Technical Information

Outputting PostScript Jobs

Linotype-Hell

Often users of the PostScript** page description language get a diskette with a file on it, and are asked to output it. If life were perfect, all of these jobs would run without a problem, but sometimes, for a variety of reasons, they won't run. Or, if they do run, some job parameter may not be set correctly. Frequently it is because of a miscommunication (or maybe no communication at all) between the creator of the file and the person who has to output it.

To help resolve these conflicts it is important to get certain information when accepting a file. Service bureaus usually have customers fill out checklists of information before they will accept a file. (See the appendix on the last page for an example.) Also helpful is a sample output (for example laser printer output for a job that is destined for an imagesetter). Having this kind of information in hand can help avoid costly rerunning of files. And much of this information is device specific. To understand why, let's consider the difference between the terms *device specific* and *device independent*.

Specific or independent?

One of the primary benefits of the PostScript page description language is device independence. Device independence means that a job may be sent to any of a number of output devices, and yet print to the best ability of any one of them. The affect of this on the graphic arts industry has been dramatic. People rarely think twice today about proofing a job to a laser printer and then later sending it to a color printer, or a slide recorder, or an imagesetter. But to do this, you have to accept some obvious limitations of devices. For example, if you print a color document on a black & white laser printer, any color elements will either get color separated or printed as a gray tint. All of these device specific factors (i.e., color, page size, resolution, halftoning) have to be taken into account. Some of the most common output mistakes are a result of device specific factors.

Printer description files

There is actually a special file that is devoted to solving device specific problems: the printer description file. There are several different types of printer description files: APD or Aldus Printer Description files (for use with PageMaker), PPD or PostScript Printer Description files (for use with Aldus FreeHand, Adobe Illustrator and Adobe Separator), and PDX or Printer Description Extension files (for use with Aldus PrePrint).

Note: Linotype-Hell customers can order a diskette of up-to-date PPDs through the Linotype-Hell parts department. The part number is 201146.

Since printer description files help prepare a file for a specific printer, using the wrong file can cause problems. Some applications, like QuarkXPress, have included the information in the printer description files as part of the program. This makes it easier for the average user, but harder for anyone who wants to go in and hand tune a printer description file.

Halftoning

Halftoning is one device specific trait that has caused a lot of grief for PostScript language users. There are several reasons for this:

- The resolution (more accurately called the addressability) of the output device plays a critical role in halftone quality. There is a clear relationship between screen ruling, the resolution setting of the output device, and the number of grays that can be reproduced.

- Screen ruling must be carefully chosen based on the paper and printing press that the job will be printed on, the resolution setting of the output device, and manufacturer's recommendations for screen angle and ruling.
- Halftones reproduced in color are susceptible to moiré. Screen angle and ruling must be carefully chosen to avoid it. The ability of an output device to create halftones with unobjectionable moiré is determined by device characteristics such as the halftoning method, the resolution of the output device, and the manufacturer's recommendations for angle and ruling.

The way that a file is prepared for screening plays an important role in the final quality of the output. Linotype-Hell's specially-designed halftoning filters for raster image processors (RIPs) make it easier for users to deal with halftoning. These filters, as shown in the RIP 30 and RIP 40, ensure that screen angle and ruling are chosen appropriately for the device.

Note: In a latebreaking product announcement, Linotype-Hell has introduced I.S. Technology*. I.S. Technology brings irrational screening to the PostScript world. For more information, please refer to the Linotype-Hell technical information piece entitled Rational and Irrational, part number 3305.

The filters accomplish two functions. They allow the user to select a halftoning method, and then when a file is sent to the RIP, they choose the angles and rulings that are most appropriate for that method. For PostScript, Linotype-Hell's methods of halftoning are called RT Screening* and HQS Screening*. RT Screening is suitable for black & white halftones, as well as color halftones in less-demanding applications where achieving a conventional rosette is not critical. HQS Screening is for color applications that require higher quality.

The Linotype Utility allows you four different choices: *Default* (RT Screening with no filter), *Black & White* (RT Screening with a filter for recommended B&W values), *RT Screening* (RT Screening with a filter for recommended color separation values), and *HQS Screening* (HQS Screening with a filter for recommended color separation values).You should choose the setting that is appropriate for your work. You may want to change the settings during the day for different types of jobs.

