

printer

COLLABORATORS

| | | | |
|---------------|---------------------------|---------------|------------------|
| | <i>TITLE :</i> printer | | |
| <i>ACTION</i> | <i>NAME</i> | <i>DATE</i> | <i>SIGNATURE</i> |
| WRITTEN BY | | July 18, 2024 | |

REVISION HISTORY

| NUMBER | DATE | DESCRIPTION | NAME |
|--------|------|-------------|------|
| | | | |

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Chapter 1

printer

1.1 printer.doc

| | | | |
|-------------|-----------|----------------|--------------|
| CMD_FLUSH | CMD_START | PRD_DUMPRPORT | PRD_RAWWRITE |
| CMD_INVALID | CMD_STOP | PRD_PRTCOMMAND | PWrite() |
| CMD_RESET | CMD_WRITE | PRD_QUERY | |

1.2 printer.device/CMD_FLUSH

NAME

CMD_FLUSH -- abort all I/O requests (immediate)

FUNCTION

CMD_FLUSH aborts all stopped I/O at the unit.

IO REQUEST

| | |
|------------|---|
| io_Message | mn_ReplyPort set if quick I/O is not possible |
| io_Device | preset by the call to OpenDevice |
| io_Command | CMD_FLUSH |
| io_Flags | IOB_QUICK set if quick I/O is possible |

1.3 printer.device/CMD_INVALID

NAME

CMD_INVALID -- invalid command

FUNCTION

CMD_INVALID is always an invalid command, and sets the device error appropriately.

IO REQUEST

| | |
|------------|---|
| io_Message | mn_ReplyPort set if quick I/O is not possible |
| io_Command | CMD_INVALID |
| io_Flags | IOB_QUICK set if quick I/O is possible |

1.4 printer.device/CMD_RESET

NAME

CMD_RESET -- reset the printer

FUNCTION

CMD_RESET resets the printer device without destroying handles to the open device.

IO REQUEST

| | |
|------------|---|
| io_Message | mn_ReplyPort set if quick I/O is not possible |
| io_Device | preset by the call to OpenDevice |
| io_Command | CMD_RESET |
| io_Flags | IOB_QUICK set if quick I/O is possible |

1.5 printer.device/CMD_START

NAME

CMD_START -- restart after stop (immediate)

FUNCTION

CMD_START restarts the unit after a stop command.

IO REQUEST

| | |
|------------|---|
| io_Message | mn_ReplyPort set if quick I/O is not possible |
| io_Device | preset by the call to OpenDevice |
| io_Command | CMD_START |
| io_Flags | IOB_QUICK set if quick I/O is possible |

1.6 printer.device/CMD_STOP

NAME

CMD_STOP -- pause current and queued I/O requests (immediate)

FUNCTION

CMD_STOP pauses all queued requests for the unit, and tries to pause the current I/O request. The only commands that will be subsequently allowed to be performed are immediate I/O requests, which include those to start, flush, and finish the I/O after the stop command.

IO REQUEST

| | |
|------------|---|
| io_Message | mn_ReplyPort set if quick I/O is not possible |
| io_Device | preset by the call to OpenDevice |
| io_Command | CMD_STOP |
| io_Flags | IOB_QUICK set if quick I/O is possible |

1.7 printer.device/CMD_WRITE

NAME

CMD_WRITE -- send output to the printer

FUNCTION

This function causes a buffer of characters to be written to the current printer port (usually parallel or serial). The number of characters is specified in `io_Length`, unless `-1` is used, in which case output is sent until a `0x00` is encountered.

The Printer device, like the Console device, maps ANSI X3.64 style 7-bit printer control codes to the control code set of the current printer. The ANSI codes supported can be found below.

NOTES

Not all printers will support all functions. In particular you may not assume that the MARGINS or TABS can be set. Close to half the supported printers don't fully implement one or the other. If you want the features of margins or tabs you will need to fake it internally by sending out spaces.

Note that the printer device may have already sent out a "set margins" command to the printer. If you are faking your own margins, be sure to cancel the old ones first. (use the "aCAM" command)

Defaults are set up so that if a normal AmigaDOS text file is sent to PRT:, it has the greatest chance of working.

(AmigaDOS text files are defined as follows:)

| | |
|-----------|----------------------------------|
| tabs | - every 8 |
| CR (0x0D) | - moves to start of current line |
| LF (0x0A) | - moves to start of next line |

IO REQUEST

| | |
|-------------------------|--|
| <code>io_Message</code> | <code>mn_ReplyPort</code> set |
| <code>io_Device</code> | preset by <code>OpenDevice</code> |
| <code>io_Unit</code> | preset by <code>OpenDevice</code> |
| <code>io_Command</code> | <code>CMD_WRITE</code> |
| <code>io_Length</code> | number of characters to process, or if <code>-1</code> , process until <code>0x00</code> encountered |
| <code>io_Data</code> | pointer to block of data to process |

RESULTS

`io_Error` : if `CMD_WRITE` succeeded, then `io_Error` will be zero. Otherwise `io_Error` will be non-zero.

