

μÑCàÅxÍ;1Öéã^aéÊÓËÑ^o;ÓË¹´ãËé;ÒÃ´´ÓÁÍ\$ fog table
·O\$O¹EAxÍäAè·O\$O¹

Direct3D ËÁÒÂ¶Ö\$;ÒÃì´áÊ´\$¼Å¹ÖéÊÒÁÒÃ¶áÊ´\$¼Å^{oo} D3D â
´AáE´\$¼Å^a´é·Né\$^{oo} vertex fog EAxÍ table fog
à;A^oO\$»AÐàA·äAèÊÒÁÒA¶ã^aéçCOAÉOAOA¶´O;íÒÃì´áÇÃì D3D ä
éàµçA»AÐEO·OAO¾áAÐµé\$ã^aé table fog à·éO¹Né¹
;OÄàÅxÍ;μÑCàÅxÍ;1ÖéèèÇAãËéá¹èä´ä´éçèOà;A»AÐàA:
´N\$;AèOç´Ð·O\$O¹á´émOA»;μO;N^oá»Aà«Éà«IAì;AO;O;çÍ\$ NVidia

μÑÇàÅ×í;¹ÕéªèÇÃãËéκØ³ÊÒÁÒÃ¶Î;àÅÔ;ì;ÒÃãªéκØ³ÊÁºÑμÔ
DirectX àÇIAiªNè¹ãEAè æ ã¹ã 'AàÇIAiã 'é
à;ÁºÒ§»ÃÐàÀ·ÕèàçÕÂ¹çÕé¹à¾¼×èìãªé;Ñº DirectX àCÍÃiªNè¹;è¹
æ lÒ ªAè·Q§O¹¶éOκØ³μO' μNé§ DirectX àÇIAiªNè¹ 6 ÊA×I 7 àÇé
;OÀàÅ×í;μÑÇàÅ×í;¹Oéª»ç¹;OÀ;QE¹ 'ãÉéAÐºº·Q§O¹ã¹ãEA' DirectX
5 'N§¹Né¹à;AAØè¹à;èO' O§ÊOÁOÁ¶·O§O¹ã 'éíÀèO§¶U;μéí§
ãªéμÑÇàÅ×í;¹ÕéËÒ;κØ³μéí§;ÒÃÃÑ¹à;ÁÃØè¹à;èÒ·ÕèàÀè·O§Ò¹ËÃ
×I·O§O¹ãAè»jμO

ÊÑèšăĔéîÔÃì´áÇÃì»ÃÑºæèÒæÇÒÁÅÖ; Z-buffer
ãĔĕµAŞµOA·Oèãl»¾AOàæªN¹µéíŞ;OA
â´Â»µÔ æØ³æÇÃ;ÓĔ¹´ăĔĕµÑÇàÅ×í;¹Ŏé·ÓŞÒ¹
A;àÇé¹ă¹;A³Ŏ·ŎèµéíŞ;OA;ŎĔ¹´ Z-buffer àŞ EÒ;ăÁè;ŎĔ¹
´ăĔĕµÑÇàÅ×í;¹Ŏé·ÓŞÒ¹ â»Aá;AAá»¾AOàæªN¹·Ŏèăªé Z-buffer
ăAèµAŞ;Nº·Ŏèă´é;ŎĔ¹´æèŎæ¹;Ŏ;ăÇé ĐăAè·ŎŞŎ¹

ÊÒÁÔÃ¶àÅ×í;ã^aéà·π¹Ôπã¹;ÒÃ;ÓË¹´πÇÒÁÃÖ;çÍ§^oÑ;à;íÃìä´é
πØ³ÊÁ^oÑμÔ¹Õé·ÓãËéíÒÃ;´áÇÃìÊÒÁÔÃ¶ã^aé;Åä;μèÒ§ æ ã¹;ÒÃ;ÓË¹
´πÇÒÁÃÖ;çÍ§^oÑ;à;íÃìÊÒÁÔÃ¶ã^aé;Åä;μèÒ§ æ ã¹;ÒÃ;ÓË¹
à^{3/4}×éìãËéÊÒÁÔÃ¶ÊÁéÓ§ÁÔ^{3/4} 3D ä´éÁÔ»ΑΔΕÔ·,ÒÁÔ^{3/4}ÊÛ§ÂÔè§
çÔé¹

ıÖÃıÓË¹´ăĚéáĚ´şâÂâıé NVidia ã¹ Direct3D
μÑÇàÅ×ıı¹Öé´ĐáĚ´şâÂâıé NVidia ·ÖèÁØÁĚèÒşçÍş´ÍÀÒ¾
ç³Đ·OèAN¹áı»¾AOàα²N¹ Direct3D

â»Ãà«Èà«ÍÃì»ÃĐÁÇÃ¼Å;ÃÒ;Ô; NVidia ÈÒÁÒÃ¶ÊÃéÒŞÁÔ»áÁç»â
ÁINµâ¹ANµQà¾×èlà¾OèA·Nés»AĐEO· OAO¾ã¹;OAEèŞ
çéIAUA;OAEAEÓŞ¾×e¹¼OÇ¼eO¹⁰NEáÁĐ»AĐEO·, OAO¾ã¹;ÒÃ·ÓŞ
O¹çIŞal»¾ÁOàα²N¹
ÍÀèÒşãÃ;µÒÁ â»Ãá;ÃÁáí»¾ÁÔàα²N¹⁰Òş»ÃĐàÀ·ÍÒ··ÁÕ;ÒÃáÊ
Ş¼A·OèãAè¶U;µéIŞEO;OÉ¹
ãEèã²éα³EA⁰NµOAO»áAç»ÁÑµâ¹ÁÑµÔ ;ÒÃá;é»ÑÈÒ·ãĚéα³Å
ÁĐ·N⁰;OAEAEÓŞAO»áAç»ÁŞ·¹;CèÒ·ĐáÊ·Ş¼A¶U;µéIŞ;OAA·ÁĐ
·N⁰·ÁÔ»áAç»·ĐEOAOA¶á;é»ÑÈÒ;OACOŞµOáE¹èŞ¾×e¹¼OÇãĚé
"ãAèAOAIAµèI" (áµè·Đ·OãĚéα³·AO¾çIŞ;OAAĚ·Ş¼AA·ÁŞ
·éÇAà²e¹;N¹)

