

**GraphicsD**

|                      |
|----------------------|
| <b>COLLABORATORS</b> |
|----------------------|

|               |                             |                   |                  |
|---------------|-----------------------------|-------------------|------------------|
|               | <i>TITLE :</i><br>GraphicsD |                   |                  |
| <i>ACTION</i> | <i>NAME</i>                 | <i>DATE</i>       | <i>SIGNATURE</i> |
| WRITTEN BY    |                             | November 24, 2024 |                  |

|                         |
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| <b>REVISION HISTORY</b> |
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| NUMBER | DATE | DESCRIPTION | NAME |
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|        |      |             |      |

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## Chapter 1

# GraphicsD

### 1.1 GraphicsD

#### Konstanten

|                        |                         |                    |
|------------------------|-------------------------|--------------------|
| a2024MonitorID         | a2024fifteenhertzKey    | a2024tenhertzKey   |
| alertLayersNoMem       | anfracsize              | animhalf           |
| b2Bobber               | b2Norm                  | b2Swap             |
| bigBlits               | blitMsgFault            | borderHit          |
| bottomHit              | broadcastBeamcon        | broadcastHbstop    |
| broadcastHbstrt        | broadcastHsstop         | broadcastHsstrt    |
| broadcastVbstop        | broadcastVbstrt         | broadcastVsstop    |
| broadcastVsstrt        | colorMask               | colorOn            |
| dblpf                  | defaultMonitorID        | defaultMonitorName |
| dftchMask              | diAvailNochip           | diAvailNomonitor   |
| diAvailNotwithgenlock  | displayNameLen          | dtagDims           |
| dtagDisp               | dtagMntr                | dtagName           |
| extrahalfbriteKey      | extrahalfbritelaceKey   | fineScroll         |
| fineScrollMask         | fineScrollShift         | fromMonitor        |
| hamKey                 | hamlaceKey              | hiresKey           |
| hiresdpf2Key           | hiresdpfKey             | hireslaceKey       |
| hireslacedpf2Key       | hireslacedpfKey         | holdnmodify        |
| horizPos               | interlace               | invalidID          |
| isGrtrX                | isGrtrY                 | isLessX            |
| isLessY                | jam1                    | jam2               |
| leftHit                | lmnRegion               | lof                |
| loresKey               | loresdpf2Key            | loresdpfKey        |
| loreslaceKey           | loreslacedpf2Key        | loreslacedpfKey    |
| m640                   | mapColor                | maxFontMatchWeight |
| mcompatMixed           | mcompatNobody           | mcompatSelf        |
| minNtscRow             | minPalRow               | minVga70Row        |
| minVgaRow              | monitorIDmask           | monitorSpecType    |
| move                   | needsNoConcealedRasters | ←                  |
| needsNoLayerblitDamage |                         |                    |
| newLayerInfoCalled     | next                    | normalFont         |
| ntscMonitorID          | ntscMonitorName         | palMonitorID       |
| palMonitorName         | pf2pri                  | plnCntMsk          |
| plnCntShft             | protoMonitorID          | ratioFixedpart     |
| ratioUnity             | requestA2024            | requestNtsc        |
| requestPal             | requestSpecial          | rightHit           |
| ringtrigger            | sht                     | specialBeamcon     |

|                          |                       |                    |
|--------------------------|-----------------------|--------------------|
| specialMonitorType       | spriteAttached        | ssGraphics         |
| standardColorclocks      | standardDeniseMax     | standardDeniseMin  |
| standardHbstop           | standardHbstrt        | standardHsstop     |
| standardHsstrt           | standardMonitorMask   | ←                  |
| standardNtscBeamcon      |                       |                    |
| standardNtscRows         | standardPalBeamcon    | standardPalRows    |
| standardVbstop           | standardVbstrt        | standardViewX      |
| standardViewY            | standardVsstop        | standardVsstrt     |
| standardXoffset          | standardYoffset       | superKey           |
| superdpf2Key             | superdpfKey           | superlaceKey       |
| superlacedpf2Key         | superlacedpfKey       | sys                |
| taDeviceDPI              | toMonitor             | topHit             |
| vga70Beamcon             | vga70Colorclocks      | vga70DeniseMin     |
| vga70Hbstop              | vga70Hbstrt           | vga70Hsstop        |
| vga70Hsstrt              | vga70MonitorName      | vga70TotalRows     |
| vga70Vbstop              | vga70Vbstrt           | vga70Vsstop        |
| vga70Vsstrt              | vgaColorclocks        | vgaDeniseMin       |
| vgaHbstop                | vgaHbstrt             | vgaHsstop          |
| vgaHsstrt                | vgaMonitorID          | vgaMonitorName     |
| vgaTotalRows             | vgaVbstop             | vgaVbstrt          |
| vgaVsstop                | vgaVsstrt             | ←                  |
| vgaextrahalfbriteKey     |                       |                    |
| vgaextrahalfbritelaceKey | vgaextraloresKey      | ←                  |
| vgaextraloresdpf2Key     |                       |                    |
| vgaextraloresdpfKey      | vgaextraloreslaceKey  | ←                  |
| vgaextraloreslacedpf2Key |                       |                    |
| vgaextraloreslacedpfKey  | vgahamKey             | vgahamlaceKey      |
| vgaloresKey              | vgaloresdpf2Key       | vgaloresdpfKey     |
| vgaloreslaceKey          | vgaloreslacedpf2Key   | vgaloreslacedpfKey |
| vgaproductKey            | vgaproductdpf2Key     | vgaproductdpfKey   |
| vgaproductlaceKey        | vgaproductlacedpf2Key | ←                  |
| vgaproductlacedpfKey     |                       |                    |
| viewExtraType            | viewportExtraType     | vposrlof           |
| vrtclPos                 | vrtclPosShift         | vtagEndCm          |
| wait                     |                       |                    |

