

Chapter 1

About RIP

1.1 What is RIP?

RIP (Raster Image Processor) is an interpreter that converts computer-edited vector graphics and/or text into a raster (bit-mapped) image. Raster image processors are widely used in laser imagesetter and large format color-printers.

1.2 Why Large Format Printers Use RIP?

Large format printers need RIP software support because of limitations of their hardware and drivers.

■ Printer's Limitations of Hardware

☐ Speed of Printer's Chip is Too Slow

Development of large format printer chip is much slower than that of personal computer chip. Therefore, printer chip speed is much slower than PC's chip speed at the same age. That is to say, PC's chip speed is much higher than the chip speed of printer. When a computer and a printer process the same operation, the printer's operation will be much slower than the computer's operation.

The **MainTop RIP** will make full use of the characteristics of CPU such as Pentium MMX, Pentium III. Therefore, it can easily obtain a higher speed, which is much higher than the speed of printer's chip. The **RIP** will give the printer operation to a computer to get a higher speed.

☐ Printing Size is Limited

A general large format printer has a limited RAM and a limited external RAM. It can not process complicated or super-large format graphics, and has not the functions of tile printing the super-large format graphics.

A general large format printer has no internal hard disk. Even if it has a hard disk, it will

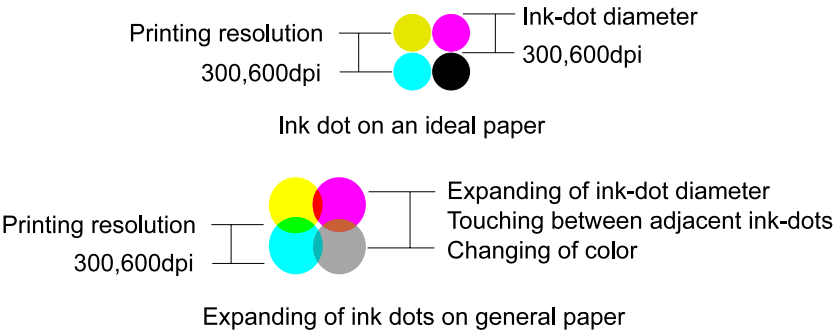
be unable to meet the requirements of super-large graphics. For example, HP Design Jet-2500CP's internal hard disk has only 420MB for output cache; and 3500CP has only 719MB.

Generally, a file (in printer RAW language) used to print an A0-size 600dpi graphics is 140~240 MB. Size of the file changes with different graphics. Therefore, to print a sheet of graphics more than 10m² needs more than 1 GB space.

The MainTop RIP software uses computer's hard disk as the cache of Printer RAW file. Therefore, it can meet the requirements of printing large-format graphics.

❑ **Types of Paper are Too Few**

Different media (such as paper, film, and cloth) and different ways (such as back-printing and front-printing) need different ink-jetting capacity. To meet an ideal requirements needs a lot of tests and strict control. But, the paper types provided by printer manufacturers are too few to meet the printing requirements of different users.



■ **Printer Driver is Limited by Windows API**

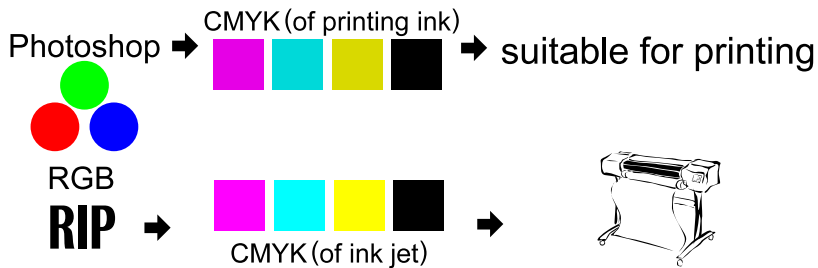
General printer driver must use the Graphic Device Interface(GDI)in the Windows API. But, the internal structure of Windows is designed for small-format office-automation software. It is not suitable to process large format printer RAW file (about 100MB or more) and complicated lines.

The MainTop RIP uses its own calculation mode without using the Windows GDI. It converts graphics into a printer RAW file through calculation in the MainTop RIP, and transmits the printer RAW file to a large format printer through a parallel interface or a network. In this way, it can guarantee that any output data will not be lost.

■ **Printer Driver has Poor Capacity of Color Control**

Internal structure of Windows is set to process RGB graphics, incapable of color separating and CMYK processing. Common users use Photoshop to do color separation pertaining to CMYK print-ink, which is quite different from large format printer ink, and will cause great color deviation.

MainTop RIP are endowed with built-in color management, capable of color separation. They separate colors according to large format printer ink's CMYK values actually measured so that the output color is the same as the original page.



■ Printer Output Speed is Slow

The internal structure of Windows and the limitation of printer chip speed result in slower output. Therefore, it is very difficult to process large format graphics and complicated vector graphics such as lines, transition, and shade.

The MainTop RIP has fully improved printing speed by using the high-speed segment algorithm. As soon as the **Enter** key is pressed, the printer starts printing without waiting. It can guarantee that "pressing the **Enter** key starts continuous output", without considering the size of graphics. It will minimize the processing time by the RIP.

■ Built-in Printer Driver is Usually Incapable of PS File Processing

Common drivers have no built-in PostScript interpreter, and can not support the PostScript standardized PS and EPS.

MainTop RIP has a built-in PostScript interpreter, capable of exporting PostScript I, II standardized PS, EPS files and zooming at users' will.

