

Printers

PJ Hutchison

COLLABORATORS

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Chapter 1

Printers

1.1 Contents

A Guide to Printers on the Amiga v5.0

by
Peter J. Hutchison

Workbench Preferences Drivers

Public Domain Drivers

Commercial Drivers

What do the drivers do?

Writing Printer Drivers

Trouble shooting

1.2 Workbench Preference Drivers

From the very first Workbench, printer drivers have been provided for the range of printers that were available at that time. In the 1980s, the majority of printers available were dot-matrix and laser printers.

Installation is very simple:

Workbench 1.3

Run a CLI or Shell and insert the Extras disk. Copy the files in devs/printers to devs:printers on your Workbench disk. Run the Prefs/Printer program and select the printer required and Save the new preferences.

Workbench 2.0

Insert the Extras disk, open the disk icon to show its contents, from the Windows menu select Show/All Files. Find the Devs/Printers directory and drag the appropriate printer driver files on to your Workbench disk in devs/Printers. Run the prefs Printer program to select the printer and save. Run the PrinterGfx prefs program to change the graphics preferences.

Workbench 3.x

Do the same as WB 2.0 but the printer drivers are located on the Storage disk.

Workbench 3.5

Contains a completely new printer driver system with support for 24 bit full colour output for Photo quality and new printer drivers. Contains new drivers for HP Deskjet and HP Laserjet printers.

Upto WB3.1, the following printers are supported:

| | |
|---------------------|----------------------|
| CalComp_ColorMaster | CalComp_ColorMaster2 |
| CanonBJ10 | CBM_MPS1000 |
| Diablo_630 | EpsonQ |
| EpsonX | EpsonXOld |
| Howtek_Pixelmaster | HP_DeskJet |
| HP_DeskJetOld | HP_LaserJet |
| HP_PaintJet | HP_ThinkJet |
| ImagewriterII | NEC_Pinwriter |
| Okidata_293I | Okidata_92 |
| Okidata_20 | PostScript |
| Seiko_5300 | Seiko_5300a |
| Sharp_JX-730 | Tektronix_4693D |
| Tektronix_4696 | Toshiba_P351C |
| Toshiba_P351SX | Xerox_4020 |
| CanonEpson | StarLC10 |

Third party printer drivers are available from PD sources such as Aminet (text/print) and include:

- EpsonFx/LX
- Epson Stylus Colour II/IIIs/400/600/800
- HP Deskjet 400C/500C/550C/600C/670C/870C
- HP Laserjet 3/4
- Canon Studio LBP/BJ/BJC
- Star Printers
- Panasonic Printers
- Citizen Printers
- Postscript
- Olivetti JP
- Seikosha
- Primera

Limitations of the preference drivers (upto WB3.1):

- a) No new printer drivers since 1992 have been added to Workbench esp. new Laser and Inkjet or Bubblejet printers.
- b) 12-bit Colour limited to a maximum of 4096 colours, so true colour

pictures are not possible.

- c) Workbench does not support PC GDI printers or other 'Windows' only printers. These printers lack the standard printer language for output and is dependant on the controlling operating system to prepare and output the graphics.

For example, HP Deskjet 72xC and 820C are Windows only printers.

- d) Restricted control and adjustment by Preference programs. For example, uploading fonts, colour control, cleaning of heads, advanced features.
- e) No support for Photo printers or scanner cartridges.

1.3 Public Domain Drivers

Since no new printer drivers have been provided by Commodore or Amiga Technologies, then the Amiga developers and users have written their own Printer drivers.

Some new printer drivers have been released to the public and its a case of finding them. Be wary though, these drivers may not have been thoroughly tested and may cause unpredictable results. See docs with the drivers for further information.

Source for printer drivers:

- a) Public Domain Suppliers.

There is a disk called '100 Printer drivers' which has drivers for some common older printers:

Citizen, Epson, Canon, HP, OKI, Diablo, Toshiba, Seikosha, Tektronics, Star, Gemini, Diablo, Alphacom, Calcomp, Nec, Panasonic.

