AGILE®

ULTRA II™

External Print Protocol Converter

XES PCL

Optional

USER'S MANUAL

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Release Notes

This document was printed in September 1999 and describes release 2.45 of the AGILE ULTRA II.

Fill in for future reference:

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About This Manual

This manual covers the installation and use of the AGILE ULTRA II, as well as the optional XES-to-PCL5 translation feature for PCL5 compatible laser printers. AGILE makes no warranties, expressed or implied, as to its completeness or accuracy. The information in this manual is current as of the date of its publication, but is subject to change by AGILE at any time without notice. This manual is not intended to be used for manufacturing or engineering specifications, and it is assumed that the user understands the interrelationship between any affected systems, machines, programs and media.

AGILE periodically updates this manual for clarity, to correct inaccuracies and typographical errors, or to document added or changed product features. AGILE will be pleased to improve the manual by implementing suggestions from our customers. Please put suggestions in writing and mail to AGILE at the addresses below:

AGILE

Technical Publications
875 Alfred Nobel Drive
Hercules, CA   94547-1899

e-mail: TechPubs@agileinc.com

FCC/DOC Statement

This equipment generates, uses and can radiate radio frequency energy. If it is not installed and used in strict accordance with these instructions, it may cause interference to radio and television reception. This equipment has been tested and complies with the limits for a Class A computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio and television reception, which can be determined by turning the equipment off, the user is encouraged to try to correct the interference by one or more of the following measures:

- ▲ Reorient the receiving antenna.
- ▲ Relocate the ULTRA II with respect to the receiver.
- ▲ Move the ULTRA II away from the receiver.
- ▲ Plug the printer into a different outlet so that the printer and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The booklet, *How to Identify and Resolve Radio-TV Interference Problems,* prepared by the Federal Communications Commission, may also be helpful. This booklet is available from the US Government Printing Office, Washington, DC 20402, Stock No. 004-000-00345-4.

WARNING: This equipment has been certified to comply with the limits for a Class A computing device, pursuant to Subpart J of Part 15 of FCC rules. Only peripherals (computer input/output devices, printers, plotters, etc.) certified to comply with the Class A (commercial) or Class B (residential) limits may be attached to the ULTRA II. Operation with non-certified peripherals is likely to result in interference to radio and TV reception.

Note: This equipment uses shielded cables to meet compliance limits for a Class A computing device. Shielded cables must be used to ensure this equipment continues to meet these limits. The shield must be terminated to the metallic connector at both ends to guarantee adequate suppression of undesirable emissions. All cables are fully double shielded (Mylar foil and tinned copper braid.)

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General Information

The AGILE ULTRA II is a protocol converter that allows parallel ASCII printers to be attached to an IBM 3270-type mainframe controller. The ULTRA II optionally enables XES data streams to be printed on PCL5 printers.

The coax port allows a standard IBM RG62 A/U cable to connect to an IBM 3174 or 3274 establishment controller (EC) with a category A device adapter, a 3276 terminal/controller unit, or an IBM CPU with a Display Printer Adapter (DPA).

The ULTRA II is a fully functional protocol converter and is available with several application-specific options.

XES Translation

AGILE's XES to PCL translation engine may be added for Xerox legacy printer replacement

Extra FLASH Option

256K of FLASH RAM may be added to the standard 512K FLASH for fonts and named forms storage in large XES applications

Specifications

Printers Supported

▲ Any Centronics parallel printer (PCL 5 for XES option)

Coax Port Specifications

Host Interface

▲ 1 coax input port IBM BNC type A RG62 A/U coax

▲ 1 IEEE 1284C parallel input port

Throughput

▲ Rated printer speed up to 44 pages per minute

Resource Storage Space

▲ 512K FLASH (Standard)

▲ 256K FLASH (Optional)

▲ 256K RAM

Transparency

▲ IBM 35h

▲ Xerox 36h

▲ 2-trigger pseudo-transparency

▲ Trigger + count byte pseudo transparency

Programmability

▲ On line through coax host data stream

▲ Through parallel alternate host port

Upgradeability

▲ Firmware upgradeable via parallel input port

Custom Application Support

▲ XPAF

▲ XES

▲ DisplayWrite 370

▲ GDDM

Product Support

▲ Toll-free tech support is available from 7:30 a.m. to 4 p.m. PST

▲ Two-year product warranty

INSTALLATION

General Information

This chapter provides information on physically attaching the AGILE ULTRA II to your printer.

Prior to Installation

The following are needed before installing the ULTRA II

- ▲ A Centronics parallel printer, PCL5 required for optional XES support

- ▲ A system that delivers 3270 data streams via an RG62 A/U host interface cable

- ▲ Additionally, someone who is knowledgeable about the host system.

Selecting a Location

Refer to the user's manual for your particular laser printer to ensure that the printer is properly located.

The operational features of the ULTRA II require enough space in front of the unit to access the front panel Mode button.

The ULTRA II does not have to be placed immediately next to the printer and may be placed anywhere within the six-foot (1.83 meters) distance that the standard parallel cable will allow. However it is not recommended that the parallel cable be fully extended at all times, as the strain could damage the cable or connectors on the ULTRA II or printer.

Space Requirements

The following diagram (figure 2.1) shows the dimensions of the ULTRA II. It is recommended that the unit be placed in an area with *at least* 2 inches (5 cm) clearance to either side and on top of the unit.

A clearance of *at least* 4 inches (10.2 cm) is needed in front of and behind the unit in order to maintain access to both the front panel and the cable connectors on the back of the ULTRA II.
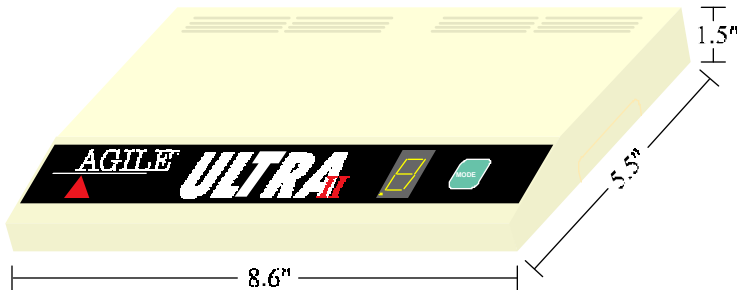
figure 2.1

Electrical Requirements

The ULTRA II requires 5 VDC at 700 milliamperes provided by the 117 VAC adapter or the optional 250 VAC adapter.

> **WARNING: Make sure there are two separate electrical circuits available for the printer and the ULTRA II. Failure to do so could result in fire and/or damage to the equipment.**

To ensure proper performance, electrical adapters, converters and extension cords should not be used with the ULTRA II.

Users with any questions regarding the electrical service available at their site should contact a qualified electrician.

Operating Environment

The ULTRA II operates best in an environment with a temperature between 50 and 90 degrees Fahrenheit and 15% to 65% relative humidity.

Unpacking

After removing the ULTRA II from the shipping container, inspect the unit

for any damage in shipment. Immediately report any damage to the freight carrier. Save the packing container.

Package Contents

Except when ordered otherwise, the shipping container includes the ULTRA II protocol converter, an AC power adapter, a parallel printer cable and this user's manual diskette. If the XES option was ordered, a second diskette with the latest version of AGILE's XEDIT XES configuration software will also be included. Should any of these items be missing, contact an AGILE sales representative.

