

$f wf\langle fv\ fgfsfbfN,\hat{l}\hat{e}\longrightarrow,\partial\bullet\check{Z}',\cdot,\acute{e},\acute{E},\acute{I}\ A[fwf\langle fv],\grave{l}\ [fgfsfbfN,\grave{l}\in\check{Y}\ \grave{o}],\partial fNf\check{S}fbfN,\mu,\check{A},,\frac{3}{4},^3,\P\ B$

DirectX f'ffc [f<

Microsoft® DirectX® f'ffc [f<,lfwf<fv,ì“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“fg,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%oCfo,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 ¶%oE,Ì•ûœüfL [,ð%oŸ,· 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“fg B[DirectX ftf@fCf<] f^fu,ì [' ^Ó],Á Afx [f^
ftf@fCf<,âffofbfO 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 BffofbfO
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 BffofbfO fo [fWf‡f“,l fRf“f [flf“fg,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,ªª· ,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,ª·Ž!,³,ê,Ä,Ĉ
,éfhf%ofCfo,ª,È,Ĉ,©Šm"F,μ,Ä,,¾,³,Ĉ B[ffBfXfvfĈfC] A[fTfEf“fh] A,“,æ,Ñ [“ü—Í] f^fu,ì [' ^Ó]
,É,à A,»,l¼,ì–â'è,ªŽ!,³,ê,Ä,Ĉ,é ê ‡,ª, ,è,Ü,· B–Ĉ”F'è,ìfhf%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,ìfAfbfvfOfĈ [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“fgf [f<
fpflf<,ðŽg,Á,ÄffofCfX,ð'Ĉ%Á,μ,Ü,· B

DirectX fRf“f| [flf“fg,İfefXfg,ð s,□

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

[fefXfg],ðfNfŠfbfN,·,é,Æ Af fbfZ [fW,ª•Ž‘,³,ê,½Æã Af,fj f^,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,İfefXfg,ðŽÀ s,³,¹,Ü,· B[,¢,¢,[]
,ðfNfŠfbfN,µ,½ ê ±,Í A,»,ê^È ãfefXfg,ÍŽÀ s,³,ê,Ü,¹,ñ B

DirectMusic,İ ê ±,Í A’P^ê,İfefXfg,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,İÆ<%oÊ,Í•Û•¶,³,ê,Ü,¹,ñ B

Šù'è,ì“@ i,ð•Ĭ X,·,é

fVfXfe€ÉfCf“fXfg [f<,³,ê,Ä,¢,éŠeffBfXfvfœfC fffofCfX,É'Ĭ,·,é [ffBfXfvfœfC] fy [fW,Ä [-³œø]
,ðNfŠfbfN,·,é,Æ ADirectDraw ,Ü,½,Ĭ Direct3D (—~—p%Ō”\,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 AfAvfŠfP [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!fAvfŠfP [fVf‡f“Žg—pŽž,Ĭf,fjf^,ĬfŠftfœfbfVf... fœ [fg,ð•Ĭ X,·,é,±
,Æ,à,Ä,«,Ü,· B,±,ĬĬ X,Ĭ A“Á'è,ĬfAvfŠfP [fVf‡f“,ÄffBfXfvfœfC,ÉŠÖ,·,é—â'è,“” ¶,µ,Ä,¢
,Ä A,»,ĬfAvfŠfP [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. [,»,è,Ä,à—â'è,ª%œœœ^,µ,È,¢ ê ±] f^fu,Ä A[ä ‘,«],ðNfŠfbfN,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],ðNfŠfbfN,µ,Ü,· B

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

1. [,»,è,Ä,à—â'è,ª%œœœ^,µ,È,¢ ê ±] f^fu,Ä A[ä ‘,«],ðNfŠfbfN,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],ðNfŠfbfN,µ,Ü,· B

fhf%oCfo,ð•œƐ³,•,é

\ ¬,É,æ,Á,Ä,Í A DirectX® f'ffc [f<,Ä A^È‘O,İfI [ffBfI fhf%oCfo,,æ,NfrffI
fhf%oCfo,ð•œƐ³,Ä,«,Ü,• Bfhf%oCfo,İ”ñƐÝŠ• «,İ-â‘è,İ%ðœ^,É,Í A,±,ê,^a Ä,à,æ,•û-@,Ä, ,é ê ‡,^a, ,è,Ü,• B
[,»,ê,Ä,à-â‘è,^a%ðœ^,µ,È,• ê ‡] f^fu,É [•œƐ³] f{f^f“,^a•Ž!,³,ê,Ä,•,é ê ‡,Í A,±,İf{f^f“,ðfNfŠfbfN,µ A DirectX
fZfbfgfAfbfv fvf fOf%o€,ðŽÀ s,Ä,«,Ü,• B