æ̀èÇÃãĒéæø³ĒÒÁÒÃ¶àÅ×í;ÇÔ, ÕÁÔ»áÁç»ÍÑµâ¹ÁÑµÔ·Õèâ»Ãà«Ēà«Í
Åí;ÁO;Ô;Đãæé
æø³ÍÒ àÅ×í;ÇÔ, Õ;ÒÃÁÔ»áÁç»á^{oo}ã^oÅÔà¹ÕÃÀìĒã×Í 8-tap
anisotropic à A·Ōeá^{oo}ã^oÅÔà¹ŌAAì ĐãĒé»AĐĒO· ŌAO^{3/4}·Ōè
, Ō;ÇèO ã¹ç³Đ·Ōèá^{oo} anisotropic ĐĒOAOA¶áĒ'şAO^{3/4}ã' éæA^aÑ
iÇèO

æø³ÉÒÁÔÃ¶»ÃÑºæèÒäºáíÊ LOD (Level of Detail) ã¹;ÒÃÁÔ»áÁç»ä
e

æèÒäºáíÊ·ÕèµèÓ·Ð·ÓãÉéæø³ÀÒ³⁄₄ç|ŞÀÒ³⁄₄,´ÕçÖé¹ ã¹
ç³Ð·Oè;OÃà³⁄₄OèAæèÒäºáíÊ·ÐàèÇAà³⁄₄OèA»AÐÉÔ·ÔÀÒ³⁄₄;ÒÃ·ÓŞÒ
¹ç|Şâ»Aá;AAá|»³⁄₄ÁÔàæªN¹æø³ÉÒÁÔA¶àA·x|;O;æèÒäºáíÊ O;IAµi
5 æèQ àAOèA O; "æø³ÀÒ³⁄₄ç|ŞÀÒ³⁄₄' O·OèÉØ " ä»¹¶IOŞ
"»AÐÉÔ·,OAO³⁄₄;ÔAAN¹' O·OèÉØ "

ÃÒÂ;ÒÃ;ÒÃµÑέξæèÒάºº;ÓË¹´àίξ (ËÃ×Í "tweak") ·ÕèæØ³ä
éºN¹.Ö;äCé
ãËéàÃ×Í;µÑCàÃ×Í;Ö;ÃQÂ;ÒÃà¾¼×èàÃÕÂ;ãéξÒ¹;ÒÃµÑέξæèÒ·Õ
èµέίξ;OÄ Ö¹Né¹ ãËéæÃÖ;»ØèA "OK" ΕΑ×Í "Apply"

æèÇÃãĒéæø³ĒÓÁÒÃŋ°Ñ¹·Öj;ÒÃµÑésæèÒ»Ñ""ø°Ñ¹ä´é (ÃÇÁ·Ñésæø
´j;ÒÃµÑésæèÒã¹ã´İĐÅçl; "çelAUÅà¾⁄₄OèAàµÔÅçl; Direct3D") à»ç¹
"AU»ã°°j;ÒÃµÑésæèO·Oèj;OE¹´àlš" àAxél°N¹·Oj;ÒÃµÑésæèOáAéÇ
ÅĐ°°"Đ¹OæèO¹Né¹ã»à»ç¹AOÅj;OÅµel·éOAAOAj;OAà´OA·OèAOIAUè
ĒÅÑš"Òj;æø³ã´é;ÒÃµÑésæèO·Õè´Õ·ÕèÊø´ÉÓĒÑ°à;Áá°° Direct3D
áAéC ãĒé°N¹·Oj;ÒÃµÑésæèO¹Né¹ãCéà»ç¹AU»ã°°·Oèj;OE¹´àlš
(custom tweak) «OèšæèÇÃãĒéæø³ĒÓÁÒÃŋj;OE¹
æèOæ¹j;Oj; Direct3D ã´élAèOŞAC´àAcÇã
´ĀàAèµelšµNésæèOµNÇàÅxlj;ãµèÅĐIAèOŞãĒÀè·ÑésĒÁ´

Åº;ÒÃµÑέξæèÒÊÕ·Õèä´éàÅ×Í;äÇé¨Ò;ÃÒÂ;ÒÃ

ã^aéæèÒ´Õ¿ÍÅμìφίς;ÒÃμÑέςæèÒ·ÑέςËÁ´

áÊ´šä´ÍĐĀćí;«Öèšă^âéÊÓĚĂÑ^º»ĂÑ^ºà»ĂŌèĀ¹;ÒĂμÑέξæèΌί×è¹ æ
ϕI§ Direct3D

μÑCàÅxί;¹Öéã²éà»ÅÕèÂ¹ÇÔ Õ;ÒÃ;ÓË¹´μÓáË¹è§¾×é¹¼ÔÇ
çÍšà·ç;à«Å (Íšμì»ΑÐ;íºçÍš¾×é¹¼ΟÇ)
;ÒÃà»ÅÕèÂ¹æè¹Öé·ΔΑÕ¼Åμè;ÒÃ;ÓË¹´μÓáË¹èšà·ç;à«Åà´ÔÁ â
A·OèæèO´O;ÍÅμì ΔΕΙ´æΑεί§;NºæQ³EAºNμOçÍš Direct3D
«;μ;ιáÇΑìºO§»ΑÐàA·IO´μεί§;OΑ;OΑ;OË¹
μOáË¹èšà·ç;à«ÅàÇέμèO§EÖ;´éÇA´æQ³AÖ¾ã¹;ÒÃáÊ´§¼ÅÀ¾çÍš
á»¾ÅQàæ²N¹»ΑÐàA·N§;ÅèOÇ Δ´OçOé¹EO;ÅO;OΑ;OË¹
´çéÍAUÀà·ç;à«ÅãEÀè â
´A»ANºáíºàÅ×é¹ã»AOÃÐËÇèÒ§ÁOÁº¹«éÒÃáÅÐ´Ø´ÈU¹Â;Àò§
çÍšà·ç;à«Å