Output

There are other variables beside screening that play an important role in film quality. The resolution setting of the imagesetter must be chosen carefully, particularly in the case of halftones. Other important choices include: paper versus film, positive versus negative, and right reading versus wrong reading. Outputting a file is very detail oriented. It is easy to miss one of the details, and as a result produce useless films.

When receiving a file…

There are some very prominent details that are frequently overlooked, and overlooking them inevitably leads to problems. Let's look at four important ones: media, file type, fonts, and embedded files.

- **Media** - The most obvious thing to note when receiving a job is the media that it will be arrive on, for example: 3.5" diskette, 44 or 88 MB removable cartridge, read/write optical, magnetic tape, or modem. If you receive a job that is compressed be sure that you will be able to decompress it. While some compressed files decompress automatically when you open them, other compressed files require a separate application for decompression.
- **File type** - Two main categories of files are important: application files and PostScript files. An application file is the file created in your software application. It can be reopened by that application and re-edited. A PostScript file, on the other hand, is the PostScript code needed to execute the job. You can create a PostScript file in several different ways (see box to left). Many service bureaus have found that if their customers send them PostScript, it simplifies the process of outputting. This is because a PostScript file by its very nature includes all of the information required.[1] While this may simplify sending the job it may also complicate doing any troubleshooting. The reason for this is that the responsibility for many of the detail issues falls with the owner of the file. The designer must be sure that

Here are several ways to create a PostScript file:

- Under System 7, there is an check box in the print dialog menu that allows you to select 'PostScript file'.
- Some applications allow you to press command F when you send a job to be printed to create a PostScript file.
- Some applications have a checkbox that allows you to 'Print PostScript to Disk'.
- If you know how to program in PostScript, you can write a file in PostScript code.

the PostScript file is set up properly for output on the service bureau's device. If it is not, the only way to make changes is to edit the PostScript file. This is a complex task, and certainly not as easy as going back into the software application to make changes.

[1]Whether fonts are included in the PostScript file depends on the location of the fonts in the workstation when the PostScript file is made. If they are accessible, for example in the system folder, they will be included. Otherwise the fonts will need to be on the RIP when the job is run. If the fonts are included, the file size increases accordingly.

- **Fonts** - It is important to list all fonts used in the job (including manufacturer and font type, i.e. Type 1, Type 3, TrueType**). For QuarkXPress files, the XPress Data file (found in the QuarkXPress application folder) should be included to assure that kerning, tracking, and hyphenation information are accessible.
- **Embedded files** - Files that are sent to service bureaus are often incomplete. The page may be included, but not all of the elements that fall on it. For example, graphics or scans are often left out. If these files are linked to the document, but not included in the package that is sent to the service bureau, then when the job is printed either they won't show up, or perhaps worse, they'll be replaced by a low resolution bitmapped version.

Output speed

Up to this point, the discussion has centered on simply getting the job output. However, most everyone is also concerned with the speed of output. While there are many different factors that play a role, let's look at how the following issues affect speed:

- Large halftone files are difficult to move around a network. Be sure that you are not capturing more information in your scan than you actually need. The Scanned File Size technical information piece (part number 3053) covers the issues involved in file size and discusses how to keep the files to a minimum. While file compression can reduce files to reasonable sizes, remember that some types of image compression involve a certain amount of data loss. There is a good reason for this. Totally "loss-less" compression schemes cannot compress at the high rate of "loss-y" ones. You may find that a barely noticeable amount of loss is worth it. Also note that the time to compress and decompress a file should be considered when determining if it makes sense to compress a file.
- A full hard disk does not perform nearly as well as one with some space to spare. Therefore you should archive files that are not used often, and optimize your hard drive with a utility application so that empty space is contiguous and accessible.
- Increasing your computer's RAM (Random Access Memory) can benefit performance. Also, well-planned allocation of RAM can improve the performance of certain applications. Some image manipulation applications that use large files (like Adobe Photoshop**) suggest having three times the image file size in contiguous disk space available. You won't be able to save an edited file without it.
- Traffic on a network can slow down the transfer of files. A direct connection to the imagesetter can improve this.
- Never run your application from a file server (or download printer fonts from the server automatically).
- If your RIP takes a long time to boot up, you should clear your font cache.
- As resolution increases so does the amount of data that must be calculated by the RIP. A doubling of resolution results in a quadrupling of data. While this does not translate into a four-fold speed decrease, higher resolutions generally do run slower. (Be aware that many factors play a role in speed.)
- Blends should not be created with too many steps. Extra steps add processing time.