#### Typ-Deklarationen

|                      |                         |                   |
|----------------------|-------------------------|-------------------|
| AnalogSignalInterval | AnalogSignalIntervalPtr | AnimComp          |
| AnimCompPtr          | AnimOb                  | AnimObPtr         |
| AreaInfo             | AreaInfoPtr             | ←                 |
| AvailabilityFlagSet  |                         |                   |
| AvailabilityFlags    | BitMap                  | BitMapPtr         |
| BitScaleArgs         | BitScaleArgsPtr         | Bob               |
| BobFlagSet           | BobFlags                | BobPtr            |
| ChipRevSet           | ChipRevs                | ClipRect          |
| ClipRectPtr          | CollTable               | CollTablePtr      |
| ColorFontColors      | ColorFontColorsPtr      | ColorMap          |
| ColorMapFlagSet      | ColorMapFlags           | ColorMapPtr       |
| ColorMapType         | ColorTextFont           | ←                 |
| ColorTextFontFlagSet |                         |                   |
| ColorTextFontFlags   | ColorTextFontPtr        | CopIns            |
| CopInsPtr            | CopList                 | CopListPtr        |
| Copinit              | CopinitPtr              | Cprlist           |
| CprlistPtr           | DBufPacket              | DBufPacketPtr     |
| DimensionInfo        | DimensionInfoPtr        | DisplayFlagSet    |
| DisplayFlags         | DisplayInfo             | DisplayInfoHandle |

|                      |                   |                    |
|----------------------|-------------------|--------------------|
| DisplayInfoPtr       | DrawModeSet       | DrawModes          |
| ExtendedNode         | ExtendedNodePtr   | FontFlagSet        |
| FontFlags            | FontStyleSet      | FontStyles         |
| GelsInfo             | GelsInfoPtr       | GfxBase            |
| GfxBasePtr           | Isrvstr           | IsrvstrPtr         |
| Layer                | LayerFlagSet      | LayerFlags         |
| LayerInfo            | LayerInfoPtr      | LayerPtr           |
| LongProc             | MonitorInfo       | MonitorInfoPtr     |
| MonitorSpec          | MonitorSpecPtr    | NameInfo           |
| NameInfoPtr          | Point             | PointPtr           |
| PropertyFlagSet      | PropertyFlags     | QueryHeader        |
| QueryHeaderPtr       | RasInfo           | RasInfoPtr         |
| RastPort             | RastPortFlagSet   | RastPortFlags      |
| RastPortPtr          | Rect32            | Rect32Ptr          |
| Rectangle            | RectanglePtr      | Region             |
| RegionPtr            | RegionRectangle   | RegionRectanglePtr |
| SimpleSprite         | SimpleSpritePtr   | SpecialMonitor     |
| SpecialMonitorPtr    | TTextAttr         | TTextAttrPtr       |
| TextAttr             | TextAttrPtr       | TextExtent         |
| TextExtentPtr        | TextFont          | ←                  |
| TextFontExt0FlagSet  |                   |                    |
| TextFontExt0Flags    | TextFontExtension | ←                  |
| TextFontExtensionPtr |                   |                    |
| TextFontPtr          | TmpRas            | TmpRasPtr          |
| UCopList             | UCopListPtr       | VSprite            |
| VSpriteFlagSet       | VSpriteFlags      | VSpritePtr         |
| VTags                | View              | ViewExtra          |
| ViewExtraPtr         | ViewModeSet       | ViewModes          |
| ViewPort             | ViewPortExtra     | ViewPortExtraPtr   |
| ViewPortPtr          | ViewPtr           |                    |

## 1.2 TMP:Modula-2/GraphicsD.def

```
DEFINITION MODULE GraphicsD; (*$ Implementation:=FALSE *)
(* 10-Mar-1992/cn *)
```

```
FROM SYSTEM IMPORT ADDRESS,BITSET,BYTE,LONGSET,WORD,SHIFT,SHORTSET;
```

```
FROM ExecD IMPORT
  Interrupt , Library , List , Message , MinList , Node , NodePtr , NodeType ,
  SignalSemaphore , SignalSemaphorePtr , TaskPtr , MsgPortPtr ;
```

```
FROM Hardware IMPORT
  BltnodePtr , BeamConFlags , BeamConFlagSet ;
```

```
FROM UtilityD IMPORT
  HookPtr ,tagUser, TagItemPtr ;
```

```
TYPE
```

```
(*
  Die Datentypen von Graphics referenzieren sich oft gegenseitig.
  Aus diesem Grund werden alle Zeiger zuerst deklariert.
*)
```

```
(*36*) AnalogSignalIntervalPtr =POINTER TO AnalogSignalInterval ;
  AnimCompPtr =POINTER TO AnimComp ;
```

```

AnimObPtr =POINTER TO  AnimOb ;
AreaInfoPtr =POINTER TO  AreaInfo ;
BitMapPtr =POINTER TO  BitMap ;
(*36*) BitScaleArgsPtr =POINTER TO  BitScaleArgs ;
BobPtr =POINTER TO  Bob ;
ClipRectPtr =POINTER TO  ClipRect ;
CollTablePtr =POINTER TO  CollTable ;
(*36*) ColorFontColorsPtr =POINTER TO  ColorFontColors ;
ColorMapPtr =POINTER TO  ColorMap ;
(*36*) ColorTextFontPtr =POINTER TO  ColorTextFont ;
CopinitPtr =POINTER TO  Copinit ;
CopInsPtr =POINTER TO  CopIns ;
CopListPtr =POINTER TO  CopList ;
CprlistPtr =POINTER TO  Cprlist ;
DBufPacketPtr =POINTER TO  DBufPacket ;
(*36*) DimensionInfoPtr =POINTER TO  DimensionInfo ;
(*36*) DisplayInfoPtr =POINTER TO  DisplayInfo ;
(*36*) ExtendedNodePtr =POINTER TO  ExtendedNode ;
GelsInfoPtr =POINTER TO  GelsInfo ;
GfxBasePtr =POINTER TO  GfxBase ;
IsrvstrPtr =POINTER TO  Isrvstr ;
LayerPtr =POINTER TO  Layer ;
LayerInfoPtr =POINTER TO  LayerInfo ;
(*36*) MonitorInfoPtr =POINTER TO  MonitorInfo ;
(*36*) MonitorSpecPtr =POINTER TO  MonitorSpec ;
(*36*) NameInfoPtr =POINTER TO  NameInfo ;
(*36*) PointPtr =POINTER TO  Point ;
(*36*) QueryHeaderPtr =POINTER TO  QueryHeader ;
RasInfoPtr =POINTER TO  RasInfo ;
RastPortPtr =POINTER TO  RastPort ;
(*36*) Rect32Ptr =POINTER TO  Rect32 ;
RectanglePtr =POINTER TO  Rectangle ;
RegionPtr =POINTER TO  Region ;
RegionRectanglePtr =POINTER TO  RegionRectangle ;
SimpleSpritePtr =POINTER TO  SimpleSprite ;
(*36*) SpecialMonitorPtr =POINTER TO  SpecialMonitor ;
TextAttrPtr =POINTER TO  TextAttr ;
(*36*) TextExtentPtr =POINTER TO  TextExtent ;
(*36*) TextFontExtensionPtr =POINTER TO  TextFontExtension ;
TextFontPtr =POINTER TO  TextFont ;
TmpRasPtr =POINTER TO  TmpRas ;
(*36*) TTextAttrPtr =POINTER TO  TTextAttr ;
UCopListPtr =POINTER TO  UCopList ;
(*36*) ViewExtraPtr =POINTER TO  ViewExtra ;
ViewPtr =POINTER TO  View ;
(*36*) ViewPortExtraPtr =POINTER TO  ViewPortExtra ;
ViewPortPtr =POINTER TO  ViewPort ;
VSpritePtr =POINTER TO  VSprite ;

Rectangle =RECORD
minX,minY,maxX,maxY:INTEGER;
END;

Rect32 =RECORD
minX,minY,maxX,maxY:LONGINT
END;