;ÒÃ:Óà^aè¹¹Õé^ãĐà^eÇÃËéâ»Ãà«Èà«ÍÃi»ÃĐÁÇÃ^{1/4}Ã;ÃÒ;Ô;ÊÒÁÒÃ¶ã
à^e»ADã^{a1}·O;E¹èÇÃÇÒÃ·OçIŞAD^{oo}·Oè;OE¹·ãÇé
à^{3/4}×èl^oN¹:O;çéIAUA;OAEAEóS^{3/4}×é^{11/4}OCã·é
(¹l;·O;ã^aéE¹èÇÃÇÒÃ·OçIŞ;OÃi·áÉ·S^{1/4}Ãã^{3/4}OÃŞÍÀèÒSà·ÕÃÇ)

ËÁÒÃèËµØ: ·Ó¹C¹Ë¹èÇÃÇÒÃ·ÓÊÛŞÊØ
çIŞAD^{oo}·ÕèÊÒÁÒÃ¶¹ÓÁOã^aéEAEóS^{3/4}×é^{11/4}ÔÇÊÒÁÒÃ¶çÓ¹C
³ã·é·O;·Ó¹C¹RAM·OèµO·µNéŞIAUèã¹àã×èIŞIA^{3/4}OCàµIÃi
çIŞçØ³·ÁOèŞµO·µNéŞRAM·àÇéAO;à·èOã·
æèO·OèÊÒÁÒÃ¶ã^aéã·é;ç·Đà^{3/4}OèAAO;çOé¹·éÇÃ

;ÒÃµNéŞçèÒ¹Õéã^aéã·é;Ñ^o;ÒÃi·áÊ·S^{1/4}Å PCI (ËÃÍ;ÒÃi·áÊ·S^{1/4}Å
AGP·Oè·OŞO¹ã¹àEA·PCI)

μÑÇàÅ×í;¹Õëãªé;ÓË¹´´´Ó¹Ç¹;ÒÃÅ´ÃÍÄËÑ;·Õèãªéã¹áí»¾ÅÔàªÑ¹
D3D

íÒÃÅ´ÃÍÄËÑ;à»ç¹à·ª¹Ôª·Õèãªéã¹;ÒÃÅ´ "àÊé¹çÃØçÃÐ"
«Òè§ºQ§ªANés·Ð»AQ; çÒé¹µOAç¹ç¹SAO¾¾ 3D EOÉANº
áí»¾ÅÔàªÑ¹ºO§IAèO§ªØ³EQAOA¶àÅ×í;ä
´éµNésáµè;OÃÅºAIAEÑ;äÉéEA
´ä»¹¶O§àÅ×í;äÉéAO´O¹Ç¹AIAEÑ;ä´éÊÛÊØ´

ã^aéμÑCàÅ×Í:1Öéã¹;ÒÃÅ
,ΑΙΑΕΑΝ;ã¹άλ»^{3/4}ÅÖàκ^aN¹.ÖèäAèÊÒÁÒÃ¶ã^aéκ³ÊÁ^oÑμÔ¹Öéä´éâ
,ÅμΑξ
â»Ã´.ÃÒ^oCèÒ^oÒςάλ»^{3/4}ÅÔàκ^aN¹«ÖèςäAèÊÒÁÒÃ¶ã^aéà·κ¹Ôκ¹Öéä
,éIÖ·ÖãÉäAèÊÒÁÒÃ¶áÉ´ξ^{1/4}Åã
,éIÀèÒςàΕΑΟΔΕΑΕΑ×IàAèÊÒÁÒÃ¶àÃ¹à´ÍÃ\ÀÒ^{3/4}ä´έμÒÁ»;μÔ
κ³κ³CAã^aéμÑCàÅ×Í:1ÖéIÀèÒςΑΔΑΝ´ΑΔÇΝς»Ö
,μÑCàÅ×Í:1ÖéÊÖ;κ³κ^{3/4}»NEÖã¹;ÖAáÉ
,ξ^{1/4}Åã;ΑΕΑ×Iál»^{3/4}ÅÖàκ^aN¹«ÖèςäAèÊÒÁÒÃ¶ã^aéà·κ¹Ôκ¹;ÒÃÅ
,ΑΙΑΕΑΝ;ã¹é

μÑÇàÅ×j;1Õéã^aé;ÓË¹´;ÒÃàμÃÕÃÁ´´Ó¹Ç¹à;ÃÁ
çlš«O^{3/4}OAU;èl¹.Oè`Đ»ADACÁ^{1/4}ÀàAXèl³àAO;ã^aé;ÒÃ«Ôšâ¹Ãä¹
«iã¹á¹ÇμNés
ã¹⁰Òš;Ã³Õ`ÂÔèšÃÕ´´Ó¹Ç¹à;ÃÁÁÒ;çÖé¹à·èÒã´ "input lag"
lÒ´μl⁰E¹lšμèl⁰»;A³lμèÒšæ à^aè¹ lÁËμOè; à;Áá^{3/4}
EA×lá»é^{13/4}OA^{3/4}lã´é´OçOé¹
ãËéÁ´¹æèÒ¹ÕéÃšËÒ;^{3/4}ÇèÒ;ÒÃμl⁰E¹lšμèl⁰»;Ã³lμèÒš æ
·Oèà^a×èlAμèlIAUè;N⁰à¹ãAXèlšxIA^{3/4}OÇàμlAìà»ç¹ã»lAèOšÅèÒ^aéÒÁ
Ò;ã¹ç³Đ·Oè¹ã³àÅé¹à;A