SEE ALSO

`printer.h`, `parallel.device`, `serial.device`, Preferences

ANSI X3.64 style COMMANDS

| | | |
|--------------------|---------------------|------------------------|
| <code>aRIS</code> | <code>ESCc</code> | hard reset |
| <code>aRIN</code> | <code>ESC#1</code> | initialize to defaults |
| <code>aIND</code> | <code>ESCD</code> | true linefeed (lf) |
| <code>aNEL</code> | <code>ESCE</code> | return,lf |
| <code>aRI</code> | <code>ESCM</code> | reverse lf * |
| <code>aSGR0</code> | <code>ESC[0m</code> | normal character set |

| | | | |
|---------|----------|------------------------------|------------|
| aSGR3 | ESC[3m | italics on | |
| aSGR23 | ESC[23m | italics off | |
| aSGR4 | ESC[4m | underline on | |
| aSGR24 | ESC[24m | underline off | |
| aSGR1 | ESC[1m | boldface on | |
| aSGR22 | ESC[22m | boldface off | |
| aSFC | SGR30-39 | set foreground color | |
| aSBC | SGR40-49 | set background color | |
| | | | |
| aSHORP0 | ESC[0w | normal pitch | |
| aSHORP2 | ESC[2w | elite on | |
| aSHORP1 | ESC[1w | elite off | |
| aSHORP4 | ESC[4w | condensed on | |
| aSHORP3 | ESC[3w | condensed off | |
| aSHORP6 | ESC[6w | enlarged on | |
| aSHORP5 | ESC[5w | enlarged off | |
| | | | |
| aDEN6 | ESC[6"z | shadow print on | |
| aDEN5 | ESC[5"z | shadow print off | |
| aDEN4 | ESC[4"z | doublestrike on | |
| aDEN3 | ESC[3"z | doublestrike off | |
| aDEN2 | ESC[2"z | Near Letter Quality (NLQ) on | |
| aDEN1 | ESC[1"z | NLQ off | |
| | | | |
| aSUS2 | ESC[2v | superscript on | |
| aSUS1 | ESC[1v | superscript off | |
| aSUS4 | ESC[4v | subscript on | |
| aSUS3 | ESC[3v | subscript off | |
| aSUS0 | ESC[0v | normalize the line | * |
| aPLU | ESCL | partial line up | * |
| aPLD | ESCK | partial line down | * |
| | | | |
| aFNT0 | ESC(B | US char set (default) | or Font 0 |
| aFNT1 | ESC(R | French char set | or Font 1 |
| aFNT2 | ESC(K | German char set | or Font 2 |
| aFNT3 | ESC(A | UK char set | or Font 3 |
| aFNT4 | ESC(E | Danish I char set | or Font 4 |
| aFNT5 | ESC(H | Sweden char set | or Font 5 |
| aFNT6 | ESC(Y | Italian char set | or Font 6 |
| aFNT7 | ESC(Z | Spanish char set | or Font 7 |
| aFNT8 | ESC(J | Japanese char set | or Font 8 |
| aFNT9 | ESC(6 | Norweign char set | or Font 9 |
| aFNT10 | ESC(C | Danish II char set | or Font 10 |
| | | | |
| aPROP2 | ESC[2p | proportional on | * |
| aPROP1 | ESC[1p | proportional off | * |
| aPROP0 | ESC[0p | proportional clear | * |
| aTSS | ESC[n E | set proportional offset | * |
| aJFY5 | ESC[5 F | auto left justify | * |
| aJFY7 | ESC[7 F | auto right justify | * |
| aJFY6 | ESC[6 F | auto full justify | * |
| aJFY0 | ESC[0 F | auto justify off | * |
| aJFY3 | ESC[3 F | letter space (justify) | * |
| aJFY1 | ESC[1 F | word fill(auto center) | * |
| | | | |
| aVERP0 | ESC[0z | 1/8" line spacing | |
| aVERP1 | ESC[1z | 1/6" line spacing | |

| | | | |
|---------|--------------|--|---|
| aSLPP | ESC[nt | set form length n | |
| aPERF | ESC[nq | set perforation skip to n lines (n>0) | |
| aPERF0 | ESC[0q | perforation skip off | |
| aLMS | ESC#9 | Left margin set | * |
| aRMS | ESC#0 | Right margin set | * |
| aTMS | ESC#8 | Top margin set | * |
| aBMS | ESC#2 | Bottom margin set | * |
| aSTBM | ESC[Pn1;Pn2r | set T&B margins | * |
| aSLRM | ESC[Pn1;Pn2s | set L&R margin | * |
| aCAM | ESC#3 | Clear margins | |
| aHTS | ESCH | Set horiz tab | * |
| aVTS | ESCJ | Set vertical tabs | * |
| aTBC0 | ESC[0g | Clr horiz tab | * |
| aTBC3 | ESC[3g | Clear all h tab | * |
| aTBC1 | ESC[1g | Clr vertical tabs | * |
| aTBC4 | ESC[4g | Clr all v tabs | * |
| aTBCALL | ESC#4 | Clr all h & v tabs | * |
| aTBSALL | ESC#5 | Set default tabs (every 8) | |
| aEXTEND | ESC[Pn"x | Extended commands This is a mechanism for printer drivers to support extra commands which can be called by ANSI control sequences | |
| aRAW | ESC[Pn"r | Next 'Pn' chars are raw (ie. they are not parsed by the printer device, instead they are sent directly to the printer. | |

(*) indicates that sending this command may cause unexpected results on a large number of printers.

1.8 printer.device/PRD_DUMPRPORT

NAME

PRD_DUMPRPORT -- dump the specified RastPort to a graphics printer

FUNCTION

Print a rendition of the supplied RastPort, using the supplied ColorMap, position and scaling information, as specified in the printer preferences.