**User's Manual
&
XEDIT Program**

ULTRA II

AC Power Adapter

Parallel Printer Cable
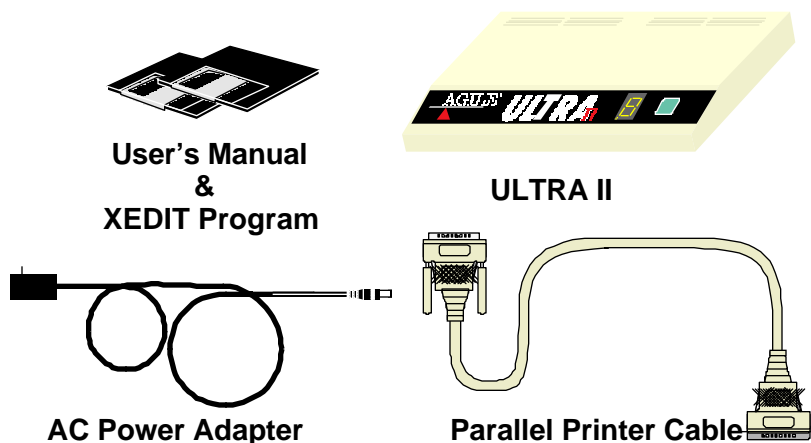
Connections

The following section describes and illustrates how to make the physical connections between the ULTRA II and the other components of the system. Be certain to use AGILE cables for all printer connections.

ULTRA II Rear Panel

The rear panel of the ULTRA II provides an on/off switch, an AC power adapter outlet, a coax port for connection to the establishment controller (RG62 A/U), a Centronics parallel printer port (PARALLEL I/O) and a parallel input port for alternate host and programming functions.

ULTRA II Connection to Establishment Controller

Attach the device end of an RG62 A/U coax cable to the coax connector on the rear panel of the unit. Rotate the cable connector 1/4 turn clockwise to lock it in place. Attach the EC end of the coaxial cable to the establishment controller at the coax port designated for the ULTRA II.
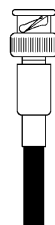
ULTRA II Connection to Printer/Plotter

Insert the device end of the AGILE printer cable into the connector on the rear of the printer. Then connect the ULTRA II end of the AGILE printer cable to the proper output port of the unit. Secure the cable to the printer using the clips provided.

The FCC requires all printer interface cables to be properly shielded.
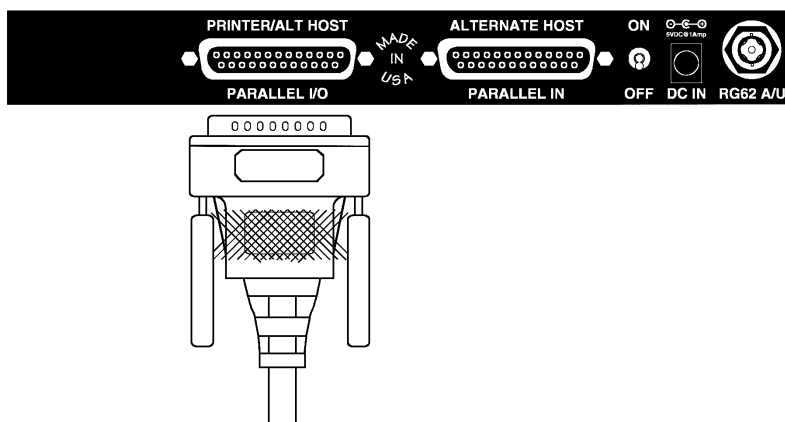
ULTRA II Connection to AC Outlet

Ensure that the power switch on the ULTRA II is set in the OFF (down) position. Insert the low voltage DC plug from the AC adapter into the DC IN receptacle on the rear of the ULTRA II. Insert the AC adapter into an appropriate wall receptacle.

ULTRA II Front Panel

The front panel of the ULTRA II provides a mode indicator in the form of a seven-segment LED, and a pushbutton for changing modes. To select a mode, press the MODE selector button repetitively until the appropriate mode number is indicated by the LED. The indicated operation will begin two seconds after the last time the selector button is pushed. Each of the possible modes is described below:

Modes

0 — Normal Operating Mode

Host data may be accepted at any time during normal operating mode. If the LED decimal point is on, the establishment controller is actively communicating with the ULTRA II. A flashing decimal point indicates that the controller unit is in slow poll mode.

1 — Reserved

This is a reserved mode and has no current function.

2 — Reserved

This is a reserved mode and has no current function.

3 — Reset

The ULTRA II will reset and return to normal operating mode.

4 — XES Configuration Report

The ULTRA II will cause an XES configuration report to be printed on the attached printer if the XES option is installed on the ULTRA II and return to normal operating mode on completion of printing. This mode selection has no effect if the XES option is not installed..

5 — General Configuration Report

The ULTRA II will return to normal operating mode after sending the General Configuration Report to the printer. (See Appendix for a sample report.)

6 — Coax Translate Table Report

The ULTRA II will return to normal operating mode after a Translate Table and Function Report is sent to the current printer. (See Appendix for a sample report.)

7 — Coax PFS Report

The ULTRA II will return to normal operating mode after a PFS Report is sent to the current printer. (See the *Appendix* for a sample report.)

8 — Printer Test Report

This mode tests the connection between the ULTRA II and the current printer. It sends out a continuous stream of characters, including alphabetic, numeric and special characters. (See *Appendix*.) The ULTRA II must be powered down to stop this operation.

9 — Reserved

This is a reserved mode and has no current function.

A — Reserved

This is a reserved mode and has no current function.

B — Reserved

This is a reserved mode and has no current function.

C — Reserved

This is a reserved mode and has no current function.

D — Diagnostic Functions

This mode is used to select one of several diagnostic functions and requires that an additional value be selected in the following manner: repeatedly press the button until "D" appears in the LED; wait two seconds until "0" is displayed; and repeatedly press the button again until the next required value is displayed. The selected mode will be invoked within two seconds of the last button press.

These modes are:

D1 - Coax Input diagnostics

D2 - Coax Output Diagnostics

D3 - Reserved

D4 - Print Manifest

D5-DF - Reserved

E — Reserved

This is a reserved mode and has no current function.

F — Reserved

This mode is reserved for customer support use only.

ULTRA II Power Up

Power on the printer. After the printer completes its power on initialization sequence, verify that it is on line and ready to receive and print data. If necessary, refer to the printer user's manual for detailed information.

Power on the ULTRA II. The LED should display a 0. If proper connection to the establishment controller has been made, the decimal point to the left of the 0 should also be displayed.

A flashing decimal point indicates the controller is in slow poll mode (i.e.,

that a connection is not established between the controller and the
ULTRA II). To correct this problem, power off the ULTRA II, then turn it
back on.

Connection Tests

The following tests will verify that proper connections have been made with
the ULTRA II, the host and the printer.

Printer

In order to verify the printer connection, print a General Configuration
Report by repeatedly pressing the MODE button on the front panel of the
ALLY until the LED reads 5. A sample General Configuration Report can be
found in the *Appendix*.

If the report does not print:

> ▲ Check that the ULTRA II and the printer are connected to
> a power source, powered on and on line.

> ▲ Verify that the printer is securely connected to the
> ULTRA II with an AGILE cable.

> ▲ Confirm that the printer is functioning properly by having it
> perform a self test. Refer to the printer user's manual for
> instructions.

If the report prints incorrectly:

> ▲ Verify that all settings are made correctly as required by
> the printer and the host.

Coax Host Verification

After successfully printing a General Configuration Report, verify the host
connection to the ULTRA II by sending a Local Copy or a typical host-
generated print transaction to the printer. Refer to the system documentation
for instructions. Verify that the transaction is properly formatted and output
by the printer.

If it does not print:

▲ Check that the ULTRA II and the host are securely connected to the coax cable, and that the decimal point on the ULTRA II LED is on, indicating a proper connection.

A flashing decimal point indicates that the controller is in slow poll mode (i.e., that a connection is not established between the ULTRA II and the controller). To correct the problem, power off the ULTRA II, then turn it back on.

▲ Refer to *Section 3 — Configuration* for detailed instructions on configuration, check the settings of Option Group #50 in the General Configuration Report, and change the settings as needed.

