



QMS[®] 2060 Print System Reference

1800450-001B

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1

Introduction

In This Chapter . . .

- “About This Manual” on page 1-2
- “Typographic Conventions” on page 1-3

Introduction

This manual provides detailed instructions and technical information for your QMS 2060 Print System. Use this guide in conjunction with your other printer documentation.

This chapter gives you a brief overview of this manual.

About This Manual

This manual contains printer configuration and reference information. It is divided into the following sections:

1	Introduction	Provides an overview of the manual.
2	Print Media	Lists print media sizes, margins, and imageable areas and provides media storage information.
3	Professional Printing	Discusses typefaces, fonts, and typographic terms; and displays the printer's typefaces.
4	Printer Configuration	Explains the methods of configuring the printer, demonstrates how to use the printer control panel, and provides a detailed discussion of the configuration menu.
5	Added Technical Information	Defines ESP and SIO, communication modes, halftones and memory. Discusses end job mode, IEEE 1284 bidirectional parallel interface modes, PS Protocol, and HP-GL color encoding.

A	QMS Customer Support	Provides world-wide product sales and support telephone numbers and describes how to communicate with QMS through the QMS Bulletin Board, CompuServe, Internet, and Q-FAX.
B	Technical Specifications	Provides technical specifications for the printer and lists available supplies and replacement parts.
C	Document Option Commands	Lists printer-supported Document Option Commands (DOCs).
D	Notices	Lists manual and legal notices.
E	Configuration Menu	Provides a view of the printer's configuration menu.

Typographic Conventions

The following typographic conventions are used in this manual:

Mixed-Case Courier	Text you type, and messages and information displayed on the screen
<i>Mixed-Case Italic Courier</i>	Variable text you type; replace the italicized word(s) with information specific to your printer or computer
UPPERCASE COURIER	Information displayed in the printer message window
lowercase bold	PostScript operators and DOS commands
<i>lowercase italic</i>	Variable information in text
UPPERCASE	File and utility names

Introduction

↵	Press the Enter key (PC) or Return key (Macintosh)
^	Press and hold down the Ctrl key (PC)

» **Note:** *Notes contain tips, extra information, or important information that deserves emphasis or reiteration.*

s **Caution:** *Cautions present information that you need to know to avoid equipment damage, process failure, or extreme annoyance.*

⚠ **WARNING!** *Warnings indicate the possibility of personal injury if a specific procedure is not performed exactly as described in the manual.*

ACHTUNG! *Bitte halten Sie sich exakt an die im Handbuch beschriebene Vorgehensweise, da sonst Verletzungsgefahr bestehen könnte.*



2

Print Media

In This Chapter . . .

- “Media Sizes and Imageable Areas” on page 2-2
- “Media Types and Weights” on page 2-5
- “Storing Media” on page 2-6

Introduction

This chapter lists the media sizes and imageable areas supported by the QMS 2060 Print System, and then provides information on selecting and storing media.

Media Sizes and Imageable Areas

Your printer supports media in a number of sizes. Each media size has a certain imageable area, the maximum area on which the printer can print clearly and without distortion. This area is subject to both hardware limits (the physical media size and the margins required by the printer) and software constraints (the amount of memory available for the full-page frame buffer).

- » **Note:** *Ensure that the media size matches the cassette size (for example, letter/A4 media must be loaded only when the cassette is set to letter/A4 size). Since the media cassette sends a media size signal to the printer controller, using a wrong size media could cause a media jam, incorrect positioning of the image, or a clipped image. Also, see chapter 3, “Advanced Printing Features,” in the Operation manual for information on the amount of memory needed to print on each media size.*

The following table lists the dimension, imageable area, and feed edge (the edge of the media drawn into the printer first), and input source for each media size.

Media Sizes and Imageable Areas

Media	Media Size		Imageable Area		Feed Edge	Input Source
	Inches	Millimeters	Inches	Millimeters		
8.5x13*	8.50x13.00	215.90x330.20	8.16x12.66	207.26x321.75	S	M U
11x17	11.00x17.00	279.4x431.80	11.00x17.00	279.40x431.80	S	M U
12x19	12.00x19.50	304.80x495.30	12.00x19.50	304.80x495.30	S	M
13x22	13.00x22.00	330.20x558.80	13.00x22.00	330.20x558.80	S	M
13x26	13.00x26.00	330.20x660.40	13.00x26.00	330.20x660.41	S	M
A3	11.70x16.54	297.00x420.00	11.69x16.54	296.62x419.93	S	M U
A4	8.27x11.70	210.00x297.00	7.93x11.35	201.50x288.37	L	M U L
A5	5.85x8.27	148.50x210.00	5.49x7.93	139.53x201.50	L	M U
B4	10.12x14.33	257.00x364.00	9.78x13.99	248.41x355.54	S	M U
B5	7.17x10.12	182.00x257.00	6.82x9.78	173.46x248.41	L	M U
C5	6.38x9.02	162.00x229.00	6.04x8.68	153.41x220.47	S	M
COM-10	4.125x9.50	104.78x241.30	3.78x9.16	96.18x232.85	S	M
DL	4.33x8.66	110.00x220.00	3.99x8.32	101.43x211.52	S	M
Envelope	6.93x9.76	176.00x248.00	6.59x9.42	167.47x239.50	S	M
Executive	7.25x10.50	184.20x266.70	6.19x10.16	175.6x258.25	S	M
Legal	8.50x14.0	215.90x355.60	8.16x13.66	207.26x347.16	S	M U
Letter	8.50x11.00	215.90x279.40	8.16x10.66	207.26x270.93	L	M U L
Monarch	3.875x7.50	98.425x190.5	3.54x7.16	89.91x182.05	S	M
Postcard	3.94x5.83	100.0x148.00	3.60x5.49	91.44x139.55	S	M
Statement	5.50x8.50	139.70x215.90	5.16x8.16	131.25x207.26	L	M
Universal	13.00x19.00	330.20x482.60	13.00x19.00	330.20x482.60	S	M

Input Source:

L=Letter/A4 cassette

M=Multipurpose tray

U=Universal cassette

Feed Edge:

L= Long S= Short

*8.5"x13" media is supported in the universal cassette only when the paper positioning guide is set about halfway between the A4 and the LGL tickmarks.

Working Within the Imageable Area

The imageable areas for print media on your QMS 2060 Print System are not centered vertically on their respective pages and may vary $\frac{1}{16}$ " (1.6 mm). You can align the image in several different ways:

- Adjust the margins or page size through your application.
- Use the printer's control panel (Administration/Engine/Image Alignment menu).
- Use the PostScript **translate** and **scale** operators to reduce image size and change its placement on the page.

Page Margins

Margins are set through your application. Some applications allow you to set custom page sizes and margins while others have only standard page sizes and margins from which to choose. If you choose a standard format, you may lose part of your image (due to imageable area constraints). If you can custom-size your page, use those sizes given for the imageable area for optimum results.

Media Types and Weights

Paper Type

The printer supports plain paper, recycled paper, letterhead/memo, thick paper, and postcard. Use only paper recommended for laser printers, such as Hammermill Laser Print.

- » **Note:** *We do not recommend printing on perforated or 3-hole punched paper.*

Paper Weight

The printer supports 16-24 lb (60-90 g/m²) plain paper, in the cassettes and 16-41.75 lb (60-157 g/m²) plain paper, in the multipurpose tray.

Envelope Type

The printer supports the following envelopes: Commercial 10, Monarch, International DL, International C5, and custom envelopes in the multipurpose tray.

-
- ▲ **Caution:** *The heat of the fuser may seal some envelopes. Test an envelope to make sure it can withstand the fusing temperature before starting a big job.*
-

Transparency Type

The printer supports transparencies meeting normal photocopier standards, such as 3M PP2500.

- » **Note:** *Use only transparencies recommended for laser printers.*

Transparency Weight

The printer supports 24-42 lb (90-157 g/m²) transparencies.

Label Type

Use only labels recommended for laser printers, such as Avery 5160. Adhesive label stock has pressure-sensitive (peel and stick) adhesive backing.

- » **Note:** *Always use the multipurpose tray to print labels.*

Label Weight

The printer supports 24-42 lb (90-157 g/m²) labels.

Storing Media

How you store paper and other media can make a big difference in print quality and printer operation. Improperly stored media increases the chance of jams during printing and can drastically affect the appearance of your work. Keep media in good condition by storing it

- In its wrapper
- On a flat surface
- In a closed cabinet
- In a cool, dry area



3

Professional Printing

In This Chapter . . .

- “About Typefaces and Fonts” on page 3-2
- “Resident Fonts, Typefaces, and Symbol Sets” on page 3-7
- “Optional Fonts” on page 3-13

Introduction

This chapter defines common terms used in the description of fonts and typefaces, and displays the printer's resident typefaces.

About Typefaces and Fonts

Many of the terms and phrases used in desktop publishing are derived from the language of professional printers and typesetters. This section explains common words and phrases used when discussing typefaces.

Typeface	Typeface Family
A named design of a set of printed characters, such as Times, that has a specified obliqueness (degree of slant) and stroke weight (thickness of stroke). It does not define a particular size.	A group of similar typefaces. For example, the Times typeface family consists of four typefaces: Times Roman, Times Bold , <i>Times Italic</i> , and <i>Times Bold Italic</i> .
Font	Character Set
A set of characters of the same typeface (such as Times), style (such as <i>italic</i>), stroke weight (such as bold), and point size (such as 10). Although you hear the term "font" used more generally, as if referring to a typeface, it's really a subset of a typeface.	A collection of symbols designed for various printing applications. Many character sets are composed of the letters (uppercase and lowercase A-Z), digits (0-9), and any symbol (such as blank space, dollar sign, and ampersand). Other character sets are composed entirely of symbols.

Typeface Classification

One way of classifying the different typefaces is to group them into the following categories:

Serif

A serif is a decorative line or tail on the ends of the strokes of a letter. Serifs, usually on the lower half of a letter, have also been

Times Roman referred to as feet or curlicues.
Courier, ITC Bookman, New
Century Schoolbook, Palatino,

and Times are serif typefaces. In the example shown, all the letters except “e” and “o” have serifs.

Sans Serif

Sans serif (“sans” is French for “without”) indicates a typeface without any of these small tails. A

sans serif typeface is decorative by the shape and styling of its letters but has less detail than a serif typeface. Helvetica, Helvetica Condensed, Helvetica Narrow, and ITC Avant Garde are all sans serif typefaces. In the example shown above, the slight curving at the bottom of the letters “t” and “a” is not a serif. It is part of the line forming the letter rather than a decorative line added on.

Helvetica

Script

Script typefaces simulate handwriting or brush lettering. Each letter

Zapf Chancery is connected visually, if not
physically. ITC Zapf Chancery is
a script typeface.

Pi or Symbol

Pi or symbol typefaces are collections of assorted special-purpose characters (for example, decorative, graphic, math, or monetary characters). They are especially useful for highlighting items in lists, providing graphics, and displaying symbols that might otherwise have to be drawn in by hand. Many typefaces today include a complement of the more commonly used pi characters. Symbol and ITC Zapf Dingbats are pi typefaces.

Σ ψ μ β ο λ

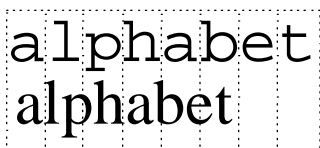
Typography Terms

Monospacing

The terms “monospaced” and “fixed-pitch” refer to a typeface whose characters all have uniform and equal spacing. These typefaces are useful for spreadsheets and other documents with columnar data. Monospacing is the opposite of proportional spacing.

Proportional Spacing

The term “proportionally spaced” refers to a typeface in which the width of each character varies. For example, the letter “i” is thinner than the letter “m” and therefore takes up less space. Proportional spacing saves page space and is easier on the eye. This manual’s text uses the Helvetica font, a proportionally-spaced typeface.

The image shows the word "alphabet" in two different typefaces. The top line, "alphabet", is in a monospaced font (Courier) and is enclosed in a dashed rectangular box. The bottom line, "alphabet", is in a proportional font (Times) and is also enclosed in a dashed rectangular box. The proportional font's letters are of varying widths, fitting more snugly within the box compared to the uniform-width letters of the monospaced font.

Because proportionally spaced typefaces place each character according to its individual size, they increase legibility and readability. This example shows the difference

between a monospaced typeface (Courier) and a proportionally-spaced typeface (Times).

Bitmapped Font

A bitmapped font is one in which each character is represented by a set of dot patterns. Each font size requires a different set of dot patterns.

Dots

Scalable Font

A scalable font is one in which each character's dot pattern (bitmap) is generated from a mathematical representation (or outline) of the character. Scalable fonts eliminate the need to store many different font sizes.



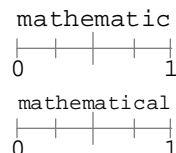
Point Size

Point size refers to the height of a proportionally spaced typeface. A point is a unit of measure approximately equal to $\frac{1}{72}$ ". Therefore, the larger the point size, the larger the letter. The following example shows characters in 8, 10, 12, 24, and 36 point sizes:

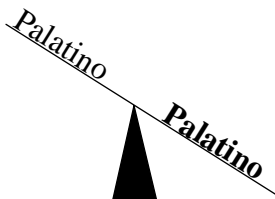
A B C D E

Pitch

Pitch refers to the number of characters per horizontal inch (cpi) in a monospaced typeface. Therefore, the larger the pitch, the smaller the letter. For example, a ten-pitch typeface prints ten characters per inch (or 10 cpi) while a twelve-pitch typeface prints twelve characters per inch (or 12 cpi). The example shows ten-pitch and twelve-pitch Courier.



Stroke Weight



Stroke weight (light/medium/bold) is the width (thickness), of the lines (strokes) that make up a character. The example at left shows the medium and bold weights of Palatino.

Italic and Oblique Forms

Italic was originally developed in the early sixteenth century as a typeface based on cursive handwriting. Today's italics are still individually crafted typefaces designed to blend with a specific roman (upright) typeface.

Times Roman
Times Italic

ITC Avant Garde Roman
ITC Avant Garde Oblique

Oblique (or slanted) type forms, however, are not designed and crafted

individually but are mechanically slanted versions of the roman form from which they derive.

Orientation

Orientation is the direction of the print or image on a page. Portrait orientation reads from left to right, across the narrower dimension of the page. Landscape orientation also reads from left to right but places the print across the wider dimension of the page. Spreadsheet and table applications commonly use landscape printing. Both terms

[illegible][illegible]

Your printer supports type 1 and type 3 downloaded PostScript fonts. PostScript supports TrueType downloaded fonts only in type 42 format. All of these typeface families are authentic: they are licensed, they carry the true name, and they have multilingual character sets.

Resident Fonts, Typefaces, and Symbol Sets

Serif Fonts

ITC Bookman Light
ITC Bookman Light Italic
ITC Bookman Demi
ITC Bookman Demi Italic

New Century Schoolbook Roman
New Century Schoolbook Italic
New Century Schoolbook Bold
New Century Schoolbook Bold Italic

Palatino Roman
Palatino Italic
Palatino Bold
Palatino Bold Italic

Times Roman
Times Italic
Times Bold
Times Bold Italic

Courier
Courier Oblique
Courier Bold
Courier Bold Oblique

Sans Serif Fonts

ITC Avant Garde
ITC Avant Garde Book Oblique
ITC Avant Garde Demi
ITC Avant Garde Demi Oblique

Helvetica
Helvetica Oblique
Helvetica Bold
Helvetica Bold Oblique

Helvetica Condensed
Helvetica Condensed Oblique
Helvetica Condensed Bold
Helvetica Condensed Bold Oblique

Helvetica Narrow
Helvetica Narrow Oblique
Helvetica Narrow Bold
Helvetica Narrow Bold Oblique

Script Font

ITC Zapf Chancery Medium Italic

Pi or Symbol Fonts

Σψμβολ (Symbol)

☞■▣▤▥▦ (ITC Zapf Dingbats)

Other Fonts

LetterGothicML (IBM Character set 2, Multi-Lingual)

LetterGothicUS (IBM Character set 1, US)

OCR-B

Resident HP PCL 5e Fonts

The QMS 2060 printer has 51 resident HP PCL 5e fonts (including Intellifonts) in 15 typefaces, allowing it to emulate the HP LaserJet 5Si. All fonts can be automatically rotated to landscape orientation. Some are fixed in pitch and point size while others are scalable.

- » **Note:** 300/600 dpi resolution switching is available but 1200 dpi is supported only by HP-GL2.

This table is a complete list of the fonts available for PCL 5e. They can be automatically rotated to landscape orientation. All fonts are scalable and available in 35 symbol sets unless otherwise noted.

Font	Scalable/ Bitmap	Pi/ Symbol	Sans Serif	Script	Serif
Adobe Symbol Medium (1 symbol set)	S	✓			
Albertus Semi Bold	S		✓		
Albertus Extra Bold	S		✓		
Antique Olive Medium	S		✓		
Antique Olive Italic Medium	S		✓		
Antique Olive Bold	S		✓		
Arial	S		✓		
Arial Bold	S		✓		
Arial Italic	S		✓		
Arial Bold Italic	S		✓		
Clarendon Condensed Bold	S				✓
Coronet Italic Medium	S			✓	
Courier Medium	S				✓
Courier Italic Medium	S				✓
Courier Bold	S				✓
Courier Bold Italic	S				✓

Resident Fonts, Typefaces, and Symbol Sets

Font	Scalable/ Bitmap	Pi/ Symbol	Sans Serif	Script	Serif
Garamond (Stempel) Medium	S				✓
Garamond (Stempel) Italic Medium	S				✓
Garamond (Stempel) Bold	S				✓
Garamond (Stempel) Italic Bold	S				✓
Letter Gothic Medium	S		✓		
Letter Gothic Italic Medium	S		✓		
Letter Gothic Bold	S		✓		
Line Printer Legal Medium	B		✓		
Line Printer PC-850	B		✓		
Line Printer PC-8 D/N	B		✓		
Line Printer PC-8 Medium	B		✓		
Line Printer Roman-8 Medium	B		✓		
Line Printer ECMA-94 Latin (ISO8859) (8.5 points, 25 symbol sets)	B		✓		
Marigold.pcl	S			✓	
Omega Medium	S		✓		
Omega Italic Medium	S		✓		
Omega Bold	S		✓		
Omega Italic Bold	S		✓		
Times Medium	S				✓
Times Italic Medium	S				✓
Times Bold	S				✓
Times Italic Bold	S				✓
Times Roman Medium	S				✓
Times Roman Italic Medium	S				✓
Times Roman Bold	S				✓
Times Roman Italic Bold	S				✓
Univers Medium	S		✓		
Univers Italic Medium	S		✓		
Univers Bold	S		✓		
Univers Italic Bold	S		✓		

Font	Scalable/ Bitmap	Pi/ Symbol	Sans Serif	Script	Serif
Univers Condensed Medium	S		✓		
Univers Condensed Italic Medium	S		✓		
Univers Condensed Bold	S		✓		
Univers Condensed Italic Bold	S		✓		
Wingdings (1 symbol set)	S	✓			
» Note: <i>S=Scalable, B=Bitmap</i>					

PCL 5e Symbol Sets

This table lists all of the PCL 5e symbol sets that are supported on the QMS 2060 Print System.

Desktop	PC - 850
ISO - 4 (UK)	PC - 852 (Latin 2)
ISO - 6 (ASCII)	PC - 8tk
ISO - 11 (SWED)	PC8 - US
ISO - 15 (ITAL)	PC8 - DN
ISO - 17 (SPAN)	PI - font
ISO - 21 (GERM)	PS - Math
ISO - 60 (NORW)	PS - Text
ISO - 69 (FREN)	Roman - 8
ISO - Latin - 1	Ventura - Intl
ISO - Latin - 2	Ventura - Math
ISO - Latin - 5	Ventura - US
Legal	Windows 3.0 (LATIN 1)
MC - Text	Windows 3.1 1-1 (Latin 1)
Math - 8	Windows 3.1 1-2 (Latin 2)
Microsoft - Pub	Windows 3.1 1-3 (Latin 3)

Resident Fonts, Typefaces, and Symbol Sets

Resident HP-GL Fonts

Your printer has the following 40 resident scalable HP-GL fonts in both fixed- and variable-spaced versions.

Set 0—Fixed space ANSI ASCII	Set 30—Fixed space ISO Swedish
Set 1—Fixed space 9825 Character Set	Set 31—Fixed space ISO Swedish for names
Set 2—Fixed space French/German	Set 32—Fixed space ISO Norway version 1
Set 3—Fixed space Scandinavian	Set 33—Fixed space ISO German
Set 4—Fixed space Spanish/Latin American	Set 34—Fixed space French
Set 5—Fixed space Special Symbols	Set 35—Fixed space United Kingdom
Set 6—Fixed space JIS ASCII	Set 36—Fixed space Italian
Set 7—Fixed space Roman extensions	Set 37—Fixed space Spanish
Set 8—Fixed space Katakana	Set 38—Fixed space Portuguese
Set 9—Fixed space ISO IRV	Set 39—Fixed space Norway version 2
Set 10—Variable space ANSI ASCII	Set 40—Variable space ISO Swedish
Set 11—Variable space 9825 Character set	Set 41—Variable space ISO Swedish for names
Set 12—Variable space French/German	Set 42—Variable space ISO Norway version 1
Set 13—Variable space Scandinavian	Set 43—Variable space German
Set 14—Variable space Spanish/ Latin American	Set 44—Variable space French
Set 15—Variable space Special symbols	Set 45—Variable space United Kingdom
Set 16—Variable space ASCII	Set 46—Variable space Italian
Set 17—Variable space Roman extensions	Set 47—Variable space Spanish
Set 18—Variable space Katakana	Set 48—Variable space Portuguese
Set 19—Variable space ISO IRV	Set 49—Variable space Norway version 2

Optional Fonts

The following types of optional fonts are available for the QMS 2060 Print System:

- A disk and a SIMM containing the 65 ProCollection fonts for the HP emulation on your printer.
 - An internal hard disk and a SIMM containing Kanji fonts and other files.
- » **Note:** See chapter 5, “Software,” in the Options manual for more information. Contact your QMS vendor for availability of these fonts as well as logos, signatures, and form services. See appendix A, “QMS Customer Support,” in your printer documentation, for locations and telephone numbers.



4

Printer Configuration

In This Chapter . . .

- “Methods of Configuration” on page 4-2
- “Configuration Menu” on page 4-4
- “Operator Control Menu” on page 4-17
- “Administration Menu” on page 4-25
- “Installation Menu” on page 4-70
- “Configuring Optional Features” on page 4-71

Introduction

This chapter begins by listing and describing the different ways you can configure your printer to meet your special printing needs.

The next section describes how to use the printer control panel to access the configuration menu and how to make configuration changes.

The rest of the chapter provides basic printer configuration information about some of the configuration menu options. The *QMS CrownNet Interface System Administrator's Guide* (in Adobe Acrobat or on the *QMS Software Utilities* CD-ROM) contains the CrownNet menu configuration information for the Ethernet interface. In both guides, menu features are grouped according to task. Each feature is introduced, then a table describes the feature's location in the configuration menu, the available choices for that feature, and the factory default (the value set at the factory).

Methods of Configuration

You have five ways to configure your printer to meet your printing needs:

- Through an application
- Through printer commands
- Through the printer control panel
- Through a remote console (for network users)
- Through CrownAdmin 3

Using an Application

Using your application is the best way to control your printer since most printing is done on a per-job basis. This helps prevent confusion in network environments and saves you from making changes at the printer control panel. Your application documentation explains how to control your printer settings: probably by choosing options from a printing menu.

Applications use printer drivers to send appropriate commands to the printer for requested tasks. If your application doesn't have a QMS 2060 Print System driver, you can select a comparable PostScript driver, such as the QMS Level 2 Windows driver or a LaserWriter driver. However, comparable drivers may not allow you to access all of your printer's features, such as 1200x1200 dpi printing, duplexing, or collating.

Using QMS Document Option Commands

QMS Document Option Commands (DOCs) can enable job-specific features your application or page description language can't access. See your *QMS Crown Document Option Commands* manual (in Adobe Acrobat format on the QMS Software Utilities disk) for information on DOCs. See appendix C, "Document Option Commands," of this manual for a list of DOCs this printer supports.