```

---

```
Point =RECORD
x,y:INTEGER;
END;
```

```
BitMap =RECORD
bytesPerRow:CARDINAL;
rows:CARDINAL;
flags:SHORTCARD;
depth:SHORTCARD;
pad:CARDINAL;
planes:ARRAY [0..7] OF ADDRESS;
END;
```

```
Layer =RECORD
front: LayerPtr ;
back: LayerPtr ;
clipRect: ClipRectPtr ;
rp: RastPortPtr ;
bounds: Rectangle ;
reserved:ARRAY [0..3] OF BYTE;
priority:CARDINAL;
flags:CARDINAL;
superBitMap: BitMapPtr ;
superClipRect: ClipRectPtr ;
window:ADDRESS;
scrollX:INTEGER;
scrollY:INTEGER;
cr: ClipRectPtr ;
cr2: ClipRectPtr ;
crnew: ClipRectPtr ;
superSaveClipRects: ClipRectPtr ;
cliprects: ClipRectPtr ;
layerInfo: LayerInfoPtr ;
lock: SignalSemaphore ;
backFill: HookPtr ;
reserved1:LONGCARD;
clipRegion: RegionPtr ;
saveClipRects: RegionPtr ;
width,height:INTEGER;
reserved2:ARRAY [0..17] OF BYTE;
damageList: RegionPtr ;
END;
```

```
ClipRect =RECORD
next: ClipRectPtr ;
prev: ClipRectPtr ;
lobs: LayerPtr ;
bitMap: BitMapPtr ;
bounds: Rectangle ;
p1: ClipRectPtr ;
p2: ClipRectPtr ;
reserved:LONGINT;
flags:LONGINT;
END;
```

```
CONST
needsNoConcealedRasters=01H;
```

---



```
needsNoLayerblitDamage=02H;
```

```
isLessX=1;  
isLessY=2;  
isGrtrX=4;  
isGrtrY=8;
```

```
CONST
```

```
borderHit=0;  
topHit=1;  
bottomHit=2;  
leftHit=4;  
rightHit=8;
```

```
CONST
```

```
move=0;  
wait=1;  
next=2;  
sys=13;  
sht=14;  
lof=15;
```

```
TYPE
```

```
  CopIns =RECORD  
  CASE opCode:CARDINAL OF  
    | move:  
      destAddr:INTEGER;  
      destData:INTEGER;  
    | wait:  
      vWaitPos:INTEGER;  
      hWaitPos:INTEGER;  
    | next:  
      nxtlist: CopListPtr ;  
  END;
```

```
END;
```

```
  Cprlist =RECORD  
  next: CprlistPtr ;  
  start:ADDRESS;  
  maxCount:INTEGER;
```

```
END;
```

```
  CopList =RECORD  
  next: CopListPtr ;  
  copList: CopListPtr ;  
  viewPort: ViewPortPtr ;  
  copIns: CopInsPtr ;  
  copPtr: CopInsPtr ;  
  copLStart:ADDRESS;  
  copSStart:ADDRESS;  
  count:INTEGER;  
  maxCount:INTEGER;  
  dyOffset:INTEGER;  
  (*34*) cop2Start:ADDRESS;  
  (*34*) cop3Start:ADDRESS;  
  (*34*) cop4Start:ADDRESS;  
  (*34*) cop5Start:ADDRESS;
```

END;

```
UCopList =RECORD
next: UCopListPtr ;
firstCopList: CopListPtr ;
copList: CopListPtr ;
END;
```

```
Copinit =RECORD
vsynchHBlank:ARRAY [0..1] OF CARDINAL;
diwstart:ARRAY [0..3] OF CARDINAL;
diagstrt:ARRAY [0..3] OF CARDINAL;
sprstrtup:ARRAY [0..(2*8*2)-1] OF CARDINAL;
wait14:ARRAY [0..1] OF CARDINAL;
normHBlank:ARRAY [0..1] OF CARDINAL;
genloc:ARRAY [0..3] OF CARDINAL;
jump:ARRAY [0..(2*2)-1] OF CARDINAL;
waitForever:ARRAY [0..1] OF CARDINAL;
sprstop:ARRAY [0..3] OF CARDINAL;
END;
```

