

Seagate Crystal Reports 5 and 6

Alignment, Preview, Printing and WYSIWYG

Overview

The purpose of this document is to give an informed overview of the way Seagate Crystal Reports generates previews and printed copies of reports, and how these are dependent on operating systems, fonts and printers.

This document is not intended as a stand-alone “be-all, end-all” for report preview/printing troubleshooting. Instead, is intended to help provide a summarized outline of what has been documented in the *Seagate Crystal Reports v6 - User’s Guide*, and the Report Design technical briefs: *Printer Driver Dependency Document* and *Factors Affecting Print Speed in Seagate Crystal Reports*.

Contents

CONCEPTS & TERMS	2
WYSIWYG AND THE PREVIEW WINDOW	3
HOW SEAGATE CRYSTAL REPORTS PRINTS IN WINDOWS.....	4
DIFFERENCES BETWEEN DEFAULT PROPERTIES AND DEFAULT PRINTER	8
Default Properties.....	8
Default Printer.....	9
PRINTERS, PRINTER DRIVERS & FONTS	10
TIPS & TRICKS TO BETTER PRINTING	11
FINDING MORE INFORMATION.....	12
CONTACTING CRYSTAL DECISIONS FOR TECHNICAL SUPPORT	12

Concepts & Terms

Before going further, it is important to understand some basic printing and operating system concepts and terms. Please familiarize yourself with the following, before proceeding further:

Scalable Font A font represented in an object-oriented graphics language such as PostScript or TrueType. Such fonts are called scalable because the representation of the font defines the shape of each character (the typeface) but not the size. Given a typeface definition, a scalable-font system can produce characters at any size (or scale).

Outline Font A scalable font in which the outlines of each character are geometrically defined. The most popular languages for defining outline fonts are PostScript and TrueType.

True Type Font An outline font technology developed jointly by Microsoft and Apple. Because TrueType support is built into all Windows and Macintosh operating systems, anyone using these operating systems can create documents using TrueType fonts.

Printer Fonts Printer fonts are fonts that have been specially created to work with a *specific printer*, and are often installed when the printer is added to the operating system. However, many printers also store these printer fonts in memory modules in the physical printer, which are accessed by the operating system and software programs when the printer is online.

Printer Devices Printer Devices refer to the actual hardware that is creating the output page. These devices can include printers, fax machines, fax modems, printer capture programs, printer emulators, etc. It is important to note, that not all these devices create actual paper outputs. Often, they result in electronic media versions of the document being printed, which can then be transmitted to the recipient.

Printer Drivers Printer Drivers are the software components that are required by the operating system to properly install, operate and detect the related Printer Device. Usually (but not always), these driver files are named *.DRV, and located in the Windows system directory.

Print Spooler The Print Spooler (or Print Manager for Windows 3.x users) is the part of the Windows operating system which handles all print jobs. Especially in more recent versions of Windows (Win95, Win98, NT), the Print Spooler is capable of caching multiple print jobs and printing them to the Printer Device in the “background”, allowing the user to continue to use other programs while the print jobs complete.

Metapage A metapage is a graphic representation of the page or document to be printed that is sent to the Print Spooler for printing. The majority of newer Windows programs utilize metapage technology to handle printing. Depending on the printer settings, the print driver, and operating system settings, this metapage print job may be further manipulated and adjusted prior to final output of the hard copy. This often results in the printed output varying from the Preview window.

WYSIWYG and the Preview Window

WYSIWYG (otherwise known as “What You See Is What You Get”), refers to the concept of providing the user with an on-screen view of a document or image that looks very similar to what the printed (hard copy) output should look like. Because WYSIWYG is an interpretive process (the screen is not a printer, nor are all screens capable of displaying in the same resolution as many printers), it is often difficult for software manufacturers to get perfect WYSIWYG output to the screen.

Often, there are many hardware and software components involved in the final printed (hard copy) output, which may or may not be available to the software facilitating the printing of the document. Often, WYSIWYG requires devices and components of the system to properly communicate back information about themselves, which is then used by the software WYSIWYG engine to determine what to output on the screen.

