

# NATIVE INTERPRETATION IN THE HARLEQUIN RIP<sup>®</sup>

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# Introduction

When Harlequin® RIPs first shipped for production use in 1988, they were “PostScript® language compatible interpreters”. They could read PostScript language files, and render them to rasters that could be used to mark onto film or to other media. In the twenty years since then many new features have been added to the Harlequin RIP, including in-RIP separation, trapping, imposition, color management, font emulation and a host of other functionality to make pre-press production faster, more efficient and easier.

## Supporting PDF

Amongst those features, support for Adobe®’s Portable Document Format (PDF) was added in 1997. At the time our developers had the choice of following the route taken by Adobe, of adding a converter from PDF to PostScript in front of a RIP that still only understood PostScript, or of building a RIP that could read PDF as well. After much consideration we decided to add a native PDF interpreter, because we believed that adding an extra conversion step had a very high likelihood of introducing errors in the output, and would reduce the performance of the RIP.

Back in 1997 PDF was at version 1.3 (Acrobat 4), and didn’t include any transparency support; a conversion from PDF to PostScript would have been a relatively lightweight and simple process. When Adobe added live transparency to PDF version 1.4 (Acrobat 5), our decision was vindicated. Overnight a conversion from PDF to PostScript became much harder, requiring flattening of any transparent objects and so greatly increasing the likelihood of conversion errors and reducing performance. That’s not to say that updating our native PDF interpretation to support transparency properly was easy, but it was clearly the right thing to do. Version 6.0 of the Harlequin RIP (the Eclipse Release™) was one of the first products to natively consume PDF files, and to process live transparency in them for production use in professional print sites, when it was released in 2002.

Harlequin RIPs since 2002 have automatically recognized when PDF files contain any transparency, and have acted on that to generate the correct results, even when in-RIP trapping is in use.

Since 2002 the Harlequin RIP has automatically recognized when PDF files contain transparency and generated the correct result. In fact, unlike other RIPs the Harlequin RIP provides native interpretation of PostScript, PDF and XPS in a single RIP.

## The future of PostScript

A second decision we had to make in 1997 when we first added native PDF interpretation, and then to re-confirm in 2002 when we added support for live PDF transparency, was what we should do about PostScript. We could either build two separate RIPs, one for PostScript, and one for PDF, or we could combine support for both formats into a single RIP. We looked at the functionality that we'd added into our original PostScript language support, such as in-RIP trapping, color management, separation, calibration and high-quality screening, and it was obvious that it would all need to be supported for both PostScript and PDF into the future.

Harlequin RIPs are sold through OEM partners, and we didn't want to give those partners the added workload of providing interfaces to configure the extra functionality twice, once for PostScript and once for PDF. There was also the risk that unintended differences in the behavior of something like color management between PostScript and PDF might occur if they were supported in separate RIPs, leading to increased training costs and reduced confidence amongst our users.

It was clear that the only sensible solution was to build support for both PostScript and PDF into a single RIP.

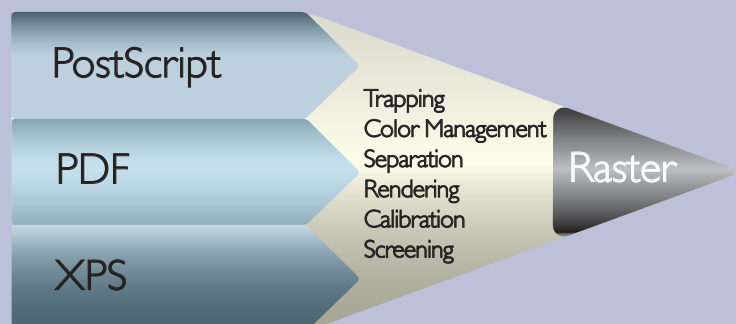
### WHAT DOES “NATIVE INTERPRETATION” MEAN, ANYWAY?

RIPs read a job in page description language such as PostScript, PDF or XPS and store a representation of all the graphical elements that make up the pages in a structure known as a Display List (DL). The DL is then rendered to produce a raster file (a bitmap or byte-map).

The Harlequin RIP contains three interpreters, one for each of PostScript, PDF and XPS. Each one reads the relevant type of input and converts it into a single DL. The same rendering pipeline is then used to process all pages, whatever format they started out in.

Additional functionality, such as trapping, color management, calibration, separation, screening is performed either on the DL before rendering, or during rendering process itself. Other features, such as font emulation or imposition may be performed at any time; in a Harlequin RIP they are handled during interpretation, but using code that can easily be shared between different interpreters.

This level of commonality extends to job submission too. Whether you're using a hot folder or JDF to send files to a Harlequin RIP you can set up a single channel and the RIP will automatically recognize what file format it's delivered in and process it correctly.



# And then there were three

In 2003 Global Graphics (the company behind the Harlequin RIP) was commissioned by Microsoft to assist in defining a new page description language that would be used as the core of the print subsystems in their upcoming Windows Vista operating system. The format became known as XPS, the XML Paper Specification. Global Graphics was involved throughout the definition phase of XPS, and first demonstrated XPS RIPs based on the Harlequin RIP kernel in 2004. Support for XPS in professional print was rolled out in the Harlequin PLUS Server RIP in 2007. Transparency in XPS is processed fully automatically, just as it is in PDF.

We'd already been through all the design decisions around performance and output quality when we added PDF support; it was obvious what we should do for XPS. We added a third interpreter alongside PostScript and PDF to handle it.

And that's where the Harlequin RIP stands today. Whether you've built a PDF workflow, or you're still working with PostScript files, or you're ahead of the curve on XPS adoption, the Harlequin RIP will help you deliver high-quality results at high speed. If you have a mixed workflow, receiving files in more than one format, or if you re-design your processes to move from one to another you don't need to learn different tool sets for color management, trapping, screening etc. If you've learned it once, then you've learned it for all formats.

## Harlequin: not like “most other RIPs”

### About Global Graphics Software

Global Graphics Software <http://www.globalgraphics.com> is a leading developer of platforms for digital printing, including the [Harlequin RIP®](#), [ScreenPro](#), [Fundamentals](#) and [Mako](#). Customers include [HP](#), [Canon](#), [Durst](#), [Roland](#), [Kodak](#) and [Agfa](#). [The roots of the company go back to 1986](#) and to the iconic university town of Cambridge, and, today the majority of the R&D team is still based near here. Global Graphics Software is a subsidiary of Global Graphics PLC (Euronext: GLOG).



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