

graphics

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Chapter 1

graphics

1.1 graphics.doc

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```

1.2 graphics.library/AddAnimOb

NAME

AddAnimOb -- Add an AnimOb to the linked list of AnimObs.

SYNOPSIS

```

AddAnimOb(anOb, anKey, rp)
           A0      A1      A2

```

```

void AddAnimOb(struct AnimOb *, struct AnimOb **, struct RastPort *);

```

FUNCTION

Links this AnimOb into the current list pointed to by animKey.
 Initializes all the Timers of the AnimOb's components.
 Calls AddBob with each component's Bob.
 rp->GelsInfo must point to an initialized GelsInfo structure.

INPUTS

anOb = pointer to the AnimOb structure to be added to the list
 anKey = address of a pointer to the first AnimOb in the list
 (anKey = NULL if there are no AnimObs in the list so far)
 rp = pointer to a valid RastPort

RESULT

BUGS

SEE ALSO

Animate() graphics/rastport.h graphics/gels.h

1.3 graphics.library/AddBob

NAME

AddBob -- Adds a Bob to current gel list.

SYNOPSIS

```

AddBob(Bob, rp)

```

A0 A1

```
void AddBob(struct Bob *, struct RastPort *);
```

FUNCTION

Sets up the system Bob flags, then links this gel into the list via AddVSprite.

INPUTS

Bob = pointer to the Bob structure to be added to the gel list
rp = pointer to a RastPort structure

RESULT

BUGS

SEE ALSO

InitGels() AddVSprite() graphics/gels.h graphics/rastport.h

1.4 graphics.library/AddFont

NAME

AddFont -- add a font to the system list

SYNOPSIS

```
AddFont(textFont)
        A1
```

```
void AddFont(struct TextFont *);
```

FUNCTION

This function adds the text font to the system, making it available for use by any application. The font added must be in public memory, and remain until successfully removed.

INPUTS

textFont - a TextFont structure in public ram.

RESULT

NOTES

This function will set the tf_Accessors to 0.

BUGS

SEE ALSO

SetFont() RemFont() graphics/text.h

1.5 graphics.library/AddVSprite

NAME

AddVSprite -- Add a VSprite to the current gel list.

SYNOPSIS

```
AddVSprite(vs, rp)
           A0  A1
```

```
void AddVSprite(struct VSprite *, struct RastPort *);
```

FUNCTION

Sets up the system VSprite flags

Links this VSprite into the current gel list using its Y,X

INPUTS

vs = pointer to the VSprite structure to be added to the gel list

rp = pointer to a RastPort structure

RESULT

BUGS

SEE ALSO

InitGels() graphics/rastport.h graphics/gels.h

1.6 graphics.library/AllocBitMap

NAME

AllocBitMap -- Allocate a bitmap and attach bitplanes to it. (V39)

SYNOPSIS

```
bitmap=AllocBitMap(sizeX,sizeY,depth, flags, friend_bitmap)
                  d0      d1      d2      d3      a0
```

```
struct BitMap *AllocBitMap(ULONG,ULONG,ULONG,ULONG, struct BitMap *);
```

FUNCTION

Allocates and initializes a bitmap structure. Allocates and initializes bitplane data, and sets the bitmap's planes to point to it.

INPUTS

sizeX = the width (in pixels) desired for the bitmap data.

sizeY = the height (in pixels) desired.

depth = the number of bitplanes deep for the allocation.

 Pixels with AT LEAST this many bits will be allocated.

flags = BMF_CLEAR to specify that the allocated raster should be filled with color 0.

 BMF_DISPLAYABLE to specify that this bitmap data should be allocated in such a manner that it can be displayed. Displayable data has more severe alignment restrictions than non-displayable data in some systems.

 BMF_INTERLEAVED tells graphics that you would like your

bitmap to be allocated with one large chunk of display memory for all bitplanes. This minimizes color flashing on deep displays. If there is not enough contiguous RAM for an interleaved bitmap, graphics.library will fall back to a non-interleaved one.

BMF_MINPLANES causes graphics to only allocate enough space in the bitmap structure for "depth" plane pointers. This is for system use and should not be used by applications use as it is inefficient, and may waste memory.

friend_bitmap = pointer to another bitmap, or NULL. If this pointer is passed, then the bitmap data will be allocated in the most efficient form for blitting to friend_bitmap.

BUGS

NOTES

When allocating using a friend bitmap, it is not safe to assume anything about the structure of the bitmap data if that friend BitMap might not be a standard amiga bitmap (for instance, if the workbench is running on a non-amiga display device, its Screen->RastPort->BitMap won't be in standard amiga format. The only safe operations to perform on a non-standard BitMap are:

- blitting it to another bitmap, which must be either a standard Amiga bitmap, or a friend of this bitmap.
- blitting from this bitmap to a friend bitmap or to a standard Amiga bitmap.
- attaching it to a rastport and making rendering calls.

Good arguments to pass for the friend_bitmap are your window's RPort->BitMap, and your screen's RastPort->BitMap. Do NOT pass &(screenptr->BitMap)!

BitMaps not allocated with BMF_DISPLAYABLE may not be used as Intuition Custom BitMaps or as RasInfo->BitMaps. They may be blitted to a BMF_DISPLAYABLE BitMap, using one of the BltBitMap() family of functions.

SEE ALSO
FreeBitMap()

1.7 graphics.library/AllocDBufInfo

NAME

AllocDBufInfo -- Allocate structure for multi-buffered animation (V39)

SYNOPSIS

```
AllocDBufInfo(vp)
    a0
```

```
struct DBufInfo * AllocDBufInfo(struct ViewPort *)
```

FUNCTION

Allocates a structure which is used by the `ChangeVPBitMap()` routine.

INPUTS

`vp` = A pointer to a `Viewport` structure.

BUGS

NOTES

Returns 0 if there is no memory available or if the display mode of the viewport does not support double-buffering.

The only fields of the `DBufInfo` structure which can be used by application programs are the `dbi_SafeMessage`, `dbi_DispatchMessage`, `dbi_UserData1` and `dbi_UserData2` fields.

`dbi_SafeMessage` and `dbi_DispatchMessage` are standard exec message structures which may be used for synchronizing your animation with the screen update.

`dbi_SafeMessage` is a message which is replied to when it is safe to write to the old `BitMap` (the one which was installed when you called `ChangeVPBitMap()`).

`dbi_DispatchMessage` is replied to when it is safe to call `ChangeVPBitMap` again and be certain that the new frame has been seen at least once.

The `dbi_UserData1` and `dbi_UserData2` fields, which are stored after each message, are for your application to stuff any data into that it may need to examine when looking at the reply coming into the `ReplyPort` for either of the embedded Message structures.

`DBufInfo` structures MUST be allocated with this function. The size of the structure will grow in future releases.

The following fragment shows proper double buffering synchronization:

```
int SafeToChange=TRUE, SafeToWrite=TRUE, CurBuffer=1;
struct MsgPort *ports[2];    /* reply ports for DispatchMessage and SafeMessage
*/
struct BitMap *BmPtrs[2];
struct DBufInfo *myDBI;

... allocate bitmap pointers, DBufInfo, set up viewports, etc.

myDBI->dbi_SafeMessage.mn_ReplyPort=ports[0];
myDBI->dbi_DispatchMessage.mn_ReplyPort=ports[1];
while (! done)
{
    if (! SafeToWrite)
        while (! GetMsg(ports[0])) Wait(11<<(ports[0]->mp_SigBit));
        SafeToWrite=TRUE;

    ... render to bitmap # CurBuffer.

    if (! SafeToChange)
        while (! GetMsg(ports[1])) Wait(11<<(ports[1]->mp_SigBit));
```

```

    SafeToChange=TRUE;
    WaitBlit();          /* be sure rendering has finished */
    ChangeVPBitMap(vp,BmPtrs[CurBuffer],myDBI);
    SafeToChange=FALSE;
    SafeToWrite=FALSE;
    CurBuffer ^=1; /* toggle current buffer */
}

    if (! SafeToChange) /* cleanup pending messages */
while(! GetMsg(ports[1])) Wait(1l<<(ports[1]->mp_SigBit));
    if (! SafeToWrite) /* cleanup */
while(! GetMsg(ports[0])) Wait(1l<<(ports[0]->mp_SigBit));

SEE ALSO
FreeDBufInfo() ChangeVPBitMap()

```

1.8 graphics.library/AllocRaster

NAME
AllocRaster -- Allocate space for a bitplane.

SYNOPSIS
planePtr = AllocRaster(width, height)
 d0 d0 d1

PLANEPTR AllocRaster(ULONG,ULONG);

FUNCTION
This function calls the memory allocation routines to allocate memory space for a bitplane "width" bits wide and "height" bits high.

INPUTS
width - number of columns in bitplane
height - number of rows in bitplane

RESULT
planePtr - pointer to first word in bitplane, or NULL if it was not possible to allocate the desired amount of memory.

NOTES
In order to assure proper alignment of display memory, the AllocBitMap() function should be used instead of AllocRaster when you wish to allocate display memory (rasters which are attached to a ViewPort or Screen).

BUGS

SEE ALSO
FreeRaster() graphics/gfx.h

1.9 graphics.library/AllocSpriteDataA

NAME

AllocSpriteDataA -- allocate sprite data and convert from a bitmap. (V39)
 AllocSpriteData -- varargs stub for AllocSpriteDataA(). (V39)

SYNOPSIS

```
SpritePtr | 0 = AllocSpriteDataA(bitmap,taglist)
d0                a2          a1
```

```
struct ExtSprite *AllocSpriteDataA( struct BitMap *, struct TagItem * );
```

```
extsprite=AllocSpriteData(bitmap,tags,...TAG_END)
```

FUNCTION

Allocate memory to hold a sprite image, and convert the passed-in bitmap data to the appropriate format. The tags allow specification of width, scaling, and other options.

INPUTS

bitmap - ptr to a bitmap. This bitmap provides the source data for the sprite image.

tags -

SPRITEA_Width specifies how many pixels wide you desire the sprite to be. Specifying a width wider than the hardware can handle will cause the function to return failure. If the bitmap passed in is narrower than the width asked for, then it will be padded on the right with transparent pixels. Defaults to 16.

SPRITEA_XReplication controls the horizontal pixel replication factor used when converting the bitmap data. Valid values are:

- 0 - perform a 1 to 1 conversion
- 1 - each pixel from the source is replicated twice in the output.
- 2 - each pixel is replicated 4 times.
 - 1 - skip every other pixel in the source bitmap
 - 2 - only include every fourth pixel from the source.

This tag is useful for converting data from one resolution to another. For instance, hi-res bitmap data can be correctly converted for a lo-res sprite by using an x replication factor of -1. Defaults to 0.

SPRITEA_YReplication controls the vertical pixel replication factor in the same manner as SPRITEA_XReplication controls the horizontal.

SPRITEA_OutputHeight specifies how tall the resulting sprite should be. Defaults to the bitmap height. The bitmap MUST be at least as tall as the output height.

SPRITEA_Attached tells the function that you wish to convert the data for the second sprite in an attached sprite pair. This will cause AllocSpriteData() to take its data from the 3rd and 4th bitplanes of the passed in bitmap.

Bitplane data is not required to be in chip ram for this function.

RESULTS

SpritePtr = a pointer to a ExtSprite structure, or 0 if there is a failure. You should pass this pointer to FreeSpriteData() when finished with the sprite.

BUGS

Under V39, the appropriate attach bits would not be set in the sprite data.

The work-around is to set the bits manually. Bit 7 of the second word should be set. On a 32 bit sprite, bit 7 of the 3rd word should also be set. For a 64 bit sprite, bit 7 of the 5th word should also be set. This should NOT be done under V40, as the bug is fixed.

SEE ALSO

FreeSpriteData() FreeSprite() ChangeSprite() MoveSprite() GetExtSpriteA()
AllocBitMap() graphics/sprite.h

1.10 graphics.library/AndRectRegion

NAME

AndRectRegion -- Perform 2d AND operation of rectangle with region, leaving result in region.

SYNOPSIS

```
AndRectRegion(region, rectangle)
    a0  a1
```

```
void AndRectRegion( struct Region *, struct Rectangle * );
```

FUNCTION

Clip away any portion of the region that exists outside of the rectangle. Leave the result in region.

INPUTS

region - pointer to Region structure
rectangle - pointer to Rectangle structure

NOTES

Unlike the other rect-region primitives, AndRectRegion() cannot fail.

BUGS

SEE ALSO

AndRegionRegion() OrRectRegion() graphics/regions.h

1.11 graphics.library/AndRegionRegion

NAME

AndRegionRegion -- Perform 2d AND operation of one region
with second region, leaving result in second region.

SYNOPSIS

```
status = AndRegionRegion(region1, region2)
           d0                a0        a1
```

```
BOOL AndregionRegion(struct Region *, struct Region * );
```

FUNCTION

Remove any portion of region2 that is not in region1.

INPUTS

region1 - pointer to Region structure
region2 - pointer to Region structure to use and for result

RESULTS

status - return TRUE if successful operation
return FALSE if ran out of memory

BUGS

SEE ALSO

OrRegionRegion() AndRectRegion() graphics/regions.h

1.12 graphics.library/Animate

NAME

Animate -- Processes every AnimOb in the current animation list.

SYNOPSIS

```
Animate(anKey, rp)
           A0      A1
```

```
void Animate(struct AnimOb **, struct RastPort *);
```

FUNCTION

For every AnimOb in the list

- update its location and velocities
- call the AnimOb's special routine if one is supplied
- for each component of the AnimOb
 - if this sequence times out, switch to the new one
 - call this component's special routine if one is supplied
 - set the sequence's VSprite's y,x coordinates based on whatever these routines cause

INPUTS

ankey = address of the variable that points to the head AnimOb
rp = pointer to the RastPort structure

RESULT

BUGS

SEE ALSO

AddAnimOb() graphics/gels.h graphics/rastport.h

1.13 graphics.library/AreaCircle

NAME

AreaCircle -- add a circle to areainfo list for areafill.

SYNOPSIS

```
error = (int) AreaCircle( rp,  cx,  cy, radius)
D0          A1    D0    D1    D2
```

```
ULONG AreaCircle(struct RastPort *, WORD, WORD, UWORD);
```

FUNCTION

Add circle to the vector buffer. It will be drawn to the rastport when AreaEnd is executed.

INPUTS

rp - pointer to a RastPort structure

cx, cy - the coordinates of the center of the desired circle.

radius - is the radius of the circle to draw around the centerpoint.

RESULTS

0 if no error

-1 if no space left in vector list

NOTES

This function is actually a macro which calls
AreaEllipse(rp,cx,cy,radius,radius).

SEE ALSO

AreaMove() AreaDraw() AreaCircle() InitArea() AreaEnd()
graphics/rastport.h graphics/gfxmacros.h

1.14 graphics.library/AreaDraw

NAME

AreaDraw -- Add a point to a list of end points for areafill.

SYNOPSIS

```
error = AreaDraw( rp,  x,      y)
d0          A1 D0:16 D1:16
```

```
ULONG AreaDraw( struct RastPort *, SHORT, SHORT);
```

FUNCTION

Add point to the vector buffer.

INPUTS

rp - points to a RastPort structure.
x,y - are coordinates of a point in the raster.

RESULT

error - zero for success, else -1 if no there was no space left in the vector list.

BUGS

SEE ALSO

AreaMove() InitArea() AreaEnd() graphics/rastport.h

1.15 graphics.library/AreaEllipse

NAME

AreaEllipse -- add a ellipse to areainfo list for areafill.

SYNOPSIS

```
error = AreaEllipse( rp, cx, cy, a, b )  
d0      a1 d0:16 d1:16 d2:16 d3:16
```

LONG AreaEllipse(struct RastPort *, SHORT, SHORT, SHORT, SHORT)

FUNCTION

Add an ellipse to the vector buffer. It will be draw when AreaEnd() is called.

INPUTS

rp - pointer to a RastPort structure
cx - x coordinate of the centerpoint relative to the rastport.
cy - y coordinate of the centerpoint relative to the rastport.
a - the horizontal radius of the ellipse (note: a must be > 0)
b - the vertical radius of the ellipse (note: b must be > 0)

RESULT

error - zero for success, or -1 if there is no space left in the vector list

SEE ALSO

AreaMove() AreaDraw() AreaCircle() InitArea() AreaEnd()
graphics/rastport.h

1.16 graphics.library/AreaEnd

NAME

AreaEnd -- Process table of vectors and ellipses and produce areafill.

SYNOPSIS

```
error = AreaEnd(rp)
      d0          A1
```

```
LONG AreaEnd( struct RastPort * );
```

FUNCTION

Trigger the filling operation.
Process the vector buffer and generate required fill into the raster planes. After the fill is complete, reinitialize for the next AreaMove or AreaEllipse. Use the raster set up by InitTmpRas when generating an areafill mask.

RESULT

error - zero for success, or -1 if an error occurred anywhere.

INPUTS

rp - pointer to a RastPort structure which specifies where the filled regions will be rendered to.

BUGS

SEE ALSO

InitArea() AreaMove() AreaDraw() AreaEllipse() InitTmpRas()
graphics/rastport.h

1.17 graphics.library/AreaMove

NAME

AreaMove -- Define a new starting point for a new shape in the vector list.

SYNOPSIS

```
error = AreaMove( rp,    x,    y)
      d0          a1  d0:16  d1:16
```

```
LONG AreaMove( struct RastPort *, SHORT, SHORT );
```

FUNCTION

Close the last polygon and start another polygon at (x,y). Add the necessary points to vector buffer. Closing a polygon may result in the generation of another AreaDraw() to close previous polygon. Remember to have an initialized AreaInfo structure attached to the RastPort.

INPUTS

rp - points to a RastPort structure
x,y - positions in the raster

RETURNS

error - zero for success, or -1 if there is no space left in the

vector list

BUGS

SEE ALSO

InitArea() AreaDraw() AreaEllipse() AreaEnd() graphics/rastport.h

1.18 graphics.library/AskFont

NAME

AskFont -- get the text attributes of the current font

SYNOPSIS

```
AskFont(rp, textAttr)
        A1  A0
```

```
void AskFont(struct RastPort *, struct TextAttr *);
```

FUNCTION

This function fills the text attributes structure with the attributes of the current font in the RastPort.

INPUTS

rp - the RastPort from which the text attributes are
 extracted
textAttr - the TextAttr structure to be filled. Note that
 there is no support for a TTextAttr.

RESULT

The textAttr structure is filled with the RastPort's text attributes.

BUGS

SEE ALSO

graphics/text.h

1.19 graphics.library/AskSoftStyle

NAME

AskSoftStyle -- Get the soft style bits of the current font.

SYNOPSIS

```
enable = AskSoftStyle(rp)
D0                           A1
```

```
ULONG AskSoftStyle(struct RastPort *);
```

FUNCTION

This function returns those style bits of the current font that are not intrinsic in the font itself, but

algorithmically generated. These are the bits that are valid to set in the enable mask for SetSoftStyle().

INPUTS

rp - the RastPort from which the font and style are extracted.

RESULTS

enable - those bits in the style algorithmically generated.
Style bits that are not defined are also set.

BUGS

SEE ALSO

SetSoftStyle() graphics/text.h

1.20 graphics.library/AttachPalExtra

NAME

AttachPalExtra -- Allocate and attach a palette sharing structure to a colormap. (V39)

SYNOPSIS

```
status=AttachPalExtra( cm, vp)
                    a0  a1
```

```
LONG AttachPalExtra( Struct ColorMap *, struct ViewPort *);
```

FUNCTION

Allocates and attaches a PalExtra structure to a ColorMap. This is necessary for color palette sharing to work. The PalExtra structure will be freed by FreeColorMap(). The set of available colors will be determined by the mode and depth of the viewport.

INPUTS

cm = A pointer to a color map created by GetColorMap().

vp = A pointer to the viewport structure associated with the ColorMap.

RESULTS

status - 0 if successful, else an error number. The only currently defined error number is out of memory (1).

BUGS

NOTES

This function is for use with custom ViewPorts and custom ColorMaps, as Intuition attaches a PalExtra to all of its Screens. If there is already a PalExtra associated with the ColorMap, then this function will do nothing.

SEE ALSO

GetColorMap() FreeColorMap() ObtainPen() ObtainBestPenA()

1.21 graphics.library/AttemptLockLayerRom

*

NAME
AttemptLockLayerRom -- Attempt to Lock Layer structure
by ROM(gfx lib) code

SYNOPSIS
gotit = AttemptLockLayerRom(layer)
d0 a5

BOOL AttemptLockLayerRom(struct Layer *);

FUNCTION
Query the current state of the lock on this Layer. If it is already locked then return FALSE, could not lock. If the Layer was not locked then lock it and return TRUE. This call does not destroy any registers. This call nests so that callers in this chain will not lock themselves out.

INPUTS
layer - pointer to Layer structure

RESULT
gotit - TRUE or FALSE depending on whether the Layer was successfully locked by the caller.

SEE ALSO
LockLayerRom() UnlockLayerRom()

1.22 graphics.library/BestModeIDA

NAME
BestModeIDA -- calculate the best ModeID with given parameters (V39)
BestModeID -- varargs stub for BestModeIDA()

SYNOPSIS
ID = BestModeIDA(TagItems)
d0 a0

ULONG BestModeIDA(struct TagItem *);

ID = BestModeID(Tag1, ...)