▲ Refer to *Section 6 — Coax Host Considerations*. Check that the ULTRA II is connected to a Category A device adapter. Make certain that the ULTRA II is defined to the host as an LU1 or LU3, and as a 3287 printer with a maximum of 4K physical buffer space (and/or with other features required by the application and supported by the ULTRA II). If using VTAM or another Network Control Program, confirm that the ULTRA II is defined as a type 2 physical unit.

If the print output is not formatted correctly:

▲ Refer to the printer user's manual for the commands necessary to format the printer's output to suit the needs of the application.

CONFIGURATION OPTIONS

General Information

This section describes each of the parameters of the General Configuration Options that the user can select to adapt the ULTRA II to the user's specific environment.

Configuring the ULTRA II changes the way in which it handles the data stream from the coax host or alternate host before the data is sent to the printer. The configuration option parameters allow the user to change printer output, page formatting, host parameters, transparency modes, etc. Under many circumstances, the ULTRA II configuration will not have to be modified, because it is already set up for the most common environments.

Should the unit need to be configured in its operating environment, AGILE provides a utilities diskette with the ULTRA II.

Note: This section only deals with coax configuration options and does not cover XES configurations (on units with XES to PCL option). For more information on XES configuration, see Section 13 — Introduction to XES.

Getting a Configuration Report

Before changing any of the configuration settings, you should print a General Configuration Report that will display the current settings. A General Configuration Report can be generated by doing any of the following:

> ▲ cycling the power on the ULTRA II
>
> ▲ from the alternate host CPU, running ***coaxrpt.bat*** from the AGILE utilities diskette for a protocol converter configuration report
>
> ▲ from the alternate host CPU, running ***xesrpt.bat*** from the AGILE utilities diskette for an XES Status Sheet

Sample reports are found in the Appendix (Mode 4 or 5).

Configuring the ULTRA II

In general, there are two ways to configure the options of the ULTRA II. It can be configured from the coax host or parallel input. Both of these methods are described in Section 6 and Section 15 respectively.

Following is a basic description of the configuration options available on the ULTRA II.

Configuration Option Descriptions

1 — Column Width

▲ **Range= 000-255**

▲ **Default= 132**

This option allows the user to limit the number of printable columns per page to any value between 0 and 255. The value of this option is the last column at which the ULTRA II will allow any character to be printed before sending a CR/LF sequence. The default value is 132. A value of 0 implies an infinite line length.

Note: To avoid unexpected formatting results, this option should be set to infinite line length if any of the following are true:

▲ the user or the user's application embeds escape sequences in the data stream

▲ the user or the user's application embeds transparency or pseudo transparency strings in the data stream

▲ the user embeds ULTRA II commands (configuration, translate table or PFS commands) within print jobs

Refer to Section 8 — DisplayWrite 370 Support for more information.

This option should **not** be set to infinite line length if **Option #15 — Bold Print Emulation** is set to any value other than C (none).

2 — Lines Per Page

▲ **Range= 000-255**

▲ **Default= 000**

This option allows the user to set the number of printable lines per page to any value between 0 and 255. The value of this option is the last line on the page at which the ULTRA II will allow any character to be printed before sending a form feed. The default value is 0, which implies an infinite page length.

Note: To avoid unexpected formatting results, this option should be set to infinite page length if any of the following are true.

    ▲ the user or the user's application embeds escape sequences in the data stream

    ▲ the user or the user's application embeds transparency or pseudo transparency strings in the data stream

    ▲ the user embeds ULTRA II commands (configuration, translate table or PFS commands) within print jobs

Refer to Section 8 — DisplayWrite 370 Support for more information.

3 — Line Spacing

▲ **Range= 001-009**

▲ **Default= 001**

This option allows the user to set line spacing to any value between 1 and 9. Any line feeds received from the coax host or sent out by the ULTRA II are multiplied by the value of this option. The default is 1 (single spacing).

4 — Local Copy Null Line Suppression

▲ **Range= Y/N**

▲ **Default= Y**

In a local copy or DSC print job, this option determines whether or not lines containing only nulls are printed. The default value is "Yes."

5 — Xerox 36 Hex Transparency

▲ **Range= Y/N**

▲ **Default= N**

If this option is set to "Yes," Xerox 36 Hex transparency is enabled. If this

option is set to "No," 36h will be ignored. The default value is "No." *Refer to Section 7 — Transparency Modes for more information.*

Note: If this option is set to "Yes," Option #1 — Column width should be set to 0 (infinite line length), Option #2 — Lines Per Page should be set to 0 (infinite page length), and Option #15 — Bold Print Emulation should be set to C (none). Otherwise, unpredictable formatting errors could occur. Refer to Section 12 — DisplayWrite 370 Support for more information.

6 — Form Feed Before Local Copy

▲ **Range= Y/N**

▲ **Default= N**

Determines whether or not a form feed will be sent to the printer before beginning a local copy. The default value is "No."

7 — Form Feed After Local Copy

▲ **Range= Y/N**

▲ **Default= Y**

Determines whether or not a form feed will be sent to the printer after finishing a local copy. The default value is "Yes."

8 — New Line Order

▲ **Range= A-B**

▲ **Default= A**

Determines whether new lines will be sent to the printer as: (A) CR/LF (a carriage return followed by a line feed) or as (B) LF/CR. The default is (A).

9 — Reserved

This option is reserved.

10 — Output in ASCII or EBCDIC

▲ **Range= A-B**

▲ **Default= A**

Some printer types (such as Xerox 4045s) can accept EBCDIC data. This option determines whether the ULTRA II outputs data in the (A) ASCII or (B) EBCDIC character set.

11 — Reserved

This option is reserved

12 — Reserved

This option is reserved.

13 — Reserved

This option is reserved.

14 — Reserved

This option is reserved.

15 — Bold Print Emulation

▲ **Range= A-C**

▲ **Default= C**

Determines how the ULTRA II implements bold printing. The choices are: (A) 3287 printer emulation, (B) DisplayWrite 370 emulation or (C) None. The default value is (C). *For more information, refer to section 8 — DisplayWrite 370 Support.*

Note: To avoid unexpected formatting results, this option should be set to

C (none) if any of the following are true:

▲ the user or the user's application embeds escape sequences in the data stream

▲ the user or the user's application embeds transparency or pseudo transparency strings in the data stream

▲ the user embeds ULTRA II commands (configuration, translate table or PFS commands) within print jobs

▲ Option #1 — Column Width is set to 0 (infinite line length)

Refer to Section 8 — DisplayWrite 370 Support for more information:

16 — Reserved

This option is reserved.

17 — Reserved

This option is reserved.

18 — Reserved

This option is reserved.

19 — Reserved

This option is reserved.

20 — Reserved

This option is reserved.

21 — Reserved

This option is reserved.

22 — Reserved

This option is reserved.

23 — Reserved

This option is reserved.

24 — Reserved

This option is reserved.

25 — Reserved

This option is reserved.

26 — Intervention Required

▲ **Range= Y/N**

▲ **Default= Y**

The host should be informed when a problem is detected with the printer or the protocol converter. This option determines whether or not the ULTRA II transmits an Intervention Required message to the coax host when a printer fault (e.g., out of paper) is reported by the printer. The default value is "Yes."

Coax host systems react differently to Intervention Required. In some cases, the printer may be disabled until a command is sent to reacquire the printer and printing can restart either at page 1, from the top of the page where the intervention occurred, or from where the printing stopped.

If the handling of intervention is causing a problem, the best solution is to change the way in which the system responds to it. For example, since laser printers buffer all data received, it is not necessary to retransmit any data from a previous page. The system should be configured to halt when an Intervention Required is received, so when the error condition is cleared, the system will continue transmitting from where it left off.

Intervention Required can be disabled to prevent the error message from being sent, or a delay can be set to give the user time to fix the problem.