CONST

```
m640=08000H;
plnCntMsk=07H;
plnCntShft=12;
pf2pri=40H;
colorOn=200H;
dblpf=400H;
holdnmodify=800H;
interlace=04H;
```

```
fineScroll=0FH;
fineScrollShift=04H;
fineScrollMask=0FH;
horizPos=07FH;
vrtclPos=01FFH;
vrtclPosShift=07H;
dftchMask=0FFH;
vposrlof=08000H;
```

TYPE

```
ExtendedNode =RECORD
succ: NodePtr ;
pred: NodePtr ;
type: NodeType ;
pri:SHORTINT;
name:ADDRESS;
subsystem:SHORTCARD;
subtype:SHORTCARD;
library:LONGINT;
init:PROCEDURE():LONGINT;
END;
```

CONST

```
ssGraphics=02H;

viewExtraType=1;
```

---

```
viewportExtraType=2;
specialMonitorType=3;
monitorSpecType=4;

TYPE
  LongProc =PROCEDURE():LONGINT;

  MonitorSpec =RECORD
    node: ExtendedNode ;
    flags:BITSET;
    ratioh:LONGINT;
    ratiov:LONGINT;
    totalRows:CARDINAL;
    totalColorclocks:CARDINAL;
    deniseMaxDisplayColumn:CARDINAL;
    beamCon0:CARDINAL;
    minRow:CARDINAL;
    special: SpecialMonitorPtr ;
    openCount:CARDINAL;
    transform: LongProc ;
    translate: LongProc ;
    scale: LongProc ;
    xoffset:CARDINAL;
    yoffset:CARDINAL;
    legalView: Rectangle ;
    maxoscan: LongProc ;
    videoscan: LongProc ;
    deniseMinDisplayColumn:CARDINAL;
    displayCompatible:LONGCARD;
    displayInfoDataBase: List ;
    displayInfoDataBaseSemaphore: SignalSemaphore ;
    reserved00:LONGCARD;
    reserved01:LONGCARD;
  END;

CONST
  toMonitor=0;
  fromMonitor=1;

  standardXoffset=9;
  standardYoffset=0;

  requestNtsc=1;
  requestPal=2;
  requestSpecial=4;
  requestA2024=8;

  defaultMonitorName="default.monitor";
  ntscMonitorName="ntsc.monitor";
  palMonitorName="pal.monitor";

  standardMonitorMask=requestNtsc+requestPal;

  standardNtscRows=262;
  standardPalRows=312;
  standardColorclocks=226;
  standardDeniseMax=455;
```

---

```
standardDeniseMin=93;
standardNtscBeamcon=0000H;
standardPalBeamcon=displayPal;

specialBeamcon= BeamConFlagSet {
    varVBlank, lolDis, varVSync, varBeam, cSBlank};

minNtscRow=21;
minPalRow=29;

standardViewX=81H;
standardViewY=2CH;
standardHbstrt=06H;
standardHsstrt=0BH;
standardHsstop=1CH;
standardHbstop=2CH;
standardVbstrt=0122H;
standardVsstrt=02A6H;
standardVsstop=03AAH;
standardVbstop=1066H;

vgaColorclocks=standardColorclocks DIV 2;
vgaTotalRows=standardNtscRows*2;
vgaDeniseMin=59;

minVgaRow=29;

vgaHbstrt=08H;
vgaHsstrt=0EH;
vgaHsstop=1CH;
vgaHbstop=1EH;
vgaVbstrt=0000H;
vgaVsstrt=0153H;
vgaVsstop=0235H;
vgaVbstop=0CCDH;

vgaMonitorName="vga.monitor";

vga70Colorclocks=standardColorclocks DIV 2;
vga70TotalRows=449;
vga70DeniseMin=59;
minVga70Row=35;
vga70Hbstrt=08H;
vga70Hsstrt=0EH;
vga70Hsstop=1CH;
vga70Hbstop=1EH;
vga70Vbstrt=0000H;
vga70Vsstrt=02A6H;
vga70Vsstop=0388H;
vga70Vbstop=0F73H;

vga70Beamcon=specialBeamcon/ BeamConFlagSet {vSyncTrue};

vga70MonitorName="vga70.monitor";

broadcastHbstrt=01H;
broadcastHsstrt=06H;
```

---

```

broadcastHsstop=17H;
broadcastHbstop=27H;
broadcastVbstrt=0000H;
broadcastVsstrt=02A6H;
broadcastVsstop=054CH;
broadcastVbstop=1C40H;
broadcastBeamcon= BeamConFlagSet {lolDis,cSBlank};

```

```

ratioFixedpart=4;
ratioUnity=SHIFT (LONGCARD (1),ratioFixedpart);

```

TYPE

```

  AnalogSignalInterval =RECORD
    strt:CARDINAL;
    stop:CARDINAL;
  END;

```

```

  SpecialMonitor =RECORD
    node: ExtendedNode ;
    flags:BITSET;
    doMonitor: LongProc ;
    reserved1: LongProc ;
    reserved2: LongProc ;
    reserved3: LongProc ;
    hblank: AnalogSignalInterval ;
    vblank: AnalogSignalInterval ;
    hsync: AnalogSignalInterval ;
    vsync: AnalogSignalInterval ;
  END;

```

TYPE

```

  DisplayInfoHandle =ADDRESS;

```

CONST

```

dtagDisp=800000000H;
dtagDims=80001000H;
dtagMntr=80002000H;
dtagName=80003000H;

```

TYPE

```

  QueryHeader =RECORD
    structID:LONGCARD;
    displayID:LONGCARD;
    skipID:LONGCARD;
    length:LONGCARD;
  END;