ULONG BestModeID(ULONG, ...);

FUNCTION
To determine the best ModeID to fit the parameters set in the TagList.

INPUTS

TagItems - A pointer to an array of TagItems.

TAGS

BIDTAG_DIPFMustHave (ULONG) - Mask of DIPF_ flags
(from DisplayInfo->PropertyFlags) that the returned ModeID
must have.
Default - NULL

BIDTAG_DIPFMustNotHave (ULONG) - Mask of DIPF_ flags that the
returned ModeID must not have.
Default - SPECIAL_FLAGS

BIDTAG_ViewPort (struct ViewPort *) - ViewPort for which a best-fit
ModeID is sought.
Default - NULL

BIDTAG_NominalWidth (UWORD),
BIDTAG_NominalHeight (UWORD) - together make the aspect ratio.
These values override the vp->DWidth and vp->DHeight values
in the given ViewPort.
Default - SourceID NominalDimensionInfo if BIDTAG_SourceID is
passed, or vp->DWidth and vp->DHeight if BIDTAG_ViewPort is
passed, or 640 x 200.

BIDTAG_DesiredWidth (UWORD),
BIDTAG_DesiredHeight (UWORD) - Used to distinguish between two
mode IDs with identical aspect ratios.
Default - same values as NominalWidth and NominalHeight.

BIDTAG_Depth (UBYTE) - minimum the returned ModeID must support.
Default - vp->RasInfo->BitMap->Depth if BIDTAG_ViewPort is
passed, else 1.

BIDTAG_MonitorID (ULONG) - returned ModeID must use this monitor.
Default - will not restrict the search to any particular monitor

BIDTAG_SourceID (ULONG) - Use this ModeID instead of a ViewPort.
If specified, the DIPFMustHave mask is made up of the
((DisplayInfo->PropertyFlags of this ID & SPECIAL_FLAGS) |
DIPFMustHave flags).
Default - VPMODEID(vp) if BIDTAG_ViewPort was passed, else the
DIPFMustHave and DIPFMustNotHave masks are left unchanged.

BIDTAG_RedBits (UBYTE),
BIDTAG_BlueBits (UBYTE),
BIDTAG_GreenBits (UBYTE) - Minimum bits per gun the resultant
ModeID must support.
Default - 4 bits per gun.

RESULTS

ID - ID of the best mode to use, or INVALID_ID if a match could
not be found.

NOTES

This function takes into account the Compatability of the Monitor
being matched to, and the source ViewPort or ModeID.

Incompatibility will cause a result of `INVALID_ID`.

`BIDTAG_NominalWidth`, `BIDTAG_NominalHeight`,
`BIDTAG_DesiredWidth`, `BIDTAG_DesiredHeight`, must all be non-0.

The comparisons are made against the `DimensionInfo->Nominal` values.
 ie, this will not return a best fit against overscan dimensions.

EXAMPLE

IFF Display Program with a HAM image, to be displayed in the same
 monitor type as the Workbench ViewPort.

```
ID = BestModeID(BIDTAG_NominalWidth, IFFImage->Width,
                BIDTAG_NominalHeight, IFFImage->Height,
                BIDTAG_Depth, IFFImage->Depth,
                BIDTAG_DIPFMustHave, DIPF_IS_HAM,
                BIDTAG_MonitorID, (GetVPMODEID(WbVP) & MONITOR_ID_MASK),
                TAG_END);
```

To make an interlace version of a ViewPort:

```
ID = BestModeID(BIDTAG_ViewPort, ThisViewPort,
                BIDTAG_MustHave, DIPF_IS_LACE,
                TAG_END);
```

SEE ALSO

<graphics/modeid.h> <graphics/displayinfo.h>

1.23 graphics.library/BitMapScale

NAME

`BitMapScale` -- Perform raster scaling on a bit map. (V36)

SYNOPSIS

```
BitMapScale(bitScaleArgs)
    A0
```

```
void BitMapScale(struct BitScaleArgs *);
```

FUNCTION

Scale a source bit map to a non-overlapping destination
 bit map.

INPUTS

`bitScaleArgs` - structure of parameters describing scale:

- `bsa_SrcX`, `bsa_SrcY` - origin of the source bits.
- `bsa_SrcWidth`, `bsa_SrcHeight` - number of bits to scale from in x
 and y.
- `bsa_DestX`, `bsa_DestY` - origin of the destination.
- `bsa_DestWidth`, `bsa_DestHeight` - resulting number of bits in x
 and y. NOTE: these values are set by this function.
- `bsa_XSrcFactor:bsa_XDestFactor` - equivalent to the ratio
`srcWidth:destWidth`, but not necessarily the same
 numbers. Each must be in the range 1..16383.
- `bsa_YSrcFactor:bsa_YDestFactor` - equivalent to the ratio

srcHeight:destHeight, but not necessarily the same numbers. Each must be in the range 1..16383.
 bsa_SrcBitMap - source of the bits to scale.
 bsa_DestBitMap - destination for the bits to scale. This had better be big enough!
 bsa_Flags - future scaling options. Set it to zero!
 bsa_XDDA, bsa_YDDA - for future use. Need not be set by user.
 bsa_Reserved1, bsa_Reserved2 - for future use. Need not be set.

RESULT

The destWidth, destHeight fields are set by this function as described above.

NOTES

- o This function may use the blitter.
- o Overlapping source and destination bit maps are not supported.
- o No check is made to ensure destBitMap is big enough: use ScalerDiv to calculate a destination dimension.

BUGS

- o This function does not use the HighRes Agnus 'Big Blit' facility. You should not use XSrcFactor == XDestFactor, where SrcWidth or DestWidth > 1024.
- o Also, the blitter is used when expanding in the Y direction. You should not expand in the Y direction if ((DestX & 0xf) + DestWidth) >= 1024 pixels. (Up to 1008 pixels is always safe).

SEE ALSO

ScalerDiv() graphics/scale.h

1.24 graphics.library/BltBitMap

NAME

BltBitMap -- Move a rectangular region of bits in a BitMap.

SYNOPSIS

```
planeCnt = BltBitMap(SrcBitMap, SrcX, SrcY, DstBitMap,
D0          A0          D0:16 D1:16 A1
          DstX, DstY, SizeX, SizeY, Minterm, Mask [, TempA])
D2:16 D3:16 D4:16 D5:16 D6:8   D7:8   [A2]
```

```
ULONG BltBitMap(struct BitMap *, WORD, WORD, struct BitMap *,
WORD, WORD, WORD, WORD, UBYTE, UBYTE, UWORD *);
```

FUNCTION

Perform non-destructive blits to move a rectangle from one area in a BitMap to another area, which can be on a different BitMap.

This blit is assumed to be friendly: no error conditions (e.g. a rectangle outside the BitMap bounds) are tested or reported.

INPUTS

SrcBitMap, DstBitMap - the BitMap(s) containing the rectangles

- the planes copied from the source to the destination are only those whose plane numbers are identical and less than the minimum Depth of either BitMap and whose Mask bit for that plane is non-zero.
- as a special case, if a plane pointer in the SrcBitMap is zero, it acts as a pointer to a plane of all zeros, and if the plane pointer is 0xffffffff, it acts as a pointer to a plane of all ones. (Note: new for V36)
- SrcBitMap and DstBitMap can be identical if they point to actual planes.

SrcX, SrcY - the x and y coordinates of the upper left corner of the source rectangle. Valid range is positive signed integer such that the raster word's offset 0..(32767-Size)

DstX, DstY - the x and y coordinates of the upper left corner of the destination for the rectangle. Valid range is as for Src.

SizeX, SizeY - the size of the rectangle to be moved. Valid range is (X: 1..976; Y: 1..1023 such that final raster word's offset is 0..32767)

Minterm - the logic function to apply to the rectangle when A is non-zero (i.e. within the rectangle). B is the source rectangle and C, D is the destination for the rectangle.

- \$0C0 is a vanilla copy
- \$030 inverts the source before the copy
- \$050 ignores the source and inverts the destination
- see the hardware reference manual for other combinations

Mask - the write mask to apply to this operation. Bits set indicate the corresponding planes (if not greater than the minimum plane count) are to participate in the operation. Typically this is set to 0xff.

TempA - If the copy overlaps exactly to the left or right (i.e. the scan line addresses overlap), and TempA is non-zero, it points to enough chip accessible memory to hold a line of A source for the blit (ie CHIP RAM). BltBitMap will allocate (and free) the needed TempA if none is provided and one is needed. Blit overlap is determined from the relation of the first non-masked planes in the source and destination bit maps.

RESULTS

planeCnt - the number of planes actually involved in the blit.

NOTES

- o This function may use the blitter.

SEE ALSO

ClipBlit() graphics/gfx.h hardware/blit.h

1.25 graphics.library/BltBitMapRastPort

NAME

BltBitMapRastPort -- Blit from source bitmap to destination rastport.

SYNOPSIS

```
error = BltBitMapRastPort
      (srcbm, srcx, srcy, destrp, destX, destY, sizeX, sizeY, minterm)
      D0      A0      D0      D1      A1      D2      D3      D4      D5      D6
```

BOOL BltBitMapRastPort

```
(struct BitMap *, WORD, WORD, struct RastPort *, WORD, WORD,
 WORD, WORD, UBYTE);
```

FUNCTION

Blits from source bitmap to position specified in destination rastport using minterm.

INPUTS

```
srcbm - a pointer to the source bitmap
srcx  - x offset into source bitmap
srcy  - y offset into source bitmap
destrp - a pointer to the destination rastport
destX  - x offset into dest rastport
destY  - y offset into dest rastport
sizeX  - width of blit in pixels
sizeY  - height of blit in rows
minterm - minterm to use for this blit
```

RESULT

TRUE

BUGS

SEE ALSO

BltMaskBitMapRastPort() graphics/gfx.h graphics/rastport.h

1.26 graphics.library/BltClear

NAME

BltClear - Clear a block of memory words to zero.

SYNOPSIS

```
BltClear( memBlock, bytecount, flags )
          a1          d0          d1
```

```
void BltClear( void *, ULONG, ULONG );
```

FUNCTION

For memory that is local and blitter accessible, the most efficient way to clear a range of memory locations is to use the system's most efficient data mover, the blitter. This command accepts the starting location and count and clears that block to zeros.

INPUTS

memBloc - pointer to local memory to be cleared
 memBlock is assumed to be even.
 flags - set bit 0 to force function to wait until
 the blit is done.
 set bit 1 to use row/bytesperrow.

bytecount - if (flags & 2) == 0 then
 even number of bytes to clear.
 else
 low 16 bits is taken as number of bytes
 per row and upper 16 bits taken as
 number of rows.

This function is somewhat hardware dependent. In the rows/bytesperrow mode (with the pre-ECS blitter) rows must be <= 1024. In bytecount mode multiple runs of the blitter may be used to clear all the memory.

Set bit 2 to use the upper 16 bits of the Flags as the data to fill memory with instead of 0 (V36).

RESULT

The block of memory is initialized.

BUGS

SEE ALSO

1.27 graphics.library/BltMaskBitMapRastPort

NAME

BltMaskBitMapRastPort -- blit from source bitmap to destination rastport with masking of source image.

SYNOPSIS

```
BltMaskBitMapRastPort
    (srcbm, srcx, srcy, destrp, destX, destY, sizeX, sizeY,
     A0      D0      D1      A1      D2      D3      D4      D5
     minterm, bltmask)
     D6      A2
```

```
void BltMaskBitMapRastPort
    (struct BitMap *, WORD, WORD, struct RastPort *, WORD, WORD,
     WORD, WORD, UBYTE, APTR);
```

FUNCTION

Blits from source bitmap to position specified in destination rastport using bltmask to determine where source overlays destination, and minterm to determine whether to copy the source image "as is" or to "invert" the sense of the source image when copying. In either case, blit only occurs where the mask is non-zero.

INPUTS

srcbm - a pointer to the source bitmap
 srcx - x offset into source bitmap

srcy - y offset into source bitmap
 destrp - a pointer to the destination rastport
 destX - x offset into dest rastport
 destY - y offset into dest rastport
 sizeX - width of blit in pixels
 sizeY - height of blit in rows
 minterm - either (ABC|ABNC|ANBC) if copy source and blit thru mask
 or (ANBC) if invert source and blit thru mask
 bltmask - pointer to the single bit-plane mask, which must be the
 same size and dimensions as the planes of the
 source bitmap.

RESULT

BUGS

SEE ALSO

BltBitMapRastPort() graphics/gfx.h graphics/rastport.h

1.28 graphics.library/BltPattern

NAME

BltPattern -- Using standard drawing rules for areafill,
 blit through a mask.

SYNOPSIS

```

    BltPattern(rp, mask, xl, yl, maxx, maxy, bytecnt)
               a1,  a0  d0  d1  d2  d3  d4
  
```

void BltPattern

```

    (struct RastPort *, void *, SHORT, SHORT, SHORT, SHORT, SHORT);
  
```

FUNCTION

Blit using drawmode, areafill pattern, and mask
 at position rectangle (xl,yl) (maxx,maxy).

INPUTS

rp - points to the destination RastPort for the blit.
 mask - points to 2 dimensional mask if needed
 if mask == NULL then use a rectangle.
 xl,yl - coordinates of upper left of rectangular region in RastPort
 maxx,maxy - points to lower right of rectangular region in RastPort
 bytecnt - BytesPerRow for mask

RESULT

SEE ALSO

AreaEnd

1.29 graphics.library/BltTemplate

NAME

BltTemplate -- Cookie cut a shape in a rectangle to the RastPort.

SYNOPSIS

```
BltTemplate(SrcTemplate, SrcX, SrcMod, rp,
            A0          D0:16 D1:16 A1
            DstX, DstY, SizeX, SizeY)
            D2:16 D3:16 D4:16 D5:16
```

```
void BltTemplate(UWORD *, WORD, WORD, struct RastPort *,
                WORD, WORD, WORD, WORD);
```

FUNCTION

This function draws the image in the template into the RastPort in the current color and drawing mode at the specified position. The template is assumed not to overlap the destination.

If the template falls outside the RastPort boundary, it is truncated to that boundary.

Note: the SrcTemplate pointer should point to the "nearest" word (rounded down) of the template mask. Fine alignment of the mask is achieved by setting the SrcX bit offset within the range of 0 to 15 decimal.

INPUTS

```
SrcTemplate - pointer to the first (nearest) word of the template mask.
SrcX        - x bit offset into the template mask (range 0..15).
SrcMod      - number of bytes per row in template mask.
rp          - pointer to destination RastPort.
DstX, DstY  - x and y coordinates of the upper left
              corner of the destination for the blit.
SizeX, SizeY - size of the rectangle to be used as the
              template.
```

NOTES

- o This function may use the blitter.

SEE ALSO

BltBitMap() graphics/rastport.h

1.30 graphics.library/CalcIVG

NAME

CalcIVG -- Calculate the number of blank lines above a ViewPort (V39)

SYNOPSIS

```
count = CalcIVG(View, ViewPort)
d0.w          a0      a1
```

```
UWORD CalcIVG(struct View *, struct ViewPort *);
```

FUNCTION

To calculate the maximum number of blank lines above a viewport needed to

load all the copper instructions, after accounting for the viewport bandwidth and size.

INPUTS

View - pointer to the View
 ViewPort - pointer to the ViewPort you are interested in.

RESULT

count - the number of ViewPort resolution scan lines needed to execute all the copper instructions for ViewPort, or 0 if any error.

NOTES

The number of copper instructions comes from the vp->vp_DspIns list. Although there may be other copper instructions in the final list (from UCopIns, SprIns and ClrIns) they are currently ignored for this function. This also means that if the ViewPort has never been made (for example, the ViewPort of an intuition screen was opened behind) then vp->vp_DspIns is NULL.

Although CalcIVG() returns the true number of lines needed by the copper, intuition still maintains an inter-screen gap of 3 non-laced lines (6 interlaced). Therefore, for intuition screens use:
 MAX(CalcIVG(v, vp), (islaced ? 6 : 3))

SEE ALSO

GfxNew() VideoControl() graphics/view.h

1.31 graphics.library/CBump

NAME

CBump - increment user copper list pointer (bump to next position in list).

SYNOPSIS

```
CBump( c )
      al
```

```
void CBump( struct UCopList * );
```

FUNCTION

Increment pointer to space for next instruction in user copper list.

INPUTS

c - pointer to UCopList structure

RESULTS

User copper list pointer is incremented to next position. Pointer is repositioned to next user copperlist instruction block if the current block is full.

Note: CBump is usually invoked for the programmer as part of the macro definitions CWAIT or CMOVE.

BUGS

SEE ALSO
CINIT CWAIT CMOVE CEND graphics/copper.h

1.32 graphics.library/CEND

NAME
CEND -- Terminate user copper list.

SYNOPSIS
CEND(c)

struct UCopList *c;

FUNCTION
Add instruction to terminate user copper list.

INPUTS
c - pointer to UCopList structure

RESULTS
This is actually a macro that calls the macro CWAIT(c,10000,255)
10000 is a magical number that the graphics.library uses.
I hope display technology doesn't catch up too fast!

BUGS

SEE ALSO
CINIT CWAIT CMOVE graphics/copper.h

1.33 graphics.library/ChangeExtSpriteA

NAME
ChangeExtSpriteA -- Change the sprite image pointer. (V39)

SYNOPSIS
ChangeExtSpriteA(vp, oldsprite, newsprite, tags)
 a0 a1 a2 a3

success=ChangeExtSpriteA(struct ViewPort *, struct ExtSprite *,
 struct ExtSprite *, struct TagList *);

success=ChangeExtSprite(vp,old_sp,new_sp,tag,....);

FUNCTION
Attempt to change which sprite is displayed for a given
sprite engine.

INPUTS
vp - pointer to ViewPort structure that this sprite is
relative to, or 0 if relative only top of View
oldsprite - pointer the old ExtSprite structure

newsprite - pointer to the new ExtSprite structure.

RESULTS

success - 0 if there was an error.

BUGS

SEE ALSO

FreeSprite() ChangeSprite() MoveSprite() AllocSpriteDataA()
graphics/sprite.h

1.34 graphics.library/ChangeSprite

NAME

ChangeSprite -- Change the sprite image pointer.

SYNOPSIS

```
ChangeSprite( vp, s, newdata)
             a0 a1 a2
```

```
void ChangeSprite(struct ViewPort *, struct SimpleSprite *, void * )
```

FUNCTION

The sprite image is changed to use the data starting at newdata

INPUTS

vp - pointer to ViewPort structure that this sprite is
relative to, or 0 if relative only top of View
s - pointer to SimpleSprite structure
newdata - pointer to data structure of the following form.

```
struct spriteimage
{
    UWORD    posctl[2]; /* used by simple sprite machine*/
    UWORD    data[height][2]; /* actual sprite image */
    UWORD    reserved[2]; /* initialized to */
                        /* 0x0,0x0 */
};
```

The programmer must initialize reserved[2]. Spriteimage must be in CHIP memory. The height subfield of the SimpleSprite structure must be set to reflect the height of the new spriteimage BEFORE calling ChangeSprite(). The programmer may allocate two sprites to handle a single attached sprite. After GetSprite(), ChangeSprite(), the programmer can set the SPRITE_ATTACHED bit in posctl[1] of the odd numbered sprite.

If you need more than 8 sprites, look up VSprites in the graphics documentation.

RESULTS

BUGS

SEE ALSO

FreeSprite() ChangeSprite() MoveSprite() AddVSprite() graphics/sprite.h

1.35 graphics.library/ChangeVPBitMap

NAME

ChangeVPBitMap -- change display memory address for multi-buffered animation (V39)

SYNOPSIS

```
ChangeVPBitMap(vp,bm,db)
a0 a1 a2
```

```
void ChangeVPBitMap(struct ViewPort *, struct BitMap *, struct DBufInfo *);
```

FUNCTION

Changes the area of display memory which will be displayed in a viewport. This can be used to implement double (or triple) buffering, a method of achieving smooth animation.

INPUTS

```
vp = a pointer to a viewport
bm = a pointer to a BitMap structure. This BitMap structure must be
    of the same layout as the one attached to the viewport (same
    depth, alignment, and BytesPerRow).
db = A pointer to a DBufInfo.
```

BUGS

NOTES

This will set the vp->RasInfo->BitMap field to the bm pointer which is passed.

When using the synchronization features, you MUST carefully insure that all messages have been replied to before calling FreeDBufInfo or calling ChangeVPBitMap with the same DBufInfo.

SEE ALSO

AllocDBufInfo() AllocBitMap()

1.36 graphics.library/CINIT

NAME

CINIT -- Initialize user copperlist to accept intermediate user copper instructions.

SYNOPSIS

```
cl = CINIT( ucl , n )
```

```
cl = UCopperListInit( ucl , n )
a0      d0
```

```
struct CopList *UCopperListInit( struct UCopList *, UWORD );
```

FUNCTION

Allocates and/or initialize copperlist structures/buffers

internal to a UCopList structure.