OpenGL
GL_KTX_buffer_region

3D

GL_KTX_buffer_region extension
"Enable
buffer region extension"

i.ÔÃ;ÓË¹´ãËéãªé;ÔÂàµíÃì fast linear-mipmap-linear
ĐªeCAà³⁄₄OèA»ÃĐÊÔ·, OAO³⁄₄çÍŞál»³⁄₄ÃOàªªN¹ áµèªØ³ÀÒ³⁄₄
çÍŞAO³⁄₄IO`A`AŞ
ã¹ËÃÒÂ æ ;Ã³ÕªØ³ÀÒ³⁄₄çÍŞÀÒ³⁄₄ĐÃ
`ÃşªAèAQ;¹N;`NŞ¹Né¹ªØ³·OŞªCA;OË¹
´ãËéãªéŞO¹ªØ³EAºNµÔ¹Oéà³⁄₄xèllOENÂ»ÃĐâÂª¹ì´Ò;»ÃĐÊÔ·, ÔÀÒ
³⁄₄·Oèà³⁄₄OèAçOé¹

μÑÇàÅ×í:1Öé²èÇÃëËé OpenGL ÊÒÁÒÃ¶·Ó¿ÔÅàμίÃì anisotropic
à^{3/4}×èlà^{3/4}ÖèAαØ³AO^{3/4}çI§AO^{3/4}

ãĒéàĀ×Í;μÑÇàĀ×Í;¹Ōéà¾×èĀ;àĀŌ;ĠŌãªéä´ĀàÇĪĀìĒŌĒĀÑªø
ꝛŌENèš¾ŌãĒĒçĪš«Ō¾ŌAU
«Ō¾ŌĀŪºŌš»ĀĐàĀ·Ē¹ÑºĒ¹Ō¹ªŌ´ꝛŌĒĒèš 3D «Ōèšãªéä
é;Nºâ»Āà«Ēà«ĪĀ»ĀĐACĀ¼Ā;ĀŌ;Ō; NVidia
çĪšꝛŌ³áĀĐà¾ŌèĀ»ĀĐĒŌ· ŌĀŌ¾ĀĒĒĒ;ĀĒĀ×Īâ»Āá;ĀĀáĪ»¾ĀŌàꝛª
N¹ 3D μÑÇàĀ×Í;¹ŌéªèÇĀãĒĒꝛŌ³ĒŌĀŌĀĪĒENèšĀ;àĀŌ;ĠŌãªéªø
ꝛŌENèš 3D ¾ŌàĒĒĒĒĒĒŌ¹Ōéã¹ã´ĀàÇĪĀĪ
«ŌèšĀŌ»ĀĐĀĀªĪ¹;ŌĀà»ĀŌĀª·ŌĀª»ĀĐĒŌ· ŌĀŌ¾ĒĒ×Īãªéã¹;ŌĀ
áĪé»NĒŌ

μÑÇàÅ×Í;¹Õé"Đ;ÓË¹´;ÒÃÅ.ÃÍÂËÑ;ã¹Ë¹éÒ"Já^{oo}àμçÁÊÓËÑ^{oä}
"ÀÇIÀ; OpenGL ;OAA' AIAEÑ;à»ç¹à·x¹Ox·Oëã^aéã¹;OAáμεξçl^o
çlçl^oà ;μãEéàAOA^oà^{3/4}xèIA' "àEAOéAAá^{oo}çNé¹^oN¹ã
AOAã¹AO^{3/4}" «Oèξ»AO; ãEéàËç¹ã¹^oOξxANés

µÑÇàÅ×í; ÑÖëãªé; ÖË¹´ÇèÒ¾¼×é¹¼ÔÇ·ÖèÁÕÃÐ´ÑºËÕ¹Ñé¹ æ
Ð¹ÔAOãªéã¹â»Aâ; AAá¹»¾¼ÅOàªªN¹ OpenGL ÉÅ×láAè

µÑÇàÅ×í; **Use desktop color depth** à»ç¹; ÒÃ; ÖË¹´ãËéãªéÃÐ
NºEOà´OAC; Nºà´É; ì·l»ç¹ç¹ÇO¹â´ÇÉì

µÑÇàÅ×í; **Always use 16 bpp** áÅÐ. **Always use 32 bpp**
à»ç¹; OA; ÖË¹´ãËéãªéÃÐ´NºEO·Öè; ÖË¹´ à´AàAè
ç¹Öé¹; Nº; OAµNéçªèOç¹ç¹à´É; ì·l»

μÑÇàÅ×í;¹ÕëãªéÃÐºØâĒÁ´;ÒÃ·ÓŞÒ¹ buffer flipping
ãĒĒ;ÒA·ÓŞÒ¹áººàµçAE¹éO·ÍçÍŞáI»¾¼ÅOàαªN¹ OpenGL
â´ÂαØ³ĒÒÁÒÃ¶àÅ×í;ãªéÇÔ·Õ¶èÒÂâÍ¹çéÍÁUÁáºººÁçÍα (Block
Transfer) à¾¼;¿ÁO» (Page Flip) EA×IàÅ×í;INµâ¹ANµO (Auto-select)
icã´é μÑÇàÅ×í; "àÅ×í;INµâ¹ANµO" "Ð·OãĒëã
'ÀàÇIAIàÅ×í;ãªéÇO, O·Oè´O·OèEØ´µOΑαεOαI¹;Ô;çÍŞÎÒÀì´áÇÃì