27 — Intervention Required Delay

▲ **Range= 0-255**

▲ **Default= 010**

This option determines how many minutes the ULTRA II will wait after receiving a printer fault indication before sending an Intervention Required message to the coax host (if Option #26 is set to "Yes"). If the problem is minor, such as a paper jam, the user may correct the problem before it needs to be reported. The user may select any value between 0 (immediate) and 255. The default value is 10 minutes.

28 — Reserved

This option is reserved.

29 — Reserved

This option is reserved.

30 — Pseudo Transparency Mode (PTM) Selection

▲ **Range= A-B**

▲ **Default= A**

Determines which of two methods will be used to begin pseudo transparency mode: (A) Trigger 1 + Trigger 2 or (B) Trigger 1 + Count Byte. The default value is (A). *Refer to Section 7 — Transparency Modes for more information.*

31 — Discard PTM Terminating Delimiter

▲ **Range= Y/N**

▲ **Default= N**

Determines whether or not the ULTRA II, when Option #30 is set to (A) Trigger 1 + Trigger 2 PTM, will discard the character that terminates PTM (i.e., the first hexadecimal character that is outside the range of 0-9 or A-F). The default value is "No." *Refer to Section 7 — Transparency Modes for more information.*

32 — DSC Trigger 1

▲ **Range= Hex Value**

▲ **Default= 1B**

Determines which DSC character will be used (in conjunction with either Trigger 2 or a Count Byte, depending upon the setting of Option #30) to signal the start of PTM. The user may enter any two-character hexadecimal value that will not otherwise be found in the data stream. The default value is a DSC cent sign (¢) 1Bh. *Refer to Section 7 — Transparency Modes for more information.* This character is also used as a trigger for configuring the ULTRA II, invoking PFSs and programming PFSs from the coax host.

Note: The Trigger 1 character should be reserved for this use only. Any other use of the Trigger 1 character may produce unpredictable results.

33 — DSC Trigger 2

▲ **Range= Hex Value**

▲ **Default= 1A**

Determines which DSC character must follow Trigger 1 in order to start PTM when Option #30 is set to (A). The user may enter any two-character hexadecimal value, except for 18h (?), 2Eh (%), 19h (!) and 30h (&), which are used by the ULTRA II for other purposes. The default value is a DSC dollar sign ($) 1Ah. *Refer to Section 7 — Transparency Modes for more information.*

34 — SCS Trigger 1

▲ **Range= Hex Value**

▲ **Default= 4A**

Determines which SCS character will be used (in conjunction with either Trigger 2 or a Count Byte, depending upon the setting of Option #30) to signal the start of PTM. The user may enter any two-character hexadecimal value that will not otherwise be found in the data stream. The default value is an SCS cent sign (¢) 4Ah. *Refer to Section 7 — Transparency Modes for more information*. This character is also used as a trigger for configuring the ULTRA II, invoking PFSs and programming PFSs from the coax host.

Note: The Trigger 1 character should be reserved for this use only. Any other use of the Trigger 1 character may produce unpredictable results.

35 — SCS Trigger 2

▲ **Range= Hex Value**

▲ **Default= 5B**

Determines which SCS character must follow Trigger 1 in order to start PTM when Option #30 is set to (A). The user may enter any two-character hexadecimal value, except for 6Fh (?), 6Ch (%), 5Ah (!) and 50h (&), which are used by the ULTRA II for other purposes. The default value is an SCS dollar sign ($) 5Bh. *Refer to Section 7 — Transparency Modes for more information.*

36 — Reserved

This option is reserved.

37 — Reserved

This option is reserved.

38 — Reserved

This option is reserved.

39 — Transparency Trigger 1 Output

▲ **Range= Hex Value**

▲ **Default= 9B**

Determines the character that will be sent to the printer when Option #30 is set to (A) and the Trigger 1 character is not followed by the Trigger 2 character. The user may enter any two-character hexadecimal value. The default value is 9Bh. *Refer to Section 7 — Transparency Modes for more information.*

40 — Reserved

This option is reserved.

41 — Reserved

This option is reserved.

42 — Reserved

This option is reserved.

43 — Reserved

This option is reserved.

44 — Reserved

This option is reserved.

45 — Reserved

This option is reserved.

46 — Reserved

This option is reserved

47 — Reserved

This option is reserved.

48 — Reserved

This option is reserved.

49 — Eliminate DSC C0 05 Header

▲ **Range= Y/N**

▲ **Default= N**

Some applications send these two DSC characters to the printer, but they have no significance. When this option is set to "Yes," C0 05 sequences are ignored. The default value is "No."

50 — Reserved

This option is reserved.

51 — DSC EM Generates CR/LF in Infinite Line Length

▲ **Range= Y/N**

▲ **Default= N**

IBM specifies that the EM (End of Message) character will have the effect of sending a CR/LF to the printer when the printhead is in any column other than column one. Setting this option to "No" causes the ULTRA II to conform to this IBM specification, while setting it to "Yes" causes a CR/LF to be sent to the printer whenever an EM is received, regardless of the printhead position. The default value is "No." This option has no effect unless Option #1 (Column Width) has been set to 0, implying an infinite line length. *Refer to Section 11 — DSC Data Streams for more information.*

52 — SCS EM Always Generates CR/LF

▲ **Range= Y/N**

▲ **Default= N**

IBM specifications state that the EM (End of Message) character will have the effect of sending a CR/LF to the printer when the printhead is in any column other than column one. Setting this option to "No" causes the ULTRA II to conform to this IBM specification, while setting it to "Yes" causes a CR/LF to be sent to the printer whenever an EM is received, regardless of the printhead position. The default value is "No." *Refer to Section 10 — SCS Data Streams for more information.*

53 — IBM 35 Hex Transparency

▲ **Range= Y/N**

▲ **Default= N**

If this option is set to "Yes," 35 Hex transparency is enabled. If set to "No," 35h will be ignored. The default value is "No." *Refer to Section 7 — Transparency Modes for more information.*

Note: If this option is set to "Yes," Option #1 — Column width should be set to 0 (infinite line length), Option #2 — Lines Per Page should be set to 0 (infinite page length), and Option #15 — Bold Print Emulation should be set to C (none). Otherwise, unpredictable formatting errors could occur. Refer to Section 8 — DisplayWrite 370 Support for more information.

54 — Reserved

This option is reserved

55 — MD-Laser Support

▲ **Range= Y/N**

▲ **Default= N**

Determines whether or not the ULTRA II will provide Maersk Data Products continuous escape support. Select "Yes" if using Maersk Data software. If this option is set to "Yes," when the three-character sequence "Esc C 2" is detected in the data stream, the hexadecimal value of the character pairs following the sequence will be sent to the printer until a terminator (Esc) is detected. The default value is "No." *Refer to Section 7 — Transparency Modes for more information.*

Note: If this option is set to "Yes," Option #1 — Column width should be set to 0 (infinite line length), Option #2 — Lines Per Page should be set to 0 (infinite page length), and Option #15 — Bold Print Emulation should be set to C (none). Otherwise, unpredictable formatting errors could occur. Refer to Section 8 — DisplayWrite 370 Support for more information.

56 — Reserved

This option is reserved.

57 — DSC NL at EM Even If in Column 1

▲ **Range= Y/N**

▲ **Default= N**

IBM specifications state that the EM (End of Message) character will have the effect of sending a CR/LF to the printer when the printhead is in any column other than column one. Setting this option to "No" causes the ULTRA II to conform to this IBM specification, while setting it to "Yes" causes a CR/LF to be sent to the printer whenever an EM is received, regardless of the printhead position. The default value is "No." *Refer to Section 11 — DSC Data Streams for more information.*

58 — Metacode Support

▲ **Range= Y/N**

▲ **Default= N**

Metacode is a variation of 35 Hex transparency. If this option is set to "Yes," Metacode support is enabled. If set to "No," 35h will be ignored. The default value is "No." R*efer to Section 11 — Transparency Modes and Section 12 — Xerox Applications for more information.*

Note: If this option is set to "Yes," Option #1 — Column width should be set to 0 (infinite line length), Option #2 — Lines Per Page should be set to 0 (infinite page length), and Option #15 — Bold Print Emulation should be set to C (none). Otherwise, unpredictable formatting errors could occur. Refer to Section 8 — DisplayWrite 370 Support for more information.