Using the Control Panel

Your printer is configured at the factory for most typical printing environments, so most users don't have to use the control panel often. However, if you do need to change a printer setting for all print jobs (not just on a per-job basis), you can do so through the control panel. If you're working in a shared printing environment, your system administrator should be the only person to make changes through the printer's control panel.

Using a Remote Console

Many of the configuration choices that can be made at the control panel can also be made via a Remote Console session from QMS CrownAdmin. You can run Remote Console via Telnet in an UNIX environment. To avoid confusion in a shared printing environment, only the system administrator should make configuration changes. See the QMS CrownAdmin on-line help and the QMS Remote Console manual (in Adobe Acrobat format on the QMS Software Utilities CD-ROM) for information on using Remote Console.

- » **Note:** *If a remote console has the printer off line, pressing the Online key will not take effect until the console puts the printer back on line.*

Configuration Menu

The printer's configuration menu allows you to change the default printer configuration settings. Any changes made to the configuration will reside as new default settings and affect all subsequent print jobs.

- » **Note:** *Some changes take effect immediately and others take effect after the printer is rebooted.*

The options in the configuration menu are organized under three main menus:

■ Operator Control Menu

Use this menu to select document processing options such as copy count, choosing input paper bins, chaining input bins, and duplexing (if a duplexing unit is installed).

Document processing options are usually specified within individual jobs since each job has its own requirements. However, if there's no way of specifying these options within an application, use the control panel to change options, send the job, and then change the defaults back.

- » **Note:** *Defining document processing options for a particular job through the control panel is not recommended in a shared environment. When many systems are using the same printer, there's no way of making sure that no other jobs are sent to the printer while the defaults are changed. The Operator Control menu may be password protected with an optional security key if the system administrator does not want users changing defaults.*

■ Administration Menu

Use this menu to maintain printer-host communication information, and to select and configure printer emulations, configure special pages, print engine calibration, and configure hard disks (if installed).

- » **Note:** *For information on printer-host communication using the Ethernet interface or any of the Administration/Communications/Network/CrownNet options, see the QMS CrownNet System Administrator's Guide. The Administration menu may be password protected with an optional security key if the system administrator does not want users changing defaults.*

■ Installation Menu

Use this menu to establish passwords for the Operator Control and Administration menus. This menu displays only when an optional security key is installed.

- » **Note:** *This menu is not available when using Remote Console.*

Accessing the Configuration Menu

To access the configuration menu, make sure the printer is idle (`IDLE` displays in the message window), then press the Online/Offline key to take the printer off line (the Ready indicator is not lighted), and press the Menu key.

Example

The following table shows how to use the control panel menu keys to access the printer configuration menu. Press the control panel keys in the order shown. The printer responds by displaying a status message or configuration menu in the control panel message window.

- » **Note:** *You may need to press the Next key more than one time to advance through the list of options.*

Press this key...	to...	For 1.5 seconds, the message window reads...	and then it reads...
Online/Offline	Turn off the Ready indicator and enable printer configuration.	<code>IDLE</code>	<code>IDLE</code>
Menu	Access the configuration menu.	<code>CONFIGURATION</code>	<code>OPERATOR CONTROL</code>

The printer must be off line and idle before you can access the configuration menu to change printer configuration.

Selecting Configuration Menu Options

Once you access the configuration menu, you use the control panel keys to move through the menu to access the appropriate option.

Press this key...	to...
Next	Advance to the next option or submenu within a menu.
Previous	Return to the previous option or submenu within a menu.
Select	Select an option or enter a submenu.

Example

To change the default printer emulation for the Parallel interface from ESP to PostScript, press the control panel keys in the order shown in the following table.

- » **Note:** *You may need to press the Next key more than one time to advance through the list of selections or options.*

Press this key...	to...	For 1.5 seconds, the message window reads ...	and then it reads ...
Online/ Offline	Turn off the Ready indicator and enable printer configuration.	IDLE	IDLE
Menu	Access the configuration menu.	CONFIGURATION	OPERATOR CONTROL
Next	Advance to the Operator Control menu.	OPERATOR CONTROL	

Configuration

Press this key...	to...	For 1.5 seconds, the message window reads ...	and then it reads ...
Select	Access the Administration menu.	COMMUNICATIONS	
Select	Access the Communications menu.	COMMUNICATION	TIMEOUTS
Next	Advance to the Communications/Parallel menu.	TIMEOUTS	PARALLEL
Select	Access the Parallel menu.	PARALLEL	MODE
Next	Advance to the Parallel/Emulation menu.	MODE	EMULATION
Select	Access the Emulation menu.	EMULATION	*ESP
Next (more than once)	Advance to the Emulation/PostScript menu.		POSTSCRIPT
Select	Select PostScript as the default emulation		POSTSCRIPT IS SELECTED
	After 3 seconds you are returned to the Parallel/Emulation menu.	PARALLEL	EMULATION

» **Note:** Shaded table cells indicate that the message scrolls.

Changing Character Information

Sometimes, rather than selecting an option, you need to enter character information. A character is any letter, digit, or symbol. A field is a group of characters that have meaning. Use the printer control panel to enter character information in the message window during printer configuration. The maximum length of the message window is 16 characters.

Entering character information through the control panel is similar to setting the time and date on a digital watch. You enter one character at a time. The cursor flashes. Use the following keys to change the current input character:

Press this key...	to...
Next	Advance to the next choice for the current input character.
Previous	Return to the previous choice for the current input character.

Once you have changed the current input character, use the following keys to move the cursor to another input character:

Press this key...	to...
Select	Advance the cursor to the next character.
Menu	Return the cursor to the previous character.

To exit from the character selection process, move the cursor to the last character of the input field (the character farthest to the right) and press the Select key, or move to the first character of the input field (the character farthest to the left) and press the Menu key.

When you exit, the printer verifies the character information and confirms it in the message window. If the character information is valid, you are returned to the previous menu; if it is invalid, you are returned to the input field. Press the Menu key to cancel any changes to the character information.

If the current character information is longer than the value that you need to enter, replace each extra character with a space. The printer interprets a space at the end of character information as a blank.

Example

To change the HP-GL emulation scaling percent, press the control panel keys in the order shown in the following table. The printer responds by displaying a status message or configuration menu in the message window. A flashing cursor indicates the current input character in the message window.

- » **Note:** *You may need to press the Next key more than one time to advance through the list of selections or options.*

Press this key...	to...	For 1.5 seconds, the message window reads ...	and then it reads ...
Online/ Offline	Turn off the Ready indicator and enable printer configuration.	IDLE	IDLE
Menu	Access the configuration menu.	CONFIGURATION	OPERATOR CONTROL
Next	Advance to the Administration menu.	OPERATOR CONTROL	ADMINISTRATION
Select	Access the Administration menu	ADMINISTRATION	COMMUNICATIONS
Next	Advance to the Communications/ Emulation menu.	COMMUNICATIONS	EMULATIONS
Select	Access the Emulation menu.	EMULATIONS	ESP DEFAULT

Press this key...	to...	For 1.5 seconds, the message window reads ...	and then it reads ...
Next (one or more times)	Advance to the Administration/Emulations/HP-GL menu.		HP-GL
Select	Access the HP-GL menu.	HP-GL	PLOTTER
Next	Advance to the HP-GL/Scaling Percent menu.	PLOTTER	SCALING PERCENT
Select	Access the Scaling Percent menu.		<u>1</u> 00
Previous	Lower the current character to 0.		000
Select	Select 0 and move the current character to the next 0.		0 <u>0</u> 0
Next (5 times)	Advance the current character to 5.		0 <u>5</u> 0
Select	Select 5 and move the current character to last 0.		05 <u>0</u>

Configuration

Press this key...	to...	For 1.5 seconds, the message window reads ...	and then it reads ...
Select	Select 50 as the default scaling percent.		50 IS SELECTED
	After 3 seconds you are returned to the HP-GL/Scaling Percent menu.	HP-GL	SCALING PERCENT

Saving Configuration Changes

Before the printer can accept print jobs with configuration changes, the changes must be saved.

Example

To save your configuration changes, press the control panel keys in the order shown in the following table. The printer responds by displaying a status message in the message window.

Press this key...	to...	For 1.5 seconds, the message window reads...	then it reads ...
Online/ Offline or Menu	Exit from the menu and be prompted to save your change (Online/Offline) or return to the previous menu (Menu).	SAVE CHANGES?	*NO
Next	Advance to the Save Changes?/ Yes option.		YES
Select	Select Yes. The printer saves your changes, and returns to idle.		IDLE
Online/ Offline	Turn on the Ready indicator and enable the printer to accept and print new jobs.		IDLE

- » **Note:** Some changes restart the printer automatically while others display the message *REBOOT NOW?* in the control panel message window. If this message appears, select *YES* to restart the printer and have the changes take effect immediately, or select *NO* to wait until you manually restart the printer before the changes take effect. Some changes automatically restart the printer without prompting the user.

Canceling Configuration Changes

If you change a configuration option and then decide to cancel that change, you can do so when exiting from the configuration menu.

Example

To cancel your configuration changes before they have actually taken effect, press the control panel keys in the order shown in the following table. The printer responds by displaying a status message in the message window.

Press this key...	to...	For 1.5 seconds, the message window reads...	then it reads ...
Online/ Offline or Menu	Exit from the menu and be prompted to save your change (Online/Offline) or return to the previous menu level (Menu).	SAVE CHANGES?	*NO
Select	Select No. The printer does not save your changes, and returns to idle.		IDLE
Online/ Offline	Turn on the Ready indicator and enable the printer to accept new jobs.		IDLE

Setting the Message Window Language

Status messages and configuration menus can be displayed in the message window in English, French, German, or Spanish. If you need to change the message window language, use the Keypad Language option in the Administration/Miscellaneous menu.

Menu	Administration/Miscellaneous/Keypad Language
Choices	English, French, German, Spanish
Default	English
Notes	The printer must be restarted for changes to the Keypad Language menu to take effect. You can either let the printer restart automatically after you save the change and exit from the Configuration menu, or you can wait for the change to take effect the next time you manually turn on the printer.

Restoring the Factory Default Configuration

If you need to cancel all of the configuration changes you have made, you can reset all of the configuration settings to their factory defaults.

Menu	Administration/Miscellaneous/Restore Defaults
Choices	Yes, No
Default	No
Notes	This option auto restarts the printer. This process takes a few minutes to complete.

Rebooting the System

Use this option to restart the system after making a group of configuration menu changes. Before making configuration changes, you should print an advanced status page. After changing any option that requires a system restart, you are prompted **REBOOT NOW?** If you want to make other configuration changes choose **NO**. After you make all configuration changes, choose **YES** to restart the system and have all configuration menu changes take effect at once.

Menu	Administration/Miscellaneous/Reboot System
-------------	--

Configuration

Choices	Yes—Reboots the system. No—Does not reboot the system.
Default	No
Notes	This process takes a few minutes to complete. If you save a change and for some reason want to return to the previous state, use the advanced status page as a reference.

Working with Custom Configurations

Saving a Default Custom Configuration

Menu	Administration/Miscellaneous/Save Defaults
Purpose	Saves the current printer configuration as a custom default
Choices	Yes—Save the current configuration settings as a custom default No—Don't save the current configuration settings as a custom default
Default	No
Notes	You can save only one configuration; however, you can change the saved configuration at any time

Restoring a Default Custom Configuration

Menu	Administration/Miscellaneous/Restore Defaults/Saved Defaults
Purpose	Recognizes the printer by using the default custom configuration
Choices	Yes, No
Default	No
Notes	To restore the saved defaults, access the menu item and select Yes.

Operator Control Menu

The Operator Control menu contains the following selections:

Selection	See this section...
Accounting	"Accounting Menu" on page 4-18 <i>»Note: This option is available only when you have a hard disk installed.</i>
Chain Inputbins	"Media Input" on page 4-22
Collation	"Collation" on page 4-21
Copies	"Copies" on page 4-21
Duplex	"Duplexing" on page 4-25 <i>»Note: This option is available only when you have an optional duplexer installed.</i>
Inputbin	"Media Input" on page 4-22
Multipurpose Sz	"Selecting Media Size" on page 4-23
Orientation	"Media Orientation" on page 4-23

Accounting

Crown accounting, a tool to help you keep track of the use of printer resources, is available on your QMS 2060 Print System with a hard disk installed, with or without a network connection.

Paper use is the most commonly monitored resource. However, Crown accounting also allows you to monitor

- Paper use per user
- Time consumed serving each user's jobs
- Connectivity options
- Frequency of jams
- Times of peak use
- Number, complexity, and average size of jobs per user
- Commonly used features, such as duplexing or finishing

- » **Note:** *If you are connected to a network via TCP/IP, you have a choice of using Crown accounting or the standard TCP/IP accounting through your UNIX host software. See the TCP/IP Protocol Option User's Guide for more information on TCP/IP accounting.*

As jobs are printed on your QMS printer, the system collects information about different job parameters in relation to the jobs. When each job completes, the printer stores an entry for the job in the Job Accounting file(s).

-
- ▲ **Caution:** *Do not turn the printer off while the disk is being accessed. Doing so may cause inconsistencies in the information stored.*
-

Accounting Menu

The Accounting menu includes five submenus, allowing you to enable or disable job accounting, allocate disk space when accounting is enabled, reset accounting, store job accounting information in a single job file or in multiple files, and transfer the accounting files to your host.

Job accounting information may be stored in a single file if it can be retrieved via FTP on your host. Otherwise, the selected job accounting file should be spread into several files.

Setting the Accounting Mode

Menu	Operator Control/Accounting/Mode
Purpose	Enables or disables job accounting
Choices	Enabled, Disabled
Default	Disabled
Notes	<p>You can also enable accounting via Remote Console.</p> <p>When accounting is disabled, any files containing data remain untouched. However, empty files are removed to save disk space.</p>

Allocating Disk Space

Menu	Operator Control/Accounting/Disk Space
Purpose	Allocates disk space for job accounting files
Choices	50-10240 (KB)
Default	1024 (KB)
Notes	<p>1024 KB = 1 MB 10240 KB = 10 MB</p> <p>The amount of space required for each job can vary between 200 and 250 bytes, so each 1 MB in the job accounting file stores information on 4,000 to 5,000 jobs.</p> <p>If the selected value is greater than the current value, the file size is increased to reserve the extra space. If the value is smaller than the current file size, any empty job accounting files are moved. If only one file is used and it is not empty, it cannot be shrunk.</p>

Resetaccounting

Menu	Operator Control/Accounting/Resetaccounting
Purpose	Erases the Accounting files and recreates them using the current file size.
Choices	Yes, No
Default	No

Notes	<p>If this operation is selected when accounting is disabled, the files are removed but not recreated, thus saving disk space.</p> <p>This operation is also available as the resetaccount command for the admin user at a remote console. See the <i>Remote Console User's Guide</i> documentation for more information on the resetaccount command.</p> <p>When job files are more than 80% full but less than 100% full, the following message displays on the control panel and remote console:</p> <pre>xxxxxxx FILE xxx% FULL</pre> <p>(xxx% is the percentage full, reported as 80%, 85%, 90%, or 95%.) This is an appropriate time to transfer them to your host computer using ftp if it is available to you. Then use the option to reset the accounting files to empty after they have been transferred to the host.</p> <p>When the file is 100% full, the</p> <pre>xxx FILE IS FULL</pre> <p>message displays.</p> <p>» Note: <i>When accounting is enabled and the Job Accounting files are 100% full, no further print jobs are accepted by the printer until Resetaccounting is selected or until Accounting is disabled. If you disable Accounting at this time, no job information is stored. You can retrieve your accounting files while they are full and then do the Resetaccounting operation. However, to avoid delaying jobs being sent to the printer, it is advisable to perform the retrieve/reset operations before the job accounting files fill up.</i></p>
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Segmenting the Accounting Job File

Menu	Operator Control/Accounting/File Segment
Purpose	Allows you to specify whether accounting information is stored in the printer in a single file or in multiple files.
Choices	Single, Multiple
Default	Multiple

Notes	<p>Job accounting information may be stored in a single file if it can be retrieved via FTP on your host. Otherwise, the selected job accounting file should be spread into several files.</p> <p>If a single file is used, its size equals the Disk Space value described earlier in this section. The file name will be ACC1.JOB.</p> <p>If multiple files are selected, their combined size equals the File Size value described earlier in this section. Each file will be 1 MB, except the last file, which includes the remaining dedicated space. That is, if you dedicate 10 MB to accounting and select multiple files, the printer creates 10 files of 1 MB each. If you dedicate 5.5 MB to accounting, the printer creates 5 files of 1 MB each and one of 500 KB. The Job file names will be ACC1.JOB, ACC2.JOB, and so on.</p>
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Collation

Enabling/Disabling Collation

Menu	Operator Control/Collation
Choices	On—Enable collation. Off—Disable collation.
Default	Off

Copies

While it is preferable to use your application to select the number of copies to print, you can change the default number of copies for all print jobs through the printer control panel.

Menu	Operator Control/Copies
Choices	001-999

Default	001
Notes	Sets the default number of copies for all subsequent print jobs. When power is turned off and then back on again, the number of copies is restored to the default setting of 001.

Media Input

Your QMS 2060 Print System comes standard with one media cassette and one media feeder. Using the control panel, you can select a default media input source, chain these input sources, and name them. See “Naming Media Inputbins” on page 4-61 for details on how to name inputbins.

Selecting a Media Inputbin

Your printer has the following inputbins:

Upper Feeder	The cassette holds approximately 250 or 500 sheets of paper, depending on the cassette used.
Optional Feeder	The cassette holds approximately 250 or 500 sheets of paper, depending on the cassette used.
Multipurpose Tray	The tray holds approximately 150 sheets of a variety of print media.

See the “Media Types and Weights” section of chapter 2, “Print Media,” for information on the types and weights of media.

The Operator Control/Inputbin menu allows you to select the default tray or feeder (inputbin) from which media is drawn from the cassette into the printer.

Menu	Operator Control/Inputbin
Choices	Inputbin 1—Multipurpose tray Inputbin 2—Upper feeder Inputbin 5—Optional feeder
Default	Inputbin 2

Chaining Media Inputbins

You can “chain” inputbins so that when the first inputbin empties, the printer automatically draws media from another inputbin.

Menu	Operator Control/Inputbin
Choices	<p>On—Switch to the next inputbin with the same size and type of media when the default inputbin is empty.</p> <p>» Note: <i>Make sure the two inputbins use the same size media.</i></p> <p>Off—Don't switch inputbins; use only the default inputbin.</p> <p>On Any—Switch to the next inputbin with any size and type of media when the default inputbin is empty.</p>
Default	On

Media Orientation

While you can usually specify the orientation of a print job in your application, if you consistently use a certain media orientation, you can set this in the Operator Control/Orientation menu.

Menu	Operator Control/Orientation
Choices	<p>Portrait—Vertical</p> <p>Landscape—Horizontal</p>
Default	Portrait

Selecting Media Size

The multipurpose tray must be adjusted to accept different media sizes. See the instructions for adjusting the tray media sizes in chapter 2, “Consumables,” of the *Operation* manual.

Selecting Media

Use the Operator Control/Multipurpose Sz menu to identify and select the size media in the multipurpose tray (inputbin 1). Your printer supports the following media sizes via the multipurpose tray:

Menu	Operator Control/Multipurpose Sz		
	8.5x13	8.5x13.0	215.90x330.20
	11x17	11.00x17.00	279.4x431.8
	12x19	12.00x19.50	304.80x495.30
	13x22	13.00x22.00	330.20x558.80
	13x26	13.00x26.00	330.20x660.40
	A3	11.70x16.53	297.0x420.0
	A4	11.69x8.7	297.0x210.0
	A5	5.85x8.27	148.5x210.0
	B4	10.12x14.33	257.0x364.0
	B5	7.17x10.12	182.0x257.0
	C5	6.38x9.02	162x229
	COM-10	4.125x9.5	104.78x241.3
	DL	4.33x8.66	110.0x220.0
	Envelope	6.93x9.76	176.00x248.00
	Executive	7.25x10.50	184.20x266.70
	Legal	8.5x14.0	215.9x355.6
	Letter	8.5x11.0	214.90x279.40
	Monarch	3.875x7.5	98.425x190.5
	Postcard	3.94x5.83	100.0x148.0
	Universal	13.00x19.00	330.20x482.60
Default	Letter		
Notes	The sizes (inches and millimeters) shown above appear in the documentation only for reference. They do not appear in the message window.		

Duplexing

The Duplex option allows you to print on both sides of the media.

Menu	Operator Control/Def. Duplex
Choices	Off, On, Tumble Off—Prints simplex pages. On—Duplexes each page of each job. Tumble—Prints jobs so they can be bound at the top edge (flip-chart style).
Default	Off
Notes	This option is available only when the optional duplexer is installed. If you want to print individual jobs duplex, leave the printer set to Off and choose duplex through your application. See chapter 3, “Professional Printing” on page 4-1, for more information on duplex printing.

Administration Menu

The Administration menu contains the following submenus:

Selection	See this section...
Communications	“Communications” on page 4-26
Emulations	“Emulations” on page 4-31
Special Pages	“Special Pages” on page 4-46
Startup Options	“Printer Start-Up Options” on page 4-50
Memory	“Memory” on page 4-51
Engine	“Engine” on page 4-59
Miscellaneous	“Miscellaneous” on page 4-66
Storage Devices	“Storage Devices” on page 4-67

Communications

This menu contains several options that allow you to configure the printers communication parameters to match the host and application parameters.

- » **Note:** *This section contains information on the Timeouts, Parallel and Network menus. For information on printer-host communication using the Ethernet interface or any options located under the CrownNet submenu (Administration/Communications/Network /CrownNet), see the QMS CrownNet System Administrator's Guide.*

Setting Timeouts

The Timeouts options limit the amount of time the printer waits on transmission from the host for various types of data.

Setting a PostScript Emulation Timeout

The PostScript emulation timeout is the maximum number of seconds the PostScript emulation waits for incoming data.

Menu	Administration/Communications/Timeouts/PS Wait Timeout
Choices	00000-99999
Default	00030 (30 sec.)
Notes	<p>A value of 00000 is the same as infinity (no timeout). The job is closed and the next job in the queue begins if all of the following occur:</p> <ul style="list-style-type: none">■ No additional data is received during the specified period of time.■ The interface didn't time out.■ An EOD (end-of-document commands) was not seen. <p>When a print job is sent from a Macintosh, the PS Wait timeout is automatically changed to 00300 (5 min.). Large print jobs, such as those generated by graphics or computer-aided design applications, require timeouts of 00300 (5 min.).</p>

Setting an Emulation Timeout

The emulation timeout is the maximum number of seconds emulations other than PostScript (such as HP-GL, PCL 5e, and Lineprinter) wait for incoming data.

Menu	Administration/Communications/Timeouts/Emul Timeout
Choices	00000-99999
Default	00005 (5 sec.)
Notes	A value of 00000 is the same as infinity (no timeout).

Setting a Print Job Timeout

The print job timeout is the maximum number of seconds the printer processes a print job before it ends the job.

Menu	Administration/Communications/Timeouts/Job Timeout
Choices	00000-99999
Default	00000 (infinity, no timeout)
Notes	A value of 00000 is the same as infinity (no timeout).

Setting an ESP Timeout

The ESP timeout is the maximum number of seconds the printer waits to match an emulation before printing the job in the default ESP emulation.

Menu	Administration/Communications/Timeouts/ESP Timeout
Choices	00000-99999
Default	00003 (3 sec.)
Notes	A value of 00000 is the same as infinity (no timeout).

Setting Parallel Interface Parameters

Use the Administration/Communications/Parallel menu to set the parallel interface values used for printer-host communications.

Mode

The parallel interface supports Centronics parallel communication as well as IEEE 1284 bidirectional parallel communication.

Menu	Administration/Communications/Parallel/Mode
Choices	Interactive—Establish two-way communication between the host and the printer. Noninteractive—Establish one-way communication from the host to the printer. Disabled—Turn off parallel communication with the host. The printer stops accepting print jobs over the parallel interface.
Default	Noninteractive
Notes	The printer must be restarted for changes to the menu to take effect. You can either let the printer restart automatically after you save the change and exit from the Configuration menu, or you can wait for the change to take effect the next time you manually turn on the printer. See chapter 5, “Additional Technical Information,” for a discussion of the different modes.