μÑÇàÅ×Í;¹Õéãªé;ÓË¹´;ÒÃ«ÔŞâαÃä¹«ìá¹ÇμÑέŞã¹â»ÃÁ;ÃÁ OpenGL
μÑÇàÅ×Í; **Always off** ¨ĐÂ;àÅÔ;ì;ÒÃ«ÔŞâαÃä¹«ìá¹ÇμÑέŞ
çÍŞáí»¾¼ÀÒàαªN¹ OpenGL ·ÑέŞEA
μÑÇàÅ×Í; **Off by default** ¨ĐÄÁèãªé;ÒÃ«ÔŞâαÃä¹«ìá¹ÇμÑέŞ
¹;ÇèÓáí»¾¼ÀÒàαªN¹ ¨Đ;ÓË¹´ªÉéãªéŞÒ¹
μÑÇàÅ×Í; **On by default**
¨Đãªé;ÒÃ«ÔŞâαÃä¹«ìá¹ÇμÑέŞà»c¹αèÒ´Õ;ÍÅμì
¹;ÇèÓáí»¾¼ÀÒàαªN¹ ¨Đ;ÓË¹´ªÉéÅ;àÅÔ;ì;ÒÃãªéŞÒ¹

ãĒé°Ñ¹·Öij;ÒÃµÑέξæèÒà»ç¹ "ÃÙ»áºº·Õè;ÓĒ¹´àίξ"
àAxèlºN¹·Öij;ÒÃµÑέξæèOãÁέC
ADºº"Đ¹OæèO¹Né¹ã»à»ç¹AOA;ÒÃµèí·éOÃÃOÀ;ÒÃà´OÁ·ÕèÁOÍÁÙè
ĒÃñş"Ò;æØ³ä´é;ÒÃµÑέξæèÒ·Õè´Õ·ÕèĒØ´ĒOĒÃñºáí»¾ÅÔàæªÑ¹
OpenGL áÁέC;OAN¹·Öij;ÒÃµÑέξæèO¹Né¹ãCé
"ĐæèCAãĒÉææØ³ĒOAOÃµÑέξæèOæí¹;O;OpenGL ä´είÁèOşÃÇ
´àAcÇ;ej¹·Oè"ĐàAOèAæªéâ»Aá;AA ä
´AãĒéµéίşµNéξæèOµNÇàÃxIµéOş æ ãĒÁè·Ø;æÃñέş

ι;ÒÃã^aéá¶^oàÁ×èí^{1a}èÇÃãËé×Ø³»ÃÑ^o×ÇÒÁËÇèÒ§ ×ÇÒÁ×Á^aÑ´
ÉA×|×éOá;AAOç|šá^{a1}à¹AEÖ·OèàA×|jã´é

ι;ÒÃá;éä
çEOã^ae»ÃÑ^o×ÇÒÁËÇèÒ§·Öèáμ;μèÒ§;Ñ¹ÃÐËÇèÒ§ÃÙ»μέ¹©^oÑ^o;Ñ^o
à|Oμ^{3/4}Øμ·OèáÉ´§^{o1}ÍØ»jA³íáÉ´§^{1/4}Ã
«OèšAO»ÃÐáA^{a1}íáA×èí·OšO¹;Ñ^oã»Ãá;ÃÁ»ÃÐÁÇÃ^{1/4}ÃÃÙ»ÀÒ^{3/4}
à^{3/4}×èláÉéá´éEÖ·Oè¶U;μéí§·OèEØ´(ã^ae¹ AU»¶éOA) àA×èláÉ
§^{1/4}Ã^{o1}·|×|A^{3/4}OÇàμ|Ái

1í;·Ò;¹Öé à;Á 3D ÈÀÒÀà;Á·ÐÁÖ;ÒÃáÉ´§^{1/4}Ã·Öè×èí¹çéÒ§Á×´
ι;ÒÃã^{3/4}OèA×éO×ÇÒÁËÇèÒ§áÁÐ/ÉA×|×éOá;AAOá^{a1}á¹AEÖ·NéšËÁ
·Ð^aeÇÃãËéAO^{3/4}ã¹a;AËÇèÒ§çOé¹ ×Ø³·OšEOAOA¶láÁé¹à;Aá´é´O
çOé¹

α0³ÉÒÁÒÃñàÅ×íjá^{a1}à¹ÅÊÖä´éâ´Âã^aéáñ^oàÅ×è¹
·NéξANξEOAOAñ»AN^oá^{a1}à¹AEOá ξ EOàçOAC EAXÍÊÖ¹éÓàξÔ¹ä´éâ
´ΑμΑξ EAXÍ·Đ»AN^o·Néξ 3 á^{a1}à¹A^{3/4}AéIA æ ;N¹;çä´é

ĩÃÒ;áÊ´šªèÇŞÊÕ àÊé¹âæés¹Õé¨ĐáÊ
§¹⁄₄Ā;OĀà»ĀŌèA¹á»ĀŞ·N¹·Ō·ŌèæØ³»ÃÑºæèŌæÇÒÁæÁªÑ´
æÇŌAÉÇèŌŞ EA×ÍæèŌã;AAO

ÃÒÂ;ÒÃ;ÒÃµÑέξæèÒ·Õèæ³⁰Ñ¹·Ö;äÇé
ãÉéàΑ×|;µΝÇàΑ×|; Ò;ΑΟΑ;ΟΑà^{3/4}×είàÃÕÂ;ã^aέξÒ¹;ÒÃµÑέξæèÒ·Õ
έμείξ;ΟΑ

πϑ³ÉÒÁÒÃ¶^ºÑ¹·Öj;ÒÃμÑέξæèÒÊÕ»Ñ^{ˆˆˆ}ϑ^ºÑ¹äÇéà»ç¹ÃÙ»á^{ºº}·Õè;ÓË
1^ˆ àšä é àA×èl^ºÑ¹·Öj;ÒÃμÑέξæèÒáÁέÇ·ΑΔ^{ºº}·Đ¹ΟæèΟ¹Νé¹ä»à»ç¹
ÃΟΑ;ΟΑμèl·έΟΑΑΟΑ;ΟΑà' ΟΑ·ΟèΑΟΙΑÙè

