOW256

,±,ìfPf€fbfg,^a256,ì €-Ú,·,×,Á,ð`è<,Á,«,^a,é,±,Æ,ðŽ,· B

DDPCAPS_PRIMARYSURFACE

fPf€fbfg,^afVf%oCf}fŠ Eft [ftfFfX,ÉfAf^fbf`³,é,Á,¢,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,È”\—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,À,ç,é B

dwSVBCaps

fVfXfef€ Ef f,š |ffBfXfvfCEfC Ef f,šfuf fbfN“]‘—,ìfhf%ofCfo”\—Í B

dwSVBCKeysCaps

fVfXfef€ Ef f,š |ffBfXfvfCEfC Ef f,šfuf fbfN“]‘—,ìfhf%ofCfofJf% [EfL [EYŠ· « B

dwSVBFXCaps

fVfXfef€ Ef f,š |ffBfXfvfCEfC Ef f,šfuf fbfN“]‘—,ìfhf%ofCfoFXEYŠ· « B

dwSVBRops[DD_ROP_SPACE]

fVfXfef€ Ef f,š |ffBfXfvfCEfC Ef f,šfuf fbfN“]‘—,ìf%ofXf^ ^— fTf| [fg B

dwVSBCaps

ffBfXfvfCEfC Ef f,š |fVfXfef€ Ef f,šfuf fbfN“]‘—,ìfhf%ofCfo”\—Í B

dwVSBCKeysCaps

ffBfXfvfCEfC Ef f,š |fVfXfef€ Ef f,šfuf fbfN“]‘—,ìfhf%ofCfofJf% [EfL [EYŠ· « B

dwVSBFXCaps

ffBfXfvfCEfC Ef f,š |fVfXfef€ Ef f,šfuf fbfN“]‘—,ìfhf%ofCfoFXEYŠ· « B

dwVSBRops[DD_ROP_SPACE]

ffBfXfvfCEfC Ef f,š |fVfXfef€ Ef f,šfuf fbfN“]‘—,ìf%ofXf^ ^— fTf| [fg B

dwSSBCaps

fVfXfef€ Ef f,š |fVfXfef€ Ef f,šfuf fbfN“]‘—,ìfhf%ofCfo”\—Í B

dwSSBCKeysCaps

fVfXfef€ Ef f,š |fVfXfef€ Ef f,šfuf fbfN“]‘—,ìfhf%ofCfofJf% [EfL [EYŠ· « B

wSSBCFXCaps

fVfXfef€ Ef f,š |fVfXfef€ Ef f,šfuf fbfN“]‘—,ìfhf%ofCfoFXEYŠ· « B

dwSSBRops[DD_ROP_SPACE]

fVfXfef€ Ef f,š |fVfXfef€ Ef f,šfuf fbfN“]‘—,ìf%ofXf^ ^— fTf| [fg B

dwReserved4, dwReserved5, dwReserved6

«—,ì,½,ß,Ê—\—ñ,³,ê,À,ç,é B

DDCOLORKEY

```
typedef struct _DDCOLORKEY{
    DWORD dwColorSpaceLowValue;
    DWORD dwColorSpaceHighValue;
} DDCOLORKEY, FAR* LPDDCOLORKEY;
```

*fuf fbfN“]‘—E³fJf%o [EfL [,à,μ,Ífuf fbfN“]‘— æfJf%o [EfL [,Æ,È,é F<óŠÔ,ðŽw’è,.,é B
,à,μ ãEÀ,Æ%°EÀ,Ì”ÍÍ¹,“““,¶,Ä, ,é,È,ç AfJf%o [EfL [,Æ,μ,ÄŽw’è,³,ê,é B,±,Ì \‘c‘Í,Í
 IDirectDrawSurface2::GetColorKey,,”æ,Ñ IDirectDrawSurface2::SetColorKey f\fbfh,ÄŽg,í,ê,é B*

dwColorSpaceLowValue

fJf%o [EfL [,Æ,μ,Ä—p,ç,ç,ê,é F”ÍÍ,Ì%°EÀ¹ B

dwColorSpaceHighValue

fJf%o [EfL [,Æ,μ,Ä—p,ç,ç,ê,é F”ÍÍ,Ì ãEÀ¹ B

DDOVERLAYFX

```
typedef struct _DDOVERLAYFX{
    DWORD dwSize;
    DWORD dwAlphaEdgeBlendBitDepth;
    DWORD dwAlphaEdgeBlend;
    DWORD dwReserved;
    DWORD dwAlphaDestConstBitDepth;
union
{
    DWORD dwAlphaDestConst;
    LPDIRECTDRAW SURFACE lpDDSAAlphaDest;
};
    DWORD dwAlphaSrcConstBitDepth;
union
{
    DWORD dwAlphaSrcConst;
    LPDIRECTDRAW SURFACE lpDDSAAlphaSrc;
};
    DDCOLORKEY dckDestColorkey;
    DDCOLORKEY dckSrcColorkey;

    DWORD dwDDFX;
    DWORD dwFlags;
} DDOVERLAYFX, FAR *LPDDOVERLAYFX;
```

IDirectDrawSurface2::UpdateOverlay f\fbfh,É“n,³,ê,éfl [fofŒfC îñ B

dwSize

‘ç‘ì,ì‘á,«,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,éfrfbfg [“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,éfrfbfg [“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,éfrfbfg [“x B

dwAlphaSrcConst

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

lpDDSAAlphaSrc

fuf fbfN“]‘—Œ³,ìfAf<ftf@ Ef`ffflf<,Æ,µ,ÄŽg,í,ê,éT [ftfFfX,ìf|fCf“f^ B

dckDestColorkey

—D æ,·,éfuf fbfN“]‘— æfJf%o [EfL [B

dckSrcColorkey

—D æ,·,éfuf fbfN“]‘—Œ³fJf%o [EfL [B

dwDDFX

fI [fo [fŒfC FXftf%oO B

DDOVERFX_ARITHSTRETCHY

,à,µŠg‘á,·,é,È,ç A,™Ž²,É%o^,Á,Ä%o%ŽŽŠg‘á,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 alpha. The alpha channel is stored in the alpha component of the pixel. The alpha channel is stored in the alpha component of the pixel.

DDPF_ALPHAPIXELS
The pixel format is alpha pixels. The alpha channel is stored in the alpha component of the pixel. The alpha channel is stored in the alpha component of the pixel.

DDPF_COMPRESSED
The pixel format is compressed. The pixel data is stored in a compressed format. The pixel data is stored in a compressed format.

DDPF_FOURCC
The pixel format is fourCC. The pixel format is defined by the fourCC value. The pixel format is defined by the fourCC value.

DDPF_PALETTEINDEXED1

DDPF_PALETTEINDEXED2

DDPF_PALETTEINDEXED4

DDPF_PALETTEINDEXED8

The pixel format is palette indexed. The pixel data is stored in a palette indexed format. The pixel data is stored in a palette indexed format.

DDPF_PALETTEINDEXEDTO8

$fT [ftfFX, \hat{I}, Pfrfbfg A, Qfrfbfg, , \acute{e}, \text{c}, \acute{I}$
 $, Sfrfbfg, \hat{I} F, \delta, Wfrfbfg Efpf\text{Efbfg}, \acute{E}fCf \text{“}ffbfNfX, \mu, \hat{A}, \text{c}, \acute{e} B$

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

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

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

$fAf\langle ftf@ Ef\text{“}fflf\langle Efrfbfg [“x iDDBD_1 A DDBD_2 A DDBD_4 A, , \acute{e}, \text{c}, \hat{I}DDBD_8 j B$

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

$fAf\langle ftf@ Ef\text{“}fflf\langle, \hat{I}f\}fXfN B$

dwYUVAAlphaBitMask

$fAf\langle ftf@ Ef\text{“}fflf\langle, \hat{I}f\}fXfN B$

DDSCAPS

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

DirectDrawSurface fIfufWfFfNfg,Ì”—Í,ð’è<,·,é B ,±,Ì \‘c’ì,Í DirectDraw fIfufWfFfNfg,Ì”—Í,ð·L q,·,é,½,ß,ÉŽg,í,ê,é DDCAPS \‘c’ì,Ìê”,Á, ,é B

dwCaps

```
fT [ftfFfX,Ì”—Í,ð·,· B ^È%°,ìftf%oO,Ì,ð,ç,Ð,Æ,Â,Û,½,Í, ,é,ç,Í·j ”,ì® «,ðŽ ,Â B
DDSCAPS_3D
,±,ê,Ì%°ÊEÝŠ· «,Ì,½,ß,ÉfTf| [fg,³,ê,Á,ç,é,ª AfAfvfŠfP [fvf±f“,Í,ã,í,è,É A
DDSCAPS_3DDEVICE ftf%oO,ðŽg,ð,×,«,Á, ,é B
```

DDSCAPS_3DDEVICE

```
,±,ìfT [ftfFfX,ªR,c·E»—p,É—~—p%Á””,È,±,Æ,ð·,· B
fAfvfŠfP [fvf±f“,ÍftfOfCfX,ªK Ø,Èfq [fv,©,çŠ,,è—
,Á,ç,ê,½fÌftfXfNfŠ [f“ Eft [ftfFfX,ðŽ ,Á,Á,ç,é A“Á’è,Ìfq [fv,Ì,Ý,ð·E”,·,é,±
,Æ,ª,Á,ª,«,é,±,Æ,ð·Û Ø,·,é,½,ß,É A,±,ìftf%oO,ðŽg—p,·,é,±,Æ,ª,Á,ª,«,é B ,à,µ,±
,ìftf%oO,ªfq [fv,Ì,½,ß,ÉfZfbfg,³,ê,Á,ç,é,È,ç AfT [ftfFfX,Í,»,Ìfq [fv,©,çŠ,,è—,Á,ç,ê,È,ç B
```

DDSCAPS_ALLOCONLOAD

```
fT [ftfFfX,ªIDirect3DTexture::Loadf f\fbfh,É,æ,Á,Äf [fh,³,ê,é,Û,Á AfT [ftfFfX,Éf f, f
Š,ðŠ,,è—,Á,È,ç,Æ,ç,ªŽw’è B
```

DDSCAPS_ALPHA

```
,±,ìfT [ftfFfX,ªfAf<ftf@ îñ,ðŠÛ,ñ,Á,ç,é,±,Æ,ð·,· B fsfNfZf< EftH [f]fbfg,Í,±
,ìfT [ftfFfX,ª,½,¾fAf<ftf@ îñ, ,é,ç,ÍfsfNfZf< Fff [f^ îRGBA , ,é,ç,ÍYUVA,Ì,æ,ð
,È j,Æ ¬ ±,³,ê,½fAf<ftf@ îñ,¾, ,ðŠÛ,ñ,Á,ç,é,©,Ç,ª,©E”è,·,é,½,ß,ÉŽæ“¾,³,ê,È,-
,Á,Ì,È,ç,È,ç B
```

DDSCAPS_BACKBUFFER

```
,±,ìfT [ftfFfX,ªfT [ftfFfX EftfŠfbfsf“fO \‘c’ì,ÌfobfN Efofbftf@,Á, ,é,±,Æ,ð·,· B
^è”È,É,±,ìftf%oO,Í DDSCAPS_FLIPftf%oO,ªŽg—
p,³,ê,½IDirectDraw2::CreateSurface f\fbfh,É,æ,Á,Ä Ý’è,³,ê,é BDDSCAPS_FRONTBUFFERf
T [ftfFfX,æ,è¼ Ú æ s,·,éft [ftfFfX,¾, ,±,ìftf%oO,ðŽ ,Á,Á,ç,é B ¼,ìfT [ftfFfX,Í
DDSCAPS_FLIP ADDSCAPS_BACKBUFFER ftf%oO,Ì’¶ Ý A,·,æ,Ñ
DDSCAPS_FRONTBUFFER,ÌE±”@,É,æ,èfobfN Efofbftf@,Æ,µ,Ä”F”m,³,ê,é B,±,Ì”—Í,ª
IDirectDraw2::CreateSurface f\fbfh,É’—,ç,ê,é,Æ A“Æ—
§E^,ÌfobfN Efofbftf@,ª ì ¬,³,ê,é B,±,Ìf f\fbfh,ªEÄ,Ñ o,³,ê,½Eã A,±
,ìfT [ftfFfX,Í AfT [ftfFfX EftfŠfbfsf“fO \‘c’ì,ðE” ¬,·,é,½,ß,Éftf f“fg Efofbftf@ A,ª
,ð,Ð,Æ,Á,ÌfobfN Efofbftf@ A, ,é,ç,Í—¼·û,Æ,à,ÉfAf^fbf’,·,é,±,Æ,ª,Á,ª,«,é B Ú ×,Í
IDirectDrawSurface2::AddAttachedSurface,ðŽQ Æ,·,é,±,Æ B DirectDraw
,ìftfŠfbfsf“fO \‘c’ì,Á”C”O,Ì ”,ìfT [ftfFfX,ðfTf| [fg,·,é B
```

DDSCAPS_COMPLEX

```
·j ±fT [ftfFfX,ªL q,³,ê,Á,ç,é,±,Æ,ð·,· B
·j ±fT [ftfFfX,Í,P’È ã,ìfT [ftfFfX,Ì ì ¬,ð,à,½,ç,· B
’Ç%ÁfT [ftfFfX,Ìf< [fg Eft [ftfFfX,ÉfAf^fbf’,³,ê,é B·j ± \‘c’ì,Í,½,¾f< [fg,ð”]Šü,·,é,±
,Æ,É,æ,Á,Ä”]Šü,·,é,±,Æ,ª,Á,ª,«,é B
```

DDSCAPS_FLIP

```
,±,ìfT [ftfFfX,ªfT [ftfFfXftfŠfbfsf“fO \‘c’ì,Ìê”,Á, ,é,±,Æ,ð·,· B ,±,Ì”—Í,ª
IDirectDraw2::CreateSurface f\fbfh,É”n,³,ê,é,Æ,« A,Ð,Æ,Á,Ìftf f“fg Efofbftf@,·,æ,Ñ,Ð,
Æ,Á^È ã,ÌfobfN Efofbftf@,ª ì ¬,³,ê,é B DirectDraw
,Ìftf f“fg Efofbftf@,ÌDDSCAPS_FRONTBUFFERf\fbfg,·,æ,Ñftf f“fg Efofbftf@,É—
× Ú,µ,Á,ç,éft [ftfFfX,Í DDSCAPS_BACKBUFFERf\fbfg,ðfZfbfg,·,é B,±
,ìftf%oO,ðŽw’è,·,é ê ± ADDSURFACEDESC \‘c’ì,Ì dwBackBufferCountf f“fo,Í ,È,-
,Æ,à,P,ÉfZfbfg,µ,È, ,é,Ì,ç, ,È,ç B IDirectDraw2::CreateSurface f\fbfh,ðŽg—p,µ,Á
’½ ”,ìfT [ftfFfX,ð ì,éŽž A í,ÉDDSCAPS_COMPLEXftf%oO,ðfZfbfg,µ,È, ,Á,Ì,È,ç,È,ç B
```

DDSCAPS_FRONTBUFFER

```
,±,ìfT [ftfFfX,ªfT [ftfFfX EftfŠfbfsf“fO \‘c’ì,Ìftf f“fg Efofbftf@,Á, ,é,±,Æ,ð·,· B ,±
,ìftf%oO,Íè”È,É DDSCAPS_FLIP”—Í,ªfZfbfg,³,ê,½,Æ,«
```

IDirectDraw2::CreateSurface f\fbfh,É,æ,Á,ÄZfbfg,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 B

DDSCAPS_HWCODEC

,±,ÌfT [ftfFfX,ªfn [fhEFeFA,É,æ,Á,Ä³ k%ð æ,³,é,½fXfgfŠ [fE,ðŽ ,Ä,±,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 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 [ftfFfX,ª ‘,«±,Ý ê—p,Æ,È,é,±,Æ,ð\,· B
fT [ftfFfX,©,ç,Ì“Ç,Ý o,µfAfNfZfX,ª“ê”Ê•ÛËì i,f,o j—áŠO,ð ¶ ¬,·,é%oÂ”\ «,à, ,é B,±
,ÌfT [ftfFfX,©,ç,Ì“Ç,Ý o,µË%oÊ,Ì“à—e,Í•Û Ø,³,ê,È,¢ B

DDSCAPS_ZBUFFER

,±,ÌfT [ftfFfX,ªZfofbftf@,Â, ,é,±,Æ,ð\,· B Zfofbftf@,Í\Ž,Â,«È,¢ îñ,ðŠÛ,ñ,Â,¢
,é BfsfNfZfç,Ì%oA—Ê ÁŽ“™,É—~—p,³,ê,éfrfbfg [“x îñ,ðŠÛ,ñ,Â,¢,é B

DDSURFACEDESC

```
typedef struct _DDSURFACEDESC{
    DWORD dwSize;
    DWORD dwFlags;
    DWORD dwHeight;
    DWORD dwWidth;
    LONG lPitch;
    DWORD dwBackBufferCount;
    union
    {
        DWORD dwMipMapCount;
        DWORD dwZBufferBitDepth;
        DWORD dwRefreshRate;
    };

    DWORD dwAlphaBitDepth;
    DWORD dwReserved;
    LPVOID lpSurface;
    DDCOLORKEY ddckCKDestOverlay;
    DDCOLORKEY ddckCKDestBlt;

    DDCOLORKEY ddckCKSrcOverlay;
    DDCOLORKEY ddckCKSrcBlt;
    DDPIXELFORMAT ddpfPixelFormat;
    DDSCAPS ddsCaps;
} DDSURFACEDESC, FAR* LPDDSURFACEDESC;
```

fT [ftFFX,ð ì ¬,;éffXfNfŠfvf^,ð·\· B ,±,Ì \‘ç’ì,ÍIDirectDraw2::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·j ”,ì·® «,ðŽ ,Â B \‘ç’ì,Ì,ç,¼f f“fo,ª—
LÈø,È,Ì,©Žw’è,·,é B

DDSD_ALL

“ü—Í,³,ê,¼,·,×,Ä,¼f f“fo,ª—LÈø,Á, ,é,±,Æ,ð·\· B

DDSD_ALPHABITDEPTH

dwAlphaBitDepth f f“fo,ª—LÈø,Á, ,é,±,Æ,ð·\· B

DDSD_BACKBUFFERCOUNT

dwBackBufferCount f f“fo,ª—LÈø,Á, ,é,±,Æ,ð·\· B

DDSD_CAPS

ddsCaps f f“fo,ª—LÈø,Á, ,é,±,Æ,ð·\· B

DDSD_CKDESTBLT

ddckCKDestBlt f f“fo,ª—LÈø,Á, ,é,±,Æ,ð·\· B

DDSD_CKDESTOVERLAY

ddckCKDestOverlay f f“fo,ª—LÈø,Á, ,é,±,Æ,ð·\· B

DDSD_CKSRCLT

ddckCKSrcBlt f f“fo,ª—LÈø,Á, ,é,±,Æ,ð·\· B

DDSD_CKSRCOVERLAY

ddckCKSrcOverlay f f“fo,ª—LÈø,Á, ,é,±,Æ,ð·\· B

DDSD_HEIGHT

dwHeight f f“fo,ª—LÈø,Á, ,é,±,Æ,ð·\· B

DDSD_MIPMAPCOUNT

dwMipMapCount f f“fo,ª—LÈø,Á, ,é,±,Æ,ð·\· B

DDSD_PITCH

IPitch *f* f“fo,ª—LŒø,Å, ,é,±,Æ,ð\,· B

DDSD_PIXELFORMAT

ddpfPixelFormat *f* f“fo,ª—LŒø,Å, ,é,±,Æ,ð\,· B

DDSD_REFRESHRATE

dwRefreshRate *f* f“fo,ª—LŒø,Å, ,é,±,Æ,ð\,· B

DDSD_WIDTH

dwWidth *f* f“fo,ª—LŒø,Å, ,é,±,Æ,ð\,· B

DDSD_ZBUFFERBITDEPTH

dwZBufferBitDepth *f* f“fo,ª—LŒø,Å, ,é,±,Æ,ð\,· B

dwHeight

fT [ftFfX,ì ,,³ B

dwWidth

“ü—ÍfT [ftFfX,ì• B

IPitch

ŽŸ,ìf%oCf“ŠJŽn,Ü,Å,ì<—É i•Ô¹,ì,Ý j ifsfbf` j B

dwBackBufferCount

*f*ofbfN Efofbftf@,ì ” B

dwMipMapCount

f~fbfvf}fbfvfŒfxf<,ì ” B

dwZBufferBitDepth

*Z*fofbftf@,ì [“x B

dwRefreshRate

*f*ŠftfŒfbVf...‘~“x iffbfXfvfŒfC Ef, [fh,ªL q,³,ê,éŽŽŽg—p,³,ê,é j B

dwAlphaBitDepth

*f*Af<ftf@ Efofbftf@,ì [“x B

dwReserved

—\~ñ,³,ê,Ä,Œ,é B

lpSurface

ŠÖ~A,Ä,¯,ç,ê,½fT [ftFfX Ef f,fŠ,ìfAfhfŒfX B

ddckCKDestOverlay

*f*I [fo [fŒfC æ,ÉŽg—p,·,éfJf%o [EfL [B

ddckCKDestBlit

*f*uf fbfN“]‘— æ,ÉŽg—p,·,éfJf%o [EfL [B

ddckCKSrcOverlay

*f*I [fo [fŒfCŒ³,ÉŽg—p,·,éfJf%o [EfL [B

ddckCKSrcBlit

*f*uf fbfN“]‘—Œ³,ÉŽg—p,·,éfJf%o [EfL [B

ddpfPixelFormat

fT [ftFfX,ìfsfNfZf< EftfH [f}fbfg<L q B

ddsCaps

DirectDraw *fT* [ftFfX”\—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,»æ,¼,ê,Ïf f\fbfh,³•Ô,³,ê,é%oÄ”\ «,Ì, ,éfGf%o [fR [fh,ÏfŠfXfg,Í Af f\fbfh,ÌL q,ðŽQ Æ,·,é,±,Æ B

DD_OK
—v< ,Í ¬Æ÷,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,ÏÆÄ,Ñ o,µ,É“n,³,ê,é“]‘—
Æ³fT [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,»æ,È 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,²,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,ÏffBfXfvfÆfC 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,ÏffBfXfvfÆfC 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,²,Æ,µ,½ B

DDERR_COLORKEYNOTSET
“]‘—Æ³Jf%o [Efl [,³Žw’è,³,ê,Ä,¢,È,¢ B

DDERR_CURRENTLYNOTAVAIL
Æ» 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,ì,c,b,µ,©Žæ“¾,·,é,±,Æ,Í,Ä,«È,¢ B

DDERR_DIRECTDRAWALREADYCREATED
DirectDrawfIfufWfFfNfg,Í,·,Ä,É ì ¬,³,ê,Ä,¢,é B

DDERR_EXCEPTION
—v< ,³,ê,½ ^ — ,ð s,²ŠÖ,É—áŠO,“” ¶,µ,½ B

DDERR_EXCLUSIVEMODEALREADYSET
,·,Ä,É”r¼“If, [fh,³fZfbfg,³,ê,Ä,¢,é,È,à,©,ì,ç, , Acl’²fÆxf<,ðfZfbfg,µ,æ,²,Æ,µ,½ B

DDERR_GENERIC
-¢’è<,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,¢
,ÍEfBf“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 [fhEFA,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 [fhEFAfTf] [fg,ª,È,¢,½,ß A ^— ,ðŽÄ s,Ä,«,È,¢ B

DDERR_NOZBUFFERHW

Zfofbftf@,É'Í,·,éfn [fhEFA 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 [fhEFA,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 [fhEFA,ª,·,Ä,ÉŠ,,,è“—,Ä,ç,ê,Ä,¢,é B

DDERR_OUTOFMEMORY

DirectDraw,ª ^— ,ð s,²,Ï,É \ª,Èf f,fŠ,ª,È,¢ B

DDERR_OUTOFVIDEOMEMORY

DirectDraw,ª ^— ,ð s,²,Ï,É \ª,ÈffBfXfvfEFC Ef f,fŠ,ª,È,¢ B

DDERR_OVERLAYCANTCLIP

fn [fhEFA,ÍfnfŠfbfsf“fO EfI [fo [fEFC,ðfTf] [fg,µ,È,¢ B

DDERR_OVERLAYCOLORKEYONLYONEACTIVE

fI [fo [fEFC ä,É,Ð,Æ,Ä`È ä,Ï—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 , à , ò , Ð , Æ , Â , Ì f X f C E f b f h , É , æ , Á , Ä f f b f N , 3 , ê , Ä , Ç , é , ½ , ß A f A f N f Z f X , a , " Û , 3 , ê , ½ B

DDERR_PRIMARYSURFACEALREADYEXISTS

, ± , Ì ^ — , Í , · , Ä , É f v f % o f Š f } f Š E f T [f t f F f X , ð ì ¬ , µ , Ä , Ç , é B

DDERR_REGIONTOOSMALL

IDirectDrawClipper::GetClipList f f \ b f h , É " n , 3 , ê , ½ — Ì ^ æ , a ¬ , 3 , · , ¬ , é B

DDERR_SURFACEALREADYATTACHED

, · , Ä , É f A f ^ f b f ^ , µ , Ä , Ç , é , à , ò , Ð , Æ , Â , Ì f T [f t f F f X , É f T [f t f F f X , ð f A f ^ f b f ^ , µ , æ , ò , Æ , µ , ½ B

DDERR_SURFACEALREADYDEPENDENT

, · , Ä , É ¼ , Ì f T [f t f F f X , É ^ È ' ¶ , µ , Ä , Ç , é f T [f t f F f X , ð ^ È ' ¶ , 3 , 1 , æ , ò , Æ , µ , ½ B

DDERR_SURFACEBUSY

f T [f t f F f X , a , à , ò , Ð , Æ , Â , Ì f X f C E f b f h , É , æ , Á , Ä f f b f N , 3 , ê , Ä , Ç , é , ½ , ß A f T [f t f F f X , Ö , Ì f A f N f Z f X , a , " Û , 3 , ê , ½ B

DERR_SURFACEISOBSCURED

f T [f t f F f X , Ö , Ì f A f N f Z f X , a A f T [f t f F f X , a , Ç , Ç % B , 3 , ê , Ä , Ç , é , ½ , ß < " Û , 3 , ê , ½ B

DDERR_SURFACELOST

f T [f t f F f X E f f , f Š , Ì s ' « , Ì , ½ , ß A f T [f t f F f X , Ö , Ì f A f N f Z f X , a , " Û , 3 , ê , ½ B , ± , Ì f T [f t f F f X , ð · , · DirectDrawSurface f l u f W f F f N f g , É , IDirectDrawSurface2::Restore f f \ b f h , a Ç Ä , Ñ o , 3 , ê , È , ¬ , ê , Í , È , Ç , È , Ç B

DDERR_SURFACENOTATTACHED

— v < , 3 , ê , ½ f T [f t f F f X , Í f A f ^ f b f ^ , Ä , « , È , Ç B

DDERR_TOOBIGHEIGHT

DirectDraw , É , æ , Á , Ä — v < , 3 , ê , ½ , , 3 , a a , « , · , ¬ , é B

DDERR_TOOBIGSIZE

DirectDraw , É , æ , Á , Ä — v < , 3 , ê , ½ ' ä , « , 3 , a a , « , · , ¬ , é B , µ , © , µ A C E Â · È , Ì , , 3 , Æ · , Í — ä ' è , a , È , Ç B

DDERR_TOOBIGWIDTH

DirectDraw , É , æ , Á , Ä — v < , 3 , ê , ½ · , a a , « , · , ¬ , é B

DDERR_UNSUPPORTED

f T f | [f g , 3 , ê , Ä , Ç , È , Ç ^ — , Ä , , Á , ½ B

DDERR_UNSUPPORTEDFORMAT

— v < , 3 , ê , ½ FourCC f t f H [f } f b f g , Í DirectDraw , É , æ , Á , Ä f T f | [f g , 3 , ê , Ä , Ç , È , Ç B

DDERR_UNSUPPORTEDMASK

— v < , 3 , ê , ½ f s f N f Z f < E f t f H [f } f b f g , Ä , Ì f r f b f g f } f X f N , Í DirectDraw , É , æ , Á , Ä f T f | [f g , 3 , ê , Ä , Ç , È , Ç B

DDERR_UNSUPPORTEDMODE

f f B f X f v f C f C , Í C » Ý f T f | [f g , 3 , ê , Ä , Ç , È , Ç f , [f h , Ä , , é B

DDERR_VERTICALBLANKINPROGRESS

, ¼ < A ü Š ú Š Ö , Ä , , é B

DDERR_WASSTILLDRAWING

, ± , Ì f T [f t f F f X , © , Ç A , Ü , ½ , Ì f T [f t f F f X , Ö , Ì ' O % ñ , Ì f u f f b f N "] ' — ' € i , a Š @ — 1 , µ , Ä , Ç , È , Ç B

DDERR_WRONGMODE

^ Û , È , Ä , ½ f , [f h , Ä ì , Ç , ê , ½ , ½ , ß A , ± , Ì f T [f t f F f X , Í f Š f X f g f A , · , é , ± , Æ , a , Ä , « , È , Ç B

DDERR_XALIGN

— ^ , 1 , Ç , ê , ½ é C ' , ð · K — v , Æ , 3 , ê , é " Í , É ... · ½ ^ è — ñ , É · Ä , × , é , ± , Æ , a , Ä , « , È , © , Ä , ½ B

DirectSound, É, Ā, Ć, Ä

The Microsoft® DirectSound® fAfvfŠfP [fVf‡f“ Efvf fOf%of~f“fO EfCf“f^ [ftfFfCfX(API), Ā ADirectX™ 3 Software Development Kit (SDK), ĩfI [ffBfI EfRf“f [flf“fg, Ā, ,é BDirectSound, ĩ‘Ö, ěŽžŠÖ ifŒfCfef“fV j, ĩ - ,Ē, Ćf~fLfvf“fO Afn [fhEfffA, ĩfAfNfZf%ofŒ [fVf‡f“ A, »μ, ĀfTfef“fh EfffofCfX, Ö, ĩfCfŒfNfg, ĒfAfNfZfX, đŽÄŒ», ,é B, ±, ê, ċ, ĩ<@”\ , ĩŽÄŒ», ĩ, ½, ß, Ē, ĩ ACE»‘¶, ĩWindows ä, ĩfAfvfŠfP [fVf‡f“, ĄfffofCfX Efhf%ofCfo, Ą, ĩŠÖ, ĩŒÝŠ· «,ª•K— v đŒ ,Ą,Ē,é B

DirectX

3, Ē, Ą, Ā, Ā Afn [fhEfffA, ĒŠÖ, ,é Ú ×, Ē‘mž-, Ē, μ, ĀffBfXfvŒfC, ĄfI [ffBfI EfffofCfX, ÖfAfNfZfX, ,é, ± ,Ą, %oĀ”\, Ē, Ē, é BDirectX ÝŒvŽž, ĩ Ā—D æ—Ú“ĪŽ— Ą, ĩXfs [fh, Ā, ,é B ,fŒfxf<ŠÖ ”ŒQ, Ē, Ą, è A DirectSound, ĩfffofCfX”ñĒĒ‘¶fCf“f^ [ftfFfCfX, đ‘ñ<Ÿ, μ A, »ê, Ē, Ą, Ā, ĀfAfvfŠfP [fVf‡f“, ĩfI [ffBfI<@Ši, ĩ”— ĩ, đ Ā‘âŒĀ, Ēĵø, « o, , ±, Ą,ª, Ā, «, é B

DirectSoundfA [fLfefNf`ff

,±,ì ß,Â,Í ADirectSoundfRf“f| [flf“fg,Æ,»»ì¼,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

fnfCfpfTfH [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,^MIDIxfxfŠ [f€
,ÆDirectSound,ì,Ó,½,Ä,lf f\fbfh,Ä, é B MIDIxfxfŠ [f€,Í AWindows 95}f<f^f ffbfAAPI,ì^è,^,Ä, é B
MIDIxfxfŠ [f€,ÍMIDIf fbfZ [fW,Éf^fCf€fXf^f^fv,ðt,^ A,»,lf fbfZ [fW,lfobftf@,ðfVfXfef€,Ö^—
M,^,é BMIDIxfxfŠ [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^ç^%o^1,3,è,½fTf^fvfŠf^fO EftfEf^fh,ì Ä ¶,ÆfTf^fvfŠf^fO%o^1E^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^âEÄ,É^ø,« o,µ AfN [fhEfFfA,ÄE» Ý—çfTf [fg,ì^—Í,^,è,Í A,»,è,ðf
tfgEfFfA,ÄfGf~f...fE [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^E,à,Ä,«,é BDirectX 3
SDK,ÄfAfvfŠfP [fvf^f^,ì ì ^,É,ÍCOM,ÌŠT^O,Ö,ì— %oð,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^,ÍDirectSoundIfufWfFfNfg,ÍDirectSound::CreateSoundBuffer f\fbfh,ðŽg—
p,µ,ÄDirectSoundBufferIfufWfFfNfg,ð ì ^,^,é BDirectSoundBufferIfufWfFfNfg,Æ,Í Afobftf@,ðŠÜ,ðfTfEf^fh
Efl [f^,ì,±,Æ,Ä, ,é Bfvf%ofCf}
fŠDirectSoundBufferIfufWfFfNfg,É,Í; ^,ìDirectSoundBufferIfufWfFfNfg,^¶ Ý,µ A^ŠEÿ,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,^,é,é B

DirectSoundfobftf@,Í AfIf^f [fhRAM A
fEfF [fufe [fuf< Ef f,š Af_cfCf€Nfg Ef f,š EfAfNfZfX(DMA)^ffflf< A%o¼^zfobftf@(UOf|
[fg,^,ð,Æ,Ä,lf [ffBfI EfJ [fh,ì è ^),ì,ç,,è,©,lfN [fhEfFfA—
p,É ì ^,^,é Bfobftf@ ì ^,Í AfJ [fh,lf^fCfv,É^E¶,^,é BDirectSoundfobftf@,ì,½,ß,lfN [fhEfFfA,^,È,ç è
‡,Í AfVfXfef€ Ef f,š,ÄfGf~f...fE [fg,^,é,é B

fvf%ofCf}fŠ EftfEf^fh Efofobftf@,ÍÊ ífZfJf^f fŠ EftfEf^fh Efofobftf@,©,ç^—
,ç,è,éTfEf^fh,lf~fLfVf^fO,ì,½,ß,ÉŽg—
p,^,é,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,^,é,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 ¶,^,é,é,éTfEf^fh,ðL%o^-,µ,Ä,,^,±
,Æ,^,Ä,«,é BfZfJf^f_fŠ Efofobftf@,ÉL%o^-,^,é,½fTfEf^fh,Í AfAfvfŠfP [fvf^f^,ì^t,Ä A1%oñEÄ,è,lfCfxf^fg,Æ
,µ,Ä Ä ¶,^,é,±,Æ,à A^A^±,µ,Ä,è•Ö,µ Ä ¶,^,é,éç [fsf^fO EftfEf^fh,Æ,µ,Ä Ä ¶,^,é,±,Æ,à%oÄ^,Ä, é B

,^,ç,É AfZfJf^f_fŠ Efofobftf@,Í A—
L(Eø,ÈTfEf^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%o^-,^,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]

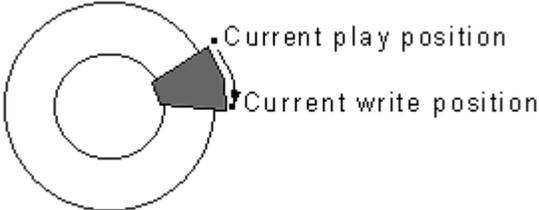
[flf“fg EfIfufWfFfNfg Ef,ff“(COM)fCf“f^ [ftfFfCfX,Á, ,é B,±
,ÍfCf“f^ [ftfFfCfX,Íf f\fbfh,É,æ,è AfAvfšfP [fvf±f“,©,çJ [fh,ì“Á «,ð•Í X,.,é,±,Æ,ª,«,é B

‘æ“ñ,ÍflfufWfFfNfg Ef^fCfv,ÍfTfEf“fh Efobftf@,Á, ,é BDirectSound,Ífvf%ofCf}
fš EfTfEf“fh Efobftf@ A,.,æ,ÑfZfJf“f_fš 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_fš EfTfEf“f
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_fš 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 A¼,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_fš Efobftf@,Ö s,µ•ù,ª,ç BfZfJf“f_fš 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,Á,«,é,©,ç,Á, ,é B

fZfJf“f_fš 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_fš 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,µ°S,ð,©, -,é,±,Æ,ª,È,ç B

fZfJf“f_fš EfTfEf“fh Efobftf@,É,Í AfXf^fefBfbfn EfTfEf“fh Efobftf@ A,.,æ,ÑfXfgš [f€ EfTfEf“fh
Efobftf@,ì,QŽí—p,ª, ,é BfXf^fefBfbfn EfTfEf“fh Efobftf@,Æ,Í AfTfEf“fh Eff [f^S¹,ðŽû—
e,.,éfofobftf@,Á, ,é BfXfgš [f€ EfTfEf“fh Efobftf@,Æ,ÍfTfEf“fh,ìê”,¾, -ðŽû—e,.,éfofobftf@,Á, ,é A,»,ì,
½,B,É Ä ¶†,ÍfAvfšfP [fvf±f“,©,ç ä,ì, V,µ,çff [f^,ðfofobftf@,Ö ‘,«,±,B•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,ÁfXf^fefBfbfn Efobftf@,ðŠm•Û,µ,æ,µ
,Æ,.,é BfTfEf“fh@Ší ä,ÉŠm•Û,³,è,½fofobftf@,Í Afn [fhfEfffA ä,Äf~fLfvf“fO,ªŠ®—1,µ,Ä,ç
,é,½,ß A Ä ¶†,ÉfvfXfef€ ~ ŽžŠÖ,ð A”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 Eg|fWfVf±f“,Æ,ç,µ,Ó,½,Á,ì d—v,Èf|
fWfVf±f“,Ä“® ì,.,é BfJfEf“fg EfvfEfc Ef|
fWfVf±f“,Í Afobftf@,ì†,ÍfTfEf“fh,ì Á ¶,ªŠŽn,³,è,éÈ’u,ðŽ,µ,Ä,ç,é BfJfEf“fg Ef%ofCf Eg|
fWfVf±f“,Í Afobftf@,ì†,ÁÄ’S,Éff [f^,ð•Í X,Á,ç,éÈ’u,ðŽ,µ,Ä,ç,é BŽÝ,ì },ì,±,ì,Ó,½,Á,ì|
fWfVf±f“,ìŠÖEW,ðŽ,µ,Ä,ç,é B



DirectSoundfofobftf@,ÍŠT”O“I,É,Ífšf“fO ó,é,È,Á,Ä,ç,é,ª AŽÀ Û,É,ÍA’±,µ,½fšfjA,Èf f, fš,Á ì -³,è,Á,ç
,é ifšf“fO Efobftf@ j BfJfEf“fg EfvfEfc Ef|fWfVf±f“,Ífofobftf@,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,¢,é,»ê,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,¢,éDirectSoundIfufWfFfNfg,ð—
ñ<“,·,é B

Windows,Íf}f<f^fXfN EfIfyf€ [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,¢,Æ l,!,é,ì,Í“—R,Á, ,é BDirectSoundIfufWfFfNfg,Í“ü—
ÍftfH [fJfX,ì'Ç Ö,ð s,Ä,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...
[fg,³,é,é B•; ”,ÌfAfvfŠfP [fVf±f“,ª“ü,¶fTfEf“fhffofCfX,É'Í,·,é,»ê,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 B€%oÊ“I,É AfAfvfŠfP [fVf±f“,Í“ü—
ÍftfH [fJfX,ª•İ,í,é,½,Ñ,Éfobftf@,ì Ä ¶ E'âž~,ðEJ,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 AC€¾€ê
,Ìf}fNf 'è<,ðŠÜ,ñ,Ä,¢,é B

DirectSoundBufferIfufWfFNfg

,D,Æ,Â,Ð,Æ,Â,ÏfTfEf“fh,“,æ,ÑfI [ffBfI EfXfgfŠ [f€,ÍDirectSoundBuffer,Â, ,è AfAvfšfP [fVf±f“,
ÍIDirectSoundBufferfCf“f^ [ftfFfCfX,ð'É,µ,Ä,±
,è,ç,Ö,ÏfAfNfZfX,ð s,µ BIDirectSound::CreateSoundBuffer f\fbfh,ðÆÄ,Ñ o,.,Æ ADirectSoundBufferIfufWfFNfg
Nfg,ð ì -,.,é,±,Æ,ª,Ä,«,é B,±,ì•Ö'l,ÍIDirectSoundBufferfCf“f^ [ftfFfCfX,Ä, ,é B

,Ü,½ AfAvfšfP [fVf±f“,ÍfVf%ofCf}
fŠ EfTfEf“fh Efofbftf@,ÆZfJf“f fŠ EfTfEf“fh Efofbftf@,ð ì -,.,é,±,Æ,ª,Ä,«,é BÆ» Ý,Ì,Æ,±
,è,Í A,Ð,Æ,Â,ÍDirectSoundfIfufWfFNfg,É,Ä,« A,Ð,Æ,Â,ÏfVf%ofCf}fŠ Efofbftf@,µ,©Ž ,Ä,±,Æ,ª,Ä,«,È,¢ B

fAvfšfP [fVf±f“,É,æ,éfTfEf“fh Efofbftf@,Ö,Ïff [f^,Ì ‘,«,±,Ý,Í A,Ü,.,fofbftf@,ðf fbfN,µ,Ä,©,ç ‘,«,±
,Ý,ð s,¢ A,»,lÆä,Éfofbftf@,Ïf fbfN,ð%ð æ,.,é Bfofbftf@,ðf fbfN,.,é,É,ÍIDirectSoundBuffer::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“,É,æ,éfi [ffBfI Eff [f^,Ïfofbftf@,Ö,ÏfRfs [,^
%oÄ”\,É,È,é Bfofbftf@,Ö,Ïff [f^ ‘,«,±,Ý I—lÆä Afobftf@,Ïf fbfN,ð%ð æ,µ,Ä ‘,«,±,Ý‘€ ì,ðŠ®—
¹,.,é Bfofbftf@.Ïf fbfN,ð%ð æ,.,é,É,ÍIDirectSoundBuffer::Unlock f\fbfh,ðÆÄ,Ñ o,· B

fVf%ofCf}fŠ EfTfEf“fh Efofbftf@,É,ÍŽÄ Ü,É•.,«Žæ,è%oÄ”\,Èff [f^,ªŠi”[,³,è,é B_
IDirectSoundBuffer::Play f\fbfh,ðŽg—p,.,é,±
,Æ,É,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,Ä,«,È,¢ è ± A
IDirectSoundBuffer::Play,Í,P%õñ,¾,~fofbftf@,ð Ä ¶,µ,Ä ÄÆä,Ä'âŽ~,.,é B,±,Ïf f\fbfh“à,É
DSBPLAY_LOOPINGftf%ofO,ðŽw'è,.,é,Æ A^A^±f< [fv,Ï'†,ÄÆj,è•Ö,µfTfEf“fh,ð Ä ¶,Ä,«,é B Ä ¶'†,Ïfofbftf@
,ð'âŽ~,.,é,É,ÍIDirectSoundBuffer::Stop f\fbfh,ðŽg—p,.,é B

fTfEf“fh Efofbftf@,²,Æ,ÏfAvfšfP [fVf±f“,É,æ,éŽg,¢ª,~ ,Í AfTfEf“fh,Ì Ä ¶ŽžšÖ,ÄÆ~'è,.,é BfTfEf“fh,Ï',³,ª
”b'ò“x,Ä, ,è,Í AfXf^fefBfbfN EfTfEf“fh Efofbftf@,ÖfTfEf“fh,ðŠi”[,.,é,±
,Æ,ª,Ä,«,é B,»,è,æ,è,à',¢fTfEf“fh,Ä, ,è,Í AfXfgfŠ [f€ EfTfEf“fh Efofbftf@,ðŽg—p,.,é,Æ,æ,¢ B

fXf^fefBfbfN Efofbftf@,ðŽ ,ÄDirectSoundBufferIfufWfFNfg,ð ì -,.,é,É,Í A
IDirectSound::CreateSoundBuffer f\fbfh,ðŽg—p,µ,Ä A DSBCAPS_STATICftf%ofO,ð~¾L,.,é (±
,Ïftf%ofO,ðŽw'è,µ,È,~ ,è,Í AfXfgfŠ [f€ Efofbftf@,ª ì -,³,è,é) B DirectSound,Í AfTfEf“fh<@Ši,ª—
LÆø,Ä, ,è,Í A,»,l<@Ši ä,É, ,éfTfEf“fh Ef f,fŠ,ðŽg—
p,µ,ÄfXf^fefBfbfN Efofbftf@,Ö,ÏŠi”[,ðŽž,Ý,é BfTfEf“fh<@Ši ä,É<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,¢ BfGf“fWf“%o¹ AŠ½ ° A,â,¶,È,Ç,Ï,-
,è•Ö,µŽg,í,è,éfTfEf“fh,Í AfXf^fefBfbfN Efofbftf@—p,Æ,µ,Ä Ä“K,Ä, ,é B

fn [fhfEFFFa Ef~fLfvf“fo,ðfTf] [fg,µ,½ ,~fofX iPCI,Ì,æ,µ,È j ä,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,¢
,È,¢ è ±,Í Afn [fhfEFFFa Ef~fLfvf“fo,Ï~—,æ,èff [f^“]—,Ïfi [fo [fwfbfh,Ï,Ü,µ,ª,ª,«,.,È,Ä,Ä,µ,Ü,µ B
DirectSound,Í AfTfEf“fh EfffofCfX,ª ,~fofX ä,É, ,é è ±,É,¾,~fXfgfŠ [f€ Efofbftf@,ðfn [fhfEFFFa ä,É
ì -,.,é B

f\ftfgfEfFfA EfGf~f...fĈ [fVf‡f“

DirectSound,Í A, ,éfTfEf“fh EfJ [fh,žÀ Ű,É,ÍfTf] [fg,μ,Ä,ĉ,È,ĉ<@”\,đ Af\ftfgfEfFfA,ÁfGf~f...
fĈ [fg,Á,«,é B **DirectSound::GetCapsf** f\fbfh,đŽg—

p,·,ê,Î AfAfvfŠfP [fVf‡f“,©,çDirectSound,É‘Î,μ,ÄfI [ffBfI<@Ší,İ<@”\,đ•ñ ,·,é,æ,□—v< ,Á,«,é B,±
,ê,É,æ,Á,Ä AfnfCfpftfH [f}f“fX,İfQ [fĉ,Á,» ,İfI [ffBfI,İ“Á «,đ’2,×,é,Æ,ĉ,Á,½,±,Æ,%oÁ”\,Á, ,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 ĩ -,.,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,Ē 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<%,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,Ý,©,ç,μ,©%°,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

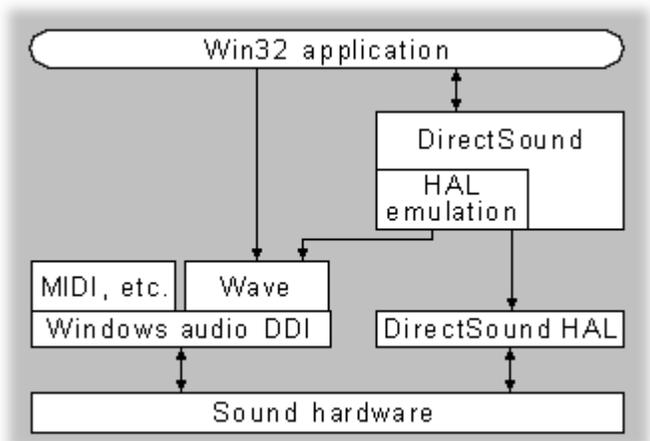
Ā,à ãĒ,Ī'²fĀfxf<,Ī u ‘,«±,Ý—D æ v,Ā, ,é B DirectSoundIfufWfFfNfg,đ ‘,«±,Ý—D æĪ'²fĀfxf<,ĀŽg—
p,.,é,Æ AfTfEf“fh Efofbftf@,Ōf_CfĀfNfg,ÉfAfNfZfX,Ā,«é B,±
,Īf, [fh,Ā,Ī AfAfvfŠfP [fVf‡f“,ª**IDirectSoundBuffer::Lock** f\fbfh,đ—p,ç,Āfobftf@,đf fbfN,μ Afvf%ofCf}
fŠ Efofbftf@,É'¼ Ū ‘,« ž,b,±,Æ,É,È,é B,±,Ī Ū AfZfJf“f_fŠ 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,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 ĩ -,.,é,½,ß,Ī•K—
v â'Ī đĀ ,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€„İ“ ‡

ŽŸ,İ },İDirectSound,Æ,»„İ¼„İfvXfef€fI [ffBfI EfRf“f] [flf“fg,Æ,İŠÖEW,đŽ„ı,Ä,¢,é B



DirectSound HAL—p,É ì,ç,ê,½fTfEf“fh EfffofCfX Efhf%ofCfo,Í AfI [ffBfI Ä ¶Žž,É Ä „İ”—Í,đ”- Šö„,é BfffofCfX Efhf%ofCfo,İHAL,ì<@”„đŠe XŽÄ s,ı,ÄfTfEf“fh<@Ší,İfA [fLfefNf“ff,Ö“- «,©,“ A,»„İ<@”\ «,ÆfpftfH [f}f“fX,đ”ø,« o„ BHAL,İfn [fhEfFfA,İ”\— Í,đDirectSound,Ö,Æ“m,ç,¹ ADirectSound,©,ç,İ—v< „đfn [fhEfFfA,Ö,Æ“„ı,é B„à,ıfn [fhEfFfA,“—v< „É%öž„ı,é”\ —Í,“„É,¢ ê ‡,İ ADirectSound,“fvtfgfEfFfA,ÄfGf~f...f€ [fg„,é B

DirectSoundfhf%ofCfo,“É,¢ ê ‡,Ä„àfAvfšfP [fvf‡f“„Ä,İDirectSoundŠÖ „,İžg—p,İ%oÄ”„Ä, „é BfTfEf“fh<@Ší,É DirectSoundfhf%ofCfo,“fCf“fXfg [f<,³,é,Ä,¢,É,¢ ê ‡ ADirectSound,Žg—p„,ı,é,İ,İHALfGf~f... f€ [fvf‡f“ Ef€fCf„„Ä, „é B„±,İf€fCf„„Ä,İWindowsf}f~f ffBfA,İfEfF [fuftfH [f€ EfI [ffBfIŠÖ „,đŽg —p,ı,Ä,¢,é B

DirectSoundŠÖ „,ÆfEfF [fu EfI [ffBfIŠÖ „,đ—p,¢ „é,Æ AfTfEf“fh<@Ší,İfEfF [fuftfH [f€ EfI [ffBfI,Ö,İfPfX,É“T“đŽ^,“—^„ı,ç,é,é B „Đ,Æ,Ä,İfffofCfX,Ä,İ A“è“x,ÉfAfNfZfX,đ”ñ<Ÿ„,épfX,İ,Đ,Æ,Ä,Ä, „é BfEfF [fuftfH [f€ EfI [ffBfI Efhf% ofCfo,“Đ,Æ,Ä,İfffofCfX,đŠ„„è“—,Ä,é ê ‡ ADirectSound,Ä,İ“fffofCfX,Ö,İŠ„„è“—,Ä,İŽ„s„,é B“— İ,É ADirectSound,“Đ,Æ,Ä,İfffofCfX,đŠ„„è“— „Ä,é,Æ AfEfF [fuftfH [f€ EfI [ffBfI Efhf%ofCfo,Ä,İfffofCfX,İŠ„„è“—,Ä,İŽ„s„,é B

fAvfšfP [fvf‡f“„“—¼•ü„İŠÖ „,đŽg—p„,éK—v„,“ „éžž,É,Í A„,é,¼,é,İŠÖ „,đ€đ€Ý,Éžg— p„,ı,é,İ,æ,¢ B„Ä,Ü,è A **DirectSoundCreateŠÖ** „,ÄfTfEf“fh Efn [fhEfFfA,đfI [fvf“„ı A **IDirectSound**„,æ,Ñ**IDirectSoundBufferCf**“f^ [ftfFfCfX,ÄfTfEf“fh,đ Ä ¶,ı A **IDirectSound**„,æ,Ñ**Release** f\fbfh,Ä“fn [fhEfFfA,đfnf [fY„,é,Æ,¢,Ä,½,±,Æ„%oÄ”„Ä, „é BfTfEf“fh Efn [fh EfFfA,“—L€ø,Æ,É,é,İ,İ AWin32 SDK,İfEfF [fuftfH [f€ EfI [ffBfIŠÖ „,É,æ,é B

„Ó,½,Ä,İfTfEf“fh EfffofCfX,“fvXfef€„ÉfCf“fXfg [f<,³,é,Ä,¢,é ê ‡,à,Ü,½“— İ,É ADirectSoundŠÖ „,ÆfEfF [fuftfH [f€ EfI [ffBfIŠÖ „,İ,Ç,ı,ç,đ—p,¢ „Ä,à AfAvfšfP [fvf‡f“„İ„,é,¼,é,İfffofCfX,É“Æ—š,ı,½fAfNfZfX,“%oÄ”„Ä, „é B „,éŽİ,İfAvfšfP [fvf‡f“„É,„,éfEfF [fuftfH [f€ EfI [ffBfIŠÖ „,İžg—p,İ A”ñ İ,É—L€ø,È%ođ€^— @„,Æ,É,é,±,Æ,“„ı,ı,ı, „é B„½,Æ„,İ A **PlaySound**„,æ,Ñ**WaveOutŠÖ** „,İžg— p„,É,æ,Ä,Ä A“±“ü%¹,É,Ç„İP“è,İfTfEf“fh„âfI [ffBfI EfXfgš [f€,İ Ä ¶,“—e^Ö,É,È,é B

Note
 Microsoft Video for Windows,Í ACE» Ýavi(audio visual interleaved)ftf@fCf<,İfI [ffBfI Efgh%ofbfN,đ o— Í„,é,İ,ÉfEfF [fuftfH [f€ EfI [ffBfIŠÖ „,đŽg—p,ı,Ä,¢,é B„,»„İ,½,Đ AfAvfšfP [fvf‡f“„DirectSound,đŽg— p,ı,Ä,©,çaviftf@fCf<,đ Ä ¶,ı,æ,ı,Æ,ı,Ä,à A„,»„İfI [ffBfI Efgh%ofbfN,İ Ä ¶,Ä,«„É,¢ B“— İ,Ä Aaviftf@fCf<,đ Ä ¶,ı,Ä,©,çDirectSoundfİufWfFfNfg,đ İ ı,ı,æ,ı „,Æ,ı,Ä,à A İ ı—žž,İŠÖ „,İfGf% [„đ•Ö„ B
 €» Ý,İ,Æ,± „é,Ä,İ AfAvfšfP [fvf‡f“„DirectSoundfİufWfFfNfg,đ%ođ“ú„,é,½,Đ,É,Í Aaviftf@fCf<,İ Ä ¶“O,É**IDirectSound**„:

Release, ÌĈÄ, Ñ o, μ, ð s, □ BfAfvfŠfP [fvf‡f“, Ífrffl, Ì Ä ¶ I—
'Ĉã, 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 ò,·,é B

DirectSound,ì“Á’Ÿ

3DfTfEf“fh

DirectSound, ì“Á’¥

,±, ì ß, Â, ÍDirectSound, ìfi [ffBfi Ef~fLfVf“fO, Æ Afn [fhfEfFfA EfAfNfZf%fCE [fVf±f“, ð—~—p, µ, ½”\—
Í, É, Â, Ç, Ä%ø ò, ·, é B, ³, ç, É AfAvfšfP [fVf±f“, ðffUfCf“, ·, é Û, ìvf%fCf}
fš EfTfEf“fh Efofbftf@, Ö, ì ‘, «, ±, ÝŽž, É l—¶, ·, ×, “—, É, Â, Ç, Ä, à%ø ò, ·, é B

f~fLfVf“fO

fn [fhfEfFfA EfAfNfZf%fCE [fVf±f“

fvf%fCf}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, »., èÈ ã, ìfZfJf“f Š 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 ¶, Ì, Ìfofbftf@, ð, ., x, Āf~fLfVf“fO, ., é B, », µ, Ā Af~fLfVf“fO, µ, ½, Ç, %oÈ, ð AfTfEf“fh<@Ší, Ō, ÌfI [ffBfI Eff [f^, Ì, Ÿ<<, ð, µ, Ā, Ç, évf%ofCf} fŠ EftfEf“fh Efofbftf@, É ‘, «, ±, p, ±, Ā, à, Ā, «, é BDirectSound, àf~fLfVf“fO, Ā, «, éfofbftf@, Ì ”, Í A—LÇø, È ^— ŽšŠŌ, É, æ, Ā, Ā, Ì, Ÿ §ÇĀ, 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, Ç, Ì, Ā, , é B, ± Ì ðÇ %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, Ç ê ‡(fTfEf“fh<@Ší— p, ÌDirectSoundfhf%ofCfo, à, È, Ç ê ‡) Afn [fhfEfFfA, 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, È“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 Efofbftf@f f,fŠ“™,ìfTfEf“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 Efofbftf@,ìŽw’è,ª,Á,«,é,æ,
•,É,È,é B

,±,é,Í A,»,é,¼,ê,ìCEø%ÊŽg—p,âfTfEf“fh Efofbftf@ Ä ¶,ìf^fCf~f“fO Afofbftf@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,¬,ê,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 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,İŽšŌ,đ%ò,¬ A,»,ê,È,æ,Á,ÄfI [ffBfI,Á%o¹,“r Ø,ê,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,Á ,·,çfpftfH [f}f“fX,đŽÄĈ,·,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%Á”\,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%°,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

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[fg,·,éfn [fhfEfFfA,"è"È"Í,É,È,è,Í A,±,è"ÈŠO,ìŕŕWfVf±ŕŕf"ŕO—v'f,ªVfXfœf€,É'g,Ÿ ž,Û,è,é,±
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,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"1f~fTfçf<,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,»,ìŕŔXfi [,É<B,Ä,« AŽ,Á,Ä,Ä,ç,,¾,è,± B

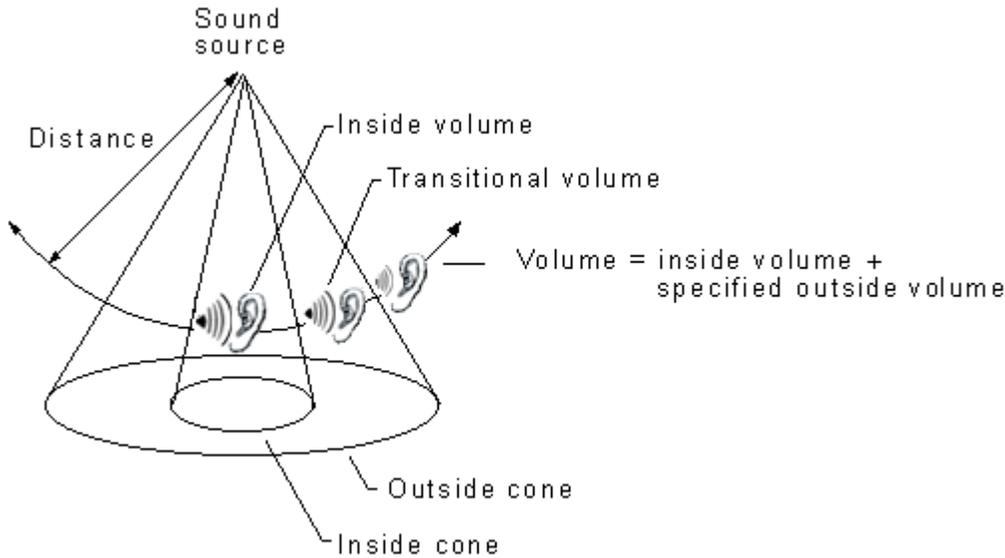
fŠfXfi [

•“İ,afŠfXfi [,İžü,è,ð90“x%õñ“],µ,½ ê ‡,Æ AfŠfXfi [,““İ,É‘Š‘İ,µ,Ä90“x““a,ð%õñ“]
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^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,-
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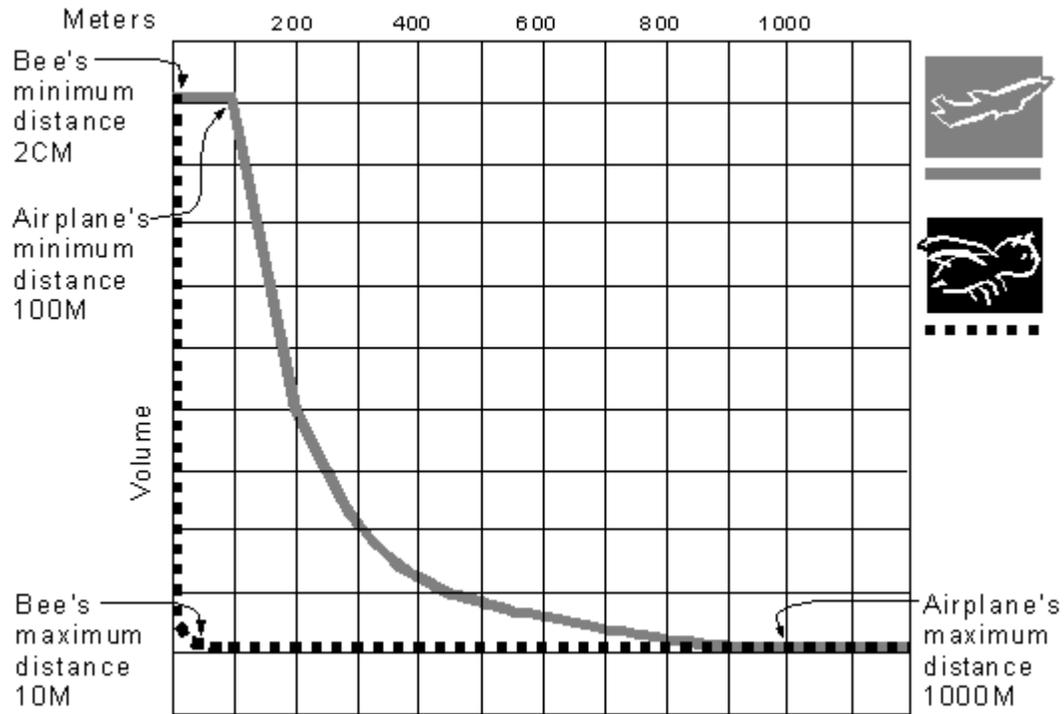


<Z p“l,É,Í A
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‘¬x’² B,Í A““Û,Ûfhfbfvf% [Æø%Ê,ð²,µ,½,ç ê ‡,É—L—p,Ä, ,é B,½,Æ,¡,Û A,µ,È,è,ð, ,°,Ä¬,Ä,Ä,- ,éfÆ [fVf“fOfJ [,ªfŠfXfi [,Û%o,ðÊ,è%oß,¬,é,Æ,«Û%o¹,ª—,µ,ç ,Æ,µ,æ,µ B,à,µfŠfXfi [,ÉÛ,µ,Äfhfbfvf% [Æø%Ê,ð²,³,¹,½,Æ,·,é,Æ A,»,Û²,ÛfŠfXfi [,É·,«Žæ,è%Ä”\ ,È,·,×,Ä,ÛfTfEf“fh Efofbftf@,É%oeç,ðçy,Û,µ,Ä,µ,Û,µ B fÆ [fVf“fOfJ [,É,¾,¬,±,ÛÆø%Ê,ð< ’²,³,¹,é,É,Í AfÆ [fVf“fOfJ [,ÛDfTfEf“fh Efofbftf@,Û¬x Ý’è,ðŠg’â,·,é,Û,æ,ç B

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Direct3D, Ö, İ“ ‡

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, 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 ADirect3D, ÄŽg—
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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

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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

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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

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IDirectSound3DBuffer fCf“f^ [ftFfCfX

IDirectSound3DListener fCf“f^ [ftFfCfX

IDirectSoundBuffer fCf“f^ [ftFfCfX

IDirectSoundCf“f^ [ftFfCfX

DirectSoundIfufWfFfNfg,ÍfVfXfef€ ã,Ìfn [fhfEfFfA,ð•\,µ,Ä,¢
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fbftf@,É,Ä,¢,Ä,Ì Ú ×,Í AIDirectSoundBufferCf“f^ [ftFfCfX,ðŽQ Æ,·,é,±
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@ AfVfXfef€ EfXfs [fJ,ÌŠÄ«« Ý’è-@,“,æ,Ñfn [fhfEfFfA,ÌfRf“fpfNfg,Èf f,fŠ Ý’è•û-@,Ì%ð à,ð,·,é B

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DirectSoundCreateŠÖ ”,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,±
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fTfEf“fh EfffofCfX,É’î,µ,Ä,‘²fCfxf<,ð Ý’è,·,é,É,Í**DirectSound::SetCooperativeLevel** f\fbfh,ðŽg—p,·,é B,± ,ê,Í AfTfEf“fh Efofbftf@,ð Ä ¶,·,é’O,É s,•K—v,ª ,é B,Û,Æ,ñ,Ç,ÌfAvfŠfP [fVf‡f“,Í•W €,ì,‘²fCfxf<,Ä, ,é DSSCL_NORMAL,ðŽg—p,·,é B,±,ìfCfxf<,Í A’¼,ìfAvfŠfP [fVf‡f“,Æ<£ ‡,·,é,±,Æ,ÍCE^,µ,Ä,È,¢ 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,ªŠÜ,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%fEf“fh EfTfEf“fh,ª,
,é B

fn [fhfEfFfAf f,fŠŠÇ—

IDirectSound::Compact f\fbfh,đŽg—

p,·,é,Æ Af1f“f{ [fh,ìfTfEf“fh Ef f,fŠ,đ,·,×,Ä~A‘±fuf fbfn,Ö^Ú“@,μ,Ä Å‘â,ìftfŠ [f f,fŠ—îæ,đ ì ¬,·,é,± ,Æ,^a,Ä,«,é B

IDirectSound3DBufferCf“f^ [ftFfCfX

IDirectSound3DBufferCf“f^ [ftFfCfX,Í AfTfEf“fh Efofbftf@,ì3Dfpf%of [f^,É:Í,·,éfAfNfZfX,ð'ñ<ÿ,µ,Ä,c
,é B,±,ìfCf“f^ [ftFfCfX,Í,·,×,Ä,ìTfEf“fh Efofbftf@,ÄfTf] [fg,³,ê,Ä,c,é,í,¯,Ä,Í,È,c B

,±,ì B,Ä,Í**IDirectSound3DBufferCf“f^ [ftFfCfX,ìf|fCf“f^,ðŽæ“¾,·,é•û-**
@,Æ AfCf“f^ [ftFfCfX Ef f\fbfh,ðŽg—p,µ,½fofbftf@ Efpf%of [f^,ìŠÇ— ,É,Ä,c,Ä à-
¾,·,é B`È%°,ìfgfsfbfN,É,Ä,c,Ä à-¾,·,é B

IDirectSound3DBufferCf“f^ [ftFfCfX Ef|fCf“f^,ìŽæ“¾

fobf`fpf%of [f^€ ì

Ä'Z<—£'l,Æ Ä'<—£'l

€ ìf, [fh

Ê'u,Æ'¬“x

fTfEf“fh Efvf fWfEfNfVf≠f“ EfR [f“

IDirectSound3DBuffer

```
IDirectSound3DBuffer, IDirectSound::CreateSoundBuffer, ADSBUFFERDESC, dwFlags, IDirectSoundBuffer::QueryInterface, IDirectSound3DListener, IDirectSound3D, lpDsbSecondary, IID_IDirectSound3DBuffer, lpDs3dBuffer, SUCCEEDED(hr), IDirectSound3D, IDirectSound3DListener
```

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DirectSound, IDirectSound, IDirectSound3D, IDirectSound3DListener, IDirectSound3D, IDirectSound3DListener
```

Note

DirectSound, IDirectSound, IDirectSound3D, IDirectSound3DListener, IDirectSound3D, IDirectSound3DListener

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.^a, ,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⁻³Eø,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,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,ð,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,^afŠfXfi [,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,¢ BÊ'u,Æ'¬“x,İŠÖÆW,É,Â,¢
,Ä,Ì Ú ×,Í AÊ'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,‘,Ü,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’ÿ,Ä,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 Ä ¶,‘,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•,±,ì,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,è,½fR [f“,ÌŠO“²,Ä,Íf{fŠf... [f€ ,%ø°,° ,é BŠO”fR [f“Šp“x,Í,Ä,È,É“à”fR [f“Šp“x,Æ“^,¶,©,» ,é,æ,è,à’â,«,È¹l,Ä ,é•K—v,ª ,é B

“à•” EŠO”fR [f“ Ef{fŠf... [f€

ŠO”fR [f“ Ef{fŠf... [f€,Æ,Í AfŠfXfi [,ªfofbftf@,ÌfTfEf“fh EFR [f“,ÌŠO“²,É,ç,é,Æ,«,Ì•t%øÁ“l,Èf{fŠf... [f€,ÌE, Š,ì,±,Æ,Ä ,é B,±,Ì—v’f,Í100dB,Ä•C³,è,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,è,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—£,è,é,²,Æ,ÉE, Š,µ,Ä,ç, B

fŠfXfi [,ªfTfEf“fh EFR [f“,Ì†,É,ç,é,Æ,«,Ífm [f}f,Èfofbftf@ Ef{fŠf... [f€,ªŽg—p,³,è,é(± ,Ì¹,ÍIDirectSoundBuffer::GetVolume f\fbfh,È,æ,è•Ö,³,è,é) BfŠfXfi [,ªfTfEf“fh EFR [f“,ÌŠO,É,ç ,é,Æ,«,Íf{fŠf... [f€,ÌŠO“²,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,ÍfXf€ [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 Efofbftf@ EflfufWfFfNfg,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 EflfCf“f^,ìŽæ“¾

fobf` Efpf%of [f^€ ì

~,ì'u,« Ý'è

←—£—v'f

fhfbvf%o [—v'f

fŠfXfi [,ìÊ'u,Æ'—“x

fŠfXfi [,ì•ûÆü

f [fçIfft—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,^a,,é B,±

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

DSBUFFERDESC \“c‘İ,İdwFlags f“fo‘†,ÉDSBCAPS_CTRL3Dftf%ofO,đŽw“è,·,é B,»μ,Ä ì ¬,³ê,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 ofbf tf@,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%õñ,ìCEÀ,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%oF,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

Note

,Ç,İ ~,'u,« Ý'è,à AIDirectSound3DListener::CommitDeferredSettings,ðEÄ,Ñ o,·,Ü,Ä,Í A““,¶ Ý'è,ðDS3D_IMME
DIATEftf%oF,ðŽg—p,μ,ÄEÄ,Ñ o,İ A ã ‘,ª s,İ,ê,é B ~,'u,«ftf%oF,ðŽg—p,μ,ÄfŠfXfi [‘-“x,ð(1,2,3)
,É Ý'è,μ A,»,ê,©,ç““,¶ftf%oF,ðŽg—p,μ,ÄfŠfXfi [‘-“x,ð(4,5,6),É Ý'è,μ,½,Æ,·,é,Æ AfŠfXfi [‘-“x,İ(4,5,6)
,Æ,È,é B,»,İEã DirectSound3DListener::CommitDeferredSettings f\fbfh,ðEÄ,Ñ o,·,Æ A‘-“x,İ(4,5,6),Æ,È,é B

←—£—v'f

DirectSound,ÍffftfHf<fg,l,←—£“è’PÊ,Æ,μ,Äf [fgf<,ðŽg—p,μ,Ä,ç,é B,à,μfAfvfŠfP [fVf‡f“,“f [fgf<,ðŽg—
p,μ,Ê,ç ê ‡ A←—£—v'f,ð Ý'è,·,é,±,Æ,“Ä,«,é B←—£—v'f,Ê,Ä,ç,Ä,Ì îñ,Í A“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**IDirectSound3DListener::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,Í AfAfvfŠfP [fVf‡f“ÆÄ—L,Ì←—£—v'f,ðŽg—
p,μ,ÄÆÄ,Ñ o,μ,Ä,«,é B

fAfvfŠfP [fVf‡f“,Í,Û,½ ACE» Ý,Ì←—£—v'f Ý'è,ð**IDirectSound3DListener::GetDistanceFactor**f f\fbfh,ðŽg—
p,μ,ÄŽæ“4,·,é,±,Æ,“Ä,«,é BffftfHf<fg'l,ÍDS3D_DEFAULTDISTANCEFACTOR (1.0),Ä, ,é B,±,é,Í,Đ,Æ,Ä,Ì←—
£'PÊ,“1f [fgf<,É‘Š—,·,é,Æ,ç,□Ó—j,Ä, ,é BffftfHf<fg'l,Ä,Í A^Ê'ufxfNfgf<(3.0,7.2,-20.9),Æ,ç,□
,Ì,Í““Í,“Æ³,ÌÊ'u,æ,è3m%oE A7.2m ã A20.9mÆã,è,É, ,é,Æ,ç,□Ó—j,É,È,é B←—£—
v'f,“2.0,É•Í X,³,è,é,Æ A““,¶Ê'ufxfNfgf<,Ä,à““Í,“6m%oE A14.4m ã A41.8mÆã,è,É, ,é,Æ,ç,□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 [,l'Ê'u,Æ'¬“x

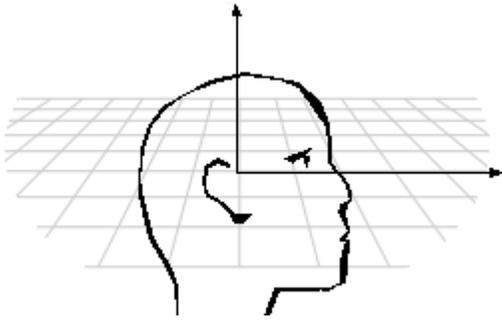
IDirectSound3DListener::SetPosition A,“,æ,Ñ IDirectSound3DListener::GetPosition f f\fbfh,ðŽg—
p,μ,Ä A3D<óŠÔ,É,“,̄,éfŠfXfi [,l'Ê'u,ð Ý'è EŽæ“¾,Ä,«,é B

fŠfXfi [,Ö,lfhfbfvyf%o [Eø%oÊ,ðEvŽZ,·,é,½,ß,ÉŽg—
p,·,é'¬“x,ð Ý'è EŽæ“¾,·,é,É,Í IDirectSound3DListener::SetVelocity A,“,æ,Ñ IDirectSound3DListener::GetVelocity
f f\fbfh,ðŽg—p,·,é BfŠfXfi [,l'Ê'u,Í,» ,l'¬“x,É,Í%oe<¿,ðŽó,̄,É,¢ B^Ê'u,Æ'¬“x,İŠÖEW,É,Ä,¢
,Ä,İ Ú ×,Í A^Ê'u,Æ'¬“x,ðŽQ Æ,·,é,±,Æ B

fŠfXfi [l̂•ûĈü

fŠfXfi [l̂•ûĈü, í3DEø%Ê, Ì ^ — ,É, ,ç, Ä—Í, È—ðŠ,, ð%Ê, ½, · B<óŠÓ“à, Ìè’è, ÌÊ’u, Á%o¹, ” ¶, μ, ½, æ, ρ
, È öŠo, ð ì, è o, ·, ½, ß, É ADirectSound, ÍfTfEf“fh EfLf... [l̂, ðŠTŽZ, ·, é BfLf... [l̂, 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•ûfxfNfgf<, Æ‘O•ûfxfNfgf<, Æ, ç, ρ ACE’“_ , ð<ρ—
L, ·, é, Ó, ½, Ä, ÌfxfNfgf<, ÌŠÖEW, É, æ, Á, Ä’è<³, é, é B ã•ûfxfNfgf<, ÍfŠfXfi [l̂“a, Ì’t S, ©, çŽn, Ü, è A“a, Ì’è”Ö ã, ÉĈü,
©, Á, Ä’è’¼ ü, È’Ê%ß, ·, é B‘O•ûfxfNfgf<, à, Ü, ½fŠfXfi [l̂“a, Ì’t S, ©, çŽn, Ü, é, a A ã•ûfxfNfgf<, ©, çĈE©, é, Æ%E, ÖĈ
ü, ©, ç AfŠfXfi [l̂, Ìšç, Ì‘O—Ê, ð’Ê%ß, ·, é BŽŸ, Ì } , Ì, ±, é, ç, ÌfxfNfgf<, ÌŠÖEW, 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, Ì A‘O•ûfxfNfgf<, a
(0,0,1.0) A ã•ûfxfNfgf<, a(0,1.0,0), É, È, Ä, Ä, ç, é B

f [f<fIft—v'f

f [f<fIft,Í AfŠfXfi [,ÆfTfEf“fh,ì<—£,É,æ,Á,Ä ¶,¶,é%º¹,ìCE, Š,ì“x ±,Á, ,é BDirectSound,Í Af [f<fIft,ðCE
»ŽÀ ĆŠE,Á'ìCE±,Á,«,é10”{,Û,Á,Ì”ÍÍ,Á ¶,¶,³,¹,é,±,Æ,ª,Á,«,é B,±,Ì—
v'f,ð Ý'è,·,é,É,Í**DirectSound3DListener::SetRolloffFactor**f f\fbfh,ðŽg—p,·,é Bf [f<fIft—
v'f,Í0,©,ç10,Ì”ÍÍ,Á Ý'è,Á,«,é B0,Íf [f<fIft,ªfTfEf“fh,É%ºÁ,!,ç,ê,Á,Ć,È,Ć,±
,Æ,ðŽ',· B,»,·,Ì¼,Ì ”¹,ÍCE»ŽÀ ĆŠE,Á'ìCE±,Á,«,éf [f<fIft,Ì”{ ”,ð·\,· B,Á,Û,è A1,Í ACE»ŽÀ ĆŠE,ÁŠ
,¶,ç,ê,é f [f<fIft,ººÁ,!,ç,é,±,Æ,ð·\,µ A2,ÍCE»ŽÀ ĆŠE,ÁŠ',¶,ç,ê,é f [f<fIft,²”{ººÁ,!,ç,ê,é,±,Æ,ð·\
,· Bf [f<fIft—v'f,ðŽæ“¼,·,é,É,Í**DirectSound3DListener::GetRolloffFactor**f f\fbfh,ðŽg—p,·,é B

IDirectSoundBufferfCf“f^ [ftFfCfX

IDirectSoundBufferfCf“f^ [ftFfCfX,É,æ,è AfAvfŠfP [fvf‡f“,ÍfI [ffBfI Eff [f^,İfobftf@,đ'€ 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€ ,İ,Đ,Æ,Â,Đ,Æ,Â,É'í,µ,ÄfAvfŠfP [fvf‡f“,ÍDirectSoundfobftf@,đ ì ¬,·,é B

fvf%ofCf}fŠ EfTfEf“fh Efobftf@,Í AfTfEf“fh EfffofCfX,ÖE» Ý'—,ç,è,Ä,ç ,éTf“fvfŠf“fO EfI [ffBfI,đ•\,· B,±,è,ç,İTf“fvfç,Í'P^è,İfXfgfŠ [f€,Ä,à A•i ”,İfI [ffBfI EfXfgfŠ [f€ ,đf~fLfVf“fO,µ,Ä o—Í,µ,½,à,İ,Ä,à,æ,ç B'È í,İfvf%ofCf} fŠ EfTfEf“fh Efobftf@“à,İfI [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,İ-Ú“İ,Äfvf%ofCf}fŠ Efobftf@,đŽg—p,·,é,±,Æ,Í,Ä,«é B

fZfJf“f fŠ EfTfEf“fh Efobftf@,Í'P^è,İfXfgfŠ [f€ o—Í,·,æ,ÑTfEf“fh o—Í,đ•\,· B,±,İfobftf@,İfvf%ofCf} fŠ EfTfEf“fh Efobftf@,Ä Ä ¶,·,é,±,Æ,³,Ä,«é B“Žž,É Ä ¶,³,è,½fZfJf“f_fŠ Efobftf@,İfvf%ofCf} fŠ Efobftf@,Äf~fLfVf“fO,³,è A,»,è,çfTfEf“fh EfffofCfX,Ö'—,ç,è,é B

Note

DirectSoundBufferIfufWfFfNfg,Í,»,è,ç,đ ì ¬,µ,½DirectSoundIfufWfFfNfg,Ì Š— L,Æ,È,é BDirectSoundIfufWfFfNfg,³%đ•ú,³,è,é,Æ A,»,İfIfufWfFfNfg,ª ì ¬,µ,½fobftf@,à,·,×,Ä%đ•ú,³,è AŽQ Æ,³,è,é,±,Æ,Í,È,ç B

,±,ì B,Ä,Í AfTfEf“fh Efobftf@,İ^%¹ E Ä ¶,İŠÇ— •û-@ Af{fŠf... [f€ ,İfgf%obfLf“fO,Æ §Eä AŽü”g ” Afpf“ Ý'è AfTfEf“fh Efobftf@ î•ñ,İžæ“¾ Af f,fŠŠÇ— ,É,Ä,ç,Ä à-¾,·,é B

- Ä ¶İŠÇ—
- fTfEf“fhŠÄ«ŠÇ—
- î•ñ,İžæ“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** ,;æ,Ñ **IDirectSoundBuffer::SetFormat** f\fbfh,ðŽg—
p,µ,Ä Afvf%ofCf}fŠ EftfEf“fh Efofbftf@“à,İfTfEf“fh Eff [f^,İCE`Ž®,ð Ý’è,.,é,±,Æ,à,Ä,«,é

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

f f,fššÇ—

IDirectSoundBuffer::Restore f\fbfh,ðŽg—

p,μ,Ä AŽw'è,³,ê,½DirectSoundBufferIfufWfFfNfg,lfTfEf“fh Efofbftf@f f,fš,ðfšfXfgfA,·,é,±,Æ,^a,Ä,«^a,é B,±
,ê,Ífofbftf@,^aŽ,ⁱ,ê,½ ê ‡,É—L—p,^¾,^a A

IDirectSoundBuffer::Restore,^afšfXfgfA,·,é,ì,í,»,lf f,fšž@·ì,ì,Ý,Ä, ,é Bf f,fš,lfRf“fgf [f<,ÍfšfXfgfA,μ,È,ç
Bfofbftf@ Ef f,fš,^afšfXfgfA,³,ê,½Eä,Í A,»,±,Ö—LÆø,ÈfTfEf“fhff [f^,ð ‘,«,±,Đ•K—v,^a, ,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::SetCooperativeLevelf 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 BfftfHf<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, ·, ×, 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, É 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 [f|f“fg, ÉšÖ~A, µ, ½ È%°, Ĩè”Ê“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, ĩ, é, é, Ü, Ā, ĩfTfEf"fh Efobf\@, 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 ‡  
    // .  
    // .  
    // .  
}
```

DirectSoundEnumerateŠÖ ", 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'ĩ, ðf`fFfbfN, ., é•K—v, a, , é  
  
    hr = DirectSoundCreate(lpGuid, &lpDirectSound, NULL);  
    // .  
}
```

```
// .  
// :  
}
```

fTfEf“fh EfffofCfX,^aÈ,©,Á,½,è A
lpGuidfpf%of [f^,ÁŽw’è,³,è,^½*fTfEf*“fh EfffofCfX,ÉfEfF [fufFH [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,É,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,Ž,”s,μ,½ ê ±,É”ö,¹,é•K—v,^a, é B

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%fE [fVf‡f“,đ s,□ ,ì,Ä A,Û,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,» ,ÌTfEf“fh—v< ,É%ž,·,éfn [fhfEfffA,Ì<@”\,đ’m,é,½,ß,É,±,Ì î•ñ,đŽg—p,·,é,± ,Æ,ª,Ä,«,é B,½,Æ,·,Ì Afn [fhfEfffA Ef~fLfvf“fO,ª—LÆø,È,ç A Ä ¶,Ä,«,éTfEf“fh,ª,æ,è‘½,,É,é B

fn [fhfEfffA «”\,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,Û,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) {
        // -Ç±,µ,½,çDSCAPS \‘ç‘ì,đ•%öđ,·,é
        // .
        // .
        // .
    }
    // .
    // .
    // .
}
```

DSCAPS \‘ç‘ì,É,Í A,» ,ê,¼,ê,ìf^Cfv,ì Ä‘âfšf\ [fX,âÇ» Ý— LÆø,Èfšf\ [fX î•ñ,È,Ç AfTfEf“fh EfffofCfX,ìfpftfH [f}f“fX,Æfšf\ [fX,ÉŠÖ,·,é î•ñ,ªŠÛ,Û,ê,Ä,Ç,é B,± ,ê,ç,Í,³,Û,·,Û,Èfšf\ [fXŠÖ,Ä—µ ,,đ ¶,¶,³,¹,é ê ‡,ª, ,é B,½,Æ,·,Ì A’P’ê,ìfn [fhfEfffA EfXfgfš [fE 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,ðÇÄ,Ñ o,µ,Ä Afobftf@ ì -,É \ª,Èfšf\ [fX,ª, ,é,©,ðf`fffbfN,·,é•K—v,ª, ,é B

fTfEf“fhffofCfX,ì“@ ì,É,Ä,Ç,Ä ŸŽè,É%¼’è,·,é,±,Æ,Í”ð,¯,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 AÇ»‘¶,·,éfffofCfX,Æ,ÍÛ,È,é“@ ì,ð,·,é,±,Æ,à l,·,ç,é,é B

fn [fhfEfffA,ìfšf\ [fXš,,è“—,Ä,ð s,□,Æ AfAvfšfP [fVf‡f“,Í‘á,ì,é,È,» ,ê,ç,ðf\ftfgfEfffA Efofbftf@,Öš,,è“— ,Ä,æ,□ ,Æ,·,é B,Ä,È,·,·,×,Ä,ìfn [fhfEfffA Efšf\ [fX,É‘Í,µ,Äš“S,ÈfAfNfZfX,đ s,·,é,ì,¯,Ä,Í,È,Ç B,½,Æ,·,ÍIDirectSound::GetCapsf f\fbfh,Íó,«fšf\ [fX,ð•Ž!,·,é,ª AWindows,Íf}f<f^fXfN,ÈfIfyfE [fefBf“fO EfVfXfefE,Ä, ,é,½,ß A fšf\ [fXš,,è“—,Ä,ð,µ,æ,□,Æ,µ,Ä,à•È,ÌfAvfšfP [fVf‡f“,Éš,,è“—,Ä,ç,é,é%Ä”\ «,ª, ,é B

fTfEf“fh Efofbftf@,ì ì ¬

,±,ì ß,À,İŞÈ’P,ÈfTfEf“fh Efofbftf@,ì ì ¬•û-@,ð à-
¾,.,é B,Û,½ A ì ¬,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 ¬

§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;  
    // wavefth [f]fbfg \c'ì,ð Ý'è,·,é  
    memset(&pcmwf, 0, sizeof(PCMWAVEFORMAT));  
    pcmwf.wf.wFormatTag = WAVE_FORMAT_PCM;  
    pcmwf.wf.nChannels = 2;  
    pcmwf.wf.nSamplesPerSec = 22050;  
    pcmwf.wf.nBlockAlign = 4;  
    pcmwf.wf.nAvgBytesPerSec =  
        pcmwf.wf.nSamplesPerSec * pcmwf.wf.nBlockAlign;  
    pcmwf.wBitsPerSample = 16;  
    // DSBUFFERDESC \c'ì,ð Ý'è,·,é  
    memset(&dsbdesc, 0, sizeof(DSBUFFERDESC)); // 0,É Ý'è B  
    dsbdesc.dwSize = sizeof(DSBUFFERDESC);  
    // ffftHf<fg,ÌfRf"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,^a ,é B,± ,é,É,Í,DSBUFFERDESC \‘c’ì,ìdwFlagsf f“fo,ðŽg—

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

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

p,·,é B,½,Æ,·,Í AfffofCfX,^afn [fhfEfFfA Efofbftf@,ðfTf| [fg,μ,Ä,ç

,Ä,à A,»,ìfobftf@,É’Í,·,éfpf“ §CEä,Íñ<Ÿ,μ,Ä,ç,È,ç ê ‡,^a ,é B,±

,ì ê ‡DirectSound,Í ADSBCAPS_CTRLPANftf%o,^aŽw’è,³,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“,^aŽ©^a,ÄŽg—

p,·,éIfvfVf‡f“,ì,Ÿ,ðŽw’è,·,é B

fobftf@,^aŽ ,Á,Ä,ç,È,çf f\fbfh,ðCEÄ,Ñ o,μ,Ä,àŽ,“s,É I,í,é B,½,Æ,·,Í A₂

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,^aŽw’è,³,ê,Ä,ç

,é,Íf f\fbfh,Í -CE÷,·,é Bftf%o,^aŽw’è,³,ê,Ä,ç,È,·,ê,Íf f\fbfh,ÍŽ,“s,É I,í,è A

DSERR_CONTROLUNAVAILfGf%o [fR [fh,^aÖ,³,é,é Bfobftf@,ì §CEä,É,æ,è ACE»‘¶,àŠŪ,ñ,Ä «—

ˆñ<Ÿ,³,é,éfffofCfX ä,Ä,ìfAfvfŠfP [fVf‡f“,ì“® ì•Ū Ø,^a,æ,èŠmŽÄ,É,È,é B

fXf^fefBfbfN EfTfEf“fh Efofbftf@,ÆfXfgfŠ [f€ EfTfEf“fh Efofbftf@

fXf^fefBfbfN EfTfEf“fh Efofbftf@.Í Af f,fŠ“à,ÉfTfEf“fh‘S‘ì,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,« AfVfXfef€,Í,±,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“ EfVfXfef€ 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‘ã,«,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%fo,ðŽw’è,·,é,Ì,æ,¢ BDSBCAPS_LOCHARDWAREftf%fo,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,α,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%fo,ðŠm”F,·,é,Ì,æ,¢ B,Ä,È,È,Ç,·,é,©,ÉŽw’è,³,ê,Ä,¢,é B

fvf%ofCf}fŠ EftTef“fh Efofbftf@,ÆfZfJf“f_Š EftTef“fh Efofbftf@

fvf%ofCf}fŠ EftTef“fh Efofbftf@,Í AŽÀ Û,ÉfŠfXfi [,,«Žæ,éfTf“fvfŠf“fO EfI [ffBfI,Á, é BfZfJf“f_Š EftTef“fh Efofbftf@,Í,»,é,¼,èPè,İfTef“fh,“,æ,ÑfI [ffBfI EfXfgš [fÉ,Á, é Bfvf%ofCf} fŠ Efofbftf@,ð ì -,.,é,É,Í A_*

DSBUFFERDESC \‘ç‘İ,İ†,ÄSBCAPS_PRIMARYBUFFERftf%ofO,ðŽw’è,.,é,İ,æ,ç BfZfJf“f_Š Efofbftf@,ª ì - ,³,è,é,İ,Í A,±,İftf%ofO,ªŽw’è,³,è,È,çŽž,Á, ,é B

‘È í,İ,Đ,Æ,Â,İfAfvfŠfP [fvf±f“,É,-,é,.,×,Ä,İfTef“fh,É:İ,µ,ÄfZfJf“f_Š Efofbftf@,ð ì -,.,é BCEÄ,çff [f^, É V,µ,çff [f^,ð ä ‘,.,é,±,Æ,ÄfTef“fh Efofbftf@,İ Ä~—p,“%Ä”,Ä, é BDirectSound,ª s,ª ^— ,Í Afn [fhfEfFfA,İfš\ [fXŠ,,,è—,Ä,â A Ä ¶†,İ,.,×,Ä,İfobftf@,İf~fLfVf“fO,Ä, é B

fAfvfŠfP [fvf±f“,ªfZfJf“f_Š Efofbftf@,ðŽg—p,µ,Ä,ç,é,È,ç,Í A“Á’è,İ §Eä,ð s,ª,½,ß,Éfvf%ofCf} fŠ Efofbftf@,ð ì -,.,é,±,Æ,à,Ä,«,é B,½,Æ,İ Afvf%ofCf}

*fŠ Efofbftf@ ä,Ä**IDirectSoundBuffer::SetFormat** ffbfh,ðEÄ,Ñ o,.,Æ Afn [fhfEfFfA,İ o— İE`Ž@,ð §Eä,.,é,±,Æ,ª,Ä,«,é B,½,¾,µ*

IDirectSoundBuffer::Lock ä**IDirectSoundBuffer::GetCurrentPosition**,È,ç,İ Afobftf@ Ef f, fŠ,ÖfAfnfZfX,ð s,ª ffbfh,İ,.,×,ÄŽ,“s,.,é B

fAfvfŠfP [fvf±f“,ªf~fLfVf“fO,ðŽÀ s,.,é Û ADirectSound,İfvf%ofCf}fŠ Efofbftf@,Ö,İ ‘,«,± ,ÝfAfnfZfX,ðñçY,.,é B,±,İfobftf@,Ö,İ ‘,« ž,Ý,Í A,.,İ,â, s,İ,é,é•K—v,ª, é B,à,µff [f^,ª X V,³,é,È,ç ,Æ Afobftf@,İ‘O%ñ,İff [f^,ðEJ,è•Ö,µ A%o‘ °,É,,é,ª ¶,¶,é Bfvf%ofCf}fŠ Efofbftf@,Ö,İ ‘,«,± ,ÝfAfnfZfX,Í AfAfvfŠfP [fvf±f“,ªDSSCL_WRITEPRIMARY,ç‘²fçfxfç,ð Ý’è,µ,Ä,ç,é è †,İ,Ý—LÇø,Ä, é B,± ,İ,ç²fçfxfç,Ä,İfZfJf“f_Š Efofbftf@,İ,Û,Ä,½, Ä ¶,³,è,È,ç B

fvf%ofCf}fŠ EftTef“fh Efofbftf@,İfç [fv,Ä Ä ¶,³,è,é,± ,Æ,É’ ^Ö,.,é B•K,DSBPLAY_LOOPINGftf%ofO,ðfZfbfg,.,é,±,Æ B

fvf%ofCf}fŠ Efofbftf@,Ö,İ ‘,«,±,ÝfAfnfZfX,ðŽæ“¾,.,éû—@,ðŽŸ,İ—á,ÄŽ,µ,Ä,ç,é B

```
BOOL AppCreateWritePrimaryBuffer(
    LPDIRECTSOUND lpDirectSound, LPDIRECTSOUNDBUFFER *lpDsb,
    LPDWORD lpdwBufferSize, HWND hwnd)
{
    DSBUFFERDESC dsbdesc;
    SBCAPS dsbcaps;
    HRESULT hr;
    // wave format, İ \‘ç‘İ,ð Ý’è,.,é
    memset(&pcmwf, 0, sizeof(PCMWAVEFORMAT));
    pcmwf.wf.wFormatTag = WAVE_FORMAT_PCM;
    pcmwf.wf.nChannels = 2;
    pcmwf.wf.nSamplesPerSec = 22050;
    pcmwf.wf.nBlockAlign = 4;
    pcmwf.wf.nAvgBytesPerSec =
        pcmwf.wf.nSamplesPerSec * pcmwf.wf.nBlockAlign;
    pcmwf.wBitsPerSample = 16;
    // DSBUFFERDESC \‘ç‘İ,ð Ý’è,.,é
    memset(&lpDsb, 0, sizeof(DSBUFFERDESC)); // 0,É Ý’è
    dsbdesc.dwSize = sizeof(DSBUFFERDESC);
    dsbdesc.dwFlags = SBCAPS_PRIMARYBUFFER;
    // fobftf@ftfçfY,İfTef“fhç@Ší,É,æ,è §EÄ,³,è,é
    dsbdesc.dwBufferBytes = 0;
    dsbdesc.lpwfxFormat = NULL; // fvf%ofCf}fŠ Efofbftf@,İNULL,Ä,È,,Ä,İ,È,ç,È,ç

    // ‘,« ž,Ý—D æç‘²fçfxfç,ðŽæ“¾
    hr = lpDirectSound->lpVtbl->SetCooperativeLevel(lpDirectSound,
        hwnd, DSSCL_WRITEPRIMARY);
    if(DS_OK == hr) {
        // -Ç÷ Bfobftf@,İ ì -,ðŽž,Ý,é
        hr = lpDirectSound->lpVtbl->CreateSoundBuffer(lpDirectSound,
            &dsbdesc, lpDsb, NULL);
        if(DS_OK == hr) {
            // -Ç÷ 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,đĀÄ,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,»),İEãDirectSoundBuffer::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 A400f ofCfg,Ìf ofbftf@,Ì“r”t,Ä300f ofCfg,ðf fbfn,µ,½ ê ‡ A
IDirectSoundBuffer::Lock,Í Ä %o,Ìf ofbftf@,ðŽc,è,Ì300f ofCfg,Ìf|fCf“fg,Æ,µ,Ä•Ö,µ A Ä %o
,Ì100f ofCfg,ðŽÝ,Ìf ofbftf@,Æ,µ,Ä•Ö,· Bfofbftf@,ÌfIftfZfbfg,Æ’·,³,É,æ,Ä,Í A,Ó,½,Ä,ß,Ìf|
fCf“f^,İNULL,É,È,é ê ‡,à, é B

fTfEf“fh Efofbftf@,İf f,fŠ,İŽ,·,í,é,é,±,Æ,à, é B,±
,é,Í,Ä,Éf ofbftf@,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,İŽg—
p’+ ,ÉfTfEf“fh EfJ [fhŽ©’ì,“”²,«Žæ,ç,é,Ä,µ,Ü,² ê ‡,Ä, é B,±,è,İPCMCA,ÌTfEf“fh EfJ [fh,Ä,æ,<N,±
,é B,Ü,½ A ‘,« ž,Ý—D æ<’²fEfxf<,Ìf AfvfŠfP [fVf‡f“,“ü—İftH [fJfX,ð“¼,½ ê ‡,É,à<N,±,è,â,·,ç B,±
,Ìftf%ofO,² Ý’è,³,é,Ä,c,é,Æ Afth [fJfX,ðŽ ,Ä AfvfŠfP [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,² B,±
,é,²N,«¼ ê ‡ ADirectSound,Í IDirectSoundBuffer::Lock,·,æ,Ñ

IDirectSoundBuffer::Play f\fbfh,É’Í,µ,ÄDSERR_BUFFERLOSTfGf%o [fR [fh,ð•Ö,· B,»,Ìf AfvfŠfP [fVf‡f“,² ‘
,« ž,Ý—D æ<’²fEfxf<,©,ç’¼,ÌfEfxf<,É%o°,²,Ä,½,è A“ü—
İftH [fJfX,ðŽ,Ä,½,è,·,é,Æ A’¼,Ìf AfvfŠfP [fVf‡f“,IDirectSoundBuffer::Restore f\fbfh,ðEÄ,Ñ o,µ,Äf ofbftf
@ Ef f,fŠ,İ ÄŠ,,é—,Ä,ðŽÄ s,Ä,«é B -E±,·,é,Æ A,±,İf f\fbfh,Ìf ofbftf@ Ef f,fŠ,â A,»,Ì’¼,Ìf{fŠf...
[f€

,âfpf“ Ý’è,È,Ç,Ìf ofbftf@,İ Ý’è,·,×,Ä,ðfŠfXfgfA,·,é B,µ,©,µ AfŠfXfgfA,³,é,½f ofbftf@,İTfEf“fh Ef [f^,Í”
%óó,³,é,Ä,ç,é B ef AfvfŠfP [fVf‡f“,İfŠfXfgfA,³,é,½f ofbftf@,Öff [f^,ð Ä ‘,«,±,Ý,·,é•K—v,², é B

ŽÝ,İ—á,Ä,ÍDirectSoundBuffer::Lock,·,æ,Ñ IDirectSoundBuffer::Unlock f f\fbfh,ðŽg—
p,µ,ÄTfEf“fh Efofbftf@,Öff [f^,ð ‘,«,±,ñ,Ä,ç,é B

```
BOOL AppWriteDataToBuffer(
    LPDIRECTSOUNDBUFFER lpDsb, DWORD dwOffset, LPBYTE lpbSoundData,
    DWORD dwSoundBytes)
{
    LPVOID lpvPtr1;
    DWORD dwBytes1;
    LPVOID lpvPtr2;
    DWORD dwBytes2;
    HRESULT hr;
    // f%ofCfgf|fCf“f^,İŽæ“¼
    hr = lpDsb->lpVtbl->Lock(lpDsb, dwOffset, dwSoundBytes, &lpvPtr1,
        &dwBytes1, &lpvPtr2, &dwBytes2, 0);

    // BUFFERLOST,³•Ö,³,é,½ ê ‡ AfŠfXfgfA,Æ Äf fbfn,ð s,²
    if(DSERR_BUFFERLOST == hr) {
        lpDsb->lpVtbl->Restore(lpDsb);
        hr = lpDsb->lpVtbl->Lock(lpDsb, dwOffset, dwSoundBytes,
            &lpvPtr1, &dwAudio1, &lpvPtr2, &dwAudio2, 0);
    }
    if(DS_OK == hr) {
        // f|fCf“f^,Ö ‘,«,±,Ý,ð s,²
        CopyMemory(lpvPtr1, lpbSoundData, dwBytes1);
        if(NULL != lpvPtr2) {
            CopyMemory(lpvPtr2, lpbSoundData+dwBytes1, dwBytes2);
        }
        // DirectSound,Öff [f^,ð•Ö,·
        hr = lpDsb->lpVtbl->Unlock(lpDsb, lpvPtr1, dwBytes1, lpvPtr2,
            dwBytes2);
        if(DS_OK == hr) {
            // -E± B
            return TRUE;
        }
    }
}
```

```
}  
// f bfN Af bfN%ođ æ A,à,μ,,Í—v< ,İŽ,”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 Efobftf@,đ ì ¬,µ A,»,é,¼,é,İfobftf@,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,Äfobftf@,Éff [f^,đ ‘,«,±,Ý A
IDirectSoundBuffer::Play,Äfobftf@,đ Ä ¶,·,é,±,Æ,ª,Ä,«,é B,Ü,½ A IDirectSoundBuffer::Stopf f\fbfh,đŽg—
p,µ,Ä A Ä ¶†,İfobftf@,đ,ç,Ä,Ä,à’âŽ~,·,é,±,Æ,ª,Ä,«,é B