IO REQUEST

| | |
|-------------|---|
| io_Message | mn_ReplyPort set if quick I/O is not possible. |
| io_Command | PRD_DUMPRPORT. |
| io_Flags | IOB_QUICK set if quick I/O is possible. |
| io_RastPort | ptr to a RastPort. |
| io_ColorMap | ptr to a ColorMap. |
| io_Modes | the 'modes' flag from a ViewPort structure, (the upper word is reserved and should be zero). |

If you are running under version 36, or greater of graphics.library, it is recommended that you fill in "io_Modes" with the ULONG (32-bit)

value returned from calling:

```
ULONG ModeID = GetVPMODEID(struct ViewPort *);
```

Doing so provides for upwards compatibility with the new display modes available under V36 (example: aspect ratio calculations for new display modes).

| | |
|--|--|
| <pre>io_SrcX io_SrcY io_SrcWidth io_SrcHeight io_DestCols io_DestRows io_Special</pre> | <pre>x offset into the RastPort to start printing from. y offset into the RastPort to start printing from. width of the RastPort to print (from io_SrcX). height of the RastPort to print (from io_SrcY). width of the printout in printer pixels. height of the printout in printer pixels. flag bits (some of which pertain to DestCols and DestRows). -if SPECIAL_MIL is set, then the associated parameter is specified in thousandths of an inch on the printer. ie. if DestCols = 8000, DestRows = 10500 and SPECIAL_MILROWS and SPECIAL_MILCOLS is set then the printout would be 8.000 x 10.500 inches. -if SPECIAL_FULL is set, then the specific dimension is set to the maximum possible as determined by the printer limits or the configuration limits; whichever is less. -if SPECIAL_FRAC is set, the parameter is taken to be a longword binary fraction of the maximum for that dimension. -if all bits for a dimension are clear, (ie. SPECIAL MIL/FULL/FRAC and ASPECT are NOT set) then the parameter is specified in printer pixels. -if SPECIAL_CENTER is set then the image will be put between the left and right edge of the paper. -if SPECIAL_ASPECT is set, one of the dimensions may be reduced/expanded to preserve the aspect ratio of the print. -SPECIAL_DENSITY(1-7) this allows for a maximum of 7 different print densities. DENSITY1 is the lowest density and the default. -SPECIAL_NOFORMFEED - this allows for the mixing of text and graphics or multiple graphic dumps on page oriented printers (usually laser jet printers). When this flag is set the page will not be ejected after a graphic dump. If you perform another graphic dump without this flag set OR close the printer after printing text after a graphic dump, the page will be ejected. -if SPECIAL_TRUSTME is set then the printer specific driver is instructed to not issue a reset command before and after the dump. If this flag is NOT checked by the printer specific driver then setting this flag has no effect. Since we now recommend that printer driver writers no longer issue a reset command it is probably a safe idea to always set this flag when calling for a dump.</pre> |
|--|--|

-if SPECIAL_NOPRINT is set then the following is done:
 Compute print size, set 'io_DestCols' and 'io_DestRows' in the calling program's 'IODRPreq' structure and exit, DON'T PRINT. This allows the calling program to see what the final print size would be in printer pixels. Note that it modifies the 'io_DestCols' and 'io_DestRows' fields of your 'IODRPreq' structure. It also sets the print density and updates the 'MaxXDots', 'MaxYDots', 'XDotsInch', and 'YDotsInch' fields of the 'PrinterExtendedData' structure.

The following rules for the interpretation of io_DestRows and io_DestCols that may produce unexpected results when they are not greater than zero and io_Special is zero. They have been retained for compatibility. The user will not trigger these other rules with well formed usage of io_Special.

When io_Special is equal to 0, the following rules (from the V1.1 printer.device, and retained for compatibility reasons) take effect. Remember, these special rules are for io_DestRows and io_DestCols and only take effect if io_Special is 0).

- a) DestCols>0 & DestRows>0 - use as absolute values.
 ie. DestCols=320 & DestRows=200 means that the picture will appear on the printer as 320x200 dots.
- b) DestCols=0 & DestRows>0 - use the printers maximum number of columns and print DestRows lines. ie. if DestCols=0 and DestRows=200 then the picture will appear on the printer as wide as it can be and 200 dots high.
- c) DestCols=0 & DestRows=0 - same as above except the driver determines the proper number of lines to print based on the aspect ratio of the printer. ie. This results in the largest picture possible that is not distorted or inverted.
 Note: As of this writing, this is the call made by such program as DeluxePaint, GraphicCraft, and AegisImages.
- d) DestCols>0 & DestRows=0 - use the specified width and the driver determines the proper number of lines to print based on the aspect ratio of the printer. ie. if you desire a picture that is 500 pixels wide and aspect ratio correct, use DestCols=500 and DestRows=0.
- e) DestCols<0 or DestRows>0 - the final picture is either a reduction or expansion based on the fraction $|DestCols| / DestRows$ in the proper aspect ratio.
 Some examples:
 - 1) if DestCols=-2 & DestRows=1 then the printed picture will be 2x the AMIGA picture and in the proper aspect ratio.
 (2x is derived from $|-2| / 1$ which gives 2.0)
 - 2) if DestCols=-1 & DestRows=2 then the printed picture will be 1/2x the AMIGA picture in the proper aspect ratio.
 (1/2x is derived from $|-1| / 2$ which gives 0.5)

NOTES

The printer selected in preferences must have graphics capability to use this command. The error 'PDERR_NOTGRAPHICS' is returned if the printer can not print graphics.

Color printers may not be able to print black and white or greyscale pictures -- specifically, the Okimate 20 cannot print these with a color ribbon: you must use a black ribbon instead. If the printer has an input buffer option, use it. If the printer can be uni or bi directional, select uni-directional; this produces a much cleaner picture. Most printer drivers will attempt to set unidirectional printing if it is possible under software control.

Please note that the width and height of the printable area on the printer is in terms of pixels and bounded by the following:

- a) WIDTH = (RIGHT_MARGIN - LEFT_MARGIN + 1) / CHARACTERS_PER_INCH
- b) HEIGHT = LENGTH / LINES_PER_INCH

Margins are set by preferences.

