The
Grappler LS Printer Interface
and the
Hewlett Packard Deskjet Printer

by Dwight Stewart

Stop dreaming about a LaserWriter. Finally, there is a 300 dots per inch (dpi) laser quality printer for the rest of us.

Orange Micro has taken a popular low-cost inkjet printer and made a hardware/software interface to attach it to the Macintosh. The result is a low cost printer setup with 90% of the abilities of a laser printer, at less than a fifth of the price.

Let's take a step-by-step look at each part of this new interface and printer setup.

The Grappler LS Interface

Software written for the Macintosh is not designed to work with just any printer. Mac software expects to find one of the printers sold by Apple Computer. If any printer is going to work in this situation, it has to act like an Apple Printer.

The Grappler LS interface, from Orange Micro, is a hardware and software package that makes the HP Deskjet act like an ImageWriter LQ, at least as far as Macintosh Software is concerned. The software uses the normal ImageWriter LQ print windows and drivers. The software sees nothing unusual when it prints. The Grappler intercepts these ImageWriter LQ codes and converts them into codes that the HP Deskjet can understand.

Installation of the Grappler LS is a fairly simple four step process: hook up the Grappler LS cable; install the ImageWriter LQ Print Driver; install the desired fonts; and then install and turn on the Grappler Spooler.

First, remove any other print spoolers that may be in your System Folder. The Grappler LS will not work with these installed. Drag the LQ print driver, Grappler LS Spooler (CDEV), and printer configuration file for the Deskjet into the System Folder. Install the fonts using Font/DA Mover.

Select the ImageWriter LQ printer using the Chooser under the Apple Menu. Open the Control Panel under the Apple Menu and select the Grappler LS by clicking on the icon. Turn the Grappler LS on by clicking the "on" button. Select the HP Deskjet printer by clicking on the "Select Printer..." button. Close the Control Panel and restart the Macintosh.

The Grappler LS will be ready to use as soon as the HP Deskjet is attached.

Fonts

The Grappler LS software comes with special fonts to use for optimum print quality. Why use special fonts?

On the Macintosh screen, everything - even text - is represented as a collection of tiny dots and most of the information the Macintosh sends to a printer is defined by collections, or patterns, of dots. Programmers call these dot patterns "bit–maps."

Fonts currently used on the Macintosh are bit–maps. That means that each character is actually a small picture, made up of individual dots on the Mac screen, of what is typed on the keyboard. Printing is handled the same way. Very small dots are used to create the text and graphics on paper.

The Macintosh screen displays 72 dots per inch (dpi). Bit–mapped text and graphics on the screen are limited to this resolution. The HP Deskjet prints at 300dpi (actually 288dpi), which is exactly four times the number of dots shown on the Macintosh screen.

To get the best possible quality from the printer, the Mac's printer driver performs a font substitution as it prepares the document for the printer. Instead of sending the screen's bit–mapped font (72dpi), it sends a bit–mapped font that is four times larger (288dpi) to match the printer's resolution.

So, for best results from the Deskjet, you must load a set of fonts four times the size of the fonts you expect to use for your high quality print jobs. For example, if you want to print a 10 point font, you will need a 40 point size of the same font type.

This chart shows the normal screen sizes and the corresponding printer sizes needed by the printer for maximum resolution.

Screen Font Size   Printer Font Size (4x)

6	24
9	36
10	40
12	48
14	56
18	72
24	96
28	112

The Grappler LS software comes with three very high quality fonts; Dutch (Times-like), Swiss (Helvetica-like), and Courier. You can also use fonts designed for the LaserWriter IISC. In fact, just about any bit–mapped Macintosh font that has the right combination of sizes can be used. Postscript fonts, designed for Apple's Postscript LaserWriters, cannot be used.

Both the screen size and the printer size are needed. If you load a printer size without the screen size, the text may not be readable on the screen. For example, you could use a 3 point size since there is a 12 point printer size, but you will not be able to read it on the screen because there is no 3 point screen size. But, the 3 point size will print just fine on paper.

[Tip: If you have a large font that is printer font size, but you have no screen sized font to match and cannot read the text. Type (and edit) your document using another font and then change the text to the desired font just before printing.-Author]

Likewise if you load a screen size without a printer size, the print quality will not be as high. If you print a screen size without a printer size, text will print like it appears on screen.