There are some disks specific for later models eg. Epson, Deskjet, Canon if you ask for them.

- b) Bulletin Boards.

Request a complete file list from your local BBS as they may have some drivers on their File Areas.

- c) Utility CDs.

If you have a CD ROM then you can buy CDs full of PD and shareware programs and drivers. The Aminet Series are the best ones to for as they have a directory full of printing utilities and drivers.

- d) The Internet

The only company that currently supports free software on the internet is Canon and they are located at: <http://www.europe.canon.com/> who supply the Canon Studio software.

The latest PD drivers are uploaded on the Amiga's main file archive, Aminet at...

<http://sunsite.doc.ic.ac.uk/~aminet/>

Check the tree and look in text and print.

You can also download some of the popular drivers from my home page at:

<http://www.blizzard.u-net.com/>

1.4 Commercial Printer Drivers

The latest commercial software for the Amiga such as Word processors, Desktop Publishing and Paint packages do provide their own printer drivers. Some may be additional preference drivers or drivers specific to that program.

There are three software packages available that replace the preference drivers altogether and provide new features for today's high speed, colour printers:

a) Print Studio 2.2

Cost: 49.99

Suppliers: Hisoft, First Computer Centre, Schatztruhe

List of

Supported Printers

b) Turbo Print 7 (new version)

Cost: 39.99

Suppliers: IrseeSoft, Wizard Developments, Eyetech, Power Computing, First Computer Centre.

List of

Supported Printers

c) EnPrint (for Epson Stylus Printers)

Cost: 29.99

Supplier: Eyetech

List of

Supported Printers

These provide a wide range of drivers for old and new printers and have

new features that overcome the limitations of Workbench printer drivers such as true colour printing and supports higher resolution output.

1.5 Supported Print Studio Printers

The following is a list of currently supported printers.

AMS, Amstrad, Bizer, Brother, Bull, C.Itoh, Calcomp, Canon, Chipset, Citizen, Commodore, Compaq, Craft, Dataproducts, Datatrade, DEC, Epson, Facit, Fordata, Fujitsu, GCC, Genicom, Hewlett Packard, IBM, Kodak, Kyocera, LaserMaster, Mannesmann, MicroPlex, Minolta, NEC, NewGen, Oce, Okidata, Olivetti, Panasonic, Philips, PrePress, QMS, Qume, Ricoh, Samsung, Sanyo, Seikosha, Sharp, Siemens, Star, Texas, Triumph Adler,

Vobis, Unisys and Zygal.

Updates are freely available on Aminet in biz/patch and supply drivers for other packages besides Workbench drivers.

There is also the Canon Studio which is also freely available on Aminet and at Canon's web site. You can register it for the full version.

Further information is available at Schatztruhe's web page:

<http://www.schatztruhe.de/softe/studio.html>

Who to contact:

CompuServe: Wolf Faust 100116,1070
Internet: 100116.1070@compuserve.com

1.6 Supported Turbo Print Printers

The following is a list of currently supported printers for v7:

Brother_24-Pin, Brother_9-Pin

Canon_BJ Series, Canon_BJC210, Canon_BJC240 incl. Photo Cartridge,
Canon_BJC250, Canon_BJC4000, Canon_BJC4100, Canon_BJC4200 incl. Photo
Cartridge, Canon_BJC4300, Canon_BJC600, Canon_BJC600e
Canon_BJC610, Canon_BJC620, Canon_BJC6000, Canon_BJC70, Canon_BJC7000,
Canon_BJC800, Canon_LBP Laserprinter, Canon_PJ1080A
Canon_BJC 1000, 2000, 4400, Canon_BJC 6000, 6100, 7100 (inc. photo cartridge)

Citizen_120D+, Citizen_120D, Citizen_PRINTiva600c, Citizen_PRINTiva700c,
Citizen_Swift24,240, Citizen_Swift9