For BGR printer support, the YMC values in the printer specific render.c functions equate to BGR respectively, ie. yellow is blue, magenta is green, and cyan is red.

Data Structures

The printer specific and non-specific data structures can be read ONCE you have opened the printer device. Here is a code fragment to illustrate how to do just that.

```
#include <exec/types.h>
#include <devices/printer.h>
#include <devices/prtbase.h>
#include <devices/prtgfx.h>

struct IODRPreq PReq;
struct PrinterData *PD;
struct PrinterExtendedData *PED;

open the printer device / if it opened...
if (OpenDevice("printer.device", 0, &PReq, 0) == NULL) {
    get pointer to printer data
    PD = (struct PrinterData *)PReq.io_Device;
    get pointer to printer extended data
    PED = &PD->pd_SegmentData->ps_PED;
    let's see what's there
    printf("PrinterName = '%s', Version=%u, Revision=%u\n",
        PED->ped_PrinterName, PD->pd_SegmentData->ps_Version,
        PD->pd_SegmentData->ps_Revision,);
    printf("PrinterClass=%u, ColorClass=%u\n",
        PED->ped_PrinterClass, PED->ped_ColorClass);
    printf("MaxColumns=%u, NumCharSets=%u, NumRows=%u\n",
        PED->ped_MaxColumns, PED->ped_NumCharSets, PED->ped_NumRows);
    printf("MaxXDots=%lu, MaxYDots=%lu, XDotsInch=%u, YDotsInch=%u\n",
        PED->ped_MaxXDots, PED->ped_MaxYDots,
        PED->ped_XDotsInch, PED->ped_YDotsInch);
    CloseDevice(&PReq);
}
```

Preferences

If you want the user to be able to access the printer preferences items without having to run preferences (like DPAINT II's printer requester), here is what you do. You can look at the printer's copy of preferences by referring to 'PD->pd_Preferences' (the printer device MUST already be opened at this point). After you have this you could put up a requester and allow the user to change whatever parameters they wanted. BEAR IN MIND THAT YOU ARE RESPONSIBLE FOR RANGE CHECKING THESE SELECTIONS! Listed below are the printer preferences items and their valid values.

```
PrintPitch          - PICA, ELITE, FINE.
PrintQuality        - DRAFT, LETTER.
PrintSpacing        - SIX_LPI, EIGHT_LPI.
PrintLeftMargin     - 1 to PrintRightMargin.
PrintRightMargin    - PrintLeftMargin to 999.
PaperLength         - 1 to 999.
PrintImage          - IMAGE_POSITIVE, IMAGE_NEGATIVE.
PrintAspect         - ASPECT_HORIZ, ASPECT_VERT.
PrintShade          - SHADE_BW, SHADE_GREYSCALE, SHADE_COLOR.
PrintThreshold      - 1 to 15.
PrintFlags          - CORRECT_RED, CORRECT_GREEN, CORRECT_BLUE,
                    CENTER_IMAGE, IGNORE_DIMENSIONS,
                    BOUNDED_DIMENSIONS, ABSOLUTE_DIMENSIONS,
                    PIXEL_DIMENSIONS, MULTIPLY_DIMENSIONS,
                    INTEGER_SCALING, ORDERED_DITHERING,
                    HALFTONE_DITHERING, FLOYD_DITHERING, ANTI_ALIAS,
                    GREY_SCALE2
PrintMaxWidth       - 0 to 65535.
PrintMaxHeight      - 0 to 65535.
PrintDensity        - 1 to 7.
PrintXOffset        - 0 to 255.
```

Asynchronous I/O

The recommended way to do asynchronous i/o is...

a) To send requests for i/o.

```
struct IORequest *ioreq;
struct MsgPort *port;
UBYTE signal;

port = ioreq->io_Message.mn_ReplyPort;
signal = port->mp_SigBit;

SendIO(ioreq);  send request
Wait(signal);  wait for completion (go to sleep)
while ((Msg = GetMsg(port)) != NULL) {  get ALL messages
}
```

b) To abort a previous request for i/o.

```
struct IORequest *ioreq;

AbortIO(ioreq);  abort request
WaitIO(ioreq);  wait for reply
```

at this point you can re-use 'ioreq'.

Note that in the above examples 'ioreq' could be any one of...

- a) struct IOStdReq a standard i/o request
- b) struct IODRPRReq a dumphrport i/o request
- c) struct IOPrtCmdReq a printer command i/o request

It is recommend that you do asynchronous i/o in your programs and give the user a way of aborting all requests.

V1.3 Printer Driver Notes

=====

In general densities which use more than one pass should only be used for B&W shade dumps. They can be used for Grey-Scale or Color Shade dumps BUT the output may tend to look muddy or dark. Also multiple pass Color dumps tend to dirty or smear the ribbon (ie. yellow will get contaminated with the other colors on the ribbon; you have been warned).

Alphacom_AlphaPro_101

- 1. Daisywheel printer (text only).

Brother_HR-15XL

- 1. Daisywheel printer (text only).

CalComp_ColorMaster

- 1. Thermal transfer b&w/color printer (text and graphics).
- 2. Use Black ribbon for non-color dumps; Color ribbon for color dumps.
- 3. Linefeeds # of vertical dots printed.
- 4. Densities supported are 203x200(1) dpi.
- 5. This is a dual printer driver. Select a PaperSize of 'Narrow Tractor' for use with the ColorMaster; 'Wide Tractor' for use with the ColorView-5912 (which uses 11 x 17 inch paper).