IDirectSoundBuffer::Playf f\fbfh,İ,Ä,È,Éfobftf@,İfJfEf“fg EflfWfVf#f“,©,ç Ä ¶,đŽn,ß,é BfJfEf“fg Efl
fWfVf#f“,Í Afobftf@“à,İfIfZfbfg,ÄfocfgP’È,ÄŽw’è,³,é,é B V<K ì ¬,³,é,½fobftf@,İfJfEf“fg Efl
fWfVf#f“,İO,Ä, ,é Bfobftf@,“àŽ~,·,é,Æ AfJfEf“fg EflfWfVf#f“,Í,Žž,ÉŽÝ,É Ä ¶,³,é,ÉfTf“fvf<,Ö~Ú“®,·,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,İfobftf@,İ I,İ,é,È“ž’B,µ,½,Æ,«,É Ä ¶,đ I—,·,é B,±
,é,İf< [fv,È,µ,İfXf^fefBfbfn Efobftf@,İ“K ØÈ“® ì,Ä, ,é(fJfEf“fg EflfWfVf#f“,Í,±
,İŽž“_Äfobftf@,İŠJŽn’È’u,Ü,ÄfŠfZfbfg,³,é,é) B
fXfgfŠ [f€ Efobftf@,¬,æ,ÑfXf^fefBfbfn Efobftf@,đ^A±“I,É Ä ¶,·,é ê ±,Í A
IDirectSoundBuffer::Play,đCEÄ,Ñ o,µ,Ä AdwFlagsfpf%of [f^“à,ÉDSBPLAY_LOOPINGftf%ofO,đŽw’è,·,é B,±
,é,È,æ,è Afobftf@,¹ 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 Efobftf@,Ä,Í A Ä ¶fJ [f<,³ŠJŽn’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<fobfNŠÖ ”,ªŽÄ s,³,é,é,æ,µ,É,·,é,İ,æ,ç B,³,ç,É A½,·,
,İDirectSoundAfvfŠfP [fVf#f“,Í AfŠfAf<f^fCfDirectDrawRf“f]
[f^“fg,đŽ ,Ä,Ä,¬,è AfBfXfvfEfC,É,Í,µ,Ä’èŠú“I,ÉfT [frfX,đ s,µ,à,İ,Ä, ,é B,±,İfRf“f]
[f^“fg,İDirectSoundfobftf@,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 Efobftf@,É,Í,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 Efobftf@,Ä,Í•K,Žw’è,µ,½,Ü,µ,ª,æ,ç BDirectSound,İ,±,é,ç,İfobftf@,đ—
LCEø,Éfn [fhEfFFA Ef f,fŠ,Éf [fh,·,é,İ,Ä Af~fLfvf“fOŽž,İfI [fo [fwfbfh,İ,È,ç B Ä,à d—
v,ÉfXf^fefBfbfn EfTfEf“fh Efobftf@,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,Ä,ç,é,İ A DirectSoundf~fLFT [,Í Ä ,«%øiŽç,İfTfEf“fh,đ ì,è o,· B,±
,İ đCE %ø,Ä,Í Af~fLFT [,İCE`Ž®iŠ·,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 Efobftf@,đ ì ¬,µ,ÄIDirectSoundBuffer::SetFormatf f\fbfh,đCEÄ,Ñ o,· B,½,¾,µ A,±
,İfvf%ofCf}fŠ Efobftf@,Í §CEä,İ—Ú“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%ø,İIDirectSoundBuffer::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 [,đžg—p,·,é,ª A,±,ê,Í A,Û,Ú,·,×,Ä,lf~fLfvf“fO,ì—v< ,đž,½,µ A,Û,½ Až@“@“I,Éfn [fhEfffA EfAfNfZf%of€ [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 ‘,«,±,ŸfAfNfZfX,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,€Ä,ç,ê,½fnfCfpftfH [f}f“fX,lfAfvfšfP [fVf‡f“,Á,Ì,Ÿ —L€ø,Á, ,é B,±,ì<@“\,đ—p,µ,½fAfvfšfP [fVf‡f“,Íf [ffBfl,Ì,,é,đ%ñ”ð,·,é,ì,“i,µ,È,é,Ì,Á AfpftfH [f} f“fX—v< ,ª€µ,µ,,È,é B

fJfXf^f€ Ef~fLft [,đ ì ¬,·,é,É,Í A,Û, DSSCL_WRITEPRIMARY<¹²f€fxf<,đžæ“¾,µ Afvf%ofCf} fš EftfEf“fh Efofbftf@,đ ì ¬,·,é BžŸ,ÉIDirectSoundBuffer::Lock f\fbfh,đ€Ä,Ñ o,µ A•Ö,³,ê,½f} fCf“f^,Öff [f^,đ ‘,«,± ,Ÿ A,»„µ,ÄIDirectSoundBuffer::Unlock f\fbfh,đ€Ä,Ñ o,µ,ADirectSound,Öff [f^,đ•Ö,· BfAfvfšfP [fVf‡f“,ÍIDirectSoundBuffer::Play f\fbfh,Ì€Ä,Ñ o,µ,Áfvf%ofCf}fš Efofbftf@,đ Ä ¶,µ Af [f^,đfXfs [fJ,É o—Í,µ,È,·,Ä,Í,È,ç,È,ç BDSBPLAY_LOOPINGf%ofO,©Žw’è,³,ê,Á,ç,È,ç,Æ IDirectSoundBuffer::Play,Ì€Ä,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 Eff ofCfX,ªff [f^ Efuf fbfn,Ì Ä ¶,đ€J,è•Ö,³,È,ç,æ,ª^è,ÌšÖš,Á€Ä,Ñ o,µ,³,é,é•K—v,ª, ,é BCustomMixeršÖ ”,Í AfvfšfP [fVf‡f“,ª^è<,µ,½šÖ ”,Ä A AfvfšfP [fVf‡f“,ª^è<,µ,½CustomMixer,ì†,Ážw’è,³,ê,½,Æ,«,É•j ”,lfXfgfš [f€ ,đf~fLfvf“fO,µ A€%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;
    // ‘,«,±,ŸffCf“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) {
            // -€÷
            return TRUE;
        }
    }
    // f fbfn,ª,Ñf fbfn%đ æ,ìž,“s
    return FALSE;
}
```

^3 kwave, Ĺg—p

» 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 ”, Ĺg—p, Ĺ, Ĺ, Ĺ
—v, Ĺ, Ĺ BŽĀ 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, Ĺ [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, IUknown FAR * pUnkOuter);
```

IDirectSound fCf“f^ [ftffCfX,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,Î**DSERR_INVALIDPARAM**,ÏGf%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<fofbfNšÖ ” 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<fofbfNšÖ ” 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<fofbfNšÖ ” 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<fofbfNšÖ ”,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,·,é,±,Æ,³,Ā,«é B•Źš-ñ,đ,±,ÌfR [f<fofbfNšÖ ”,Ö“n,·,Ì,Éžg—
p,³,é,½f f,fš,Í A,±,ÌfR [f<fofbfNšÖ ”,žĀ s’†,Ì,Æ,«É,Ì,Ý—LÆø,Æ,È,é B

žQ Æ @DirectSoundEnumerate

IDirectSound

*fAfvfŠfP [fVf‡f^,ÍDirectSoundIfufWfFfNfg,ì ì ¬,ÆŠÂ« Ý'è,ÉIDirectSoundfCf^f^ [ftfFfCfX,Ìf f\fbfh,ðŽg
—p,.,é B,±,Ì 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,è,Ä,ç,é

f f,fŠŠ,,,è“—,Ä

Compact

Initialize

fOfbftf@ ì ñ

CreateSoundBuffer

DuplicateSoundBuffer

SetCooperativeLevel

ffofCfX «”

GetCaps

fXfs [fJ Ý’è

GetSpeakerConfig

SetSpeakerConfig

*,,·,×,Ä,ÌCOMfCf^f^ [ftfFfCfX,Æ“—1 AIDirectSoundfCf^f^ [ftfFfCfX,Í_
IUnknownfCf^f^ [ftfFfCfXf f\fbfh,ðEp ³,µ,Ä,ç,é BIUnknownfCf^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 [fPf“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,İf|fCf“f^ B
lplpDirectSoundBuffer
    V<K,İDirectSoundBufferIfufWfFfNfg,Ö,İf|fCf“f^ Bfobftf@,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 Efobftf@,đ Ä ¶%oÄ”\,É,·,é,½,ß,É AŽ-‘O,É**IDirectSound::SetCooperativeLevel**f f\fbfh,đŽg—
p,µ,ÄDirectSoundfIfufWfFfNfg,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,½fobftf@,İf^fCfv 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,.,İDirectSoundfIfufWfFfNfg,đ ì ¬,·,é,Æ,«,É  
DSBCAPS_CTRLFREQUENCYftf%ofO,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 ã,İfobftf@,đ“Ĉ,Ÿ ž,Đ ê ‡,Í A DSBCAPS_STATICftf%ofO,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,©,đfobftf@,Ö<-  
§“L,ÉŽw’è,·,é,É,Í ADSBCAPS_LOCHARDWARE A,à,µ,.,İ DSBCAPS_LOCSOFTWAREftf%ofO,đŽg—p,·,é B
```

ŽQ Æ @**DSBUFFERDESC**, **IDirectSound**,

- IDirectSound::DuplicateSoundBuffer**, **IDirectSound::SetCooperativeLevel**, **IDirectSoundBuffer**,
- IDirectSoundBuffer::GetFormat**, **IDirectSoundBuffer::GetVolume**, **IDirectSoundBuffer::Lock**,
- IDirectSoundBuffer::Play**, **IDirectSoundBuffer::SetFormat**, **IDirectSoundBuffer::SetFrequency**

IDirectSound::DuplicateSoundBuffer

```
HRESULT DuplicateSoundBuffer(
    LPDIRECTSOUNDBUFFER lpDsbOriginal,
    LPLPDIRECTSOUNDBUFFER lplpDsbDuplicate);
```

DirectSoundBufferIfufWfFfNfg,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““,¶fpf%of [f^,đŽ ,Â B,½,¾,µ A,»,ê,¼,ê,ìfpf%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,ìff [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,ĪfXfefĒfI EfXfs [fJ,©,ç o—Ī,³,ê,é(fftfHf<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);

fTfEf“fh EfffofCfX,ÉĪ,·,éfAfvfŠfP [fvf‡f“,Ī’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,½<’²fĈfxf< B ŽŸ,Ī’l,²Žw’è,Ā,«,é B

DSSCL_EXCLUSIVE

fAfvfŠfP [fvf‡f“,đ”r¼fĈfxf<,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,É<’² ó’Ō,đ Ý’è,·,é B Ā,àXf€ [fY,Èf}
f<f^fXfLf“fo,ĀfŠf\ [fX<ᵀ—L,đ s,ᵀ
,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 Efofbftf@,Ō,Ī ‘,«,±,ÝfAfNfZfX,đ—L,μ,Ā,ç
,é BfZfJf“f fŠ EfTfEf“fh Efofbftf@,Ī Ā ¶,Īê Ø,Ā,«,È,ç B

fofbftf@,đ Ā ¶,·,é’O,É A,±,Īf f\fbfh,đĈĀ,Ñ o,μ,Ā<’²fĈfxf<,đ Ý’è,μ,Ā,“;±,Ā,Ī•K {,Ā, ,é B „ §,Ī<’²fĈfxf
<,ĪDSSCL_NORMAL,Ā, ,é B¼,Ī—D æfĈfxf<,Ī•K—v,É%ž,¶,ĀŽg—p,·,é B Ū ×,É,Ā,ç
,Ā,Ī A<’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

-Œ÷, ·, 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, ðXfefŒfl, É, È, é(fftfHf<fg'l) B

DSSPEAKER_SURROUND

fXfs [fJ, ðTf%ofEf“fh EfTfEf“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,ê,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 fWfEfNfvf#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,Â,ç,Ä,Ì î•ñ,ðŽæ“¾,·,é B

-E÷,·,ê,ÎDS_OK AŽ,”s,·,ê,Î**DSERR_INVALIDPARAM**fGf%o [fR [fh,ð•Ô,· B

lpDs3dBuffer

DS3DBUFFER \ç‘ì,Ö,ì|fCf“f^ B,±,ì \ç‘ì,ÍfTfEf“fh Efobftf@,ì3D“Á «,É,Â,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,đŽæ“¼,.,é B  
-Æ÷,.,ê,ÏDS_OK AŽ,”s,.,ê,ÏDSERR_INVALIDPARAM fGf%o [fR [fh,đ•Ô,· B  
  
lpdwInsideConeAngle ;,æ,Ñ lpdwOutsideConeAngle  
fTfEf“fh Efvf fWfFfNfVf‡f“ EfR [f“,ì“à•”Šp,ÆŠO•”Šp,đŽ!,·İ ”,Ö,Ïf|fCf“f^ B
```

IDirectSound3DBuffer::GetConeOrientation

HRESULT GetConeOrientation(LP3DVECTOR lpvOrientation);

HRESULT GetConeOrientation(LP3DVECTOR lpvOrientation);

lpvOrientation

D3DVECTOR lpvOrientation; HRESULT GetConeOrientation(LP3DVECTOR lpvOrientation);

HRESULT GetConeOrientation(LP3DVECTOR lpvOrientation); HRESULT GetConeOrientation(LP3DVECTOR lpvOrientation);

IDirectSound3DBuffer::GetConeOutsideVolume

HRESULT GetConeOutsideVolume (LPLONG lplConeOutsideVolume);

HRESULT GetConeOutsideVolume (LPLONG lplConeOutsideVolume);

HRESULT GetConeOutsideVolume (LPLONG lplConeOutsideVolume);

HRESULT GetConeOutsideVolume (LPLONG lplConeOutsideVolume);

HRESULT GetConeOutsideVolume (LPLONG lplConeOutsideVolume);

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,Í³EÀ,É,È,Á,Ä,ç,é B Á'Z<—É,Æ Á'·<—É,É,Â,ç,Ä,ì Ú × îñ,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,ì¹,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);

ftfEfh 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,ÍfTfEfh Efofbftf@'†,ìfJfEfh EflfWfVf‡f“,ðŽ!,µ,Ä,ç,é B

IDirectSound3DBuffer::GetVelocity

HRESULT GetVelocity(LPD3DVECTOR lpvVelocity);

ftfEf“fh Efofbftf@,ìĚ» Ý,ì“x,đŽæ“%4,·,é B

-Ě÷,·,ê,îDS_OK AŽ,”s,·,ê,î**DSERR_INVALIDPARAM** fGf% [fR [fh,đ•Ô,· B

lpvVelocity

D3DVECTOR \‘ċ‘ì,Ö,ìf|fCf“f^ B,±,ì \‘ċ‘ì,ÍftfEf“fh Efofbftf@,ìĚ» Ý,ì“x,đŽ,μ,Ä,ċ,é B

‘-“x,Ífhfbfvf% [Ěø%Ê,À,ì,ÝŽg—p,³,ê,é BŽÀ Û,Éfofbftf@,đ~Ú“®,·,é,±,Æ,Í,È,ċ 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!,·! BŽŸ,ì!l,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,^a s,í,ê,éf^fCf~f“fO,đŽ!,·! BŽŸ,İ!,ĂŽ!,³,ê,é B

DS3D_DEFERRED fAfvfŠfP [fVf‡f“,^aIDirectSound3DListener::Commi
tDeferredSettings 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 ÄCEvŽŽ,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 À•W,İ
ÄCEvŽŽ,đ s,± B

Šp“x,Ì”ÍÍ,Í0“x(fR [f“,È,μ),©,ç360“x(“S”ÍÍ),Û,Ă,Ă, ,é BffftfHf·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•ûĈÛ,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,Ĉ,È,Ĉ,ÆĈø%ŎÈ,““¾,Ĉ,è,È,Ĉ B
-Ĉ±,·,è,İDS_OK AŽ,”s,·,è,İDSERR_INVALIDPARAM fGf%Ŏ [fR [fh,đ•Ŏ,· B

x, y, , ;æ,Ñ z
D3DVALUE,İf^fCfv,đŽ!,·l B,±,è,İ V<K,İfTfEf“fh EfR [f“,İ•ûĈÛfxfNfgf<,İ Ä•W,đ•\,· B

dwApply
Ý’è,ª s,í,è,éf^fCf~f“fO,đŽ!,·l B^È%Ŏ,İl,ÄŽ!,³,è,é B

DS3D_DEFERRED fAfVfŠfP [fVf±f“,ª**IDirectSound3DListener::Commi**
tDeferredSettingsf f\fbfh,đĈÄ,Ñ o,·,Û,Ä Ý’è,İ s,í
,è,È,Ĉ B•j ”,İ Ý’è,đ•İ X,µ,½,è A’P“Æ,İ ÄĈvŽŽ,đ
ŽÄ s,·,é,±,Æ,“%ŎÄ”\ B

DS3D_IMMEDIATE Ý’è,İ!ŽŽ,É s,í,è AfVfXfef€
,İ,·,×,Ä,İ3DfTfEf“fh Efofbftf@,É.İ,·,é3D Ä•W,İ
ÄĈvŽŽ,đ s,ª B

IDirectSound3DBuffer::GetConeOrientation f f\fbfh,İ
lpvOrientationfpf%Ŏf [f^“à,İfxfNfgf< î•ñ,İ AfTfEf“fh EfR [f“,İ+ S,đ•\,µ,Ä,Ĉ,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,^a s,í,ê,éf^fCf~f“fO,đŽ!,·l B^È%o°,ìl,ĂŽ!,³,é,é B

DS3D_DEFERRED fAfvfŠfP [fVf‡f“,”**IDirectSound3DListener::CommitD
eferredSettings**f f\fbfh,đCEĂ,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, ^a 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, ê, 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, ê AfVfXfef€
, Í, ·, ×, Ä, Ì3DfTfEf“fh Efofbftf@, É'Í, ·, é3D Ä·W, Ì Ä
CEvŽZ, ð s, µ B

ffftfHf<fg, Ä, Í Á'·<—É'1, Í³CEÄ, É, È, Á, 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 "l Ý'è,ð·l X,µ,½,è A'P"Æ,ì ÄEvŽZ,ðŽÄ s
,;é,±,Æ,ª%oÄ" B

DS3D_IMMEDIATE Ý'è,Í;Žž,É s,í,ê AfVfXfef€
,l,·,×,Ä,ì3DfTfEf"fh Efofbftf@,É'î,;é3D Ä·w,ì Ä
EvŽZ,ð s,ª B

ffftHf<fg,Ä,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,Ä,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 Ä,;é,±,Æ B

ŽQ Ä @**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•,±  
        ,ì,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,Ì â‘Îfpf%of [f^,ÍfŠfXfi [ Efpf%of [f  
        f^,³,İ X,³,ê,½,Æ,«,ÉŽ©“®“l,É X V,³,ê,é,ì,Ă A’Š’Îfpf%of [f^,Í,İ  
        ,ì,ç,È,ç,Û,Û,Ă, ,é B  
    DS3DMODE_NORMAL  
        •W €,ì ^— B,±,ê,³ffftfHf<fg Ef, [fh,É,È,Ă,Ă,ç,é B  
  
dwApply  
    Ý’è,ª s,ì,ê,éf^fCf~f“fO,ðŽ‘,·‘l B^È%o,ì‘l,ĂŽ‘,³,ê,é B  
    DS3D_DEFERRED fAfvfŠfP [fVfžf“,ªIDirectSound3DListener::CommitDef  
erredSettingsf f\fbfh,ðŒĂ,Ŧ o,·,Û,Ă Ý’è,Í s,ì,ê,È,ç  
B•; ”,ì Ý’è,ð•İ X,μ,½,è A’P“Æ,ì ĂŒvŽZ,ðŽĂ s,·,é,±  
,Æ,ª%oĂ”\ B  
    DS3D_IMMEDIATE Ý’è,Í‘Žž,É s,ì,ê AfVfXfef€  
,Í,·,×,Ă,ì3DfTfEf“fh Efofbftf@,É‘Í,·,é3D À•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,ÛÊ‘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,Û·ï 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,í,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,Ä Ý’è,Í s,í,ê,È,¢ B·j ”,ì Ý
’è,ð·ï X,µ,½,è A’P^Æ,Û ÄEvŽZ,ðŽÄ s,·,é,±
,Æ,ª%oÄ”\ B*

DS3D_IMMEDIATE *Ý’è,Í‘ŽŽ,É s,í,ê AfVfXfef€
,Í,·,×,Ä,ÛDfTfEf“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,¢“x fxfNfgf<,ì À•W,đ•\,· B

dwApply

Ý’è,ª s,í,ê,éf^fCf~f“fO,đŽ!,·l B^È%o,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%oÈ,Ä,ì,ÝŽg—p,³,ê,é BŽÀ Û,Éfofbftf@,đ~Ú“®,·,é,±
,Æ,Í,È,¢ B Û ×,Í^È’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@fEf“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,ìÈ%°,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,đEp ³,μ,Ā,č,é BIUunknownfCf“f^ [ftfFfCfX,ìÈ%°,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,ìĒĀ,Ñ o,μ^ÈĒĀ,É ì ¬,³,ê,½ ~,|'u,« Ý'è,ðfRf~fbfg,·,é B

-Ē÷,·,ê,ĤDS_OK AŽ,„s,·,ê,ĤDSERR_INVALIDPARAMfGf%o [fR [fh,ð•Ô,· B

Ā'â,ì"¬,Ā ~,|'u,« Ý'è,ðŽg—p,·,é•û-@,É,Ā,ĉ,Ā,Ì Ú ×,Í ~,|'u,« Ý'è,ðŽQ Ā,·,é,±,Ā 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, DSERR_INVALIDPARAMfGf%o [fR [fh, ð•Ô, · B

lpflDistanceFactor

D3DVALUEf^fCfv, Ì•İ ”, 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, é, 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,ì•ûEü,ð‘O•ûfxNfgf<,Æ ã•ûfxNfgf<,ì,Ó,½,Â,ÌfxNfgf<,ÅŽæ“¾,·,é B
-E±,·,ê,îDS_OK AŽ,”s,·,ê,îDSERR_INVALIDPARAM fGf%o [fR [fh,ð•Ô,· B

lpvOrientFront

D3DVECTOR \‘c‘ì,Ö,Ìf|fCf“f^ BfŠfXfi [,ì‘O•ûfxNfgf<,ðŽ!,μ,Ä,ç,é B

lpvOrientTop

D3DVECTOR \‘c‘ì,Ö,Ìf|fCf“f^ BfŠfXfi [,ì ã•ûfxNfgf<,ðŽ!,μ,Ä,ç,é B

‘O•ûfxNfgf<,ÍfŠfXfi [,ì•@,É^Ê‘u,μ A ã•ûfxNfgf<,ÍfŠfXfi [,ì“ã ã,©,ç^Ê‘u,·,é BfftfHf<fg,Å,Í‘O•ûfxNfgf<,Í(0,0,1.0) A ã•ûfxNfgf<,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

—Æ÷, ·, 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, ¢, é B

fftfHf<fg'l, ÎDS3D_DEFAULTROLLOFFFACTOR (1.0), Ä, ·, é Bf [f<fIft—v'f, É, Ä, ¢, 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,îDSERR_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,ì‘Ů“@,Í,È,č BfŠfXfi [,ìÊ‘u,đ•ï X,·,é,É,îIDirectSound3DListener::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

-Ç±,.,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
ferredSettingsf f\fbfh,ðÇÄ,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 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 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
D3DVALUEf^fCfv,Î'l B'O•ûfxNfgf<,l À•W,ðŽ',µ,Ä,ç,é B

xTop, yTop, ,”æ,Ñ zTop
D3DVALUEf^fCfv,Î'l B ã•ûfxNfgf<,l À•W,ðŽ',µ,Ä,ç,é B

dwApply
Ý'è,ª s,í,ê,é f^fCf~f“fO,ðŽ',·'l B^È%º,Î'l,ÅŽ',¾,é,é B

DS3D_DEFERRED fAfVfŠfP [fVfšf“ªIDirectSound3DListener::CommitD
eferredSettings

f f\fbfh,ðCEÄ,Ñ o,·,Ü,Ä Ý'è,Í s,í,ê,È,ç B•j ”,l Ý
'è,ð•l X,µ,½,è A'P“Æ,Î ÄEvŽZ,ðŽÄ s,·,é,±
,Æ,“%oÄ”\,Ä, ,é B

DS3D_IMMEDIATE Ý'è,Í'Žž,É s,í,ê AfVfXfef€
,Í,·,×,Ä,Î3DfTfef“fh Efofbftf@,É'Í,·,é3D Ä•W,Î Ä
CEvŽZ,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,ç,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 A**IDirectSound3DListener::SetDistanceFactor** f\fbfh,ðŽg—p,µ,Ä'PÊ,İ·İ X,à s,ı,é B
-CE±,·,ê,İDS_OK AŽ,»s,·,ê,İ**DSERR_INVALIDPARAM**fGf%o [fR [fh,ð•Ô,· B

x, y, z, æ, Ñ z
D3DVALUEf^fCfv,İ'l BfŠfXfi [,l V<K,İÊ'ufxfNfgf<,İ À•W,ðŽ',µ,Ä,ç,é B

dwApply
Ý'è,ª s,ı,ê,éf^fCf~f“fO,ðŽ',·l BÊ%o,İ'l,ÄŽ',¾,ê,é B

DS3D_DEFERRED fAfvfŠfP [fVf#f“,ª**IDirectSound3DListener::CommitD
eferredSettings**f f\fbfh,ðCEÄ,Ñ o,·,Ü,Ä Ý'è,İ s,ı,ê,È
,ç B•j ”,İ Ý'è,ð•İ X,µ,½,è A'P“Æ,İ ÄEvŽZ,ðŽÄ s
,µ,½,è,Ä,«,é B

DS3D_IMMEDIATE Ý'è,İ'Žž,É s,ı,ê 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%º,ì'l,ÁŽ,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 Æ,·,é,±,Æ B

ŽQ Æ @**IDirectSound3DListener::GetRolloffFactor**

IDirectSound3DListener::SetVelocity

HRESULT SetVelocity(D3DVALUE x,
D3DVALUE y, D3DVALUE z, DWORD dwApply);

fŠfXfi [,l'-'x,đ Y'è,;é B

-Ĉ÷,;ê,ÎDS_OK AŽ,;s,;ê,ÎDSERR_INVALIDPARAM fGf%o [fR [fh,đ•Ô,· B

x, y, ;,æ,Ñ z

D3DVALUEf^fCfv,Îl BfŠfXfi [,l V<K,Î'-'x,Î À•W,đŽ',µ,Ä,Ĉ,é B

dwApply

Y'è,ª s,í,ê,éf^fCf~f"fo,đŽ',·l B^È%°,Îl,ÄŽ',³,ê,é B

DS3D_DEFERRED fAfvfŠfP [fVfžf",ª**IDirectSound3DListener::CommitD
eferredSettings**
f f\fbfh,đĈÄ,Ñ o,;Ü,Ä Y'è,Í s,í,ê,È,Ĉ B•j ",l Y
'è,đ•Ī X,µ,½,è A'P"Æ,Ī ÄĈvŽZ,ĪŽÄ s,ª%oÄ",Ä, é
B

DS3D_IMMEDIATE Y'è,Í'Žž,É s,í,ê AfVfXfef€
,Í,·,x,Ä,Ī3DfTfEf"fh Efofbftf@,É'Í,·,é3D À•W,Î Ä
ĈvŽZ,đ s,ª B

'-'x,Ífhfbfvf%o [—v'f,Ä,Ī,YŽg—p,³,ê,é BŽÀ Ū,ÉfŠfXfi [,đ'Ū"®,;é,±
,Æ,Í,È,Ĉ BfŠfXfi [,l'Ê'u,đ•Ī X,·,é,É,Í**IDirectSound3DListener::SetPosition**f f\fbfh,đŽg—p,·,é BffftfHf<fg,Î'-'x,Í
(0,0,0),Ä, é B

ŽQ Æ @**IDirectSound3DListener::GetVelocity**

IDirectSoundBuffer

DirectSoundBufferIfufWfFfNfg,ð ì ¬,µ,ÄŠÂ«« Ý'è,ð s,α,É,Í A

IDirectSoundBufferfCf“f^ [ftfFfCfX,ìf f\fbfh,ðŽg—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,éDSBUFFERDESC \‘c‘ì,Æ“™,Ì î•ñ,É%oÁ,|, Ä X,È,é’Ç%oÁ î•ñ,ª,ĉ,,Ä,©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,ÍDSBUFFERDESC \‘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,ÍDSBCAPS_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\f<,æ,Ñ ‘,«,±,ÝfJ [f\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,ÌfIfzfzfbfg,Ä, ;è AfofCfG,ÄŽw’è,³,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,ÌfIfzfzfbfg,Ä, ;è AfofCfG,ÄŽw’è,³,ê,é B

‘,«,±,ÝfJ [f\f<,Í Afofbftf@,Ö,Ìff [f^ ‘,«,±,Ý,^À’S,É,Ä,«,éÊ’u,ðŽ|,;é B ‘,«,±
,ÝfJ [f\f<,Í A Ä ¶fJ [f\f<,æ,è’Ê í15f~fŠ•b‘Š“-,ÌfI [ffBfI Eff [f^•¾,¾, æ,É, ;é B

lpdwCurrentPlayCursorpf%of [f^,ÄŽ|,³,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,Á,ç,Ä,Ì îñ,ðŽæ“¾,·,é B,à,µ,ÌE`Ž®,É,Á,ç,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,Á,ç,Ä,Ì îñ,ðŠÛ,ðWAVEFORMATEX \‘ç‘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 \‘ç‘Ì,Ìf ofCf g’P`Ê,ÌTfCY BDirectSound,Ì|fCf“f^,Ö ‘,«±,ð,Ì,Í,¹,ç
,º,çdwSizeAllocated,Ìf ofCf g ”,Ì,Ý,Á, ,é B,à,µWAVEFORMATEX \‘ç‘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 \‘ç‘Ì,Ö ‘,«±,Û,è,½f ofCf g ”,ðŽ!,·,Í ”,Ö,Ì|fCf“f^ B,±,Ìf pf%of [f^,ÎNULL,Á,à,æ,ç B

WAVEFORMATEX \‘ç‘Ì,Í%oÁ•í·,Á, ,é BfAfvfŠP [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 \‘ç‘Ì,ÌTfCY,
ÌlpdwSizeWrittenfpf%of [f^,Ö•Ô,³,è,é B,»,ÌEãfAfvfŠP [fVf±f“,Í \ª,Èf f, fŠ,ðŠ,,è—
,Á,Á Ä“xIDirectSoundBuffer::GetFormat,ðEÄ,Ñ o,·,±,Æ,Á AÈ`Ž®,É,Á,ç,Ä,Ì îñ,ÌŽæ“¾,ª,Á,«é B

ŽQ Æ @IDirectSoundBuffer, IDirectSoundBuffer::SetFormat

IDirectSoundBuffer::GetFrequency

HRESULT GetFrequency(LPDWORD lpdwFrequency);

fofbftf@,ª Ä ¶,³,ê,Ä,¢,é ê Š,ì1•bŠŌ,ìžü”g ”,ðžæ“¾,·,é B
-Æ÷,·,ê,îDS_OK Až,”s,·,ê,îžŸ,ìfGf%∞ [fR [fh,ð•Ō,· B

DSERR_CONTROLUNAVAIL

DSERR_INVALIDPARAM

DSERR_PRIOLEVELNEEDED

lpdwFrequency

fI [ffBfI Efofbftf@,ª Ä ¶,³,ê,Ä,¢,é ê Š,ìžü”g ”,ðž!,·,î ”,Ō,ìf|fCf“f^ B

žü”g ”,ì1,í100,©,ç 100,000,ì”í1,Æ,È,Á,Ä,¢,é B

žQ Æ @IDirectSoundBuffer, **IDirectSoundBuffer::SetFrequency**

IDirectSoundBuffer::GetPan

HRESULT GetPan(LPLONG lplPan);

¶,Æ%E,İfI [fffBfI 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,Á,í ”,Á,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»³,ê,Ä,č,È,čDirectSoundBufferIfufWfFfNfg,đ «Šú»³,·,é B

DSERR_ALREADYINITIALIZEDfGf% [fR [fh,đ•Ô,· B

lpDirectSound

DirectSoundBufferIfufWfFfNfg,ÆE< ‡,μ,½DirectSoundIfufWfFfNfg,Ö,ì|fCf“f^ B

lpDSBufferDesc

fTfEf“fh Ef of bftf@,ì «Šú»³,ÉŽg—p,·,é'l,đŽ',μ,Ä,č,éDSBUFFERDESC \‘c‘ì,Ö,ì|fCf“f^ B

IDirectSound::CreateSoundBufferf f\bfh,í“à”,Å**IDirectSoundBuffer::Initialize**,đEÄ,Ñ o,·,ì,Ä ACE» Ý,ìfŠfŠ [fX
,ìDirectSound,Ä,í•K—v,È,č B,±,ê,í «—^,ìŠg'É «,ì,½,ß,É—p^Ó,³,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 Eff [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,·,éfofbftf@—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,éfofbftf@,İ Ä %o,İfuf fbfN,Ö,İf|Cf“f^ B

lpdwAudioBytes1

lplpvAudioPtr1fpf%of [f^,ÄŽ,³,é,½fofCfG ”,ðŽ,·,İ ”,Ö,İf|Cf“f^ B,±
,İ¹,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^,İ¹,^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,½fofCfG ”,ðŽ,·,İ ”,İfAhfÆfX B lplpvAudioPtr2,^NULL,İ ê ± A,±
,İ¹,İÖ,Æ,È,é B

dwFlags

f fbfN,İfCxf“fg,ð C ³,·,éftf%ofO B^È%o,İ¹,ÄŽ,³,é,é B

DSBLOCK_FROMWRITECURSOR

«» Ý,İ ‘,«,±,ÝfJ [f^ç,©,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,İ,½,B,Ä, ,é Bf fbfN,³,é,½fofbftf@,^ I—
r^Ê‘u,Ä zŠÄ,μ,È,ç ê ± A,Ó,½,Ä,ß,İf|Cf“f^,Ä, ,

élplpvAudioBytes2,İNULL,É,È,é B,½,¾,μ zŠÄ,·,é ê ±,İ A,Ó,½,Ä,ß,İf|Cf“f^,İfofbftf@,İŠJŽn^Ê‘u,ðŽ,· B

lplpvAudioPtr2,·,æ,Ñ

lpdwAudioBytes2fpf%of [f^,É‘İ,μ,ÄNULL,ð“n,·,Æ ADirectSound,İfofbftf@,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,Öfofbftf@,ð•Ö,·,½,ß,É,İDirectSoundBuffer::Unlockf f\fbfh,ðÆÄ,Ñ o,•K—v,^a, ,é BftfEf“fh E
fofbftf@,Ö,İf fbfN,İ·ŽžŠÖ,·,×,«,Ä,İ,È,ç B·ŽžŠÖf fbfN,³,é,é,Æ A Ä ¶fJ [f^ç,^f fbfN,³,é,½—
İæ,Ö“ž‘B,μ,Ä,μ,Ü,ç Af%of“f_fÆmfCY,Æ,ç,Ä,½ A@Ší \ ^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¬%¹ E Ä ¶¹,ª,ª,ª,é,½ftf%oO,Ï'è"Ö Ä¸B,É'è'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 æ¹²fŒfxfç,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,Ï¹²fŒfxfç,É Ý'è,³,é,Ä,ç,é ê ±,Ï A,±
,Ïf f\fbfh,É,æ,éZfJf“f_ÏfŠ Efofbftf@,Ï Ä ¶,ª,ª,ª,Ä,à s,í,é,Ä,ç,È,·,Ä,àfvf%oCf}
fŠ Efofbftf@,ª Ä ¶,³,é,é B,±,Ï ê ±,Ï—%¹,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 A¹²fŒfxfç,ðŽw'è,·,é•K—
v,ª, ,é B'É Ï,ÏSSCL_NORMAL,ðŽw'è,·,é B,à,µ**IDirectSound::SetCooperativeLevel**f 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,,Î A“ü—
ÍftfH [fJfX,ðŽ ,ÄfAfvfŠfP [fVf÷f“,“DSSCL_WRITEPRIMARY<’²fçfxfç,É Ý’è,³,ê,Ä,ç
,é ê ÷ A‘¼,Ì,·,×,Ä,ÌfAfvfŠfP [fVf÷f“,Ífobftf@,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 Efobftf@,ðfŠfXfgfA,·,é,½,ß,É,Í A“ü—ÍftfH [fJfX,ðŽ ,Á,Ä,ç,é•K—v,ª, ,é B

DirectSound,ªfobftf@ Ef f,fŠ,ðfŠfXfgfA,μ,½ ê ÷ A—LCEø,ÈfTfEf“fh Eft [f^,Ì Ä ‘,«±,Ý,ª•K—v,Ä, ,é BD
irectSound,Íf 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,Éfobftf@,ðŽw’è,μ,Ä,“-
,Æ A,»,Ìfobftf@,ªŽ,,í,ê,½,Æ,ç,ª’m,ç,¹,ðŽó, ,é,±,Æ,ª,Ä,«,é B,±
,é,ç,Ìf f\fbfh,Í Afobftf@,ªŽ,,í,ê,½ ê ÷,ÎDSERR_BUFFERLOST,ð•Ô,· B**IDirectSoundBuffer::GetStatus**f f\fbfh,
à,Û,½ AfTfEf“fh Efobftf@,Ì ó‘Ô,Ìžæ“¾,ÆDSBSTATUS_BUFFERLOSTftf%ofo,ÌfefXfg,ÉŽg—p,³,é,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%*C*f}fŠ E*f*T*f*E*f*“*f*h E*f*o*f*b*f*t*f*@,İ*f*A*f*v*f*Š*f*P [fVf‡f“,Ä,İCE`Ž@,đ Ý`è,·,é B,±,İ*f*A*f*v*f*Š*f*P [fVf‡f“,“ü—
İ*f*t*f*H [fJfX,đŽ ,Ä,½,Ñ,ÉDirectSound,İ*f*v*f*%*C*f}fŠ E*f*o*f*b*f*t*f*@,đ“Ä`è,İCE`Ž@,É Ý`è,·,é B

-CE÷,·,é,İDS_OK AŽ,”s,·,é,İŽŸ,İ*f*G*f*% [fR [fh,đ•Ö,· B

DSERR_BADFORMAT

DSERR_INVALIDCALL

DSERR_INVALIDPARAM

DSERR_OUTOFMEMORY

DSERR_PRIOLEVELNEEDED

DSERR_UNSUPPORTED

lpfxFormat

WAVEFORMATEX \`c`ì,Ö,İ*f*f*C*f“*f*^ B*f*v*f*%*C*f}fŠ E*f*T*f*E*f*“*f*h E*f*o*f*b*f*t*f*@,İ V,µ,CE`Ž@,đ•\,· B

‘,« ž,Ý—D æ‘’²*f*C*f*x*f*ˆ,Ä*f*A*f*N*f*Z*f*X,³é,Ä,c,é*f*v*f*%*C*f}fŠ E*f*o*f*b*f*t*f*@ ä,Ä,±
,İ*f* f\i**b**f*h*,đCEÄ,Ñ o,· ê ‡ A*f*o*f*b*f*t*f*@,đ**IDirectSoundBuffer::SetFormat**,“CEÄ,Ñ o,³é,é‘O,É‘âŽ~,µ,Ä,“,©,È,¯,é,İ,È,
ç,È,c B,±,İ*f* f\i**b**f*h*,^a ‘,« ž,Ý—D æ^ÈŠO,İ‘’²*f*C*f*x*f*ˆ ä,ÄCEÄ,Ñ o,³é,½ ê ‡,İ ADirectSound,İ“à•”,Ä*f*v*f*%*C*f}
fŠ E*f*o*f*b*f*t*f*@,đ‘âŽ~,µ ACE`Ž@,đ•İ X,µ A*f*v*f*%*C*f}fŠ,đfŠ*f*X*f*^ [f*g*,·,é B*f*A*f*v*f*Š*f*P [fVf‡f“,^a±,é,ç,İ ìÆ,đ-
¾Ž!,·,é•K—v,İ,È,c B

—v< ,³é,½PCME`Ž@,đf*n* [f*h*fE*f*F*f*A,^a¼ Ú*f*T*f*] [f*g*,µ,Ä,c,È,c ê ‡ A,±
,İ*f* f\i**b**f*h*,İCEÄ,Ñ o,µ,İŽ,”s,·,é B*f*A*f*v*f*Š*f*P [fVf‡f“,“DSSCL_NORMAL<‘’²*f*C*f*x*f*ˆ,đŽ ,Ä,Ä,c,é ê ‡,àŽ,”s,·,é B

*f*Z*f*J*f*“*f* fŠ E*f*T*f*E*f*“*f*h E*f*o*f*b*f*t*f*@,İCE`Ž@,đ•İ X,·,é•K—
v,^a ¶,¶,½ ê ‡ A V<KDirectSoundBuffer*f*I*f*u*f*W*f*F*f*N*f*g,đ V,µ,CE`Ž@,Ä ì -,·,é•K—v,^a,é B

DirectSound,İPCME`Ž@,đfTf] [f*g*,µ,Ä,c,é BCE» Ý,Í³ kCE`Ž@,İfTf] [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
-Æ±,·,ê,îDS_OK AŽ,„s,·,ê,îŽŸ,îfGf% [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,îŽ©`R,Èf{fŠf... [f€,í0,Å, ,é B,±,ê,í—¼•û,lf`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“ §CEä,í{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< ,³,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,İ³%¹ 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,^aƒXƒgƒŠ [ƒ€,İƒİƒŠƒƒWƒİƒ<,İƒ{ƒŠƒ... [ƒ€,Ä, ,é B

³,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^a,É,È,è A20dBŒ, Š,;é,Œ4^a,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@,ÌÊ’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,“â “,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 ÊŠO,Ì,“fŒfxf<,đŽ ,Á,Ä,ç,é,È,ç,Ì A,±,Ìf f\fbfh,Í **IDirectSoundBuffer::Play**,ÌŒø%oÊ,đ—Œø,É,·,é,¾,·,Ä, ,é B fZfJf“f_fŠ Efofbftf@,“ 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@,“±,±,Ä i,·,é,ç,Í’¼,ÌfAfvfŠfP [fVf±f“,Ä j Ä ¶,³,ê,Ä,ç,é,È,ç A,»,ê,ç,“âŽ~,·,é,Û,Äfvf%ofCf} fŠ Efofbftf@,àŽÄ Û,É,Í’âŽ~,µ,È,ç B ,½,Æ,Ìfofbftf@,“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’“fTfEf“fh Efvf fWfFfNfVf‡f“ EfR [f“,ìŠp“x B

dwOutsideConeAngle

ŠO’“fTfEf“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’ìfpf%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,Û,Û,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,l fTfCY 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,Ñ flDopplerFactor

,»ê,¼,êCE» Ý,l<—£ Af [f<flft,"æ,Ñ fhfbfvf%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,·,éftf%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 AfAvfŠfP
[fVf‡f“,É,æ,é,æ,è ³Sm,È Ä ¶“È’u,ÌŽæ“¾,ª%Ä”,É,È,Ä,½ B,±
,ìftf%oF,ªŽw’è,³,é,È,ç ó’Ö,Ä,·é,ì%oß,Ž,ì“® ì,ªEÝŠ· «,ì,½,ß,É~ÛŽ ,
³,é,Ä,ç,é B,±,Ìftf%oF,ª%oç,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 [fofc,ÈfTfEf“fh Efofbftf@,Ä,·é B,±
,ìftf%oF,ðfZfbfg,·,é,±
,Æ,É,æ,è A,à,µf† [fU,ª¼,ìfAvfŠfP [fVf‡f“,ÉftfH [fJfX,ð Ø,è’
Ö,ì,½,è A V,µ,çfAvfŠfP [fVf‡f“,ªDirectSound,ðŽg,ª è ‡ A
DirectSound,ðŽg,Ä,Ä,ç,éfAvfŠfP [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,ì,²fCEfxfç,ðŽg,ªDirectSound
fAvfŠfP [fVf‡f“,É Ø,è’Ö,ì,½ è ‡,Í—áŠO,Ä,·é B,±
,ì è ‡ A¼,ìfAvfŠfP [fVf‡f“,©,ç,ìfOf [fofc,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
fAvfŠfP [fVf‡f“,Íf~fLfVf“fo Ef ffflfç,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"Ű
,Á, ,Á,Á,à Afobftf@,Í,-
§"Í,Éf\ftfgEfffA Ef f,fŠ,ÉŠi"[,³,è Af\ftfgEfffA 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,Á A,»,µ,Á%½"x,à Á ¶,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,ÌÈÄ,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,Á,¢
,È,¢fAfvfŠfP [fVf‡f"É Ø,è'Ö,ì,Á,à A DirectSound ,ðŽg,Á,Á,¢
,éfAfvfŠfP [fVf‡f"Í,».,ÌfXfefBfbfL [EftfH [fJfX Efofbftf@,Á
Á ¶,µ±,·,é,±,Æ,ª,Á,«,é B ,±
,Ì ó'Ö,ÁfAfvfŠfP [fVf‡f"Í·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%œ 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,Á Á%¹,³,è,é B

dwBufferBytes

,±,Ìfobftf@,ÌfofCfg·P^È,ÌftfCfY B

dwUnlockTransferRate

ÍDirectSoundBuffer::Unlock,ªÈÄ,Ñ o,³,è,½,Æ,ª,Éfobftf@ Ef f,fŠ,Éff [f^,ª"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,Á,¢
,éf\ftfgEfffA 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"Ű «,ª, ,é,½,ß A,
æ,è'x,,È,é%Ō"Ű «,ª, ,é B,»,µ,Á"ª—'—"x,ªÈ'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@,È,·,¢,Á,Í A,±
,Ìf f"fo,Ìf~fLfVf"fo,ªTfEf"fh EftfofCfX,È,æ,Á,Á s,ì,è,é,Ì,Á A,O,Á, ,é B f\ftfgEfffA Efofbftf@,È,·,¢
,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 ffbfh,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 îñ,É,Í Afobftf@ ifn [fhfEfffA ,é,¢,Íf\ftfgEfffA j,ÌÈ'u,Æ,¢,-
,Á,©,ÌfRfXfg·P^È ifn [fhfEfffA,É'È'u,µ,Á,¢
,é,È,çfobftf@,ðf [fh,·,éŽžŠÖ Af\ftfgEfffA,Áfobftf@,ª~fLfVf"fo,³,è,é,È,ç Ä ¶,·,é,Æ,«,Ì ^—
,ÌfI [fo [fwfbfh,ì,æ,µ,È îñ j,ªŠÜ,Ü,é,é B

DSBCAPS \`c'ì,Ì dwFlags f f"fo,ª DSBUFFERDESC \`c'ì,É,æ,Á,ÁŽg,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,·,¢,Á 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,Í'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,P"–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,±fvf%ofCf}fŠ Efof bftf@,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<fg,ÌfRf"fgf [f< EfIfvfVf±f" ,ðŽ ,Á,×,«,Á, ,é
B ,±,ê,ÍDSBCAPS_CTRLPAN A
DSBCAPS_CTRLVOLUME,·,æ,ÑDSBCAPS_CTRLFREQUENCYftf%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 Û,Ì%°,æ,è,à Û–§,Á,Ä i,ñ,Á,¢
,½ BE» Ý,Á,Í
DSBCAPS_GETCURRENTPOSITION2ftf%ofO,ªŽw'è,³,ê AfAfvfŠfP [f
Vf±f" ,É,æ,é,æ,è ³Sm,È Ä ¶È'u,ÌŽæ"¾,ª%oÄ" ,É,È,Á,½ B ,±
,Ìftf%ofO,ªŽw'è,³,ê,È,¢ ó'Ô,Á, ,é,Ì%oß<Ž,Ì"® ì,ªEÝŠ: «,Ì,½,ß,É^ÛŽ ,
³,ê,Á,¢,é B ,±,Ìftf%ofO,ª%o<ç,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 Efof bftf@,Á, ,é B ,±
,Ìftf%ofO,ðfZfbfg,·,é,±
,æ,É,æ,è A,à,µf† [fU,ª¼,ÌAfvfŠfP [fVf±f" ,ÉftfH [fJfX,ð Ø,è'Ö,!,½,è A
V,µ,¢AfAfvfŠfP [fVf±f" ,ªDirectSound,ðŽg,± ê ± A DirectSound ,ðŽg,Á,Á,¢
,éAfAfvfŠfP [fVf±f" ,Í,» ,Ìf ofbftf@,ð Ä ¶,µ'±, ,é,±,æ,ª,Á,« ,é B
,µ,©,µ AfTfH [fJfX,ð DSSCL_EXCLUSIVE , ,é,¢,Í
DSSCL_WRITEPRIMARYftf%ofO,ì<'²fEfxf<,ðŽg,±DirectSound
AfAfvfŠfP [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, ºŽw’è,³,è,È,,Ä,à Afobftf@,Í-
§“Í,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, ºŽw’è,³,èfn [fhfEfffA EfŠf\ [fX,ª—~p%ºÄ”\
,Ä, ,Ä,Ä,à Afobftf@,Í-
§“Í,ÉftfEfffA Ef f, fŠ,ÉŠ!“[,³,è Af\ftfgEfffA 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,È,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,ª“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%ofO,ª**IDirectSound::CreateSoundBuffer**, ÌEÄ,Ñ o,µ,ÄŽw’è,·,é,±
,Æ,ª,Ä,«é B ,±,Ìftf%ofO,ªfZfbfg,³,è,é,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,éª 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,ª
,ÈŽ AfQ [fE“ÈŠÖ,ÌfAfvfŠfP [fvf÷f“ A,½,Æ,·,Ì%of%œ Ä ¶
(ActiveMovie™),È,Ç,Ä—§,Ä B,µ,©,µ Af† [fU,ª,à,µ¼,Ì DirectSound
fAfvfŠfP [fvf÷f“,É Ø,è“Ö,·,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,ª,±,Æ,ª,Ä,«é B

dwFlags f f“fo,ÄŽg,í,è,é DSBCAPS_LOCHARDWARE ,Æ DSBCAPS_LOCSOFTWARE

ftf%ofO,ÌfIfvVf÷f“,Ä, ,è A,»µ,Ä·ŠEÝ,É”r¼“L,Ä, ,é B DSBCAPS_LOCHARDWARE
,Ìfobftf@,ðfTfEfh Efh [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%ofO,ª **DSBCAPS** \“Ç,Ì **dwFlags** f f“fo,Ä,àŽg,í,è,é B,»±,Ä,Í AŽw’è,³,è,½ftf%ofO,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 EftfocfX,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\bfbh,É,æ,Á,ÄŽg—p,³,ê,é DirectSound fffofCfX,Ì”—Í,ðŽw’è,.,é B*

dwSize

,±,Ì \‘c’l,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 Efobftf@,ðfTf| [fg,·,é B

DSCAPS_SECONDARY8BIT

fffofCfX,Í,WfrfbfgfTf“fvf,Åfn [fhEfFfA Ef~fLfvf“fO EfZfJ
f“f_fŠ EfTfEf“fh,ðfTf| [fg,·,é B

DSCAPS_SECONDARYMONO

fffofCfX,Ífn [fhEfFfA Ef~fLfvf“fO’P%ofZfJf“f_fŠ EfTfEf“fh
,ðfTf| [fg,·,é B

DSCAPS_SECONDARYSTEREO

fffofCfX,Ífn [fhEfFfA Ef~fLfvf“fO EfXfefEfi EfZfJf“f_fŠ
EfTfEf“fh,ðfTf| [fg,·,é B

dwMinSecondarySampleRate ,·,æ,Ñ **dwMaxSecondarySampleRate**

,±,ÌfffofCfX,Ìfn [fhEfFfA EfZfJf“f_fŠ Efobftf@,ÅfTf|
[fg,³,è,é Å’á E Å ,,ÌTf“fvfŠf“fOfE [fg,ðŽw’è B

dwPrimaryBuffers

fTf| [fg,³,è,éfvf%ofCf}fŠ Efobftf@,Ì ” B ;%õñ,ÌfŠfŠ [fX,Å,Í,P,Å, ,é B

dwMaxHwMixingAllBuffers

fn [fhEfFfA,Åf~fLfvf“fO,Å,«,éofobftf@,Ì ±Ev,Ì ”,ðŽw’è,·,é B ,±,Ìf f“fo,Í **dwMaxHwMixingStaticBuffers**
,Æ **dwMaxHwMixingStreamingBuffers**,Ì ±Ev,æ,è ,È,¢ B fŠf\ [fX,ÌfgfE [fhfift,³,µ,Í,µ,Î” ¶,·,é B

dwMaxHwMixingStaticBuffers

fXf^fefBfbfn EfTfEf“fh Efobftf@,Ì Å’á ”,ðŽw’è,·,é B

dwMaxHwMixingStreamingBuffers

fXfgfŠ [fE EfTfEf“fh Efobftf@,Ì Å’á ”,ðŽw’è,·,é B

dwFreeHwMixingAllBuffers, **dwFreeHwMixingStaticBuffers**, ,·,æ,Ñ **dwFreeHwMixingStreamingBuffers**

Š,,,è“-,Å,ç,è,Å,ç,È,¢fffofCfX,Ì Afn [fhEfFfA Ef~fLfvf“fO”-Í,Ì Ý’è B
fAvfŠfP [fvf±f“ ,Í Afn [fhEfFfA EfŠf\ [fX,³fZfJf“f_fŠ EfTfEf“fh Efobftf@,ÌŠ,,,è“-,Å,Ì,½,ß,É~—
p%oÅ”\,Å, ,é,©,Ç,±,»”»f, ,é,½,ß,É A,±,è,ç,Ì’l,ðŽg,±,±,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,ç,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,ç,È,¢fffofCfX,Ì Afn [fhEfFfA,R,c’èÈE”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 Efobftf@,ðŠi”[·,éTfEf“fh EfJ [fh ã,Ìf f,fŠ—è-È,ÌfofCfg’P’È,ÌTfCfY B

dwFreeHwMemBytes

fTfEf“fh EfJ [fh ã,ÌftfŠ [f f,fŠ,ÌfofCfg’P’È,ÌTfCfY B

dwMaxContigFreeHwMemBytes

fTfEf“fh EfJ [fh ã,ÌftfŠ [f f,fŠ,Å A Å,à,«,¢^A±uf fbfn,ÌfofCfg’P’È,ÌTfCfY B

dwUnlockTransferRateHwBuffers

fn [fhEfFfAfXf^fefBfbfn EfTfEf“fh Efobftf@ iflf“f\ [fhTfEf“fh f,fŠ,É”z’u,³,è,Å,ç
,é j,Éff [f^,“”’-³,è,éfE [fg,ð,P·b-^,Ìk

fofCfg,ÅL q,·,é B,±,ÌfE [fg,ÆfofCfg,Å,Ì”’-—È,Í

IDirectSoundBuffer::Unlock f\fbfhEÄ,Ñ o,µ,ÌEp±ŽžŠÔ,ðE”è,·,é B

dwPlayCpuOverheadSwBuffers

f\ftfgfEFA Efobftf@ if fC“fvfXfefE f,fŠ,É”z’u,µ,Å,ç,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·i%o»,·,é B

f fbfn,³,è,Å,ç,È,¢f\ftfgfEFA Efobftf@,Ì”’-fE [fg,Í Af [f^,ð,Ç,±,É,à”’-·,é·K—v,³,è,ç,½,ß,O,Å, ,é
B “-1,Éfn [fhEfFfAfofobftf@,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,ç,é B Žg—p,Å,«,È,¢ 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,ÌDirectSound ,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'†,ÄcN,±,Á,½ B

DSERR_INVALIDCALL

,±,ÌŠÖ ”,Í,±,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

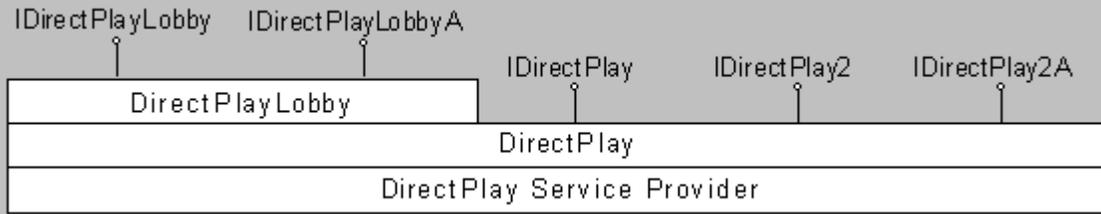
CEÄ,Ñ o,μ,½ŠÖ ”,Í,±,±,Á,ÍfTf| [fg,³,ê,Ä,¢,È,¢ B

DirectPlay,É,Á,ç,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,ç,ÍfIf“f%ofCf“ EfT [frfX,É`È`¶,µ,È,ç`È M•û–
@,ð AfAfvfŠfP [fVf‡f“,¾,Ä,È, Af fr [EfT [fo [,É,à`ñ<ÿ,.éfefNfmf fW,Æ,È,Ä,Ä,ç,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,ç
,ç 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,ç,é,Ì,Á, ,é BDirectPlay,Í A,±,è,ç,ÌŠe Ú‘±•û–@,Ì’á,ç,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,ç,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`fvf(EfCf,, 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,ì,æ, A,»,ì”}ì,ð’ñ<ÿ,·,éf,ff€
,âflfbfgf [fN A,·,é,c,Íflf“f%ofCf“ Eft [frfX,É,Á,c,Á<C,É,·,é·K—v,ì,È,c B

DirectPlay,Í Af† [fU,ìfVfXfef€ ä,ÉfCf“fXfg [f<,³,ê,½,Ç,ñ,È
DirectPlayfT [frfX Efvf fofCf_,É,à“@“l,ÉŒ< ‡,·,é BfAvfšfP [fVf‡f“,Í ADirectPlayIfufWfFfNfg,ÆŒÝ,Œ
,ÉfAfNfZfX,·,é B DirectPlayIfufWfFfNfg,Í AŽg—p%oÁ””,ÈDirectPlayfT [frfX Efvf fofCf_,ì,ð,Æ,Á,ÆŒÝ,Œ
,É’È M,µ A’l’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°ÈŒÝŠ· «,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,ð,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,»,ìflfufWfFfNfg,ð’È,µ,Ä,·,×,Ä,ì’È M,ðŽÄ s,·,é BfpftfH [f}
f“fX,ð’ÛŽ ·,·,é,½,ß ADirectPlayIfufWfFfNfg,¾,“,ª¼ Ú,“ŒÝ,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,·,×,Ä,ìfvfŒfCf,„,ì,½,ß,É,»,ìf fbZ [fW,ð ì,à,µ·K—v,È,ç,Í j;ì »;µ Af fbZ [fW EfLf...
[,É’Ç%oÁ,·,é B

,±,ìfo [fWf‡f“,ìDirectPlay,Í AfsfA Efc [EfsfA,ìfQ [f€ Efpf%of_fCf€,ðfTf| [fg,·,é B
,Ä,Û,è A,·,×,Ä,ìfvfŒfCf,„,ì AfZfbfVf‡f““†,ì¼,ì,c,©,È,éfvfŒfCf,„,È,Ä,âf fbZ [fW,ð’— M,·,é,±,Æ,ª,Á,«,é B
fZfbfVf‡f“ EfzfXfg,Í AfZfbfVf‡f“,É%oÁ,ì,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“—,Ä,é BšJ”-
ŽÖ,Í AfNf%ofCfAf“fg ^fT [fo Ef,ff<,ÁfQ [f€,ð ÝŒv,·,é,±
,Æ,ª,Á,«,é BfNf%ofCfAf“fg ^fT [fo Ef,ff<,Á,Í A,·,×,Ä,ìf fbZ [fW,ªfzXfg EfRf“fsf...
[f^ ä,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,“@ i,µ Af fr [Eft [fo l,Æ’Ê M,·,é Bf† [fU,Í Af fr [EfNf%ofCfAf“fg,“žÁ‘,µ,Ä,c

,éft [fU EfCf“f^ [ftfFfCfX,É,æ,Á,Ä A’¼,ÌfvfCfCf,,ðC@,Ä,¯,ÄfQ [f€ EfZfbfVf‡f“,ÈŽQ%Á,·,é,±

,Æ,“Á,«,é BfvfCfCf,, EfOf< [fv,“fZfbfVf‡f“,ðŠŽn,·,é,±

,Æ,ðC^,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±,³,é AŠJŽn%Á”\

,Æ,È,Ä,½DirectPlayfAfvfŠfP [fVf‡f“,Í Af fr [%Á”\

,ÆCÄ,Ì,é,é B,Û,½ ADirectPlayLobby,Í AfZfbfVf‡f“,Ì i s’t,ÉfAfvfŠfP [fVf‡f“,“f 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,“ž ,Á,Ä,c

,éDirectPlayfAfvfŠfP [fVf‡f“,ð”»’è,·,é,±,Æ,“Á,«,é B,Û,½ ADirectPlayEnumerateŠÖ ”,È,æ,Ä,ÄŽg—p%Á”\

,ÈfT [frfX EfVf fofCf_,ð”»’è,·,é,±,Æ,à,Ä,«,é Bf fr [EfNf%ofCfAf“fg,Í Af† [fU,“fZfbfVf‡f“,È%Á,í,é,±

,Æ,ðC^,ß A•K—

v,ÈfAfvfŠfP [fVf‡f“,ÆfT [frfX EfVf fofCf_,Ì“Ÿ,ðŠm”F,µ,½CÄ AIDirectPlayLobby::RunApplicationf f\fb

fh,ð—p,ç,ÄfAfvfŠfP [fVf‡f“,ÌŠJŽn,ÆfZfbfVf‡f“,Ö,Ì Ú±,ðŽA s,Ä,«,é B,±

,ÌCÄ,Ñ o,µ,È,æ,Ä,Ä Af fr [EfNf%ofCfAf“fg,Í AŽA s,·,éfAfvfŠfP [fVf‡f“ AŽg—

p,·,éDirectPlayT [frfX EfVf fofCf_ AfT [frfX EfVf fofCf_,“fZfbfVf‡f“,Æ Ú±,·,é,½,ß,É•K—

v,È îñ iIDirectPlayLobby::CreateAddress,·,æ,ÑIDirectPlayLobby::EnumAddress,ðŽg—

p,µ,Ä j Af fr [ŠÄ««,Ä,Ìf† [fU,Ì-¼’O,ðŽw’è,·,é B

DirectPlayLobby,ÌŽA s%Á”\fAfvfŠfP [fVf‡f“,Ì è Š,ð’Á’è,µ A“K Ø,ÈfRf}

f“fhf%ofCf“ EfXfCfbf’,ÄŠJŽn,·,é B,³,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::ReceiveLobbyMessagef f\fbfh,ð—p,ç,Ä’Ê M,·,é,±,Æ,“Á,«,é BIDirectPlayLobby::RunApplication

f f\fbfh,È,æ,Ä,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“,“f fr [%Á”\,Ä,·,é,½,ß,É,Í AIDirectPlayLobbyfCf“f^ [ftfFfCfX,ð ì -,·,éK—v,“ ,é BfAfvfŠfP [fVf‡f“,Í AIDirectPlayLobby::GetConnectionSettingsf f\fbfh,È,æ,Ä,Äf fr [EfNf%ofCfAf“fg,“

’ñ`ÿ,µ,½ Ú±fppf%of [f^,ð²,×,é,±,Æ,“Á,«,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,ðCÄ,Ñ o,· B,±

,ÌŠôf fr [EfNf%ofCfAf“fg,Í AfAfvfŠfP [fVf‡f“ŠJŽnfvf fZfX,ðŽ,·fvfXfef€ Ef fbZ [fW,ðŽó M,·,é B

fvfCfCf,,“ ì -,³,è,é,Æ,« AfAfvfŠfP [fVf‡f“,Í AfvfCfCf,—

¼ff [f^,ð iIDirectPlayLobby::GetConnectionSettings,È,æ,Ä,Ä jŽæ“¾,µ A,»,ÌfvfCfCf,,ÈŠ,,è“-,Ä,È,-

,Ä,Ì,È,ç,È,ç BIDirectPlayLobby::ConnectCÄ,Ñ o,µ,Í i -C÷,·,è,Ì j A`È%°,ÌCÄ,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 [,“fZfbfVf‡f“ îñ,ðŽw’è,·,é,½,ß Af† [fU,“»,Ì,µ,ç,Ì,ð,Æ,Ä,ð’I,Ô•K—v,Ì,È,ç j
- 4 **IDirectPlay2::Open** ifZfbfVf‡f“,ÍŽ©“@“I,ÈŠJŽn,³,è,é)

IDirectPlayLobby::GetConnectionSettings,“DPERR_NOTLOBBIEDfGf%o [,ð•Ô,·,Æ,«,Í Af fr [EfNf%ofCfAf“fg,“fAfvfŠfP [fVf‡f“ŠJŽnŽŽ,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%»,ðŽA 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,þ,·,×,Ä,Í'g D,Í A ê—pfn [fhfEfffA,â'Ê M”}·ì,½,ß,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%Á,·,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,âfIfvfVfzf“,ìfpfXf [fh AŽQ%Á%Á”\
,ÈfvfçfCf,,ì ”,Æ,ç,Ä,½ AfZfbfVfzf“,ì“Á «,ªŠÜ,Û,è,Ä,ç
,é BfZfbfVfzf“,ðfI [fvf“,µ,½Eã,Í AfAfvfŠfP [fVfzf“,©,ç**IDirectPlay2::GetCaps** f\fbfh,ðEÄ,Ñ o,µ,Ä A’Ê
M’-“x,â A’¼,ìf\fbfgf [fN,âfT [frfX Efvf fofCf_,ì“Á «,ðŽæ“¾,·,é,±,Æ,ª,Ä,«,é B

fZfbfVfzf“,ìE» Ý,ì“Á «,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 è † 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 [fVfzf“,Í ADirectPlay,ÍfVfCfCf,,ŠC— f f\fbfh,đŽg—p,µ,Ä AfZfbfVfzf“+ ,ÍfVfCfCf,,đŠC— ,.é,± ,Æ,ª,Ä,«é BfVfCfCf,,,Ì Ì -,Æ í œ,É%Á,!,Ä AfAfVfŠfP [fVfzf“,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 AfZfbfVfzf“+ ,ÍfVfCfCf,,,Ì Ì -,.,æ,Ñ í œ,đ s,µ BfVfCfCf,,ª Ì -,³,è,é,Æ AfAfVfŠfP [fVfzf“,ÍfVfCfCf,,,Ì µ 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 [fVfzf“,ÆDirectPlay,Í A,±,Ìf+ [fUID,đ—p,¢ ,Äf fbfZ [fW Efg%oftfBfbfN,Ìœo~H,đœ^è,.,é BDirectPlay,ª µ Ì,â ³Ž@-¼ Ì,đŽg,µ,±,Æ,Í,È,¢ ,ª AfAfVfŠfP [fVfzf“,Í A,»,è,ç,đ—p,µ,ÄfVfCfCf,,,đŽ•È,.,é,±,Æ,ª,Ä,«é B

fAfVfŠfP [fVfzf“,Í **AIDirectPlay2::EnumPlayers**f f\fbfh,đŽg—p,µ,Ä ACE» Ý,ÍfZfbfVfzf“,É,¢ ,é,èfVfCfCf,,â A,»,Ì µ Ì,Æ ³Ž@-¼ Ì,đ”»’è,.,é,± ,Æ,ª,Ä,«é B’È íAfVfŠfP [fVfzf“,Í **AIDirectPlay2::Open**f f\fbfh,É,æ,Ä,ÄfZfbfVfzf“,đŠJŽn,µ,½’¼œã,É,± ,Ìf f\fbfh,đœÄ,Ñ o,· BfZfbfVfzf“à,Ì,·×,Ä,ÍfVfCfCf,,,đ—ñ“,.,é,É,Í **AIDirectPlay2::EnumPlayers**f f\fbfh,đ— p,.,é BfZfbfVfzf“,Ö,ÍfVfCfCf,,,Ì Ú’±¬“x,É,Ä,¢,Ä,Ì î•ñ,ªK— v,ÈfAfVfŠfP [fVfzf“,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,,,Ì-¼’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 %Šú 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\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\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,,ŠÖ,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^Ó,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,.,x,Ä,İfvŒfCf,,.Éf fbfZ [fW,ð’—,é,±,Æ,,.Á,«,é B’— M æ,É,Í A,»,é,¼,é AfvŒfCf,,.ID AfOf< [fvID A,Ü,½,İDPID_ALLPLAYERS,ðŽw’è,.,é BDirectPlay,,“—

M,Ä,«,éf fbfZ [fW,İ’â,«,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’Ô,.ªİ X,³,é AfZfbfVf‡f““†,İ’¼,İ,.,x,Ä,İfvŒfCf,,.É,»,.İ X,ð’È’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— ŠÖ ”,ð—~ p,µ,½,Ü,ª,ª•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 **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’È’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,ª,©,ðŽw’è,Ä,«,é B, ,éfvŒfCf,,.É’İ,µ,ÄfLf... [,É’u,©,è,Ä,ç,éf fbfZ [fW,İ ”,ðŽæ“¾,.,é,É,Í **DirectPlay2::GetMessageCountf** f\fbfh,ðŽg —p,.,é B

DirectPlay,Í AfZfbfVf‡f““†,Ä<N,«,½•İ X,ðfvŒfCf,,.É’È’m,.,éfvfXfef€ Ef fbfZ [fW,ð ¶ ¬,.,é B,.,x,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~•È,.,é32frfbfg’l,©,çŽn,Ü,é BfVfXfef€ Ef f bZ [fW,ð\,.’è ”,İDPSYS_ÄŽn,Ü,Ä,Ä,.”è A’İ%ž,.,éf fbfZ [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

•È,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,»è,ðZfbfg,·,éflfufWfFfNfg,¾,¯,ªŽg—p%oÂ”,Á, ,é B,±
,é,É’Í,µ,ÄfŠf, [fg Eff [f^,Í AfZfbfVf‡f““+,ì,»è,¼,è,ìfRf“fsf... [f^,É’É’m,³,é,é B,±
,ìÇ%oÊ AfŠf, [fg Eff [f^,Í,·,×,Ä,ìfŠf, [fg EfRf“fsf... [f^ŠÖ,ì<□—Lf f,Š,Æ,È,é B,Ü,è•Í X,³,é,é,±
,Æ,ª,È, A,·,×,Ä,ìfRf“fsf... [f^,ªfAfNfZfX,·,é•K—v,ª, ,éff [f^,ðŠi”[,·,é,Æ,«,Í AfŠf, [fg Eff [f^,ð—
p,·,é,×,«,Á, ,é B¼,ìfRf“fsf... [f^,Ç,fAfNfZfX,·,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 fbZ [fW,ðŽg,Á,Äff [f^,ð“”B,·,é,© A—
³•Û Ø,ìf fbZ [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,½fobftf@,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“™,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_fvf€ftfBfNfX,ÄŽn,Ü,é j“K Ø,È \‘ç'ì,Éfobftf@,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_DELETEPLAYERFROMGROUP

UP

DPSYS_DESTROYPLAYERORGROUP

DPMSG_DESTROYPLAYERORGROUP

UP

DPSYS_HOST

DPMSG_HOST

DPSYS_SESSIONLOST

DPMSG_SESSIONLOST

DPSYS_SETPLAYERORGROUPDATA

DPMSG_SETPLAYERORGROUPDATA

TA

DPSYS_SETPLAYERORGROUPNAME

DPMSG_SETPLAYERORGROUPNAME

ME

IDirectPlayLobby::ReceiveLobbyMessage f\fbfh,ª•Ô,·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,İfVfXfef€ 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,·fobftf@,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“™,µ,ç'l,İdwType—v'f,ð—LCEø,É,·,é,±,Æ,ª,Ä,«,é B

“Šú

DirectPlay,Í AfAvfŠfP [fVf‡f“,ì“Šú,É,Â,¢,Ä,Íê”Ê“I,È•û-@,ð'ñ<ÿ,µ,Ä,¢
,È,¢ B'ñ<ÿ,µ,½ ê ‡,Í AfAvfŠfP [fVf‡f“Ê Mfpf%of_fCf€,É §CEÀ,ð—^,!,Ä,µ,Û,µ,É^á,¢
,È,¢ B,µ,©,µ AfVfXfef€,É,Í A,±,ê,¢,ìf^fXfN,ðŽx%o‡,·,é,½,ß,É ÝCEv,³,ê,½,¢,,Ä,©,ìfT [frfX,ªŠÛ,Û,ê,Ä,¢
,é B,½,Æ,!,Í AfAvfŠfP [fVf‡f“,ªfvfCEfCf,,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

,±,lfZfNfVfzf“,l îñ,Í ADirectPlayLobbyfNf%oCfAf“fg,ìŠJ”ŽÒ,ì,½,B,ì,à,ì,À, ,è A`è”È“i,ÈfAfvfŠfP [fVfzf“ŠJ”-ŽÒ,É,ÍŠÖEW,ì,È,ç îñ,àŠÜ,Ü,è,Ä,ç,é B

DirectPlay,Í AfIfbfgf [fN EfAfhfCFX Eff [f^,ðJfVfZf<%»;,é,±,Æ,ª,Ä,«,é B
DirectPlay,É,Í ADirectPlayZfbfVfzf“,Æ,ì Ú±,É·K—v,È,·,×,Ä,ì îñ,ªŠÜ,Ü,è,Ä,ç,é B,±,ì îñ,ì-Ú“i,Í Af† [fU,É îñ,ì“ü—í,ð‘£,·f_fCfAf fO Ef{fbfNfX,ì·Ž,ð s,ª,æ,ª,ÈfT [frfX Efvf fofCf_,ð—p,¹, AfAfvfŠfP [fVfzf“,çfZfbfVfzf“,É Ú±,Ä,«,é,æ,ª,É,·,é,±,Æ,É, ,é B’È ífT [frfX Efvf fofCf_,Í Af† [fU,ç îñ,ð“¼,é,½,B,Éf_fCfAf fO Ef{fbfNfX,ð·Ž,·,é,ª AŠ@‘S,ÈDirectPlayfAfhfCFX,ðñ<ÿ,·,é,±,Æ,É,æ,ª,Ä A,±,lf_fCfAf fO,ð%ñ”ð,·,é,±,Æ,ª,Ä,«,é B

DirectPlayfAfhfCFX,ìftfH [f}fbfg,Í AfŠf\ [fXCEðŠ·ftf@fCf<CEŽ® iRIFf j,ÉŽ—,Ä,ç,é B,±,è,Í`è~A,Ìf`fff“fN,Ä \ -³,è,Ä,ç,é B,»,è,¼,è,Ìf`fff“fN,Í AZÿ,ì—v‘f,ç -,è—š,Ä,Ä,ç,é B

f`fff“fN,ªŠÜ,bff [f^,lf^fCfv,ðŽ,·fOf [fof< Ef†fj [fNŽ~·ÈŽq iGUID j
ff [f^ EfTfCY
ff [f^ EftfB [f<fh

DirectPlay,Ä,Í A`È%°,Ìf`fff“fNŽ~·ÈŽq,ª`è<³,è,Ä,ç,é B

GUID

ff [f^,lf^fCfv

DPAID_ComPort

DPCOMPORTADDRESS \‘ç`ì 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®,ìIPfAfhfCFX,Ü,½,Í“dplay.mi
crosoft.com”,ì,æ,ª,ÈfT [fo [-¼,ð·\,· ASCII·¶Žš—ñ B

DPAID_Phone

“d`b”Ô †,ì ”,ìCE...,ð·\,µ,Ä,ç,é ASCII·¶Žš—ñ B

DPAID_ServiceProvider

,±,lfAfhfCFX,ª ì,ç,è,½fT [frfX Efvf fofCf_,ì16f ofCfg,ìGUID B,ç,-,Ä,ç,ÍÜ,È,éT [frfX Efvf fofCf_,ª““,¶f^fCfv,ì flfbfgf [fN EfAfhfCFX,ðŽg,ª,±,Æ,ª,Ä,«,é,½,B A,±,lf`fff“fN,Í³Ž<³,è,é,±,Æ,ª,Ä,«,é B

f`fff“fN Ž~·ÈŽq,ì16fofCfg,ìGUID,Ä, ,é B

DirectPlayfo [fWfzf 3,Ä%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,Â,Û,è AfR [fh
,É%½,Ì,İ X,à%Á,!,,,É ADirectX 3 SDK,ÌDirectPley,ð—p,Ç,ÄfAfVfŠfP [fVfzf,ð ÄfRf"fpfCf, ,é,±
,Æ,ª,Ä,«,é BDirectX 3 SDK, "ñ<ÿ, ,éDirectPlay,Í A`È'O,Ìfo [fWfzf,ÌDirectPlay,Ì, ,×,Ä,ÌAPI,Æ"® ì,ðfTf|
[fg, ,é B

DirectPlay 3,ÌDLL,Ì—¼'O,ÍCefo [fWfzf,Æ`Û,È,Á,Ä,Ç,é,½,ß ADirectX
2`È'O,Ìfo [fWfzf,ÄfRf"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,-
,Ä,Í,È,ç,È,Ç B

V,µ,ÇDirectPlay2, ,é,Ç,ÍIDirectPlay2AfCf" f^ [ftfFfCfX,ðŽg—
p,µ,ÄfAfVfŠfP [fVfzf,ðfAfbfvff [fg,µ Af fr [%oÄ" ,ÈfAfVfŠfP [fVfzf,ð ì -, ,é,½,ß,È•K—
v,ÈfR [fh,ð'Ç%oÄ, ,é,±,Æ,ª A< , , S,ª,è,Ä,Ç,é B,±,è,È,æ,Ä,Ä AŠO" ,Ìf fr [, ,é,Ç,Íf fr [EfVf fOf%of€
,ªfAfVfŠfP [fVfzf,ðŠJŽn,µ AfZfbfVfzf,Æ Ú±, ,é,½,ß,È•K—v,È, ,×,Ä,Ì îñ,ð'ñ<ÿ, ,é,±
,Æ,ª,Ä,«,é BfAfVfŠfP [fVfzf,Í AfT [frfX EfVf fOfCf_ ,ÌCE`è,âfZfbfVfzf,Ì'I'ð A,» ,¼,Ì îñ i" d"b"Ô †,âf
lfbfG [fN EfAfhfCEfX,È,Ç j,Ìñ<ÿ,Ì,½,ß,È Af† [fU,È-â,Ç †,í,¹,ð, ,é•K—v,ª,È,Ç B

DirectPlay,É,Í A,±,Ì,Û,©,Ì V,µ,Ç<@" ,ª,Ç, ,Ä,©'Ç%oÄ,ª,è,Ä,Ç,é B

fCf" f^ [flfbG EfTf| [fg B
'¼ ÚfVfŠfAf< Ú± B
,æ,è , ,Ç`À`è «,Æ< x « B
'n`æ'İ%ož,ð,æ,èfTf| [fg, ,é,½,ß,È AUnicode,ÌfTf| [fg B
fzfXfg,ÌÚ s B,à,µfZfbfVfzf,ÌfzfXfg,ªfZfbfVfzf,©,ç"², - ,é ê † AfzfXfg,Ì Ó±
, ,È,ÌfVfCEfCf, ,È"n,ª,è,é BDirectPlayfo [fWfzf"2,Ä,Í AfzfXfg ifl [f€ EfT [fo j,ªfZfbfVfzf,©,ç"², - ,½ è
‡ A V,µ,ÇfVfCEfCf, ,ð ì -, ,é,±,Æ,ª,Ä,«,È,©,Ä,½ B
fAfVfŠfP [fVfzf,Ìf fr [EfVf fOf%of€,Æ,Ì`È M<@" B,±,è,È,æ,Ä,Ä A %oŠú ó'Ô,È,Ä,Ç
,Ä,Ì îñ,ðŽ, -Zæ,Ä,½,è AfQ [f€,Ì ó'Ô,ð X V, ,é,±,Æ,ª,Ä,«,é B
1`ä,ÌfRf"fsf... [f^,Ì ä,Ä; j , ,ÌfAfVfŠfP [fVfzf" EfZfbfVfzf,ªfzfXfg,ð±,ß,é" —Í B
fŠf, [fg EfRf"fsf... [f^,Ì Ú±,Ì Ø'f,ð"»è,µ A"K Ø,Èf bfbZ [fW,ð ¶ -, ,é" —Í B

,Û,½ A`È MŠÇ— ,Ì,½,ß,ÌfR [fh,Ì—È,ðCE, ,ç, ,½,ß AŽÿ,Ì,æ,µ,È<@" ,DirectPlay 3,É'Ç%oÄ,ª,è,Ä,Ç,é B

fAfVfŠfP [fVfzf"CEÄ—L,Ìff [f^,ðDirectPlayfOf< [fVfzf,ÌfVfCEfCf, ,ID,ÆŠÖ`A•t, - ,é<@" B,±
,è,È,æ,Ä,ÄfAfVfŠfP [fVfzf,Í ADirectPlay,Ì1" ,Ä, ,éfVfCEfCf, ,âfOf< [fv,ÌfŠfXfgŠÇ— fR [fh,ðŠg'É, ,é,±
,Æ,ª,Ä,«,é Bf [fJf< Eff [f^,Æ,Í AfvVfCEfCf, ,ð, ,frfbfGf)fbfv,Ì,æ,µ
,È Af [fJf< EfAfVfŠfP [fVfzf, ,¼ ÚŽg—p, :éff [f^,Ä, ,é Bf [fJf< Eff [f^,flfbGf [fN ä,É'—
M,ª,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%oÄ, ,ç,è,½,İ X,Í ADirectPlay,È,æ,Ä,Ä AfZfbfVfzf"±,Ì¼,Ì
, ,×,Ä,ÌfAfVfŠfP [fVfzf, ,È'È'm,ª,è,é BfŠf, [fg Eff [f^,Í AfvVfCEfCf, ,Ì'È'u,âCEü,« A' -ª, ,Ì,æ,µ
,È AfZfbfVfzf"±,Ì, ,×,Ä,ÌfAfVfŠfP [fVfzf"ŠÖ,Ä<—L,ª,è,È,Ä,Í,È,ç,È,Ç,à,Ì,Ä, ,é B,±
,Ìff [f^,Ì" B,ÉDirectPlay,ðŽg—p, ,é,Í AfAfVfŠfP [fVfzf,ª îñ,Ì—Žó M,Ì,½,ß,Ì`È`A,Ìf f\fbfh,ð—p,Ç
,Äff [f^,ðŠÇ— , ,é•K—v,Í,È, ,È,é B
fAfVfŠfP [fVfzf,ªfOf< [fv,È—¼'O,ðŠÖ`A•t, - ,é<@" B,±,è,Íf` [f€<Z,È-ð—§,Ä B

DirectPlay 3,Ì V<@" ,Ì,µ,ç,Ì,Ç, ,Ä,©,Í AfAfVfŠfP [fVfzf,Æ,Í¼ ÚŠÖEW,ª,È,Ç,à,Ì,Ä, ,é B

f fr [EfNf%ofCfAf"fg Ef\ftfgfEfFfA,ªf fr [%oÄ" ,ÈDirectPlayfAfVfŠfP [fVfzf,ÌŠJŽn,â Ú±,ÉŽg—
p, ,éAPI B,Û,½ AfZfbfVfzf,ÌŠÖ,ÈfAfVfŠfP [fVfzf,Æf fr [,ª îñ,ðCEðŠ,Ä,« ,é,æ,µ,È, ,éAPI,àŠÜ,Û,è,Ä,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,Û,è,Ä,Ç,é B

,±,ÌfZfNfVfzf,Ä,Í ADirectPlay 3,Ì V,µ,Çf f\fbfh AIDirectPlay2fCf" f^ [ftfFfCfX,È`Ú s, ,é,½,ß,È•K—
v,ÈŽè † AfAfbfvff [fg,ª,è,½DirectPlay,Ì<@" ,ÈfAfNfZfX, ,éü-@,È,Ä,Ç,Ä -
¼, ,é B`È%o,ÌfgfsfbfN,ªŠÜ,Û,è,Ä,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<fobfNŠÖ ”,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,Í **ADirectPlayCreate**ŠÖ ”,đEÄ,Ñ o,· **BDirectPlayEnumerate**fR [f<fobfNŠÖ ”;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,.,é,šfXfg,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•Ÿš— ñ,Ì“Ç,Ý ‘,«,Ì•û—@,Á,.,é BUnicodefCf“f^ [ftFfCfX,Á,Í **ALPWSTR**EÄ,Ì \‘ç‘Íf f“fo,ÉUnicode•Ÿš— ñ,“Ç,Ý ‘,«,ª,³,é,é BANSIfCf“f^ [ftFfCfX,Á,Í **ALPSTR**EÄ,Ì \‘ç‘Íf f“fo,ÉANSI•Ÿš—ñ,“Ç,Ý ‘,«,ª,³,é,é B

- 4 Šù•Ÿ,ÌIAPi,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•Ÿš—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 Ÿ -,.,é,æ,ª,É,.,é B

- 7 **DPSESSIONDESC** \‘ç‘Í,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<fobfNŠÖ ”,đ X V,.,é B

9

IDirectPlay2::CreatePlayerf ffbfh,Ö,ÌbEventpfpf%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,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,Đ,Æ,Ä,ÌfCfxf“fg,ð ì ¬,·,é,±
,Æ,ª,Ä,«,é B

10 fvfÇfCf,,ªfQ [f€,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,ÌzfXfg,ªfZfbfVf‡f“,ð”²,¯,Ä,à A•Ê,ÌfRf“fsf...
[f^,ªfzfXfg,É,È,é,±,Æ,ª,Ä,«,é BfzfXfg,ð<N“@,·,é,½,ß,Ì“Á•Ê,ÈfR [fh,ð’è<`,µ,Ä,ç
,é ê ‡,Í AfZfbfVf‡f“,ì ì -Žž,É,±
,Ìftf%ofO,ðfZfbfg,µ A,³,ç,É ADPSYS_HOSTfVfXfef€ Ef fbfZ [fW,ÌfTf] [fg,ð’Ç%oÁ,·,é,×,«,Ä, ,é BfVfXf
ef€ Ef fbfZ [fW,ÌfŠfXfg,É,Ä,ç,Ä,Í A ufVfXfef€ Ef fbfZ [fW,Ìžg—p v,ðžQ Æ,³,é,½,ç B

12 IDirectPlay2fCf“f^ [ftfFfCfX,Ì V,µ,çf f\fbfh,ð,æ,— %oð,µ,Äžg—p,·,é,±
,Æ B“Á,É AIDirectPlay2::SetPlayerData,ÆIDirectPlay2::GetPlayerData f\fbfh,É,Í’ ^Ó,ª•K—v,Ä, ,é BfvfÇf
Cf,,Ì ó‘Ô,ð¼,Ì,·,×,Ä,ÌfvfÇfCf,,Éfuf [fhfLfffXfg,·,éfR [fh,Í AIDirectPlay2::Send,ÆIDirectPlay2::Receive
f f\fbfh,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<Y,·,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,È’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,“I’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, ç, IDirectPlayfCf“f^ [ftFfCfX, “T‘ð, ³, ê, é, © iUnicode, IDi
rectPlay2, © ANSI, IDirectPlay2A j, É, æ, Á, Ä A \‘c‘l, ©, Ç“K Ø, È, Zš—ñ, ð“Ç, Ý ‘, «, μ A, à, ð^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<“,³ê AŠJŽn,³ê,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<“,³ê,Ä,¢,é B"Application
Name",Í ADirectPlayLobby,³fAfvfŠfP [fVf‡f“,đ—ñ<“,µ,½,Æ,«,É•Ô,³ê,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,·,éftfBfCfNfgfŠ,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,Â,¢,Ä AfXfefbfv EfofC EfXfefbfv,É à-¾,µ,½,Ó,½,Â,Ìf`f... [fgfŠfAf<,ªŠÛ,Û,ê,Ä,¢
,é BLOBBYfTf“fvf<,Í ADirectPlayf fr [,ð—p,¢,ÄfAfvfŠfP [fVf±f“,ð Ú‘±,·,é•û-@,ð à-¾,µ,Ä,¢
,é BDIALOGfTf“fvf<,Á,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,Á,ÄfAfvfŠfP [fVf±f“,ðŠJŽn,Á,«,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++,Á ‘,©,ê,Ä,¢,é B,bfRf“fpfCf%,ðŽg—p,µ,Ä,¢
,é ê ±,Í AfRf“fpfCf<,ð’È,·,½,ß Aftf@fCf<,É“K Ø,È•İ X,ð%Á,!,È,,Ä,Í,È,ç,È,¢ B ,È,-
,Æ,à AfCf“f^ [ftfFfCfX Ef f\fbfh,Ö,Ìvtable,Æthis|fCf“f^,ð’Ç%Á,µ,È,,Ä,Í,È,ç,È,¢ B Ú ×,É,Ä,¢
,Ä,Í,Ä,ÌCOMfIfufWfFfNfQ,Ö,ÌfAfNfZfX,ðŽQ Æ,³,ê,½,¢ B

f`f... [fgfŠfAf< 1: f fr [,đŽg—p,μ,½ Ú±

IDirectPlayLobbyfCf“f^ [ftfFfCfX,đŽg—

p,μ,Ä ‘,©,ê,½fAfvfŠfP [fVf‡f“,Í Af† [fU,žè ì<Æ,Ä Ú± î•ñ,đf_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“,đ ì ¬,·,é•û-@,đ à-¾,·,é B

Step 1: DirectPlayLobbyfIfufWfEfNfg,Ī ì ¬

Step 2: Ú±ŠÄ«,ìŽæ“¾

Step 3: fZfbfVf‡f“L q,Ī Ý’è

Step 4: fZfbfVf‡f“,Ö,Ī Ú±

Step 5: fvfEfCf„,Ī ì ¬

Step 1: DirectPlayLobbyIfufWfFfNfg,ì ì ñ

DirectPlayf fr [<@”\, ðŽg, ¼, ½, ß A, Ü, ,
DirectPlayLobbyCreateŠÖ ”, ðŒÄ, Ñ o, µ, ÄDirectPlayLobbyIfufWfFfNfg, ìfCf“fXf^“fX, ð ì ñ, ·, é B, ±
, ĪŠÖ ”, Ī5, Ä, Īfpf%of [f^, ðŠÜ, ñ, Ä, Ç, é B’æ1 A’æ3 A’æ4pf%of [f^, Ī A «—^, ĪŠg’£, Ī, ½, ß, É—\—
ñ, ³, ê, Ä, ”, è A, Ä, È, 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, Æ A, ±, Īf|fCf“f^, ð—p, Ç
, ÄfIfufWfFfNfg, ĪÈ’u, ðŽ•È, ·, é, ±, Æ,ª, Ä, «, é B’æ5pf%of [f^, à «—^, ĪŠg’£, Ī, ½, ß, É—\—
ñ, ³, ê, Ä, ”, è A, Ä, È, É0, É Ý’è, ·, é B

ŽŸ, ì—á, Ī ADirectPlayLobbyIfufWfFfNfg, ì ì ñ•û—@, Ī, Ð, Æ, Ä, Ä, , 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,ê,é,Æ AfAfvfŠfP [fVfzf“,Í fZfbfVfzf“,Æ Ú±
,·,é,½,ß,ÉIDirectPlayLobby::Connect f\fbfh,đŽg—p,·,é,±,Æ,ª,Á,«,é B,±,İf f\fbfh,ªDP_OK,đ•Ö,¹,Î A,Đ,Æ,Á, ,é,¢
,Í•j ”,İfvfƐfCf,,đ ì ¬,·,é,±,Æ,ª,Á,«,é B,±
,İf f\fbfh,ªDPERR_NOTLOBBIED,đ•Ö,µ,½,Æ,«,Í Af† [fU,ÍÊ M”}·İ,đŽè“®,Á‘đ,µ,È,¯,ê,Î,È,ç,È,¢ ifVfXfef€
,ÉfCf“fXfg [f<,³,ê,Ä,¢,éT [frfX Efvf fofCf_,đŽ¯Ê,·,é,É,Í ADirectPlayEnumerateŠÖ ”,đ~—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,đŽ',·fGf% [,đ•ñ ,·,é,×,«,Á, ,é B
```

ŽŸ,ì—á,Í AfZfbfVfzf“,Æ,ì Ú±•û—@,đŽ',µ,Ä,¢,é B

```
// fZfbfVfzf“,É Ú±,·,é BANSI IDirectPlay2Afcf“f^ [ftfFfCfX,đ•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 B DIALOGfTf“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);

DirectPlayEnumerateŠÖ ”,ì‘æ1fpf%of [f^,Í ADirectPlay,É,æ,Á,Ä“o~^,³,é,½fT [frfX Efvf fofCf_,ð— ñ<“,·,éR [f<fobfNŠÖ ”,Ä, ,é BŽŸ,ì—á,Í A,±,ìR [f<fobfNŠÖ ”,ðfCf“fvfŠf f“fg,·,é•û-@,ì,Ð,Æ,Ä,ðŽ!,µ,Ä,¢ ,é B

BOOL FAR PASCAL DirectPlayEnumerateCallback(
LPGUID lpSPGuid, LPTSTR lpszSPName, DWORD dwMajorVersion,
DWORD dwMinorVersion, LPVOID lpContext)

{
HWND hWnd = lpContext;
LRESULT iIndex;
LPGUID lpGuid;

// fT [frfX Efvf fofCf_,l~¼‘O,ðfRf“f{ Ef{fbfNfX,ÉŠi”[,·,é B
iIndex = SendDlgItemMessage(hWnd, IDC_SPCOMBO, CB_ADDSTRING,
0, (LPARAM) lpszSPName);
if (iIndex == CB_ERR)
goto FAILURE;

// fAfvfŠfP [fvf‡f“GUID,ì—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: IDirectPlay1fufWfFfNfg, Ī ì ñ

f† [fU,žg—p,·,éT [frfX Efvf fofCf_,đ'I'đ,·,é,Æ A'I'đ,ÉŠi,Ā,¢
,ĀDirectPlay1fufWfFfNfg,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 BDirectPlay1fufWfFfNfg,Ī ì ñ,É,Ī A**DirectPlayCreateŠÖ** ”,đŽg—p,·,é B,±
,ĪŠÖ ”,ĪEĀ,Ñ o,µ,É,æ,Ā,Ā ADirectPlay,Ī'I'đ,³,ê,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,¢fQ [f€,Ī ì ñ,É—p,¢,é,±,Æ,ª,Ā,«,é,ª A,æ,è,æ,¢•û—
@,Ī A Ā V,ĪDirectPlayCf“f^ [ftfFfCfX,Ā, ,é**IDirectPlay2,**” ,æ,Ñ**IDirectPlay2A,**đ—~—p,·,é,±,Æ,Ā, ,é B,±
,ê,ç,ĪfCf“f^ [ftfFfCfX,É,Ī A'Ç%oĀ,³,ê,½DirectPlay,Ī'S<@”\,ªŠÛ,Û,ê,Ā,¢
,é B**IDirectPlay2,ĀIDirectPlay2A**fCf“f^ [ftfFfCfX,đŽæ“¾,·,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,¢,é B

HRESULT CreateDirectPlayInterface(LPGUID lpguidServiceProvider,
LPDIRECTPLAY2A *lpDirectPlay2A)

```
{  
LPDIRECTPLAY lpDirectPlay1 = NULL;  
LPDIRECTPLAY2A lpDirectPlay2A = NULL;  
HRESULT hr;
```

```
// DirectPlay 1.0fCf“f^ [ftfFfCfX,đŽæ“¾,·,é B  
hr = DirectPlayCreate(lpguidServiceProvider, &lpDirectPlay1, NULL);  
if FAILED(hr)  
    goto FAILURE;
```

```
// ANSI DirectPlay2fCf“f^ [ftfFfCfX,đ ĀE%oi,·,é B  
hr = lpDirectPlay1->QueryInterface(IID_IDirectPlay2A,  
    (LPVOID *) &lpDirectPlay2A);  
if FAILED(hr)  
    goto FAILURE;
```

```
// ì ñ,³,ê,½fCf“f^ [ftfFfCfX,đ•Ô,· B  
*lpDirectPlay2A = lpDirectPlay2A;
```

```
FAILURE:  
if (lpDirectPlay1)  
    lpDirectPlay1->Release();
```

```
return (hr);  
}
```

Step 3: fZfbfVfzf“,Ö,İŽQ%Á

```
f† [fU,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_fCfAf 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‘ð,·,é,Æ AfAfvfŠfP [fvfzf“,Íf† [fU,ÉŠù“¶,İfZfbfVfzf“,Ö,İŽQ%Á,đ<-,·,±,Æ,·,Ä,«,·,é B
Šù“¶,İfZfbfVfzf“,ÉŽQ%Á,·,é•û—@,đ~È%°,ÉŽ‘,· B
```

```
// Šù“¶,İfZfbfVfzf“,ÖŽQ%Á,·,é B
ZeroMemory(&sessionDesc, sizeof(DPSESSIONDESC2));
sessionDesc.dwSize = sizeof(DPSESSIONDESC2);
```

```
sessionDesc.guidInstance = *lpguidSessionInstance;

hr = lpDirectPlay2A->Open(&sessionDesc, DPOPEN_JOIN);
if FAILED(hr)
    goto OPEN_FAILURE;
```

Step 4: fZfbfVf#f“,İ ì 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,İ“ü
—İ,ð—v< ;,·,é ê ±,ª,·,é B
```