```

TYPE

```

  PropertyFlags =(
    isLace,isDualpf,isPf2pri,isHam,isEcs,isPal,isSprites,isGenlock,isWb,
    isDraggable,isPanelled,isBeamsync,isExtrahalfbrite,is13,is14,is15,is16
  );
  PropertyFlagSet =SET OF  PropertyFlags ;

```

```

  AvailabilityFlags =(
    availNochips,availNomonitor,availNotwithgenlock,avf3,
    avf4,avf5,avf6,avf7,avf8
  );

```

---

```

);
AvailabilityFlagSet =SET OF  AvailabilityFlags ;

DisplayInfo =RECORD
header: QueryHeader ;
notAvailable: AvailabilityFlagSet ;
propertyFlags: PropertyFlagSet ;
resolution: Point ;
pixelSpeed: CARDINAL;
numStdSprites: CARDINAL;
paletteRange: CARDINAL;
spriteResolution: Point ;
pad: ARRAY [0..3] OF SHORTCARD;
reserved2: ARRAY [0..1] OF LONGCARD;
END;

CONST
diAvailNochip= AvailabilityFlagSet {availNochips};
diAvailNoMonitor= AvailabilityFlagSet {availNoMonitor};
diAvailNotwithgenlock= AvailabilityFlagSet {availNotwithgenlock};

TYPE
DimensionInfo =RECORD
header: QueryHeader ;
maxDepth: CARDINAL;
minRasterWidth: CARDINAL;
minRasterHeight: CARDINAL;
maxRasterWidth: CARDINAL;
maxRasterHeight: CARDINAL;
nominal: Rectangle ;
maxOScan: Rectangle ;
videoOScan: Rectangle ;
txtOScan: Rectangle ;
stdOScan: Rectangle ;
pad: ARRAY [0..13] OF SHORTCARD;
reserved: ARRAY [0..1] OF LONGCARD;
END;

MonitorInfo =RECORD
header: QueryHeader ;
mspc: MonitorSpecPtr ;
viewPosition: Point ;
viewResolution: Point ;
viewPositionRange: Rectangle ;
totalRows: CARDINAL;
totalColorClocks: CARDINAL;
minRow: CARDINAL;
compatibility: INTEGER;
pad: ARRAY [0..35] OF SHORTCARD;
DefaultViewPosition: Point ;
PreferredModeID: LONGCARD;
reserved: ARRAY [0..1] OF LONGCARD;
END;

CONST
mcompatMixed=0;
mcompatSelf=1;

```

---

```
mcompatNobody=-1;

displayNameLen=32;

TYPE
    NameInfo =RECORD
        header: QueryHeader ;
        name:ARRAY [0..displayNameLen-1] OF CHAR;
        reserved:ARRAY [0..1] OF LONGCARD;
    END;

CONST
    invalidID=-1;

    monitorIDmask=0FFFF1000H;

    defaultMonitorID=00000000H;
    ntscMonitorID=00011000H;
    palMonitorID=00021000H;

    loresKey=00000000H;
    hiresKey=00008000H;
    superKey=00008020H;
    hamKey=00000800H;
    loreslaceKey=00000004H;
    hireslaceKey=00008004H;
    superlaceKey=00008024H;
    hamlaceKey=00000804H;
    loresdpfKey=00000400H;
    hiresdpfKey=00008400H;
    superdpfKey=00008420H;
    loreslacedpfKey=00000404H;
    hireslacedpfKey=00008404H;
    superlacedpfKey=00008424H;
    loresdpf2Key=00000440H;
    hiresdpf2Key=00008440H;
    superdpf2Key=00008460H;
    loreslacedpf2Key=00000444H;
    hireslacedpf2Key=00008444H;
    superlacedpf2Key=00008464H;
    extrahalfbriteKey=00000080H;
    extrahalfbritelaceKey=00000084H;

    vgaMonitorID=00031000H;

    vgaextraloresKey=00031004H;
    vgaloresKey=00039004H;
    vgaproductKey=00039024H;
    vgahamKey=00031804H;
    vgaextraloreslaceKey=00031005H;
    vgaloreslaceKey=00039005H;
    vgaproductlaceKey=00039025H;
    vgahamlaceKey=00031805H;
    vgaextraloresdpfKey=00031404H;
    vgaloresdpfKey=00039404H;
    vgaproductdpfKey=00039424H;
    vgaextraloreslacedpfKey=00031405H;
```

---

```
vgaloreslacedpfKey=00039405H;
vgaproductlacedpfKey=00039425H;
vgaextraloresdpf2Key=00031444H;
vgaloresdpf2Key=00039444H;
vgaproductdpf2Key=00039464H;
vgaextraloreslacedpf2Key=00031445H;
vgaloreslacedpf2Key=00039445H;
vgaproductlacedpf2Key=00039465H;
vgaextrahalfbriteKey=00031084H;
vgaextrahalfbritelaceKey=00031085H;
```

```
a2024MonitorID=00041000H;
```

```
a2024tenhertzKey=00041000H;
a2024fifteenhertzKey=00049000H;
```

```
protoMonitorID=00051000H;
```

CONST

```
ringtrigger=01H;
anfracsize=06H;
animhalf=020H;
```

```
b2Norm=0;
b2Swap=1;
b2Bobber=2;
```

