

$f w f \langle f v \text{ } f g f s f b f N, \hat{l} \hat{e} \longrightarrow, \partial \bullet \check{Z}, \cdot, \acute{e}, \acute{E}, \acute{I} \text{ } A[f w f \langle f v] , \grave{l} [f g f s f b f N, \grave{l} \mathbb{E} \check{Y} \text{ } \tilde{o}] , \partial f N f \check{S} f b f N, \mu, \check{A}, , \frac{3}{4}, ^3, \P \text{ } B$

DirectX f'ffc [f<

Microsoft® DirectX® f'ffc [f<,lfwf<fv,l"à—e,Í AŽŸ,Ì,Æ,,"è,Å,· B

- DirectX f'ffc [f<,É,Â,ç,Ä
- —â'è,ÌŒ^ö,ð"Á'è,·,é
- DirectX fRf"f| [f|f"f g,ÌfefXfg,ð s,□
- Šù'è,Ì"® ì,ð•Ĭ X,·,é
- fhf%ofCfo,ð•œŒ³,·,é
- î•ñ,ð•Û'¶,·,é
- —â'è,ð•ñ ,·,é

DirectX f'ffc [f<,É,Â,c,Ä

DirectX® f'ffc [f<,Í AfVfXfef€ ã,Ì Microsoft® DirectX fAfvfŠfP [fVf‡f“ fvf fOf%of~f“fO
fCf“f^ [ftfFfCfX,ÌfRf“f| [flf“fg,“,æ,Ñfhf%ofCfo,ÉŠÖ,·,é î•ñ,ð•Ž',μ AfTfEf“fh,âfOf%oftfBfbfNfX,Ì o—
ÍfefXfg,ð s,c,Ü,· B,Ü,½ A^ê•”,Ìfn [fhfEfFfA fAfNfZf%fœ [f^,Ï<@”\,ð–³œø,É,·,é,±,Æ,à,Â,«,Ü,· B
,±,Ìfc [f<,ðŽg,ϣ,Æ AfTf| [fg fZf“f^ [Ö,Ì–â,c ‡,í,¹†,É î•ñ,ðŽû W,μ AfTf| [fg<Z pŽÒ,É“`,',é,±
,Æ,ª,Â,«,Ü,· B,Ü,½ Afc [f<,ªŽû W,μ,½ î•ñ,ð•Û‘¶,μ A“dŽqf [f<f fbfZ [fW,É“\,è•t,¯,é,±,Æ,à,Â,«,Ü,· B
î•ñ,Í A ”fy [fW,Ìf^fu,É•ª,¯,Ä•Ž',³,ê,Ü,· Bfy [fW,©,çfy [fW,Ö~Ú“@,·,é,É,Í AŽŸ,Ì•û–@,ª,è,Ü,· B
· f^fu,ðfNfŠfbfN,·,é B
· [ŽŸfy [fW],ðfNfŠfbfN,·,é B
· “ü—ÍftfH [fJfX,ªf^fu,É,·,é,Æ,«,É A ¶%œE,Ì•ûœüfL [,ð%œŸ,· B
' :fffBfXfvfœfC fJ [fh,Ìf f,fŠ—Ê,È,Ç A^ê•”,Ì î•ñ,É,Â,c,Ä,Í AŠTŽZ,Ì'l,Â,·,é ê ‡,ª,è,Ü,· B

–â'è,ìĖ"ö,ð"Á'è,·,é

DirectX fAfvfŠfP [fVf‡f“,lŽÀ s'†,É–â'è," ¶,μ,½ ê ‡,Í ADirectX f'ffc [f<,ðŽg,□,Æ–â'è,ìĖ
"ö,ð"Á'è,Ä,«,Ü,· BŽŸ,ì,æ,□,È–â'è,"É,Ĉ,©Šm"F,μ,Ä,,¾,³,Ĉ B

· Ĉë,Á,½fo [fWf‡f“,l DirectX fRf"f [flf"f g B[DirectX ftf@fCf<] f^fu,ì [' ^Ó],Á Afx [f^
ftf@fCf<,âfffofbfO ftf@fCf<,ÉŠÖ,·,éĈx ,ª,È,Ĉ,©Šm"F,μ,Ä,,¾,³,Ĉ Bfx [f^ ftf@fCf<,Í %Šú,lfeXfg—
pfo [fWf‡f“,Á A □—p fAfvfŠfP [fVf‡f“,Æ<□,ÉfCf"fXfg [f<,·,×,«,à,ì,Á,Í, ,è,Ü,¹,ñ BfffofbfO
fo [fWf‡f“,Ívf fOf%of€,ðŠJ",·,é Ü,ÉŽg,í,ê,éftf@fCf<,Á A,±,ê,à Á I »·i,Æ<□
,ÉfCf"fXfg [f<,·,×,«,à,ì,Á,Í, ,è,Ü,¹,ñ BfffofbfO fo [fWf‡f“,l fRf"f [flf"f g,ªfCf"fXfg [f<,³,ê,Ä,Ĉ
,é,Æ A »·i"Á,ªfCf"fXfg [f<,³,ê,Ä,Ĉ,é ê ‡,æ,è,à fAfvfŠfP [fVf‡f“,lŽÀ s'–"x,"ª• ,É'á%°,·,é,±,Æ,ª, ,è,Ü,·
B