Seagate Crystal Reports utilizes two components: the printer driver and the screen resolution, to determine how to create the WYSIWYG preview of a report. Screen resolution is used to help assist with how we create the preview window at different zoom levels. The printer driver is used to determine how the final document will be sent to the Windows Spooler for printing.

For best accuracy between the Preview window view and your final printed output, it is recommended that you:

- Set the Preview window to 100% zoom
- Design your report on the printer device that you intend to print the report on
- Ensure the printer device you are designing with is set as the Windows default printer
- Ensure that your printer device’s Font properties is set to one of:
 - Print TrueType Fonts as Graphics
 - Print using TrueType Fonts
 - Always use TrueType Fonts
- Avoid having your printer device’s Font properties set to:
 - Print using the Font Substitution Table
 - Print using Printer or Built-in Fonts
- Never use TrueType Fonts

Although the above is recommended (especially if you are distributing your reports to be used on many different printer devices), sometimes because of printer driver limitations (some of these options were not available on older printer drivers) or personal choice, you may end up using settings different than those recommended. In such cases, you can expect to see a marked difference between the Preview window and the final printed hard copy.

NOTE

It is important to understand, that even if the above recommendations are followed, *printed output may not be exactly as in the Preview window*. Because screen resolution is used by Seagate Crystal Reports to assist in generating the WYSIWYG view in the Preview window, and because screen resolution *is not* used in the printing process, there can often be *slight variations between the Preview window and the printed output*.

How Seagate Crystal Reports Prints in Windows

If you remember back in the old days of DOS (before Windows), all programs printed directly to the printer port. Although this method resulted in quick, immediate printing, the huge disadvantage to this was that if you sent a large document to the printer (ie. 80 pages), you were not able to do *anything else* until the last couple pages were sent to the printer device's buffer. Obviously, this was not an effective use of time, as the user ended up killing time until the print job completed.

With the introduction of Windows, all of this changed. The early Windows 3.x operating systems introduced a new system component – the Print Manager. This memory resident program allowed printing to occur in the “background”, while the user continued to work in other programs – no longer having to wait for the print job to complete. This new component (which also exists in Windows 95, 98 and NT and is called the Print Spooler), now handles all communication with the printer port – effectively removing the need or ability to print directly to the printer port.

As you can see in the diagram below (Fig. 1), the Print Spooler acts as a middleman – juggling multiple print jobs from programs, while allowing the user to continue to use programs with very little interruption.

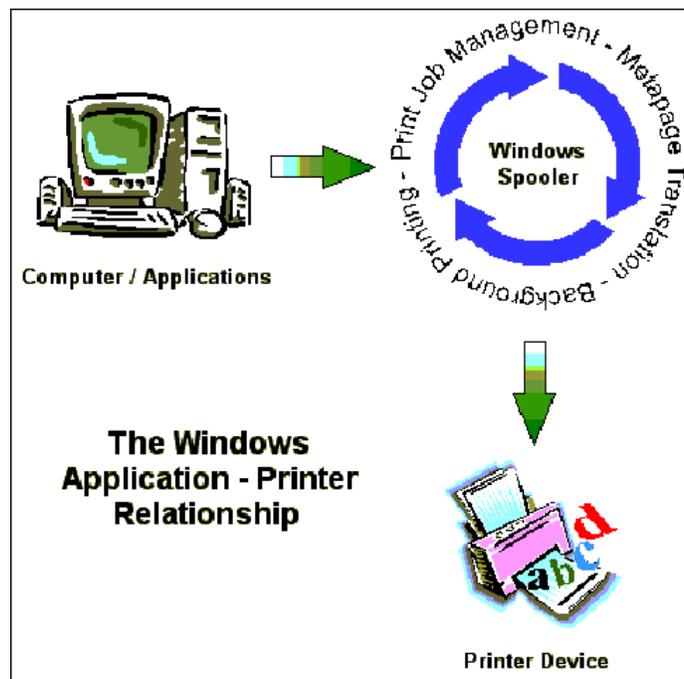


Fig. 1 – The Application – Printer Relationship

Seagate Crystal Reports has a two step process that is used to communicate with the printer device and send print jobs to the Windows Print Spooler.