I have tried Beverly Hills 6/7/9/12/18/24, Black Chancery 9/12/18/24, Clairvaux 9/12, York 9/10/12/18, and Palencia 6/7/9/12 on the Deskjet, with excellent results. Each of these fonts had the corresponding printer sizes loaded into the computer.

The Deskjet Printer

Now that the Macintosh is set up, you will need to set up the Hewlett Packard Deskjet Printer. You can purchase any standard Deskjet to use with the Orange Micro Grappler LS. By shopping around, it is possible to find it priced at less then $700 by mail order. Hewlett Packard sells font cartridges for the Deskjet, but don't buy them since they cannot be used with the Macintosh.

The printer comes with one print cartridge, an external power supply, the manual, and two 5.5 inch disks to use with IBM computers (useless with the Macintosh). All the software you will need to use the Deskjet on the Macintosh is included in the Grappler LS package.

It is simple to unpack and set up the printer. But a few words of wisdom. Use the manual that comes with the printer to unpack the printer, install the print cartridge, and attach the cords. Use the manual that comes with the Grappler LS to setup the printer to use with the Macintosh.

There are two small dip switches located under the front of the printer. These will have to be set using the Grappler LS manual as a guide. This is simple and can be done in seconds.

Load some paper into the printer. There is a bin located in the front of the printer to hold about 100 sheets. The HP Deskjet automatically feeds the paper when needed.

Before going any further, a few words about paper. The Deskjet works well with most types of paper, although some paper compositions will affect the print quality. High quality cotton bond papers with a smooth finish will yield excellent results.

Paper with hair (small hair-like fibers) sticking out of the paper surface can smear the ink. Also, paper designed for inkjet printers should not be used. Finally, certain papers wrinkle excessively when wet from printing large areas of black. I strongly recommend that you obtain samples of paper from your dealer to test in the printer, before purchasing large amounts of the paper.

Once everything is set up, turn on the printer while holding down the "FONT" key, located on the front of the printer, to execute a built-in self test. If the test goes well, you are ready to go. Now that the Grappler LS and the printer is setup, you are ready to begin printing.

Graphics

The Deskjet can print any graphic that can be printed on the ImageWriter LQ. It will print MacPaint–type graphics and

object–oriented graphics like those created by "Draw" programs. It also prints graphics created by most scanners, without the grey scale information. It will not print PostScript (EPSF) graphics created for PostScript laser printers.

MacPaint–type, or bit–mapped, programs are designed to allow you to create and modify images created with dots. It is the most common format. The biggest problem with the bit–mapped format is that the printed image is the same resolution and quality as the image on the screen. It looks good on the screen, but the edges of the graphic will look jagged when printed.

The object oriented, or PICT, graphics format was created to improve the quality of printed graphics. Object oriented graphics can be created to match the resolution of the printer and is perfect for use with the Deskjet. Drawings will look less jagged when printed.

Ideally, to get the best quality from the Deskjet, we would use only graphics created in object oriented programs. But to do so would force us to ignore the thousands of pieces of clip art available in MacPaint format. Besides, detailed graphics can be very difficult to draw using object oriented graphics programs.

What we need is a program that works with both formats. SuperPaint and Canvas, for example, both support MacPaint and object oriented graphics. These programs give us access to clip art collections in MacPaint format, can make drawing new art easier, and will still allow us to print in the highest possible resolution.

SuperPaint can take MacPaint graphics and turn them into true object oriented graphics to match the resolution of the printer. SuperPaint can do this two ways. It can shrink the MacPaint graphic to match the printer's resolution. In the case of the Deskjet, four times smaller. An 8x10 inch graphic will shrink to 2x2.5 inches. This works similar to the way we described fonts above.

Or SuperPaint can convert the graphic while leaving it the same size. It does this by filling in four dots for every dot in the MacPaint graphic. Of course, this allows for larger sized graphics, but we still have the jagged edges. By selecting a "Smoothing" option, SuperPaint can attempt to fill in the jagged edges as it is converting the graphic. However, some editing will still have to be done, but far less than if this option was not available.