· "F'è,³,ê,Ä,Ĉ,È,Ĉfhf%ofCfo B[DirectX fhf%ofCfo] f^fu,ìftf@fCf<,lê—,Á A–Ĉ"F'è,ðŽ',·f} [fN,"ªŽ',³,ê,Ä,Ĉ
,éfhf%ofCfo,ª,È,Ĉ,©Šm"F,μ,Ä,,¾,³,Ĉ B[ffBfXfvfĈfC] A[fTfEf"f h] A,·,æ,Ñ ["ü—Í] f^fu,ì [' ^Ó]
,É,à A,»,l'¼,l–â'è,"Ž',³,ê,Ä,Ĉ,é ê ‡,ª, ,è,Ü,· B–Ĉ"F'è,l fhf%ofCfo,Í A Á Vfo [fWf‡f“,l DirectX
,ÆŠ®'S,ÉĈŸŠ· «,ª, ,é,©,Ĉ,□,©,ðf}fCfNf f\ftfg,É,æ,Á,ÄfefXfg,³,ê,Ä,Ĉ,Ü,¹,ñ B

· fn [fhfEfFfA fAfNfZf%ofĈ [f^,lĈ‡" @ B"ê",l fvf fOf%of€,Í ADirectDraw®,Ü,½,Í Direct3D®
fn [fhfEfFfA fAfNfZf%ofĈ [f^,ª—p,Á,«,È,Ĉ,Æ AŽÀ s'–"x,"ª"ñ í,É'á%°,·,é,© A,Ü,½,Í,Ü,Á,½,-
"® ì,μ,Ü,¹,ñ B[ffBfXfvfĈfC] f^fu,ì [DirectX,ì<@"] ,Á ADirectDraw ,Ü,½,Í Direct3D ,É "Žg—p%Á"
,ÈfAfNfZf%ofĈ [f^,È,μ" ,Æ•Ž',³,ê,Ä,Ĉ,È,Ĉ,©Šm"F,μ,Ä,,¾,³,Ĉ B•Ž',³,ê,Ä,Ĉ
,é ê ‡,Í Afn [fhfEfFfA,l fAfbfvfOfĈ [fh,ðĈŸ"Ĉ,μ,½,Ü,□,ª,æ,Ĉ,©,à,μ,ê,Ü,¹,ñ B

· fffofCfX,ª Ú'±,³,ê,Ä,Ĉ,È,Ĉ BfWf‡fCfXfefBfbfN,È,Ĉ,ì"ü—ÍffofCfX,ª%ž"š,μ,È,Ĉ ê ‡ A ³,μ,-
fZfbfgfAfbfv,³,ê,Ä,Ĉ,È,Ĉ%Á" «,ª, ,è,Ü,· B,»,lffofCfX,ª ADirectX f'ffc [f<,l ["ü—Í] f^fu,É•Ž',³,ê,Ä,Ĉ
,é,©,Ĉ,□,©Šm"F,μ,Ä,,¾,³,Ĉ B•Ž',³,ê,Ä,Ĉ,È,Ĉ ê ‡,Í AfRf"f g f [f<
fpflf<,ðŽg,Á,ÄffofCfX,ð'Ĉ%Á,μ,Ü,· B

DirectX fRf“f| [flf“fg,lfefXfg,ð s,□

DirectX f'ffc [f<,ðŽg,Á,Ä AfVfXfef€,É Ú'±,³,ê,Ä,¢,éŠef,fjf^,Ä,Ì DirectDraw ,“,æ,Ñ Direct3D ,lfefXfg AŠe
WAVE o—ÍfffofCfX,Ä,Ì DirectSound®,lfefXfg A,“,æ,ÑŠef~f... [fWfbfN f| [fg,Ä,Ì DirectMusic™
,lfefXfg,ð s,□,±,Æ,ª,Ä,«,Ü,· B