ÅºÃÒÂ;ÒÃ;ÒÃµÑέξæèÒÊÕ·Õèä´éàÅ×Í;äÇé¨Ò;ÃÒÂ;ÒÃ

ã^aéÃÙ»á^oÊÕ´Õ¿ÍÅμìϕÍ§ÍÒÃì´áÇÃì

ã^áéàÅ×í;âËÁ´ä·ÁìÁÔèςçÍ§¨ÍÀÒ¾

μÑÇàÅ×í; **Auto-Detect** ã^áéã¹;ÒÃ;ÓË¹´ãËéçÔ¹â

CEIAN^ºæO·OèàEAODEA´O; IaE´S¹/₄Â·AμA§

«Oè§μÑÇàÅ×í;¹Oé·Đã^áéà»ç¹æO´O;IAμiã»A

·AO^ºÇèO¨ÍAO¾AØ^èà;èO^ºO§AØ^èIO¨ãAèEOÁÒÃ¶ã^áéæØ³ÊÁ^ºÑ
μO¹Oéã´é

μÑÇàÅ×í; **General Timing Formula** ËÃ×Í **GTF**

à»ç¹μÑÇàÅ×í;·OèAN;ã^áé;N^ºIOAì´áÇAIØ^è1ãEAè æ

μÑÇàÅ×í; **Discrete Monitor Timings** ËÃ×Í **DMT**

à»ç¹AOμA^ºO¹AØ^èà;èO·OèAN§æã^áéã¹IOAì´áÇAI^ºO§ÃØ^è1

ãËéã^áé§O¹μÑÇàÅ×í;¹OéEO;IOAì´áÇAIçÍ§æØ³μéÍã^áéâEA´ DMT

à¾ÔèÁäíí¹ NVidia QuickTweak äÇé·Õè·ÒÊìºÒÃìçÍŞÇÔ¹â´ÇÊì
äíí¹¹Õéãªé;ÓË¹´ÃÙ»áºº Direct3D, OpenGL ĘÃ×Í;ÒÃµÑéŞæèÒÊÕ
´éÇÂµ¹àîŞ "ã, éíÀèOŞAC´àAcC" ¨O;àA¹U»êl»JN» ¹í; O;¹Oé
àA¹U¹OéANŞAOAOA;OAEÓEANºãªéæèO´O;íÁµiáÁĐàAÓA;ãªéä
´IDÁçí 'æØ³EAºNµO;OAáE´Ş¼Á'

α0³ÊÒÁÒÃñàÅ×Í;äíαí¹ÊÓËÃÑºãªéá·¹ÂÙ·ÔÅÔμÕ QuickTweak
º¹·ÔË;ìºÔΑιçIŞÇÖ¹ã ÇËiã´é
àÅ×Í;äíαí¹·Õèμέλς;ÒÃ¨Ò;ÃÒÂ;ÒÃ¨Ò;¹Ñé¹ αÅÔ; "OK" ËÃ×Í
"Apply" à¾×éIIN»à μäíαí¹º¹·ÔË;ìºÔΑι

»Ô´ä´ÍĐĂċĭ;¹ŦéáĂĐºÑ¹.Ö:ĭ:ÒĂà»ĂŦèĀ¹á»ĂşăCé
áµè¼Āĭ;ŦĂà»ĂŦèĀ¹á»Ăş ĐĂŦ¼ĀĒĀŦş Ŧĭ;ŦŦ³ŦĂŦ; "OK" ĒĂxÍ
"Apply" ä¹
ä´ÍĐĂċĭ; "Additional Properties"

ãĒéα∅³;ÓĒ¹'ÇèÒ"Đãªé»ØèÁã
çİşàAOĒİàĀŌĀ;àĀ¹UàĀ×èİAO;ÒĀαĀÔ;·ŌèäİαÍ¹º¹·ÒĒ;ìºŌĀì

à»Ô´ËÃ×Í»Ô´φείαÇÒÁÂ×¹ÃÑ¹
à²çμÑCàÅ×Í;¹Öé ÈÒ;πØ³äÀèμεί§;ÒÃãËéáÊ´§
φείαÇÒÁÂ×¹ÃÑ¹·Ø;πANés·OèãEÀ πl¹;Oà;làA²Ñ¹ 3D
O;àA¹U·OÉ;ìºOÀi

àÅxÍµÑçàÅxÍµ¹Öé ÆÒ;ϣØ³μείξ;ÒÃάÊ´§^{1/4}ÀàÁ¹Ù·ÒÊ;ìºÒÃì
éÇÃαλζαζιμι 3D

μÑÇàÅ×í:1Öëã^aé:ÓË¹´μÓáË¹èξ;ÒÃáÊ´SÀÒ^{3/4}o¹´´Íá^{o1}
àA×éI:OξO¹·OèαÇOAAĐàÍOÁ´μεO;ÇeOαÇOAAĐàÍOÁ´ÊUξÊØ
·OèEOAOA¶ã^aéã´e

ã^aé»ØèÁÅÛ;ÈÃà^{3/4}×èí»ÃÑ^oμÓáË¹èςφίς^{3/4}×é¹.Õèà´Êì·í»^{o1}´´íaÊ
ς^{1/4}Å

ÃŒà«çµæèŒà´Êµ:Í»à¾¼×èĩãªéæèŒ´Œ¿ÍÅµìçÍ§æèŒçŒŒÁÐàíŒÂ
´áÐÍΝµΑΟ;ŒΑΑŒà¿Αª»Ν´ŒŒ¹

μÑCàÅ×í;àËÀèÒ¹Õéã²é;ÓË¹´»ÃĐàÀ·çííØ»;Ã³ìàíÒμì¾¼Øμ (¨íÀÒ¾
íá^{σ¹} ÉA×íâ·A·NE¹íâ´AçÓé¹íÀUè;NºíØ»;A³·í·Òè;OAI IE¹NºE¹Ø¹)