Emulation

Sets the parallel interface emulation.

Menu	Administration/Communications/Parallel/Emulation
Choices	ESP, Hexdump, PostScript, PCL5e, HPGL, Lineprinter » Note: <i>Other optional emulations may also appear, if installed.</i>
Default	ESP

Minimum Number of Kilobytes for Spooling

Sets the minimum number of kilobytes of system memory allocated to the parallel interface.

Menu	Administration/Communications/Parallel/Min K Spool
Choices	00000-99999
Default	00015

Notes	<p>This value must be less than K Mem For Spool in the administration/memory submenu.</p> <p>A 00000 value does not turn off the spooling buffer for the parallel interface. If the value is set to 00000, the printer calculates the Min K Spool automatically at initialization.</p> <p>The printer must be restarted for changes to the Min K Spool menu to take effect. You can either let the printer restart automatically after you save the change and exit the configuration menu, or you can wait for the change to take effect the next time you manually turn on the printer.</p>
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Spooling Timeout

Sets the number of seconds the interface waits for data from the host before terminating a spooled print job.

Menu	Administration/Communications/Parallel/Spool Timeout
Choices	00000-99999
Default	00030

Data Bits

Sets the number of data bits transmitted per character.

Menu	Administration/Communications/Parallel/Data Bits
Choices	7 Bits, 8 Bits
Default	8 Bits

End Job Mode

Enables (and identifies an end-of-job sequence) or disables data stream sensing for the end-of-document (EOD) command.

Menu	Administration/Communications/Parallel/End Job Mode
-------------	---

Choices	None—The printer recognizes only the PostScript ^D command. QMS EOD—The printer recognizes only the QMS %%EndOfDocument command. HP EOD—The printer recognizes only the HP <ESC>%12345X command.
Default	None
Notes	See chapter 5, “Additional Technical Information,” for details on how to implement this feature on your QMS 2060 Print System.

Default Job Priority

Allows you to specify which jobs are printed first, according to the interface through which they are received, when jobs are received simultaneously.

Menu	Administration/Communications/Parallel/Def Job Prio
Choices	001-100 (highest-lowest priority)
Default	001 (highest priority)
Notes	For example, you can give jobs received via the parallel interface priority over jobs received via the Ethernet interface.

PS Protocol

Sets the binary communications protocol (BCP) for communicating over a parallel interface to a PostScript printer.

Menu	Administration/Communications/Parallel/PS Protocol
-------------	--

Choices	Normal—Enables standard, ASCII (7-bit) hex protocol. Data is sent and received in ASCII format. This mode is recommended if you do not print binary data. It was designed for data in the printable ASCII range. Print jobs can change this setting through PostScript operators.
	Normal Fixed—Enables standard, ASCII (7-bit) hex protocol. Print jobs cannot change this setting through PostScript operators.
	Binary—Enables quoted binary communications protocol (BCP). Print jobs can change this setting through PostScript operators. Data in the printable ASCII range also prints.
	Binary Fixed—Enables binary communications protocol (BCP). Print jobs cannot alter change this setting through PostScript operators. Data in the printable ASCII range also prints.
Default	Normal
Notes	See chapter 5, “Additional Technical Information,” for a full discussion of PS Protocol.

Setting Network 2 Options

For information on options and defaults found in this menu, see chapter 2, “Printer Configuration,” in the *QMS CrownNet System Administrator's Guide*.

Emulations

Use the Administration/Emulations menu to set the parameters for the available printer emulations. Optional printing emulations appear only if installed.

- » **Note:** *To choose an emulation or ESP for a particular interface, use the appropriate interface menu in the Administration/Communications menu.*

Setting ESP Default Parameters

The ESP Default Emul sets the ESP default emulation used when ESP is unable to identify the language of a print job. This allows the system administrator to select alternate default emulations.

Menu	Administration/Emulations/ESP Default
Choices	HPGL, Lineprinter, PCL5e, PostScript
Default	PCL5e

Setting PostScript Parameters

The PostScript menu allows you to select the halftone type and intensity.

Halftone Type

Sets the halftone type.

Menu	Administration/Emulations/PostScript/Halftone Type
Choices	Basic, Standard, Advanced
Default	Basic
Notes	See chapter 5, the “Halftones” section of this manual for more information on halftone type.

Intensity

Sets the intensity for PostScript printing.

Menu	Administration/Emulations/PostScript/Intensity
Choices	Darkest, Darker, Nominal, Lighter, Lightest
Default	Nominal
Notes	Intensity uses the PostScript settransfer operator's functionality to make the print lighter or darker.

Setting PCL 5e Parameters

The PCL 5e menu maintains PCL 5e emulation attributes such as default font, symbol set, and point size. There are ten configuration settings. See appendix C, “Document Option Commands,” for a list of supported PCL 5e emulation DOCs.

Default Font

Sets the printer's default PCL 5E font.

Menu	Administration/Emulations/PCL5E/Default Font
Choices	Courier12, Courier12bold, Courier12italic, Courier10, Courier10bold, Courier10italic, Lineprinter, Times*, Times*Italic, Times*Bold, Times*BldItalic, Univ*, Univ*Italic, Univ*Bold, Univ*BldItalic, Univcond*, Univcond*Italic, Univcond*Bold, Univcond*BldItlc, Select By Index
Default	Courier12
Notes	<p>Fonts with an asterisk “*” in their names are scalable. Their default point size is set by the Point Size X100 option. Choosing Select by Index as the default font selects the font by the index number printed on the advanced status page and is set through the Default Font Idx option.</p> <p>»Note: <i>You must use the select by index value to select an Intellifont.</i></p> <p>Lineprinter is a bitmap font with a fixed point size. Selecting a bound, bitmap font overrides the default settings for symbol set and point size. An unbound font uses the specified default symbol set if possible, and a scalable font uses the default font size.</p>

Download Location

Controls the default storage location of PCL objects (fonts, macros, and patterns) when it is not otherwise specified through DOC commands.

Menu	Administration/Emulations/PCL5E/Downld Location
Choices	Disk—All downloaded PCL objects are stored in the default disk resource, if present. Memory—All downloaded PCL objects are stored in temporary storage in RAM.
Default	Disk
Notes	<p>»Note: <i>Before downloading any fonts, macros, or patterns ensure that the printer has enough memory to do the download.</i></p> <p>DOC commands specifying resources override this option on a per-job basis.</p> <p>If this option is set to Disk and no hard disk is installed, memory is used as the default storage location.</p> <p>If the printer has both a hard disk and a large amount of memory, setting this option to Memory enhances printer performance.</p>

Symbol Set

Selects the default symbol set for the emulation. Not all symbol sets are available with certain resident fonts. In particular, the Desktop, PS Math, Math 8, Microsoft Pub, Pi Font, PS Text, Ventura Intl, Ventura Math, Ventura US, and Windows symbol sets cannot be used with the resident bitmap lineprinter font.

Menu	Administration/Emulations/PCL5E/Symbol Set
Choices	Roman-8, PC-850, PC8-US, PC8-DN, Legal, ISO-4, ISO-6, ISO-11, ISO-15, ISO-17, ISO-21, ISO-60, ISO-69, Desktop, PS Math, Math-8, Microsoft-Pub, Pi - font, PS-Text, Ventura-Intl, Ventura-Math, Ventura-US, Windows, ISO-Latin-1, ISO-Latin-2, ISO-Latin-5, PC-852, PC-8tk, Windows 3.1-1, Windows 3.1-2, Windows 3.1-3, MC-Text

Default	Roman-8
Notes	If a mismatch between symbol set and fonts occurs, the standard PCL font selection mechanism is used to locate a font that matches the selected symbol set. With the standard set of fonts distributed for your printer, this matches the Times* font, but other user-installed fonts could change this result.

Lines Per Inch

Sets the default lines printed per inch in PCL jobs, regardless of page size.

Menu	Administration/Emulations/PCL5E/Lines/Inch X100
Choices	100 to 4800
Default	600
Notes	You must enter the number of lines per inch times 100. For example, 6 lines per inch is entered as 600; 6.6 lines per inch is entered as 660.

Line Termination

Indicates the default line termination mode. This setting specifies the treatment of line feeds and carriage returns. (See Appendix C, "Document Option Commands," for more information on line termination).

Menu	Administration/Emulations/PCL5E/Line Termination
Choices	CR=CR LF=LF CR=CR+LF LF=LF CR=CR LF=CR+LF CR or LF=CR+LF
Default	CR=CR LF=LF

Point Size x 100

Sets the point size for scalable default fonts in units of hundredths of a point. For example, a 24 point default point size is selected by entering 2400. The smallest increment allowed in point size is .25 point (for example, 8.5 point and 8.75 point fonts are allowed, but 8.6 point is not).

Menu	Administration/Emulations/PCL5E/Point Size x100
Choices	00025-99975 (0.25-999.75 points)
Default	01200 (12 points)
Notes	If the font is not scalable or if a bitmap font is specified, the setting is ignored.

Retain Temporary

Allows you to control the PCL 5e print environment across print jobs.

Menu	Administration/Emulations/PCL5E/Retain Temporary
Choices	<p>Off, On, On Compatibility</p> <p>Off—Resets PCL to its default state at the end of each PCL print job, executes an implicit <ESC>E at the start and end of the job, and deletes any temporary fonts, macros, and patterns.</p> <p>On—Resets PCL to its default state at the end of each PCL print job. Temporary fonts, macros, and patterns from previous PCL jobs are retained in memory after the print job has completed. You can recall these downloaded fonts, macros, or patterns from within your PCL file without having to download them again.</p> <p>On Compatibility—Retains the entire state of PCL as well as the temporary macros, fonts, and patterns from previous PCL jobs when jobs of other emulations are printed between PCL jobs.</p>

Default	Off
Notes	<p>A retained state is cleared if you do any of the following:</p> <ul style="list-style-type: none">■ Explicitly clear the PCL state by sending an <ESC>E or Printer Job Language.■ Turn off the printer. (Note that if Retain Temporary is set to On or On Compatibility and power is turned off and back on again, all temporary objects on the disk's standard resource will become permanent. RAM-based temporary objects are lost).■ Change any PCL front panel option.■ Send any PCL-specific DOC commands (except the DOC emulation command).■ Send a PCL job from a different communications port. For example, the state set up by a PCL job using the parallel port is cleared if a subsequent PCL job arrives at the serial port.

Default Font Index

Sets the default font if the default font is set to selectbyindex.

Menu	Administration/Emulations/PCL5E/Default Font Idx
Choices	0 to 32767
Default	00000
Note	The index number can be obtained by the listing printed on the advanced status page. See "Printing a Status Page" on page 4-47, for status page details.

Monochrome GL/2

Allows your printer to emulate a monochrome or color plotter.

Menu	Administration/Emulations/PCL5E/Monochrome GL/2																
Choices	<p>On—Sets the printer to monochrome (2 pen).</p> <p>Off—Sets the printer to color (8 pen). Since a monochrome print system has two pen colors only (black and white), grayscale patterns are substituted for other colors.</p> <p>The printer maps each pen to its assigned color, then converts the color to a grayscale using the National Television System Committee (NTSC) color standard for luminosity coefficients (Additive System):</p> $Y = .3R + .59G + .11B$																
Notes	<p>Examples on How to Use the Color Standard Formula</p> <table><tr><td>White</td><td>$Y = [(1*0.3) + (1*0.59) + (1*0.11)]$—100% gray</td></tr><tr><td>Black</td><td>$Y = [(0*0.3) + (0*0.59) + (0*0.11)]$—0% gray</td></tr><tr><td>Red</td><td>$Y = [(1*0.3) + (0*0.59) + (0*0.11)]$—30% gray</td></tr><tr><td>Green</td><td>$Y = [(0*0.3) + (1*0.59) + (0*0.11)]$—59% gray</td></tr><tr><td>Yellow</td><td>$Y = [(1*0.3) + (1*0.59) + (0*0.11)]$—89% gray</td></tr><tr><td>Blue</td><td>$Y = [(0*0.3) + (0*0.59) + (1*0.11)]$—11% gray</td></tr><tr><td>Magenta</td><td>$Y = [(1*0.3) + (0*0.59) + (1*0.11)]$—41% gray</td></tr><tr><td>Cyan</td><td>$Y = [(0*0.3) + (1*0.59) + (1*0.11)]$—70% gray</td></tr></table>	White	$Y = [(1*0.3) + (1*0.59) + (1*0.11)]$ —100% gray	Black	$Y = [(0*0.3) + (0*0.59) + (0*0.11)]$ —0% gray	Red	$Y = [(1*0.3) + (0*0.59) + (0*0.11)]$ —30% gray	Green	$Y = [(0*0.3) + (1*0.59) + (0*0.11)]$ —59% gray	Yellow	$Y = [(1*0.3) + (1*0.59) + (0*0.11)]$ —89% gray	Blue	$Y = [(0*0.3) + (0*0.59) + (1*0.11)]$ —11% gray	Magenta	$Y = [(1*0.3) + (0*0.59) + (1*0.11)]$ —41% gray	Cyan	$Y = [(0*0.3) + (1*0.59) + (1*0.11)]$ —70% gray
White	$Y = [(1*0.3) + (1*0.59) + (1*0.11)]$ —100% gray																
Black	$Y = [(0*0.3) + (0*0.59) + (0*0.11)]$ —0% gray																
Red	$Y = [(1*0.3) + (0*0.59) + (0*0.11)]$ —30% gray																
Green	$Y = [(0*0.3) + (1*0.59) + (0*0.11)]$ —59% gray																
Yellow	$Y = [(1*0.3) + (1*0.59) + (0*0.11)]$ —89% gray																
Blue	$Y = [(0*0.3) + (0*0.59) + (1*0.11)]$ —11% gray																
Magenta	$Y = [(1*0.3) + (0*0.59) + (1*0.11)]$ —41% gray																
Cyan	$Y = [(0*0.3) + (1*0.59) + (1*0.11)]$ —70% gray																
Default	<p>On</p> <p>Pen Color Defaults:</p> <p>Pen 0 = White Pen 1 = Black Pen 2 = Red Pen 3 = Green Pen 4 = Yellow Pen 5 = Blue Pen 6 = Magenta Pen 7 = Cyan</p>																

Setting HP-GL Parameters

This section contains the configuration choices available under Emulations/HP-GL.

Enhanced Mode

Increases the resolution of the grid for downloaded characters. The HP-GL UC (User-defined Character) command allows you to download and draw characters using an encoding scheme consisting of sequences of pen control movements and coordinate sequences. The characters are drawn on a grid that is superimposed on the character plot cell.

Menu	Administration/Emulations/HPGL/Enhanced Mode
Choices	On—Standard resolution for fixed- and variable-spaced fonts (4x8 grid). Off—Enhanced resolution for variable-spaced fonts (26x36 grid).
Default	Off

Expand Mode

Defines a larger imageable area which affects the default placement of the scaling points P1 and P2.

Menu	Administration/Emulations/HPGL/Expand Mode
Choices	On—Turn on expand mode Off—Use default scaling points, plotting range, and plotting area.

Emulations

Default	Off
Notes	<p>The available range of plotter units for a particular media size is only partially determined by setting the Expand Mode to On. When the printer/plotter senses the media size it automatically sets the hard clip limit to 15mm on three sides and 39 mm on the fourth. If Expand Mode is On, then the hard clip limits are set to 5mm on three sides and 29 mm on the fourth side. This is what allows you to define a larger imageable area.</p> <p>The HP-GL emulation senses the media type if the paper type is set to Scale to Paper. It is also possible to have the HP-GL emulation use a particular media size by setting Original Paper Type through the control panel or by using a Document Option Command.</p>

Paper Type

Identifies the original image's paper size.

Menu	Administration/Emulations/HPGL/Paper Type
Choices	A—(8.5" x 11"—216 x 279 mm), A0—(33.11" x 46.81"—841 x 1189 mm) A1—(23.39" x 3.11"—594 x 1189 mm) A2—(16.54" x 23.29"—420 x 594 mm) A3—(11.69" x 16.54"—297 x 420 mm) A4—(8.27" x 11.69"—210 x 297 mm) B—(11" x 17"—279 x 432 mm) C—(17" x 22"—431.80 x 558.80 mm) D—(22" x 34"—558.80 x 863.60 mm) E—(34" x 44"—863.60 x 1117.60 mm) C ARCH D ARCH E ARCH Scale to Paper
Default	Scale to Paper

Pen 1 - Pen 8

Sets the width and color for the eight plotter pens. Each pen has a width and a color option available.

- » **Note:** See chapter 5, “Additional Technical Information,” for more information on the HP-GL emulation color encoding equation.

Menu	Administration/Emulations/HPGL/Pen x/Width
Choices	0-60 (0.0-6.0 mm)
Default	Pen 1—7 (0.7 mm) Pen 2—3 (0.3 mm) Pen 3—3 (0.3 mm) Pen 4—3 (0.3 mm) Pen 5—3 (0.3 mm) Pen 6—3 (0.3 mm) Pen 7—3 (0.3 mm) Pen 8—3 (0.3 mm)
Note	A choice of 0 defaults to a pixel of “1”.
Menu	Administration/Emulations/HPGL/Pen x/Color
Choices	Black, Blue, Brown, Cyan, Gray-25%, Gray-50%, Gray-75%, Green, Magenta, Orange, Red, Violet, Yellow
Default	Pen 1—Black (100% black) Pen 2—Black (100% black) Pen 3—Red (70% black) Pen 4—Green (41% black) Pen 5—Blue (89% black) Pen 6—Violet (59% black) Pen 7—Orange (25.8% black) Pen 8—Brown (50% black)

Plotter

Identifies the HP-GL plotter type.

Menu	Administration/Emulations/HPGL/Plotter
Choices	7475A— 7470A— Colorpro— 7550A— DraftMaster—Supports architectural and engineering paper sizes (for example, A to E and Arch A to Arch E). These paper sizes describe a mapping to the physical paper. This mapping is a scaling factor (or a size ratio) between the chosen paper size and the physical paper size in the default inputbin. For example if A3 is selected (size 11.69" x 16.54") for paper size and the physical paper size in the default inputbin is A4 (8.27" x 11.69"), then the plot is scaled by a factor of 2.
Default	7550A

Scaling Percent

Identifies the percentage to reduce or enlarge an image.

Menu	Administration/Emulations/HPGL/Scaling Percent
Choices	001-150 (1-150%)
Default	100 (100%)

- » **Note:** *To scale plots, select the paper size originally used for the plot in the Paper Type menu and then enter the reduction or enlargement needed to fit the plot on the new page in the Scaling Percent menu.*

Setting Line Printer Parameters

Autowrap

Indicates whether long lines are to be wrapped to the next line instead of being truncated.

Menu	Administration/Emulations/Line Printer/Autowrap
Choices	On—Wrap long lines. Off—Truncate long lines.
Default	On

Character Map

Specifies the type of character map to be used.

Menu	Administration/Emulations/Line Printer/Character Map
Choices	ASCII, EBCDIC, PC ASCII, PC Multilingual
Default	ASCII
Note	If you select the PC ASCII or PC Multilingual character map, special PostScript fonts will be substituted for the lineprinter character map.

CR IS CRLF

Stipulates whether each carriage return (CR) in the print job is translated to a carriage return/line feed (CRLF) combination.

Menu	Administration/Emulations/Line Printer/CR IS CRLF
Choices	On—Translate all carriage returns to line feeds. Off—Use carriage returns only as carriage returns.
Default	Off

Emulations

FF is CRFF

Stipulates whether each form feed (FF) in the print job is translated to a carriage return/form feed (CRFF) combination.

Menu	Administration/Emulations/Line Printer/FF IS CRFF
Choices	On—Translate all form feeds to carriage return/form feed combinations. Off—Use form feeds only as form feeds.
Default	On

Font

Sets the printer fonts for the current print job. Any PostScript fonts available on the printer can be used. To see a list of available PostScript fonts, print an advanced status page through the printer configuration menu or through the Status Page key on the front panel.

Menu	Administration/Emulations/Line Printer/Font
Choices	All printer-resident PostScript fonts.
Default	Courier

LF is CRLF

Stipulates whether each line feed (LF) in the print job is translated to a carriage return/line feed (CRLF) combination.

Menu	Administration/Emulations/Line Printer/LF IS CRLF
Choices	On—Translate all line feeds to carriage return/line feed combinations. Off—Use line feeds only as line feeds.
Default	On

Line Numbering

Specifies that a five-digit number is to be prefixed to each line.

Menu	Administration/Emulations/Line Printer/Line Numbering
Choices	On—Number all lines. Off—Don't number lines.
Default	Off

Lines Per Page

Specifies the number of lines printed on a page before an automatic page eject. Interline spacing is set to the selected point size. Logical pages consisting of more lines than specified are split into multiple pages.

Menu	Administration/Emulations/Line Printer/Lines per Page
Choices	1-128
Default	87

Margins

Defines the left, right, top, and bottom margins in 1/7200" increments.

Menu	Administration/Emulations/Line Printer/Margins	
Choices	Bottom	0-79200 (0"-11.00")
	Left	0-79200 (0"-11.00")
	Right	0-79200 (0"-11.00")
	Top	0-79200 (0"-11.00")
Default	Bottom	0
	Left	0
	Right	0
	Top	0
Note	The margins are in 1/7200 increments (79200" is 11.00" at 1/7200" increments.	

Orientation

Specifies whether text and graphics are placed on the page in a portrait or landscape orientation.

Menu	Administration/Emulations/Line Printer/Orientation
Choices	Landscape, Portrait
Default	Portrait

Point Sz 100ths

Sets the five-digit value used to specify the point size of the font for the current print job.

Menu	Administration/Emulations/Line Printer/Point Sz 100ths
Choices	00000-99999
Default	00880 (8.8 points)

Tab Stops

Specifies the number of spaces between tab stops.

Menu	Administration/Emulations/Lineprinter/Tab Stops
Choices	0-256
Default	8

Special Pages

Use the Administration/Special Pages menu to print special pages, such as status pages, header pages, and trailer pages.

Working with Status Pages

Printing a status page is a two-step procedure: Identify the type of status page you want to print, and then print it.

Identifying a Status Page Type

Two types of status pages are available.

Menu	Administration/Special Pages/Status Page Type
Choices	<p>Standard—Lists printer identification information, paper source, current memory configuration, timeouts, communication settings, input buffer sizes, and all options.</p> <p>Advanced—Contains the same information as the standard status page as well as configuration menu settings, fonts, and downloaded emulations.</p>
Default	Standard

Printing a Status Page

After you have identified the type of status page to print, use the Status Page key on the printer control panel to print it.

- » **Note:** *If you choose an advanced status page but only a standard status page prints, the printer has run out of RAM. Either reallocate memory among the memory clients (see chapter 5, "Additional Technical Information") or add more memory to the printer (see chapter 2, "Memory and System Software," in the Options guide).*

Calibration Page

Prints a calibration page.

Menu	Administration/Special Pages/Calibration Page
Choices	<p>Yes—Prints calibration page.</p> <p>No—Calibration page will not be printed.</p>
Default	Yes
Notes	See the Administration/Engine/Image Alignment menu for calibration instructions.

Working with Header Pages

A header page is a separator page that prints before a print job to help users sort their jobs. The information on the header page can be customized.

Enabling/Disabling Header Pages

Menu	Administration/Special Pages/Header Page
Choices	On—Print a header page before each job. Off—Don't print a header page before each job.
Default	Off

Identifying a Header Page Input Source

You can select the input bin (tray or cassette) from which the printer pulls media when printing the header page.

Menu	Administration/Special Pages/Header Inputbin
Choices	Upper—Pull header page media from the upper cassette. Optional—Pull header page media from the optional feeder, if installed. Multipurpose—Pull header page media from the multipurpose tray.
Default	Multipurpose
Notes	If you used the Administration/Engine/Inputbin x Name options to change the names of the input bins, these names replace Multipurpose, Upper, and Optional in the message window

Working with Trailer Pages

A trailer page is a separator page that prints after a print job to help users sort out their jobs and, if requested, identify print job errors.

