



Technote 1112

Introducing the LaserWriter Driver Version 8.5.1

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This Technote outlines some of the changes and new features that Apple has made with the LaserWriter version 8.5.1 release. It describes new utilities, expanded technology support, and what this means to you, the developer.

Note:

This Technote is a generic overview of the changes in the LaserWriter version 8.5.1 release. There are several more Technotes on Apple's Technote web site that provide more detail on how to implement and support some of the new features with your driver or application.

Desktop Printer Utility

In the current LaserWriter 8 driver, the Chooser lists printers which are available on the AppleTalk network (either LocalTalk or AppleTalk) with an NBP type of "LaserWriter." When the user selects one of these printers, LaserWriter 8 creates a desktop printer by sending an Apple Event to the Finder. In the past, this mechanism of setting up printers has served the needs of most users. However, with LaserWriter 8.5.1, Apple is responding to several requests for more flexible desktop printing functionality. To this end, Apple has introduced a new application called Desktop Printer Utility which enables users to create additional types of desktop printers. Users can now create desktop printers which use the Unix *lpr* protocol for printing, in addition to the regular AppleTalk Printer Access Protocol printers. There are also "hold" printers which represent local print queues and "virtual" printers which represent printers which are not available on the network.

Note:

The Desktop Printer Utility will not work on Mac OS 8.0. Due to the parallel development schedules and Finder dependencies, this utility will only work on Mac OS 7.5 through 7.6.1 and Mac OS 8.0.1 and above.

Types of Desktop Printers Currently Implemented With the Desktop Printer Utility

Virtual- Printer (No Printer Connection):

Many users have asked Apple to provide a mechanism to create desktop printers that save their PostScript output to a file without having to be connected to a network. This is a useful feature for those users who publish or archive PostScript documents as well as for those users preparing to take a document to a service bureau. This can be done with Desktop Printer Utility by having the user set up a 'virtual printer' that saves PostScript files to disk.

Hold- Translator (PostScript):

A type of desktop printer useful for PowerBook users is a "hold" desktop printer. Such a desktop printer is always in hold mode and, as the user prints, the spool files appear in the desktop printer queue but are never printed. When the PowerBook is connected to a network with printers, the user can then copy the spool files from the hold desktop printer queue to a desktop printer that represents a real printer on the network.

TCP/IP/LPR- Printer (LPR):

Many users, especially network administrators at universities, have asked for LPR support for LaserWriter 8. With Desktop Printer Utility, printers that represent TCP/IP printers are supported. When creating a TCP/IP desktop printer, the user provides either the name of the printer or its IP address. When LaserWriter 8.5.1 prints to one of these DTPs, it will send the job using the LPR protocol.

DTP Utility Customization

Along with the expanded capabilities, Desktop Printer Utility is also customizable. LaserWriter 8.5.1 and Desktop Printer Utility (together) support the creation and use of desktop printers known as Custom DTPs. When printed to, Custom DTPs cause the LaserWriter 8.5.1 driver to create a PostScript file and to launch an application that can post-process the PostScript. This post-processing application can do anything it likes with the PostScript file, such as converting the PostScript into another file format, transferring the file to another location using a modem or a network connection, or displaying the PostScript file to the user. Customization simply requires a developer to create a few resources and the LaserWriter 8.5.1 driver will do the rest. Please see "Customizing Desktop Printer Utility" in this issue for more information.