First, when a new report is started, or an existing report is loaded, Seagate Crystal Reports “polls” the printer driver for information about:

- Paper Size
- Page Orientation
- Minimum Margins (unprintable areas)
- Font Metrics (this will be explained later)
- If the printer is the current Windows default printer, Seagate Crystal Reports can often gather the following additional information about the printer (dependent on the printer driver and how it responds):
 - Color options
 - User-defined or Custom paper sizes
 - Additional Paper Trays
 - Printer Fonts
 - Print Quality (dpi)

Seagate Crystal Reports then uses this collection of information to assist in creating and controlling the aspects of a report. When the report is printed to the printer device, Seagate Crystal Reports generates metapages of the report based on the printer information gathered, and sends these metapages to the Windows Spooler.

The Windows Spooler then handles the entire printing process and communication with the printer device. Seagate Crystal Reports *does not print directly to printer ports*. The figure below (Fig. 2) shows the relationships discussed above:

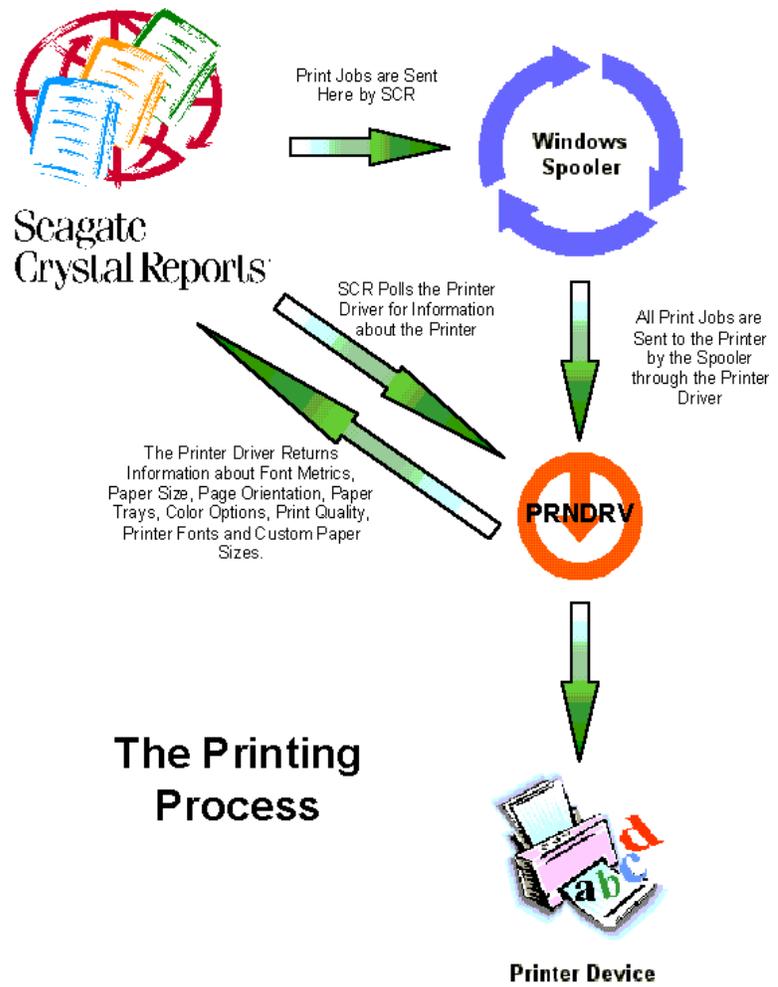


Fig. 2 – The Printing Process

Another important aspect on how Seagate Crystal Reports prints in Windows, is the Printer Setup screen. There are a number of important things to remember about this screen, if you wish to effectively control how other people view and print your report.