Enabling/Disabling Trailer Pages

Menu	Administration/Special Pages/Trailer Page
Choices	<p>Off—Don't print a trailer/error page for each print job.</p> <p>On—Print a trailer/error page for each print job.</p> <p>On Error—If any print job errors exist, print a trailer page that lists the errors as well as other trailer page information.</p> <p>Errors Only—If any print job errors exist, print a trailer page that lists the errors but omits other trailer page information.</p>
Default	Off
Notes	See the <i>QMS Crown Document Option Commands</i> manual for more information.

Identifying a Trailer Page Input Source

You can select the input bin (tray or cassette) from which the printer pulls media when printing the trailer page.

Menu	Administration/Special Pages/Trailer Inputbin
Choices	<p>Upper—Pull trailer page media from the upper cassette.</p> <p>Optional—Pull trailer page media from the optional feeder, if installed.</p> <p>Multipurpose—Pull header page media from the multipurpose tray.</p>
Default	Multipurpose
Notes	If you used the Administration/Engine/Inputbin x Name options to change the names of the inputbins, these names replace Multipurpose, Upper, and Optional in the message window.

Printer Start-Up Options

The Administration/Startup Options menu allows you to configure your printer to run certain options automatically when you turn it on.

Enabling/Disabling the Start-Up Page

By default, the printer prints a start-up page when you turn it on. The start-up page lists basic information about the printer, such as its name, the PostScript version, and various printer settings. However, you can turn the start-up page off to conserve paper and toner.

Menu	Administration/Startup Options/Do Start Page
Choices	Yes—Print a start-up page each time the printer is turned on.
	No—Don't print a start-up page each time the printer is turned on.
Default	Yes

Enabling/Disabling the SYS\START File

If you have a hard disk and Do Sys Start is enabled, when the printer is turned on, the controller checks the hard disk for a PostScript file named SYS\START and executes this file.

Menu	Administration/Startup Options/Do Sys Start
Choices	Yes—Check the hard disk for and execute the SYS\START file when the printer is turned on.
	No—Don't check the hard disk for a SYS\START file.
Default	Yes
Notes	Information on creating a SYS\START file is available via Q-FAX (see appendix A, "QMS Customer Support," for information on using Q-FAX).

Loading the PostScript Error Handler

Error Handler is a diagnostic tool that identifies PostScript errors encountered during a print job.

Menu	Administration/Startup Options/Do Error Handler
Choices	Yes—Load the Error Handler at power on. No—Don't load the Error Handler.
Default	No
Notes	You must restart the printer before this change will take effect. Refer to the <i>PostScript Language Reference Manual</i> (Adobe Systems Incorporated, Reading, PA: Addison-Wesley, 1990, ISBN 0-201-18127-4) for more information on PostScript errors.

Memory

This submenu allows you to allocate the printer's memory (RAM) among the various memory clients. The flexibility of defining memory available to clients allows experienced users to optimize the printer's performance according to a given set of conditions.

This section briefly describes each of the memory submenus and the memory clients. See chapter 5, "Additional Technical Information," for more detailed information on the printer's memory and what benefits, if any, may result from adding memory to each client.

To find out how memory is currently allocated, print a status page using the Status Page key on the control panel or check each client individually in the configuration menu.

Quick Configuration Menu

This submenu allows you to "quickly configure" the memory clients to the settings which allow the printer to perform best.

Memory

- » **Note:** *The printer is automatically restarted after this menu change.*

The results of Quick Config depend on the amount of memory installed, the resolution used for printing, paper size, and if the duplexer is installed.

- » **Note:** *This menu will only appear if there is no hard disk installed in the printer or if Enable Disk Swap is turned off. The 1200 dpi selection will only appear if the 1200x 1200 dpi Multi-Res daughterboard is installed.*

Menu	Administration/Memory/Quick Config/300dpi
Choices	Letter/A4, Legal, 8.5x13, 11x17, 12x19, 13x22, 13x26, Universal, A5, A3, B5, B4, Statement, Executive
Menu	Administration/Memory/Quick Config/600dpi
Choices	Letter/A4, Legal, 8.5x13, 11x17, 12x19, 13x22, 13x26, Universal, A5, A3, B5, B4, Statement, Executive
Menu	Administration/Memory/Quick Config/1200dpi
Choices	Letter/A4, Legal, 8.5x13, 11x17, 12x19, 13x22, 13x26, Universal, A5, A3, B5, B4, Statement, Executive
Note	Under the Quick Config option documented on the advanced status page you will see "*****". This option isn't user-definable. Quick Config configures memory depending only on the resolution and paper size.

Enable Disk Swap Menu

Enable Disk Swap gives your printer virtual memory capability for all memory clients through the creation of a "swap file" on the printer's hard disk. The printer uses this file as an extension of its memory. As the physical RAM fills, the printer can swap the contents to the hard disk file to allow more space. This file swapping between disk and RAM occurs at various times throughout the printing process and is completely transparent.

- » **Note:** *The printer must have a hard disk to take advantage of this feature. If there is no hard disk installed, this menu does not appear.*

Menu	Administration/Memory/Enable Disk Swap
Choices	Off—Don't enable disk swapping. On—Enable disk swapping.

Default	On
Notes	<p>If disk swapping is enabled and the hard disk is removed or not turned on, the printer will automatically reset to the factory defaults.</p> <p>The printer must be restarted for changes to the Enable Disk Swap and other memory menus to take effect. You can either let the printer restart automatically after you save the change and exit from the Configuration menu, or you can wait for the change to take effect the next time you manually turn on the printer.</p>

Manual Configuration Menu

The manual configuration menu allows you to adjust memory clients based on your printing needs.

Configuring Spooling

The K Mem for Spool, listed on the status page as Host Input, is the total number of kilobytes of RAM allocated to all spooling buffers. This memory client stores incoming data from the various interfaces until it is processed and printed.

Menu	Administration/Memory/Manual Config/K Mem for Spool
Choices	00128-30720
Notes	<p>This value must be greater than the sum of the Min K Spool for all installed and enabled interfaces. The maximum value listed depends on the amount of memory installed and if a disk drive is present.</p> <p>If you change the K Mem for Spool value, the printer automatically restarts after you save your changes and exit from the configuration menu.</p>

When the sum of the Min K Spool for all interfaces is less than K Mem for Spool, memory is allocated as follows:

- 1 Interfaces with Min K Spool (in the Administration/Communications menu) value greater than zero receive their specified allocation.

- 2 The remaining memory in K Mem for Spool is allocated to Shared Spooling Space. This can be seen in the Communications Settings & Input Buffer Sizes area of the status page.
 - 3 The Shared Spooling Space can be allocated to any of the communication interfaces if the input jobs require more spooling space. The limit to this is the amount of Host Input (K Mem for Spool) shown on the status page.
- » **Note:** *If you add the Input Buffer Sizes allocated to each interface and the Shared Spooling Space, the result should equal Host Input.*

PostScript Heap

The K Mem for PSHeap, listed on the status page as Heap, is the number of kilobytes of RAM dedicated to the PostScript emulation interpreter. This memory client holds downloaded PostScript emulation fonts, operators, and forms.

Menu	Administration/Memory/Manual Config/K Mem for PSHeap
Choices	01280-no maximum
Notes	If you change the K Mem for PSHeap value, the printer automatically restarts after you save your changes and exit from the configuration menu. The maximum value listed depends on the amount of memory installed and whether a hard disk is present.

PostScript Fonts

The K Mem for PS Fonts, listed on the status page as Font Cache, is the number of kilobytes of RAM dedicated to caching previously scaled bitmap representations of fonts for the PostScript emulation interpreter.

Menu	Administration/Memory/Manual Config/K Mem for PS Fonts
Choices	00088-05120

Notes	<p>This memory setting can reduce the number of times a PostScript font must be converted from outline form to bitmap form, thus reducing processing time. On the other hand, it can increase the length of time the font cache must be searched, thus increasing processing time. The maximum value listed depends on the amount of memory installed and if a hard disk is present.</p> <p>If you change the K Mem for PS Fonts value, the printer automatically restarts after you save your changes and exit from the Configuration menu.</p>
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Emulation

The K Mem Emulation, listed on the status page as Emulation, is the number of kilobytes of RAM to be used by non-PostScript emulations for temporary storage and for loading optional emulations.

Menu	Administration/Memory/Manual Config/K Mem Emulation
Choices	01024-no maximum
Notes	<p>If you receive an emulation error, you may need to increase the amount of memory for this client. The maximum value listed depends on the amount of memory installed and if a hard disk is present.</p> <p>QMS recommends that you should add at least 1MB of physical RAM to your printer and increase this memory client by 1 MB. If the Enable Disk Swap option is turned on, then you can increase the emulation memory client using this memory. Failure to add memory to this client may prevent the printer from loading and using the emulation. Check the documentation included with the loadable emulation for information on additional resources requirements.</p> <p>If you change the K Mem Emulation value, the printer automatically restarts after you save your changes and exit from the configuration menu.</p>

Emulation (Temporary)

The K Mem Emul Temp, listed on the status page as Emulation Temporary, is the number of kilobytes of RAM to be used by non-Post-Script emulations for storing downloaded (soft) fonts, forms, or macros.

Menu	Administration/Memory/Manual Config/K Mem Emul Temp
Choices	00256-30720
Notes	<p>Data in this client disappears when the printer is turned off. Increasing this client's size increases the number of PCL downloaded fonts which can be accepted. The maximum value listed depends on the amount of memory installed and if a hard disk is present.</p> <p>If you change the K Mem Emul Tmp value, the printer automatically restarts after you save your changes and exit from the Configuration menu.</p>

Display List

The K Mem Display is the number of kilobytes of RAM dedicated to the display lists. The display list holds the intermediate representation of pages to be printed. Increasing the size of the Display List increases the number of pages that can be collated. The maximum number of pages that can be collated is 128 pages.

Menu	Administration/Memory/Manual Config/K Mem Display
Choices	00384-no maximum
Notes	<p>The maximum value listed depends on the amount of memory installed and if a hard disk is present. If you change the K Mem Display value, the printer automatically restarts after you save your changes and exit from the configuration menu.</p>

Disk Cache

The K Mem Disk Cache is the number of kilobytes of RAM dedicated to the disk cache. This memory client speeds file system throughput on any installed hard disks by storing frequently used data in system memory instead of continually storing it to and retrieving it from a hard disk.

Menu	Administration/Memory/Manual Config/K Mem Disk Cache
Choices	00000-30720
Default	00028
Notes	<p>If no hard disk is installed (such as on the QMS 2060 BX system), the disk cache will be set to the minimum (zero). The printer then reallocates the released memory to other clients that need additional memory.</p> <p>If you change the K Mem Disk Cache value, the printer automatically restarts after you save your changes and exit from the configuration menu.</p>

The amount of memory needed for this memory client depends on the size and number of hard disks, the number of subdirectories on each disk, and the amount of memory dedicated to caching.

- » **Note:** *If sufficient memory is available to the disk cache, all disks are accessible. If insufficient memory is available to the disk cache, some disks may be accessible while others may not be.*

The recommended amount of memory for the disk cache client is

- 128 KB minimum plus 0.5 KB per MB of disk storage total for all disks

For example, the recommended amount of memory for the disk cache for a single 1200 MB hard disk is 728 KB, and for two 1200 MB hard disks it is 1456 KB. These are recommended values. The printer will still operate with a smaller cache, but decreased performance may result.

Frame Buffer

The Frame Buffer memory client holds rasterized or bitmapped images of page faces which are ready to be sent to the print engine. A frame holds the contents of each single page image. For example, a 600 dpi page printed on letter size paper would consume Frame Buffer memory space as follows: $(600\text{dpi} \times 600\text{dpi} \times 8.5" \times 11")/8 = 4,207,500$ bytes or 4.1 M. The actual value is lower because you're dealing with imageable area.

Frame Buffer memory should always be the first memory client that is configured in the printer. After this, all other clients can be configured depending on your printing needs. Anytime the frame buffer client is changed, all of the other clients will be resized to their default values. Frame Buffer can be configured manually, through the Quick Config Menu, or by resetting the printer defaults. In all cases, be sure to keep a copy of the status page as a record of memory client settings. See chapter 5, "Additional Technical Information," for more information on memory and the frame buffer client.

Menu	Administration/Memory/Manual Config/K Mem Framebuff
Choices	02200-104532

Printer Memory

MB Printer Mem, listed as Total Memory on the status page, is the number of megabytes of RAM available to be split among the various memory clients. The size of this client's memory limits the number of jobs that may be queued simultaneously. When this client's memory is exhausted, the printer slows down, and the hosts are forced to wait.

Menu	Administration/Memory/Manual Config/MB Printer Mem
Choices	000-999
Default	Depends on the amount of memory installed.
Notes	This memory client is not user-configurable. If disk swapping is enabled (Administration/Memory/Enable Disk Swap menu), the amount of memory displayed is larger than the actual amount of memory installed in the printer.

Engine

Through the Administration/Engine menu you can set print engine-related parameters.

Adjusting the Image Alignment

This option allows you to adjust the horizontal and vertical placement of printed images.

To check image alignment, print a standard status page (Print Status key). When the printer is placing images properly, the alignment angle bar in the lower-left corner of the status page is 0.5"/12.7 mm from the left and bottom edges of the page. If the angle bar is off, use the Administration/Engine/Image Alignment option to align the image horizontally and vertically in pixel increments (1/300" or 0.08 mm).

- » **Note:** *Engine constraints may limit the accuracy of pixel alignment.*

Horizontal Offset

Menu	Administration/Engine/Image Alignment/Horiz Offset
Choices	000-300 (0.00"/0 mm-1.00"/25.4 mm)
Default	100 (0.33"/.84 mm)
Notes	Values above 100 move the image to the right. Values below 100 move the image to the left.

Vertical Offset

Menu	Administration/Engine/Image Alignment/Vertical Offset
Choices	000-300 (0.00"-1.00")
Default	100 (0.33"/.84 mm)
Notes	Values above 100 move the image down. Values below 100 move the image up.

Duplex H. Offset

Menu	Administration/Engine/Image Alignment/Duplex H. Offset
Choices	000-300 (0.00"/0 mm-1.00"/25.4 mm)
Default	100 (0.33"/.84 mm)
Notes	Values above 100 move the image to the right. Values below 100 move the image to the left.

Duplex V. Offset

Menu	Administration/Engine/Image Alignment/Duplex V. Offset
Choices	000-300 (0.00"-1.00")
Default	100 (0.33"/.84 mm)
Notes	Values above 100 move the image down. Values below 100 move the image up.

Setting the Rotate Simplex Option

This option rotates the image so that it prints correctly on 3-hole punched paper.

- » **Note:** *You must insert the paper with the holes on the leading edge of the paper. If installed the opposite way, you will get an error message.*

Menu	Administration/Engine/Rotate Simplex
Choices	Yes No
Default	No
Note	This feature allows simplex printing only. You cannot print duplex on 3-hole punched paper.

Setting Default Paper

Default Paper is used when the default media is requested but the default input bin is missing from the engine, there's no way to sense the media size automatically.

Menu	Administration/Engine/Default Paper
Choices	Letter, A4
Default	Letter

Naming Media Inputbins

Options in the Administration/Engine menu allow you to give each inputbin a more descriptive name. These names are displayed in the printer message window, where appropriate. You can also use the descriptive names with Document Option Commands. (See the *QMS Crown Document Option Commands* included in Adobe Acrobat format on the QMS *Software Utilities* CD-ROM for more information.)

Menu	Administration/Engine/Inputbin x Name
Choices	Up to 16 alphanumeric characters
Default	Inputbin 1 multipurpose Inputbin 2 upper Inputbin 5 optional
Note	Inputbin 5 appears only if the optional feeder is installed.

Naming the Media Outputbin

The Administration/Engine/Outputbin menu is used to name output bin 1. You can also use the descriptive names with Document Option Commands. (See the *QMS Crown Document Option Commands*, included in Adobe Acrobat format on the QMS *Software Utilities* CD-ROM for more information.).

Outputbin 1

Menu	Administration/Engine/Outputbin 1 Name
Choices	Up to 16 characters
Default	upper

Setting Default Resolution

This option sets the print engine's default resolution.

Menu	Administration/Engine/Def Resolution
Choices	300 dpi—300x300 dpi resolution. 600 dpi—600x600 dpi resolution. 1200 dpi—1200x1200 dpi resolution » Note: <i>The 1200x1200 dpi resolution option is available only when the optional 1200x1200 dpi daughterboard is installed.</i>
Default	600 dpi
Notes	If your printer is configured for duplex printing and has less than 16 MB RAM, 600x600 dpi isn't available on all media sizes. Duplexing using 600x600 or 1200x1200 resolution requires additional memory. See the "High-Resolution Printing" section in chapter 3, "Advanced Printing Features," of the <i>Operation</i> guide. The 1200 dpi option will not show up in this menu until the 1200x1200 dpi daughterboard is installed and the frame buffer has sufficient memory to support 1200 dpi. Restoring defaults or selecting Administration/Memory/Quick Config menu should reconfigure the frame buffer memory client.

Specifying Page Recovery Action

When a media jam or other similar error occurs, the printer can reprint the job starting from the page on which the jam occurred.

Menu	Administration/Engine/Page Recovery
Choices	On—Reprints a print job from the page on which the jam or error occurred. Off—Don't reprint a print job when a jam or error occurs.
Default	Off

Setting Toner Low Action

You can configure the printer to stop or to continue printing when a **TONER LOW** error message is displayed in the message window.

Menu	Administration/Engine/Toner Low Act.
Choices	Continue—Continue printing when a TONER LOW message displays.
	Stop—Stop printing when a TONER LOW message displays.
Default	Continue

Setting Energy Conservation

The Energy Saver option specifies whether the printer changes to a low-power state (the engine remains on, but the fuser turns off) after the printer is inactive for a user-defined length of time. When a print job is received, the printer returns to normal power within 90 seconds.

Menu	Administration/Engine/Energy Saver
Choices	15 minutes, 30 minutes, 1 hour, 2 hours, 3 hours—Idle time before activation of low-power state.
	Off—Use normal power all of the time.
Default	1 hour

Setting Toner Density

The Toner Density option adjusts the density of the toner that is laid down on the paper.

Menu	Administration/Engine/Toner Density
Choices	0-7
	0—Lightest setting
	7—Darkest setting
Default	4
Notes	Setting a toner density to less than 4 may result in printing that is too light at 1200 dpi.

Setting Manual Feed Timeout

This option allows you to set the amount of time the printer waits for paper to be inserted into the multipurpose tray before it cancels the job.

Menu	Administration/Engine/Man. Feed Timeout
Choices	000 - 300 seconds
Default	060 seconds
Notes	A value of 000 sets the timeout to infinity

Setting the Letterhead Option

This option appears only if the duplexing unit is installed on the printer. The letterhead option allows you to print both simplex and duplex jobs on letterhead paper from the same input bin without having to sort the pages manually.

Menu	Administration/Engine/Letterhead
Choices	On, off
Default	Off
Notes	Load letterhead paper face down in the input bin with the long edge inserted first and the top of the sheet toward the right side of the printer. You may notice a decrease in the printing speed depending on the mix of simplex and duplex pages.

Print Quality

The Print Quality option allows the printer to operate at a lower rate of toner consumption and extend the life of your toner cartridges. This option also allows you to enable smoothing.

- » **Note:** *Smoothing does not work at 1200x1200 dpi.*

Menu	Administration/Engine/Print Quality
Choices	Normal—Normal toner use. Conserve Toner—Toner use is lowered. Smooth(600dpi)—Requires Multi-Res daughterboard.

Default	Normal
Notes	<p>When Conserve Toner is selected, the Administrative/Engine/Toner Density option can be adjusted for the best acceptable print quality. Toner density can be set from 0 to 7.</p> <p>Smoothing alters the size and position of dots that lie on the outer edges of an object by reducing the width of the laser pulse to a fraction of the full pulse width. This smooths jagged-edges in text, lines, and graphics and generally improves their print quality.</p> <p>Smoothing does not work with 1200 dpi.</p>

Media

The Media option allows you to set the media type.

Menu	Administration/Engine/Print Quality/MPT Media
Choices	<p>Plain—Print on plain or recycled paper.</p> <p>Transparency—Print on transparency film.</p> <p>Thin—Print on thin paper.</p>
Default	Plain paper
Note	<i>MPT is the multipurpose tray.</i>

Menu	Administration/Engine/Print Quality/Lower Media
Choices	<p>Plain—Print on plain or recycled paper.</p> <p>Transparency—Print on transparency film.</p> <p>Thin—Print on thin paper.</p>
Default	Plain paper

Miscellaneous

The Miscellaneous submenu allows you to change printer configurations, such as defaults and message window language.

Restoring the Factory Default Configuration

If you need to cancel all of the configuration changes you have made, you can reset all of the configuration settings to their factory defaults.

Menu	Administration/Miscellaneous/Restore Defaults
Choices	Yes, No
Default	No
Notes	This option automatically restarts the printer. This process takes several minutes to complete.

Reboot System

You can use this selection to restart the printer without turning off the power switch. You would use this when you've made changes to the configuration and need to restart the printer before the new settings will be acknowledged.

Menu	Administration/Miscellaneous/Reboot System
Choices	Yes, No
Default	No

New Flash Image

The system software in your printer is stored on flash ROM, read-only memory that can be erased and written to "in a flash." This allows you to update the system software without opening the printer and installing new PROMs.

Menu	Administration/Miscellaneous/New Flash Image
Choices	Yes, No
Default	No

Notes	The procedures for downloading a new flash image are in chapter 2, "Memory and System Software," in the <i>Options</i> guide.
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Setting the Message Window Language

Status messages and configuration menus can be displayed in the message window in English, French, German, or Spanish.

Menu	Administration/Miscellaneous/Keypad Language
Choices	English, French, German, Spanish
Default	English
Notes	The printer must be restarted for changes to the Keypad Language menu to take effect. You can either let the printer restart automatically after you save the change and exit from the Configuration menu, or you can wait for the change to take effect the next time you manually turn on the printer.

Storage Devices

The Administration/Disk Operations menu can be used to work with an internal IDE hard disk and external SCSI hard disks as well as Iomega Jaz and Zip drives.

Working with Custom Configurations

Saving a Default Custom Configuration

Menu	Administration/Miscellaneous/Save Defaults
Purpose	Saves the current printer configuration as a custom default
Choices	Yes—Save the current configuration settings as a custom default No—Don't save the current configuration settings as a custom default
Default	No
Notes	You can save only one configuration; however, you can change the saved configuration at any time

Restoring a Default Custom Configuration

Menu	Administration/Miscellaneous/Restore Defaults/Saved Defaults
Purpose	Recognizes the printer by using the default custom configuration
Choices	Yes, No
Default	No
Notes	To restore the saved defaults, access the menu item and select Yes.

Backing up a Hard Disk

Menu	Administration/Disk Operations/Backup Hard Disk/Full
Purpose	Allows you to back up all the files stored on a storage device
Choices	All attached storage devices (Dsk#0–Dsk#4, Dsk#6, Dsk#7)
Default	DSK#7
Notes	DSK#5 is reserved for an optional CrownCopy scanner, and Dsk#7 is reserved for the internal hard disk (optional on some models). Refer to chapter 5, “Storage Devices,” in the <i>Options</i> manual for complete information on backing up hard disks.

Formatting a Hard Disk

Menu	Administration/Disk Operations/Format Disk
Purpose	Allows you to format a storage device.
Choices	Dsk#0–Dsk#4, Dsk#6, Dsk#7
Default	Dsk#7
Notes	<p>Dsk#5 is reserved for the optional CrownCopy scanner, and Dsk#7 is reserved for the internal hard disk (optional on some models). DSK#7 may contain all the printer system code and, if formatted, cause the printer not to function. Do not format Dsk#7 unless you are troubleshooting a disk problem. See Chapter 8, “Troubleshooting,” in the <i>Operations</i> manual for more information.</p> <p>Refer to chapter 5, “Storage Devices,” in the <i>Options</i> manual for complete information on formatting hard disks.</p>

Restoring a Hard Disk

Menu	Administration/Disk Operations/Restore Disk/Dsk#
Purpose	Allows you to restore a storage device from the backup you made using the Administration/Disk Operations/Backup Hard Disk menu.
Choices	All attached storage devices (Dsk#0–Dsk#4, Dsk#6, Dsk#7)
Default	DSK#7
Notes	<p>DSK#5 is reserved for an optional CrownCopy scanner, and Dsk#7 is reserved for the internal hard disk) optional on some models).</p> <p>Refer to chapter 5, “Storage Devices,” in the <i>Options</i> manual for complete information on restoring hard disks.</p>

Installation Menu

The Installation menu appears only if a security key is installed. The system administrator uses the Installation menu to set passwords for the Operator Control and Administration menus. For more information see chapter 6, "Security Key and Warning Buzzer," in the *Options* manual.