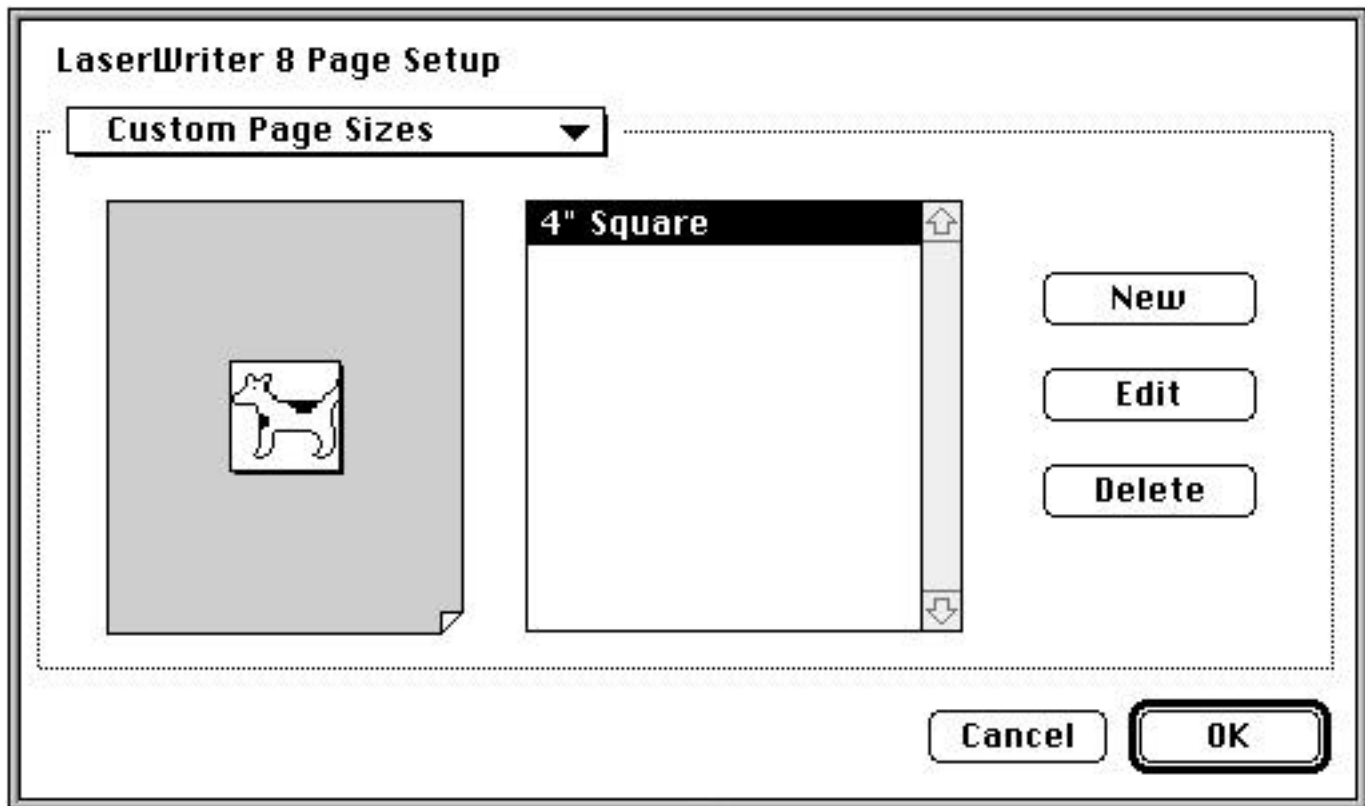
The Extended 'PAPA'

In order to support the new types of desktop printers for Desktop Printer Utility, Apple needed to grow the 'PAPA' resource stored in the driver. It has grown from 103 bytes to 1024 bytes. The new 'PAPA' looks just like an old style 'PAPA'; that is, the 'PAPA' resource begins with three packed Pascal strings representing the printer name, the network type (usually LaserWriter), and the printer's zone. After these strings comes the 4-byte network address. The new DTP data begins at the 104th byte in the resource. The data from byte 104 to 1024 (1-based indices) is a series of tagged values where each value begins with a 4-byte tag, a 2-byte length value, and then the actual data. For more information on the extended 'PAPA' resource, please see Apple's Technote web site.