[fefXfg],ðfNfŠfbfN,·,é,Æ Af fbfZ [fW,ª•Ž',³,ê,½Æã Af,fjf^,â o—
ÍfffofCfX,ÄfefXfg,ªŽÀ s,³,ê,Ü,· BfefXfg,ª ¬Æ÷,µ,½,©,Ç,□
,©,ðŠm”F,·,éf fbfZ [fW,ª•Ž',³,ê,é,Ü,Ä A,»,ê,¼,ê,lfefXfg,ðŽÀ s,³,¹,Ü,· B[,¢,¢,[]
,ðfNfŠfbfN,µ,½ ê ±,Í A,»,ê^È ãfefXfg,ÍŽÀ s,³,ê,Ü,¹,ñ B

DirectMusic,Ì ê ±,Í A^Pê,lfefXfg,ª s,í,ê,Ü,· B%%o‘t,³,ê,½%o¹Šy,É-â‘è,ª,È,¢ ê ± A,Ü,½,Í ³,µ,%%
%o‘t,³,ê,È,¢ ê ± A^P,É [OK],ðfNfŠfbfN,µ,Ü,· B

î•ñ,ð•Û•¶,µ,Ä,à AfefXfg,ÌÆ<%oÊ,Í•Û•¶,³,ê,Ü,¹,ñ B

Šù'è,ì“@ i,ð•Ĭ X,·,é

fVfXfēfē,ÉfCf“fXfg [f<,³,ê,Ä,¢,éŠeffBfXfvfœfC fffofCfX,É'Ĭ,·,é [ffBfXfvfœfC] fy [fW,Ä [-³œø]
,ðfNfŠfbfN,·,é,Æ ADirectDraw ,Ü,½,Ĭ Direct3D (—~—p%œÄ”\,È ê ±),Ĭfn [fhfEfFfA fAfNfZf%œfœ [f^,ð—
³œø,É,·,é,±,Æ,ª,Ä,«,Ü,· B—³œø,É,µ,½fAfNfZf%œfœ [f^,Ĭ DirectX f'ffc [f<,ð I—
¹,µ,½œä,à,»,Ĭ,Ü,Ü,Ä AfAfvfŠfP [fVf‡f“,©,ç—~—p,·,é,±,Æ,Ĭ,Ä,«,Ü,¹,ñ BfAfNfZf%œfœ [f^,ð,à,à,²ê“x—
Lœø,É,·,é,É,Ĭ A[—Lœø] fNfŠfbfN,µ,Ü,· B

’ : DirectDraw fAfNfZf%œfœ [f^,ð—³œø,É,·,é,Æ ADirect3D ,ĬfAfNfZf%œfœ [f^,à—³œø,É,È,è,Ü,· B

,Ü,½ ADirectDraw ,Ĭ'S%œ—Ê•Ž!fAfvfŠfP [fVf‡f“Žg—pŽž,Ĭf,fjf^,ĬfŠftfœfbfVf... fœ [fg,ð•Ĭ X,·,é,±
,Æ,à,Ä,«,Ü,· B,±,ĬĬ X,Ĭ A“Á'è,ĬfAfvfŠfP [fVf‡f“,ÄffBfXfvfœfC,ÉŠÖ,·,é—â'è,“” ¶,µ,Ä,¢
,Ä A,»,ĬfAfvfŠfP [fVf‡f“,ª—³œø,ÈfŠftfœfbfVf... fœ [fg,ð Ý'è,µ,Ä,¢,é,ÆŽv,í,ê,é ³“—,È— —
R,ª,·,é ê ±,É,¾,¯ s,Ä,Ä,,¾,³,¢ B

► fŠftfœfbfVf... fœ [fg,ð•Ĭ X,·,é,É,Ĭ

1. [,»,ê,Ä,à—â'è,ª%œðœ^,µ,È,¢ ê ±] f^fu,Ä A[ä ‘,«],ðfNfŠfbfN,µ,Ü,· B
2. [DirectDraw fŠftfœfbfVf... fœ [fg,Ĭ ä ‘,«] f_CfAf fO f{fbfNfX,ÄfGffBfbfg
f{fbfNfX,ð'I'ð,µ Af,fjf^,É'Ĭ,µ,Ä—Lœø,ÈfŠftfœfbfVf... fœ [fg,ð“ü—Ĭ,µ,Ü,· B,±,Ĭf{fbfNfX,É'l,ð“ü—
Ĭ,·,é,Æ A[ä ‘,«'l],ªŽ©“@“I,ÉfIf“,É,È,è,Ü,· B
3. [OK],ðfNfŠfbfN,µ,Ü,· B