Epson_EX,FX,LX Series, Epson_LQ,SQ Series, Epson_Stylus
Epson_Stylus820, Epson_StylusColor, Epson_StylusColorII
Epson_Stylus ColorIIs, Epson_Stylus Pro(XL), Epson_Stylus Color 200,
Epson_Stylus 400, Epson_Stylus Color 500, Epson_Stylus Color 600,
Epson_Stylus Color 800, Epson_Stylus Color 1520, Epson_Stylus
Color Photo, Epson_Stylus Color 300, Epson_Stylus_Color3000,
Epson_Stylus_Color440, Epson_StylusColor640, Epson_StylusColor740,
EpsonStylusColor850, EpsonStylusPhoto700, Epson_StylusPhotoEX
Epson_Stylus Color 460, 660, 760, 860, 900
Epson_Stylus Photo 750, 1200 with full photo ink support

Facit_B3450

Fargo_Primer, Fargo_PrimerPro, Fargo_FotoFUN!
Fujitsu_DL-1100

HP_DeskJet, HP_DeskJet1200, HP_Deskjet400C, HP_DeskJet500,
HP_DeskJet500C, HP_DeskJet520, HP_DeskJet540C, HP_DeskJet550C,
HP_DeskJet560C, HP_DeskJet600C, HP_DeskJet660C, HP_Deskjet 670C/672C,
HP_DeskJet690/693/694C incl. Photo Cartridge,
HP_Deskjet 810, 812, 815, 830, 832, 882C,
HP_Deskjet 850C, HP_DeskJet850C, HP_Deskjet 870Cxi/Cse, HP_DeskJet 890C,
HP_DeskJet880C HP_Deskjet 895C,

HP_Deskjet_1100C, HP_Deskjet1120C
HP_LaserJet2, HP_LaserJet3, HP_LaserJet4 (l,p), HP_LaserJet5(l,p)
HP_LaserJet6 (l.p), HP_ColorLaserJet5
HP_PaintJet,PaintJetXL, HP_PaintJet300XL

Lexmark_ExecJetIIC
MannesmannTally_7400
Nec_Pinwriter
Okimate20, Oki_ML-38x, Oki_ML-39x
Panasonic_KX-P1124, Panasonic_KX-P1540
Seikosha_24-Pin, Seikosha_9-Pin, Seikosha_SL-80AI, Seikosha_SL-80IP
Star_9-Pin, Star_LC,XB-24, Star_LC-10, Star_SJ144

Updates are available from Irsee's home page:

<http://home.t-online.de/home/irseesoftware/>

1.7 Enprint Supported Printers

This is a list of supported Epson printers:

Epson Stylus COLOR, COLOR II, IIs, 820, Pro, Pro XL, 500.

Other printer drivers included are:

Epson Stylus 300, 400, 800, 800+, 1000, 1500

Updates are available for registered users.

Enprint 3.0 will/should be available for new Epson printers such as the 600 and Photo. No update has been released yet nor whether it will be released.

Web page: <http://www.endicor.com/>

1.8 What do drivers do?

To print on a printer requires special codes which tell the printer about the text or graphics to print. There are many standards for these printer languages such as Epson ESC/P, Hewlett Packard's PCL language, IBM's ProPrinter and there's the high end Postscript language for Apple and Laser printers.

Each printer has its own features and limitations and therefore each printer requires a driver to access these features from Workbench.

When printing something from a program, the output is usually sent to the PRT: device, this is handled by the printer.device located in the DEVS drawer.

Workbench supports a list of printer commands (see p.9-23 in the Workbench User Guide for these codes) and most Amiga programs use these codes for

printing text or graphics.

Obviously, these codes are understood by Workbench only and do not relate to any specific printer. To convert them to a format the printer understands requires a driver for each different printer type. The driver then converts the Workbench printer codes to real printer codes. For example, if we had an Epson compatible printer (NB: <ESC> = Code 27):

| Description | Workbench code | Epson code |
|--------------|----------------|------------|
| Init Printer | <ESC>#1 | <ESC>@ |
| Boldface on | <ESC>[1m | <ESC>E |
| Italics on | <ESC>[3m | <ESC>4 |
| Underline on | <ESC>[4m | <ESC>_1 |

and so on these are stored in a Command Table in the printer driver and stored in data.c. There is also a ExtendedCharTable which will send a complex string of commands to print special characters such as symbols and accented characters/

Complicated printer commands are dealt with a dospecial.c program which requires more program code for certain printing features such as sending a printer initialisation string when printer is first used, setting the form length, margins, setting initial font or typeface and using special text styles such as subscript and superscript.