59 — Laserpage Support

▲ **Range= Y/N**

▲ **Default= N**

Determines whether or not the ULTRA II supports Laserpage, a software product that allows IBM AFP data streams to be printed to Xerox and Hewlett-Packard laser printing systems. Laserpage uses a transparency mode similar to pseudo transparency mode, but with repeat count capabilities. The default value is "No." If using Laserpage, set this option to "Yes." *Refer to Section 7 — Transparency Modes for more information.*

Note: If this option is set to "Yes," Option #1 — Column width should be set to 0 (infinite line length), Option #2 — Lines Per Page should be set to 0 (infinite page length), and Option #15 — Bold Print Emulation should be set to C (none). Otherwise, unpredictable formatting errors could occur. Refer to Section 8 — DisplayWrite 370 Support for more information.

60 — Xerox Graphic Window Support

▲ **Range= Y/N**

▲ **Default= Y (ULTRA II with XES option)**
              N (Standard ULTRA II)

Determines whether or not the ULTRA II supports Graphic Windows, a feature of Xerox printers. The default is value "No." *Refer to Section 12 — Xerox Applications for more information.*

Note: This option must be set to "No" if EBCDIC output is selected using Option #10-B or 10-C.

61 — Reserved

This option is reserved.

62 — Allow EBCDIC Font Downloading

▲ **Range= Y/N**

▲ **Default= Y** (Standard ULTRA II)
          N (ULTRA II with XES option)

Determines whether or not the ULTRA II supports the downloading of Xerox EBCDIC fonts. The default value is "Yes." *Refer to Section 12 — Xerox Applications for more information.*

Note: This option must be set to "No" if EBCDIC output is selected using Option #10-B or 10-C.

ULTRA II Configuration Options Table

The following table lists the ULTRA II General Configuration Options, the valid range of values for each option, and the default value for each option.

#	Configuration Description	Valid Range	Default Value
1	Column Width	0-255	132
2	Lines Per Page	0-255	0
3	Line Spacing	1-9	1
4	Null Line Suppression	Y,N	Y
5	Xerox 36h Transparency	Y,N	N
6	Form Feed Before Local Copy	Y,N	N
7	Form Feed After Local Copy	Y,N	Y
8	New Line Sequence CR/LF or LF/CR	A,B	A (CR/LF)

9	Reserved		
10	Output in ASCII or EBCIIC	A,B	A (ASCII)
11	Reserved		
12	Reserved		
13	Reserved		
14	Reserved		
15	Bold Emulation	A-C	C (None)
16	Reserved		
17	Reserved		
18	Reserved		
19	Reserved		
20	Reserved		
21	Reserved		
22	Reserved		
23	Reserved		
24	Reserved		
25	Reserved		
26	Intervention Required	Y,N	Y
27	Intervention Required Delay	0-255	10 (minutes)
28	Reserved		
29	Reserved		
30	Pseudo Transparency Mode	A,B	A
31	Discard Transparency Delimiter	Y,N	N

32	DSC Transparency Trigger 1	HEX	1B
33	DSC Transparency Trigger 2	HEX	1A
34	SCS Transparency Trigger 1	HEX	4A
35	SCS Transparency Trigger 2	HEX	5B
36	Reserved		
37	Reserved		
38	Reserved		
39	Transparency Trigger 1 Output	HEX	9B
40	Reserved		
41	Reserved		
42	Reserved		
43	Reserved		
44	Reserved		
45	Reserved		
46	Reserved		
47	Reserved		
48	Reserved		
49	C005 Header Elimination	Y,N	N
50	Reserved		
51	NL at DSC EM Even in Infinite	Y,N	N
52	Ignore SCS EM if in Column 1	Y,N	N
53	Ignore 35h Transparency	Y,N	N
54	Reserved		

55	MD-Laser Supported	Y,N	N
56	Reserved		
57	NL at DSC EM Even in Column 1	Y,N	N
58	Metacode Supported	Y,N	N
59	Laserpage Supported	Y,N	N
60	Xerox Graphic Window Supported	Y,N	Y
61	Reserved		
62	Allow EBCDIC Font Downloads	Y,N	Y

Functional Grouping of ULTRA II Options

The ULTRA II is a dynamic product that is constantly evolving to suit the requirements of the ever-changing environment in which it performs its task. As it has changed, new options have been added with the result that the numerical listing of its functions does not correspond to functional groups. The following lists the options of the ULTRA II in functional groups, so the user can better understand how to configure the unit for the user's specific environment.

Printer Output

Option 10 — Output in ASCII or EBCDIC

Page Formatting

Option 1 — Column Width

Option 2 — Lines Per Page

Option 3 — Line Spacing

SCS Options

Option 5 — Xerox 36 Hex Transparency

Option 34 — SCS Trigger 1

Option 35 — SCS Trigger 2

Option 52 — SCS EM Always Generates CR/LF

Option 53 — IBM 35 Hex Transparency

Option 58 — Metacode Support

DSC Options

Option 32 — DSC Trigger 1

Option 33 — DSC Trigger 2

Option 49 — Eliminate DSC C0 05 Header

Option 51 — DSC EM Generates CR/LF in Infinite Line Length

Option 57 — DSC NL at EM Even If in Column 1

Local Copy Page Formatting

Option 4 — Local Copy Null Line Suppression

Option 6 — Form Feed Before Local Copy

Option 7 — Form Feed After Local Copy

Host Parameters

Option 26 — Intervention Required

Option 27 — Intervention Required Delay

Transparency Modes

Option 5 — Xerox 35 Hex Transparency

Option 30 — Pseudo Transparency Mode (PTM) Selection

Option 31 — Discard PTM Terminating Delimiter

Option 32 — DSC Trigger 1

Option 33 — DSC Trigger 2

Option 34 — SCS Trigger 1

Option 35 — SCS Trigger 2

Option 39 — Non-Transparency Trigger 1 Output

Option 53 — IBM 35 Hex Transparency

Option 55 — MD-Laser Support

Option 58 — Metacode Support

Option 59 — Laserpage Support

Custom Configuration

Option 8 — New Line Order

Option 15 — Bold Print Emulation

Option 49 — Eliminate DSC C0 05 Header

Option 55 — MD Laser Support

Option 58 — Metacode Support

Option 59 — Laserpage Support

Option 60 — Xerox Graphic Window Support

Option 62 — Allow EBCDIC Font Downloading

PROGRAMMABLE FUNCTION STRINGS

General Information

Programmable function strings (PFSs) provide a means of storing frequently used printer data and instruction strings and sending them to the printer. PFSs are used by the ULTRA II to implement special features found on a variety of printers. These features include bolding, underlining, overstriking, etc.

The ULTRAII sends the appropriate PFS to the printer whenever some special formatting or control function is required. PFSs are sometimes sent to the printer automatically in response to a host command, sometimes in response to the characteristics of the data stream, and sometimes as a response to a trigger that the user has embedded in the data stream. For example, the ULTRA II looks up the contents of PFS 8 — Bold On and sends it to the printer if: a) the system requests bolding; b) Option #15 — Bold Print Emulation is set to (A) 3287 emulation or (B) DisplayWrite emulation and a *[character-backspace-same character]* sequence is detected in the data stream; or c) the user has placed the command **¢&8** *[Trigger 1-Ampersand-PFS#]* in the data stream.