```
V,µ,¢fZfbfVf#f“,İ ì ñ•û-@,ðŽŸ,ÉŽ',· B
```

```
// V,µ,¢fZfbfVf#f“,İfzfXfg,ð-±,ß,é B
ZeroMemory(&sessionDesc, sizeof(DPSESSIONDESC2));
sessionDesc.dwSize = sizeof(DPSESSIONDESC2);
sessionDesc.dwFlags = DPSESSION_MIGRATEHOST | DPSESSION_KEEPLIVE;
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` à ñ

```
fZfbfVfþf“,ð ì ñ A, ,é,ç  
,ÍfZfbfVfþf“,ÉŽQ%Á,µ,½Ĉã AfAvfŠfP [fVfþf“,Í AIDirectPlay2::CreatePlayer f\fbfh,É,æ,Á,Ä,Đ,Æ,Â^È ã,ì  
fvfCfCf,,ð ì ñ,·,é,±,Æ,ª,Á,«,é BŽŸ,ì—á,Á,Í AfvfCfCf,,ð ì ñ,·,é•û-@,ì,Đ,Æ,Á,ðŽ',µ,Ä,ç,é B
```

```
// -¼'O \ç'İ,ð Ÿ'è,·,é B  
ZeroMemory(&dpName, sizeof(DPNAME));  
dpName.dwSize = sizeof(DPNAME);  
dpName.lpszShortNameA = lpszPlayerName;  
dpName.lpszLongNameA = NULL;
```

```
// ,±,ì-¼'O,ÄfvfCfCf,,ð ì ñ,·,é B  
hr = lpDirectPlay2A->CreatePlayer(&dpidPlayer, &dpName,  
    lpDPInfo->hPlayerEvent, NULL, 0, 0);  
if FAILED(hr)  
    goto CREATEPLAYER_FAILURE;
```

```
fAvfŠfP [fVfþf“,Í AIDirectPlay2::GetCaps,âAIDirectPlay2::GetPlayerCaps f\fbfh,ðŽg—p,µ,ÄfvfCfCf,,ì'È M"  
—Í,ð”»'è,·,é,±,Æ,ª,Á,«,é B,Û,½ A¼,ìfvfCfCf,,ðĈ©,Á, ,é,É,Í AIDirectPlay2::EnumPlayers f\fbfh,ðŽg—  
p,·,é B
```

```
,±,è,ÄfAvfŠfP [fVfþf“,Í Ú±,³,è 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 ±, Ìf|
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 i 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 \‘¢¹,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,,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,³,ê,Ä,¢,é BNULL,ÉfZfbfg,µ,Ä,“,©,È,¬,ê,İ,È,ç,È,¢ B

lpDPL

—LĈø,ÈİDirectPlayLobbyfCf“f^ [ftfFfCfX,Ä %Šú%»,³,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,³,ê,Ä,¢,é BĈ» Ÿ,İDirectPlayLobbyCreateŠÖ ”,Ä,Í A,±
,İfpf%of [f^,ÉNULL^ÈŠÖ,İ’l,^aŽw’è,³,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,é,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 Af f [f^,đ•Ûž ,·,é f, fš,đšm•Û,µ Af f [f^,đfRfs [l,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

fAfhfĀfXŽí•Ê,đ•\,·fof [fof< Ef†fj [fNŽ¯•ÊŽq(GUID) B’è< Ī,Ý,Ö,Ìf|
fCf“f^Ží•Ê,Í ADPAID_Phone ADPAID_Inet ADPAID_ComPort,Â, ,é BfAfhfĀfXŽí•Ê,É,Â,ĉ
,Ä,Ì Ú ×DirectPlayfAfhfĀfX,đŽQ Æ,³,ê,½,ĉ B

lpContext

fR [f<fofbfNšÖ ”,É“n,³,ê,é fRf“fefLfXfg B

dwFlags

—\-ñ,³,ê,Ä,ĉ,é BŽg—p,μ,Ä,Í,ĉ,¯,È,ĉ B

EnumDPCallback

BOOL WINAPI EnumDPCallback(LPGUID lpGUIDSP,
LPSTR/LPWSTR lpSPName, DWORD dwMajorVersion,
DWORD dwMinorVersion, LPVOID lpContext);

DirectPlayEnumerateŠÖ ”,ÄŽg—p,·,éAfvfŠfP [fVf‡f“”èè,èR [f<fofbfNŠÖ ” BUNICODE,“èè,è,é,©,Ç,□
,©,É,æ,Á,Ä AfR [f<fofbfNŠÖ ”,èfvf fgf^fCfv,èlpSPName,Í ALPWSTR iUnicode,è è ‡ j, ,é,Ç
,ÍLPSTR iANSI,è è ‡ j,Æ,µ,Ä’èè,è,é B

—ñ“,ð’±,è è ‡,ÍTRUE A I—,·,é è ‡,ÍFALSE,ð•Ö,· B

lpGUIDSP

DirectPlayfT [ftrfX Efvf fofCf_,èf‡fj [fNŽ~•ÈŽq,èfAfhfÇfX B

lpSPName

fhf%ofCfo,ðŽ,·•Źš—ñ,èfAfhfÇfX BUNICODEfVf“f{f<,“èè,è,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%ofCfo,èf fWff [·,æ,Ÿf}fCfi [Efo [fWf‡f“”Ô † B

lpContext

fAfvfŠfP [fVf‡f“”èè,èRf“fefLfXfg,Ö,èf|fCf“f^ B

fR [f<fofbfNŠÖ ”,É•Ö,è,é,·,×,Ä,èf|fCf“f^,íèŽž“L,È,à,è,Ä, ,è AfR [f<fofbfNŠÖ ”“à,Ä,Ì,Ý—LÇø,Ä, ,é B|
fCf“f^ îñ,ð•Ů•Ÿ,·,é•K—v,“ ,éAfvfŠfP [fVf‡f“,Í Af f [f^,ð•ŮŽ ,·,é f, fŠ,ðŠm•Ů,µ Af f [f^,ðfRfs [·,µ A V
,µ,Çff [f^,èf|fCf“f^,ð•Ů•Ÿ,µ,È,è,è,È,Ç,È,Ç B,±,èŠÖ ”“à,èlpGUIDSP AlpSPName AlpData,íèŽž“L,Èèf|fCf“f^,Ä, ,é B

EnumLocalApplicationsCallback

BOOL WINAPI EnumLocalApplicationsCallback(
LPCDPLAPPINFO lpAppInfo, LPVOID lpContext, DWORD dwFlags);

IDirectPlayLobby::EnumLocalApplications f f\fbfh, ĀŽg—p, , éf AfvfŠfP [fVf‡f““è\, ĨfR [f<fofbfNŠÖ ” B
—ñ““, đ‘±, -, é ê ‡, ĨTRUE A I—, , é ê ‡, ĨFALSE, đ•Ō, · B

lpAppInfo
—ñ““, 3, é, ½f AfvfŠfP [fVf‡f““, Ĩ ĩ•ñ, đŠŪ, p A“Ç, Ý o, μ ê—p, ĨDPLAPPINFO \‘ç‘Ĩ, Ō, Ĩf|fCf“f^ B

lpContext
IDirectPlayLobby::EnumLocalApplications ĄÄ, Ñ o, μ, ©, ç“n, 3, é, éfRf“fefLfXfg, Ō, Ĩf|fCf“f^ B

dwFlags
—\ñ, 3, é, Ä, ç, é B Žg—p, μ, Ä, Ĩ, ç, -, È, ç B

fR [f<fofbfNŠÖ ”, É•Ō, 3, é, é, ·, ×, Ä, Ĩf|fCf“f^, ĨêŽž“Ĩ, È, à, Ĩ, Ä, , è AfR [f<fofbfNŠÖ ”“à, Ä, Ĩ, Ý—LĄø, Ä, , é B|
fCf“f^ Ĩñ, đ•Ū“¶, ·, é•K—v, 3, éf AfvfŠfP [fVf‡f““, Ĩ Af f [f^, đ•ŪŽ , ·, éf f, fŠ, đŠm•Ū, μ Af f [f^, đfRfs [μ A V
, μ, çff [f^, Ĩf|fCf“f^, đ•Ū“¶, μ, È, -, é, Ĩ, È, ç, È, ç B, ±, ĨŠÖ ”“à, ĨlpAppInfo, ĨêŽž“Ĩ, Èf|fCf“f^, Ä, , é B, Ū, ½
AlpAppInfo pf%of [f^, ĄŽ, 3, é, é \‘ç‘Ĩ, Ĩ†, Ĩf|fCf“f^ AlpszAppNameA, ·, æ, ÑlpszAppName, àêŽž“Ĩ, È, à, Ĩ, Ä, , é, ±
, Ä, È’ ^Ō, 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,¯,ê,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•Ô,· 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

€» Ý,ìf^fCf€ EfAfEfg’l,đŠÜ,đ•İ ”,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•Ô,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•Ô,· B

lpContext

fAfvfŠfP [fVf‡f“èç,ìfRf“fefLfXfg,ìfAfhf€fX B

fR [f\fofbfNŠÖ ”,É•Ô,³,é,é,·,×,Ä,ìf|fCf“f^,íèŽž“l,È,à,ì,Á, ,è AfR [f\fofbfNŠÖ ”“à,Á,ì,Ý—L€ø,Á, ,é Bf|
fCf“f^ îñ,đ•Ü•¶,·,é•K—v,³,éAfvfŠfP [fVf‡f“,í Aff [f^,đ•ÜŽ ,·,éf f,š,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,íèŽž“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,àèŽž“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,Ï,ç,,ê,©,ð•Ô,· B

DPERR_INVALIDOBJECT

DPERR_INVALIDPARAMS

DPERR_NOSESSIONS

,±
,Ïf f\fbfh,ðÆÄ,Ñ o,·,Æ Af [fJf<,É ï -,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, ÌfZfbfVfþf“„É“¶ Ý, „, éfvfœfCf„, Ì— fOf< [fv, ð ì ¬, „, é B
—œ±, „, é, ÎDD_OK AŽ, „s, „, é, ÌŽÝ, ÌfGf%o [l, Ì, œ, „, é, ©, ð•Ô, „ B

DPERR_CANTADDPLAYER

DPERR_INVALIDOBJECT

DPERR_INVALIDPARAMS

DPERR_OUTOFMEMORY

lpidGroup

DirectPlayOf< [fvID, Á—, „, ß s, „, é, é•Í ”, Ô, Ìf|Cf“f^ B , ±, Ìl, ÍDirectPlay, É, æ, Á, Ä’è<^, „, é B

lpGroupName

fOf< [fv, Ì—¼‘O, ðŽ , ÄDPNAME \‘c‘ì, Ô, Ìf|Cf“f^ B NULL, ÍfOf< [fv, ^ %oŠú—¼, ðŽ , Á, Ä, œ, É, œ, ±, Ä, ð•\, „ B

lpData

fOf< [fvID, ÄŠÖ~A•t, —, éfAfvfŠfP [fvfþf“è<^, ÌŠf, [fg Eff [f^ Efuf fbfn, Ô, Ìf|Cf“f^ B
NULL, ÍfOf< [fv, ^ %oŠúff [f^, ðŽ , Á, Ä, œ, É, œ, ±, Ä, ð•\, „ B , ±, ±
, ÄŽw’è, „, é, ½ff [f^, Í AIDirectPlay2::SetGroupData, ^œÄ, Ñ o, „, é, é, Ä, «, Ä“—
l AfZfbfVfþf“t, Ì, „, ×, Ä, ÌfAfvfŠfP [fvfþf“„É“„, |, œ, é, éfŠf, [fg Eff [f^, Ä, „, é, Äœ©, È, „, é B

dwDataSize

lpData, ^Žw, •ff [f^ Efuf fbfn, ÌfTfCfY, ðfofCfG’P^È, ÄŽw’è, „, é B

dwFlags

—\~ñ, „, é, Ä, œ, é BŽg—p, µ, Ä, Í, œ, —, È, œ B

f fbZ [fW, ÍfOf< [fv, É’— M, „, é, ±, Ä, ^, Ä, « ADirectPlay, ^fOf< [fv’t, ÌŠefvfœfCf„, Éf fbZ [fW, ð“—
, „, é BfAfvfŠfP [fvfþf“„É•Ô, „, é, ½fOf< [fvID, Í Af fbZ [fW““B, Äff [f^œ< ±, É, —, œ
, ÄfOf< [fv, ðŽ~•È, „, é, ½, B, É—p, œ, ç, é, é BDirectPlay, É, æ, Á, ÄŠ„, è“—
, Ä, œ, é, ½fvfœfCf„, ID, ÄfOf< [fvID, Í A, Ä, È, ÉfZfbfVfþf“„, Ì’t, Äf+fj [fn, Ä, „, é B, ±
, Ìf f\fbfh, ÍDPSYS_CREATEPLAYERORGROUPVfXfef€ Ef fbZ [fW, ð ¶ ¬, µ A’¼, Ì, „, ×, Ä, ÌfvfœfCf„, É’
— M, „, é, é BfVfXfef€ Ef fbZ [fW, ÌŠfXfg, É, Ä, œ, Ä, ÍfVfXfef€ Ef fbZ [fW, ÌŽg—p, ðŽQ Ä, „, é, ½, œ B

fAfvfŠfP [fvfþf“„, Í AIDirectPlay2::SetGroupNamef f\fbfh, ðŽg, Á, Ä AfOf< [fv, Ì ì ~Žž, É %oŠúfOf< [fv—
¼, ðŠÖ~A•t, —, é, ±, Ä, ^, Ä, « BlpGroupName, Ì—¼‘O, Í IŠÖ, ^—~p, „, é, ½, B, ¾, —, É’ñ<Ý, „, é A“à”, Ä, ÍŽg—p, „, é, È, œ
, Ì, Ä Af+fj [fn, Ä, „, é•K—

v, Í, È, œ BfAfvfŠfP [fvfþf“„, Í AIDirectPlay2::SetGroupDataf f\fbfh, É, æ, Á, Ä AfOf< [fv, Ì ì ~Žž, É %oŠúff [f
^, ðŠÖ~A•t, —, é, ±, Ä, ^, Ä, «, é B

ŽQ Ä @DPNAME, DPMSG_CREATEPLAYERORGROUP, IDirectPlay2::DestroyGroup,

IDirectPlay2::EnumGroups, IDirectPlay2::EnumGroupPlayers, IDirectPlay2::Send, IDirectPlay2::SetGroupData,

IDirectPlay2::SetGroupName

IDirectPlay2::CreatePlayer

HRESULT CreatePlayer(LPDPID lpidPlayer,
LPDPNAME lpPlayerName, HANDLE hEvent,
LPVOID lpData, DWORD dwDataSize, DWORD dwFlags);

«» Ý, ðfZfbfVfþf“, Éf [fJf< EfVfCfCf,, ð ì -, , é B
-CÉ, , , ê, ÎDD_OK AŽ, ”s, , , ê, ÎŽÝ, ðfGf%o [’l, ð, , , ê, ©, ð•Ô, . B

DPERR_CANTADDPLAYER

DPERR_CANTCREATEPLAYER

DPERR_GENERIC

DPERR_INVALIDOBJECT

DPERR_INVALIDPARAMS

DPERR_NOCONNECTION

lpidPlayer

DirectPlayVfCfCf,, ID, Á, , , ß s, , , 3, ê, é•İ ”, Ö, ðfCf“f^ B , ±, ðl, IDirectPlay, É, æ, Á, Á’è<, 3, ê, é B

lpPlayerName

fVfCfCf,, ð¼•O, ðŽ , ÁDPNAME \‘ç’İ, Ö, ðfCf“f^ B NULL, ðfVfCfCf,, , a %oŠú¼ î•ñ, ðŽ , Á, Á, ç, È, ç, ±, Æ, ð•\ , . B

hEvent

, ±
, ðfVfCfCf,, , Å, ðf bfbZ [fWŽó M, µ, ½, Æ, «, ÉDirectPlay, É, æ, Á, Á•N“@, 3, ê, é AfAfVfŠfP [fVfþf“, a ¶ -, µ, ½f Cxf“fg EfIfufWfFfNfg B

lpData

fVfCfCf,, ID, ÉŠÖ~A•t, , , éfAfVfŠfP [fVfþf“è<, ðfŠf, [fg Eff [f^ Efuf fbfN, Ö, ðfCf“f^ B
NULL, ðfVfCfCf,, , a %oŠúff [f^, ðŽ , Á, Á, ç, È, ç, ±, Æ, ð•\ , . B, ±, ±
, ÁŽw’è, 3, ê, ½ff [f^, Í AIDirectPlay2::SetPlayerData, aCEÄ, Ñ o, 3, ê, é, Æ, «, Æ“—
l AfZfbfVfþf“t, ð, , , ×, Á, ðfAfVfŠfP [fVfþf“, É“”B, 3, ê, éfŠf, [fg Eff [f^, Á, , é, Æ©, È, 3, ê, é B

dwDataSize

lpData, aŽw, ff [f^ Efuf fbfN, ðfTfCfY, ðfOfCfG’P’Ê, ÁŽw’è, , , é B

dwFlags

—\ñ, 3, ê, Á, ç, é BŽg—p, µ, Á, Í, ç, , È, ç B

, ð, Æ, Á, ðfVf fZfX, Í•j ”, ðf [fJf< EfVfCfCf,, ðŽ , Á, ±
, Æ, , Á, «, é Bf [fJf< EfVfCfCf,, Í ADirectPlayIfufWfFfNfg, ð’Ê, µ A•j ”, ðfRf“fsf...
[f^ ã, ÁŽÄ s’t, ð”C’Ó, ð ”, ðf [fJf< EfVfCfCf,, , ã AfŠf, [fg, ðfVfCfCf,, , Æ’Ëb, , , é, ±
, Æ, , Á, «, é BfAfVfŠfP [fVfþf“, Í A•Ô, 3, ê, ½fVfCfCf,, ID, ðŽg—
p, µ, Á Af bfbZ [fW“”B, ðf [f^C< ±, ÁŽw’è, , , éfVfCfCf,, , ðŽ•Ê, , , é BDirectPlay, É, æ, Á, ÁŠ,, è“—
, Á, ç, é, ½fVfCfCf,, ID, ÆfOf< [fvID, Í A, Á, È, ÉfZfbfVfþf“, ð’t, Áf+fj [fN, Á, , é B

fAfVfŠfP [fVfþf“, Í AIDirectPlay2::SetPlayerNamef ffbfh, ðŽg, Á, Á AfVfCfCf,, ð ì -Žž, É %oŠú-
¼, ðŠÖ~A•t, , , é, ±, Æ, , Á, «, é BlpPlayerName, aŽ, , -¼•O, Í lŠÓ, a—p, , , é, ½, B, ¾, , , É’ñ<Ý, 3, ê A“à•”, Á, ðŽg—p, 3, ê, È, ç
, ½, ß Af+fj [fN, Á, , é•K—
v, Í, È, ç BfAfVfŠfP [fVfþf“, Í AIDirectPlay2::SetPlayerDataf ffbfh, É, æ, Á, Á AfVfCfCf,, ð ì -Žž, É %oŠúff [f
^, ðŠÖ~A•t, , , é, ±, Æ, , Á, «, é B

, ±, ðf ffbfh, a 3 íÉ I—, , , é, Æ A V, µ, çfVfCfCf,, , aZfbfVfþf“, É%oÁ“ü, µ, ½, ±
, Æ, ð’Ê”m, , , é, ½, ß AfZfbfVfþf“t, ð¼, ð, , , ×, Á, ðfVfCfCf,, , ÉDPSYS_CREATEPLAYERORGROUPfVfXfefE Ef bfbZ
[fW, a—, ç, é, é BfVfXfefE Ef bfbZ [fW, ðfŠfXfg, É, Á, ç, Á, ðfVfXfefE Ef bfbZ [fW, ðŽg—p, ðŽQ Æ, 3, ê, ½, ç B

DirectPlayf bfbZ [fW, ðŽæ“¾, ð•Ê, ðfXfCfCf, Á s, çfAfVfŠfP [fVfþf“, Á, Í AhEventfPf%of [f^, ð—p, ç
, Á“ŠúfCxf“fg, ð’ñ<Ý, , , é, ±, Æ, , Á, «, é B, ±, ðfCxf“fg, Í A, ±
, ðfVfCfCf,, , a f bfbZ [fW, ðŽó, ~Zæ, Á, ½, Æ, «, ÉfZfbf, 3, ê, é BhEvent, ÁŽ, 3, ê, éfCxf“fg, Í A•j ”, ðfVfCfCf,, , ©, çŽg—
p, , , é, ±, Æ, , Á, «, é B

ŽQ Æ @DPNAME, DPMSG_CREATEPLAYERORGROUP, IDirectPlay2::DestroyPlayer,

IDirectPlay2::EnumPlayers, IDirectPlay2::Receive, IDirectPlay2::Send, IDirectPlay2::SetPlayerData, IDirectPlay2::SetPlayerName

IDirectPlay2::DeletePlayerFromGroup

HRESULT DeletePlayerFromGroup(DPID idGroup,
DPID idPlayer);

Of< [fv,©,çfvfCf,,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

fvfCf,,^a í œ,³ê,éOf< [fvID B

idPlayer

Of< [fv,©,ç í œ,³ê,éfvfCf,,ÌfvfCf,,ID B

fvfCf,,^a í œ,³ê,é,Æ A•Ī X,đ¼,ÌfvfCf,,É'Ê'm,·,é,½,ß,ÉDPSYS_DELETEPLAYERFROMGROUPfvfXfef€
Ef fbZ [fW,^a ¶ ¬,³ê,é BfvfXfef€ Ef fbZ [fW,ÌŠfXfg,É,Ā,ç,Ā,ÌfvfXfef€ Ef fbZ [fW,ÌŽg=
p,đŽQ Æ,³ê,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“,©,çfvfƐfCf,,đ í œ,·,é B,»,)fvfƐfCf,,^¶,Ä,ì,·,×,Ä,ì-¢ ^— f fbZ [fW,Íf fbZ [fW Eflf...
[,©,ç í œ,³,ê AfvfƐfCf,,Í A·®,µ,Ä,¢
,½,·,×,Ä,ìfOf< [fv,©,ç í œ,³,ê,é BƐ» Ý,ìZfbfVf†f“,ìŠŎ,Í AfvfƐfCf,,ID,ª Ä—~p,³,ê,é,±,Æ,Í,È,¢ B
-Ɛ÷,·,ê,ìDD_OK AŽ,»s,·,ê,ìŽŸ,ìGf%o [¹,ì,¢,,·,ê,©,đ•Ŏ,· B

DPERR_INVALIDOBJECT

DPERR_INVALIDPLAYER

idPlayer

fZfbfVf†f“,©,ç í œ,³,ê,éfvfƐfCf,, ID B

,±,ìf f\fbfh,Í AfvfƐfCf,,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,ìŠfXfg,É,Ä,¢,Ä,ÍfvfXfef€ Ef fbZ [fW,ìŽq
=p,đŽQ A,³,ê,½,¢ B

ŽQ A @IDirectPlay2::CreatePlayer, **DPMSG_DESTROYPLAYERORGROUP**

IDirectPlay2::EnumGroupPlayers

HRESULT EnumGroupPlayers(DPID idGroup,
LPGUID lpguidInstance,
LPDPENUMPLAYERSCALLBACK2 lpEnumPlayersCallback2,
LPVOID lpContext, DWORD dwFlags);

«» Ý, ÌfZfbfVfþf“, É“¶ Ý, ·, éfOf< [fv, Ì, ·, ×, Ä, ÌfvfÆfCf,, ð—ñ“, ·, é B
-Æ÷, ·, é, ÎDD_OK AŽ, ”s, ·, é, ÎŽÝ, ÌfGf%o [‘l, Ì, Ç, ·, é, ©, ð•Ô, · B

DPERR_EXCEPTION

DPERR_INVALIDFLAGS

DPERR_INVALIDOBJECT

DPERR_INVALIDPLAYER

idGroup

fvfÆfCf,,^a—ñ“,³, é, éfOf< [fv, ÌfOf< [fvID B

lpguidInstance

ŠÖEW, ·, éDirectPlayfZfbfVfþf“, ÌfCf“fXf^f“fX BDPENUMPLAYERS_SESSIONftf%ofo, Žw’è,³, é, È, Ç, Æ, «, Í A, ±
, Ìfpf%of [f^, ðNULL, ÉfZfbfg, µ, È, ·, Ä, Í, È, Ç, È, Ç B

lpEnumPlayersCallback2

fOf< [fv’†, ÌšefvfÆfCf,, É, Ä, Ç, ÄÆÄ, Ñ o,³, é, éEnumPlayersCallback2ŠÖ ”, Ö, ÌffCf“f^ B

lpContext

fR [f<fofbfNŠÖ ”, É“n,³, é, éfAfvfŠfP [fvfþf““è<, ÌfRf“fefLfXfg, Ö, ÌffCf“f^ B

dwFlags

fR [f<fofbfNŠÖ ”, ÌdwFlagsfpf%of [f^, É“n,³, é, éftf%ofo B

DPENUMPLAYERS_SESSION

*lpguidInstance, É, æ, Ä, ÄŽ~•É,³, é, éfZfbfVfþf““à, ÌfOf< [fv, ÌfvfÆfCf
,, ð—ñ“, ·, é B*

’È í, ±, Ìf ffbfh, Í AE» Ý, ÌfZfbfVfþf“, Ìf [fJf< EfvfÆfCf,, EfŠfXfg, ðŽg—p, µ, Ä—ñ“, ·, é B
DPENUMPLAYERS_SESSIONftf%ofo, ðfZfbfVfþf“ EfCf“fXf^f“fXGUID, Æ, Æ, à, ÈŽw’è, ·, é, Æ AfZfbfVfþf“, ÌfzfX
fg, É—ñ“fŠfXfg, Ìñ<Ý, ð—v<, ·, é B, ±, Ìf ffbfh, Í A**IDirectPlay2::EnumSessions** —ñ“, Ì†, ©, ÇÆÄ, Ñ o, ·, ±
, Æ, Í, Ä, «, È, Ç B,³, Ç, É ADPENUMPLAYERS_SESSIONftf%ofo, ðŽg—p, ·, é è ± A, ±
, Ìf ffbfh, ÌÆÄ, Ñ o, µ, Í A**IDirectPlay2::EnumSessions**f ffbfh, ÌÆÄ, Ñ o, µ, ÌÆä, ©, Ä**IDirectPlay2::Close**
, ·, æ, Ñ**IDirectPlay2::Open**f ffbfh, ÌÆÄ, Ñ o, µ, Ì’O, É s, í, È, ¯, ê, Ì, È, Ç, È, Ç B

ŽQ Æ @**IDirectPlay2::CreatePlayer**, **IDirectPlay2::DestroyPlayer**, **IDirectPlay2::AddPlayerToGroup**,
IDirectPlay2::DeletePlayerFromGroup

IDirectPlay2::EnumPlayers

HRESULT EnumPlayers(LPGUID lpGUIDInstance,
LPDPENUMPLAYERSCALLBACK2 lpEnumPlayersCallback2,
LPVOID lpContext, DWORD dwFlags);

lpGUIDInstance [f^,δNULL,ÉfZfbfVf#f“ ,·,é B

–Œ÷,·,é,ÛDD_OK AŽ,“s,·,é,ÛŽŸ,ÛfGf%o [‘l,Û,·,é,©,δ•Ō,· B

DPERR_EXCEPTION

DPERR_GENERIC

DPERR_INVALIDOBJECT

DPERR_UNSUPPORTED

lpGUIDInstance

ŠÖŒW,·,éDirectPlay fZfbfVf#f“ ,ÛfCf“fXf^f“fX BDPENUMPLAYERS_SESSIONftf%ofo,“Žw’è,³,é,È,Œ ê ÷ A,±
 ,Ûfpf%of [f^,δNULL,ÉfZfbfVf#f,µ,È,,Ä,Í,È,ç,È,Œ B

lpEnumPlayersCallback2

fZfbfVf#f“+ ,ÛšefOf< [fv,É,Ä,Œ,ÄŒÄ,Ñ o,³,é,éEnumPlayersCallback2ŠÖ ”,Ö,Ûf|fCf“f^ B

lpContext

fR [f<fofbfNŠÖ ”,É“n,³,é,éAfvfšfP [fvf#f“è< ,ÛfRf“fefLfXfg,Ö,Ûf|fCf“f^ B

dwFlags

fR [f<fofbfNŠÖ ”,ÛdwFlagsfpf%of [f^,É“n,³,é,éftf%ofo B

DPENUMPLAYERS_GROUP

fvfŒfCf,,Û—ñ<“ ,ÉfOf< [fv,δŠÜ,Đ B

DPENUMPLAYERS_LOCAL

,±,Û

DirectPlayfIfufWfFfNfg,É,æ,Ä,Äf [fJf<,É ì -,³,é,½fvfŒfCf,,
¾,–,δ—ñ<“ ,·,é B

DPENUMPLAYERS_REMOTE

fšf, [fg,ÛDirectPlayfIfufWfFfNfg,É,æ,Ä,Ä ì -,³,é,½fvfŒfCf,,¾
 ,–,δ—ñ<“ ,·,é B

DPENUMPLAYERS_SESSION

lpGUIDInstance ,É,æ,Ä,ÄŽ–•È,³,é,½fZfbfVf#f““à,ÛfOf< [fv,δ—
ñ<“ ,·,é B

’È í,±,Ûf f\fbfh,Í ACE» ÝfI [fvf“ ,³,é,Ä,Œ,éZfbfVf#f“ ,ÛfvfŒfCf,,δ—ñ<“ ,·,é B fOf< [fv,àŠÜ,ß,Ä—ñ<“ ,δ s,±
 ,É,Í ADPENUMPLAYERS_GROUPftf%ofo,δŽg—

p,·,é BDPENUMPLAYERS_SESSIONftf%ofo,δfZfbfVf#f“ EfCf“fXf^f“fXGUID,Æ,Æ,à,ÉŽw’è,·,é,Æ AfZfbfVf#f

“ ,ÛzfXfg,É—ñ<“fšfXfg,Ûñ•Ÿ,δ—v< ,·,é B,±,Ûf f\fbfh,Í AIDirectPlay2::EnumSessions —ñ<“ ,Û†,©,çŒÄ,Ñ o,·,±

,Æ,Í,Ä,«,È,Œ B,³,ç,É ADPENUMPLAYERS_SESSIONftf%ofo,δŽg—p,·,é ê ÷ A,±

,Ûf f\fbfh,ÛŒÄ,Ñ o,µ,Í AIDirectPlay2::EnumSessionsf f\fbfh,ÛŒÄ,Ñ o,µ,ÛŒä,Ä,©,ÄIDirectPlay2::Close,“,æ,ÑIDI

rectPlay2::Openf f\fbfh,ÛŒÄ,Ñ o,µ,ÛO,É s,í,È,–,é,Û,È,ç,È,Œ B

ŽQ Æ @IDirectPlay2::CreatePlayer, IDirectPlay2::DestroyPlayer, IDirectPlay2::EnumSessions

IDirectPlay2::EnumSessions

HRESULT EnumSessions(LPDPSESSIONDESC2 lpsd,
DWORD dwTimeout,
LPDPENUMSESSIONSCALLBACK2 lpEnumSessionsCallback2,
LPVOID lpContext, DWORD dwFlags);

,±,Ì DirectPlayfIfufWfFfNfg,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 fbFZ [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 ï ¬,³,ê,½¼Æä,ÉÆÄ,Ñ o,³,ê,é BfZfbfVf±f“,É Ú±,µ,Ä,¢
,éŠÖ,â AfAfvfŠfP [fVf±f“,ªfZfbfVf±f“,ð ï ¬,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“® ï,·,é B%ž“š,ðŽó M,·,é,Æ A—
ñ“,³,ê,éfZfbfVf±f“,ª—p`Ö,³,ê,é BDirectPlay,ª±
,ê,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 ï ¬,·,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 [,^afAfvfŠfP [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,é,é,Û,Á 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,ÎDD_OK AŽ,”s,·,ê,ÎŽŸ,ÌfGf%o [’l,ð•Ô,· B

DPERR_INVALIDOBJECT

DPERR_INVALIDPARAMS

lpDPCaps

DirectPlayIfufWfFfNfg,ì”\—Í,ðŽó,~Žæ,é**DPCAPS** \’ĉ’Ì,Ö,Ìf|fCf“f^ B**IDirectPlay2::GetCaps**,ðŽg—
p,·,é‘O,É ADPCAPS \’ĉ’Ì,ÌdwSizef f“fo,ð Ý’è,μ,È,,Ä,Í,È,ç,È,ĉ B

dwFlags

,±,Ìfpf%of [f^,É0,ªfZfbfg,³,ê,é,Æ A-³•Û Ø,Èf fbFZ [fWĈðŠ·,É‘Î,·,é”\—Í,ªĈvŽZ,³,ê,é B
DPGETCAPS_GUARANTEED
•Û Ø,³,ê,½f fbFZ [fW”z M,É‘Î,·,é”\—Í,ðŽæ“¾,·,é B

IDirectPlay2::GetPlayerCapsf f\fbfh,ª—vĉ ,³,ê,½fvfĈfCf,,,ì”\—Í,ð•Ô,·,ì,É‘Î,μ A,±
,Ìf f\fbfh,ÍĈ» Ý,ÌfZfbfVf±f“,ì”\—Í,ð•Ô,· B

ŽQ Æ @**DPCAPS**, **IDirectPlay2::GetPlayerCaps**, **IDirectPlay2::Send**

IDirectPlay2::GetGroupData

HRESULT GetGroupData(DPID idGroup,
LPVOID lpData, LPDWORD lpdwDataSize,
DWORD dwFlags);

IDirectPlay2::SetGroupData,É,æ,Á,ÄfOf< [fvID,ÆŠÖ~A•t,¯,ç,ê,½ AfAfvfšfP [fVfšf“CEÄ—
L,İff [f^ Efuf fbfN,đŽæ“¾,·,é B

-CE÷,·,é,İDD_OK AŽ,”s,·,é,İŽŸ,İfGf%o [‘l,İ,ç,,é,©,đ•Ô,· B

DPERR_BUFFERTOOSMALL

DPERR_INVALIDOBJECT

DPERR_INVALIDPARAMS

DPERR_INVALIDPLAYER

idGroup

ff [f^,ª—v< ,³,ê,½fOf< [fv,İfOf< [fvID B

lpData

fAfvfšfP [fVfšf“CEÄ—L,İfOf< [fv Eff [f^,ª ‘,« ž,Ü,ê,éfofbftf@,İfAfhfEfX Bff [f^,İfTfCfY,İ,Ý,ªK—
v,È ê ÷,Í A,±,İpf%of [f^,ÉNULL,đfZfbfg,·,é B,±
,İ,Æ,« AlpdwDataSizepf%of [f^,É,Í Aff [f^,đ•ŰŽ ,·,é,½,ß,É•K—v,ÈfTfCfY,ª Ý’è,³,ê,é B

lpdwDataSize

f f\fbfh,đCEÄ,Ń o,·‘O,Éfofbftf@,İfTfCfY,Ä %šú%o»,³,ê,éİ ”,Ö,İf|fCf“f^ Bf f\fbfh,ª §CEä,đ-
ß,µ,½CEä A,±
,İpf%of [f^,É,İfOf< [fv Eff [f^,İfTfCfY,ªfofCfg’PÊ,ÄfZfbfg,³,ê,é Bfofbftf@,ª ¬,³,·,·,é iDPERR_BUF
FERTOOSMALL j ê ÷ A,±,İpf%of [f^,É,Í A•K—v,Èfofbftf@ EfTfCfY,ª Ý’è,³,ê,é B

dwFlags

,±,İpf%of [f^,É0,đfZfbfg,µ,½ ê ÷,Í Afšf, [fg Eff [f^,đŽæ“¾,·,é B

DPGET_REMOTE

fšf, [fgª—
L,³,ê,½ff [f^ EfXfy [fX,©,çCE» Ý,İff [f^,đŽæ“¾,·,é B

DPGET_LOCAL

fAfvfšfP [fVfšf“,İf [fJf<,Èff [f^ EfZfbfg,đŽæ“¾,·,é B

DirectPlay,Í Af [fJf<,ª,æ,Ńfšf, [fg,İ,Ó,½,Ä,İfAfCfv,İfOf< [fv Eff [f^,đ•ŰŽ ,·,é,±
,Æ,ª,Ä,«,é BfAfvfšfP [fVfšf“,İŽæ“¾,·,éff [f^,İfAfCfv,đŽw’è,µ,È,,Ä,Í,È,ç,È,ç BDPSET_LOCALftf%ofO,đŽg,ª
,Æ ADirectPlayIfufWfFfNfg,È,æ,Á,Äf [fJf< Eff [f^,ªfZfbfg,³,ê,é B DPSET_REMOTEftf%ofO,đŽg,ª
,Æ AfZfbfVfšf““†,İ”C^Ó,İfAfvfšfP [fVfšf“,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^,ÏfTfCY,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,ËfTfCY,ª Ý'è,³,ê,é B

lpdwDataSize
f f\fbfh,ðÆÄ,Ñ o,·'O,Éfobftf@,ÏfTfCY,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^,ÏfTfCY,ªfOfCfP^Ê,ÅfZfbfg,³,ê,é Bfobftf@,ª ¬,³,·,¬,é iDPERR_BUFFERTOOSMALL j ê ‡ A
,±,Ïpf%of [f^,É,Í A•K—v,Ëfobftf@,ÏfTfCY,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,ð**DPNAME** \‘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::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^ B**IDirectPlay2::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 Ő,Èf fbfZ [fWĀđŠ·,Ē'Ī,·,é"Ī—Ī,³ĀvŽZ,³,ê,é B

DPGETCAPS_GUARANTEED

•Ū Ő,³,ê,½f fbfZ [fW"z M,Ē'Ī,·,é"Ī—Ī,đŽæ"¼,·,é B

IDirectPlay2::GetCapsf f\bfh,³Ā» Ý,ĪfZfbfVf±f"Ī"Ī—Ī,đ•Ō,·,Ī,Ē'Ī,μ A,±,Īf f\bfh,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 [fVfšf“CEÄ—
L,İff [f^ Efuf fbfN,ðŽæ“¾,·,é B

-CE÷,·,é,İDD_OK AŽ,”s,·,é,İŽŸ,İfGf%o [l,İ,ç,·,é,©,ð•Ô,· B

DPERR_BUFFERTOOSMALL

DPERR_INVALIDFLAGS

DPERR_INVALIDOBJECT

DPERR_INVALIDPLAYER

idPlayer

ff [f^,ðŽæ“¾,·,éfvfCfCf,,İfvfCfCf,,ID B

lpData

fAfvfŠfP [fVfšf“CEÄ—L,İfvfCfCf,, Eff [f^,ª ‘,« ž,Ü,ê,éfofbftf@,Ö,İf|Cf“f^ B
ff [f^,İfTfCfY,¾,¯,ðŽæ“¾,·,é ê ÷,İ A,±,İfpf%of [f^,ÉNULL,ðfZfbfg,·,é B,±
İ,Æ,« AlpdwDataSizefpf%of [f^,É,İ Af [f^,ð•ŰŽ ,·,é,½,ß,É•K—v,ÈfTfCfY,ª Ý’è,³,ê,é B

lpdwDataSize

,±,İf f\fbfh,ðCEÄ,Ñ o,·‘O,Éfofbftf@,İfTfCfY,Ä %oŠú%o»,³,ê,é•İ ”,Ö,İf|Cf“f^ B
f f\fbfh,ª §CEä,ð-ß,µ,½CEä A,±
İfpf%of [f^,É,İ AfOf< [fv Eff [f^,İfTfCfY,ªfofCfG’P^Ê,ÄfZfbfg,³,ê,é Bfofbftf@,ª ¬,³,·,¬,é iDPERR_B
UFFERTOOSMALL j ê ÷ A,±,İfpf%of [f^,É,İ•K—v,Èfofbftf@,İfTfCfY,ª Ý’è,³,ê,é B

dwFlags

,±,İfpf%of [f^,É0,ðfZfbfg,·,é,Æ AfŠf, [fg Eff [f^,ðŽæ“¾,·,é B

DPGET_REMOTE

fŠf, [fg,Ä<ª—
L,³,ê,½ff [f^ EfXfy [fX,©,çCE» Ý,İff [f^,ðŽæ“¾,·,é B

DPGET_LOCAL

,±,İfAfvfŠfP [fVfšf“É,æ,éf [fJf<,Èff [f^ EfZfbfg,ðŽæ“¾,·,é B

DirectPlay,İ Af [fJf<,ª,ÑfŠf, [fg,İ,Ó,½,Ä,İf^Cfv,İfOf< [fv Eff [f^,ð•ŰŽ ,·,é,±
,Æ,ª,Ä,«é BfAfvfŠfP [fVfšf“İŽæ“¾,·,éff [f^,İf^Cfv,ðŽw’è,µ,È,,Ä,İ,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 AfZfbfVfšf““†,İ”C^Ó,İfAfvfŠfP [fVfšf“É,æ,Á,Ä AfŠf, [fg Eff [f^,ª Ý’è,³,ê,é B

ŽQ Æ @IDirectPlay2::SetPlayerData

IDirectPlay2::GetPlayerName

HRESULT GetPlayerName(DPID idPlayer,
LPVOID lpData, LPDWORD lpdwDataSize);

f v f C f C f , , É Š Ö ~ A t , ¯ , ç , ê , ½ - ¼ ' O , ð Ž æ " % , , é B
- C E ÷ , , ê , Î D D _ O K A Ž , " s , , ê , Î Ž Ÿ , Ì f G f % [' l , Ì , ç , , ê , © , ð • Ô , · B

DPERR_BUFFERTOOSMALL

DPERR_INVALIDOBJECT

DPERR_INVALIDPLAYER

idPlayer

- ¼ ' O , ð Ž æ " % , , é f v f C f C f , , Ì f v f C f C f , , I D B

lpData

- ¼ ' O f f [f ^ , ^ , « ž , Û , ê , é f o f b f t f @ , Ì f A f h f C f X B f f [f ^ , Ì f T f C f Y , ¾ , ¯ , ð Ž æ " % , , é ê ‡ , Í A , ± , Ì f p f % o f [f ^ , É N U L L , ð f Z f b f g , , é B , ± , Ì , Æ , « A l p d w D a t a S i z e f p f % o f [f ^ , É , Í A f f [f ^ , ð • Ů Ž , , é , ½ , ß , É • K — v , È f T f C f Y , ^ Y ' è , ^ , é B

lpdwDataSize

, ± , Ì f f \ b f h , ð C Ä , Ñ o , ' O , É f o f b f t f @ , Ì f T f C f Y , Å % o Š ú % o » , ^ , é , é • Ĭ " B f f \ b f h , ^ § C ä , ð - ß , µ , ½ C ä A , ± , Ì f p f % o f [f ^ , É , Í A f O f < [f v E f f [f ^ , Ì f T f C f Y , ^ f o f C f g ' P ^ È , Å f Z f b f g , ^ , é , é B f o f b f t f @ , ^ ¬ , ^ , ^ , é i D P E R R _ B U F F E R T O O S M A L L j ê ‡ A , ± , Ì f p f % o f [f ^ , É , Í • K — v , È f o f b f t f @ , Ì f T f C f Y , ^ Y ' è , ^ , é B

, ± , Ì f f \ b f h , ^ § C ä , ð - ß , µ , ½ C ä A f O f < [f v - ¼ f f [f ^ , ð " Ç , Ý o , , ½ , ß , É , Í A f | f C f " f ^ l p D a t a , ð DPNAME \ " Ç ' Ì , È f L f f f X f g , µ , È , , Ä , Í , È , ç , È , Ç B

@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,« AlpdwDataSizef%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,ðDPSESSIONDESC2
 \‘c’ì,ÉfLfffXfg,µ,È,,Ä,Í,È,ç,È,¢ B

ŽQ Æ @DPSESSIONDESC2, IDirectPlay2::EnumSessions, IDirectPlay2::Open

IDirectPlay2::Initialize

HRESULT Initialize(LPGUID lpGUID);

, ±, ìf f\bfbh, ÍCOMfvf fgfRf<, Ö, ì'î%ž, ì, ½, ß, É'ñ<Ÿ, ³, ê, é B

DPERR_ALREADYINITIALIZED, ð•Ô, · B

lpGUID

fCf“f^ [ftfFfCfX, ðž•Ê, ·, é, ½, ß, ìfOf [fof< Ef+fj [fNž•Êžq iGUID j, ìfAfhfEfX B

DirectPlayIfufWfFfNfg, Í ì -žž, É %šú%»», ³, ê, é, ½, ß A, ±

, ìf f\bfbh, 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
-Œ÷,·,ê,Î DD_OK AŽ,”s,·,ê,İŽŸ,İfGf%o [‘l,İ,Œ,,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** \‘Œ‘İ,Ö,İf|fCf“f^ B

dwFlags
ˆÈ%°,İftf%ofo,İ,Œ,,ê,© B

DOPEN_CREATE
fQ [f€ EfZfbfVf‡f“,İ V,µ,ŒfCf“fXf^f“fX,đ ì ¬,·,é B

DOPEN_JOIN
fQ [f€ EfZfbfVf‡f“,İŠù‘ŒfCf“fXf^f“fX,ÉŽQ%oÁ,·,é B

fAfvfŠfP [fVf‡f“,Í A V,µ,ŒfZfbfVf‡f“,đ ì ¬,·,é,© i,»,İfZfbfVf‡f“,É,Í¼,İfŠf, [fg EfAfvfŠfP [fVf‡f“,Ž
Q%oÁ,·,é j AŠù‘Œ,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,Œ BfAfvfŠfP [fVf‡f“,³Šù‘Œ,İfZfbfVf‡f“,ÉŽQ%oÁ,·,é‘O,É,Í AŽQ%oÁ%oÁ”\,ÈfZfbfVf‡f“,İˆ—
,Æ,»,ê,ç,İfZfbfVf‡f“<L q,đŽæ“¼,·,é,½,ß,É **IDirectPlay2::EnumSessions**,đŽg—p,·,é,×,«,Á,·,é B V,µ,ŒfvfŒfCf,,³-
³Œø,É,³,ê,Á,Œ,éfZfbfVf‡f“,ÉŽQ%oÁ,µ,æ,µ,½ ê ‡ A,Û,½,İŽQ%oÁ,Á,«,È,Œ ê ‡ A,·,é,Œ
,İfvfŒfCf,, šŒÄ,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,ì’g,Ý ±,í,¹,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%oÄª,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,« AlpdwDataSizepf%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^fCfv,ð²²,x,é,½,ß AdwTypef f“fo,ðf FFfbfN,·,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,NDPERR_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,ð'²,×,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,ç'1,ðŽ',·f fbZ [fW,Í AfvfCfCf,,³Žó M,·,é,±,Æ,³,Ä,«,È,ç B

DPSESSION_NOMESSAGEIDftf%ofO,"fZfbfVf‡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"j'¹,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"j'¹,³Eÿ 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, ÌfvfCf,, AfOf< [fv"à, ÌfvfCf,, A, Ü, ½, Í, ·, ×, Ä, ÌfvfCf,, Éf fbfZ [fW, ð'— M, ·, é B

³ í I—1, µ, ½, Æ, «, â A, ½, , ³, ñ, Ìf fbfZ [fW, "DirectPlay, Ì"à" fLf... [, Á'—
M'Ò, ç, Ì è ‡, IDP_OK, ð•Ö, · B, » , è ÈŠO, ÍŽŸ, ÌfGf%o [, Í, ç, , è, ©, ð•Ö, · B

DPERR_BUSY

DPERR_INVALIDOBJECT

DPERR_INVALIDPARAMS

DPERR_INVALIDPLAYER

DPERR_SENDTOOBIG

idFrom

'— M'ª, ÌfvfCf,, ID BfvfCf,, ID, Í A, ±, ÌfRf"fsf... [f^, Ì à, Ìf [fJf<, ÈfvfCf,, Ì, ð, Æ, Ä, È'Í%ž, µ, Ä, ç
, È, Ä, Í, È, ç, È, ç B

idTo

f fbfZ [fW, "—
M, ³, è, éfvfCf,, ID AfOf< [fvID A, Ü, ½, ÍDPID_ALLPLAYERS BDPID_ALLPLAYERS, ðŽw'è, ·, é, Æ AfZfbf
Vf‡f""à, Ì, ·, ×, Ä, ÌfvfCf,, Éf fbfZ [fW, ð'—
M, ·, é BDPSEND_OPENSTREAM, âDPSEND_CLOSESTREAMftf%o, ðŽg—p, ·, é è ‡, Í A, ±
, Ìfpf%of [f^, ÈfvfCf,, ID, ð Ÿ'è, ·, é B

dwFlags

f fbfZ [fW, Ì'— M•û-@, ðŽ', · B, ±, Ìfpf%of [f^, È, O, ðfZfbfg, ·, é, Æ Af fbfZ [fW, Í•Û Ø, ³, è, , A•W €"I, È
—D æ ‡È, Ä'— M, ³, è, é B, ½, , ³, ñ, Ìf fbfZ [fW, ð'—, è, ¢, Æ, µ, Ä, ç, é, ±
, Æ, ðDirectPlay, âfT [frfX Efvf fofCf_, É"" , è, È, Í ADPSEND_OPENSTREAM, ÆDPSEND_CLOSESTREAM, ðŽg
—p, ·, é BfRf~f...fjfp [fvf‡f" EfpfCfv ifXfgfŠ [f€ j, ÌfI [fvf" ^fnf [fY, ð s, í, , Éf fbfZ [fW, ð'—
M, ·, é, Ü, ¢, Æ—
"I, È è ‡ AfT [frfX Efvf fofCf_, Í ADPSEND_CLOSESTREAMftf%o, ðŽw'è, µ, ÄIDirectPlay2::Send f\ f
bfh, ðÄ, Ñ o, ·, Ü, Ä A, » , ÌfvfCf,, ID, ÌfXfgfŠ [f€, ðfI [fvf", µ, ½, Ü, Ü, È, µ, Ä, ", B
DPSEND_OPENSTREAM, ÆDPSEND_CLOSESTREAM, ÌidTo, "—LÆØ, ÈfvfCf,, ID, Ä, , éf fbfZ [fW, È, Ä, ç, Ä, Ì, Ÿ
—LÆØ, Ä, , é BfT [frfX Efvf fofCf_, Í A•K, , µ, àDPSEND_OPENSTREAM, ÆDPSEND_CLOSESTREAM, ðfTf|
[fg, ·, é•K—v, Í, È, ç B

DPSEND_GUARANTEED

%oÄ"Ä, , è, è•Û Ø•t, «, Ì"z M•û-@, Äf fbfZ [fW, ð'— M, ·, é B

DPSEND_HIGHPRIORITY

Ä—D æf fbfZ [fW, ð'—
M, ·, é B, ·, @, È"z M, ·, é, ½, ß Af fbfZ [fW, Í< §"I, È'— MfLf...
[, Ì æ""É'u, ©, è AŽó MfAfvfŠfP [fvf‡f", È, ", ç
, Ä, à AŽó Mfobftf@, Ì æ""É'... M, ³, è, é B

DPSEND_OPENSTREAM

fvfCf,, È "½, Ìf fbfZ [fW, ð'—, è, ¢, Æ, µ, Ä, ç
, é, Æ, « AfT [frfX Efvf fofCf_, È Ä"K%o», Ìfqf"fg, ðŽ', · B

DPSEND_CLOSESTREAM

fvfCf,, È'—, è, ¢, Æ, µ, Ä, ç, éf fbfZ [fW, Ì " , » , è, Ü, Ç'½, È, -
, È, Ä, ½, ±, Æ, ðŽ', · B

lpData

'— M, ³, è, éf [f^, Ö, Ìf|Cf" f^ B ŽÀ Û, È'— M, ·, éf fbfZ [fW, ¢, È, ç, Æ, «, Í A, ±, Ìfpf%of [f^, ð
NULL, ÈfZfbfg, ·, é BDPSEND_OPENSTREAM, âDPSEND_CLOSESTREAMftf%o, ðŽw'è, ·, é è ‡ ANULL, È, µ, È
, , Ä, Í, È, ç, È, ç B

dwDataSize

'— M, ³, è, éf [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::ReleaseDCf 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%œ ”,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±,·,ê,ĭDD_OK AŽ,”s,·,ê,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,ê,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,ê A•Ū Ø,È,µ,ĭf fbfZ [fW,É,æ,Ā,
Ā`Ē`m,³,ê,é B

DPSET_REMOTE

,±,ĭff [f^,ĭ,·,×,Ā,ĭfAfvfŠfP [fVf‡f“,É,æ,Ā,ĀŽg—
p,³,ê AfZfbfVf‡f““à,ĭ¼,ĭ,·,×,Ā,ĭfAfvfŠfP [fVf‡f“,É“`B,³,ê,é B

DPSET_LOCAL

,±,ĭff [f^,ĭf [fJf<,ÈŽg—p,ĭ,½,β,¾,¯,É—p`Ó,³,ê A“`B,³,ê,é,±
,Ā,ĭ,È,ĉ B

DPSET_GUARANTEED

i%oĀ”\,Ā, ,ê,ĭ j•Ū Ø•t,«f fbfZ [fW,É,æ,Ā,Āff [f^,đ“`B,·,é B,±
,ĭftf%o fO,ĭDPSET_REMOTE,Ā`ê ,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,ê,é BDPSESSION_NODATAMESSAGES
,³Žw`è,³,ê,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,ê,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,ê,Ā jfOf< [fv,³”jŠü,³,ê,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,ê,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,bDPNAME \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 † , , é , ĩ D D _ O K A Ž , ” s , , é , ĩ Ž Ÿ , ĩ f G f % [’ l , ĩ , C , , é , © , đ • Ô , • B

DPERR_INVALIDFLAGS

DPERR_INVALIDOBJECT

DPERR_INVALIDPLAYER

idPlayer

ff [f ^ , đ Ÿ ’ 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 , é , é f f [f ^ , ĩ f f C f “ f ^ B Š Ÿ “ ĩ , ĩ v f C f C f , , E f f [f ^ , đ f N f Š f A , , é é † , 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 , 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 , é A • Ů Ø , È , μ , ĩ f f b f Z [f W , É , æ , Á , Á “ ” B , 3 , é , 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 , é 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 , é , 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 , é A “ ” B , 3 , é , é , † , A , ĩ , È , C B

DPSET_GUARANTEED

ı % Ä ” \ , Ä , , é , ĩ j • Ů 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 , A “ é , È Ž w ’ è , μ , È , , Ä , ĩ , È , Ç , È , C B

DirectPlay , ĩ A f [f J f < , , æ , ĩ f Š f , [f g , ĩ Ó , ½ , Ä , ĩ f ^ C f v , ĩ f O f < [f v E f f [f ^ , đ • Ů Ž , , , é , † , A , a , 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 ^ ä , ĩ f A f v f Š f P [f v f † f “ , É ĩ , μ , Ä , ĩ , Ÿ — 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 , é , 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 , a Ž w ’ è , 3 , é , 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 , a “ — , ç , é , 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 , a “ À “ S , Ä , , é B f [f J f < E f f [f ^ E f u f f b f N , ĩ ĩ D P M S G _ D E S T R O Y P L A Y E R O R G R O U P f v f X f e f € E f f b f Z [f W , a “ — , ç , é , Ä j f O f < [f v , a ” j Š Ÿ , 3 , é , æ , o , A , μ , Ä , C , é , A , « , É , à — L C Ø , Ä , , é , ½ , B A f A f v f Š f P [f v f † f “ , ĩ , † , é , ç , ĩ f Š f \ [f X , đ % đ • ú , , , é , † , A , a , « , 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 q — p , đ Ž Q A , 3 , é , ½ , C B

Ž Q A @ D P M S G _ S E T P L A Y E R O R G R O U P D A T A , ĩ D i r e c t P l a y 2 : : G e t P l a y e r D a t a , ĩ D i r e c t P l a y 2 : : S e n d

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 E f f b f Z [f W ,
a " - , C , e , e B f V f X f e f E 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 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 % [' 1 , I , C , , e , C , d o O , . B

DPERR_INVALIDOBJECT

DPERR_INVALIDPLAYER

idPlayer
- 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

lpPlayerName
f v f C f C f , , I - 1 / 4 ' O i n , d S U , p **DPNAME** \ ' 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 f % o f [f ^ , E N U L L , d Y ' e , , e B

dwFlags
, z , I f p f % 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

DPSET_GUARANTEED
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

Z Q A E @ **DPNAME** , **DPMSG_SETPLAYERORGROUPNAME** , **IDirectPlay2::GetPlayerName** , **IDirectPlay2::Send**

IDirectPlay2::SetSessionDesc

HRESULT SetSessionDesc(LPDPSESSIONDESC2 lpSessDesc,
DWORD dwFlags);

,±,Ïf f\fbfh,ÍE» ÝfTf| [fg,³,ê,Ä,¢,È,¢ B

E» Ý,ÏfZfbfVf‡f“,ì“Á «,ð•ì X,·,é B,±,Ïf f\fbfh,Í AfZfbfVf‡f“,ÏzfXfg,Ä, ,éfRf“fsf...
[f^ ã,ÄCEÄ,Ñ o,³,ê,½,Æ,«,Ï,Ý“@ ì,·,é B

DPERR_UNSUPPORTED,ð•Ô,· B

lpSessDesc

V,µ,¢ Ý'è,ðŠÜ,ñ,Ä,¢,éfZfbfVf‡f“«L q \‘¢'Ï,Ö,Ïf|fCf“f^ B

dwFlags

,±,Ïf 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^ [ftFfCfX,İf f\fbfh,ðŽg—*
p,µ,Ä AfAfvfŠfP [fVf‡f“,*ÆfAfvfŠfP [fVf‡f“*,*ÉŠÖ`A•t,¯,ç,ê,½ff [f^,ð §Eä,.,é B,±*
,İfZfNfVf‡f“,*Í AIDirectPlayLobbyfCf“f^ [ftFfCfX Ef f\fbfh,İfŠftf@fEf“fX,Ä, ,é BŠT”O,É,Â,ç,Ä,İŠT—*
v,ÍIDirectPlayLobbyfCf“f^ [ftFfCfX,ðŽQ Æ,³,ê,½,ç B

fAfhfEfXŠÇ—

[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<Y’,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,ċ,,é,©,đ•Ô,· B

CLASS E_NOAGGREGATION

DPERR_INVALIDFLAGS

DPERR_INVALIDINTERFACE

DPERR_INVALIDOBJECT

DPERR_INVALIDPARAMS

DPERR_NOTLOBBIED

DPERR_OUTOFMEMORY

dwFlags

—\-ñ,³,é,Ä,ċ,é B0,Ä,È,,Ä,Í,È,ċ,È,ċ B

lpDP

—LĚø,ÈfCf“f^ [ftfFfCfX,Ä %Šú%o»,³,é,é|fCf“f^,Ö,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,ċ,,é,©,Ä,·,é B

pUnk

IUnknown fCf“f^ [ftfFfCfX,ÌfAfhfĚfX B,±,Ìfpf%of [f^,Í «—^,ÌCOM W -%o»<@”\
,Æ,ÌĚŸŠ· ,Ä,½,ß,É’ñ<Y’,³,é,Ä,ċ,é BĚ» Ý,Í**IDirectPlayLobby::Connect**,Ä,Í A,±
,Ìfpf%of [f^,ÉNULL^ÈŠO,Ì’l,ªŽw’è,³,é,é,ÆfGf%o [,đ•Ô,· B

-Ě÷,·,é,Æ A ³,µ,ċfT [ffX EfVf fofCf_,ÉDirectPlayIfufWfFfNfg,đ ì ¬,µ A ³,µ,ċfZfbfVfŠf“,đfI [fVf“,·
,é Bf† [fU,É-â,ċ ‡,í,¹,Ìf_fCfAf fO Ef{fbfNfX,đ•Ž},·,é,±,Æ,Í,È,ċ B,±
,Ìf f\fbfh,ªŽ,”s,µ,ÄDPERR_NOTLOBBIEDfGf%o [,đ•Ô,· ê ‡ AfAfVfŠfP [fVfŠf“,Í’È í,ÌŽè ‡,đŽÀ s,µ A**DirectPlayEnumerate** A**DirectPlayCreate** A**IDirectPlay2::EnumSessions** A**IDirectPlay2::Open**,đĚÄ,Ñ o,³,È,-
,Ä,Í,È,ċ,È,ċ B¼,ÌfGf%o [’l,ÄŽ,”s,·,é ê ‡,Í AfZfbfVfŠf“,Ö,Ì Ú±,É-â’è,ª,·,é B

,±,Ìf f\fbfh,đĚÄ,Ñ o,·‘O,É AfAfVfŠfP [fVfŠf“,đŠJŽn,·,é,½,ß,É—p,ċ,ç,é,é Ú± Ý’è,đ²,×,é,±,Æ,ª,Ä,«é B,±
,Ì,½,ß,È,Í**IDirectPlayLobby::GetConnectionSettings** 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,ÄfZfbfµ¼,·,±
,Æ,ª,Ä,«é BDPSESSIONDESC2 \ċ’Ì,É,Í A“K Ø,ÈfZfbfVfŠf“Ä «,ª Ý’è,³,é,é,æ,ª,É“Á•É,É’ ^Ó,đ•Ÿ,í,È,-
,Ä,Í,È,ċ,È,ċ B“Ä,É AdwFlags AdwMaxPlayers AdwUserf f“fo,É,Í’ ^Ó,ªK—v,Ä,·,é B

ŽQ Æ @**DirectPlayCreate**

IDirectPlayLobby::CreateAddress

HRESULT CreateAddress(REFGUID guidSP,
REFGUID guidDataType, LPCVOID lpData,
DWORD dwDataSize, LPVOID lpAddress,
LPDWORD lpdwAddressSize);

—^,!,ç,ê,½fT [frfX Efvf fofCf_ĈÄ—
L,ìflfbfgf [fN EfAfhfĈfX,©,ç ADirectPlayfAfhfĈfX,ð ì ¬,·,é BĈ<%oÊ,ìfAfhfĈfX,É,Í AfT [frfX Efvf
fofCf_ÌfOf [fof< Ef+fj [fNŽ~•ÊŽq iGUID j A,“,æ,ÑfT [frfX Efvf fofCf_,³flfbfgf [fN EfAfhfĈfX,
Æ,μ,Ä%oðŽB,·,é,±,Æ,ª,Ä,«,éff [f^,ªŠÜ,Û,ê,é B

-Ĉ÷,·,é,êIDD_OK AŽ,“s,·,é,ÎŽÿ,ìfGf%o [!l,ì,ç,·,é,©,ð•Ô,· B

DPERR_BUFFERTOOSMALL

DPERR_INVALIDPARAMS

guidSP

fT [frfX Efvf fofCf_,ìGUID,Ö,ìf|fCf“f^ iC++,Ä,íGUID,Ö,ìŽQ Æ,Ä,·,é j B

guidDataType

ĈÄ—

L,ìflfbfgf [fN EfAfhfĈfX Ef^fCfv,ðŽ~•Ê,·,éGUID,ìfAfhfĈfX B'è<` Ì,Ý,ìflfbfgf [fN EfAfhfĈfX
Ef^fCfv,É,Ä,ç,Ä,íDirectPlayfAfhfĈfX,ðŽQ Æ,³,ê,½,ç iC++,Ä,íGUID,Ö,ìŽQ Æ,Ä,·,é j B

lpData

ĈÄ—L,ìflfbfgf [fN EfAfhfĈfX,ðŠÜ,ðfobftf@,Ö,ìf|fCf“f^ B

dwDataSize

lpData,ìflfbfgf [fN EfAfhfĈfX,ìfTfCfY,ðfofCfY'P^Ê,ÄŽw'è,·,é B

lpAddress

¶ ¬,³,ê,½DirectPlayfAfhfĈfX,ª ‘,« ž,Û,ê,éfofobftf@,Ö,ìf|fCf“f^ B

lpdwAddressSize

DirectPlayfAfhfĈfX Efobftf@,ìfTfCfY,ðŠÜ,ð•ì ”,Ö,ìf|fCf“f^ BfT [frfX Efvf fofCf_Í A,±
,ìf f\fbfh,ðĈÄ,Ñ o,‘O,ÉlpdwAddressSize,ðfofobftf@,ìfTfCfY,Ä %oŠú%o»,μ,È,,Ä,Í,È,ç,É,ç B

f f\fbfh,ª §Ĉä,ð-ß,·,Æ A,±

,ìfpf%of [f^,É,ÍlpAddress,É ‘,« ž,Û,ê,½fofCfY ”,ªŠi”[³,ê,é Bfofobftf@,ª ¬,³,·,¬,é iDPERR_BUFFERTOOSM
ALL j ê ‡ A,±,ìfpf%of [f^,É,ÍDirectPlayfAfhfĈfX,ðŠi”[·,é,½,ß,É•K—v,ÈfTfCfY,ªfZfbfg,³,ê,é B

ŽQ Æ @IDirectPlayLobby::EnumAddress

IDirectPlayLobby::EnumAddress

HRESULT EnumAddress(LPDPENUMADDRESS lpEnumAddressCallback,
LPCVOID lpAddress, DWORD dwAddressSize,
LPVOID lpContext);

DirectPlayfAfhfEfX Efofbftf@,©,çf`fff“fN,ð%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,Ìšĕ 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“fefLfXfg B

ŽQ Æ @DirectPlayfAfhfEfX, IDirectPlayLobby::CreateAddress

IDirectPlayLobby::EnumAddressTypes

HRESULT EnumAddressTypes(
LDDPLENUMADDRESSTYPESCALLBACK lpEnumAddressTypeCallback,
REFGUID guidSP, LPVOID lpContext,
DWORD dwFlags);

Žw'è,³,ê,½fT [frfX Efvf fofCf_,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,Œ,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“,išJžn,â Ú±,É•K—v,È,·,×,Ä,ì îñ,ðšÜ,ðDPLCONNECTION
`c`l,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,ì A,Ü,½,ÍIDirectPlayLobby::SetConnectionSettings
f f\bfh,ìCEÄ,Ñ o,µ,Ä Ý’è,³,ê,é,à,ì,Æ““,¶,Ä, ,é B

-CE±,·,é,îDD_OK Až,“s,·,é,îžŸ,ìfGf%o [‘l,ì,¢,·,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,¢,·,Ä,©,ì AfvfšfP [fVfšf“,Æ•È M,·,é j B AfvfšfP [fVfšf“,æÄ,Ñ o,·,Æ,«,Í A,±
,ìpf%of [f^,Í,Ä,È,-
,Ä,Í,È,¢,È,¢ if AfvfšfP [fVfšf“,Í A,Ð,Æ,Ä,ìf fr [EfNf%ofCfAf“fg,Æ,µ,©•È M,µ,È,¢ j B,±
,ìID”Ô †,ÍIDirectPlayLobby::RunApplication,©,çžæ“¾,³,ê,é B

lpData

Ú± Ý’è,ª ‘,« ž,Ü,ê,é ofbf@,Ö,ìf|Cf“f^ B ff [f^,ìTfCY,¾,-,ðžæ“¾,·,é ê ±,Í A,±
,ìpf%of [f^,ÉNULL,ð Ý’è,·,é B,±,ì,Æ,« AlpdwDataSizepf%of [f^,É,Í Af [f^,ð•Ÿž ,·,é,½,ß,É•K—
v,È Ä ¬,ìTfCY,“š!”[,³,ê,é B

lpdwDataSize

,±,ìf f\bfh,ðCEÄ,Ñ o,·“O,É ofbf@,ìTfCY,Ä %šú%o»,³,ê,éİ ”,Ö,ìf|Cf“f^ Bf f\bfh,ª §CEä,ð-
ß,µ,½CEä A,±
,ìpf%of [f^,É,Íff [f^,ìTfCY,ª ofCfP^È,ÄfZfbg,³,ê,é B ofbf@,ª ¬,³,·,¬,é iDPERR_BUFFERTOOSMA
LL j ê ±,Í A,±,ìpf%of [f^,É,Í•K—v,È Ä ¬,ì ofbf@ EfTfCY,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 Alpdaf f“fo,ðLPDPLCONNECTION `c`l,ÉfLfffXfg,µ,È,-
,Ä,Í,È,¢,È,¢ 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,·ŠëĒ,Í,È,ç B

-Ē÷,·,ê,İDD_OK AŽ,·s,·,ê,İŽŸ,İfGf%o [!l,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,ªĒÄ,Ñ o,· ê ‡ A Ú± Ý’è,đŽæ“¾,·,é fAfvfŠfP [fVf‡f“đŽ-·Ē,·,é if fr [EfN
f%ofCfAf“fg,Í,ç,·,Ä,©,İfAfvfŠfP [fVf‡f“Æ’Ē M,·,é j BfAfvfŠfP [fVf‡f“ªĒÄ,Ñ o,·,Æ,«,Í A,±
,İfpf%of [f^,İ0,Ä,È,-
,Ä,Í,È,ç,È,ç ifAfvfŠfP [fVf‡f“Í A,Đ,Æ,Ä,İf fr [EfNf%ofCfAf“fg,Æ,µ,©’Ē M,µ,È,ç j B,±
,İID”Ö †,İDirectPlayLobby::RunApplication,©,çŽæ“¾,³,ê,é B

lpdwMessageFlags

•Ö,³,ê,Ä,ç,é fbfZ [fW,İf^fCfv,đŽ!,·ftf%ofO B
DPLAD_SYSTEM

fAfvfŠfP [fVf‡f“ÉfCfxf“fg,đ’Ē’m,·,éfvfXfef€ Ef fbfZ [fW,
Ä,·,é,±,Æ,đŽ!,· B” ¶,µ,½fCfxf“fg,İŽí—p,đĒ^è,·,é,É,Í AlpDataf|
fCf“f^,đDPLMSG_GENERICfvfXfef€ Ef fbfZ [fW,ÉfLffXf
g,µ,ÄdwTypef f“fo,đ—LĒø,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•Ÿ ,·,é,½,ß,É•K
—v,È Ä -,İfTfCfY,ªŠi”[,³,ê,é B

lpdwDataSize

,±,İf f\bfh,đĒÄ,Ñ o,·O,Éfofbftf@,İfTfCfY,Ä %oŠú%o»,³,ê,éİ ”,İfAfhfĒfX Bf f\bfh,ª §Ēä,đ-
ß,µ,½ĒĒ A,±
,İfpf%of [f^,É,İf fbfZ [fW,İfTfCfY,ªfofCfG’P^Ē,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’İ,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,³,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,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,đ‘— M,·,é B
-Ĉ÷,·,ê,İDD_OK AŽ,”s,·,ê,İŽŸ,İfGf%o [‘l,İ,ĉ,,ê,©,đ•Ô,· B

- DPERR_APPNOTSTARTED**
- DPERR_BUFFERTOOLARGE**
- DPERR_GENERIC**
- DPERR_INVALIDINTERFACE**
- DPERR_INVALIDOBJECT**
- DPERR_INVALIDPARAMS**
- DPERR_OUTOFMEMORY**
- DPERR_TIMEOUT**

dwFlags
—\-ñ,³,ê,Ä,ĉ,é B0,Â,È,,Ä,Í,È,ĉ,È,ĉ B

dwAppID
f fr [EfNf%ofCfAf“fg,³ĈÄ,Ñ o,· ê ‡ A Ú± Ý’è,đŽæ“¾,·,éfAfvfŠfP [fVf‡f“,đŽ-•Ê,·,é if fr [EfN
f%ofCfAf“fg,İ,ĉ,,Ä,©,İfAfvfŠfP [fVf‡f“,Æ’Ê M,·,é j BfAfvfŠfP [fVf‡f“,³ĈÄ,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**,©,ĉŽæ“¾,³,ê,é B

lpData
‘— M,·,éf fbfZ [fW,đŠÜ,Đfobftf@,Ö,İ|fCf“f^ B

dwDataSize
fobftf@,İfTfCfY,đfofCf’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,c,,ê,©,đ•Ö,· B

DPERR_GENERIC

DPERR_INVALIDINTERFACE

DPERR_INVALIDOBJECT

DPERR_INVALIDPARAMS

DPERR_OUTOFMEMORY

dwFlags

—\-ñ,³,ê,Ä,c,é B0,Ä,È,,Ä,Í,È,ç,È,c B

dwAppID

f fr [EfNf%oCfAf“fg,ªÆÄ,Ñ o,· ê ‡ A Ú‘± Ý’è,đŽæ“¼,·,éfAfVfŠfP [fVf‡f“,đŽ-•Ê,·,é if fr [EfN
f%oCfAf“fg,Í,c,,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,c ifAfVfŠfP [fVf‡f“,Í A,Đ,Æ,Ä,İf fr [EfNf%oCfAf“fg,Æ,µ,©’Ê M,µ,È,c j B,±
,İID”Ö †,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^“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,İÆÄ,Ñ o,µ,ÄŽw’è,³,ê,½fCfxf“fg,đ•İ X,·,é,±
,Æ,ª,Ä,«,é B

-Æ÷,·,ê,İDD_OK AŽ,“s,·,ê,İŽŸ,İfGf%o [‘l,İ,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^,İ0,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 \‘c’Ì, Í“Ç, Ý o, µ ê—p, Ä, , é B*

dwSize

DPCAPS \‘c’Ì, ÌfTfCfY, ðf of Cf g’P’Ê, ÄŽw’è, , é Bf AfvfŠfP [fvf±f“ , IDPCAPS \‘c’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 fof 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 fof 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 fof Cf _ , °fTf| [fg, µ, Ä, ©
, é A, , é, ©
, ÌDirectPlay, °•Û Ø, È, µ, ÌfT [frfX Ef vf fof Cf _ ã, ÈfCf“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 fof Cf _ , Í AfZfbfVf±f“ , Ö, Ì Ú‘±, °Ž’, í, ê, ½, ±
, Ä, ðĒÿ o, Ä, «, é B

dwMaxBufferSize

, ±, ÌfT [frfX Ef vf fof 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 fof Cf _ , Ì , , ’è”½%ožžššÖ, ðf~fš•b, ÄŽw’è, , é BDirectPlay, , ”½%ožžššÖ, ð , , è, Ä, «, È, © ê ± A, ±
, Ì’l, Í, Ä, , é BfT [frfX Ef vf fof 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,¿,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_,̀fTfCfY,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^fCfEfAfEfg’l B’Ē iDirectPlay,Í Af fbZ [fW,Ì%ž“š,ð’Ò,Ā,Æ,«,É,±
,̀f^fCfEfAfEfg’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_RTSEFLOW 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`·,·,é,Ä,¢,é B

DPLAPPINFO

```
typedef struct DPLAPPINFO {
    DWORD dwSize;
    GUID guidApplication;
    union
    {
        LPSTR lpszAppNameA;
        LPWSTR lpszAppName;
    };
} DPLAPPINFO, * LPDPLAPPINFO;
```

fCfWfXfgfŠ,ÉŠi”[³,ê AIDirectPlayLobby::EnumLocalApplicationsfR [f<fofbfNŠÖ ”,É“n,³,ê,é AfAfvfŠfP [fVf
‡f“,É,Á,c,Ä,İ î•ñ,đŠŮ,p B

dwSize

DPLAPPINFO \‘c‘î,îTfCfY,đfofCfP^Ê,ÂŽw’è,.,é BfAfvfŠfP [fVf‡f“,ÍDPLAPPINFO \‘c‘î,đŽg—p,.,é‘O,É,±
,îf f“fo,đ 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,đŽ,·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;
    LPDPSESSIONDESC2 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 î•ñ,đŠÜ,Đ B

dwSize

DPLCONNECTION \‘c’ì,ÌTfCfY,đfofCf’P’Ê,ĂŽw’è,·,é BfAfVfŠfP [fVf‡f“,ÍDPLCONNECTION \‘c’ì,đŽg—p,·,é‘O,É,±,Ìf f“fo,đ Ý’è,μ,È,·,Ă,Í,È,ç,È,‘c B,»„,Ă,È,‘c 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,‘fZfbfVf‡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 ¬,Û,½,ÍŽQ%Ă,·,é fZfbfVf‡f“,đ•\,· DPSESSIONDESC2 \‘c’ì,Ö,Ìf|fCf“f^ B

lpPlayerName

fVf(CfCf,, ì ¬ŽŽ,ÉŽg—p,³,ê,é—¼‘O,đŽ’,· DPNAME \‘c’ì,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,·,é fT [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 î•ñ,đŠÜ,ĐDirectPlayfAfhf(CfX,Ö,Ìf|fCf“f^ B

dwAddressSize

fAfhf(CfX Eft [f^,ÌTfCfY,đfofCf’P’Ê,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,ÌDirectPlayfGf“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,»,»,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%oO,Ì’g,Ý ±,í,¹ B

DPSESSION_JOINDISABLED

V,µ,çfAfVfŠfP [fVfzf“i,±,ÌfZfbfVfzf“i,É%°Ä,í,é,±
,Æ,ª,Ä,«,È,ç B DOPEN_JOINftf%oO,Æ,±
,ÌfZfbfVfzf“ EfCf“fXf^f“fX,ÌfOf [fof< Eftfj [fNŽ~•ÈŽq 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%oO,ªŽw’è,³,ê,Ä,ç
,È,~.ê,Í AfZfbfVfzf“ EfVfÆfCf,, ”,Ì §ÆÄ,É’B,.,é,Ü,Ä A V,µ,ç
fŠf, [fg EfAfVfŠfP [fVfzf“i,ÍfZfbfVfzf“i,ÉŽQ%°Ä,.,é,±
,Æ,ª,Ä,«,é B

DPSESSION_KEEPLIVE

fŠf, [fg EfVfÆfCf,,ªQ [f€,ðÛ í I—¹,µ,½,±
,Æ,ðŽ@“@I,ÉÆÛ o,.,é B,±
,ê,ç,ÌfVfÆfCf,,ÌfZfbfVfzf“i,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“i,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%oO,ªŽw’è,³,ê,Ä,ç
,È,~.ê,Í ADirectPlay,Í,±,Ì<@”\,ðfTf] [fg,µ,È,ç B

DPSESSION_MIGRATEHOST

Æ> Ý,ÌfZfXfg,ª I—¹,.,é ê ± A V,µ,çfVfÆfCf,,ÌŽQ%°Ä,ð±,~.é,±
,Æ,ª,Ä,«,é,æ,ª,È Afzfxfg,ð•È,ÌfRf“fsf... [f^,É’Ú,»,µ,Æ,.,é B,±
,Ìftf%oO,ªŽw’è,³,ê,Ä,ç
,È,~.ê,Í Afzfxfg,ÍÚ“@,¹, A V,µ,çfVfÆfCf,,ð ì ~,.,é,±
,Æ,Í,Ä,«,È,ç B

DPSESSION_NEWPLAYERSDISABLED

V,μ,ϕfvfϕfCf,,δfZfbfVf±f“É ì ¬,À,«È,ϕ,±,Æ,δŽ!,· B
fAfvfŠfP [fvf±f“,±
,ìfZfbfVf±f“,É‘Î,μ,À**IDirectPlay2::CreatePlayer**
f f\fbfh,ðEÀ,Ñ o,μ,À,à A•K,,fGf%o [,Æ,È,é B V,μ,ϕfAfvfŠfP
[fvf±f“,afZfbfVf±f“,ÉŽQ%oÁ,·,é,±,Æ,à,À,«È,ϕ B,±
,ìftf%ofo,“Žw’è,³,è,Ä,ϕ
,È,¬,è,Î AfZfbfVf±f“ EfvfϕfCf,, ”,ì §EÀ,É’B,·,é,Ü,ÄfvfϕfCf,,
ð ì ¬,·,é,±,Æ,“À,«,é B

DPSESSION_NODATAMESSAGES

**IDirectPlay2::SetPlayerData AIDirectPlay2::SetGroupData AIDirect
Play2::SetPlayerName AIDirectPlay2::SetGroupName**f f\fbfh,É,æ,Ä
,ÄfŠf, [fg EfvfϕfCf,, Eff [f^,âfŠf, [fg EfOf< [fv Eff [f^,“
İ X,³,è,½,Æ,« AfVfXfef€ Ef fbfZ [fW,ð‘— M,μ,È,ϕ B,±
,ìftf%ofo,“Žw’è,³,è,Ä,ϕ
,È,¬,è,Î Af f [f^,İ•İ X,ðŽ!,·f fbfZ [fW,“ ¶ ¬,³,è,é B

DPSESSION_NOMESSAGEID

f fbfZ [fW,ì‘—
MŽÖ,ÆŽó MŽÖ,ðŽ!,·ff [f^,ðf fbfZ [fW,É•t%oÁ,μ,È,ϕ B,±
,ì îñ,“ d—v,À,È,¬,è,Î Af fbfZ [fW Efl [fo [fwfbfh,ð B—
ñ,·,é,±
,Æ,“À,«,é B i Ú ×,İ**IDirectPlay2::Receive**f f\fbfh,ðŽQ Æ j,±
,ìftf%ofo,“Žw’è,³,è,Ä,ϕ,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,Ä,ϕ,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“,Ä<¬,³,è,é Ä‘âfvfϕfCf,, ” B

dwCurrentPlayers

,±,ìfZfbfVf±f“,İE» Ý,İfvfϕfCf,, ” B

lpszSessionName and lpszPassword

fZfbfVf±f“,ì¼¼‘O,ÆfpfXf [fh,ðŠÜ,ðUnicode•¶Žš—ñ,Ö,İf|fCf“f^ B,±
,ìf f“fo,İ**IDirectPlay2**fCf“f^ [ftfFfCfX,ðŽg—p,μ,Ä,ϕ,é è †,İ,ÝŽg—p,·,é B

lpszSessionNameA and lpszPasswordA

fZfbfVf±f“,ì¼¼‘O,ÆfpfXf [fh,ðŠÜ,ðANSI•¶Žš—ñ,Ö,İf|fCf“f^ B,±
,ìf f“fo,İ**IDirectPlay2A**fCf“f^ [ftfFfCfX,ðŽg—p,μ,Ä,ϕ,é è †,İ,ÝŽg—p,·,é B

dwReserved1 and dwReserved2

«—,İ,½,ß,È—\—ñ,³,è,Ä,ϕ,é B

dwUser1, dwUser2, dwUser3, and dwUser4

fZfbfVf±f“,ì,½,ß,İfAfvfŠfP [fvf±f“EÄ—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,^a I—

¹,µ AfAfvfŠfP [fVf‡f“,ªŠJŽn,µ,½,±,Æ,ð·\,· B

DPLSYS_CONNECTIONSETTINGSREAD

IDirectPlayLobby::RunApplication f fbfh,^a Ú± Ý’è,ð“Ç,Ý o,µ

AfAfvfŠfP [fVf‡f“,ªŠJŽn,µ,½,±,Æ,ð·\,· B

DPLSYS_DPLAYCONNECTFAILED

IDirectPlayLobby::RunApplication,^a fZfbfVf‡f“,Ö,Ì Ú±

,ÉŽ,”s,µ AfAfvfŠfP [fVf‡f“,ªŠJŽn,µ,½,±,Æ,ð·\,· B

DPLSYS_DPLAYCONNECTSUCCEEDED

IDirectPlayLobby::RunApplication,^a fZfbfVf‡f“,ð ì ¬,µ,Ä¼,ÌfAfvf

ŠfP [fVf‡f“,ðŽQ%oÁ,^{3,1} é €”ð,^a Á,«,½,© AfZfbfVf‡f“,Ö,ÌŽQ%oÁ,^a

—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,î 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,Ïf fbfZ [fW,ð'— M,·,é B

dwType

f fbfZ [fW,ðŽ•Ê,·,é B,±
,Ïf 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,ÏfOf< [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,,Ïfvf€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|fCf“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 î•ñ,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 fbZ [fW,Ì îñ,ðŠÜ,Þ B fVfXfef€
,Í Afvf€fCf,,âfOf< [fv,ªfZfbfVf‡f“,É í œ,³,ê,½,Æ,«,É,±,ê,ç,lf fbZ [fW,ð— M,·,é B

dwType

f fbZ [fW,ðŽ•Ê,·,é B,±,lf f“fo,É,ÍDPSYS_DESTROYPLAYERORGROUP,ªfZfbfg,³,ê,é B

dwPlayerType

f fbZ [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 í œ,³,ê,½,©,ðŽ!,· B

lpLocalData

,±,lfvf€fCf,,Ü,½,ÍfOf< [fv,ÉŠÖ~A•t,¯,ç,ê,½f [fJf< Eff [f^,Ö,lf|fCf“f^ B

dwLocalDataSize

f [fJf< Eff [f^,lfTfCfY B

lpRemoteData

,±,lfvf€fCf,,Ü,½,ÍfOf< [fv,ÉŠÖ~A•t,¯,ç,ê,½fŠf, [fg Eff [f^,Ö,lf|fCf“f^ B

dwRemoteDataSize

fŠf, [fg Eff [f^,lfTfCfY B

ŽQ Æ @IDirectPlay2::DestroyGroup, IDirectPlay2::DestroyPlayer

DPMSG_GENERIC

```
typedef struct{  
    DWORD dwType;  
} DPMSG_GENERIC, *LPDPMSG_GENERIC;
```

,±,ì \‘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,Û,è AlpidFromfpf%of [f^,É,æ,Á,ÄŽ!,³,ê,½’l,°DPID_SYSMSG,  
É“™,µ,ç,Æ,« j A,Û,,-  
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, ÌfZfbfVf‡f“ E_{fzfXfg},^afZfbfVf‡f“, ð I⁻¹, ·, é, Æ, « A, ±, Ìf fbfZ [fW, ÍfzfXfg”C-±, ðEp³, ·, éfRf“fsf...
[f^, Ì ã, Ì, ·, ×, Ä, ÌfvfÆfCf,, É‘— M, ³, ê, é B

DPMSG_SESSIONLOST

```
typedef DPMSG_GENERIC DPMSG_SESSIONLOST;  
typedef DPMSG_SESSIONLOST *LPDPMSG_SESSIONLOST;
```

```
fZfbfVfzf+“†,ì¼,ì,·,×,Ä,ÌfvfCfCf,,,Ö,Ì Ú±,ªŽ,,í,ê,½,Æ,« ADirectPlay,É,æ,Á,Ä,±  
,Ìf fbfZ [fW,ª ¶ ¬,³,ê,é BfZfbfVfzf“,ªŽ,,í,ê,½ÆÄ,Ì AfŠf, [fg EfvfCfCf,,,Éf fbfZ [fW,ð—,é,±  
,Æ,Í,Ä,«,È,¢ B,µ,©,µ AfZfbfVfzf“,ªŽ,,í,ê,½ŽŽ“_,ì,·,×,Ä,Ìff [f^,ª,Û,¾—LÆø,Ä, ,é B,±  
,Ìf fbfZ [fW,ðŽó, ¯Žæ,Á,½,ç AfAvfŠfP [fVfzf“,Í¬,â,©,É•æ•Æ,µ A I—¹,·,é,×,«,Ä, ,é B
```

DPMSG_SETPLAYERORGROUPDATA

```
typedef struct {
    DWORD dwType;
    DWORD dwPlayerType;
    DPID dpId;
    LPVOID lpData;
    DWORD dwDataSize;
} DPMSG_SETPLAYERORGROUPDATA, *LPDPMSG_SETPLAYERORGROUPDATA;
```

C DPSYS_SETPLAYERORGROUPDATA fVfXfef€ Ef fbfZ [fW,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 [fvf±f““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 [fvf±f“,ªšf, [fg Efvf€fCf,,âfšf, [fg EfOf< [fv,Ìff [f^,ð•İ X,µ,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,-

IDirectPlay2::GetGroupData,Û,½, **IDirectPlay2::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,¢
,éfZfbfvf±f“,Ä,Í A,±,Ìf fbfZ [fW,Í ¶ ¬,³,ê,Ë,¢ B

ŽQ Æ @IDirectPlay2::GetGroupData, IDirectPlay2::GetPlayerData, IDirectPlay2::SetGroupData,
IDirectPlay2::SetPlayerData

DPMSG_SETPLAYERORGROUPNAME