à»Ô´Ë¹éÔμèÒξà³/₄χèίμÑέξαèÔμèÒξ æ ϕίσιØ» ;Ã³ιάÊ
ξ¹/₄Å·Ôã²έξO¹IAUè

ÃĐ°ØÃÙ»á°°áÃĐ»ÃĐà·È·Õèã°é;ÒÃáÊ´§¼Å·Òșâ·Ã·ÑÈ¹ì

à»Ô´Ë¹éÒµèÒξà¾×èÍÃĐºØÃÙ»áºº;ÒÃáÊ´ξ¾Å·Òξâ·Ã·ÑÈ¹ì

ÃÒÂ; ÒÃ¹ÕéãéàÅ×Í; ÃÙ»áºº; ÒÃáÊ
´§¼Å·Ôâ·A·NE¹µÔA»AÐà·È·Ôè×Ø³ÍÂÙèíÒÈÑÂ
ÈÁÒÂàÈµØ: ÈÒ; »ÃÐà·È·Õè×Ø³ÍÂÙèäÁè»ÃÒ; ́ÍÂÙèã¹ÃÒÂ; ÒÃ
ãÈéàÅ×Í; »AÐà·È·ÔèÍÂÙèã; Áé»AÐà·È·Ôè×Ø³ÍÂÙèAÒ; ·ÔèÈØ´

¡ÓË¹´ãËéÃÙ»áºº·ÕèàÅ×Í;à»ç¹ÃÙ»áºº·ÕèãªéàÁ×èlà»Ô´àãÃ×èí§
àÁ×èlà»Ô´àãÃ×èí§πÍÁ¾ÔÇàμÍÀ·Õèàª×èÍÁμèÍâ·Ã·ÑÈ¹à
çéO;Nº;OÃÍ´.Í´μNÇàÅ×Í;¹OéªèÇAãEéANè¹ã´á´éçèO
çéIπCOA·Né§EÁ·OéãE
¹§º¹´ÍAO¾AÐÉÇèÒ§;AÐºÇ¹;ÒÃºÙμ´Ð»ÃÒ;º¹´Íâ·Ã·ÑÈ¹ÍÁèÒ§¶Ù;μé
Í§

ãé;ÓË¹´¹Ô´çÍ§ÊÑÒ³àíÒµì³¼Øµ·ÕèÊè§¼èÒ¹»ÂÑ§â·Ã·ÑÈ¹ì
ËÒ;Ø³´éàèÍÁµèí´ÂãéÊÒÂààÒ·Õè¶Ù;µéí§ ¹Ô´ÊÑÒ³
S-Video out ÐãÉéØ³O³¼EU§;ÇèQÊNO³ Composite video out
EO;Ø³Aé¹è à;ÖèAÇ;N¹Ô´çÍ§ÊNO³ ÉÀI; **Auto-select**

ã^aé»ØèÁÀÛ;ÉÃ»ÃÑ^oμÓáĚ¹èšà´Ê;ì·Í»^{o1}´íâ·Ã·ÑĚ¹ì

ĚÁÒĀàĚμØ:

ĚO;AO^{3/4}ã¹â:Ã·ÑĚ¹ìĀéÁĚĚ×ĭäÁèÁŌĀò^{3/4}à¹×èĭš"Ò;ì;ÒĀ»ÃÑ^oμ
Nés ãĚéAĭ»AĐAO³ 10 ÇO¹Q·O AO^{3/4}·Đ;ĀN^oAOáĚ
´š^{1/4}Ā·ŌèμOáĚ¹èš·Ōèà»ç¹´Ō;ĭĀμĭâ´ĀĬNμâ¹ĀNμŌ
"Ō;¹Né¹æ³ANŞEOAOĀĭĭāĀŌèA·Ō;ŌĀ»ĀN^oμNésæèŌãĚĀèĭŌ;æ
ĀNés ĒĀNŞ"Ō;ĭ;ŌĒ¹μŌáĚ¹èšçĭšà´Ê;ì·ĭ»áĀeÇ
æŌ³μéĭšæĀŌ;·Ōè»ØèA "OK" ĒA×ĭ "Apply"
à^{3/4}×èĭ^oN¹·Ō;æèŌĀŌĀã¹àçĀŌ 10 çŌ¹Ō·Ō

ÃÕà«çµà´Êj·Í»ä»ÂÑşµÓáË¹èş´Õ¿ÍÅµìº¹â·Ã·ÑÈ¹ìâ
´ÃãªéαÇOAAĐàIOA »N 0ºN¹

ã^aéµÑÇϣÇ^oϣØÁàËÅèÒ¹Öéã¹¡;ÒÃ»ÃÑ^oϣÇÒÁÊÇèÒŞáÅĐϣÇÒÁÍÔèÁµ
ÑÇç¡ŞEOç¡ŞAO^{3/4}ã¹â·A·NE¹¡

ã^aéµÑÇꝛC^oꝛØÁàËÅèÒ¹Õéã¹;ÒÃ»ÃÑ^oꝛÇÒÁÊÇèÒŞáÅĐꝛÇÒÁꝛÁ^aÑ
çIŞAO^{3/4}ã¹â·A·NE¹i

ã^äéµÑÇκC^ºαØÁ¹Õéà^¾×èí»ÃÑ^º;ÔÅàµíÃìÀ´;ÒÃÊÑè¹
ϕÍΣΑΟ^¾·ÕèµéíΣ;ΟΑã^äé;Ñ^ºâ·Α·ΝΕ¹ì
ϕÍá¹Ð¹ÓãËéαØ³»Ô´;ÔÅàµíÃìÀ´;ÒÃÊÑè¹
ϕÍΣΑΟ^¾àΑ×èìàÀè¹ΑΟ^¾Α¹µΑì DVD "Ο;|Ø»;Ã³ì¶Í´ÃËÑÊϕÍΣÌÒÃì
άÇΑì