TYPE

```
VSpriteFlags =(
    vsprite, saveBack, overlay, mustDraw, vf4, vf5, vf6, vf7,
    backSaved, bobUpdate, gelGone, vsOverflow, vf12, vf13, vf14, vf15
);
VSpriteFlagSet =SET OF VSpriteFlags ;
VSprite =RECORD
    nextVSprite: VSpritePtr ;
    prevVSprite: VSpritePtr ;
    drawPath: VSpritePtr ;
    clearPath: VSpritePtr ;
    oldY:INTEGER;
    oldX:INTEGER;
    flags: VSpriteFlagSet ;
    y:INTEGER;
    x:INTEGER;
    height:INTEGER;
    width:INTEGER;
    depth:INTEGER;
    meMask:BITSET;
    hitMask:BITSET;
    imageData:ADDRESS;
    borderLine:ADDRESS;
    collMask:ADDRESS;
    sprColors:ADDRESS;
    vsBob: BobPtr ;
    planePick:SHORTCARD;
    planeOnOff:SHORTCARD;
END;
```



```
BobFlags =(
  saveBob,bobIsComp,bf2,bf3,bf4,bf5,bf6,bf7,
  bWaiting,bDrawn,bobsAway,bobNix,savePreserve,outStep,bf14,bf15
);
BobFlagSet =SET OF  BobFlags ;
```

```
Bob =RECORD
  flags: BobFlagSet ;
  saveBuffer:ADDRESS;
  imageShadow:ADDRESS;
  before: BobPtr ;
  after: BobPtr ;
  bobVSprite: VSpritePtr ;
  bobComp: AnimCompPtr ;
  dBuffer: DBufPacketPtr ;
END;
```

```
AnimComp =RECORD
  flags:INTEGER;
  timer:INTEGER;
  timeSet:INTEGER;
  nextComp: AnimCompPtr ;
  prevComp: AnimCompPtr ;
  nextSeq: AnimCompPtr ;
  prevSeq: AnimCompPtr ;
  animCRoutine:ADDRESS;
  yTrans:INTEGER;
  xTrans:INTEGER;
  headOb: AnimObPtr ;
  animBob: BobPtr ;
END;
```

```
AnimOb =RECORD
  nextOb: AnimObPtr ;
  prevOb: AnimObPtr ;
  clock:LONGINT;
  anOldY:INTEGER;
  anOldX:INTEGER;
  anY:INTEGER;
  anX:INTEGER;
  yVel:INTEGER;
  xVel:INTEGER;
  yAccel:INTEGER;
  xAccel:INTEGER;
  ringYTrans:INTEGER;
  ringXTrans:INTEGER;
  animORoutine:ADDRESS;
  headComp: AnimCompPtr ;
END;
```

```
DBufPacket =RECORD
  bufY:INTEGER;
  bufX:INTEGER;
  bufPath: VSpritePtr ;
  bufBuffer:ADDRESS;
END;
```

---

```

CollTable =RECORD
collPtrs:ARRAY [0..15] OF ADDRESS
END;

DisplayFlags =(
    ntsc,genloc,pal,todaSafe,df4,df5,df6,df7,
    df8,df9,df10,df11,df12,df13,df14,df15
);
DisplayFlagSet =SET OF DisplayFlags ;

(*36*) ChipRevs =(hrAgnus,hrDenise,cr2,cr3,cr4,cr5,cr6,cr7);
(*36*) ChipRevSet =SET OF ChipRevs ;

CONST
    bigBlits=hrAgnus;

TYPE
    GfxBase =RECORD
        libNode: Library ;
        actiView: ViewPtr ;
        copinit: CopinitPtr ;
        cia:ADDRESS;
        blitter:ADDRESS;
        loFlist:ADDRESS;
        shFlist:ADDRESS;
        blthd: BltnodePtr ;
        blttl: BltnodePtr ;
        bsblthd: BltnodePtr ;
        bsblttl: BltnodePtr ;
        vbsrv: Interrupt ;
        timsrv: Interrupt ;
        bltsrv: Interrupt ;
        textFonts: List ;
        defaultFont: TextFontPtr ;
        modes:BITSET;
        vBlank:SHORTCARD;
        debug:BYTE;
        beamSync:INTEGER;
        bplcon0:BITSET;
        spriteReserved:SHORTCARD;
        bytereserved:SHORTCARD;
        flags:BITSET;
        blitLock:INTEGER;
        blitNest:INTEGER;
        blitWaitQ: List ;
        blitOwner: TaskPtr ;
        waitQ: List ;
        displayFlags: DisplayFlagSet ;
        simpleSprites:ADDRESS;
        maxDisplayRow:CARDINAL;
        maxDisplayColumn:CARDINAL;
        normalDisplayRows:CARDINAL;
        normalDisplayColumns:CARDINAL;
        normalDPMX:CARDINAL;
        normalDPMY:CARDINAL;
        lastChanceMemory: SignalSemaphorePtr ;
        lcMptr:ADDRESS;

```

---

```

microsPerLine: CARDINAL;
minDisplayColumn: CARDINAL;
(*36*) chipRevBits0: ChipRevSet ;
(*36*) reservedPad: SHORTCARD;
(*36*) reserved: ARRAY [0..3] OF SHORTCARD;
(*36*) monitorId: CARDINAL;
(*36*) hedley: ARRAY [0..7] OF ADDRESS;
(*36*) hedleySprites: ARRAY [0..7] OF ADDRESS;
(*36*) hedleySprites1: ARRAY [0..7] OF ADDRESS;
(*36*) hedleyCount: INTEGER;
(*36*) hedleyFlags: BITSET;
(*36*) hedleyTmp: INTEGER;
(*36*) hashTable: ADDRESS;
(*36*) currentTotRows: CARDINAL;
(*36*) currentTotCclks: CARDINAL;
(*36*) hedleyHint: SHORTCARD;
(*36*) hedleyHint2: SHORTCARD;
(*36*) nreserved: ARRAY [0..3] OF LONGCARD;
(*36*) a2024SyncRaster: ADDRESS;
(*36*) controlDeltaPal: INTEGER;
(*36*) controlDeltaNtsc: INTEGER;
(*36*) currentMonitor: MonitorSpecPtr ;
(*36*) monitorList: List ;
(*36*) defaultMonitor: MonitorSpecPtr ;
(*36*) monitorListSemaphore: SignalSemaphorePtr ;
(*36*) displayInfoDataBase: ADDRESS;
(*36*) lapad: INTEGER;
(*36*) actiViewCprSemaphore: SignalSemaphorePtr ;
(*36*) utilityBase: ADDRESS;
(*36*) execBase: ADDRESS;
END;

CONST
  blitMsgFault=4;

TYPE
  Isrvstr = RECORD
    node: Node ;
    iptr: IsrvstrPtr ;
    code: ADDRESS;
    ccode: ADDRESS;
    carg: LONGINT;
  END;

  LayerFlags = (
    layerSimple, layerSmart, layerSuper, lf3, layerUpdating, lf5, layerBackdrop,
    layerRefresh, layerClipRectsLost
  );
  LayerFlagSet = SET OF LayerFlags ;

  LayerInfo = RECORD
    layer: LayerPtr ;
    lp: LayerPtr ;
    obs: ClipRectPtr ;
    freeClipRects: MinList ;
    lock: SignalSemaphore ;
    head: List ;