CalComp_ColorMaster2

- 1. Thermal transfer b&w/color printer (text and graphics).
- 2. Use Black ribbon for non-color dumps; Color ribbon for color dumps.
- 3. Linefeeds # of vertical dots printed.
- 4. Densities supported are 203x200(1) dpi.
- 5. This is a dual printer driver. Select a PaperSize of 'Narrow Tractor' for use with the ColorMaster; 'Wide Tractor' for use with the ColorView-5912 (which uses 11 x 17 inch paper).
- 6. This driver is the same as the Calcomp_ColorMaster driver EXCEPT it is approximately 2 times faster (during color dumps) and requires LOTS of memory (up to 1,272,003 bytes for a full 8 x 10 inch (1600 x 2000 dot) color dump). Typically full-size (color) dumps are 1600 x 1149 dots and require 730,767 bytes. Memory requirements for the ColorView-5912 are up to 2,572,803 bytes for a full 10 x 16 inch (2048 x 3200 dot) color dump. Typically full-size (color) dumps are 2048 x 2155 dots and require 1,732,623 bytes. The memory requirements are 1/3 when doing a non-color printout (on both the ColorMaster and ColorView).

Canon_PJ-1080A

1. Ink jet b&w/color printer (text and graphics).
2. Linefeeds # of vertical dots printed.
3. Densities supported are 83x84(1) dpi.

CBM_MPS1000

1. Dot matrix b&w printer (text and graphics).
 2. Linefeeds # of vertical dots printed
(-1/3 dot if PaperType = Single). *2
 3. Density XDPI YDPI XYDPI Comments
- | | | | | |
|---|-----------|-----|-------|---------------|
| 1 | 120 | 72 | 8640 | |
| 2 | 120 | 144 | 17280 | two pass |
| 3 | 240 | 72 | 17280 | *1 |
| 4 | 120 | 216 | 25920 | three pass |
| 5 | 240 | 144 | 34560 | two pass *1 |
| 6 | 240 | 216 | 51840 | three pass *1 |
| 7 | same as 6 | | | |

Diablo_630

1. Daisywheel printer (text only).

Diablo_Advantage_D25

1. Daisywheel printer (text only).

Diablo_C-150

1. Ink jet b&w/color printer (text and graphics).
2. Always linefeeds 4 dots (limitation of printer).
3. A PaperSize of 'Wide Tractor' selects a maximum print width of 8.5 inches (for wide roll paper).
5. Densities supported are 120x120(1) dpi.

EpsonQ (24-pin Epson compatible)

1. Dot matrix b&w/color printer (text and graphics).
 2. Drives all EpsonQ (LQ1500, LQ2500, etc.) compatible printers.
 3. Linefeeds # of vertical dots printed.
 4. Density XDPI YDPI XYDPI Comments
- | | | | | |
|-------|-----------|-----|-------|----|
| 1 | 90 | 180 | 16200 | |
| 2 | 120 | 180 | 21600 | |
| 3 | 180 | 180 | 32400 | |
| 4 | 360 | 180 | 64800 | *1 |
| 5,6,7 | same as 4 | | | |
5. A PaperSize of 'Wide Tractor' selects a maximum print width of 13.6 inches (for wide carriage printers).
 6. A PaperType of 'Single' uses only 16 of the 24 pins, whereas a PaperType of 'Fanfold' uses all 24 pins. The 'Single' option is useful for those printers which have a weak power supply and cannot drive all 24 pins continuously. If during a single pass of the print head you notice that the top two thirds of the graphics are darker than the bottom one third then you will probably need to drop down to 16 pins.

EpsonX[CBM_MPS-1250] (8/9-pin Epson compatible)

1. Dot matrix b&w/color printer (text and graphics).
2. Drives all EpsonX (EX/FX/JX/LX/MX/RX, etc.) compatible printers.
3. Linefeeds # of vertical dots printed (-1/3 dot if PaperType = Single). *2
4. Density XDPI YDPI XYDPI Comments

| | | | | |
|---|-----------|-----|-------|---------------|
| 1 | 120 | 72 | 8640 | |
| 2 | 120 | 144 | 17280 | two pass |
| 3 | 240 | 72 | 17280 | *1 |
| 4 | 120 | 216 | 25920 | three pass |
| 5 | 240 | 144 | 34560 | two pass *1 |
| 6 | 240 | 216 | 51840 | three pass *1 |
| 7 | same as 6 | | | |
5. A PaperSize of 'Wide Tractor' selects a maximum print width of 13.6 inches (for wide carriage printers).
6. Use this driver if you own a CBM_MPS-1250 (as it is EpsonX compatible).

EpsonXOld (8/9-pin Epson compatible)

1. Dot matrix b&w printer (text and graphics).
2. Drives all very old EpsonX (EX/FX/JX/LX/MX/RX, etc.) compatible printers.
3. Linefeeds # of vertical dots printed.
4. Density XDPI YDPI XYDPI Comments

| | | | | |
|---|-----|----|-------|-----------------------------------|
| 1 | 60 | 72 | 4320 | |
| 2 | 120 | 72 | 8640 | (double speed) *1 |
| 3 | 120 | 72 | 8640 | |
| 4 | 240 | 72 | 17280 | *1 |
| 5 | 120 | 72 | 8640 | (for use on old Star printers) |
| 6 | 240 | 72 | 17280 | (for use on old Star printers) *1 |
| 7 | 240 | 72 | 17280 | (same as density 4) *1 |
5. A PaperSize of 'Wide Tractor' selects a maximum print width of 13.6 inches (for wide carriage printers).
6. Use this driver if the EpsonX driver does not work properly in graphics or text mode on your EpsonX compatible printer.

generic

1. Text only printer.

Howtek_Pixelmaster

1. Plastic ink jet b&w/color printer (text and graphics).
2. Linefeeds # of vertical dots printed.
3. Density XDPI YDPI XYDPI Comments

| | | | | |
|-------|-----------|-----|-------|--|
| 1 | 80 | 80 | 6400 | |
| 2 | 120 | 120 | 14400 | |
| 3 | 160 | 160 | 25600 | |
| 4 | 240 | 240 | 57600 | |
| 5,6,7 | same as 4 | | | |
4. Maximum print area is 8.0 x 10.0 inches.