To send graphics two other programs are written called render.c, transfer.c and density.c. These programs convert the graphics data from the program into CMY or RGB data streams and adds the printer's graphics commands to enable graphics to be printed out. Graphics can be send out uncompressed or compressed depending on the printer language and the model of the printer. Compressed data takes longer to prepare but quicker to print out. Older printers such as EpsonX use Bitmap rendering while modern inkjets now use Raster graphics printing.

1.9 Writing Printer Drivers

Writing a printer driver is more complex than you think and ←
requires some
programming knowledge, an assembler or compiler that can produce object code and access to the Amiga Development Kit on floppy or CD.

Information on writing a printer driver is available from:

Amiga ROM Kernel Reference Manual: Devices p196 - 245
Addison-Wesley 1992, ISBN 0-201-56775-X.
Description of files and programs to write inc. examples
of Epson & HP driver!

NDUK 3.1 Example source

You might be able to get hold of the example files in the
RKM Companion files from Aminet.

The EpsonX and HP_Laserjet are a good place to start to base
your printer driver on them as a lot of the work is done for you!

Printer Language info

You will also need a reference guide for the printer commands for your driver. You can sometimes get this on the net (HP), a manual with the printer or you may need to buy an extra manual (eg. Epson) Epson's manual is now available in PDF format on their web page.

<http://www.hp.com/cposupport/eschome.html> (PCL Commands)

<http://www.epson.co.uk/support/manuals/select/escp.htm>

Amiga Developer CD

Contains the RKM information and includes to write printer drivers.

Notes about compiling a driver:

Compiling with SAS/C

1.10 Compiling with SAS/C

If you are using SAS C 6.5 or better then please note that:

1. Use the following command to create a working make file:
 MKMK TARGET=PRINTER_NAME printertag.asm init.asm data.c dospecial.c
 render.c density.c transfer.c

2. Use the following SCOPTIONS:

```
DATA=FAR
ANSI
NOSTACKCHECK
NOCHECKABORT
OPTIMIZE
VERBOSE
STRIPDEBUG
MAP
MAPSYMBOLS
MAPXREFERENCE
NOERRORHIGHLIGHT
NOSTARTUP
PROGRAMNAME=PRINTER_NAME
```

NOLINK

3. Make sure that you prototype the functions in each of the C programs. You may need to combine the function name and parameters for better compatibility.

4. There are two functions that produce prototype errors, you will need to modify the prtbase.h Printer Base structure as follows:

```
int (*pd_PWrite)(UBYTE *buf, int leng);
int (*pd_PBothReady)(void);
```

5. You will need to include the proto/exec.c header for the AllocMem and

FreeMem functions in render.c

1.11 Trouble Shooting

1. I have 'xxx' printer, what printer driver should I use?

Workbench supplies the 'Generic' driver which can print text for ANY printer. If you wish to print graphics then you need a specific driver. A lot of printers use emulation in particular ESC/P, ESC/P2 (Epson) and PCL3 (HP Deskjet) or PCL5 (Laserjet) emulation is very common. Check the printer's manual for emulation modes available.

2. Where can I get 'xxx' driver for my Printer?

Besides Workbench, you can get drivers from Aminet at...

<http://sunsite.doc.ic.ac.uk/~aminet>

and my Web Page. You can also buy a commercial Printer Driver suite which supports new printers and provide better quality output.

3. I am having trouble getting output from my driver?

Check that your Amiga is connected to the printer via a good parallel cable and if you have a switch box connected is pointing to the correct port.