For more information, you may wish to refer to these technical information pieces:

- Resolution and Screen Ruling, #3050
- Blends and Shadestepping, #3059
- Analyzing Film Output, #3062
- Moiré, #3064
- Troubleshooting PostScript Errors, #3067
- Screen Angle and Ruling Recommendations, #3072
- Part II: Angle and Ruling Recommendations, #3301

- Flatness is a setting in illustration programs that determines how much leeway there is (in device pixels) between the theoretical curve, and what actually gets executed by the imagesetter. A value of zero is very difficult to compute at high resolutions, a value of five or ten is more manageable.

Job complexity

While there is no formula for determining how long a file will take to print, you can get some idea of the complexity of a file by filling out the check list to the right. The more checks the more complex, and the longer it will take to print.

Type of File	None	Few	Many
•Fonts	❐	❐	❐
•Scanned line art	❐	❐	❐
•Synthetic line art	❐	❐	❐
•Simple B&W synthetic art	❐	❐	❐
•Complex B&W synthetic art	❐	❐	❐
•B&W scans	❐	❐	❐
•Simple color synthetic art	❐	❐	❐
•Complex color synthetic art	❐	❐	❐
•Color scans	❐	❐	❐

Note: Synthetic art is another term for vector art (i.e., the kind of files created in Adobe Illustrator or Aldus FreeHand). Synthetic line art contains no tints. Simple synthetic art would only include line art and tints, but no blends. Complex synthetic art would include line art, tints, blends, and repeated patterns.

Conclusion

Anyone who receives files to output should do their best to educate the people who give them files. In the long run, it makes life easier for both parties.

Comments

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Appendix: An example of an output check list

Output device: ❐ Printer 60 ❐ Linotronic 230 ❐ Linotronic 330 ❐ Linotronic 530 ❐ Linotronic 630

Resolution/Addressability: ❐ 3386 ❐ 2540 ❐ 2032 ❐ 1693 ❐ 1270 ❐ 847 ❐ 635
❐ 3251 ❐ 2438 ❐ 1219 ❐ Other (list)

Output media: ❐ Paper ❐ Film ❐ Plate material

Specify: ❐ Positive ❐ Right reading ❐ Emulsion up (Note: Films are usually read emulsion down,
❐ Negative ❐ Wrong reading ❐ Emulsion down paper can only be read emulsion up)

Screening: ❐ RT Screening ❐ HQS Screening ❐ I.S. Technology

Screen ruling: ❐ 85 ❐ 100 ❐ 120 ❐ 133 ❐ 150 ❐ 175 ❐ 200 ❐ Other (list)

Frontend: ❐ IBM PC or compatible ❐ Macintosh ❐ Other

Delivery media: ❐ Diskette ❐ Optical disk ❐ Removable disk ❐ Modem ❐ Other (list)

Software applications used: (list, include version #) **Job file type:** ❐ Application file ❐ PostScript file ❐ Other (list)

System software: (list)**:** **Printer drivers:** (list) **Printer description files:** (list)

Files needed for job: ❐ Fonts (list) ❐ Scans ❐ Synthetic graphics ❐ XPress data file ❐ Other (list)

Number of pages and page size: (list)

Does job include… **Scans or tints:** ❐ Yes ❐ No **Color:** ❐ Spot ❐ Process ❐ Both (list colors of all plates)
Trapping of butting colors: ❐ Yes ❐ No **If yes, have traps been added by the designer?:** ❐ Yes ❐ No

Proof: ❐ None ❐ Laser printer ❐ Color printer ❐ Overlay ❐ Laminated ❐ Other (list)