This is a macro that calls UCopListInit. You must pass a (non-initialized) UCopList to CINIT (CINIT will NOT allocate a new UCopList if ucl==0). If (ucl != 0) it will initialize the intermediate data buffers internal to a UCopList.

The maximum number of intermediate copper list instructions that these internal CopList data buffers contain is specified as the parameter n.

INPUTS

ucl - pointer to UCopList structure

n - number of instructions buffer must be able to hold

RESULTS

cl- a pointer to a buffer which will accept n intermediate copper instructions.

NOTE: this is NOT a UCopList pointer, rather a pointer to the UCopList's->FirstCopList sub-structure.

BUGS

CINIT will not actually allocate a new UCopList if ucl==0. Instead you must allocate a block MEMF_PUBLIC|MEMF_CLEAR, the sizeof(struct UCopList) and pass it to this function.

The system's FreeVPortCopLists function will take care of deallocating it if they are called.

Prior to release V36 the CINIT macro had { } braces surrounding the definition, preventing the proper return of the result value. These braces have been removed for the V36 include definitions.

SEE ALSO

CINIT CMOVE CEND graphics/copper.h

1.37 graphics.library/ClearEOL

NAME

ClearEOL -- Clear from current position to end of line.

SYNOPSIS

```
ClearEOL(rp)
    Al
```

```
void ClearEOL(struct RastPort *);
```

FUNCTION

Clear a rectangular swath from the current position to the right edge of the rastPort. The height of the swath is taken from that of the current text font, and the vertical positioning of the swath is adjusted by the text baseline, such that text output at this position would lie wholly on this newly cleared area.

Clearing consists of setting the color of the swath to zero, or, if the DrawMode is 2, to the BgPen.

INPUTS

rp - pointer to RastPort structure

RESULT

NOTES

- o This function may use the blitter.

SEE ALSO

Text() ClearScreen() SetRast()
graphics/text.h graphics/rastport.h

1.38 graphics.library/ClearRectRegion

NAME

ClearRectRegion -- Perform 2d CLEAR operation of rectangle with region, leaving result in region.

SYNOPSIS

```
status = ClearRectRegion(region, rectangle)
d0      a0      a1
```

```
BOOL ClearRectRegion(struct Region *, struct Rectangle * );
```

FUNCTION

Clip away any portion of the region that exists inside of the rectangle. Leave the result in region.

INPUTS

region - pointer to Region structure
rectangle - pointer to Rectangle structure

RESULTS

status - return TRUE if successful operation
return FALSE if ran out of memory

BUGS

SEE ALSO

AndRectRegion() graphics/regions.h

1.39 graphics.library/ClearRegion

NAME

ClearRegion -- Remove all rectangles from region.

SYNOPSIS

```
ClearRegion(region)
a0
```

```
void ClearRegion( struct Region * );
```

FUNCTION

Clip away all rectangles in the region leaving nothing.

INPUTS

region - pointer to Region structure

BUGS

SEE ALSO

NewRegion() graphics/regions.h

1.40 graphics.library/ClearScreen

NAME

ClearScreen -- Clear from current position to end of RastPort.

SYNOPSIS

```
ClearScreen(rp)
    A1
```

```
void ClearScreen(struct RastPort *);
```

FUNCTION

Clear a rectangular swath from the current position to the right edge of the rastPort with ClearEOL, then clear the rest of the screen from just beneath the swath to the bottom of the rastPort.

Clearing consists of setting the color of the swath to zero, or, if the DrawMode is 2, to the BgPen.

INPUTS

rp - pointer to RastPort structure

NOTES

- o This function may use the blitter.

SEE ALSO

ClearEOL() Text() SetRast()
graphics/text.h graphics/rastport.h

1.41 graphics.library/ClipBlit

NAME

ClipBlit -- Calls BltBitMap() after accounting for windows

SYNOPSIS

```
ClipBlit(Src, SrcX, SrcY, Dest, DestX, DestY, XSize, YSize, Minterm)
    A0    D0    D1    A1    D2    D3    D4    D5    D6
```



```
void ClipBlit
    (struct RastPort *, WORD, WORD, struct RastPort *, WORD, WORD,
     WORD, WORD, UBYTE);
```

FUNCTION

Performs the same function as `BltBitMap()`, except that it takes into account the Layers and ClipRects of the layer library, all of which are (and should be) transparent to you. So, whereas `BltBitMap()` requires pointers to BitMaps, `ClipBlit` requires pointers to the RastPorts that contain the Bitmaps, Layers, etcetera.

If you are going to blit blocks of data around via the RastPort of your Intuition Window, you must call this routine (rather than `BltBitMap()`).

Either the Src RastPort, the Dest RastPort, both, or neither, can have Layers. This routine takes care of all cases.

See `BltBitMap()` for a thorough explanation.

INPUTS

Src = pointer to the RastPort of the source for your blit
 SrcX, SrcY = the topleft offset into Src for your data
 Dest = pointer to the RastPort to receive the blitted data
 DestX, DestY = the topleft offset into the destination RastPort
 XSize = the width of the blit (must be at least 1)
 YSize = the height of the blit (must be at least 1)
 Minterm = the boolean blitter function, where SRCB is associated with the Src RastPort and SRCC goes to the Dest RastPort

RESULT

BUGS

SEE ALSO

`BltBitMap()`;

1.42 graphics.library/CloseFont

NAME

`CloseFont` -- Release a pointer to a system font.

SYNOPSIS

```
CloseFont(font)
    A1
```

```
void CloseFont(struct TextFont *);
```

FUNCTION

This function indicates that the font specified is no longer in use. It is used to close a font opened by `OpenFont`, so that fonts that are no longer in use do not consume system resources.

INPUTS

font - a font pointer as returned by `OpenFont()` or `OpenDiskFont()`

RESULT

BUGS

SEE ALSO

OpenFont() diskfont.library/OpenDiskFont graphics/text.h

1.43 graphics.library/CloseMonitor

NAME

CloseMonitor -- close a MonitorSpec (V36)

SYNOPSIS

```
error = CloseMonitor( monitor_spec )
d0                                a0
```

```
LONG CloseMonitor( struct MonitorSpec * );
```

FUNCTION

Relinquish access to a MonitorSpec.

INPUTS

monitor_spec - a pointer to a MonitorSpec opened via OpenMonitor(), or NULL.

RESULTS

error - FALSE if MonitorSpec closed uneventfully.
 TRUE if MonitorSpec could not be closed.

BUGS

SEE ALSO

OpenMonitor()

1.44 graphics.library/CMOVE

NAME

CMOVE -- append copper move instruction to user copper list.

SYNOPSIS

```
CMOVE( c , a , v )
```

```
CMove( c , a , v )
```

```
      a1 d0 d1
```

```
CBump( c )
```

```
      a1
```

```
void CMove( struct UCopList *, void *, WORD );
```

FUNCTION

Add instruction to move value v to hardware register a.

INPUTS
 c - pointer to UCopList structure
 a - hardware register
 v - 16 bit value to be written

RESULTS
 This is actually a macro that calls CMove(c,&a,v) and then calls CBump(c) to bump the local pointer to the next instruction. Watch out for macro side affects.

BUGS

SEE ALSO
 CINIT CWAIT CEND graphics/copper.h

1.45 graphics.library/CoerceMode

NAME
 CoerceMode -- calculate ViewPort mode coercion (V39)

SYNOPSIS
 ID = CoerceMode(RealViewPort, MonitorID, Flags);
 d0 a0 d0 d1

ULONG CoerceMode(struct ViewPort *, ULONG, ULONG);

FUNCTION
 To determine the best mode in the MonitorID to coerce RealViewPort to, given the restrictions set in Flags.

INPUTS
 RealViewPort - ViewPort to coerce
 MonitorID - Montor number to coerce to (ie a mode masked with MONITOR_ID_MASK).
 Flags - PRESERVE_COLORS - keep the number of bitplanes in the ViewPort.
 - AVOID_FLICKER - do not coerce to an interlace mode

RESULTS
 ID - ID of the best mode to coerce to, or INVALID_ID if could not coerce (see NOTES).

NOTES
 This function takes into account the compatibility of the Monitor being coerced to, and the ViewPort that is being coerced. Incompatibilities will cause a result of INVALID_ID.

EXAMPLE
 newmode = CoerceMode(vp, VGA_MONITOR_ID, PRESERVE_COLORS);

SEE ALSO
 <graphics/coerce.h> <graphics/displayinfo.h>

1.46 graphics.library/CopySBitMap

NAME

CopySBitMap -- Synchronize Layer window with contents of Super BitMap

SYNOPSIS

```
CopySBitMap( layer )
            a0
```

```
void CopySBitMap(struct Layer *);
```

FUNCTION

This is the inverse of SyncSBitMap.

Copy all bits from SuperBitMap to Layer bounds. This is used for those functions that do not want to deal with the ClipRect structures but do want to be able to work with a SuperBitMap Layer.

INPUTS

layer - pointer to a SuperBitMap Layer
The Layer must already be locked by the caller.

BUGS

SEE ALSO

LockLayerRom() SyncSBitMap()

1.47 graphics.library/CWAIT

NAME

CWAIT -- Append copper wait instruction to user copper list.

SYNOPSIS

```
CWAIT( c , v , h )
```

```
CWait( c , v , h )
      a1 d0 d1
```

```
CBump( c )
      a1
```

```
void CWait( struct UCopList *, WORD, WORD)
```

FUNCTION

Add instruction to wait for vertical beam position v and horizontal position h to this intermediate copper list.

INPUTS

c - pointer to UCopList structure
v - vertical beam position (relative to top of viewport)
h - horizontal beam position

RESULTS

this is actually a macro that calls CWait(c,v,h)

and then calls CBump(c) to bump the local pointer to the next instruction.

BUGS

User waiting for horizontal values of greater than 222 decimal is illegal.

SEE ALSO

CINIT CMOVE CEND graphics/copper.h

1.48 graphics.library/DisownBlitter

NAME

DisownBlitter -- return blitter to free state.

SYNOPSIS

DisownBlitter()

void DisownBlitter(void);

FUNCTION

Free blitter up for use by other blitter users.

INPUTS

RETURNS

SEE ALSO

OwnBlitter()

1.49 graphics.library/DisposeRegion

NAME

DisposeRegion -- Return all space for this region to free memory pool.

SYNOPSIS

DisposeRegion(region)
a0

void DisposeRegion(struct Region *);

FUNCTION

Free all RegionRectangles for this Region then free the Region itself.

INPUTS

region - pointer to Region structure

BUGS

SEE ALSO
NewRegion() graphics/regions.h

1.50 graphics.library/DoCollision

NAME
DoCollision -- Test every gel in gel list for collisions.

SYNOPSIS
DoCollision(rp)
 Al

void DoCollision(struct RastPort *);

FUNCTION
Tests each gel in gel list for boundary and gel-to-gel collisions. On detecting one of these collisions, the appropriate collision-handling routine is called. See the documentation for a thorough description of which collision routine is called. This routine expects to find the gel list correctly sorted in Y,X order. The system routine SortGList performs this function for the user.

INPUTS
rp = pointer to a RastPort

RESULT

BUGS

SEE ALSO
InitGels() SortGList() graphics/gels.h graphics/gels.h

1.51 graphics.library/Draw

NAME
Draw -- Draw a line between the current pen position and the new x,y position.

SYNOPSIS
Draw(rp, x, y)
 al d0:16 d1:16

void Draw(struct RastPort *, SHORT, SHORT);

FUNCTION
Draw a line from the current pen position to (x,y).

INPUTS
rp - pointer to the destination RastPort
x,y - coordinates of where in the RastPort to end the line.

BUGS

SEE ALSO

Move() graphics/rastport.h

1.52 graphics.library/DrawEllipse

NAME

DrawEllipse -- Draw an ellipse centered at cx,cy with vertical and horizontal radii of a,b respectively.

SYNOPSIS

```
DrawEllipse( rp, cx, cy, a, b )
            a1 d0 d1 d2 d3
```

```
void DrawEllipse( struct RastPort *, SHORT, SHORT, SHORT, SHORT);
```

FUNCTION

Creates an elliptical outline within the rectangular region specified by the parameters, using the current foreground pen color.

INPUTS

rp - pointer to the RastPort into which the ellipse will be drawn.
cx - x coordinate of the centerpoint relative to the rastport.
cy - y coordinate of the centerpoint relative to the rastport.
a - the horizontal radius of the ellipse (note: a must be > 0)
b - the vertical radius of the ellipse (note: b must be > 0)

BUGS

NOTES

this routine does not clip the ellipse to a non-layered rastport.

SEE ALSO

DrawCircle(), graphics/rastport.h

1.53 graphics.library/DrawGLList

NAME

DrawGLList -- Process the gel list, queueing VSprites, drawing Bobs.

SYNOPSIS

```
DrawGLList(rp, vp)
            A1 A0
```

```
void DrawGLList(struct RastPort *, struct ViewPort *);
```

FUNCTION

Performs one pass of the current gel list.

- If nextLine and lastColor are defined, these are initialized for each gel.

- If it's a VSprite, build it into the copper list.
- If it's a Bob, draw it into the current raster.
- Copy the save values into the "old" variables, double-buffering if required.

INPUTS

rp = pointer to the RastPort where Bobs will be drawn
vp = pointer to the ViewPort for which VSprites will be created

RESULT

BUGS

MUSTDRAW isn't implemented yet.

SEE ALSO

InitGels() graphics/gels.h graphics/rastport.h graphics/view.h

1.54 graphics.library/EraseRect

NAME

EraseRect -- Fill a defined rectangular area using the current BackFill hook. (V36)

SYNOPSIS

```
EraseRect( rp, xmin, ymin, xmax, ymax)
          a1 d0:16 d1:16 d2:16 d3:16
```

```
void EraseRect(struct RastPort *, SHORT, SHORT, SHORT, SHORT);
```

FUNCTION

Fill the rectangular region specified by the parameters with the BackFill hook. If non-layered, the rectangular region specified by the parameters is cleared. If layered the Layer->BackFill Hook is used.

INPUTS

rp - pointer to a RastPort structure
xmin - x coordinate of the upper left corner of the region to fill.
ymin - y coordinate of the upper left corner of the region to fill.
xmax - x coordinate of the lower right corner of the region to fill.
ymax - y coordinate of the lower right corner of the region to fill.

BUGS

NOTES

The following relation MUST be true:
(xmax >= xmin) and (ymax >= ymin)

SEE ALSO

graphics/rastport.h graphics/clip.h

1.55 graphics.library/ExtendFont

NAME

ExtendFont -- ensure tf_Extension has been built for a font (V36)

SYNOPSIS

```
success = ExtendFont(font, fontTags)
```

```
D0                A0      A1
```

```
ULONG ExtendFont(struct TextFont *, struct TagItem *);
```

```
success = ExtendFontTags(font, Tag1, ...) (V39)
```

```
ULONG ExtendFontTags(struct TextFont *, ULONG, ...);
```

FUNCTION

To extend a TextFont structure.

INPUTS

font - The font to extend.

fontTags - An optional taglist. If NULL, then a default is used.
Currently, the only tag defined is TA_DeviceDPI.

RESULT

success - 1 if the TextFont was properly extended, else 0.

NOTES

The varargs stub was missing from amiga.lib until V39.

SEE ALSO

graphics/text.h

1.56 graphics.library/FindColor

NAME

FindColor -- Find the closest matching color in a colormap. (V39)

SYNOPSIS

```
color = FindColor(  cm,  R,   G,   B , maxpen)
                  a3   d1   d2   d3   d4
```

```
ULONG FindColor( struct ColorMap *, ULONG, ULONG, ULONG, LONG);
```

INPUTS

cm = colormap

R = red level (32 bit left justified fraction)

G = green level (32 bit left justified fraction)

B = blue level (32 bit left justified fraction)

MaxPen = the maximum entry in the color table to search. A value of
-1 will limit the search to only those pens which could be
rendered in (for instance, it will not examine the sprite
colors on a 4 color screen).

RESULT

The system will attempt to find the color in the passed colormap

which most closely matches the RGB values passed. No new pens will be allocated, and you should not `ReleasePen()` the returned pen. This function is not sensitive to palette sharing issues. Its intended use is for:

- (a) programs which pop up on public screens when those screens are not using palette sharing. You might use this function as a fallback when `ObtainBestPenA()` says that there are no sharable pens.
- (b) Internal color matching by an application which is either running on a non-public screen, or which wants to match colors to an internal color table which may not be associated with any displayed screen.

BUGS

NOTES

In order to use the `MaxPen=-1` feature, you must have initialized palette sharing via `AttachPalExtra()` (all intuition screens do this). Otherwise, `MaxPen=-1` will search all colors in the colormap.

SEE ALSO

`ObtainBestPenA()` `GetColorMap()` `ObtainPen()` `ReleasePen()`

1.57 graphics.library/FindDisplayInfo

NAME

`FindDisplayInfo` -- search for a record identified by a specific key (V36)

SYNOPSIS

```
handle = FindDisplayInfo(ID)
D0                                     D0
```

```
DisplayInfoHandle FindDisplayInfo(ULONG);
```

FUNCTION

Given a 32-bit Mode Key, return a handle to a valid `DisplayInfoRecord` found in the graphics database. Using this handle, you can obtain information about this Mode, including its default dimensions, properties, and whether it is currently available for use.

INPUTS

ID - unsigned long identifier

RESULT

handle - handle to a `displayinfo` Record with that key
or NULL if no match.

BUGS

SEE ALSO

`graphics/displayinfo.h`

1.58 graphics.library/Flood

NAME

Flood -- Flood rastport like areafill.

SYNOPSIS

```
error = Flood( rp, mode, x, y)
           d0          a1    d2  d0  d1
```

```
BOOL Flood(struct RastPort *, ULONG, SHORT, SHORT);
```

FUNCTION

Search the BitMap starting at (x,y).

Fill all adjacent pixels if they are:

Mode 0: not the same color as AOLPen

Mode 1: the same color as the pixel at (x,y)

When actually doing the fill use the modes that apply to standard areafill routine such as drawmodes and patterns.

INPUTS

rp - pointer to RastPort

(x,y) - coordinate in BitMap to start the flood fill at.

mode - 0 fill all adjacent pixels searching for border.

1 fill all adjacent pixels that have same pen number as the one at (x,y).

NOTES

In order to use Flood, the destination RastPort must have a valid TmpRas raster whose size is as large as that of the RastPort.

SEE ALSO

AreaEnd() InitTmpRas() graphics/rastport.h

1.59 graphics.library/FontExtent

NAME

FontExtent -- get the font attributes of the current font (V36)

SYNOPSIS

```
FontExtent(font, fontExtent)
           A0      A1
```

```
void FontExtent(struct TextFont *, struct TextExtent *);
```

FUNCTION

This function fills the text extent structure with a bounding (i.e. maximum) extent for the characters in the specified font.

INPUTS

font - the TextFont from which the font metrics are extracted.

fontExtent - the TextExtent structure to be filled.

RESULT
fontExtent is filled.

NOTES
The TextFont, not the RastPort, is specified -- unlike TextExtent(), effect of algorithmic enhancements is not included, nor does te_Width include any effect of rp_TxSpacing. The returned te_Width will be negative only when FPF_REVPATH is set in the tf_Flags of the font -- the effect of left-moving characters is ignored for the width of a normal font, and the effect of right-moving characters is ignored if a REVPATH font. These characters will, however, be reflected in the bounding extent.

SEE ALSO
TextExtent() graphics/text.h

1.60 graphics.library/FreeBitMap

NAME
FreeBitMap -- free a bitmap created by AllocBitMap (V39)

SYNOPSIS
FreeBitMap(bm)
 a0

VOID FreeBitMap(struct BitMap *)

FUNCTION
Frees bitmap and all associated bitplanes

INPUTS
bm = A pointer to a BitMap structure. Passing a NULL-pointer (meaning "do nothing") is OK.

BUGS

NOTES
Be careful to insure that any rendering done to the bitmap has completed (by calling WaitBlit()) before you call this function.

SEE ALSO
AllocBitMap()

1.61 graphics.library/FreeColorMap

NAME
FreeColorMap -- Free the ColorMap structure and return memory to free memory pool.

SYNOPSIS
FreeColorMap(colormap)

a0

```
void FreeColorMap(struct ColorMap *);
```

FUNCTION

Return the memory to the free memory pool that was allocated with GetColorMap.

INPUTS

colormap - pointer to ColorMap allocated with GetColorMap.

Passing a NULL pointer (meaning "do nothing") is acceptable (V39).

RESULT

The space is made available for others to use.

BUGS

SEE ALSO

SetRGB4() GetColorMap() graphics/view.h

1.62 graphics.library/FreeCopList

NAME

FreeCopList -- deallocate intermediate copper list

SYNOPSIS

```
FreeCopList(coplist)
a0
```

```
void FreeCopList( struct CopList *);
```

FUNCTION

Deallocate all memory associated with this copper list.