```
typedef struct {
    DWORD dwType;
    DWORD dwPlayerType;
    DPID dpId;
    DPNAME dpnName;
} DPMSG_SETPLAYERORGROUPNAME, *LPDPMSG_SETPLAYERORGROUPNAME;
```

DPSYS_SETPLAYERORGROUPNAME fVfXfef€ Ef fbfZ [fW,Ì î•ñ,ðŠÛ,Þ 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,Þ \‘¢‘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**IDirectPlay2::GetPlayerName**f f\fbfh,ðŽg—p,•,é,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 @**IDirectPlay2::GetGroupName**, **IDirectPlay2::GetPlayerName**, **IDirectPlay2::SetGroupName**,
IDirectPlay2::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 à¾,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—žˆo,© AŠÔ^á,Á,½fPfXf [fh,ª—^,¹,ç,ê,½ B

DPERR_ACTIVEPLAYERS

—LÆø,ÈfvfÆfCf,,ª“¶ Ý,·,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@,ª“â,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,,ðfZfbfVf‡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,,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,č B

DPERR_NOCAPS

DirectPlay,“Žg,“,µ,Ä,č,é’È MfŠf“fN,Í A,±
,İŠÖ ”,Ä,ÍŽÄ s,Ä,«,È,č B

DPERR_NOCONNECTION

’È MfŠf“fN,“Šm—š,3,ê,Ä,č,È,č B

DPERR_NOINTERFACE

,±,lfCf“f^ [ftfFfCfX,ÍfTf| [fg,3,ê,Ä,č,È,č B

DPERR_NOMESSAGES

Žó M,3,ê,½f fbfZ [fW,a,È,č B

DPERR_NONAMESERVERFOUND

fl [f€fT [fo ifzfXfg j,“E©,Á,©,č,È,č BvfEfCf,,ì ì ¬,É,ÍfzfXf
g,“K—v,Á, ,é B

DPERR_NOPLAYERS

,±,lfZfbfVf±f“,É,Í—LCEø,ÈfvfEfCf,,“a,č,È,č B

DPERR_NOSESSIONS

,±,lfQ [f€,É,ÍŠù“¶,lfZfbfVf±f“,“a,È,č B

DPERR_NOTLOBBIED

IDirectPlayLobby::RunApplication,É,æ,Á,ÄfAfvfŠfP [fVf±f“,“ŠJžn,3,
è,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,č B

DPERR_PLAYERLOST

fZfbfVf±f“,É Ú±,µ,Ä,č,½fvfEfCf,,“a,č,È,È,Á,½ B

DPERR_SENDTOOBIG

IDirectPlay2::Sendf f\fbfh,É“n,3,ê,½f fbfZ [fW Efofbftf@,“<—
%oÁ,3,ê,Ä,č,é,æ,è,à’ã,«,č B

DPERR_SESSIONLOST

fZfbfVf±f“,Ö,ì Ú±,“Ž,“í,è,½ B

DPERR_TIMEOUT

Žw’è,3,ê,½žžššô“à,É ^— ,“ I—1,µ,È,©,Á,½ B

DPERR_UNAVAILABLE

—v< ,3,ê,½ššÖ ”,ÍE» Ý—LCEø,Á,Í,È,č 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,č 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

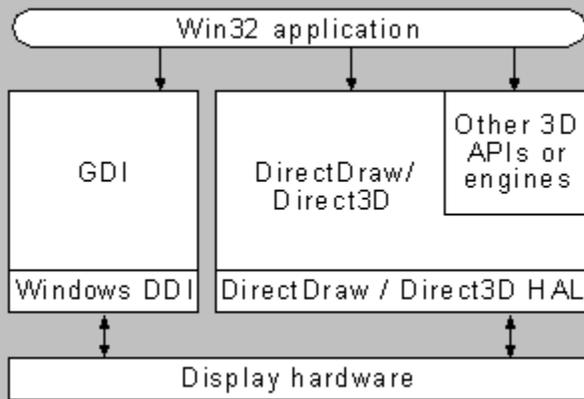
Direct3D, É, Â, ç, Ä

Microsoft, ĨŠg'£3DfOf%oftfBfbfNfX Ef\vfŠf...

[fVf#f“É, Ĩ ADirect3D™, ĩ, æ, ĩOpenGL, ĨAfvfŠfP [fVf#f“ Efvf fOf%of~f“fO EfCf“f^ [ftfFfCfX iAPI j, aŠ
Ü, Ü, ê, Ä, ç, é B

ŽŸ, Ĩ }, Ĩ AWindows, ĨfOf%oftfBfbfNfX EfVfXfef€ , Æ AWin32@

API, ÄL q, 3, ê, ½fAfvfŠfP [fVf#f“ A, » , Ĩ¼, ĨWindowsfVfXfef€ A, ĩ, æ, ĩfn [fhfEfFfA, Æ, ĨŠÖEW, đŽ!, µ, ½, à, Ĩ, 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€,ÄfCf“f^f%ofNfefBfu,È3D<Z p,Ä,·,é BDirect3D,Í ,‘-“® ì, ð‘æ^ê,ÉffUfCf““³,è,Ä,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,Ä,Ä Afp [f\if< EfRf“fsf... [f^,Ì »“CE³,Í3DfOf%oftfBfbfNŠÄ<<«ð,·,®,ÉfTf [fg,·,é,± ,Æ,“Ä,« AfGf“fh Ef† [fU,“fVfXfef€,ÉfnfCfGf“fh,È3DfOf%oftfBfbfNŠÄ<<«ð’Ç%oÄ,·,é,± ,Æ,àŠÈ’P,É,È,é BfVfXfef€,Í,Í,·,©,Éf f,fŠ,µ,©•K—v,Æ,µ,È,Ç,½,ß AfCf“fXfg [f< Í,ÿ,Ì,Û,Æ,ñ,Ç,ÌRf“fsf... [f^ EfVfXfef€ ã,Ä%oð“K,È“® ì,·,é B

Direct3D,ÍfŠfAf< Ef^fCf€ 3D
fof%oftfBfbfNfX EfT [frfX,ÌŠ®‘SfZfbfg,Ä,·,è Af\ftgfEfffA Efx [fX,Ì ,‘-,ÈfCEf“f_Šf“fo EfpfCfvf%ofC f“ i•İŠ· A Æ¾ Af%ofXf^ ^—
j,â Afn [fhfEfffA EfAfNfZf%ofC [f^,Ö,Ì”¼ Ú“I,ÈfAfNfZfX,ðŽÄCE»,·,é BAPIfT [frfX,É,Í A“ ^è,³,è,½ ,fCEfxf<,È•ÛŽ f, [fhAPI,Æ A’áfCEfxf<,È”¼ Úf, [fhAPI,“è,è ADirect3D,ðŽg—
p,µ,Ä3Dfn [fhfEfffA EfAfNfZf%ofC [f^,ÉfAfNfZfX,·,éVfXfef€,ðfTf [fg,·,é BDirect3D,ÍŠ®‘S,ÉfXfP [f%ofuf<,Ä Afn [fhfEfffA,Í ADirect3D,È,æ,Ä,Ä3DfCEf“f_Šf“fo EfpfCfvf %ofCf“Íê”,Û,½,Í‘S”,ð ,‘-%o»,·,é,± ,Æ,“Ä,«é BDirect3D,Í AZfobftf@fŠf“fo AfAf“f`fGfCfŠfAfVf“fo AfAf<ftf@ EfufCEf“ffBf“fo Af~fbfv f}fbfv AfGftfFfNfg A ³Šm,Èfp [fX,È,æ,éfefNfXf`ff Ef} fbfsf“fo,È,Ç,Ì A3Dfn [fhfEfffA EfAfNfZf%ofC [f^,ÌŠg’Efof%oftfBfbfNfX”\—Í,ð ¶,©,·,± ,Æ,“Ä,«é BDirect3D,Í¼,ÌDirectXfefNfmf fW [,ÆŠ®‘S,È“ ‡,³,è,Ä,Ç,é,½,ß Afrffl Ef} fbfsf“fo A2D,ÌfI [fo [fCEfC EfvfCE [f“,Ä,Ì3DfCEf“f_Šf“fo AfXfvf%ofCfg,Æ,Ç,Ä,½Šg’E<@”,à“< Ú,µ,Ä,Ç ,é B,± ,è,É,æ,Ä,Ä AfCf“f^f%ofNfefBfu,Èf ffbfA Ef^fCfGf<,Ä AfV [f€fCEfX,È2D,Æ3D,Ìfof%oftfBfbfNfX,ðŽg— p,·,é,±,Æ,“Ä,«é B

Direct3D,ÌfCf“fvfŠf f“fg•û-@,É,Í A•ÛŽ f, [fh,Æ”¼ Úf, [fh,Æ,Ç,µ A,Û,Ä,½,^Û,È,é ,Ó,½,Ä,Ìf, [fh,“è B•ÛŽ f, [fh,Í AfAvfŠfP [fVf‡f““fof%oftfBfbfN Eft [f^,ð•ÛŽ ,·,é ,fCEfxf<API,Ä,·,é B”¼ Úf, [fh,Í AfAvfŠfP [fVf‡f““¾Ž,“I,ÉŽÄ sfobftf@,Éff [f^,ð o—Í,·,é’áfCEfxf<API,Ä,·,é B ,±,Ì Í,Ä,Í ADirect3D,Ì”¼ Úf, [fh,Æ•ÛŽ f, [fh,È,Ä,Ç,Ä à¾,·,é,Æ,Æ,à,È ADirect3D,ð’È,µ,Ä—~p,·,é,± ,Æ,“Ä,«éfn [fhfEfffA EfAfufXfgf%ofNfVf‡f“ i’Š Û%o» j,ÆfGf~f...fCE [fVf‡f“É,Ä,Ç,Ä,àŽæ,èµ,µ B

•ÛŽ f, [fh

”¼ Úf, [fh

fn [fhfEfffA EfAfufXfgf%ofNfVf‡f“ i’Š Û%o» j,ÆfGf~f...fCE [fVf‡f“

•ŮŽ f, [fh

Direct3D,ŮŽ f, [fhAPI,Í A3DfIfufWfFfNfg,Ů€ ì,Æ3DfOf%oftfBfbfNfX,Ů ^— ,Ů,½,ß,É ÝEv,³,ê,Ä,¢
,é B•ŮŽ f, [fh,ð—p,¢,ê,Ů AŠù“Ů,Ů WindowsfAfvfŠfP [fVf‡f“,Ö,Ů3D<@”\
,ŮÇ%oÁ,â A V,µ,¢3DfAfvfŠfP [fVf‡f“,Ů ì ¬,ð—e^Ö,É s,µ,±,Æ,³,Ä,«„é B•ŮŽ f, [fh,É‘g,Ý ž,Ü,ê,Ä,¢
,éfWfIf fgfŠ EfGf“fWf“,Í AfL [ftf€ [f€ EfAfjf [fVf‡f“,Ů,æ,µ,ÈŠg‘£@”\,ðfTf|
 [fg,µ,Ä,“„è AfIfufWfFfNfg Eff [f^fx [fX,Ů ì ¬,âfIfufWfFfNfg,Ů“à” \‘¢Ů,ŮŠÇ— ,ð•K—
v,Æ,µ,È,¢ B,Ä,Ü,èfAfvfŠfP [fVf‡f“,Í A’è^ Ĩ,Ý,Ů3D
fIfufWfFfNfg,ðf [fh,.,éCEÄ,Ů o,µ,ð1%oñ s,Ů,Ů AAPI,“ñ<Ů,·,éŠÈ’P,Èf f\fbfh,ðŽg—
p,µ,Ä AfŠfAf<f^fCf€ EfV [f“,ŮfIfufWfFfNfg,ð“à”,ŮfWfIf fgfŠ EfGf“fWf“,ð^ŮŽ~,Ů,.,É‘€ ì,Ä,«„é,æ,µ
,É,È,é B

•ŮŽ f, [fh,Ů¼ Úf, [fh,Ů 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 «—^,Ůfo [fWf‡f“,ŮWindows,É•ŮŽ f, [fh,ð‘g,Ý“ü,ê,é—’è,Ä, ,é B Ů,µ,-
,Ů DirectDraw v,“„æ,Ů ufCf“fgf f_fNfVf‡f“:Direct3D,ŮŽ f, [fh EfIfufWfFfNfg v,ðŽQ Æ,³,ê,½,¢ B

'¼ Úf, [fh

Direct3D, Ì¼ Úf, [fh, Í A Microsoft, Ìá fCfxf<3D API, Á, , é B'¼ 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 A Windows fIfyfC [fefBf“fO EfVfXfef€ ã, ĀŽÀC», ., é, ±, Æ, ª, Ā, «, é B

'¼ Úf, [fh, Í Afn [fhEfFFA<@”\, Ö, ÌfAfNfZfX, ð%Ā”\ , É, ., éfŠfAf<f^fCf€3DfAfNfZf%ofC [f^, Ì ã, ÉĚu, ., é A”-, cfCfCf, ,, Ā, , é B, Ü, ½ Afn [fhEfFFA, ª”ñ<Ÿ, µ, È, C<@ ”\, É, Ā, c, Ā, à A Ā , Ìf\ftfgfEfFFA EfCf“f_Šf“fO, ð”ñ<Ÿ, ., é ê ‡, ª, , é B'¼ Úf, [fh, Ā, Í AŠJ”- ŽŌŽ© g, ÌfCf“f_Šf“fO<Z p, â€ ì<Z p, É _“ ĭ «, ðŽ , ½, 1, é, ±, Æ, ª, Ā, «, é B

'¼ Úf, [fh, Æ, Í A'áfCfxf<, ĀfAfNfZf%ofC [f^ Efn [fhEfFFA, Æ'Ê M, ., é, ½, ß, Ì AfffofCfX, ÉĚ“¶, µ, È, C•û— @, Ā, , é B

•ŮŽ f, [fh, Æ”Û, È, è A'¼ Úf, [fh, ÍfWfIf fgfŠ EfGf“fWf“, ð”ñ<Ÿ, µ, È, C B, ±, Ì, ½, ß A'¼ Úf, [fh, ð—~— p, ., éfAvfŠfP [fVf‡f“, Í A“ÆŽ©, ÌfIfufWfFfNfg, â%œ—Ê §Cäf< [f`f“, ð—p^Ó, µ, È, - , Ā, Í, È, ç, È, C B, µ, ½, ª, Ā, Ā A'¼ Úf, [fh, ðCø—, “I, É—p, c, é, ½, ß, É, Í A3DfOf%oftfBfbfN, Ìvf fOf%of~f“fO, É, Ā, c , Ā, Ì *ª, È”mŽ—, ªK—v, Ā, , é B

Direct3D, ÍOLEfRf“f [flf“fg EfIfufWfFfNfg Ef, fff< iCOM j, ÉŠĭ, Ā, c, Ā, ., è A DirectDraw, ÆŠ@‘S, É“ ‡, ª, è, Ā, c , é B Microsoft, Í A «—^, Ìfo [fWf‡f“, ÌWindows, ÉDirect3D, ð’g, Ÿ ž, Ð—\`è, Ā, , 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%NfVf#f“(Š Ū%»),ÆfGf~f...fŒ [fVf#f“

Direct3D API,Í A`¼,ÌDirectX API,Æ“—

l,É Afn [fhfEFFFfA EfAfufXfgf%NfVf#f“ EfŒfCf,, iHAL j,Ì ã,É`g,Ý ž,Ü,ê,Ä,Œ
,é BHAL,Ífn [fhfEFFFfA,ÌfffofCfX`È`¶ «,ð%B•Á,·,é BDirect3D HAL,É,æ,Á,ÄfTf|

[fg,³,ê,È,Œ•”•,Í Afn [fhfEFFFfA EfGf~f...fŒ [fVf#f“ EfŒfCf,, iHEL j,É,æ,Á,Ä•âŠ®,³,ê,é B Direct3D

HEL,Í Afn [fhfEFFFfA,³ñ<Ý,µ,È,Œ<@”\,ðf\ftfgfEFFFfA“l,ÉfGf~f...fŒ [fg,·,é B,±

,ê,Œ,Ìfn [fhfEFFFfA EfAfufXfgf%NfVf#f“ i`Š Ū%» j,ÆfGf~f...

fŒ [fVf#f“,Ì`g,Ý †,í,¹,É,æ,Á,Ä AAPIfT [ftrfX,³,Ä,È,É~—p,Ä,«é,æ,µ,É,È,Á,Ä,Œ,é B

Direct3D HAL,Í ADirectDraw HAL,âGDIffBfXfvfŒfC Efhf%ŒfCfo,ÆŠ®`S,É“ †,³,ê,Ä,Œ

,é BHAL,Í AMicrosoft,ÌfO%oftfBfbfNAPI,Ö,Ì`P`êfCf“f^ [ftfFfCfX,Æ A3DfAfNfZf%Œ [f^,Ì“ ^ê,³,ê,½fhf%Œ

Cfo Ef,ftf<,ðfn [fhfEFFFfA »i,É`ñ<Ý,·,é Bfn [fhfEFFFfA »i,Í ADirect3D,âDirectDraw AGDI AOpenGL,ð ,`¬

%»,,éfhf%ŒfCfo`P`l,Ì,Ý,ð—

p`Ó,·,ê,Ì,æ,Œ Bfhf%ŒfCfo,É,æ,Á,Ä Afn [fhfEFFFfA,Í AfWfIf fgfŠ•İŠ•,ðŠÜ,ð3DfO%oftfBfbfNfX,ÌŒf“f_fŠf“f

O EfpfCfv A3DfNfŠfbsf“fO Af%ŒfXf^ ^— ,İ`S•”,Ü,½,İ`ê•”,ð ,`¬%»,,é,±,Æ,³,Ä,«é BDirect3D

HAL,Í AŒ» Ý~—p,Ä,«éOf%oftfBfbfN EfAfNfZf%Œ [f^,É%Œ,| A «—,Ì,à,Ì,É,à`Î%ž,Ä,«é,æ,µ

,É ÝŒv,³,ê,Ä,Œ,é B

DirectDraw

DirectDraw,Í A f f B f X f v f C f C,É f O f % o f t f B f b f N f X,ð·Ž!,·,é 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,¢ A f X f € [f Y,È f A f j f [f V f † f “,ðŽÀ€»,·,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 AŠù‘¶,ì f ^ f C f g f <,ìWindows,Ö,ìÚ A,ð’ZŠúŠÔ,ì,µ,¿,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,¢,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^È'u,·,é”-,¢ 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^È·¶,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,¢ ,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,b—\’è,Á, ,é B Û,µ,,Í uDirectDraw,É,Á,¢,Ä v,ðŽQ Æ,³,è,½,¢ 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%oæ“œ ^—
,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 BŒ» Ý,ÌOpenGL,Í AOpenGL—
p,É ÝŒv,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 Efšf... [fVfšf“,đñ<Ÿ,µ ADirect3D API,đ’Ê,µ,Ä’á%
¿šI,È3Dfn [fhEfFfA iOpenGL,ª•K—v,Æ,·,é ,—š,È đŒ ,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 [fhEfFfA,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

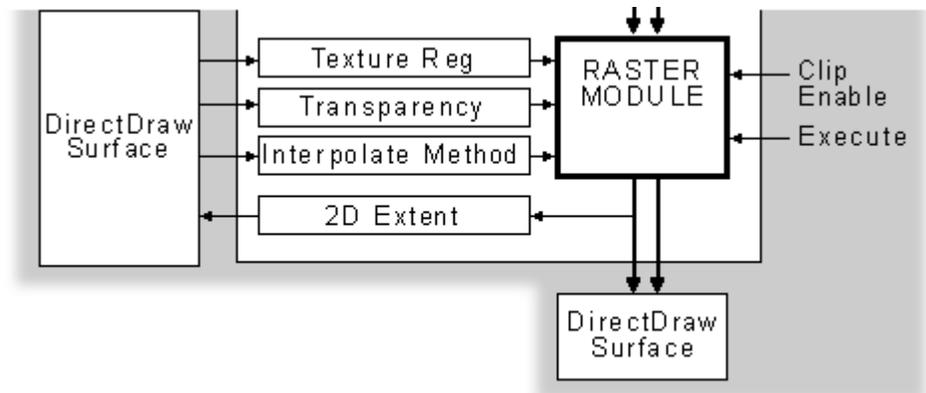
Direct3D, ĩrfWf†f“

Direct3D, ĩ A Windows,“@ ĩ, ., éfRf“fsf... [f^ ã, Ā Af [f<fhf fCfh, ÈfQ [f€ , áfCf“f^f%NfefBfu, È3DfOf%ftfBfbfNfX, ðŽÀĈ», ., é, ½, B, È ÝĈv, ³, è, Ā, ĉ , é BDirect3D, ĩ AfffofCfX, ÈĒĒ, μ, ½3DfrffI EfffBfXfvfĈfC Efn [fhfEfFfA, Ö, ĩfAfNfZfX, ð AfffofCfX, ÈĒĒ ‘Œ, μ, È, ĉ, ũ-@, Ā, ñ, Ÿ, ., é-ðŠ,, ð’S, Ā, Ā, ĉ, é BfAfVfŠfP [fVf†f“, ĩ AfefNfXf^ff Ef} fbfsf“fO, ā 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@ŠĈ— 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, àžg—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•ĩŠ• A3DfNfŠfbfsf“fO A Ā— ¾Ĉœ%œÈ, 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%œ”, ³, è, ½3DfĈf“f_Šf“fO EfpfCfvf%ofCf“, ĩ, ., ×, Ā, ðf\ftfgfEfFfA“I, ÈfCf“fvfŠf f“fg, ., é, ± , Ā, , Ā, «, é B, ± , ĩfpcfVf%ofCf“, ĩrè”, Û, ½, ĩ“S”, ĩ”CÓ, ĩfvf fZfX, ĩ AfN [fhfEfFfA EfAfNfZf%ofĈ [f^, È, æ, Ā, Ā ^— , ., é, ± , Ā, , %œĀ”, 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

, ±, ĩfZfNfVf†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, — %œð, 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



Šef,fWf... [f<,Í Afn [fhEfFfA“I,É ,‘-‰»,·,é,±,Æ,à Af\ftfgfEfFfA“I,ÉfGf~f...fŒ [fg,·,é,±,Æ,à‰‰”,Á, ,é B
 ,Û,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,±,é,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 [fŒŠÔ,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,èšfAf<,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•Û,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,ç,Ä Ý’è,µ,½ ó’Ô,ð,»,è,¼,è•ÛŽ ,µ,Ä,ç ,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,ç,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 ,çCefxfç,Ä @ i,.,é B

ŽÀ sfobftf@,Í AŠ@’S,ÉŽ©CEÈ“à•iCE^,Ì A“Æ—§,µ,½ îñ,ÌfpPfbfg,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 ifIfyFR [fh j,Æ A,±,ÌfIfyFR [fh,ª€ ì,.,éff [f^,ç \ -,³,è,Ä,ç ,é BDirect3D,ÌfIfyFR [fh,Í **AD3DOPCODE**—ñ“CE^,É’èç’,³,è,Ä,ç,é BŽÀ sfobftf@“à,Ì—½— B,Í **AD3DINSTRUCTION** \ç’i,ÉŠ”[,³,è,Ä,“,è AfIfyFR [fh AŠe—½—Bf [f^ Ef†fjfbfg,ÌTfCfY A,»,ÌCEÄ,É’±, -ŠÖ’Aff [f^ Ef†fjfbfg,Ì ”,ªŠÜ,Ü,è,Ä,ç,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’èç’,µ,Ä,ç,é B Ä,âè”É“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,ç,½,ß AfvfŠf~fefBfu,Ì’,“_Žç_____“ä,ÌŠO•”,É, ,é è ‡ A•İŠ•f,fWf... [f<,É,»,Ìfobftf@‘S’i,ð—³Žç,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\bfh,ðCEÄ,Ñ o,µ **AD3DDEVICEDESC** \ç’i,ÌdwMaxBufferSizef f“fo,ð²,x,é Bf\ftfgfEfFfA Efhf%ofCfo,ðŽg—p,µ,Ä,ç ,é è ‡ A”è”É“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,ç,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— @,ªi X,³,è AfCef“f_fŠf“fO EfpfCfvf%ofCf“,Ìf%ofXf^ ^— ’iŠK,Ä,ì,Ý A•İŠ,â Æ—¾ ^— ,ð,Ü,Ç,± ,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,ç,± ,Æ,É’ ^Ó,.,é,±,Æ B

ŽÀ sfobftf@,Æ ó’Ô•İ‰»,É‰%Á,!,Ä ADirect3D,Í,à,µ,Ð,Æ,Ä,ÌCEÄ,Ñ o,µ<@ \,ð”ð,!,Ä,ç,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,Ç Af%ofXf^ ^— ,ð•K—v,Æ,µ,È,ç 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,İfpf%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 Ý’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 Ý’è,·,é,±,Æ,à,Â,«é,^ A,Â,«é,¾,~”đ,~ ,é,x,«,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,μ B

fffBfXfvfĈfC EfŠfXfg,Í A,½,^,ñ,İ^Ů,È,éf^fCfv,İ’“_ îñ,đfTf| [fg,·,é B

f%ofXf^ ^ — ,İ,Ý,đfTf| [fg,·,éfn [fhfEfffA,Â,Í AfAfvfŠfP [fVf#f“ ,ÍD3DTLVERTEX \‘Ĉ’İ,đŽg—p,·,é,x,«,Â, ,
é BD3DTLVERTEX \‘Ĉ’İ,İ•İŞ·,â Æ—¾ ^ — ,đ s,Â,½Ĉĕ,İ’“_ ,đŽ,μ,Â,Ĉ
,é,½,ß AfXfNfŠ [f“ Â•W,Æ F,đŠŮ,ñ,Â,Ĉ,é Bfn [fhfEfffA,^•İŞ·‘Ĉ İ,đfTf|
[fg,·,é ê # AfAfvfŠfP [fVf#f“ ,ÍD3DLVERTEX \‘Ĉ’İ,đŽg—p,·,é B,±
,İ \‘Ĉ’İ,Í Aff [f^,Æ AĈĕĈĕ¹,đf\ftfgfEfffA“L,É ^ — ,·,é,Æ,«,É Ý’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 [fhfEfffA,^ĈĕĈĕ¹,đfTf| [fg,·,é ê #,Í AfAfvfŠfP [fVf#f“ ,İ’P 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\ftfgfEfffA 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 f\fbfh,^, ,é B,Đ,Æ,Â,İ•İŞ·f,fWf... [f<,İ ó’Ô,đ Ý’è,·,é,à,İ,Â, ,è A,à,μ
,Đ,Æ,Â,Í A•İŞ·f,fWf... [f<,đ’¼ ÚŽg—p,μ,Â A’“_ fZfbfg,đ’Ĉ İ,·,é,à,İ,Â, ,é B•İŞ·f,fWf...
[f<,İ’¼ ÚĈĕ,Ñ 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» Ý,İ•İŞ· s—ñ,đ—p,Ĉ,Â AfWfIf fgfŠ•İŞ·,đŽÀ s,·,é B,Ů,½ AĈ» Ý,İfrf...
[,É,Í,μ,ÂfNfŠfbfsf“fO EfefXfg,đ s,μ,±,Æ,à,Â,«é B•İŞ·f,fWf...
[f<,đ’¼ ÚĈĕ,Ñ o,·ŠÖ ”ĈEQ,Í A,·,×,Â AD3DTRANSFORMDATA \‘Ĉ’İ,đŽg—p,·,é B

•İŞ·,É,Â,Ĉ,Ä,İ’è”É”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“ ,à•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 ,İST—v,É,Â,Ĉ,Ä,Í u3D•İŠ· v,đŽQ Æ,^,ê,½,Ĉ B

,ê,ç,ìfxfNfgf<,í ACE» Ý,ìf [f<fh s—ñ,É,æ,Á,Äf,fff< Ä•W,É•İŠ•,³,ê,é B,±
 ,ì,½,ß AfxfNfgf<,ðf [f<fh Ä•W,É•İŠ•,·,é,±,Æ,È, ACEø—“I,Éf,fff<,É Æ—¾CEø%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,»»,İ‘Î Û,Æ,È,éfrf... [f|

[fg,İfpf%of [f^,É,æ,Á,ÄfNfŠfbfsf“fO îñ,ª ¶ ¬,³,é,é B,±,±,Äfrf...
[“à,É’,“_ª,Ð,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%ð Í,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,Û,½,İ·İŠ·,Æ Æ-¾,ð·K—v,Æ,µ,Ä,¢,é,İ,©,ð”»’è,·,é B,±
,é,ç,İ‘€ î,ªŠ@—,µ,½CEä,É-½—BfŠfXfg,ª%ð“Ç,³,é AfCEf“f_Šf“fO,ª s,í,é,é B

fXfNfŠ [f“ Ä·W,İ”ÍÍ,Í AffofCfX ifXfNfŠ [f“,Û,½,ÍfEfBf“fhfE j,İ ¶ ä(0,0),©,ç AffofCfX,İ%E%o(· -1,
,,³-1),Û,Ä,Ä, ,é B [“x,İ”ÍÍ,Ío iž< ‘ä,İftf f“fg j,©,çl ifofbfN j,Û,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 Ú 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,»,İ’,“_ªžžCEv%oñ,è,İCEü,«,É·Ä,ñ,Ä,¢,é,à,İ,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”½ŽËÖ,Ì F,Žæ,è“¾,é’l,É,Á,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,lfvf%ofCf} fŠ EfT [ftfFfX,ÉDiretDrawfpfCEfbfg,ðfAf^fbf`µ,È,,Ä,Í,È,ç,È,¢ B,±,İSDK,İDirect3DfTf“fvf< EfR [fh,Ä,Í AfEfBf“fhfE,ªWM_ACTIVATEf fbfZ [fW,ðŽó,~Žæ,é,½,Ñ,É Afvf%ofCf} fŠ EfT [ftfFfX,É'Í,µ,ÄfpfCEfbfg,ðfAf^fbf`µ,Ä,¢,é BDirect3D,ª8frfbfg,İDirectDrawfT [ftfFfX,İfpfCEfbfg,É'Í,µ,Ä s,Á,½•İ X,ð'Ç Ö,·,é,É,Í AIDirectDrawPalette::GetEntriesf f\fbfh,ðŽg—p,·,é B

fAfvfŠfP [fVf±f“Í AŽŸ,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 €;İPALETTEENTRY \‘‘ì,İpeFlagsf f“fo,É Ý'è,·,é ifpfCEfbfg,Ì«—L•û—@,ðŽw'è,·,é,É,Í AD3DRMPALETTEENTRY \‘‘ì,İD3DRMPALETTEFLAGS—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,İfpfCEfbfg,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,ç,é B

f, fmfNf Æ-¾f, [fh,Á,ìftfHfO,Í A,» ,ì F,ª •,ç,Æ,« A,Û,½,ÍĚöĚ¹,ª,È,ç ,Æ,« ,É,¾, - ³Šm,É"® ì, ,é BĚöĚ¹,ª,È,ç,Æ,« ,É,Í AftfHfO,ª%½ F,Á, ,Á,Ä,à" ,¶Ě<%oÊ,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,ç,é B

fŠfjFA EftfHfO,ð—p,ç,é,Æ,« ,Í AftfHfOĚø%oÊ,ìŠJŽn"_,Æ I— 1"_,ðŽw'è, ,é BftfHfOĚø%oÊ,ÍŽw'è,³,ê,½ŠJŽn"_,çŽn,Û,è A I—1"_,Á Á'â-š"x,É'B, ,é,Û,Á A"ä— á'I,É' %oÁ, ,é B

Žw "ftfHfO Ef, [fh,Í A,í, ,ç,É"ŽŽ",Á,« ,é'ö"x,ìftfHfO,çŽn,Û,è A Á'â- š"x,Û,ÁŠö%½<%o "I,É' %oÁ, ,é BŽw "ftfHfO Ef, [fh,Á,ÍŽŸ,ìĚöŽ®,ª ¬—š, ,é B

$$f = e^{-(density \times z)}$$

•½•ûŽw "ftfHfO Ef, [fh,Á,Í AŽw "ftfHfO Ef, [fh,æ,è,à< }¬,ÉftfHfOĚø%oÊ,ª" %oÁ, ,é BŽŸ,ìĚöŽ®,ª ¬— š, ,é B

$$f = e^{-(density \times z)^2}$$

,±,ê,ç,ìĚöŽ®,É, ,ç,Äe,ÍŽ©'R'î ",ì'è,ðŽ',µ A,» ,ì'l,Í-ñ2.71828,Á, ,é BftfHfO,Í"š-¾"x,ð\,Šî € ,Á, ,é i ftfHfO,ì'l,ª ¬,³,ç,Û,ç AfIfufWfFfNfg,ÍĚ©, ,É, ,È,é j B

fAfvfŠfP [fVf#f",ªŽw "ftfHfO Ef, [fh,ðŽg—p, ,é ê ‡ AftfHfO,ì-š"x,ª0.5,Á, ,é,Æ, ,é,Æ AŽŸ,ì—á,ÉŽ', ,æ,ª ,É AfJf f%o,ç0.8,ì<—£,É, ,é'Ê'u,ìftfHfO,ì'l,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**,Ìf%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,ªTRUE,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~³ƒø,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,é^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,ÌfXfe [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_RENDERER**fIfyfR [fh,ð^Ä—Ü,ÉŽg— p,·,é **BD3DOP_STATE_RENDERER**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,½ƒæ 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,ÌMiscftHf<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,ðĒðŠ·,·,é,±,Æ,%oÂ”\,Á, ,é BfAfjf [fVf±f“ EfZfbfg,ÌfTf| [fg,É,æ,Á,Ä A`è` İ,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` İ,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%of€,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 À•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 ,É,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 $\mathbb{A} \cdot \mathbb{W} \mathbb{C} \mathbb{E} \mathbb{n}, \mathbb{E} \% \mathbb{E} \mathbb{Z} \mathbb{è} \mathbb{A} \cdot \mathbb{W} \mathbb{C} \mathbb{E} \mathbb{n}, \mathbb{I} \mathbb{Z} \mathbb{í} \text{—} \mathbb{p}, \mathbb{I}$
ffJf<fg $\mathbb{A} \cdot \mathbb{W} \mathbb{C} \mathbb{E} \mathbb{n}, \mathbb{a}, \mathbb{é} \mathbb{B}, \mathbb{C}, \mathbb{ç}, \mathbb{ç}, \mathbb{I} \mathbb{A} \cdot \mathbb{W} \mathbb{C} \mathbb{E} \mathbb{n}, \mathbb{A}, \mathbb{à} \mathbb{A} \mathbb{^3} \mathbb{u} \mathbb{C} \mathbb{E} \mathbb{ü}, \mathbb{I} \mathbb{x} \mathbb{Z} \mathbb{^2}, \mathbb{I} \% \mathbb{E}, \mathbb{ð} \mathbb{C} \mathbb{E} \mathbb{ü}, \ll \mathbb{A} \mathbb{^3} \mathbb{u} \mathbb{C} \mathbb{E} \mathbb{ü}, \mathbb{I} \mathbb{y} \mathbb{Z} \mathbb{^2}, \mathbb{I} \mathbb{ã}, \mathbb{ð} \mathbb{C} \mathbb{E} \mathbb{ü}, \mathbb{c}, \mathbb{A}, \mathbb{c}$
, $\mathbb{é} \mathbb{B} \mathbb{^3} \mathbb{u} \mathbb{C} \mathbb{E} \mathbb{ü}, \mathbb{I} \mathbb{z} \mathbb{A} \cdot \mathbb{W}, \mathbb{a}, \mathbb{C}, \mathbb{ç}, \mathbb{ç}, \mathbb{ð} \mathbb{C} \mathbb{E} \mathbb{ü}, \mathbb{c}, \mathbb{A}, \mathbb{c}$
, $\mathbb{é}, \mathbb{©}, \mathbb{I} \mathbb{A} \mathbb{¶} \mathbb{Z} \mathbb{è}, \mathbb{Ü}, \mathbb{½}, \mathbb{I} \% \mathbb{E} \mathbb{Z} \mathbb{è}, \mathbb{I} \mathbb{Z} \mathbb{w}, \mathbb{ð} \mathbb{^3}, \mathbb{I} \mathbb{x} \mathbb{Z} \mathbb{^2} \cdot \mathbb{u} \mathbb{C} \mathbb{E} \mathbb{ü}, \mathbb{É} \mathbb{C} \mathbb{E} \mathbb{ü}, \text{—} \mathbb{A}, \mathbb{»}, \mathbb{é}, \mathbb{ð} \mathbb{^3}, \mathbb{I} \mathbb{y} \mathbb{Z} \mathbb{^2} \cdot \mathbb{u} \mathbb{C} \mathbb{E} \mathbb{ü}, \mathbb{É} \% \mathbb{o} \mathbb{n} \ll \mathbb{I}, \mathbb{^3}, \mathbb{^1}, \mathbb{é}, \mathbb{±}, \mathbb{A}, \mathbb{É}, \mathbb{æ}, \mathbb{A}, \mathbb{A}' \mathbb{m}, \mathbb{é}, \mathbb{±}$
, $\mathbb{A}, \mathbb{a}, \mathbb{A}, \ll \mathbb{é} \mathbb{B} \mathbb{e} \mathbb{Z} \mathbb{w}, \mathbb{I} \mathbb{Z}, \cdot \mathbb{u} \mathbb{C} \mathbb{E} \mathbb{ü}, \mathbb{a} \mathbb{A} \mathbb{Z} \mathbb{©} \mathbb{^a}, \mathbb{ð} \mathbb{Z} \mathbb{w}, \mathbb{μ}, \mathbb{A}, \mathbb{c}, \mathbb{A}, \mathbb{à}, \mathbb{»}, \mathbb{a}, \mathbb{A}, \mathbb{È}, \mathbb{,}, \mathbb{A}, \mathbb{à} \mathbb{A}, \mathbb{»}, \mathbb{I} \mathbb{A} \cdot \mathbb{W} \mathbb{C} \mathbb{E} \mathbb{n}, \mathbb{A}, \mathbb{I} \mathbb{^3}, \mathbb{I} \mathbb{z} \mathbb{Z} \mathbb{^2}, \mathbb{I} \mathbb{C} \mathbb{E} \mathbb{ü}, \ll \mathbb{A}, \mathbb{,} \mathbb{é} \mathbb{B}$
, $\mathbb{±}, \mathbb{I} \mathbb{f} \mathbb{Z} \mathbb{f} \mathbb{N} \mathbb{f} \mathbb{V} \mathbb{f} \mathbb{±} \mathbb{f} \ll \mathbb{A}, \mathbb{I} \mathbb{A} \mathbb{f} \mathbb{A} \mathbb{f} \mathbb{v} \mathbb{f} \mathbb{Š} \mathbb{f} \mathbb{P} \ll \mathbb{I} \mathbb{f} \mathbb{V} \mathbb{f} \mathbb{±} \mathbb{f} \ll \mathbb{A} \text{—} \mathbb{~} \mathbb{p}, \cdot, \mathbb{é}, \mathbb{±}, \mathbb{A}, \mathbb{a}, \mathbb{A}, \ll \mathbb{é} \mathbb{D} \mathbb{i} \mathbb{r} \mathbb{e} \mathbb{c} \mathbb{t} \mathbb{3} \mathbb{D} \mathbb{A} \cdot \mathbb{W} \mathbb{C} \mathbb{E} \mathbb{n}, \mathbb{A} \mathbb{A} \cdot \mathbb{W}, \mathbb{I} \mathbb{f} \mathbb{^} \mathbb{C} \mathbb{f} \mathbb{v}, \mathbb{É}, \mathbb{A}, \mathbb{c}, \mathbb{A} \mathbb{à} \mathbb{¾}, \cdot, \mathbb{é} \mathbb{B}$

Direct3D, I $\mathbb{A} \cdot \mathbb{W} \mathbb{C} \mathbb{E} \mathbb{n}$

U $\mathbb{A} \cdot \mathbb{W}, \mathbb{A} \mathbb{E} \mathbb{V} \mathbb{A} \cdot \mathbb{W}$

U $\hat{A} \cdot W, \mathcal{A}V \hat{A} \cdot W$

Direct3D, $\hat{A} \cdot W, \mathcal{A}Zg - p, \cdot, \acute{e} B, \pm, \hat{e}, \zeta, \grave{\text{I}} \hat{A} \cdot W$ $iu, \ddot{,} \text{æ}, \tilde{N}v$ $j, \acute{\text{I}} AfIfufWfFfNfg \tilde{a}, \acute{E}fNfXf^ff, \delta^{\backslash}$
 $, \acute{e}, \bar{t}, \bar{,} \acute{e}, \mathcal{A}, \ll, \acute{E} - \sim - p, ^3, \hat{e}, \acute{e} BvxfNfgf \langle, \acute{\text{I}} AfNfXf^ff, \grave{\text{I}} \cdot \acute{u} \mathcal{E} \ddot{u}, \acute{U}, \frac{1}{2}, \acute{\text{I}} \mathcal{E} \ddot{u}, \ll, \delta \acute{Z}, \mu Az\acute{Z}^2, \acute{E} \% \hat{,} \acute{A}, \acute{A}, \mathcal{C}$
 $, \acute{e} BvxfNfgf \langle i, \acute{U}, \frac{1}{2}, \acute{\text{I}} \tilde{a}fxfNfgf \langle j, \acute{\text{I}} A \hat{e} \text{”} \acute{E}, \acute{E} ACE \text{”} _ [0, 0, 0], \delta \acute{Z} n \text{”} _, \mathcal{A}, \mu, \acute{A} y \acute{Z}^2, \acute{E} \% \hat{,} \acute{A}, \acute{A}, \mathcal{C}$
 $, \acute{e} Bu \hat{A} \cdot W, \ddot{,} \text{æ}, \tilde{N}v \hat{A} \cdot W, \acute{E}, \hat{A}, \mathcal{C}, \acute{A} \acute{U}, \mu, \acute{\text{I}} A u \underline{Direct3DRMWrapCf} \text{”} f^{\wedge} \underline{[ftfFcX]} v, \delta \acute{Z} Q \mathcal{A}, ^3, \hat{e}, \frac{1}{2}, \mathcal{C} B$

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•ûĈÛ 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•ĈvŽZ,đ s,µ
 ,É,Í A,».,é,ç,ìĈø%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 BftfĈ [fĈ•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“„ªSÛ,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 à,Ì,“_ ,đŽ ,Åf|fŠfSf“,đ^μ,±,±,Æ,³,Å,«,é,³ A,»,ê,ċ,ÍfVfXfefĚ ,É,æ,Å,Å AfIfufWfFfNfg,³ĀĒf“f_Šf“fO,³,ê,é'O,ÉŽOŠpĀ,É•İŠ,³,ê,é B'¼ Úf, [fhfAfvfŠfP [fVf‡f“,Í AŽOŠp Ā,đŽg—p,μ,È,Ä,Í,È,ċ,È,ċ B

,±,ÌfZfNfVf‡f“,Å,Í AfAfvfŠfP [fVf‡f“,ÅDirect3Df|fŠfSf“,đŽg—p,·,é•û-@,É,Å,ċ,Ä à-¾,·,é B

Šô%½“l đĀ

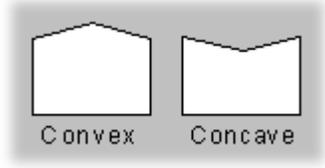
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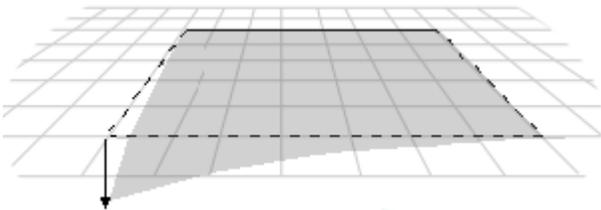
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ŽOŠpCE`Í A“Ê ó,©,Â•½-Ê,Â, ,é,Æ,ç,□ AfCEf“f_Šf“fO,Â—v< ,³,ê,é,Ó,½,Â,Ì đCE ,đ,Â,Ë,É-ž,½,µ,Ä,ç
 ,é,½,ß A^µ,ç,â,·,çCE`Ìf|ŠfSf“,Â, ,é Bf|fŠfSf“,Ì^Ó,ì,Ó,½,Â,Ì,“_„đCE<,Ô ü,ª A,Â,Ë,É,»„Ìf|ŠfSf“,Ì“à•”,É, ,é,Æ,«
 Af|fŠfSf“,Í“Ê ó,Â, ,é,Æ,ç,□ B

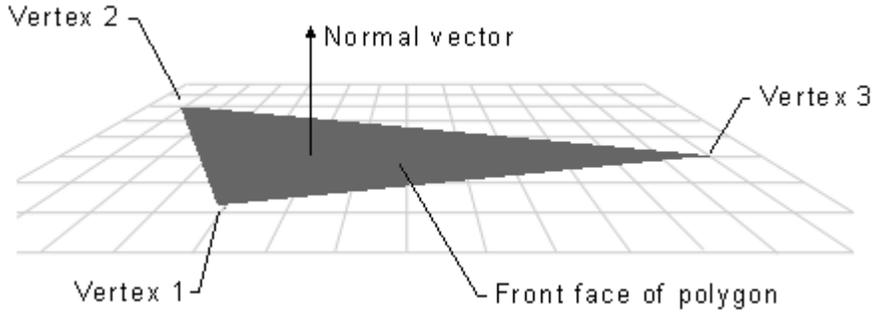


ŽOŠpCE`ì,R,Â,Ì,“_„Í•½-Ê,đ•\,·,ª A,»„±,É•Ê,Ì,“_„đ^Ç%Á,·,é,±,Æ,É,æ,Á,Ä A—e^Ö,É—§‘Ìf|fŠfSf“,đ ì ¬,·,é,±
 ,Æ,ª,Â,«„é B

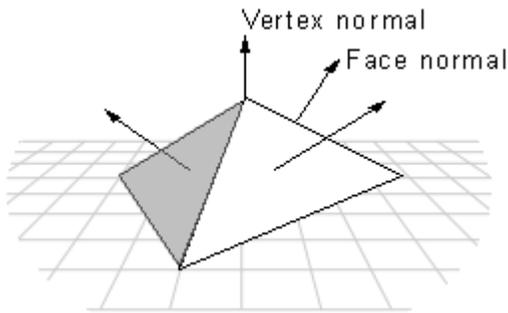


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,é ‡ ~,Æ A À•WĈn,ª%ÉŽè À•WĈn,Æ ¶Žè À•WĈn,Ì,Ç,ì,ç,Á, ,é,©,É,æ,Á,ÄĈ^è³,é,é B-@ üxfNfgf<,ªfrf...
[fA,ÉĈü,©,Á,Ä,¢,é‘ª,ª-Ê,ì\,Á, ,é BDirect3D,Á,Í A-Ê,ì\,Ì,Ý,ªŽ< ‘ä,Á, ,é B,Û,½Direct3D,Á,Í A\,©,ç-
Ê,ðĈ©,½ ê ‡ A•K,ŽžĈv%õñ,è,É',“-ªè<³,ê,Ä,¢,é B



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@ ü,ðĈvŽž,·,é BfvfXfefĈ,ª-Ê-@ ü,ðŽg—p,·,é,ì,Í Aftf%fbfg EfVfF [ffBf“fO Ef, [fh,ì ê ‡,Á, ,é
BftfHf“ EfVfF [fffBf“fO Ef, [fh,ÆfOf [EfVfF [fffBf“fO Ef, [fh,ì ê ‡ A,ª,ÑĈöĈ¹,âfefNfXf'ffĈ
ø%Ê,ð §Ĉä,·,é ê ‡,É,Í AfVfXfefĈ,Í,“-@ ü,ðŽg—p,·,é B



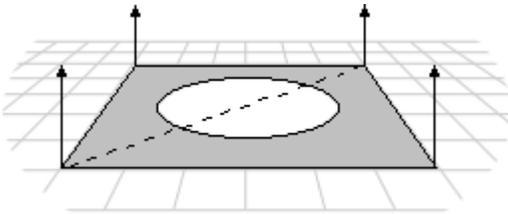
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ftf%fbfg EfVfF [fffBf“fO Ef, [fh,Á,Í AfVfXfef€ ,Í A,Đ,Æ,Â,Ì,“_ ,ì F,đfvfŠf~fefBfu,ì¼,Ì-
 Ê‘S,ì,É,ı » ,:é BfOf [EfVfF [fffBf“fO Ef, [fh,ÆftfHf“ EfVfF [fffBf“fO Ef, [fh,Á,Í A’ ,“-@ ü,đ-
 p,ç,Äf|fŠfSf“ EfIfufWfFfNfg,İŠOŠİ,đfXf€ [fY,É,μ A,» ,İŠÖ,İfXfy [fX,É,Í-
 × Ú,μ,½’ ,“- ,ì F,ÆP“x,“}“ü,³,ê,é BftfHf“ EfVfF [fffBf“fO Ef, [fh,Á,Í AfVfXfef€,“
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Note

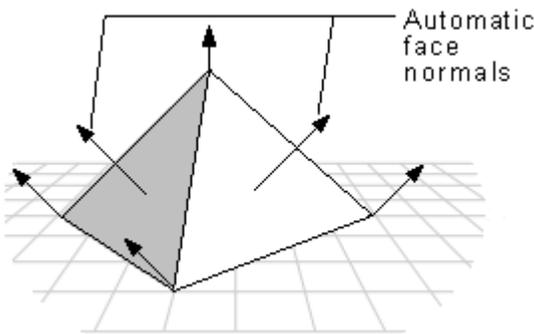
ftfHf“ EfVfF [fffBf“fO Ef, [fh,Í ACE» Ý,ÍfTf| [fg,³,ê,Ä,ç,È,ç B

fOf [EfVfF [fffBf“fO Ef, [fh,Í AfIfufWfFfNfgŠOŠİ,đfXf€ [fY,É•Ž,μ ACEvŽZ äEø—“I,Á, ,é B,±
 ,ì,½,β A’½, ,İfAfvfŠfP [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,-
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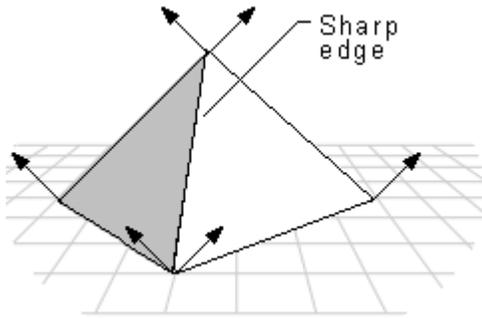


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 fbfgf%ofCfg,đ‘S,-³Ž<,μ,Á,μ,Ü,ç AfXf|fbfgf%ofCfg,“¶ Ý,μ,È,ç,©,Ì,æ,μ,É-Ê,“fEf“f_Šf“fO,³,ê,é B

ftf%fbfg EfVfF [fffBf“fO Ef, [fh,Á,Í AŽŸ,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
 %øe’l,“Ó,İžü•Ó,É•đŠ@,³,é A Á I“I,É,ÍÈ-Ê,Ä \ ,³,ê,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, , ,x,Ä,İEđ ü,È,Ä,ç,Ä A’ ,“-@ ü,đ•ı » ,μ,È, ,Ä,Í,È,ç,È,ç B



fOf [EfVfF [ffBf“fO Ef, [fh,Í A,Đ,Æ,Â,ÌfIfufWfFNfg ã,É·È-Ê,Æ·½-Ê,ðŠÛ,ß,é,±,Æ,ð%oÂ”\
 ,É,·,é,¾,¯,Â,Ê, A·½-Ê,É“-
 ,½,Â,½œö,ðftf%ofbfg EfVfF [ffBf“fO Ef, [fh,æ,è,àfŠfAf<,É·\œ»,·,é Bftf%ofbfg EfVfF [ffBf“fO Ef, [f
 h,Ì-Ê,Ì F,Íîê,Â, ,é,ª AfOf [EfVfF [ffBf“fO Ef, [fh,Â,Í A-Ê,ð ³Šm,Ê~Â,,·,é,±,Æ,ª,«,é B,±
 ,İœ%oÊ,Í A,·,®<ß,,Éœðœ¹,ª, ,é ê ±,Éœ°~ ,Â, ,é B
 ,Û,Æ,ñ,Ç,ÌDirect3DAfvfŠfP [fVf‡f“É“K Ø,ÈEfVfF [ffBf“fO Ef, [fh,Í AfOf [EfVfF [ffBf“fO Ef, [
 fh,Â, ,é B

ŽOŠpĚ`ì•âŠ®—v'f

fVfXfef€Í A-Ê,ðfĚf“f_fŠf“fO,·,é Ů AŽOŠpĚ`S'ì,É,»,'ì,“_ì'Á'¥,ð“K—p,·,é B

F
”½ŽĚĚö
ftfHfO
fAf<ftf@

ŽOŠpĚ`É%Á,·,ç,ê,½“Á'¥,Í AĚ» Ý,ìfVfF [ffBf“fO Ef, [fh,É,æ,Á,Ä'² ®,³,ê,é B

ftf%fbfg %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'“_ìŠŎ,ÉfŠfjA•âŠ®,ª s,í,ê,é B
ftfHf“ Ě» Ý,ì Ě-¾,ð—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,Ě”½ŽĚĚö,ì•âŠ®—
v'f,Í•Ê X,É^µ,í,ê AfJf% [Ef,fffc,É^È“¶,·,é BRGBfJf% [•ûŽ® **iD3DCOLOR RGB** j,Á,Í AfVfXfef€
,Í A Ô A—Î A Ä,ì F—v'f,ðŽg—p,·,é Bf,fmfNf Ef,fffc **iD3DCOLOR MONO** j,Á,Í AfVfXfef€
,Í A'“_ì F,ì Ä,ì—v'f,¾,¯,ðŽg—p,·,é B

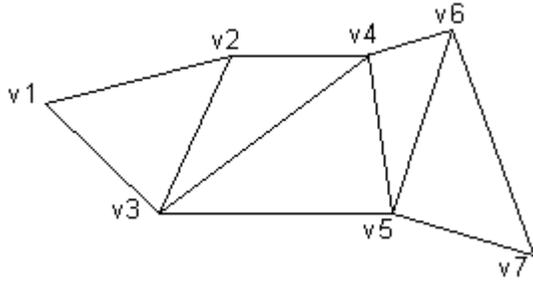
,½,Ě,·,ì A'“_1,ì F,ì Ô,ì—v'f,ª0.8,Ä A'“_2,ì Ô,ì—v'f,ª0.4,ì,Ě,« A,±
,ì,Ô,½,Ä,ì'“_ðĚ<,Ô ü,ì† S,ìfsfNfZf<,ÉfVfXfef€,ªŠ,,è“-,Ä,é Ô,ì—
v'f,Í AfOf [EfVfF [ffBf“fO Ef, [fh,ìRGBfJf% [Ef,fffc,Á,Í0.6,Ä,·,é B

F,ìfAf<ftf@—v'f,Í A“Ě—§,µ,½•âŠ®—v'f,Ě,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'Ù,È,é•û-
@,É,æ,Á,Ä“§-¾“x,ðfCf“fvfŠf f“fg,Ä,«,é,½,ß,Ä,·,é B

fAfvfŠfP [fVf±f“Í AĚ» Ý,ìfffofCfX Efhf%ofCfo,ªfTf| [fg,·,é
•âŠ®ĚŽ®,ðŽæ“¾,·,é,½,ß,É **AD3DPRIMCAPS,ldwShadeCapsf** f“fo,ðŽQ Ě,·,é,±,Ě,ª,Ä,«,é B

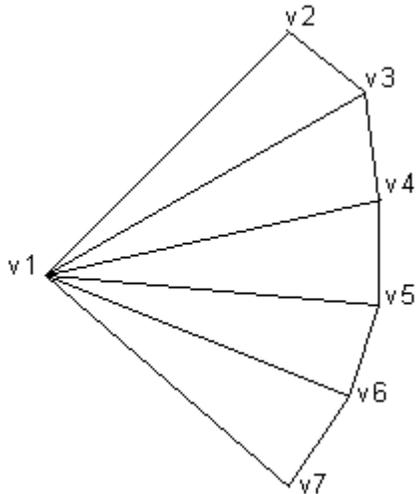
ŽOŠpĚ`ì“WŠJ } ,Æ íĚ`

fT [ftfFX`S`ì,đL q,·,é,É,Í AŠeŽOŠpĚ`ì,“_đ,·,×,ÄŽw`è,·,é,ì,Á,Í,È, A“WŠJ } ,â íĚ` ,đŽg—p,·,é,± ,Æ,ª,Ä,« ,é B,½,Æ,;,ÌŽÝ,ì,æ,¼,È“WŠJ } ,đ`èç,·,é ê ‡ A·K—v,È,“_ ,Í7,Ä,¾,¯,Ä, ,é B



fVfXfef€ ,Í A Ä % ,ìŽOŠpĚ` ,đ·%œ ,·,é,½,ß,É,“_v0 Av1 Av2,đŽg—p,·,é B2”Ô— Ú,ìŽOŠpĚ` ,É,Ív1 Av3 Av2,đ A3”Ô—Ú,ìŽOŠpĚ` ,É,Ív3 Av4 Av2,đ—p,č,é B2”Ô— Ú,ìŽOŠpĚ` ,ì,“_ ,Í ‡”Ô,É,È,Ä,Ä,č,È,č,ª A,±,ê,Í,·,×,Ä,ìŽOŠpĚ` ,ªŽžĚv%oñ,è,ìĚü,« ,É·%œ,³,ê,é,½,ß,Ä, ,é B

íĚ` ,ì“WŠJ } ,ÆŽ—,Ä,č,é,ª A,·,×,Ä,ìŽOŠpĚ` ,ª,Đ,Æ,Ä,ì,“_ ,đç—L,·,é“_ ,ªÛ,È,Ä,Ä,č,é B



fVfXfef€ ,Í A,“_v0 Av1 Av2,đ—p,č,Ä Ä % ,ìŽOŠpĚ` ,đ·%œ ,·,é B2”Ô— Ú,ìŽOŠpĚ` ,ì·%œ,É,Í A,“_v0 Av2 Av3,đŽg—p,·,é B

“WŠJ } ,â íĚ` ,đŽg—p,·,é,É,Í AD3DTRIANGLE `ç`ì,ìwFlagsf 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"Í,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— §,Ä îñ,ð·ÛŽ ,µ,Ä,Ç,é,ª A,»,İ ^%ö,Í ≠ ¬,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,ðŠi € ,Æ,µ,Ä%õñ",µ,½Eã A%õñ"1,É,æ,Ä,ÄŽ²,ðŠi € ,Æ,µ,Ä%õñ",·,é v,± ,Æ,Ä, ,é B "Šw"Í,É,Í Aq1,Æq2,İ ± ¬,ðQ = q1 o q2,Æ·<L,·,é B,µ,½,ª ,Ä,ÄQ,Í Aq2,Æq1,ð"K—p,µ,Ä"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 ±— "Í,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©,·,é B,½,Æ,İ,Í A—^,·,ç,è,½Eü,« ,É%õñ",·,éEvŽZ,É,Ä,Ç,Ä 1,·,é B,± ,İ,½,ß,É,Í AŽ²,ðŠi € ,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,í,©,Ä,Ä,Ç,È,Ç B ± ¬,ð—p,ç,é,Æ A,Ó,½,Ä,İ%õñ" ,ð'g,Ý ±,í,¹ ACE%õñ,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%±,·,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<%õñ,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,İŠfjfa·âŠ@,ð s,ª B

·ÛŽ f, [fh EfAfvfŠfP [fvf±f",Ä,Í AfxfNfgf<,âfNfH [f^fjIf",ðµ,ªf^fXfN,ðŠÈ— %õñ,·,é,½,ß A^E%õñ,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,Á,Í A¼,ÌDirectXfA [fLfefNf`ff,Æ“⁻l,É A53frfbfg,ì•,“® ¬ ”“ _ ,“x,^ap,¢
,ç,ê,é BfAfvfŠfP [fVf‡f“,Á,±,ì ,“x,ð•Ī X,·,é•K—v,^a, ,é ê ‡,Ī AĈvŽZ,^aŠ®⁻¹,μ,½,Æ,«,É53frfbfg,É-β,³,È,-
,Ā,Ī,È,ç,È,¢ B,»,□,μ,È,¢,Æ AffftfHf<fg,ì¹,É^È“¶,·,éfVfXfef€,ìfRf“f| [flf“fg,Ī A ^— ,^a,Ā,«,È,,È,é B

fpftfH [f}f“fX,ì Á“K%»

3DfOf%oftfBfbfNfX,ð—p,ç,½fŠfAf<f^fCf€ EfAfvfŠfP [fVf‡f“,ð ì ¬,·,éŠJ”ŽÒ,Í,·,×,Ä AfpftfH [f} f“fX,ì Á“K%»ÉŠÖ S,ðŽ ,Á,Ä,ç,é B,±,ìfZfNfVf‡f“,Á,Í AfR [fh,©,ç Á ,.ÌfpftfH [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,Á,«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,Á,«é BÈ%°,ìfZfNfVf‡f“,Á q,×,ç,è,Ä,ç,éfpftfH [f}f“fX,ì Af%of“fv Efhf%ofCfo,É,Á,ç ,Á“K—p,ª,é B

f%of“fv EfpftfH [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’ì,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,^a, ,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,³,è,é,±,Æ,^a ,È,,È,é B

fefNfXf`ff,lfTfCY

fefNfXf`ff Ef}fbfsf“fO,lfpftfH [f}f“fX,Í Af f,fŠ,ì“x,É‘â,«^È‘¶,·,é BfefNfXf`ff,lfLfffbfVf...
EfpftfH [f}f“fX,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 EfLfffbfVf...,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|
fŠfSf“,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““,¶fpfCEfbfg,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%õ ”,đE,ç,·,±,Æ,à,Ä,«,é B‘½,-
,lfefNfXf`ff,đ•K—v,Æ,µ,È,çAfvfŠfP [fvf‡f“,Í A“-R A256 ~256,lfefNfXf`ff,đŽg—
p,·,é,x,«,Ä,Í,È,ç B,È,°,È,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%ofCfAf“fof< Eftf%ofO

D3DTRIANGLE \`c`l`lwFlagsf f“fo,É,Í AfVfXfef€,“ŽOŠpCE`l`ê•”,â îCE`ð \ -,·,é Û,É A’,“_ð Ä—
p,Â,«,é,æ,ð,É,·,éftf%ofO,“ Y’è,³,ê,Ä,¢,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%ofCfo,ÉfAfNfZf%ofCE [fVf‡f“,Ì•û-@,ðŽ! ‘,·,é,±
,Æ,“Ä,«,é B

D3DTRIFLAG_STARTFLAT(len)

CE» Ý,ÌŽOŠpCE`aŽæ,è o,³,ê,é,Æ Afhf%ofCfo,à A“WŠJ }
,â îCE`,©,ç ACEä,É‘±,ŽOŠpCE`ðlen,“Ž!· ”,¾,¯Žæ,è o,·,±
,Æ,“Ä,«,é B

D3DTRIFLAG_ODD,ÆD3DTRIFLAG_EVEN

fhf%ofCfo,Í AŽOŠpCE`,©,ç,Ð,Æ,Ä,Ì V,µ,¢’,“_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 ,,ÌfpftfH [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,¢fhf%ofCfo,à ,é,Ì,Ä A,±,Ìftf%ofO,ðŽg—p,·,é,É,Í’ ^Ó,“K—v,Ä,
,é B,±,Ìftf%ofO,ðf`fFfbfN,µ,È,¢fhf%ofCfo,ðŽg,ðfAfvfŠfP [fVf‡f“,Ä,Í AfCEf“f_Šf“fo,³,ê,é,Í,,Ìf|
fŠfSf“,“fCEf“f_Šf“fo,³,ê,È,¢ ê ‡,“ ,é B

fAfvfŠfP [fVf‡f“,Í AD3DTRIFLAG_ODD,âD3DTRIFLAG_EVENftf%ofO,ð—p,¢,é‘O,É A

D3DTRIFLAG_STARTftf%ofO,ðŽw’è,µ,È,,Ä,Í,È,ç,È,¢ BD3DTRIFLAG_STARTftf%ofO,ðŽg—
p,·,é,Æ Afhf%ofCfo,Í,·,×,Ä,ÌŽOŠp’,“_ð Äf [fh,·,é BD3DTRIFLAG_STARTftf%ofO,ðŽw’è,µ,½CEä,ÌŽOŠpCE`,Í A
D3DTRIFLAG_ODD,ÆD3DTRIFLAG_EVENftf%ofO,ð—p,¢,Ä•Ó,ð◄—L,·,é,±,Æ,“Ä,«,é B

fffofbfo Efo [fWf‡f“,ÌSDK,Í AD3DTRIFLAG_ODD,ÆD3DTRIFLAG_EVENftf%ofO,ð—LCEø,É,µ,Ä,¢,é B

Ú,µ,,Í uŽOŠpCE`,Ì“WŠJ },Æ îCE` v,ðŽQ Æ,³,ê,½,¢ 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, lfefNfjfbfN, d“K—p, ., é, ×, «, Å, , é B

, ., ×, Ä, lfefNfXf`ff, Å“ , lfpfCEfbfg, d“L, ., é B

fpfCEfbfg, l F ”, d, Á, «, é, ¾, ¯ , È, ., é B64 F`È%°, a Å“K, Á, , é B

f}fefŠfAf<, lf%of“fv EfTfCfY, d16`È%°, É, ., é B

, ., ×, Ä, lf}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, lf}fefŠfAf<, d” , µ, Ä A”½ŽÈfppf [, d“™, µ, •Û, Å B`½, - , lfAvfVŠfP [fVf‡f“ , Á, í A, D, Æ, Å, lfV [f“ , É, Ó, ½, Å`È ä, lf}fefŠfAf<, í•K—v, È, ç B, D, Æ, Å, í, è, a, ½ŽÈ, µ, Ä, ç , éIfufWfFfNfg, Å, , è A, à, a, D, Æ, Å, í”½ŽÈ, µ, È, çIfufWfFfNfg, Å, , é B

, Å, «, é, è, èfNfXf`ff, d -³, ., é B

•i ”, l -³, ÈfNfXf`ff, í A256 ~256fsfNfZf<, l1-‡, lfefNfXf`ff, É ‡, í, 1, é B

-³, ÈŽOŠpE`, lfOf [EfVfF [ffBf“fO Ef, [fh, Å A`a, «, ÈŽOŠpE`, lftf%ofbfg EfVfF [ffBf“fO Ef, [fh, ÅfCEf“f_Šf“fO, ., é B

, D, Æ, Å`È ä, lfpfCEfbfg, dŽg—p, ., é•K—v, a, , éŠJ”ŽÒ, í A, D, Æ, Å, lfpfCEfbfg, d}fXf^ [EfpfCEfbfg, Æ, µ, Ä— p, ç A`¼, lfpfCEfbfg, lf}fXf^ [EfpfCEfbfg, lfTfufZfbfg, dŠÛ, p, æ, a, É ÝCv, ., 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...^a *^a,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,^a— ‘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,ð< ,ß,é,±,Æ,Í%Ä“^,Ä, ,é BfI [fo [fhf [,Ì•½,í,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 fbvVf
...,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,è,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 äL,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,âŽg—p,³,è,Ä,ç,éOf%oftfBfbfN EfAf_fvf^,ÌŽí—
p,É‘É‘,·,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 AfvXfef€ Ef f,fŠ,ð
—~p,µ,Ä“@ i,·,é B,±,ÌfvfVf‡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 AfvXfef€,ð’âŽ~,¹,,ÉfEf“f_fŠf“fO,ð‘+f,·,é•ü-@,ð‘m,é,±
,Æ,ª,Ä,«,é B,½,Æ,,ÌDirectDraw,Í AfvXfef€ 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,ðfvf‡fBfg 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^,İD3DTEXTUREBLEND_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—§,Â B

8frfbfg EfJf%o [İŒðŒ¹,ª,È,çf,fmfNf Ef,ffç,ðŽg,µfAfvfŠfP [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,»,è,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

,±,lfZfNfVf±f“,Á,Í ADirect3D,lfŮŽ f, [fh,É,Â,ċ,Ä à¾,·,é B•ŮŽ f, [fh,Í Afp [f\fiċ EfRf“fsf...
[f^ ã,Á3DfOf%oftfBfbfNfX,ðŽÀE»,·,é,½,ß,ÉMicrosoft,“ñ<Ÿ,·,éf\Ÿf... [fVf±f“,Á, ,é B3DŠÀ«ð ì ¬,µ AfŠf
Af<f^fCfċ,É ^— ,µ,½,ċ ê ±,Í ADirect3D,lfŮŽ f, [fhAPI,ðŽg—p,·,é,x,«,Ä, ,é B

Direct3D,ÍDirectDraw,ÆŠ@‘S,É“ ±,³,ê,Ä,ċ,é BDirectDrawIfufWfFfNfg,Í ADirectDraw,ÆDirect3D,lf—
¼•û,ì óÖ,ð•ŮŽ ,µ,Ä,ċ,é BfAfvfŠfP [fVf±f“,Í AIDirectDraw::QueryInterface f\fbfh,ð—p,ċ
,Ä ADirectDrawIfufWfFfNfg,lfDirect3DfCf“f^ [ftfFfCfX,ðŽæ“¾,·,é,±
,Æ,ª,Ä,«,é BDirect3D,ÆDirectDraw,lf“ ±,É,Ä,ċ,Ä Ú,µ,-
,Í A uDirect3Dfhf%ofCfo EfCf“f^ [ftfFfCfX v,ðŽQ Æ,³,ê,½,ċ B

• ŮŽ f, [fh,lfŠi‘b,É, ,éŠT”O,Í A^È‘O,É3DfOf%oftfBfbfNfX,lfR [fh,ð ‘,ċ,½,±,Æ,ì, ,éŠJ”ŽÒ,É,Æ,Á,Ä,Í“é ò,Ÿ [,ċ
,à,lf¾,ë,ª B,µ,©,µ A %o,ß,Á3Dfvf fOf%of~f“fO,ð s,ðŠJ”ŽÒ,Í A ufCf“fgf f_fNfVf±f“:
Direct3D,lfŮŽ f, [fh EfIfufWfFfNfg v,Æ u3Dfvf fOf%of~f“fO,lfŠi‘b:Z p v,ð \ª,É— %oð,·,é•K—v,ª, ,é B,±
,ê,©,ċ3Dfvf fOf%of~f“fO,ðŽn,ß,éŠJ”ŽÒ,à AŽn,ß,½,Í,©,è,lfŠJ”ŽÒ,à A,±,ÍSDK,ÉŠÜ,Ü,ê,Ä,ċ
,éfTf“fvfċ EfR [fh,ð’ ^Ó [“Ĉ,ñ,Ä,ċ
,½,¾,«,½,ċ BfTf“fvfċ EfR [fh,Í AŽÀ Ů,lfAfvfŠfP [fVf±f“,É•ŮŽ f, [fh,ðŽÀ•,·,é•û-@,ðŽ!,µ,Ä,ċ,é B

,±,lfZfNfVf±f“,Í A3D fvf fOf%of~f“fO,Ö,lfCf“fgf f_fNfVf±f“,Ä, ,é B,±,±,Ä,Í AMicrosoft,lf3D
fOf%oftfBfbfNfX,É‘Í,·,é f\Ÿf... [fVf±f“,Æ A3 ŽŸE³ ã,lf“_ð€ ì,·,é,½,ß,É•K—v,È A,ċ,,Ä,©,lfZ p“l,È—
\”ò’mŽ ,É,Ä,ċ,Ä à¾,·,é B,±,ê,Í ADirect3D,lfŮŽ f, [fh,lfvf fOf%of~f“fO,lf %o•à,É,Ä,ċ,Ä à-
¾,µ,½,à,lf,Ä,Í,É,ċ B•ŮŽ f, [fh,lfvf fOf%of~f“fO,É,Ä,ċ,Ä,Í A uDirect3D,lfŮŽ f, [fh,lf’f...
[fgfŠfAfċ v,ðŽQ 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,»,,ê,¼,ê,É,Ä,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,Ī,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%oÄŽ<ffBfXfvfCEfC,đŽĪ,·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 Ī,.,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 Ī,.,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’É,È“Á”Ÿ,đ•ŮŽ ,μ,Ä,ç,é B

Direct3DRMPickedArray

,±,ĪfIfufWfFfNfg,Í A— ^,Ī,ç,ê,½2D,Ī“_É’Ī%ž,.,éfIfufWfFfNfg,đŽ-•Ê,.,é B

Direct3DRMShadow

%oA%oe,đ’èç,.,éfIfufWfFfNfg,Ä, ,é B

Direct3DRMTexture

F,Ī•t,ç,½fsfNfZfç,ª,éCE’,É•Ä,ñ,¾fIfufWfFfNfg,Ä, ,é B

Direct3DRMUserVisual

fVfXfefç,ªñçÿ,μ,È,ç<@”\ ,đŽÄCE»,.,é,½,ß AfAfvfŠfP [fVf‡f“,ª”èç,.,éfIfufWfFfNfg,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,«„éfIfufWfFfNfg,Ä, ,é BfrfWf... fAf< EfIfufWfFfNfg,Ī%oÄŽ< ó’Ó,Ä,È,- ,Ä,à,æ,ç B,½,Æ,Ī,Ī AftfCE [fç,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,ðEfvŽŽ,·,é B

‘½,,ÏIfufWfFfNfg,Í A”z-ñfIfufWfFfNfg,ÆEÄ,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,Ïf|fCf“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

fIfufWfFfNfg,ÆfCf“f^ [ftFfCfX

IObjectName::QueryInterface,Í AfIfufWfFfNfg,»,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

fIfufWfFfNfg¼ 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,ÌDirect3DRMDevicefIfufWfFfNfg,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,çDirect3DRMDevicefIfufWfFfNfg,ð ¶ -,·,é BfIfufWfFfNfg,Ì %Šú%»,Í **AIDirect3DRMDevice::InitFromClip
perf** f\fbfh,É,æ,Ä,Ä s,í,é,é **BIDirect3DRMDevice::QueryInterface** f\fbfh,ÌÆÄ,Ñ o,µ,Í AIDirect3DRMDevicefIf
ufWfFfNfg,Ö,Ì,Ó,½,Ä,ß,ÌfCf“f^ [ftFfCfX iWM_PAINT,ª,ÑWM_ACTIVATEf fbFZ [fw,Ö,Ì%ž“šŽž,É—p,ç
,ç,é,é,É**IDirect3DRMWinDevice**fCf“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,ÌfIfufWfFfNfg,ðŽQ Æ,µ,Ä,ç,é,ç,ç,µ
,ç,ð”»’è,·,é,É,Í A,»,é,¼,é,ÌfCf“f^ [ftFfCfX,É,Ä,ç,Ä**QueryInterface** f\fbfh,ðÆÄ,Ñ o,µ A•Ö,³,ê,éf|
fCf“f^,Ì¹,ð”šŠr,·,é Bf|fCf“f^,Ì¹,“™,µ,ç ê ± AfCf“f^ [ftFfCfX,Í“¶,¶IfufWfFfNfg,ðŽQ Æ,µ,Ä,ç,é B

Direct3D,Ì,·,×,Ä,Ì•Ÿ f, [fh EfIfufWfFfNfg,Í A’O q,µ,½fŠfXfg’†,ÌfCf“f^ [ftFfCfX,É%Ä,Í **AIDirect3DRMO
bject**fCf“f^ [ftFfCfX,Æ**IUnknown**fCf“f^ [ftFfCfX,ðfTf| [fg,µ,Ä,ç
,é B,µ,ç,µ **AIDirect3DRMObject**fIfufWfFfNfg,Í”z—ñfIfufWfFfNfg,ð’ñ<Ÿ,µ,È,ç B”z—ñfIfufWfFfNfg,Í A•K—
v,ª,È,ç,½,ß AfNf%ofXŽ•ÈŽq iCLSID j,ðŽ ,Ä,Ä,ç
,È,ç **BIDirect3DRM::CreateObject** f\fbfh,ÌÆÄ,Ñ o,µ,Ä,Í A”z—ñfIfufWfFfNfg,ð ì -,·,é,±
,Æ,Í,Ä,«,È,ç B,»,Ì”ã,í,é AŞefCf“f^ [ftFfCfX,É,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**Direct3DRMFrame::AddChild**f f\fbfh,ðŽg—p,µ,Ä A ,é efIfufWfFfNfg,©,ç•È,ì 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,ì 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,é,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,é,Ä,¢,È,¢^ê”ÊfIfufWfFfNfg
€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,ÌfAfff [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 BDirect3DRMAnimationIfufWfFfNfg,Í Af^fCf€'l,É,æ,Á,Ä,Ç,Ì,æ,¤,É•İŠ· ^—
,ª s,í,ê,é,©,ð'è^,·,é,à,Ì,Á, ,é BfAfff [fVf‡f“,Í ADirect3DRMFrameIfufWfFfNfg ã,Á“@ ì,·,é,æ,¤
,É Ý'è,·,é,±,Æ,ª,Á,«,é B,±
,Ì,½,ßDirect3DRMAnimationIfufWfFfNfg,Í ADirect3DRMVisual ADirect3DRMLight A,·,æ,ÑDirect3DRMViewport
fIfufWfFfNfg,ÌÊ'u E€ü,«,ÌfAfff [fVf‡f“,âfXfP [fŠf“fO,ÉŽg—p,·,é,±,Æ,ª,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“,ªf^fCf€'199,Ìf|
fWfVf‡f“ EfL [,ð'Ç%oÁ,µ,½ ê ‡ Af^fCf€'149,Ì V,µ,¢f|
fWfVf‡f“ EfL [,Í AfAfff [fVf‡f“,Ì i0,©,çŽn,Ü,é jŠŽnŽž“_,Æ Á %o,Ìf|fWfVf‡f“ EfL [,Ì,ç,â,¤
,Ç+ŠÖ,ÁfCxf“fg,ð ¶ ¬,·,é B

fAfff [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 BfAfff [fVf‡f“ EfL
[,ð'Ç%oÁ,·,é f\fbfh,É,·,¢
,Ä **AIDirect3DRMAnimation::SetTime**,Ìf^fCf€'l,Í AfAfvfŠfP [fVf‡f“,ª,·,Á,É'Ç%oÁ,µ,½fL [,ÌÊ'u,ÉŠî,Ä,¢
,½“C^Ó,Ì'1,Á, ,é B

Direct3DRMAnimationSetfIfufWfFfNfg,Í ADirect3DRMAnimationSetfIfufWfFfNfg,ðfOf< [fv%o»,·,é,±
,Æ,ª,Á,«,é B,±,ê,É,æ,Á,Ä AfAfff [fVf‡f“ EfZfbfg't,Ì,·,×,Ä,ÌfAfff [fVf‡f“,Í“^,¶f^fCf€ Efpf%of [f^,ð<¤
—L,µ A·;ŽG,ÈfAfff [fVf‡f“,Ì Ä ¶,ªŠÈ—
“%o»,³,ê,é BfAfvfŠfP [fVf‡f“,Í **AIDirect3DRMAnimationSet::AddAnimation** f\fbfh,ð—p,¢
,ÄfAfff [fVf‡f“,ðfAfff [fVf‡f“ EfZfbfg,É'Ç%oÁ,·,é,±
,Æ,ª,Á,«,é BfAfff [fVf‡f“,ð í æ,·,é,É,Í **AIDirect3DRMAnimationSet::DeleteAnimation** f\fbfh,ðŽg—
p,·,é BfAfff [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©,İfNfIfŠfefB,ðŽ ,Á,Ä,¢,é,ª Af fbfVf...,ª—
p,Á,«,éfNfIfŠfefB,İ ãEÄ,İfffofCfX,ÉˆE“¶,·,é B

fAfvfŠfP [fVf±f“,Í AIDirect3DRMDevice::SetQuality,â IDirect3DRMMeshBuilder::SetQuality f\fbfh,ð—p,¢
,Ä AfffofCfX,İfEf“f_Šf“fO “x,ð•Í X,·,é,±
,E,ª,Ä,«,é BfffofCfX,İfEf“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,¢€ 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 A**Direct3**
DRMWinDevice::HandlePaint,æ,Ñ**Direct3DRMWinDevice::HandleActivate**f f\fbfh,ðŽg—
p,µ,ÂDirect3D,É'É'm,µ,É,,Á,Í,È,ç,È,¢ B

ŠÖ`A î•ñ,É,Â,¢,Ä,Í u**Direct3DRMWinDevice** v,ðŽQ Æ,³,ê,½,¢ B

IDirect3DRMFace, AIDirect3DRMFaceArray $fCf^f \wedge [ftfFfCfX$

-Ê,Í Af fbfVf... ã,ì,Ð,Æ,Â,Ï|fŠfSf“,ð•\,µ,Ä,¢,é BfAfvfŠfP [fVf‡f“,Í AIDirect3DRMFace::SetColor A
IDirect3DRMFace::SetColorRGB AIDirect3DRMFace::SetTexture A IDirect3DRMFace::SetMaterial f f\bfh,ðŽg—
p,µ,Ä A-Ê,Ï F,âfefNfXf^ff Af}fefŠfAf<,ð 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’,“_,ð“Ç,ÝŽæ,é,É,Í AIDirect3DRMFace::GetVertices,âIDirect3DRMFace::GetVertex f f\bfh,ðŽg—p,·,é B
ŠÖ~A î•ñ,É,Â,¢,Ä,Í IDirect3DRMFace v,ðŽQ Æ,³,ê,½,¢ B

IDirect3DRMFrame,ÆIDirect3DRMFrameArrayCf“f^ [ftFfCfX

ftfCE [f€„Æ„c„pCEê„Í AfIfufWfFfNfg„ì•— ftfCE [f€„ðŽQ Æ„μ„Ä„c„é„±„Æ„©„ç„—^„Ä„c„
„é„B„ŮŽ f„ [fh„É„;„^„éftfCE [f€„ì-ðŠ„„Í AfEfBf“fhfE EfVfXfef€„É„;„^„éEfBf“fhfE„ì-ðŠ„„ÉŽ—„Ä„c„
„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“Í„ÈfŠfCE [fVf‡f“fVfbfv i‘ŠCEÝŠÖCEW j„ðL q„^„é„±„Æ„É„æ„Ä„ÄfV [f“„É”z’u„^„é„é„BftfCE [f€„
„ÍfIfufWfFfNfg„ðfV [f“„É”z’u„^„é„B„Ů„½ AfrfWf...fAf< EfIfufWfFfNfg„ð^Ž„;„^„é„Æ„«„É„Í AftfCE [f€„
„©„ç„^É’u„âCEü„«„ðŽæ“¾„^„é„B

•ŮŽ f„ [fh„ìfV [f“„Í A eftfCE [f€„ðŽ „½„È„cftfCE [f€„A„Ä„Ů„è„è AftfCE [f€„ŠK’w„ìfgfbfv„É„„éftfCE [f€„
„É„æ„Ä„Ä’è<„^„é„é„B„±„ìftfCE [f€„Í Af< [fg EftfCE [f€„
„ÆCEÄ„Í„ê„é„BfV [f“„Í A’¼„ì„^„x„Ä„ìfIfufWfFfNfg„Ö„ÌŽQ ÆftfCE [f€„à’è<„μ„Ä„c„é„B

fV [f“„Í A’¼„ì„^„x„Ä„ìfIfufWfFfNfg„É„Ä„c„ÄŽQ ÆftfCE [f€„ð’è<„μ„Ä„c„
„é„B’æ1fpf%of [f^„ÉNULL„ðŽw’è„μ„Ä**IDirect3DRM::CreateFrameŠÖ** „ðCEÄ„Ñ o„μ AfV [f“„ð ì ¬„^„é„±„
„Æ„^„Ä„«„é„B

ftfCE [f€„ð’è<„ì„^„é„½„B„É„Í ADirect3D„ì ¶Žè Ä•WCEn„ð— %ð„μ„È„„Ä„Í„È„ç„È„c„B Ä•WCEn„É„Ä„c„Ä Ú„μ„-
„Í u3D Ä•WCEn v„ðŽQ Æ„^„é„½„c„B

ŠÖ~A î•ñ„É„Ä„c„Ä„Í uIDirect3DRMFrame v„ðŽQ Æ„^„é„½„c„B

„±„ìfzfNfvf‡f“„Ä„Í AftfCE [f€„Æ„»„ÌŽg—p—@„É„Ä„c„Ä à-¾„^„é„B

ŠK’w

•İŠ

“@„« if„ [fVf‡f“ j

fR [f<fofbfNŠÖ ”

ŠK'w

fV [f“, ðftfCE [f€, ðŠK'w \`c, É, È, Á, Ä, Ç, é BftfCE [f€, Í eftfCE [f€, äžqftfCE [f€, ðŽ , Á, ± , Æ, ª, Å, «, é B eftfCE [f€, ðŽ , ½, È, ÇftfCE [f€, Íf< [fg EftfCE [f€, ÆCEÄ, Î, ê AfV [f“, ð'è<, , é B

ŽqftfCE [f€, Í A eftfCE [f€, É'Î, µ, Ä'Š'Î'I, È'Ê'u, ÆEü, «, ðŽ, µ, Ä, Ç, é B eftfCE [f€, ^Ú“@, , é, Æ AžqftfCE [f€, à^Ú“@, , é B

ftfCE [f€, ð'Ê'u, âEü, «, Í AfV [f“ ä, ð'¼, ðftfCE [f€, ©, Ç, ð'Š'Î'l, Ä Ý'è, , é, ±, Æ, ª, Å, «, é B â'Î'Ê'u, ð Ý'è, , é•K—v, ª, , é ê ð, Í Af< [fg EftfCE [f€, ©, Ç, ð'Š'Î'l, ªŽg—p, Ä, «, é B, Ü, ½ A, , é eftfCE [f€, ©, ÇftfCE [f€, ð í œ, µ **AIDirect3DRMFrame::AddChild** f\fbfh, É, æ, è A, Ç, Ä, Ä, à'¼, ðftfCE [f€, È'Ç%Á, , é, ± , Æ, ª, Å, «, é BžqftfCE [f€, ðŠ@'S, É í œ, , é, È, **IDirect3DRMFrame::DeleteChild** f\fbfh, ðŽg—p, , é BžqftfCE [f€, â eftfCE [f€, ðŽæ“¾, , é, È, Í **AIDirect3DRMFrame::GetChildren**, **âIDirect3DRMFrame::GetParent** f\fbfh, ðŽg—p, , é B

ftfCE [f€, Í A'¼, ðftfCE [f€, ðfrfWf...fAf< EfIfufWfFfNfg, Æ, µ, Ä'Ç%Á, Ä, « A—^, |, Ç, è, ½ŠK'w \`c , ð AfV [f“S'Î, È“n, Ä, Ä%½“x, à~—p, , é, ±, Æ, ª%Ä”\ , È, È, é B V, µ, ÇŠK'w, ÍfCf“fXf^f“fX, ÆCEÄ, Î, ê, é BfpftfH [f}f“fX, ð'á%°, ð—h, @, ½, ß A eftfCE [f€, ðžqftfCE [f€, È“ü, è ž, Ü, È, Ç, æ, µ, È' ^Ó, ª•K—v, Ä, , é B•ÜŽ f, [fh, Í AŽÄ sžž, È , %ñŠK'w, ð s, í, È, Ç B , %ñŠK'w, ð ð ñ, Í **AIDirect3DRMFrame**fCf“f^ [ftfFfCfX, ðf f\fbfh, Ä, Í, Ä, «, , AftfCE [f€, ðfrfWf... fAf< EfIfufWfFfNfg, Æ, µ, Ä'Ç%Á, , é, Æ, «, È, ð, Ý%Ä“\, Ä, , é B

•iŠ•

ftfCE [f€ ,îÊ'u,âCEü,«Í A eftfCE [f€ ,©,ç'Š'Í'I,É 1,|,é,±,Æ,à,À,«é B,±,î ê ‡ A üCE'•iŠ,É,æ,Á,Ä eftfCE [f€ ,©,çŽqftfCE [f€ ,Ö,î'Š'ÍfxfNfgf<,ðŽæ“¾,µ A eftfCE [f€ ,Ö,î'Š'ÍfxfNfgf<,ð< ,ß,é B

•iŠ,í4 s4—ñ,î s—ñ,É,æ,Á,Ä•CE»,³,é,é B À•W,ðŽ,.,É,Í A[x, y, z, 1],î,æ,µ,É—ñ,î—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,î,æ,µ,É'è<,³,é,é B

vparent=vchildTchild

Tchild,Í AŽqftfCE [f€ ,î•iŠ, s—ñ,Á, ,é B

ŽqftfCE [f€ ,©,çf< [fg EftfCE [f€ ,Ü,Á,î,·,×,Ä,î eftfCE [f€ ,î•iŠ,Í AŽqftfCE [f€

,^af [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,î'O,É AŽqftfCE [f€ ã,îfufWf...fAf< EfIfufWfFfNfg,É'Í,µ,Ä“K—
p,³,é,é BŽqftfCE [f€ ,É'Í,.,é'Š'Í À•W,Í Af,fff< À•W,ÆCEÄ,î,ê,é,±,Æ,^a ,é Bf [f<fh•iŠ,^a s,í,ê,½ À•W,Í
Af [f<fh À•W,ÆCEÄ,î,ê,é B

ftfCE [f€

,î•iŠ,Í AIDirect3DRMFrame::AddTransform AIDirect3DRMFrame::AddScale AIDirect3DRMFrame::AddRotation

AIDirect3DRMFrame::AddTranslation,îŠef f\fbfh,É,æ,Á,Ä A'¼ Ú'İ X,.,é,±
,Æ,^a ,Ä,«é B,»,ê,¼,ê,îf f\fbfh,É,ÍD3DRMCOMBINETYPE—ñ<“CE^,îf f“fo,ð“n,µ A,Ç,î,æ,µ
,ÉfAfvfŠfP [fVf‡f“,”ñ<Ÿ,µ,½ s—ñ,ðCE» Ÿ,îftfCE [f€ ,î s—ñ,Æ ‡ ¬,.,é,©,ðŽw'è,.,é B

IDirect3DRMFrame::GetRotation,ÆIDirect3DRMFrame::GetTransformf f\fbfh,Í AftfCE [f€ ,î%ñ“]Ž²,Æ•iŠ, s—
ñ,ðŽæ“¾,.,é BftfCE [f€ ,î%ñ“],ð•İ 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
^{rm}f f\fbfh,ðŽg—p,.,é B

•iŠ,É,Á,ç,Ä,î' ‡“I,È îñ,Í Afrf... [f| [fg,É,Á,ç,Ä à-¾,µ,½fZfNfVf‡f“ u•iŠ, v,Á“¾,é,±
,Æ,^a ,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,îŠT—v,É,Á,ç,Ä,Í A u3D•iŠ: v,ðŽQ Æ,³,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,·,×,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,âEü,«,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,ÌfrfWf...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

frf... [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,Ìfrf... [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,Å Æ,ç,µ ACEöCE¹,ªfIfufWfFfNfg,©,ç,,Á,Æ—£,ê,½^Ê'u,É, ,é,æ,
□,ÈCEø%Ê,ð—^,!,é BffBfCEfNfVf‡fif<CEöCE¹,Í A³⁄⁴—z,Ï,æ,□,È%“,—£,ê,½CEöCE¹,ðfVf~f...fCE [fg,·,é,½,ß,É—~—
p,³,ê,é B

fpf%ofCf< Ef|fCf“fg

fpf%ofCf< Ef|

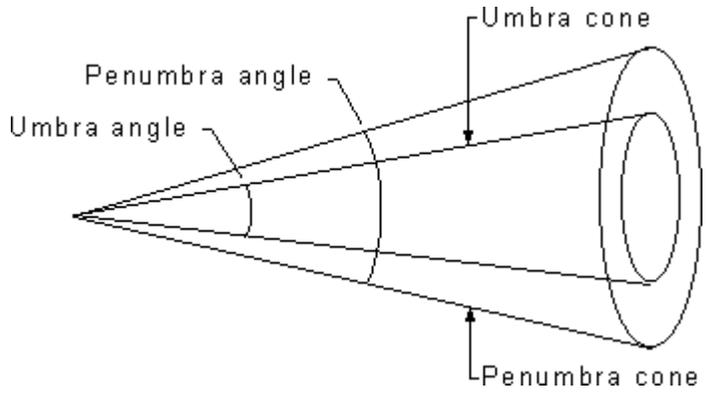
fCf“fgCEðCE¹,Ífpf%ofCf< Ef%ofCf,ÅfIfufWfFfNfg,ð Æ,ç,·,ª ACEð,ÌCEü,«ÍCEðCE¹,ÌÊ'ü,©,çCE'è,³,é,é B,Â,Û,è A
fpf%ofCf< Ef|fCf“fgCEðCE¹,É,ÍffBfCEfNfVf‡fif<CEðCE¹,Ì,æ,µ,ÉCEü,«ª, ,è A,³,ç,É^Ê'u,àŽ ,Á,Ä,ç
,é B,½,Æ,,Î Afpf%ofCf< Ef|fCf“fgCEðCE¹,Ì—¼'µ,Éf fbfVf...,ª, ,é ê ‡ ACEðCE¹,É-Ê,µ,Ä,ç,é,Û,µ,Ìf fbfVf...,ª-
¼,é,,É,é Bfpf%ofCf< Ef|fCf“fgCEðCE¹,ÌfCEf“f_Šf“fO EfXfs [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<,ðEvžžZ,.,é•K-v,ª, .é,½,ß Afpf%ofEf< Efl
fCf“fgEöE¹,æ,è,àEvžžžšŎ,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,ÌCEð,ð ¶ ¬,·,é BCEð,Í A%o~ ,ì“à•”,É, ,éfIfufWfFfNfg,É,ì,Ý“-
,Ä,ç,é,é B%o~ ,Í,Ó,½,Ä,Ì:P“x,ð ¶ ¬,·,é B’+%o,Ì-¾,é,ç•”•ª i-¾•” j,Íf|Cf“fgCEδCE¹,Æ““¶“«„ð,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



IDirect3DRMMaterialfCf“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

IDirect3DRMMaterialfCf“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,AE-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,İŠÖŠİ,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 AfVfXfefe
,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,ªİ%»»,µ,È,¢ A ,é,¢,Í-Ä’½,É•İ%»»,µ,È,¢ ê ‡,Í A,±,İ•İŠ,ªfpftfH [f}f^fX,É—
^,!,é%»»<ç,Í-³Ž<,Ä,«é’ö“x,Ì,à,Ì,Ä, ,é B**

,¢,,Á,©,Ì’,“_,â-Ê,É“¬,¶“Á « if}fefŠfAf<,âfefNfXf`ff j,ðŠ,,è“-,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,Á’,“_,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,Á’,“_,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,Á,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 [fhEFA,ª64,jfOfCfG,Ì §ÆÄ,ðŽ ,Ä,Ä,“è Af fbfVf...
,İfTfCY,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@”
,Ì,½,ß,É ADirect3DRMMesh,AEIDirect3DRMMeshBuilder,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,Íf fbfVf... ä,Ì,»,é,¼,é,Ì-Ê,É,Ä,¢,Ä Ý’è,.,é,±
,Æ,à A,.,x,Ä,Ì-Ê,É,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%»»ef, [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,ÏIfufWfFfNfg,É,ó'È,ÈŠi-{fNf%ofX,Ä, ,é BDirect3DRMObjectIfufWfFfNfg,Í A,.,×,Ä,ÏIfufWfFfNfg,É,ó'È,È"Á «,ð"ò,,Ä,ç,é B

Direct3DRMObjectIfufWfFfNfg,Í ACOMfIfufWfFfNfg,Æ,µ,ÄfCf"fx^f"fx ¶ ¬,ª s,i,é,é BŠefIfufWfFfNfg,Í AUnknownfCf" f^ [ftfFfCfX,É%Á, A^è"È,Èf f\fbfh,Ï•W €fZfbfg,ðŠÜ,ñ,Ä,ç,é B

fIfufWfFfNfg,ð ì ¬,.,é,É,Í A,Û,,**Direct3DRMCreate**ŠÖ ",ðCEÄ,Ñ o,µ ADirect3D,Ï•Ûž f, [fh EfIfufWfFfNfg,ÏfCf"fx^f"fx,ð ¶ ¬,µ,È,-,Ä,Í,È,ç,È,ç BŽŸ,ÈfAfvfŠfP [fVf±f",Í AfIfufWfFfNfg,ð ì ¬,.,é,Cf" f^ [ftfFfCfX,Ïf f\fbfh,ðCEÄ,Ñ o,µ AfIfufWfFfNfg,ÉCEÄ—

L,Ïfpf%of [f^,ðŽw'è,.,é B,½,Æ,,Í ADirect3DRMAnimationfIfufWfFfNfg,ð ì ¬,.,é,É,Í**Direct3DRM::CreateAnimation**f f\fbfh,ÏCEÄ,Ñ o,µ,ð s,µ B ì ¬f f\fbfh,Í V,µ,çIfufWfFfNfg,ð ì ¬,µ Afpf%of [f^,Ä"n,³,è,½ff [f^,ç,ç A,ç,-

,Ä,ç,ÏIfufWfFfNfg,Ï'® «,ð %Šú%»,µ A,,ÏIfufWfFfNfg,ð•Ï• Bfpf%of [f^,ÄŽw'è,³,è,È,ç'® «,É,ÏfftfHf<fg,Ï'l,ð—^,Ä,;, BfAfvfŠfP [fVf±f",Í A,±,ÏIfufWfFfNfg,ÏfCf" f^ [ftfFfCfX,ðŽw'è,µ,Ä'® «,ð'Í X,µ AfIfufWfFfNfg,Ïžg—p,ðŠŽn,.,é,±,Æ,ª,Ä,«é B

,.,×,Ä,ÏIfufWfFfNfg,Í AfAfvfŠfP [fVf±f""èç,Ï32frfbfg,Ïff [f^,ðŠi",.,é,±,Æ,ª,Ä,«é B•Ûž f, [fh,Ä,Í A,±,Ïff [f^,%ð Ì,³,è,½,è•Ï X,³,è,½,è,.,é,±,Æ,Í,È,ç BfAfvfŠfP [fVf±f",ç,ç,±,Ïff [f^,ð"Ç,Ýžæ,é,É,Í A**Direct3DRMObject::GetAppData** f\fbfh,ðžg—

p,.,é Bff [f^,Ï',« ž,Ý,É,Í A**Direct3DRMObject::SetAppData** f\fbfh,ðžg,µ,±,Æ,ª,Ä,«é BfAfvfŠfP [fVf±f",ªŠeDirect3DRMFramefIfufWfFfNfg,Ï \ç'Ï,ð•Ûž ,µ,Ä,ç,è,Í A,±,Ïff [f^,ðŽæ"¾,.,é,Ï,ÏŠÈ'P,Ä, ,é B,½,Æ,,Í A**Direct3DRMFrame::GetParent** f\fbfh,ðCEÄ,Ñ o,µ,ÄDirect3DRMFramefIfufWfFfNfg,ðžó,žæ,é è ± AfAfvfŠfP [fVf±f",Ïvf%ofCfx [fg,È \ç'Ï,Ï,ÏfCf" f^,ð—p,ç AžžŠÖ,Ï,ç,ç,éÉY ò,ð s,i,,È—e^Ï,Éff [f^,ðŽæ"¾,.,é,±,Æ,ª,Ä,«é B

fAfvfŠfP [fVf±f",Ï \z,ðâ •,.,é,½,ß,É A,Û,½,ÏfAfvfŠfP [fVf±f",Ïf† [fU EfCf" f^ [ftfFfCfX,Ï1•",Æ,µ,Ä A fIfufWfFfNfg,È-¼'O,ðŠ,,è"—,Ä,½,ç,±,Æ,ª, ,é,¾,è,µ BfIfufWfFfNfg,Ï-¼'O,ð Ý'è Ežæ"¾,.,é,É,Í A**Direct3DRMObject::SetName**,A**Direct3DRMObject::GetName** f\fbfh,ðžg—p,.,é B

fAfvfŠfP [fVf±f"CEÄ—L,Ïff [f^,Ïžg,ç•û,Ï,à,µ,Ð,Æ,Ä,Ï—á,Æ,µ,Ä AfAfvfŠfP [fVf±f",af fbfVf... ã,Ï-È,ðTfufZfbfg,ÉfOf< [fv%»,µ,½,ç è ± i,½,Æ,,Í Aftf f"fg,ÆfobfN,Ï W ±,ÉfOf< [fv%»,.,é è ± j,ª l,,ç,è,é B,±,Ï,Æ,« A, ,é-È,ª,ç,ç,ÏfOf< [fv,È',.,ç,ðçL%-,.,é,½,ß,É AfAfvfŠfP [fVf±f""èç,Ïff [f^,ð—~—p,.,é,±,Æ,ª,Ä,«é B

fAfvfŠfP [fVf±f",Í AfIfufWfFfNfg,"jŠü,³,è,é,Æ,«ÉCEÄ,Ñ o,•ŠÖ ",ðžw'è,.,é,±,Æ,ª,Ä,«é B,±,ÏŠÖ ",ªCEÄ,Ñ o,³,è,½,Æ,« AfAfvfŠfP [fVf±f",Í AfIfufWfFfNfg,ÉŠÖ~A•t,ç,è,½f f,š,ð%ð•ú,µ,È,-,Ä,Í,È,ç,È,ç BŠÖ ",ðžw'è,.,é,É,Í A **Direct3DRMObject::AddDestroyCallback** f\fbfh,ðžg—p,.,é BÈ'O,É,±,Ïf f\fbfh,È,æ,Ä,Ä"o^,³,è,½ŠÖ ",ð í æ,.,é,É,Í A**Direct3DRMObject::DeleteDestroyCallback** f\fbfh,ðCEÄ,Ñ o,• B

fR [f<ofbfNŠÖ ",Í AfIfufWfFfNfg,"jŠü,³,è,é,Æ,«¾,CEÄ,Ñ o,³,è,é B,Ä,Û,è AfIfufWfFfNfg,ÏžQ **ÆfJfEf" f**g,ª0,É'B,µ AfVfXfef€,ªfIfufWfFfNfg,Ïf f,š,ð%ð•ú,µ,æ,µ,Æ,µ,Ä,ç,é,Æ,«Ä, ,é BfAfvfŠfP [fVf±f",ªfIfufWfFfNfg,É,Ä,ç,Ä,Ï•%Ä î•ñ,ð•Ûž ,µ,Ä,ç,é è ± A,±,ÏfR [f<ofbfNŠÖ ",ð—~—p,µ,Ä Aff [f^,ð"jŠü,µ,Ä,æ,ç,±,Æ,ðfAfvfŠfP [fVf±f"žÇ g,È'È'm,.,é,±,Æ,ª,Ä,«é B

ŠÖ~A î•ñ,É,Ä,ç,Ä,Í u**Direct3DRMObject** v,ðžQ Æ,³,è,½,ç 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,»,ê,©,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,^a,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,^a,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%ofbvv,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,ªTf| [fg,·,éfefNfXf`ff,ÌŽi—B,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
BIDirect3DRMTexture::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,»ÌCEã 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 ¶ ä<,©,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,·,ê,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,½Ěä,Í AfefNfXf`ff—
v'f ifefNfZf< j,ª Å IfCf [fW,ĭĚÂ X,ĭfsNfZf<,Æ^ê'v,·,é,±,Æ,Í—
Å'½,É,Ě,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<“Ě^,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•Í 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“I,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,ÆIDirect3DRMViewportArrayfCf“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*r... [*f*] [*f*g,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*] [*f*g,Í AfJf f% EftfCE [*f*€
,ì ³,ìzŽ² ã,É, ,é%oÄŽ<fIfufWfFfNfg,¾,¯,ð AyŽ² ã,ì ³•ûCEü,ÉfCEf“f_Šf“fO,·,é B

*f*AfvfŠP [*f*Vf‡f“,Í A—^,|,ç,ê,½ftr... [*f*] [*f*g,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*
[*f*g,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 $\hat{A} \cdot W, \hat{l} f l f u f W f F f N f g, \delta 2 D f E f B f " f h f E, \acute{E} f \acute{C} f " f _ f \acute{S} f " f O, \cdot, \acute{e}, \frac{1}{2}, \beta, \acute{E}, \acute{I} A f l f u f W f F f N f g, \delta f l f _ f \% E f t f \acute{C} E [f \acute{C} " \acute{a}, \acute{E} \cdot \acute{I} \acute{S} \cdot, \mu, \acute{E}, \acute{A}, \acute{I}, \acute{E}, \acute{C}, \acute{E}, \acute{C} B, \gg, \pm, \acute{A} A 4, \acute{A}, \acute{l} - v " f, \delta \acute{Z} \cdot, \acute{A} " \acute{Z} \acute{c}, \acute{l} \acute{A} \cdot W [x y z w], \delta \acute{c} \cdot, \beta, \acute{e}, \frac{1}{2}, \beta A \acute{Z} \acute{E} \% e s - \acute{n}, \acute{a} - p, \acute{C} \cdot, \acute{c}, \acute{e}, \acute{e} B \acute{A} \cdot W [x y z w], \acute{I} A 3 - v " f, \acute{l} \acute{A} \cdot W [x / w y / w z / w], \delta \acute{Z} \acute{a} " \acute{3} 4, \cdot, \acute{e}, \frac{1}{2}, \beta, \acute{E} \acute{Z} g, \acute{i}, \acute{e}, \acute{e} B [x / w y / w], \acute{I} f E f B f " f h f E, \acute{a} \acute{Z} g - p, \cdot, \acute{e} \acute{A} \cdot W, \acute{A}, \acute{e} B, \acute{U}, \frac{1}{2} A z / w, \acute{I} \% e s, \acute{«}, \delta 0, \acute{C}, \acute{c} 1, \acute{l} " \acute{I} \acute{I}, \acute{A} \acute{Z} \acute{l}, \mu A 0, \acute{I} \acute{C} \acute{O} \acute{u} f N f \acute{S} f b f v - \acute{E} A 1, \acute{I} \acute{C} \acute{E} \acute{a} \acute{u} f N f \acute{S} f b f v - \acute{E} \acute{A}, \acute{E}, \acute{e} B \acute{Z} \acute{E} \% e s - \acute{n}, \acute{I} A " \acute{S} \acute{Z} \cdot \acute{I} \acute{S} \cdot, \acute{l} \acute{C} \acute{E} \acute{a}, \acute{E} f l f u f W f F f N f g, \acute{l} f X f P [f \acute{S} f " f O, \acute{A} \acute{E} \acute{U} " \acute{C}, \delta \acute{C} \acute{C} \acute{c} \acute{z}, \mu, \frac{1}{2}, \acute{a}, \acute{l}, \acute{A}, \acute{e} B$

$\acute{Z} \acute{Y}, \acute{l} s - \acute{n}, \acute{a} \acute{Z} \acute{E} \% e s - \acute{n}, \acute{A}, \acute{e} B, \pm, \acute{l} " \acute{T} \acute{M} \acute{Z} \acute{C}, \acute{E}, \cdot, \acute{c}, \acute{A} A h, \acute{I} \acute{Z} \acute{c} _ " \acute{a}, \acute{l} " \frac{1}{4} \acute{a}, \acute{l} \cdot, \acute{3} A F, \acute{I} \acute{C} \acute{E} \acute{a} \acute{u} f N f \acute{S} f b f v - \acute{E}, \acute{l} z \acute{A} \cdot W A D, \acute{I} \acute{C} \acute{O} \acute{u} f N f \acute{S} f b f v - \acute{E}, \acute{l} z \acute{A} \cdot W, \delta \acute{Z} \acute{l}, \mu, \acute{A}, \acute{C}, \acute{e} B$

$$P = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & \frac{hF}{D(F-D)} & \frac{h}{D} \\ 0 & 0 & \frac{-hF}{F-D} & 0 \end{bmatrix}$$

Direct3D, $\acute{A}, \acute{I} A \acute{Z} \acute{E} \% e s - \acute{n}, \acute{l} 4 - v " f, \acute{E} \cdot \% \acute{C}, \acute{l} \acute{l}, \delta \acute{Y} \acute{e}, \cdot, \acute{e}, \pm, \acute{A}, \acute{I}, \acute{A}, \acute{«}, \acute{E}, \acute{C} B$

$\acute{Z} \acute{Y}, \acute{l} s - \acute{n}, \acute{I} A f E f B f " f h f E E f X f P [f \acute{S} f " f O, \delta s, \acute{a} i f X f P [f \acute{C}, \acute{I} f E f B f " f h f E, \acute{l} t f \acute{C} f Y, \acute{A} \acute{E} \acute{u}, \acute{E} \acute{E} \acute{C}, \cdot, \acute{e} j B, \pm, \acute{l} \acute{C} \acute{E} \acute{Z} \acute{C}, \acute{A}, \acute{I} A s, \acute{I} f E f B f " f h f E, \acute{l} f X f P [f \acute{S} f " f O E W " A o, \acute{I} f E f B f " f h f E, \acute{l} \acute{C} \acute{E} " _ , \acute{A}, \acute{e} B$

$$W = \begin{bmatrix} s_x & 0 & 0 & 0 \\ 0 & -s_y & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

$\acute{Z} \acute{Y}, \acute{l} s - \acute{n}, \acute{I} f t f \dots [s - \acute{n}, \acute{A}, \acute{e} B, \pm, \acute{e}, \acute{I} A \acute{Z} \acute{E} \% e s - \acute{n}, \acute{A} f E f B f " f h f E s - \acute{n}, \acute{l} \acute{z} \acute{A} \acute{C} \acute{E} \acute{3}, \acute{c} \acute{S}, \cdot, \acute{e}, \acute{I} P, \acute{A} W, \acute{l} \acute{l}, \acute{A}, \acute{e} B$

$$V = P \cdot W = \begin{bmatrix} s_x & 0 & 0 & 0 \\ 0 & -s_y & 0 & 0 \\ \frac{h o_x}{D} & \frac{h o_y}{D} & \frac{h F}{D(F-D)} & \frac{h}{D} \\ 0 & 0 & \frac{-h F}{F-D} & 0 \end{bmatrix}$$

$f X f P [f \acute{S} f " f O E W " \cdot, \acute{A} \acute{C} \acute{E} " _ s_x A s_y A o_x A o_y, \acute{I} A [-h -h D], \acute{C}, \acute{c} [h h D], \acute{U}, \acute{A}, \acute{l} \acute{S} [f W f \acute{z} " \cdot, \acute{A} f E f B f " f h f E, \acute{l} \cdot, \acute{3}, \acute{a} \cdot \acute{E} \acute{3} \acute{S} m, \acute{E} f t f B f b f g, \cdot, \acute{e}, \acute{a}, \acute{a}, \acute{E} \acute{I} \acute{D}, \acute{3}, \acute{e}, \acute{e} B$

$f X f N f \acute{S} [f " \acute{A} \cdot W, \acute{C}, \acute{c} f [f \acute{C} f h \acute{A} \cdot W A, \acute{U}, \frac{1}{2} \acute{c}, \acute{E} f [f \acute{C} f h \acute{A} \cdot W, \acute{C}, \acute{c} f X f N f \acute{S} [f " \acute{A} \cdot W, \acute{E} f x f N f g f \acute{C}, \delta \acute{I} \acute{S} \cdot, \cdot, \acute{e}, \acute{E}, \acute{I} A]$
Direct3DRMViewport::Transform, Direct3DRMViewport::InverseTransform $f \backslash f b f h, \delta \acute{Z} g - p, \cdot, \acute{e} B \acute{Z} \acute{Y}, \acute{l} - \acute{a}, \acute{l}, \acute{a}, \acute{C}$
 $\acute{E} A f A f v f \acute{S} f P [f v f \acute{z} " \acute{I} A, \pm, \acute{e}, \acute{c}, \acute{l} f \backslash f b f h, \delta - \sim - p, \mu, \acute{A} f h f \% f b f O, \delta f T f [f g, \cdot, \acute{e}, \pm, \acute{A}, \acute{a}, \acute{«}, \acute{e} B$

```
/*
 * 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);
```

```

p2.x += delta_x * p2.w;
p2.y += delta_y * p2.w;
view->InverseTransform(&p1, &p2);
frame->SetPosition(scene, p1.x, p1.y, p1.z);
}

```

ff... [f] [fg·İŠ·đ—p,ç,é,Æ Af [f<fh À•W,À,İfIfuFwfFfNfg,İÚ“@<—É,đfJf f%,©,ç%œ s,«,Ü,À,İ<—É ,Æ^ê'v,³,¹,é,±,Æ,ª,À,«,é B **Direct3DRMViewport::Transform** f\fbfh,İE:‰E,Í A4,À,İ—v'f,đŽ ,ÂfxfNfgf<,À•\ ,³,é,é,±,Æ,É' ^Ó,³,é,½,ç B,±,ê,É,æ,À,À AfJf f%,İÊ'u,ÉEÀ,è,È,ç À•W,À ¶,¶,é-â'è,đ%ñ”ð,·,é,±,Æ,ª,À,«,é B

ff... [f] [fg,İŽE‰œ s—ñ,ª ¶ ¬,·,é3D À•W,Í AŽ< 'ä,ì“à•”,ì“_¾,¯,đ-¾Šm,É,µ,À,ç,é B“Š‰œEä,İ“_ [x y z w] ,É,À,ç,À,Í A^Ê‰°,İ“™Ž@,ª ¬—§,·,é B

$$wx_{min} \leq x < wx_{max}$$

$$wy_{min} \leq y < wy_{max}$$

$$0 \leq z < w$$

where

$$x_{min} = viewport_x - viewport_{width} / 2$$

$$x_{max} = viewport_x + viewport_{width} / 2$$

$$y_{min} = viewport_y - viewport_{height} / 2$$

$$y_{max} = viewport_y + viewport_{height} / 2$$

ftfE [f€·İŠ·É,À,ç,À,Í u·İŠ· v,đŽQ Æ,³,é,½,ç B,Ü,½ A·İŠ·f,fWf... [f<,É,À,ç ,À,Í uDirect3DfA [fLfefNf`ff v,İfZfNfVf†f“ u·İŠ·f,fWf... [f< v,À à-¾,µ,À,ç,é B·İŠ·E vŽZ,İŠT—v,É,À,ç ,À,Í A u3D·İŠ· v,đŽQ Æ,³,é,½,ç B

fsfbfLf“fO

fsfbfLf“fO,Æ,Í Afrf... [f] [fg,ìfEfBf“fhfE,Å A2D À•W,©,çfV [f“ ã,ÌfufWf...
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 ‡,ÌfŠfXfg,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,“%oÁŽ<,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,ÏyŽ²,É%o^,Á,Ä,¢,é B€
‘“_ ,Ï[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,È,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,È,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%ˆ,Á,Ä A%~'E ó,©fh [fifc ó,ÌE` ó,©,Ì,æ,□ ,Éf%fbfvfAf%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- È,É,Í AfefNfXf`ff,ª-³EÀ,Éf^fCfŠf“fO,ª,é,é B,±,Ì ê ‡ A—LÆø,Èu,¨,æ,Ñv À•W'1,Ì1.0`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%øß,·,é B

D3DRENDERSTATE_WRAPU,Ü,½,ÍD3DRENDERSTATE_WRAPV,Ì,¢ ,·,é,©,ªfZfbfg,ª,é,½ ê ‡ AfefNfXf`ff,Í%~Žü1.0,Ì I,í,è,Ì,È,¢ %~“>E`É,È,é B1.0`È ã,ÌfefNfXf`ff À•W,Í Af%fbfv,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,È,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%øß,·,é B

D3DRENDERSTATE_WRAPU,ÆD3DRENDERSTATE_WRAPVftf%fO,Ì— ¼•û,ªfZfbfg,ª,é,½,Æ,«,Í AfefNfXf`ff,Í%~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,Ì-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%øß,·,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

ˆè”Ê,ÉfAfvfŠfP [fvf‡f“,Í AfefNfXf`ff,ÌEð ü,ª-Ê,Ì•Ó,Æˆè'v,µ,È,¢ ,Æ,« A%~'E ó,Éf%fbfv,·,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`³,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,^aç,β,ç,ê,é B

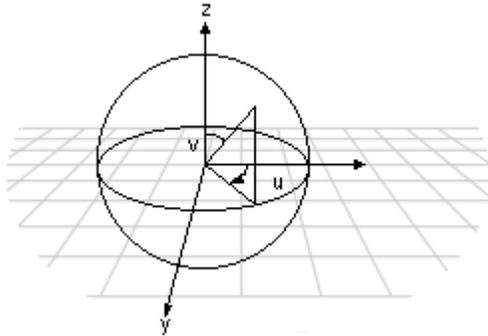
u=sux-ou

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,^a—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

...

...
 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

$$u = \frac{S_u}{2\pi} \tan^{-1} \frac{x}{y} - o_u$$

$$v = \frac{S_v}{\pi} \tan^{-1} \frac{z}{\sqrt{x^2 + y^2 + z^2}} - o_v$$

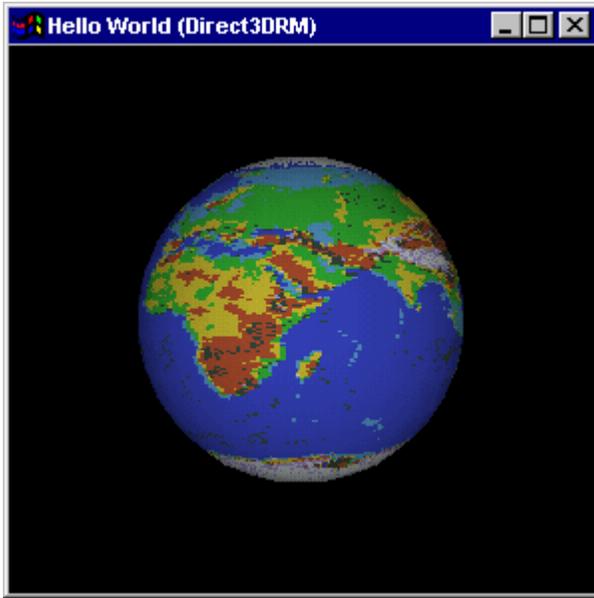
±,±,Á,Í AfXfP [fŠf“fO,³,ê,Ä,c,È,cu,Æv,Ì”ÍÍ,Í,Á,È,É0,©,ç1,Á, ,é,½,ß AfXfP [fŠf“fOEW ”,ÆfefNfXf`ff,ÌE
 “_Í•K—v,Æ,³,ê,È,c,±,Æ,ª½,c B

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”½ŽĚfxfNfgf<,ðĈvŽŽ,·,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”½ŽĚfxfNfgf<,ìĈð ü,©,çfefNfXf`ff,ìu,“,æ,Ñv À•W,ðĈvŽŽ,·,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^Ů, 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%° }
, ĩ A“® ĩ’t, ĩfAfjf [fVf‡f“, ĩtfCE [f€ĭ, Ð, Æ, Â, Â, , é B



, ±, ĩf... [fgfŠfAf<, Í A^È%°, ĩfZfNfVf‡f“, É•ª, ¬, ç, è, Ä, ç, é B

Helworld.c, É, Â, ç, Ä

f}fNf 'è<, Æfof [fof•ĭ ”

Windows, ĩfZfbfqfAfbfv, Æ %Šú%»

fffofCfX E fhf%ofCfo, ĩ—ñ<“

3DŠÂ««, ĩfZfbfqfAfbfv

fCEf“f fŠf“fo Ef< [fv

fV [f“, ĩ ì ¬

I— ĩ—

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,±
,İfhfLf...f f“fg,É,Í ADirect3D,İ•ŮŽ f, [fh EfAfvfŠfP [fVf‡f“,İ İ -,É•K—v,È,·,×,Ä,İfR [fh,ªL Ú,³,ê,Ä,c
,é B,±,İf`f... [fgfŠfAf<,İfR [fh,ð A,Đ,Æ,Â,İ.cftf@fCf<,ÉfRfs [.·,ê,Î AfRf“fpfCf<,µ,ÄŽÄ s,·,é,±
,Æ,ª,Ä,«é i,½,¾,µ AfRf“fpfCf%,ªDirectX SDK,İffBfCfEfNfgfŠ,É, éSphere3.xftf@fCf<,ðCE©,Â,¯,é,±
,Æ,ª,Ä,« A,³,ç,È AHello.ppm,Æ,c,ª¼’O,İfRfbfgrf}fbfv ftf@fCf<,ª—pˆÓ,³,ê,Ä,c,é,±,Æ j B,±
,İfTf“fvf<,Â,Í A3DEø%oÈ,ðŽÀCE»,·,éfR [fh,İ,Ů,Æ,ñ,Ç,ÍCEÂ X,İŠÖ ”,É•ª,¯,ç,ê,Ä,c,é,½,ß AŽ© g,İCEoCE±
,É%ž,¶,Ä AfVfXfef€,İê•”,É ,µ,,Ä•İ X,ð%Á,!,é,±,Æ,ª,Ä,«é B,æ,è•jŽG,ÈDirect3D,İ<@”\
,ðfCf“fvfŠf f“fg,·,é,½,ß,É,Í ASDK,İfTf“fvf<,ðŽQ Æ,·,é,Æ,æ,c B

,±,İfZfNfVf‡f“,Â,Í AŠÈ’P,ÈDirect3D,İ•ŮŽ f, [fh EfAfvfŠfP [fVf‡f“,ðŠJ”,·,é ä,Ä,İ-â’è“_,É,Â,c,Ä A,c,-
,Ä,© à-¾,·,é B

fTf“fvf<,İ §CEÀ

fXf^fefBfbfN Ef%ofCfuf%ofŠ

DirectDraw,İfEfBf“fhfE Ef, [fh

ftf“fvf,ì §ÆÀ

,±,ìf`f... [fgfŠfAf<,É,Í AHelworld.cfTf“fvf< Efr [fh,ŠÜ,Ü,ê,Ä,¢
,é BHelworld.c,Í A<...ì,ð ì ¬,µ A,»,ê,ÉfefNfXf`ff,ð“\,è•t, AfEfBf“fhfE“à,Å%õñ“],^{3,1},é B,±
,ìfAfvfŠfP [fVf‡f“,ðfrf<fh,·,é,½,ß,É•K—v,Èf\ [fX Eftf@fCf<,Í AHelworld.c,¾,¯,Ä, ,é B,±,ì‘¼,É ADirectX
SDK,ìffBfEfNfgfŠ,ÉfRfs [,³,ê,½Shpere3.x,Æ,¢,of fbVf... Eftf@fCf<,Æ AHello.ppm,Æ,¢,¤¼‘O,ìfrfbfgf}
fbfvftf@fCf<,ªK—v,Ä, ,é B

,±,ìTf“fvf<,Í ADirectX SDK,ìê•”,Ä, ,éGlobefTf“fvf<,ÉŠì,Ä,¢,Ä,¢,é,^a A à¾,ì,½,ß,É,æ,èŠÈ—%»,³,é,Ä,¢
,é BSDK,ÉŠÜ,Ü,ê,é¼,ìDirect3D•ŮŽ f, [fh,ìTf“fvf<,Æ“—l AGlobefTf“fvf<,É,Í ARmmain.cpp,Æ,¢
,ofTf@fCf<,Æ ”¼,ìwfbf_ Eftf@fCf<,ìfCf“fNf< [fh,ªK—v,Ä, ,Ä,½,^a AHelworld.c,Ä,Í ARmmain.cpp,ÌŠÖ•A,µ,
½%õ Ÿ,ðC++,©,çC,É ‘,«¼,µ Af\ [fX fR [fh’†,É’g,Ý ž,ñ,Ä,¢,é B

,±,ìf`f... [fgfŠfAf<,Ä Ð%õì,µ,Ä,¢,éfR [fh,Í A,»,ì,Ü,Ü »•i,ìfR [fh,É“K—p,Ä,«é,í,¯,Ä,Í,È,¢ B,±,ìfvf fOf%of€
,Äf† [fU,^a,Ä,«é,±,Æ,Í Afvf fOf%of€,ðŽÀ s,µ A l—1,µ AŽÀ s’†,ÉfEfBf“fhfE,ð Ä ¬%»,·,é,±,Æ,¾,¯,Ä, ,é
B ^— ,ð,í,©,è,â,·,·,·,é,½,ß,É A,Ü,Æ,ñ,ç,ìfGf% [EfFFfbfN,Í È—^{a,3},é,Ä,¢,é B,±,ìTf“fvf<,ìÓ } ,Í A%æ—
Ê,É”Hello, world!” ,ð•Žì,·,é,¾,¯,ì—L¼,Èfvf fOf%of€,ªŽì,·,Æ,±,è,Æ—DŽ—,µ,Ä,¨,è A,Ä,«é,¾,¯,ì,©,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, ðfŠf“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 Ä %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,ìfR [fh,Í AHelworld.cTf“fvf<,ì Á %ò,ì”•,Á, ,é BHelwold.c,Í A,±,ìfAfvfŠfP [fVf±f“„ðrf<fh,.,é,½,ß,É•K  
—v,È—B^è,ìftf@fCf<,Á, ,è A¼,ìfwfbf_ Eftf@fCf<,âf\ [fX Eftf@fCf<,Í•s—v,Á, ,é B
```

```
INITGUID,Í A¼,ìfCf“fNf< [fh,âf}fNf 'è<,æ,è,à'O,Édefine,³,è,Ä,ç,È,,Á,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,Á, ,é B
```

```
////////////////////////////////////  
//  
// Copyright (C) 1996 Microsoft Corporation. All Rights Reserved.  
//  
// File: Helworld.c  
//  
// "Globe" SDKfTf“fvf<,ÉŠí,Á,ç,½ AŠÈ'P,ÈDirect3D•ŮŽ f, [fh,ìfTf“fvf<  
//  
////////////////////////////////////
```

```
#define INITGUID // '¼,ìf}fNf 'è<,âfCf“fNf< [fh,ì'O,É  
// 'è<,µ,È,,Á,Í,È,ç,È,ç
```

```
#include <windows.h>  
#include <malloc.h> // memset,ìŒÄ,Ñ o,µ,É•K—v  
#include <d3drmwin.h>
```

```
#define MAX_DRIVERS 5 // D3Dfhf%oCfo,ì Á'â ”
```

```
// fOf [fOf•İ ”
```

```
LPDIRECT3DRM lpD3DRM; // Direct3DRMfIfufWfFfNfg  
LPDIRECTDRAWCLIPPER lpDDClipper; // DirectDrawClipperfIfufWfFfNfg
```

```
struct _myglobs {  
    LPDIRECT3DRMDEVICE dev; // Direct3DRMfffofCfX  
    LPDIRECT3DRMVIEWPORT view; // fV [f“„,³,è,éDirect3DRMrf... [f] [fg  
    LPDIRECT3DRMFRAME scene; // '¼,ìfIfufWfFfNfg,“z'u,³,è,éf}fXf^ [ EftfŒ [fŒ  
    LPDIRECT3DRMFRAME camera; // f† [fU,ìPOV,ðŽ',·ftfŒ [fŒ
```

```
    GUID DriverGUID[MAX_DRIVERS]; // —LŒø,ÈD3Dfhf%oCfo,ìGUID  
    char DriverName[MAX_DRIVERS][50]; // —LŒø,ÈD3Dfhf%oCfo,ì¼'O  
    int NumDrivers; // —LŒø,ÈD3Dfhf%oCfo,ì ”  
    int CurrDriver; // Œ» ÝŽg,í,è,Ä,ç,éD3Dfhf%oCfo,ì ”
```

```
    BOOL bQuit; // fvf fOf%oŒ,ª I—1,µ,æ,²,Æ,µ,Ä,ç,é  
    BOOL bInitialized; // ,·,×,Ä,ìD3DRMfIfufWfFfNfg,ª %òŠú%ò»,³,è,½  
    BOOL bMinimized; // fEfBf“fhfE,ª Á —%ò»,³,è,½
```

```
    int BPP; // Œ» Ý,ìffBfXfvfŒfC Ef, [fh,ìfrfbfg [“x
```

```
} myglobs;
```

```
// ŠÖ ”,ìfvf 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 ”,ÌEÄ,Ñ o,µ,Ä, ,é BRenderLoopŠÖ ”,Í AfAfjf [fVf‡f“,Ì,»„ê,¼,ê,Ìftf€ [f€  
,ð•%œ,·,é,½,ß,É•K—v,Ä, ,é BRenderLoopŠÖ ”,É,Ä,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 I—,µ,æ,ª,Æ,à,µ,Ä,“,ç, A,©,Ä  
// D3DRM,ª %Šú%»„³,é,Ä,ç,ê,Ì Af€f“f_Šf“fO,ðŠJŽn,·,é B
```

```
if (!myglobs.bMinimized && !myglobs.bQuit &&  
myglobs.bInitialized) {
```

```
// ftf€ [f€,Ìf€f“f_Šf“fO,ðŽŽ,Ý,é Bf€f“f_Šf“fO,ª2%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,Ì %Šú%»ŠÖ ”,Í A,Û,Æ,ñ,Ç,ÌWindowsfAfvfŠfP [fVf‡f“,Æ“—
l,É AfEfBf“fhfE EfNf%oX,ð“o^,µ Af fCf“ EfAfvfŠfP [fVf‡f“ EfEfBf“fhfE,ð ì ¬,·,é B,»,ÌCEä ADirect
Draw,âDirect3D,ð—p,¢,éAfAfvfŠfP [fVf‡f“,É“Á—L,Ì ^— ,ð s,µ B

InitAppŠÖ ”,Í A,Û, ACE» Ý,ÌffBfXfvfŒfC,ÌfsNfZf“—,½,è,Ìrfbfg ”,ðŽæ“¾,·,é B,±
,Ìl,Í AfAfvfŠfP [fVf‡f“,afŒf“f_Šf“fO,ÌiŽi,ð Ý’è,·,é Û,ÉŽg—p,¾,é B Û,µ,-
,Í ufŒf“f_Šf“fO EfXfe [fg,Ì Ý’è v,ðŽQ Æ,¾,è,½,¢ B

,»,ÌCEä A,Ç,ÌDirect3Dfhf%oCfo,ª—LŒø,Á, ,é,©,ðŒ“è,µ A“K Ø,Èfhf%oCfo,ð‘I’ð,·,é,½,ß,É Af [fJf‘è’,ÌEnum
DriversŠÖ ”,ðCEÄ,Ñ o,· Bfhf%oCfo,Ì—ñ“,É,Á,¢,Ä Û,µ,,Í A ufffofCfX Efhh%oCfo,Ì—
ñ“ v,ðŽQ Æ,¾,è,½,¢ B

ŽÝ,É ADirect3DRMCreateŠÖ ”,ðCEÄ,Ñ o,µ AIDirect3DRMfCf“f^ [ftfFfCfX,ð ì ¬,·,é B,±
,ÌfCf“f^ [ftfFfCfX,Í AfV [f“,âfJf f%o EftfŒ [fŒ,ð ì ¬,µ,½,è AfJf f%o
,ðfV [f“,É Ý‘u,·,é,½,ß AIDirect3DRM::CreateFrame,âIDirect3DRMFrame::SetPosition,ðCEÄ,Ñ o,·,Æ,«,ÉŽg—
p,¾,è,é B

DirectDrawClipperfIfufWfFfNfg,Í A3DfV [f“,Ì%ÄŽ,“ª,ð §Œä,·,éfNfŠfbfsf“fO fvfŒ [f“,ÌŠÇ—
,ðŠÈ’P,É,·,é BHelwold.c,Á,Í AIDirectDrawClipperfCf“f^ [ftfFfCfX,ð ì ¬,·,é,½,ß,ÉDirectDrawCreateClipperŠÖ
”,ðCEÄ,Ñ o,µ AIDirectDrawClipper::SetHwndf ffbfh,ðŽg—
p,µ,Ä AfNfŠfbfsf“fO îñ,ðŽæ“¾,·,éEfBf“fhfE,Ìfnf“fhf,ð Ý’è,·,é B

,»,µ,Ä Af [fJf‘è’,ÌCreateDevAndViewŠÖ ”,ðCEÄ,Ñ o,µ ADirect3DffofCfX,Æfrf... [f] [fg,ð ì ¬,·,é B,±
,ÌŠÖ ”,É,Á,¢,Ä Û,µ,,Í ufffofCfX,Æfrf... [f] [fg,Ì ì ¬ v,ðŽQ Æ,¾,è,½,¢ B

Direct3DfAfvfŠfP [fVf‡f“,afTf] [fg,·,é,·,×,Ä,Ì \‘‘Ì,Ì %Šú%»,ªŠ@—1,·,é,Æ A3DfV [f“,ð ×,©, \ ¬,·,é,±
,Æ,ª,Ä,«,é,æ,µ,É,É,é B,±,Ì ^— ,ÍMySceneŠÖ ”,ª s,Á,Ä,¢,é BMySceneŠÖ ”,É,Á,¢,Ä Û,µ,,Í ufffofCfX,Æfrf...
[f] [fg,Ì ì ¬ v,ðŽQ Æ,¾,è,½,¢ B

ACEä,ÉInitAppŠÖ ”,Í A·W €“I,È %Šú%»ŠÖ ”,Æ“—l,É AfEfBf“fhfE,ÌŽ!,Æ X V,ð s,µ B

