Harlequin RIP™

Some Performance Hints

Technical Note Hqn009

June 2001

Firstly, see the hints in Appendix C of the Harlequin RIP OEM Manual.

Other points include:

Memory

- The basic rule is the more the better, with some reservations.
- As a rough guide, the basic RIP needs about 8MB to run efficiently.
- If you are using Harlequin Precision Screening, you will need an extra 8 to 16 MB
- If you are using Composite fonts, you will need an extra 4 to 8MB*
- If you are using a network buffer of size x, you will need that x extra
- If you are using a printer buffer of size x, you will need that x extra

** Per composite font used at the same time*

So, for example, if you are using Precision Screening, an 8MB network buffer and a 4MB printer buffer, you would need between 27 and 31MB of memory available to the RIP.

However:

If you are doing lots of complex work such as some Aldus FreeHand jobs (Not large images), then you may want to increase the memory given to the basic RIP, as otherwise you may find that the RIP starts doing 'virtual' paint to disks (See the Harlequin RIP OEM manual for details).

By reducing the accuracy requirements for Precision Screening, the memory requirements can be greatly reduced. The default accuracies of 0.004 and 0.02 (for angle and frequency accuracies) will mean that clear centered rosettes are generated across the whole page, but if the registration when printed is going to be poor (say out by half a halftone dot or more), there is no point in having such accurate rosettes as they will be lost in the printing. In this case, accuracies of 0.01 and 0.05 can be used, which will use less memory. If the Precision screening does run out of memory, it will automatically adopt a less accurate screen (unless you have configured it to abort the job). However, if there is nearly enough memory, it will use the accurate screen but it may then run considerably slower. For more details of HPS memory requirements etc see tech note Hqn002.

When using composite fonts, it is very hard to estimate how much memory is required, as the amount varies considerably between different fonts. If you are using several composite fonts, then you will also need more memory if you want the fonts to be cached (which can double or triple performance). The only way to find out is to experiment with the particular fonts and types of job you want to use. See the Harlequin RIP OEM manual for more information on composite fonts. For more details of composite font memory requirements etc see tech note Hqn001.

The network buffer provides two functions. It increases performance by ensuring that whenever possible there is postscript available for the RIP. So, for example, when printing 'Musicians', a network buffer of 8MB is desirable, as this means that the whole of the next separation will have been read in while the previous separation is being rendered. This saves up to 10 minutes on the whole job if the job is being sent over LocalTalk.

The network buffer also increases productivity of the users by freeing up their Macintoshes more quickly. So, for example, with 'Musicians', the sending Mac can be freed up in about 5 minutes if a 32MB network buffer is used, even though the job may take more than 20 minutes to output. Even more, on Free-hand jobs, such as the Trout, it is possible to free the sending Mac in about 30 seconds, though the job will take up to ten minutes to finish. See the Harlequin RIP OEM manual for more information on the network buffer.

The printer buffer is there to allow the use of the Multiple parallel mode, and to allow users to run other applications on the RIP Mac, without causing stop/starts of the printer. Generally, about 4MB of printer buffer is enough for running the Multiple Parallel mode (including any memory on the interface card, so with 4MB on the card, a minimal printer buffer can be used). See the Harlequin RIP OEM manual for more information on the printer buffer.

If you have memory left over after the above considerations, then you may be able to create a RAM disk with the surplus and use it for page buffers. You can only do this if the RAM disk would be large enough to hold a page buffer. To get throughput (i.e. make the RAM disk worthwhile), you would want a RAM disk to be large enough to hold at least two page buffers. For 2540 colour work, you would probably need a RAM disk of around 100MB to hold this much successfully. For 1016 output, a 30MB or so RAM disk should be enough.

Imposition and Film Saving

On wide printers, using the film saving option (See the Harlequin RIP OEM manual) can save both time and media. You need to make sure that you set the media width for the cassette being used correctly, as it is the media width that is used to determine if the rotated page would fit on the media.

For some pages, they may have surplus white space at the sides, and this may mean that film saving will not rotate the page. You can force the rotation in Page Setup and also tell the RIP to centre the page if appropriate, so that only the white space is clipped.