INPUTS

coplist - pointer to structure CopList

RESULTS

memory returned to memory manager

BUGS

SEE ALSO

graphics/copper.h

1.63 graphics.library/FreeCprList

NAME

FreeCprList -- deallocate hardware copper list

SYNOPSIS

```
FreeCprList(cprlist)
a0
```

```
void FreeCprList(struct cprlist *);
```

FUNCTION

return cprlist to free memory pool

INPUTS

cprlist - pointer to cprlist structure

RESULTS

memory returned and made available to other tasks

BUGS

SEE ALSO

graphics/copper.h

1.64 graphics.library/FreeDBufInfo

NAME

FreeDBufInfo -- free information for multi-buffered animation (V39)

SYNOPSIS

```
FreeDBufInfo(db)
a1
```

```
void FreeDBufInfo(struct DBufInfo *)
```

FUNCTION

Frees a structure obtained from AllocDBufInfo

INPUTS

db = A pointer to a DBufInfo.

BUGS

NOTES

FreeDBufInfo(NULL) is a no-op.

SEE ALSO

AllocDBufInfo() ChangeVPBitMap()

1.65 graphics.library/FreeGBuffers

NAME

FreeGBuffers -- Deallocate memory obtained by GetGBuffers.

SYNOPSIS

```
FreeGBuffers(anOb, rp, db)
```

A0 A1 D0

```
void FreeGBuffers(struct AnimOb *, struct RastPort *, BOOL);
```

FUNCTION

For each sequence of each component of the AnimOb, deallocate memory for:

```
    SaveBuffer
    BorderLine
    CollMask and ImageShadow (point to same buffer)
    if db is set (user had used double-buffering) deallocate:
        DBufPacket
        BufBuffer
```

INPUTS

```
anOb = pointer to the AnimOb structure
rp   = pointer to the current RastPort
db   = double-buffer indicator (set TRUE for double-buffering)
```

RESULT

BUGS

SEE ALSO

GetGBuffers() graphics/gels.h graphics/rastport.h

1.66 graphics.library/FreeRaster

NAME

FreeRaster -- Release an allocated area to the system free memory pool

.

SYNOPSIS

```
FreeRaster( p, width, height)
a0    d0:16   d1:16
```

```
void FreeRaster( PLANEPTR, USHORT, USHORT);
```

FUNCTION

Return the memory associated with this PLANEPTR of size width and height to the MEMF_CHIP memory pool.

INPUTS

```
p = a pointer to a memory space returned as a
    result of a call to AllocRaster.
```

width - the width in bits of the bitplane.

height - number of rows in bitplane.

BUGS

NOTES

Width and height should be the same values with which you called AllocRaster in the first place.

SEE ALSO
AllocRaster() graphics/gfx.h

1.67 graphics.library/FreeSprite

NAME
FreeSprite -- Return sprite for use by others and virtual
sprite machine.

SYNOPSIS
FreeSprite(pick)
 d0

void FreeSprite(WORD);

FUNCTION
Mark sprite as available for others to use.
These sprite routines are provided to ease sharing of sprite
hardware and to handle simple cases of sprite usage and
movement. It is assumed the programs that use these routines
do want to be good citizens in their hearts. ie: they will
not FreeSprite unless they actually own the sprite.
The Virtual Sprite machine may ignore the simple sprite machine.

INPUTS
pick - number in range of 0-7

RESULTS
sprite made available for subsequent callers of GetSprite
as well as use by Virtual Sprite Machine.

BUGS

SEE ALSO
GetSprite() ChangeSprite() MoveSprite() graphics/sprite.h

1.68 graphics.library/FreeSpriteData

NAME
FreeSpriteData -- free sprite data allocated by AllocSpriteData() (V39)

SYNOPSIS
FreeSpriteData(extsp)
 a2

void FreeSpriteData(struct ExtSprite *);

FUNCTION

INPUTS

extsp - The extended sprite structure to be freed. Passing NULL is a NO-OP.

SEE ALSO

FreeSpriteData() FreeSprite() ChangeSprite() MoveSprite() GetExtSprite()
AllocBitMap() graphics/sprite.h

1.69 graphics.library/FreeVPortCopLists

NAME

FreeVPortCopLists -- deallocate all intermediate copper lists and their headers from a viewport

SYNOPSIS

```
FreeVPortCopLists(vp)
                   a0
```

```
void FreeVPortCopLists(struct ViewPort *);
```

FUNCTION

Search display, color, sprite, and user copper lists and call FreeMem() to deallocate them from memory

INPUTS

vp - pointer to ViewPort structure

RESULTS

The memory allocated to the various copper lists will be returned to the system's free memory pool, and the following fields in the viewport structure will be set to NULL:

DspIns, Sprins, ClrIns, UCopIns

BUGS

none known

SEE ALSO

graphics/view.h

1.70 graphics.library/GetAPen

NAME

GetAPen -- Get the A Pen value for a RastPort (V39).

SYNOPSIS

```
pen = GetAPen ( rp )
d0   a0
```

```
ULONG GetAPen(struct RastPort *)
```

FUNCTION

Return the current value of the A pen for the rastport. This function should be used instead of peeking the structure directly, because future graphics devices may store it differently, for instance, using more bits.

INPUTS

rp = a pointer to a valid RastPort structure.

BUGS

NOTES

SEE ALSO

SetAPen() graphics/gfx.h

1.71 graphics.library/GetBitMapAttr

NAME

GetBitMapAttr -- Returns information about a bitmap (V39)

SYNOPSIS

```
value=GetBitMapAttr(bitmap,attribute_number);
    d0                      a0          d1
```

```
ULONG GetBitMapAttr(struct BitMap *,ULONG);
```

FUNCTION

Determines information about a bitmap. This function should be used instead of reading the bitmap structure fields directly. This will provide future compatibility.

INPUTS

bm = A pointer to a BitMap structure.

attribute_number = A number telling graphics which attribute of the bitmap should be returned:

```
BMA_HEIGHT returns the height in pixels
BMA_WIDTH  returns the width in pixels.
BMA_DEPTH  returns the depth. This is the number of
            bits which are required to store the information
            for one pixel in the bitmap.
BMA_FLAGS  returns a longword bitfield describing
            various attributes which the bitmap may have.
            Currently defined flags are BMF_DISPLAYABLE,
            BMF_INTERLEAVED (see AllocBitMap()). The flag
            BMF_STANDARD returns will be set if the
            bitmap is represented as planar data in Amiga
            Chip RAM.
```

BUGS

NOTES

Unknown attributes are reserved for future use, and return zero.

BMF_DISPLAYABLE will only be set if the source bitmap meets all of the required alignment restrictions. A bitmap which does not meet these restrictions may still be displayable at some loss of efficiency.

Size values returned by this function may not exactly match the values which were passed to AllocBitMap(), due to alignment restrictions.

SEE ALSO
AllocBitMap()

1.72 graphics.library/GetBPen

NAME

GetBPen -- Get the B Pen value for a RastPort (V39).

SYNOPSIS

```
pen = GetBPen ( rp )  
d0      a0
```

```
ULONG GetBPen(struct RastPort *)
```

FUNCTION

Return the current value of the B pen for the rastport. This function should be used instead of peeking the structure directly, because future graphics devices may store it differently, using more bits.

INPUTS

rp = a pointer to a valid RastPort structure.

BUGS

NOTES

SEE ALSO
SetBPen() graphics/gfx.h

1.73 graphics.library/GetColorMap

NAME

GetColorMap -- allocate and initialize Colormap

SYNOPSIS

```
cm = GetColorMap( entries )  
d0      d0  
  
struct ColorMap *GetColorMap( ULONG);
```

FUNCTION

Allocates, initializes and returns a pointer to a ColorMap

data structure, later enabling calls to SetRGB4 and LoadRGB4 to load colors for a view port. The ColorTable pointer in the ColorMap structure points to a hardware specific colormap data structure. You should not count on it being anything you can understand. Use GetRGB4() to query it or SetRGB4CM to set it directly.

INPUTS

entries - number of entries for this colormap

RESULT

The pointer value returned by this routine, if nonzero, may be stored into the ViewPort.ColorMap pointer. If a value of 0 is returned, the system was unable to allocate enough memory space for the required data structures.

BUGS

SEE ALSO

SetRGB4() FreeColorMap()

1.74 graphics.library/GetDisplayInfoData

NAME

GetDisplayInfoData -- query DisplayInfo Record parameters (V36)

SYNOPSIS

```
result = GetDisplayInfoData(handle, buf, size, tagID, [ID])
D0                      A0      A1      D0      D1      [D2]
```

```
ULONG GetDisplayInfoData(DisplayInfoHandle, UBYTE *, ULONG, ULONG, ULONG);
```

FUNCTION

GetDisplayInfoData() fills a buffer with data meaningful to the DisplayInfoRecord pointed at by your valid handle. The data type that you are interested in is indicated by a tagID for that chunk. The types of tagged information that may be available include:

```
DTAG_DISP: (DisplayInfo)   - properties and availability information.
DTAG_DIMS: (DimensionInfo) - default dimensions and overscan info.
DTAG_MNTR: (MonitorInfo)   - type, position, scanrate, and compatibility
DTAG_NAME: (NameInfo)      - a user friendly way to refer to this mode.
```

INPUTS

```
handle - displayinfo handle
buf     - pointer to destination buffer
size    - buffer size in bytes
tagID   - data chunk type
ID      - displayinfo identifier, optionally used if handle is NULL
```

RESULT

```
result - if positive, number of bytes actually transferred
        if zero, no information for ID was available
```

BUGS

SEE ALSO

FindDisplayInfo(), NextDisplayInfo()
graphics/displayinfo.h

1.75 graphics.library/GetDrMd

NAME

GetDrMd -- Get the draw mode value for a RastPort (V39).

SYNOPSIS

```
mode = GetDrMd ( rp )  
d0          a0
```

```
ULONG GetDrMd(struct RastPort *)
```

FUNCTION

Return the current value of the draw mode for the rastport. This function should be used instead of peeking the structure directly, because future graphics devices may store it differently.

INPUTS

rp = a pointer to a valid RastPort structure.

BUGS

NOTES

SEE ALSO

SetDrMd() graphics/gfx.h

1.76 graphics.library/GetExtSpriteA

NAME

GetExtSpriteA -- Attempt to get a sprite for the extended sprite manager. (V39)
GetExtSprite -- varargs stub for GetExtSpriteA. (V39)

SYNOPSIS

```
Sprite_Number = GetExtSpriteA( sprite, tags ) (V39)  
d0          a2          a1
```

```
LONG GetExtSpriteA( struct ExtSprite *, struct TagItem * );
```

```
spritenum=GetExtSprite(sprite,tags,...);
```

FUNCTION

Attempt to allocate one of the eight sprites for private use with the extended sprite manager.

INPUTS

sprite - ptr to programmer's ExtSprite (from AllocSpriteData()).
 tags - a standard tag list:

GSTAG_SPRITE_NUM specifies a specific sprite to get by number.

GSTAG_ATTACHED specifies that you wish to get a sprite pair.
 the tag data field points to a ExtSprite structure
 for the second sprite. You must free both sprites.

RESULTS

Sprite_number = a sprite number or -1 for an error.
 This call will fail if no sprites could be allocated, or
 if you try to allocate a sprite which would require
 a mode change when there are other sprites of incompatible
 modes in use.

BUGS

GSTAG_ATTACHED does not work in version 39. When running under V39,
 you should attach the second sprite with a separate GetExtSprite call.

SEE ALSO

FreeSprite() ChangeSprite() MoveSprite() GetSprite() graphics/sprite.h

1.77 graphics.library/GetGBuffers

NAME

GetGBuffers -- Attempt to allocate ALL buffers of an entire AnimOb.

SYNOPSIS

```
status = GetGBuffers(anOb, rp, db)
D0                      A0      A1  D0
```

```
BOOL GetGBuffers(struct AnimOb *, struct RastPort *, BOOL);
```

FUNCTION

For each sequence of each component of the AnimOb, allocate memory for:

```
SaveBuffer
BorderLine
CollMask and ImageShadow (point to same buffer)
if db is set TRUE (user wants double-buffering) allocate:
    DBufPacket
    BufBuffer
```

INPUTS

anOb = pointer to the AnimOb structure
 rp = pointer to the current RastPort
 db = double-buffer indicator (set TRUE for double-buffering)

RESULT

status = TRUE if the memory allocations were all successful, else FALSE

BUGS

If any of the memory allocations fail it does not free the partial allocations that did succeed.

SEE ALSO
FreeGBuffers() graphics/gels.h

1.78 graphics.library/GetOPen

NAME

GetOPen -- Get the O Pen value for a RastPort (V39).

SYNOPSIS

```
pen = GetOPen ( rp )
d0    a0
```

```
ULONG GetOPen(struct RastPort *)
```

FUNCTION

Return the current value of the O pen for the rastport. This function should be used instead of peeking the structure directly, because future graphics devices may store it differently, for instance, using more bits.

INPUTS

rp = a pointer to a valid RastPort structure.

BUGS

NOTES

SEE ALSO
SetOutlinePen() graphics/gfx.h

1.79 graphics.library/GetRGB32

NAME

GetRGB32 -- Set a series of color registers for this Viewport. (V39)

SYNOPSIS

```
GetRGB32( cm, firstcolor, ncolors, table )
a0    d0          d1    a1
```

```
void GetRGB32( struct ColorMap *, ULONG, ULONG, ULONG *);
```

INPUTS

cm = colormap
firstcolor = the first color register to get
ncolors = the number of color registers to set.
table=a pointer to a series of 32-bit RGB triplets.

RESULT

The ULONG data pointed to by 'table' will be filled with the 32 bit

fractional RGB values from the colormap.
BUGS

NOTES
'Table' should point to at least ncolors*3 longwords.

SEE ALSO
LoadRGB4() GetColorMap() LoadRGB32() SetRGB32CM() graphics/view.h

1.80 graphics.library/GetRGB4

NAME

GetRGB4 -- Inquire value of entry in ColorMap.

SYNOPSIS

```
value = GetRGB4( colormap, entry )
           d0             a0         d0
```

```
ULONG GetRGB4(struct ColorMap *, LONG);
```

FUNCTION

Read and format a value from the ColorMap.

INPUTS

colormap - pointer to ColorMap structure
entry - index into colormap

RESULT

returns -1 if no valid entry
return UWORD RGB value 4 bits per gun right justified

NOTE

Intuition's DisplayBeep() changes color 0. Reading Color 0 during a DisplayBeep() will lead to incorrect results.

BUGS

SEE ALSO

SetRGB4() LoadRGB4() GetColorMap() FreeColorMap() graphics/view.h

1.81 graphics.library/GetRAttrA

NAME

GetRAttrA -- examine rastport settings via a tag list
GetRAttrs -- varargs stub for GetRAttrA

SYNOPSIS

```
GetRAttrA(rp, tags)
           a0    a1
```

```
void GetRAttrA(struct RastPort *, struct TagItem *);
```



```
GetRPAattrs(rp, attr1, &result1, ...);
```

FUNCTION

Read the settings of a rastport into variables. The `ti_Tag` field of the `TagItem` specifies which attribute should be read, and the `ti_Data` field points at the location where the result should be stored. All current tags store the return data as LONGs (32 bits).

currently available tags are:

```
RPTAG_Font      Font for Text()
RPTAG_SoftStyle  style for text (see graphics/text.h)
RPTAG_APen      Primary rendering pen
RPTAG_BPen      Secondary rendering pen
RPTAG_DrMd      Drawing mode (see graphics/rastport.h)
RPTAG_OutLinePen Area Outline pen
RPTAG_WriteMask  Bit Mask for writing.
RPTAG_MaxPen     Maximum pen to render (see SetMaxPen())
RPTAG_DrawBounds Determine the area that will be rendered
                  into by rendering commands. Can be used
                  to optimize window refresh. Pass a pointer
                  to a rectangle in the tag data. On return,
                  the rectangle's MinX will be greater than
                  its MaxX if there are no active cliprects.
```

INPUTS

`rp` - pointer to the `RastPort` to examine.
`tags` - a standard tag list specifying the attributes to be read, and where to store their values.

RESULT

BUGS

SEE ALSO

`GetAPen()` `GetBPen()` `GetDrMd()` `GetOutLinePen()`
`GetWriteMask()` `SetRPAattrA()` `graphics/rpattr.h`

1.82 graphics.library/GetSprite

NAME

`GetSprite` -- Attempt to get a sprite for the simple sprite manager.

SYNOPSIS

```
Sprite_Number = GetSprite( sprite, pick )
                d0          a0          d0
```

```
WORD GetSprite( struct SimpleSprite *, WORD );
```

FUNCTION

Attempt to allocate one of the eight sprites for private use with the simple sprite manager. This must be done before using further calls to the simple sprite machine. If the programmer wants to use 15 color sprites, they must allocate both sprites

and set the 'SPRITE_ATTACHED' bit in the odd sprite's posctldata array.

INPUTS

sprite - ptr to programmers SimpleSprite structure.
pick - number in the range of 0-7 or
-1 if programmer just wants the next one.

RESULTS

If pick is 0-7 attempt to allocate the sprite. If the sprite is already allocated then return -1.
If pick -1 allocate the next sprite starting search at 0.
If no sprites are available return -1 and fill -1 in num entry of SimpleSprite structure.
If the sprite is available for allocation, mark it allocated and fill in the 'num' entry of the SimpleSprite structure.
If successful return the sprite number.

BUGS

SEE ALSO

FreeSprite() ChangeSprite() MoveSprite() GetSprite() graphics/sprite.h

1.83 graphics.library/GetVPMoDeID

NAME

GetVPMoDeID -- get the 32 bit DisplayID from a ViewPort. (V36)

SYNOPSIS

```
modeID = GetVPMoDeID( vp )  
d0      a0
```

```
ULONG GetVPMoDeID( struct ViewPort *);
```

FUNCTION

returns the normal display modeID, if one is currently associated with this ViewPort.

INPUTS

vp -- pointer to a ViewPort structure.

RESULT

modeID -- a 32 bit DisplayInfoRecord identifier associated with this ViewPort, or INVALID_ID.

NOTES

Test the return value of this function against INVALID_ID, not NULL. (INVALID_ID is defined in graphics/displayinfo.h).

BUGS

SEE ALSO

graphics/displayinfo.h, ModeNotAvailable()

1.84 graphics.library/GfxAssociate

NAME

GfxAssociate -- associate a graphics extended node with a given pointer
(V36)

SYNOPSIS

```
GfxAssociate(pointer, node);  
           A0      A1
```

```
void GfxAssociate(VOID *, struct ExtendedNode *);
```

FUNCTION

Associate a special graphics extended data structure (each of which begins with an ExtendedNode structure) with another structure via the other structure's pointer. Later, when you call GfxLookUp() with the other structure's pointer you may retrieve a pointer to this special graphics extended data structure, if it is available.

INPUTS

pointer = a pointer to a data structure.

node = an ExtendedNode structure to associate with the pointer

RESULT

an association is created between the pointer and the node such that given the pointer the node can be retrieved via GfxLookUp().

BUGS

SEE ALSO

graphics/gfxnodes.h GfxNew() GfxFree() GfxLookUp()

1.85 graphics.library/GfxFree

NAME

GfxFree -- free a graphics extended data structure (V36)

SYNOPSIS

```
GfxFree( node );  
      a0
```

```
void GfxFree(struct ExtendedNode *);
```

FUNCTION

Free a special graphics extended data structure (each of which begins with an ExtendedNode structure).

INPUTS

node = pointer to a graphics extended data structure obtained via GfxNew().

RESULT

the node is deallocated from memory. graphics will disassociate

this special graphics extended node from any associated data structures, if necessary, before freeing it (see GfxAssociate()).

BUGS

an Alert() will be called if you attempt to free any structure other than a graphics extended data structure obtained via GfxFree().

SEE ALSO

graphics/gfxnodes.h GfxNew() GfxAssociate() GfxLookUp()

1.86 graphics.library/GfxLookUP

NAME

GfxLookUp -- find a graphics extended node associated with a given pointer (V36)

SYNOPSIS

```
result = GfxLookUp( pointer );  
d0      a0
```

```
struct ExtendedNode *GfxLookUp( void *);
```

FUNCTION

Finds a special graphics extended data structure (if any) associated with the pointer to a data structure (eg: ViewExtra associated with a View structure).

INPUTS

pointer = a pointer to a data structure which may have an ExtendedNode associated with it (typically a View).

RESULT

result = a pointer to the ExtendedNode that has previously been associated with the pointer.

BUGS

SEE ALSO

graphics/gfxnodes.h GfxNew() GfxFree() GfxAssociate()

1.87 graphics.library/GfxNew

NAME

GfxNew -- allocate a graphics extended data structure (V36)

SYNOPSIS

```
result = GfxNew( node_type );  
d0      d0
```

```
struct ExtendedNode *GfxNew( ULONG);
```

FUNCTION

Allocate a special graphics extended data structure (each of which begins with an ExtendedNode structure). The type of structure to be allocated is specified by the node_type identifier.

INPUTS

node_type = which type of graphics extended data structure to allocate.
(see gfxnodes.h for identifier definitions.)

RESULT

result = a pointer to the allocated graphics node or NULL if the allocation failed.