Object oriented (PICT) graphics, either converted from MacPaint or originally created as objected oriented, can be transferred to other programs, such as desktop publishing programs, without loosing print quality. This allows very high quality graphics to be printed on the Deskjet from nearly any program.

Another program that deserves mention here is Clarity DA (Shareware-$10) by Andrew Welch of Mark 3 Software, 29 Grey Rocks Road, Wilton CT 06897. It is a desk accessory, that is selected under the Apple Menu, which allows for immediate conversion of any MacPaint graphic and the results can be pasted into any program that supports graphics.

Clarity DA takes a MacPaint graphic that has been copied to the clipboard, converts it into a object oriented graphic at the resolution you select, and pastes it back to the clipboard ready to insert into a program. This program works by shrinking the graphic to obtain the correct resolution.

Most scanners can save in either MacPaint format or the object oriented (PICT) format. These graphics can then be edited using a normal graphics program and printed on the Deskjet. Drawings, text, and some high contrast photos can be scanned successfully and look great on the Deskjet.

The biggest disadvantage of the Grappler LS/Deskjet, as compared to a laser printer, is the Deskjet's inability to handle scanned photographs which require shades of grey to get the right look. The Deskjet cannot print shades of grey, only black & white. A photograph with subtle grey information will not look good scanned, or printed, in only black & white.

Those that want to use photographs in newsletters, or similar publications, may find this a serious disadvantage. However, photos can still be added to documents created on the Deskjet, but only after the fact. Leave a blank area where you want the photo in the document and take the photo with you to the print shop that handles your mass reproduction. Let the print shop insert the photograph.

Manuals

The manual that comes with the Grappler LS is not very impressive looking, but it seems to cover everything it needs to cover. The manual starts with a step-by-step guide to installing the software and hooking up the printer. Since the Grappler LS is designed to work with several printers, there are confusing mentions of other printers, but it is easy to ignore this.

There is a discussion about fonts, Font/DA Mover, and spoolers. Most of this information is designed for beginners, so it is very easy for those with Mac experience to understand. There is a troubleshooting guide, and information about Multifinder, in the back of the manual.

The Deskjet manual is hugh, at least 200 pages. However, most of the information can be ignored. To use the Deskjet on the Macintosh, you only need to read chapters one and six. All the other chapters contain details for users of non-Macintosh computers to setup their hardware and software.

Chapter one covers unpacking the printer, the printer controls, loading paper/envelopes, and installing/replacing the print cartridge. Chapter six covers clearing paper jams, improving print quality, and printer maintenance.

The Deskjet manual is also well written and contains clear, precise information without needless details.

Conclusions

The Deskjet print quality is excellent. Black areas are clear and clean, with no fading. Text or graphics printed on the Deskjet are also very consistent, creating a finished look to the original printed document. [Hairlines print as hairlines.-Author]

The printer is nearly silent while printing. There is an occasional clacking from the printhead as it parks to reset itself, but other then that it makes less noise than an average computer fan. In fact, at times it is difficult to tell if the printer is actually printing in a office with normal background noise.

The Grappler LS/Deskjet works just fine with all of the software on my hard disk. I have tested it extensively with PageMaker 3.01, SuperPaint 2.0, and WriteNow 2.0, with no major problems.

I did have a serious problem with the spooler, that took days to solve. The printer would print fine without the spooler, but as soon as I tried to print with the spooler the computer would crash. The problem was finally traced to bad Bitstream fonts and a conflict with my screen saver. It seems the spooler has a problem with most screen savers. It will not work with MacBugs and older versions of Pyro. Remove these from the System Folder before trying to use the spooler. I have heard that the newest version of Pyro works just fine, but I was unable to verify this. If this is not the case, you'll have to go back to the barbaric method of turning down the screen brightness by hand.

The Bitstream fonts, currently sold separately by Orange Micro, have serious problems with PageMaker. Using these fonts, alone or with the spooler, results in the computer crashing. Orange Micro is aware of the problem and should have this fixed by the time this article is published. Call to verify this before purchasing these fonts.