Operator Password

Allows you to enter a password used to enter the Operator menu when enabled.

Menu	Installation/Operator Passwrđ
Choices	Up to 16 alphanumeric characters
Default	Blank (no password)
Notes	Enable the password in the Installation/Use Operator Pwd menu.

Use Operator Password

Determines if a password is required to enter the Operator menu.

Menu	Installation/Use Operator Pwd
Choices	On—Requires a password to enter the Operator Control menu. Off—No password required to enter the Operator Control menu.
Default	Off
Notes	Enter the password in the Installation/Operator Passwrđ menu.

Admin Password

This represents the password used to enter the Administration menu when enabled.

Menu	Installation/Admin Password
Choices	Up to 16 alphanumeric characters
Default	Blank (no password)
Notes	Enable the password in the Installation/Use Admin Pwd menu.

Use Admin Password

Determines if a password is required to enter the Administration menu.

Menu	Installation/Use Admin Pwd
Choices	On—Require a password to enter the Administration menu. Off—Don't require a password to enter the Administration menu.
Default	Off
Notes	Enter the password in the Installation/Admin Password menu.

Configuring Optional Features

Several of the optional features available affect printer configuration and the Configuration menu. When an optional feature is installed, its configuration information merges into the Configuration menu. See the *Options* guide for more information.



5

Additional Technical Information

In This Chapter . . .

- “Job Accounting Files” on page 5-2.
- “Printer-Host Communication” on page 5-15
- “Halftones” on page 5-17
- “Memory” on page 5-19
- “End Job Mode” on page 5-35
- “Parallel Interface Modes” on page 5-43
- “PS Protocol Option” on page 5-44
- “HP-GL Color Encoding” on page 5-47

Introduction

This chapter provides additional technical information on accounting files, memory management, end job mode, the PS Protocol option, and HP-GL color-to-grayscale conversion.

Accounting

Job Accounting Files

The following accounting files are stored in ASCII format on SYS, the printer's hard disk, in the SYS:/ADMIN directory:

- Job Accounting File (ACCx.JOB)

This is the main accounting file. When each job completes, the printer stores an entry for the job in this file. The job accounting file may be a single file or multiple files, with x as the file number when multiple files are used. Information in this file is kept intact after the printer is turned off and back on again.

- Paper Accounting File (ACC.PAP)

This file contains descriptions of the paper types supported on the QMS 2060 Print System.

- Status Accounting File (ACC.STA)

This file stores configuration information about accounting.

- Dictionary File (ACC.DIC)

This file contains documentation about accounting and a description of the fields used in the other accounting files.

▲ **Caution:** *All the accounting files are stored in ASCII format to make it simpler to use the information in different environments after it is retrieved from the printer's hard disk.*

Accounting File Format Description

Accounting files are recorded in ASCII format in a series of tagged fields. New fields can be added without losing backward compatibility, because each field is tagged. A version field is included in the ACC.STA file to identify the supported fields as the system evolves.

- » **Note:** *Field 45 in the Job Accounting File example on page 5-5 illustrates that new fields can be added to the series but used where logical, in this case between fields 6 and 7. Field 45, which provides information about the interface used, was added in response to a customer request. The date and time fields appear in the accounting records for the QMS 2060 Print System for compatibility with other QMS products, but they are unused for this product.*

Conventions

The following conventions are the same for job, paper, and status files:

■ Tag Identifiers

These three-digit numbers are used to identify fields. The three-digit number is used instead of a name to minimize use of disk space. The Dictionary file (ACC.DIC) provides the field names associated with each tag identifier.

■ String Information

String information for record field values is stored inside braces (for example, {this is a string}). This allows spaces within strings and stores only the necessary characters of a string value. String fields for which no value is specified are stored as {}, instead of using blanks or the maximum field size.

■ New Records

New records are separated by a <CR> character to increase readability.

■ Separators

A typical record in any of the accounting files is a sequence of pairs of tag identifiers and field values separated by commas. The tag identifier and field value are separated by a colon.

Example

The following is an example of the format of an accounting file record:

```
1: 3, 2:{this is a string}, <CR>
```

In this example, the record has fields identified by tags 1 and 2. Since these values don't use 3 digits for the tag identifier, spaces are stored instead, to provide consistency and simplicity while using only a small amount of extra space. In this example, the value for the field tagged 1 is the integer 3 and the value for the field tagged 2 is a string. The <CR> represents the carriage return character.

Accounting Files Description of Fields

This section includes examples of a job accounting file, a paper accounting file, and a status accounting file. Each example is followed by a chart explaining the various fields, using data from the example to help clarify the fields.

- » **Note:** *The date and time fields appear in the accounting records for the QMS 2060 Print System, but they are unused for this product.*

Job Accounting File Record Example

This is a sample record extracted from an actual job accounting file:

```
0: 6, 1: 1, 2:{ 8h 5m52}, 3:{ 2/14/98}, 4:3,  
5:{lsmith}, 6:{}, 45:{ IF 1 Ethernet},  
7:{Microsoft Word - WW6083WO.DOC}, 8:{}, 9:  
2794, 10: 15414, 11: 1, 12: 0, 13: 2, 14: 3,  
15: 0, 16:0, 17: 1, 18: 0, 19: 1, 49: 500  
20:3, 21: 2
```


Job Accounting File Record Description

Field ID	Description	Example	Explanation
0:	The Job ID field is the document's number. The number sequence restarts whenever the printer is turned off and on again.	0: 6	This is the 6th job since the printer was restarted.
1:	This field is the document's internally assigned priority.	1:1	Priority 1, the highest, has been assigned to this job.
2:	This field indicates the time a document arrived in the printer by hour, minute, and second.	8h 5m52	The printer received the job at 8:05:52.
3:	This field indicates the date a document arrived in the printer.	2/14/98	The printer received the job on February 14, 1998.
4:	This field is the document's completion code: 0 User aborted document 1 Printer aborted document 2 Emulation aborted document 3 Successfully printed document	4: 3	Job printed successfully.
5:	The User Name field corresponds to the %% For DOC.	5: {lsmith}	L Smith sent job.
6:	The Host Name field corresponds to the %% Host DOC.	6: {}	No host name assigned.
45:	The Connection field indicates the I/O port in which the job arrived.	45:IF 1 Ethernet	This job arrived via Ethernet.

7:	The File Name field corresponds to the %%Title DOC.	7: {Microsoft Word - WW6083WO.DOC}	QMS DOC was used to assign the title Microsoft Word - WW6083WO.DOC.
8:	The Charge Number field corresponds to the %%Charge Number DOC. This field identifies the account.	8: {}	No charge number assigned.
9:	The Compile Time field is the processor time in milliseconds ($1/1000$ second) spent translating the page description language. Typically, it also includes minimal other system activity.	9: 2794	Processor spent 2.794 seconds compiling the page.
10	The Print Time field represents the total elapsed time in milliseconds ($1/1000$ second) used by the document since its first page started printing until its last page cleared the printer.	10: 15414	Job took 15.414 seconds from the start of the first page to the end of the last page.
11:	The Header Count field indicates how many images comprise the document header page(s) subjob. An image equals one page face.	11: 1	There is one header page.
12:	The Error Count field indicates how many images comprise the document error page(s) subjob. An image equals one page face.	12: 0	No error pages.
13:	The Body Count field represents the number of images in the actual document, excluding multiple copies. An image equals one page face.	13: 2	Two pages in the document.

14:	The Simplex Count field is number of the page faces printed, including body and header pages and taking into consideration multiple copies.	14: 3	Three page faces printed.
15:	The Duplex Count field represents the sheet count of duplex pages printed, taking into consideration multiple copies.	15: 0	No duplex pages.
16:	The Finishing Options field is a number formed by adding the codes for the different options: 0 None 2 Offset Stacking	16: 0	No finishing options.
17:	The Chunk Count field represents the number of collated chunks for this job. If the complete document does not fit in memory, chunk collation is activated. A value of 1 for this field indicates no partial collation was necessary.	17: 1	Entire job printing in one collated unit.
18:	The Jam field indicates how many times the printer jammed while printing the document.	18: 0	No jams during this document.
19:	The Paper Types Count field indicates how many different types of paper were used in the document and represents the number of separate index entries that follow the main record for the document in the Job Accounting file. A <CR> follows this field before the index entries.	19: 1	One type of paper used in this job.

49:	The Black Count field indicates the percentage of the printable area covered with black toner (in 0.001 percent increments). A <CR> follows this field before the index entries.	49: 500	0.5 percent of the printable area is covered with black toner.
20:	The Index Count field represents the number of sheets of paper of a specific type used by the document. The actual description of the paper is in the Paper Accounting file.	20: 3	Job used three sheets of paper.
21:	The Index field represents the record number in the Paper Accounting file that contains the description for the preceding paper count. A <CR> follows each occurrence of this field.	21: 2	A description of the paper type is in Paper Accounting file number 2.

Paper Accounting File Record Example

The following example shows a Paper Accounting file:

```

22: 8268, 23: 11693, 24: 75, 25:{ white},
26:{ plain}, 27:{ },
22: 8500, 23: 11000, 24: 75, 25:{ white},
26:{ plain}, 27:{ },
22: 7165, 23: 10118, 24: 75, 25:{ white},
26:{ plain}, 27:{ },
22: 14000, 23: 8500, 24: 75, 25:{ white},
26:{ plain}, 27:{ },
22: 16535, 23: 11693, 24: 75, 25:{ white},
26:{ plain}, 27:{ },
22: 14331, 23: 10118, 24: 75, 25:{ white},
26:{ plain}, 27:{ },
22: 17000, 23: 11000, 24: 75, 25:{ white},
26:{ plain}, 27:{ },
22: 7500, 23: 10500, 24: 75, 25:{ white},
26:{ plain}, 27:{ },
22: 8268, 23: 5827, 24: 75, 25:{ white},
26:{plain}, 27:{ },

```

Paper Accounting File Record Description

The Paper Accounting file has one record for each of the nine possible paper sizes. Field 21 refers to a specific record in the Paper Accounting file. In the example above, Field 21 indicates that the paper is of the second type. Therefore, the second record from the Paper Accounting file describes the paper used. The second record tells you:

Field ID	Description	Example	Explanation
22:	The Paper Width field contains the paper width in mils ($1/1000$).	22: 8500	The paper is 8500 mils or 8.5" wide

23:	The Paper Height field contains the paper height in mils (¹ /1000").	23: 11000	Paper is 11000 mils or 11" high
24:	The Paper Weight represents the weight per surface square units (g/m ²)	24: 75	Paper weighs 75 g/m ²
25:	The Color field indicates the color of the paper.	25: white	Paper is white
26:	The Type field indicates additional properties of the paper.	26: plain	Paper is plain
27:	The Label field represents a name for the paper type.	27: { }	No paper type name

» **Note:** Fields 24, 25, 26, and 27 are designed primarily for future enhancements to the accounting capabilities.

Status Accounting File Record Example

The following is an example of the Status Accounting file:

28: 1, 29: 9, 30: 1048576, 31: 1048576, 32: 74993,
33: 74993, 34: 1, 35: 1, 36: 309, 37:2, 38:1, 39:0,
40:0, 41:31, 42:23, 43:31, 44:31

Status Accounting File Record Description

Field ID	Description	Example	Explanation
28:	The Version field indicates the accounting file's version number. The initial version is 1.	28: 1	This is the first version of the file
29:	The Number of Paper Types field indicates how many records are in the Paper Accounting file.	29: 9	The paper accounting file has 9 records

30:	The Job Accounting File Size field indicates how many bytes are dedicated to accounting files. Maximum is 10 MB.	30: 1048576	1048576 bytes, or 1 MB, is dedicated to accounting
31:	The Last Job File Size field indicates the size of the last file. In the multiple-file configuration, each file is 1 MB except the last, which holds any remaining space.	31: 1048576	1048576 bytes, or 1 MB, is in the last file
32:	The Job File Usage field indicates in bytes the total current use in all the job files.	32: 74993	All accounting files total 74993 bytes
33:	The Current Job File Usage field indicates in bytes the current level of use in the current Job Accounting file.	33: 74993	The accounting file which is currently receiving data totals 74993 bytes
34:	The Maximum Number of Job Files field indicates the maximum number of job files. For example, even if your system is configured for multiple files, if only 1 MB is dedicated to accounting, the maximum number of files is 1. If 5.5 MB is dedicated to accounting, the maximum number of files is 6.	34: 1	There can be only 1 job accounting file. Although the printer is configured for multiple files (see field 37) there is only one because only 1 MB is dedicated to accounting
35:	The Current Job File field indicates which file has been used most recently. By comparing this with Field 33, you can determine which file is current and how much space is left in it.	35: 1	The most recently used file is File 1

36:	The Number of Jobs field indicates how many documents are accounted for in the Job Accounting file(s). A value of 0 can mean that no jobs have been printed or that accounting is disabled.	36: 309	Current Job Accounting files hold data on 309 jobs
37:	The Multifile field has a value of 1 if a single file is used and a value of 2 if multiple files are used to store job information.	37: 2	Job Accounting is set for multiple files
38:	The Enabled field indicates whether accounting is currently enabled or disabled. 1 Enabled 0 Disabled	38: 1	Accounting is currently enabled
39:	The Job File Full flag indicates whether the Job Accounting file is full. 1 File is full; Reset accounting should be performed 0 Job accounting file is not full	39: 0	Accounting files are not full
40:	The Paper Accounting File Full flag indicates whether the Paper Accounting file is full. 1 File is full; Reset accounting should be performed 0 Job accounting file is not full	40: 0	The Paper Accounting file is not full
41:	The User field indicates the maximum character length of the User Name field in the Job Accounting file. User names are assigned with QMS DOC.	41: 31	The User name can be up to 31 characters
42:	The Host field indicates the maximum character length of the Host Name field in the Job Accounting file. Host names are assigned with QMS DOC.	42: 23	The Host name can be up to 23 characters

43:	The File field indicates the maximum character length of the File Name field in the Job Accounting file. File names are assigned with QMS DOC.	43: 31	The File Name can be up to 31 characters
44:	The Charge field indicates the maximum character length of the Charge Number field in the Job Accounting file. Charge numbers are assigned with QMS DOC.	44: 31	The Charge field can be up to 31 characters

Copy Accounting Files to Host

Accounting files should be transferred to your host computer periodically to keep the printer from being overloaded with data and to allow for easy analysis of data.

Using the QMS Crown Printer Auditor (CPA) Utility

You can access the accounting files with the Windows-based QMS Crown Printer Auditor (CPA) utility on the *QMS Software Utilities* CD-ROM. Refer to the CPA on-line help for more information.

Using the File Transfer Protocol (FTP)

- » **Note:** *FTP works only when the printer is on line and the message window displays **IDLE**. Use the **ls** command in the **SYS:/ADMIN** directory to see which accounting files you are going to retrieve. The **ls** command is issued from a remote terminal. If multiple Job Accounting files are used, each of the **ACCx.JOB** files should be copied. (*x* is the number of each subsequent Job Accounting file.)*

Use File Transfer Protocol (ftp) on the host, if a TCP/IP connection is available to the printer, to copy the files from the printer's hard disk to the host as follows:

- 1 **Type `ftp printer-name` (where *printer-name* is either the IP address of the printer or its corresponding host name).**

2 If your printer has a DECnet interface, follow these steps. Otherwise go to step 3.

- a When prompted for a user id, enter `admin` as the user name and give the appropriate password, if required.
- b At the `ftp>` prompt, type `bin↵` to use binary mode for the download procedure.
- c Type

```
get SYS:/admin/acc1.job acc1.job↵  
get SYS:/admin/acc.pap acc.pap↵  
get SYS:/admin/acc.sta acc.sta↵
```

» **Note:** If multiple Job Accounting files are used, each of the `ACCx.JOB` files should be copied. (*x* is the number of each subsequent Job Accounting file.)

- d Continue at step 4.

3 If your printer has a CrownNet interface, follow these steps:

- a When prompted for a user id, enter `root` as the user name and give the default password (`pass`).
- b At the `ftp>` prompt, type `bin↵` to use binary mode for the download procedure.
- c Type

```
get SYS:/admin/acc1.job acc1.job↵  
get SYS:/admin/acc.pap acc.pap↵  
get SYS:/admin/acc.sta acc.sta↵
```

» **Note:** If multiple Job Accounting files are used, each of the `ACCx.JOB` files should be copied. (*x* is the number of each subsequent Job Accounting file.)

4 Exit ftp.

Type `quit↵`

Processing Accounting Information on the Host

After the accounting files are stored on your host, you can create your own filters (programs) based on your specific requirements using the file and record descriptions shown earlier in this chapter.

Printer-Host Communication

Interface

An interface is the point at which two elements connect so they can work together. A printer-host interface is the way a printer connects to and works with a host (a microcomputer, workstation, minicomputer, mainframe computer, or network), and it involves both hardware and software. The way your printer interfaces with a host depends on many things, including computer type, computer ports available, interface cabling, application software, printer emulations, and printer drivers.

Simultaneous Interface Operation (SIO)

Simultaneous Interface Operation (SIO), a standard feature of QMS Crown architecture, enables your QMS 2060 Print System to communicate simultaneously with hosts through the parallel, optional serial, Ethernet, and optional interface ports. In other words, SIO allows you to have more than one host communicating with the printer at one time.

ESP Technology

Emulation Sensing Processor (ESP) technology is another standard feature of QMS Crown architecture. ESP technology, which works with most popular commercially available applications, uses a form of artificial intelligence to analyze incoming file data and select the appropriate printer emulation (for example, PostScript emulation,

Printer-Host Communication

HP-GL emulation, HP-PCL emulation, or another optional emulation) from those installed on the printer.

The print job is processed without your having to change printer switch settings or send software commands to accommodate different printer emulations.

When your printer is in ESP mode, you can easily print files prepared for a PostScript printer, an HP LaserJet, or an HP-GL plotter. The file prints correctly as long as it contains the traditional PostScript, HP PCL, or HP-GL commands for such items as page formats and job parameters (number of copies, page margins, fonts).

The QMS 2060 Print System prints almost any file sent in a language ESP technology understands, whether you have one, two, or more hosts, and whether you are communicating through a parallel, Ethernet, or other optional interface. Most users never have to change from ESP mode to another mode.

Communication Modes

You can either allow your printer to operate in its default ESP mode or configure its ports to accept jobs in only a particular emulation mode (for example, PostScript emulation only, HP PCL only, or HP-GL emulation only). The default printer communication settings can be changed through the Configuration menu, which you access through the control panel—in the Administration/Communications menu, you can choose a default emulation for the parallel and optional serial interfaces, and in the Administration/Emulations menu, you can configure the printer defaults for each emulation mode. (The optional LocalTalk interface uses only PostScript.)

Advanced users can also use PostScript operators to reconfigure printer ports. Generally, it is best to keep your printer in ESP mode. Since ESP mode is the factory default, all you have to do to use it initially is connect your host and printer and then send a file.

If you do want to reconfigure the interface ports for specific emulations (or if you need to return the printer to ESP mode), use the printer's control panel (the Administration/Communications menu). Configuring the printer through the control panel is described in chapter 4, "Printer Configuration," of this manual.

Halftones

The ability of the printer to produce halftones allows you to add scanned images or halftone graphics to your documents. This section will explain some of the options available on the QMS 2060 for halftone printing.

What are Halftones?

Continuous tone scanned images have to be converted to dot pattern images on a laser printer. Laser printers, like printing presses, only have the ability to print patterns of dots controlled by turning on and off the laser. Because of the limited resolving power of the eye halftones appear as continuous tone images. For example, if you hold a newspaper photograph very close to your eyes you can see the halftone dots.

Halftone characteristics can be changed by settings available on your QMS 2060 Print System. The following factors can be used to adjust the halftone characteristics of your documents.

- Printer resolution
- Screen frequency and screen angles (Halftone types)
- Smoothing

There can be some side effects to changing these factors. Factors such as the number of gray levels, printer performance, and scanned image quality can be affected.

Gray Levels

Gray levels are a progressive series of gray tones between black and white. Gray levels are produced by varying the ratio of black to white halftone dots. The number of gray levels depends on printer resolution and screen frequency.

Screen Frequency

Screen frequency or lines per inch (lpi) is the number of lines of halftone dots that compose each inch of a halftone screen. The screen frequency determines the number of halftone dots used to represent gray levels in a given area.

The following formula shows the relationship between screen frequency, print resolution and gray levels. As the screen frequency increases, the number of gray levels decrease. If resolution is increased, the number of gray levels will also increase.

$$\blacksquare \text{ gray levels} = (\text{resolution/screen frequency})^2 + 1$$

You can change screen frequency by selecting the halftone type in the QMS 2060 configuration menu through your application, or by using the PostScript **setscreen** operator.

The extra gray levels available through a higher resolution provide a smoother shift from the darkest black to very light grays.

Screen Angle

A screen angle is the angle at which a halftone screen prints. The default screen angle for your QMS 2060 Print System is 45° at 300x300, 600x600, and 1200x1200 dpi. This is the normal angle for black and white printers. You can change the screen angle through most software applications.

Halftone Types

Your printer provides three different options for halftones—basic, standard, and advanced. The basic halftone is the default and it has been optimized for performance and quality. The number of gray levels varies by changing the halftone type and the printer resolution.

Smoothing

Your QMS 2060 Print System offers a Smoothing option under the Administration/Engine menu if the Multi-Res daughterboard is installed. See chapter 4, “Printer Configuration.” This QMS edge smoothing technique alters the size and position of dots on the outer edges of an object by reducing the width of the laser pulse to a fraction of the full pulse width. This smooths jagged-edges in text, lines, and graphics and generally improves their print quality.

- » **Note:** *Smoothing isn't recommended when printing halftones, because it may introduce artifacts in the halftone or scanned image.*

Memory

Memory allows your printer to store and retrieve information that's required to perform many of its tasks. The memory requirements of each printer are dictated by the applications to be run. Each printer comes standard with a certain amount of memory, but you may add more memory as necessary.

The memory is divided among users (or “clients”), each of which are allocated a specific amount (or “block”) of memory. Each memory client is dedicated to a specific printing and application purpose. Your QMS 2060 Print System allows you to distribute its memory among the various memory clients where it can best serve your specific printing needs. The following sections provide information on memory management so you can get the most from your printer.

Generally, there are two main reasons for wanting to reconfigure your printer's memory:

- To achieve maximum performance
- To enable additional features

The ability to configure your printer's memory doesn't necessarily mean that you must change your current configuration. If you're presently using all the features you need and the printer is performing efficiently, you shouldn't feel compelled to reconfigure your printer's memory. Just remember that if your printing needs change, not only do you have the ability to increase the amount of printer memory, but you also can redistribute it where you feel it would best meet your printing requirements.

QMS Memory Management

Managing the memory on your printer is much the same as managing your personal income. In money management, you have a certain amount of income and many ways of spending that income. You decide where that money goes according to what's important to you. There's no single correct way to manage money, but there is one best way for you according to your financial obligations. Just as long as your method works for you.

The same is true for managing the memory on your printer. There's no single correct way for everyone to allocate available printer memory. There is, however, a best way to configure your printer's memory for maximum efficiency in your specific printing environment. For example, if you use a large number of PostScript fonts of various point sizes, you may want to increase the amount of memory allocated to the area specified for PostScript fonts. Or you may want to increase memory to the area that minimizes slowdowns when collating large print jobs.

Memory configuration affects these things as well as the number of jobs that can be accepted by the printer, the number of options available simultaneously, the number of downloadable fonts and emulations that can be stored, and overall printer performance.