There are slight differences in the dialogue screen between 16-bit and 32-bit Seagate Crystal Reports. For ease of explanation, 32-bit will be used for the example, and 16-bit will be summarized later on. Figure 3 below is a typical view of the Printer Setup screen for 32-bit Seagate Crystal Reports (found in the File menu):

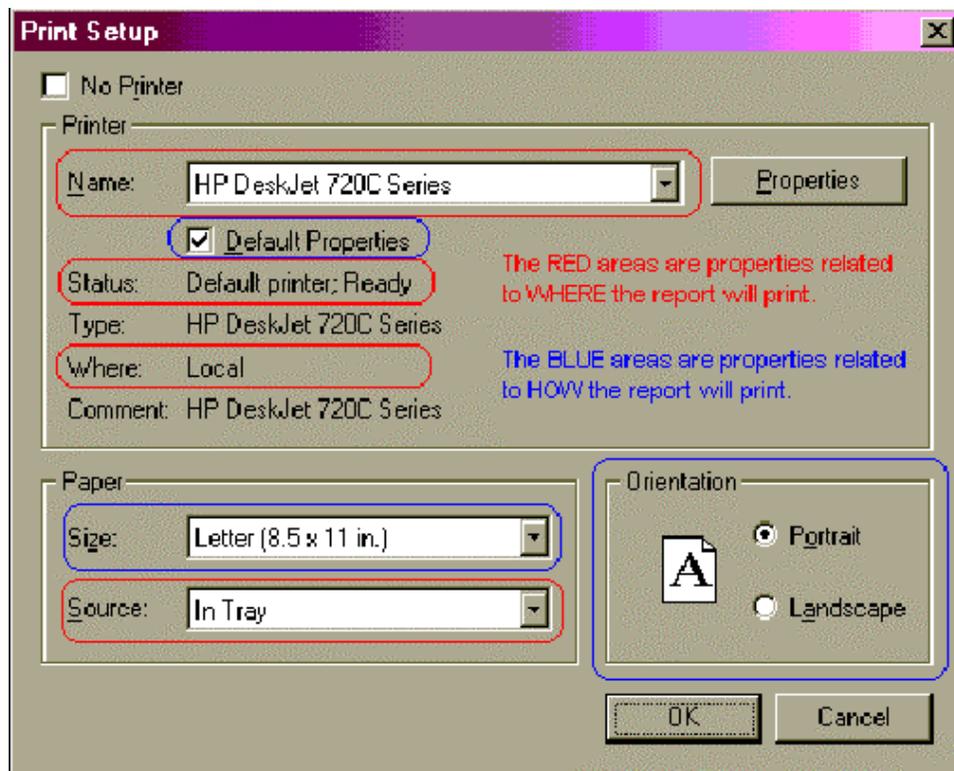


Fig. 3 – The 32bit Printer Setup Dialogue Box

As you can see, there are two concepts at work with the Printer Setup dialogue box. The first are properties that control WHERE the report will print (indicated in red). The printer Name, the Status line, the Where line and the Source, all tell us WHERE the report will print.

Using the example in Figure 3, the report would print to:

- An HP Deskjet 720C Series printer
- Which is the Windows Default printer
- Connected to the Local machine (as opposed to a network printer)
- Using paper from the printer's Tray (as opposed to an envelope feeder or additional paper tray)

None of these items have anything to do with HOW the report will print. At this point, all that is known is what printer, and what paper source will be used when the report is printed. To determine HOW the report will print, you must look at the properties highlighted in blue in Figure 3.

Using the same example in Figure 3, the report would print:

- Using the printer's own default properties
- On 8.5 x 11 in. paper
- In portrait orientation

Differences Between Default Properties and Default Printer

These are probably the most widely confused and misunderstood concepts in printing for users of Seagate Crystal Reports. It is important to realize that they are NOT one-in-the-same, and that how they are used can have a significant impact on how reports are viewed and printed when reports are shared among users and systems.

Default Properties

Referring back to Figure 3, one will notice the checkbox "Default Properties", located right below the printer Name box. Obviously, this option has two states, enabled (checked) or disabled (unchecked).

When Default Properties is checked or enabled, the report, when printed, will use the printer's default Windows settings to print the report. This can include:

- Page Orientation
- Paper Size
- Paper Source (trays, etc.)
- Color Settings

It is really important to understand exactly what enabling this box will do. For example, assume that Figure 3 represents the printer setup settings that the report designer/developer has used and saved with the report. That person then sends the report to another user who wants to print it. This new user, has a Canon BJ4000 color printer, and currently has it set in Windows to default to landscape, legal (8.5 x 14 in.) paper.