Programming the PFSs is necessary to access the printer's special functions. Refer to the printer user's manual for a list of escape sequences that control the printer. *Refer to Section 6 — Coax Host Configuration for information on programming PFSs.*

The user may also want to use the ULTRA II PFSs in a way not anticipated by AGILE. Any of the PFS slots may programmed or reprogrammed with custom command strings.

The Ultra II is shipped from the factory configured for use in most printing environments. There are two sections that may require configuration: The Coax General Configuration and the optional XES2PCL PDL conversion.

This section describes each of the parameters of the Coax General Configuration Options that the user can select to adapt the Ultra II to a specific environment.

The Ultra II may be configured by sending a configuration file from the mainframe, via a cluster controller "Local Copy" or "Screen Print", or loading a configuration through the parallel Alternate Host port.

Mainframe configuration of the Ultra II requires that a print file containing the desired option changes be created and sent to the Ultra II as if it were a normal print job.

All configuration command strings in the file must begin and end with the character string "¢?¢"(please refer to the appropriate character set table for the correct hexadecimal value). The character sequence to change an option is comprised of the characters "¢?" followed by the option number, followed by "=", followed by the new value for the option. All characters must be upper case. All command sequences are terminated with a semicolon (;).

For example:

¢?¢   (required start string)

¢?01=255;   (sets option #01, Column Width to 255)

¢?¢   (required ending string)

If an invalid configuration sequence is entered, a download error message will be printed. An invalid option number causes the following message to print:

     "DOWNLOAD ERROR - BAD OPTION FIELD VALUE

An invalid range value causes the following message to print:

     "DOWNLOAD ERROR - BAD DATA FIELD VALUE
      45 = X
      XXXXXXXX THROWN AWAY

Adding a comma at the end of the valid range value allows several option#=range sequences to be grouped together on one line. The line is terminated with a semicolon. For example:

     ¢?02=66,26=N,30=B;

Configuring the Ultra II via the Alternate Host port is done using the utility COAXCFG.EXE.

PFS Table

The following table shows the default function of each PFS along with its access number: (The user may print this table and record data strings)

PFS#	Default Function
0	Power On Sequence
1	
2	
3	
4	
5	
6	
7	
8	DisplayWrite 370 Bolding On
9	DisplayWrite 370 Bolding Off
A	
B	
C	
D	
E	
F	
G	
H	
I	

J

K

Accessing PFSs from the Host

All of the ULTRA II PFSs may be triggered by the user directly, rather than by the host application. To force an escape sequence from the coax host, simply key:

¢&n

where ¢ (the Trigger 1 default) is the trigger; an ampersand (&) tells the ULTRA II to send a PFS to the printer; and **n** is the number of the PFS to send. Here are some examples:

¢&0 send the Power On Sequence PFS to the printer

¢&2 set line density to 8 lines per inch

PFSs can be triggered at any appropriate place in the data stream, or the trigger sequence may be sent as a file print or as a local copy.

Note: If the user intends to trigger PFSs in the data stream of a print job, Option #1 — Column Width should be set to 0 (infinite line length), Option #2 — Lines Per Page should be set to 0 (infinite page length), and Option #15 — Bold Print Emulation should be set to C (none). Otherwise, unpredictable formatting errors could occur. Refer to Section 8 — DisplayWrite 370 Support for more information.

Multiple Function Strings

Programmable Function Strings may be set up so they will automatically execute additional PFSs. By including a plus sign (+) as the last character in a PFS, the ULTRA II will send that PFS *plus* the following PFS to the printer. For example, if PFS 3 is defined as:

[xx][xx][xx]+   (where [xx] represents a hexadecimal pair)

whenever PFS 3 is executed, the contents of both PFS 3 and PFS 4 will be sent to the printer.

By including a plus sign (+) *and* a PFS number as the last two characters in a PFS, the ULTRA II will send that PFS *plus* PFS *n* to the printer. For example, if PFS 2 is defined as:

[xx][xx][xx]+7   (where [xx] represents a hexadecimal pair)

whenever PFS 2 is executed, the contents of both PFS 2 and PFS 7 will be sent to the printer.

PFS Descriptions

The following is a complete list of PFSs currently offered. A description of when each PFS is triggered by the host application is included, although PFSs can also be triggered by the user at any time.

0 — Power On Sequence

The contents of the Power On Sequence PFS are sent to the printer each time the ULTRA II is powered on or RESET. The Power On Sequence is also sent to the printer when a **¢&0** *[Trigger 1-ampersand-zero]* that the user has embedded in the data stream is encountered by the ULTRA II.

8 — DisplayWrite 370 Bolding On or User-defined

If a *[character-backspace-same character]* sequence is detected in the data stream, this PFS is sent to the printer. *Note: This is used only when Option #15 — Bold Print Emulation is set to (A) 3287 emulation or (B) DisplayWrite 370 emulation.* The Bolding On PFS will also be sent to the printer when a **¢&9** *[Trigger 1-ampersand-nine]* that the user has embedded in the data stream is encountered by the ULTRA II. If the user is certain that the host never turns on bolding, or if Option #15 has been set to (C) None, the user may program this PFS for any purpose.

9 — DisplayWrite 370 Bolding Off or User-defined

If bolding was on previously and a *[character-non-backspace]* sequence is detected in the data stream, this PFS is sent to the printer. *Note: This is used only when Option #15 — Bold Print Emulation is set to (A) 3287 emulation or (B) DisplayWrite 370 emulation.* The Bolding Off PFS will also be sent to the printer when a **¢&A** *[Trigger 1-ampersand-A]* that the user has embedded in the data stream is encountered by the ULTRA II. If the user is certain that the host never turns off bolding, or if Option #15 has been set to (C) None, the user may program this PFS for any purpose.

TRANSLATE TABLES

General Information

The data stream from the coax host or alternate host is not sent directly through the ULTRA II to the attached printer. Rather, all characters must first pass through the appropriate character code translation table, even if the printer uses the same data format as the source device.

If the data formats of the two devices are different, a translation table is selected that will convert the data from one format to another. The most basic function of the ULTRA II is to convert EBCDIC (or coax host) data to ASCII data one byte at a time. Each translate table has 256 entries numbered 00 to FF. When a character is received by the ULTRA II, the corresponding character from the appropriate translate table is substituted, and that value is sent to the printer.

The ULTRA II uses twelve translate tables that can be modified by the user (although five are reserved). The tables are listed here with their table access number or letter:

Table #   Description

    1   **DSC to ASCII**

    2   **SCS to ASCII**

    3   **ASCII to ASCII (also used for the configuration report)**

    4   **DSC to EBCDIC**

    5   **SCS to EBCDIC**

    6   **ASCII to EBCDIC (also used for the configuration report)**

    7   **Reserved — Not used**

    8   **Reserved — Not used**

    9   **Reserved — SCS font download table**

    A   **Reserved — DSC font download table**

B **Reserved — Not used**

C **Reserved — Not used**

Translate tables can be modified from the coax host or from an alternate host. *Refer to Section 6 — Coax Host Configuration and Section 15 — Alternate Host Configuration for information.*

Note: Modifying translate tables should be attempted only by advanced users with a clear understanding of how the translate tables function.

Translate Table Selection

The ULTRA II determines the appropriate translation table to use based upon both the user's configuration of the ULTRA II and the data stream it receives.

The output (ASCII or EBCDIC) is determined by the user's configuration of the ULTRA II using configuration Option #10.

The input is detected by analysis of the data stream by the ULTRA II. When an EBCDIC character from the host arrives at the ULTRA II, it may be either DSC or SCS data. *See Section 10 — SCS Data Streams and Section 11 — DSC Data Streams for more information*. The table to be used is selected by the ULTRA II by combining the information from the input and output variables as follows:

Input:

▲ If the data stream is ASCII (from an alternate host), the appropriate translate table is 3 (for ASCII output) or 6 (for EBCDIC output).