```

---

```

longreserved:LONGINT;
flags: LayerFlagSet ;
count:SHORTINT;
lockLayersCount:SHORTINT;
layerInfoExtraSize:CARDINAL;
blitbuff:ADDRESS;
layerInfoExtra:ADDRESS;
END;

```

CONST

```

lmnRegion=-1;
newLayerInfoCalled=01H;
alertLayersNoMem=083010000H;

```

TYPE

```

AreaInfo =RECORD
vctrTbl:ADDRESS;
vctrPtr:ADDRESS;
flagTbl:ADDRESS;
flagPtr:ADDRESS;
count:INTEGER;
maxCount:INTEGER;
firstX:INTEGER;
firstY:INTEGER;

```

END;

```

TmpRas =RECORD
rasPtr:ADDRESS;
size:LONGINT;

```

END;

```

GelsInfo =RECORD
sprRsrvd:SHORTINT;
flags:SHORTCARD;
gelHead: VSpritePtr ;
gelTail: VSpritePtr ;
nextLine:ADDRESS;
lastColor:ADDRESS;
collHandler: CollTablePtr ;
leftmost:INTEGER;
rightmost:INTEGER;
topmost:INTEGER;
bottommost:INTEGER;
firstBlissObj:ADDRESS;
lastBlissObj:ADDRESS;

```

END;

```

DrawModes =(dm0,complement,inversvid);
DrawModeSet =SET OF DrawModes ;

```

```

FontStyles =(
underlined,bold,italic,extended,fs4,fs5,colorFont,tagged
);
FontStyleSet =SET OF FontStyles ;

```

```

FontFlags =(
romFont,diskFont,revPath,tallDot,wideDot,proportional,designed,removed

```

```

);
FontFlagSet =SET OF FontFlags ;

RastPortFlags =(
firstDot,oneDot,dBuffer,areaOutline,rpf4,noCrossFill,rpf6,rpf7,rpf8
);
RastPortFlagSet =SET OF RastPortFlags ;

RastPort =RECORD
layer: LayerPtr ;
bitMap: BitMapPtr ;
areaPtrn:ADDRESS;
tmpRas: TmpRasPtr ;
areaInfo: AreaInfoPtr ;
gelsInfo: GelsInfoPtr ;
mask:SHORTCARD;
fgPen:SHORTCARD;
bgPen:SHORTCARD;
aOlPen:SHORTCARD;
drawMode: DrawModeSet ;
areaPtSz:SHORTCARD;
linPatCnt:SHORTCARD;
dummy:BYTE;
flags: RastPortFlagSet ;
linePtrn:CARDINAL;
x:INTEGER;
y:INTEGER;
minterms:ARRAY [0..7] OF SHORTCARD;
penWidth:INTEGER;
penHeight:INTEGER;
font: TextFontPtr ;
algoStyle: FontStyleSet ;
txFlags: FontFlagSet ;
txHeight:CARDINAL;
txWidth:CARDINAL;
txBaseline:CARDINAL;
txSpacing:INTEGER;
user:ADDRESS;
longreserved:ARRAY [0..1] OF LONGINT;
wordreserved:ARRAY [0..6] OF WORD;
reserved:ARRAY [0..7] OF BYTE;
END;

CONST
jam1= DrawModeSet {};
jam2= DrawModeSet {dm0};

spriteAttached=080H;
normalFont= FontStyleSet {};

TYPE
RegionRectangle =RECORD
next: RegionRectanglePtr ;
prev: RegionRectanglePtr ;
bounds: Rectangle ;
END;

```

---

```
Region =RECORD
bounds: Rectangle ;
regionRectangle: RegionRectanglePtr ;
END;
```

TYPE

```
BitScaleArgs =RECORD
srcX: CARDINAL;
srcY: CARDINAL;
srcWidth: CARDINAL;
srcHeight: CARDINAL;
srcXFactor: CARDINAL;
srcYFactor: CARDINAL;
destX: CARDINAL;
destY: CARDINAL;
destWidth: CARDINAL;
destHeight: CARDINAL;
xDestFactor: CARDINAL;
yDestFactor: CARDINAL;
srcBitMap: BitMapPtr ;
destBitMap: BitMapPtr ;
flags: LONGCARD;
xDDA: CARDINAL;
yDDA: CARDINAL;
reserved1: LONGINT;
reserved2: LONGINT;
END;
```

```
SimpleSprite =RECORD
posctlldata: ADDRESS;
height: CARDINAL;
x: CARDINAL;
y: CARDINAL;
num: INTEGER;
END;
```

```
TextAttr =RECORD
name: ADDRESS;
ySize: CARDINAL;
style: FontStyleSet ;
flags: FontFlagSet ;
END;
```

```
TTextAttr =RECORD
name: ADDRESS;
ySize: CARDINAL;
style: FontStyleSet ;
flags: FontFlagSet ;
tags: TagItemPtr ;
END;
```