```
////////////////////////////////////  
//  
// InitApp  
// fEfBf“fhfE,ð ì ¬,µ AfŒf“f_Šf“fO,ðŠJŽn,·,é,½,ß,É·K—v,È,·,×,Ä,ÌIfufWfFfNfg,ð  
// %Šú%»,·,é B  
//  
////////////////////////////////////
```

```
static BOOL  
InitApp(HINSTANCE this_inst, int cmdshow)  
{  
    HWND win;  
    HDC hdc;  
    WNDCLASS wc;  
    RECT rc;  
  
    // fZfbfgfAfbfv,ð s,¢ AfEfBf“fhfE EfNf%oX,ð“o^,·,é B  
  
    wc.style = CS_HREDRAW | CS_VREDRAW;  
    wc.lpfnWndProc = WindowProc;  
    wc.cbClsExtra = 0;  
    wc.cbWndExtra = sizeof(DWORD);  
    wc.hInstance = this_inst;  
    wc.hIcon = LoadIcon(this_inst, "AppIcon");  
    wc.hCursor = LoadCursor(NULL, IDC_ARROW);  
    wc.hbrBackground = (HBRUSH)GetStockObject(BLACK_BRUSH);  
    wc.lpszMenuName = NULL;  
    wc.lpszClassName = "D3DRM Example";  
    if (!RegisterClass(&wc))  
        return FALSE;
```

```

// fOf [fof<İ ”,đ %Šú%»,:é B

memset(&myglobs, 0, sizeof(myglobs));

// fEfBf“fhfE,đ ì ¬,,:é B

win =
    CreateWindow
    (
        "D3DRM Example", // fEfBf“fhfE EfNf%ofX
        "Hello World (Direct3DRM)", // f^fCfGf<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,İ•
        300, // %Šú,İ ,3
        NULL, // efEfBf“fhfE
        NULL, // f fJf... [ Efnf“fhf<
        this_inst, // fvf fOf%of€,İfCf“fXf^f“fX Efnf“fhf<
        NULL // ì ¬fpf%of [f^
    );
if (!win)
    return FALSE;

// Ć» Ý,İffBfXfvfEfC,İfsfNfZf<“¬,½,è,İfrfbfg ”,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;

// D3DRMfIfufWfFfNfg,ÆD3DRMfIfufWfFfNfg,đ ì ¬,,:é B

lpD3DRM = NULL;
Direct3DRMCreate(&lpD3DRM);

// f}fXf^ [ EfV [f“,İftfĆ [f€,ÆfJf f% EftfĆ [f€,đ ì ¬,,:é B

lpD3DRM->lpVtbl->CreateFrame(lpD3DRM, NULL, &myglobs.scene);
lpD3DRM->lpVtbl->CreateFrame(lpD3DRM, myglobs.scene,
    &myglobs.camera);
myglobs.camera->lpVtbl->SetPosition(myglobs.camera, myglobs.scene,
    D3DVAL(0.0), D3DVAL(0.0), D3DVAL(0.0));

// DirectDrawClipperfIfufWfFfNfg,đ ì ¬,µ AfEfBf“fhfE,ÆŠÖ~A•t,¬,é B

DirectDrawCreateClipper(0, &lpDDClipper, NULL);
lpDDClipper->lpVtbl->SetHWND(lpDDClipper, 0, win);

// ‘I’đ,3,è,½D3Dfhf%ofCfo,đ—p,ĉ,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; // %Šú%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<,lft [fU,l“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 ”,ªfAfvfŠfP [fVf‡f“,ìfV [f“,ÆfJf f‰,ð ¶ ¬,·,é¼‘O,ÉCEÄ,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 ”,ðCEÄ,Ñ o,µ,ÄDirectDrawIfufWfFfNfg,ð ¶ ¬,·,é B±,¢
,ÄEnumDriversŠÖ ”,Í AQueryInterface f\fbfh,ð—p,¢
,ÄIDirect3DfCf“f^ [ftfFfCfX,ð ¶ ¬,·,é BCE¾CEê,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,ìfAfhfCEfX,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 [fVf‡f“,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 BBPPToDDBDŠÖ ”,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€Á,Í AD3DDEVICEDESC \‘ç’Ì,¼,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%ofCfg,æ,è,àRGBf%ofCfg,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 ”

```
enum DeviceFuncR [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% [ 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,Ī,Ĉ 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%»»,ÌèšÂ,Æ,μ,Ä ì ñ,³,é,é BInitAppšÖ ”,Í ADirectDrawClipperIfufWfFfNfg,đ ¶ ñ,μ,½Ěä ADirectDrawClipperIfufWfFfNfg,Æ‘İđ,³,é,½fhf%ofCfo A,“,æ,ÑfNf%ofCfAf“fg<Ě“,Ì ÿ @,đfpf%of [f^,Æ,μ,Ä ACreateDevAndViewšÖ ”,đĚÄ,Ñ o,· B

CreateDevAndViewšÖ ”,Í A—ñ<“fvf fZfX,Ä‘İđ,³,é,½fhf%ofCfo,đžg—

p,μ,Ä A**IDirect3DRM::CreateDeviceFromClipper** f\fbfh,É,æ,Ä,ÄDirect3DRMffofCfX,đ ì ñ,·,é B,± ,**IDirect3DRMDevice**fC“f^ [ftFfCfX,Í AffofCfX,Ì· ,“,æ,Ñ ,³,đžæ“¾,·,é**IDirect3DRMDevice::GetWidth**,**AIDirect3DRMDevice::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,đž æ“¾,·,é B

žŸ,ÉCreateDevAndViewšÖ ”,³**IDirect3DRMViewport::SetBack** f\fbfh,É,æ,Ä,Äfrf... [f] [fg,ÌĚä·ûNfšfbfv-É,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‘â,«,È ”,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·žžĭ A“h,è,Ä,Ô,μf, [fh AĚđĚĚ,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 = myglobs.dev->lpVtbl->SetQuality(myglobs.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 (myglobs.BPP) {

 case 1:

 if (FAILED(myglobs.dev->lpVtbl->SetShades(myglobs.dev, 4)))
 goto shades_error;
 if (FAILED(lpD3DRM->lpVtbl->SetDefaultTextureShades(lpD3DRM, 4)))
 goto shades_error;
 break;

 case 16:

 if (FAILED(myglobs.dev->lpVtbl->SetShades(myglobs.dev, 32)))
 goto shades_error;
 if (FAILED(lpD3DRM->lpVtbl->SetDefaultTextureColors(lpD3DRM, 64)))
 goto shades_error;
 if (FAILED(lpD3DRM->lpVtbl->SetDefaultTextureShades(lpD3DRM, 32)))
 goto shades_error;
 break;

```
case 24:
case 32:
    if (FAILED(myglobs.dev->lpVtbl->
        SetShades(myglobs.dev, 256)))
        goto shades_error;
    if (FAILED(lpD3DRM->lpVtbl->
        SetDefaultTextureColors(lpD3DRM, 64)))
        goto shades_error;
    if (FAILED(lpD3DRM->lpVtbl->
        SetDefaultTextureShades(lpD3DRM, 256)))
        goto shades_error;
    break;
}
return TRUE;
shades_error:
return FALSE;
}
```

fCef“f_Šf“fO Efc [fv

WinMainŠÖ ”,Í AŽŸ,ÌftfCE [f€,đ•%œæ,·,é,½,β 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,□ 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%ofCfo,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 ”ŒEQ,ðŒÄ,Ñ o,· B

MySceneŠÖ ”

MakeMyFrames ŠÖ ”

MakeMyLights ŠÖ ”

SetMyPositions ŠÖ ”

MakeMyMesh ŠÖ ”

MakeMyWrap ŠÖ ”

AddMyTexture ŠÖ ”

MySceneŠÖ ”

```
Helworld.c,ÌMySceneŠÖ ”,Í A DirectX SDK,Ì,·,×,Ä,ÌDirect3DfTf“fvf<,ÉfCf“fvfŠf f“fg,³,ê,Ä,¢
,é ABuildSceneŠÖ ”,É:Š“-.,é BfAfvfšfP [fvfšf“,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 Ýè,·,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%øð•ú,·,é,±,Æ,ª,Ä,«,é B
```

```
////////////////////////////////////
//
// MyScene
// ftfCE [f€ ACEðCE¹ Af fbvVf... AfefNfXf`ff,ð ì ¬,·,éŠÖ ”,ðCEÄ,Ñ o,· BŠ@—¹,µ,½,ç A,·,×,Ä,Ì
// fCf“f^ [ftfFfCfX,ð%øð•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 ¬,·,é·K—v,ª,é ê ± i,½,Æ,Ì ACEð,èP,—È,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;  
}
```

MakeMyFramesŠÖ ”

```
MySceneŠÖ ”,ÍMakeMyFramesŠÖ ”,ðĀ,Ñ o,μ AHelworld.c,Ā—p,ĉ,ĉ,ê,éffBfĉfNfVf‡fif<ĉĉĉĉfĉ [fĉ  
,âf [f<fh Eftfĉ [fĉ  
,ð ĩ ĩ,.,é BMakeMyFramesŠÖ ”,Í AIDirect3DRM::CreateFrame f\fbfh,ðĀ,Ñ o,μ,Ā A,±,ì ^—  
,ðŽĀ s,.,é B
```

```
////////////////////////////////////  
//  
// MakeMyFrames  
// fV [f“,ĀŽg—p,.,éftfĉ [fĉ,ð ĩ ĩ,.,é B  
//  
////////////////////////////////////
```

```
void MakeMyFrames(LPDIRECT3DRMFRAME lpScene, LPDIRECT3DRMFRAME lpCamera,  
    LPDIRECT3DRMFRAME * lpLightFrame1,  
    LPDIRECT3DRMFRAME * lpWorld_frame)  
{  
    lpD3DRM->lpVtbl->CreateFrame(lpD3DRM, lpScene, lpLightFrame1);  
    lpD3DRM->lpVtbl->CreateFrame(lpD3DRM, lpScene, lpWorld_frame);  
}
```

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,Ē’Ç%Ā,·,é ifAf“frfGf“fg Ef%ofCfġ,Í A,Ā,Ē,ĒfV [f“‘S’ì,
ĒŠÖ~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::SetOrientation/ f\fbfh,İŒÄ,Ñ o,µ,É,æ,Á,ÄŽÀ s,·,é
BIDirect3DRMFrame::SetRotation/ 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,Þ•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—

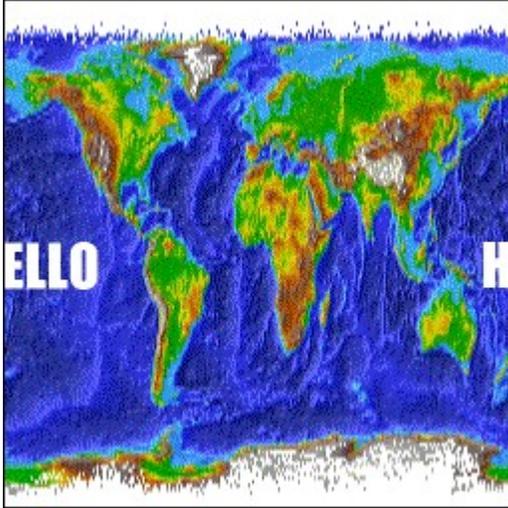
p,·,é BIDirect3DRMWrapf f\fbfh,Í%~‘CE,ÌfefNfXf`ff Ef%öbfv,ð ì ¬,µ AIDirect3DRMWrapCf“f^ [ftfFfCfX
,ðŽæ“¾,·,é BfefNfXf`ff À•W,ð<...‘Ì,É“K—p,·,é,É,Í AIDirect3DRMWrap::Applyf f\fbfh,ÌCEÄ,Ñ o,µ,ð s,² B

```
////////////////////////////////////  
//  
// 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,đŽó, Žæ,Á,½,Æ,« A,Ü,½,ÍRenderLoopŠÖ ”,ìĈÄ,Ñ o,μ,É%½“x,©Ž,”s,
μ,½,Æ,« ACleanUpŠÖ ”,đĈÄ,Ñ o,· B

```
////////////////////////////////////  
//  
// Cleanup  
// ,·,x,Ä,İD3DRMfIfufWfFfNfg,đ%đ•ú,μ AbQuitftf%fo,đfZfbfg,·,é B  
//  
////////////////////////////////////
```

```
void  
Cleanup(void)  
{  
    myglobs.bInitialized = FALSE;  
    myglobs.scene->lpVtbl->Release(myglobs.scene);  
    myglobs.camera->lpVtbl->Release(myglobs.camera);  
    myglobs.view->lpVtbl->Release(myglobs.view);  
    myglobs.dev->lpVtbl->Release(myglobs.dev);  
    lpD3DRM->lpVtbl->Release(lpD3DRM);  
    lpDDClipper->lpVtbl->Release(lpDDClipper);  
  
    myglobs.bQuit = TRUE;  
}
```

¼ Úf, [fh,iŠT—v

¼ Úf, [fh,É,Â,ç,Ä

,±,lfZfNfVf±f“,Á,Í AMicrosoft,lfCEfxf<3D API,Ä, ,é¼ Úf, [fh,É,Â,ç,Ä à-
¾,.,é BDirect3D,lf¼ Úf, [fh,Í AfQ [f€„â„»„lf¼,lfnfC EfpftfH [f}f“fX,Èf}
f<f`f fffBfA EfAfvfŠfP [fVf±f“,ð AMicrosoft Windows flfyfCE [fefBf“fO EfVfXfef€ ä,É \z,.,é•K—
v,Ì, ,éŠJ”ŽÖ,É,Æ,Á,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

ˆè”Ê,É A•ÜŽ f, [fh,lfã,í,è,É¼ Úf, [fh,ð~—p,.,éŠJ”ŽÖ,Í AfnfC EfpftfH [f}f“fX,Èfvf fOf%of~f“fO,lfžè-
@,É ,’È,µ,Ä,“,è A,³,ç,É A3DfOf%oftfBfbfNfX,É,Ä,ç,Ä,lf \“a,È’mŽ-,àž ,Á,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,.,é•K—v,“, ,é B,±,lfZfNfVf±f“,Á,Í AfVfXfef€„ðCEø—
!“I,É šCEä,.,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,Á,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 î•ñCE,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 î•ñ,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, ©, ç 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 uDirect3DfA [fLfefNf`ff v, ðŽQ Æ, ³, è, ½, Ç B

ŽŸ, Ĩ•, Ĩ A¼ Úf, [fh, Ĩ8, Ä, ĨIfufWfFfNfgE^ A, »), ĨRf“f|
 [flf“fg EfIfufWfFfNfg Ef, fff< iCOM jfCf“f^ [ftfFfCfX A, ĩ, æ, Ñ, »), è, ¼, è, É, Ä, Ç, Ä, Ĩ à—¾, ðŽ’, µ, Ä, Ç, é B

fIfufWfFfNfgE^	COMfCf“f^ [ftfFfCfX, Æ à—¾
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
ŒöE¹	<u>IDirect3DTexturefCf“f^ [ftfFfCfX</u>
ftf... [f] [fg	fCf [fW, ðŠÜ, ÞDirectDrawfT [ftfFfX
s—ñ	<u>IDirect3DMaterialfCf“f^ [ftfFfCfX</u>
ŽÀ sfobftf@	F, âfefNfXf`ff, È, Ç, Ĩ AfT [ftfFfX, Ĩ“Á «
	<u>IDirect3DLightfCf“f^ [ftfFfCfX</u>
	ŒöE¹
	<u>IDirect3DViewportfCf“f^ [ftfFfCfX</u>
	•%œæ, ., 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, ÆfE^f“f_Šf“fO•Ů—@, ĨŽwŽ’

fE^f“f_Šf“fO, ĨŽÀ sfobftf@, È, æ, Á, Ä s, Ĩ, è, é B, ±, Ĩfobftf@, È, Ĩ A’, “_Ĩff [f^, ÆfIfyfR [fh, ðŠÜ, Ü, è, Ä, Ç
 , é BfIfyfR [fh, Ĩ A%ð“Ç, ³, è, é, Æ AfE^f“f_Šf“fO fGf“fWf”, ÉfCf [fW, ð ¶ ĩ, ., é, æ, □
 , ÈŽwŽ’, ., é BŽÀ sfobftf@ COMfIfufWfFfNfg, È, Ĩ Af|fCf“f^, Æ Afobftf@ EftfH [f}fbfg, È, Ä, Ç, Ä, Ĩ à—
 ¾, ¾, ĩ, ðŠÜ, Ü, è, Ä, Ç, é B, ±, Ĩfobftf@, Ĩ“@“Ĩ, ÈŠm•Ů, ³, è AfOf%ftfBfbfNfJ [fh, Ĩf f, fŠ“à, È•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, ðCE%°È“Ĩ, Ä, , é B
 COMfIfufWfFfNfg B
 COMfIfufWfFfNfg’Ĩ, 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, È•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

	COMfCf“f^ [ftfFfC	\`c`Ĩ	fnf“fhf<
	fX		
ffofCfX	~		
fefNfXf`ff	~	~	~
f}fefŠfAf<	~	~	~
ŒöE¹	~	~	
ftf... [f] [fg	~		
s—ñ	~	~	~
ŽÀ sfobftf@	~	~	

Direct3DIfufWfFfNfg

,±,ìfZfNfVf±f“,Á,Í ADirect3D,ìfIfufWfFfNfg,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,^a,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,İfCf“f^ [ftFfCfX,Á, ,é B***Direct3DDeviceCf“f^ [ftFfCfX,đ ¶** -,.,é,É,Í *AfofbNfobftf@,İIDirectDrawSurface2::QueryInterface f\fbfh,İCEÄ,Ñ o,µ,đ s,µ BŽŸ,İ—*

á,Á,Í **AIDirectDraw::CreateSurface, AIDirectDrawSurface::GetAttachedSurface** f\fbfh,đCEÄ,Ñ o,µ *AfofbN_Efobftf@,İfT [ftFfX,đŽæ“¾,.,é B***DirectDraw2, AIDirectDrawSurface2fCf“f^ [ftFfCfX,Á,±,İfAfNfVf†f“**,đŽÄ s,.,é,É,Í **AQueryInterface** f\fbfh,đ—p,¢,Ä V,µ,¢fCf“f^ [ftFfCfX,Ö,İf|fCf“f^,đ—v< ,.,é B

```
lpDirectDraw->CreateSurface(  
    lpDDSurfDesc, // DDSURFACEDESC \‘İ,Ö,İf|fCf“f^  
    lpFrontBuffer, // DIRECTDRAWSURFACE \‘İ,Ö,İf|fCf“f^  
    pUnkOuter); // NULL  
lpFrontBuffer->GetAttachedSurface(  
    &ddscaps, // DDSCAPS \‘İ,Ö,İf|fCf“f^  
    &lpBackBuffer); // DIRECTDRAWSURFACE \‘İ,Ö,İf|fCf“f^  
lpBackBuffer->QueryInterface(  
    GUIDforID3DDevice, // IDirect3DDeviceCf“f^ [ftFfCfX,İID  
    lpD3DDevice); // DIRECT3DDEVICEIfufWfFfNfg,Ö,İf|fCf“f^
```

fobfbNfobftf@,İ,½,ß,İIDirectDrawSurface::QueryInterface f\fbfh,İCEÄ,Ñ o,µ,ÁŽw’è,.,é Ä %
,İfpf%of [f^,Í **AIDirect3DDeviceCf“f^ [ftFfCfX,đŽ,** AfOf [fof< Ef(Efxf<,Á—B^è,İŽ•ÊŽq iGUID j,Á, ,
é B,±,İGUID,Í **AIDirect3D::EnumDevices** f\fbfh,İCEÄ,Ñ o,µ,É,æ,Á,ÄŽæ“¾,.,é,±,Æ,ª,Ä,«é BfVfXfef€
Í **AIDirect3D::EnumDevicesSÖ** ”,İCEÄ,Ñ o,µ,İ†,ÄfAfVfŠfP [fvf†f“;”ñ<Ÿ,.;é**D3DENUMDEVICESCALLBACK**
R [f<fofbfNŠÖ ”,đCEÄ,Ñ o,.,Æ,« A,±,İGUID,đ<Ÿ<<,.,é B

Direct3D,İfffofCfX EfIfufWfFfNfg,Í AfCf“f^ [ftFfCfX EfŠfXfg,É¶ Ý,µ i,.,é,¢
,Í u’@,µ v j AŽ© g,İŽÄ sfobftf@,Æfrf... [f] [fg,İfŠfXfg,đŽ ,Á,Ä,¢,é B,Ü,½ AfefNfXf`ff,âf}
fefŠfAf<,İfŠfXfg,àŠÜ,ñ,Ä,“è A,»è,ç,İfŠfXfg’t,İŽŸ,İfefNfXf`ff,âf}fefŠfAf<,Ö,İf|
fCf“f^,Æ A’O,İfffofCfX,Ö,İf|fCf“f^,İ—¼•û,đ•ŪŽ ,µ,Ä,¢,é B,±,İŠK’w \‘¢,É,Ä,¢,Ä Ú,µ,-
,Í *ufIfufWfFfNfg,İCE< ± < v,đŽQ* Æ,³,è,½,¢ B

IDirect3DDeviceCf“f^ [ftFfCfX,İf f\fbfh,İfn [fhEfFfA”—Í,đ’Ê’m,µ Afrf... [f] [fg EfŠfXfg,İŪŽ Af}
fefŠfAf<fIfufWfFfNfg,İ’€ İ AŽÄ sfobftf@ EfIfufWfFfNfg,İŽÄ s,đ s,µ B

s—ñ,İfnf“fhf<,Æ,µ,Ä,İ,ŸŽæ“¾,.,é,±,Æ,ª,Ä,«é BDirect3D,İ s—
ñ,đ İ -,.,é,É,Í**AIDirect3DDevice::CreateMatrix** f\fbfh,đCEÄ,Ñ o,µ **AIDirect3DDevice::SetMatrix** f\fbfh,É,æ,Á,Ä
s—ñ,İ’â—e,đ Ÿ’è,.,é,±,Æ,ª,Ä,«é B s—ñ,İfnf“fhf<,İŽÄ sfobftf@,Ä—p,¢,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 B**IDirect3DText**
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,ê,½,c B

ˆÈ%º,ì—á,Á,Í A**IDirect3DTextureCf“f^ [ftFfCfX,ì ì ¬•û—**
@,Æ AIDirect3DTexture::GetHandle,.,æ,Ñ**IDirect3DTexture::Load**f 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,ê,Ä,.,è AfffofCfX EfŠfXfg`t,ÌŽÝ,ÌfefNfXf`
ff,Æ AŠÖ~A•t,¬,ç,ê,½fffofCfX,Ì A—¼•û,ðŽw,·f|Cf“f^,ðŽ ,Á,Á,c,é i,±,ÌŠK`w \`c,É,Á,ç,Ä Ú,µ,-
,Í ufIfufWfFfNfg,ÌCE< ± « v,ðŽQ Æ,³,ê,½,c j BfefNfXf`ff Efnf“fhf<,Íf}fefŠfAf<,ãŽÀ sfobftf@,Á—p,c
,ç,é Afrf... [f]

[fg,Á,ÌZfobftf@,Æ,µ,ÄŽg,í,ê,é BfefNfXf`ff,Ìf [fh,ÆfAf`f [fh Afnf“fhf<,ÌŽæ“¾ AfpfCEfbfg•İ%º,ÌŽæ“
¾,É,Í A**IDirect3DTextureCf“f^ [ftFfCfX,ªŽg—p,Á,«,é B**

,±,ÌfZfNfVf±f“,Á,Í ADirect3D,ÌfefNfXf`ff,Æ,»,ÌŽg,c•û,ð à¾,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`É%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`É%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`É%oß,·,é B

-³CEø-Ì`æ,É, ,Ä,½fefNfXf`ff À•W,ð-LCEø-Ì`æ,ÉŽû,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,ß,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,ÌfCf“f_Šf“fO ,“x,ð ,,B,éŽè'i,Å, ,é Bf~fbfvf}
fbfv'†,ÌftfBf<f^,³,ê,½fCf [fW,âfCfxf<,Í A'O,ÌfCfxf<,æ,è,à ¬,³,,È,Å,Ä,¢, B

D3DTEXTUREFILTER—ñ“CÆ^,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^Cfv,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“Í,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::GetHandlef f\fbfh,đ—p,¢ Af}
fefŠfAf<,Ì Ý'è,Æfnf“fhf<,ÌŽæ“¼,đ s,Ä,Ä,¢,é B

```
lpDirect3D->CreateMaterial(  
    lpDirect3DMaterial, // V,µ,¢f}fefŠfAf<,Ö,Ìf|Cf“f^  
    pUnkOuter); // NULL  
lpDirect3DMaterial->SetMaterial(  
    lpD3DMat); // D3DMATERIAL `¢'Ì,Ö,Ìf|Cf“f^  
lpDirect3DMaterial->GetHandle(  
    lpD3DDevice, // DIRECT3DDEVICE `¢'Ì,Ö,Ìf|Cf“f^  
    lpD3DMat); // D3DMATERIAL `¢'Ì,Ö,Ìf|Cf“f^
```

f}fefŠfAf<fIfufWfFfNfg,ÍfCf“f^ [ftFfCfX EfŠfXfg,ÉŠÜ,Ü,ê,Ä,“è AfffofCfX EfŠfXfg'†,ÌŽŸ,Ìf}
fefŠfAf<,Ö,Ìf|Cf“f^,Æ AŠÖ`A•t, ¯,ç,ê,½ffofCfX,Ö,Ìf|Cf“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”wCEi,đ Ý'è,·,é,½,ß,ÉŽg—
p,³,ê,é BIDirect3DMaterialCf“f^ [ftFfCfX,đ—p,¢,é,Æ Af}
fefŠfAf<,ÌŽæ“¼,â Ý'è Afnf“fhf<,ÌŽæ“¼ 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,¢
,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,¢CEðCE¹,Ö,Ìf|fCf“f^  
    pUnkOuter);      // NULL  
lpDirect3DLight->SetLight(  
    lpLight);        // D3DLIGHT \“ì,Ö,Ìf|fCf“f^
```

CEðCE¹f|fufWfFfNfg,ÍfCf“f^ [ftFfCfX EfŠfXfg,Æftr... [f| [fg EfŠfXfg,ÉŠÜ,Ü,ê,Ä,¢
,é **BIDirect3DLight** [ftFfCfX,ðŽg—p,µ,Ä ACEðCE¹,ÌŽæ“¾,â Ý'è,ð s,²,±,Æ,ª,Ä,«.,é B

IDirect3DViewport

IDirect3DViewport *IDirect3D::CreateViewport* *IDirect3DDevice::AddViewport* *IDirect3DViewport::SetViewport* *IDirect3DViewport::SetBackground* *IDirect3DViewport::AddLight*

```
lpDirect3D->CreateViewport (
    lpDirect3DViewport, // V,µ,¢ftrf... [f] [fg,Ö,Ï|fCf“f^
    pUnkOuter); // NULL
lpD3DDevice->AddViewport (
    lpD3DViewport) // ftrf... [f] [fg,ðfffofCfX,ÉfAf^fbf`,,·,é
lpD3DViewport->SetViewport (
    lpData); // fXfNfŠ [f“ â,Ïftrf... [f] [fg,Ï^u,ð Y’è,·,é
// D3DVIEWPORT `¢·Ï,Ï,Ï|fCf“f^
lpD3DViewport->SetBackground (
    lphMat); // ”wEi,ÏD3DMATERIALHANDLE `¢·Ï,Ï,Ï|fCf“f^
lpD3DViewport->AddLight (
    lpD3DLight); // ŒöŒ¹fIfufWfFfNfg,Ï,Ï|fCf“f^
```

ftrf... [f] [fg,Ï|fCf“f^ [ftfFfCfX EfŠfXfg,ÆfffofCfX EfŠfXfg,ÉŠÛ,Û,è,Ä,¢
,é BfIfufWfFfNfg,Ï AfXfNfŠ [f“ Eff [f^,Æ,Æ,à,ÉŒöŒ¹fŠfXfg,ð·ÛŽ ,µ,Ä,“,è A”wEi,Ïf}
fefŠfAf<fnf“fhf<,âfefNfXf`ff Efnf“fhf<,ðŽ ,Ä ê ‡,à, ,é B IDirect3DViewport *IDirect3DViewport*
p,µ,Ä A”wEi,âftrf... [f] [fg,ÏŽæ“¾,Æ Y’è ACEöŒ¹,Ï’Œ%Á,Æ í œ A’,“_,Ï·ÏŠ,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

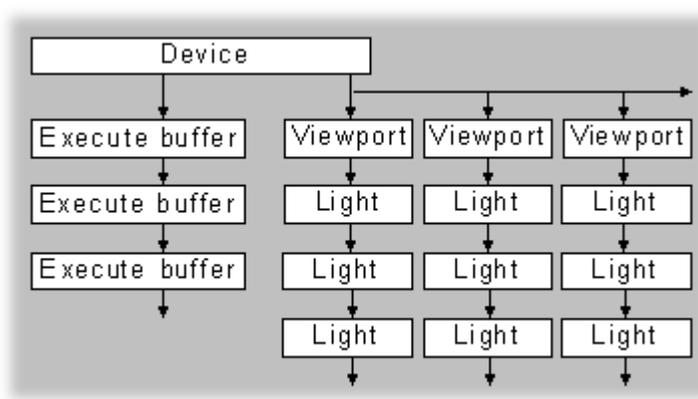
```
lpD3DExBuf->Lock(  
    lpDesc); .        // DIRECT3DEXECUTEBUFFERDESC \“ì,Ö,Ìf|Cf“f^  
// .  
// . Store contents through the supplied address  
// .  
lpD3DExBuf->Unlock();  
lpD3DExBuf->SetExecuteData(  
    lpData);         // D3DEXECUTEDATA \“ì,Ö,Ìf|Cf“f^
```

,±,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,ÄŽw’è,.,é B

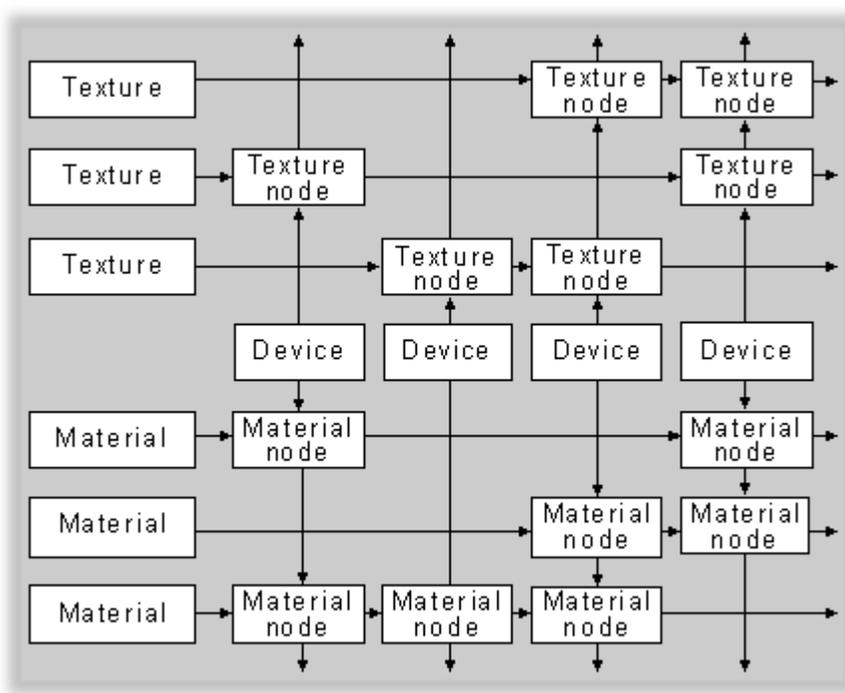
ŽÀ sf [f^,ÌŽæ“¾,â Ý’è Af fbfN AfAf“f fbfN A Ä“K%» A,“,æ,ÑŽÀ sfobftf@,ìEÿ Ø,ð s,□
,É,Í AIDirect3DExecuteBufferCf“f^ [ftFfCfX,ðŽg—p,.,é B

Device

Execute buffer, Viewport, Light



Texture, Texture node, Device, Material, Material node



Texture node, Device, Material node, Material node

fV [f“iŠÇ—

,·,×,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,éŽÄ 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 AŽÄ 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€,É o,³,ê,é,·,×,Ä,Ì`%œ- ½—ß,Í A1%oi,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 ”%oi,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 ”%oi,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%oe,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,ìfŠfXfg,É à-¾,·,éfXfefbfv,ð“Ÿ,Ð,±
,Æ,É,æ,Á,Ä AfAfvfŠfP [fVf±f“,Í A,·,×,Ä,ì3DfAfNfZf%ofCE [f^ ifV [f“,ìLfffvf`ff,ðŽÀ s,·,é,à,ì,àŠÜ,Ð j,Ä
³Šm,ÉfCEf“f_Šf“fO,ð s,º,±,Æ,³,Ä,«,é B,±,ê,ç,ìfXfefbfv,Í A‘O q,µ,½fZfNfVf±f“,ÄŠT à,³,ê,Ä,ç,é îñ,ð—v—
ñ,µ,Ä,ç,é B

- 1 ,Ð,Æ,Ä,ìftfCE [f€
,ì•%ºæfvfŠf~fefBfu,ðŠÜ,ÐŽÀ sfobftf@,ðŽÀ s,·,é‘O,É A1“x**IDirect3DDevice::BeginScene**f f\fbfh,ðCEÄ,Ñ o,
µ AŽÀ sCEä,É,Í ÄCEä,É**IDirect3DDevice::EndScene**f f\fbfh,ðCEÄ,Ñ o,· B
- 2 DirectDraw,ì”\—Í,ðŽ,·ftrfbfg**DDCAPS2_NO2DDURING3DSCENE**,ðf`fFfbfN,·,é B,±,ìftrfbfg,ªfZfbfg,³,ê,Ä,ç
,½,ç **AIDirect3DDevice::BeginScene**,ìCEÄ,Ñ o,µ,©,ç**IDirect3DDevice::EndScene**,ìCEÄ,Ñ o,µ,Û,Ä,ìŠÖ,É AfCEf“f
_fŠf“fO EfT [ftfFfX,É‘Í,µ,ÄDirectDraw,ìfuf 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 f\fbfh,ª §CEä,ð—
ß,µ,Ä,à A,Ð,Æ,Ä,ìŽÀ sfobftf@,ÉŠÜ,Û,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“ EfLfffvf`ff EfJ [fh,Í AfV [f“,ªŠ@—
!,·,é,Û,Ä i,Ä,Û,è **AIDirect3DDevice::EndScene**f f\fbfh,ªCEÄ,Ñ o,³,ê,é,Û,Ä jfCEf“f_Šf“fO,ð%º,Šú,·,é B

Direct3D, ¼ Úf, [fh,lf`f... [fgfŠfAf<

Windowsfx [fX,İDirect3D,¼ Úf, [fh EfAfvfŠfP [fVf‡f“,đ ì -,.,é,É,Í ADirectDraw,ÆDirect3DfIfufWfFfNfg ,đ ¶ -,µ AfCEf“f_fŠf“fO EfXfe [fg,đ Ý’è,µ AŽÀ sfofbftf@,đ Ý’è,µ A,»„İfobftf@,đŽÀ s,.,é B,± ,İfZfNfVf‡f“,Í A’P f,È¼ Úf, [fh,İfAfvfŠfP [fVf‡f“,İfCf“fVfŠf f“fg,É,Ä,¢,Ä A ‡,đ’Ç,Ä,Ä à¾,µ,½f`f... [fgfŠfAf<,Ä, ,é B,±,İf`f... [fgfŠfAf<,İfTf“fvf< Efr [fh,Í ASDK,İê”,Ä, ,é B

,±,İSDK,“ñ<ÿ,.,éTf“fvf<,İ†,İD3dmain.cppftf@fCf<,Í A¼,İ,.,×,Ä,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_fŠf“fO EfXfe [fg,İ Ý’è

Step 6: %Šú%»,İŠ®—¹

Step 7: fCEf“f_fŠf“fO Ef< [fv,İŽÀ s

Step 8: I—¹ ^—

,±,İSDK,İ†,¼ Úf, [fh,İfTf“fvf<,É,Í A,±,±,É,ÍL 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“,đL q,.,é ê ‡,É—đ—š,Ä,Ä, ,è,µ 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,µ ,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,Á,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,à,¹, 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%» ^— ,İ'½,-
,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

fffofCfX,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 AfffofCfX ì ¬fR [f<fobfNŠÖ ”,δfZfbfgfAfbfv,·,é B,±,İfR [f<fobfNŠÖ ”,É,Ä,¢,Ä,İ uStep 3:
fffofCfX ì ¬fR [f<fobfNŠÖ ”,İfZfbfgfAfbfv v,δŽQ Æ,³,è,½,¢ B

fffofCfX 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 ^—
¹, 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“,^ Šú%»,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 AfffofCfX,δ”jŠü,·,éfR [f<fobfNŠÖ ”,δCEÄ,Ñ o,· BfAvfŠfP [fVf±f“,^ftf<fXfNfŠ [f“ Ef, [fh,ÄŽ
À s,³,è,Ä,¢
,é ê ±,İ AfffBfXfvfCfC 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 ”,ìæ3fpf%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

Å %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 \‘ç‘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 Å %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,Í,ÍDirect3D::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,ÁŽŸ,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
ŽŸ,ÈInitViewŠÖ ”,Í AŽÀ sfofbtft@,ì ì ñ,ÆfZfbfgfAfbfv,đ s,µ BD3DEXECUTEBUFFERDESC \‘çì,ìf f“fo
,đ %Šú%»·,µ,Á,©,ç AIDirect3DDevice::CreateExecuteBuffer f\fbfh,đCEÁ,Ñ o,µ,ÁŽÀ sfofbtft@,đ ì ñ,µ A“à
—è,đ Ý’è,·,é,¼,ß,ÍDirect3DExecuteBuffer::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@,ì€ ì,È,
Á,¢,Á A,æ,è’¼,·,ì ·ñ,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@,Èff [f^,đ Ý’è,·,é B
IDirect3DDevice::BeginScene AIDirect3DDevice::Execute AIDirect3DDevice::EndScenef f\fbfh,đ—p,¢
,ÁŽÀ sfofbtft@,đŽÀ s,·,é B,»,ìCEä,ì,±,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,Èf}
fefŠfAf<,đ Ý’è,µ,¼,Æ,«,Æ“”,¶žè ‡,đ—p,¢,é Bf}fefŠfAf<,ì ì ñ,È,ÍDirect3D::CreateMaterial f\fbfh,đŽg—
p,µ Af}
fefŠfAf<,ìff [f^,đ Ý’è,·,é,È,Í A iD3DMATERIAL \‘çì,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 “_,ì¹,đD3DVERTEX \‘çì,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,ì,è,é B
ÁCEä,È AInitViewŠÖ ”,ÍOct1.c,ìCEöE¹,đfZfbfgfAfbfv,·,é BD3DLIGHT \‘çì,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‘Ŏ,đ Ý’è,·éŽÀ sfobftf@,ì ì ¬,ÆŽÀ s,đ s,□ BD3DAppCreateFromH WNDŠÖ ”,Í AD3dapp.c,©,çD3DAppISetRenderStateŠÖ ”,ðĈĀ,Ñ o,· B“è”É“I,ÉfTf“fvf< EfR [fh,Í A Ý’è,âfŠfZ fbfg,“K—v,É,É,é,½,Ñ,ÉD3DAppISetRenderStateŠÖ ”,ìĈĀ,Ñ o,μ,đ s,□ B,± ,ìfZfNfVf†f“,Ā,Í AD3DAppISetRenderStateŠÖ ”,đ ifGf%o [Ef fFfbfN,ìfR [fh,đ œ,Ĉ,Ā j Đ%oi,·é B

D3DAppISetRenderStateŠÖ ”,Í **AD3DEXECUTEBUFFERDESC** \‘Ĉ‘ì,â**D3DEXECUTEDATA** \‘Ĉ‘ì,đŠÜ,Đ,Ĉ,- ,Ā,©,ìf [fJf·ī ”,đ Ý’è,μ,½ĈĀ **AIDirect3DDevice::CreateExecuteBuffer** f\fbfh,đŽg— p,μ,ĀŽÀ sfobftf@,đ ì ¬,·,é BŽÀ sfobftf@,ª ì ¬,³,è,é,Æ A,»,ì† g,đ Ý’è,·,é,½,β,É**IDirect3DExecuteBuffer: Lock** f\fbfh,ðĈĀ,Ñ o,μ,Āfobftf@,đf fbfn,·,é B

```
BOOL D3DAppISetRenderState()
{
D3DEXECUTEBUFFERDESC debDesc;
D3DEXECUTEDATA d3dExData;
LPDIRECT3DEXECUTEBUFFER lpD3DExCmdBuf = NULL;
LPVOID lpBuffer, lpInsStart;
size_t size;
```

// —v< ,³,è,½fTfCfY,ìŽÀ sfobftf@,đ ì ¬,μ A“à—e,đ Ý’è,Ā,«,é,æ,□,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,Ŏ,ìf|fCf“f^,Ā, ,é BdebDesc·ī ” **ID3DEXECUTEBUFFERDESC** \‘Ĉ‘ì j,ìlpDataf f“fo,Í AŽÀ sfobftf@“à,ìŽÀ Ū,ìff [f^,Ŏ,ìf| fCf“f^,Ā, ,é B

,³,Ā AD3DAppISetRenderStateŠÖ ”,Í AfĈf“f_Šf“fo EfXfe [fg,ì Ý’è,đ s,□ B ^— ,đŠĚ‘P,É,·,é,½,β,É AD3DAppISetRenderStateŠÖ ”,ÍOP_STATE_DATAf}fNf ,đŽg—p,μ,Ā,Ĉ,é B,±,ìf} fNf ,ÍPUTD3DINSTRUCTIONf}fNf ,ðĈĀ,Ñ o,· B,±,è,ç,Ŏ,½,Ā,ìf}fNf ,Í A,± ,ìSDK,ìD3dmacs.hfwbfb_ Eftf@fCf<,Ā^È%o,ì,æ,□,É‘è<,³,è,Ā,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 ”,Í**D3DINSTRUCTION** \‘Ĉ‘ì,ìf f“fo,æ,è ,È,Ĉ,±,Æ,É’ ^Ŏ,“K—v,Ā, ,é BOP_S TATE_RENDERf}fNf ,ìPUTD3DINSTRUCTION,ìæ1fpf%of [f^D3DOP_STATERENDER,Í **AD3DOPCODE**— ñ<Ĉ^†,ìfIfyfr [fh,ì,Đ,Æ,Ā,Ā, ,é B2”Ŏ—Ū,ìfpf%of [f^,Í**D3DRENDERSTATETYPE** \‘Ĉ‘ì,Ŏ,ìf| fCf“f^,Æ**D3DSTATE** \‘Ĉ‘ì,ìfTfCfY,đŽ,μ,Ā,Ĉ,é B

,â,Í,èD3dmacs.h,Ā‘è<,³,è,éSTATE_DATAf}fNf ,Í AfĈf“f_Šf“fo EfXfe [fg,đ‘€ 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_EXITf|fyfR [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::EndScenef 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,Ù,Æ,ñ,Ç ,đ ì ¬,·,é,ª A,»„ê,Ā İ,í,è,Ā,İ,È,ç 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,ç B

CreateD3DAppŠÖ ”,Í ĀĒ» Ý,İfĀf“f_Šf“fO EfXfe [fg,đfAfvfŠfP [fVf‡f“ Ef [fJf<,ÈD3DAppRenderState \çĀ,İĒRfs [,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,çŠÖ ”,İ,Đ,Æ,Ā,Ā, ,é BOverrideDefaultsŠÖ ”,Ā,İ,Ù,Æ,ñ,Ç %½,à s,í,È,çfAfvfŠfP [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·,é,¾,Ā, ,é B

ŽŸ,ÉCreateD3DAppŠÖ ”,Í AD3DAppSetRenderStateŠÖ ”,đĀĀ,Ñ o,· BD3DAppSetRenderStateŠÖ ”,Í A•Ÿ,³,ê,½f Āf“f_Šf“fO EfXfe [fg,İ ó,Ÿ,đf^fFfbfN,µ A i,à,µfĀf“f_Šf“fO EfXfe [fg,É%½,à Ý'è,³,ê,Ā,ç ,È,©,Ā,½,ç jfŠfZfbfg,·,é,© AD3DAppISetRenderStateŠÖ ”,İĀĀ,Ñ o,µ,İ•O,É•Ÿ,·,é,©,đ”è,·,é BD3DAppISetRen derStateŠÖ ”,É,Ā,ç,Ā,Í uStep 5: ¼ Ÿf, [fh,İfĀf“f_Šf“fO EfXfe [fg,İ Ý'è v,ĀŽæ,èµ,Ā,Ā,ç,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-Ÿ,Ā, ,é B Ā % ,İĀĀ,Ñ o,µ,İ AAfterDeviceCreatedfR [f<fofbfNŠÖ ”,ª s,Ā,Ā,ç,é j B,± ,İInitViewŠÖ ”,İ ĀĀĀ,İĀĀ,Ñ o,µ,Ā A İfffofCfX ì -Žž,©,çİ X,ª%Ā,İ,ç,è,Ā,ç,é ê ‡,İ jfrf... [f] [fg,İ ĀfZfbfgfAfbfv,đ s,ç AfTf“fvf<,İŽÀ sfobftf@,đ Ā \z,·,é BInitViewŠÖ ”,É,Ā,ç,Ā Ÿ,µ,İ uStep 4: frf... [f] [fg,İ %Šú%» v,đŽQ Ā,³,ê,½,ç B

,±,ê,ĀD3dmain.cpp,İCreateD3DAppŠÖ ”,ª İ—,·,é B,»„ê,¾,Ā,È, AAppInitŠÖ ”,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, AefGf%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

¬Ç÷,,: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^, ĭfAfhfçfX 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, Íf AfvfŠfP [fVf‡f“„Ä‘è‘, 3, ê, é B  
-Œ÷, ‚, é, Æ AŠ, „è“-„Ä, ç, ê, ½f f, fŠ, Ìf AfhfŒfX, 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, ĂŽw’è, ‚, é B
```

```
•W €Cf%of“f^fCf€ Ef< [f`f“„Ä, Í•s \•ª, È ê ‡ Af AfvfŠfP [fVf‡f“„Í A“ÆŽ©, Ìf f, fŠŠ, „è“-„ÄŠÖ ”, ð‘è< ‚, é, ±  
, Æ,ª, Ă, «, 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);

$\check{Z}w'è,^3,ê,½\check{Z}^2,ð'† S,É A\check{Z}w'è,^3,ê,½\check{S}p"x if\%fWfAf""P^Ê j,Ì\%ñ["],ð s,□ B$

$-CE÷,·,é,Æ A'æ1fpf\%of [f^,Æ,μ,Ä"n,^3,ê,½4\check{Z}ÿ s—ñ,Ö,Ìf|fCf"f^,ð•Ô,· B\check{Z},"s,·,é,Æ0,ð•Ô,· B$

lpquat

$‘€ iCE\%oÊ,ð\check{Z}ó,~\check{Z}æ,éD3DRMQUATERNION \‘c'ì B$

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,é,éD3DRMQUATERNION \`C`İ B

alpha

lpa,Ælpb,İšÔ,É•âš@,·,é←—£,đŽ!,· A0,©,ç1,İšÔ,Ì! 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%ÁŽZ,·,é B

-Œ÷,·,é,Æ A'æ1fpf%of [f^,Æ,µ,Ä“n,³,ê,½fxfNfgf<,ð•Ô,· BŽ,”s,·,é,Æ0,ð•Ô,· B

lpd

%oÁŽZ,ÌŒ<%oÊ,ðŽó,~Žæ,éD3DVECTOR \‘Œ’ì B

lps1, lps2

%oÁŽZ,³,ê,éD3DVECTOR \‘Œ’ì B

D3DRMVectorCrossProduct

LPD3DVECTOR D3DRMVectorCrossProduct(LPD3DVECTOR lpd, LPD3DVECTOR lps1,
LPD3DVECTOR lps2);

,Ó,½,Â,ÌfxfNfgf<,ÌŠO Ī,ðŒvŽZ,·,é B

-Œ÷,·,é,Æ A'æ1fpf%of [f^,Æ,μ,Ä“n,³,ê,½fxfNfgf<,ð•Ô,· BŽ,”s,·,é,Æ0,ð•Ô,· B

lpd

ŠO 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(LPD3DVECTOR 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);
```

$\vec{w} = \frac{1}{2}(\vec{u} + \vec{v})$

$\vec{r} = \frac{1}{2}(\vec{u} - \vec{v})$

$\vec{d} = \frac{1}{2}(\vec{u} + \vec{v}) - \frac{1}{2}(\vec{u} - \vec{v}) = \vec{v}$

$\vec{r} = \frac{1}{2}(\vec{u} - \vec{v})$

$\vec{r} = \frac{1}{2}(\vec{u} - \vec{v})$

D3DRMVectorRotate

```
LPD3DVECTOR D3DRMVectorRotate(LP3DVECTOR lpr, LP3DVECTOR lpv,  
    LP3DVECTOR 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

red, green, blue

red, green, blue

red, green, blue

red, green, blue

D3DRMLOADCALLBACK

```
void (*D3DRMLOADCALLBACK) (LPDIRECT3DRMOBJECT lpObject, REFIID ObjectGuid,  
LPVOID lpArg);
```

IDirect3DRM::Load *f\fbfh“à”*,ÁfIfufWfFfNfg,Ìf [fh,ð s,² 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

–Ĉ±,·,é,ÆD3DRM_OK AŽ,”s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,Ìê——,É,Â,ĉ ,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“ĈĀ—L,Ìf [f^ B

lpD3DRMTexture

Direct3DRMTexturefIfufWfFfNfg B

fAfvfŠfP [fVf‡f“„Í AWindowsf\fbfgh}fbfv i.bmp j,âf [f^fuf< EfsfNfXf}fbfv i.ppm jP6 Ĉ`Ž®`ÈŠÖ,ÌfefNfXf`ff,ÌfTf [fg,đfCf“fvfŠf f“fg,·,é,½,ß A,±,ÌfR [f<fofbfNŠÖ ”,đŽg—p,·,é,±,Æ,ª,Á,«,é B

fVfXfef€,Í AfR [f<fofbfNŠÖ ”,đĈĀ,Ñ o,· ‡ ~,đĈĀ`è,·,é,½,ß A,Û,ŠK`w,Ìfgfbfv EfĈfxf<,É,·,éfIfufWfFfNfg,đĈĀ`è,·,é BŽŸ,É A ì ¬,³,é,½ ‡”Ô,ÉfR [f<fofbfNŠÖ ”,đĈĀ,Ñ o,· B

ŽQ Æ @IDirect3DRM::Load, IDirect3DRMAnimationSet::Load, IDirect3DRMFrame::Load, IDirect3DRMMeshBuilder::Load

D3DRMOBJECTCALLBACK

```
void (*D3DRMOBJECTCALLBACK) (LPDIRECT3DRMOBJECT lpD3DRMObj,  
    LPVOID lpArg);
```

IDirect3DRM::EnumerateObjects *f\b\fh, ĪĈĀ, Ñ o, μ, É%ž“Š, ., éIfufWfFfNfg, ð—ñ<“, ., é B, ±, ĪfR [f<fofbfNŠÖ ”, ĪŽÀ‘Ī, ĪfAfvfŠfP [fVf‡f““è<, Ā, , é B*

•Ô‘Ī, Ī, È, ĉ B

lpD3DRMObj

fIfufWfFfNfg, ð—ñ<“, ., éIDirect3DRMObjectfCf“f^ [ftFfCfX BfAfvfŠfP [fVf‡f“, Ī A—ñ<“, 3, ê, ½ŠefIfufWfFfNfg, É, Ā, ĉ, ĀReleasef f\b\fh, ðĈĀ, Ñ o, 3, È, , Ā, Ī, È, ĉ, È, ĉ B

lpArg

fR [f<fofbfNŠÖ ”, É“n, 3, ê, éfAfvfŠfP [fVf‡f““è<, Īff [f^ B

fVfXfefÉ, ĪfR [f<fofbfNŠÖ ”, ðĈĀ, Ñ o, . ‡ ~, ðĈ“è, ., é, ½, β A, Ū, , ŠK‘w, Īfgfbfv EfĈfxf<, É, ., éIfufWfFfNfg, ðĈĀ, Ñ o, ., é BŽŸ, É A ì ¬, 3, ê, ½ ‡”Ô, ÉfR [f<fofbfNŠÖ ”, ðĈĀ, 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€, İ AfR [f<fofbfNŠÖ ”, ðÈÄ, Ñ o, . ‡ ~, ðÈ~è, ., é, ½, ß A, Ü, , ŠK‘w, İfgfbfv EfÈfxf<, 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,^a,é,±,Æ,đ'É'm,·,é B,±,İfR [f<fobfNŠÖ ”,İŽÀ'İ,İfAfvfŠfP [fVf‡f“è<,Á, ,é B

*lpD3DRMUVreasonfpf%of [f^,ÉD3DRMUSERVISUAL_CANSEE,^aŽw'è,³,ê Af† [fU EfrfWf...
fAf< EfIfufWfFfNfg,^afrr... [f] [fg“à,Á%oÁŽ< ó'Ö,İ,Æ,«,Í ATRUE,đ•Ö,· B,»[□]
,Á,È,~,ê,İFALSE,đ•Ö,· BlpD3DRMUVreason fpf%of [f^,ÉD3DRMUSERVISUAL_RENDER,^aŽw'è,³,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,^aÀ'S,Á, ,é B*

*lpD3DRMUV
Direct3DRMUserVisualfIfufWfFfNfg B*

*lpArg
fR [f<fobfNŠÖ ”,É“n,³,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< EfIfufWfFfNfg,^afrr... [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,³,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,³,ê,½ffofCfX,đŽg,□ B*

*lpD3DRMDev
Direct3DRMUserVisualfIfufWfFfNfg,đfĈf“f_Šf“fO,·,é,½,β,ÉŽg,í,ê,éDirect3DRMDevicefIfufWfFfNfg B*

*lpD3DRMview
Direct3DRMUserVisual fIfufWfFfNfg,^a%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,Ū,ŠK'w,İfgfbfv EfĈfxf<,É, ,éfIfufWfFfNfg,đ
Ĉf“è,·,é BŽŸ,É A ì ~,³,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, IfufWfFfNfg, lOf< [fv, dŒÇ— ,·, é B·Ê í AfAvfŠfP [fVf‡f“, í, ±, IfCf“f^ [ftFfCfX, d'¼ ÚŽg, í, A, ±, IfCf“f^ [ftFfCfX, ©, ç”h ¶, µ, ½”z—ñIfufWfFfNfg, d—~—p,·, é B, ±, IfZfNfVf‡f“, í **AIDirect3DRMArray** *Vtbl* [ftFfCfX Ef f\bfh, IfŠftf@fEf“fX, Å, é B

IDirect3DRMArray *Vtbl* [ftFfCfX, **GetSize** f\bfh, dftf] [fg,·, é B

,·, ×, Ä, lCOMfCf“f^ [ftFfCfX, Æ“—

l **AIDirect3DRMArray** *Vtbl* [ftFfCfX, **IUnknown** *Vtbl* [ftFfCfX Ef f\bfh, dŒp ³,·, é B, ±, IfCf“f^ [ftFfCfX, ŽŸ, Ì, R, Â, If f\bfh, dftf] [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 AIDirect3DRMDeviceArrayCf“f^ [ftfFfCfX,ìf f\fbfh,ð—
p,·,é B,±,ìfZfNfVf‡f“,Í AIDirect3DRMDeviceArrayCf“f^ [ftfFfCfX Ef f\fbfh,ìfŠftf@fœf“fX,À, ,é BŠT”O,
É,Â,ç,Ä,ìŠT—v,Í A uIDirect3DRMDevice,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[UnknownfCf“f^ [ftfFfCfX Ef f\fbfh,ðEp ³,·,é BIUnknownfCf“f^ [ftfFfCfX,ìŽŸ,ì,R,Â,ìf f\fbfh,ðfTf|
[fg,·,é B

AddRef

QueryInterface

Release

,³,ç,É AIDirect3DRMDeviceArrayCf“f^ [ftfFfCfX,Í AIDirect3DRMObjectCf“f^ [ftfFfCfX,©,çŽŸ,ìf f\fbfh,ð
Ep ³,·,é B

AddDestroyCallback

Clone

DeleteDestroyCallback

GetAppData

GetClassName

GetName

SetAppData

SetName

Direct3DRMDeviceArrayIfufWfFfNfg,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,©,čŽw'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

lplpD3DRMDevice

IDirect3DRMDevice fCf“f^ [ftfFfCfX,Ö,Ï|fCf“f^ B

IDirect3DRMDeviceArray::GetSize

DWORD GetSize();

Direct3DRMDeviceArray fIfufWfFfNfg,ÉŠÜ,Ü,ê,é—v‘f ”,ðŽæ“¾,·,é B
—v‘f ”,ð•Ô,· B

IDirect3DRMFaceArray

f fbfVf... ā,î-Ê,ðfOf< [fv%»»,.é,É,Í AIDirect3DRMFaceArrayCf“f^ [ftFfCfX,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,¢ ,Ä,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,Ï,Ä,Ïf f\fbfh,ðfT
f| [fg,.,é B

AddRef

QueryInterface

Release

,³,ç,É AIDirect3DRMFaceArrayCf“f^ [ftFfCfX,Í AIDirect3DRMObjectCf“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,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

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

*ftfCE [fE EfIfufWfFfNfg,ðfOf< [fv%o»»,·,é,É,Í AIDirect3DRMFrameArrayCf“f^ [ftfFfCfX,Ìf f\fbfh,ð—
p,·,é B,±,ÌfZfNfVf±f“,Í AIDirect3DRMFrameArrayCf“f^ [ftfFfCfX Ef f\fbfh,ÌfŠftf@fœf“fX,À, ,é BŠT”O,
É,Â,ç,Ä,ÌŠT—v,Í A uIDirect3DRMFrame,ÆIDirect3DRMFrameArrayCf“f^ [ftfFfCfX v,ðŽQ Æ,·,é,±,Æ B*

IDirect3DRMFrameArrayCf“f^ [ftfFfCfX,Í AŽŸ,Ìf f\fbfh,ðfTf| [fg,·,é B

GetElement

GetSize

*IDirect3DRMFrameArrayCf“f^ [ftfFfCfX,Í A,·,×,Ä,ÌCOMfCf“f^ [ftfFfCfX,Æ—
l A[UnknownfCf“f^ [ftfFfCfX Ef f\fbfh,ðEp ³,·,é BIUnknownfCf“f^ [ftfFfCfX,Í AŽŸ,Ì,R,Â,Ìf f\fbfh,ðfT
f| [fg,·,é B*

AddRef

QueryInterface

Release

*,³,ç,É AIIDirect3DRMFrameArrayCf“f^ [ftfFfCfX,Í AIDirect3DRMObjectCf“f^ [ftfFfCfX,©,çŽŸ,Ìf f\fbfh,ð
Ep ³,·,é B*

AddDestroyCallback

Clone

DeleteDestroyCallback

GetAppData

GetClassName

GetName

SetAppData

SetName

*Direct3DRMFrameArrayfIfufWfFfNfg,Í AIDirect3DRMPickedArray::GetPick,Ü,½,ÍIDirect3DRMFrame::GetChildre
nf f\fbfh,ÌEÄ,Ñ o,µ,É,æ,Á,ÄŽæ“¾,³,ê,é B*

IDirect3DRMFrameArray::GetElement

HRESULT GetElement(DWORD index, LPDIRECT3DRMFRAME * lplpD3DRMFrame);

Direct3DRMFrameArrayIfufWfFfNfg,©,čŽw'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

lplpD3DRMFrame

IDirect3DRMFrame fCf“f^ [ftfFfCfX,Ö,Ï|fCf“f^,đŽó,~Žæ,éfAfhfĈfX 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::GetLightsf 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,lf f\fbfh,đ—
p.,.é B,±,lfZfNfVf‡f“,Í AIDirect3DRMPickedArrayCf“f^ [ftFfCfX Ef f\fbfh,lfŠftf@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,lf 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,lf f\fbfh,đfTf]
[fg,.,é B**

AddRef

QueryInterface

Release

**,³,ç,É AIDirect3DRMPickedArrayCf“f^ [ftFfCfX,Í AIDirect3DRMObjectCf“f^ [ftFfCfX,©,çŽŸ,lf 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,ÄCEð .,.,éDirect3DRMVisual,ÆDirect3DRMFramefIfufWfFfNfg,ðŽæ“¾,.,é B
-CE±,.,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,Ìf|fCf“f^,ÌfAfhfCEfX B

lplpFrameArray

Žw'è,³,ê,½fsfbfN,ÉŠÖ~A•t, -,ç,ê,½Direct3DRMFrameArrayfIfufWfFfNfg,Ìf|fCf“f^,ÌfAfhfCEfX B

lpD3DRMPickDesc

fsfbfN,ÎÊ'u A-
Ê AŽæ“¾,.,éIfufWfFfNfg,ÌfOf< [fvŽ~ÊŽq,ðŽw'è,.,éD3DRMPICKDESC \`¢'Ì,Ö,ÌfAfhfCEfX 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,ðfOf< [fv%o»,·,é,É,Í **AIDirect3DRMViewportArray***ff*“f^ [ftFfCfX,lf f\fbfh,ð —~—p,·,é B,±,lfZfNfVf±f“,Í**IDirect3DRMViewportArray***ff*“f^ [ftFfCfX Ef f\fbfh,lfŠftf@fEf“fX,Å,·,é BŠ T”O,É,Å,ç,Ä,ìŠT—v,Í A u**IDirect3DRMViewport,ÆIDirect3DRMViewportArray***ff*“f^ [ftFfCfX v,ðŽQ Æ,·,é,± ,Æ B

IDirect3DRMViewportArray*ff*“f^ [ftFfCfX,ÍŽŸ,lf f\fbfh,ðfTf] [fg,·,é B

GetElement

GetSize

IDirect3DRMViewportArray*ff*“f^ [ftFfCfX,Í A,·,×,Ä,ìCOM*ff*“f^ [ftFfCfX,Æ“—1 **AUnknown***ff*“f^ [ftFfCfX Ef f\fbfh,ðEp ³,·,é **BIUnknown***ff*“f^ [ftFfCfX,ÍŽŸ,ì,R,Å,lf f\fbfh,ðfTf] [fg,·,é B

AddRef

QueryInterface

Release

,³,ç,É **AIDirect3DRMViewportArray***ff*“f^ [ftFfCfX,Í **AIDirect3DRMObject***ff*“f^ [ftFfCfX,©,çŽŸ,lf f\fbfh,ðEp ³,·,é B

AddDestroyCallback

Clone

DeleteDestroyCallback

GetAppData

GetClassName

GetName

SetAppData

SetName

IDirect3DRMViewportArray*ff*“f^ [ftFfCfX,Í A

IDirect3DRM::CreateFrame*ff*“f^ [ftFfCfX,ìCEÄ,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,Ïf f\fbfh,ð—
—p,.,é B,±,ÏfZfNfVf±f“,Í AIDirect3DRMVisualArrayCf“f^ [ftFfCfX Ef f\fbfh,ÏfŠftf@fÆf“fX,Á,.,é BŠT”
O,É,Á,¢,Ä,ÏŠT—v,Í A uIDirect3DRMVisual,ÆIDirect3DRMVisualArrayCf“f^ [ftFfCfX v,ðŽQ Æ,.,é,±,Æ B*

GetElement

GetSize

*IDirect3DRMVisualArrayCf“f^ [ftFfCfX,Í A,.,×,Ä,ÏCOMfCf“f^ [ftFfCfX,Æ“—
l A[UnknownfCf“f^ [ftFfCfX Ef f\fbfh,ðÆp ³,.,é BIUnknownfCf“f^ [ftFfCfX,ÏŽÿ,ì,R,Á,Ïf f\fbfh,ðfTf|
[fg,.,é B*

AddRef

QueryInterface

Release

*,³,ç,É AIDirect3DRMVisualArrayCf“f^ [ftFfCfX,Í AIDirect3DRMObjectCf“f^ [ftFfCfX,©,çŽÿ,Ïf f\fbfh,ðÆ
p ³,.,é B*

AddDestroyCallback

Clone

DeleteDestroyCallback

GetAppData

GetClassName

GetName

SetAppData

SetName

*Direct3DRMVisualArrayfIfufWfFfNfg,Í **IDirect3DRMFrame::GetVisuals**
method.f f\fbfh,ÏÆÄ,Ñ o,µ,É,æ,Á,ÄŽæ“¾,³,ê,é B*

IDirect3DRMVisualArray::GetElement

HRESULT GetElement(DWORD index, LPDIRECT3DRMVISUAL * lpD3DRMVisual);

Direct3DRMVisualArrayIfufWfFfNfg,©,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

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 ¬,µ AfVfXfef€ EfƆEfxf<,ìĪ ”,ð“€ ì,·,é,½,ß,É—p,Ɔ,ç,ê,é B,±,ìfZfNfVf#f“,Í A **IDirect3DRM** *fCf“f^ [ftfFfCfX,ìf f\fbfh,ìfŠftf@fƆEf“fX,Å, ,é BŠT”O,É,Â,Ɔ,Ä,ĪŠT—v,Í A u* **IDirect3DRM** *fCf“f^ [ftfFfCfX v,ðŽQ Æ,·,é,±,Æ B**

IDirect3DRM *fCf“f^ [ftfFfCfX Ef f\fbfh,Í A^È%°,ìfOf< [fv,É*—D,·,é,±,Æ,^,Å,«,é B*

fAfjf [fvf#f“ [CreateAnimation](#)
[CreateAnimationSet](#)

ffofCfX [CreateDevice](#)
[CreateDeviceFromClipper](#)
[CreateDeviceFromD3D](#)
[CreateDeviceFromSurface](#)
[GetDevices](#)

—ñ<“ [EnumerateObjects](#)

—Ê iftfFfCfX j [CreateFace](#)

ftfƆ [f€ [CreateFrame](#)

ƆöƆ¹ [CreateLight](#)
[CreateLightRGB](#)

f}fefŠfAf< [CreateMaterial](#)

f fbvVf... [CreateMesh](#)
[CreateMeshBuilder](#)

,»,ì‘¼ [CreateObject](#)
[CreateUserVisual](#)
[GetNamedObject](#)
[Load](#)
[Tick](#)

fpfXƆÿ ö [AddSearchPath](#)
[GetSearchPath](#)
[SetSearchPath](#)

%A%oe [CreateShadow](#)

fefNfXf`ff [CreateTexture](#)
[CreateTextureFromSurface](#)
[LoadTexture](#)
[LoadTextureFromResource](#)
[SetDefaultTextureColors](#)
[SetDefaultTextureShades](#)

frf... [f| [fg **CreateViewport**

f%fbfv **CreateWrap**

IDirect3DRM **COM** **“f^** **[ftfFfCfX,** **Í** **A,** **·,** **×,** **Ä,** **Ì** **COM** **“f^** **[ftfFfCfX,** **Æ** **“** **—**
l **A** **Unknown** **“f^** **[ftfFfCfX** **E** **f** **f\fbfh,** **ð** **Ep** **³,** **·,** **é** **BIUnknown** **“f^** **[ftfFfCfX,** **Í** **Ž** **Ÿ,** **ì,** **R,** **Â,** **ì** **f** **f\fbfh,** **ð** **fTf**
[fg, **·,** **é** **B**

AddRef

QueryInterface

Release

IDirect3DRM **COM** **“f^** **[ftfFfCfX,** **Í** **ADirect3DRMCreate,** **ì** **Æ** **Ä,** **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, ÉffBfÇfNfgfŠ, ìfŠfXfg, ð'Ç%Á, ·, é B
-E÷, ·, é, ÅED3DRM_OK AŽ, ”s, ·, é, ÅfGf%o [, ð•Ô, · B•Ô'l, Îê——, É, Å, ç
, Ä, Í A uDirect3D•ŮŽ f, [fh, Î•Ô'l v, ðŽQ Å, ·, é, ±, Å 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, Å, ½ffBfÇfNfgfŠ, ìfŠfXfg, Å, È, , Ä, Í, È, ç, È, ç B

ŽQ Å @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,Ìf|
fCf“f^ B

IDirect3DRM::CreateDevice

```
HRESULT CreateDevice(DWORD dwWidth, DWORD dwHeight,  
    LPDIRECT3DRMDEVICE* lplpD3DRMDevice);
```

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

-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

lpDDClipper

DirectDrawClipper fIfufWfFfNfg,ÎfAfhfŒfX B

lpGUID

fOf [fof< Ef†fj [fNŽ~•ÉŽq iGUID j,ÎfAfhfŒfX 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

ŒÄ,Ñ o,µ,ª -Œ÷,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 AfVfXfefŒ,ÍffofCfX,Î “\,ð²,×,é B,±

,ê,Í Af† [fU,ª V,µ,Œfn [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,Œ,é B

fVfXfefŒ,Í A“à•”,ÎffofCfX-ñ<“,ÌŒÄ,Ñ o,µ,Î†,Á AD3DPRIMCAPS \‘c'ì,©,çŽŸ,Îftf%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,ªŒ©,Â,©,ç,È,Œ

,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,Œ“Á•Ê,È-v< ,ðŽ ,ÂfAvfšP [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

¬Ē÷,·,é,ÆD3DRM_OK AŽ,˝s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,îê——,É,Á,ċ
,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

ĒÄ,Ñ o,μ,ª ¬Ē÷,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< Eftfj [fNŽ~•ÊŽq iGUID j,ĪfAfhfĈfX B,±
 ,Īfpf%of [f^,ĒNULL,³Žw'è,³,ê,é,Ā AfftfHf<fg,ĪffofCfX Efhf%oCfo,³Žg—p,³,ê,é B

lpDD

DirectDrawFT [ftFfX,ĪĈ³,É,È,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

ĒÄ, 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€,ð ì ¬,·,é B

¬CE÷,·,é,ÆD3DRM_OK AŽ, ”s,·,é,ÆfGf%o [,ð•Ö,· B•Ö'l,Îê——,É,Á,¢
,Ä,Í A uDirect3D•ŮŽ f, [fh,Î•Ö'l v,ðŽQ 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,ðŽó,¬Žæ,éf|fCf“f^,Ö,Ìf|fCf“f^ B

ŽqftfCE [f€,Í eftfCE [f€,ì“® ì‘® «,ðCEp 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
‘¬,ð'† S,Æ,μ,Ä%oñ“],·,é B eftfCE [f€,ðŽ ,½,È,¢ftfCE [f€

,ÍV [f“,ÆCEÄ,Î,ê,é BfV [f“,ð ì ¬,·,é,É,Í A eftfCE [f€,Æ,μ,ÄNULL

,ðŽw'è,·,ê,Î,æ,¢ BfAfvfŠfP [fVf‡f“,Í A e,ðŽ ,½,È,¢ftfCE [f€,ð ì,Á,½CEã,É AIDirect3DRMFrame::AddChild

methodf f\fbfh,ð—p,¢,Ä,» ,ÌftfCE [f€,ð 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 «,Âf}fefŠfAf<,đ i -,·,é B

-Ĉ÷,·,é,ÆD3DRM_OK AŽ,"s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,îê——,É,Á,ĉ
,Ä,Í A uDirect3D•ŮŽ f, [fh,î•Ô'l v,đŽQ Æ,·,é,±,Æ B

vPower

"½ŽĚ,înfCf%ofCf g"•ª,î'N-¾"x B,±,î'l,É5,đŽw'è,·,é,Æ AfĈf"f_fŠf"fO,³,ê,½•\-Ê,Íà'®,î,æ,□
,ÈŠOŠÍ,É,È,è A,»,"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,đŽó, ~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,đ 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,đŽQ Æ,·,é,±,Æ B

lpD3DRMMeshBuilder

ĈÄ,Ñ o,μ,a ¬E÷,μ,½,Æ,«,ÉIDirect3DRMMeshBuilderfCf“f^ [ftfFfCfX,Ö,Ï|fCf“f^,đŽó,Žæ,éfAfhfĈfX B

IDirect3DRM::CreateObject

HRESULT CreateObject(REFCLSID rclsid, LPUNKNOWN pUnkOuter,
REFIID riid, LPVOID FAR* ppv);

‰Šú‰»³,ê,Ä,¢,È,¢ V,µ,¢fIfufWfFfNfg,ð ì ¬,·,é B

–¢÷,·,é,ÆD3DRM_OK AŽ, ”s,·,é,ÆfGf‰ [,ð•Ô,· B•Ô'l,Îê—,É,Ä,¢
,Ä,Í A uDirect3D•ŮŽ f, [fh,Î•Ô'l v,ðŽQ Æ,·,é,±,Æ B

rclsid

V,µ,¢fIfufWfFfNfg,ÌfNf‰ofXŽ~•ÊŽq B

pUnkOuter

COM W ¬‰»«@”\,É‘Î‰ž,·,é B

riid

ì ¬,³,é,éIfufWfFfNfg,ÌfCf“f^ [ftfFfCfXŽ~•ÊŽq B

ppv

f f\fbfh,^a §¢ä,ð–ß,µ,½,Æ,«,ÉfIfufWfFfNfg,ðŽó,~Žæ,é|fCf“f^,Ö,Ìf|fCf“f^ B

,±,Ìf f\fbfh,É,æ,è ì ¬,³,é,½fIfufWfFfNfg,Í AfAfvfŠfP [fVf‡f“,É,æ,Ä,Ä ‰Šú‰»³,ê,È,-
,Ä,Í,È,¢,È,¢ iDirect3DRMfCf“f^ [ftfFfCfX,Ì¼,Ì ì ¬f f\fbfh,Í AŽ©“@“l,ÉfIfufWfFfNfg,ð ‰Šú‰»³,·,é j B
V,µ,¢fIfufWfFfNfg,ð ‰Šú‰»³,·,é,É,Í AInitf f\fbfh,ðŽg—
p,·,é BInitf f\fbfh,Ì¢Ä,Ň o,µ,Í AfIfufWfFfNfg,É,Ä,¢,Ä1‰ñ,Ì,Ý s,□ B

fAfvfŠfP [fVf‡f“,Í A,±,Ìf f\fbfh,ð–p,¢,ÄDirect3DRMfIfufWfFfNfg,Ì W ‡l,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,½fWf...fAf<,ÆCEðCE¹,ð—p,¢ AŽw'è,³,ê,½•½-Ê,É“Š%œ,³,¹,Ä%œ,ð ì ¬,·,é B%œ,Í AfWf...
fAf<,ðŠÜ,ðftfCE [f€,É'Ç%œ,³,ê,éWf...fAf<,Ä, ,é B

-CE÷,·,é,ÆD3DRM_OK AŽ, ”s,·,é,ÆGf% [,ð•Ô,· B•Ô'l,Îê—,É,Ä,¢
,Ä,Í A uDirect3D•ŮŽ f, [fh,Î•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lpVisual

%œ,ÏCE³,É,È,é Direct3DRMVisual fIfWfFfNfg B

lpLight

CEðCE¹,Æ,È,éIDirect3DRMLightfCf“f^ [ftfFfCfX B

px, py, pz

%œ,“Š%œ,³,ê,é•½-Ê B

nx, ny, nz

%œ,“Š%œ,³,ê,é•½-Ê,Ï-@ ü B

lpShadow

CEÄ,Ñ o,µ,ª -CE÷,µ,½,Æ,« A%œfWf...fAf<,Ö—LCEø,Èf|Cf“f^,Ä %Šú%œ»,³,ê,éf|Cf“f^,Ö,Ïf|Cf“f^ B

IDirect3DRM::CreateTexture

```
HRESULT CreateTexture(LPD3DRMIMAGE lpImage,  
    LPDIRECT3DRMTEXTURE* lplpD3DRMTexture);
```

f f, fŠ ã, ÌfCf [fW, ©, çfefNfXf`ff, ð ì ¬, ·, é B

*¬E÷, ·, é, ÆD3DRM_OK AŽ, ”s, ·, é, ÆfGf%o [, ð•Ô, · B•Ô'l, Ìê——, É, Á, Ç
 , Ä, Í A uDirect3D•ŮŽ f, [fh, Ì•Ô'l v, ðŽQ Æ, ·, é, ±, Æ B*

lpImage

fefNfXf`ff, Ìf\ [fX, ð•, ·D3DRMIMAGE \`Ç'Í B

lplpD3DRMTexture

ÆÄ, Ñ o, µ, ª ¬E÷, µ, ½, Æ, «, ÉIDirect3DRMTexturefCf“f^ [ftfFfCfX, ðŽó, Žæ, éf|fCf“f^, Ö, Ìf|fCf“f^ B

fefNfXf`ff, ªfÆf“f_Šf“fO, ³, é, é, ½, Ñ ADirect3DRM, Ìfobftf@, 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, ±
 , Ì, ½, ÆfCf [fW, Í AfÆf“f_Šf“fO, Ìf^ [fQfbfg, Æ, µ, Ä, àfefNfXf`ff, Æ, µ, Ä, àŽg—p, ·, é, ±, Æ, ª, Á, «, é B*

IDirect3DRM::CreateTextureFromSurface

```
HRESULT CreateTextureFromSurface(LPDIRECTDRAWSURFACE lpDDS,  
    LPDIRECT3DRMTEXTURE * 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,ċ
,Ä,Ī A uDirect3D•ŮŽ f, [fh,Ī•Ô'l v,ðŽQ Ē,·,é,±,Ē B

lpDDS

fefNfXf`ff,ðŠŮ,ÐDirectDrawSurfaceIfufWfFfNfg B

lplpD3DRMTexture

ĒĀ,Ñ o,μ,^a ¬Ē÷,μ,½,Ē,«,ÉIDirect3DRMTexturefCf“f^ [ftFfCfX,Ö,Ī|fCf“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 -ĈĕĀ AfıfWf...  
fAfç EfIfufWfFfNfg,đfV [f“,É’Ç%Á,μ AfAfvfŠfP [fVf‡f“èç,İfnf“fhf%,đ—p,ç,ĀfĈf“f_Šf“fO,Ā,«,é B  
-Ĉ÷,·,é,ĀD3DRM_OK AŽ,“s,·,é,ĀfGf%o [,đ•Ô,· B•Ô'l,İê—,É,Ā,ç  
,Ā,Í A uDirect3D•ŮŽ f, [fh,İ•Ô'l v,đŽQ Ā,·,é,±,Ā B
```

```
fn  
fAfvfŠfP [fVf‡f“èç,İD3DRMUSERVISUALCALLBACKfR [fçfofbfNŠÖ ” B
```

```
lpArg  
fR [fçfofbfNŠÖ ”,É“n,³,ê,é AfAfvfŠfP [fVf‡f“èç,İf [f^ B
```

```
lpD3DRMUV  
ĈĀ,Ň o,μ,ª -Ĉ÷,μ,½,Ā,«,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% [, 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... [, ÌÊ'u, Æ·ûCEü, ð·L q, ·, éftfCE [f€Ö, Ìf|fCf“f^ B

dwXPos, dwYPos, dwWidth, ·, æ, Ñ dwHeight

frf... [, ÌÊ'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,c
,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,Ä,Œ
,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,^a –Œ÷,μ,½,Æ,«,É A^ê’v,μ,½Direct3DRMObject,Îf|fCf“f^,Ö,Îf|fCf“f^ B

IDirect3DRM::GetSearchPath

HRESULT GetSearchPath(DWORD * lpdwSize, LPSTR lpszPath);

» Ý, ðpfX, 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•ÜŽ f, [fh, Î•Ô'l v, ðŽQ AE, •, é, ±, AE B

lpdwSize

fpfX, ð—v'f ”, Ö, ðf|fCf“f^ B, ±, ðpf%of [f^, ÉNULL, ðŽw'è, •, é, ±, AE, Í, Â, «, È, ç B

lpszPath

CEÝ ðpfX, ðŽ!, • ANULL, Â I, í, é•¶Žš—ñ B, ±
, ðpf%of [f^, ÉNULL, ðŽw'è, •, é, AE AlpdwSizefpf%of [f^, É, æ, Á, ÄŽ!, ³, ê, é ê Š, É•K—v, È•¶Žš—
ñ, ðTfCfY, ð•Ô, • B

ŽQ AE @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 jP6E`Ž®,Ì,ç,,ê,©,Â,È,,Ä,Í,È,ç,È,ç 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,Ì•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lpFileName

.bmp,Û,½,Í.ppmftf@fCf<,Ì-¼'O,ðŽw'è,·,é B

lpD3DRMTexture

ÆÄ,Ñ o,µ,ª -E÷,µ,½,Æ,«,É A—LÆø,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,Œ
,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,î|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,ê,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,ÌŒŸ ðfpfX,ÍŠÂ«•Ī ”D3DPATH,Ī'l,©,çŽæ,è o,³,é,é B,±,ÌŠÂ«•Ī ”,ª Ý'è,³,é,Ä,Œ
,È,Œ ê ‡ ŒŒŸ ðfpfX,Ī'ó,É,È,é Bftf@fCf<,ðfI [fvf“,·,é,Œ,« AfVfXfef€
,Í,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,ªĈÄ,Ñ o,³,ê,é,Æ A,·,×,Ä,İ%oÂ“@ftfĈ [f€ ,İÊ'u,ÍĈ» Ý,İ“® ì“® «,É,μ,½,ª,Á,Ä X V,³,ê AfV [f“,ªĈ» Ý,İffofCfX,ÉfĈf“f_Šf“fO,³,ê,é B,Û,½ AŠÖ~A, μ,½fR [f·fobfNŠÖ ”,ª“K Ø,È,Æ,«,ÉĈÄ,Ñ o,³,ê,é B,±,İf f\fbfh,Í AfĈf“f_Šf“fO EfTfCfNf€,ªŠ@—^{1,μ,½,Æ,«,É} §Ĉä,đ•Ô,· B

-Ĉ±,·,é,ÆD3DRM_OK AŽ,”s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,İê——,É,Â,ĉ ,Ä,Í A uDirect3D•ÛŽ f, [fh,İ•Ô'l v,đŽQ Æ,·,é,±,Æ B

d3dvalTick

IDirect3DRMFrame::SetRotation,ÆIDirect3DRMFrame::SetVelocityf f\fbfh,İ“~“x,“,æ,Ñ%oñ“]fXfefbfv B

fV [f“,İfĈf“f_Šf“fO,É _“î «,đŽ ,½,¹,é,½,ß A'¼ Úf, [fh,İ'¼,İf f\fbfh,đ—p,ĉ,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 Direct3DRMObjectCf“f^ [ftFfCfX,©,çŽŸ,İf f\fbfh,ðCEp ³,·
,é B

AddDestroyCallback

Clone

DeleteDestroyCallback

GetAppData

GetClassName

GetName

SetAppData

SetName

Direct3DRMAnimationfIfufWfFfNfg,Í A Direct3DRM::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%õñ“]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%õñ“]fL [,đ Ý'è, .,é,Æ,«,ĪŽžŠÔ B0,đŠĪ € ,Æ, .,é”C^Ó,Ī'P^Ê,ĪŽžŠÔ,đŽw'è, .,é,±
,Æ, ^,Ä,«,é B ÄEä,ĪfL [,ĪrvTime,Ī'l,^99,Ī,Æ,« ArvTime,^49,Ä, ,éfL [,^fAfjf [fVf‡f“ ,Ī,ċ,â,²,Ç'+ŠÔ,Ä, ,é B

rqQuat

%õñ“],đ•, .4ŽŸE³ s—ñ B

,±,Īf f\fbfh,É,æ,Á,Ä A%õñ“]•ĪŠ, ^“K—p,³,ê,é B•ĪŠ,đŠŮ,² 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 [,đ'Ç%Á,;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

rvTime

fAfjf [fVf#f“,î'†,ÄfXfP [f< EfL [,đ<L%—,;é,Æ,«,îŽžŠÔ B0,đŒ
“_„Æ,;é”C^Ô,î'P^Ê,îŽžŠÔ,đŽw'è,Ä,«„é B ÄŒä,îfL [,îrvTime,î'l,^99,î,Æ,« ArvTime,^49,Ä, ,éfL [,^fAfjf [fV
f#f“,î,č,â,²,Ç'†ŠÔ,Ä, ,é B

rvX, rvY, rvZ
kŽŮŒEW ” B.

,±,îf f\fbfh,É,æ,Ä,Ä A kŽŮ•îŠ,“K—p,³,ê,é B•îŠ,đŠŮ,Đ s—ñŒvŽŽ,É,Â,Œ,Ä,Í A u3D•îŠ: v,đŽQ 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);

fAfjf [fVf#f“ ,ÉftfŒ [f€,đ Ý’è,·,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

lpD3DRMFrame

fAfjf [fVf#f“ ,É Ý’è,·,éftfŒ [f€,đŽw’è,·,é•İ ”,ÎfAfhfŒfX 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,ìžžšŎ,đ Ý’è, ,é B

-CE÷, ,é,ÆD3DRM_OK AŽ, ”s, ,é,ÆfGf%o [,đ•Ŏ, · B•Ŏ’l,Îê——,É,Â,¢
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ī•Ŏ’l v,đŽQ Æ, ,é,±,Æ B

rvTime

fAfjf [fVf#f“ ,É Ý’è, ,é V,µ,¢CE» Ý,ìžžšŎ B0,đCE’“_,Æ, ,é”C^Ŏ,Ì’P^Ê,ìžžšŎ,đŽw’è, ,é,±
,Æ, ^Ä,« ,é B ĀCEä,ĪfL [,ĪrvTime,Ī’l,^99,Ī,Æ,« ArvTime,^49,Ä, ,éfL [,^fAfjf [fVf#f“ ,Ī,ĭ,â,µ,Ç’+šŎ,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— ,ı,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, ,x,Ä,İCOMfCf“f^ [ftfFfCfX,Æ“— l AİUnknownfCf“f^ [ftfFfCfX Ef f\fbfh,đEp ³, : ,é BIUnknownfCf“f^ [ftfFfCfX,İŽŸ,İ,R,Ä,İf f\fbfh,đTf| [fg, : ,é B

AddRef

QueryInterface

Release

,³,ç,É AIDirect3DRMAnimationSetfCf“f^ [ftfFfCfX,Í AIDirect3DRMObjectfCf“f^ [ftfFfCfX,©,çŽŸ,İf f\fbfh,đ Ep ³, : ,é B

AddDestroyCallback

Clone

DeleteDestroyCallback

GetAppData

GetClassName

GetName

SetAppData

SetName

Direct3DRMAnimationSetfIfufWfFfNfg,Í AIDirect3DRM::CreateAnimationSetf f\fbfh,İEÄ,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,ðŽQ Æ,·,é,±,Æ B

lpD3DRMAnimation

fAfjf [fVf†f“ EfZfbfg,©,ç í œ,³,ê,éDirect3DRMAnimationIfufWfFfNfg B

IDirect3DRMAnimationSet::Load

```
HRESULT Load(LPVOID lpvObjSource, LPVOID lpvObjID,  
             D3DRMLOADOPTIONS d3drmLOFlags,  
             D3DRMLOADTEXTURECALLBACK d3drmLoadTextureProc, LPVOID lpArgLTP,  
             LPDIRECT3DRMFRAME lpParentFrame);
```

```
fAfjf [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,Ïf|  
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,ÏfXfgfŠ [f€,đŽw'è,·,é B
```

```
lpvObjID  
f [fh,·,éIfufWfFfNfg,ì¼'Ō,Ū,½,ÎÊ'u,Ō,Ïf|fCf“f^ B,±  
,Ïpf%of [f^,Í Ad3drmLOFlagsfpf%of [f^,ªŽ',·Ž·ÊŽqftf%oŌ,É,æ,Á,Ä%ođŽB,³,ê,é BD3DRMLOAD_BYPOSI  
TIONftf%oŌ,đŽw'è,µ,½ ê ± A,±,Ïpf%of [f^,Í Aftf@fCf<,l'±,ÏIfufWfFfNfg,Ï ± ~,đŽ',·DWORD'l,Ō,Ïf|  
fCf“f^,Ä, é B,±,Ïpf%of [f^,É,ÍNULL,đŽw'è,·,é,±,Œ,à,Ä,«,é B
```

```
d3drmLOFlags  
f [fh EfIfvfVfzf“,đŽ',·D3DRMLOADOPTIONSŒ^,Ï'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,Ñ o,³,ê,é B,±  
,Ïpf%of [f^,É,ÍNULL,đŽw'è,·,é,±,Œ,ª,Ä,«,é B
```

```
lpArgLTP  
D3DRMLOADTEXTURECALLBACKfR [f<fofbfNŠŌ ”,É“n,³,ê,é AfAfvfŠfP [fVfzf“è<,Ïff [f^ B
```

```
lpParentFrame  
eftfŒ [f€,ÏfAfhfŒfX B,±,Ïpf%of [f^,Í AfAfjf [fVfzf“fZfbfg,ÏftfŒ [f€,ª A eftfŒ [f€,  
,đNULL,Œ,µ,Ä ï ¬,³,ê,Ä,µ,Ū,ª,Ä,±,Œ,đ-hŽ~,·,é B
```

```
ffftfHf<fg,Ä,Í A,±,Ïf f\fbfh,ÏlvObjSourcefpf%of [f^,ÄŽw'è,³,ê,éftf@fCf<,Ï Ä %o  
,ÏfAfjf [fVfzf“ EfZfbfg,df [fh,·,é B
```

IDirect3DRMAnimationSet::SetTime

HRESULT SetTime(D3DVALUE rvTime);

fAfjf [fVf†f“;ìE» Ý,ìŽžšŔ,đ Ý'è,·,é B

-E÷,·,é,ÆD3DRM_OK AŽ,“s,·,é,ÆfGf%o [,đ•Ŕ,· B•Ŕ'l,îê——,É,Â,¢
,Ä,Í A uDirect3D•ŔŽ f, [fh,î•Ŕ'l v,đŽQ Æ,·,é,±,Æ B

rvTime

V,µ,¢žžšŔ

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 ADirect3DRM::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,³Ī 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€,Ī,±,ĪfR [f<fofbfNŠÖ ”,đĀ,Ñ o,· B

-Ā,·,·,é,ÆD3DRM_OK AŽ,“s,·,é,ÆfGf%o [·,đ·Ö,· B·Ö'l,Īê——,É,Á,ĉ
,Ä,Ī A uDirect3D·ŮŽ f, [fh,Ī·Ö'l v,đŽQ Æ,·,é,±,Æ B

d3drmUpdateProc

fAfvfŠfP [fVf‡f“èĉ,³**D3DRMUPDATECALLBACK**fR [f<fofbfNŠÖ ”,ĪfAfhfĀfX B

arg

X VfR [f<fofbfNŠÖ ”,É“n,³,ê,éAfvfŠfP [fVf‡f“èĉ,Īff [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 ",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

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,lfJf% [Ef,fff<đŽæ“¾,·,é B

Direct3D fJf% [Ef,fff< iRGB , ,é,¢,Íf,fmfNf j,đŽ!,· 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 ÁčŽ,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%œ,Ì ”,đŽæ“¾,·,é B,±,Ì ”,Í AŽg—p,³,ê,Ä,č,é F ”,Á·\Œ»,³,ê,é B

%A%œ,Ì ”,đ•Ô,· B

ŽQ Æ @IDirect3DRMDevice::SetShades

IDirect3DRMDevice::GetTextureQuality

D3DRMTEXTUREQUALITY GetTextureQuality();

fffofCfX,ìE» Ý,ìfefNfXf`ff•iŽ;ìpf%of [f^,đŽæ“¾,·,é BfefNfXf`ff,ì•iŽ;ì,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* lplpViewports);

fffofCfX,lfrrf... [f| [fg,đŽ',· Direct3DRMViewportArrayIfufWfFfNfg,đ \z,·,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,İ•Ô'l v,đŽQ Æ,·,é,±,Æ B

lplpViewports

EA,Ñ o,μ,a -E÷,μ,½,Æ,«,É A—LCEø,ÈDirect3DRMViewportArrayIfufWfFfNfg,Ä,ä“ü,éf|fCf“f^,Ö,Ìf|
fCf“f^ B

IDirect3DRMDevice::GetWidth

DWORD GetWidth();

fffofCfX, ì• ,ðfsfNfZf<, ĀŽæ“%4, :é B, ±, ìf f\fbfh, í•Ö—~, ÈŠÖ ”, Ā, ,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'l,lfrrfbfgOR,ª•Ō,³,ê,é B

D3DRMWIREFRAME_CULL

—-Ê,lf tfŒ [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

fC“f^ [ftfFfCfXŽ~•ĒŽq,Ē,μ,ĀŽg—p,³,ê,éfOf [fof< Ef†fj [fNŽ~•ĒŽq iGUID j B

width, height

ffofCfX,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’†,Ìfobftf@,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);

ffofCfX, ðffBfU Eftf%fO, ð Ý'è, ,é B

-E÷, ,é, ED3DRM_OK AŽ, ”s, ,é, AfGf% [, 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

ffofCfX, 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,Ä,½fffofCfX,É,Í A^Ů,È,Ä,½•iŽç,đŽw'è,·,é,±,Œ,ª,Ä,«é B,½,Œ,!,Í AfvfŒf...
[,Ì,½,B,ÌfffofCfX,Íê”È,È•iŽç,ªá,ç,ª A Ä I“I,È•Ž',É—p,ç,ç,é,éfffofCfX,Í A,à,Á,Œ ,,ç•iŽç,Ì,à,Ì,Á, ,é B

ŽQ Œ @IDirect3DRMDevice::GetQuality

IDirect3DRMDevice::SetShades

HRESULT SetShades (DWORD ulShades);

%A%e,ì“x ‡,¢,đ Ý'è,·,é B,±,ì ”,Í AŽg—p,³,ê,Ä,¢,é F ”,Ä•\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 uDirect3D•ŮŽ f, [fh,Î•Ô'l v,ðŽQ Æ,·,é,±,Æ B

ulShades

V,µ,¢%A%e,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
,Ä,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,Ä, ,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%ofCfo,Éfn [fgfr [fgŠÖ ”,đ
'ñ<Ÿ,.é B

-CE÷,.é,ÆD3DRM_OK AŽ,”s,.é,ÆfGf%o [,đ•Ö:. B•Ö'l,Îê——,É,Â,¢
,Ä,Í A uDirect3D•ŮŽ f, [fh,Î•Ö'l v,đŽQ Æ,.é,±,Æ B

,±,Ïf f\fbfh,ªEÄ,Ñ o,³,ê,é,½,Ñ,É AfVfXfef€
,ÍfAfvfŠfP [fVf#f“è` ,D3DRMUPDATECALLBACKfR [f<fofbfNŠÖ ”,đEÄ,Ñ o,. BfR [f<fofbfNŠÖ ”,đÇ
%oÁ,.é,É,Í AIDirect3DRMDevice::AddUpdateCallbackf f\fbfh,đŽg—p,.é B

ŽQ Æ @IDirect3DRMDevice::AddUpdateCallback, D3DRMUPDATECALLBACK

IDirect3DRMFace

fAfVfŠfP [fVf‡f“Í Af fbfVf... ä, Ì, Ð, Æ, Â, Ìf|fŠfSf“, ÆËÝ, 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@fËf“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, ðËp³, ·, 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, ðËp³, ·, é
B

AddDestroyCallback
Clone
DeleteDestroyCallback
GetAppData
GetClassName
GetName
SetAppData
SetName

Direct3DRMFaceIfufWfFfNfg,Í AIDirect3DRM::CreateFace f\bfh,ìCEÄ,Ñ o,μ,É,æ,Á,Žæ“¼,³,ê,é B

IDirect3DRMFace::AddVertex

HRESULT AddVertex(D3DVALUE x, D3DVALUE y, D3DVALUE z);

Direct3DRMFaceIfufWfFfNfg,É'“_„đ'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

x, y, z

V,μ,¢,“_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,lf}fefŠfAf<,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,Ī•Ó'l v,đŽQ Æ,·,é,±,Æ B

lpMaterial

-Ê,É“K—p,³,ê,Ä,¢,éDirect3DRMMaterialIfuWfFfNfg,Ö,İf|fCf“f^,đŽó,~Žæ,é•Ī ”,Ö,İf|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,³,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,Ī•Ô'l v,đŽQ Æ,·,é,±,Æ B

lpTexture

—Ê,É“K—p,³,ê,½fefNfXf`ff,Ö,Īf|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

–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

'“_̀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 [,ð•Ô,· B•Ô'l,Îê——,É,Â,¢
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ĵ•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',“_ÏfCf“fffbfNfX,ðŽæ“¾,·,é B,±  
,ÏfCf“fffbfNfX,ÍdwIndexfpf%of [f^,ĂŽw'è,³,ê,½fCf“fffbfNfX,É'Î%ž,·,é B  
fCf“fffbfNfX,ð•Ô,· B
```

dwIndex

```
-Ë,É,é',“_ÏfCf“fffbfNfX 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

-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

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 \‘ç'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, Ĩ•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•Ó'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%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

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 Œ,·,é,±,Œ B

cylU, cylV

fefNfXf`ff,^u,Œv,Ĵ,ç,ç,ĴŽŸŒ³,Â%~'Œ^Ê‘Š,đŽ ,Á,Ä,Œ,é,©,đŽ',· B

ŽQ Œ @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^ [ftfFfCfX,Í A,.,x,Ä,ÌCOMfCf“f^ [ftfFfCfX,E“—

l A|UnknownfCf“f^ [ftfFfCfX Ef f\fbfh,ðEp ³,;é BIUnknownfCf“f^ [ftfFfCfX,ÍŽŸ,Ì,R,Â,Ìf f\fbfh,ðfTf|
[fg,.,é B

AddRef

QueryInterface

Release

,³,ç,É AIDirect3DRMFramefCf“f^ [ftfFfCfX,Í A|Direct3DRMObjectfCf“f^ [ftfFfCfX,©,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,ÄŽæ³⁴,³,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,É**IDirect3DRMFrame::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 "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,Î•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, aŽ', ·f%ofWfAf""PÊ, ĨŠp"x·ª A(rvX, rvY, rvZ), É'Î, µ, Ä%õñ", ³, 1, é B

-CE÷, ·, é, ÆD3DRM_OK AŽ, "s, ·, é, ÆfGf%o [, ð·Ô, · B·Ô'l, Îê——, É, Á, ¢
, Ä, Í A uDirect3D·ÛŽ f, [fh, Î·Ô'l v, ðŽQ Æ, ·, é, ±, Æ B

rctCombine

V, µ, ¢%õñ", ðCE» Ý, ìCE» Ý, ìftfCE [f€·İŠ·, Æ ‡ ¬, ·, é·û-@, ðŽ', · AD3DRMCOMBINETYPE—
ñ«CE^, İf f"fo B

rvX, rvY, rvZ

%õñ"Ž² B

rvTheta

f%ofWfAf""PÊ, ÄŽ', µ, ½%õñ"Žšp"x B

Žw'è, ³, ê, ½%õñ", Í A, ±, İDirect3DRMFramefCf"f^ [ftfFfCfX, É, æ, Á, ÄŽ·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%õñ, Ì, Ý s, □ B

ŽQ Æ @3D·İŠ·, IDirect3DRMFrame::SetRotation

IDirect3DRMFrame::AddScale

HRESULT AddScale(D3DRMCOMBINETYPE rctCombine, D3DVALUE rvX,
D3DVALUE rvY, D3DVALUE rvZ);

(rvX, rvY, rvZ), É, æ, Á, Ä f t f E [f €, ì f [f J f < ì Š ·, ð f X f P [f Š f “ f O, ·, é B