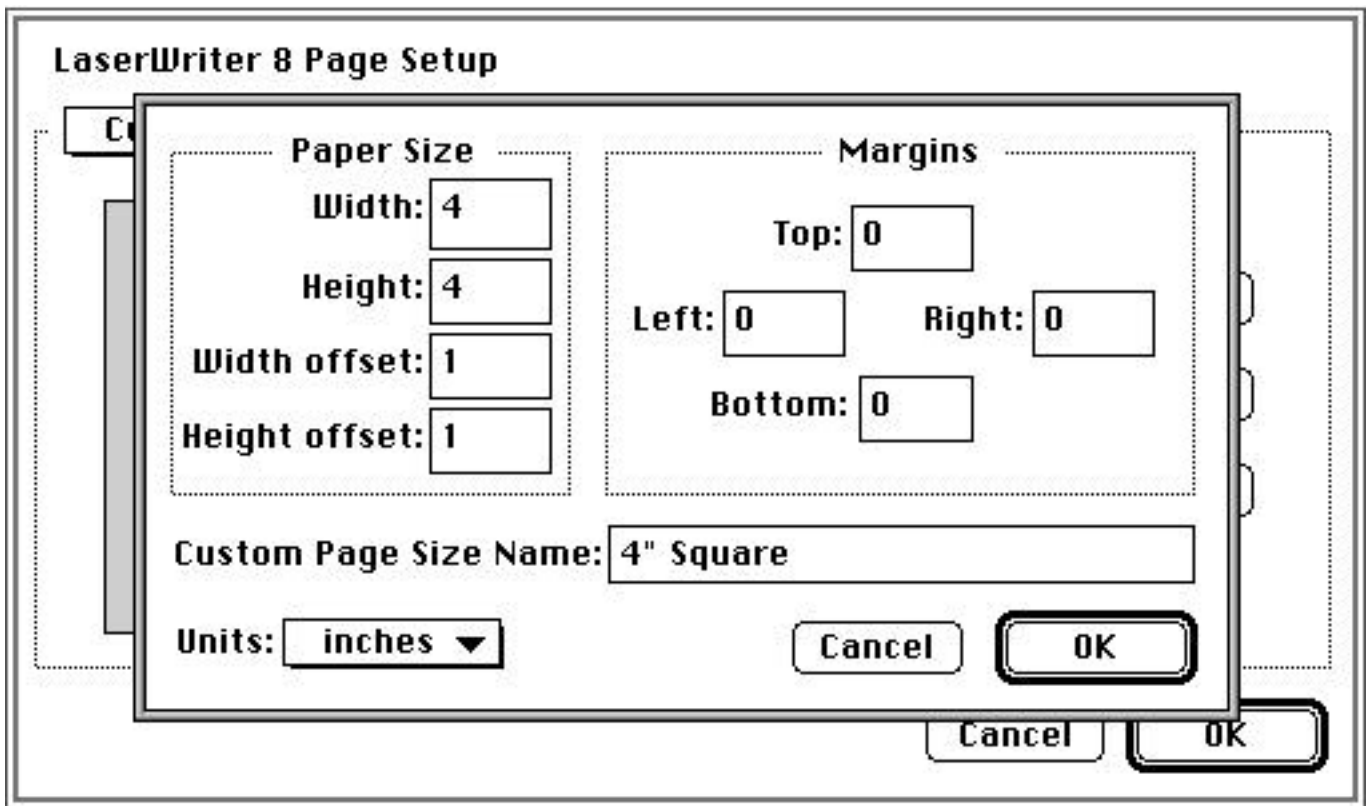
Redesigned Custom Page Size Support

With LaserWriter 8.4.x, Apple temporarily removed its custom page size support. However, with LaserWriter 8.5.1, this functionality has been redesigned and returns with a much improved user interface.

When a printer's PPD file has a `"*CustomPageSize True:"` entry in it, then LaserWriter 8.5.1 displays a "Custom Page Sizes" panel in the Page Setup dialog.



Each new page size has a width and height as well as margins on the four edges. In addition to these standard paper descriptors, each page has a width and height offset for the sheet it is being printed upon. This new panel allows the user to create and modify named page sizes. You should consult the PPD 4.3 specification from Adobe for more details on PPD files and the parameters for custom page sizes.



Notes and Limitations

- Page sizes that are created are shared among all printers that support custom page sizes; the list of custom page sizes is sticky to the driver, not to the PPD.
- If a print record specifies a custom page size, but the current printer does not support custom page sizes, then the paper pop-up in the 'Page Attributes' panel will specify 'other' as the current paper size.
- The standard print record places some limitations on the number and sizes of custom page sizes that a user may create. For a given paper size there can only be two custom paper size entries and they must have different imageable areas. If an application uses the extended print record, this restriction no longer applies.

PostScript Level 3- CopyBits/StdPix expanded support

LaserWriter 8.5.1 supports the PostScript Level 3 deep masked image extension. This extension allows Apple to support the QuickDraw transparent `CopyBits()` mode as well as more fully support the `maskRgn` parameter.