HP_DeskJet

1. Ink jet non-color printer (text and graphics).
2. Linefeeds # of vertical dots printed.
3. Density XDPI YDPI XYDPI Comments

| | | | | |
|-------|-----------|-----|-------|--|
| 1 | 75 | 75 | 5625 | |
| 2 | 100 | 100 | 10000 | |
| 3 | 150 | 150 | 22500 | |
| 4 | 300 | 300 | 90000 | |
| 5,6,7 | same as 4 | | | |

4. Maximum print area is 8.0 x 10.0 inches.

HP_LaserJet (LaserJet+/LaserJetII compatible)

1. Laser engine non-color printer (text and graphics).
2. Linefeeds # of vertical dots printed.
3. Density XDPI YDPI XYDPI Comments

| | | | | |
|-------|-----------|-----|-------|--|
| 1 | 75 | 75 | 5625 | |
| 2 | 100 | 100 | 10000 | |
| 3 | 150 | 150 | 22500 | |
| 4 | 300 | 300 | 90000 | |
| 5,6,7 | same as 4 | | | |

4. Maximum print area is 8.0 x 10.0 inches.

HP_PaintJet

1. Ink jet b&w/color printer (text and graphics).
2. Linefeeds # of vertical dots printed.
3. Densities supported are 180x180(1) dpi.

HP_ThinkJet

1. Ink jet non-color printer (text and graphics).
2. Linefeeds # of vertical dots printed.
3. Density XDPI YDPI XYDPI Comments

| | | | | |
|-----------|-----------|----|-------|--|
| 1 | 96 | 96 | 9216 | |
| 2 | 192 | 96 | 18432 | |
| 3,4,5,6,7 | same as 4 | | | |

Imagewriter II (Imagewriter compatible)

1. Dot matrix b&w/color printer (text and graphics).
2. Linefeeds # of vertical dots printed.
3. Density XDPI YDPI XYDPI Comments

| | | | | |
|---|-----|-----|-------|----------|
| 1 | 80 | 72 | 5760 | |
| 2 | 120 | 72 | 8640 | |
| 3 | 144 | 72 | 10368 | |
| 4 | 160 | 72 | 11520 | |
| 5 | 120 | 144 | 17280 | two pass |
| 6 | 144 | 144 | 20736 | two pass |
| 7 | 160 | 144 | 23040 | two pass |

Nec_Pinwriter (24-wire Pinwriter compatible (P5/P6/P7/P9/P2200))

1. Dot matrix b&w/color printer (text and graphics).
2. Drives all Nec 24-wire Pinwriter compatible printers.

3. Linefeeds # of vertical dots printed.

| 4. Density | XDPI | YDPI | XYDPI | Comments |
|------------|------|------|--------|----------|
| 1 | 90 | 180 | 16200 | |
| 2 | 120 | 180 | 21600 | |
| 3 | 180 | 180 | 32400 | |
| 4 | 120 | 360 | 43200 | two pass |
| 5 | 180 | 360 | 64800 | two pass |
| 6 | 360 | 180 | 64800 | |
| 7 | 360 | 360 | 129600 | two pass |

5. A PaperSize of 'Wide Tractor' selects a maximum print width of 13.6 inches (for wide carriage printers).

Okidata_92

1. Dot matrix non-color printer (text and graphics).
2. Always linefeeds 7/72 inch (limitation of printer in graphics mode).
3. Densities supported are 72x72 dpi.

Okidata_293I

1. Dot matrix b&w/color printer (text and graphics).
 2. Drives 292 or 293 using the IBM interface module.
 3. Linefeeds # of vertical dots printed (-1/2 dot if PaperType = Single) *3
- | 4. Density | XDPI | YDPI | XYDPI | Comments |
|------------|-----------|------|-------|----------|
| 1 | 120 | 144 | 17280 | |
| 2 | 240 | 144 | 34560 | |
| 3 | 120 | 288 | 34560 | two pass |
| 4 | 240 | 288 | 69120 | two pass |
| 5,6,7 | same as 4 | | | |

5. A PaperSize of 'Wide Tractor' selects a maximum print width of 13.6 inches (for wide carriage printers).

Okimate-20

1. Thermal transfer b&w/color printer (text and graphics).
2. Use Black ribbon for non-color dumps; Color ribbon for color dumps.
3. Linefeeds an even # of dots printed. (ie. if 3 printed, 4 advanced).
4. Densities supported are 120x144(1) dpi.

Quadram_QuadJet

1. Ink jet b&w/color printer (text and graphics).
2. Linefeeds # of vertical dots printed.
3. Densities supported are 83x84(1) dpi.

Qume_LetterPro_20

1. Daisywheel printer (text only).

Seiko_5300

1. Thermal transfer b&w/color printer (graphics only).
 2. Use Black ribbon for non-color dumps; Color ribbon for color dumps.
- | 3. Density | XDPI | YDPI | XYDPI | Comments |
|------------|------|------|-------|------------------------|
| 1 | 152 | 152 | 23104 | drives CH-5301 printer |

| | | | | |
|----------|-----|-----------|-------|------------------------|
| 2 | 203 | 203 | 41209 | drives CH-5312 printer |
| 3 | 240 | 240 | 57600 | drives CH-5303 printer |
| 4, 5,6,7 | | same as 3 | | |

You must select the proper density to drive the specific printer that you have.