Make sure that your printer has enough ink to print with, some printers may prevent printing to stop damage to the heads. If you are using a ribbon cartridge make sure the ribbon has popped out from the print head and that it is not over used (you'll see a long grey line along the ribbon if its used).

First, make sure you have the latest release of the driver. Some drivers are updated, to fix bugs, users have reported. Also make sure that your set up is set how you want it to be. In some cases, it may be necessary to not to use the suggested format, fine tuning may be necessary for your output.

There are three printer prefs programs:

Printer, PrinterGfx and PrinterPS.

The PrinterPS is for Postscript printers only so that does not need to be used. Check that you are not using it in conjunction with other programs. TurboPPrint, Studio and PageStream use their own drivers so don't mix them!

4. Can I use a networked printer on my Amiga?

That is possible with a new printer.device v43 which is available on Aminet and my text page, see docs for usage.

5. How can I speed up printing from my Amiga. It is slow?

Modern printers use higher and higher resolutions, now upto 1440 dpi and

that requires a lot of data to be sent to the printer. Fast and efficient drivers are required, some now use data compression to speed up data flow such as RLE (Run Length Encoding). A fast processor and a fast parallel port can also improve throughput as well. It is not always necessary to print at the highest density, trying some lower densities will speed up output. Use draft output wherever possible to increase print speed.

6. Why don't 'Windows' printers work on the Amiga?

These type of printers rely on the Operating System to control the printer rather than the printer itself. You can tell if a printer is Windows only, by getting nothing printed at all even if you use the Generic driver. It may be possible to use a printer via Emulation via PCx or PC-Task as they can run the supplied printer drivers for the PC. Check the list of OS' supported, if it mentions DOS or Mac as well then they should work on the Amiga.

7. Why can't i get a driver for my printer?

Writing a printer driver requires access to the printer's command language information. If the manufacturer won't let you access to such information then it is impossible to write a driver without such information. You will then have to rely on Emulation modes to access limited features of the printer.

For the latest printers, I would recommend buying a printer driver enhancer such as TurboPrint or Print Studio or even upgrade to Amiga OS 3.5 when it appears.

8. Can I get Photo quality output via Workbench printers?

In a word, no, the Workbench printer system was designed for dot matrix, daisy wheel and laser printers mainly when it was written. Colour was a new feature and not widely used as it is now. Workbench drivers usually support Black, RGB or CMYK printers and even then was limited to a palette of 4096 colours. Only the commercial printer packages give adequate support for Photo printers.

9. Which printers would you recommend?

I recommend the Epson, Canon and Hewlett Packard Printers as they are widely supported on the Amiga. Check that you can get a driver for your printer first, before purchasing the printer.

10. How do I stop banding on my printer?

Some printers use Microweave (such as Epson) which will 'dither' the lines a little to stop white bands appearing on the paper between lines. Also, make sure you have plenty of ink, as banding can become more obvious as less and less ink is available.

11. My printer output is too dark or too light?

Change the 'Threshold' value in the Printer preferences, a lower value will make black more lighter. If its too light, increase the Threshold. Also, try a different font when printing from a Word processor to make text more bolder or lighter.

12. I constantly get line or page feeds. Whats wrong?

The page length or the margins may be set incorrectly for your printer. For inkjets, it is important that a minimum margin around the top and sides is set and that the correct page length is entered. Unfortunately, Workbench printer preferences doesn't give much control over this.

1.12 About the Author

Since this guide was first released I have written some printer drivers for the Amiga. These have been based on the EpsonX and HP_Laserjet example code provided by Commodore in SAS/C 6.58 with substantial modification for new features:

HP Laserjet III
HP Deskjet 400C, 600C, 670C, and 870C.
Epson Stylus Colour 400, 600, 800
Olivetti JP

If you wish to contact me about printers, printer drivers (or even other types of drivers) then send me a message to:

Peter John Hutchison

E-Mail: PJHutch@blizzard.u-net.com
Web page: <http://www.blizzard.u-net.com/>

Amiga 1200 WB 3.1
Blizzard 1240/40MHz (32Mb RAM)
Epson Stylus 500 (TurboPrint 7)