BUGS

SEE ALSO

graphics/gfxnodes.h GfxFree() GfxAssociate() GfxLookUp()

1.88 graphics.library/InitArea

NAME

InitArea -- Initialize vector collection matrix

SYNOPSIS

```
InitArea( areainfo, buffer, maxvectors )
          a0         a1         d0
```

```
void InitArea(struct AreaInfo *, void *, SHORT);
```

FUNCTION

This function provides initialization for the vector collection matrix such that it has a size of (max vectors). The size of the region pointed to by buffer (short pointer) should be five (5) times as large as maxvectors. This size is in bytes. Areafills done by using AreaMove, AreaDraw, and AreaEnd must have enough space allocated in this table to store all the points of the largest fill. AreaEllipse takes up two vectors for every call. If AreaMove/Draw/Ellipse detect too many vectors going into the buffer they will return -1.

INPUTS

areainfo - pointer to AreaInfo structure
buffer - pointer to chunk of memory to collect vertices
maxvectors - max number of vectors this buffer can hold

RESULT

Pointers are set up to begin storage of vectors done by AreaMove, AreaDraw, and AreaEllipse.

BUGS

SEE ALSO

AreaEnd() AreaMove() AreaDraw() AreaEllipse() graphics/rastport.h

1.89 graphics.library/InitBitMap

NAME

InitBitMap -- Initialize bit map structure with input values.

SYNOPSIS

```
InitBitMap( bm, depth, width, height )
           a0    d0      d1      d2
```

```
void InitBitMap( struct BitMap *, BYTE, UWORD, UWORD );
```

FUNCTION

Initialize various elements in the BitMap structure to correctly reflect depth, width, and height. Must be used before use of BitMap in other graphics calls. The Planes[8] are not initialized and need to be set up by the caller. The Planes table was put at the end of the structure so that it may be truncated to conserve space, as well as extended. All routines that use BitMap should only depend on existence of depth number of bitplanes. The Flagsh and pad fields are reserved for future use and should not be used by application programs.

INPUTS

bm - pointer to a BitMap structure (gfx.h)
 depth - number of bitplanes that this bitmap will have
 width - number of bits (columns) wide for this BitMap
 height - number of bits (rows) tall for this BitMap

BUGS

SEE ALSO

graphics/gfx.h

1.90 graphics.library/InitGels

NAME

InitGels -- initialize a gel list; must be called before using gels.

SYNOPSIS

```
InitGels(head, tail, GInfo)
        A0      A1      A2
```

```
void InitGels(struct VSprite *, struct VSprite *, struct GelsInfo *);
```

FUNCTION

Assigns the VSprites as the head and tail of the gel list in GfxBase. Links these two gels together as the keystones of the list. If the collHandler vector points to some memory array, sets the BORDERHIT vector to NULL.

INPUTS

head = pointer to the VSprite structure to be used as the gel list head

tail = pointer to the VSprite structure to be used as the gel list tail
GInfo = pointer to the GelsInfo structure to be initialized

RESULT

BUGS

SEE ALSO

graphics/gels.h graphics/rastport.h

1.91 graphics.library/InitGMasks

NAME

InitGMasks -- Initialize all of the masks of an AnimOb.

SYNOPSIS

InitGMasks(anOb)
A0

void InitGMasks(struct AnimOb *);

FUNCTION

For every sequence of every component call InitMasks.

INPUTS

anOb = pointer to the AnimOb

BUGS

SEE ALSO

InitMasks() graphics/gels.h

1.92 graphics.library/InitMasks

NAME

InitMasks -- Initialize the BorderLine and CollMask masks of a VSprite.

SYNOPSIS

InitMasks(vs)
A0

void InitMasks(struct VSprite *);

FUNCTION

Creates the appropriate BorderLine and CollMask masks of the VSprite. Correctly detects if the VSprite is actually a Bob definition, handles the image data accordingly.

INPUTS

vs = pointer to the VSprite structure

RESULT

BUGS

SEE ALSO

InitGels() graphics/gels.h

1.93 graphics.library/InitRastPort

NAME

InitRastPort -- Initialize raster port structure

SYNOPSIS

```
InitRastPort( rp )
             a1
```

```
void InitRastPort(struct RastPort *rp);
```

FUNCTION

Initialize a RastPort structure to standard values.

INPUTS

rp = pointer to a RastPort structure.

RESULT

all entries in RastPort get zeroed out, with the following exceptions:

- Mask, FgPen, AOLPen, and LinePtrn are set to -1.
- The DrawMode is set to JAM2
- The font is set to the standard system font

NOTES

The struct Rastport describes a control structure for a write-able raster. The RastPort structure describes how a complete single playfield display will be written into. A RastPort structure is referenced whenever any drawing or filling operations are to be performed on a section of memory.

The section of memory which is being used in this way may or may not be presently a part of the current actual onscreen display memory. The name of the actual memory section which is linked to the RastPort is referred to here as a "raster" or as a bitmap.

NOTE: Calling the routine InitRastPort only establishes various defaults. It does NOT establish where, in memory, the rasters are located. To do graphics with this RastPort the user must set up the BitMap pointer in the RastPort.

BUGS

SEE ALSO

graphics/rastport.h

1.94 graphics.library/InitTmpRas

NAME

InitTmpRas -- Initialize area of local memory for usage by
areafill, floodfill, text.

SYNOPSIS

```
InitTmpRas(tmpras, buffer, size)
           a0         a1       d0
```

```
void InitTmpRas( struct TmpRas *, void *, ULONG );
```

FUNCTION

The area of memory pointed to by buffer is set up to be used by RastPort routines that may need to get some memory for intermediate operations in preparation to putting the graphics into the final BitMap.

Tmpras is used to control the usage of buffer.

INPUTS

tmpras - pointer to a TmpRas structure to be linked into
a RastPort
buffer - pointer to a contiguous piece of chip memory.
size - size in bytes of buffer

RESULT

makes buffer available for users of RastPort

BUGS

Would be nice if RastPorts could share one TmpRas.

SEE ALSO

AreaEnd() Flood() Text() graphics/rastport.h

1.95 graphics.library/InitView

NAME

InitView - Initialize View structure.

SYNOPSIS

```
InitView( view )
        a1
```

```
void InitView( struct View * );
```

FUNCTION

Initialize View structure to default values.

INPUTS

view - pointer to a View structure

RESULT
View structure set to all 0's. (1.0,1.1.1.2)
Then values are put in DxOffset,DyOffset to properly position
default display about .5 inches from top and left on monitor.
InitView pays no attention to previous contents of view.

BUGS

SEE ALSO
MakeVPort graphics/view.h

1.96 graphics.library/InitVPort

NAME
InitVPort - Initialize ViewPort structure.

SYNOPSIS
InitVPort(vp)
a0

void InitViewPort(struct ViewPort *);

FUNCTION
Initialize ViewPort structure to default values.

INPUTS
vp - pointer to a ViewPort structure

RESULT
ViewPort structure set to all 0's. (1.0,1.1)
New field added SpritePriorities, initialized to 0x24 (1.2)

BUGS

SEE ALSO
MakeVPort() graphics/view.h

1.97 graphics.library/LoadRGB32

NAME
LoadRGB32 -- Set a series of color registers for this Viewport. (V39)

SYNOPSIS
LoadRGB32(vp, table)
a0 a1

void LoadRGB32(struct ViewPort *, ULONG *);

INPUTS
vp = viewport
table = a pointer to a series of records which describe which colors to

```

        modify.
RESULT
The selected color registers are changed to match your specs.
BUGS

NOTES

Passing a NULL "table" is ignored.
The format of the table passed to this function is a series of records,
each with the following format:

    1 Word with the number of colors to load
    1 Word with the first color to be loaded.
    3 longwords representing a left justified 32 bit rgb triplet.
    The list is terminated by a count value of 0.

examples:
    ULONG table[]={11<<16+0,0xffffffff,0,0,0} loads color register
        0 with 100% red.
    ULONG table[]={256<<16+0,r1,g1,b1,r2,g2,b2,.....0} can be used
        to load an entire 256 color palette.

Lower order bits of the palette specification will be discarded,
depending on the color palette resolution of the target graphics
device. Use 0xffffffff for the full value, 0x7fffffff for 50%,
etc. You can find out the palette range for your screen by
querying the graphics data base.

LoadRGB32 is faster than SetRGB32, even for one color.

SEE ALSO
LoadRGB4() GetColorMap() GetRGB32() SetRGB32CM() graphics/view.h

```

1.98 graphics.library/LoadRGB4

```

NAME
LoadRGB4 -- Load RGB color values from table.

SYNOPSIS
LoadRGB4( vp, colors , count )
          a0    a1      d0:16

void LoadRGB4( struct ViewPort *, UWORD *, WORD);

FUNCTION
    load the count words of the colormap from table starting at
    entry 0.

INPUTS
vp - pointer to ViewPort, whose colors you wish to change
colors - pointer to table of RGB values set up as an array
        of USHORTS
background-- 0x0RGB
color1      -- 0x0RGB
color2      -- 0x0RGB

```

```

    etc.          UWORD per value.
    The colors are interpreted as 15 = maximum intensity.
                                0 = minimum intensity.
count = number of UWORDS in the table to load into the
        colormap starting at color 0(background) and proceeding
        to the next higher color number

```

RESULTS

The ViewPort should have a pointer to a valid ColorMap to store the colors in.

Updates the hardware copperlist to reflect the new colors.

Updates the intermediate copperlist with the new colors.

BUGS

NOTE: Under V36 and up, it is not safe to call this function from an interrupt, due to semaphore protection of graphics copper lists.

SEE ALSO

SetRGB4() GetRGB4() GetColorMap() graphics/view.h

1.99 graphics.library/LoadView

NAME _____

```
LoadView -- Use a (possibly freshly created) coprocessor instruction
           list to create the current display.
```

SYNOPSIS

```
LoadView( View )
           A1
```

```
void LoadView( struct View * );
```

FUNCTION

```
Install a new view to be displayed during the next display
refresh pass.
```

Coprocessor instruction list has been created by
InitVPort(), MakeVPort(), and MrgCop().

INPUTS

View - a pointer to the View structure which contains the pointer to the constructed coprocessor instructions list, or NULL.

RESULT

If the View pointer is non-NULL, the new View is displayed, according to your instructions. The vertical blank routine will pick this pointer up and direct the copper to start displaying this View.

If the View pointer is NULL, no View is displayed.

NOTE

Even though a LoadView(NULL) is performed, display DMA will still be active. Sprites will continue to be displayed after a LoadView(NULL)

unless an OFF_SPRITE is subsequently performed.

BUGS

SEE ALSO

InitVPort() MakeVPort() MrgCop() intuition/RethinkDisplay()
graphics/view.h

1.100 graphics.library/LockLayerRom

NAME

LockLayerRom -- Lock Layer structure by ROM(gfx lib) code.

SYNOPSIS

```
LockLayerRom( layer )
               a5
```

```
void LockLayerRom( struct Layer * );
```

FUNCTION

Return when the layer is locked and no other task may alter the ClipRect structure in the Layer structure.

This call does not destroy any registers.

This call nests so that callers in this chain will not lock themselves out.

Do not have the Layer locked during a call to intuition.

There is a potential deadlock problem here, if intuition needs to get other locks as well.

Having the layer locked prevents other tasks from using the layer library functions, most notably intuition itself. So be brief.

layers.library's LockLayer is identical to LockLayerRom.

INPUTS

layer - pointer to Layer structure

RESULTS

The layer is locked and the task can render assuming the ClipRects will not change out from underneath it until an UnlockLayerRom is called.

SEE ALSO

UnlockLayerRom() layers.library/LockLayer() graphics/clip.h

1.101 graphics.library/MakeVPort

NAME

MakeVPort -- generate display copper list for a viewport.

SYNOPSIS

```
error = MakeVPort( view, viewport )
d0              a0      a1
```

```
ULONG MakeVPort( struct View *, struct ViewPort * );
```

FUNCTION

Uses information in the View, ViewPort, ViewPort->RasInfo to construct and intermediate copper list for this ViewPort.

INPUTS

view - pointer to a View structure

viewport - pointer to a ViewPort structure

The viewport must have valid pointer to a RasInfo.

RESULTS

constructs intermediate copper list and puts pointers in

viewport.DspIns

If the ColorMap ptr in ViewPort is NULL then it uses colors from the default color table.

If DUALPF in Modes then there must be a second RasInfo pointed to by the first RasInfo

From V39, MakeVPort can return a ULONG error value (previous versions returned void), to indicate that either not enough memory could be allocated for MakeVPort's use, or that the ViewPort mode and bitplane alignments are incorrect for the bitplane's depth.

You should check for these error values - they are defined in <graphics/view.h>.

BUGS

In V37 and earlier, narrow Viewports (whose righthand edge is less than 3/4 of the way across the display) do not work properly.

SEE ALSO

InitVPort() MrgCop() graphics/view.h intuition.library/MakeScreen() intuition.library/RemakeDisplay() intuition.library/RethinkDisplay()

1.102 graphics.library/ModeNotAvailable

NAME

ModeNotAvailable -- check to see if a DisplayID isn't available. (V36)

SYNOPSIS

```
error = ModeNotAvailable( modeID )
d0
```

```
ULONG ModeNotAvailable( ULONG);
```

FUNCTION

returns an error code, indicating why this modeID is not available, or NULL if there is no reason known why this mode should not be there.

INPUTS

modeID -- a 32 bit DisplayInfoRecord identifier.

RESULT
error -- a general indication of why this modeID is not available,
or NULL if there is no reason why it shouldn't be available.

NOTE
ULONG return values from this function are a proper superset of the
DisplayInfo.NotAvailable field (defined in graphics/displayinfo.h).

BUGS

SEE ALSO
graphics/displayinfo.h, GetVPMoDeID()

1.103 graphics.library/Move

NAME
Move -- Move graphics pen position.

SYNOPSIS
Move(rp, x, y)
a1 d0:16 d1:16

void Move(struct RastPort *, SHORT, SHORT);

FUNCTION
Move graphics pen position to (x,y) relative to upper left (0,0)
of RastPort. This sets the starting point for subsequent Draw()
and Text() calls.

INPUTS
rp - pointer to a RastPort structure
x,y - point in the RastPort

RESULTS

BUGS

SEE ALSO
Draw graphics/rastport.h

1.104 graphics.library/MoveSprite

NAME
MoveSprite -- Move sprite to a point relative to top of viewport.

SYNOPSIS
MoveSprite(vp, sprite, x, y)
A0 A1 D0 D1

void MoveSprite(struct ViewPort *, struct SimpleSprite *, WORD, WORD);

FUNCTION

Move sprite image to new place on display.

INPUTS

vp - pointer to ViewPort structure
 if vp = 0, sprite is positioned relative to View.
 sprite - pointer to SimpleSprite structure
 (x,y) - new position relative to top of viewport or view.

RESULTS

Calculate the hardware information for the sprite and place it in the posctldata array. During next video display the sprite will appear in new position.

BUGS

Sprites really appear one pixel to the left of the position you specify. This bug affects the apparent display position of the sprite on the screen, but does not affect the numeric position relative to the viewport or view. This behaviour only applies to SimpleSprites, not to ExtSprites.

SEE ALSO

FreeSprite() ChangeSprite() GetSprite() graphics/sprite.h

1.105 graphics.library/MrgCop

NAME

MrgCop -- Merge together coprocessor instructions.

SYNOPSIS

```
error = MrgCop( View )
d0      A1
```

```
ULONG MrgCop( struct View * );
```

FUNCTION

Merge together the display, color, sprite and user coprocessor instructions into a single coprocessor instruction stream. This essentially creates a per-display-frame program for the coprocessor. This function MrgCop is used, for example, by the graphics animation routines which effectively add information into an essentially static background display. This changes some of the user or sprite instructions, but not those which have formed the basic display in the first place. When all forms of coprocessor instructions are merged together, you will have a complete per-frame instruction list for the coprocessor.

Restrictions: Each of the coprocessor instruction lists MUST be internally sorted in min to max Y-X order. The merge routines depend on this! Each list must be terminated using CEND(copperlist).

INPUTS

View - a pointer to the view structure whose coprocessor instructions are to be merged.

RESULT

The view structure will now contain a complete, sorted/merged list of instructions for the coprocessor, ready to be used by the display processor. The display processor is told to use this new instruction stream through the instruction LoadView().

From V39, MrgCop() can return a ULONG error value (previous versions returned void), to indicate that either there was insufficient memory to build the system copper lists, or that MrgCop() had no work to do if, for example, there were no ViewPorts in the list.

You should check for these error values - they are defined in <graphics/view.h>.

BUGS**SEE ALSO**

InitVPort() MakeVPort() LoadView() graphics/view.h
intuition.library/RethinkDisplay()

1.106 graphics.library/NewRegion

NAME

NewRegion -- Get an empty region.

SYNOPSIS

region = NewRegion()

d0

```
struct Region *NewRegion();
```

FUNCTION

Create a Region structure, initialize it to empty, and return a pointer to it.

RESULTS

region - pointer to initialized region. If it could not allocate required memory region = NULL.

INPUTS

none

BUGS**SEE ALSO**

graphics/regions.h

1.107 graphics.library/NextDisplayInfo

NAME

NextDisplayInfo -- iterate current displayinfo identifiers (V36)

SYNOPSIS

```
next_ID = NextDisplayInfo(last_ID)
D0          D0
```

```
ULONG NextDisplayInfo(ULONG);
```

FUNCTION

The basic iteration function with which to find all records in the graphics database. Using each ID in succession, you can then call FindDisplayInfo() to obtain the handle associated with each ID. Each ID is a 32-bit Key which uniquely identifies one record. The INVALID_ID is special, and indicates the end-of-list.

INPUTS

last_ID - previous displayinfo identifier
or INVALID_ID if beginning iteration.

RESULT

next_ID - subsequent displayinfo identifier
or INVALID_ID if no more records.

BUGS

SEE ALSO

FindDisplayInfo(), GetDisplayInfoData()
graphics/displayinfo.h

1.108 graphics.library/ObtainBestPenA

NAME

ObtainBestPenA --- Search for the closest color match, or allocate a new one. (V39)
ObtainBestPen --- varargs stub for ObtainBestPenA

SYNOPSIS

```
color | -1 =ObtainBestPenA(  cm,  R,  G,  B,  taglist)
                           a0  d1  d2  d3      a1
```

```
LONG ObtainBestPenA( struct ColorMap *, ULONG, ULONG,
                    ULONG, struct TagItem *);
```

```
color = ObtainBestPen(cm,r,g,b,tags....);
```

INPUTS

cm = colormap
R = red level (32 bit left justified fraction)
G = green level (32 bit left justified fraction)
B = blue level (32 bit left justified fraction)
taglist = a pointer to a standard tag list specifying the color matching settings desired:

OBP_Precision - specifies the desired precision for the match. Should be PRECISION_GUI, PRECISION_ICON, or PRECISION_IMAGE or PRECISION_EXACT.
Defaults to PRECISION_IMAGE.

OBP_FailIfBad - specifies that you want ObtainBestPen to return a failure value if there is not a color within the given tolerance, instead of returning the closest color. With OBP_FailIfBad==FALSE, ObtainBestPen will only fail if the ViewPort contains no sharable colors. Defaults to FALSE.

FUNCTION

This function can be used by applications to figure out what pen to use to represent a given color.

The system will attempt to find the color in your viewport closest to the specified color. If there is no color within your tolerance, then a new one will be allocated, if available. If none is available, then the closest one found will be returned.

RESULT

The correct pen value, or -1 if no sharable palette entries are available.

BUGS

NOTES

If this call succeeds, then you must call ReleasePen() when you are done with the color.

The error metric used for ObtainBestPen() is based on the magnitude squared between the two RGB values, scaled by the percentage of free entries.

SEE ALSO

GetColorMap() ObtainPen() ReleasePen()

1.109 graphics.library/ObtainPen

NAME

ObtainPen -- Obtain a free palette entry for use by your program. (V39)

SYNOPSIS

```
n = ObtainPen( cm, n, r, g, b, flags)
d0          a0 d0 d1 d2 d3 d4
```

```
LONG ObtainPen(struct ColorMap *,ULONG,ULONG,ULONG,ULONG,ULONG);
```

FUNCTION

Attempt to allocate an entry in the colormap for use by the application. If successful, you should ReleasePen() this entry after you have finished with it.

Applications needing exclusive use of a color register (say for color cycling) will typically call this function with n=-1. Applications needing only the shared use of a color will typically use ObtainBestPenA() instead.

Other uses of this function are rare.

INPUTS

cm = A pointer to a color map created by `GetColorMap()`.
 n = The index of the desired entry, or -1 if any one is acceptable
 rgb = The RGB values (32 bit left justified fractions) to set the new palette entry to.
 flags= `PEN_EXCLUSIVE` - tells the system that you want exclusive (non-shared) use of this pen value. Default is shared access.

`PEN_NO_SETCOLOR` - tells the system to not change the rgb values for the selected pen. Really only makes sense for exclusive pens.

RESULTS

n = The allocated pen. -1 will be returned if there is no pen available for you.

BUGS

NOTES

When you allocate a palette entry in non-exclusive mode, you should not change it (via `SetRGB32`), because other programs on the same screen may be using it. With `PEN_EXCLUSIVE` mode, you can change the returned entry at will.

To avoid visual artifacts, you should not free up a palette entry until you are sure that your application is not displaying any pixels in that color at the time you free it. Otherwise, another task could allocate and set that color index, thus changing the colors of your pixels.