1.3 Key Techniques of MainTop RIP

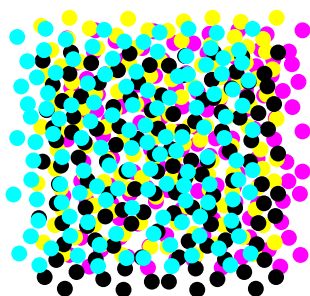
■ Color Separation

Color Separation is one of the MainTop RIP's key techniques. Graphic files in a computer are encoded in continuous color, while ink-gun heads spray color dots one by one with only four colors of CMYK. MainTop RIP has the ability of separating four colors, and according to different CMYK color values of large format printer inks, of standardizing color separation.

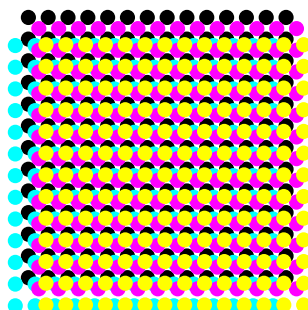
■ Screening

Screening Technique is the key to spray-drawing printing quality. Amplitude modulation screening dots and frequency modulation screening dots are commonly used.

Amplitude modulation screening dots are regularly set, varied dot sizes representing gray grades. And same dot pitch will very likely cause paralleling. Frequency modulation screening dots can represent more clearly and more accurately tiny fine-colored parts of an image, and can describe grays of 256 grades, which approximate continuous colors.

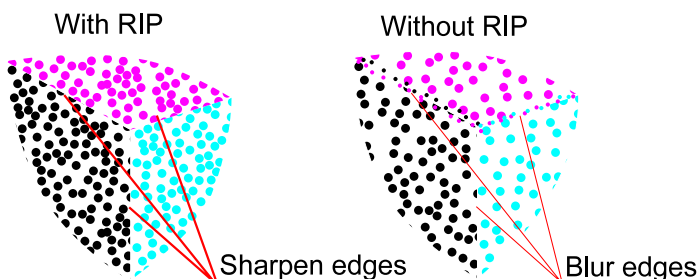


FM halftone-dots



AM halftone-dots

MainTop RIP adopts a high precision enhanced error diffusion technique to create delicate frequency modulation screen, avoiding the appearance of parallel lines and stripes, in order to obtain photo effects.



■ Color Management

All color information of images derives from natural visible light. Enormous amount of RGB mode color information is obtained through photographing, picture-taking and scanning. Printing output is the imitation in CMYK of RGB input by given CMYK color-values of printing ink. Narrowing of CMYK gamut results in printing output color errors.

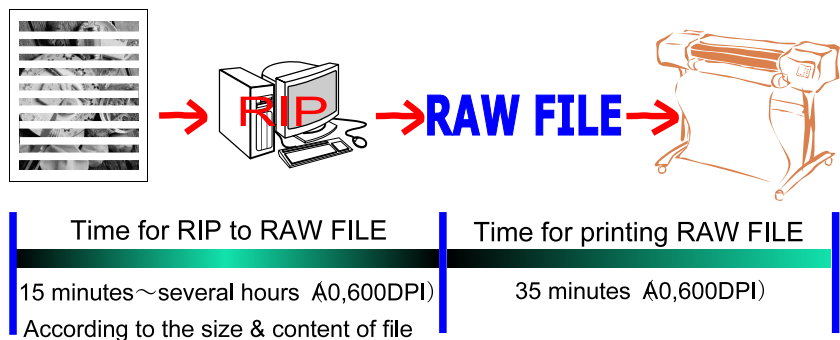
If CMYK color-values of printing ink is adopted in spray-draw exporting, CMYK color-values of printing ink have to be converted into those of spray-draw ink. Thus a second color error occurs.

More precise colors can be achieved only through separating colors of RGB color information directly according to CMYK color-values of spray-draw ink.

MainTop software uses RGB color information instead of that of CMYK.

1.4 Features of MainTop RIP

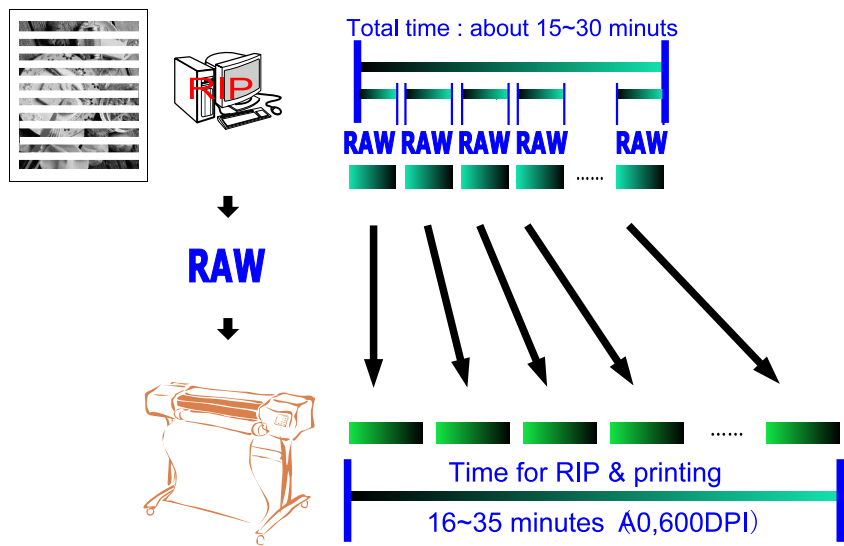
Common RIP Output Mode



MainTop RIP's Output Mode

MainTop RIP's process data in a manner of one subsection by another that enable they to have the excellence output speed of MainTop RIP in addition to their advantages over others in hardware driver program.

One-subsection-by-another processing gives MainTop RIP a process speed as fast as continuous-print starting immediately after enter button pressed. Files are into many segments with landscape mode for processing of each only several seconds needed, and then immediately sends them to a large format printer.



As more time taken for print a segment sent from RIP than that of its treatment, continuous printing by a large format printer with RIP is ensured.