-CE ÷, ·, é, Æ D3DRM_OK A Ž, ” s, ·, é, Æ f G f % [, ð · Ô, · B · Ô ' l, ì ê —, É, Á, ¢
, Ä, Í A u Direct3D · Û Ž f, [f h, ì · Ô ' l v, ð Ž Q Æ, ·, é, ±, Æ B

rctCombine

V, µ, ¢ k Ž Ú, ð CE » Ý, ì f t f E [f € · ì Š ·, Æ ‡ ¬, ·, é · û - @, ð Ž ' , · AD3DRMCOMBINETYPE — ñ “ CE ^, ì f f “ f o B

rvX, rvY, rvZ

x Ay Az · û CE ü, ì k Ž Ú CE W ”, ð ' è ¸, ·, é B

Ž w ' è, ³, ê, ½ · ì Š ·, Í A, ±, ì Direct3DRMFrame f C f “ f ^ [f t f F f C f X, É, æ, Á, Ä Ž · Ê, ³, ê, é f t f E [f €, ì · ì Š · s — ñ, ¾, ¯, ð · ì X, ·, é B

Ž Q Æ @ 3D · ì Š

IDirect3DRMFrame::AddTransform

```
HRESULT AddTransform(D3DRMCOMBINETYPE rctCombine,
    D3DRMMATRIX4D rmMatrix);
```

rctCombine pf%of [f^,l',É],¢ Aftf¢ [f€,lf [fJf< À•W,đfAftfBf“•İŠ•,•é B
-¢÷,•,é,ÆD3DRM_OK AŽ,”s,•,é,ÆfGf%o [,đ•Ô,• B•Ô'l,İê—,É,Á,¢
,Ä,Í A uDirect3D•ŮŽ f, [fh,İ•Ô'l v,đŽQ Æ,•,é,±,Æ B

rctCombine
V,µ,¢•İŠ•,đ¢» Ý,İ•İŠ•,Æ ‡ ¬,•,é•û-@,đŽ!,• AD3DRMCOMBINETYPE—ñ<“¢^,İf f“fo B

rmMatrix
‡ ¬,•,³,ê,é•İŠ• s—ñ,đ'è`•,•éD3DRMMATRIX4D”z—ñ,İf f“fo B

•İŠ•,É,Í4 s4—ñ,İ s—ñ,đŽw'è,•,é,a AfAftfBf“•İŠ•,đ~—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,¬,đ•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, đftfĀ [fĀ, Ĩf [fJfĀ À•WĀEn, É'Ā%Á, , é B

-Ā÷, , é, ĀD3DRM_OK AŽ, ”s, , é, ĀfGf% [, đ•Ō, : B•Ō'l, Ĩê—, É, Ā, Ā,
, Ā, Ĩ A uDirect3D•ŪŽ f, [fh, Ĩ•Ō'l v, đŽQ Ā, , é, ±, Ā B

rctCombine

V, μ, Ā•ĨŠ, đĀ» Ý, Ĩ•ĨŠ, Ā ‡ -, , é•ŭ-@, đŽ!, • AD3DRMCOMBINETYPE—ñĀĀĀ, Ĩf f“fo B

rvX, rvY, rvZ

x Ay Az•ŭĀü, ĨĒ'u•Ĩ X, đ'èĀ, , é B

Žw'è, ³, é, ½•ĨŠ, Ĩ A, ±, ĨDirect3DRMFramefĀfĀ [ftfFfĀfX, É, æ, Á, ĀŽ-•Ē, ³, é, éftfĀ [fĀ, Ĩ•ĨŠ s—ñ, ¼, -, đ•Ĩ X, , é B

ŽQ Ā @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,·,éDirect3DRMVisualIfufWfFfNfg,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,ÎIfufWfFfNfg,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 Ā,³,ê,Ā,ç,È,̄,ê,Î A,·,×,Ā,İžqftfCE [f€ AĀöĀ¹ Af fbVf...
,Ā,Ā,à,É"jŠü,³,ê,é B

-Ā÷,·,é,ĀD3DRM_OK Až,"s,·,é,ĀfGf%o [,đ•Ō,· B•Ō'l,İê—,É,Ā,ç
,Ā,Ī A uDirect3D•Ūž f, [fh,Ī•Ō'l v,đžQ Ā,·,é,±,Ā B

lpChild

žqftfCE [f€,Ā,µ,Āžg,í,ê,Ā,ç,éDirect3DRMFramefIfufWfFfNfg,đž!,•Ī " B

žQ Ā @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::GetChildren

HRESULT GetChildren(LPDIRECT3DRMFRAMEARRAY* lpChildren);

Direct3DRMFrameArrayIfufWfFfNfg, ìCE`Ž®, ĀŽqftfCE [f€, ìfŠfXfg, ðŽæ“¾, ·, é B

–CE÷, ·, 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

lpChildren

CEĀ, Ñ o, μ, a –CE÷, μ, ½, Æ, «, É A—LCEø, ÈDirect3DRMFrameArray|fCf“f^, “ü, éf|fCf“f^, ìfAfhfCEfX B

ŽQ Æ @Direct3DRMFrameArray, ŠK'w

IDirect3DRMFrame::GetColor

D3DCOLOR GetColor();

ftfŒ [f€, Ì F, ðŽæ“¾, ·, é B

Direct3DRMFramefIfufWfFfNfg, Ì F, ð•Ô, · B

ŽQ Æ @IDirect3DRMFrame::SetColor

IDirect3DRMFrame::GetLights

HRESULT GetLights(LPDIRECT3DRMLIGHTARRAY* lpLights);

Direct3DRMLightArrayIfuWfFfNfg, ÌE`Ž@, ÅftfE [f€, ÌEõE!fŠfXfg, 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 u
Direct3D•ÛŽ f, [fh, Î•Ô'l v, ðŽQ Æ, ·, é, ±, Æ B

lpLights

EÄ, Ñ o, µ, a -E÷, µ, ½, Æ, «, É A—LÆø, ÈDirect3DRMLightArray|fCf“f^, “ü, éf|fCf“f^, ÌfAfhfEfx 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, Î•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, ðftf [f, ðŽæ“¼, ·, é B

-E÷, ·, é, ED3DRM_OK AŽ, ”s, ·, é, AfGf% [, 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

lpParent

ftf [f, ð e, ðŽ, ·Direct3DRMFrameIfufWfFfNfg, Ö, ð|fCf“f^, ðŽó, Žæ, éf|
fCf“f^, ðAfhfCEfX B» Ý, ðftf [f, ð e, ðftf [f, ð ê ‡ A, ±, ð|fCf“f^, É, ÍNULL, a 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,éDirect3DRMFrameIfufWfFfNfg,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,½ftfĈ [fĚ,ðŠŮ,ðŠK'w,ìfĸ [fg EftfĈ [fĚ,ðŽæ“¼,·,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,Ĵ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

lpRoot

fV [f“,ì Ā ãêftfĈ [fĚ,ðŽ',·Direct3DRMFramefIfufWfFfNfg,ðŽó, Žæ,éf|fCf“f^,Ö,Ïf|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, º—LCEø, Å, , é, ©, Ç, º, ©, ø•Ô, · B
ftfHfO, º—LCEø, Å, , ê, ÎTRUE A, » , º, Å, È, ¯, ê, ÎFALSE, ø•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();

ŽqftfĀ [fĀ,đ ^— ,;é,½,ß,ÉŽg,í,ê,é^a—Đf, [fh,đŽæ“¾,;é B
•^a—Đf, [fh,đŽ!,D3DRMSORTMODE—ñ“Ā^,Īf f“fo,đ•Ō,· B

ŽQ Æ @IDirect3DRMFrame::SetSortMode

IDirect3DRMFrame::GetTexture

HRESULT GetTexture(LPDIRECT3DRMTEXTURE* lpTexture);

Žw'è,³,ê,½ftfĈ [f€,̀ìfefNfXf`ff,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,Ī•Ó'l v,đŽQ Æ,·,é,±,Æ B

lpTexture

ftfĈ [f€,̀ìfefNfXf`ff,đŽl,·Direct3DRMTextureIfufWfFfNfg,đŽó,~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 [fĕ 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,îê——,É,Ā,ĉ
,Ā,Ī A uDirect3D•ŮŽ f, [fh,Ī•Ô'l v,ðŽQ Ā,·,é,±,Ā B

lpbWrap_u, lpbWrap_v

Ĉ%oÊ,ðŽó,~Žæ,éĪ " BfefNfXf`ff,³u•ûĈü,âv•ûĈü,Éf}fbfv,³,ê,é,Ā,« A,»,ê,¼,ê,ĪĪ ",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, Ìê——, 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 AftfCE [f€,É'Î,·,é AftfCE [f€,Ì'Š'Î'¬“x,đŽæ“¾,·,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,Ì•Ô'l v,đŽQ A,·,é,±,Æ B

lpRef

ŽQ A,Æ,μ,Ä—p,¢,ç,ê,éDirect3DRMFramefIfufWfFfNfg,đŽ!,·•Ī ” B

lprvVel

ftfCE [f€,Ì'¬“x,đŽó,¬Žæ,éD3DVECTOR \‘¢'Ī,ĪAfhfCEfX B

fRotVel

êŽŸCE³,Ì'¬“x,đŽæ“¾,·,é ê ‡fIfufWfFfNfg,Ì%oň“]’¬“x,ª l—¶,É“ü,ê,ç,ê,é,©,Ç,¤,©,đŽ!,·ftf%ofO B,±
,Īfpf%of [f^,ÉTRUE,đŽw'è,·,é,ÆfIfufWfFfNfg,Ì%oň“]’¬“x,ªCEvŽZ,ÉŠŮ,ß,ç,ê,é B

ŽQ A @IDirect3DRMFrame::SetVelocity

IDirect3DRMFrame::GetVisuals

```
HRESULT GetVisuals(LPDIRECT3DRMVISUALARRAY* lpVisuals);
```

lpVisuals [f€ ã, ìfrfWf...fAf<, ìfŠfXfg, ðŽæ“¾, ·, é B

–CE÷, ·, é, ÆD3DRM_OK AŽ, ”s, ·, é, ÆfGf%o [, ð•Ô, · B•Ô'l, ìê—, É, Â, ç
, Ä, Í A uDirect3D•ÜŽ f, [fh, ì•Ô'l v, ðŽQ Æ, ·, é, ±, Æ B

lpVisuals

CEÄ, Ñ o, µ, a –CE÷, µ, ½, Æ, «, É A—LCEø, ÈDirect3DRMVisualArray f|fCf“f^, Ä %oŠú%o», ³, é, 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 Ć < % Ń É, δ lprvDst f p f % f [f ^, É · Ô, · B

- Ć ÷, ·, é, Ā D3DRM_OK A Ž, ” s, ·, é, Ā f G f % [, ð · Ô, · B · Ô ' l, Ĩ ě —, É, Ā, Ć
, Ā, Ĩ A u Direct3D · Ů Ž f, [f h, Ĩ · Ô ' l v, ð Ž Q Ā, ·, é, ±, Ā B

lprvDst

· Ĩ Š · Ć < % Ń É, ð Ž ó, Ž æ, é D3DVECTOR \ ' Ć ' Ĩ B

lprvSrc

· Ĩ Š ·, Ĩ f \ [f X, Ā, É, é D3DVECTOR \ ' Ć ' Ĩ B

Ž Q Ā @ IDirect3DRMFrame::Transform, 3D · Ĩ Š

IDirect3DRMFrame::LookAt

```
HRESULT LookAt(LPDIRECT3DRMFRAME lpTarget, LPDIRECT3DRMFRAME lpRef,  
              D3DRMFRAMECONSTRAINT rfcConstraint);
```

Žw'è,3,ê,½ŽQ ÆftfĀ [fĀ,Æ"ăšr,μ,Ä 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% [,đ•Ô,· B•Ô'l,Îê—,É,Ā,Ā
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ī•Ô'l v,đŽQ Æ,·,é,±,Æ B

lpTarget, lpRef

-Ů•W,·,æ,ŃŽQ Æ,Æ,μ,Ä—p,Ā,ç,é,éDirect3DRMFramefIfufWfFfNfg,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€ ä,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 BŠe 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);

ftfĀ [fĒ,ĭf}fefŠfAf<f, [fh,đ Ý'è,·,é Bf}fefŠfAf<f, [fh,Í AftfĀ [fĒ,ÉfĀf“f_Šf“fO,³,è,éfrrfWf...fAf<,ĭf}fefŠfAf< ĭ•ñ,ĭf\ [fX,đĀ“è,·,é B

-Ā÷,·,é,ĀD3DRM_OK AŽ,“s,·,é,ĀfGf% [,đ•Ô,· B•Ô'l,ĭĕ——,É,Ā,ĉ,Ä,Í A uDirect3D•ŮŽ f, [fh,ĭ•Ô'l v,đŽQ Ā,·,é,±,Ā B

rmmMode

D3DRMMATERIALMODE—ñ“Ā^f f“fo [ĭ,Đ,Ā,Ā B

ŽQ Ā @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,Ā,Ā A uDirect3D•ŮŽ f, [fh,Ā•Ô'l v,đŽQ Ā,·,é,±,Ā B

lpRef

ŽQ Ā,Ā,μ,Ā—p,Ā,Ā,Ā,éDirect3DRMFrame fIfufWfFfNfg,đŽ,·Ā " B

rvDx, rvDy, rvDz

ftfĀ [fĀ,Ā V,μ,ĀzŽ² B

rvUx, rvUy, rvUz

ftfĀ [fĀ,Ā V,μ,ĀyŽ² B

ffftfHf<fg,Ā,Ā AftfĀ [fĀ,Ā•ûĀüfxfNfgf<[0, 0, 1],Ā ĀfxfNfgf<[0, 1, 0],đŽ ,Ā,Ā,Ā,é B

[rvUx, rvUy, rvUz],ª[rvDx, rvDy, rvDz]

,Ā•½ s,Ē Ē Ā,Ā AD3DRMERR_BADVALUEfGf%o [l,ª•Ô,ª,é B,»ĀĒŠO,Ā Ē Ā,Ā A“n,ª,é,½[rvUx, rvUy,
rvUz]fxfNfgf<ª[rvDx, rvDy, rvDz],Ē ,¼,Ē•½-Ē Ā,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—£,ª[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);

ftf€ [f€ ,l%õñ“]Ž²,Æ%õñ“]Šp“x,đ Ý'è,·,é B,±,Ì Ý'è,Í **IDirect3DRM::Tick**,Û,½,Í **IDirect3DRMFrame::Move** f\fbfh,“CEÄ,Ñ o,³,ê,é,½,Ñ,É“K—p,³,ê,é B•üCEüxfNfgf<[rvX, rvY, rvZ] ,Í AŽQ Æftf€ [f€,Ä'è`³,ê,é B

-CE÷,·,é,ÆD3DRM_OK AŽ,“s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,Îê——,É,Â,c ,Ä,Í A uDirect3D•ÛŽ f, [fh,Î•Ô'l v,đŽQ Æ,·,é,±,Æ B

lpRef
ŽQ Æ,Æ,µ,Ä—p,ç,ç,ê,éDirect3DRMFramefIfufWfFfNfg,đŽ',·,İ ” B

rvX, rvY, rvZ
%õñ“]Ž²,Æ,È,éfxfNfgf< B

rvTheta
f%oWfAf““P^Ê,Ì%õñ“]Šp“x B

ftf€ [f€ ã,ÌIfufWfFfNfg,đ1%õñ,µ,©•Í X,µ,È,ç**IDirect3DRMFrame::AddRotation** f\fbfh,Æ^Û,È,è A,± ,Ìf f\fbfh,Í AŽw'è,³,ê,½%õñ“,É,æ,Ä,ÄfCEf“f_Šf“fO,Ìf^fCf~f“fO,²,Æ,É•İŠ· s—ñ,đ•Í 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,İ•Ô'l v,đŽQ Æ,·,é,±,Æ B

rcColor

”wEi,İ 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 [ftfFX B

fCf [fW,Ī [“x,Í16,Ä,È,,Ä,Í,È,ç,È,¢ BfCf [fW,Æftrf... [f] [fg,ĪfTfCY,“Û,È,Ä,Ä,¢
,é ê ‡ A,Ů,, AfCf [fW,“fXfP [fŠf“fO,³,ê,é B”wEi [“xfobftf@,ĪfAjjf [fVf‡f“„Ä Ä ,,ĪpftfH [f}
f“fX,đ“¾,é,½,ß,É,Í AfCf [fW,ĪfTfCY,“ftrf... [f] [fg,Æ““,Ī,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,ÏfTfCfY,â F ”,ªfrf... [*f*] [*f*g,Æ^Û,È,Á,Ä,ç,é,Æ A,Ü,, AfCf [*f*W,ªfXfP [*f*Šf“fO,³,ê,é,© A“K“-
,È F ”,É•İŠ·,³,ê,é B”wEi,ÏfAfjf [*f*Vf±f“,Å Å ,,ÏpftfH [*f*]
f“fX,ð“¾,é,½,ß,É,Í AfCf [*f*W,ÏfTfCfY,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

rvRed, rvGreen, rvBlue are floating-point values in the range of -1.0 to 1.0. If the value is outside this range, the function will clamp the value to the range. If the value is 0.0, the color is black. If the value is 1.0, the color is white. If the value is -1.0, the color is the opposite of the color.

rvRed, rvGreen, rvBlue
are floating-point values in the range of -1.0 to 1.0. If the value is outside this range, the function will clamp the value to the range. If the value is 0.0, the color is black. If the value is 1.0, the color is white. If the value is -1.0, the color is the opposite of the color.

IDirect3DRMFrame::SetSceneFogColor

HRESULT SetSceneFogColor(D3DCOLOR rcColor);

fV [f“, ÌftHfO, 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

ftHfO, 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 Direct3D•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^,Ĵf 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,“ 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);

ŽqftfE [f€,đ ^— ,:é,½,ß,ÉŽg,í,ê,é^a—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,^aÄ,«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

•^a—Đf, [fh,đŽw'è,:éD3DRMSORTMODE— ñ<“CE^,lf f“fo,İ,Đ,Æ,Â Bf^tf^tHf<f^gl,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);

ftfĒ [fĒ ā,ĭfIufWfFfNfg,ĭ AfefNfXf`ff Ā•W,ĭÊ‘Š“Á «,đ'è<`,·,é B

-Ē÷,·,é,ĒD3DRM_OK AŽ,“s,·,é,ĒfGf%o [,đ•Ô,· B•Ô'l,ĭĕ——,É,Ā,ĉ
,Ā,ĭ A uDirect3D•ŮŽ f, [fh,ĭ•Ô'l v,đŽQ Ē,·,é,±,Ē B

bWrap_u, bWrap_v

Ÿ'è,·,é'l,đŽĭ,·ĕ ” B,••ûĒü,Ů,½,ĭ,-•ûĒü,ÉfefNfXf`ff,đf}fbfv,·,é,Ē,« A'ĭ%ž,·,éĕ ”,ÉTRUE,đ Ÿ'è,·,é B

ŽQ Ē @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,Ì^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
^êŽÝĈ³,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,ÉŠÜ,ß,ç,ê,é B

ŽQ Æ @IDirect3DRMFrame::GetVelocity

IDirect3DRMFrame::SetZbufferMode

HRESULT SetZbufferMode(D3DRMZBUFFERMODE d3drmZBM);

Zfofbftf@ Ef, [fh,đ Ý'è,·,é B,·,È,í,¿ 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 BfftfHf<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 < , ž f , f f f < À · W , © , ç f [f < f h À · W , É · Ĩ Š · , μ A Ą < % o Ê , ž l p d 3 d V D s t f p f % o f [f ^ , É · Ô , · B

- Ą ÷ , · , é , Ą D 3 D R M _ O K A ž , ” s , · , é , Ą f G f % o [, ž · Ô , · B · Ô ' l , Ĩ ê — , É , Ą , Ą , Ą , Ĩ A u Direct3D · Ů ž f , [f h , Ĩ · Ô ' l v , ž ž Q Ą , · , é , ± , Ą B

lpd3dVDst

· Ĩ Š · ^ — , Ĩ Ą < % o Ê , ž ž ó , ž æ , Ą D 3 D V E C T O R \ ' Ą ' Ĩ B

lpd3dVSrc

· Ĩ Š · ^ — , 3 , ê , Ą D 3 D V E C T O R \ ' Ą ' Ĩ B

ž Q Ą @ 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,·,×,Ä,ÌCOMfCf“f^ [ftfFfCfX,Æ“— l AUnknownfCf“f^ [ftfFfCfX Ef f\fbfh,ðCEp 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,ðCEp 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 fIfufWfFfNfg, ĪĒ, Š'è ",đŽæ“¾,·,é B

Ē, Š'è ",đ•Ô,· B

Ē, Š'è ",Ī'Ī,Ī”½”ä—á“Ī,ÉĒö“x,É%œ<¿,đ—^,!,é B,½,Æ,!,Ī ĀĒ, Š'è ",²,Ī,Æ,« ĀĒö,Ī“x,Ī”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,İ—LCE0,ÈftfCE [f€ ,đŽó,~Žæ,éf|fCf“f^,Ö,İf|fCf“f^ B

ŽQ Æ @IDirect3DRMLight::SetEnableFrame

IDirect3DRMLight::GetLinearAttenuation

D3DVALUE GetLinearAttenuation();

1. ŽY, ŠEW ",žæ¼,·,é B

1. ŽY, ŠEW ",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, ì2ŽÝCE, ŠCEW ”, ðŽæ“¾, ·, é B

2ŽÝCE, ŠCEW ”, ð•Ô, · B

ŽQ Æ @**IDirect3DRMLight::SetQuadraticAttenuation**

IDirect3DRMLight::GetRange

D3DVALUE GetRange();

«» Ý, ìDirect3DRMLightIfufWfFfNfg, ì”ÍÍ, ðŽæ“¾, ·, é B

”ÍÍ, ðŽ!, ·, l, ð•Ô, · B

ŽQ Æ @**IDirect3DRMLight::SetRange**

IDirect3DRMLight::GetType

D3DRMLIGHTTYPE GetType();

Žw'è,³,ê,½,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,½ĚĚĚ,Ī F,đ Ý'è,·,é B

-Ě÷,·,é,ĚD3DRM_OK AŽ,"s,·,é,ĚfGf% [,đ•Ō,· B•Ō'l,Īĕ——,É,Ā,ĉ
,Ā,Ī A uDirect3D•ŪŽ f, [fh,Ī•Ō'l v,đŽQ Ě,·,é,±,Ě B

rcColor

ĚĚĚ,Ī V,μ,ĉ F B

ŽQ Ě @IDirect3DRMLight::GetColor

IDirect3DRMLight::SetConstantAttenuation

HRESULT SetConstantAttenuation(D3DVALUE rvAtt);

CEđCE¹,İCE, ŠCEW " ,đ Y'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—^,|,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(LPDIRECT3DRMFRAME lpEnableFrame);

CEdCE1, l—LCEøftfCE [f€, δ Ý'è, ·, é B

-CE÷, ·, 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 AE, ·, é, ±, AE B

lpEnableFrame

CEdCE1, l—LCEøftfCE [f€, Ö, Îf|Cf“f^ B, ±, ÎftfCE [f€, É, Í eftfCE [f€, AE“—l, ÎCEdCE1, AE, È, é B

ŽQ AE @IDirect3DRMLight::GetEnableFrame

IDirect3DRMLight::SetLinearAttenuation

HRESULT SetLinearAttenuation(D3DVALUE rvAtt);

ŠCEW " ,đ Ý'è , ,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 , Î•Ô'l v , đŽQ Æ , , ,é , ± , Æ B

rvAtt

V , μ , çCE , ŠCEW " B

ŽQ Æ @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 ¬,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);

CE0E1,ì2ŽÝCE, ŠCEW " ,đ Ý'è, : ,é B

-CE±, : ,é, ÆD3DRM_OK AŽ, "s, : ,é, ÆfGf% [,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

rvAtt

V, µ, çCE, 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”,İŠp“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”,İŠp“x B,±,İŠp“x,Í A^Ä%oe”,İŠp“x,æ,è,à - ,³,ç,© A“™,µ,,È,,Ä,Í,ç, -,È,ç B-
¼”,İŠp“x,đ^Ä%oe”,İŠp“x,æ,è,â,«, Ý’è,µ,½ ê ‡ A-
¼”,Í^Ä%oe”,Æ“ ,İŠp“x,Æ,È,é BfftfHf<fg’l,Í0.4%ofWfAf“,Ä, ,é B

ŽQ Æ @IDirect3DRMLight::GetUmbra

IDirect3DRMMaterial

*fAfVfŠfP [fVf‡f“Í Af}fefŠfAf<fIfufWfFfNfg,ÆEÝ,¢
,É,â,èŽæ,è,·,é,½,ß,ÉIDirect3DRMMaterialfCf“f^ [ftfFfCfX,lf f\fbfh,ðŽg—p,·,é B,±
,lfZfNfVf‡f“Í AIDirect3DRMMaterialfCf“f^ [ftfFfCfX Ef f\fbfh,lfŠftf@fÆf“fX,Á, ,é BŠT”O,É,Â,¢,Ä,ÌŠT
—v,Í A uIDirect3DRMMaterialfCf“f^ [ftfFfCfX v,ðŽQ Æ,·,é,±,Æ B*

IDirect3DRMMaterialfCf“f^ [ftfFfCfX Ef f\fbfh,Í A`È%°,ÌfOf< [fv,É•ª—D,·,é,±,Æ,ª,Á,«,é B

•úŽĚ [GetEmissive](#)
[SetEmissive](#)

”½ŽĚŽw ”,ì“x [GetPower](#)
[SetPower](#)

”½ŽĚ [GetSpecular](#)
[SetSpecular](#)

*IDirect3DRMMaterialfCf“f^ [ftfFfCfX,Í A,·,×,Ä,ÌCOMfCf“f^ [ftfFfCfX,Æ“—
l A[UnknownfCf“f^ [ftfFfCfX Ef f\fbfh,ðEp ³,·,é BIUnknownfCf“f^ [ftfFfCfX,ÍŽŸ,ì,R,Â,lf f\fbfh,ðfTf|
[fg,·,é B*

[AddRef](#)

[QueryInterface](#)

[Release](#)

*,³,ç,É AIDirect3DRMMaterialfCf“f^ [ftfFfCfX,Í AIDirect3DRMObjectfCf“f^ [ftfFfCfX,©,çŽŸ,lf f\fbfh,ðEp ³
,·,é B*

[AddDestroyCallback](#)

[Clone](#)

[DeleteDestroyCallback](#)

[GetAppData](#)

[GetClassName](#)

[GetName](#)

[SetAppData](#)

[SetName](#)

Direct3DRMMaterialfIfufWfFfNfg,Í AIDirect3DRM::CreateMaterial f\fbfh,ÌEÄ,Ñ o,µ,É,æ,Á,ÄŽæ“¼,³,ê,é B

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,^a §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,^a §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”½ŽĚŽw ”,đ Ý’è, :é B

*-Ě÷, :é, ĚD3DRM_OK AŽ, ”s, :é, ĚfGf%o [,đ•Ô, : B•Ô’l, Ĩĕ——, É, Ĥ, ċ
, Ĥ, Ĩ A uDirect3D•ŮŽ f, [fh, Ĩ•Ô’l v,đŽQ Ě, :é, ±, Ě B*

rvPower

V, μ, ċ”½ŽĚŽw ” B

ŽQ Ě @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,Ī•Ô'l v,đŽQ Æ,·,é,±,Æ B

r, g, b
”½ŽĚfnfCf%ofCfG,ì F,ì Ô A—Î A Â,ĪŠe—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](#)

ì -,Æ îñ [AddGroup](#)
[GetBox](#)
[GetGroup](#)
[GetGroupCount](#)

f}fefŠfAf< [GetGroupMaterial](#)
[SetGroupMaterial](#)

,»,İ¼ [Scale](#)
[Translate](#)

fÆf“f_Šf“fO•iŽ; [GetGroupQuality](#)
[SetGroupQuality](#)

**fefNfXf`ff Ef}
fbfsf“fO** [GetGroupMapping](#)
[SetGroupMapping](#)

fefNfXf`ff [GetGroupTexture](#)
[SetGroupTexture](#)

,“_ ,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,³,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,³,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,đŠÜ,Đ•ûĈ`”ÍÍ,đŽæ“¾,·,é B•ûĈ`”ÍÍ,Í A,»„ê,¼,ê,ÌŽŸĈ³,Ìf,ff< À•W,Ì À -'l,Æ À
'â'l,đŽ!,· B

-Ĉ÷,·,é,ÆD3DRM_OK AŽ,“s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,Ìê——,É,Â,ĉ
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ì•Ô'l v,đŽQ Æ,·,é,±,Æ B

lpD3DRMBox

•ûĈ`”ÍÍ,Ì À•W,đŽó,Žæ,éD3DRMBOX \‘ĉ'ì 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,Ä,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,Ä,«,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,Ä,«,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,Ä,«,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“¬,¶,Ä, ,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

-Æ÷,µ,½ ê ‡,ÍfOf< [fv,Ì ",ð•Ô,· B,»»,□,Å,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,Ï,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,³,ê,½fOf< [fv,ìfĒf“f_šf“fO•iŽ_i,ðŽæ“¾,·,é B

-Ē÷,·,é,ÆD3DRMRENDERQUALITY,ĂŽ_i,³,ê,é—ñ<“Ē^,ì'1,ð•Ô,· BŽ,”s,·,é,Æ0,ð•Ô,· B,±
ê,ç,ì'1,É,Í AfIfufWfFfNfg,ÌfVfF [ffBf“fO Ef, [fh,â Æ-¾f, [fh A“h,è,Ā,Ô,μf, [fh,“ŠÜ,Ü,ê,Ă,Ĉ,é B

id

fOf< [fv,ìŽ⁻•ÊŽq B,±,ìŽ⁻•ÊŽq,ÍIDirect3DRMMesh::AddGroup,ðŽg,Á,Ă ¶ ¬,³,ê,½,à,ì,Ă,È,,Ă,Í,È,ç,È,Ĉ B

ŽQ Æ @IDirect3DRMMesh::SetGroupQuality

IDirect3DRMMesh::GetGroupTexture

```
HRESULT GetGroupTexture(D3DRMGROUPINDEX id,  
    LPDIRECT3DTEXTURE *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,¢
,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 ¶ ¬,³,ê,½,à,Ì,Á,È,,Ä,Í,È,ç,È,¢ B

returnPtr

f f\fbfh,^a §Æä,ð•Ô,·,Æ,« AfOf < [fv,ÌDirect3DRMTexturefCf“f^ [ftfFfCfX,ðŽó,Žæ,é•Í ”,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 ¶ ¬,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

IDirect3DRMMesh::Scale

HRESULT Scale(D3DVALUE sx, D3DVALUE sy, D3DVALUE sz);

$f, \text{fff} \leftarrow \hat{A} \cdot W, \hat{l}x \hat{Z}^2 \text{ Ay} \hat{Z}^2 \text{ Az} \hat{Z}^2, \hat{E} \hat{l}, \mu \text{ A} \text{---}$
^,!,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

$x \hat{Z}^2 \text{ Ay} \hat{Z}^2 \text{ Az} \hat{Z}^2, \hat{E} \% \hat{o} \hat{A}, \hat{A} \text{“K—p,}^3 \hat{e}, \hat{e} \text{ kŽÚŒW ” B}$

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•ŮŽ f, [fh, ð•Ô'l v, ðŽQ Æ, ., é, ±, Æ B

id

fOf< [fv, ðŽ⁻•ÊŽq B, ±, ðŽ⁻•ÊŽq, IDirect3DRMMesh::AddGroup, ðŽg, Á, Ä ¶ ¬, ³, ê, ½, à, ð, Á, 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,Ä,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,ϖ,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 Œ,·,é,±,Œ 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 Œ @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•Ô,· B•Ô'l,Îê——,É,Â,¢
,Ä,Í A uDirect3D•ÜŽ f, [fh,Î•Ô'l v,ðŽQ Æ,·,é,±,Æ B

id

fOf< [fv,ìŽ~•ÊŽq B,±,ìŽ~•ÊŽq,ÍIDirect3DRMMesh::AddGroup,ðŽg,Á,Ä ¶ ¬,³,ê,½,à,ì,Â,È,,Ä,Í,È,ç,È,¢ B

value

Direct3DRMMeshIfufWfFfNfg,ÉŠÖ~A•t,¯,éIDirect3DRMMaterialfCf“f^ [ftfFfCfX,ìfAfhfEfX B

ŽQ Æ @IDirect3DRMMesh::GetGroupMaterial

IDirect3DRMMesh::SetGroupQuality

HRESULT SetGroupQuality(D3DRMGROUPINDEX id, D3DRMRENDERQUALITY value);

Žw'è,³,ê,½fOf< [fv,ìfœf“f_šf“fO•iž,đ Ý'è,.,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

id

fOf< [fv,ìž⁻•êžq B,±,ìž⁻•êžq,íIDirect3DRMMesh::AddGroup,ðžg,Á,Ä ¶ ¬,³,ê,½,à,ì,Á,È,,Ä,Í,È,ç,È,ç 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,ªšŮ,Ü,ê,Ä,ç,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

-E±, ·, é, AED3DRM_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 A, ·, é, ±, A B

id

fOf< [fv, ðŽ~•ÊŽq B, ±, ðŽ~•ÊŽq, IDirect3DRMMesh::AddGroup, ðŽg, Á, Ä ¶ ¬, ³, ê, ½, à, Ì, Á, È, , Ä, Í, È, Ç, È, Ç B

value

Direct3DRMMeshIfufWfFfNfg, ÉŠÖ~A•t, ¯, é IDirect3DRMTexturefCf“f^ [ftfFfCfX, ðfAfhfÇfX B

ŽQ A @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

-Ĉ÷,·,é,ĀD3DRM_OK AŽ,“s,·,é,ĀfGf%o [,ð•Ô,· B•Ô'l,îê—,É,Ā,ĉ
,Ā,Ī A uDirect3D•ŮŽ f, [fh,Ī•Ô'l v,ðŽQ Ā,·,é,±,Ā B

id

fOf< [fv,ìŽ-•ÊŽq B,±,ìŽ-•ÊŽq,ĪDirect3DRMMesh::AddGroup,ðŽg,Ā,Ā ¶ ñ,³,ê,½,à,ì,Ā,È,,Ā,Ī,È,ç,È,ĉ B

index

',“_îÊ'u,ð Ý'è,·,éŽn“_ðŽ!,· Avaluesfpf%of [f^,î”z—ñ,Ō,ĪfCf“ffbfNfX B

count

index fpf%of [f^,āŽ!,·fCf“ffbfNfX,É'±,ĉ,Ā Ý'è,·,é A',“_ì ” B

values

Ý'è,·,é',“_îÊ'u,ðŽ!,·D3DRMVERTEX \‘ĉ'Ī,î”z—ñ B

'“_îñ,ĪfOf< [fv,²,Ā,ÉŽ ,Ā B,Ó,½,Ā,îÛ,È,Ā,½fOf< [fvšÔ,Ā',“_ðĉ—L,·,é•K—v,ª,·,é ê ± i,½,Ā,,Ī Af fbf
Vf... ã,Ī—× Ú,µ,½-Ê,Ī F,ªÛ,È,é,Ā,« j A—¼•û,ĪfOf< [fv,Ā',“_ðfRfs [µ,È,,Ā,Ī,È,ç,È,ĉ B

ŽQ Ā @IDirect3DRMMesh::GetVertices

IDirect3DRMMesh::Translate

HRESULT Translate(D3DVALUE tx, D3DVALUE ty, D3DVALUE tz);

Direct3DRMMeshIfufWfFfNfg't,ì'“_ìÊ'u,É AŽw'è,³,è,½fIfzfzfbfg,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,İ•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,éfIfzfzfbfg B

IDirect3DRMMeshBuilder

fAfvfŠfP [fVf‡f“Í Af fbfVf...fIfufWfFfNfg,ÆÉÝ,¢
,É,â,èŽæ,è,·,é,½,ß,ÉIDirect3DRMMeshBuilderfCf“f^ [ftfFfCfX,Ïf f\fbfh,ðŽg—p,·,é B,±
,ÏfZfNfVf‡f“Í AIDirect3DRMMeshBuilderfCf“f^ [ftfFfCfX Ef f\fbfh,ÏfŠtf@fÆf“fX,Å,·,é BŠT”O,É,Â,¢
,Ä,ÏŠT—v,Í A uIDirect3DRMMesh,ÆIDirect3DRMMeshBuilderfCf“f^ [ftfFfCfX v,ðŽQ Æ,·,é,±,Æ B

IDirect3DRMMeshBuilderfCf“f^ [ftfFfCfX Ef f\fbfh,Í A^È%°,ÏfOf< [fv,É•ª—D,·,é,±,Æ,ª,Å,«,é B

F GetColorSource
SetColor
SetColorRGB
SetColorSource

ì -,Æ îñ GetBox

-Ê AddFace
AddFaces
CreateFace
GetFaceCount
GetFaces

f [fh Load

f fbfVf... AddMesh
CreateMesh

,»,Ï¼ 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|**Unknown**fCf“f^ [ftFfCfX Ef f\fbfh,ðEp ³,·,é **BIUnknown**fCf“f^ [ftFfCfX,ÍŽŸ,ì,R,Â,ìf f\fbfh,ðfTf|
[fg,·,é B

AddRef

QueryInterface

Release

,³,ç,É **AIDirect3DRMMeshBuilder** fCf“f^ [ftFfCfX,Í**IDirect3DRMObject**fCf“f^ [ftFfCfX,©,çŽŸ,ìf f\fbfh,ðEp
³,·,é B

AddDestroyCallback

Clone

DeleteDestroyCallback

GetAppData

GetClassName

GetName

SetAppData

SetName

Direct3DRMMeshBuilder fIfufWfFfNfg,Í **AIDirect3DRM::CreateMeshBuilder** 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

-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

lpD3DRMFace

'Ç%Á,·,é-Ê,ÏfAfhfÆfX B

,Ð,Æ,Â,Ï-Ê,Í A1"x,É,Ð,Æ,Â,Ïf fbVf...,É,µ,©'¶ Ý,·,é,±,Æ,Í,Â,«,È,¢ 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** \‘c'ì, Ì”z—ñ, Ìfx [fX EfAfhfÇfX, Ö, Ìf|fCf“f^ B

normalCount
-@ ü, Ì ” B

lpNormals
-@ ü, ÌÊ'u, ðŠi”[, ·, é **D3DVECTOR** \‘c'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, a±, 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, Í, Ö, ð Ý'è, µ, È, , Ä, Í, È, Ç, È, Ç B

lpD3DRMFaceArray
V, ½, É Ì - , ¾, ê, ½-Ê, Ö, Ìf|fCf“f^, ðŠi”[, ·, é **AIDirect3DRMFaceArray**fCf“f^ [ftfFfCfX, Ö, Ìf|
fCf“f^, ÌfAfhfÇfX B

IDirect3DRMMeshBuilder::AddFrame

HRESULT AddFrame (LPDIRECT3DRMFRAME lpD3DRMFrame);

ftfCE [f€, ìfRf“fef“fc, ðDirect3DRMMeshBuilderIfufWfFfNfg, 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, Ĩ 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, ED3DRM_OK AŽ, ”s, ·, é, AfGf%o [, ð•Ô, · B•Ô'l, Îê——, É, Â, ¢
, Ä, Í A uDirect3D•ŮŽ f, [fh, Î•Ô'l v, ðŽQ AE, ·, é, ±, AE B

lpD3DRMMeshBuild

Direct3DRMMeshBuilderIfuWfFfNfg, ìfAfhfEfX B, ±, ìIfuWfFfNfg, ìfRf“fef“fc, aÇ%Á, 3, ê, é B

, ±, ì ^— , ð s, Á, Ä, à A, à, AE, ìDirect3DRMMeshBuilderIfuWfFfNfg, aİ X, Ü, ½, ÍŽQ AE, 3, ê, é, ±, AE, 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•ûŒü,ðŽ!,·x Ay Az,ìŠe—v‘f B
```

IDirect3DRMMeshBuilder::AddVertex

```
int AddVertex(D3DVALUE x, D3DVALUE y, D3DVALUE z);
```

```
' , “_ , δDirect3DRMMeshBuilderIfufWffNfg,É'Ç%Á, ,é B
```

```
' , “_ , ÌfCf“ffbfNfX,δ•Ô, · B
```

x, y, z

```
V,μ,ϕ, “_ , 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 fbVf..., 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,lfJf% [Ef\ [fX,đŽæ“¾,·,é BfJf% [Ef\ [fX,Í-Ê,Â,à',“_.,À,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•ŪŽ 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,³,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^,Ž,·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,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

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

D3DRMLOADTEXTURECALLBACKfR [f<fofbfNŠÖ ” B,±,é,Í A“Á•Ê,ÈftfH [f}fbfg,ð•K—
 v,Æ,·,éIfuFwFfNfg,ª—p,c,éfefNfXf ff,ð“Ç,Ý o,·,Æ,« ,ÉÆÄ,Ñ o,³,é,é B,±
 ,Îfpf%of [f^,É,ÎNULL,ðŽw'è,·,é,±,Æ,ª,Ä,« ,é B

lpvArg

D3DRMLOADTEXTURECALLBACKfR [f<fofbfNŠÖ ”,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,ED3DRM_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,Ů,îf|fCf“f^ Bftf@fCf<-¼,îŠg’£Žq,Í.X,Á,È,,Ä,Í,È,ç,È,¢ B

d3drmXOFFFormat

D3DRMXOFFORMAT—ñ,“Œ^,îD3DRMXOF_TEXT'l B

d3drmSOContents

•Ů‘¶f1fvfVf‡f“,đ•,·**D3DRMSAVEOPTIONS**(Œ^,î'l B

IDirect3DRMMeshBuilder::Scale

HRESULT Scale(D3DVALUE sx, D3DVALUE sy, D3DVALUE sz);

$f, f f \leftarrow \dot{A} \cdot W, \dot{I} x \dot{Z}^2 \quad A y \dot{Z}^2 \quad A z \dot{Z}^2, \dot{E} \text{---}$
^,!,ç,ê,½ kŽÚŒW ”,É,æ,Á,Ä ADirect3DRMMeshBuilderIfufWfFfNfg,ðfXfP [fŠf“fO,·,é B

-Œ÷,·,é,ÆD3DRM_OK AŽ,”s,·,é,ÆfGf%o [,ð•Ô,· B•Ô'l,îê——,É,Á,ç
,Ä,Í A uDirect3D•ŮŽ f, [fh,î•Ô'l v,ðŽQ Æ,·,é,±,Æ B

sx, sy, sz

$x \dot{Z}^2 \quad A y \dot{Z}^2 \quad A z \dot{Z}^2, \dot{E} \% \hat{\text{^}}, \dot{A}, \dot{A} \text{“K—p,}^3, \hat{\text{e}}, \text{é kŽÚŒW ” B}$

IDirect3DRMMeshBuilder::SetColor

HRESULT SetColor(D3DCOLOR color);

Direct3DRMMeshBuilderIfufWfFfNfg,î,·,×,Ä,î-Ê,É AŽw'è,³,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,³,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,IfJf% [Ef\ [fX,đ Y'è,.,é B

-E÷,.,é,ED3DRM_OK AŽ,"s,.,é,ÆfGf% [,đ•Ô,· B•Ô'l,Îê——,É,Â,¢
,Ä,Í A uDirect3D•ŮŽ f, [fh,Ĵ•Ó'l v,đŽQ Æ,.,é,±,Æ B

source

V,μ,Žg—p,.,éfJf% [Ef\ [fX,đŽ!,·D3DRMCOLORSOURCE—ñ“CE^,If 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“ffbfNfX 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,Í-³Æø,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,»„,Å,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

-Œ÷,·,é,ÆD3DRM_OK AŽ,"s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,Î^ê——,É,Â,ç
,Ä,Í A uDirect3D•ŮŽ f, [fh,Î•Ô'l v,đŽQ Æ,·,é,±,Æ B

cylU, cylV

uŽŸŒ³,ÆvŽŸŒ³,Î^Ê'Šftf%fo BuŽŸŒ³,Ů,½,ÍvŽŸŒ³,É%~'Œ^Ê'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, ffh,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,ìŠe—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,Ĵ•Ô'l v,ðŽQ Æ,·,é,±,Æ B

index
Ý'è,·,é',“_ÌfCf“fffbfNfX B

color
Žw'è,³,ê,½',“_ÉŠ,,è“-Ä,é F B

ŽQ Æ @IDirect3DRMMeshBuilder::GetVertexColor

IDirect3DRMMeshBuilder::SetVertexColorRGB

HRESULT SetVertexColorRGB(DWORD index, D3DVALUE red,
D3DVALUE green, D3DVALUE blue);

Direct3DRMMeshBuilderIfufWfFfNfg, Ī AŽw'è,³,ê,½',“_Ī F,đ Ý'è,·,é B
-Ĉ÷,·,é,ÆD3DRM_OK AŽ,“s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,Īê——,É,Â,ĉ
,Ä,Ī A uDirect3D•ŮŽ f, [fh,Ī•Ô'l v,đŽQ Æ,·,é,±,Æ B

index

Ý'è,·,é',“_ĪfCf“fffbfNfX B

red, green, blue

'“_ÉŠ,,è“-,Ä,é F,Ī Ô A—Ī A Â,ĪŠe—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

IIDirect3DRMObject

IIDirect3DRMObject [fVfzf, IIDirect3DRMfIfufWfFfNfg, IfX [fp [EfNf%ofX, A, a, eZæ, è, ·, é, ½, B A IIDirect3DRMObjectCf
“f^ [ftfFfCfX, If f\fbfh, dZg—p, ·, é B, ±
, IfZfNfVfzf, IIDirect3DRMObjectCf“f^ [ftfFfCfX Ef f\fbfh, IfŠtf@fCf“fX, A, ·, é BŠT”O, É, Â, c, Ä, ÌŠT—
v, Í A u IIDirect3DRMObjectCf“f^ [ftfFfCfX v, dZQ A, ·, é, ±, A B

IIDirect3DRMObjectCf“f^ [ftfFfCfX Ef f\fbfh, Í A È%°, IfOf< [fv, É·—D, ·, é, ±, A, a, A, «, é B

fAfvfŠfP [fVfzf“CÄ— GetAppData
L, Iff [f^

SetAppData

·i » Clone

¼‘O GetClassName

GetName

SetName

É’m AddDestroyCallback

DeleteDestroyCallback

IIDirect3DRMObjectCf“f^ [ftfFfCfX, Í A, ·, x, Ä, ICOMfCf“f^ [ftfFfCfX, A—
l A IUnknownfCf“f^ [ftfFfCfX Ef f\fbfh, dCep ³, ·, é BIUnknownfCf“f^ [ftfFfCfX, ÍŽŸ, Ì, R, Â, If f\fbfh, dTf|
[fg, ·, é B

AddRef

QueryInterface

Release

Direct3DRMObjectfIfufWfFfNfg, Í A“K Ø, ÈQueryInterface f\fbfh, dCÄ, Ñ o, ·, ±
, A, É, æ, è A, Ç, IIDirect3DRMfIfufWfFfNfg, ©, ç, Ä, àZæ“¾, ·, é, ±
, A, a, A, «, é B, ·, x, Ä, IIDirect3DRMfIfufWfFfNfg, Í A IIDirect3DRMObjectCf“f^ [ftfFfCfX Ef f\fbfh, dCep ³, ·, é
B

IDirect3DRMObject::AddDestroyCallback

HRESULT AddDestroyCallback(D3DRMOBJECTCALLBACK lpCallback,
LPVOID lpArg);

If the callback function is called, the object is destroyed.

The callback function must be implemented as follows:
void WINAPI AddDestroyCallback(D3DRMOBJECTCALLBACK lpCallback,
LPVOID lpArg)

lpCallback

If the callback function is called, the object is destroyed.

lpArg

The callback function must be implemented as follows:
void WINAPI AddDestroyCallback(D3DRMOBJECTCALLBACK lpCallback,
LPVOID lpArg)

IDirect3DRMObject::Clone

HRESULT Clone(LPUNKNOWN pUnkOuter, REFIID riid, LPVOID *ppvObj);

fIfufWfFfNfg,İ•i »đ ì ¬,•,é B

¬Ĉ÷,•,é,ÆD3DRM_OK AŽ,„s,•,é,ÆfGf%o [,đ•Ô,• B•Ô'l,İ^ê——,É,Â,ĉ
,Ä,Í A uDirect3D•ŮŽ f, [fh,İ•Ô'l v,đŽQ Æ,•,é,±,Æ 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,^a §Ĉä,đ•Ô,•,Æ,« AfIfufWfFfNfg,İ•i »•,đŠi”[,•,éAfhfĈfX 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);

flufWfFfNfg, ÌfNf%ofX-¼, ðŽæ“¾, ·, é B

*-Æ÷, ·, é, ÆD3DRM_OK AŽ, ”s, ·, é, ÆfGf%o [, ð•Ô, · B•Ô'l, Ìê——, É, Â, ç
 , Ä, Í A uDirect3D•ÛŽ f, [fh, Ì•Ô'l v, ðŽQ Æ, ·, é, ±, Æ B*

lpdwSize

lpNamepf%of [f^, aŽ!, ·fobftf@, ÌfTfCfY, afofCfG'P^Ê, Â“ü, é•İ ”, ÌfAfhfÆfX B

lpName

*f f\fbfh, a §Æä, ð•Ô, ·, Æ, « AfNf%ofX-¼, ðŽ!, ·NULL, Å I, í, é•¶Žš—ñ, Ö, Ìf|fCf“f^ B, ±
 , Ìfpf%of [f^, aNULL, Ì ê ‡ AlpdwSizepf%of [f^, É, Í•¶Žš—ñ, É•K—v, ÈfTfCfY, a Ý'è, ³, é, é B*

IDirect3DRMObject::GetName

HRESULT GetName(LPDWORD lpdwSize, LPSTR lpName);

fIfufWfFfNfg¼,đŽæ“%4,·,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

lpdwSize

lpNamepf%of [f^,žl,·fobftf@,ĪfTfCfY,afofCfG’PÊ,Â“ü,é•Ī ” B

lpName

f f\fbfh,ª §Eä,đ•Ô,·,Æ,« AfIfufWfFfNfg,Ī¼‘O,đŽl,·NULL,Â I,í,é•ŮŽš—ñ,Ö,Īf|Cf“f^ B,±
,Īfpf%of [f^,NULL,Ī ê ‡ AlpdwSizefpf%of [f^,É,Ī•ŮŽš—ñ,É•K—v,ÈfTfCfY,ª Ý’è,³,é,é B

ŽQ Æ @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”[³,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•Ó'l v,ðŽQ Æ,·,é,±,Æ B

lpName

fIfufWfFfNfg,Ì¼'O,ðŽ!,·f† [fU'èç,Ìff [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\fbfh,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<,•İ X,³,ê,½,Æ,«,ÍTRUE,ð Ý'è,·,é B

bPalette

fpfœfbfg,•İ X,³,ê,½,Æ,«,ÍTRUE,ð Ý'è,·,é B

IDirect3DRMTexture::GetColors

DWORD GetColors();

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““,¶,Å, ,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

Direct3DRM_OK AŽ, s, é, AfGf% [, 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

lprvWidth, lprvHeight

f f\fbfh,ª §Æä, ð•Ô, ·, Æ, «, ÉfffJ [f<, Î• , Æ , , 3, ðŽó, Žæ, é•İ ” 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,ìfAhfÇfX,ð•Ö,· B

«» 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 Ũ 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,ì îñ,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%» îñ,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,©,çDirect3DRMTextureIfufWfFfNfg,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“fhfç,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<, ÌE´“_„đ AfffJ [f<, Ì ¶ ã, ©, ç, ÌfIftfZfbfg, Æ, µ, Ä Ý'è, ·, é B

*-E÷, ·, é, ÆD3DRM_OK AŽ, ”s, ·, é, ÆfGf%o [„, ð•Ô, · B•Ô'l, Ìê——, É, Ä, ç
„, Ä, Í A uDirect3D•ŮŽ f, [fh, Ì•Ó'l v, ðŽQ Æ, ·, é, ±, Æ B*

lX, lY

V, µ, çE´“_„đfffJ [f< Ä•W, ÄŽw'è, ·, é BffftfHf<fg, ÌE´“_„Í[0, 0], Ä, ·, é B

fE´“f_fŠf“fO, Æ, «, É, Í AfffJ [f<, ÌE´“_„Í, »„, ÌftfE [f€, ÌÊ'ü, Éf}fbfv, ³, é, é B, ½, Æ, ;, Í A Vžš, ÌfffJ [f<, ÌE´“_„ÍfffJ [f<, Ì'†%o, É A%°Eü, «, Ì-ÿó, ÌE´“_„Íê•Ó, Ì'†%o, ÉfZfbfg, ³, é, é B

ŽQ Æ @IDirect3DRMTexture::GetDecalOrigin

IDirect3DRMTexture::SetDecalScale

HRESULT SetDecalScale(DWORD dwScale);

ffj [f<, Ì kŽÚ“Á «, ðfZfbfg, ·, 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

dwScale

, ±, Ìfpf% f [f^, ÉTRUE, ðŽw'è, ·, é, Æ A [“x, ð l—

¶, É“ü, ê, Äffj [f<, ðfXfP [fŠf“fO, ·, é BFALSE, ðŽw'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, 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

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,fff<,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 A*Direct3DRMUserVisualIfufWfFfNfg*,đ %oŠú%o»,·,é,½,β,É*IDirect3DRMUserVisualfCf“f^ [f*
tfFfCfX,Ìf f\fbfh,đŽg—

p,·,é B*fAfVfŠfP [fVf‡f“*,***IDirect3DRM::CreateUserVisual*** *f\fbfh,ðCEÄ,Ñ o,·,Æ,«*,Í A,±,Ì %oŠú%o»,Í•s—v,Ä, ,é
B %oŠú%o»,³•K—v,È,Ì,Í A ***IDirect3DRM::CreateObject*** *f\fbfh,ðCEÄ,Ñ o,μ,ÄfWf...*

fAf< EfIfufWfFfNfg,đ ¶ ¬,·,é ê ‡,¾, ,Ä, ,é B,±

,ÌfZfNfVf‡f“*,Í AIDirect3DRMUserVisualfCf“f^ [ftFfCfX Ef f\fbfh,ÌfŠftf@fEf“fX,Ä, ,é BŠT”O,É,Ä,¢*
,Ä,ÌŠT—v,Í AIDirect3DRMUserVisualfCf“f^ [ftFfCfX,đŽQ Æ,·,é,±,Æ B

IDirect3DRMUserVisualfCf“f^ [ftFfCfX,ÍInit *f\fbfh,ðfTf| [fg,·,é B*

IDirect3DRMUserVisualfCf“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,Ä,Ìf f\fbfh,ðfTf|***
[fg,·,é B

AddRef

QueryInterface

Release

³,ç,É A*Direct3DRMUserVisualfCf“f^ [ftFfCfX,Í AIDirect3DRMObjectfCf“f^ [ftFfCfX,©,çŽŸ,Ìf f\fbfh,ðEp*
³,·,é B

AddDestroyCallback

Clone

DeleteDestroyCallback

GetAppData

GetClassName

GetName

SetAppData

SetName

Direct3DRMUserVisualIfufWfFfNfg,Í AIDirect3DRM::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@fEf“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 EfvfÆ [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

,³,ç,É AIDirect3DRMViewportfCf“f^ [ftfFfCfX,ÍDirect3DRMObjectfCf“f^ [ftfFfCfX,©,çŽŸ,Ìf f\fbfh,ðEp ³,·,
é B

AddDestroyCallback

Clone

DeleteDestroyCallback

GetAppData

GetClassName

GetName

SetAppData

SetName

Direct3DRMViewportIfufWfFfNfg,Í AIDirect3DRM::CreateViewportf f\fbfh,ÌEÄ,Ñ o,μ,É,æ,Á,ÄŽæ“¾,³,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, Ĩ•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
, ìlX A lY AdwWidth AdwHeight, ì, Ç, , , è, ©, °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,³,ê,^{1/2}—
*l*æ,Í AŽŸ%õñ,*l***IDirect3DRMDevice::Update** *f*\f**fh**,*l*ÉÄ,Ñ o,µ,ÅfXfNfŠ [*f*“,ÉfRfs [³,é,é B

—É±,·,é,ÆD3DRM_OK AŽ,”s,·,é,ÆfGf%o [*l*,ð•Ô,· B•Ô’*l*,*l*ê——,É,Â,c
,Ä,Í A *l*Direct3D•ŮŽ *f*, *l*fh,*l*•Ô’*l* v,ðŽQ Æ,·,é,±,Æ B

dwX1, dwY1
X V—*l*æ,*l* ¶ ã<±,*l* À•W B

dwX2, dwY2
X V—*l*æ,*l*%E%o<±,*l* À•W B

fVfXfef€,Í AŽw’è,³,ê,^{1/2}<É`æ,è,à‘â,«ÈfŠ [*fWf*±*f*“,ð X V,·,é,±,Æ,^a,é B ê ±,É,æ,Á,Ä,Í AfEfBf“fhfE‘S’*l*,^a
X V,³,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

Direct3DRMDeviceIfufWffNfg,“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, \frf... [EftfB [f<fh, dZæ“¾, ·, é B
frf... [, \ftfB [f<fh, dZ', ·, l, ð•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();

*f*r... [*f*] [*f*g, ðŽĚ%oe^f^*f*C*f*v, ðŽæ“¼, ·, é B*f*r*f*... [*f*] [*f*g, É, Í A•½ s“Š%oe, Æ“ŠŽ, “Š%oe, ð, Ç, ĺ, Ç, Á, à—p, Ć, é, ±, Æ, ª, Á, «, é B

D3DRMPROJECTIONTYPE—ñ“Ĉ^, ðf “*f*o, ð, Æ, Á, 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,B,É—p,ç,é,é A kŽÚ“Á «,đŽæ“¾,·,é B
frf... [f| [fg,“è‘è,Ì”ä—,ÁfXfP [fŠf“fO,¾,é,é ê ‡,ÍTRUE A,»„,Á,È,¯,ê,ÎFALSE,đ•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•WfIftfZfbfg,ðŽæ“¾,·,é B
yfIftfZfbfg,ð•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 [fĈ B

xpos, ypos

rf... [f] [fg,Î ¶ ā±,Ïx 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 < 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, e D3DVECTOR \ ' c ' Ĩ B

lprvSrc

· Ĩ Š ·, 3, é, e D3DRMVECTOR4D \ ' c ' 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,ðE©,Á,¯ o,· BŽæ“¾,µ,½”z—
ñ,É,Í Af< [fg,©,çfIfufWfFfNfg,ðŠÛ,ÞftfE [f€,É“ž’B,·,é,Û,Á,ÌŠK`wfpfX,ªŠi”[³,é,é B

-E±,·,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

EA,Ñ o,µ,ª -E±,µ,½,Æ,« AIDirect3DRMPickedArrayfCf“f^ [ftfFfCfX,Ö,Ì—LEø,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

*,±,Ìf 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€,Ì ³,ÌzŽ²•ûŒü,É%ˆ,Á,Ă A ³,ÿŽ²,Ì ã•ûŒü,ÉŒü,¯,ç,ê,é B*

ŽQ Œ @IDirect3DRMViewport::GetCamera, fJf f%o

IDirect3DRMViewport::SetField

HRESULT SetField(D3DVALUE rvField);

rvField... [f] [fg,Éf_rf... [,lftfB [f<fh,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

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% [,ð•Ô,· B

ŽQ Æ @IDirect3DRMViewport::GetField, Ž< _____ä

IDirect3DRMViewport::SetPlane

HRESULT SetPlane(D3DVALUE rvLeft, D3DVALUE rvRight, D3DVALUE rvBottom, D3DVALUE rvTop);

fJf f%o, lzŽ², É'Í, :érf... [f] [fg, ìfTfCfY, ð'O•ûfNfŠfbfv-É, É Y'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'² ®,³, 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^Ê'u, Ìfrf... [f] [fg, ðŽw'è, :é, ±, Æ, ^a, Á, «, é B, ½, Æ, Ì, Í A^a—£
, µ, ½Ž< 'ä, ð \z, µ, Á A%oE-Ů, â ¶-Ů, ÌfXfefÆfI Efrf... [, ðfCf"fvfŠf f"fg, :é, ±, Æ, ^a, 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

→E÷,·,é,ÆD3DRM_OK AŽ,"s,·,é,ÆfGf%o [,đ•Ô,· B•Ô'l,Îê——,É,Â,c,Ä,Í A@Direct3D•ŮŽ f, [fh,ĵ•Ô'lE
đŽQ Æ,·,é,±,Æ B

rptType

D3DRMPROJECTIONTYPE—ñ<“E^,Ïf f“fo,Ï,Đ,Æ,Â B

ŽQ Æ @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,ê,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);
```

```
lprvSrcpfpf%of [f^,^Ži,·fxfNfgf<,đf [f<fh À·W,©,çfXfNfŠ [f“ À·W,É·İŠ·,µ ACE<%oÊ,đlprvDstpfpf%of [f^,É·  
Ō,· B
```

```
·CE÷,·,é,ÆD3DRM_OK AŽ,”s,·,é,ÆfGf%o [,đ·Ō,· B·Ō'l,İê—,É,Â,ç,Ä,Í AçDirect3D·ŪŽ f, [fh,İ·Ō'lE  
,đŽQ Æ,·,é,±,Æ B
```

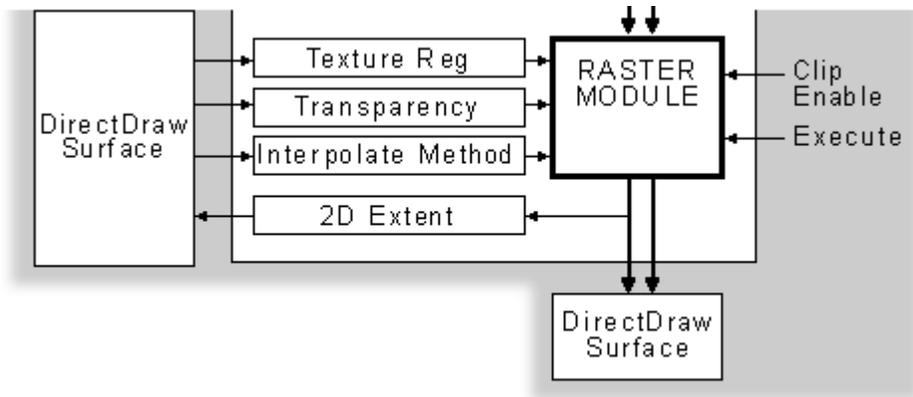
lprvDst

```
·İŠ··€ i,İ o—Í æ,Æ,È,éD3DRMVECTOR4D \‘ç’İ B
```

lprvSrc

```
·İŠ· ^— ,İf\ [fX,Æ,È,éD3DVECTOR \‘ç’İ B
```

```
·İŠ··€<%oÊ,É,Í A4—v’f,İ“Ži,İfxfNfgf<,·Ō,³,é,é B`È%o°,İ·û’öŽ@,^ ^,Â, ,é,İ ACE<%oÊ,İfxfNfgf<,^Ži,·“_,Í%oÂŽ< ó‘Ō,  
Â, ,é B
```



IDirect3DRMWinDevice

fAfvfŠfP [fVf‡f“Í AfEfBf“fhfE Efvf fV [fWff,ÁfEfBf“fhfE Ef fbZ [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 AUnknown 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,ÄIDirect3DRM::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, Â, ç, Ä, Í AcDirect3D·ÛŽ f, [fh, ð·Ô'lE
, ðŽQ Æ, ·, é, ±, Æ B

wParam
f bfZ [fW ^— fv 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,ÍIDirect3DRMObjectfCf“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, l, "Éf%bfv, ð Ý'è, ,é B Á %o,ÉŠe' "Éftf€ [f€  
,lf [f<fh•İŠ' ,ð s,¢ AŽŸ,Éf%bfv,İŽQ Æftf€ [f€,l<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%ofbfsf“fO, ·,éflufWfFfNfg,ðŠÜ,ðDirect3DRMFrameflufWfFfNfg B
```

mesh

```
“K—p, ·,éDirect3DRMWrapflufWfFfNfg B
```

ŽQ Æ @**IDirect3DRM::CreateWrap**

IDirect3DRMWrap::Init

```
HRESULT Init(D3DRMWRAPTYPE d3drmwt, 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

–CE÷,:é,ÆD3DRM_OK AŽ,”s,:é,ÆfGf% [,đ•Ô,: B•Ô'l,îê—,É,Â,¢,Ä,Í A¢Direct3D•ŮŽ f. [fh,î•Ô'lÉ
,đŽQ Æ,:é,±,Æ B

d3drmwt

D3DRMWRAPTYPE—ñ“CE^,îf f“fo,î,Đ,Æ,Â B

lpd3drmfRef

,±,îDirect3DRMWrapIfufWfFfNfg,îŽQ ÆftfCE [f€,đŽ!,·Direct3DRMFramefIfufWfFfNfg,îfAfhfCEfX B

ox, oy, oz

f%ofbfv,îCE“_ B

dx, dy, dz

f%ofbfv,îzŽ² B

ux, uy, uz

f%ofbfv,îyŽ² B

ou, ov

fefNfXf`ff,îCE“_ B

su , ,æ,Ñ sv

fefNfXf`ff,î kŽÚCEW ” B

ŽQ Æ @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 \“‘Ì, Å, , é B

ŽQ Æ @D3DVECTOR, IDirect3DRMMesh::GetBox, IDirect3DRMMeshBuilder::GetBox

D3DRMIMAGE

```
typedef struct _D3DRMIMAGE {
    int width, height;
    int aspectx, aspecty;
    int depth;
    int rgb;
    int bytes_per_line;
    void* buffer1;
    void* buffer2;
    unsigned long red_mask;
    unsigned long green_mask;
    unsigned long blue_mask;
    unsigned long alpha_mask;
    int palette_size;
    D3DRMPALETTEENTRY* palette;
} D3DRMIMAGE;
typedef D3DRMIMAGE, *LPD3DRMIMAGE;
```

IDirect3DRM::CreateTexture *f\fbfh,É,æ,Á,ÄfefNfXf`ff,ÉfAf^fbf`³,ê,éfCf [fW,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<,ÍpfCfBfg,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 AfpfCfBfg’t,Ä d—v,È Ö A—Í A Ä,ÌŠe—v’ffrfbfg,Ìf}fXfN,Ä, ,é B,½,Æ,¹,Í½,Ì
SVGAffBfXfvfCfC,Ä,Í AŽg—p,·,é Ö A—Í A Ä,Ì“x ±,Í64,Ä, ,é,½,ß A,·,×,Ä,Ìf}
fXfN,Í0xfc,ÉfZfbfg,³,é,é B*

palette_size
fpfCfBfg EfGf“fgfŠ,Ì ” B

palette
*rgb,³FALSE,Ì ê ± A,±,Ìf f“fo,ÍfpfCfBfg EfGf“fgfŠ,ðŽ!,·**D3DRMPALETTEENTRY** \“è,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**

D3DRMLOADRESOURCE

```
typedef struct _D3DRMLOADRESOURCE {
    HMODULE hModule;
    LPCTSTR lpName;
    LPCTSTR lpType;
} D3DRMLOADRESOURCE, *LPD3DRMLOADRESOURCE;
```

fAfvfŠfP [fVf‡f“,”D3DRMLOAD_FROMRESOURCE,đŽw’è,μ,ÄIDirect3DRM::Loadf f\fbfh i,Ü,½,Í¼,ÌLoadf f\fbfh,Ì,Đ,Æ,Â j,đĎÄ,Ñ o,μ,½,Æ,«,Éf [fh,³,è,éfŠf\ [fX,đŽ,· B

hModule

f [fh,³,è,éfŠf\ [fX,đŠÜ,Đf,fWf... [f,Ìfnf“fhf< BfŠf\ [fX,“ĎÄ,Ñ o,μĎ³,ÌŽÄ s%Ō”\ftf@fCf<,ÉfAf^fbf^,³,è,Ä,Ď,é,Æ,«,Í A,± ,Ìf f“fo,ÉNULL,đŽw’è,·,é B

lpName

f [fh,³,è,éfŠf\ [fX,Ì¼‘O B,½,Æ,!,Í AfŠf\ [fX,“f fbVfVf...,Ä, ,è,Í A,±,Ìf f“fo,Éf fbVfVf... Eftf@fCf<,Ì¼‘O,đŽw’è,·,é B

lpType

fŠf\ [fX,đŽ·Ď,·,éf† [fU’è<,Ìf^fCfv B

lpName,âlpTypef f“fo,Ì ãĎf [fh,“0,Ì ê ‡ A%“ĎĎf [fh,Í A,»,-¼‘O,Ì ® ”Ž·ĎŽq,Ü,½,ÍŽw’è,³,è,½fŠf\ [fX,Ìf^fCfv,đŽ,· B,»„Ä,È,-,è,Í A,± ,è,Ď,Ìfpf%of [f^,ÌNULL,Ä I,i,é•Žš—ñ,Ö,Ìf f“fO Ef|fCf“f^,Ä, ,é B•Žš—ñ,Ì æ“•Žš,“fVff [fv<L † i# j,Ì,Æ,«,Í AŽc,è,Ì•Žš,ÍfŠf\ [fX,Ì¼‘O,âf^fCfv,Ì ® ”Ž·ĎŽq,đŽ,·10 i ”,đ\ ,· B,½,Æ,!,Í A•Žš—ñ”#258”,Í ® ”Ž·ĎŽq258,đ\,· B¼‘O,Ì‘ä,i,è,É ® ”Ž·ĎŽq,đŽQ Æ,·,è,Í AfŠf\ [fX,“K—v,Æ,·,éf f,fŠ,Ì—Ď,đĎ,Ď,±,±,Æ,“Ä,«,é B

D3DRMLOAD_FROMRESOURCE,đŽw’è,μ,ÄLoadf f\fbfh,đĎÄ,Ñ o,!,Í AfAfvfŠfP [fVf‡f“,ÄfŠf\ [fX,đ‘T,μ,½,è fAf“f fbN,·,éK—v,Í,È,Ď B,±,Ì ê ‡ AfVfXfef€,“Ž“®“I,É,»„,Ì ^— ,đ s,“ B

ŽQ Æ @IDirect3DRM::Load, IDirect3DRMAnimationSet::Load, IDirect3DRMFrame::Load, IDirect3DRMMeshBuilder::Load, D3DRMLOADMEMORY, D3DRMLOADOPTIONS

D3DRMPALETTEENTRY

```
typedef struct _D3DRMPALETTEENTRY {
    unsigned char red;
    unsigned char green;
    unsigned char blue;
    unsigned char flags;
} D3DRMPALETTEENTRY;
typedef D3DRMPALETTEENTRY *LPD3DRMPALETTEENTRY;
```

D3DRMIMAGE `\C\I,ÅŽg—p,³,ê,éJf% [EfpfEfBfg,ð<L q,·,é B,±`
`,İ \C\I,Í AD3DRMIMAGE \C\I,İrgbf f“fo,ÉFALSE,²Žw’è,³,ê,Ä,¢,é,Æ,«,İ,Ý—~—p,³,ê,é iTRUE,²Žw’è,³,ê,Ä,¢`
`,é,Æ,«,Í ARGB¹l,²—p,¢,ç,é,é j B`

red, #green, #blue

`fPfEfBfg,ð’è<’,·,éE’ F—v’f,ð’è<’,·,é¹ B0,©,ç255,İ”ÍÍ,İ¹,ðŽw’è,·,é,±,Æ,²,Ä,«,é B`

flags

`fEf“f_fŠf“fOŽž,ÉfpfEfBfg,²,Ç,İ,æ,²,ÉŽg—p,³,ê,é,©,ð’è<’,·,é¹ B,±,İ¹,ÍD3DRMPALETTEFLAGS—`
`ñ<“E^,İf f“fo,İ,Đ,Æ,Ä,Ä, ,é B`

ŽQ Æ @D3DRMIMAGE, D3DRMPALETTEFLAGS

D3DRMPICKDESC

```
typedef struct _D3DRMPICKDESC {
    ULONG        ulFaceIdx;
    LONG         lGroupIdx;
    D3DVECTOR    vPosition;
} D3DRMPICKDESC, *LPD3DRMPICKDESC;
```

IDirect3DRMPickedArray::GetPick f\fbfh,É,æ,Á,ÄŽæ“¼,³,ê,½ AfsfbfN,ÎÊ’u A-
Ê AfOf< [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\fbfh,É,æ,é•İŠ,İ o—
Í æ,Æ,μ,Ä A,;æ,ÑIDirect3DRMViewport::InverseTransform f\fbfh,É,æ,é•İŠ,İf\ [fX,Æ,μ,ÄŽg—p,³,ê,é B

x, #y, #z, #w

D3DVALUECE^,İl B•İŠ•CE%oÊ, a“ü,é B

ŽQ Æ @IDirect3DRMViewport::Transform, IDirect3DRMViewport::InverseTransform

D3DRMVERTEX

```
typedef struct _D3DRMVERTEX{
    D3DVECTOR position;
    D3DVECTOR normal;
    D3DVALUE tu, tv;
    D3DCOLOR color;
} D3DRMVERTEX;
```

Direct3DRMMeshIfufWfFfNfg't,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“Ĉ^

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,*CE» 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,*CE» 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

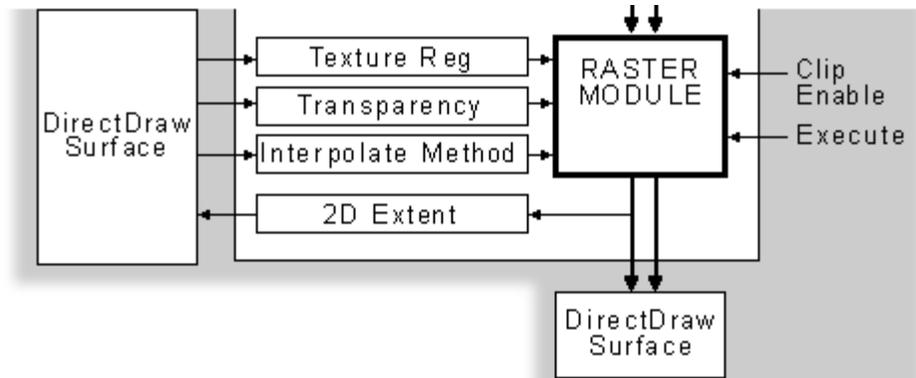
f $f = \frac{end - z}{end - start}$

$$f = \frac{end - z}{end - start}$$

f $f = \frac{end - z}{end - start}$

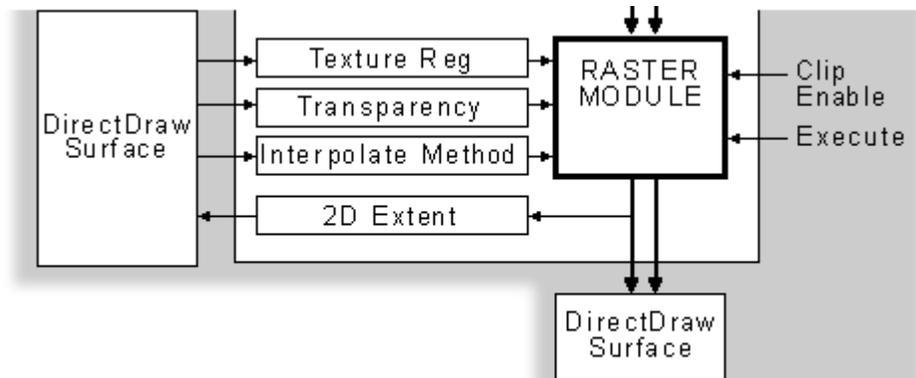
D3DRMFOG_EXPONENTIAL

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

fCf“f_f%o [,í,±,ìfGf“fgfŠ,đŽ©—R,ÉŽg—p,Á,«,«,é B

D3DRMPALETTE_READONLY

ĀÁ'è,³,ê,Ā,ç,é,ª AfCf“f_f%o [,ªŽg,±,±,Ā,ª,Ā,«,«,é B

D3DRMPALETTE_RESERVED

fCf“f_f%o [,ªŽg,±,±,Ā,Ī,Ā,«,È,ç B

ŽQ Ā @**D3DRMPALETTEENTRY**

D3DRMPROJECTIONTYPE

```
typedef enum _D3DRMPROJECTIONTYPE{
    D3DRMPROJECT_PERSPECTIVE,
    D3DRMPROJECT_ORTHOGRAPHIC
} D3DRMPROJECTIONTYPE;
```

Direct3DRMViewport fIfufWfFfNfg, ĀŽg—p, 3, ê, éŽĚ%œf^fCfv, δ'è`., é B, ±, Ì—
ñ<“Ĉ^, Í A IDirect3DRMViewport::GetProjection, Æ IDirect3DRMViewport::SetProjection f \fbfh, É, æ, Á, Ä—p, Ć
, ç, ê, é B

D3DRMPROJECT_PERSPECTIVE

“§Ž<“Š%œ B

D3DRMPROJECT_ORTHOGRAPHIC

•½ s“Š%œ B

ŽQ Æ @ IDirect3DRMViewport::GetProjection, IDirect3DRMViewport::SetProjection

D3DRMRENDERQUALITY

```
typedef enum _D3DRMSHADEMODE {
    D3DRMSHADE_FLAT           = 0,
    D3DRMSHADE_GOURAUD        = 1,
    D3DRMSHADE_PHONG          = 2,
    D3DRMSHADE_MASK           = 7,
    D3DRMSHADE_MAX            = 8
} D3DRMSHADEMODE;

typedef enum _D3DRMLIGHTMODE {
    D3DRMLIGHT_OFF            = 0 * D3DRMSHADE_MAX,
    D3DRMLIGHT_ON             = 1 * D3DRMSHADE_MAX,
    D3DRMLIGHT_MASK           = 7 * D3DRMSHADE_MAX,
    D3DRMLIGHT_MAX            = 8 * D3DRMSHADE_MAX
} D3DRMLIGHTMODE;

typedef enum _D3DRMFILLMODE {
    D3DRMFILL_POINTS          = 0 * D3DRMLIGHT_MAX,
    D3DRMFILL_WIREFRAME       = 1 * D3DRMLIGHT_MAX,
    D3DRMFILL_SOLID           = 2 * D3DRMLIGHT_MAX,
    D3DRMFILL_MASK            = 7 * D3DRMLIGHT_MAX,
    D3DRMFILL_MAX             = 8 * D3DRMLIGHT_MAX
} D3DRMFILLMODE;

typedef DWORD D3DRMRENDERQUALITY;

#define D3DRMRENDER_WIREFRAME (D3DRMSHADE_FLAT+D3DRMLIGHT_OFF+D3DRMFILL_WIREFRAME)
#define D3DRMRENDER_UNLITFLAT (D3DRMSHADE_FLAT+D3DRMLIGHT_OFF+D3DRMFILL_SOLID)
#define D3DRMRENDER_FLAT      (D3DRMSHADE_FLAT+D3DRMLIGHT_ON+D3DRMFILL_SOLID)
#define D3DRMRENDER_GOURAUD   (D3DRMSHADE_GOURAUD+D3DRMLIGHT_ON+D3DRMFILL_SOLID)
#define D3DRMRENDER_PHONG     (D3DRMSHADE_PHONG+D3DRMLIGHT_ON+D3DRMFILL_SOLID)
```

Direct3DRMMeshIfufWfFfNfg,lfVfF [ffBf“fO Ef, [fh AĈĉĈ¹f, [fh A“h,è,Ā,Ō,µf, [fh,ðĈ< ‡,·,é B

D3DRMSHADEMODE, D3DRMLIGHTMODE, D3DRMFILLMODE

fVfF [ffBf“fO AĈĉĈ¹ A“h,è,Ā,Ō,µf, [fh,ðŽ,· B

D3DRMRENDER_WIREFRAME

•Ō,ì,Ÿ,ð·Ž,·,é B

D3DRMRENDER_UNLITFLAT

ĈĉĈ¹,È,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,ÍĈ» Ÿ,ÍfTf| [fg,³,ê,Ā,Ĉ,È,ĉ B

ŽQ Æ @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` , ĀŽg, í, ê, é—ñ«“ Ć^, ì, Đ, Ą, Ā B

ŽQ Ą @**D3DRMFILLMODE**, **D3DRMLIGHTMODE**, **D3DRMRENDERQUALITY**

D3DRMSORTMODE

```
typedef enum _D3DRMSORTMODE {
    D3DRMSORT_FROMPARENT,
    D3DRMSORT_NONE,
    D3DRMSORT_FRONTTOBACK,
    D3DRMSORT_BACKTOFRONT
} D3DRMSORTMODE;
```

fV [f“ ã,É,Ç,Ì,æ,ϣ,ÉŽqftfŒ [f€,ªª—p,³,ê,é,©,ðŽ!,· B

D3DRMSORT_FROMPARENT

ŽqftfŒ [f€,Í eftfŒ [f€,Ìf\ [fg ‡ ~,ðŒp ³,·,é B,±,ê,ÍfftfHf<fg Ý'è,Å, ,é B

D3DRMSORT_NONE

ŽqftfŒ [f€,Íf\ [fg,³,ê,È,¢ B

D3DRMSORT_FRONTTOBACK

ŽqftfŒ [f€,Í‘O,©,çŒã,ë,Öf\ [fg,³,ê,é B

D3DRMSORT_BACKTOFRONT

ŽqftfŒ [f€,ÍŒã,ë,©,ç‘O,Öf\ [fg,³,ê,é B

ŽQ Æ @IDirect3DRMFrame::GetSortMode,

IDirect3DRMFrame::SetSortMode

D3DRMTEXTUREQUALITY

```
typedef enum _D3DRMTEXTUREQUALITY{
    D3DRMTEXTURE_NEAREST,
    D3DRMTEXTURE_LINEAR,
    D3DRMTEXTURE_MIPNEAREST,
    D3DRMTEXTURE_MIPLINEAR,
    D3DRMTEXTURE_LINEARMIPNEAREST,
    D3DRMTEXTURE_LINEARMIPLINEAR
} D3DRMTEXTUREQUALITY;
```

IDirect3DRMDevice::SetTextureQuality, **IDirect3DRMDevice::GetTextureQuality** *f\fbfh,Ä—p,ç,ê,éfefNfXf`ff•iŽç,ðL q,·,é B*

D3DRMTEXTURE_NEAREST

fefNfXf`ff ã,İ Ä,àß,çfsfNfZfç,ðI'ð,·,é B

D3DRMTEXTURE_LINEAR

Ä,àß,ç4,Ä,İfsfNfZfç,ð üE`É•ãŠ®,·,é B

D3DRMTEXTURE_MIPNEAREST

D3DRMTEXTURE_NEAREST,ÉŽ—,Ä,ç,é,ª AfefNfXf`ff,İ'ã,í,è,É“K Ø,Èf~fbfvf}fbfv,ðŽg—p,·,é B

D3DRMTEXTURE_MIPLINEAR

D3DRMTEXTURE_LINEAR,ÉŽ—,Ä,ç,é,ª AfefNfXf`ff,İ'ã,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,İf~fbfvf}fbfvŠÔ,ð•ãŠ®,·,é B

D3DRMTEXTURE_LINEARMIPLINEAR

D3DRMTEXTURE_MIPLINEAR,ÉŽ—,Ä,ç,é,ª A Ä,àß,ç,Ó,½,Ä,İf~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 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,ÍfftfHf<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;
```

Zfofbtf@,³—LÆø,©,Ç,²,©,ðŽ,· B

D3DRMZBUFFER_FROMPARENT

ftfÆ [f€,Í eftfÆ [f€,©,çZfofbtf@,Ì Ý'è,ðÆp ³,·,é B,±,ê,ÍfftfHf<fg Ý'è,Å, ,é B

D3DRMZBUFFER_ENABLE

Zfofbtf@,Í—LÆø,Å, ,é B

D3DRMZBUFFER_DISABLE

Zfofbtf@,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,âIDirect3DRMAnimation::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,.,éfAfjf [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,Á,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,Á,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,¢,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 AfIfufWfFfNfg,δf [fh,³,è,é•û-@,δ•İ X, ,é B

f\ [fX Eftf%ofO

D3DRMLOAD_FROMFILE

f\ [fX Eftf%ofO,çf [fh, ,é B,±,è,İfI ftfHf<fg Ý’è,Ä, ,é B

D3DRMLOAD_FROMRESOURCE

fŠf\ [fX,çf [fh, ,é B,±,İfI ftf%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,±,İfI ftf%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,ÄfIfufWfFfNfg,δf [fh, ,é B

D3DRMLOAD_BYPOSITION

^!,ç,è,½ A0,çŽn,Ü,éÊ’u,É AfXf^f“fh EfAf f“,İfIfufWfFfNfg,δf [fh, ,é i,Ä,Ü,è Aftf@fCf<†,İn”Ö-Ü,İfIfufWfFfNfg,δf [fh, ,é j BfXf^f“fh EfAf f“,İfIfufWfFfNfg,İ¼,İfIfufWfFfNfg,δŠÜ,µ,±,Æ,³,Ä,«,é,³ A¼,İfIfufWfFfNfg,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,ÄfIfufWfFfNfg,δf [fh, ,é B

D3DRMLOAD_FIRST

,±,è,İfI ftfHf<fg Ý’è,Ä, ,é B—^!,ç,è,½f^fCfv,İfXf^f“fh EfAf f“,İfIfufWfFfNfg,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“,İfIfufWfFfNfg,İ¼,İfIfufWfFfNfg,δŠÜ,µ,±,Æ,³,Ä,«,é,³ A¼,İfIfufWfFfNfg,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,İfIfufWfFfNfg,“¶ Ý, ,é,ç,ç,µ,ç,δf^fFfbfN, ,é B¶ Ý, ,é è ‡ A V,µ,çfIfufWfFfNfg,δ ì -, ,é’ä,í,è,É A,»,İfIfufWfFfNfg,İfCf“fXf^f“fX,δŽg—p, ,é B

D3DRMLOAD_INSTANCEBYCOPYING

Žw’è,³,è,½-¼‘O,Æ“—,¼‘O,İfIfufWfFfNfg,“¶ Ý, ,é,ç,ç,µ,ç,δf^fFfbfN, ,é B¶ Ý, ,é è ‡ A V,µ,çfIfufWfFfNfg,δ ì -, ,é’ä,í,è,É A,»,İfIfufWfFfNfg,δfRfs [, ,é B

ŠeLoadf f\fbfh,İ AlpvObjSourcefpf%of [f^,δŽg—p,µ,ÄfIfufWfFfNfg,İf [fX,δŽw’è,µ AlpvObjIDfpf%of [f^,É,æ,Ä,ÄfIfufWfFfNfg,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%òžž•û-
@,É,Í%½,à•Í X,ð%Á,!,È,¢ BD3DRMLOAD_INSTANCEBYREFERENCEftf%ofO,ð—p,¢
,é,Æ A V,µ,¢fIfufWfFfNfg,ð ì ¬,·,é,±,Æ,È,“¬,¶ftf@fCf<,ð2%ñf [fh,·,é,±,Æ,ª,Á,«,é BfIfufWfFfNfg,ª-
¼‘O,ðž ,Á,Ä,¢
,È,¢ ê ‡ AD3DRMLOAD_INSTANCEBYREFERENCEftf%ofO,ðfZfbfg,·,é,Æ AD3DRMLOAD_INSTANCEBYCOPY
INGftf%ofO,ðfZfbfg,µ,½,Æ,«,Æ“¬,¶(Eø%Ê,ð“¾,é,±,Æ,ª,Á,«,é Bf [f_,Í A“~è,ìfIfufWfFfNfg,ª¶ Ý,µ,Ä,à AŠe-
¼‘O,È,µfIfufWfFfNfg,ð 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,lfOf< [fv,Ö,İf}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^,æ“-,¶ 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%“·ß•â ³,³,é,é B

D3DRMMAP_WRAPU,ÆD3DRMMAP_WRAPVftf%ofO,Í Af%ofXf^f%ofCfU,³fefNfXf`ff À•W,ð%ðŽß,.,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,±
,İ'¼ ü,İfpfX,Æ Au,“,æ,Ñv Ä•W,İ—LÆø'l,Í Af%ofbfsf“fO Eftf%ofO,İŽg,ç•û,É,æ,Á,Ä^Û,È,é B^ê•û,Û,½,Í—
¼•û,İftf%ofO,³fZfbfg,³,é,é,Æ A'¼ ü,Íu,Û,½,Ív•ûÆü,İfefNfXf`ff,İ•Ö,ðf%ofbfv EfAf%ofEf“fh,.,é B,±
,İ ê ‡ AfefNfXf`ff,Í%~'Æ ó,©fh [fifc ä,İÊ·Š,ðŽ ,Ä,Ä,ç,é,©,İ,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•ÛŽ f, [fh,ÌfRf“f] [flf“fg EfIfufWfFfNfg Ef,ff< iCOM j
fCf“f^ [ftfFfCfX Ef f\fbfh,Í AŽŸ,Ì¹,ð•Ö,· B

D3DRM_OK

¬Œ÷ B

D3DRMERR_BADALLOC

f f,fŠ•s‘« B

D3DRMERR_BADDEVICE

ffofCfX,ÍfŒf“f_%o [,ÆŒŸŠ· «,ª,È,Œ B

D3DRMERR_BADFILE

ff [f^ftf@fCf<,ª•s ³ B

D3DRMERR_BADMAJORVERSION

DLL,Ìf fWff [Efo [fWf‡f“,ª•s ³ B

D3DRMERR_BADMINORVERSION

DLL,Ìf}fCfi [Efo [fWf‡f“,ª•s ³ B

D3DRMERR_BADOBJECT

ˆø ”,É,ÍfIfufWfFfNfg,ª•K—v B

D3DRMERR_BADTYPE

•s ³,ÈŒ^,Ìˆø ”,ª“n,³,ê,½ B

D3DRMERR_BADVALUE

•s ³,È¹,Ìˆø ”,ª“n,³,ê,½ B

D3DRMERR_FACEUSED

—È,Íf fbfVf... ã,ÅŽg—p Ĩ,Ÿ,Å, ,é B

D3DRMERR_FILENOTFOUND

ftf@fCf<,ðŠJ,,±,Æ,ª,Å,«,È,Œ B

D3DRMERR_NOTDONEYET

ŽÀ‘,³,ê,Å,Œ,È,Œ B

D3DRMERR_NOTFOUND

Žw’è,³,ê,½•½—È,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 →^al,đ F,Ì'l,É•İŠ·,·,é B

RGB →^al,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 →^al,đ F,î'l,É•İŠ•,•,é B

RGBA →^al,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 æ,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 (E^,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_SHADEMODE,İf(Æf“f_Šf“fo,İ ó'Ô,İf fbfN,Æ%øð æ,ð s
,ª B

// -¾“xf, [fh,ðf fbfN

STATE_DATA(D3DSTATE_OVERRIDE(D3DRENDERSTATE_SHADEMODE), TRUE, lpBuffer);

// fŠ [fhfIf“fŠ [,Å,È,¢,Æ,« A-¾“xf, [fh,ðŽÀ s,µf fbfN%øð æ,·,é

STATE_DATA(D3DSTATE_OVERRIDE(D3DRENDERSTATE_SHADEMODE), FALSE, lpBuffer);

f(Æf“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(ϵ^{\wedge} , \dot{I}^{\prime} , \acute{E} , $\dot{I}\check{S}$, \cdot , \acute{e} B

$\cdot\dot{I}\check{S}\cdot\mathcal{E}\grave{a}$, \dot{I}^{\prime} , $\delta\cdot\acute{O}$, \cdot B

val

$\cdot\dot{I}\check{S}\cdot^3$, \acute{e} , \acute{e}^{\prime} B

ŽQ Æ @**D3DVALP**

D3DVALP

D3DVALP(val, prec) ((float)val)

,“x,đ•İŠ·,;é B

•İŠ·Ĉĕã,î¹,đ•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 ñ•ª,ðžæ,è o,· B

—î ñ•ª,ð•Ô,· B

rgb

—î ñ•ª,ðžæ,è o,· F,ìD3DCOLOR'l B

RGB_GETRED

```
RGB_GETRED(rgb)    (((rgb) >> 16) & 0xff)
```

D3DCOLOR'l,©,ç Ô -•ª,ðŽæ,è o,· B

Ô -•ª,ð•Ô,· B

rgb

Ô -•ª,ðŽæ,è o,· F,ÌD3DCOLOR'l B

RGB_MAKE

RGB_MAKE(r, g, b) ((D3DCOLOR) (((r) << 16) | ((g) << 8) | (b)))

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, 3DCOLOR'l,æ,è—î  →ª,ðžæ,è o,· B
```

```
—î  →ª'l,ð•Ô,· B
```

rgb

```
—î  →ª,ðžæ,è o,· F, 3DCOLOR'l B
```

RGBA_GETRED

```
RGB_GETRED(rgb)    (((rgb) >> 16) & 0xff)
```

```
RGBA, 3DCOLOR'l,æ,è Ô -•ª,ðžæ,è o,· B
```

```
Ô -•ª'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, ÉfAftf@ -•ª, ð Ý'è, ·, é B`

`fAftf@ -•ª1,ª Ý'è,³,ê,½RGBA F, ð•Ô, · B`

rgba

`fAftf@ -•ª1,ª Ý'è,³,ê,éRGBA F B`

x

`Ý'è, ·, éfAftf@ -•ª1 B`

RGBA_TORGB

RGBA_TORGB(rgba) ((D3DCOLOR) ((rgba) & 0xffffffff))

RGBA, D3DCOLOR -^a1, ©, çfAf<ftf@ -^a, 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 ”

D3DENUMDEVICSCALLBACK

```
typedef HRESULT (FAR PASCAL * LPD3DENUMDEVICSCALLBACK)  
(LPGUID lpGuid, LPSTR lpDeviceDescription,  
 LPSTR lpDeviceName, LPD3DDEVICEDESC lpD3DHWDeviceDesc,  
 LPD3DDEVICEDESC lpD3DHELDeviceDesc, LPVOID lpUserArg);
```

```
fCf“fXfg [f<,3,ê,Ä,¢,éDirect3DffofCfX,ð—ñ<“,.,éfR [f<fofbfNŠÖ ”,ìfvf fgf^fCfv`è` B  
 fAfvfŠfP [fVf‡f“,Í A`È%°,ì'l,ì,¢,,ê,©,ð•Ö,· B  
 D3DENUMRET_CANCEL  
 —ñ<“,ð'†Ž~,.,é B
```

D3DENUMRET_OK

```
—ñ<“,ðEp'±,.,é B
```

lpGuid

```
fOf [fof< Ef†fj [fNŽ~•ÊŽq(GUID),Ö,ìf|fCf“f^ B
```

lpDeviceDescription

```
fffofCfX,ì' ŽB,Ö,ìf|fCf“f^ B
```

lpDeviceName

```
fffofCfX—¼,Ö,ìf|fCf“f^ B
```

lpD3DHWDeviceDesc

```
Direct3DffofCfX Efn [fhfEfFfA î•ñ,ìD3DDEVICEDESC \`¢'ì,Ö,ìf|fCf“f^ B
```

lpD3DHELDeviceDesc

```
Direct3DffofCfX EfGf~f...fE [fVf‡f“ î•ñ,ìD3DDEVICEDESC \`¢'ì,Ö,ìf|fCf“f^ B
```

lpUserArg

```
,±,ìfR [f<fofbfNŠÖ ”,É“n,³,ê,éAfvfŠfP [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\fbfh,ðCEÄ,Ñ o,·,Æ,«,É—  
^,¡,ç,ê,éfAfvfŠfP [fVf‡f““è`fR [f<fofbfNŠÖ ”,Ä, ,é B,±  
,İf f\fbfh,Æ,Í AfGf%o [,ðCEŸ o,µ,½,Æ,«,ÉŽÀ sfobftf@,İf`fFbfN,âfobftf@,İfİftfZfbfg,ð•Ö,·fffofbfO Ef<  
[f`f“,Ä, ,é B
```

```
lpUserArg  
,±,İfR [f<fofbfNŠÖ ”,É“n,³,ê,éfAfvfŠfP [fVf‡f““è`ff [f^,Ö,İf|fCf“f^ B
```

```
dwOffset  
fVfXfef€,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,ª 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, Æ, «, é B, ±, Ì Æ, Æ, Í A **IDirect3D** fCf“f^ [ftfFfCfX, Ìf f\fbfh, È, Â, Ç, Ä à¬¼, , é BŠT—³, È, Ä, 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, , fTf| [fg, , éf f\fbfh, Í AŽŸ, Ì’È, è B

AddRef

QueryInterface

Release

IDirect3D::CreateLight

```
HRESULT CreateLight(LPDIRECT3DLIGHT* lpDirect3DLight,  
    IUnknown* pUnkOuter);
```

Direct3DLight fIfufWfFfNfg, Š, è, Ä, é B, ±, ÌfIfufWfFfNfg, Í AIDirect3DViewport::AddLight f\fbfh, ŠŽg, □
, ÆfIf... [f] [fg, ÆE< ‡, ·, é, ±, Æ, º, Ä, «, é B

-E±, ·, é, ÎD3D_OK AŽ, ”s, ·, é, Î AŽÿ, Ì'l, Ì, ¢, ·, é, ©, Š•Ô, · B

DDERR_INVALIDOBJECT

DDERR_INVALIDPARAMS

lpDirect3DLight

-E±, ·, é, Î AIDirect3DLightfCf“f^ [ftfFfCfX, Ö, Ìf|fCf“f^, º Ý'è, º, é, éf|fCf“f^ B

pUnkOuter

, ±, Ìfpf%of [f^, ÍCOM W -%»«@”, Æ «—^ ACEÝŠ· «, ŠŽæ, é, ½, B, Ì, à, Ì, Ä, ·, é

BIDirect3D::CreateLight f\fbfh, Í, ±, Ìfpf%of [f^, ºNULL^ÈŠO, Ì, Æ, «fGf%o [Š•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^ [ftfFfCfX,Ö,ìf|fCf“f^,ìfAfhfĈfX B

pUnkOuter

,±,ìfpf%of [f^,Í ACOM'S'İ,đ «— AŠg'£,·,é,½,ß,ì,à,ì,Ä, ,é BIDirect3D::CreateMaterial f\fbfh,Í A,±
,ìfpf%of [f^,^NULL^ÈŠO,ì,Æ,«fGf%o [,đ•Ô,· B

IDirect3D::CreateViewport

```
HRESULT CreateViewport(LPDIRECT3DVIEWPORT* lpD3DViewport,  
    IUnknown* pUnkOuter);
```

Direct3DViewportIfufWfFfNfg,đ ¶ -,.,é B,±,Ìrf... [f] [fg,Í AIDirect3DDevice::AddViewport f\fbfh,Āžg—
p,³,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,ðEÏ 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

EÏ 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 Y’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 u IDirect3DDevice fCf“f^ [ftFfCfX v,ðŽQ Æ,·,é,±,Æ B

IDirect3DDevice fCf“f^ [ftFfCfX,]f f\fbfh,Í A ŽŸ,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 ŽŸ,ìÈ,è B

AddRef

QueryInterface

Release

Direct3DDevicefIfufWfFfNfg,Í A3D%æ—
È,Æ,μ,Ä ¶ ñ,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,½frrf... [f] [fg,ð AfffofCfX,É”z'u,³,ê,½frrf... [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 .Äfobftf@“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|Cf“f^ B, ±
, İfobftf@, İfTfCfY, “, «, è, , fIfufWfFfNfg, “ ¶ - , 3, é, È, Ç, Æ, «, É, Í ACEÄ, Ñ o, µ, ÉŽ, ”s, ;, é B

lplpDirect3DExecuteBuffer

V, µ, ÇDirect3DExecuteBufferIfufWfFfNfg, Ö, İf|Cf“f^, Ö, İf|Cf“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, éfTfCfY, 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•ŰŽ , µ, æ, □
, Æ, ·, é B

fAfvfŠfP [fVf±f“, **İDirect3DExecuteBuffer::Lock** f\fbfh, đŽg, □, Æ Af f, fŠ, İ^Ű“@, đ—vç , ·, é, ±, Æ, “, Ä, «, é B, ±
, İf f\fbfh, “-ß, Ä, ½, Æ, « Af f [f^, “fVfXfef€ Ef f, fŠ, Ü, ½, İfrrffl 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<İ ”,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 s—
ñ, ð í A **IDirect3DDevice::CreateMatrix** f f\bfh, 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 f\bfh ¢ B

ŽQ Æ @ **IDirect3DDevice::CreateMatrix** A **IDirect3DDevice::SetMatrix**

IDirect3DDevice::DeleteViewport

HRESULT DeleteViewport(LPDIRECT3DVIEWPORT lpDirect3DViewport);

ffofCfX,ÉŠÖ^A,μ,½frf... [f] [fg EIfufWfFfNfg,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•Ö,· 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);

Direct3DDeviceIfuWfFfNfg,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 [fhEfFfA 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, Ì|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•Ī ”,Ö,Īf|fCf“f^ B

lpD3DMatrix

f f\fbfh,³•Ô,· s—ñ,ðšŮ,ðD3DMATRIX \ç'ì,Ö,Īf|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,ÎNULL,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,ÎD3D_OK,đ•Ô,μ A,»,Ì¼,Ì,Æ,«,ÍfGf% [,Á, ,é B•Ô'l,É,Á,¢,Ä,Í A uDirect3D
'¼ Úf, [fh,Ì•Ô'l v,đŽQ Æ, ,é,±,Æ B*

lpd3d

%Šú%», : ,éDirect3D ffofCfX,Ö,Ìf|fCf“f^ B

lpGUID

fCf“f^ [ftfFfCfXŽ~•ÊŽq,Á, ,éfOf [fof< Ef+fj [fNŽ~•ÊŽq(GUID),Ö,Ìf|fCf“f^ B

lp3ddvdesc

%Šú%», : ,éDirect3DDevicefIfufWfFfNfg,đŽ!,•D3DDEVICEDESC \‘İ,Ö,Ìf|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,¢,,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 AlpRectpfpf%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%ofo,Í,È,¢ B
```

```
lpRect
Žæ,è o,³,ê,éfffofCfX À•W—İæ,đŽ!,•D3DRECT \`¢'İ,Ö,İf|fCf“f^ B
```

```
lpRectpfpf%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);
```

— s—ñfnf“fhf<,Ö s—ñ,ð%Á,‘,é B,±,Ì s—ñfnf“fhf<,Í A IDirect3DDevice::CreateMatrix
f f\fbfh,Á ì ¬,μ,½,à,ì,Á,È,¯,ê,Î,È,ç,È,ç B

—CE±,·,ê,ÎD3D_OK AŽ,”s,·,ê,Î AŽÿ,Ì!l,ð•Ô,· B

DDERR_INVALIDPARAMS

d3dMatHandle

ÿ’è,³,ê,é s—ñfnf“fhf< B

lpD3DMatrix

ÿ’è,³,ê,é s—ñ,ðŽ!,·D3DMATRIX \‘ç’ì,Ö,Ìf|fCf“f^ B

—
ñ,Ìfnf“fhf<,ðŠÛ,þŽÀ sfobftf@“à,ð•İŠ·,·,é B IDirect3DDevice::SetMatrix f\fbfh,ÍŽÀ sfobftf@,ðf fbN Af f
bfN%øð œ,¹,·,É,±,Ì”z—ñ,ð•İ X,Á,«,é B

ŽQ Æ @ IDirect3DDevice::CreateMatrix A IDirect3DDevice::GetMatrix A IDirect3DDevice::DeleteMatrix

IDirect3DDevice::SwapTextureHandles

```
HRESULT SwapTextureHandles(LPDIRECT3DTEXTURE 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,^a-ß,Â,½,Æ,« AŒðŠ·,³ê,éefNfXf`ff,Ìfnf`fhf<,Ö,Ì|fCf`f^ B

,±

,Ìf f\fbfh,Í A'Ê íAfvfŠfP [fVf±f`^afufWfFfNfg,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, ÌÈ, è B

AddRef

QueryInterface

Release

IDirect3DExecuteBuffer::GetExecuteData

HRESULT GetExecuteData(LPD3DEXECUTEDATA lpData);

Direct3DExecuteBufferIfufWfFfNfg, ðŽÀ sf [f^, ð ÓÔ, ðŽæ“¾, ;é BŽÀ sf [f^, Í ADirect3DExecuteBufferIfufWfFfNfg, ðL q, ÉŽg—p, ³, ê, é B