The support for transparent and clipped images has been placed in LaserWriter 8.5.1's implementation of QuickDraw's `CopyBits()` call. In particular, LaserWriter 8.5.1 recognizes the `maskRgn` `CopyBits()` parameter and honors it (*Inside Macintosh: Imaging With QuickDraw* , p.3-112). LaserWriter 8.5.1 also respects the transparent transfer mode when passed in the 'mode' parameter for `CopyBits()` (*Inside Macintosh: Imaging With QuickDraw* , p. 4-39).

For an in-depth look at LaserWriter 8.5.1's support for `CopyBits()`, see Apple's Technote web site.

For more information on PostScript Level 3, please contact Adobe Systems Incorporated.

PrGeneral opcodes

The table below lists the current PrGeneral opcodes that are implemented/supported by the LaserWriter 8.5.1 driver. With the LaserWriter 8.5.1 release, the driver added complete support for the enableColorMatchingOp opcode for ColorSync. See the ColorSync 2.1.x Support section for further details.

Opcode	Operation
4	getRslDataOp
5	setRslOp
6	draftBitsOp
7	noDraftBitsOp
8	getRotnOp
9	NoGraySc1 (not used by LaserWriter 8)
10	getPSInfoOp
11	PSIntentionsOp
12	enableColorMatchingOp (LaserWriter 8.5.1 and above)
13	registerProfileOp (ColorSync 1.x only; not used by LaserWriter 8)
14	PSAdobeOp
15	PSPrimaryPPDOp
16	kLoadCommProcsOp
17	kUnloadCommProcsOp
18	kExtendPrintRecOp (LaserWriter version 8.4 and above)
19	kGetExtendedPrintRecOp (LaserWriter version 8.4 and above)
20	kPrinterDirectOpCode (not used by any LaserWriter driver)
21	kSetExtendedPrintRecOp (LaserWriter version 8.4 and above)
22	kPrVersionOp (LaserWriter version 8.4 and above)

Please refer to "Meet PrGeneral, the Trap that Makes the Most of the Printing Manager" in develop Issue 3 for more information on PrGeneral.

ColorSync 2.1.x Support

New Tag Support- 'dsc2'

ColorSync 2.1.x provides a new profile tag that contains the profile's name in several languages. This tag, 'dsc2', provides localized names for a given profile. LaserWriter 8.5.1 looks inside of a profile for this tag and tries to match the language of the system font against the list of languages in the 'dsc2' tag. If a match is found, the localized text from the profile is used in the Print Dialog's 'Color Matching' panel. If the scripts can not be matched, then the string from the profile's name tag is used. See the *Advanced Color Imaging on the Mac OS* book for more information on the 'dsc2' tag.

Intent Overrides

Added to LaserWriter 8.5.1's 'Color Matching' panel is a pop-up that allows the user to override the system profile's intent for a given print job. The intent pop-up lists the four possible intents (Perceptual, Relative Colorimetric, Saturation, and Absolute Colorimetric) as documented in the (<http://www.color.org>) ICC Profile Specification. The pop-up also offers an automatic option which will cause the driver to use a Saturation intent when drawing text and line objects but to use the Perceptual intent on images.

PrGeneral

LaserWriter 8.5.1 adds support for the PrGeneral opcode (`enableColorMatchingOp`) for enabling and disabling color matching as described in *Advanced Color Imaging on the Mac OS*. This PrGeneral opcode is only supported if the caller passes in an extended print record. If the caller passes in a standard print record, PrGeneral returns an error indicating that the opcode is not implemented. Enabling color matching via this call puts LaserWriter 8.5.1 into PostScript color matching mode with the printer's default Color Rendering Dictionary. This is the only device independent color matching mode available in the driver. If the caller disables color matching using PrGeneral, then the driver uses the Color/Gray scale color mode.

Destination Profile

LaserWriter 8.5.1 allows applications to determine the destination profile set by the user in the Color Matching panel. In order to get this information, an application must use the extended print record. After running the Print dialog, an application can use the PrGeneral `kGetExtendedPrintRecOp` (opcode 19) to obtain a Collection Manager collection describing the user's job parameters. Once this collection is obtained, the application uses the Collection Manager to obtain tag `kHintDestProfileTag` ('dprf'), id `kHintDestProfileId` (1). The data returned by the Collection Manager for this tag is the FSSpec of the user's chosen destination profile. If the tag does not exist in the collection, then the user has requested the printer's default Color Rendering Dictionary. For more information on collections, please see *Inside Macintosh: QuickDraw GX Environment and Utilities*.