4. This driver is not on the V1.3 Workbench or Extras disk. It is available on BIX and directly from Seiko.

Seiko_5300a

-
1. Thermal transfer b&w/color printer (graphics only).
 2. Use Black ribbon for non-color dumps; Color ribbon for color dumps.
 3. Density XDPI YDPI XYDPI Comments

| | | | | |
|----------|-----|-----------|-------|------------------------|
| 1 | 152 | 152 | 23104 | drives CH-5301 printer |
| 2 | 203 | 203 | 41209 | drives CH-5312 printer |
| 3 | 240 | 240 | 57600 | drives CH-5303 printer |
| 4, 5,6,7 | | same as 3 | | |

You must select the proper density to drive the specific printer that you have.

4. This driver is the same as the Seiko_5300 driver EXCEPT it is approximately 2 times faster (during color dumps) and requires LOTS of memory (up to 1,564,569 bytes for a full 8 x 10 inch (1927 x 2173 dot) color dump). Typically full-size (color) dumps are 1927 x 1248 dots and require 898,569 bytes. The memory requirements are 1/3 when doing a non-color printout.
5. This driver is not on the V1.3 Workbench or Extras disk. It is available on BIX and directly from Seiko.

Tektronix_4693D

-
1. Thermal transfer b&w/color printer (graphics only).
 2. Densities supported are 300x300(1) dpi
 3. Due to the way the printer images a picture none of the printer preferences options affect the printout with the following exceptions:
 - a) Aspect - Horizontal, Vertical
 - b) Shade - B&W, Grey_Scale, Color
 ...as a result of this only full size pictures can be printed.
 4. Keypad menu option 3b COLOR ADJUSTMENT may be set from the keypad. For normal prints this option should be set to "do not adjust".
 5. Keypad menu option 3d VIDEO COLOR CORRECTION may be set from the keypad. For normal prints this option should be set to "do not adjust".
 6. Keypad menu option 5 BACKGROUND COLOR EXCHANGE may be set from the keypad. For normal prints this option should be set to "print colors as received".
 7. Once a picture has been printed additional copies may be printed without resending by using the printers keypad.
 8. This driver is not on the V1.3 Workbench or Extras disk. It is available on BIX and directly from Tektronix.

Tektronix_4696

-
1. Ink jet b&w/color printer (text and graphics).
 2. Always linefeeds 4 dots (limitation of printer).
 3. Densities supported are 121x120(1), 242x120(black)(2) and 242x120(color)(3).

Selecting a density of 2 or higher really doesn't give you true 242 dpi resolution since the printer only has 121 x dots per inch. Instead this mode tells the printer to go into it's double pass mode. Here, it outputs a line of dots at 121 dpi; and outputs the line again (shifted to the right by 1/242 of an inch). This produces much more vibrant colors and gives the illusion of more resolution. One drawback is that large areas of solid colors (red, green, and blue specifically) tend to over-saturate the paper with ink. Density 1 outputs all colors in one pass. Density 2 does a double pass on black. Density 3 does a double pass on all colors. Density 1 to 3 correspond to the printer's graphics printing modes 1 to 3 (respectively).

4. This driver is not on the V1.3 Workbench or Extras disk. It is available on BIX and directly from Tektronix.
5. A PaperSize of 'Wide Tractor' selects a maximum print width of 9.0 inches (for wide roll paper).

Toshiba_P351C (24-pin Toshiba compatible)

1. Dot matrix b&w/color printer (text and graphics).
2. Drives all Toshiba_P351C compatible printers.
3. Linefeeds # of vertical dots printed.
4. Density XDPI YDPI XYDPI Comments

| | | | | |
|-----------|-----|-----------|-------|--|
| 1 | 180 | 180 | 32400 | |
| 2 | 360 | 180 | 64800 | |
| 3,4,5,6,7 | | same as 2 | | |

5. A PaperSize of 'Wide Tractor' selects a maximum print width of 13.5 inches (for wide carriage printers).

Toshiba_P351SX (24-pin Toshiba compatible)

1. Dot matrix b&w/color printer (text and graphics).
2. Drives all Toshiba_P351SX (321SL, 321SLC, 341SL) compatible printers.
3. Linefeeds # of vertical dots printed.
4. Density XDPI YDPI XYDPI Comments

| | | | | |
|-------|-----|-----------|--------|----------|
| 1 | 180 | 180 | 32400 | |
| 2 | 360 | 180 | 64800 | |
| 3 | 180 | 360 | 64800 | two pass |
| 4 | 360 | 360 | 129600 | two pass |
| 5,6,7 | | same as 4 | | |

5. A PaperSize of 'Wide Tractor' selects a maximum print width of 13.5 inches (for wide carriage printers).

Xerox_4020

1. Ink jet b&w/color printer (text and graphics).
2. Always linefeeds 4 dots (limitation of printer).
3. This driver is IDENTICAL to the Diablo_C-150 driver EXCEPT it outputs all black dots TWICE. This is a special feature of this printer and produces much more solid, darker black shades. Please note that some printing time overhead results from this feature; if you don't want it use the Diablo_C-150 driver.
4. Densities supported are 121x120(1) and 242x240(2) dpi. Selecting a density of 2 or higher really doesn't give you true 240 dpi resolution since the Xerox_4020 only has 121 x dots per inch. Instead this mode tells the printer to go into it's pseudo 240 dpi mode.