-Ĉ÷, ., ê, ÎD3D_OK AŽ,”s, ., ê, Í AŽŸ, ð¹, ð, , ê, ©, ð•Ô, · B

D3DERR_EXECUTE_LOCKED

DDERR_INVALIDOBJECT

DDERR_INVALIDPARAMS

lpData

Direct3DExecuteBufferIfufWfFfNfg, ðĈ» Ý, ðŽÀ sf [f^, ð ÓÔ,ª Ý’è,³,ê,½**D3DEXECUTEDATA** \‘Ĉ‘Ï, Ö, ðf| fCf“f^ B

Direct3DExecuteBufferIfufWfFfNfg,ªf fbfN,³,ê,Ä,Ĉ,é,Æ,«,Í A,±, ðĈÄ, 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',·ffofCfX,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(Efbfh,•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, ê, Ä, Ĉ, é, Ĉ, «, Ĩ A, ±, ĨĈÄ, Ñ o, μ, ĨŽ,"s, ., é B

ŽQ Æ @**IDirect3DExecuteBuffer::GetExecuteData**

IDirect3DExecuteBuffer::Unlock

HRESULT Unlock();

ŽÀ sfofbftf@,ÏRf}f“fh,Ö,Ïf|fCf“f^,ð%øð•ú,·,é B,½,¾,µ,±,Ïf|
fCf“f^,Í Afobftf@,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,Ï'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

%oŠú%o»

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, Å, , 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,¢ ,Á,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<,^ 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, Ö, ìf|fCf“f^ B

IDirect3DMaterial::Reserve

HRESULT Reserve ();

«» Ý AŽÄ•,³,ê,Ä,ç,È,ç 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

IDirect3DTexturefCf“f^ [ftFfCfX,lf f\fbfh,Í AŽŸ,ÌfOf< [fv,©,ç,È,é B

fnf“fhf< **GetHandle**

%oŠú%o» **Initialize**

f [fh **Load**
Unload

fpfÆfbfg îñ **PaletteChanged**

IDirect3DTexturefCf“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,ªfTf| [fg,.,éf f\fbfh,Í AŽŸ,ÌÊ,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<, ^ Ý’è, ¾, ê, é•Í ”, Ö, ðf|fCf“f^ B

IDirect3DTexture::Initialize

```
HRESULT Initialize(LPDIRECT3DDEVICE lpD3DDevice,  
                  LPDIRECTDRAWSURFACE lpDDSurface);
```

, ±, 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

lpDDSurface

, ±, 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 Úf, [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,c,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,Ïİ 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**

ŒðŒ¹ **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,ðEp 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);

fr... [f] [fg,ÉŠÖ~A,µ,½Direct3DLightfIfufWfFfNfg,ÏfŠfXfg,É AŽw'è,³,ê,½CEöCE¹,ð'Ç%oÁ,·,é B
-CE÷,·,ê,ÎD3D_OK AŽ,„s,·,ê,Î AŽŸ,Ï¹,Ï,ç,,ê,©,ð•Ö,· B

DDERR_INVALIDOBJECT

DDERR_INVALIDPARAMS

lpDirect3DLight

Direct3DDevicefIfufWfFfNfg,ÉŠÖ~A,µ,½Direct3DLightfIfufWfFfNfg,Ö,Ïf|fCf“f^ B

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*] [*f*g,ÉŠÖ^A,μ,½Direct3DLightfIfufWfFfNfg,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

Direct3DDevicefIfufWfFfNfg,©,ç Ø,è—£,· ADirect3DLightfIfufWfFfNfg,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<,đŽæ“¾,·,é B
-€÷,·,ê,ÎD3D_OK AŽ,”s,·,ê,Î AŽŸ,Ì!l,Ì,ç,,ê,©,đ•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,đŽ!,·,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,Ì'l,Ì,ç,,ê,©,đ•Ô,· B

DDERR_INVALIDOBJECT

DDERR_INVALIDPARAMS

lpData

frf... [f] [fg,đŽæ“¾,·,éD3DVIEWPORT \‘ç‘İ,Ö,Ìf|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 %šú%», ·, é, ½, ß ADDERR ALREADYINITIALIZED, º•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);
```

lpDirect3DLight Direct3DDeviceIfuWfFfNfg,ÉŠÖ~A,μ,½CEöCE¹fŠfXfg,ì¹†,ìCEöCE¹,Ö,ìf|fCf“f^ B
lplpDirect3DLight Direct3DDeviceIfuWfFfNfg,ÉŠÖ~A,μ,½CEöCE¹fŠfXfg,ì¹†,©,ç—v< ,³,ê,½CEöCE¹,ðŠÜ,Þf|fCf“f^,Ö,ìf|fCf“f^ B—
v< ,³,ê,éCEöCE¹,Í AdwFlagspf%of [f^,ÄŽw'è,³,ê,é B

DDERR_INVALIDOBJECT

DDERR_INVALIDPARAMS

lpDirect3DLight

Direct3DDeviceIfuWfFfNfg,ÉŠÖ~A,μ,½CEöCE¹fŠfXfg,ì¹†,ìCEöCE¹,Ö,ìf|fCf“f^ B

lplpDirect3DLight

Direct3DDeviceIfuWfFfNfg,ÉŠÖ~A,μ,½CEöCE¹fŠfXfg,ì¹†,©,ç—v< ,³,ê,½CEöCE¹,ðŠÜ,Þf|fCf“f^,Ö,ìf|fCf“f^ B—
v< ,³,ê,éCEöCE¹,Í AdwFlagspf%of [f^,ÄŽw'è,³,ê,é B

dwFlags

CEöCE¹fŠfXfg,©,çŽæ“¾,·,éCEöCE¹,ðŽw'è,·,éftf%ofO BfftfHf<fg,Æ,μ,Ä AD3DNEXT_NEXT,ª Ý'è,³,ê,é B

D3DNEXT_HEAD fŠfXfg,ì Å %o,ì €-Ú B

D3DNEXT_NEXT fŠfXfg,ìŽŸ,ì €-Ú B

D3DNEXT_TAIL fŠfXfg,ì ÅĒã,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,ì"weì ["x,đ Ý'è,;é B

-E÷,;ê,îD3D_OK AŽ,"s,;ê,î AŽÝ,Ì'l,ì,;,ê,©,đ•Ö,· B

DDERR_INVALIDOBJECT

DDERR_INVALIDPARAMS

lpDDSurface

"weì ["x,đ•\,·DirectDrawSurfacefIfufWfFfNfg,Ö,ìf|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 AŽÝ,Ì'l,Ì,ç,,ê,©,đ•Ô,· B

DDERR_INVALIDOBJECT

DDERR_INVALIDPARAMS

lpData

V<Kfrf... [f] [fg,đŽ!,·**D3DVIEWPORT** \ç'ì,Ö,Ìf|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,ðD3DTRANSFORMDATA \c'İ,Ö,İf|fCf“f^ B
```

```
dwFlags  
^È%°,İftf%ofo,İ“à,Đ,Æ,Â B,±,ê,ç,İftf%ofo,İŽg,ç•û,É,Â,ç,Ä,Í ACEã q,İ à-¾,ðŽQ Æ,·,é,±,Æ B
```

D3DTRANSFORM_CLIPPED
D3DTRANSFORM_UNCLIPPED

```
lpOffscreen  
•İŠ·Œã A',“_„fXfNfŠ [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',“_„fNfŠfbfsf“fo,³,ê,é,Æ,«Í Ait,İ'†,İD3DLVERTEX \c'İ,É'İ%ž,·,é”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',“_„fXfNfŠ  
[f“ŠO,Äfrf... [f|  
[fg,É,©,ç,È,ç BD3DTRANSFORMDATA \c'İ,İdrExtentf f“fo,à A•İŠ·Œã,İ',“_„İD<éŒ”ÍÍ,É Ý'è,³,ê,é B
```

```
itfpf%of [f^,ªD3DTRANSFORM_UNCLIPPED,İ,Æ,« A,±,İf f\fbfh,Í',“_„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\ftfgfEfFA,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,³,½,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,±,l \‘c‘l,Í A•Šò \‘c‘l,Á, ,é B

dwMask

•Šò,Ì,½,ß,Ìf rfbfgf}fXfN B,±,lf}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‘l,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,ÏTfCfY B

dwFlags

,±,Ï \ç'Ï,Ï—LÈØ,Èff [f^,ª Ý'è,³,ê,Ä,Ç,é f“fo,ðŽ-•Ê,·,éftf%oO B

D3DDD_BCLIPPING

bClipping f“fo,ª—LÈØ B

D3DDD_COLORMODEL

dcmColorModel f“fo,ª—LÈØ B

D3DDD_DEVCAPS

dwDevCaps f“fo,ª—LÈØ B

D3DDD_LIGHTINGCAPS

dlcLightingCaps f“fo,ª—LÈØ B

D3DDD_LINECAPS

dpcLineCaps f“fo,ª—LÈØ B

D3DDD_MAXBUFFERSIZE

dwMaxBufferSize f“fo,ª—LÈØ B

D3DDD_MAXVERTEXCOUNT

dwMaxVertexCount f“fo,ª—LÈØ B

D3DDD_TRANSFORMCAPS

dtcTransformCaps f“fo,ª—LÈØ B

D3DDD_TRICAPS

dpcTriCaps f“fo,ª—LÈØ B

dcmColorModel

ffofCfX,ÏfJf% [Ef,ffç,ðŽw'è,µ,Ä,Ç,é D3DCOLORMODEL—ñç“È^f f“fo,Ï,Ð,Æ,Â B

dwDevCaps

ffofCfX,Ï”\—Ï,ðŽ-•Ê,·,éftf%oO B

D3DDEVCAPS_EXECUTESYSTEMMEM

ORY

fVxfef€ Ef f,fŠ,ðŽÀ sfobftf@,ÉŽg—p%oÂ”\ B

D3DDEVCAPS_EXECUTEVIDEOMEMORY

frffI Ef f,fŠ,ðŽÀ sfobftf@,ÉŽg—p%oÂ”\ 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

d3dLineCaps=d3dTriCaps

ü,ãŽOŠpĈĕ,đ·%oæ,·,é,½,ß AfffofCfX,İfTf| [fg î·ñ,đ'èĉ',·,éD3DPRIMCAPS \‘ĉ'İ B

dwDeviceRenderBitDepth

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

dwDeviceZBufferBitDepth

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

dwMaxBufferSize

,±,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

dwMaxVertexCount

,±,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, l, 1/2, B Aff [f^, dZw'è, :é B, ±, ìf f\fbfh, aEÄ, Î, ê•İŠ: ,a I—
l, ., 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::FindDevicef f\fbfh,ðEÄ,Ñ o,µ AŽæ“¾,·,éffofCfX,ðŽ·Ê,·,é B

dwSize

,±,ì \‘‘ì,ìffofCfg’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’P’Ê,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,Â’È 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,Æ^ê’v,·,é B

D3DFDS_COLORMODEL

,±
,İ \‘c‘İ,ÌdcmColorModelf f“fo,ĂŽw’è,³,é,½fJf%o [Ef,ff<,Æ^ê’v
,·,é B

D3DFDS_DSTBLENDCAPS

,±
,İ \‘c‘İ,ÌdpcPrimCapsf f“fo,Æ,μ,ĂŽw’è,³,é,½D3DPRIMCAPS \‘c‘
Ì,ÌdwDestBlendCapsf f“fo,Æ^ê’v,·,é B

D3DFDS_GUID

,±
,İ \‘c‘İ,Ìguidf f“fo,ĂŽw’è,³,é,½fOf [f of< Eftfj [fNŽ~•ÉŽq(G
UID),Æ^ê’v,·,é B

D3DFDS_HARDWARE

,±,İ \‘c‘İ,ÌbHardwaref f“fo,É—^,!,ç,é,Ă,ƒ
,éfn [fhfEfFfA,©f\ftfgfEfffA,ÌŽæ“¾“à—e,Æ^ê’v,·,é B

D3DFDS_LINES

D3DDEVICEDESC \‘c‘İ,ÌdpcLineCapsf f“fo,ĂŽw’è,³,é,½
D3DPRIMCAPS \‘c‘İ,Æ^ê’v,·,é B

D3DFDS_MISCCAPS

,±
,İ \‘c‘İ,ÌdpcPrimCapsf f“fo,Æ,μ,ĂŽw’è,³,é,½D3DPRIMCAPS \‘c‘
Ì,ÌdwMiscCapsf f“fo,Æ^ê’v,·,é B

D3DFDS_RASTERCAPS

,±
,İ \‘c‘İ,ÌdpcPrimCapsf f“fo,Æ,μ,ĂŽw’è,³,é,½D3DPRIMCAPS \‘c‘
Ì,ÌdwRasterCapsf f“fo,Æ^ê’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,Æ^ê’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 Afn [fhfEfFfA,©f\ftfgfEfFfA,ì,Ç,ç,Å, ,é,©,ðŽw’è,·,éftf%oO B,±
,ìf f“fo,ªTRUE,ì,Æ,«,Í Afn [fhfEfFfA,ìf%ofXf^,ðŽæ“¾,·,é B,»,μ,Ä Afn [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,ff<,ÄŽæ“¾,·,éffofCfX,ðŽw’è,·,éD3DCOLORMODEL—ñ<“E^f f“fo,ì,Ð,Æ,Â B

guid

Œÿ o,·,éffofCfX,ìfOf [fof< Ef†fj [fNŽ·ÊŽq(GUID) B

dwCaps

”\—Í,ìftf%oO B

dpcPrimCaps

,»,ê,¼,ê,ìfvfšf~fefBfuE^,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’,“_δ’èç’,.é B,±,l \‘ç’l,Í AD3DTRANSFORMDATA \‘ç’l,îê”Á,é B

dwFlags

“ŽŸ’,“_îfNfŠfbfsf“fo ó‘Ô,δ’èç’,.éftf%fo B,± ,îf f“fo,Í AD3DTRANSFORMDATA \‘ç’l,îdwClipf f“fo,îftf%fo,ð,Ð,Æ,Â^È ã Ý’è,Á,«é B

dvHX A dvHY A dvHZ

“ŽŸ’ À•W,Ö,îİŠ,δŽw’è,.éD3DVALUEÇ^,îl B,±,ê,ç,ì À•W,Í A’,“_δŽ!,. 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•İ'·-½—ß,ìfŠfXfg,æ,è ì -γ,³,ê,é B,»,ê,¼,ê,ì-½—ß,Í A<ª'Ê,È-½—ßfwfbf_,ĂŽn,Û,è A,»,ì-½—ß,ìpf%of [f^,ª±, B

bOpcode

D3DOPCODE —ñ<“Ɖ^,ìf f“fo,Æ,µ,ĂŽw'è,³,ê,éƉf“f_Šf“fO-½—ß B B

bSize

-½—ßff [f^††fjfbfg,ìfTfCfY B,±,ìf f“fo,Í A ‡ŽŸ,ÉŽŸ,ì-½—ß,É”ò,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,ª,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’P^Ê,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,ì^“@—Ê B,±,ê,Í AfAfvfŠfP [fVf‡f“,^—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,ì^“@—Ê B,±,ê,Í AfAfvfŠfP [fVf‡f“,^ 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, ðEöE¹\—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

ËöE¹f, fWf... [f<, Ì”\—Í, ðŽ!, ·ftf%ofO BŽŸ, Ìftf%ofO, ”è<³, é, Å, ç, é B

D3DLIGHTCAPS_DIRECTIONAL

—LËËüËö, ðf Tf| [fg, ·, é B

D3DLIGHTCAPS_GLSPOT

Open-GL fXf^fCf<, ÌfXf|fbfgf%ofCf g, ðf Tf| [fg, ·, é B

D3DLIGHTCAPS_PARALLELPOINT

fpf%ofËf< E|fCf“fgËö, ðf Tf| [fg, ·, é B

D3DLIGHTCAPS_POINT

f|fCf“fgËöE¹, ðf Tf| [fg, ·, é B

D3DLIGHTCAPS_SPOT

fXf|fbfgf%ofCf g, ðf Tf| [fg, ·, é B

dwLightingModel

ËöE¹f, fff<,ª ARGB, ©f, fmfNf , Å, , é, ©, ð’è<, ·, éftf%ofO BŽŸ, Ìftf%ofO, ”è<³, é, é B

D3DLIGHTINGMODEL_MONO

f, fmfNf ËöE¹f, fff< B

D3DLIGHTINGMODEL_RGB

RGBËöE¹f, fff< B

dwNumLights

Žg—p, Å, «, éËöE¹ ” B

D3DLIGHTINGELEMENT

```
typedef struct _D3DLIGHTINGELEMENT {
    D3DVECTOR dvPosition;
    D3DVECTOR dvNormal;
} D3DLIGHTINGELEMENT, *LPD3DLIGHTINGELEMENT;
```

f,fff«óŠÔ“à,ì Æ-¾^Ê'u,ðŽ',. B,±,ì \‘ç'í,í AD3DLIGHTDATA \‘ç'í,íê”,Á, ,é B

dvPosition

f,fff«óŠÔ,Á,ì Æ-¾^Ê'u,ðŽw'è,.,é'l B,±,ì'l,í AD3DVECTOR \‘ç'í,Á, ,é B

dvNormal

-@ üfxfNfgf<,ðŽw'è,.,é'l B,±,ì'l,í AD3DVECTOR \‘ç'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“ Efppf^ [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, ĩfofCfƒg’P’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, ç, ĩ’l, ĩ **D3DCOLORVALUE** \‘c’ĭ, Á, , é B

dvPower

“Š%oe, ĩfnfCf%ofCfƒg, ĩ, ³, đŽw’è, ., é **D3DVALUE** ĀĀ, ĩ’l B

hTexture

fefNfXf`ff Ef}fbfv, ĩfnf“fhf< B

dwRampSize

F, ĩĀEXŽĭ, ĩ’á, «, ³ B’P F, ĩ(ĀEXŽĭ)fhf%ofCfo, Á, ĩ A”wĀEi, ÉŽw’è, ³, é, ½f} fefŠfAf<, ĩ, ½, ß, É A, ±, ĩ’l, ĩ’Ē%°, Á, Ē, ĩ, ĩ, Ē, ç, Ē, Ā B, », ĩ’¼, ĩ, Ā, « A”wĀEi, ĩ•Žĭ, ³, é, Ē, Ā B, ±, ĩ“@, «, ĩ A”wĀEi, ÉŽw’è, ³, é, ½fefNfXf`ff, ³ **dwRampSize** f“fo, ³ĭĒ ā, Āf} fefŠfAf<, đĀĀ< ±, μ, Ā, Ā, é, Ā, «, Ē, 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, **IDirect3DDevice::SetMatrix**, $\lambda, \alpha, \beta, \gamma, \delta, \epsilon, \zeta, \eta, \theta, \iota, \kappa, \lambda, \mu, \nu, \xi, \omicron, \pi, \rho, \sigma, \tau, \upsilon, \phi, \chi, \psi, \omega$ s—ñ, ðŽ', · B

Direct3D, Å A“Š%oe s—ñ, ð_44—v'f, Í•%o ”, ð Ý'è, Å, «, È, ¢ BfAfvfŠfP [fVf#f“, Å, ±, ð'Ê'u, É•%o ”, ðŽg, ¢•K—v, a, , é
ê ‡ A, », ð'ã, í, è, È-1, Å“Š%oe s—ñ'S'ð, ð kŽÚ, ·, é B

ŽQ Æ @**IDirect3DDevice::GetMatrix** **IDirect3DDevice::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, $\hat{\mathbb{I}}$, $\frac{1}{2}$, β , $\hat{\mathbb{I}}fIfyf\%of$ “ fh E ff [f \wedge , $\delta\check{Z}$], \cdot B

hDestMatrix

$\mathbb{C}v\check{Z}\mathbb{C}\%o\hat{\mathbb{E}}, \delta\check{S}i$ [, \cdot , \acute{e} s— \tilde{n} , $\hat{\mathbb{I}}fnf$ “fhf \langle B

hSrcMatrix1 \square hSrcMatrix2

1” $\hat{\mathbb{O}}-\acute{U}$, $\mathbb{A}2$ ” $\hat{\mathbb{O}}-\acute{U}$, $\hat{\mathbb{I}}\mathbb{C}v\check{Z}\acute{f}$ $\hat{\mathbb{U}}$, $\hat{\mathbb{I}}$ s— \tilde{n} , $\hat{\mathbb{I}}fnf$ “fhf \langle B

$\check{Z}Q$ \mathbb{A} $\hat{\mathbb{E}}$ $\hat{\mathbb{A}}$ **D3DOPCODE**

D3DPICKRECORD

```
typedef struct _D3DPICKRECORD {
    BYTE    bOpcode;
    BYTE    bPad;
    DWORD   dwOffset;
    D3DVALUE dvZ;
} D3DPICKRECORD, *LPD3DPICKRECORD;
```

IDirect3DDevice::GetPickRecords f\bfh—p,É AŽÀ sfobftf@,ì‘đfvfŠf~fefBfu,É,Â,ç,Ä,ì î•ñ,ð•Ô,· B

bOpcode

‘I‘đfvfŠf~fefBfu,ìIfyfR [fh B

bPad

PadfofCf g B

dwOffset

ĖŸ o,³,ê,½‘I‘đfvfŠf~fefBfu,ìŽÀ sfobftf@,ì æ“³,©,ç,ìIfIfZfbfg B

dvZ

‘I‘đfvfŠf~fefBfu,ì [“x B

‘I‘đfvfŠf~fefBfu,ìx Ay À•W,Í A‘đfĖfR [fh,Ä ¶ −,³,ê,é**IDirect3DDevice::Pick** f\bfh,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 Efh [f^,ðŽ!,. B

wCount
,“_ì ” B

wFirst
À %o,ì’“_ìfCf“ffbfNfX B

,“_ì A’“_fŠfXfg,É,æ,è`%oæ,³,ê,é B

ŽQ Æ @D3DOPCODE

fffofCfX,Í A Æ-¾ ^—
 ,İŠÖ† AD3DTLVERTEX \c'İ,İspecularf f“fo,Ä—
 ^,İ,ç,ê,½D3DCOLOR¹,İfAf<ftf@ ¬•†,İ¹,ðEvŽZ,·,é B,»,µ,Ä Af%of
 Xf^,İŠÖ† AftfHfO¹,ð ‘,«Š,·,é B

D3DPRASTERCAPS_PAT

fhf%ofCfo,Í Afpf^ [f“•%œ,ð ^—
 ,Ä,«,é B(D3DRENDERSTATE_LINEPATTERN,â
 D3DRENDERSTATE_STIPPLEPATTERNfEf“f_Šf“fO óÔ,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^ÈŠO,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`f¹,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,
 ±,İfufbfg,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,İ”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•Ž¹,·,é B

dwZCmpCaps

fhf%ofCfo,ªŽÄ s%oÄ”,ÈŠÖ ”,ð”äŠr,·,éZfofbftf@ B,±,İf f“fo,Í AZŸ,İ¹,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“fOŒW ”(1-As, 1-As, 1-As, 1-As)
,ÆffXfefBfl [fVf±f“,ÌfufŒf“ffBf“fOŒW ”(As, As, As,
As) BffXfefBfl [fVf±f“,ÌfufŒf“ffBf“fO,Ì'ò,Í A-³Œø,Æ,È,é B

D3DPBLENDCAPS_BOTHSRCALPHA

f\ [fX,ÌfufŒf“ffBf“fOŒW ”(As, As, As, As)
,ÆffXfefBfl [fVf±f“,ÌfufŒf“ffBf“fOŒW ”(1-As, 1-As, 1-As, 1-
As) BffXfefBfl [fVf±f“,ÌfufŒf“ffBf“fO,Ì'ò,Í A-³Œø,Æ,È,é B

D3DPBLENDCAPS_DESTALPHA

fufŒf“ffBf“fOŒW ”(Ad, Ad, Ad, Ad) B

D3DPBLENDCAPS_DESTCOLOR

fufŒf“ffBf“fOŒW ”(Rd, Gd, Bd, Ad) B

D3DPBLENDCAPS_INVDESTALPHA

fufŒf“ffBf“fOŒW ”(1-Ad, 1-Ad, 1-Ad, 1-Ad) B

D3DPBLENDCAPS_INVDESTCOLOR

fufŒf“ffBf“fOŒW ”(1-Rd, 1-Gd, 1-Bd, 1-Ad) B

D3DPBLENDCAPS_INVSRCALPHA

fufŒf“ffBf“fOŒW ”(1-As, 1-As, 1-As, 1-As) B

D3DPBLENDCAPS_INVSRCOLOR

fufŒf“ffBf“fOŒW ”(1-Rd, 1-Gd, 1-Bd, 1-Ad) B

D3DPBLENDCAPS_ONE

fufŒf“ffBf“fOŒW ”(1, 1, 1, 1) B

D3DPBLENDCAPS_SRCALPHA

fufŒf“ffBf“fOŒW ”(As, As, As, As) B

D3DPBLENDCAPS_SRCALPHASAT

fufŒf“ffBf“fOŒW ”(f, f, f, 1) Af = min(As, 1-Ad) B

D3DPBLENDCAPS_SRCOLOR

fufŒf“ffBf“fOŒW ”(Rs, Gs, Bs, As) B

D3DPBLENDCAPS_ZERO

fufŒf“ffBf“fOŒW ”(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^,ÄŽw'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 ¶ -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,ªfAfvfŠfP
[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,É•½—
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,İ ARGBf, [fh,İ Ô A—
İ A Á,İ F ñ•ª,Ä“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%o [f, [fh
,î½-ÊfVfF [fffBf“fO,îfnfCf%ofCfG“Š%oe,ðfTf] [fg,Â,«,é B

D3DPSHADECAPS_SPECULARGOURAUDMONO

D3DPSHADECAPS_SPECULARGOURAURGB

ffofCfX,Í AD3DCOLOR_MONO,ÆD3DCOLOR_RGBfJf%o [f, [fh
,îfOf [EfVfF [fffBf“fO,îfnfCf%ofCfG“Š%oe,ðfTf] [fg,Â,«,é B

D3DPSHADECAPS_SPECULARPHONGMONO

D3DPSHADECAPS_SPECULARPHONGRGB

ffofCfX,Í AD3DCOLOR_MONO,ÆD3DCOLOR_RGBfJf%o [f, [fh
,îftHf“ EfVfF [ffBf“fO,îfnfCf%ofCfG“Š%oe,ðfTf] [fg,Â,«,é B

dwTextureCaps

↪ ‡fefNfXf`ff Ef}fbfsf“fO îñ B,±,îf f“fo,Í AŽŸ,ì'l,ð,Ð,Æ,ÂÈ ã Ý'è,Â,«,é B

D3DPTTEXTURECAPS_ALPHA

D3DTEX_DECAL,ÆD3DTEX_MODULATEfefNfXf`ffftfBf<f^ [f, [f
h,ìRGBAfefNfXf`ff,ðfTf] [fg,·,é B,±,ì<@”,^a Ý'è,³,é,Â,¢
,È,¢ ê ‡ ARGBfefNfXf`ff,ì,Ý,^a A,±,é,¢,ìf, [fh,ÂfTf]
[fg,³,é B,±,ìftf%o,ì Ý'è,ð-Ž<,·,é,Æ AfAf<ftf@,ìŽg—p%oÂ”\
,D3DTEX_DECAL_MASK AD3DTEX_DECAL_ALPHA AD3DTEX_
MODULATE_ALPHAftfBf<f^f, [fh,ÂfTf] [fg,³,é,é B

D3DPTTEXTURECAPS_BORDER

«ŠE ü,È%o^,Â,ÂfefNfXf`ff Ef}fbfsf“fO,ðfTf] [fg,·,é B

D3DPTTEXTURECAPS_PERSPECTIVE

“šŽ<“Š%oe,^afTf] [fg,³,é,é B

D3DPTTEXTURECAPS_POW2

,±,ìftf%o,^a Ý'è,³,é,½ ê ‡ Af~fbfvf}
fbfv,Â,È,¢fefNfXf`ff,Í A2 æ,ÂŽw'è,³,é,½ • ,Æ ,,³,ðŽ ,½,È,-,ê,î,È,
ç,È,¢(f~fbfvf}
fbfv EfefNfXf`ff,Í A•K,² æŽŸ€³,Â,È,-,ê,î,È,ç,È,¢) B

D3DPTTEXTURECAPS_SQUAREONLY

fefNfXf`ff,Í A,·,×,Â<€E',Â,È,-,ê,î,È,ç,È,¢ B

D3DPTTEXTURECAPS_TRANSPARENCY

“Š%oßfefNfXf`ff,^afTf] [fg,³,é,é(€» Ý,ì“Š%oß F,Â,È,¢,±
,ê,ç,ìfefNfXf`ffs,ì,Ý•%oæ,³,é,é) B

dwTextureFilterCaps

fefNfXf`ff,ìf}fbfsf“fO îñ B,±,îf f“fo,Í AŽŸ,ì'l,ð,Ð,Æ,ÂÈ ã Ý'è,Â,«,é B

D3DPTFILTERCAPS_LINEAR

fsfNfZf<,ðŽæ,èŠ^a,fefNfZf<,ì2 ~2—ìæ,É d,Ý•t,-³,é,½•½<ì'l B,±
,ê,ì AŠg'â,Æ k -,ì—¼•û,ÂŽg—p,³,é,é BŠg'â,© k -,^afTf]
[fg,³,é,Â,¢,é,Æ,«,Í A—¼•û,^afTf] [fg,³,é,Â,¢,È,-,ê,î,È,ç,È,¢ B

D3DPTFILTERCAPS_LINEARMIPLINEAR

D3DPRIM_TEX_MIP_LINEAR,Æ“—1,¾,^a A,Ó,½,Â,ì<ßŽ—f~fbfvf}
fbfv,ð ‘,«Š•,ì,é B

D3DPTFILTERCAPS_LINEARMIPEAREST

D3DPRIM_TEX_MIP_NEAREST,Æ“—1,¾,^a A,Ó,½,Â,ì<ßŽ—f~fbfvf}
fbfv,ð ‘,«Š•,ì,é B

D3DPTFILTERCAPS_MIPLINEAR

D3DPRIM_TEX_LINEAR,Æ“—1,¾,^a A'I'ðfefNfZf<,É'î%ož,·,éf~fbfvf}
fbfv,ðŽg—p,·,é B

D3DPTFILTERCAPS_MIPNEAREST

D3DPRIM_TEX_NEAREST,Æ“—
1,¾,^a 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, ÁŽg—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, %œ È A ^ — ‘—x, %œü’P, 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%œ È, 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 Å %œ, Ì’, “_ ÌfCf“fffbfNfX B

wDest

f [fJf< Efobftf@, Ì Å %œ, Ì’, “_ ÌfCf“fffbfNfX B

dwCount

^ — , ³, ê, é’, “_ ” B

dwReserved

—\ñ Ì, Ý B0, Å, 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,ĪD3DOP_SPANfIfyfR [fh—
p,É A’,“_ĪfXfpf“,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 ĩ,ç,ê,é B

wCount

fXfpf“,Ī ” B

wFirst

Ā %o,Ī’,“_ĪfCf“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‘Ō, ĀŽw’è, 3, ê, é B, ±, ĩ \‘ĉ‘ĭ, ĩ Ā %o, ĩf f“fo, ĩ AŠŌ~A, μ, ½—ñĉ“Ć^, Ā, , é B2”Ō—
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‘Ō, 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'†,ì**D3DOP_SETSTATUS**fIfyfR [fh,ÁŽg—p,³,ê,é B

dwFlags

fXfe [f^fX A”Íí A,Û,½,í,»»,ì—¼•û,Á, ,é,±,Æ,ðŽw'è,·,éŽÝ,ìftf%oF,ì,Đ,Æ,Á,ð Ý'è,·,é B

D3DSETSTATUS_STATUS

fXfe [f^fX,ð Ý'è B

D3DSETSTATUS_EXTENTS

drExtentf f“fo,ÁŽw'è,³,ê,½”Íí,ð Ý'è B

D3DSETSTATUS_ALL

fXfe [f^fX,Æ”Íí,ì—¼•û,ð Ý'è B

dwStatus

fNfŠfbfsf“fO Eftf%oF B,±,ìf f“fo,í AŽÝ,ìftf%oF,ì,Đ,Æ,Á^È ã,ð Ý'è,·,é B

‘g,Ý ‡,í,¹,Æ^ê”Êftf%oF

D3DSTATUS_CLIPINTERSECTION

,·,×,Á,ìCLIPINTERSECTIONftf%oF,ì'g,Ý ‡,í,¹ B

D3DSTATUS_CLIPUNIONALL

,·,×,Á,ìCLIPUNIONftf%oF,ì'g,Ý ‡,í,¹ B

D3DSTATUS_DEFAULT

D3DSTATUS_CLIPINTERSECTION,Æ

D3DSTATUS_ZNOTVISIBLEftf%oF,ì'g,Ý ‡,í,¹ B,±

,ì¹,ª AffftfHf<fg,Á, ,é B

D3DSTATUS_ZNOTVISIBLE

fNfŠfbfvĚđ ·ftf%oF

D3DSTATUS_CLIPINTERSECTIONBACK

Ž< ‘ä,ìĚä•ûfNfŠfbfv-Ê,ì’ “,_,ìfNfŠfbfsf“fO Eftf%oF,ì’_—
ì,ð,Æ,é B

D3DSTATUS_CLIPINTERSECTIONBOTTOM

Ž< ‘ä,ì%°,ì’ “,_,ìfNfŠfbfsf“fO Eftf%oF,ì’_— ì,ð,Æ,é B

D3DSTATUS_CLIPINTERSECTIONFRONT

Ž< ‘ä,ì'O•ûfNfŠfbfv-Ê,ì’ “,_,ìfNfŠfbfsf“fO Eftf%oF,ì’_—
ì,ð,Æ,é B

D3DSTATUS_CLIPINTERSECTIONGEN0 `D3DSTATUS_CLIPINTERSECTIONGEN5

fAfVfŠfP [fVf‡f“è<,ìfNfŠfbfv-Ê,ì’_— ì,ð,Æ,é B

D3DSTATUS_CLIPINTERSECTIONLEFT

Ž< ‘ä,ì ¶“²,ì’ “,_,ìfNfŠfbfsf“fO Eftf%oF,ì’_— ì,ð,Æ,é B

D3DSTATUS_CLIPINTERSECTIONRIGHT

Ž< ‘ä,ì%°E“²,ì’ “,_,ìfNfŠfbfsf“fO Eftf%oF,ì’_— ì,ð,Æ,é B

D3DSTATUS_CLIPINTERSECTIONTOP

Ž< ‘ä,ì ã,ì’ “,_,ìfNfŠfbfsf“fO Eftf%oF,ì’_— ì,ð,Æ,é B

fNfŠfbfvĚ< ‡ftf%oF

D3DSTATUS_CLIPUNIONBACK

D3DCLIP_BACK,Æ“¬,¶ B
D3DSTATUS_CLIPUNIONBOTTOM
 D3DCLIP_BOTTOM,Æ“¬,¶ B
D3DSTATUS_CLIPUNIONFRONT
 D3DCLIP_FRONT,Æ“¬,¶ B
D3DSTATUS_CLIPUNIONGEN0 `D3DSTATUS_CLIPUNIONGEN5
 D3DCLIP_GEN0 `D3DCLIP_GEN5,Æ“¬,¶ B
D3DSTATUS_CLIPUNIONLEFT
 D3DCLIP_LEFT,Æ“¬,¶ B
D3DSTATUS_CLIPUNIONRIGHT
 D3DCLIP_RIGHT,Æ“¬,¶ B
D3DSTATUS_CLIPUNIONTOP
 D3DCLIP_TOP,Æ“¬,¶ B

Šî-*{fNfŠfbfsf“fO Eftf%oFO*

D3DCLIP_BACK
 Ž< ‘ä,ì”w-Ê,É,æ,èfNfŠfbfsf“fO,³,ê,é B
D3DCLIP_BOTTOM
 Ž< ‘ä,ì’ê-Ê,É,æ,èfNfŠfbfsf“fO,³,ê,é B
D3DCLIP_FRONT
 Ž< ‘ä,ì’O-Ê,É,æ,èfNfŠfbfsf“fO,³,ê,é B
D3DCLIP_LEFT
 Ž< ‘ä,ì ¶“¬-Ê,É,æ,èfNfŠfbfsf“fO,³,ê,é B
D3DCLIP_RIGHT
 Ž< ‘ä,ì%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<éCE`,ð’è<’,·,é**D3DRECT** \‘¢‘î B,½,Æ,!,î **AD3DPROCESSVERTICES**
 \‘¢‘î,ì’‡,Ä Ý’è,³,ê,é**D3DPROCESSVERTICES_UPDATEEXTENTS**f_tf%oFO,ðŽæ“¾,·,é**D3DOP_PROCESSVERTIC**
ESIfIfyFR [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<éCE`,ì’ä,«,³,í AŠeŽÀ s,Ä‘ ‘ä,·,é,ªŽû k,µ,È,¢ **BD3DOP_SE**
TSTATUSIfIfyFR [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'è\,·,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,ĂŠ,,Á,½'1,Ă, ,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;
```

ffofCfX, ì·İŠ·”\—Í, ðŽw’è, ·, é B, ±, ì \‘‘ì, Í AD3DDEVICEDESC \‘‘ì, ìê·”, Å, , é B

dwSize

, ±, ì \‘‘ì, ìfofCfg’P^Ê, ìTfCfY B

dwCaps

*·İŠ·’†, ìfVfXfef€^afNfŠfbfsf“fO, ·, é, ©, Ç, □, ©, ðŽw’è, ·, éftf%ofO B, ±
·, ìf f“fo, Ì A0, Û, ½, ÍŽŸ, ìftf%ofO,^a Ý’è, Å, «, é B*

D3DTRANSFORMCAPS_CLIP *fVfXfef€
·, ì·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* *f* *b* *f* *h* — *p*, *l* • *l*Š • *î* • *n*, *đ*Ž , *Â* *B*

dwSize

, *±*, *l* \ ' *c* ' *l*, *l* *f* *o* *f* *C* *f* *g* ' *P* ' *E*, *l* *f* *T* *f* *C* *f* *Y* *B*

lpIn

• *l*Š • *³*, *ê*, *é*, " _ , *Ö*, *l* *f* *|* *f* *C* *f* " *f* *^* *B*, *±*, *ê*, *l* AD3DLVERTEX \ ' *c* ' *l*, *Â*, , *é* *B*

dwInSize

• *l*Š • *³*, *ê*, *é*, " _ , *l*Š *Ö*Š *u* *B*

lpOut

• *l*Š • *³*, *ê*, *½*, " _ , *Ö*, *l* *f* *|* *f* *C* *f* " *f* *^* *B*

dwOutSize

o — *l*Š • *³*, *ê*, *½* *B*

lpHOut

• *l*Š • *³*, *ê*, *½*, " _ , *đ*Š *Ü*, *Đ*, *l*, *Ö*, *l* *f* *|* *f* *C* *f* " *f* *^* *B*, *±*, *l*, *l* AD3DHVERTEX \ ' *c* ' *l*, *Â*, , *é* *B*

wClip

' , " _ , *³*, *l*, *æ*, *±*, *É*, *f* *N* *f* *Š* *f* *b* *f* *s* *f* " *f* *O*, *³*, *ê*, *é*, ©, *đ*Ž *w* ' *è*, , *é* *f* *t* *f* *%* *o* *f* *B*, *±*, *l* *f* " *f* *o*, *É*, *l* *A*Ž *Ÿ*, *l*, *đ*, *Đ*, *Æ*, *Â* *È* *ã* *Ÿ* *è*, , *é* *B*

D3DCLIP_BACK

Ž < ' *ä*, *l* " *w* — *É*, *É*, *æ*, *è* *f* *N* *f* *Š* *f* *b* *f* *s* *f* " *f* *O*, *³*, *ê*, *é* *B*

D3DCLIP_BOTTOM

Ž < ' *ä*, *l* ' *è* — *É*, *É*, *æ*, *è* *f* *N* *f* *Š* *f* *b* *f* *s* *f* " *f* *O*, *³*, *ê*, *é* *B*

D3DCLIP_FRONT

Ž < ' *ä*, *l* ' *O* — *É*, *É*, *æ*, *è* *f* *N* *f* *Š* *f* *b* *f* *s* *f* " *f* *O*, *³*, *ê*, *é* *B*

D3DCLIP_GEN0 through D3DCLIP_GEN5

f *A* *f* *v* *f* *Š* *f* *P* [*f* *V* *f* *‡* *f* " *è* < , *l* *f* *N* *f* *Š* *f* *b* *f* *v* — *É* *B*

D3DCLIP_LEFT

Ž < ' *ä*, *l* ¶ " — *É*, *É*, *æ*, *è* *f* *N* *f* *Š* *f* *b* *f* *s* *f* " *f* *O*, *³*, *ê*, *é* *B*

D3DCLIP_RIGHT

Ž < ' *ä*, *l* % *E* " — *É*, *É*, *æ*, *è* *f* *N* *f* *Š* *f* *b* *f* *s* *f* " *f* *O*, *³*, *ê*, *é* *B*

D3DCLIP_TOP

Ž < ' *ä*, *l* *ã* ' *è* — *É*, *É*, *æ*, *è* *f* *N* *f* *Š* *f* *b* *f* *s* *f* " *f* *O*, *³*, *ê*, *é* *B*

dwClipIntersection

f *N* *f* *Š* *f* *b* *f* *s* *f* " *f* *O* *E* *f* *t* *f* *%* *o* *f*, *l* *È* *đ* . *đ*Ž *l*, . *f* *t* *f* *%* *o* *f* *B*, *±*, *l* *f* " *f* *o*, *É*, *l* *A*Ž *Ÿ*, *l*, *đ*, *Đ*, *Æ*, *Â* *È* *ã* *Ÿ* *è*, , *é* *B*

D3DSTATUS_CLIPINTERSECTIONBACK

Ž < ' *ä*, *l* *È* *đ* • *è* *f* *N* *f* *Š* *f* *b* *f* *v* — *É*, *l* ' , " _ , *l* *f* *N* *f* *Š* *f* *b* *f* *s* *f* " *f* *O* *E* *f* *t* *f* *%* *o* *f*, *l* *Ÿ* — *l*, *đ*, *Æ*, *é* *B*

D3DSTATUS_CLIPINTERSECTIONBOTTOM

Ž < ' *ä*, *l* % *o* , *l* ' , " _ , *l* *f* *N* *f* *Š* *f* *b* *f* *s* *f* " *f* *O* *E* *f* *t* *f* *%* *o* *f*, *l* *Ÿ* — *l*, *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,³,é,é BfNfŠfbfsf“fO,³,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—Ê,ð—^!,é B

•İŠ·f,fWf... [f<,É,æ,è ¶ ^,³,é,½',“_Í A16ftrfbfg ,“x'l,Æ,µ,ĀŠi”[³,é,é BfNfŠfbfsf“fO,Í A—

^,!,ç,è,½·İŠ·Ā,ì',“_ðfNfŠfbfsf“fO,·,éŽ< ‘äfvfĀ [f“_İ·İŠŪ“T—

~a,Ā Ý'è,³,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%fo(,±,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 Y'è,.,é B

fGfbfW Eftf%fo

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%fo

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,©,è,½,Æ,« A,»,İCEä,İŽOŠpE,İŽw'è,³,è,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,Ö,.,½,ß,É'¼ ÚŽg—p,Ä,«.,é B•½—
ÈfVfF [ffBf“fo,Ä A F,Æ“Š%oe -ª,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“fffb
fNfX,Ä,.,é B

Žg—p%Ä”\,ÈfGfbfW,Í Af fCf,,ftfE [f€ Ef, [fh,Ä%ÄŽ< ó'Ö,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,¢•İŠ. s—ñ,ð \z,.,é B

frf... [f] [fg,ì Å•W,Æ”z—ñ,Í AfffofCfX,ì ¶ ã,©,ç,İ‘Š‘Í’l,Å, ,é B

dwSize

,±,ì \‘ç’ì,ìfofCfg’P’Ê,ìfTfCY B

dwX □ dwY

frf... [f] [fg,ì ¶ ã÷,ì Å•W B

dwWidth □ dwHeight

frf... [f] [fg,ì”z—ñ B

dvScaleX □ dvScaleY

fXfNfŠ [f“ ,ÉçİŽç,ÈfXfP [f<”ä,ðŽw’è,.,é D3DVALUE€^,ì’l B

dvMaxX A dvMaxY A dvMinZ A dvMaxZ

x Ay Az,ìçİŽç Å•W,ì Å‘á’l,Æ Å -’l,ðŽw’è,.,é D3DVALUE€^,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 — $\tilde{n} \langle \text{E}^{\wedge}, \text{I}^{\dagger} \rangle$, **D3DRENDERSTATE_ZFUNC**, **D3DRENDERSTATE_ALPHAFUNC**
'l, ð, ½, ß, É, f, T, f | [fg, ³, ê, ½] "äŠrŠÖ ", ð'è', ·, é B

D3DCMP_NEVER
, Â, Ë, 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, s, f, N, f, Z, f, < 'l, æ, è - , ³, Ç, Æ, «, É%ž, ¶, é B

D3DCMP_EQUAL
V, μ, Ç, f, s, f, N, f, Z, f, < 'l, ^a ACE» Ý, ð, s, f, N, f, Z, f, < 'l, Æ™, μ, Ç, Æ, «, É%ž, ¶, é B

D3DCMP_LESSEQUAL
V, μ, Ç, f, s, f, N, f, Z, f, < 'l, ^a ACE» Ý, ð, s, f, N, f, Z, f, < 'l, È%°, ð, Æ, «, É%ž, ¶, é B

D3DCMP_GREATER
V, μ, Ç, f, s, f, N, f, Z, f, < 'l, ^a ACE» Ý, ð, s, f, N, f, Z, f, < 'l, æ, è 'â, «, Ç, Æ, «, É%ž, ¶, é B

D3DCMP_NOTEQUAL
V, μ, Ç, f, s, f, N, f, Z, f, < 'l, ^a ACE» Ý, ð, s, f, N, f, Z, f, < 'l, Æ™, μ, È, Ç, Æ, «, É%ž, ¶, é B

D3DCMP_GREATEREQUAL
V, μ, Ç, f, s, f, N, f, Z, f, < 'l, ^a ACE» Ý, ð, s, f, N, f, Z, f, < 'l, È ã, ð, Æ, «, É%ž, ¶, é B

D3DCMP_ALWAYS
, Â, Ë, É, f, e, f, X, f, g, ð, Ž, Æ 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,\ Á,\l,Í A`,`_,\P“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;
```

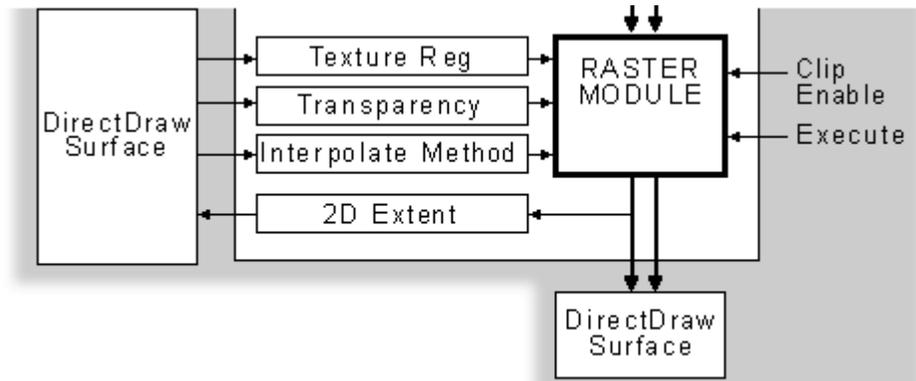
ftfHfO Ef, [fh,đŽw'è,·,é'è ",đ Ý'è,·,é B,±,ê,ç,ì'l,Í AD3DRENDERSTATETYPE—
 ñ<“Œ^,ì†,ìD3DRENDERSTATE_FOGTABLEMODEfŒf“f_Šf“fO ó‘Ô,ì,½,ß,ÉŽg—p,³,é,é B

D3DFOG_NONE

ftfHfOŒø%Œ,Í,È,ç B

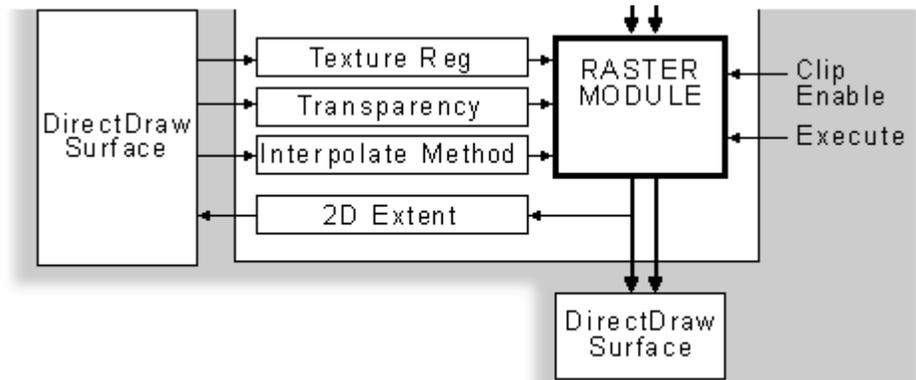
D3DFOG_EXP

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

D3DLIGHT_POINT

D3DLIGHT_SPOT

D3DLIGHT_SPOT

D3DLIGHT_DIRECTIONAL

D3DLIGHT_DIRECTIONAL

D3DLIGHT_PARALLELPOINT

D3DLIGHT_PARALLELPOINT

D3DLIGHT_GLSPOT

D3DLIGHT_GLSPOT

@IDirect3DRMLight, IDirect3DRMLightArray

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@,lfIfyfR [fh,ðŠÜ,D B

D3DOP_POINT

fĈf“f_f% [,É“_„ð—,é BfIfyf%of“fh Eff [f^,Í AD3DPOINT \‘ĉ‘ì,Ăžw’è,³,ê,é B

D3DOP_LINE

fĈf“f_f% [,É ü„ð—,é BfIfyf%of“fh Eff [f^,Í AD3DLINE \‘ĉ‘ì,Ăžw’è,³,ê,é B

D3DOP_TRIANGLE

fĈf“f_f% [,ÉŽOŠpĈ“„ð—,é BfIfyf%of“fh Eff [f^,ÍID3DTRIANGLE \‘ĉ‘ì,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 \‘ĉ‘ì,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 \‘ĉ‘ì,Ăžw’è,³,ê,é B

D3DOP_STATETRANSFORM

•İŠ·f,fWf... [f←
p,İfĈf“f_fŠf“fO EfGf“fWf“„É A“à” ó‘Ō·İ ”,İl,ð Ý’è,·,é BfIfyf%of“fh Eff [f^,Í A·İ ”,Ā, ,éfg [fNf“,Ā
V,μ,ĉ¹,Ā, ,é Bfg [fNf“,Í A“à” ó‘Ō·İ ”,ðŽ!,· B,±,İ·İ ””l,É,Í A V,μ,ĉ¹,ª Ý’è,³,ê,é B,±,ê,ç,İ·İ ”,É,Ā,ĉ
,Ā,İ Ú ×,Í AD3DSTATE \‘ĉ‘ì,ĀD3DTRANSFORMSTATETYPE—ñĉ“Ĉ^,ðŽQ Ā,·,é,±,Ā B

D3DOP_STATELIGHT

ĈöĈ¹f,fWf... [f←
p,İfĈf“f_fŠf“fO EfGf“fWf“„É“à” ó‘Ō·İ ”,İl,ð Ý’è,·,é BfIfyf%of“fh Eff [f^,Í A·İ ”,Ā, ,éfg [fNf“,Ā
V,μ,ĉ¹,Ā, ,é Bfg [fNf“,Í A“à” ó‘Ō·İ ”,ðŽ!,· B,±,İ·İ ””l,É,Í A V,μ,ĉ¹,ª Ý’è,³,ê,é B,±,ê,ç,İ·İ ”,É,Ā,ĉ
,Ā,İ Ú ×,Í AD3DSTATE \‘ĉ‘ì,ĀD3DLIGHTSTATETYPE—ñĉ“Ĉ^,ðŽQ Ā,·,é,±,Ā B

D3DOP_STATERENDER

fĈf“f_fŠf“fOf,fWf... [f←
p,İfĈf“f_fŠf“fO EfGf“fWf“„É“à” ó‘Ō·İ ”,İl,ð Ý’è,·,é BfIfyf%of“fh Eff [f^,Í A·İ ”,Ā, ,éfg [fNf“,Ā
V,μ,ĉ¹,Ā, ,é Bfg [fNf“,Í A“à” ó‘Ō·İ ”,ðŽ!,· B,±,İ·İ ””l,É,Í A V,μ,ĉ¹,ª Ý’è,³,ê,é B,±,ê,ç,İ·İ ”,É,Ā,ĉ
,Ā,İ Ú ×,Í AD3DSTATE \‘ĉ‘ì,ĀD3DRENDERSTATETYPE—ñĉ“Ĉ^,ðŽQ Ā,·,é,±,Ā B

D3DOP_PROCESSVERTICES

’,“_„İĈöĈ¹,Ā·İŠ·,ð Ý’è,·,é BfIfyf%of“fh Eff [f^,Í AD3DPROCESSVERTICES \‘ĉ‘ì,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 \‘ĉ‘ì,Ăžw’è,³,ê,é B

D3DOP_EXIT

“ž”B,μ,½fŠfXfg,İ I—,É“ž”B,μ,½ž—,ðŽ!,· B

D3DOP_BRANCHFORWARD

ŽÀ sfobftf@,İ·Šò,ð%Ā”\,Ā,·,é B Ú ×,Í AD3DBRANCH \‘ĉ‘ì,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_ANTI_ALIAS = 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_BLENDEENABLE = 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 **AD3DSTATE** \ ‘ ç ‘ ì, ì è • ”. Á, , é B Ž Ÿ, Ì L q, È L Ú, ³, è, ½ ‘ 1, Í A, ±, Ì \ ‘ ç ‘ ì, Ì 2 ” Ô — Ú, Ì f f “ f o, È Ý ‘ è, ³, è, é B

D3DRENDERSTATE_TEXTUREHANDLE

f e f N f X f f f f, Ì f n f “ f h f < B f f f t f H f < f g ‘ l, Í NULL, Á, , é B

D3DRENDERSTATE_ANTI_ALIAS

f A f “ f ‘ f G f C f Š f A f V f “ f O — v ‘ f, Ì [B f f f t f H f < f g ‘ l, Í FALSE, Á, , é B

D3DRENDERSTATE_TEXTUREADDRESS

D3DTEXTUREADDRESS — ñ “ C E ^, Ì f f “ f o, Ì, ð, È, Á B f f f t f H f < f g ‘ l, Í D3DTEXTUREADDRESS_WRAP, Á, , é B

D3DRENDERSTATE_TEXTUREPERSPECTIVE

TRUE, Ì, È, « A “ š Ž < C ³ B f f f t f H f < f g ‘ l, Í FALSE, Á, , é B

D3DRENDERSTATE_WRAPU

TRUE, Ì, È, « A u • ù C ü, È ‘ È, è • t, , é B f f f t f H f < f g ‘ l, Í FALSE, 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@, ĩ"ãŠrfeFXfg, ð%Ā" \, É, , é BffftfHf<fg'l, ĪFALSE, Ā, , é B

D3DRENDERSTATE_FILLMODE

D3DFILLMODE—ñ<“Ĉ^, ĭf f“fo, ĭ, Đ, Ā, Ā BffftfHf<fg'l, ĪD3DFILL_SOLID, Ā, , é B

D3DRENDERSTATE_SHADEMODE

D3DSHADEMODE—ñ<“Ĉ^, 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, Ā², ×, 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

ULONGĈ^, ĭ•— fvfĈ [f“f}fXfN BffftfHf<fg'l, Ī A0, Ā, , é B

D3DRENDERSTATE_ZWRITEENABLE

TRUE, ĭ, Ā, « AZ ‘, « ž, Ÿ, ð%Ā" \, Ā, , é BffftfHf<fg'l, Ī ATRUE, Ā, , é B, ±, ĭf f“fo, Ī AfAfvfŠfP [fVf±f“, ÉfVfXfē€, V, µ, ĈZ' Ī, AZfofbftf@, ð X V, , é, ĭ, ð-h, @Ž-, ð<-%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@' Ī, ŠĪ €, Ā, È, éfsfNfZf<, ĪŽó, Žæ, è, âŽó, Žæ, è, “Ū, ĩ"ãŽ~, ð<-%Ā, , é B

D3DRENDERSTATE_LASTPIXEL

TRUE, ĭ, Ā, « A ü, ĭ ĀĈã, ĭfsfNfZf<, ð•%œ, , é, ĭ, ðŽ~, B, é BffftfHf<fg'l, Ī ATRUE, Ā, , é B

D3DRENDERSTATE_TEXTUREMAG

D3DTEXTUREFILTER—ñ<“Ĉ^, ĭf f“fo, ĭ, Đ, Ā, Ā BffftfHf<fg'l, Ī AD3DFILTER_NEAREST, Ā, , é B

D3DRENDERSTATE_TEXTUREMIN

D3DTEXTUREFILTER—ñ<“Ĉ^, ĭf f“fo, ĭ, Đ, Ā, Ā BffftfHf<fg'l, Ī AD3DFILTER_NEAREST, Ā, , é B

D3DRENDERSTATE_SRCBLEND

D3DBLEND—ñ<“Ĉ^, ĭf f“fo, ĭ, Đ, Ā, Ā BffftfHf<fg'l, ĪD3DBLEND_ONE, Ā, , é B

D3DRENDERSTATE_DESTBLEND

D3DBLEND—ñ<“Ĉ^, ĭf f“fo, ĭ, Đ, Ā, Ā BffftfHf<fg'l, ĪD3DBLEND_ZERO, Ā, , é B

D3DRENDERSTATE_TEXTUREMAPBLEND

D3DTEXTUREBLEND—ñ<“Ĉ^, ĭf f“fo, ĭ, Đ, Ā, Ā BffftfHf<fg'l, ĪD3DTBLEND_MODULATE, Ā, , é B

D3DRENDERSTATE_CULLMODE

D3DCULL—ñ<“Ĉ^, 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<“Ĉ^, ĭf f“fo, ĭ, Đ, Ā, Ā BffftfHf<fg'l, ĪD3DCMP_LESSEQUAL, Ā, , é B, ±, ĭf f“fo, Ī AfAfvfŠfP [fVf±f“, Éĭf f%œ, ©, Ĉ, Ī<—É, ðŠĪ €, Ā, , éfsfNfZf<, ĪŽó, Žæ, è, âŽó, Žæ, è, “Ū, ð<-%Ā, , é B

D3DRENDERSTATE_ALPHAREF

fAf<ftf@ EfefXfg, %Ā" \, É, Ā, « AfefXfg, 3, è, éfsfNfZf<, É'Ī, , éŽQ ĀfAf<ftf@' Ī, ðŽw'è, , é' Ī B, ±, ĭ' Ī, ĪĈ^, ĪD3DFIXED, Ā, , é BffftfHf<fg'l, Ī0, Ā, , é B

D3DRENDERSTATE_ALPHAFUNC

D3DCMPFUNC—ñ<“Ĉ^, 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@' Ī, ðŠĪ €, Ā, , éfsfNfZf<, ĪŽó, Žæ, è, âŽó, Žæ, è, “Ū, ð<-%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·%æ, ·, éf|
fŠfSf“, ðCE©, Å, ¯, é, ½, ßZfofbftf@, Ê’Í, µ, ÄfefXfg, ³, ê, é A, ·, ×, Ä, Ìf|
fŠfSf“, ÌfOf< [fv, ÌfXfNfŠ [f“óŠÔ, Ê·, ©, ê, éf|fŠfSf“, Å, Ì Ø, è”², «Z, Ì, ±, Æ, Å, , é B

D3DRENDERSTATE_SUBPIXEL

TRUE, Ì, Æ, «ftfufsfNfZf<, Ì’ù ³, ð%Å”\, Æ, ·, é BffftfHf<fg’l, ÍFALSE, Å, , é B

D3DRENDERSTATE_SUBPIXELX

TRUE, Ì, Æ, «X, ¾, ¯, Ì’ù 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

D3DCOLORCE^, Ì’l 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, Ì’Ê’u, Å, , é B

D3DRENDERSTATE_FOGTABLEEND

ftfHfO Efe [fuf<, Ì I—¹ B, ±, ê, Í A üCE`ftfHfO Ef, [fh, Ì Å’â—§“x, Ê“ž’B, µ, ½ftfHfOCEø%Ê, Ì’Ê’u, Å, , é B

D3DRENDERSTATE_FOGTABLEDENSITY

üCE`ftfHfO Ef, [fh, Ì Å’âftfHfO—§“x, ð Ý’è, ·, é B, ±, Ì’l, Ì’Í’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, ¼, ê, ÌfCEf“f_fŠf“fo ó’Ô, Í A“·fpf^ [f“, Ì“—£ ü, Ê“K%ž, ³, ê, é B

ŽQ Æ @D3DOPCODE AD3DSTATE

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,³,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,³,ê,é B

D3DTBLEND_DECAL

ffJ [f< BfefNfXf`ff ~ ‡f, [fh,^afTf] [fg,³,ê,é B,±
,ìf, [fh,Á,Í AfefNfXf`ff,ìRGB,ÆfAf<ftf@'l,Í AfefNfXf`ff,ÁŽg—p,³,ê,Á,ç,È,ç F,ð'uŠ',·,é B

D3DTBLEND_MODULATE

•í² BfefNfXf`ff ~ ‡f, [fh,^afTf] [fg,³,ê,é B,±,ìf, [fh,Á,Í AfefNfXf`ff,ìRGB'l,Í AfefNfXf`ff,ÁŽg—
p,³,ê,Á,ç,È,çRGB'l,ðEJ,è'Ô,· BfefNfXf`ff,ìfAf<ftf@'l,Í AfefNfXf`ff,ÁŽg—p,³,ê,Á,ç
,È,ç F,ìfAf<ftf@'l,ð'uŠ',·,é B

D3DTBLEND_DECALALPHA

ffJ [f< EfAf<ftf@ BfefNfXf`ff ~ ‡f, [fh,^afTf] [fg,³,ê,é B,±
,ìf, [fh,Á,Í AfefNfXf`ff,ìRGB,ÆfAf<ftf@'l,Í AŽŸ,ì•ù'òŽ@,ÁfefNfXf`ff,ÁŽg—p,³,ê,Á,ç
,È,ç F,Á ~ ‡,³,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,³,ê,Á,ç
,È,ç F,ìfAf<ftf@'l,ð'uŠ',·,é B

D3DTBLEND_MODULATEALPHA

•í²fAf<ftf@,ìfefNfXf`ff ~ ‡f, [fh,^afTf] [fg,³,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,^afTf] [fg,³,ê,é B

D3DTBLEND_MODULATEMASK

•í²}fXfN,ìfefNfXf`ff ~ ‡f, [fh,^afTf] [fg,³,ê,é B

D3DTBLEND_COPY

•žÉfefNfXf`ff ~ ‡f, [fh,^afTf] [fg,³,ê,é B

•í²,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,l,Á A^è
,É ¶ ~,³,ê,½CEÁ X,ì F,ð'í²,·,é B,»,ì ~^a,ìf\ [fX,ì,Đ,Æ,Á,™™(1),ì,Æ,« A'P"x,ì'á,ç F ~^a,ÍE, ,µ,È,ç B“—
l,É AfIfufWfFfNfg,É'í%ž,·,éfefNfXf`ff,^a A™(1 A1 A1)
,ì,Æ,« AfefNfXf`ff,ì F,Í A^ŸŽ ,³,ê A'í X,³,ê,È,ç B

D3DTRANSFORMSTATETYPE

```
typedef enum _D3DTRANSFORMSTATETYPE {
    D3DTRANSFORMSTATE_WORLD      = 1,
    D3DTRANSFORMSTATE_VIEW       = 2,
    D3DTRANSFORMSTATE_PROJECTION = 3,
} D3DTRANSFORMSTATETYPE;
```

D3DOPCODE — \tilde{n} “ \mathbb{C}^\wedge , \tilde{I} D3DOP_STATE_TRANSFORM $f|f_yfR$ [f_h — p , \acute{E} • $\tilde{I}\tilde{S}$ • \acute{o} “ \hat{O} , $\acute{d}\check{Z}w$ ’ \acute{e} , \cdot , \acute{e} B, \pm , \tilde{I} — \tilde{n} “ \mathbb{C}^\wedge , \tilde{I} D3DSTATE \“ \mathbb{C}^\wedge , \tilde{I} ” \acute{e} ” \tilde{A} , \cdot , \acute{e} B

D3DTRANSFORMSTATE_WORLD

D3DTRANSFORMSTATE_VIEW

D3DTRANSFORMSTATE_PROJECTION

• $\tilde{I}\tilde{S}$ •, \cdot , $\acute{e}f$ [f < f_h A f_r ... [A “ $\tilde{S}\%oe$, \tilde{I} ” \tilde{z} — \tilde{n} , \acute{d} ’ \acute{e} < \cdot , \cdot , \acute{e} B f f f f H f < f g ’ \tilde{I} ANULL, \tilde{A} , \cdot , \acute{e} (“ \tilde{z} — \tilde{n}) B

$\check{Z}Q$ \acute{A} @D3DOPCODE \acute{A} D3DRENDERSTATETYPE

»,i¼,iE^

D3DVALUE

```
typedef float D3DVALUE, *LPD3DVALUE;
```

```
, ±, ìÉ^, í AŠî-{"I, ÈDirect3D, ì• "ff [f^É^, Å, , é B
```

•Ô'1

fGf%o [,Í•%o ””l,Â•\,³,ê A'g,Ý ‡,í,³,ê,é,±,Æ,Í,È,ç BŽŸ,É A,·,×,Ä,ÌDirect3Df 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 AffWf^f< EfWfþfCfXfefBfbfN EfffofCfX, Ö, ÌfAfNfZfX, “%Á”\, É, È, Á, ½ B, ± , ê, 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%ofCfo Ef, fff<, ©, ç \ -, ³, ê, 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, » , ê , “-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, ÌDirectInputCf“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,ÍfTf] [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,ff<,Ì‘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‘İ,É,Ä,¢,Ä à–¾,µ A Win32fWf‡fCfXfefBfbfNAPI,©,ç,Ì‘İ X“_„ð–¾,ç,©,É,·,é BDirectInput API,Í Af^fbf^fXfNfŠ [f“,âf^fufœfbfg Af%ofCgfyf“,Æ,¢,Ä,½ â‘İ À•WEn“à,ÄÈ‘u,ð‘Ç Ō,·,é‘¼,Ìâ •“ü– ÍffofCfX,É,à“K—p,³,ê,é B<@”\Šg’£ ,É,æ,è Af%of_ [Efyf_f< Aftf%ofCfg Ef^ [fN Afo [f^ff< EfŠfAfŠfefB EfwfbfhfMfA,È,Ç‘¼,ÌffofCfX,É ‘İ,·,éfTf| [fg,à’ñ<ÿ,³,ê,é BŠeffofCfX,Í Ä‘â6–{,Ì%o^“®Ž² AZ<“_fnfbfg,“,æ,Ñ32CEÄ,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,½fAvfšfP [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#fCfXfefBfbfN,ì<@”

DirectInputfT [frfX,Í AfIfyfĈ [fefBf“fO EfVfXfefĈN“@Žž,Éf [fh,³,ê,é BDirectInput,ÍfAfif fO,;æ,ÑffWf
^f<,ÌfWf#fCfXfefBfbfN,đfTf| [fg,·,é BfAfif fO EfWf#fCfXfefBfbfN,Í A,æ,èfŠfAf<f^fCfĈ,È%ž“š,đ•K—
v,Æ,µ AfIfWf^f< EfWf#fCfXfefBfbfN,æ,è,à‘â,«,È•%×,đfVfXfefĈ,É—
^,|,é BDirectInputfT [frfX,Í A^Û,È,é \ ¬,ÌfAfif fO EfWf#fCfXfefBfbfN,đ•j ”“~Žž,Éf,fjf^,·,é,±
,Æ,^a,Á,«,é B,»,ì \ ¬,Í A Á‘â4-{,Ì%“@Žž,đ‘Ç Ō,µ Á‘â4,Á,Ìf{f^f“,đ—p,Ĉ
,éfAfif fO EfWf#fCfXfefBfbfN2Šî,©,ç A2-{,Ì%“@Žž,đ‘Ç Ō,µ Á‘â4,Á,Ìf{f^f“,đ—p,Ĉ
,éfAfif fO EfWf#fCfXfefBfbfN4Šî,Û,Á,Ì‘ÍÍ,É“n,é B,Û,½ffWf^f< EfWf#fCfXfefBfbfN,É,Á,Ĉ
,Á,Í“~Žž,É Á‘â16Šîf,fjf^,Á,«,é B1Šî, ,½,è A%“@Žž,Í Á‘â6-{ Af{f^f“,Í Á‘â32ĈĈ,Û,Á,Á, ,é B

fWf#fCfXfefBfbfN,^aÇ Ō,·,éŠe%“@Žž,É,Í i“@”ÍÍ,^a, ,é B i“@”ÍÍ,Æ,Í AfWf#fCfXfefBfbfN,Ìnf“fhf<,đfjf...
[fg%of<,Û,½,Í Áž~ ó‘Ů,ÌÈ‘u,©,ç“@,©,1,é“Ō—£,ê,½“_,Û,Á,Ì<—£,Á, ,é B

fWf#fCfXfefBfbfN Efhf%ofCfo,Í Á‘â16,Ìf~fjfhf%ofCfo,đfTf|
[fg,µ AŠef~fjfhf%ofCfo,Í,Đ,Æ,Á,ÌfWf#fCfXfefBfbfN,đfTf| [fg,·,é BjoyGetNumDevsŠÖ ”,đ—p,Ĉ,é,±
,Æ,È,æ,è AfWf#fCfXfefBfbfN Efhf%ofCfo,^afTf| [fg,·,éfWf#fCfXfefBfbfN ”,đ‘2,×,é,±,Æ,^a,Á,«,é B,±
,ÌŠÖ ”,Ìfhf%ofCfo,^afTf| [fg%“Á”
,ÉfWf#fCfXfefBfbfN ”,đžw‘è,·,é•, †,È,µ @ ”,đ•Ō,· BfWf#fCfXfefBfbfN,^afTf| [fg,³,é,Á,Ĉ
,È,Ĉ è †,Í0,đ•Ō,· B

fAfvfŠfP [fVf#f“,Í AjoyGetPosExŠÖ ”,đ—p,Ĉ,é,±,Æ,É,æ,è AfRf“fsf... [f^,ÉfWf#fCfXfefBfbfN,^a Ú‘±
,³,ê,Á,Ĉ,é,©,Ç,©,²,×,é,±,Æ,^a,Á,«,é B,±,ÌŠÖ ”,Í Ažw‘è,³,ê,½ffofCfX,^a Ú‘±,³,ê,Á,Ĉ
,ê,ÌJOYERR_NOERROR A,»,±,Á,È,_,ê,ÌJOYERR_UNPLUGGED,đ•Ō,· B

ŠefWf#fCfXfefBfbfN,É,Í AfAfvfŠfP [fVf#f“,©,ç—~—p%“Á”,È<@”\,^a,Ĉ,,Á,©‘¶ Ý,·,é B,»,ì<@”
,Í AjoyGetDevCapsŠÖ ”,đ—p,Ĉ,Á‘2,×,é,±,Æ,^a,Á,«,é B,±,ÌŠÖ ”,Í AfWf#fCfXfefBfbfN,Ì—
LĈø,È%“@Žž,â Á•WĈEn,Ì Á -‘1,“,æ,Ñ Á‘â1 AfWf#fCfXfefBfbfN â,Ìf{f^f“ ”,Æ,Ĉ
,Á,½fWf#fCfXfefBfbfN,ì<@”\,đJOYCAPS \‘Ĉ‘Ì,É‘â“ü,·,é B

· ~Ō

joyGetNumDevs,Ì•Ō‘1,Í AfVfXfefĈ,É Ú‘±,³,ê,½fWf#fCfXfefBfbfN ”,Á,Í,È, AfVfXfefĈ,^afTf|
[fg,·,éfWf#fCfXfefBfbfN ”,đž!,· 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”È“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“,ª%oÄ”

,Æ,È,é BfLfffŠfufŒ [fVf#f“ îñ,lfŒfWfXfgfŠ,ÉŠ”[³,è,é,Ì,Ä A ÄfLfffŠfufŒ [fVf#f“,·,é,±,Æ,È,-

fWf#fCfXfefBfbfN,ð•È,Ì,à,Ì,ÉŽæ,è‘Ö,!,é,±

,Æ,ª,Ä,«,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,Ä,ç

,ÄfŒfWfXfgfŠ,ð X V,µ A,»è,ðfWf#fCfXfefBfbfN Efhf%ofCfo,É’È’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’È’m,·,é,±,Æ,ª,Ä,«,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‘ã32ÆÄ,İf{f^f“,İ óÔ î•ñ

fLfffŠfufÆ [fVf#f“,³,é,Ä,ç,È,ç(“¾,ç,é,½,Û,Û,Ì)fWf#fCfXfefBfbfN,İff [f^

'è<,³,é,Ä,ç,é¹,Ì”Í,Ä•]‰z,³,é,½ff [f^

'† S,É, ,é•]‰zff [f^

fWf#fCfXfefBfbfN,İfjf... [fgf%of<Ê'uŽüÍ,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,ªñ<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

DirectInputfIfufWfFfNfg, **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

DirectInputfCf“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

DirectInputDevicefIfufWfFfNfg,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^ [ftFfCfX,ð•Ô,· B

IDirectInput::CreateDevice,ì‘æ^ê,ìfpf%of [f^,ÍfCf“fXf^f“fXGUID,Ä A,± ,ê,ÍfCf“f^ [ftFfCfX,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 [fhEfFfA(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,ÈfffofCfX,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”,ÈfffofCfX 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,İdwDataftB [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,ÄfffofCfX,“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,Í 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,·,×,«È,İ,Í Af}fEfX,É,Í âİÊ’u,Æ,ç,µ l,·ü,“¶ Ý,µ,È,ç,Æ,ç,µ“_,Ä, ,é B,»İCE%Ê A âİ Ä•W, İDirectInput,©,ç“¾,ç,é,½,·,×,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—,ª,È,ç,± ,Æ,đŽ!,µ,Ä,·,è Af}fEfX Eff[fCf“f^,İfXfNfŠ [f“ Ä•W,Æ,Í—ŠÖEW,Ä, ,é BfAfvfŠfP [fvf±f“ ,Í A âİ Ä•W,đ- çm,İCE“_,É,Í,.,é,Š,İ Ä•W,Ä, ,é,Æ,µ,Ä,µ,µ B ½,Æ,·,İ AfAfvfŠfP [fvf±f“,İfffofCfX,İ”FŽ“¼CEä,É,»,İ,Æ,« ,İ âİÊ’u,đL^,µ A,»,é,đ u%o¼zCE ‘_ v,Æ,µ,Ä•ÜŽ ,.,é,±,Æ,ª,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,ÄfffofCfX,©,çŽæ“¾,³,é,é âİ Ä•W,©,ç%o¼zCE“_,Æ,İ ,.,đ,Æ,é,(± ,é,đŽY,İIDirectInputDevice::Unacquire,Ü,Ä±,_,é) B f ^,È,Š,İfffofCfX(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—,ª, ,é B

f}fEfX,İCE» 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,äŞef{f^f“,İ óÖ,Æ,ç,Ä,½ îñ,ª, ,é B

f}fEfX,©,çfobftf@ Eff [f^,đŽæ“¾,.,é,É,Í ADIDEVICEOBJECTDATA \‘ç,İ,İ”z—ñ,đ ì -,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,Èff [f^,ª,È, - È,é,ç, ,é,ç,İ”z—ñ,ª,»,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,©,çfobftf@ Eff [f^,đŽæ“¾,.,é Ü A’Pê,İDIDEVICEOBJECTDATA \‘ç,İ,È—^,!,ç,é,éff [f^,İf} fEfX ä,İP^èfİfufWfFfNfg,İ óÖ,ÈŠÖ,·,é,İ X“_,Ä, ,é B,½,Æ,·,İ A“TCE^I,Èf} fEfX,È,İÄ,Ä,İfİfufWfFfNfg A,.,É,İ,ç“ü—Í [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!,B•üCEü,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•üCEü,İ•İ%o»,ª, ,Ä,½,±,Æ,đŽ!,—vf A,ª,ÑyŽ²•üCEü,İ•İ%o»,ª, ,Ä,½,± ,Æ,đŽ!,—vf,Ä, ,é B

IDirectInputDevice::GetDeviceData,İCEÄ,Ñ o,µ,İCEä AfAfvfŠfP [fvf±f“,Í A, ,ç,©,¶,B’èç,³,é,Ä,ç ,é,è ”,ÆDIDEVICEOBJECTDATA \‘ç,İ,İdwOfstfB [f<fh,Æ,đ”äŠr,.,é,±,Æ,È,æ,è”z—ñ’†,İ— vf,ª,ç,İfİfufWfFfNfg,đŽQ Æ,µ,Ä,ç,é,ç,đ’m,é,±,Æ,ª,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,ª,æ,ÑDIMOFBS_Z,Ä, ,é B,±,é,ç,İ,è ”,Í A DIMOUSESTATE \‘ç,İ,Ä,İ,İ,İfİfZfbfg,đŽQ Æ,.,é B,±,é,ç,İ,è ”,đ—p,ç ,Ä ADIDEVICEOBJECTDATA \‘ç,İ,İff [f^,ªf}fEfX ä,İ,ç,İfİfufWfFfNfg,đŽQ Æ,µ,Ä,ç,é,ç,đ ³Sm,È’m,é,± ,Æ,ª,Ä,«é B,»,İfİfufWfFfNfg,È,İ,.,éŽÄff [f^,Í \‘ç,İ,İdwDataftB [f<fh,È“¶ Ý,.,é Bf{f^f“ EfİfufWfFfNfg,È, Ä,ç,Ä,İdwData,İ%o^ÈföfCfG,¾,^,ª—L^Ö,Ä, ,é B,±,İföfCfG,İ äÊftrfbfg,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 Afobftf@ 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 AŽŽ •t,«,İf}fEfX Eff [f^,ª—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,İ²fCefxf<,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-p”É,ÉDIERR_INPUTLOST,ð`È'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“,ªDISCL_FOREGROUNDf, [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 ADIERR_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“,ªDISCL_NONEXCLUSIVEf, [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“,ªDISCL_EXCLUSIVEf, [fh,Äf}fEfX,ÉfAfNfZfX,μ,Ä,ç,é è ± Af}
fEfX Eff [f^,ÍDirectInput,ð%ð,μ,Ä,Ï,ÏŽæ“¾%Ä”\,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^,đŽæ“¾,.,é,É,Í A

IDirectInputDevice::SetDataFormat,đc dfDIKeyboardff [f^ EftFH [f} fbfg,ÁEÄ,Ñ o,³,È,̄,ē,Ī,Ē,ç,È,ç BDirectInput,Í AfCf“f^ [fifVf‡fif< EfL [f{ [fh ā,É“¶ Ý,.,é’Ç%ÁfL [Ī,©,è, Á,È,Šg’EfL [f{ [fh ā,ĪŠefL [Ī,É’Ī,μ,Ā,ā’è ”,đ’è<,μ,Ā,ç,é B,Ū,Æ,ñ,Ç,Ī ē ‡ A,± ,é,ç,Ī’è ”,ĪŽÀ Ū,É,ĪPCŠg’EfXfLfff“fR [fh,Ā, ,é B,±,é,ç,ĪfL [’è ”,ĪDIK_,ĀŽn,Ū,è Adinput.h,Ā’è<,³,é,Ā,ç ,é BNECFL [f{ [fh,ĪPCŠg’EfL [f{ [fh,Æ,ĪŪ,È,éfXfLfff“fR [fh,đfTf] [fg,μ,Ā,ç ,é,Ī,Ā ADirectInput,ĪNECFL [fXfLfff“fR [fh,đ%Ā”],È,©,~,èPCŠg’EfXfLfff“fR [fh,É,ĪŠ,μ,Ā,ç ,é B,æ,è Ū ×,È ĩñ,Ē,Ā,ç,Ā,Ī AfL [ff [fh EffXfLfff“fR [fh,đŽQ Æ,Ī,±,Æ B

fL [f{ [fh,ĪCE» Ý,Ī ó’Ô,đŽæ“¾,.,é,½,β,É,Í A256fofCfG,Ī \’c’Ī,đ éCE¾,μ A,»Īf| fCf“f^,đ**IDirectInputDevice::GetDeviceState** f f\fbfh,Ö“n,³,È,̄,ē,Ī,Ē,ç,È,ç B

IDirectInputDevice::GetDeviceState f f\fbfh,ĪWindows,ĪGetKeyboardStateŠÖ ”,Æ“—Ī,Ī@”\

,đ%Ē,½,· BfffofCfX,Ī ó’Ô,Ī,±,Ī256fofCfG,Ī”z— ñ,ÉŠi”[,³,è AŠefofCfG,Ī,Đ,Æ,Ā,ĪfL [Ī ó’Ô,É’Ī%ž,.,é B,½,Æ,Ī,Ī ADIK_ENTER”Ö— Ū,ĪfofCfG,Ī āĒftrfbfg,³fZfbfg,³,é,Ā,ç,é ē ‡ AEnterfL [Ī,°%Ÿ,³,é,Ā,ç ,é B,μ,©,μGetKeyboardState,Æ,ĪŪ,È,è ADirectInput,ĪfofCfG,Ī āĒftrfbfg,μ,©Žg— p,μ,È,ç B āĒftrfbfg,³fZfbfg,³,é,Ā,ç,é ē ‡ A,»ĪfL [Ī,°%Ÿ,³,é,Ā,ç,é,±,Æ,đŽĪ,· B,»μ ,Ā,È,̄,ē,Ī AfL [Ī,°%Ÿ,³,é,Ā,ç,È,ç B

fL [f{ [fh,©,çfofbftf@ Eff [f^,đŽæ“¾,.,é,É,Í **ADIDeviceObjectData** \’c’Ī,Ī”z—ñ,đ ĩ~,μ Af| fCf“f^,.,æ,Ñ,±,Ī”z—ñ,ĪfTfCfY,đŠŪ,b•Ī ”,đ**IDirectInputDevice::GetDeviceData**,É“n,³,È,̄,ē,Ī,Ē,ç,È,ç B“ü—Ī’Ö,ç s— ñ,Éff [f^,ā,È,̄,ē,©, ,é,ç,Ī”z—ñ,ā,.,Ū,Ā,Ā,μ,Ū,μ,Ū,Ā ADirectInput,Ī Ā,àEÄ,çfL [f{ [fh Eff [f^,©,ç”z— ñ,É“ü,ē,Ā,ç, B **IDirectInputDevice::GetDeviceData**,©,ç•Ö,³,é,éfTfCfY•Ī ”,ĪŽÀ Ū,ÉŽg—p,³,é,Ā,ç,é”z—ñ— v’f ”,Ā, ,é BfL [f{ [fh,©,çfofbftf@ Eff [f^,đŽæ“¾,.,é Ū A’P’è,Ī**IDIDeviceObjectData** \’c’Ī,É— ^,Ī,ç,é,éf [f^,ĪfL [f{ [fh ā,Ī’P’èfIfufWfFfNfg,Ī ó’Ô,ÉŠÖ,.,éĪ X“—,Ā, ,é BfL [f{ [fh ā,ĪŠefL [Ī,Ū,½,Īf{f^f “,ĪfIfufWfFfNfg,đ•,· Bf† [fU,°Ā”fL [Ī,đ%Ÿ,μ,Ā—Ē,μ A’±,ç,ĀÖR”fL [Ī,đ%Ÿ,.,Æ A **IDirectInputDevice::GetDeviceData**,Ö“n,³,é,½,ĐIDEVICEOBJECTDATA \’c’Ī,Ī”z—ñ,É,Ī,Ī— v’f,°ā“ü,³,é,é B“Ā”fL [Ī,°%Ÿ,³,é,½,±,Æ,đŽĪ,·—v’f AĀ”fL [Ī,°—Ē,³,é,½,±,Æ,đŽĪ,·—v’f A,.,æ,Ñ ÖR”fL [Ī,°%Ÿ,³,é,½,±,Æ,đŽĪ,·—v’f,Ā, ,é B

IDirectInputDevice::GetDeviceData,ĪEÄ,Ñ o,μ,ĪEā AfAfVfŠfP [fVf‡f“Ī A, ,ç,©,¶,β’è<,³,é,Ā,ç ,éDIK_*”è ”,Æ**IDIDeviceObjectData** \’c’Ī,ĪdwOfstfB [f<fh,đ”āŠr,μ,Ā A”z—ñ’†,Ī— v’f,°ç,ĪfIfufWfFfNfg(Ī,Ū,½,ĪfL [Ī,đŽQ Æ,μ,Ā,ç,é,©,đ’m,é,±,Æ,°Ā,«é B,Ū,½**DIK_***”è ”,đ—p,ç ,Ā **ADIDeviceObjectData** \’c’Ī,Īff [f^,āfL [f{ [fh ā,Ī,ç,ĪfIfufWfFfNfg,đŽQ Æ,μ,Ā,ç,é,©,đ ³Šm,É’m,é,± ,Æ,°Ā,«é BfIfufWfFfNfg,ĪŽĀff [f^,Ī \’c’Ī,ĪdwDataftfB [f<fh,É“¶ Ý,.,é BfL [f{ [fh ā,ĪfL [Ī,æ,μ ,É,Éf{f^f“fIfufWfFfNfg,É,Ā,ç,Ā,ĪdwData,Ī%”ÉfofCfG,¾,°,°—L’Ó,Ā, ,é B,± ,ĪfofCfG,Ī āĒftrfbfg,Ī AfL [Ī,°%Ÿ,³,é,é,ÆfZfbfg,³,é AfL [Ī,°—Ē,³,é,é,ÆfNfŠfA,³,é,é B

ff [f^,°**IDirectInputDevice::GetDeviceData**,.,æ,èŽæ“¾,³,é,Ā,ç,é ē ‡,Ī,Ý AŽž •t,«,ĪfL [f{ [fh Eff [f^,ā—~ p%Ā”],Æ,È,é B

fAfVfŠfP [fVf‡f“Ī AfTfofCfX,đ”FŽ~,μ,Āff [f^,đŽæ“¾,.,é’O,É AfL [f{ [fh EfffofCfX,Īç’²fCefxf<,đfZfbfg,μ ,È,̄,ē,Ī,Ē,ç,È,çĪ,.,Ī,½,β,É,Í A•K— v,Éç’²fCefxf<,đŽĪ,·fTfofO,đfZfbfg,μ,Ā**IDirectInputDevice::SetCooperativeLevel**,đEÄ,Ñ o,· BWindows 95ŠĀ«%»,Ā,Ī AfL [f{ [fh EfffofCfX,É’Ī,μ,ĀĒ%»,Īç’²fCefxf<,fTf] [fg,³,é,Ā,ç,é B **DISCL_BACKGROUND | DISCL_NONEXCLUSIVE ADISCL_FOREGROUND | DISCL_NONEXCLUSIVE**,Ā, ,é BDirectInput 3.0,Ā,Ī**DISCL_BACKGROUND | DISCL_EXCLUSIVE ADISCL_FOREGROUND | DISCL_EXCLUSIVE**,ĪfL [f{ [fh EfffofCfX,É’Ī,μ,ĀfTf] [fg,³,é,Ā,ç,È,ç B,± ,é,Ī AfL [f{ [fh Eff [f^,ā,Ā,È,ÉDirectInput,ÆWindowsf fbFZ [fW,Æ,đ’È,μ,ĀŽó M,³,é,é,±,Æ,đ’Ó— ĵ,·,é BŠeç’²fCefxf<,Ī’Ó—ĵ,ÉŠÖ,.,é Ū ×,È ĩñ,Ē,Ā,ç,Ā,Ī A,±,é,ç,Īç’²CEĀ’è ”,É,Ā,ç,Ā,ĪçL q,đŽQ Æ,.,é,±,Æ B

DirectX,Ī «—~fo [fWf‡f“,Ā,Ī AWindows NT ā,ĀDirectInput,°fTf] [fg,³,é,é,æ,μ,É,È,é B,¾,° AWindows NT,Ā,ĪfL [f{ [fh EfffofCfX,É’Ī,μ,Ā**DISCL_FOREGROUND | DISCL_NONEXCLUSIVE**,μ,©fTf] [fg,³,é,È,ç BfAfVfŠfP [fVf‡f“,đWindows NT,ĀŽĀ s,.,éK—v,° ,é ē ‡ AfL [f{ [fh,Ö,ĪfAfNfZfX,É,Ī,± ,Īç’²fCefxf<,đŽg,μ,±,Æ,È,È,é BfL [f{ [fhfhf%ofCfo,ĪfTf] [fgfCefxf<,É,æ,Ā,Ā,Ī AWindows 95 ā,ĪDirectInput,Ā,Ā**DISCL_FOREGROUND | DISCL_NONEXCLUSIVE**,¾,°,ĪfTf] [fg,ÉCEĀ’è,³,é,é%Ā”\ «,°, ,é B,μ,½,°,Ā,Ā A, ,é,¾,°,·,×,Ā,ĪfVf%ofbfgftfH [fç ,.,æ,ÑfL [f{ [fhfhf%ofCfo ā,ĀfAfVfŠfP [fVf‡f“,đŽĀ s,.,éK—v,° ,é ē ‡ A,±,Īç’²fCefxf<,đ—p,ç,é,×,«Ā, ,é B

IDirectInputDevice::GetDeviceData,Ū,½,Ī**IDirectInputDevice::GetDeviceState**,.,æ,èfL [f{ [fh EfffofCfX,©,çff [f^,đŽæ“¾,.,é’O,É **AIDirectInputDevice::Acquire**,đEÄ,Ñ o,μ,ĀfffofCfX,đ”F Ž~,μ,Ā,.,©,È,̄,ē,Ī,Ē,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,Ā,ÍfVfXfefĀ Ef fjf... [,ªI•đ,³,ê,é,© A,Û,½,ÍfEfBf“fhfE,ªfŠfTfCfY, ,é,Ā ,ÍŪ“@,³,ê,é ê ‡,à AfffofCfX,đ%đ•ú,μ,È,¯,ê,Í,È,ç,È,Ā 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,ÅfL [f{ [fh,đŽg—p,μ,Ä,Ā ,é ê ‡ AIDirectInputDevice::GetDeviceData,Û,½,Í IDirectInputDevice::GetDeviceState. ,©,ç,ÌDIERR_INPUTLOST•Ô¹,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•Ô¹,đŽó,¯Žæ,Á,½ ê ‡fAfvfŠfP [fVf‡f“,ÍfL [f{ [fh EfffofCfX,ì”FŽ¯,đ Ä“x s,ª,x,«,Å, ,é B,μ,©,μ A,Ç,ì,æ,ª,Èf^fCfv,ìfGf%o [,ªª ¶,μ,½ Û,Å,à³ đĀ ,ÉDirectInputfffofCfX,đ”FŽ¯,μ¼,³,¹,é,æ,ª ,ÈfAfvfŠfP [fVf‡f“,đ ‘,Ā,Í,È,ç,È,Ā B”FŽ¯,Å,«,È,ĀfffofCfX,đ”FŽ¯,μ,æ,ª,Æ,μ,Å³ĀfĀ [fv,ÉŠx,é%Å”\ «,ª, ,é ,©,ç,Å, ,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,è,é,Ì,Á, ,é B

,±,Ì,±,Æ,ð à-¾,·,é,½,ß AfL [f{ [fh,ÌŠî-{fÇfCfAfEfG,ðUS PCSŠg'EfL [f{ [fh,Æ,·,é B, ,éfL [,“¶ Ý,µ,È,ç,Æ,ç
,q,Æ,«„Í A,»„ÌfL [,ÍUS PCSŠg'EfL [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,è,½,ÆZ,3,è,é,Æ,« A,»„ÌfL [,ÍUS PCSŠg'EfL [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'EfL [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,±,è,ç,ÌfL [,ª•— “I,É—~p%Á”\,©,Ç,q,©,ð'm,é•û-@,Í,È,ç B

DIK_PAUSEfL [fR [fh,Í¶ Ý,µ,È,ç,Æ,ç,q,±,Æ,É' ^Ó,ð—v,·,é BPCŠg'EfL [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,è,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'EfL [(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,è,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 Ý,·,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 Ý,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%oÝ,³,ê,é,Æ%oÝ,³,ê,½,Æ,Œ
 ,mfCxf“fg,ð Ų ¬,µ AŽŸ,É%oÝ,³,ê,é,Æ—£,³,ê,½,Æ,Œ,ŒmfCxf“fg,ð Ų ¬,·,é B

fL [f{ [fh	•t%oÁfL [“Ų Ý,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%ofbfbfvfgfbfvfL [f{ [fh	DIK_F13, F14, F15 DIK_KANA DIK_KANJI DIK_NOCONVERT DIK_NUMPADCOMMA DIK_NUMPADEQUALS DIK_STOP DIK_UNDERLINE DIK_YEN	DIK_GRAVE DIK_NUMLOCK DIK_NUMPADENTER DIK_RCONTROL DIK_RMENU DIK_RSHIFT DIK_SCROLL
AXfL [f{ [fh	DIK_AX DIK_CONVERT DIK_KANJI DIK_NOCONVERT DIK_YEN	DIK_RCONTROL DIK_RMENU
J-3100fL [f{ [fh	DIK_KANA DIK_KANJI DIK_NOLABEL	DIK_RCONTROL DIK_RMENU

DIK_YEN

DirectInputŠftf@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)
```

```
fIfufWfFfNfgf^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^êfpf%of [f^,Æ‘æ^ñfpf%of [f^,Æ,ì ‡ ~ŠÖEW,ª A‘æ^ñfpf%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,èŽžŸEn—ñ“I,É æ s,·,é,©,ðf`fFfbfN,·,é B

```
if (DISEQUENCE_COMPARE(dwSequence1, <, dwSequence2)) {  
    ...  
}
```

ŽŸ,ì—á,ÍdwSequence1,ªdwSequence2,æ,èŽžŸEn—ñ“I,ÉŸEã±,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 ”

DirectInputCreate

```
HRESULT DirectInputCreate(  
    HINSTANCE hinst,  
    DWORD dwVersion,  
    LPDIRECTINPUT * lplpDirectInput,  
    LPUNKNOWN punkOuter);
```

IIDirectInput COMFCF“f^ [ftfFfCfX,đfTf]

[fg,·,éDirectInputIfufWfFfNfg,đ ì ¬,·,é,½,ß,ÉĀ,Ñ o,³,ê,é B ³ í,ÉĀ,Ñ o,³,ê,é,Ā AŠÖ ”,Í*lpplDirectInput,É,·,·,é V,½,ÈfIfufWfFfNfg,Öf|fCf“f^,đ·Ö,· B

,±,İŠÖ ”,đpunkOuter = NULL,ĀĀ,Ñ o,·,±,Ā,Í A CoCreateInstance(&CLSID_DirectInput, punkOuter, CLSCTX_INPROC_SERVER, &IID_IDirectInput, lplpDirectInput),đ%öî,µ,ĀfIfufWfFfNfg,đ ì ¬,µInitialize,Ā %Šú%»·,·,é,±,Ā,Ā“™,Ā,·,é B

,±,İŠÖ ”,đpunkOuter != NULL,ĀĀ,Ñ o,·,±,Ā,Í A CoCreateInstance(&CLSID_DirectInput, punkOuter, CLSCTX_INPROC_SERVER, &IID_IUnknown, lplpDirectInput),đ%öî,µ,ĀfIfufWfFfNfg,đ ì ¬,·,é,±,Ā,Ā“™,Ā,·,é B W ¬»»,³,ê,½fIfufWfFfNfg,ÍŽè ìĀ,Ā %Šú%»·,µ,È,¬,ê,İ,È,ç,È,ç B

,±
,İfT [frfX,É,ÍANSIfö [fWf#f“,·,æ,ÑUNICODEfö [fWf#f“,·,É,É¶ Ý,·,é BANSIfö [fWf#f“,·,ÍIDirectInputAfCf“ f^ [ftfFfCfX,đfTf]

[fg,·,éIfufWfFfNfg,đ ì ¬,µ AUNICODEfö [fWf#f“,·,ÍIDirectInputWfCf“f^ [ftfFfCfX,đfTf]
[fg,·,éIfufWfFfNfg,đ ì ¬,·,é B¶ŽšfZfbfg,·,â-è,Ā,È,é¼,İfVfXfef€ EfT [frfX,É,Ā,ç,Ā,Í Afwfbf_ftf@fCf<,İf}fNf ,ÍDirectInputCreate,đ“K Ø,È,¶ŽšfZfbfg,Éf}fbfsf“fO,·,é B

hinst

DirectInputIfufWfFfNfg,đ ì ¬,µ,Ā,ç,éAfvfšfP [fVf#f“,Ü,½,İDLL,İfCf“fXf^f“fX Efnf“fhf< B

dwVersion

Žg—p,³,ê,½dinput.hfwfbf_ftf@fCf<,İfo [fWf#f“”Ô † B,±,İ¹,İDIRECTINPUT_VERSION,Ā,È,¬,ê,İ,È,ç,È,ç B

DirectInput,İ,±,İ¹,đ—p,ç

,Ā A,ç,İfo [fWf#f“,İDirectInput,É,İ,µ,ĀAfvfšfP [fVf#f“,Ü,½,İDLL,· ÝĀv,³,ê,½,İ,©,đ’m,é B

lplpDirectInput

³ İŽĀ s,³,ê,é ê † AIDirectInputfCf“f^ [ftfFfCfX,Ö,İf|fCf“f^,đ,ç,±,É·Ö,·,©,đŽw,µŽ!,· B

punkOuter

OLE W ¬»»<@”\,·,ç-m,İ §Ā,Ö,İf|fCf“f^ BfCf“f^ [ftfFfCfX,· W ¬»»»,³,ê,Ā,ç,È,ç ê †,İO B,Ü,Ā,ñ,ç,İĀ,Ñ o,µ,·,İO,đ“n,· B

W ¬»»»,·—v< ,³,ê,½ ê † A*lpplDirectInput,É·Ö,³,ê,éIfufWfFfNfg,İIUnknown,Ö,İf|fCf“f^,Ā,·,é B
OLE W ¬¹,·—v< ,·,éIDirectInput,Ö,İf|fCf“f^,Ā,İ,È,ç,±,Ā,Ē’ ^Ó B

·Ö¹

COMfGf%ö [fR [fh,đ·Ö,· B^È%°,İfGf%ö [fR [fh,İ·Ö,³,ê,éfR [fh,İ,·,×,Ā,Ā,ÍĀ,ç,È,ç B

DI_OK = S_OK: ‘€ ì,·³ í I—,µ,½ B

DIERR_INVALIDPARAM = E_INVALIDARG: lpplDirectInputpf%öf [f^,·—LĀø,Èf|fCf“f^,Ā,İ,È,ç B

DIERR_OUTOFMEMORY = E_OUTOFMEMORY: f f,š,·s“«,µ,Ā,ç,é B

DIERR_OLDDIRECTINPUTVERSION: DirectInput,İfo [fWf#f“,·Ā,ç B

DIERR_BETADIRECTINPUTVERSION: fTf]

[fgŠO,Ā,·,éDirectInputfx [f^ Efo [fWf#f“,É·İ,µ,ĀAfvfšfP [fVf#f“,·,·,©,ê,Ā,ç,½ B

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 ”,İ Af† [fU,ªfWf‡fCfXfefBfbfN,İLfffŠfufŒ [fVf‡f“, ,é,Œ,İ ÄLfffŠfufŒ [fVf‡f“,ð s,ª
,Æ,« A,Ü,½,İ•Ê,İfWf‡fCfXfefBfbfN EftfofCfX,ªI'ð,³,ê,é,Æ,«,É AfRf“fgf [f<fpplf<,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,Œ
,é ê ‡ AŒ» Ý'I'ð,³,ê,Ä,Œ,éfWf‡fCfXfefBfbfN,É'İ,·,éfŒfWfXfgfŠ,İJOYSTICK USER'1,ªİ X,³,ê,½,±,Æ,ð A,±
,İŠÖ ”,ð—p,Œ,ÄfWf‡fCfXfefBfbfNfhf%ofCfo,É'Ê'm,·,é,±,Æ,ª,Ä,«,é BJOYSTICK
USER'1,İfŒfWfXfgfŠ,İHKEY_LOCAL_MACHINE”ª,É, ,é B

dwFlags

—\-ñ,³,ê,Ä,“,è A0,ÉfZfbfg,µ,Ä,“,©,È,_,ê,İ,È,ç,È,Œ B

•Œ'1

-Œ÷,·,ê,İ JOYERR_NOERROR AŽ,”s,·,ê,İŽŸ,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, iŽ̄·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 fhfCfo, Tf [fg, μ, Ā, Ą, éWfXfBfN ", dhfCfo, ©, çŽæ“¾, ·, é B

Žw'è, ³, ê, ½WfXfBfN, fRf“fsf... [f^, É, ·— “I, É Ú‘±, ³, ê, Ā, Ą, é, ©, Ç, ρ, ©, δ'², ×, é, É, Í A joyGetPosExšÖ ”, δ
—p, Ą, é B

•Ō'l

fhfCfo, Tf [fg, ·, éWfXfBfN ", δ•Ō, · B fhfCfo, “¶ Ý, μ, È, -, ê, î0, δ•Ō, · 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_f< AŽ<“_fnfbfg A‘½ ”,ìf{f^f“,ðŽ ,ĀffofCfX,Æ,ĉ
,Á,½Šg‘ĒffofCfX,;,æ,Ñ Ā^â6Ž^2,ð—p,ĉ,½ Ā·WĒn,Ö,ìfAfNfZfX,“%Ā”\,Æ,È,é B

uJoyID
Æ%öi,^,ê,é,fWf‡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 AfAvfŠfP [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,éR [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%fXftf@fNfgfŠ,Æ’¼ 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'±,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);
```

*fIfuFwFfNfg ã,Ì¼,ÌfCf“f^ [ftFfCfX,ÉfNf%fCfAf“fg EfAfNfZfX,ð—^,é BOLEf}fjf...
fAf<,ÌIUnknown::QueryInterface,ðŽQ Æ,·,é,±,Æ B*

riid

•K—v,ÈfCf“f^ [ftFfCfXIID B

ppvObj

“¼,ç,ê,é,fCf“f^ [ftFfCfX,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 *fIfu fWfFfNfg, ÍDirectInput fTfu fVfXfef€, ð•\, µ A'P^ê“ü—ÍfffofCfX, ð•*
DirectInputDevice *fIfu fWfFfNfg, 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,ðfVfXfefE,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%ofo,ðdwFlagsfpf%of [f^,ÉfZfbfg,·,é Bftf%ofo **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 AlpCallbackfpf%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,»,ĪfjfbfNfĪ [fĉ A,·,æ
,Ñ »*iGUID,Æ,»,ĪfjfbfNfĪ [fĉ,ª AŠeffofCfX,É—^,!,ĉ,é,é B’P”ê,Ī“ü—
ĪffofCfX,É; ”,ĪDirectInputffofCfX Ef^fCfv,Īĉ”\,ª, ,é ê ±,Í AfTfĪ
[fg,·,éŠeffofCfX Ef^fCfv,É,Ī,μ,Ä,¹,ªÖ,³,é,é i,½,Æ,!,Ī A“à‘ f}fEfX,ð,à,ÄfL [f{ [fh,Í AfL [f{ [fh,·,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,·,æ,ÑfL [f{ [fh EffofCfX,Ī,Ý,ª—ñĉ“,³,ê,Ä,ĉ,é B

*lpDirectInput
±,Īf f“fo,ªŒÄ,Ñ o,³,ê,½DirectInputfIfufWfFfNfg,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_*¹,Æ,È,è A—ñĉ“,³,ê,éffofCfX Ef^fCfv,ðŽ!,· B,±,ĪfŠfŠ [fX,ĪDirectInput,Ä,Í Af}
fEfX EffofCfX,·,æ,ÑfL [f{ [fh,¾,¯,ª—ñĉ“,³,ê,é B*

*lpCallback
ŠeDirectInputffofCfX,ĪĉL q,Æ,Æ,à,ÉŒÄ,Ñ o,³,é,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» Ý“èĉ,³,ê,Ä,ĉ,éftf%ofo,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 Ī I—¹,μ,½ BfR [f<fofbfN,ª“r‘t,Ä—ñĉ“,ðŽž~,μ,½ ê ± A—ñĉ“,Ī ³ Ī I—
¹,μ,½,ÆŒŒ,È,³,ê,é,±,Æ,É’ Ö B
DIERR_INVALIDPARAM = E_INVALIDARG: flfpf%of [f^,É—³Œø,Èftf%ofo,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.
Parametry: *lpDirectInput* – ukazatel na objekt *LPDIRECTINPUT*, který je připojen k zařízení.
rguidInstance – GUID zařízení, jehož stav se má zjistit.

lpDirectInput

Účel: Získání stavu připojeného zařízení.
Parametry: *lpDirectInput* – ukazatel na objekt *LPDIRECTINPUT*, který je připojen k zařízení.
rguidInstance – GUID zařízení, jehož stav se má zjistit.

rguidInstance

Účel: Získání stavu připojeného zařízení.
Parametry: *lpDirectInput* – ukazatel na objekt *LPDIRECTINPUT*, který je připojen k zařízení.
rguidInstance – GUID zařízení, jehož stav se má zjistit.