▲ If the coax host data stream is in DSC format, the appropriate translate table is 1 (for ASCII output) or 4 (EBCDIC output).

▲ If the coax host data stream is in SCS format, the appropriate translate table is 2 (for ASCII output) or 5 (EBCDIC output).

Output:

▲ If the ULTRA II is configured for ASCII output, the

appropriate translate table is 1, 2 or 3.

▲ If the ULTRA II is configured for EBCDIC output, the
appropriate translate table is 4, 5 or 6.

Reading Translate Tables

A Translate Table Report, with the default values of the tables selected, can
be found in the Appendix.

The left column of each table is a series of numbers and letters representing
the most significant digit of the hexadecimal input character received by the
ULTRA II. The top row of each table is a series of numbers and letters
representing the least significant digit of the hexadecimal input character
received by the ULTRA II.

The intersection in the table of the most significant and least significant
digits of the input character is the location of the output value that the
ULTRA II sends to the printer upon receiving a given input character in the
data stream.

To understand the way that the translate tables work, look at Translate
Table 1 — DSC to ASCII. Find the output value for the hexadecimal input
character '3B.' Look down the left column and find the entry "3." Look
across the table until reaching the intersection of the column headed by "B."
The table shows that the output value for the input value of '3B' is '7E.'

General Considerations and Notes

ASCII is a seven-bit code with 128 possible characters (96 printable
characters and 32 control characters). The ULTRA II translates incoming
SCS and DSC (EBCDIC) characters directly into the appropriate seven-bit
ASCII character whenever possible. Two IBM characters, the cent sign (¢)
and the logical not (¬) are not found in seven-bit ASCII and are translated as
follows:

DSC	SCS	Symbol	Name	ASCII	Symbol	Name
36h	5Fh	¬	Logical Not	5Eh	^	Caret
1Bh	4Ah	¢	Cent Sign	*printer dependent*		

The actual characters displayed by a printer may vary depending upon the
printer manufacturer. For instance, when an ASCII 7Ch is received, some

printers will display a solid vertical line (|), while others will display a broken vertical line (¦). Many printers have their own version of eight-bit (extended) ASCII. Extended ASCII allows the printer to display up to 128 additional characters.

Functions

Some translate tables perform functions in addition to performing character translation. Each input hexadecimal character that performs a function is first translated into 05h. The function that is performed by the 05h character is determined by the location of the 05h in the table and is indicated by the code beneath each 05h entry in the table. Each function is listed below, including a description for each function that does not perform in a standard manner.

▲ **EM** (End of Message)

▲ **FF** (SCS or DSC Form Feed): Dependent upon the setting of Option #2 — Lines Per Page. If set to 0 (infinite page length), the ULTRA II will send a form feed whenever a form feed is received. If set to a nonzero value, the ULTRA II will output CR/LF until the lines per page value is reached.

▲ **NL** (New Line)

▲ **CR** (Carriage Return)

▲ **VCS** (SCS Vertical Channel Select)

▲ **HT** (SCS Horizontal Tab): Converted into the appropriate number of spaces to reach the next horizontal tab position.

▲ **LF** (Line Feed)

▲ **TRN** (Transparency)

▲ **BS** (Backspace)

▲ **ESC** (SCS Escape): When the SCS control sequence prefix 2Bh is received, it indicates the beginning of an SCS format command stream such as SHF, SVF, SLD, etc.

▲ **VT** (SCS Vertical Tab): Converted into the appropriate number of line feeds to reach the next vertical tab position.

▲ **GE** (Graphic Escape)

▲ **IRS** (SCS Interchange Record Separator)

▲ **NULL** (SCS or DSC Null): Output to the printer as a space.

▲ **SP** (Space)

▲ **SA** (SCS Set Attribute)

▲ **¢** (Trigger 1 character): Processing of the Trigger 1 character depends upon the setting of Option #30 — Pseudo Transparency Mode Selection.

Translate Table Charts

The following pages show all of the translate tables with their default values. An explanation of when each table is invoked by the ULTRA II is included, and a description of the functions performed by each table is provided.

Table 1 — DSC to ASCII Functions

This translate table is invoked when a DSC data stream is detected by the ULTRA II and when Option #10 is set to (A) ASCII.

During an unformatted operation, printing begins with the first data byte and continues until the last data byte is printed, or until a valid EM character is received. Each print line is left justified. At the end of each printout, a CR/LF is sent to allow the printer to start the next printout at the left margin. When an EM appears in the first print position of a print line, a CR/LF is not sent to the printer, because the printer is already positioned at the left margin for the next printout.

In DSC, 16h is a solid vertical line (|) and is translated into an ASCII 7Ch and sent to the printer. Some printers display a solid vertical line when a 7Ch is received, and some display a broken vertical line (¦). In DSC, 17h is a broken vertical line and is translated into extended ASCII 99h, an eight-bit ASCII character. This is compatible with Xerox laser printers.

DSC 31h is a hyphen (-), and is translated into an ASCII 2Dh. If DSC input codes for graphic characters, international character sets or non-translatable characters are found in the data, they will be translated into a hyphen.

Six locations in the DSC to ASCII table are used to perform functions. The

following chart indicates the function that will be performed upon the receipt of each DSC input value:

Input value   **Function**

        00h   Null
        01h   EM (End of Message)
        02h   FF (Form Feed)
        03h   NL (New Line)
        05h   CR (Carriage Return)
        10h   SP (Space)
        1Bh   ¢ (Trigger 1 character default)

Table 1 — DSC to ASCII

LS	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
MS	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00 0	05 NULL	05 EM	05 FF	05 NL	2D -	05 CR	2D -	2D -	3E ^	3C <	5B [	5D]	29)	28 (	7D }	7B {
16 1	05 SP	3D =	27 '	22 "	2F /	5C \	7C |	99 ¦	3F ?	21 !	24 $	05 ¢	2D -	2D -	2D -	2D -
32 2	30 0	31 1	32 2	33 3	34 4	35 5	36 6	37 7	38 8	39 9	2D -	15	23 #	40 @	25 %	5F _
48 3	26 &	2D -	2E .	2C ,	3A :	2B +	5E ^	2D -	2D -	2D -	5E ^	7E ~	2D -	60 `	27 '	2D -
64 4	2D -	2D -	2D -	2D -	2D -	2D -	2D -	2D -	2D -	2D -	2D -	2D -	2D -	2D -	2D -	2D -
80 5	2D -	2D -	2D -	2D -	2D -	2D -	2D -	2D -	2D -	2D -	2D -	2D -	2D -	2D -	2D -	2D -
96 6	2D -	2D -	2D -	2D -	2D -	2D -	2D -	2D -	2D -	2D -	2D -	2D -	2D -	2D -	2D -	2D -
112 7	2D -	2D -	2D -	2D -	2D -	2D -	2D -	2D -	2D -	2D -	2D -	2D -	2D -	2D -	2D -	2D -
128 8	61 a	62 b	63 c	64 d	65 e	66 f	67 g	68 h	69 i	6A j	6B k	6C l	6D m	6E n	6F o	70 p
144 9	71 q	72 r	73 s	74 t	75 u	76 v	77 w	78 x	79 y	7A z	2D -	2D -	2D -	2D -	2D -	2D -
160 A	41 A	42 B	43 C	44 D	45 E	46 F	47 G	48 H	49 I	4A J	4B K	4C L	4D M	4E N	4F O	50 P
176 B	51 Q	52 R	53 S	54 T	55 U	56 V	57 W	58 X	59 Y	5A Z	2D -	2D -	2D -	2D -	3B ;	2A *
192 C	20 SP	20 SP	20 SP	20 SP	20 SP	20 SP	20 SP	20 SP	20 SP	20 SP	20 SP	20 SP	20 SP	20 SP	20 SP	20 SP
208 D	20 SP	20 SP	20 SP	20 SP	20 SP	20 SP	20 SP	20 SP	20 SP	20 SP	20 SP	20 SP	20 SP	20 SP	20 SP	20 SP
224 E	20 SP	20 SP	20 SP	20 SP	20 SP	20 SP	20 SP	20 SP	20 SP	20 SP	20 SP	20 SP	20 SP	20 SP	20 SP	20 SP
240 F	20 SP	20 SP	20 SP	20 SP	20 SP	20 SP	20 SP	20 SP	20 SP	20 SP	20 SP	20 SP	20 SP	20 SP	20 SP	20 SP

Table 2 — SCS to ASCII Functions

Translate Table 2 is invoked when the ULTRA II detects an SCS data stream and when Option #10 is set to (A) ASCII.