Faster First-Page Out

Today, when printing in two-pass mode with LaserWriter 8.4.x and below, all of a document's fonts are downloaded prior to the PostScript for the first page. In order to improve the printing time of the first page of a document, when printing in two-pass mode directly to a printer, LaserWriter 8.5.1 sacrifices page independence and downloads fonts immediately prior to the first page in the document in which they are used. By distributing the downloading of fonts over a document, Apple has improved the printing time for the first page of a document in most cases.

Collation

With LaserWriter 8.5.1, Apple has added collation to the driver. The general panel of the Print Dialog will add a collate check box if there is no collate option available in the PPD. With LaserWriter 8's collate option, when it is checked, and while printing n copies, the LaserWriter 8.5.1 driver will print the entire document n times in the following order: 1-2-3, 1-2-3, rather than 1-1, 2-2, 3-3. If the printer's PPD states that the printer supports collation itself, then the LaserWriter 8.5.1 driver is prevented from printing the job n times, and the collate option shows up in the 'Printer Specific' panel. In this case, the printer, not LaserWriter 8.5.1, is responsible for collating the output.

Media Selection

LaserWriter 8.5.1, in order to more fully support printers that use deferred media selection, and to make it easier to print onto multiple media types. If a printer indicates that it supports media types (with the "*MediaTyp" keyword in the PPD), these types are listed in the Paper pop-ups in the Print Dialog.

Print to PDF

Due to many requests, in order to support the creation of Adobe Acrobat PDF documents, the Save panel of LaserWriter 8.5.1 adds Acrobat PDF as one of the supported formats. When Acrobat PDF is selected the PDF options are displayed in the save panel.

The screenshot shows the 'Save' panel of LaserWriter 8.5.1. At the top, 'Printer:' is set to 'Griffin Fax' and 'Destination:' is set to 'File'. Below these, 'Save as File' is selected. The 'Format:' dropdown is set to 'Acrobat PDF'. A 'General' section contains four checkboxes: 'Compress Text and Line Art' (checked), 'Embed All Fonts' (unchecked), 'ASCII Format' (checked), and 'Make Font Subsets' (unchecked). Below this, 'Color Bitmap Images' is selected. The 'Compression:' dropdown is set to 'ZIP/JPEG Medium', and 'Downsample to' is set to '72 dpi'. At the bottom are 'Save Settings', 'Cancel', and 'Save' buttons.

When the user selects Acrobat PDF as the destination file format, LaserWriter 8.5.1 creates a PostScript file in the user's Temporary Items folder, and then launches Acrobat Distiller passing the location of the PostScript file and the intended location of the PDF file. The driver waits for Distiller to finish making the PDF file and then deletes the temporary PostScript file. This process is referred to as 'local distilling' as it requires Distiller to be run on the user's machine rather than on a remote server.

LaserWriter 8.5.1 uses Apple Events to communicate with Distiller, so the application running the driver's converter must be high-level event aware. In practice, this means that if an application is not high-level event aware, then foreground printing will be disabled if save to PDF is requested. In order to create PDF files from non-high level event aware applications, the user must print in the background.

Note:

If Distiller is not available on the user's mounted hard drive, then the Acrobat Distiller option is disabled.

Summary

This Technote has described all of the new features of LaserWriter 8.5.1. We encourage users and developers to explore the new printing capabilities with their printer.

Further References

- Apple's Technote Website
- PPD 4.3 Specification from
(http://www.adobe.com/supportservice/devrelations/PDFS/TN/5003.PPD_Spec_v4.3.pdf)
Adobe Systems Incorporated.
- (<http://www.adobe.com>) PostScript Level 3 documentation from Adobe Systems Incorporated.
- Inside Macintosh: Imaging With QuickDraw
- *Inside Macintosh: Advanced Color Imaging on the Mac OS*
- *Inside Macintosh: QuickDraw GX Environment and Utilities*
- ICC Profile Specification from www.color.org

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