When the Canon printer user prints the report, *because Default Properties is ENABLED*, the report will print out drastically different from the designer/developer's printer (namely, the report will print on legal paper in landscape orientation – not the portrait letter (8.5 x 11 in.) paper it was designed with).

Let's take this same example above, but this time, the designer/developer unchecks/disables the Default Properties box, saves the report and sends it to the same user with the Canon BJ4000 color printer.

Now when the Canon printer user prints the report, *because Default Properties is DISABLED*, the report will try to force the original saved settings on the Canon printer. Now the report will print with portrait orientation, and will print on the Legal (8.5 x 14 in.) paper (because no other paper is available on the printer – this setting cannot be overridden). However, the report will only print using the first 11 vertical inches on each page (as if the paper WAS letter sized).

The basic rule of thumb to remember is:

If you want your users to print using the same paper size, paper tray and paper orientation as you have designed the report with, always UNCHECK the Default Properties box.

Again, this is not a 100% guarantee that your printer settings will be “forced” on the user’s printer. Only those settings accepted by the user’s printer will be enforced. For example, if a report is saved with Default Properties UNCHECKED with A4 paper type and Manual Feed as the paper source, and given to a user who’s printer *does not support A4 paper and/or does not have a Manual Feed paper source*, then those settings will be ignored, and the user’s printer’s default settings will be used.

Default Printer

The Default Printer is the printer that your Windows operating system has flagged as the printer to “use unless otherwise specified”. All Windows applications will print to the Default Printer unless direct user intervention occurs to prevent otherwise. The Default Printer is *where* the report will print.

When you design a report using the default printer, Seagate Crystal Reports will be able to gather additional printer information that is not available when designing on a *specified printer* (or non-default printer). These printer properties may include:

- Custom or user-defined paper sizes
- Additional printer fonts
- Duplex printing options

Designing a report on the Default Printer is the best thing to do when you are going to *distribute* your report to a large number of users, especially when they are not using your printer. A report designed on the Default Printer will automatically use the user’s Default Windows Printer whenever printed. In this way, a report designer does not have to worry about *what* printer the user has installed, as long as *any printer* is installed and set to be the Windows Default printer.

Of course, with this advantage, there are a number of disadvantages to consider. These include, but are not limited to:

Reports will print differently (to varying degrees) on different printers

Some printers do not support all possible printer options (ie. design a color intensive report on a color printer, and then print to a black & white printer will *obviously* result in a dramatically different report, a non-duplex printer will not duplex print a report, etc.)

Some fonts are not available on all printers (ie. output will be different, fonts may be substituted or changed, font sizes may be changed, etc.)

Printer margins may affect report output (designing on a printer that supports 0.5 inch margins, and moving to a printer who’s minimum is 1.0 inch margins may result in more pages, cutoff text, unprintable area error messages, etc.)

Printers, Printer Drivers & Fonts

Before starting to design a report, especially one that you want to distribute to a large number of clients who will all be using different printers and operating systems, it is important to understand the relationships and characteristics of printers, printer drivers and fonts.

Every printer device requires a printer driver to properly operate within the Windows environment. For the majority of older printers, the operating system's installation disks/CD will contain up to date drivers for them. However, with newer printers, especially ones released in the past 6 months, it is often recommended to visit the printer manufacturer's website to ensure you have the latest drivers available.

Printer drivers control how print jobs from the Windows Spooler are translated into information the printer can understand. Old or out of date drivers can have a dramatic impact on printer performance, quality and special printer options available to the user.

At the present time, almost every printer driver out on the market, interprets fonts differently. This is even evident with printer drivers from the same manufacturer. How one printer driver sees Times New Roman 10pt, can be entirely different than another printer driver.

Because TrueType font files (.TTF) are operating system dependent, even the same font can print differently in Windows 95 and Windows NT. Part of this problem is that there is no recognized "standard" for fonts out in the market. Printers, software programs and operating systems, can all create and ship their own versions of fonts (like Arial, Times New Roman, etc.), and none of them are exactly the same, resulting in many different possible print outcomes.

Fonts also have two properties that can drastically affect how they print on different printers. The first is the Font Face, the second is the Font Script(s).