CONST

```
taDeviceDPI=tagUser+1;
maxFontMatchWeight=32767;
```

TYPE

```
TextFont =RECORD
```

```

message: Message ;
ySize: CARDINAL;
style: FontStyleSet ;
flags: FontFlagSet ;
xSize: CARDINAL;
baseline: CARDINAL;
boldSmear: CARDINAL;
accessors: CARDINAL;
loChar: CHAR;
hiChar: CHAR;
charData: ADDRESS;
modulo: CARDINAL;
charLoc: ADDRESS;
charSpace: ADDRESS;
charKern: ADDRESS;
END;

```

TYPE

```

TextFontExt0Flags = (noRemFont) ;
TextFontExt0FlagSet = SET OF TextFontExt0Flags ;

TextFontExtension = RECORD
matchWord: CARDINAL;
flags0: TextFontExt0FlagSet ;
flags1: SHORTSET;
backPtr: TextFontPtr ;
origReplyPort: MsgPortPtr ;
tags: TagItemPtr ;
oFontPatchS: ADDRESS;
oFontPatchK: ADDRESS;
END;

```

TYPE

```

ColorFontColors = RECORD
reserved: CARDINAL;
count: CARDINAL;
colorTable: POINTER TO ARRAY [0..1000] OF CARDINAL;
END;

ColorTextFontFlags = (
colorfont, greyfont, antialias, ctf3, ctf4, ctf5, ctf6, ctf7,
ctf8, ctf9, ctf10, ctf11, ctf12, ctf13, ctf14, ctf15
);
ColorTextFontFlagSet = SET OF ColorTextFontFlags ;

```

CONST

```

mapColor = colorFont;
colorMask = ColorTextFontFlagSet {colorfont..ctf3};

```

TYPE

```

ColorTextFont = RECORD
tf: TextFont ;
flags: CARDINAL;
depth: SHORTCARD;
fgColor: SHORTCARD;
low: SHORTCARD;
high: SHORTCARD;

```

```
planePick:SHORTCARD;  
planeOnOff:SHORTCARD;  
colorFontColors: ColorFontColorsPtr ;  
charData:ARRAY[0..7] OF ADDRESS;  
END;
```

```
TextExtent =RECORD  
width:CARDINAL;  
height:CARDINAL;  
extent: Rectangle ;  
END;
```

```
CONST  
vtagEndCm=00000000H;
```

```
TYPE  
VTags =(  
vtagChromaKeyClr:=tagUser,  
vtagChromaKeySet,  
vtagBitplaneKeyClr,  
vtagBitplaneKeySet,  
vtagBorderblankClr,  
vtagBorderblankSet,  
vtagBordernotransClr,  
vtagBordernotransSet,  
vtagChromaPenClr,  
vtagChromaPenSet,  
vtagChromaPlaneSet,  
vtagAttachCmSet,  
vtagNextbufCm,  
vtagBatchCmClr,  
vtagBatchCmSet,  
vtagNormalDispGet,  
vtagNormalDispSet,  
vtagCoerceDispGet,  
vtagCoerceDispSet,  
vtagViewportextraGet,  
vtagViewportextraSet,  
vtagChromaKeyGet,  
vtagBitplaneKeyGet,  
vtagBorderblankGet,  
vtagBordernotransGet,  
vtagChromaPenGet,  
vtagChromaPlaneGet,  
vtagAttachCmGet,  
vtagBatchCmGet,  
vtagBatchItemsGet,  
vtagBatchItemsSet,  
vtagBatchItemsAdd,  
vtagVpmodeidGet,  
vtagVpmodeidSet,  
vtagVpmodeidClr,  
vtagUserclipGet,  
vtagUserclipSet,  
vtagUserclipClr  
);
```

---



```
ViewModes =(
vm0,genlocVideo,lace,vm3,vm4,superHires,pfba,extraHalfbrite,
genlocAudio,vm9,dualpf,ham,extendedMode,vphide,sprites,hires
);
ViewModeSet =SET OF ViewModes ;
```

```
ViewPort =RECORD
next: ViewPortPtr ;
colorMap: ColorMapPtr ;
dspIns: CopListPtr ;
sprIns: CopListPtr ;
clrIns: CopListPtr ;
uCopIns: UCopListPtr ;
dWidth:INTEGER;
dHeight:INTEGER;
dxOffset:INTEGER;
dyOffset:INTEGER;
modes: ViewModeSet ;
spritePriorities:SHORTCARD;
extendedModes:SHORTSET;
rasInfo: RasInfoPtr ;
END;
```

```
View =RECORD
viewPort: ViewPortPtr ;
lofCprList: CprlistPtr ;
shfCprList: CprlistPtr ;
dyOffset:INTEGER;
dxOffset:INTEGER;
modes: ViewModeSet ;
END;
```

```
ViewExtra =RECORD
n: ExtendedNode ;
view: ViewPtr ;
monitor: MonitorSpecPtr ;
END;
```

```
ViewPortExtra =RECORD
n: ExtendedNode ;
viewPort: ViewPortPtr ;
displayClip: Rectangle ;
END;
```

```
RasInfo =RECORD
next: RasInfoPtr ;
bitMap: BitMapPtr ;
rxOffset:INTEGER;
ryOffset:INTEGER;
END;
```

TYPE

```
ColorMapType =(colorMapTypeV33,colorMapTypeV36);
```

```
ColorMapFlags =(
colormapTransparency,colorPlaneTransparency,borderBlanking,
```

```
borderNoTransparency,videoControlBatch,userCopperClip,cm6,cm7
);
ColorMapFlagSet =SET OF   ColorMapFlags ;

ColorMap =RECORD
flags: ColorMapFlagSet ;
type: ColorMapType ;
count:CARDINAL;
colorTable:ADDRESS;
vpe: ViewPortExtraPtr ;
transparencyBits:ADDRESS;
transparencyPlane:SHORTCARD;
reserved1:SHORTCARD;
reserved2:CARDINAL;
vp: ViewPortPtr ;
normalDisplayInfo:ADDRESS;
coerceDisplayInfo:ADDRESS;
batchItems: TagItemPtr ;
vpModeID:LONGCARD;
END;

END GraphicsD.noimp
```

---