Generally, for shared access, you should use `ObtainBestPenA()` instead, since it will not allocate a new color if there is one "close enough" to the one you want already.
 If there is no Palextra attached to the colormap, then this routine will always fail.

SEE ALSO

`GetColorMap()` `ReleasePen()` `AttachPalExtra()` `ObtainBestPenA()`

1.110 graphics.library/OpenFont

NAME

`OpenFont` -- Get a pointer to a system font.

SYNOPSIS

```
font = OpenFont(textAttr)
D0                                A0
```

```
struct TextFont *OpenFont(struct TextAttr *);
```

FUNCTION

This function searches the system font space for the graphics

text font that best matches the attributes specified. The pointer to the font returned can be used in subsequent SetFont and CloseFont calls. It is important to match this call with a corresponding CloseFont call for effective management of ram fonts.

INPUTS

textAttr - a TextAttr or TTextAttr structure that describes the text font attributes desired.

RESULT

font is zero if the desired font cannot be found. If the named font is found, but the size and style specified are not available, a font with the nearest attributes is returned.

BUGS

Prior to V39 this function would return a TextFont pointer for any font which matched exactly in Y size, regardless of differences in DPI, or DotSize.

As part of fixing this bug it is REQUIRED that you use pass the same TextAttr (or TTextAttr) to this function that was used when OpenDiskFont() was called.

OpenFont(), and OpenDiskFont() use WeighTAMatch() to measure how well two fonts match. WeightTAMatch() was a public function in graphics.library V36-V37; it is now a system PRIVATE function as of V39.

SEE ALSO

CloseFont() SetFont()
diskfont.library/OpenDiskFont graphics/text.h
intuition/intuition.h

1.111 graphics.library/OpenMonitor

NAME

OpenMonitor -- open a named MonitorSpec (V36)

SYNOPSIS

```
mbsp = OpenMonitor( monitor_name , display_id)
d0          a1          d0

struct MonitorSpec *OpenMonitor( char *, ULONG );
```

FUNCTION

Locate and open a named MonitorSpec.

INPUTS

monitor_name - a pointer to a null terminated string.
display_id - an optional 32 bit monitor/mode identifier

RESULTS

mbsp - a pointer to an open MonitorSpec structure.
NULL if MonitorSpec could not be opened.

NOTE

if monitor_name is non-NULL, the monitor will be opened by name.
 if monitor_name is NULL the monitor will be opened by optional ID.
 if both monitor_name and display_id are NULL returns default monitor.

BUGS

SEE ALSO

CloseMonitor() graphics/monitor.h

1.112 graphics.library/OrRectRegion

NAME

OrRectRegion -- Perform 2d OR operation of rectangle
 with region, leaving result in region.

SYNOPSIS

```
status = OrRectRegion(region,rectangle)
      d0              a0      a1
```

```
BOOL OrRectRegion( struct Region *, struct Rectangle * );
```

FUNCTION

If any portion of rectangle is not in the region then add
 that portion to the region.

INPUTS

region - pointer to Region structure
 rectangle - pointer to Rectangle structure

RESULTS

status - return TRUE if successful operation
 return FALSE if ran out of memory

BUGS

SEE ALSO

AndRectRegion() OrRegionRegion() graphics/regions.h

1.113 graphics.library/OrRegionRegion

NAME

OrRegionRegion -- Perform 2d OR operation of one region
 with second region, leaving result in second region

SYNOPSIS

```
status = OrRegionRegion(region1,region2)
      d0              a0      a1
```

```
BOOL OrRegionRegion( struct Region *, struct Region * );
```

FUNCTION

If any portion of region1 is not in the region then add that portion to the region2

INPUTS

region1 - pointer to Region structure
region2 - pointer to Region structure

RESULTS

status - return TRUE if successful operation
return FALSE if ran out of memory

BUGS**SEE ALSO**

OrRectRegion() graphics/regions.h

1.114 graphics.library/OwnBlitter

NAME

OwnBlitter -- get the blitter for private usage

SYNOPSIS

OwnBlitter()

void OwnBlitter(void);

FUNCTION

If blitter is available return immediately with the blitter locked for your exclusive use. If the blitter is not available put task to sleep. It will be awakened as soon as the blitter is available. When the task first owns the blitter the blitter may still be finishing up a blit for the previous owner. You must do a WaitBlit before actually using the blitter registers.

Calls to OwnBlitter() do not nest. If a task that owns the blitter calls OwnBlitter() again, a lockup will result. (Same situation if the task calls a system function that tries to own the blitter).

INPUTS

NONE

RETURNS

NONE

SEE ALSO

DisownBlitter() WaitBlit()

1.115 graphics.library/PolyDraw

NAME

PolyDraw -- Draw lines from table of (x,y) values.

SYNOPSIS

```
PolyDraw( rp, count , array )
          a1    d0      a0
```

```
void PolyDraw( struct RastPort *, WORD, WORD * );
```

FUNCTION

starting with the first pair in the array, draw connected lines to it and every successive pair.

INPUTS

rp - pointer to RastPort structure
count - number of (x,y) pairs in the array
array - pointer to first (x,y) pair

BUGS

SEE ALSO

Draw() Move() graphics/rastport.h

1.116 graphics.library/QBlit

NAME

QBlit -- Queue up a request for blitter usage

SYNOPSIS

```
QBlit( bp )
      a1
```

```
void QBlit( struct bltnode * );
```

FUNCTION

Link a request for the use of the blitter to the end of the current blitter queue. The pointer bp points to a blit structure containing, among other things, the link information, and the address of your routine which is to be called when the blitter queue finally gets around to this specific request. When your routine is called, you are in control of the blitter ... it is not busy with anyone else's requests. This means that you can directly specify the register contents and start the blitter. See the description of the blit structure and the uses of QBlit in the section titled Graphics Support in the OS Kernel Manual. Your code must be written to run either in supervisor or user mode on the 68000.

INPUTS

bp - pointer to a blit structure

RESULT

Your routine is called when the blitter is ready for you.

In general requests for blitter usage through this channel are put in front of those who use the blitter via OwnBlitter and DisownBlitter. However for small blits there is more overhead using the queuer than Own/Disown Blitter.

NOTES

Code which uses QBlit(), or QBSBlit() should make use of the pointer to a cleanup routine in the bltnode structure. The cleanup routine may be called on the context of an interrupt, therefore the routine may set a flag, and signal a task, but it may not call FreeMem() directly. Use of the cleanup routine is the only safe way to signal that your bltnode has completed.

BUGS

QBlit(), and QBSBlit() have been rewritten for V39 due to various long standing bugs in earlier versions of this code.

SEE ALSO

QBSBlit() hardware/blit.h

1.117 graphics.library/QBSBlit

NAME

QBSBlit -- Synchronize the blitter request with the video beam.

SYNOPSIS

```
QBSBlit( bsp )  
    al
```

```
void QBSBlit( struct bltnode * );
```

FUNCTION

Call a user routine for use of the blitter, enqueued separately from the QBlit queue. Calls the user routine contained in the blit structure when the video beam is located at a specified position onscreen. Useful when you are trying to blit into a visible part of the screen and wish to perform the data move while the beam is not trying to display that same area. (prevents showing part of an old display and part of a new display simultaneously). Blitter requests on the QBSBlit queue take precedence over those on the regular blitter queue. The beam position is specified the bltnode.

INPUTS

bsp - pointer to a blit structure. See description in the Graphics Support section of the manual for more info.

RESULT

User routine is called when the QBSBlit queue reaches this request AND the video beam is in the specified position. If there are lots of blits going on and the video beam has wrapped around back to the top it will call all the remaining bltnodes as fast as it can to try and catch up.

NOTES

QBlit(), and QBSBlit() have been rewritten for V39. Queued blits are now handled in FIFO order. Tasks trying to OwnBlitter() are now given a fair share of the total blitter time available. QBSBlit() are no longer queued separately from nodes added by QBlit(). This fixes the ordering dependencies listed under BUGS in prior autodoc notes.

BUGS

SEE ALSO

QBlit() hardware/blit.h

1.118 graphics.library/ReadPixel

NAME

ReadPixel -- read the pen number value of the pixel at a specified x,y location within a certain RastPort.

SYNOPSIS

```
penno = ReadPixel( rp,      x,      y )
                d0          a1  d0:16 d1:16
```

```
LONG ReadPixel( struct RastPort *, SHORT, SHORT );
```

FUNCTION

Combine the bits from each of the bit-planes used to describe a particular RastPort into the pen number selector which that bit combination normally forms for the system hardware selection of pixel color.

INPUTS

rp - pointer to a RastPort structure
(x,y) a point in the RastPort

RESULT

penno - the pen number of the pixel at (x,y) is returned.
-1 is returned if the pixel cannot be read for some reason.

BUGS

SEE ALSO

WritePixel() graphics/rastport.h

1.119 graphics.library/ReadPixelArray8

NAME

ReadPixelArray8 -- read the pen number value of a rectangular array of pixels starting at a specified x,y location and continuing through to another x,y location within a certain RastPort. (V36)

SYNOPSIS

```
count = ReadPixelArray8(rp,xstart,ystart,xstop,ystop,array,temprp)
D0                                A0 D0:16  D1:16  D2:16 D3:16 A2    A1
```

```
LONG ReadPixelArray8(struct RastPort *, UWORD, UWORD, UWORD, UWORD,
    UBYTE *, struct RastPort *);
```

FUNCTION

For each pixel in a rectangular region, combine the bits from each of the bit-planes used to describe a particular RastPort into the pen number selector which that bit combination normally forms for the system hardware selection of pixel color.

INPUTS

```
rp      - pointer to a RastPort structure
(xstart,ystart) - starting point in the RastPort
(xstop,ystop)   - stopping point in the RastPort
array - pointer to an array of UBYTES from which to fetch the pixel data
        allocate at least (((width+15)>>4)<<4)*(ystop-ystart+1)) bytes.
temprp - temporary rastport (copy of rp with Layer set == NULL,
        temporary memory allocated for
        temprp->BitMap with Rows set == 1,
        temprp->BytesPerRow == (((width+15)>>4)<<1),
        and temporary memory allocated for
        temprp->BitMap->Planes[])
```

RESULT

```
For each pixel in the array:
    Pen - (0..255) number at that position is returned
count - the number of pixels read.
```

NOTE

```
xstop must be >= xstart
ystop must be >= ystart
```

BUGS

SEE ALSO

```
ReadPixel()  ReadPixelLine8()  graphics/rastport.h
```

1.120 graphics.library/ReadPixelLine8

NAME

```
ReadPixelLine8 -- read the pen number value of a horizontal line
of pixels starting at a specified x,y location and continuing
right for count pixels. (V36)
```

SYNOPSIS

```
count = ReadPixelLine8(rp,xstart,ystart,width,array,temprp)
D0                                A0 D0:16  D1:16  D2    A2    A1
```

```
LONG ReadPixelLine8(struct RastPort *, UWORD, UWORD, UWORD,
    UBYTE *, struct RastPort * );
```

FUNCTION

For each pixel in a rectangular region, combine the bits from each of the bit-planes used to describe a particular RastPort into the pen number selector which that bit combination normally forms for the system hardware selection of pixel color.

INPUTS

rp - pointer to a RastPort structure
 (x,y) - a point in the RastPort
 width - count of horizontal pixels to read
 array - pointer to an array of UBYTES from which to fetch the pixel data
 allocate at least $((width+15)>>4)<<4$ bytes.
 temprp - temporary rastport (copy of rp with Layer set == NULL,
 temporary memory allocated for
 temprp->BitMap with Rows set == 1,
 temprp->BytesPerRow == $((width+15)>>4)<<1$,
 and temporary memory allocated for
 temprp->BitMap->Planes[])

RESULT

For each pixel in the array:
 Pen - (0..255) number at that position is returned
 count - the number of pixels read.

NOTE

width must be non negative

BUGS

SEE ALSO

ReadPixel() graphics/rastport.h

1.121 graphics.library/RectFill

NAME

RectFill -- Fill a rectangular region in a RastPort.

SYNOPSIS

```
RectFill( rp, xmin, ymin, xmax, ymax)
         a1 d0:16 d1:16 d2:16 d3:16
```

```
void RectFill( struct RastPort *, SHORT, SHORT, SHORT, SHORT );
```

FUNCTION

Fills the rectangular region specified by the parameters with the chosen pen colors, areafill pattern, and drawing mode. If no areafill pattern is specified, fill the rectangular region with the FgPen color, taking into account the drawing mode.

INPUTS

rp - pointer to a RastPort structure
 (xmin,ymin) (xmax,ymax) are the coordinates of the upper
 left corner and the lower right corner, respectively, of the

rectangle.

NOTE

The following relation MUST be true:

(xmax >= xmin) and (ymax >= ymin)

BUGS

Complement mode with FgPen complements all bitplanes.

SEE ALSO

AreaEnd() graphics/rastport.h

1.122 graphics.library/ReleasePen

NAME

ReleasePen -- Release an allocated palette entry to the free pool. (V39)

SYNOPSIS

```
ReleasePen( cm, n)
           a0 d0
```

```
void ReleasePen( Struct ColorMap *, ULONG);
```

FUNCTION

Return the palette entry for use by other applications.

If the reference count for this palette entry goes to zero, then it may be reset to another RGB value.

INPUTS

cm = A pointer to a color map created by GetColorMap().

n = A palette index obtained via any of the palette allocation functions. Passing a -1 will result in this call doing nothing.

BUGS

NOTES

This function works for both shared and exclusive palette entries.

SEE ALSO

GetColorMap() ObtainPen() ObtainBestPenA()

1.123 graphics.library/RemBob

NAME

RemBob -- Macro to remove a Bob from the gel list.

SYNOPSIS

```
RemBob(bob)
```

```
RemBob(struct Bob *);
```

FUNCTION

Marks a Bob as no-longer-required. The gels internal code then removes the Bob from the list of active gels the next time DrawGList is executed. This is implemented as a macro. If the user is double-buffering the Bob, it could take two calls to DrawGList before the Bob actually disappears from the RastPort.

INPUTS

Bob = pointer to the Bob to be removed

RESULT

BUGS

SEE ALSO

RemIBob() DrawGList() graphics/gels.h graphics/gfxmacros.h

1.124 graphics.library/RemFont

NAME

RemFont -- Remove a font from the system list.

SYNOPSIS

```
RemFont(textFont)
    A1
```

```
void RemFont(struct TextFont *);
```

FUNCTION

This function removes a font from the system, ensuring that access to it is restricted to those applications that currently have an active pointer to it: i.e. no new SetFont requests to this font are satisfied.

INPUTS

textFont - the TextFont structure to remove.

RESULT

BUGS

SEE ALSO

SetFont() AddFont() graphics/text.h

1.125 graphics.library/RemIBob

NAME

RemIBob -- Immediately remove a Bob from the gel list and the RastPort.

SYNOPSIS

```
RemIBob(bob, rp, vp)
        A0   A1   A2
```

```
void RemIBob(struct Bob *, struct RastPort *, struct ViewPort *);
```

FUNCTION

Removes a Bob immediately by uncoupling it from the gel list and erases it from the RastPort.

INPUTS

bob = pointer to the Bob to be removed
rp = pointer to the RastPort if the Bob is to be erased
vp = pointer to the ViewPort for beam-synchronizing

RESULT

BUGS

SEE ALSO

InitGels() RemVSprite() graphics/gels.h

1.126 graphics.library/RemVSprite

NAME

RemVSprite -- Remove a VSprite from the current gel list.

SYNOPSIS

```
RemVSprite(vs)
        A0
```

```
void RemVSprite(struct VSprite *);
```

FUNCTION

Unlinks the VSprite from the current gel list.

INPUTS

vs = pointer to the VSprite structure to be removed from the gel list

RESULT

BUGS

SEE ALSO

InitGels() RemIBob() graphics/gels.h

1.127 graphics.library/ScalerDiv

NAME

ScalerDiv -- Get the scaling result that BitMapScale would. (V36)

SYNOPSIS

```
result = ScalerDiv(factor, numerator, denominator)
D0          D0          D1          D2
```

```
UWORD ScalerDiv(UWORD, UWORD, UWORD);
```

FUNCTION

Calculate the expression (factor*numerator/denominator) such that the result is the same as the width of the destination result of BitMapScale when the factor here is the width of the source, and the numerator and denominator are the XDestFactor and XSrcFactor for BitMapScale.

INPUTS

factor - a number in the range 0..16383
 numerator, denominator - numbers in the range 1..16383

RESULT

this returns factor*numerator/denominator

1.128 graphics.library/ScrollRaster

NAME

ScrollRaster -- Push bits in rectangle in raster around by dx,dy towards 0,0 inside rectangle.

SYNOPSIS

```
ScrollRaster(rp, dx, dy, xmin, ymin, xmax, ymax)
           A1  D0  D1  D2    D3    D4    D5
```

```
void ScrollRaster
    (struct RastPort *, WORD, WORD, WORD, WORD, WORD, WORD);
```

FUNCTION

Move the bits in the raster by (dx,dy) towards (0,0) The space vacated is RectFilled with BGPen. Limit the scroll operation to the rectangle defined by (xmin,ymin)(xmax,ymax). Bits outside will not be affected. If xmax,ymax is outside the rastport then use the lower right corner of the rastport. If you are dealing with a SimpleRefresh layered RastPort you should check rp->Layer->Flags & LAYERREFRESH to see if there is any damage in the damage list. If there is you should call the appropriate BeginRefresh(Intuition) or BeginUpdate(graphics) routine sequence.

INPUTS

rp - pointer to a RastPort structure
 dx,dy are integers that may be positive, zero, or negative
 xmin,ymin - upper left of bounding rectangle
 xmax,ymax - lower right of bounding rectangle

EXAMPLE

```
ScrollRaster(rp,0,1,minx,miny,maxx,mxy) /* shift raster up by one row */
ScrollRaster(rp,-1,-1,minx,miny,maxx,mxy)
    /* shift raster down and to the right by 1 pixel
```


BUGS

In 1.2/V1.3 if you ScrollRaster a SUPERBITMAP exactly left or right, and there is no TmpRas attached to the RastPort, the system will allocate one for you, but will never free it or record its location. This bug has been fixed for V36. The workaround for 1.2/1.3 is to attach a valid TmpRas of size at least MAXBYTESPERROW to the RastPort before the call.

Beginning with V36 ScrollRaster adds the shifted areas into the damage list for SIMPLE_REFRESH windows. Due to unacceptable system overhead, the decision was made NOT to propagate this shifted area damage for SMART_REFRESH windows.

SEE ALSO

ScrollRasterBF() graphics/rastport.h

1.129 graphics.library/ScrollRasterBF

NAME

ScrollRasterBF -- Push bits in rectangle in raster around by dx,dy towards 0,0 inside rectangle. Newly empty areas will be filled via EraseRect(). (V39)

SYNOPSIS

```
ScrollRasterBF(rp, dx, dy, xmin, ymin, xmax, ymax)
               A1  D0  D1  D2      D3      D4      D5
```

```
void ScrollRasterBF
    (struct RastPort *, WORD, WORD, WORD, WORD, WORD, WORD);
```

FUNCTION

Move the bits in the raster by (dx,dy) towards (0,0). The space vacated is filled by calling EraseRect(). Limit the scroll operation to the rectangle defined by (xmin,ymin) (xmax,ymax). Bits outside will not be affected. If xmax,ymax is outside the rastport then use the lower right corner of the rastport. If you are dealing with a SimpleRefresh layered RastPort you should check rp->Layer->Flags & LAYERREFRESH to see if there is any damage in the damage list. If there is you should call the appropriate BeginRefresh(Intuition) or BeginUpdate(graphics) routine sequence.

INPUTS

rp - pointer to a RastPort structure
 dx,dy are integers that may be positive, zero, or negative
 xmin,ymin - upper left of bounding rectangle
 xmax,ymax - lower right of bounding rectangle

NOTES

This call is exactly the same as ScrollRaster, except that it calls EraseRect() instead of RectFill() when clearing the newly exposed area. This allows use of a custom layer backfill hook.

BUGS

SEE ALSO

ScrollRaster() EraseRect() intuition.library/ScrollWindowRaster()
graphics/rastport.h

1.130 graphics.library/ScrollVPort

NAME

ScrollVPort -- Reinterpret RasInfo information in ViewPort to reflect the current Offset values.

SYNOPSIS

```
ScrollVPort( vp )
            a0
```

```
void ScrollVPort(struct ViewPort *vp);
```

FUNCTION

After the programmer has adjusted the Offset values in the RasInfo structures of ViewPort, change the the copper lists to reflect the the Scroll positions. Changing the BitMap ptr in RasInfo and not changing the the Offsets will effect a double buffering affect.

INPUTS

vp - pointer to a ViewPort structure
that is currently be displayed.

RESULTS

modifies hardware and intermediate copperlists to reflect new RasInfo

BUGS

pokes not fast enough to avoid some visible hashing of display (V37)
This function was re-written in V39 and is ~10 times faster than before.

SEE ALSO

MakeVPort() MrgCop() LoadView() graphics/view.h

1.131 graphics.library/SetABPenDrMd

NAME

SetABPenDrMd -- Set pen colors and draw mode for a RastPort.