Memory Terms

Before you can configure your printer's memory efficiently, you must first understand the different types of memory and how they work together. Your QMS 2060 Print System documentation uses the following memory terms.

Memory

Memory allows your printer to store and retrieve information. It's the space within your printer where information is stored while being actively worked on.

Memory Client

A memory client is a user of a block of memory dedicated to a specific function. Each memory client controls certain features. When insufficient memory is allocated to a specific client, the features it controls may not be accessible.

Excess Memory

Some printers designate one or two memory clients to receive all the excess, or unassigned memory. On your QMS 2060 Print System excess memory is distributed among all the memory clients.

Storage

Storage is a device in (or on) which information can be kept. There are three main types of storage—ROM, RAM, and hard disk drives. ROM stores read-only data, RAM represents temporary storage, and hard disk drives hold information on a more permanent basis (see the following definitions).

ROM (Read Only Memory)

This type of memory contains data and/or machine-executable instructions that can be read but not modified. This information is not lost when the printer's power is turned off.

RAM (Random Access Memory)

RAM is the memory your printer uses to perform each task. It can be written to and read from. Once a task is complete, the memory is free again to be used for another file. This memory is volatile, so if your printer loses power while a file is being sent, you must resend the file. The number and type of features you can run on your printer simultaneously depend on the amount of RAM you have and how that RAM is distributed. Your printer comes with either 16, 32 or 48 MB of RAM, but it is upgradable to 128 MB by adding Single In-line Memory Modules (SIMMs).

RAM Disk

Also called a virtual disk, the RAM disk is an area of RAM that is used to simulate an additional hard disk. Data can be written and read more quickly than on a hard disk, but a RAM disk loses any information stored on it when the printer's power is turned off. The spooling buffer is a RAM disk client if a hard disk is not available.

SCSI (Small Computer System Interface)

The printer's SCSI port allows you to connect up to three optional SCSI hard disks or the optional CrownCopy scanner and up to 2 optional SCSI hard disks, providing storage for fonts, emulations, and other files. Hard disks are also used to increase the amount of collation that can be accepted and provide a secondary storage area for spooled data, while providing virtual memory capabilities.

IDE (Integrated Drive Electronics)

This is an optional internal hard disk. "Integrated" refers to the fact that all of the controller electronics are on the drive itself, so no separate adapter card or expansion slot is required.

Volatile Memory

This type of memory is cleared when the printer is turned off. For example, most RAM is volatile.

Non-volatile Memory

This type of memory is not lost when the printer loses power.

NV RAM

This protected form of RAM is used to store information such as your printer's configuration menu. Configuration options you have chosen, such as emulations, memory settings, and input bins, are saved to this non-volatile RAM. This information is not lost when you turn off your printer.

Physical Memory

Physical memory refers to the amount of RAM installed in the printer.

Virtual Memory

Virtual memory extends the effective size of the printer's memory by using a disk file or swap file to simulate additional memory space. It enables the hard disk to accept data swapped from RAM to free temporarily the RAM for other tasks.

Flash ROM

Quick loading, reprogrammable memory that holds information even when the printer is turned off is known as flash ROM. Your 2060 Print System has flash ROM available to hold system code and future system upgrades. The chief advantage of flash ROM is that system upgrades can be loaded from your computer without the necessity of swapping out expensive EPROMS or having to place a service call.

Spool

Spooling is temporary storage to hold print jobs until the printer is available to process them.

Evaluation of Your Printing Environment

The first step in allocating your printer's memory is to define your printing needs. Each of your printer's features requires a minimum amount of memory. If you use a feature, you must allocate enough memory to the client which controls it. On the other hand, if there are features you don't use, you can take the memory in the clients that control the unused features and assign it to other clients that need additional memory.

Evaluation Questions

To get a better idea of what your printing requirements and your printer's capabilities are, answer the following questions. The memory client or menu option associated with each evaluation question is listed after the question.

- 1 How much RAM does your printer have (standard and additional memory)? *Total Memory*
- 2 Do you have the option of installing additional memory if it's needed? *Total Memory*
- 3 Does your printer have any internal or external hard disks connected? If so, how many and what size? *Disk Cache*
- 4 Which resident emulations will you be running? *PS Heap or Emulation*
- 5 Will you be loading any nonresident emulations? If so, how many and which ones? *Emulation and Emulation Temp*
- 6 How many printer ports will be connected? *Host Input and Input Buffer*
- 7 Do you have an optional interface connected? *Input Buffer*
- 8 How many people will be using this printer simultaneously? *Host Input or K Mem for Spool*
- 9 How many downloadable fonts will you be using? What sizes? From which emulation? *Font Cache or Emulation Temp*
- 10 Will you use many different sizes of fonts/typefaces? *Font Cache*

- 11 How large are the files you typically print? How large is the largest file you'll be printing? *Host Input or K Mem for Spool*
- 12 Are most of your files text, or are any graphics intensive? *Display List*
- 13 Will you want to download fonts, forms, or operators to memory? *Font Cache or Emulation Temp*
- 14 Will you be collating documents? If so, how large and complex will these documents be? *Display List*
- 15 What media sizes will you be using? *Frame Buffer*
- 16 At which resolution will you be printing? *Frame Buffer*
- 17 Will you use CrownCopy? ImageServer?
Emulations, Frame Buffer, or Display List

After you have answered all of these questions, read the following sections to find out which memory clients control features you plan to use and which memory clients control features you don't need.

Memory Clients

Memory clients are users of printer memory that are dedicated to a specific purpose. Each of the memory clients is located in the Administration/Memory menu. When you allocate memory to a specific client through the control panel, it's allocated in kilobytes (KB). Each time you make changes in the Administration/Memory menu, print out a status page to confirm the memory reallocation.

- » **Note:** *The value for each memory client must be divisible by 4 KB. Therefore, if a value is entered that is not evenly divisible by 4 KB, it's automatically converted to the next lower value that's divisible by 4 KB. For example, if you enter 102 KB, the actual value is lowered to 100 KB, assuming there is enough memory available to allocate to this client. See the "Memory" section of chapter 4, "Printer Configuration," for each memory client's minimum and default settings.*

Memory clients in the 2060 are automatically allocated when the printer is installed or when you upgrade the printer's memory. There are other occasions when the printer's memory is automatically reallocated:

- When new system software is installed.
- When adding or removing hard disks, duplexer, or Multi-Res daughterboard.
- When Quick Config is selected in the menu.
- When Disk Swap is enabled or disabled.
- When Frame Buffer is manually adjusted.
- When restoring printer defaults.

Remember that if you perform any of these functions the memory clients will be set to default values. The default values depend on the amount of physical memory installed in your printer and if you have a hard drive, duplexer, and/or a Multi-Res daughterboard. The default allocation adjusts the Frame Buffer memory client first. It is set to the minimum values of physical memory needed for your print jobs, that is, paper size, resolution, and duplex printing. The other memory clients are allocated memory from what is left over in physical memory.

Frame Buffer

The Frame Buffer memory client holds rasterized or bitmapped images of page faces which are ready to be sent to the print engine. A frame holds the contents of each single page image. For example, a 600 dpi page printed on letter size paper would consume frame buffer memory space as follows: $(600\text{dpi} \times 600\text{dpi} \times 8.5 \text{ in} \times 11 \text{ in}) / 8 = 4,207,500 \text{ bytes or } 4.1 \text{ MB}$.

Because the frame buffer memory is so critical to the actual printing of a page, its allocation takes precedence over that of other memory clients. The number of frames needed to print at engine speed is engine specific and depends on the size media and resolution. For example, printing at 600x600 dpi requires four times the amount of memory in the frame buffer than does 300x300 dpi.

If you are uncertain about how to configure your printer's memory, use only the Administration/Memory/QuickConfig menu. This menu appears if your printer does not have a disk drive attached or if the disk swap option is disabled. Use this menu as a starting point before trying manually to configure your printer's memory. It provides a simple method of defining how much memory should go to each of the clients for the most complicated printing conditions in your environment. Menu options allow you to specify the largest media size at the resolution you plan to use. Memory is then automatically allocated to the clients.

Menu	Administration/Memory/K Mem Frame Buffer
Choices	02200-variable depending on options installed

See the "How Much Memory Do You Need?" section of Ichapter 3, "Advanced Printing Features," in the *Operation* manual for details on minimum frame buffer memory requirements.

Display List

Also known as K Mem Display, this client stores compressed representations, or blocks, of the pages to be printed. It takes approximately one compressed block for a normal 8.5" x 11" (215.9 mm x 279.4 mm) text page, four compressed blocks for an 8.5" x 11" (215.9 mm x 279.4 mm) page that includes some graphics, and as many as 500 compressed blocks for an extremely complex page.

Many pages of compressed blocks belonging to multiple print jobs can be stored at the same time in the display list. If enough memory is allocated to this memory client, a page can always be ready to print as soon as another page has been imaged to the print engine.

The amount of memory required for each compressed block is printer specific. The QMS 2060 Print System takes approximately 64 KB of memory from the display list for each compressed block. However, if a page includes raster image data (for example, TIFF or bitmap data), each compressed block will require much more memory.

Increasing the amount of memory in this client may improve printing throughput and minimize slowdowns due to collating or printing complex pages. If your QMS 2060 Print System has a hard drive and the disk swap option is enabled the memory added to this client is taken from virtual memory. If your printer does not have a hard disk then the memory added to this client is taken from the amount of physical memory in your printer. It may be necessary to reduce memory added to another client before adding memory to the Display List. Check that the Frame Buffer still has the minimum amount of memory needed for your printing needs before reallocating this memory.

PostScript Font Cache

Also known as K Mem PS Fonts and Font Cache, this memory client stores bitmapped representations of previously scaled PostScript fonts. This process reduces the number of times a font must be converted from outline form to bitmap form. Printing pages that have characters already stored in the font cache is immensely faster than printing characters not yet in the font cache.

As the font cache memory fills, the printer makes room for new bit-mapped characters by erasing those that have been in the cache longest without being used. By increasing the memory allocated to this client, the printer can store more characters and spend less time erasing and replacing characters in the cache. You should be careful when increasing this client because the printer may spend more time searching the cache than it would scaling the character. This client has a limit to the maximum point size it will store.

Normally, you don't need to change this memory client unless you use a large number of fonts at various point sizes. If you do, you may allocate additional memory to this client to improve printer performance.

There's no specific formula to use in figuring the amount of memory required by the font cache, but after a certain point, large font caches cause the printer to take longer to print than smaller font caches because of the search time through the cache. The recommended font cache size is in the following ranges:

- 128-256 KB for 300x300 dpi printing
- 256-512 KB for 600x600 dpi printing
- 384-512 KB for 1200x1200 dpi printing

You should experiment to see what font cache size works best for you.

PS Heap

Also known as K Mem PSHeap, Heap, PostScript VM, and Virtual Memory, this client holds downloaded fonts, PostScript operators, and forms.

Inefficiently coded PostScript jobs can consume an extremely large amount of virtual memory or leave objects in the PostScript heap after the print jobs are completed, leading to virtual memory errors. If not enough memory is allocated to the PS heap, the job cannot print.

Increasing the memory allocated to this client allows more complex jobs to print and increases the number of fonts that can be downloaded to virtual memory. However, this client should be increased only if you receive a virtual memory error when attempting to print a job or download a font, and even then it should be increased only in small increments until the error message goes away. Excess memory in the PS heap is not used.

Emulation

Also known as K Mem Emulation, this client is used to store any optional or loadable emulations, such as LN03 Plus or QUIC II. Increasing this client's memory allows you to load more than one optional emulation so that it doesn't have to be reloaded every time the print job is sent.

If an emulation is loaded to process a print job and there is not enough memory in the emulation client, another emulation already loaded may be unloaded automatically to obtain enough memory. If you notice a delay in printing between jobs that have different nonresident emulations, it's possible that the emulations are having to reload each time they're run. Adding to the emulation client may eliminate the unloading and reloading of these emulations and, consequently, increase throughput. QMS recommends that you should add at least 1 MB of physical RAM to your printer and increase this memory client by 1 MB. If your printer has an optional hard disk and the disk swapping option is turned on then you can increase the emulation memory client using this memory.

- » **Note:** *You should add at least 1 MB to the emulation memory client for each loadable emulation that your printer uses. Failure to add memory to this client may prevent the printer from loading and using the emulation. You should check the documentation accompanying your loadable emulation for information on additional resource requirements.*

Also increase the emulation client if you're printing complex non-PostScript jobs that may require more memory to process correctly.

Emulation Temporary

Also known as K Mem Emul Tmp and Emulation Temporary, this client sets the amount of system memory to be used by non-PostScript emulations for storing downloaded fonts, forms, and macros. By dedicating a portion of memory to this client, your printer can perform "context switching," the ability to retain downloaded fonts and forms even after the printer changes from one emulation to another. Context switching prevents unnecessary repetitive downloading and traffic congestion on networks.

Normally, this memory client doesn't need to be changed unless you plan to download many different non-PostScript fonts.

Spool Buffers

Also known as Host Input and K Mem for Spool, this memory client stores incoming data from all the interfaces until the emulation can process the print job. When enough memory is allocated to this client, the host becomes free more quickly, and the number of jobs that the printer can accept simultaneously is increased. You should consider the amount of data being sent simultaneously when allocating memory to the spool buffer. If available, a hard disk can supplement this client with additional memory needed for spooling. See the “Hard Disk Management” section later in this chapter.

- » **Note:** *While increasing this client is beneficial in reducing network traffic, throughput is not necessarily increased. In addition, making this client too large could actually decrease throughput because of the overhead involved with managing a large spool.*

Disk Cache

This memory client stores frequently used data in system memory instead of continually storing and retrieving it from a hard disk. If a hard disk is used and a lot of disk access is required, adding memory to the disk cache may increase the printer's performance.

For example, if many fonts are stored on disk, faster access to these fonts is achieved by increasing the disk cache size. Conversely, if no hard disk is used, the disk cache will automatically be set to 0 KB until a hard disk is installed and formatted. However, when one or more hard disks are installed and formatted, disk cache is automatically allocated 256 KB. Also, if there is more than 8 MB of memory installed, then 28 KB will be allocated to the Disk Cache client for any optional font SIMMs.

The disk cache is a high speed temporary buffer for data going to and from the hard disk. It can speed the printer in two ways:

- Information such as frequently referenced fonts and logos may still be in the cache and may not have to be pulled off a hard disk each time they're needed.
- Information being written to a hard disk can be held in the cache temporarily until a more convenient time to be written to disk.

Memory

The amount of memory needed for the disk cache client is dependent on the size of the disk, the number of disks, the number of subdirectories on each disk, and the amount of memory dedicated to caching. As long as the disk cache is enabled and there is enough memory in the disk cache, all disks are accessible. If insufficient memory is allocated to the disk cache, some disks may be seen while others are not.

The recommended amount of memory for the disk cache client is

- 128 KB minimum plus 0.5 KB per MB of disk storage total for all disks

For example, the recommended amount of memory for the disk cache for a single 1200 MB hard disk is 728 KB, and for two 1200 MB hard disks it is 1456 KB. These are recommended values. The printer will still operate with a smaller cache, but decreased performance may result.

MB Printer Mem

This field on the status page shows the size of the physical RAM installed in the printer. If a hard disk is installed and disk swapping is enabled (Administration/Memory/Enable Disk Swap), this field also gives the size of available virtual memory.

System Memory

Also known as System Use, this non-configurable client is the amount of RAM used to run the printer's operating system. It's never increased or decreased. The system memory subtracted from the total amount of RAM identifies the amount of RAM available for all the other memory clients.

Hard Disk Management

You can add one internal IDE hard disk (standard on 2060 EX) and either up to three optional SCSI hard disks or the optional CrownCopy scanner and up to two optional SCSI hard disks, to your QMS 2060 Print System. These hard disks serve as secondary storage places for such items as downloaded fonts, emulations, and spooled data.

See FAQ 7181 for a list of each QMS-approved hard disk, its manufacturers and part numbers, and the QMS products on which it can be used. You can access QMS FAQs through the Internet at <http://www.qms.com/support/supportbase/> or through Q-FAX (see appendix A, "QMS Customer Support," to find out how to access Q-FAX documents).

- » **Note:** *FAQ numbers may be subject to change, so you may want to obtain a directory of Q-FAX documents before requesting a specific document.*

Virtual Memory Support

Your printer supports virtual memory capabilities for all of the memory clients except Disk Cache and Frame Buffer when a hard disk is installed and disk swapping is enabled (Administration/Memory/Enable Disk Swap menu). These capabilities extend the amount of memory available for certain supported features, such as spooling and collation.

Specific Printing Environment Example

Since configuring memory is not an exact science, it may be helpful to see how others have allocated their printer memory to meet their printing needs best. The following example is to be used only as a example for configuring your own printer's memory.

Example

A QMS 2060 BX Print System with 16 MB of RAM. As many as 10 people use this printer, sending text and graphics PostScript files to be printed on 8.5" x 11" (215.9 mm x 279.4 mm) media. They have configured their printer to print at 600x600 dpi.

Location	Size
Host Input:	512 KB
Display List:	1356 KB
Font Cache:	256 KB
Heap:	2200 KB
Framebuffer:	7960 KB
Emulation:	2000 KB
Emulation Temporary:	192 KB
Disk Cache:	28 KB
System Use:	512 KB
Total Memory:	16384 KB
PostScript Emulation VM:	1458404
VM allocated:	94191
VM remaining:	1364213
Paper Size:	8.5" x 11"
Resolution:	600

This 2060 has the minimum memory configuration (16 MB) without a hard disk. Notice that the Frame Buffer is only allocated enough physical RAM to cover one letter size page. If the printer had at least 32 MB of memory, the frame buffer would be configured for 15880 KB, enough for two letter size pages. If the printer had a duplexer and 32 MB or greater memory, then the Frame Buffer would be configured for 15880 KB, enough to hold 3 letter-size bitmaps.

End Job Mode

When sending print jobs through the serial and parallel protocols, some applications and their printer drivers append an end-of-document command (EOD) to each print job to ensure that each file prints correctly. The reason for this is that some protocols and print queuing systems send print jobs to the printer as one continuous data stream (one print job immediately following another).

But the problem with this system is that some applications are limited by the printer language and are unable to produce an EOD command. This becomes even more problematic when you're printing to a QMS 2060 Print System, where print jobs of all supported emulations can be received simultaneously. ESP technology examines the first part of each print job to determine its emulation. Once the emulation is identified, the print job processes without further checking. This minimizes any slowdown resulting from the sensing process. To help ESP technology determine the proper emulation of successive print jobs, the printer must be able to identify the end of job for each job.

Therefore, unless a wait timeout (the amount of time the printer is waiting on data from the host) occurs and ends each print job, or unless you add an EOD command between each file being printed through these protocols, some print jobs may be interpreted by the printer as one job and may "run" together. See chapter 4, "Printer Configuration," for more information on emulation timeout.

When printing multiple jobs with little or no time delay and with no EOD command between each job, the serial and parallel protocols may be unable to detect an end of job automatically. So the End Job Mode feature on QMS Crown printers was designed to allow you to set the end of document for print jobs being sent through these protocols.

Common Reasons to Use End Job Mode

If you are printing via the serial and parallel protocols, and one of the following conditions exists, you may need to set the end job mode:

- Multiple print jobs with little or no time delay and with no EOD commands have been sent to the printer and the message window displays only one active job.
- Multiple print jobs of the same printer language have been sent to the printer and they print on the same page. (For example, you send the AUTOEXEC.BAT file with no EOD command followed with little or no time delay by the CONFIG.SYS file, and they both print on the same page.)
- Multiple print jobs of different printer languages “run” together as if they are a single print job. (For example, you send a PCL print job followed by a PostScript print job, and the PCL job prints and is followed by what appears to be program code instead of your PostScript print job.)
- You want to print multiple jobs with header pages.
- You want to print multiple jobs where job separation is important.

When your printer is in ESP mode, printing multiple jobs through the serial and parallel protocols and end job mode is not set, ESP technology interprets the emulation for only the first job. The print jobs that follow are interpreted as being the same emulation as the first job. For example, if there are two print jobs, the first a PCL file with no EOD command, and the second a PostScript file with a Ctrl-D (a PostScript end-of-file character)—ESP technology interprets the emulation of the first job correctly. But since the first print job has no EOD command, it “runs” into the second job, and even though the second job is PostScript, it prints in PCL.

Using the EOD Commands

Since the serial and parallel protocols may not be able to detect an EOD automatically, due to a lack of an EOD command in some printer languages, you can insert an EOD command at the end of your file to tell the printer where your print job ends. QMS Crown printers recognize three end-of-document commands: QMS EOD, HP EOD, and CTRL-D (for PostScript only).

These commands are functionally the same. They enable data stream sensing for the EOD command, allowing your host computer to control print job separation. The QMS EOD and the HP EOD commands perform an end of document for all of the printer emulations supported on your printer (PostScript, HP-GL, HP PCL, and Lineprinter).

See your system administrator or applications development department to have them identify the standard EOD command for your organization, or to have them select a standard EOD command.

Setting the End Job Mode for the Serial and Parallel Protocols

Your printer can be connected through the optional serial or parallel interface to a stand-alone PC, to a PC print server, or to some other type of print queuing system. This section provides a quick guide to the steps needed to set the end job mode for each environment. The following sections provide more detailed information for each step.

Stand-Alone PC

- 1 Set the end job mode from the printer's control panel.**
- 2 Add the EOD command to your file.**

» **Note:** *If using steps 1 and 2 is not feasible in your stand-alone PC environment, you can alternatively use a program that either causes an emulation timeout or that inserts an EOD command between each print job. See your QMS vendor for more information on this type of program.*

PC Print Server

- 1 Set the end job mode from the printer's control panel.
- 2 Create a job separator to append an EOD command and send it between each print job.

Other Print Queuing Systems

If you use a print queuing system other than a PC print server and you experience what appears to be an EOD command problem, you may need to use another procedure, such as a print utility, an initialization sequence, or a header page to add an EOD command. See your print queuing system documentation, your network administrator, or your QMS vendor for more information.

Setting the End Job Mode via the Control Panel

Use the following procedure to set the end job mode from the printer's control panel for printers connected via the serial or parallel interface to a stand-alone PC, a PC print server, or some other type of print queuing system

- » **Note:** *If you print both serial and parallel protocol jobs, then you must set the end job mode for each protocol.*

Wait for the printer to go idle, and then press the control panel keys in the order shown in the following instructions to access the End Job Mode option. The printer responds by displaying a status message in the message window.

- » **Note:** You may need to press the Next key one or more times to advance through the list of selections or options.

Press this key...	to...	For 1.5 seconds, the message window reads...	and then it reads...
Online/Offline	Turn off the Ready indicator and enable printer configuration.		IDLE
Menu	Access the configuration menu.	CONFIGURATION	OPERATOR CONTROL
Next	Advance to the Administration menu.		ADMINISTRATION
Select	Access the Administration menu.		COMMUNICATIONS
Next	Advance to the Communications/Parallel (or Serial) menu.		PARALLEL (or SERIAL)
Select	Access the Parallel (or Serial) menu.		PARALLEL (or SERIAL) MODE
Next (one or more times)	Advance to the Parallel (or Serial) /End Job Mode menu.		END JOB MODE
Select	Access the End Job Mode menu.		NONE

End Job Mode

Press this key...	to...	For 1.5 seconds, the message window reads...	and then it reads...
Next	Advance to the appropriate option (QMS EOD, HP EOD, or None).		OPTION
Select	Select the option.		OPTION IS SELECTED
	Return to the Parallel (or Serial)/ End Job Mode menu.	PARALLEL (or SERIAL)	END JOB MODE
Online/ Offline	Receive prompt asking if you want to save your change.	SAVE CHANGES?	*NO
Next	Advance to the Yes option		YES
Select	Save changes and idle the printer		IDLE
Online/ Offline	Put the printer back on online		IDLE
Shaded table cells indicate that the message scrolls.			

Adding an EOD Command to Your File

When adding an EOD command to your file, use the syntax for the selected EOD command exactly as written (the command's syntax is case sensitive).

- » **Note:** <ESC> represents the escape character. (The decimal value for the escape character is 027, and the hexadecimal value is 1B.) How you enter the escape character depends on your application. Some applications allow you to press and hold the ALT key and then type 027 to enter the escape character, while others allow you to type certain character sequences to represent the escape character. See your computer or application documentation to find out how to enter the escape character on your system.