Here, it outputs a line of dots at 121 dpi; moves the paper up 1/240 of an inch and outputs the line again (shifted to the right by 1/240 of an inch). This produces much more vibrant colors and gives the illusion of more resolution. One drawback is that large areas of solid colors (red, green, and blue specifically) tend to over-saturate the paper with ink.

5. A PaperSize of 'Wide Tractor' selects a maximum print width of 9.0 inches (for wide roll paper).

Notes

- *0 - on most printers friction fed paper tends to produce better looking (ie. less horizontal banding) graphic dumps than tractor fed paper.
- *1 - in this mode the printer cannot print two consecutive dots in a row. It is recommended that you only use this density for B&W Shade dumps.
- *2 - only when 72 YDPI is selected. This option is useful if you notice tiny white horizontal strips in your printout.
- *3 - only when 144 YDPI is selected. This option is useful if you notice tiny white horizontal strips in your printout.

1.9 printer.device/PRD_PRTCOMMAND

NAME

PRD_PRTCOMMAND -- send a command to the printer

FUNCTION

This function sends a command to either the parallel or serial device. The printer device maps this command to the control code set of the current printer. The commands supported can be found with the printer.device/Write command. All printers may not support all functions.

IO REQUEST IOPrtCmdReq

| | |
|---------------|---------------------------|
| io_Message | mn_ReplyPort set |
| io_Device | preset by OpenDevice |
| io_Unit | preset by OpenDevice |
| io_Command | PRD_PRTCOMMAND |
| io_PrtCommand | the actual command number |
| io_Parm0 | parameter for the command |
| io_Parm1 | parameter for the command |
| io_Parm2 | parameter for the command |
| io_Parm3 | parameter for the command |

RESULTS

Errors: if the PRD_PRTCOMMAND succeeded, then `io_Error` will be zero. Otherwise `io_Error` will be non-zero. An error of -1 indicates that the command is not supported by the current printer driver. This could be used to check if the connected printer supports a particular command (*italics for example*).

SEE ALSO

printer.device/Write printer.h, parallel.device, Preferences

1.10 printer.device/PRD_QUERY

NAME

PRD_QUERY -- query printer port/line status

FUNCTION

This command returns the status of the printer port's lines and registers. Since the printer port uses either the serial or parallel port for i/o, the actual status returned is either the serial or parallel port's status.

IO REQUEST

| | |
|------------|---|
| io_Message | mn_ReplyPort set if quick I/O is not possible |
| io_Device | preset by the call to OpenDevice |
| io_Command | PRD_QUERY |
| io_Data | ptr to 2 UBYTES where result will be stored. |

RESULTS

| io_Data | BIT | ACTIVE | FUNCTION (SERIAL DEVICE) |
|---------|-----|--------|--------------------------|
|---------|-----|--------|--------------------------|

| | | | |
|-----|-------|------|----------------------------------|
| LSB | 0 | low | reserved |
| | 1 | low | reserved |
| | 2 | low | reserved |
| | 3 | low | Data Set Ready |
| | 4 | low | Clear To Send |
| | 5 | low | Carrier Detect |
| | 6 | low | Ready To Send |
| MSB | 7 | low | Data Terminal Ready |
| | 8 | high | read buffer overflow |
| | 9 | high | break sent (most recent output) |
| | 10 | high | break received (as latest input) |
| | 11 | high | transmit x-OFFed |
| | 12 | high | receive x-OFFed |
| | 13-15 | | reserved |

| io_Data | BIT | ACTIVE | FUNCTION (PARALLEL DEVICE) |
|---------|-----|--------|----------------------------|
|---------|-----|--------|----------------------------|

| | | | |
|--|-----|----|---|
| | 0 | hi | printer busy (offline) |
| | 1 | hi | paper out |
| | 2 | hi | printer selected |
| | | | (WARNING: the bit 2 line is also connected to the serial port's ring indicator pin on the A500 and A2000) |
| | 3-7 | | reserved |

| | |
|-----------|----------------------|
| io_Actual | 1-parallel, 2-serial |
|-----------|----------------------|

1.11 printer.device/PRD_RAWWRITE

NAME

PRD_RAWWRITE -- transparent write command

FUNCTION

This is a non standard write command that performs no processing on the data passed to it.

IO REQUEST

| | |
|------------|---|
| io_Message | mn_ReplyPort set if quick I/O is not possible |
| io_Command | PRD_RAWWRITE |
| io_Flags | IOB_QUICK set if quick I/O is possible |
| io_Length | the number of bytes in io_Data |
| io_Data | the raw bytes to write to the printer |

1.12 printer.device/PWrite

NAME

PWrite -- internal write to printer port

SYNOPSIS

```
error = (*PrinterData->pd_PWrite)(buffer, length);
D0                A0                D0
```

FUNCTION

PWrite writes 'length' bytes directly to the printer. This function is generally called by printer drivers to send their buffer(s) to the printer.

This function is accessed by referencing off the PrinterData (PD) structure. Below is a code fragment to show how to do get access to a pointer to the PrinterData (PD) structure.

```
#include <exec/types.h>
#include <devices/printer.h>
#include <devices/prtbase.h>

struct IODRPreq PReq;
struct PrinterData *PD;
struct PrinterExtendedData *PED;

/* open the printer device (any version); if it opened... */
if (OpenDevice("printer.device", 0, &PReq, 0) == NULL) {

    /* get pointer to printer data structure */
    PD = (struct PrinterData *)PReq.io_Device;

    /* write something directly to the printer */
    (*PD->pd_PWrite)("Hello world\n", 12);

    CloseDevice(&PReq); /* close the printer device */
}
```