SYNOPSIS

```
SetABPenDrMd( rp, apen, bpen, mode )
            a1  d0      d1      d2
```

```
void SetABPenDrMd( struct RastPort *, ULONG, ULONG, ULONG );
```

FUNCTION

Set the pen values and drawing mode for lines, fills and text.
Get the bit definitions from rastport.h

INPUTS

rp - pointer to RastPort structure.
apen - primary pen value
bpen - secondary pen value
mode - 0-255, some combinations may not make much sense.

RESULT

The mode set is dependent on the bits selected.
Changes minterms to reflect new drawing mode and colors.
Sets line drawer to restart pattern.

NOTES

This call is essentially the same as a sequence of SetAPen()/SetBPen()/SetDrMD() calls, except that it is significantly faster. The minterms will only be generated once, or not at all if nothing changed (warning to illegal RastPort pokers!).

BUGS

SEE ALSO

SetAPen() SetBPen() SetDrMd() graphics/rastport.h

1.132 graphics.library/SetAPen

NAME

SetAPen -- Set the primary pen for a RastPort.

SYNOPSIS

```
SetAPen( rp, pen )
    al  d0
```

```
void SetAPen( struct RastPort *, UBYTE );
```

FUNCTION

Set the primary drawing pen for lines, fills, and text.

INPUTS

rp - pointer to RastPort structure.
pen - (0-255)

RESULT

Changes the minterms in the RastPort to reflect new primary pen.
Sets line drawer to restart pattern.

BUGS

SEE ALSO

SetBPen() graphics/rastport.h

1.133 graphics.library/SetBPen

NAME

SetBPen -- Set secondary pen for a RastPort

SYNOPSIS

```
SetBPen( rp, pen )
        a1 d0
```

```
void SetBPen( struct RastPort *, UBYTE );
```

FUNCTION

Set the secondary drawing pen for lines, fills, and text.

INPUTS

rp - pointer to RastPort structure.
pen - (0-255)

RESULT

Changes the minterms in the RastPort to reflect new secondary pen.
Sets line drawer to restart pattern.

BUGS

SEE ALSO

SetAPen() graphics/rastport.h

1.134 graphics.library/SetChipRev

NAME

SetChipRev -- turns on the features of a Chip Set (V39)

SYNOPSIS

```
chiprevbits = SetChipRev(ChipRev)
                    d0
```

```
ULONG SetChipRev(ULONG);
```

FUNCTION

Enables the features of the requested Chip Set if available,
and updates the graphics database accordingly.

INPUTS

ChipRev - Chip Rev that you would like to be enabled.

RESULT

chiprevbits - Actual bits set in GfxBase->ChipRevBits0.

NOTES

This routine should only be called once. It will be called by the system
in the startup-sequence, but is included in the autodocs for authors
of bootblock-games that wish to take advantage of post-ECS features.

SEE ALSO

<graphics/gfxbase.h>

1.135 graphics.library/SetCollision

NAME

SetCollision -- Set a pointer to a user collision routine.

SYNOPSIS

```
SetCollision(num, routine, GInfo)
           D0    A0        A1
```

```
void SetCollision(ULONG, VOID (* )(), struct GelsInfo *);
```

FUNCTION

Sets a specified entry (num) in the user's collision vectors table equal to the address of the specified collision routine.

INPUTS

num = collision vector number
routine = pointer to the user's collision routine
GInfo = pointer to a GelsInfo structure

RESULT

BUGS

SEE ALSO

InitGels() graphics/gels.h graphics/rastport.h

1.136 graphics.library/SetDrMd

NAME

SetDrMd -- Set drawing mode for a RastPort

SYNOPSIS

```
SetDrMd( rp, mode )
      a1  d0:8
```

```
void SetDrMd( struct RastPort *, UBYTE );
```

FUNCTION

Set the drawing mode for lines, fills and text.
Get the bit definitions from rastport.h

INPUTS

rp - pointer to RastPort structure.
mode - 0-255, some combinations may not make much sense.

RESULT

The mode set is dependent on the bits selected.
Changes minterms to reflect new drawing mode.
Sets line drawer to restart pattern.

BUGS

SEE ALSO

SetAPen() SetBPen() graphics/rastport.h

1.137 graphics.library/SetFont

NAME

SetFont -- Set the text font and attributes in a RastPort.

SYNOPSIS

```
SetFont(rp, font)
        A1    A0
```

```
void SetFont(struct RastPort *, struct TextFont *);
```

FUNCTION

This function sets the font in the RastPort to that described by font, and updates the text attributes to reflect that change. This function clears the effect of any previous soft styles.

INPUTS

rp - the RastPort in which the text attributes are to be changed
font - pointer to a TextFont structure returned from OpenFont()
or OpenDiskFont()

RESULT

NOTES

This function had previously been documented that it would accept a null font. This practice is discouraged.

- o Use of a RastPort with a null font with text routines has always been incorrect and risked the guru.
- o Keeping an obsolete font pointer in the RastPort is no more dangerous than keeping a zero one there.
- o SetFont(rp, 0) causes spurious low memory accesses under some system software releases.

As of V36, the following Amiga font variants are no longer directly supported:

fonts with NULL tf_CharSpace and non-NULL tf_CharKern.

fonts with non-NULL tf_CharSpace and NULL tf_CharKern.

fonts with NULL tf_CharSpace and NULL tf_CharKern with

a tf_CharLoc size component greater than tf_XSize.

Attempts to SetFont these one of these font variants will cause the system to modify your font to make it acceptable.

BUGS

Calling SetFont() on in-code TextFonts (ie fonts not OpenFont()ed) will result in a loss of 24 bytes from the system as of V36.

This can be resolved by calling StripFont().

SEE ALSO
OpenFont() StripFont()
diskfont.library/OpenDiskFont() graphics/text.h

1.138 graphics.library/SetMaxPen

NAME
SetMaxPen -- set maximum pen value for a rastport (V39).

SYNOPSIS
SetMaxPen (rp, maxpen)
a0 d0

void SetMaxPen(struct RastPort *,ULONG)

FUNCTION
This will instruct the graphics library that the owner of the rastport will not be rendering in any colors whose index is >maxpen. If there are any speed optimizations which the graphics device can make based on this fact (for instance, setting the pixel write mask), they will be done.

Basically this call sets the rastport mask, if this would improve speed. On devices where masking would slow things down (like with chunky pixels), it will be a no-op.

INPUTS
rp = a pointer to a valid RastPort structure.
maxpen = a longword pen value.

BUGS

NOTES
The maximum pen value passed must take into account not only which colors you intend to render in the future, but what colors you will be rendering on top of.
SetMaxPen(rp,0) doesn't make much sense.

SEE ALSO
SetWriteMask()

1.139 graphics.library/SetOPen

NAME
SetOPen -- Change the Area OutLine pen and turn on Outline mode for areafills.

SYNOPSIS
SetOPen(rp, pen)

void SetOPen(struct RastPort *, UBYTE);

FUNCTION
 This is implemented as a c-macro.
 Pen is the pen number that will be used to draw a border
 around an areafill during AreaEnd().

INPUTS
 rp = pointer to RastPort structure
 pen = number between 0-255

BUGS

SEE ALSO
 AreaEnd() graphics/gfxmacros.h graphics/rastport.h

1.140 graphics.library/SetOutlinePen

NAME
 SetOutlinePen -- Set the Outline Pen value for a RastPort (V39).

SYNOPSIS

```
old_pen=SetOutlinePen ( rp, pen )
d0                      a0    d0
```

ULONG SetOutlinePen(struct RastPort *,ULONG)

FUNCTION
 Set the current value of the Outline pen for the rastport and turn on area outline mode. This function should be used instead of poking the structure directly, because future graphics devices may store it differently, for instance, using more bits.

INPUTS
 rp = a pointer to a valid RastPort structure.
 pen = a longword pen number

returns the previous outline pen
 BUGS

NOTES

SEE ALSO
 GetOPen() graphics/gfxmacros.h

1.141 graphics.library/SetRast

NAME
 SetRast - Set an entire drawing area to a specified color.

SYNOPSIS

```
SetRast ( rp, pen )
```


a1 d0

```
void SetRast( struct RastPort *, UBYTE );
```

FUNCTION

Set the entire contents of the specified RastPort to the specified pen.

INPUTS

rp - pointer to RastPort structure
pen - the pen number (0-255) to jam into bitmap

RESULT

All pixels within the drawing area are set to the selected pen number.

BUGS

SEE ALSO

RectFill() graphics/rastport.h

1.142 graphics.library/SetRGB32

NAME

SetRGB32 -- Set one color register for this Viewport. (V39)

SYNOPSIS

```
SetRGB32( vp, n, r, g, b)
          a0 d0 d1 d2 d3
```

```
void SetRGB32( struct ViewPort *, ULONG, ULONG, ULONG, ULONG );
```

INPUTS

vp = viewport
n = the number of the color register to set.
r = red level (32 bit left justified fraction)
g = green level (32 bit left justified fraction)
b = blue level (32 bit left justified fraction)

RESULT

If there is a ColorMap for this viewport, then the value will be stored in the ColorMap.

The selected color register is changed to match your specs.

If the color value is unused then nothing will happen.

BUGS

NOTES

Lower order bits of the palette specification will be discarded, depending on the color palette resolution of the target graphics device. Use 0xffffffff for the full value, 0x7fffffff for 50%, etc. You can find out the palette range for your screen by querying the graphics data base.

SEE ALSO

GetColorMap() GetRGB32() SetRGB32CM() LoadRGB32() graphics/view.h

1.143 graphics.library/SetRGB32CM

NAME

SetRGB32CM -- Set one color register for this ColorMap. (V39)

SYNOPSIS

```
SetRGB32CM(  cm,  n,   r,   g,   b)
              a0 d0   d1   d2   d3
```

```
void SetRGB4CM( struct ColorMap *, ULONG, ULONG, ULONG , ULONG);
```

INPUTS

cm = colormap
 n = the number of the color register to set. Must not exceed the number of colors allocated for the colormap.
 r = red level (32 bit unsigned left justified fraction)
 g = green level
 b = blue level

RESULT

Store the (r,g,b) triplet at index n of the ColorMap structure.

This function can be used to set up a ColorMap before before linking it into a viewport.

BUGS

SEE ALSO

GetColorMap() GetRGB32() SetRGB32() SetRGB4CM() graphics/view.h

1.144 graphics.library/SetRGB4

NAME

SetRGB4 -- Set one color register for this viewport.

SYNOPSIS

```
SetRGB4(  vp, n,   r,   g,   b)
          a0 d0  d1:4 d2:4 d3:4
```

```
void SetRGB4( struct ViewPort *, SHORT, UBYTE, UBYTE, UBYTE );
```

FUNCTION

Change the color look up table so that this viewport displays the color (r,g,b) for pen number n.

INPUTS

vp - pointer to viewport structure
 n - the color number (range from 0 to 31)
 r - red level (0-15)
 g - green level (0-15)

b - blue level (0-15)

RESULT

If there is a ColorMap for this viewport, then the value will be stored in the ColorMap.

The selected color register is changed to match your specs. If the color value is unused then nothing will happen.

BUGS

NOTE: Under V36 and up, it is not safe to call this function from an interrupt, due to semaphore protection of graphics copper lists.

SEE ALSO

LoadRGB4() GetRGB4() graphics/view.h

1.145 graphics.library/SetRGB4CM

NAME

SetRGB4CM -- Set one color register for this ColorMap.

SYNOPSIS

```
SetRGB4CM( cm, n, r, g, b)
           a0 d0 d1:4 d2:4 d3:4
```

```
void SetRGB4CM( struct ColorMap *, SHORT, UBYTE, UBYTE, UBYTE );
```

INPUTS

cm = colormap
 n = the number of the color register to set. Ranges from 0 to 31 on current Amiga displays.
 r = red level (0-15)
 g = green level (0-15)
 b = blue level (0-15)

RESULT

Store the (r,g,b) triplet at index n of the ColorMap structure.

This function can be used to set up a ColorMap before before linking it into a viewport.

BUGS

SEE ALSO

GetColorMap() GetRGB4() SetRGB4() graphics/view.h

1.146 graphics.library/SetRAttrA

NAME

SetRAttrA -- modify rastport settings via a tag list
 SetRAttrs -- varargs stub for SetRAttrA

SYNOPSIS

```
SetRPAAttrA(rp, tags)
           a0  a1
```

```
void SetRPAAttrA(struct RastPort *, struct TagItem *);
```

```
SetRPAAttrs(rp, tag, ...);
```

FUNCTION

Modify settings of a rastport, based on the taglist passed.
currently available tags are:

```
RPTAG_Font      Font for Text()
RPTAG_SoftStyle  style for text (see graphics/text.h)
RPTAG_APen      Primary rendering pen
RPTAG_BPen      Secondary rendering pen
RPTAG_DrMd      Drawing mode (see graphics/rastport.h)
RPTAG_OutLinePen Area Outline pen
RPTAG_WriteMask Bit Mask for writing.
RPTAG_MaxPen     Maximum pen to render (see SetMaxPen())
```

INPUTS

rp - pointer to the RastPort to modify.
tags - a standard tag list

RESULT

BUGS

SEE ALSO

SetFont() SetSoftStyle() SetAPen() SetBPen() SetDrMd() SetOutLinePen()
SetWriteMask() SetMaxPen() GetRPAAttrA() graphics/rpattr.h

1.147 graphics.library/SetSoftStyle

NAME

SetSoftStyle -- Set the soft style of the current font.

SYNOPSIS

```
newStyle = SetSoftStyle(rp, style, enable)
D0                      A1  D0      D1
```

```
ULONG SetSoftStyle(struct RastPort *, ULONG, ULONG);
```

FUNCTION

This function alters the soft style of the current font. Only those bits that are also set in enable are affected. The resulting style is returned, since some style request changes will not be honored when the implicit style of the font precludes changing them.

INPUTS

rp - the RastPort from which the font and style
are extracted.
style - the new font style to set, subject to enable.

enable - those bits in style to be changed. Any set bits here that would not be set as a result of AskSoftStyle will be ignored, and the newStyle result will not be as expected.

RESULTS

newStyle - the resulting style, both as a result of previous soft style selection, the effect of this function, and the style inherent in the set font.

BUGS

SEE ALSO

AskSoftStyle() graphics/text.h

1.148 graphics.library/SetWriteMask

NAME

SetWriteMask -- Set the pixel write mask value for a RastPort (V39).

SYNOPSIS

```
success=SetWriteMask ( rp, msk )
d0                      a0    d0
```

ULONG SetWriteMask(struct RastPort *,ULONG)

FUNCTION

Set the current value of the bit write mask for the rastport. bits of the pixel with zeros in their mask will not be modified by subsequent drawing operations.

INPUTS

rp = a pointer to a valid RastPort structure.
msk = a longword mask value.

Graphics devices which do not support per-bit masking will return 0 (failure).

BUGS

NOTES

SEE ALSO

graphics/gfxmacros.h

1.149 graphics.library/SortGLList

NAME

SortGLList -- Sort the current gel list, ordering its y,x coordinates.

SYNOPSIS

SortGLList(rp)

A1

```
void SortGLList(struct RastPort *);
```

FUNCTION

Sorts the current gel list according to the gels' y,x coordinates. This sorting is essential before calls to DrawGLList or DoCollision.

INPUTS

rp = pointer to the RastPort structure containing the GelsInfo

RESULT

BUGS

SEE ALSO

InitGels() DoCollision() DrawGLList() graphics/rastport.h

1.150 graphics.library/StripFont

NAME

StripFont -- remove the tf_Extension from a font (V36)

SYNOPSIS

```
StripFont(font)
    A0
```

```
VOID StripFont(struct TextFont *);
```

1.151 graphics.library/SyncSBitMap

NAME

SyncSBitMap -- Synchronize Super BitMap with whatever is in the standard Layer bounds.

SYNOPSIS

```
SyncSBitMap( layer )
    a0
```

```
void SyncSBitMap( struct Layer * );
```

FUNCTION

Copy all bits from ClipRects in Layer into Super BitMap BitMap. This is used for those functions that do not want to deal with the ClipRect structures but do want to be able to work with a SuperBitMap Layer.

INPUTS

layer - pointer to a Layer that has a SuperBitMap
The Layer should already be locked by the caller.

RESULT

After calling this function, the programmer can manipulate the bits in the superbitmap associated with the layer. Afterwards, the programmer should call CopySBitMap to copy the bits back into the onscreen layer.

BUGS

SEE ALSO

CopySBitMap() graphics/clip.h

1.152 graphics.library/Text

NAME

Text -- Write text characters (no formatting).

SYNOPSIS

```
Text(rp, string, length)
    A1  A0          D0-0:16
```

```
void Text(struct RastPort *, STRPTR, WORD);
```

FUNCTION

This graphics function writes printable text characters to the specified RastPort at the current position. No control meaning is applied to any of the characters, thus only text on the current line is output.

The current position in the RastPort is updated to the next character position.

If the characters displayed run past the RastPort boundary, the current position is truncated to the boundary, and thus does not equal the old position plus the text length.

INPUTS

rp - a pointer to the RastPort which describes where the text is to be output
string - the address of string to output
length - the number of characters in the string.
 If zero, there are no characters to be output.

NOTES

- o This function may use the blitter.
- o Changing the text direction with RastPort->TxSpacing is not supported.

BUGS

For V34 and earlier:

- o The maximum string length (in pixels) is limited to (1024 - 16 = 1008) pixels wide.
- o A text string whose last character(s) have a tf_CharLoc size component that extends to the right of the rightmost of the initial and final CP positions will be (inappropriately) clipped.

SEE ALSO

Move() TextLength() graphics/text.h graphics/rastport.h

1.153 graphics.library/TextExtent

NAME

TextExtent -- Determine raster extent of text data. (V36)

SYNOPSIS

```
TextExtent(rp, string, count, textExtent)
           A1  A0           D0:16  A2
```

```
void textExtent(struct RastPort *, STRPTR, WORD,
                struct TextExtent *);
```

FUNCTION

This function determines a more complete metric of the space that a text string would render into than the TextLength() function.

INPUTS

rp - a pointer to the RastPort which describes where the text attributes reside.
string - the address of the string to determine the length of.
count - the number of characters in the string.
 If zero, there are no characters in the string.
textExtent - a structure to hold the result.

RESULTS

textExtent is filled in as follows:

te_Width - same as TextLength() result: the rp_cp_x advance that rendering this text would cause.
te_Height - same as tf_YSize. The height of the font.
te_Extent.MinX - the offset to the left side of the rectangle this would render into. Often zero.
te_Extent.MinY - same as -tf_Baseline. The offset from the baseline to the top of the rectangle this would render into.
te_Extent.MaxX - the offset of the left side of the rectangle this would render into. Often the same as te_Width-1.
te_Extent.MaxY - same as tf_YSize-tf_Baseline-1.
 The offset from the baseline to the bottom of the rectangle this would render into.

SEE ALSO

TextLength() Text() TextFit()
graphics/text.h graphics/rastport.h

1.154 graphics.library/TextFit

NAME

TextFit - count characters that will fit in a given extent (V36)

SYNOPSIS

```
chars = TextFit(rastport, string, strlen, textExtent,
               D0          A1          A0          D0          A2
               constrainingExtent, strDirection,
               A3          D1
               constrainingBitWidth, constrainingBitHeight)
               D2          D3
```

```
ULONG TextFit(struct RastPort *, STRPTR, UWORD,
              struct TextExtent *, struct TextExtent *, WORD, UWORD, UWORD);
```

FUNCTION

This function determines how many of the characters of the provided string will fit into the space described by the constraining parameters. It also returns the extent of that number of characters.

INPUTS

rp - a pointer to the RastPort which describes where the text attributes reside.

string - the address of string to determine the constraint of

strlen - The number of characters in the string.
If zero, there are no characters in the string.

textExtent - a structure to hold the extent result.

constrainingExtent - the extent that the text must fit in.
This can be NULL, indicating only the constrainingBit dimensions will describe the constraint.

strDirection - the offset to add to the string pointer to get to the next character in the string. Usually 1.
Set to -1 and the string to the end of the string to perform a TextFit() anchored at the end. No other value is valid.

constrainingBitWidth - an alternative way to specify the rendering box constraint width that is independent of the rendering origin. Range 0..32767.

constrainingBitHeight - an alternative way to specify the rendering box constraint height that is independent of the rendering origin. Range 0..32767.

RESULTS

chars - the number of characters from the origin of the given string that will fit in both the constraining extent (which specifies a CP bound and a rendering box relative to the origin) and in the rendering width and height specified.

NOTES

The result is zero chars and an empty textExtent when the fit cannot be performed. This occurs not only when no text will fit in the provided constraints, but also when:

- the RastPort rp's rp_TxSpacing sign and magnitude is so great it reverses the path of the text.
- the constrainingExtent does not include x = 0.

BUGS

Under V37, `TextFit()` would return one too few characters if the font was proportional. This can be worked around by passing `(constrainingBitWidth + 1)` for proportional fonts. This is fixed for V39.

SEE ALSO

`TextExtent()` `TextLength()` `Text()`
`graphics/text.h` `graphics/rastport.h`

1.155 graphics.library/TextLength

NAME

`TextLength` -- Determine raster length of text data.