► fŠftfœfbfVf... fœ [fg,Ĭ•Ĭ X,ðŽæ,è Ä,µ,Ä ADirectDraw fAfvfŠfP [fVf‡f“,ª“ÆŽ©,ĬfŠftfœfbfVf...
fœ [fg,ð Ý'è,Ä,«,é,æ,²,È,·,é,É,Ĭ

1. [,»,ê,Ä,à—â'è,ª%œðœ^,µ,È,¢ ê ±] f^fu,Ä A[ä ‘,«],ðfNfŠfbfN,µ,Ü,· B
2. [DirectDraw fŠftfœfbfVf... fœ [fg,Ĭ ä ‘,«] f_CfAf fO f{fbfNfX,Ä A[Šù'è'l],ðfIf“,É,µ,Ü,· B
3. [OK],ðfNfŠfbfN,µ,Ü,· B

f h f % o f C f o , ð • œ € ³ , • , é

\ ¬,É,æ,Á,Ä,Í A DirectX® f'ffc [f<,Ä A^È‘O,ÌfI [ffBfI f h f % o f C f o , , æ , Ñ f r f f I
f h f % o f C f o , ð • œ € ³ , Ä , « , Ü , • B f h f % o f C f o , Ì ” ñ € Ý Š • « , Ì - â ‘ è , Ì % ð ð € ^ , É , Í A , ± , ê , ^a Ä , à , æ , € • ù - @ , Ä , , é ê ± , ^a , è , Ü , • B
[, » , ê , Ä , à - â ‘ è , ^a % ð ð € ^ , µ , È , € ê ±] f ^ f u , É [• œ € ³] f { f ^ f “ , ^a • Ž ! , ³ , ê , Ä , € , é ê ± , Í A , ± , Ì f { f ^ f “ , ð f N f Š f b f N , µ A DirectX
f Z f b f g f A f b f v f v f f O f % o f € , ð Ž Ä s , Ä , « , Ü , • B

DirectX f Z f b f g f A f b f v , É , Í A [f I [f f B f I f h f % o f C f o , Ì • œ € ³] , Æ [f f B f X f v f € f C f h f % o f C f o , Ì • œ € ³]
f { f ^ f “ , ^a , è , Ü , • B , € , , , ê , © , Ì f { f ^ f “ , ð f N f Š f b f N , • , é , Æ A f V f X f e f € , É DirectX
, ð f C f “ f X f g [f < , µ , ½ , Æ , « , É ‘ u , « Š • , ! , ç , ê , ½ f h f % o f C f o , ^a • œ € ³ , ³ , ê , Ü , • B f { f ^ f “ , ^a Ž g — p % o Ä ” \
, Ä , È , € ê ± , Í A • œ € ³ , • , é f h f % o f C f o , Í , , è , Ü , ¹ , ñ B , » , Ì ê ± , Í A f n [f h f E f F f A , Ì » ‘ € € ³ , É -
â , € ± , í , ¹ , Ä Ä V , Ì f h f % o f C f o , ð “ ü Ž è , µ , Ä , , ¾ , ³ , € B

DirectX f Z f b f g f A f b f v , É , Í A Direct3D f n [f h f E f F f A f A f N f Z f % o f € | f ^ , ð -
³ € Ø , É , • , é f ` f F b f N f { f b f N f X , à , , è , Ü , • , ^a A , ± , ê , Í A D x D i a g “ à , Ä , à s , □ , ± , Æ , ^a , Ä , « , Ü , • (Š ù ‘ è , Ì “ ® ì , ð • Ĭ X , • , é
, ð Ž Q Æ , µ , Ä , , ¾ , ³ , €) B

î•ñ,ð•Û‘¶,•,é

DirectX f’ffc [f<,°Žû W,μ,½ î•ñ,ð•Û‘¶,•,é,É,Í A2 ,Â,î•û-@,°, ,è,Û,• B

• [î•ñ,ð,•,×,Ä•Û‘¶] ,ðfNfŠfbfN,μ,Û,• B,•,×,Ä,Ïfy [fW,î î•ñ,ª AŽw’è,μ,½ ê Š,É, ,éŽw’è,μ,½-
¼‘O,Ïftf@fCf<,É•Û‘¶,³,ê,Û,• B

,±,Ïfc [f<,ÏŠJ”ŽÒEü,¯fŠfŠ [fX,ðŽg,Á,Ä,¢,éf\ftfgfEfFfAŠJ”ŽÒ,Â, ,ê,Î AŽŸ,î•û-@,ð,Æ,é,±,Æ,à,Â,«,Û,• B