The Deskjet is slow. It takes nearly five minutes to print a normal page with text and a small graphic. Complicated graphics will print even slower. The spooler does help by not making you sit around waiting for the printer to finish before you can continue working on the computer. But, is not much good if you need something printed really fast, like right now.

Users may want to keep their ImageWriter Printers for fast jobs, such as listing programs, printing downloaded messages, or typing quick letters where quality is less important. Use the Deskjet where quality is desired, such as that important job resume, letter, or publication.

The Grappler LS spooler is not compatible with other spoolers, nor does it spool to the ImageWriter. Other spoolers must be removed before installing the Grappler LS software. After selecting the ImageWriter, with the chooser, it prints just like normal, but without spooling. [A switch box would be helpful to attach both printers to the same computer.-Author]

Customer Support for the products needs some serious work. Orange Micro's phones to technical support are always busy and the employees seem very overworked. It seems that the employees have handled so many problems, they are just not willing to spend much effort anymore helping a single customer with a problem they have heard maybe a hundred times before. If you are determined when you call, you will get your questions answered. [It might be easier to get through on the phone if Orange Micro's technical support department was open longer hours (currently 8am-1pm) - Author]

Hewlett Packard is another story. Their technical support department will not even acknowledge that the Deskjet can be used on the Macintosh. If your question does not directly apply to the printer, they will tell you to call Orange Micro.

Most information services (MacNET, GEnie, etc.) have several users of the Deskjet active and will answer questions. I can be contacted on MacNET (StewartDw) and will be glad to answer questions. Until this becomes a "established" Macintosh product, it will continued to be supported only by the companies selling the product, and dedicated users. Very Mac-like.

The Grappler LS/Deskjet combination is a good deal. There are very few problems and the print results rival that produced on the LaserWriters. Finally, the price is right. By careful shopping this setup can be purchased for less than $800.

The Grappler LS (less then $100 by mail order.-NCP) is available from Orange Micro, 1400 N. Lakeview Ave., Anaheim CA 92807. The HP Deskjet is made by Hewlett Packard, 100 Mayfield Ave, Mountain View CA 94043 and also best purchased by mail order.

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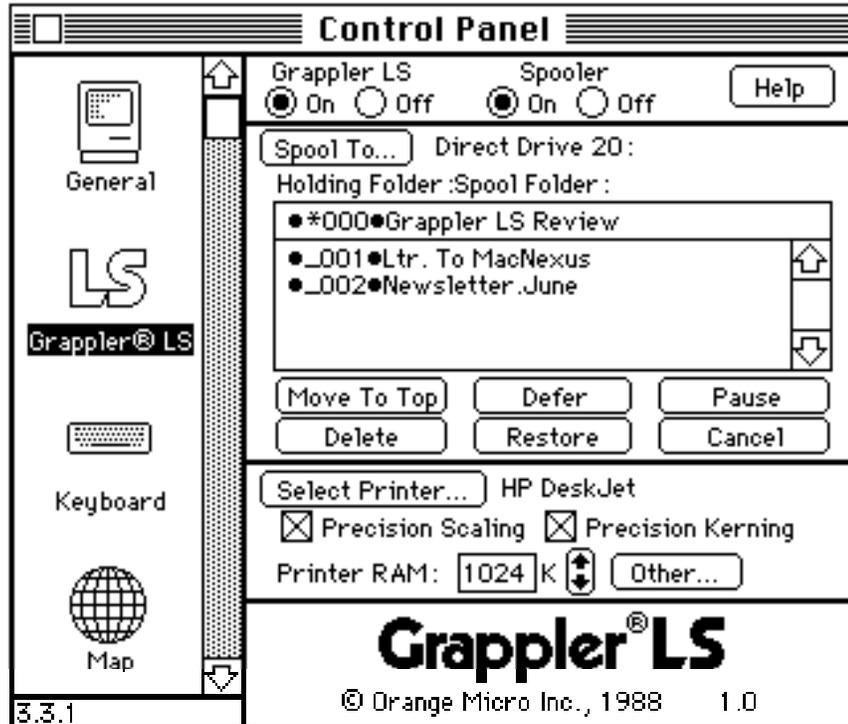
The top area of the control panel relates to the spooler. The bottom area selects the printer and printer information.