SYNOPSIS

```
length = TextLength(rp, string, count)
D0                                A1  A0      D0:16
```

```
WORD TextLength(struct RastPort *, STRPTR, WORD);
```

FUNCTION

This graphics function determines the length that text data would occupy if output to the specified `RastPort` with the current attributes. The length is specified as the number of raster dots: to determine what the current position would be after a `Text()` using this string, add the length to `cp_x` (`cp_y` is unchanged by `Text()`). Use the newer `TextExtent()` to get more information.

INPUTS

`rp` - a pointer to the `RastPort` which describes where the text attributes reside.
`string` - the address of string to determine the length of
`count` - the string length. If zero, there are no characters in the string.

RESULTS

`length` - the number of pixels in x this text would occupy, not including any negative kerning that may take place at the beginning of the text string, nor taking into account the effects of any clipping that may take place.

NOTES

Prior to V36, the result length occupied only the low word of `d0` and was not sign extended into the high word.

BUGS

A length that would overflow single word arithmetic is not calculated correctly.

SEE ALSO

```
TextExtent()  Text()  TextFit()  
graphics/text.h  graphics/rastport.h
```

1.156 graphics.library/UnlockLayerRom

NAME

UnlockLayerRom -- Unlock Layer structure by ROM(gfx lib) code.

SYNOPSIS

```
UnlockLayerRom( layer )  
    a5
```

```
void UnlockLayerRom( struct Layer * );
```

FUNCTION

Release the lock on this layer. If the same task has called LockLayerRom more than once than the same number of calls to UnlockLayerRom must happen before the layer is actually freed so that other tasks may use it.
This call does destroy scratch registers.
This call is identical to UnlockLayer (layers.library).

INPUTS

layer - pointer to Layer structure

BUGS

SEE ALSO

LockLayerRom() layers.library/UnlockLayer() graphics/clip.h

1.157 graphics.library/VBeamPos

NAME

VBeamPos -- Get vertical beam position at this instant.

SYNOPSIS

```
pos = VBeamPos()  
    d0
```

```
LONG VBeamPos( void );
```

FUNCTION

Get the vertical beam position from the hardware.

INPUTS

none

RESULT

interrogates hardware for beam position and returns value.
valid results in are the range of 0-511.
Because of multitasking, the actual value returned may have no use. If you are the highest priority task then the value

returned should be close, within 1 line.

BUGS

SEE ALSO

1.158 graphics.library/VideoControl

NAME

VideoControl -- Modify the operation of a ViewPort's ColorMap (V36)

VideoControlTags -- varargs stub for VideoControl (V36)

SYNOPSIS

```
error = VideoControl( cm , tags )
d0                      a0    a1
```

```
ULONG VideoControl( struct ColorMap *, struct TagItem * );
```

```
error= VideoControlTags(cm, tags,...);
```

FUNCTION

Process the commands in the VideoControl command TagItem buffer using cm as the target, with respect to its "attached" ViewPort.

viewport commands:

VTAG_ATTACH_CM	[_SET		_GET]	-- set/get attached viewport
VTAG_VIEWPORTEXTRA	[_SET		_GET]	-- set/get attached vp_extra
VTAG_NORMAL_DISP	[_SET		_GET]	-- set/get DisplayInfoHandle (natural mode)
VTAG_COERCE_DISP	[_SET		_GET]	-- set/get DisplayInfoHandle (coerced mode)
VTAG_PF1_BASE	[_SET		_GET]	-- set/get color base for first playfield. (V39)
VTAG_PF2_BASE	[_SET		_GET]	-- set/get color base for second playfield. (V39)
VTAG_SPODD_BASE	[_SET		_GET]	-- set/get color base for odd sprites. (V39)
VTAG_SPEVEN_BASE	[_SET		_GET]	-- set/get color base for even sprites. (V39)
VTAG_BORDERSPRITE	[_SET		_GET]	-- on/off/inquire sprites in borders. (V39)
VTAG_SPRITERESN	[_SET		_GET]	-- set/get sprite resolution (legal values are SPRITERESN_ECS/_140NS/_70NS/_35NS. see graphics/view.h) (V39)
VTAG_PF1_TO_SPRITEPRI	[_SET		_GET]	-- set/get playfield1 priority with respect to sprites (V39)
VTAG_PF2_TO_SPRITEPRI	[_SET		_GET]	-- set/get playfield2 priority with respect to sprites (V39)

9)

9)

(These two require that the ColorMap is attached to a ViewPort to be effective).

genlock commands:

```
VTAG_BORDERBLANK      [_SET | _CLR | _GET] -- on/off/inquire blanking
VTAG_BORDERNOTTRANS    [_SET | _CLR | _GET] -- on/off/inquire nottransparency
VTAG_CHROMAKEY         [_SET | _CLR | _GET] -- on/off/inquire chroma mode
VTAG_BITPLANEKEY       [_SET | _CLR | _GET] -- on/off/inquire bitplane mode
VTAG_CHROMA_PEN        [_SET | _CLR | _GET] -- set/clr/get chromakey pen #
VTAG_CHROMA_PLANE      [_SET |      | _GET] -- set/get bitplanekey plane #
```

control commands:

VTAG_IMMEDIATE - normally, VideoControl changes do not occur until the next MakeVPort. Using this tag, some changes can be made to happen immediately. The tag data is a pointer to a longword flag variable which will be cleared if all changes happened immediately. See the example. (V39)

VTAG_FULLPALETTE [_SET | _CLR | _GET] -- enable/disable loading of all colors in the copper list.

Normally, graphics will only load the color which are necessary for the viewport, based upon the screen depth and mode. In order to use the color palette banking features, you may need to use this tag to tell graphics to load ALL colors, regardless of screen depth. (V39)

VC_IntermediateCLUpdate

VC_IntermediateCLUpdate_Query

When set, graphics will update the intermediate copper lists on colour changes. When FALSE, graphics won't update the intermediate copperlists, so ScrollVPort(), ChangeVPBitMap() and colour loading functions will be faster. This value is TRUE by default. (V40)

VC NoColorPaletteLoad

VC_NoColorPaletteLoad_Query

When set, only colour 0 will be loaded for this ViewPort, hence the inter-ViewPort gap will be smaller. The colours for this ViewPort are inherited from the next higher ViewPort. The results are undefined if this is the first or only ViewPort in the display, and undefined when used in conjunction with VTAG_FULLPALETTE (!?!).

This value is FALSE by default. (V40)

VC DUALPF Disable

VC_DUALPF_Disable_Query

When set, disables the setting of the dual-playfield bit in bplcon0. When used with a dual-playfield mode screen, this allows using separate scroll and bitmaps for the odd and even bitplanes, without going through the normal dual-playfield priority and palette selection. With appropriate palette setup, this can be used for transparency effects, etc.

copper commands

[illegible]

edge of ColorMap->cm_vp
(defaults to off)

buffer commands:

VTAG_NEXTBUF_CM -- link to more VTAG commands
VTAG_END_CM -- terminate command buffer

batch mode commands:

(if you want your videocontrol taglist to be processed in "batch" mode, that is, at the next MakeVPort() for the ColorMap->cm_vp; you may install a static list of videocontrol TagItems into the ColorMap with the BATCH_ITEMS_SET command; and then enable/disable batch mode processing of those items via the BATCH_CM control command)

VTAG_BATCH_CM [_SET | _CLR | _GET] -- on/off/inquire batch mode
VTAG_BATCH_ITEMS [_SET | _ADD | _GET] -- set/add/get batched TagLists

private commands (used internally by intuition -- do not call):

VTAG_VPMODEID [_SET | _CLR | _GET] -- force GetVPMODEID() return

INPUTS

cm = pointer to struct ColorMap obtained via GetColorMap().
tags = pointer to a table of videocontrol tagitems.

RESULT

error = NULL if no error occurred in the control operation.
(non-NULL if bad colormap pointer, no tagitems or bad tag)

The operating characteristics of the ColorMap and its attached ViewPort are modified. The result will be incorporated into the ViewPort when its copper lists are reassembled via MakeVPort().

Note that you must NOT change colors in the viewport (via SetRGB4(), LoadRGB4(), SetRGB4(), etc.) after changing any of the color palette offsets (VTAG_PFL_BASE, etc), without first remaking the ViewPort.

NOTES

Sprite resolutions is controlled by two sets of tags, SPRITERESN and DEFSPRITERESN. If you don't set the sprite resolution, it will follow the intuition-controlled "default" sprite resolution. Setting the sprite resolution to one of the SPRITERESN_ values will allow the application to override intuition's control of it.

This function will modify the contents of the TagList you pass to it by changing _GET tags to the corresponding _SET or _CLR tag. The exceptions to this rule are documented as such above (such as VTAG_IMMEDIATE).

The new tags added for V40 have the prefix VC_ instead of VTAG_. These tags work in the same manner as all other tags in the system, and will not be modified by VideoControl().

```

EXAMPLE
must_remake=-1;
error=VideoControl(myvp->ColorMap, VTAG_BORDERBLANK_SET, -1,
                  (GFXBase->lib_Version>=39)?VTAG_IMMEDIATE:TAG_IGNORE,
                  &must_remake);
if (must_remake) { MakeVPort(myview, myvp); MrgCop(myview); }

```

```

EXAMPLE
struct TagItem VCTags[] =
{
    {VTAG_BORDERBLANK_GET, NULL},
    {VTAG_SPRITERESN_SET, SPRITERESN_35NS},
    {TAG_DONE, NULL},
};
BOOL bblank = FALSE;

if (VideoControl(cm, VCTags) == NULL)
{
    bblank = (VCTags[0].ti_Tag == VTAG_BORDERBLANK_SET);
}

```

```

EXAMPLE
struct TagItem VCTags[] =
{
    {VC_NoColorPaletteLoad_Query, NULL},
    {TAG_DONE},
};
ULONG query;

VCTags[0].ti_Data = (ULONG)&query;
if (VideoControl(cm, VCTags) == NULL)
{
    printf("Palette loading is %s\n", (query ? "off" : "on"));
}

```

BUGS

SEE ALSO

graphics/videocontrol.h, GetColorMap(), FreeColorMap()

1.159 graphics.library/WaitBlit

NAME

WaitBlit -- Wait for the blitter to be finished before proceeding with anything else.

SYNOPSIS

WaitBlit()

```
void WaitBlit( void );
```

FUNCTION

WaitBlit returns when the blitter is idle. This function should normally only be used when dealing with the blitter in a synchronous manner, such as when using OwnBlitter and DisownBlitter.

WaitBlit does not wait for all blits queued up using QBlit or QBSBlit. You should call WaitBlit if you are just about to modify or free some memory that the blitter may be using.

INPUTS

none

RESULT

Your program waits until the blitter is finished.
This routine does not use any the CPU registers.
do/d1/a0/a1 are preserved by this routine.
It may change the condition codes though.

BUGS

When examining bits with the CPU right after a blit, or when freeing temporary memory used by the blitter, a WaitBlit() may be required.

Note that many graphics calls fire up the blitter, and let it run. The CPU does not need to wait for the blitter to finish before returning.

Because of a bug in Agnus (prior to all revisions of fat Agnus) this code may return too soon when the blitter has, in fact, not started the blit yet, even though BltSize has been written.

This most often occurs in a heavily loaded system with extended memory, HIRES, and 4 bitplanes.

WaitBlit currently tries to avoid this Agnus problem by testing the BUSY bit multiple times to make sure the blitter has started. If the blitter is BUSY at first check, this function busy waits.

This initial hardware bug was fixed as of the first "Fat Agnus" chip, as used in all A500 and A2000 computers.

Because of a different bug in Agnus (currently all revisions thru ECS) this code may return too soon when the blitter has, in fact, not stopped the blit yet, even though blitter busy has been cleared.

This most often occurs in a heavily loaded system with extended memory, in PRODUCTIVITY mode, and 2 bitplanes.

WaitBlit currently tries to avoid this Agnus problem by testing the BUSY bit multiple times to make sure the blitter has really written its final word of destination data.

SEE ALSO

OwnBlitter() DisownBlitter() hardware/blit.h

1.160 graphics.library/WaitBOVP

NAME

WaitBOVP -- Wait till vertical beam reached bottom of this viewport.

SYNOPSIS

```
WaitBOVP( vp )  
    a0
```

```
void WaitBOVP( struct ViewPort * );
```

FUNCTION

Returns when the vertical beam has reached the bottom of this viewport

INPUTS

vp - pointer to ViewPort structure

RESULT

This function will return sometime after the beam gets beyond the bottom of the viewport. Depending on the multitasking load of the system, the actual beam position may be different than what would be expected in a lightly loaded system.

BUGS

Horrors! This function currently busy waits waiting for the beam to get to the right place. It should use the copper interrupt to trigger and send signals like WaitTOF does.

SEE ALSO

WaitTOF() VBeamPos()

1.161 graphics.library/WaitTOF

NAME

WaitTOF -- Wait for the top of the next video frame.

SYNOPSIS

```
WaitTOF()
```

```
void WaitTOF( void );
```

FUNCTION

Wait for vertical blank to occur and all vertical blank interrupt routines to complete before returning to caller.

INPUTS

none

RESULT

Places this task on the TOF wait queue. When the vertical blank interrupt comes around, the interrupt service routine will fire off signals to all the tasks doing WaitTOF. The highest priority task ready will get to run then.

BUGS

SEE ALSO

exec.library/Wait() exec.library/Signal()

1.162 graphics.library/WriteChunkyPixels

NAME

WriteChunkyPixels -- write the pen number value of a rectangular array of pixels starting at a specified x,y location and continuing through to another x,y location within a certain RastPort. (V40)

SYNOPSIS

```
WriteChunkyPixels(rp,xstart,ystart,xstop,ystop,array,bytesperrow)
                   A0 D0      D1      D2      D3      A2      D4
```

```
VOID WriteChunkyPixels(struct RastPort *, LONG, LONG,
                       LONG, LONG, UBYTE *, LONG);
```

FUNCTION

For each pixel in a rectangular region, decode the pen number selector from a linear array of pen numbers into the bit-planes used to describe a particular rastport.

INPUTS

rp - pointer to a RastPort structure
 (xstart,ystart) - starting point in the RastPort
 (xstop,ystop) - stopping point in the RastPort
 array - pointer to an array of UBYTES from which to fetch the pixel data.
 bytesperrow - The number of bytes per row in the source array.
 This should be at least as large as the number of pixels being written per line.

RESULT

NOTE

xstop must be >= xstart
 ystop must be >= ystart
 The source array can be in fast RAM.

===chunky-to-planar conversion HW:

GfxBase->ChunkyToPlanarPtr is either NULL, or a pointer to a HW register used to aid in the process of converting 8-bit chunky pixel data into the bit-plane format used by the Amiga custom display chips. If NULL, then such hardware is not present.

If an expansion device provides hardware which operates compatibly, than it can install the HW address into this pointer at boot time, and the system will use it.

This pointer may be used for direct access to the chunky-to-planar conversion HW, if more is desired than the straight chunky-pixel copy that is performed by WriteChunkyPixels().

If using the hardware directly, it should only be accessed when the task using it has control of the blitter (via OwnBlitter()), since this is the locking used to arbitrate usage of this device.

The hardware may be viewed as a device which accepts 32 8-bit

chunky pixels and outputs 8 longwords of bitplane data.

For proper operation, exactly 8 longwords (containing 32 pixels) of chunky data should be written to `*(GfxBase->ChunkyToPlanarPtr)`. After the data is written, bitplane data (starting with plane 0) can be read back a longword at a time. There is no need to read back all 8 longwords if the high-order bitplanes are not needed.

Since `WriteChunkyPixels` is not (currently) particularly fast on systems without the chunky-to-planar hardware, time critical applications (games, etc) may want to use their own custom conversion routine if `GfxBase->ChunkyToPlanarPtr` is `NULL`, and call `WriteChunkyPixels()` otherwise.

This pointer is only present in `GfxBase` in versions of `graphics.library` ≥ 40 , so this should be checked before the pointer is read.

BUGS

Not very fast on systems without chunky-to-planar conversion hardware.

SEE ALSO

`WritePixel()` `graphics/rastport.h`

1.163 `graphics.library/WritePixel`

NAME

`WritePixel` -- Change the pen num of one specific pixel in a specified `RastPort`.

SYNOPSIS

```
error = WritePixel(  rp, x,  y)
                   d0          a1 D0 D1
```

```
LONG WritePixel( struct RastPort *, SHORT, SHORT );
```

FUNCTION

Changes the pen number of the selected pixel in the specified `RastPort` to that currently specified by `PenA`, the primary drawing pen. Obeys minterms in `RastPort`.

INPUTS

`rp` - a pointer to the `RastPort` structure
`(x,y)` - point within the `RastPort` at which the selected pixel is located.

RESULT

`error` = 0 if pixel succesfully changed
 = -1 if `(x,y)` is outside the `RastPort`

BUGS

SEE ALSO

`ReadPixel()` `graphics/rastport.h`

1.164 graphics.library/WritePixelFormat8

NAME

WritePixelFormat8 -- write the pen number value of a rectangular array of pixels starting at a specified x,y location and continuing through to another x,y location within a certain RastPort. (V36)

SYNOPSIS

```
count = WritePixelFormat8(rp,xstart,ystart,xstop,ystop,array,temprp)
D0                                A0 D0:16  D1:16  D2:16 D3:16  A2   A1
```

```
LONG WritePixelFormat8(struct  RastPort *, UWORD, UWORD,
                        UWORD, UWORD, UBYTE *, struct  RastPort *);
```

FUNCTION

For each pixel in a rectangular region, decode the pen number selector from a linear array of pen numbers into the bit-planes used to describe a particular rastport.

INPUTS

```
rp      - pointer to a RastPort structure
(xstart,ystart) - starting point in the RastPort
(xstop,ystop)   - stopping point in the RastPort
array  - pointer to an array of UBYTES from which to fetch the
          pixel data. Allocate at least
          (((width+15)>>4)<<4)*(ystop-ystart+1)) bytes.
temprp - temporary rastport (copy of rp with Layer set == NULL,
          temporary memory allocated for
          temprp->BitMap with Rows set == 1,
          temprp->BytesPerRow == (((width+15)>>4)<<1),
          and temporary memory allocated for
          temprp->BitMap->Planes[])
```

RESULT

count will be set to the number of pixels plotted.

NOTE

```
xstop must be >= xstart
ystop must be >= ystart
```

BUGS

SEE ALSO

WritePixel() graphics/rastport.h

1.165 graphics.library/WritePixelLine8

NAME

WritePixelLine8 -- write the pen number value of a horizontal line of pixels starting at a specified x,y location and continuing right for count pixels. (V36)

SYNOPSIS

```
count = WritePixelLine8(rp,xstart,ystart,width,array,temprp)
```

D0	A0	D0:16	D1:16	D2	A2	A1
----	----	-------	-------	----	----	----

```
LONG WritePixelLine8(struct RastPort *, UWORD, UWORD,  
    UWORD, UBYTE *, struct RastPort *);
```

FUNCTION

For each pixel in a horizontal region, decode the pen number selector from a linear array of pen numbers into the bit-planes used to describe a particular rastport.

INPUTS

```
rp      - pointer to a RastPort structure
(x,y)   - a point in the RastPort
width   - count of horizontal pixels to write
array   - pointer to an array of UBYTEs from which to fetch the pixel data
          allocate at least (((width+15)>>4)<<4) bytes.
temprp  - temporary rastport (copy of rp with Layer set == NULL,
          temporary memory allocated for
          temprp->BitMap with Rows set == 1,
          temprp->BytesPerRow == (((width+15)>>4)<<1),
          and temporary memory allocated for
          temprp->BitMap->Planes[])
```

RESULT

Count will be set to the number of pixels plotted

NOTE

```
width must be non negative
```

BUGS

SEE ALSO

```
WritePixel() graphics/rastport.h
```

1.166 graphics.library/XorRectRegion

NAME _____

```
XorRectRegion -- Perform 2d XOR operation of rectangle
                with region, leaving result in region
```

SYNOPSIS

```
status = XorRectRegion(region, rectangle)
           d0             a0      a1
```

```
BOOL XorRectRegion( struct Region *, struct Rectangle * );
```

FUNCTION

Add portions of rectangle to region if they are not in the region.

Remove portions of rectangle from region if they are in the region.

INPUTS

```

region - pointer to Region structure
rectangle - pointer to Rectangle structure

```

RESULTS
status - return TRUE if successful operation
 return FALSE if ran out of memory

BUGS

SEE ALSO
OrRegionRegion() AndRegionRegion() graphics/regions.h

1.167 graphics.library/XorRegionRegion

NAME
XorRegionRegion -- Perform 2d XOR operation of one region
 with second region, leaving result in second region

SYNOPSIS
status = XorRegionRegion(region1,region2)
 d0 a0 a1

BOOL XorRegionRegion(struct Region *, struct Region *);

FUNCTION
Join the regions together. If any part of region1 overlaps
region2 then remove that from the new region.

INPUTS
region1 = pointer to Region structure
region2 = pointer to Region structure

RESULTS
status - return TRUE if successful operation
 return FALSE if ran out of memory

BUGS