• [,»,ê,Â,â-â‘è,ª%øðE^,μ,È,¢ ê ±] f^fu,Â A[•ñ] ,ðfNfŠfbfN,μ,Û,• B[áŠQ•ñ ,î î•ñ] f_fCfAf fO
f{fbfNfX,ª•Ž,³,ê,Û,• B•K—v,È,•,×,Ä,Ïff [f^,ð“ü—Í,μ I,,½,ç A[‘— M]
,ðfNfŠfbfN,μ,Û,• B~ŽžffBfEfNfgfŠ (,½,Æ,!,Î AC:\Windows\Temp) ,É Dxinfo.txt ,Æ,¢,ª-¼‘O,ÏfeLfXfg
ftf@fCf<,ª ì ¬,³,ê Af f,’ ,ĂŠJ,©,ê,Û,• B,±,Ïftf@fCf<,É,Í A‘O,î•û-
@,ĂŽû W,³,ê,½ î•ñ,î,Û,©,É Af_fCfAf fO f{fbfNfX,Ă“ü—Í,μ,½EÂ 1 î•ñ,â,»,î‘¼,î î•ñ,ªŠÛ,Û,ê,Û,• B

–â‘è,ð•ñ ,·,é

DirectX ,l̄fRf“f| [flf“fg,Ü,½,Ífhf%oCfo,ÉŠÖEW,^a, ,é,ÆŽv,í,ê,é–â‘è,[”] ¶,μ,½ ê ‡,Í Af})fCfNf f\ftfg
fefNfjJf< fTf| [fg,É~A— ,·,é,±,Æ,^aÄ,«,Ü,· BfefNfjJf< fTf| [fg,Ö,ì~A— ,î•û–@,É,Ä,¢,Ä,Í AMicrosoft®
Windows®fwf<fv,ì ufgf%ofuf<fVf... [fefBf“fO v,ðŽQ Æ,μ,Ä,,¾,³,¢ BŠJ”-
ŽÒÆü,¬fŠfŠ [fX,ì f’ffc [f<,ðŽg,Ä,Ä,¢,é\ftfgfEfFfAŠJ”ŽÒ,Ä, ,ê,Î A“dŽqf [f<,Ä–â‘è,ð•ñ ,·,é,±
,Æ,à,Ä,«,Ü,· B

’ : ŽŸ,ìŽè ‡,Í A,±,l̄fc [f<,l̄ŠJ”ŽÒÆü,¬fŠfŠ [fX,É,ì,Ý“K—p,³,ê,Ü,· B,±,l̄û–
@,Í A,·,×,Ä,l̄f+ [fU [,^aŽg,!,é,í,¬,Ä,Í, ,è,Ü,¹,ñ B

► “dŽqf [f<,Ä–â‘è,ð•ñ ,·,é,É,Í

1. [,»,ê,Ä,à–â‘è,[”]%øðÊ[^],μ,È,¢ ê ‡] f^fu,Ä A[•ñ] ,ðfNfŠfbfN,μ,Ü,· B
2. [áŠQ•ñ ,l̄ î•ñ] f_CfAf fO f{fbfNfX,É•K—v,È,·,×,Ä,ì î•ñ,ð“ü—Í,μ A[— M] ,ðfNfŠfbfN,μ,Ü,· B
3. ì ¬,³,ê,½fefLXfg ftf@fCf<,l̄ftf< fpfX,Æ“dŽqf [f<
fAfhfEfX,ðŽ,·f fbfZ [fW,^aŽ,!,³,ê,Ü,· B“dŽqf [f< fAfhfEfX,ð ‘,«,Ä,¬,Ä,¬,«,Ü,· B[OK]
,ðfNfŠfbfN,μ,Ü,· Bf f,’ ,^a«N“®,³,ê ADxinfo.txt,ì“à—e,^aŽ,!,³,ê,Ü,· B
4. f f,’ ,l̄[•Ò W]f fjf... [l̄[·,×,Ä‘T’ð] ,ðfNfŠfbfN,μ A[•Ò W]f fjf... [l̄[fRfs []
,ðfNfŠfbfN,μ,Ü,· Bftf@fCf<,l̄,·,×,Ä,ì“à—e,^afNfŠfbfN{ [fh,É“ü,ê,ç,ê,Ü,· B
5. “dŽqf [f<fvf fOf%of€,Ä V,μ,¢f fbfZ [fW,ð ì ¬,μ AfNfŠfbfN{ [fh,ì“à—e,ðf fbfZ [fW–{•¶,É“\
,è•t,¬,Ü,· B,±,l̄f fbfZ [fW,ð AŽè ‡3,Ä ‘,«,Ä,¬,½fAfhfEfX,É‘— M,μ,Ü,· B