For this EOD command...	Use this syntax...
QMS EOD	%%EndOfDocument <CR><LF>
HP EOD	<ESC>%-12345X

- » **Note:** The <CR><LF> sequence following the %%EndOfDocument line for the QMS EOD is necessary to avoid an INPUT IDLE message remaining in the printer message window after the document finishes printing.

When the QMS EOD or the HP EOD is set, the printer does not recognize the Ctrl-D EOD command. Add your organization's standard EOD command to the end of your print file, or add it to a separate file as follows.

Adding an EOD Command to the End of Your File

Create an output file (for example, ASCII, PCL, or PostScript file to disk) and add your organization's standard EOD command (QMS EOD or HP EOD) to the end of that file.

Sample output file:

```
Text
Text
Text
Text
%%EndOfDocument
```

Adding an EOD Command to a Separate File

Create an ASCII text file that contains only the EOD command. For example, create a DOS batch file listing each print filename followed by the EOD command filename for each file being printed. Then “run” the batch file to print your list of files.

Sample DOS batch file:

Command	Explanation
Print mktg.doc	Job filename
Print end.txt	EOD command filename
Print acct.doc	Job filename
Print end.txt	EOD command filename

Creating a Network Job Separator

If your printer is connected to a network through a PC and the PC is acting as a print server managing the printing of shared network files, then your system administrator must create a job separator and associate it with a print job queue. Different network environments have different procedures for creating the job separator, such as initialization sequences, custom banner pages, print job headers, or print job trailers. The print server does not necessarily send multiple print jobs to the printer in the order that you queued them to the printer. The network job separator is accessed with each print job, so this ensures that network job separation is enforced. See *QMS Crown Network Notes, in Adobe Acrobat format on the QMS Software Utilities CD-ROM* for more information on how to create a network job separator for several commonly used networks.

Parallel Interface Modes

In addition to Centronics parallel communication, your printer's parallel interface provides IEEE 1284 bidirectional parallel communication, which supports five modes of operation. The printer automatically recognizes and uses the mode dictated by the host.

Byte Mode

Printer-host communication is done in bytes. The byte mode may be used by the host device in a DMA (Direct Memory Access) mode for more efficient operation.

When byte transfer is complete and there is no more data to transmit, the host may do one of the following:

- Terminate and return to the compatibility mode.
- Stay in the Host Busy, Data Not Available phase.
- Set Host Busy Low, putting the interface into the idle phase.

If there is additional data, the host may do one of the following:

- Set Host Busy Low, indicating that the host can accept additional data.
- Stay in the Host Busy, Data Not Available phase.
- Terminate and return to the compatibility mode.

Check your host documentation to see if the host is 1284 compatible.

Compatibility Mode

Printer-host communication is done in a manner that ensures compatibility.

ECP (Enhanced Compatibility Port) Mode

This is an advanced version of byte mode which allows transfer of data in either direction without returning to the compatibility mode. The communication is a half-duplex channel with either device, the host or the printer, making a request for data transfer when there is available data. In the case of simultaneous requests for transfer, the printer always defers to the host.

EPP (Enhanced Parallel Port) Mode

Printer-host communication is done via asynchronous bidirectional eight-bit transfer. A return to compatibility mode is not required.

Nibble Mode

Printer-host communication is done in nibbles (four bits; one-half byte) with the low order nibble sent first. A transfer of two nibbles is required for each byte of information.

PS Protocol Option

Your QMS 2060 Print System supports PS Protocol, a protocol for communication between the printer and a host computer over the parallel, optional serial, and optional network interfaces. This binary communications protocol (BCP) allows any 8-bit binary value (0-255) to be treated as data, while allowing a few of the values to function as special control characters. When communicating 8-bit binary data in binary or binary fixed mode, the printer uses the quoting mechanism of the binary communications protocol to distinguish between the special control characters and print job binary data.

To differentiate data from the special control characters, any data that is the same as one of the following special control characters must be quoted.

ASCII Keyboard	ASCII Name	ASCII Hex	Control Function
^A	SOH	0x01	Quote data character
^C	ETX	0x03	Abort job and flush to end of file
^D	EOT	0x04	End-of-file marker
^E	ENQ	0x05	(Reserved for future use)
^Q	DC1	0x11	XON in XON/XOFF flow control
^S	DC3	0x13	XOFF in XON/XOFF flow control
T	DC4	0x14	Job status request
^\ ^_	FS	0x1C	(Reserved for future use)

A data byte is quoted by replacing it with a two-character sequence. The first character is a ^A (ASCII hex 0x01), and the second character is the character itself XORed with the ASCII value 0x40. For example, to send the value 0x14(^T) as data, send the two-character sequence 0x01 0x54 (^a T) instead. (ASCII "T" is the result of XORing ^T with 0x40).

This method of quoting guarantees that whenever the printer receives any of the eight control characters, the control function is intended regardless of whether the preceding character is a ^A. Any data byte not equal to one of the eight special control characters is transmitted by sending the data byte.

For more information on BCP and quoting, see the *PostScript Language Reference Manual* (Adobe Systems, Inc., Reading, MA: Addison-Wesley, 1990, ISBN 0-201-18127-4), the "Adobe Serial and Parallel Communications Protocols Specification" (in *Adobe Developer Support*, Adobe Systems, Inc., February 14, 1992), and the "PostScript Language Reference Manual" (in *Supplement for Version 2011*, Adobe Systems, Inc., January 24, 1992).

Options

The following options are available in the PS Protocol menu:

Menu	Administration/Communications/ <i>Interface</i> /PS Protocol	
Choices	Name and Description	Interfaces
	Normal—Enables standard, ASCII hex protocol. Data is sent and received in ASCII format. This mode is recommended if you do not print binary data. It was designed for data in the printable ASCII range. Print jobs can alter the PS protocol value through PostScript operators.	Parallel, serial, Ethernet, Token-Ring, LocalTalk
	Normal Fixed—Enables standard, ASCII hex protocol. Print jobs cannot alter this value through PostScript operators.	Parallel, serial, Ethernet, Token-Ring, LocalTalk
	Binary—Enables binary communications protocol. Print jobs can alter this value through PostScript operators. Data in the printable ASCII range also prints).	Parallel, serial, LocalTalk, Ethernet, Token-Ring
	Binary Fixed—Enables binary communications protocol. Print jobs can not alter this value through PostScript operators. Data in the printable ASCII range also prints.	Parallel, serial, LocalTalk, Ethernet, Token-Ring
	QBinary (Quoted Binary)—Enables binary communications protocol. Print jobs can alter this value through PostScript operators. Data in the printable ASCII range also prints. Use the special quoting mechanism for the special characters and ^D (EOF).	Ethernet, Token-Ring

	QBinary (Quoted Binary) Fixed—Enables binary communications protocol. Print jobs cannot alter this value through PostScript operators. Data in the printable ASCII range also prints. Use the special quoting mechanism for the special characters and ^D (EOF).	Ethernet, Token-Ring
Default	Normal	
Notes	A data stream sent through the serial or parallel interface using Binary is treated the same as a data stream sent through an optional network interface using QBinary. However, a data stream sent through an optional network interface using QBinary is not treated the same as a data stream sent through the same interface using Binary.	

Advantages

The main advantage of using the Binary and Binary Fixed PS protocol modes when sending binary data is that these modes compress the data stream allowing your documents to be smaller so you can send smaller jobs to the printer. For example, some device drivers can format bit map images as binary data instead of as ASCII hex data.

Implementation

To implement PS protocol for sending binary data on your system you need a device driver available with some applications or operating systems, or you can alternatively use a program to read the data and write out the quoted characters. See your QMS vendor for any available information on device drivers or binary filter programs.

HP-GL Color Encoding

The term “pen” in the HP-GL emulation refers to a logical pen (in other words, the current pen position) rather than to a physical pen on

HP-GL Color Encoding

a plotter. A pen and a pen color are selected to draw images. This emulation supports 8 pens and pen colors.

Since your QMS 2060 Print System is a monochrome (black and white) printer, the pen colors are converted to shades of gray. The default color mappings for the 8 pens are as follows:

Pen	Pen Color	Level of Gray
1	Black	100%
2	Black	100%
3	Red	70%
4	Green	41%
5	Blue	89%
6	Violet	59%
7	Orange	25.8%
8	Brown	50%

- » **Note:** *The default color for both pen 1 and pen 2 is black. However, the pen width for these two pens is different. Pen 1 is 0.7 mm and pen 2 is 0.3 mm.*

The printer maps each pen to its assigned color, then converts the color to a grayscale using the National Television System Committee (NTSC) standard equation for encoding color. This equation converts a given set of CMYK values to grayscale. For the 8 pen colors assigned to pens 1 - 8, the printer uses the designated grayscale; for any other pen color, the printer uses the following equation:

$$[(C*0.3) + (M*0.59) + (Y*0.11) + K] \div 255$$

- » **Note:** *This equation assumes that each grayscale is a byte value that ranges from 0 to 255 (100%). If the sum of the left-side (calculation in brackets) of the NTSC equation is greater than 255, then the sum is set equal to 255.*



A

QMS Customer Support

In This Chapter . . .

- “Sources of Support” on page A-2
- “QMS World-wide Offices” on page A-5

Sources of Support

Several sources of help and information are available, depending on the type of help you need:

Your QMS Vendor

Your local vendor (the one from whom you bought the printer) may be best equipped to help you. Your vendor has specially trained service technicians available to answer questions, and the equipment to analyze your printer problems.

Your Application Vendor

Often, "printing" problems have more to do with the application being used than with the printer. In this case, the application manufacturer is the best source of help.

Q-FAX

Q-FAX, a QMS information retrieval service, provides application notes, technical support notes on common printing problems, and information about printer specifications, options, accessories, consumables, and prices.

In the United States and Canada, call (800) 633-7213 to reach Q-FAX. In all other countries, call (334) 633-3850. Have your fax number handy when you call (or place the call from your fax machine's handset).

You can choose to have either a directory (a list of currently available documents) or a specific document sent to you. The first time you call, request the directory (press 2 on your phone or fax keypad when prompted). Then call back to request specific documents. You can order up to three documents per call.

The QMS Corporate Bulletin Board System

The QMS Corporate Bulletin Board System (BBS) contains technical support notes, application notes, drivers, patches, and utilities, and you may leave technical questions not requiring an immediate response on electronic mail for the Sysop (System Operator).

The bulletin board [(334) 633-3632] operates at 1200, 2400, 9600, and 14400 baud, 8 data bits, no parity, 1 stop bit, with XMODEM, YMODEM, and ZMODEM capabilities. Contact QMS Customer Response Center (CRC) for more information about the bulletin board.

CompuServe

Through CompuServe, you ask general (non-technical) questions, share information with other users, and access printing information and programs. When you use CompuServe, type `go qmsprint` to go directly to the forum where QMS is located. The QMS library section contains application notes, printer drivers, utilities, technical information, and announcement files.

Internet

The QMS server provides access to technical reports, new product announcements, a trade show schedule, and other general information about QMS.

If you have access to the World Wide Web, you can view the QMS home page at <http://www.qms.com/>. The QMS ftp resource is <ftp.qms.com>.

QMS Customer Response Center (CRC)

You can contact the QMS Customer Response Center (CRC) in three different ways:

- **Telephone**—You can call the CRC at (334) 633-4500 (US) Monday–Friday, 7:00 am–6:00 pm, Central Time.

» **Note:** *If you call for assistance, have the following information ready so our technicians can help you more quickly:*

- ☒ Your phone number, fax number, and shipping address
 - ☒ A description of the problem
 - ☒ The printer model
 - ☒ The type of host computer you're using
 - ☒ The type and version of operating system you're using
 - ☒ The interface you're using, and, if serial, the protocol (for example, XON/XOFF)
 - ☒ The application and version you're using
 - ☒ The emulation you're using
 - ☒ Your printer firmware version (listed on the status/start-up pages)
- **Fax**—You can fax questions to the CRC at (334) 633-3716 (US). Provide the same information as listed above, and indicate whether you would like a faxed or a phoned reply.
 - **Internet**—If you have access to the World Wide Web, you can access the CRC through the QMS home page at <http://www.qms.com/>

QMS World-wide Offices

QMS United States and Latin America

General Contact

1 (334) 633-4300

Fax 1 (334) 633-4866

Email info@qms.com

Internet <http://www.qms.com>

Information on QMS products, supplies, and accessories, and on the authorized QMS remarketer or service provider nearest you

1 (800) 523-2696

Customer Response Center (CRC)

Technical Assistance

1 (334) 633-4500 7:00 am–6:00 pm Central Time

Fax 1 (334) 633-3716

Internet <http://www.qms.com>

Bulletin Board Service

1 (334) 633-3632

Latin America Fax

1 (334) 639-3347

National Service

Service Information, Installation, and Maintenance Pricing

1 (800) 762-8894

On-Site Service and Depot Repair Information

1 (800) 858-1597 7:00 am–7:00 pm Central Time

Spare Parts Ordering and Information

1 (334) 633-4300 x2530 8:00 am–5:00 pm Central Time

QMS Canada

General Contact

1 (514) 333-5940

Fax 1 (514) 333-5949

Supplies and Accessories 1 (800) 268-0343 x223

National Service

On-Site Service and Depot Repair Information

1 (800) 268-4969 8:30 am–7:00 pm Eastern Time

Spare Parts Ordering and Information

1 (905) 206-9234 x238 8:30 am–5:00 pm Eastern Time

Bulletin Board Service

1 (905) 206-0084

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B

Technical Specifications

In This Appendix. . .

- “Print Engine Specifications” on page B-2
- “Controller Specifications” on page B-3
- “Electrical Requirements” on page B-4
- “Physical Characteristics” on page B-5
- “Print Media” on page B-6
- “Cable Pinouts” on page B-9
- “Printer Options” on page B-15
- “Consumable Supplies” on page B-17
- “Regulatory” on page B-18
- “Warranty Considerations” on page B-19

Print Engine Specifications

Engine	Minolta SP-A310
Duty Cycle	50,000 images per month maximum
Type	Desktop, non-impact printer
Print Method	Laser beam scanning and dry electrophotographic printing; fixing by heated rollers
Print Speed	<p>Up to 20 simplex images per minute using letter or A4 media at 600 dpi</p> <p>Up to 12 duplex images per minute using letter or A4 media at 600 dpi</p> <p>Up to 11 simplex pages per minute using 11x17/A3 media</p> <p>»Note: Actual print speed depends on the host application.</p>
Resolution	<p>300x300 dpi</p> <p>600x600 dpi (duplex printing may require more memory).</p> <p>1200x1200 dpi (optional; may also require more memory)</p>
Toner	Microfine toner designed especially for high-resolution printers; dry, single component in user-replaceable cartridge; keyed
Toner Cartridge Life	<p>10,000 simplex pages at normal (5%) page coverage, letter/A4-size media</p> <p>Over 35,000 pages at 5% page coverage, letter/A4-size media, if the printer is run entirely in Conserve Toner mode</p>
Warm-Up Time	70 seconds or less, assuming normal temperature and humidity

Controller Specifications

Emulations	<p>PostScript Level 2 (300/600/1200 dpi) HP PCL 5e (HP LaserJet 5Si compatible, with HP-GL/2 and without PCL; 300/600 dpi symmetric resolution)</p> <p>HP-GL 7475A/7550A/ColorPro/Draftmaster (300/600/1200 dpi symmetric resolution) Lineprinter (300/600 dpi resolution) Support for optional downloadable emulations</p>
Fonts	<p>42 resident PostScript fonts that can be scaled from 4 points upward and rotated to any angle in 1° increments; all typefaces have multilingual character sets</p> <p>1 resident bitmap HP PCLe font in 25 symbol sets, 35 resident scalable HP PCLe fonts in up to 35 symbol sets, 1 resident scalable HP PCLe font in 1 symbol set, and 5 resident scalable HP PCLe fonts, all of which can automatically be rotated to landscape orientation</p> <p>40 resident HP-GL symbol sets</p> <p>Support for Type 1 and Type 3 host-resident downloadable PostScript fonts</p> <p>Support for Type 42 (PostScript format) host-resident downloadable TrueType fonts</p> <p>Support for Truetype fonts in PCL</p>
Interfaces	<p>Centronics/IEEE 1284 bidirectional parallel and CrownNet Ethernet interfaces</p> <p>Support for an optional interface (LocalTalk, Ethernet, Token-Ring, DECnet, or serial)</p> <p>SCSI interface, supporting up to 2 external hard disks and 1 optional CrownCopy scanner or up to 3 external hard disks.</p>

Memory	16, 32, or 48 MB RAM standard (depending on your system), upgradable to 128 MB (through 4 SIMM connectors) 8 MB System Flash ROM, containing the system software and fonts SIMM connector for up to 16 MB optional fonts in ROM
System Software	Softloadable; stored in Flash ROM
Type	NEC/VR 4300 processor operating at 100 MHz

Electrical Requirements

Certifications	Energy Star compliant (base system)
Frequency	50-60 Hz (± 3 Hz)
Power Requirements	100/120v 50-60 Hz 230v 50-60 Hz
Power Consumption	820 W maximum operation 100 W standby mode 30 W power save mode

Environmental Requirements

Noise Level	Idle; maximum 38 dB (A) Printing; maximum 53 dB (A)
Relative Humidity	Printing 15-85% RH (non-condensing) Transportation/Storage 10-95% RH (non-condensing)

Temperature Range	Printing	50-90° F (10-35° C)
	Transportation/Storage	32-95° F (0-35° C)
Altitude	0 - 2500 m	

Physical Characteristics

Dimensions (WxDxH)	21.46" x 15.08" x 15.87" 545 mm x 383 mm x 403 mm	
	Note: <i>These are the printer dimensions excluding the multipurpose tray, universal, lower feeder, cassette, and duplexer.</i>	
Weight	Main unit	53 lbs (24kg)
	Cartridge	4 lbs (1.9 kg)

Print Media

Delivery	Face-down output tray; 500 sheets of 20 lb (75 g/m ²) paper
Input Source	One multipurpose tray One cassette feeder One optional cassette feeder
Feed	<p>Paper cassettes</p> <p>Either 250 or 500 sheets of 20 lb (75 g/m²) paper, depending on tray used</p> <p>Multipurpose tray</p> <p>About 150 sheets of 20 lb (75 g/m²) paper About 5 sheets of transparencies About 10 sheets of labels About 10 sheets of letterhead or memo paper About 10 envelopes About 50 postcards About 150 sheets of super B paper</p>
Loading	Automatic from cassette or multipurpose tray, and manual from the multipurpose tray
Sizes	(See "Print Media Sizes" on page B-8)
Types	<p>Cut-sheet paper, transparencies, envelopes, postcards, and labels. See "Consumable Supplies" on page B-17, for recommended media.</p> <p>»Note: <i>Do not print on perforated paper (including 3-hole-punched paper) via the cassette.</i></p>
Weight	Paper (cassette): 16-24 lb (60-90 g/m ²) Paper (multipurpose tray): 16-42 lb (60-157 g/m ²) Paper (duplexer): 16-24 lb (60-90 g/m ²)

Print Media Selection

Paper Input	Plain/ Recycled Paper	Thick Paper	Letter/ Bond Paper	Transparency	Envelope	Label	Super B	Card Stock
Multipurpose	R	R	R	R	R	R	R	R
Universal	R	N	N	N	N	N	R	N
Letter/A4	R	N	N	N	N	N	R	N

R = Recommended

N = Not Recommended or Guaranteed

Print Media Sizes

Media	Media Size		Imageable Area		Feed Edge	Input Source
	Inches	Millimeters	Inches	Millimeters		
8.5x13*	8.50x13.00	215.90x330.20	8.16x12.66	207.26x321.75	S	M U
11x17	11.00x17.00	279.4x431.80	11.00x17.00	279.40x431.80	S	M U
12x19	12.00x19.50	304.80x495.30	12.00x19.50	304.80x495.30	S	M
13x22	13.00x22.00	330.20x558.80	13.00x22.00	330.20x558.80	S	M
13x26	13.00x26.00	330.20x660.40	13.00x26.00	330.20x660.41	S	M
A3	11.70x16.54	297.00x420.00	11.69x16.54	296.62x419.93	S	M U
A4	8.27x11.70	210.00x297.00	7.93x11.35	201.50x288.37	L	M U L
A5	5.85x8.27	148.50x210.00	5.49x7.93	139.53x201.50	L	M U
B4	10.12x14.33	257.00x364.00	9.78x13.99	248.41x355.54	S	M U
B5	7.17x10.12	182.00x257.00	6.82x9.78	173.46x248.41	L	M U
C5	6.38x9.02	162.00x229.00	6.04x8.68	153.41x220.47	S	M
COM-10	4.125x9.50	104.78x241.30	3.78x9.16	96.18x232.85	S	M
DL	4.33x8.66	110.00x220.00	3.99x8.32	101.43x211.52	S	M
Envelope	6.93x9.76	176.00x248.00	6.59x9.42	167.47x239.50	S	M
Executive	7.25x10.50	184.20x266.70	6.19x10.16	175.6x258.25	S	M
Legal	8.50x14.0	215.90x355.60	8.16x13.66	207.26x347.16	S	M U
Letter	8.50x11.00	215.90x279.40	8.16x10.66	207.26x270.93	L	M U L
Monarch	3.875x7.50	98.425x190.5	3.54x7.16	89.91x182.05	S	M
Postcard	3.94x5.83	100.0x148.00	3.60x5.49	91.44x139.55	S	M
Statement	5.50x8.50	139.70x215.90	5.16x8.16	131.25x207.26	L	M
Universal	13.00x19.00	330.20x482.60	13.00x19.00	330.20x482.60	S	M

Input Source:*L=Letter/A4 cassette**M=Multipurpose tray**U=Universal cassette***Feed Edge:***L= Long S= Short*

*8.5"x13" media is supported in the universal cassette only when the paper positioning guide is set about halfway between the A4 and the LGL tickmarks.

Cable Pinouts

Centronics/IEEE 1284 Parallel

This table gives the pinouts for the printer end of the Centronics/IEEE 1284 parallel cable used to connect your printer to a computer.

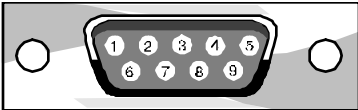
Signal Pin No.	Signal Description	Direction
1	Strobe-	In
2	Data 1	InOut
3	Data 2	InOut
4	Data 3	InOut
5	Data 4	InOut
6	Data 5	InOut
7	Data 6	InOut
8	Data 7	InOut
9	Data 8	InOut
10	Acnlg-	Out
11	Busy+	Out
12	Pe+	Out
13	Select	Out
14	Autofeed	In
15	Reserved	-
16	Ground	-
17	Ground	-
18	Vcc Test	-
19-30	Ground	-
31	lprime	In
32	Fault-	Out
33	Reserved	-
34	Reserved	-
35	Reserved	-
36	Selectin	In

Notes to the Table

- **Direction** refers to the direction of signal flow as viewed from the printer.
- **Return** denotes “twisted-pair return” and is to be connected at signal-ground level. When wiring the interface, be sure to use a twisted-pair cable for each signal and never fail to complete connection on the return side. To prevent noise effectively, these cables should be shielded and connected to the chassis of the system unit and printer, respectively.
- All interface conditions are based on Transistor-Transistor Logic (TTL) level. Both the rise and fall times of each signal must be less than 0.2 microseconds.
- Data transfer must be carried out by recognizing the ACKNLG or BUSY signal.
- The cable must have an overall braided shield, Belden 8345 or equivalent.
- Connectors must have shielded housings. The overall shield must be bonded to the shielded housings at both ends of the cable.

Serial

This table gives the correct pinouts for the 9-pin male RS-232 serial interface.

Pin	Name	Pinout View from Printer Interface
1	Not Used	
2	Receive Data (RXD)	
3	Transmit Data (TXD)	
4	Data Terminal Ready (DTR)	
5	Signal Ground (GND)	
6	Data Set Ready (DSR)	
7	Ready To Send (RTS)	
8	Clear To Send (CTS)	
9	Reserved	

IBM PC/XT, PC/AT, and Compatible Computers

The following diagrams show the serial **cable** pinouts for IBM PC/XT, PC/AT, and compatible computers.