¡ÓË¹'ꝤÇÒÁÅĐàíÕÂ'çÍ§''íaÊ'§¼ÅáÅĐÃĐ'ÑºÊÕă¹;ÒÃáÊ
§¼Å·Õ§''lá·A·NE¹

ã^aéµÑÇπC^oπØÁàËÅèÒ¹Õéã¹;ÒÃ»ÃÑ^oπØ³ÀÒ^{3/4}çÍŞËÑÒ³ÇÔ´ÕâíËÃ×í
DVD ^{o1}·ÍÁO^{3/4}

πØ³ËÒÁÒÃ¶πÇÁπØÁπèÒπÇÒÁËÇèÒŞπÇÒÁπÁ^aÑ´
πèÒπÇÒÁÍÒèÁµÑÇçÍŞËÒ^a^{3/4}×èíπØ³ÁO^{3/4};ÒÁáË´Ş^{1/4}Å·Õè
´ÒàA×èlàÀè¹AO^{3/4}A¹µÀì DVD ã¹àπA×èíŞπIA^{3/4}OÇàµíÀì

ã^aé»ÃÑ^ºçCÒÁ¶.ÕèÊÑÒ³¹ÒìÔ;ÒËÃÑ; áÅÐÊÑÒ³¹ÒìÔ;Ò
çÍŞE¹èÇÃçCOA' OçÍŞâ»Ãà«Eà«IAi»AĐAÇÁ^{1/4}Á;ÃO¿;Ô;çÍŞ NVidia ä´é

¡ÓË¹´¸CÒÁàÃçÇÊÑ-
Ö³¹ÒìÖ¡ÖÉÑ¡ç¡šâ»Ãà«Êà«ÍÃì»ÃĐÁÇÅ¼Å¡ÃÒ¿Ô¡ NVidia

ÃĐ°ØꝛÇÒÁàÃçÇÊÑÒ³¹ÒìÔ;ÒËÅÑ;à»ç¹àÁ;ĐàíÔÃµ«ì

¡ÓË¹´ϣÇÒÁàÃçÇÊÑÒ³¹ÒìÔ;ÒϕÍÍÔ¹àμίÃìà;«Ë¹èÇÂϣÇÒÁ´´Óº¹;ÒÃì
áE´§¹⁄₄Ã

ÃĐ°ØαÇÒÁàÃçCÊÑÒ³¹ÒìÔ;Ò
çìξìÒ¹àμίΑìàζ«E¹èÇΑαÇΟΑ`Οà»ç¹àÁ;ĐàÎÔÃμ«ì

· 'Éí°αCÒÁàÃçCÉÑÒ³¹ÒìÔ; ÒãËÁèà^{3/4}xèí· 'Éí°àÊ¶ÕÃÀÒ^{3/4}
ϕΙΣΑΔ^{σρ}ιελ¹ã^αεξΟ¹· ΑΟΣ
ΕΑΟΑÈΕμθ: αθ³μέις· 'Éí°; ÒÃμÑέξαèÒãËÁè«ÖèξãÁèã^αèαèÒ
'Ο; ΙΑμιϕΙΣ^{1/4}Ué^{1/4}ΑΟμ;ελ¹· Οè Æã^αέαèΟ¹Νέ¹μΑΙ'ã»

i ÒÃ à Å x í ; µ Ñ Ç à Å x í ; 1 Ò é à è Ç Ã ã È é Á Ñ è 1 ã " ä
é C è O ; O A à » Á O è A ; µ Ç O A à A ç C E N O 31 O I O ; Ò " Ð Á Ò 1/4 Å ã à é s O 1 â
' A I N µ â 1 A N µ O · Ø ; µ A N é s · O è à A O è A ã à é s O 1 Ç O 1 â ' Ç È i
È Á O Æ à È µ Ø : µ Ø 3 È O Á O Æ i ç é O Á ç Ñ é 1 µ í ; Ò Æ µ Ñ é s È Ñ -
O 31 O I O ; O I N µ â 1 A N µ O · O è · O s O 1 ç 3 Ð à A O è A µ é 1 A Ð ° ° ä ' é â
' Á ; O A ; µ O A i < Ctrl > µ é O s à Ç é ç 3 Ð · O è Ç O 1 â
' Ç È i ; O Æ N s à A O è A · O s O 1
È O ; à µ A x é i s µ I A 3/4 Ó Ç à µ í Æ à à µ x é í Á µ è í Á Æ Æ ; Ñ ° à 1 ç µ à Ç O Æ i ; ã È é ;
' µ O A i < Ctrl > µ é O s à Ç é · N 1 · Ó È Á N s " O i à ' é Å ç i ; I 1 â
ç é O È U è Ç O 1 â ' Ç È i

ÃÕà«çµÊÑÒ³¹ÒÌÔ;Ò:ÑésËÁ´ áÅéÇãËéÃÐ^{oo}µÃÇ´ÊÍÔÀÌ
´áÇÀì;AO;Oììè¹·Oè Ðã^aésO¹µNCçÇ^oçØÁ·Oè;OE¹´äÇélÕ;çÃÑés
çÍá¹D¹ÓãËéçØ³ÃÕà«çµ:Ø;çÃÑés·Õèá;Å^a BIOS çÍç;ÒÃì´´Í â
´Aã^aéã;ÅìlOAàA´EOEAN^oIN»à´µ BIOS