•••

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,^a ì ¬,³,ê,é,ÆDirectInputCreatef f\fbfh,^aŽ©“@“I,É %Šú%»,đ s,²,½,ß A'Ê í,ÍAfvfŠfP [fVf‡f“,©,ç,±,İŠÖ ”,đĀĀ,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,³,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“,ÌDirectInput,É'İ,μ,ÄAfvfŠfP [fVf‡f“,Ü,½,ÍDLL,^a ÝĀv,³,ê,½,Ì,©,đŠm'è,·,é B

•Ŏ¹

COMfGf% [fR [fh,đ•Ŏ,· B`È%°,ÌfGf% [fR [fh,İ•Ŏ,³,ê,é,·,×,Ä,ÌfR [fh,Æ,ÍĀĀ,ç,È,ç B

DI_OK = S_OK: ffofCfX,Í Ú'±,³,ê,Ä,ç,é B

DIERR_OLDDIRECTINPUTVERSION: DirectInput,Ìfo [fWf‡f“,³ĀĀ,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,^aĈep³,·,·éIUnknownfCf“f^ [ftFfCfX,îrê” BfAfvfŠfP [fVf‡f“,ažg—p,μ,æ,ϖ,Æ,μ,Ä,ϕ ,éfCf“f^ [ftFfCfX,đ,»],îIfufWfFfNfg,^afTf] [fg,μ,Ä,ϕ,é,©,Ç,ϖ,©—â,ϕ ‡,í,í,é,½,β,É—p,ϕ,é B—â,ϕ ‡,í,í,½“Á’è,ìCOMfCf“f^ [ftFfCfX,đfIfufWfFfNfg,^afTf] [fg,μ,Ä,ϕ ,é ê ‡ AfAfvfŠfP [fVf‡f“,Í,»],îfCf“f^ [ftFfCfX,đ’¼,ç,Éžg—p,μžn,β,é,±,Æ,^aÄ,«,é B•K—v,ÈfCf“f^ [ftFfCfX,^afTf] [fg,³ê,Ä,ϕ,é ê ‡ AfAfvfŠfP [fVf‡f“,ìppvObjpf%of [f^,Éf] fCf“f^,^aÔ,³ê,é BfAfvfŠfP [fVf‡f“,a,»],îfCf“f^ [ftFfCfX,đžg—p,μ,È,ϕ,© A, ,é,ϕ,Ížg—p,đ I—¹,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,^aĈÄ,Ñ o,³ê,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,^a 3 í,ÉžÄ s,³ê,é ê ‡•Ô,³ê,éfCf“f^ [ftFfCfX E|fCf“f^,“ã“ü,³ê,é^È’u,đžw,μž!,· B

- Ô’1
DI_OK
DIERR_INVALIDPARAM
DIERR_NOINTERFACE

IDirectInput::Release

```
DWORD Release(  
    LPDIRECTINPUT lpDirectInput);
```

IDirectInput,³Ep³,³éIUnknownfCf“f^ [ftfFfCfX,îrê•” BŠÖ~A,ì, ,éCOMflfufWfFfNfg,ìŽQ ÆfJfEf“fg,ðE,,ç,·,½,ß,É—p,ç,ç,ê,é BflfufWfFfNfg,^a Å %
,É ì ¬,³ê,é,Æ,« AŽQ ÆfJfEf“fg,Í1,ÉfZfbfg,³ê,é BAddRef,^aĀ,Ñ o,³ê,é,½,Ñ,ÉŽQ ÆfJfEf“fg,ÍfCf“fNfŠf f“fg,³ê ARelease,^aĀ,Ñ o,³ê,é,½,Ñ,ÉŽQ ÆfJfEf“fg,ÍffNfŠf f“fg,³ê,é BŽQ ÆfJfEf“fg,⁰É,È,é,Æ A,» ,ìIfufWfFfNfg,Í%ð•ú,³ê,é B Ú ×,É,Ā,ç,Ā,Ī AOLEf}fjf...fAf<,ì IUnknown::QueryInterface,ðŽQ Æ,·,é,±,Æ B

```
lpDirectInput  
,±,ìf f“fo,aĀ,Ñ o,3ê,é,½DirectInputflfufWfFfNfg,ðŽw,μŽ!,· B
```

•Ô¹

V,½,ÈŽQ ÆfJfEf“fg,ðŠÜ,ÐDWORD B,±,î•Ô¹,ÍffofbfO—p“r,É,¾,Žg—p,³ê,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: ffofCfX,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—

ÍfffofCfX,Ö,ÏfAfNfZfX,ðŽæ“¾,·,é BGetDeviceState,Û,½,ÍGetDeviceData,ðŒÄ,Ñ o,·‘O,É AfffofCfX,ð”FŽ̄,μ,Ä,·
,©,È,̄,ê,Î,È,ç,È,ç BfffofCfX”FŽ̄,É,ÍŽQ ÆfJfEf“fg,“¶ Ý,¹, AfffofCfX,““ñ“x”FŽ̄,³,ê,Äê“x%ð•ú,³,ê,½ ê ‡ A
fffofCfX,Í%ð•ú,³,ê,½ ó‘Ô,È,È,é B

lpDirectInputDevice

,±,Ïf f“fo,³ŒÄ,Ñ o,³,ê,½DirectInputfffofCfX EfIfufWfFfNfg,ðŽw,μŽ!,· B

•Ô¹

COMfGf%o [fR [fh,ð•Ô,· B^È%°,ÏfGf%o [fR [fh,Í A•Ô,³,ê,éfR [fh,Ì,·,×,Ä,Æ,ÍŒÄ,ç,È,ç B

DI_OK = S_OK: ‘€ ì,Í ³ í I—¹,μ,½ B

S_FALSE: fffofCfX,Í,·,Ä,É”FŽ̄,³,ê,Ä,ç,é B,±,Ì¹,Í ³ ífR [fh,Ä, ,é,±,Æ,É’ ^Ó,·,é,±,Æ B

DIERR_INPUTLOST: fffofCfX,Ö,ÏfAfNfZfX,²—^,|,ç,ê,Ä,ç,È,ç B

DIERR_INVALIDPARAM = E_INVALIDARG: fffofCfX,Í‘I’ð,³,ê,½ff [f^ EftfH [f}fbfgŒŽ®,Ä,Í,È,ç B

IDirectInputDevice::AddRef

DWORD AddRef(LPDIRECTINPUTDEVICE lpDirectInputDevice);

IDirectInputDevice,^aEp³,·,éIUnknownfCf“f^ [ftfFfCfX,î~•” BŠÖ~A,Ì, ,éCOMfIfufWfFfNfg,ÌŽQ ÆfJfEf“fg,ð³,â,·,½,ß,É—p,ç,ç,é,é BfIfufWfFfNfg,^a Ä %
,É ì ¬,³,é,é Ú,É AŽQ ÆfJfEf“fg,Í,ÉfZfbfg,³,é,é BAddRef,^aĀ,Ñ o,³,é,é,½,Ñ,ÉŽQ ÆfJfEf“fg,ÍfCf“fNfŠf f“fg,³,é ARelease,^aĀ,Ñ o,³,é,é,½,Ñ,ÉŽQ ÆfJfEf“fg,ÍffNfŠf f“fg,³,é,é BŽQ ÆfJfEf“fg,⁰,É,É,é,é,Æ A,»,ìfIf ufWfFfNfg,Í%øð•ú,³,é,é B Ú ×,É,Ā,ç,Ā,Í AOLEf}fjf...fAf<,ì IUnknown::AddRef,ðŽQ Æ,·,é,±,Æ B

lpDirectInputDevice

,±,Ìf f“fo,^aĀ,Ñ o,³,é,é,½DirectInputffofCfX EfIfufWfFfNfg,ðŽw,μŽ!,· B

•Ŏ!l

V,½,ÉŽQ ÆfJfEf“fg,ðŠŮ,ÐDWORD B

IDirectInputDevice::GetCapabilities

```
HRESULT GetCapabilities(  
    LPDIRECTINPUTDEVICE lpDirectInputDevice,  
    LPDIDEVCAPS lpDIDevCaps);
```

“ü—ÍffofCfX,ì îñ,ðŽæ“¾,·,é B

lpDirectInputDevice

,±,ìf f“fo,ªĒÄ,Ñ o,³,ê,½DirectInputffofCfX EfIfufWfFfNfg,ðŽw,μŽ!,· B

lpDIDevCaps

,±,ìŠÖ ”,ª îñ,ð•Ô,·**DIDEVCAPS** \‘c‘ì,ðŽw,μŽ!,· B,±

,ìf f\fbfh,ðĒÄ,Ñ o,·‘O,É A \‘c‘ì,ìfTfCfY,ðdwSizeftfB [f<fh,ÄŽw’è,μ,Ä,¨,©,È,¯,ê,Î,È,ç,È,¢ B

ŽQ Æ @DIDEVCAPS

•Ô¹

COMfGf%o [fR [fh,ð•Ô,· B^È%o°,ìfGf%o [fR [fh,Í•Ô,³,ê,éfR [fh,ì,·,×,Ä,Æ,ÍĒÄ,ç,È,¢ B

DI_OK = S_OK: ‘€ ì,Í ³ í I—¹,μ,½ B

DIERR_INVALIDPARAM = E_INVALIDARG: lpDIDevCapsfpf%of [f^,ª—LĒø,Èf|fCf“f^,Ä,Í,È,¢ 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”FŽ~,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,ðfCf,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,àŠi”[,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 Û,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 æ,µ,È,¢ BCEä‘±

,İGetDeviceData,İ“~,¶ff [f^,ð“Ç,ÝŽæ,é B’È í,İ Aff [f^,İ“Ç,ÝŽæ,ç,ê,½Eäfobftf@,©,ç í æ,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,Û,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—Í’l,ðf fFfbfN,·,é•K—v,“,é,± ,Æ,É’ °O 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^,“,ç,“,Ä,©Ž,í,ê,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’ °O B

DIERR_NOTACQUIRED: ffofCfX,“FŽ~,³,ê,Ä,¢,È,¢ B

DIERR_INPUTLOST:

ffofCfX,Ö,İfAvfNfZfX,“+‘f,³,ê,½ BfAvfŠfP [fVf‡f“,İffofCfX,ð Ä”FŽ~,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 æ,·,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 ”
```


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,μž',. 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, Ĩ, È, ĉ, È, Ć B

lpDirectInputDevice
 , ±, Ĩf f“fo, “ĈĀ, Ñ o, ³, ê, ½DirectInputffofCfX EfIfufWfFfNfg, đžw, μžĭ, · B

cbData
 lpvData, É, æ, èžw, μžĭ, ³, ê, éofbftf@, ĩTfCfY, đfofCfG, Āžĭ, μ, ½, à, Ĩ B

lpvData
 fffofCfX, ĨĈ» Ý, ĩ ó‘Ō, đžó, “žæ, é \‘ĉ‘ĭ, đžw, μžĭ, · Bff [f^, ĩftfH [f}fbfg, Ĩ 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, ĩfGf%o [fR [fh, Ĩ•Ō, ³, ê, éfR [fh, ĩ, ·, ×, Ā, Ā, ĨĈĀ, ĉ, È, Ć B
DI_OK = S_OK: ‘Ĉ ĩ, Ĩ ³ ĩ, È Ĩ—, μ, ½ B

E_PENDING:

ffofCfX, É, Ĩ, Ū, ¾ff [f^, “¶ Ý, μ, È, Ć BffofCfX, Ĩ‘†, É, Ĩ(½, Ā, ‘, ĨUSBfWf†fCfXfefBfbfN) AffofCfX, “fIf“, É,
 È, éžž , ĀffofCfX, “ff [f^, đ‘— M, μžn, ß, éžž , ĨŌ, É‘Ō, ĉžžŌ, đ—v, ·, é, à, Ĩ, “, , é B, ±
 , ĩfEftfH [fĈfAfbfvžžŌ‘† AGetDeviceState, ĨE_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, ĩfAfNfZfX, “†‘f, ³, ê, ½ BfAvfšfP [fvf†f“, ĨffofCfX, đ Ā”Fž̄ , μ, È, “, ê, Ĩ, È, ĉ, È, Ć B

DIERR_INVALIDPARAM= E_INVALIDARG: lpvDatafpf%of [f^, “—LĈø, Èf|fCf“f^, Ā, È, Ć

, © A‘O%oñ, ĨSetDataFormat(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,  
    LPDIPOPROHEADER pdiph);
```

“ü—ÍfffofCfX,ÉŠÖ,·,é îñ,đŽæ“¾,·,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 B IDirectInputDevice::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“¾,³,é,éfvf fpfefB,İŽ·ĒŽq B, ,ç,©,¶,ß'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—ÍfffofCfX,É'İ,μ,Ā, ,ç,©,¶,ß'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!l

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%°,İĀĀĀĀĀĀfR [fh,İ'ê·”,Í ADIPROP_BUFFERSIZEfvf fpfefB,İ'l,İŽæ“¾·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,;,ç,Ä—~—p%oÄ”\,È“ü—Íf\ [fX(Ž² Af{f^f“,È,Ç),ð—ñ<“,;é B

lpDirectInputDevice

,±,İf 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,İ,;éŽQ Æff [f^(fRf“fefLfxfg) B

fl

—ñ<“,³,ê,éfIfufWfFfNfg,İf^fCfv,ðŽw`è,·,éftf%ofo Bff [f^ EftfH [f}fbfg Ef^fCfv,İ’g,Ý ‡,í,¹,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°,İfGf%o [fR [fh,Í•Ö,³,ê,éFR [fh,İ,·,×,Ä,Æ,ÍEÀ,ç,È,ç B
DI_OK = S_OK: ‘€ ì,İ ³ í,É I—¹,μ,½ BfR [f<fofbfN,“r’†,Å—ñ<“,ð’†Ž~,μ,½ ê ‡ A—ñ<“,İ 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
İfR [f<fofbfN,ª—³Eø,ÈfXfe [f^fX EfR [fh,ð•Ö,μ,½ B

IDirectInputDevice::Initialize

```
HRESULT Initialize(  
    LPDIRECTINPUTDEVICE lpDirectInputDevice,  
    HINSTANCE hinst,  
    DWORD dwVersion,  
    REFGUID rguid);
```

DirectInputDeviceIfufWfFfNfg,đ %Šú%»,;é B

,±,lf f\fbfh,a 3 í,ÉŽÀ s,3,ê,È,©,Á,½ ê ± AfIfufWfFfNfg,Í ó'Ô,a's'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,"F Ø,3,ê,Ä,ç,é,©,Ç,μ,©,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 B**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,«,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,«,È,©,Á,½ B

IDirectInputDevice::QueryInterface

```
HRESULT QueryInterface(  
    LPDIRECTINPUTDEVICE lpDirectInputDevice,  
    REFIID riid,  
    LPVOID FAR* ppvObj);
```

IDirectInputDevice,^aEp³,[·]éIUnknownfCf“f^ [ftFfCfX,Îê” BfAfvfŠfP [fVf‡f“,^aŽg—p,μ,æ,α,Æ,μ,Ä,¢
,éfCf“f^ [ftFfCfX,đ,»],İfufWfFfNfg,^afTf] [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,^afTf] [fg,μ,Ä,¢
,é ê ‡ AfAfvfŠfP [fVf‡f“,Í,»],İfCf“f^ [ftFfCfX,đ’¼,¿,ÉŽg—p,μŽn,ß,é,±,Æ,^aÄ,«é B•K—
v,ÈfCf“f^ [ftFfCfX,^afTf] [fg,³ê,Ä,¢,é ê ‡ AfAfvfŠfP [fVf‡f“,İppvObjpf%of [f^,Éf]
fCf“f^,^aÔ,³ê,é BfAfvfŠfP [fVf‡f“,^a,»],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,^aĀ,Ñ o,³ê,½DirectInputffofCfX EfIfufWfFfNfg,đŽw,μŽ!,· B

riid

•K—v,ÈfCf“f^ [ftFfCfX,đŽ•Ê, ,éfCf“f^ [ftFfCfXID(IID),đŽw,μŽ!,· B

ppvObj

—â,¢ ‡,í,1,^a 3 í,ÉŽÄ s,³ê,½ ê ‡•Ô,³ê,éfCf“f^ [ftFfCfX Ef|fCf“f^,^a“ü,³ê,éÊ’u,đŽw,μŽ!,· B

•Ô’1

DI_OK

DIERR_INVALIDPARAM

DIERR_NOINTERFACE

IDirectInputDevice::Release

DWORD Release(LPDIRECTINPUTDEVICE lpDirectInputDevice);

IDirectInputDevice,^aEp³,·,éIUnknownfCf“f^ [ftfFfCfX,î~ê” BŠÖ~A,Ì, ,éCOMfIfufWfFfNfg,ÌŽQ ÆfJfEf“fg,ðE
,,ç,·,½,ß,É—p,ç,ç,ê,é BfIfufWfFfNfg,^a Å %
,É ì ¬,³,ê,é,Æ,« AŽQ ÆfJfEf“fg,Í,ÉZfbfg,³,ê,é BAddRef,^aĀ,Ñ o,³,ê,é,½,Ñ,ÉŽQ ÆfJfEf“fg,ÍfCf“fnfŠf f
“fg,³,ê ARelease,^aĀ,Ñ o,³,ê,é,½,Ñ,ÉŽQ ÆfJfEf“fg,ÍffNfŠf f“fg,³,ê,é BŽQ ÆfJfEf“fg,⁰,É,È,é,Æ A,»,ÌfIfu
fWfFfNfg,Í%ð·ú,³,ê,é B Ú ×,É,Ā,ç,Ā,Í AOLEf}fjf...fAf<,ì IUnknown::QueryInterface,ðŽQ Æ,·,é,±,Æ B

lpDirectInputDevice

,±,Ìf f“fo,^aĀ,Ñ o,³,ê,½DirectInputffofCfX EfIfufWfFfNfg,ðŽw,μŽ!,· B

•Ô¹

V,½,ÈŽQ ÆfJfEf“fg,ðŠÜ,ÐDWORD B,±,Ì•Ô¹,Ífffofbfo—p“r,É,¾, Žg—p,³,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, a¼, ìfCf“fXf^f“fX, âfVfXfef€ , ì¼, ì”ª, Æ, Ç, Ì, æ, ñ, É‘ŠEÝ ì—
p, ·, é, ©, ðE”è, ·, é B

fVfXfef€ Ef}fEfX, a”r¼f, [fh, Å”FŽ⁻, ³, è, Ä, c, é ê ‡ AfffofCfX, a%ð·ú, ³, è, é, Ü, Åf}
fEfX EfJ [f<, aXfNfŠ [f“, ©, çE©, , Ì, È, È, ±, Æ, É’ Ó B

IDirectInputDevice::Acquire, ÅfffofCfX, ð”FŽ⁻, ·, é‘O, É A, ±, ìf f\fbfh, ðEÄ, Ñ o, ³, È, ⁻, è, Ì, È, ç, È, c B

hwnd

ffofCfX, ÆŠÖ~A, ·, éEfBf“fhfE B DISCL_FOREGROUNDftf%oO, a“n, ³, è, Ä, c, é ê ‡ A, ±
 , ìpf%of [f^, ÍNULL^ÈŠO, Å, È, ⁻, è, Ì, È, ç, È, c B, ±
 , ìfEfBf“fhfE, ÌfgfbfvfCfxf<, Å, È, ⁻, è, Ì, È, ç, È, c BDirectInputffofCfX, É, ·, c, ÄfAfNfefBfu, Å, , éŠÖ, ÉfEfBf“fhfE,
 ð•Å, ¶, é, ÆfGf%o [, È, È, é B

dwFlags

ffofCfX, ÆŠÖ~A, ·, é<’²fCfxf<, ðL q, ·, éftf%oO B
DISCL_*ftf%oO, É, Å, c, Ä, Í•Ê“r•¶ «%o», ³, è, Ä, c, é B

•Ö¹

COMfGf%o [fR [fh, ð•Ö, · B^È%°, ÌfGf%o [fR [fh, Í•Ö, ³, è, éfR [fh, Ì, ·, ×, Ä, Æ, ÍEÄ, 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—³EØ, ÈfEfBf“fhfE Efnf“fhf<, , é, c, Í—
³EØ, Èftf%oO, Ü, ½, Ìftf%oO, Ì‘g, Ý ‡, í, ¹, a“n, ³, è, 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,Ä,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,·,×,ÄŽ,·,í,ê,é B,»),Í,½,ßffofCfX,™FŽ~³,ê,é'O,É—LÆø,Èff [f^ EftfH [f]
fbfg,ðfZfbfg,µ,Ä,·,©,È,¯,ê,Í,È,ç,È,ç BfAfvfŠfP [fVf‡f“ ,Í'Ê í A, ,ç,©,¶,ß'èç³,ê,Ä,ç,éff [f^ EftfH [f]fbfg,Ä,
,éc_dfDIMouse,Û,½,Í c_dfDIKeyboard,Ì,ç,·,é,©,ð—p,ç,é B

lpDirectInputDevice

,±,Ìf f“fo,ªEÄ,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,Ä,·,è A•Ô,³,ê,éfR [fh,Ì,·,×,Ä,Æ,ÍEÄ,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^,Ä,Í,È,ç B

DIERR_ACQUIRED: *ffofCfX,™FŽ~³,ê,Ä,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,îĪ XŽž,ÉfZfbfg,³,é,éfCxf'fg,ðŽw'è,·,é BfCxf'fg'É'm,ðfIf,É,·,é,½,β,É,à—p,ç,ç,é,é B

IDirectInputDeviceIfufWfFfNfg,ª,·,Á,É'Í'ð,μ,Ä,ç
,éfCxf'fg,É'Í,μCloseHandle,ðCEÄ,Ñ o,·,ÆfGf%o [,É,È,é B,»,½,β AfCxf'fg Efnf'fhf<,ð·Ä,¶,é'O,É AhEventf
pf%of [f^,ðNULL,ÉfZfbfg,μ,ÄIDirectInputDevice::SetEventNotification,ðCEÄ,Ñ o,³,É,·,é,Í,È,ç,È,ç B

ffofCfX,™FŽ⁻,³,é,Ä,ç,éŠÖ,ÍfCxf'fg'É'mfnf'fhf<,ð·Ī X,·,é,±,Æ,Í,Ä,«,È,ç B

ŠÖ ",ª ³ í,ÉŽÀ s,³,é,½ ê ± AfAvfŠfP [fVf±f",Í A'¼,ÌWin32fCxf'fg Efnf'fhf<,Æ—l,Ī·û—
@,ÁfCxf'fg Efnf'fhf<,ð—p,ç,é,±,Æ,ª,Ä,«,é BŽg—p@,Ī—á,ð`È%°,ÉŽ',· BWin32fEfFfCfGŠÖ ",ð—p,ç
,é Ū,Ī ĩñ,É,Ä,ç,Ä,Í AWin32 SDK,·,æ,ÑŠÖ'A,Īf}fj...fAf<,ðŽQ Æ,·,é,±,Æ B

lpDirectInputDevice

,±,Īf f"fo,ªCEÄ,Ñ o,³,é,½DirectInputffofCfX EfIfufWfFfNfg,ðŽw,μŽ,Ī,· B

hEvent

ffofCfX ó'Ô,îĪ XŽž,ÉfZfbfg,³,é,éfCxf'fg,Ö,Īfnf'fhf< BDirectInput,ÍffofCfX,Ī ó'Ô,ª'Ī%»,·,é,Æ,«,Éfnf'fh
f<,ðSetEvent,·,é B

Žè"@fŠfZfbfg EfCxf'fg,Īfnf'fhf<,ð ĩ -,·,é,É,Í A CreateEventŠÖ ",ð—p,ç
,é BfCxf'fg,ðŽ"@fŠfZfbfg EfCxf'fg,Æ,μ,Ä ĩ -,μ,½ ê ± AfEfFfCfGŽžŠÖ,ð%oβ,·,é,ÆOS,ªŽ"@·"I,ÉfC
xf'fg,ðfŠfZfbfg,·,é BfCxf'fg,ðŽè"@fŠfZfbfg EfCxf'fg,Æ,μ,Ä ĩ -,μ,½ ê ± AResetEvent,ðCEÄ,Ñ o,μ,
ÄfŠfZfbfg,·,é,Ī,ĪfAvfŠfP [fVf±f",Ī—
ðŠ,,Æ,È,é BDirectInput,ÍfCxf'fg'É'mfnf'fhf<,ð·¾,é,½,β,ÉResetEvent,ðCEÄ,Ñ o,·,±
,Æ,Í,μ,È,ç B,Ū,Æ,ñ,ç,ĪfAvfŠfP [fVf±f",Ä,ÍfCxf'fg,ðŽ"@fŠfZfbfg EfCxf'fg,Æ,μ,Ä ĩ -,·,é B

hEvent,ªNULL,Ī ê ± A'É'm,Í·s%oÄ",Æ,È,é B

·Ô'1

COMfGf%o [fR [fh,ð·Ô,· B`È%°,ĪfGf%o [fR [fh,Í·Ô,³,é,éfR [fh,Ī,·,×,Ä,Æ,ÍCEÄ,ç,È,ç B
DI_OK = S_OK: '€ ĩ,Ī ³ í,É I—1,μ,½ B

DIERR_ACQUIRED: IDirectInputDeviceIfufWfFfNfg,Í'FŽ⁻,³,é,Ä,ç

,é BIDirectInputDevice::Unacquire,ðCEÄ,Ñ o,μ,Ä A'É'm ó'Ô,îĪ X'O,ÉffofCfX,ð%oð·ú,μ,È,·,é,Í,È,ç,È,ç B

DIERR_HANDLEEXISTS:

IDirectInputDeviceIfufWfFfNfg,É,Í AfCxf'fg'É'mfnf'fhf<,ª,·,Á,É'¶ Ý,·,é BDirectInput,Ä,Í A,ð,Æ,Ä,İDire
ctInputDeviceIfufWfFfNfg,É'Í,μfTf [fg,³,é,éfCxf'fg'É'mfnf'fhf<,Í,ð,Æ,Ä,¾,·,Ä, ,é B

E_INVALIDARG: fCxf'fg Efnf'fhf<,Ä,Í,È,ç B

—á

fnf'fhf<,ªE»Žž"_,ÁfZfbfg,³,é,Ä,ç,é,©,ç,ª Afuf fbfLf"fo,¹,,Éf'fFfbfN,·,é B

```
dwResult = WaitForSingleObject(hEvent, 0);  
if (dwResult == WAIT_OBJECT_0) {  
    // fCxf'fg,ªfZfbfg,³,é,½  
    // fCxf'fg,ªŽ"@fŠfZfbfg,Æ,μ,Ä ĩ -,³,é,½ ê ± A  
    // ,»,é,à,Ū,½fŠfZfbfg,³,é,é  
}
```

ŽŸ,Ī—á,Ä,Í AfCxf'fg,ªfZfbfg,³,é,é,Ū,Ä—³ §CEÄ,Éfuf fbfLf"fo,μ,Ä,ç,é B,±,ĪŽè—
@,ÍCE~,μ,Ä ,, §,Ä,«,È,ç BfEfFfCfGŽžŠÖ,ª%oβ,·,é,Ū,Ä AfXfCEfbfh,ªfVfXfef€("Ä,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) {  
    // fCxf'fg,ªfZfbfg,³,é,½
```

```

    // fCxf"fg,"Ž"®fŠfZfbfg,Æ,µ,Ä ì ¬,³,ê,½ ê ‡ A
    // „,ê,à,Û,½fŠfZfbfg,³,ê,é
}

f fbZ [fW Efx [fX,ÄfCxf"fg,ð,Ó,½,Ä—p,c,Ä,c,éfAfvfŠfP [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:
        // fCxf"fg1,"fZfbfg,³,ê,½
        // fCxf"fg,"Ž"®fŠfZfbfg,Æ,µ,Ä ì ¬,³,ê,½ ê ‡ A
        // „,ê,à,Û,½fŠfZfbfg,³,ê,é
        ProcessInputEvent1();
        break;

    case WAIT_OBJECT_0 + 1:
        // fCxf"fg2,"fZfbfg,³,ê,½
        // fCxf"fg,"Ž"®fŠfZfbfg,Æ,µ,Ä ì ¬,³,ê,½ ê ‡ A
        // „,ê,à,Û,½fŠfZfbfg,³,ê,é
        ProcessInputEvent2();
        break;

    case WAIT_OBJECT_0 + 2:
        // Windowsf fbZ [fW,ðŽó,¬Žæ,Á,½
        // f fbZ [fW,"È,,È,é,Û,Ä ^— ,ð s,σ
        while(PeekMessage(&msg, NULL, 0, 0, PM_REMOVE)){
            if (msg.message == WM_QUIT) {
                goto exitapp;
            }
            TranslateMessage(&msg);
            DispatchMessage(&msg);
        }
        break;

    default:
        // —Šú,µ,È,cfGf%o [
        Panic();
        break;
    }
}

f fbZ [fW Efx [fX,Ä,È,cfAfvfŠfP [fVf‡f",ÄfCxf"fg,ð,Ó,½,Ä—p,c,Ä,c
,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:
        // fCxf"fg1,"fZfbfg,³,ê,½
        // fCxf"fg,"Ž"®fŠfZfbfg,Æ,µ,Ä ì ¬,³,ê,½ ê ‡ A

```

```

// ,»è,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
// ,»è,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 ç ' 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 ' 1, µ, Ä, , ç, ©, ¶, ß ' è ç ' 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, Å 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

, © A d w H o w f t f B [f < f h, a — 3 Ç Ø, © A, , é, Ç, Í d w H o w, a D I P H _ D E V I C E, É f Z f b f g, 3, è, Ä, Ç

, È, a, ç d w O b j 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^ Ac_dfDIMouse, , é, ç, Íc_dfDIKeyboard, Ì, ç, , é, ©, 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, ðDIDF_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, ðDIDF_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, è, 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, è, 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, ©, è, Ä, ç, é, © A, Û, ½, Í’è, Ì îñ, ªf— Š, È’u, ©, è, 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'Ï² Å•W
    sizeof(MYDATA), // ffofCfX 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,±,lfB [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°,lf%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 BDirectInputfo [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“¶,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 ± AD**IMOFS** *¹,ì,Ð,Æ,Ä B
fffofCfX,^fL [f{ [fh,Æ,µ,ÄfAfNfZfX,³,ê,Ä,ç,é ê ± AD**IK** *¹,ì,Ð,Æ,Ä 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%°ÊfofCfG,ì,Ý,^Ó—

;,ðŽ ,Ä Bf{f^f",^%Ý,³,ê,é,Æ%°ÊfofCfG,ì ã^Êftrfbfg,^fZfbfg,³,ê Af{f^f",^—£,³,ê,é,ÆfNfŠfA,³,ê,é B

dwTimeStamp

f~fŠ·b'P^É,Ä"@,fefBfbfN EfJfEf"f^,Ä A,±,ê,É ±,ì,¹,ÄfCfxf"fG,^ ¶ ¬,³,ê,é BCE» Ý,ÌfVfXfef€
,ÌfefBfbfN EfJfEf"f^,Í A **GetTickCount**fVfXfef€ŠÖ ",ðCEÄ,Ñ o,µ,Ä"¾,é B,±,ì¹,Í,.,æ,»50"ú,Ä^ê ,.,,é,±
,Æ,É' ^Ó B

dwSequence

,±,ÌfCfxf"fG,ÌDirectInput ± ~"Ô † B,.,×,Ä,ÌDirectInputfCfxf"fG,É,Í' %Á,.,é ± ~"Ô †,^Š,,è"—,Ä,ç,ê,Ä,ç
,é B,±,ê,É,æ,è AÜ,È,éfffofCfX,©,ç,ÌfCfxf"fG,ðŽŽEñ—ñ"¹,Éf\ [fg,Á,«,é B,±,ì¹,Í,é ,.,,é,ÆE³,É—
ß,é,ì,Ä A,Ó,½,Ä,ì ± ~"Ô †,ð"äŠr,.,é Ü,É,Í' ^Ó,ð—v,.,é B **DISEQUENCE_COMPARE**f}fNf ,ð—p,ç,Ä,±
,ì"äŠr,ð^Ä'S,ÉŽÄ s,.,é,±,Æ,^,Ä,«,é 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,³ê,é”ñf}fEfX EfffofCfX,Ì ó‘Ô,ð•Ô,· Bc_dfDIMouseff [f^ EftfH [f} fbf,ð“n,µ,Ä**IDirectInputDevice::SetDataFormat**,ðCEÄ,Ñ o,µ Af} fEfX EfXf^fCfç,ÍfAfNfZfX,^a,Ä,«,é,æ,µfffofCfX,ð €”ð,µ,Ä,“,©,È,¯,ê,Î,È,ç,È,ç B f}fEfX,Í‘Š‘ÎŽ²fffofCfX,Ä, ,é,½,ß Af}fEfX,ÎŽ²,Ì â‘ÎŽ²Ê‘u,Í‘P,É‘Š‘Î‘Ú“@,ì—ÝCEv,Ä, ,é,± ,Æ,É’ ^Ó B,»),ÌCE%êÊ A¼,Ì â‘ÎŽ²Ê‘u,Æ”äŠr,·,é,Æ,«,ð æ,ç,Ä A â‘ÎŽ²Ê‘u,Ì‘l,Ì⁻³Ó-ì,Ä, ,é B*

IX

f}fEfX,ÌxŽ²,ÉŠÖ,·,é î•ñ BfffofCfX,^a‘Š‘ÎŽ²f, [fh,Ä, ,é ê ± Af} fEfX,ÌxŽ²•ûCEü,Ì‘ÎÊ BfffofCfX,^a â‘ÎŽ²f, [fh,Ä, ,é ê ± Af}fEfX,ÌxŽ²•ûCEü,Ì â‘ÎÊ‘u B

IY

f}fEfX,ÌyŽ²,ÉŠÖ,·,é î•ñ BfffofCfX,^a‘Š‘ÎŽ²f, [fh,Ä, ,é ê ± Af} fEfX,ÌyŽ²•ûCEü,Ì‘ÎÊ BfffofCfX,^a â‘ÎŽ²f, [fh,Ä, ,é ê ± Af}fEfX,Ìy•ûCEü,Ì â‘ÎÊ‘u B

IZ

f}fEfX,ÌzŽ²,ÉŠÖ,·,é î•ñ BfffofCfX,^a‘Š‘ÎŽ²f, [fh,Ä, ,é ê ± Af} fEfX,ÌzŽ²•ûCEü,Ì‘ÎÊ BfffofCfX,^a â‘ÎŽ²f, [fh,Ä, ,é ê ± Af}fEfX,ÌzŽ²•ûCEü,Ì â‘ÎÊ‘u B f}fEfX,ÉzŽ²,è,¯,ê,Ì 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,³ê,Ä,ç,é ê ± A ãÊftrfbfg,^afZfbfg,³,é,é B

DIOBJECTDATAFORMAT

```
typedef struct {
    const GUID * pguid;
    DWORD dwOfs;
    DWORD dwType;
    DWORD dwFlags;
} DIOBJECTDATAFORMAT;
```

IDirectInputDevice::SetDataFormat f\fbfh,^ AfffofCfX"à,ìP`êfIfufWfFfNfg,É'í,µ,Äff [f^ EftfH [f] fbf,ðfZfbfg,·,é,ì,È—p,ç,é Bff [f^ EftfH [f] fbf,Í; ”,ìDIOBJECTDATAFORMAT \‘ç'ì,©,ç \ ¬,³,é AŠefIfufWfFfNfg(Ž² Af{f^f“,È,Ç) ,É'í,µ,Ä,Ð,Æ,Ä,ì \‘ç'ì,“—,Ä,ç,é,é B,±,ê,ç,ì \‘ç'ì,ì”z— ñ,Í AIDirectInputDevice::SetDataFormat,É“n,³,é,éDIDATAFORMAT \‘ç'ì,“Ž ,Ä B'È í,ÍfAfVfŠfP [fVf‡f“,“DIOB JECTDATAFORMAT \‘ç'ì,ì”z—ñ,ð ì ¬,·,·,é•K—v,Í,È, A,±,ì \‘ç'ì,É'í,µ Ý'è,ª, ,ç,©,¶,ß'èç,³,é,Ä,ç ,éc_dfDIMouse,Û,½,Í c_dfDIKeyboard,ì,ç,,é,©,ð—p,ç,é B

pguid

Ž² Af{f^f“, ,é,ç,Í¼,ì“ü—Íf\ [fX,É'í,·,éŽ·ÉŽq Bff [f^ EftfH [f]fbf,ð—vç ,·,é Û,É,± ,ìftfB [f<fh,ðNULL,ÉfZfbfg,·,é,Æ A,Ç,ì,æ,µ,Éf^fCfv,ìfIfufWfFfNfg,Ä,à,ç,ç,Æ,ç,µÖ—j,É,È,é B

dwOfs

“ü—Íf\ [fX,É'í,·,éff [f^,“Ši”],³,é,éff [f^ EfpfPfbfg“à,Ä,ìfIfZfbfg,Ä AŽ²,ì,æ,µ ,ÉDWORDfTfCfY,ìff [f^,É,Ä,ç,Ä,Í4,ì”{ ”,Ä,È,—,é,ì,È,ç,È,ç B,à,µ,- ,Í Af{f^f“,É'í,µ,Ä•Ä,×,ç,é,½fofCfg EfAf%ofCf“f f“fg,ì¹ B

dwType

fIfufWfFfNfg,ðçL q,·,éfffofCfX Ef^fCfvŽw'èŽq B,±,é,Í AfIfufWfFfNfg^fCfv(Ž² Af{f^f“,È,Ç) ,ðçL q,·,éDIDFT_*ftf%ofO,ì'g,Ý ‡,i,¹,Ä A ãÊfofCfg,É,ÍfIfufWfFfNfg EfCf“f^f“fX”Ö †,“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”,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,Í0,Ä,È,—,é,ì,È,ç,È,ç B

—á

ŽŸ,ìfIfufWfFfNfg Eff [f^ EftfH [f]fbf,žw'è,Ä,Í ADirectInput,ª Ä %o,ì—~p%Ä”\ ,ÈŽ²,ð'í,ð,µ A¹,ðfffofCfX Eff [f^,Æ,µ,ÄfIfZfbfg4,ÉDWORD,Ä'È'm,·,é B

```
DIOBJECTDATAFORMAT dfAnyAxis = {
    0, // f fCf<fhfJ [fh
    4, // fIfZfbfg
    DIDFT_AXIS | DIDFT_ANYINSTANCE, // Ç,ìŽ²,Ä,à,©,Û,í,È,ç
    0, // 0,Ä,È,—,é,ì,È,ç,È,ç
};
```

ŽŸ,ìfIfufWfFfNfg Eff [f^ EftfH [f] fbf,žw'è,Ä,Í AfffofCfX,ìXŽ²,ðfffofCfX Eff [f^,Æ,µ,ÄfIfZfbfg12,ÉDWORD,ÄŠi”[,·,é BfffofCfX,É; ”,ì XŽ²,ª¶ Ý,·,é ê ‡ A Ä %o,É—~p%Ä”\,È,à,ì,ª”ð,³,é,é B

```
DIOBJECTDATAFORMAT dfAnyXAxis = {
    &GUID_XAxis, // xŽ²,Ä,È,—,é,ì,È,ç,È,ç
    12, // fIfZfbfg
    DIDFT_AXIS | DIDFT_ANYINSTANCE, // Ç,ìXŽ²,Ä,à,©,Û,í,È,ç
    0, // 0,Ä,È,—,é,ì,È,ç,È,ç
};
```

ŽŸ,ìfIfufWfFfNfg Eff [f^ EftfH [f]fbf,žw'è,Ä,Í ADirectInput,ª Ä %o,ì—~p%Ä”\ ,Éf{f^f“,ð'í,ð,µ A,» ,ì¹,ìBYTE,ì ãÊfrfbfg,ðfffofCfX Eff [f^,Æ,µ,ÄfIfZfbfg16,É'È'm,·,é B

```
DIOBJECTDATAFORMAT dfAnyButton = {
    0, // f fCf<fhfJ [fh
    16, // fIfZfbfg
    DIDFT_BUTTON | DIDFT_ANYINSTANCE, // Ç,ìf{f^f“,Ä,à,©,Û,í,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, ©, ê, 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, ³ fAfNfZfX, ³ ê, é fIfufWfFfNfg, ðŽ⁻ · Ê, ·, é B

dwHowtfB [f<fh, ³ DIPH_DEVICE, Ä, ·, é ê ‡, Í0 B

dwHowtfB [f<fh, ³ DIPH_BYOFFSET, Ä, ·, é ê ‡ Afvf fpfefB, ³ fAfNfZfX, ³ ê, æ, □, Æ, μ, Ä, ç, é fIfufWfFfNfg, ÌE> Ý, Ìff [f^ EftfH [f}fbfg, Ö, Ì fIfTfZfbfg B

dwHowtfB [f<fh, ³ DIPH_BYID, Ä, ·, é ê ‡ A'O%ñ, Ì IDirectInputDevice::EnumObjects, ÌEÄ, Ñ o, μ, ©, ç · Ö, ³ ê, ¹/₂ D
IDeviceObjectInstance, Ì dwTypetfB [f<fh, Ê · Ö, ³ ê, é fIfufWfFfNfg Ef^fCfv, Ü, ¹/₂, Í Cf" fXf^f" fXŽ⁻ · 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*,^a AŽ²,È,Ç,ìfIfufWfFfNfg,ì"íí,ìfZfbfg,âžæ“¾,É—p,ç,é BffofCfX,ì"íí,^{a-}
³ §CEÀ,À, ,é ê ‡ A'Ê'm,³ê,é"íí,ìMin = DIPROP RANGE_NOMIN, ",æ,ÑlMax =
DIPROP RANGE_NOMAX,Æ,È,é B"íí,^{a-3} §CEÀ,À, ,éffofCfX,À,í%õñ,è ž,Ý,^a s,í,ê,é,±,Æ,É' ^Ó B

diph

^È%°,ì,æ,±,É %oŠú%o»,μ,À, ",©,È, ",ê,Î,È,ç,È,ç B

dwSize = (DIPROP RANGE),ìfTfCfY B

dwHeaderSize = (DIPROP HEADER),ìfTfCfY B

dwObj = fIfufWfFfNfgŽ~•Êžq B

dwHow = dwObj,ì%õžžß•û-@ B

lMin

"íí,ì%°CEÀ B

lMax

"íí,ì ãCEÀ 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

»‘čŽÒŽ̄•ÊŽq B

wPid

»•iŽ̄•ÊŽq B

szPname

fWf‡fCfXfefBfbfN,Ì »•i-¼,³ŠŮ,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,·,é{f^f“,ì Á·â ” B

szRegKey

fWf#fCfXfefBfbfN,É·Î,·,éfŒfWfXfgfŠ EfL [,ðŠÜ,Ð ANULL,Á I,í,é·¶Žš—ñ B

szOEMVxD

fWf#fCfXfefBfbfNfhf%oCfoOEM,ðŽ~·Ê,·,é ANULL,Á 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,ðfofCf g ”,ĂŽ!,· B

dwFlags

*,±,Ì \‘c‘ì,ÉŠi”[„,3,ê,½ îñ,ª—LÆø,Ă, ,é,©,ðŽ!,·ftf%foi—LÆø,È îñ,ðŠÜ,Û,È,¢—
v‘f,Í0,ÉfZfbfg,³,é,é;ˆÈ%º°,İftf%fo,“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 AŞefWf#fCfXfefBfbfN,İf{f^f“„,Ì ó‘Ô,ÉŠÖ,„,é—
LÆø,È îñ,“ŠÜ,Û,ê,é B*

JOY_RETURNCENTERED

ŠeŽ²,ÌİÊ,Ì‘+%º’l,ÉfWf#fCfXfefBfbfN,İfjf... [fgf%of<^Ê‘u,ð‘u, B

JOY_RETURNPOV

*dwPOV—v‘f,É,Í A—ÉŽU“l,È‘PÊ,ð—p,¢
,ĂŽ!,³,é,éŽ<“_fRf“fgf [f<,ÉŠÖ,„,é—LÆø,È îñ,“ŠÜ,Û,ê,é B*

JOY_RETURNPOVCTS

*The dwPOV—
v‘f,É,Í A“±“l,Ă100ª,Ìl“x,ð‘PÊ,Æ,µ,ĂŽ!,³,é,éŽ<“_fRf“fgf [f<,
ÉŠÖ,„,é—LÆø,È îñ,“ŠÜ,Û,ê,é B*

JOY_RETURNR

*The dwRpos—v‘f,É,Í A—LÆø,Èf%of_ [fyf_f< îñ,“ŠÜ,Û,ê,é B,±
,ê,Í4”Ô—Û,İŽ²,“¶ Ý,·,é,±,Æ,ðŽ!,·;*

JOY_RETURNRAWDATA

*fLfffŠfufÆ [fVf#f“„,³,ê,Ă,¢,È,¢fWf#fCfXfefBfbfN,İŽwŽ‘l,ª,±
,Ì \‘c‘ì,ÉŠi”[„,3,ê,Ă,¢,é,±,Æ,ðŽ!,·;*

JOY_RETURNU

*dwUpos—v‘f,É,Í AfWf#fCfXfefBfbfN,İ5”Ô—Û,İŽ²,“Žg—p%º”\,Ă, ,é,
Î A,±,İŽ²,ÉŠÖ,„,é—LÆø,Èff [f^,“ŠÜ,Û,ê,é B,»„,µ
,Ă,È,¢ ê ±,Í0,ª“Ô,³,é,é B*

JOY_RETURNV

*dwVpos—v‘f,É,Í AfWf#fCfXfefBfbfN,İ6”Ô—Û,İŽ²,“Žg—p%º”\,Ă, ,é,
Î A,±,İŽ²,ÉŠÖ,„,é—LÆø,Èff [f^,“ŠÜ,Û,ê,é B,»„,µ
,Ă,È,¢ ê ±,Í0,ª“Ô,³,é,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,Ïy À•W,ÉŠÖ,·,é—
LÆø,Èff [f^,ªŠÜ,Û,ê,é B

JOY_RETURNZ

dwZpos—v'f,É,Í AfWf‡fCfXfefBfbfN,Ìz À•W,ÉŠÖ,·,é—
LÆø,Èff [f^,ªŠÜ,Û,ê,é B

JOY_USEDEADZONE

fWf‡fCfXfefBfbfN,Ìfjf... [fgf%of<Ê'u,Ì"ÍÍ,ðŠg'£,µ A,±
,Ì"ÍÍ,ðfffbfhf] [f",ÆÆÄ,Ô BfWf‡fCfXfefBfbfNfhf%ofCfo,Ífffbfhf
f] [f""à,Ì,·,×,Ä,ÌÊ'u,É'Í,µ,Ä'è ""l,ð•Ö,· B

È%º,Ìftf%ofO,Í AfWf‡fCfXfefBfbfN,ðLfffŠfuÆ [fVf‡f",·,é,½,ß,Ìff [f^,ð'ñ<ÿ,µ AfJfXf^f€ EfLfffŠfu
fÆ [fVf‡f" EfAfvfŠfP [fVf‡f",ð'Í Û,Æ,·,é,à,Ì,Ä, ,é B

JOY_CAL_READ3

x Ay Az À•W,ð"Ç,Ý ž,Ý A,»,Ì,Û,Û,Ì'l,ðdwXpos AdwYpos AdwZ
pos—v'f,É,»,ê,¼,êŠi"[,·,é B

JOY_CAL_READ4

f%of_ [îñ,·,æ,Ñx Ay Az À•W,ð"Ç,Ý ž,Ý A,»,Ì,Û,Û,Ì'l,ðdwRpo
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,ð"Ç,Ý ž,Ý A,»,Ì,Û,Û,Ì'l,ðdw
Rpos AdwXpos AdwYpos AdwZpos AdwUpos—
v'f,É,»,ê,¼,êŠi"[,·,é B

JOY_CAL_READ6

fWf‡fCfXfefBfbfNf~fjfhf%ofCfo,ª¶ Ý,µ îñ,ð'ñ<ÿ,µ,Ä,¢
,é ê ‡,Í AvŽ²ff [f^,ð,»,Ì,Û,Û"Ç,Ý ž,Ð B,»,ª,Ä,È,¯,ê,Ì0,ð•Ö,· B

JOY_CAL_READALWAYS

fhf%ofCfo,ªffofCfX,ðÆÿ'm,µ,È,¢ ê ‡,Ä, ,Ä,Ä,à AfWf‡fCfXfefBf
bfN,Ìf| [fg,ð"Ç,Ý ž,Ð B

JOY_CAL_READONLY

fWf‡fCfXfefBfbfNf~fjfhf%ofCfo,ª¶ Ý,µff [f^,ð'ñ<ÿ,·,é ê ‡,Íf%of
_ [îñ,ð"Ç,Ý ž,Ý A,»,Ì,Û,Û,Ì'l,ðdwRpos—v'f,ÉŠi"[,·,é B,»,ª
,Ä,È,¯,ê,Ì0,ð•Ö,· B

JOY_CAL_READUONLY

fWf‡fCfXfefBfbfNf~fjfhf%ofCfo,ª¶ Ý,µff [f^,ð'ñ<ÿ,·,é ê ‡,Íu Ä
•W,ð"Ç,Ý ž,Ý A,»,Ì,Û,Û,Ì'l,ðdwUpos—v'f,ÉŠi"[,·,é B,»,ª
,Ä,È,¯,ê,Ì0,ð•Ö,· B

JOY_CAL_READVONLY

fWf‡fCfXfefBfbfNf~fjfhf%ofCfo,ª¶ Ý,µff [f^,ð'ñ<ÿ,·,é ê ‡,Ív Ä
•W,ð"Ç,Ý ž,Ý A,»,Ì,Û,Û,Ì'l,ðdwVpos—v'f,ÉŠi"[,·,é B,»,ª
,Ä,È,¯,ê,Ì0,ð•Ö,· B

JOY_CAL_READXONLY

x À•W,ð"Ç,Ý ž,Ý A,»,Ì,Û,Û,Ì'l,ðdwXpos—v'f,ÉŠi"[,·,é B

JOY_CAL_READXYONLY

x Ay À•W,ð"Ç,Ý ž,Ý A,»,Ì,Û,Û,Ì'l,ðdwXpos AdwYpos—
v'f,É,»,ê,¼,êŠi"[,·,é B

JOY_CAL_READYONLY

y À•W,ð"Ç,Ý ž,Ý A,»,Ì,Û,Û,Ì'l,ðdwYpos—v'f,ÉŠi"[,·,é B

JOY_CAL_READZONLY

z À•W,ð"Ç,Ý ž,Ý A,»,Ì,Û,Û,Ì'l,ðdwZpos—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,Ä,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,Ä,ç,é,½,ßŽg—p,µ,È,ç B

dwSize—v’f,Ì’l,Í A **joyGetPosEx**ŠÖ ”,É“n,³,é,é Ū,É,Í A,±,ì—v’f,Ì \“ç’Í,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,Ū,Æ,ñ,ç,Í A5,À,ÌÈ’u,µ,©Ž ,½,È,ç B
JOY_RETURNPOVftf%fo,²fZfbfg,³,é,Ä,ç,é,Æ,« A,±,é,ç,ÌÈ’u,ÍÈ%°,ÌJOY_POV’è ”,ð—p,ç,Ä’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,Ä,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,Í,È,ç,È,ç,¼,Ì’l,ÌŠp“x,ðfAfvfŠfP [fVf#f“,À—p,ç,é,±,Æ,³,À,«,é ê ±—p%Å”\
,À, ,é,Í’A’±“L,Èff [f^,ðJOY_RETURNPOVCTSftf%fo,ð—p,ç,ÄŽæ“¾,µ,È, ,é,Í,È,ç,È,ç
j,Ü,½JOY_RETURNPOVCTSftf%fo,Í AJOY_RETURNPOVftf%fo,Æ,Æ,à,É—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 \`ç'î,Å AfL [f{ [fh EfffofCfX,ð<L q,·,é B,±
,ÏIfufWfFfNfg,ÍDINPUT.LIBf%ofCfuf%fŠftf@fCfç,Å—^,|,ç,ê,Ä,ç,é B

,±,ì \`ç'î,Ö,Ïf|

fCf“f^,ÍIDirectInputDevice::SetDataFormat,Ö“n,³,ê A,»ÏfffofCfX,ªfL [f{ [fhÇ`Ž®,ÅfAfNfZfX,³,ê,é,±
,Æ,ðŽ',· B

c_dfDIMouse

, ,ç,©,¶,ß'è<³,ê,Ä,ç,éDIDATAFORMAT \c'î,Å Af}fEfX EfffofCfX,ð<L q,·,é B,±
,ÏIfufWfFfNfg,ÍDINPUT.LIBf%ofCfuf%ofŠftf@fCfç,Å—^,|,ç,ê,Ä,ç,é B

,±,ì \c'î,Ö,Ïf|fCf“f^,ÍIDirectInputDevice::SetDataFormat,Ö“n,³,ê A,»,ÏffofCfX,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,±
,ì'l,Í AfVfXfef€f}fEfX,É'í,·,éfCf“f^ [ftfFfCfX,ð ì ¬,·,é,½,ß,ÉIDirectInput::CreateDevice,Ö“n,³,ê,é,±,Æ,à, ,é B

'è ”

DIPROP_AXISMODE

, ,ç,©,¶,ß'èç³,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'İ,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'İ,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,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,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 BÆ¾,çŠ·,!,é,Æ Af† [fU,ªZ-%oñ“]—Ö,ð,ã,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,ìfTfCY,ðfZfbfg,µ,È,¯,ê,í,È,ç,È,ç B

,±,ê,í"Ç,Ý o,µ ê—p,ìfvf fpfefB,Å, ,é B

DISCL_EXCLUSIVE

SetCooperativeLevel,Ö,İfpf%of [f^,Å A”r¼“IfAfNfZfX,ª•K—v,Å, ,é,±,Æ,ðŽ!,· B”r¼“IfAfNfZfX,ª—
^,¡,ç,ê,é,Æ Afff of CfX,İ¼,İfCf“fXf^f“fX,Í A”FŽ–,³,ê,Å,ç
,éff of CfX,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,À Afff of CfX,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 Efff of CfX,ð”r¼f, [fh,Å”FŽ–,·,éfAfvfŠfP [fVf‡f“,Íff of CfX,ð%ð•ú,·,é,±,Æ,ð<,-
„ §,·,é B,³,à,È,ç,Æ Af† [fU,Íf fjf... [‘€ ì,âEfBf“fhfE,İ”U“® EfŠfTfCfY,ª,Å,«,È,,È,é B

DISCL_EXCLUSIVE,Æ**DISCL_NONEXCLUSIVE**,ì,⊞,ç,ì,ç,,é,©,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} , δ \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 , $,$ ζ , \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} $\%o$ δ \bullet \acute{u} , 3 , \hat{e} , \acute{e} B

DISCL_FOREGROUND, \mathcal{A} **DISCL_BACKGROUND**, \tilde{I} , \square , \hat{c} , Φ
 $,,$ \hat{e} , \textcircled{C} , 3 **DirectInputDevice::SetCooperativeLevel**, \acute{E} $“$ n , 3 , \hat{e} , \hat{E} , $—$, \hat{e} , \hat{I} , \hat{E} , ζ , \hat{E} , Φ B $—$ $\frac{1}{4}$ \bullet \hat{u} , δ $“$ n , μ , $\frac{1}{2}$, \hat{e} , Φ
 $,,$ \hat{e} , \hat{a} $“$ n , 3 , \hat{E} , Φ \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"IfAfNfZfX, a•K—v, Å, ,é, ±, Æ, ðŽ!, · BffofCfX, Ö, ÏfAfNfZfX, Í A"~ê, ÏffofCfX, ÉfAfNfZfX, µ, Ä, ç, é¼, ÏfAvfŠfP [fVf±f", ÉŠ± Å, µ, È, ç B

DISCL_EXCLUSIVE, Æ**DISCL_NONEXCLUSIVE**, Ì, ð, ç, ç
,, ê, ©, **IDirectInputDevice::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 ±, ÏfGf%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^fpfPfbfg(256fofCfg,ì”z—
 ñ)“à,Ä,ìfìftfZfbfg,ð\,µ,Ä,ç,é BŞefìftfZfbfg,ì'l,Í AŽw'è,³,é,½ff [f^,“Šì”l,³,é,Ä,ç,é”z—ñ—
 v'f,ì:Š'îÉ'u,ðŽ-•É,.,é B,».,ìfìftfZfbfg,ì^É'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%°,ÉŽì,· i , ‡ j B

DIK_ESCAPE	EscfL [
DIK_1	1 fL [
DIK_2	2 fL [
DIK_3	3 fL [
DIK_4	4 fL [
DIK_5	5 fL [
DIK_6	6 fL [
DIK_7	7 fL [
DIK_8	8 fL [
DIK_9	9 fL [
DIK_0	0 fL [
DIK_MINUS	f fCf“fL [f{ [fh,ì- fL [
DIK_EQUALS	= fL [
DIK_BACK	BackspacefL [
DIK_TAB	TabfL [
DIK_Q	Q fL [
DIK_W	W fL [
DIK_E	E fL [
DIK_R	R fL [
DIK_T	T fL [
DIK_Y	Y fL [
DIK_U	U fL [
DIK_I	I fL [
DIK_O	O fL [
DIK_P	P fL [
DIK_LBRACKET	[fL [
DIK_RBRACKET] fL [
DIK_RETURN	f fCf“fL [f{ [fh,ì Enter fL [
DIK_LCONTROL	¶CtrlfL [
DIK_A	A fL [
DIK_S	S fL [
DIK_D	D fL [
DIK_F	F fL [
DIK_G	G fL [
DIK_H	H fL [
DIK_J	J fL [
DIK_K	K fL [
DIK_L	L fL [
DIK_SEMICOLON	; fL [
DIK_APOSTROPHE	fAf fXfgf ftfB [() fL [
DIK_GRAVE	accent grave (`) fL [
DIK_LSHIFT	¶ShiftfL [
DIK_BACKSLASH	\ fL [
DIK_Z	Z fL [
DIK_X	X fL [
DIK_C	C fL [
DIK_V	V fL [
DIK_B	B fL [
DIK_N	N fL [
DIK_M	M fL [
DIK_COMMA	, fL [

DIK_PERIOD	<i>f fCf“fL [f{ [fh,î . fL [</i>
DIK_SLASH	<i>f fCf“fL [f{ [fh,î / fL [</i>
DIK_RSHIFT	<i>%oEShiftfL [</i>
DIK_MULTIPLY	<i>fef“fL [,î * fL [</i>
DIK_LMENU	<i>¶Alt fL [</i>
DIK_SPACE	<i>fXfy [fXfo [</i>
DIK_CAPITAL	<i>Caps LockfL [</i>
DIK_F1	<i>F1 fL [</i>
DIK_F2	<i>F2 fL [</i>
DIK_F3	<i>F3 fL [</i>
DIK_F4	<i>F4 fL [</i>
DIK_F5	<i>F5 fL [</i>
DIK_F6	<i>F6 fL [</i>
DIK_F7	<i>F7 fL [</i>
DIK_F8	<i>F8 fL [</i>
DIK_F9	<i>F9 fL [</i>
DIK_F10	<i>F10fL [</i>
DIK_NUMLOCK	<i>Num LockfL [</i>
DIK_SCROLL	<i>Scroll LockfL [</i>
DIK_NUMPAD7	<i>fef“fL [,î7fL [</i>
DIK_NUMPAD8	<i>fef“fL [,î8 fL [</i>
DIK_NUMPAD9	<i>fef“fL [,î9 fL [</i>
DIK_SUBTRACT	<i>fef“fL [,î - fL [</i>
DIK_NUMPAD4	<i>fef“fL [,î4 fL [</i>
DIK_NUMPAD5	<i>fef“fL [,î5 fL [</i>
DIK_NUMPAD6	<i>fef“fL [,î6 fL [</i>
DIK_ADD	<i>fef“fL [,î + fL [</i>
DIK_NUMPAD1	<i>fef“fL [,î1 fL [</i>
DIK_NUMPAD2	<i>fef“fL [,î2 fL [</i>
DIK_NUMPAD3	<i>fef“fL [,î3 fL [</i>
DIK_NUMPAD0	<i>fef“fL [,î0 fL [</i>
DIK_DECIMAL	<i>fef“fL [,î . fL [</i>
DIK_F11	<i>F11fL [</i>
DIK_F12	<i>F12fL [</i>
DIK_NUMPADENTER	<i>fef“fL [,îEnterfL [</i>
DIK_RCONTROL	<i>%oECtrlfL [</i>
DIK_DIVIDE	<i>fef“fL [,î / fL [</i>
DIK_SYSRQ	<i>SysRqfL [</i>
DIK_RMENU	<i>%oEAlt fL [</i>
DIK_HOME	<i>HomefL [</i>
DIK_UP	<i>ã-îó fL [</i>
DIK_PRIOR	<i>PgUpfL [</i>
DIK_LEFT	<i>¶-îó fL [</i>
DIK_RIGHT	<i>%oE-îó fL [</i>
DIK_END	<i>EndfL [</i>
DIK_DOWN	<i>%o-îó fL [</i>
DIK_NEXT	<i>PgDnfL [</i>
DIK_INSERT	<i>InsertfL [</i>
DIK_DELETE	<i>DeletfL [</i>
DIK_LWIN	<i>¶WindowsfL [</i>
DIK_RWIN	<i>%oEWindowsfL [</i>
DIK_APPS	<i>AppMenufL [</i>

f)EfX EfffofCfX`è ”

DIMOFS_BUTTON0

DIMOUSESTATE \`c`ì,ì æ“a,É`í,·,éf}fEfXf{f^f“0,ì ó`Ô,ìfIfzfzfbfg B,±
,ìl,í **ADIDEVICEOBJECTDATA** \`c`ì,ìdwOfsftfB [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`ì,ì æ“a,É`í,·,éf}fEfXf{f^f“1,ì ó`Ô,ìfIfzfzfbfg B,±
,ìl,í **ADIDEVICEOBJECTDATA** \`c`ì,ìdwOfsftfB [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`ì,ì æ“a,É`í,·,éf}fEfXf{f^f“2,ì ó`Ô,ìfIfzfzfbfg B,±
,ìl,í **ADIDEVICEOBJECTDATA** \`c`ì,ìdwOfsftfB [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`ì,ì æ“a,É`í,·,éf}fEfXf{f^f“3,ì ó`Ô,ìfIfzfzfbfg B,±
,ìl,í **ADIDEVICEOBJECTDATA** \`c`ì,ìdwOfsftfB [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`ì,ì æ“a,É`í,·,éf}fEfX,ìx•ûĚü,ì`Ê`u,ìfIfzfzfbfg B,±
,ìl,í **ADIDEVICEOBJECTDATA** \`c`ì,ìdwOfsftfB [f<fh,Æ,μ,Ä•Ô,³,ê Aff [f^,^f}fEfX,ìx•ûĚü,ì`Ê`u,É“K—
p,³,ê,é,±,Æ,ðŽ,· B

DIMOFS_Y

DIMOUSESTATE \`c`ì,ì æ“a,É`í,·,éf}fEfX,ìy•ûĚü,ì`Ê`u,ìfIfzfzfbfg B,±
,ìl,í **ADIDEVICEOBJECTDATA** \`c`ì,ìdwOfsftfB [f<fh,Æ,μ,Ä•Ô,³,ê Aff [f^,^f}fEfX,ìy•ûĚü,ì`Ê`u,É“K—
p,³,ê,é,±,Æ,ðŽ,· B

DIMOFS_Z

DIMOUSESTATE \`c`ì,ì æ“a,É`í,·,éf}fEfX,ìz•ûĚü,ì`Ê`u,ìfIfzfzfbfg B,±
,ìl,í **ADIDEVICEOBJECTDATA** \`c`ì,ìdwOfsftfB [f<fh,Æ,μ,Ä•Ô,³,ê Aff [f^,^f}fEfX,ìz•ûĚü,ì`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—{ĀĀNEC PC98fL [f{ [fh B

DIDEVTYPE_KEYBOARD_NEC98LAPTOP: “ú—{ĀĀNEC PC98f%ofbfvfgfbfvfL [f{ [fh B

DIDEVTYPE_KEYBOARD_NEC98106: “ú—{ĀĀNEC PC98 106fL [fL [f{ [fh B

DIDEVTYPE_KEYBOARD_JAPAN106: “ú—{ĀĀ106fL [fL [f{ [fh B

DIDEVTYPE_KEYBOARD_JAPANAX: “ú—{ĀĀAXfL [f{ [fh B

DIDEVTYPE_KEYBOARD_J3100: “ú—{ĀĀJ3100fL [f{ [fh B

DirectInputff [f^ EftfH [f]fbfg Ef^fCfv

DirectInputff [f^ EftfH [f]
fbfg Ef^fCfv,ÍffofCfX,É,,"é'PêfIfufWfFfNfg,ì® «,ðL q,.,é BffofCfX,É,,"éIfufWfFfNfg,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,ÌIfufWfFfNfg,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,,ìÊ'u,ð20,ì" { ",Ä'Ê'm,.,é,±,Æ,à, ,é,ª A,±,è,ÍŽ²,Ì Ä -'PÊ,ª20,Ä, ,é,±
,Æ,ðŽ',. BŽ²,ÌIDIPROP GRANULARITYfvf fpfefB,Í,Í,,ìŽ²,Ì Ä -'PÊ,ð'Ê'm,.,é B

'Š'ÍŽ²ffofCfX,É,Í âÍ Ä•W,ª,¶ Ý,μ,È,ç B,P,μ,è A'Ê'm,³,è,é âÍ Ä•W,Í'P,É AfffocfX,ªFŽ-³,è,Ä,ç
,éŠÖ,È,,»,ÌffofCfX,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
âÍ Ä•W,Í A¼,ì âÍ 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 âÍ'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'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 âÍ'P'ì,ìCE“_,ðfZfbfg,μ,½,èŽæª¼,μ,½,è,.,é,±,Æ,Í•s%oÄ"
,È,ì,Ä AfAvfŠfP [fVf±f“,ÍffofCfX,ð" FŽ ,μ,½¼CEä,É âÍ'Ê'u,ðL^.,é,×,«,Ä, ,é B,±,ì'ì,ì%¼'zCE
'_,Æ,È,é B,,èÊ ~,ìCEÄ,Ñ o,μ,É,Ä,ç,Ä,Í,.,×,Ä A,±,ìCE“_,ðŠì,É âÍ'Ê'u,ª l—¶,³,è,é B

DIDFT_ABSAXIS

fIfufWfFfNfg,Í âÍŽ²,Ä, ,é B âÍŽ²,Æ,Í A âÍ'Ê'u,Æ,μ,Äff [f^,ð'Ê'm,.,é,à,ì,Ä, ,é B
âÍŽ²,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,,ìÊ'u,ð20,ì" { ",Ä'Ê'm,.,é,±,Æ,à, ,é,ª A,±
,è,ÍŽ²,Ì Ä -'PÊ,ª20,Ä, ,é,±
,Æ,ðŽ',. BŽ²,ÌIDIPROP GRANULARITYfvf fpfefB,Í,Í,,ìŽ²,Ì Ä -'PÊ,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 âÍ'I E'S'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%oª,ª,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%oª,ª,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,ê,é B

JOYERR_UNPLUGGED

Žw'è,³,ê,½fWf‡fCfXfefBfbfN,ÍfRf“fsf... [f^,É Ú'±,³,ê,Ä,¢,È,¢ B

MMSYSERR_BADDEVICEID

Žw'è,³,ê,½fWf‡fCfXfefBfbfN,ÌŽ¯•ÊŽq,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,ªfvfŠfP [fVf‡f“ ,ð<N“@,·,é Û,É•K—v,Æ,È,é B

DirectSetup,Í,R,Ä,ÌAPIŠÖ ”,đ”ò,!,Ä,ç,é,ª A,» ,ì,□,çfvfŠfP [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,đ A'Ê í,İfAfvfŠfP [fVf‡f“,İfCf“fXfg [f<,É%Á,İ,ÄfCf“fXfg [f<,·,é B,±
,İfCf“fXfg [f<,É,Í**DirectXSetup**APIŠÖ ”,đ—p,¢,é B,±
,İŠÖ ”,Í ADirectX,İfCf“fXfg [f<'+,ÉffBfXfvf€fC,;„æ,ÑfI [ffBfI Efhf%ofCfo,đ(•K—
v,É%ž,¶,Ä) X V,µ ADirectX,đfTf|
[fg,·,é **BDirectXSetup**,Í Afvf f_fNfg,É“Y•t,³,ê,éDsetup.dll,ÄŠefAfvfŠfP [fVf‡f“,É'ñ<Ÿ,³,ê,Ä,¢
,é BDirectSetup,İ é€¾•¶,ÍDsetup.h,É, ,é B

DirectXSetup,đŽg—p,·,éAfvfŠfP [fVf‡f“,Í A\Redist\Directx\ffBf€fNfgfŠ,ì“à—e,Ì,Ÿ,Ä,È,-
ARedist\ffBf€fNfgfŠ,İ'S“à—e,đ”z•z,µ,É,̄,ê,İ,È,ç,È,¢ **BDirectXSetup**,É,æ,èDirectDraw®,Æ,¢
,Á,½'P"ê,İDirectXfRf“f| [flf“fg,đfCf“fXfg [f<,Ä,«„é,ª A,±,ê,Í „ š,Ä,«„È,¢ B,È,°,È,çDirectXfRf“f|
[flf“fg,ÍŠ€ŸÊ“¶ «„,Ì, ,é Ÿ€v,É,È,Ä,Ä,¢,é,Ì,Ä AfffBfXfNfXfy [fX,İ ß-ñ,É,Ì,È,ç,È,¢,©,ç,Ä, ,é BDirectXfRf“
f| [flf“fg,đ,p,Ä,¾,̄—p,¢,é ê ‡,Ä,à AfvfŠfP [fVf‡f“,ÍDirectX'S'ì,ì@”\,đ”z•z,µ,É,̄,ê,İ,È,ç,È,¢ B

DirectX fAfvfŠfP [fVf‡f“,İfCf“fXfg [f< €”ö

fAfvfŠfP [fVf‡f“,ÆDirectXftf@fCf<,ðf† [fU,İfVfXfef€,ÉfCf“fXfg [f<.,é €”ö,ð,µ,½,ç A’±
,-,ÄfZfbfgfAfbfv Efvf fOf%of€,ð ì ¬,.,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,İ€~è A“K Ø,ÈDirectX,İfCf“fXfg [f<,İ3,Ä,İ ì<Æ,ð s,□ B,»,µ,Ä”z•z”}‘İ,ÉffBfƒEfNfgfŠ,ð ì ¬,µ AfAfvfŠfP
[fVf‡f“,İ’Sftf@fCf<,,æ,Ñ•%oÁ,³,ê,½DirectXfRf“f [flf“fg,ð,±,İffBfƒEfNfgfŠ,É’u, BŽŸ,É,±
,ê,ç,İfXfefbfbv,ð à~¾,.,é B

fZfbfgfAfbfv Efvf fOf%of€,İ ì ¬

fAfvfŠfP [fVf‡f“ EfffBfƒEfNfgfŠ,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,Û,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 \“Èfn [fhffBfXfN,ì<ó,«—e—È,ª,
,é,©,ç,µ,©,ð”»è,Ä,«È,ç B,½,¾,µ Af† [fU,ì,ÄfR [fh,ð“ü—Í,·,é,ì,±,ì<@”,ð•t%Ä,·,é,±,Æ,ª,Ä,«é B,±
,ìfR [fh,ð“ü—Í,·,é é Š,ÍDinstall.cftf@fCf<,É2%Ó 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,““¶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%¼’è,·,é B,»,µ,Ä Aftf@fCf<,ðfRf“fpfNfgffBfXfN ä,É Ä,«
t, ,é Ü,É A,»,è,ç,ìftf@fCf<,ðf< [fg,É’u, ,Æ%¼’è,·,é B lpszRootPath

fpf%of [f^,ªÖFUNSTUFFÖ,ÉfZfbfg,³,è,Ä,ç,é,Æ AfRf“fpfNfgffBfXfN,É, ,éfZfbfgfAfbfv Efvf fOf%of€
(Dinstall.exe),Í ³ í,É<@”,µ,È,ç B,µ,©,µlpszRootPath fpf%of [f^,ªNULL,ÉfZfbfg,³,è,Ä,ç,é,Í A—
¼•û,ìfZfbfgfAfbfv Efvf fOf%of€,ç,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,Û,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,Û,è,é,·,×,Ä,ÍÓRockemÓ,ð€ÿ ò,µ ACEÄ 1,ìfAfvfŠfP [fVf‡f“¼,É•Í X,·,é B

3

fZfbfgfAfbfv, ,æ,Ñšfu [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,ìfZfbfgf}fbfv Eftf@fCf<,É,±,è,ç,ì¼ ì,ð,Ä, ,é,© A, ,é,ç
,Í€Ä 1,ìfZfbfgf}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 fIfvVf‡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_DIRÓ(fŠf\ [fX Eftf@fCf<,Ä,Í2%Ó Š‘¶ Ý,·,é)

,ðĀŸ ò,μ AfftfHf<fg EfffBfĀfNfgfŠ,ÏpfX,ð•Ī X,·,é B

ĀĀ 1,ÏAfvfŠfP [fVf±f“,Ï—p“r,É, ,ϱ,æ,ϱ,É ADinstall.c,“,æ,ÑDinstall.rcftf@fCf<,ð C ³,μ,½ĀĀ A,»,ê,ç,ðŽĀ s—
pDinstall.exe,ÖfRf“fpfCf<,·,é,±,Æ,Ā,«é B,±,ÏŽĀ sftf@fCf<,Ï¼ Ï,ð•Ī X,·,é,±,Æ,à,Ā,«é(½,Æ,Ï,ÏSetup.exe) B

fAfvšfP [fVfzf“ EffBfĀfNfgš,İfZfbfgfAfbfv

Ā 1,İfAfvšfP [fVfzf“,đRf“fpfNfgffBfXfN, ,é,Ā
,İftf fbfs [ffBfXfN,É“Ů,‘O,É AfZfbfgfAfbfv Efvf fOf%ofĀ
,İfefXfg,İ,½,B,İfAfvšfP [fVfzf“ EffBfĀfNfgš,đ ì ¬,µ,Ä,“-
BfAfvšfP [fVfzf“ EffBfĀfNfgš,É,İ,·,×,Ä,İfAfvšfP [fVfzf“ Eftf@fCfĀ AfZfbfgfAfbfv Efvf fOf%of
Ā ADirectXftf@fCfĀ,“,æ,Ňhf%ofCfo,“ŠŮ,Ů,ê,é,±,Ā,É,È,é B

fAfvšfP [fVfzf“ EffBfĀfNfgš,đfZfbfgfAfbfv,·,é,½,B,É AŽŸ,İfXfefbfv,đŽÀ s,·,é,±,Ā B

- 1 Ā 1,İfAfvšfP [fVfzf“ Eftf@fCfĀ,·,×,Ä,đŠŮ,đffBfĀfNfgš,đ ì ¬,·,é B•K—v,Ä, ,ê,İftuffBfĀfNfgš
,đ ì ¬,µ A“K Ø,ÈfAfvšfP [fVfzf“ Eftf@fCfĀ,đftuffBfĀfNfgš,É“u,.,æ,µ,É,·,é B
- 2 ì ¬,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,Ā,İ,İ AfAfvšfP [fVfzf“,İfĀ [fgffBfĀfNfgš,“D:Fungame,ĀE:fhf%ofCfu,“CD-ROMfhf%ofCfu,Ä, ,é ê
‡ AŽŸ,İ,æ,µ,Éf^fCfv,·,é B

xcopy /s e:\redist*. * d:\fungame

’ Ů @ @DirectXSetupŠÖ ”,“,æ,ŇDxsetup.exeftf@fCfĀ,“ 3 í,É“@ ì,·,é,½,B,É,İ ADirectX 3
SDK ä,É“z“u,3,é,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,Ā A`È%°,İ,æ,µ,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,ĉ,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,ÑDirectxfBfÆfNfgfŠ,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,©,ðŽ,· A,D,Æ,Â,Û,½,Í,»„êÈ ã,Ìftf%o 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	DirectDrawffofCfX Efhf%oCfo,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	DirectSoundffofCfX Efhf%oCfo,ðfCf“fXfg [f<,·,é B
DSETUP_DVIDEO	DirectVideo,ðfCf“fXfg [f<,·,é B
DSETUP_PROMPTFORDRIVERS	ffBfXfvfÆfC,·,æ,ÑfI [ffBfI EfffofCfX Efhf%o fCfo,ð'u,«Š,·,é‘O,ÉŠm”F,ð s,µ B
DSETUP_RESTOREDRIVERS	ffBfXfvfÆfC,·,æ,ÑfI [ffBfI Efhf%oCfo,ð•æE³, ·,é B

fZfbfgfAfbfv Efvf fOf%of€,Ä**DirectXSetup**,ðŽg—p,·,é‘O,É Af† [fU,ÌfVfXfef€,É Ä’á5 MB,Ì‘ó,«ffBfXfN—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 ÷,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

‡“î, 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

DirectXSetupŠÖ ”,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%ofbfgftfH [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,Ì—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”É“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,Ñftf@fCf<-¼,đŽw’è,µ A iconfRf}
f“fh,ÍfAfcRf“ îñ,đŠÜ,đftf@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,èÛ,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“,đCE©,Á,¯,ç,é,È,©,Á,½ ê ‡,Í A [autorun] fZfNfVf‡f“,Ì îñ,ð—~—
p,·,é BfZfNfVf‡f“,đCE©,Á,¯,é,ÆfVfFf<,Í¼,ÍfZfNfVf‡f“,ð,·,×,Ä-³Ž<,µ,Ä,µ,Û,ð
,Í,Á 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

AutoPlayAfvfŠfP [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“,^a A ^— ,đ'±,¯,Ä,c,c,©,Ç,□,©,đf_fCfAf fO Ef{fbfNfX,Ä•,-
,Æ Af† [fU,İÊ íOK,đfNfŠfbfN,·,é B,±,Ì,Æ,« Af† [fU,^af{f^f“,đ%öÿ,·,Ü,Ä,İžžŠÖ,đ—~—
p,µ,Ä AfofbfbfNfOf%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,^a,©,È,è'Z k,³,ê,é B

fn [fhfffBfXfN<óŠÖ,İ ß-ñ

fn [fhfffBfXfN—İæ,É,ÍÆÀ,è,ª, ,é B,±,±,Á,Ífn [fhfffBfXfN,ð ß-ñ,·,é,½,ß,İfAfhfofCfX,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,İ,Ý,ðfCf“fXfg [f<,·,é B,³,ç,É A,±,ê,ç,İfRf“f|
[flf“fg,ðfn [fhfffBfXfN,©,çfAf“fCf“fXfg [f<,·,é•û-@,à €”ð,µ,Ä,“, -
BfAfvfŠfP [fVf‡f“,İfAf“fCf“fXfg [f<,ÉŠÖ,·,é Ú ×,È î•ñ,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,İfQ [f€,İ I—
¹Žž,ÉfLfffbfVf...“à,İff [f^,ð Á<Ž,·,éIfvfVf‡f“,İf\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€ İ,.,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%Á”\ ,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 AfZfbfgfAfbfvfİfvfVf‡f“,đ È—ª,Á,«é B

fVfXfefCfCfWfXfgfŠ,đ•İ X,.,é,Æ Aftf fbfs [fffBfXfN,©,çAutorun.inf@fCf<,đ“Ç,Ý ž,Ü,¹,é,±,Æ,ª%Á”\ ,Æ,È,é Bftf fbfs [fffBfXfN,ÁAutoPlay,đ“® İ,³,¹,Á,àÖ—,İ,É,¢ ,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“® İ,.,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%ofCfu ã,ÁAutoPlay,ª%Ö“®,.,é B,µ,©,µ Aftf fbfs [fffBfXfN ã,ÉfCf“fXfg [f<,³,é,Á,¢ ,é,Æ,«,Í AAutoPlay,đŽè İÆ,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“® İ,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,ífZfbfg

fCfWfXfgfŠ,É,éNoDriveTypeAutoRun\1,Í Af^fCfvREG_BINARY,ì4fofCfg',ìfofCfifŠff [f^,ì1,Á,é B,±,ì1,ì Á %o,ìfofCfg,Í AAutoPlay ìÆ,©,ç æŠO,³,è,éŽí X,ìfhf%ofCfu,ð•\,· B,±,ìfofCfg,ì %Šú Ý'è,í0x95,Á A,±,é,í'FŽ,³,è,È,çf^fCfv,ìfhf%ofCfu,Á,éDRIVE_UNKNOWN ADRIVE_REMOVEABLE,¨,æ,ÑDRIVE_FIXED,ìf ffbfBfAf^fCfv,ðAutoPlay“K—p'í Û,©,ç æŠO,·,é B,Û,½AutoPlay,ì“@ ì,Éftf fbfs [ffBfXfNfhf%ofCfu,ð—~—p,·,é,É,Í Afrfbfg2,ð0,ÉfŠfZfbfg,·,é,© A,Û,½,ÍŽc,è,ì %Šú Ý'è,ð,»,ì,Û,Û,É,µ,Ä,¨,-,æ,²'10x91,ðŽw'è,·,é,©,ì,Ç,ç,ç,©,ð s,²•K—v,ª,é BfCfWfXfgfŠ'1,ì•Í X-@,ÉŠÖ,·,é î•ñ,É,Á,ç,Ä,Í AfCfWfXfgfŠ,ìŽq—p,ðŽQ Æ,·,é,±,Æ Bfrfbfg Afrfbfgf}fXfN'è ”,¨,æ,Ñfhf%ofCfu,ÉŠÖ,·,éŠÈ'P,È' Žß,ì•,ìŽÝ,ì'È,è,Ä,é B

frfbfg”Ó †	frfbfgf}fXfN'è ”	' ŽB
0 (Á%o°Êfrfbfg)	DRIVE_UNKNOWN	”FŽ,³,è,È,çfhf%ofCfuf^fCfv B
1	DRIVE_NO_ROOT_DIR	f< [fgffBfCfNfgfŠ,ª¶Y,µ,È,ç B
2	DRIVE_REMOVEABLE	ffBfXfN,ðfhf%ofCfu(ftfbfs [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%ofCfuB
5	DRIVE_CDROM	CD-ROMfhf%ofCfu B
6	DRIVE_RAMDISK	RAMffBfXfN B
7 (Á ãÊfrfbfg)		«—^,ì—~—p,ì,½,ß,É—\ñ,³,è,Ä,ç,é B

' Ó

Windows NT,É,Á,ç,Ä,Í A•í X,ð—LÆø,É,·,é‘O,ÉWindows Explorer,ð Ä•N“@,µ,È,¨,é,ì,È,ç,È,ç B

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,Å—}
§,Å,«.,é BWindows NTfo [fWf‡f“4.0,;æ,ÑWindows 95,ÅInternet Explorerfo [fWf‡f“4.0,ð—p,¢,Å,¢
,é†† [fU,Í AŽ©“®“I,ÉAutoPlay,ð—} §,.,é,±,Æ,ª,Å,«.,é B,±,İ<@“\
,Í AfXf^ [fgfAfbfv EfAfvfŠfP [fVf‡f“,Ì†,Åf† [fU,ÉAutorun.infftf@fCf<,Ì“ü,Á,Å,¢,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,Å, ,
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 [fVf‡f“ ÌAutoPlay

,Ü,½ AAutoPlay,ð—p,¢,Ä AMS-DOSfx [fX,ÌfAfvfŠfP [fVf‡f“,ðWindows MS-DOSfZfbfVf‡f“,ÄfCf“fXfg [f< A \ ¬,“,æ,ÑŽÀ s,Å,«,é BMS-DOSfx [fX,ÌŠefAfvfŠfP [fVf‡f“,É‘Î,µ“ÆŽ©,ÌfAfCfRf“ AConfig.sysftf@fCf<“,æ,ÑAutoexec.batftf@fCf<,ð Ý’è,·,é,±,Æ,ª,Ä,«,é B

Windows,ÍMS-

DOSfAfvfŠfP [fVf‡f“,Ì,½,ß,Ì ³,µ,¢ Ý’èftf@fCf<,ð Ì ¬,·,é B,Ü,½fXf^ [fgfAfbfv EfAfvfŠfP [fVf‡f“,ÍMS-DOSfAfvfŠfP [fVf‡f“,ðEfEfBf“fhfE“à,ÄN“@,Ä,«,é,æ,º,É,·,é BfXf^ [fgfAfbfv EfAfvfŠfP [fVf‡f“,Í•K—v,É%ž,¶,Ä,» ÌMS-DOSfAfvfŠfP [fVf‡f“,Ì ÄN“@,ðWindows,ÉŽwŽ,Ä,« AfAfvfŠfP [fVf‡f“,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,bftf@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<,ðÆÝ 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—^aĒ` BfJfXf^f€fRf}f“fh,ÍAutorun.inf@fCf<,Á’è`³,ê,Ä,č,È,¯,ê,Ī,È,ç,È,č B
AutoPlay,ÍAutoPlay“@ ì%oÂ”\,ÈffBfXfN,ÏfftfHf<fgf fjf... [€-Ú,Ä, ,é B

f† [fU,^aCD,ð\,·fAfCfRf“,ðf_uf<fNfŠfbfN,·,é,Æ Averb,ÁŽ¹,³,ê,éfRf}f“fh,^aŽÀ 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,·,éAfvfŠfP [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'â,«,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,è,ÍfAf<ftf@ i•s“§—¾“x j¹,³•%oÁ,³,è,Á,¢,é B“ê”É“l,Á,Í,È,¢,ª A“Á•É,É—
p“Ó,³,è,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,è,½
fCf [fW,Ís“§—¾“x,ð`è<,.,é¹ B,Ü,½,Í“Æ—§,µ,½fAf<ftf@ EfT [ftfFfX,ÉŠi”[³,è,½ AfsfNfZf<“—,½,è,è,Ís“
¾“x¹ B,Ü,½,Í AfT [ftfFfX“S¹,Ís“§—¾“x¹ B

fAf<ftf@’è ” ialpha constant j

fT [ftfFfX“S¹,É“K—p,³,è,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,ÍfIfufWfFfNfg,ÌEü,« A“Ê’u AfT [ftfFfX,Ì“Á «,ÉŠÖ,i,ç, AfV [f““S¹,ð Æ,ç,·EðE¹ Bfv [f“l
.,.,x,Á,Ì ê Š,ð“„¶Eð“x,Á Æ,ç,.,½,ß AfAf^fbf,³,è,½fTf€ [f€,ÍÊ’u,âEü,«,Í d—
v,Á,È,¢ B,Ð,Æ,Á,ÍfV [f“Á,Í A•i ”,ÍfAf“frfGf“fgEðE¹,ªE< ‡,³,è,Á,¢,é B

F<óŠÔ icolor space j

F,ðfGf“fR [fh,µ,½,è,è,Ž,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

F<óŠÔ•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,“TÉ“l,Á, ,é B

fI [ffBfI EfXfgfŠ [f€ ialudio stream j

gf~fLfvf“fO,³,è,½ A,Ü,½,Íf~fLfvf“fO,³,è,è%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 AÉ•%oÊ,ðfvf%ofCf}
fŠ EfTfEf“fh Efobftf@,É o—Í,.,é Bfvf%ofCf}
fŠ EfTfEf“fh Efobftf@,Í AfTfEf“fh Efn [fhfEfFfA,ÉfI [ftfBfI Eff [f^,ð<Ÿ<<,.,é B

fI [fo [fhf [ioverdraw j

fXfNfŠ [f“ EfsfNfZf<,ª•%oæ,³,è,é•½<l%oñ ” B

fI [fo [f€fC EfT [ftfFfX ioverlay surface j

f f, fŠ ã,İŠT”O“l,È,éE—Ïæ BŠi”[³,è,Á,¢,éCf [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,è,Á,¢,é B

fI [fo [f€fCZfI [f_ [ioverlay z-order j

fI [fo [f€fC,ªfNfŠfbfsf“fO,³,è,é ‡”Ó,ðE~è,.,é B,±,è,É,æ,è AfN [fhfEfFfA EfXfvf%ofCfge EfVfXfef€
,”DirectDraw,Ì,à,Æ,ÁŽÁ’•,³,è,é B

fIftfXfNfŠ [f“ EfT [ftfFfX ioff-screen surface j

f f, fŠ ã,İŠT”O“l,È,éE—Ïæ B”è”É“l,É A•Ž!‘O,ÉfobfNfobftf@,Öfuf fbn“l—,³,è,éfrfbfgf}
fbfv,ðŠi”[.,é,½,ß,É—p,ç,ç,è,é B’É í AfXfvf%ofCfge,ðŠi”[.,é,è,É—~p,³,è,é B

fIfyfR [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,^a—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,ê,é F,đŽ',μ,½'l B,½,Æ,,Īfn [fhfEfffA,ĪfufŠfbfg<@”\,đŽg—
p,·,é ê ‡ AfJf% [EfL [,Æ,μ,Ā Y'è,³,ê,½ F,đ œ,<éĈ—ĪæfsfNfZf<·,×,Ā,³fuf fbfn“]‘—,³,ê,é B,±
,ê,Ě,æ,Ā,Ā A<éĈ',Ā,Ě,ĉfXfvf%ofCfg,³fT [ftfFX ã,Ě ĩ ¬,³,ê,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,^a Ā ¶,³,ê,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,^aĀ,«,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”Ě“Ī,Ě—~—p,³,ê,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',·<éĈ,ĪfŠfXfg B,·,Ā,ÉfEfBf“fhfE Efnf“fhf<,³DirectDrawClipperfIfufWfFfNfg,ÉĈ<,Ñ,Ā,¯,ç,ê,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,ê,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,ê,Ě,ĉ B

ŽQ Æ @‘O•ûfNfŠfbfv-Ě

fT [frfX Efvf fofCf_ iservice provider j

DirectPlay, a~—

p,.,é AfIfbfgf [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•Y«.,,é,±,Æ,ª,Á,«.,é B

fT [ftfFfX isurface j

ŽšofCf [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 [ftfFfX AfIfXfNfŠ [f“ Eft [ftfFfX AfI [fo [fEfC Eft [ftfFfX Afvf%oCf} fŠ Eft [ftfFfX

fTfEf“fh Efofbftf@ isound buffer j

DirectSoundfI [ffBfI Eff [f^,ðŠi”],.,éf f,fŠ BfTfEf“fh Efofbftf@,Ífvf%oCf}fŠ,Á,àfZfJf“f_fŠ,Á,à,æ,- A,Ü,½ AfXf^fefBfbfN,Á,àfXfgfŠ [f€,Á,à,æ,ç B

ŽQ ÆfJfEf“fg ireference count j

fRf“f]

[flf“fg EfIfufWfFfNfg Ef,fff< iCOM jfIfufWfFfNfg,ðfRf“fgf [f<.,,é,½,ß,ÌfJfEf“f^ BfIfufWfFfNfg,ª ì -³,è,é,Æ AŽQ ÆfJfEf“fg,Í,É Y’è,³,è,é BfCf“f^ [ftfFfCfX,ªfIfufWfFfNfg,É€<,Ñ,Á,¯,ç,é,é,½,Ñ,ÉŽQ ÆfJfEf“fg,ÍfCf“fNfŠf f“fg,³,è A,»], Û‘± ,ª Øf,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-³€ø,Æ,È,é B

fV [f“ iscene j

%¼zŠÁ«<,ð \ -³,.,éfIfufWfFfNfg‘S‘ì,ÌfZfbfg B%ÅŽ<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%ÅŽ< ó‘Ô,Á, , é B“šŽ<“Š%oe,Á,Í A‘O‘ûfNfŠfbfv-È,ÆEä‘ûfNfŠfbfv- È,ÌŠÖ,Ì%¼z“L,Èfsf%of~fbfhE^,ðŽw,· B•½ s“Š%oe,É,“,ç,Á,Í—š•û‘ì,É,È,é B

ŽÀ sfobftf@ iexecute buffer j

3DfV [f“,ð<L q,;é AŠ@‘S,ÉŽ<€È“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,Ä,ç,é B

L’ istretching j

~Ü,È,éfTfCfY,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,éf f,fŠ BfTfEf“fh‘S‘ì,ð”è“x,Éfobftf@,É ‘,«.,±,ß,é,½,ß A‘Ö—,Á, ,é B

fXfefBfbfL [EftfH [fJfX istory 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“,ÆŽY,Ìf%oXf^ Ef%oCf“,Æ,ÌŠÖ,ÌfIfZfbfg,ðŽw,· BfXfgf%oCfh EfAf%oCf“f f“fg,Í AftfBfXfvfEfC Ef f,fŠ Eft [ftfFfX,ðfZfbfgfAfbfv,.,é Ü,Ì d— v,È Y€v—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,«.,éfobftf@,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 ¶ -³,.,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,³,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 ¶,³,ê,éĈÊ X,İfTfEf“fh,đŠi”[µ,½•”^a 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•”^a,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,³,ê,È,ç B’
O•ûfNfŠfbfv-Ê,İ ,,³,Í Afrf... [,İftfB [fçfh,ð’èç,.,é B
ŽQ Æ @Ĉä•ûfNfŠfbfv-Ê

,½

',"_ ivertex j
3D<óŠÖ,í" _ B

fefBfAfŠf"fo itearing j

fXfNfŠ [f" ,İfŠftfĈfbfVf... EfĈ [fg,³fAfvfŠfP [fVf‡f" ,İftfĈ [fĈ EfĈ [fg,Æ"Šú,µ,Ä,Ĉ,È,Ĉ,Æ,« ,É<N,± ,é A·Ž,³,²,É,è,æ,²,ÉĈ©,¹,éĈ» Ũ B,Đ,Æ,Ä,İftfĈ [fĈ,İ ä" ,³,É,İftfĈ [fĈ ,İ%º" ,Æ"Žž,É·Ž,³,é A,Ó,½,Ä,İfĈf [fW,İŠÖ,É—ô, _Ú,³ ¶,¶,é B

fefNfXf`ff itexture j

Direct3D,É,," ,Ä AfrfWf...fAfĈ EfIfufWfFfNfg,É"K—p,³,é,é AfsfNfZfĈ,³,éĈ,É·Ä,ñ,¾"z—ñ B

fefNfXf`ff Ä·W itexture coordinates j

ŠefefNfXf`ff,İfefNfZfĈ,É AfIfufWfFfNfg ä,İŠe', " ,³,Ĉ,²ŠÖ·A,Ä, _ ,Ĉ,é,é,©Ĉ"è,·,é Ä·W B

fefNfXf`ff EfufĈf"fffBf"fo itexture blending j

fefNfXf`ff,İ F,đf}fbfv æ,İfT [ftfFfX,İ F,Æ'g,Ý ‡,í,¹,é<Z p B

fefNfXf`ff Ef}fbfsf"fo itexture mapping j

fefNfXf`ff,đfIfufWfFfNfg,É" ,è,Ä, _ ,é,±,Æ BfefNfXf`ff,Í·½—ÊfĈf [fW,¾,³fIfufWfFfNfg,Í,» ,² ,Ä,È,Ĉ é ‡,³,²,Ĉ,İ,Ä AfefNfXf`ff Ä·W,Æf%fbfsf"fo Eftf%fo,đ—p,Ĉ ,ÄfefNfXf`ff,đfIfufWfFfNfg,İfT [ftfFfX,Éf}fbfv,µ,È,,Ä,Í,È,Ĉ,È,Ĉ B
ŽQ Æ @fefNfXf`ff Ä·W Af%fbfv

fefNfZfĈ itexel j

fefNfXf`ff,İP"è,İ—v'f BfefNfXf`ff,³fIfufWfFfNfg,É"K— p,³,é,½,Æ,« AfefNfZfĈ,³fXfNfŠ [f" ,İfsfNfZfĈ,É'İ%ž,·,é,± ,Æ,Í,ß,Ä,½,É,È,Ĉ BfAfvfŠfP [fVf‡f" ,Í AfefNfZfĈ,³,Ĉ,²fsfNfZfĈŠÖ,đ·äŠÖ,·,é,© §Ĉä,·,é,½,ß,É AfefNfXf`ff f EftfBfĈf^Šf"fo,đŽg—p,·,é,±,Æ,³,Ä,« ,é B

fffJ [fĈ idecal j

frfWf...fAfĈ EfIfufWfFfNfg,Æ,µ,Ä'¼ ÚfĈf"f_fŠf"fo,³,é,éfefNfXf`ff Bfrf... [f] [fg,Æ"è"v,µ,½,éĈ,ÉfĈf"f_fŠf"fo,³,é,é B

"[Ĉ—Ĉ³fJf% [EfL [isource color key j

fuf fbfN"[Ĉ—,É,," ,ÄfRfs [,³,é,È,Ĉ F A,Ü,½,Í AfI [fo [fĈfĈ,É,," ,Ä o—Í æ,É·Ž,³,é,È,Ĉ F B

"[Ĉ— æfJf% [EfL [idestination color key j

fuf fbfN"[Ĉ—,É,," ,Ä,Í A'u,«Š·, ,Ĉ,é,é F BfI [fo [fĈfĈ,É,," ,Ä,Í A"[Ĉ— æ,İfT [ftfFfX ä,İ·Ĉ,Ĉ %B,³,é,é F B

,í

”z—ñfIfufWfFfNfg iarray object j

,D,Æ,Ä,Ì”z—ñ,Ë,Û,Æ,ß,ç,ê,½fIfufWfFfNfg,ÌfOf< [fv B”z—
ñfIfufWfFfNfg,Ë,æ,èfOf< [fv’S’Ì,ð,æ,èŠÈ’P,É’€ ì,Ä,«é B”z—ñfIfufWfFfNfg,ð—
p,Ä,«éCOM,ÌfCf“f^ [ftfFfCfX,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,ÄfIfufWfFfNfg,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

fIfufWfFfNfg,âfAfvfŠfP [fvf±f“,³Ž—
p,·,é F,ÌfZfbfg BDirectX,Ä,Í ADirectDrawPalettefIfufWfFfNfg,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,éfIfufWfFfNfg ã,Ì€ö“_ª,ç,Ì,æ,ª
,É•Ž,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,½,½fIfufWfFfNfg,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|fufWfFfNfg,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 @_

• **±T [ftfFfX icomplex surface j**

DirectDrawSurfacefIfufWfFfNfg,Ä Af< [fg Eft [ftfFfX,ÉfAf^fbf`,³,ê,é,à,Ì,ð,Û,Æ,ß,ÄŽw,·€è B•; ±T [ftf
FfX \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,ÌfIfufWfFfNfg,Ì”z’u,Ì€³,É,È,é A”ñ•Ž,Ì’g BfIfufWfFfNfg,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 % ,İfofbftf@ B'½,,İ ê ‡ A%œÄŽ< ó'Ô,İfvf%ofCf}
fŠ EfT [ftfFfX,đŽw,· B,» ,©,Ä,È,ç,Æ,« ,Í AfefNfXf`ff,İftfŠfbfsf“fO Ef`fF [f“,İ,æ,□
,É A3DfGf“fWf“ ,afefNfXf`ff,đŽæ“¾,·,éT [ftfFfX,İ,±,Æ,Ä ,é B,±,İ ê ‡,İfvf%ofCf}
fŠ EfT [ftfFfX,Ä,İ,È,-
A·Ž,İ,à,³,ê,È,ç BftfŠfbfsf“fO EfI [fo [fCEfC EfT [ftfFfX,Ä,İftf f“fg Efofbftf@,İ·Ž,İ,³,ê,é,ª A,±
,ê,İ'P,Éfvf%ofCf}fŠ EfT [ftfFfX,ÉfI [fo [fCEfC,³,ê,½fT [ftfFfX,É,·,-,È,ç B
ŽQ Æ @fvf%ofCf}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%ofCf}fŠ EfT [ftfFfX iprimary surface j

f,fj^ [ä,É·Ž,³,ê,éCf [fW,đŠÛ,ñ,¾f f,fŠ—İæ BDirectX,Ä,Í Afvf%ofCf}fŠ EfT [ftfFfX,İfvf%ofCf}
fŠDirectDrawSurfacefIfufWfFfNfg,É,æ,Ä,Ä·,³,ê,é B

fvf%ofCf}fŠ EfTfEf“fh Efofbftf@ iprimary sound buffer j

fQ [fÉ†,Äf† [fU [,İŽ,·,É·,±
,,é%ó,đŽ ,Äfofbftf@ 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%œÄŽÒ BŠefvfCEfCf,,Í AfvfCEfCf,,ŠÖ,İf fbfZ [fWCEđŠ,đ%œÄ”
,É,·,éfvfCEfCf,,ID,ÉŠÖ~A,Ä,·,ç,ê,é B

fvfCEfCf,,ID iplayer ID j

DirectPlayZfbfVf‡f“,İŠeŽQ%œÄŽÒ,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%œ¼'zfvfCEfCf,, [BfvfXfefÉ Ef fbfZ [fW,â AfZfbfVf‡f“†,
İ,·,×,Ä,İfvfCEfCf,, [,É'È'm,³,ê,é fbfZ [fW,Í AfzfXfg,É,æ,Ä,Ä ^— ,³,ê,é B

f|fCf“fg ipoint j

CE“_,©,ç‘S·ûCEü·İ“™,ÉCEđ,đ·ú,ÄCEđCE¹ B

•úŽÈ Ý”è iemissive setting j

ŽQ Æ @·úŽÈ“Á «

•úŽÈ“Á « iemissive property j

f D,İ“Á «,İ,Đ,Æ,Ä B'f D,ªCEđ,đ·úŽÈ,·,é,©,ç,□
,©,đŽ',· B·úŽÈ“Á «,Í A'f D,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”è<,·,é AfT [ftfFfX,©,ç ,¼,É,İ,Ñ,é%œË·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,é“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‘œ“x,É,µ,½,à,Ì,Ā, ,é
B%ĀŽ<fIfufWfFfNfg,ªŠí“ŽŌ,Ì<B,,É, ,é,Æ,«,É,Í ,%ð‘œ“xfCf [fW,ª—p,ç
,ç,ê AfIfufWfFfNfg,ª%“‘,·,©,é i,»,µ,Ā ¬,³,,È,é j,É,µ,½,ª,Ā,Ā A,æ,è’á%ð‘œ“x,ÌfCf [fW,ª—p,ç,ç,é,é B

-¾“ iumbra j

fXf|fbfgf%oCf,Ì%~ ó,ÌCEð,Ā A’+%,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,é,é-Ê,ÌfZfbfg B

-Ê iface j

f fbvVf...’t,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_fvf^,ÌEGAf}f<f’vf< 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

.ç

f%ofbfv iwrap j

-È,âf fbVf...,ÏfefNfXf`ff À•W,ÏEÿŽZ,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,Ïfgfbfv,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”È,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