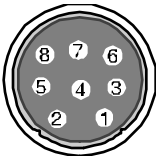
- » **Note:** *Not all serial cables are configured as shown and may require an additional null-modem adapter. Check with your cable vendor for compatibility.*

To Printer 9-Pin		To CPU XT 25-Pin Female		To Printer 9-Pin		To CPU AT 9-Pin Female	
	1	Need			1	Need	
RXD	2		2	RXD	2		2
TXD	3		3	TXD	3		3
DTR	4		20	DTR	4		4
DSR	6		6	DSR	6		6
GND	5		7	GND	5		5
RTS	7		4	RTS	7		7
CTS	8		5	CTS	8		8
	9	Not Used			9	Not Used	

- » **Note:** *To download printer system software via the serial port, your hardware must have RTS and CTS support. Make sure that pins 4 and 5 on the 25-pin serial cable and pins 7 and 8 on the 9-pin serial cable are criss-crossed as shown in this diagram.*

LocalTalk (Optional Interface)

The following table provides the pinouts for the printer's optional 8-pin LocalTalk interface:

Pin	Name	Pinout View from Printer Interface
1,2,7	Reserved	
3	Transmit Data - (TXD)	
4	Signal Ground (GND)	
5	Receive Data - (RXD)	
6	Transmit Data + (TXD)	
8	Receive Data + (RXD)	

Macintosh to Serial

The following table provides the pinouts for a cable connecting the Macintosh printer or modem port to the printer's serial port.

- » **Note:** *To download printer system software from a Macintosh, you must have this type cable. Make sure pins 4 and 5 are crisscrossed as shown in this diagram.*


To Macintosh DIN-8 Male			To Printer DB-9 Female	
HandshakeOut	1		7	RTS
HandshakeIn	2		8	CTS
TXD-	3		3	TXD
RXD-	5		2	RXD
GND,RXD+	4,8*		5	GND
	6	Not Used		
	7	Not Used		

* Pins 4 and 8 must be connected together on the DIN-8 cable.

Ethernet

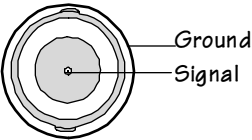
10BaseT RJ45

The following table provides the pinouts for the 10BaseT RJ45 Ethernet interface:

Pin	Name	Pinout View from Printer Interface
1	Transmit Data +	
2	Transmit Data -	
3	Receive Data +	
4	No Contact	
5	No Contact	
6	Receive Data -	
7	No Contact	
8	No Contact	

10Base2 BNC

The following table provides the pinouts for the 10Base2 BNC Ethernet interface:

Pin	Name	Pinout view from Printer Interface
1	Ground	
2	Signal	

Printer Options

Cables	You may purchase cables from your local vendor. See "Cable Pinouts" on page B-9.
CrownCopy	Monochrome scanner/copier with automatic document feed (ADF) capability; connects to the external SCSI port via a SCSI 2 to Centronics 50 cable.
Duplexer	Required for automatic two-sided printing.
Emulations	Loadable disk format (requires hard disk and additional memory): CGM XES LN03 Plus (300 dpi only; 15 typefaces) QMS QUIC II (300 dpi only)
Fonts	HP ProCollection SIMM with 65 fonts Kanji SIMM with 2 Morisawa fonts Kanji internal hard disk with 6 Kanji fonts MICR fonts
Forms Printing	QMS QFORM, printer-resident forms printing enabler
Hard Disks— Internal IDE, External SCSI	See FAQ 7181 for a list of each QMS-approved hard disk, its manufacturers and part numbers, and the QMS products on which it can be used. You can access QMS FAQs through the Internet at http://www.qms.com/support/supportbase/ or through Q-FAX (see appendix A, "QMS Customer Support," to find out how to access Q-FAX documents). Note: <i>FAQ numbers may be subject to change, so you may want to obtain a directory of Q-FAX documents before requesting a specific document.</i>
Image Printing	QMS ImageServer

Printer Options

Interfaces	CrownNet Ethernet (EtherTalk, LAN Manager/Lan Server, NetWare, TCP/IP) CrownNet Token-Ring (LAN Manager/Lan Server, NetWare, TCP/IP) DECnet LocalTalk Serial RS232
Resolution	1200x1200 dpi daughterboard—Provides edge smoothing at 600 dpi resolution, or provides 1200 dpi resolution (requires additional memory)
Security	Security key
SIMMs	<p>See FAQ 7181 for a list of each QMS-approved hard disk, its manufacturers and part numbers, and the QMS products on which it can be used. You can access QMS FAQs through the Internet at http://www.qms.com/support/supportbase/ or through Q-FAX (see appendix A, “QMS Customer Support,” to find out how to access Q-FAX documents).</p> <p>Note: <i>FAQ numbers may be subject to change, so you may want to obtain a directory of Q-FAX documents before requesting a specific document.</i></p>
Storage	Internal IDE hard disk External SCSI devices (up to 3) Iomega Jaz drive Iomega Zip drive
Warning Device	QMS BuzzBox Lite light/buzzer printer warning device

Consumable Supplies

Cassettes	250-sheet universal paper cassette 500-sheet letter paper cassette 500-sheet A4 paper cassette	
Media —Sizes	See “Print Media Sizes” on page B-8, for media size information.	
Media— Recommended Brands	Paper	Plain —Xerox 4024 Laser —Hammermill Laser Print
	Envelopes	Common office envelopes with diagonal joints and ordinary gummed flaps. They must not contain any fasteners, clasps, or peel-off strips for sealing. The material must not melt, vaporize, offset, discolor, or emit dangerous fumes at high temperatures (190° C/ 374° F).
	Labels	Avery 5160 Adhesive label stock should have pressure-sensitive (peel-and-stick) adhesive backing. Use only label sizes letter or A4.
	Transparencies	3M PP2500 Use only transparency sizes letter or A4
Toner Cartridges	The QMS 2060 Print System uses a keyed toner cartridge which is available from your QMS vendor.	

Regulatory

CE Marking	International (EU) EN 55022:1987 (Class BITE) EN 60950:1992 IEC 801-2 IEC 801-3 IEC 801-4	Emissions Safety ESD Radiated susceptibility Fast transients
Electromagnetic Compatibility (EMC)	International (EU) IEC 801-2 IEC 801-3 IEC 801-4	ESD Radiated susceptibility Fast transients
Electromagnetic Emissions (EMI)	DOC (Canada) Canadian CRC c1374 EU (International) EN 55022:1987 FCC (USA) Title 47 CFR Ch. 1, Part 15 VCCI (Japan) VCCI V-3Class 1 ITE	Class A digital device Class A ITE Class A digital device Class 1 ITE
Energy Star (USA)	Energy Star compliant	
Product Safety	cUL (Canada) EU (International) UL (USA)	CAN/CSA-C22.2 No 950-M90 EN 60950:1992 UL 1950, second edition
Product Laser Safety	CDRH (USA) EU (International)	Title 21 CFR Ch. I, Subchapter J IEC 825

Warranty Considerations

Various factors can affect a printer's warranty. Two important ones are consumables and electrostatic discharge. Read your printer warranty carefully, and then store it in a safe place.

- » **Note:** *Don't return any merchandise to the manufacturer without calling for a return merchandise authorization (RMA) number. See appendix A, "QMS Customer Support," for the QMS Customer Response Center (CRC) telephone number where you can obtain an RMA number.*

Consumables and Your Warranty

The use of non-QMS consumables and/or accessories alone does not affect either your warranty or any maintenance contract you may have purchased. However, if QMS printer failure or damage is found to be directly attributable to the use of non-QMS consumables and/or accessories, QMS will not repair the printer free of charge. In this case, standard time and material charges will be applied to service your printer for that particular failure or damage. QMS recommends that you use only QMS consumables and accessories to support your printer. For information on all QMS products, supplies, and accessories, and on the authorized QMS remarketer or service provider nearest you, call 1 (800) 523-2696. In all other countries, check appendix A, "QMS Customer Support," for the QMS office closest to you.

Electrostatic Discharge and Your Warranty

It's very important to protect the printer controller board and other printer circuit boards from electrostatic damage.

If an anti-static wrist strap is provided in your printer option kit, attach one end of it to your wrist and the other end to any convenient electrical ground. The bare metal chassis of equipment, such as on the back of a computer, is suitable if it is plugged in but **turned off**.

Never attach the wrist strap to any piece of equipment with an electrical current present. Turn off all power switches first. Plastic, rubber, wood, painted metal surfaces, and telephones are not acceptable grounding points. The printer isn't an acceptable grounding point either because it must be unplugged before you perform this task.

If you don't have an anti-static wrist strap, discharge your body's static electric charge by touching a grounded surface before you handle any printer boards or components and before removing the controller board cover. If you must walk around before completing your task, discharge your body's static electric charge again before touching the printer controller board.

Incidental and consequential damages caused by not discharging electrostatic buildup can affect your printer warranty.



C

Document Option Commands

In This Appendix. . .

- “Supported QMS DOCs” on page C-2

Introduction

This appendix lists the supported Document Option Commands (DOCs) for your QMS 2060 Print System. The commands are grouped by feature type.

Each command is preceded by either a DOC statement (%%) or an IncludeFeature statement (%%IncludeFeature). See the *QMS Crown Document Option Commands* manual for information on how to use each command.

Supported QMS DOCs

Header/Trailer Page Commands

Print copyright statement	%%CopyRight:
Print document creator	%%Creator:
Print creation date and time	%%CreationDate:
Print current date	%%Date:
Print document owner	%%For:
Print document host	%%Host:
Print routing information	%%Routing:
Print document title	%%Title:
Print version and revision	%%Version:
Print header page	%%IncludeFeature: header
Print trailer page	%%IncludeFeature: trailer

HP-GL Emulation Commands

Select enhanced resolution	%%IncludeFeature: enhanced
Expand plot	%%IncludeFeature: expand
Select original paper size	%%IncludeFeature: size
Select pen width and color	%%IncludeFeature: pen
Select plotter	%%IncludeFeature: plotter
Scale the image	%%IncludeFeature: scaling
Adjust image horizontally	%%IncludeFeature: xorigin
Adjust image vertically	%%IncludeFeature: yorigin

HP PCL 5e Emulation Commands

Install object	%%IncludeFeature: install
Remove object	%%IncludeFeature: remove
Remove resource	%%IncludeFeature: removeresource
Select default font	%%IncludeFeature: font
Select default font ID	%%IncludeFeature: fontid
Select symbol set	%%IncludeFeature: symbolset
Set carriage return to CR+LF	%%IncludeFeature: crisrlf
Set linefeed to CR+LF	%%IncludeFeature: lfisrlf
Set number of lines per inch	%%IncludeFeature: linesperinch
Set point size	%%IncludeFeature: pointsize
Resource	%%IncludeFeature: resource

Lineprinter Emulation Commands

Select font for current job	%%IncludeFeature: font
Set point size for current job	%%IncludeFeature: pointsize
Specify character map type	%%IncludeFeature: map
Number lines	%%IncludeFeature: number
Set tabs	%%IncludeFeature: tabs
Set linefeed to CR+LF	%%IncludeFeature: lfisrlf
Set carriage return to CR+LF	%%IncludeFeature: crisrlf
Set formfeed to CR+FF	%%IncludeFeature: ffisrff
Wrap lines	%%IncludeFeature: autowrap
Set number of lines per page	%%IncludeFeature: linesperpage
Set margins	%%IncludeFeature: lpmargins
Set orientation	%%IncludeFeature: lporientation

CCITT Groups 3 and 4 Commands

Start decompression	%%ImageData
Set encoded byte flag	%%EBAMode
Set end of block	%%BlockEnd
Set line end	%%LineEnd
Eject page	%%PageEnd
Set image position	%%ImagePosition
Invert image	%%InvertImage
Set dpi for image expansion	%%DPI
Set data compression	%%Compression
Reverse bits	%%BitReverse
End print job	%%JobEnd
Set image size	%%ImageSize
Set image rotation	%%Rotation

Document Formatting

Logical page orientation	%%IncludeFeature: pageorientation
Duplex print jobs	%%IncludeFeature: duplex
Number up printing	%%IncludeFeature: pagegrid
Offset logical page	%%IncludeFeature: pageoffsets
Print borders	%%IncludeFeature: border
Scale logical page	%%IncludeFeature: pagescaling
Booklet printing	%%IncludeFeature: booklet
Print background images	%%IncludeFeature: background
Set printer resolution	%%IncludeFeature: resolution
Print page range	%%IncludeFeature: pagerange
Collate print job	%%IncludeFeature: collate
Logical page size	%%IncludeFeature: pagesize
Select number of copies	%%IncludeFeature: numcopies
Select paper	%%IncludeFeature: input
Select orientation	%%IncludeFeature: orientation
Select emulation	%%IncludeFeature: emulation
Logical margins	%%IncludeFeature: margins
Select print mode	%%IncludeFeature: quality

Sessions Command

New layout command	%%IncludeFeature: newlayout
--------------------	-----------------------------

LN03 Commands

Identify product	%%IncludeFeature: product
Control line wrap	%%IncludeFeature: autowrap
Specify default paper size	%%IncludeFeature: paper_size
Control transformation point	%%IncludeFeature: paper_size_override
Adjust image horizontally	%%IncludeFeature: xorigin
Adjust image vertically	%%IncludeFeature: yorigin
Set power-up configuration	%%IncludeFeature: reset_override



D

Notices

In This Appendix. . .

- “Manual Notice” on page D-2
- “FCC Compliance Statement” on page D-2
- “Canadian Users Notice” on page D-3
- “Laser Safety” on page D-3
- “Power Cord” on page D-4
- “International Notices” on page D-4
- “Colophon” on page D-4

Manual Notice

QMS, Inc. reserves the right to make changes to this manual and to the equipment described herein without notice. Considerable effort has been made to ensure that this manual is free of inaccuracies and omissions. **However, QMS, Inc. makes no warranty of any kind including, but not limited to, any implied warranties of merchantability and fitness for a particular purpose with regard to this manual.** QMS, Inc. assumes no responsibility for, or liability for, errors contained in this manual or for incidental, special, or consequential damages arising out of the furnishing of this manual, or the use of this manual in operating the equipment, or in connection with the performance of the equipment when so operated.

FCC Compliance Statement

This equipment has been tested and found to comply with the limits for a **Class A** digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

- » **Note:** *A shielded cable is required to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules.*

-
- ▲ **Caution:** *Any modifications or changes to this product not expressly approved in writing by the manufacturer responsible for compliance to Federal Regulations could void the user's authority to operate this product within the Laws and Regulations of the Federal Communications Commission.*
-

- ⚡ **WARNING!** *To prevent electrical shock, do not remove any covers from your printer unless you are experienced in working with circuit boards and are following instructions for procedures described in QMS documentation.*

ACHTUNG! *Um elektrische Kurzschlüsse zu vermeiden, entfernen Sie keine Gehäuseteile von Ihrem Drucker, wenn Sie keine Erfahrungen im Umgang mit elektrischen Bauteilen haben. Befolgen Sie die in der QMS Dokumentation beschriebenen Hinweise.*

Canadian Users Notice

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques (de la classe A) prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

Laser Safety

This printer is certified as a Class 1 laser product under the U.S. Department of Health and Human Services (DHHS) Radiation Performance Standard according to the Radiation Control for Health and

International Notices

Safety Act of 1968. This means that the printer does not produce hazardous laser radiation.

Since radiation emitted inside the printer is completely confined within protective housings and external covers, the laser beam cannot escape from the machine during any phase of user operation.

International Notices

Power Cord

The following power cord requirements are in effect for the 220v QMS 2060 Print System.

Minimum 0.75 mm²

Minimum H05 VV - F

- » **Note:** *The male plug is certified in the country in which the equipment is to be installed, and the female plug is an IEC 320 connector.*

Colophon

This manual was written and formatted in FrameMaker. Some illustrations were created in Adobe Illustrator and translated to WMF format in Transverter Pro; other illustrations were created directly in FrameMaker. The menu configuration tree was produced using Microsoft PowerPoint. Typefaces chosen are Benguiat, Courier, and Helvetica.



E

Configuration Menu

In This Appendix. . .

- Configuration menu charts

Introduction

You may use this section as a quick reference for understanding and navigating the menu structure of the QMS 2060 Print System. The following menu charts are provided in this section:

- Installation Menu

Shows the configurations available when the security key is used to access the Installation Menu.

- Operator Control Menu

Shows the operator printer configurations.

- Administration Menu

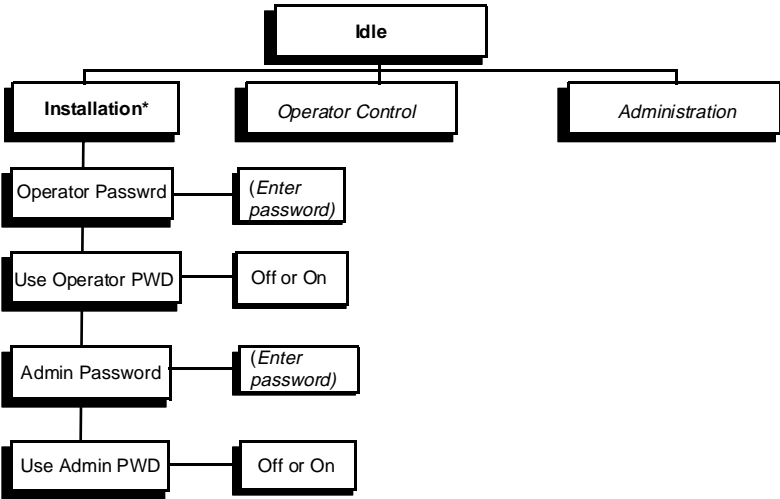
Shows the printer administration configurations.

Menu Chart Conventions

The following conventions are used in the menu charts:

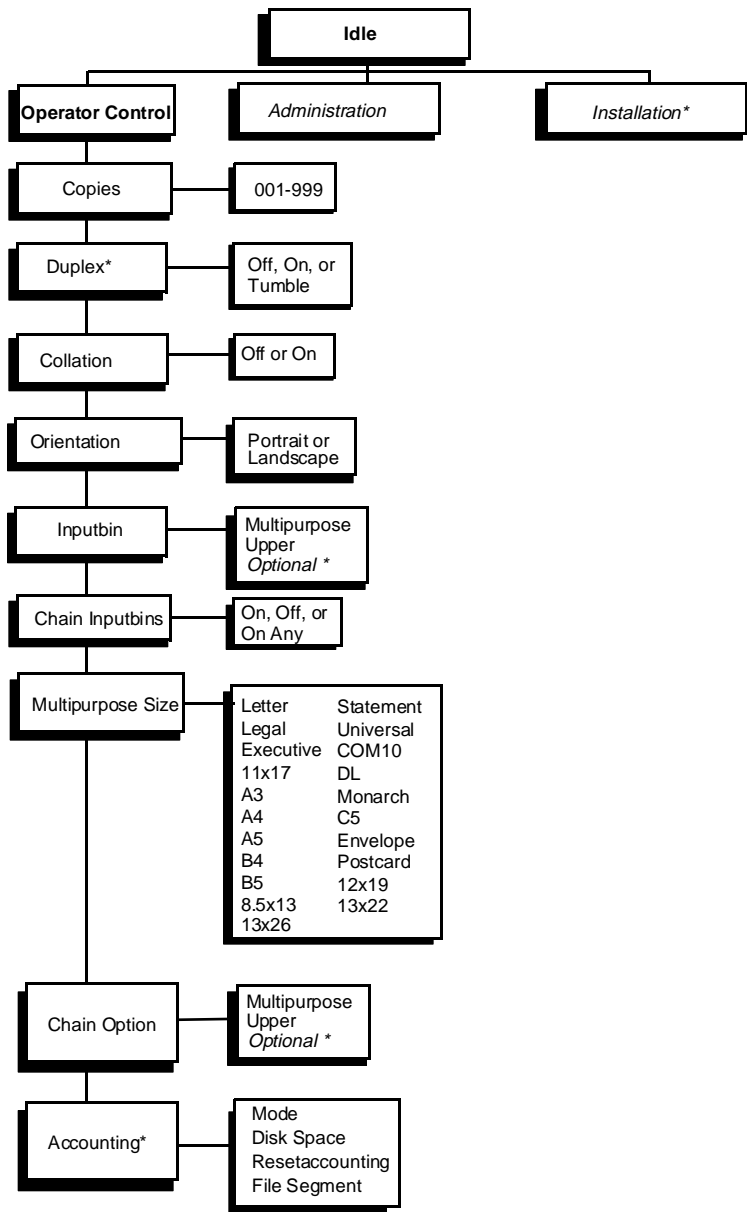
- Some menu selections are marked with an asterisk (*). These selections will only appear on your print system if the specified option is installed.
- These menu charts show only the top-level menus. See chapter 4, "Printer Configuration," of the *Reference* guide for detailed information on a menu selection's options.

Installation Menu

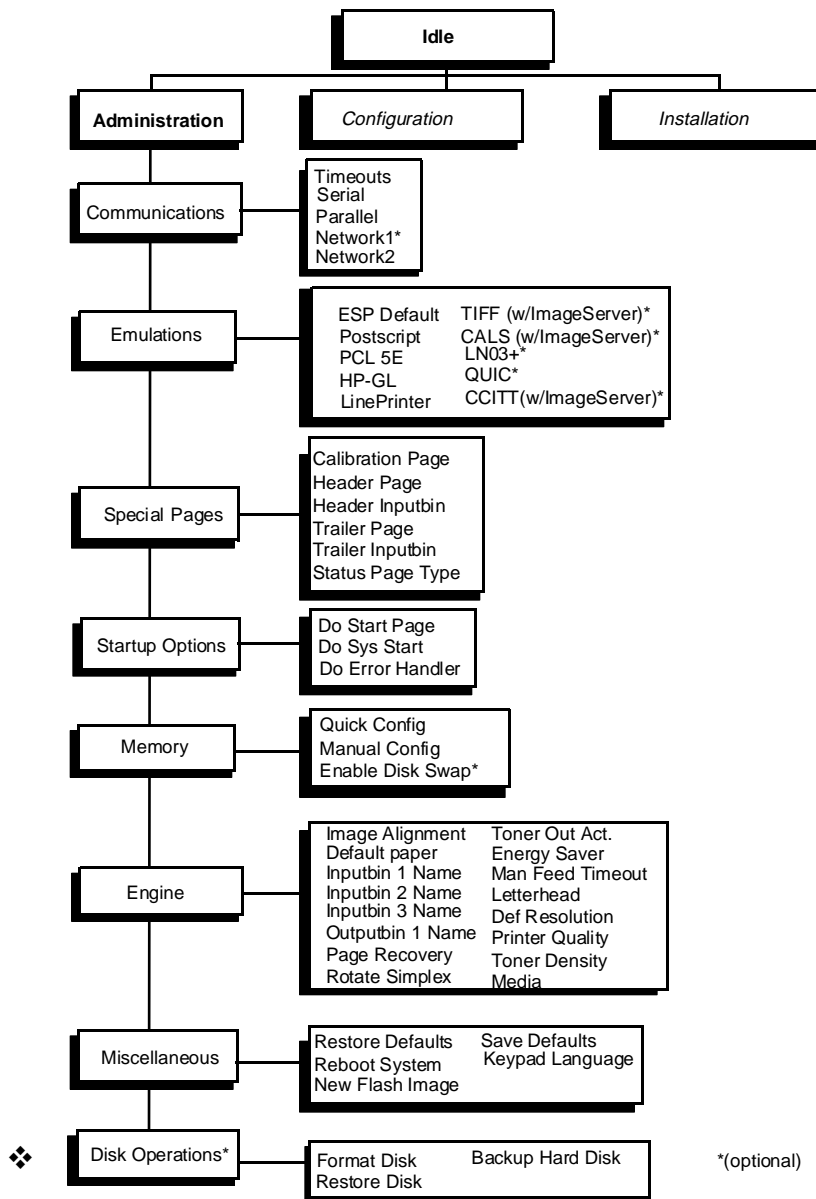


*Optional

Operator Control Menu



Administration Menu



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