Imposition in this document only refers to simple things such as printing 4 up etc., to make the best use of the printers page size. On images such as the Purup, it is possible to print 4 separations on one sheet of film. This saves 3 reloads of film, and half the imaging time. At the moment, the only way to do imposition in RIP is to use it in conjunction with an external imposition program. In level 2 Harlequin RIP it is possible to set up automatic operations such as printing 4 up or 8 up. This is done by adding small chunks of PostScript into the system which specify where to lay out the pages. This could, for example, automatically fill a large sheet of film with pages. This form of imposition will only work within a single job.

Use of Multiple Parallel mode versus the Single When Necessary mode

The preferred mode for maximum performance and convenience is the Multiple Parallel mode. It will always be the case that Single mode and Multiple mode will be worse than Multiple Parallel, and those modes are there to cope with very demanding non stop/start printers when there is very little memory to use as a printer buffer.

However, in some circumstances, it is possible that the Single When Necessary mode will be faster than the Multiple Parallel mode. This is because the bitmap of the output page does not need to be compressed, written to disk, read back from disk and decompressed again, before being printed. If the PageBuffers folder is on a RAM disk, the disk time is minimal, but you still

have to compress and decompress the page. It is a question of speed versus convenience. The multiple parallel mode offers much greater convenience, and normally will also offer the best performance.

The circumstances in which to use Single When Necessary (SWN) mode are: either if you are only outputting a single page, so there can be no benefit from the overlapping of outputting and RIPping; or if the time to compress and decompress the page to and from disk is large. An example of where this is true is the Rainbow Islands Seybold test job, where 30% savings are possible by using the SWN mode.

The main problem with the SWN mode is that if the job is too complex, then the printer will catch up, and a paint to disk will be necessary, and the page re-output, thus wasting the time spent on the failed page and being very slow.

Another potential inefficiency of SWN mode is that if the page is relatively simple, a lot of processing time is wasted when the page is outputting, which could be used to get the next page ready (as happens in the Multiple Parallel mode).

Screen caching for Harlequin Precision Screening (HPS)

HPS will normally run about as fast as ordinary screening, IF there is sufficient memory (if not, then any paints to disk etc. will be slower).

When HPS is turned on, the screens that are used can take some time to calculate the first time they are used. Because of this they are cached on disk, so that for subsequent pages there is no overhead in preparing the screens. The time to generate a screen varies from 1 second to several minutes, depending on the accuracy of the screen requested, resolution and so on.

This means that for all timings, you must make sure that the screens are cached on disk, as otherwise the timings will not be representative. Normally, caching 20 or so screens (4 angles) will take between 1MB and 5MB (approximately!), so the disk overhead is minimal. (About 20 times this amount of disk is saved by the compressed page buffers feature of the RIP.)

Printer Drivers

There are many different printer drivers, the main ones being 5.2, 6.0, 6.0.1, 6.0.2, 7.0, 7.0 tuneup, 8.0 and 8.1.1.

On a job like ‘Musicians’, each newer driver is successively slower than the previous one. However, on jobs involving text and freehand sort of things, the newer drivers can be faster. There is no hard and fast rule. However, one thing to avoid is to print the PostScript to disk from the system 7 drivers, as these will include the Truetype fonts, making the PostScript file much larger and slower to process.

LaserWriter version 8 is designed for use in background printing, and can be very slow to send large files to the RIP. We recommend that LaserWriter version 8 is not used with large scanned images.

Seybold Specific Hints

Unfortunately, the Seybold timings have to cover a large range of resolutions, so printers at 2000 dpi and 2540 dpi are compared directly with each other. However, there is 61.29% more data in a 2540 dpi bitmap than in a 200 dpi bitmap. The time to generate the 2540 dpi job, while probably not being 62% longer, is certainly substantially longer.

The only solution to this, to make the comparisons meaningful, is to use the lowest resolution possible.

Change history		
v 1.1	94.04.10	Created
v 1.2	2001.06.11	Updated cover page and copyright page. Removed references to ScriptWorks and replaced with Harlequin RIP. No other changes made to text.