The Font Face is the name of the font, and is most apparent in Windows applications when you are picking a font out of the dropdown list of fonts. For example, *Arial*, *Times New Roman* and *Courier* are all Font Faces. They denote a "family" of font that may or may not contain Scripts. For each Font Face, there is normally one font file (.TTF, etc.), although the one font file may contain many Scripts.

A Font Script is a "flavour" of the Face that may or may not be available for a font. In some Windows applications, you can see these denoted in the font dropdown list, enclosed in parenthesis. For example, *Arial (Western)*, *Arial (Baltic)*, *Arial (Turkish)*, all denote different Scripts (Western, Baltic, Turkish) within the Arial Font Face. Each Script has slightly different font metric properties, and may result in slightly different character output on different printers.

In Seagate Crystal Reports, as soon as you have used a Font Face that has more than one Script, whatever the first Script used on the report is, will ALWAYS be used anytime that Font Face is used. At the current time, you are not able to mix different Scripts of the same Face within one document. This is also evident in such programs as Word and Excel. In Seagate Crystal Reports, the only way to use a different Script of a particular Font Face, is to create an entirely NEW

report. Deleting all objects that use the “wrong” Script will still not allow you to then use a different Script in that Font Face family.

Tips & Tricks to Better Printing

There are a number of things that you can do when designing your report, and related to your operating system and printer, that will improve how a report prints. Some or all of these may be available options for you, while some systems or printers may not be able to take advantage of any of these tips.

When designing your report for distribution, it is best to follow as many of the following guidelines as possible, to ensure best printing across different platforms and printers. Again, you may or may not be able to follow all these guidelines. Realize that the more guidelines that can be followed, the better the results will be across platforms and printers, BUT print output may still vary slightly.

Ensure that reports are designed on the printer that is going to be used to print the report.

Ensure that the printer to be used (#1 above) is set as the Windows Default printer on the report developer’s system.

Ensure that all systems that are going to print the report are using the same version of operating system that the report developer used.

Ensure that all systems that are going to print the report are using the same printer that the report developer used.

Ensure that all systems that are going to print the report are using the same version of printer driver that the report developer used.

Ensure that all systems that are going to print the report have their printer (from #3 above) set as the Default Windows printer.

Ensure that all systems that are going to print the report have their Windows printer settings set the same as the report developer’s Windows printer settings.

Ensure that when setting the Windows printer settings on the report developer’s system and all systems that are going to print the report, that the printer device’s Font properties are set to one of:

- Print TrueType Fonts as Graphics
- Print using TrueType Fonts
- Always use TrueType Fonts

When configuring the Windows printer settings in #8 above, avoid having the printer device’s Font properties set to:

- Print using the Font Substitution Table
- Print using Printer or Built-in Fonts
- Never use TrueType Fonts

Ensure that the report developer and all systems that are going to print the report are using 640 x 480 screen resolutions.

Ensure that the report developer and all systems that are going to print the report have their preview windows set at 100%.

Ensure that common Windows Font Faces are used throughout the report.
Avoid using Printer Font Faces.

Ensure that the report developer and all systems that are going to print the report have the same versions of the Font files from #12 above.

Finding More Information

The following reference materials were used during the creation of this Technical Support document, or are recommended for further reading on subjects covered in this document.

PCWebopædia. The #1 online encyclopedia dedicated to computer technology. Copyright © 1998 Mecklermedia Corporation. Articles on *TrueType*, *Outline Font* and *Scaleable Font*. Located at: www.pcwebopedia.com

Printer Driver Dependency in Seagate Crystal Reports. Seagate Software Inc., Technical Brief from the Technical Support Department, GED, 1997.

Factors Affecting Print Speed in Seagate Crystal Reports. Seagate Software Inc., Technical Brief from the Technical Support department, KRP, 1997.

Contacting Crystal Decisions for Technical Support

We recommend that you refer to the product documentation and that you visit our Technical Support web site for more resources.

Self-serve Support:

<http://support.crystaldecisions.com/>

Email Support:

<http://support.crystaldecisions.com/support/answers.asp>

Telephone Support:

<http://www.crystaldecisions.com/contact/support.asp>