DirectX fZfbfgfAfbfv,É,Í A[fI [ffBfI fhf%oCfo,İ•œƐ³] ,Æ [ffBfXfvfƐfC fhf%oCfo,İ•œƐ³]
f{f^f“,^a, ,è,Ü,• B,•,,ê,©,İf{f^f“,ðfNfŠfbfN,•,é,Æ AfVfXfef€,É DirectX
,ðfCf“fXfg [f<,µ,½,Æ,«,É’u,«Š•,!,ç,ê,½fhf%oCfo,^a•œƐ³,³,ê,Ü,• Bf{f^f“,^aŽg—p%oÂ”\
,Ä,È,• ê ‡,Í A•œƐ³,•,éfhf%oCfo,Í, ,è,Ü,¹,ñ B,»,İ ê ‡,Í Afñ [fhfEfFA,İ »‘ƐƐ³,É-
â,• ‡,í,¹,Ä Ä V,İfhf%oCfo,ð“üŽè,µ,Ä,,¾,³,• B

DirectX fZfbfgfAfbfv,É,Í A Direct3D fn [fhfEfFA fAfNfZf%oƐ |f^,ð-
³Ɛø,É,•,éf`fFbfNf{fbfNfX,à, ,è,Ü,•,^a A ,±,ê,Í ADxDiag “à,Ä,à s,□,±,Æ,^a,Ä,«,Ü,• (Šù’è,İ“® ì,ð•İ X,•,é
,ðŽQ Ä,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,Ä“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,ª” ¶,µ,½ ê ‡,Í Af})fCfNf f\ftfg
fefNfjJf< fTf| [fg,É~A— ,·,é,±,Æ,ª,Ä,«,Ü,· BfefNfjJf< fTf| [fg,Ö,ì~A— ,ì•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’f< [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,ìf+ [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,ª%ððÊ^,µ,È,¢ ê ‡] f^fu,Ä A[•ñ] ,ðfNfŠfbfN,µ,Ü,· B
2. [áŠQ•ñ ,ì îñ] f_CfAf fO f{fbfNfX,É•K—v,È,·,×,Ä,ì îñ,ð“ü—Í,µ A[— M] ,ðfNfŠfbfN,µ,Ü,· B
3. ì ¬,³,ê,½fefLXfg ftf@fCf<,l̄ftf< fpfX,Æ“dŽqf [f<
fAfhfÆfX,ðŽ,·f fbfZ [fW,ª•Ž,³,ê,Ü,· B“dŽqf [f< fAfhfÆfX,ð ‘,«,Ä,¬,Ä,¬,«,Ü,· B[OK]
,ðfNfŠfbfN,µ,Ü,· Bf f, ’ ,ªN“®,³,ê ADxinfo.txt,ì“à—e,ª•Ž,³,ê,Ü,· B
4. f f, ’ ,ì[•Ò W]f fjf... [l̄[·,×,ÄT’ð] ,ðfNfŠfbfN,µ A[•Ò W]f fjf... [l̄[fRfs []
,ðfNfŠfbfN,µ,Ü,· Bftf@fCf<,l̄,·,×,Ä,ì“à—e,ªfNfŠfbfvf{ [fh,É“ü,ê,ç,ê,Ü,· B
5. “dŽqf [f< fvf fOf%of€,Ä V,µ,¢f fbfZ [fW,ð ì ¬,µ AfNfŠfbfvf{ [fh,ì“à—e,ðf fbfZ [fW–{•¶,É“\
,è•t,¬,Ü,· B,±,l̄f fbfZ [fW,ð AŽè ‡³,Ä ‘,«,Ä,¬,½fAfhfÆfX,É‘— M,µ,Ü,· B