SCS input code 40h is the SCS space character. Other SCS input codes representing attributes or graphic characters will be translated into a space (ASCII 20h). This emulates the functions of a 3287 printer.

SCS 5Eh is the logical not (¬) and is translated into ASCII 5Eh, the caret (^) symbol.

SCS 60h is a hyphen (-) and is translated into an ASCII 2Dh. If SCS input codes for graphic characters, international character sets or non-translatable characters are found in the data, they will be translated into a hyphen.

Fourteen locations in the SCS to ASCII table are used to perform functions. The following chart indicates the function that will be performed upon the receipt of each SCS input value:

Input value	Function
04h	VCS (Vertical Channel Select)
05h	HT (Horizontal Tab)
08h	GE (Graphic Escape)
0Bh	VT (Vertical Tab)
0Ch	FF (Form Feed)
0Dh	CR (Carriage Return)
15h	NL (New Line)
16h	BS (Backspace)
19h	EM (End of Message)
1Eh	IRS (Interchange Record Separator)
25h	LF (Line Feed)

28h   SA (SCS Set Attribute)

2Bh   ESC (SCS Escape)

35h   TRN (Transparency)

4Ah   ¢ (Trigger 1 character default)

Table 2 — SCS to ASCII

LS	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
MS	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00 / 0	20 SP	20 SP	20 SP	20 SP	05 VCS	05 HT	20 SP	20 SP	05 GE	20 SP	20 SP	05 VT	05 FF	05 CR	20 SP	20 SP
16 / 1	20 SP	20 SP	20 SP	20 SP	20 SP	05 NL	05 BS	20 SP	20 SP	05 EM	20 SP	20 SP	20 SP	20 SP	05 IRS	20 SP
32 / 2	20 SP	20 SP	20 SP	20 SP	20 SP	05 LF	20 SP	1B ESC	20 SP	20 SP	20 SP	05 ESC	20 SP	20 SP	20 SP	20 SP
48 / 3	20 SP	20 SP	20 SP	20 SP	20 SP	05 TRN	20 SP	20 SP	20 SP	20 SP	20 SP	20 SP	20 SP	20 SP	20 SP	20 SP
64 / 4	20 SP	2D -	2D -	2D -	2D -	2D -	2D -	2D -	2D -	2D -	05 ¢	2E .	3C <	28 (	2B +	7C |
80 / 5	26 &	2D -	2D -	2D -	2D -	2D -	2D -	2D -	2D -	2D -	21 !	24 $	2A *	29)	3B ;	5E ^
96 / 6	2D -	2F /	2D -	2D -	2D -	2D -	2D -	2D -	2D -	2D -	7C |	2C ,	25 %	5F _	3E >	3F ?
112 / 7	2D -	2D -	2D -	2D -	2D -	2D -	2D -	2D -	2D -	60 `	3A :	23 #	40 @	27 '	3D =	22 "
128 / 8	2D -	61 a	62 b	63 c	64 d	65 e	66 f	67 g	68 h	69 i	2D -	2D -	2D -	2D -	2D -	2D -
144 / 9	2D -	6A j	6B k	6C l	6D m	6E n	6F o	70 p	71 q	72 r	2D -	2D -	2D -	2D -	2D -	2D -
160 / A	2D -	7E *!	73 s	74 t	75 u	76 v	77 w	78 x	79 y	7A z	2D -	2D -	2D -	5B [	2D -	2D -
176 / B	2D -	2D -	2D -	2D -	2D -	2D -	2D -	2D -	2D -	2D -	2D -	2D -	2D -	5D]	2D -	2D -
192 / C	7B {	41 A	42 B	43 C	44 D	45 E	46 F	47 G	48 H	49 I	2D -	2D -	2D -	2D -	2D -	2D -
208 / D	7D }	4A J	4B K	4C L	4D M	4E N	4F O	50 P	51 Q	52 R	2D -	2D -	2D -	2D -	2D -	2D -
224 / E	5C \	2D -	53 S	54 T	55 U	56 V	57 W	58 X	59 Y	5A Z	2D -	2D -	2D -	2D -	2D -	2D -
240 / F	30 0	31 1	32 2	33 3	34 4	35 5	36 6	37 7	38 8	39 9	2D -	2D -	2D -	2D -	2D -	2D -

Table 3 — ASCII to ASCII

Translate Table 3 is a pass-through table used to send alternate host data to a printer using the ASCII character set. It is invoked when the ULTRA II detects an ASCII data stream and when Option #10 is set to (A) ASCII.

This table is also used to pass through the configuration report (created in ASCII) to an ASCII printer when Option #10 is set to (A) ASCII. If this table is modified by the user, the configuration report sent to the printer will be affected.

Table 3 — ASCII to ASCII

LS	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
MS	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00 0	00 NULL	01 SOH	02 STX	03 ETX	04 EOT	05 ENQ	06 ACK	07 BEL	08 BS	09 HT	0A LF	0B VT	0C FF	0D CR	0E SO	0F SI
16 1	10 DLE	11 DC1	12 DC2	13 DC3	14 DC4	15 NAK	16 SYN	17 ETB	18 CAN	19 EM	1A SUB	1B ESC	1C FS	1D GS	1E RS	1F US
32 2	20 SP	21 !	22 "	23 #	24 $	25 %	26 &	27 '	28 (	29)	2A *	2B +	2C ,	2D -	2E .	2F /
48 3	30 0	31 1	32 2	33 3	34 4	35 5	36 6	37 7	38 8	39 9	3A :	3B ;	3C <	3D =	3E >	3F ?
64 4	40 @	41 A	42 B	43 C	44 D	45 E	46 F	47 G	48 H	49 I	4A J	4B K	4C L	4D M	4E N	4F O
80 5	50 P	51 Q	52 R	53 S	54 T	55 U	56 V	57 W	58 X	59 Y	5A Z	5B [	5C \	5D]	5E ^	5F _
96 6	60 `	61 a	62 b	63 c	64 d	65 e	66 f	67 g	68 h	69 i	6A j	6B k	6C l	6D m	6E n	6F o
112 7	70 p	71 q	72 r	73 s	74 t	75 u	76 v	77 w	78 x	79 y	7A z	7B {	7C		7D }	7E ~	7F DEL
128 8	80	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F
144 9	90	91	92	93	94	95	96	97	98	99	9A	9B	9C	9D	9E	9F
160 A	A0	A1	A2	A3	A4	A5	A6	A7	A8	A9	AA	AB	AC	AD	AE	AF
176 B	B0	B1	B2	B3	B4	B5	B6	B7	B8	B9	BA	BB	BC	BD	BE	BF
192 C	C0	C1	C2	C3	C4	C5	C6	C7	C8	C9	CA	CB	CC	CD	CE	CF
208 D	D0	D1	D2	D3	D4	D5	D6	D7	D8	D9	DA	DB	DC	DD	DE	DF
224 E	E0	E1	E2	E3	E4	E5	E6	E7	E8	E9	EA	EB	EC	ED	EE	EF
240 F	F0	F1	F2	F3	F4	F5	F6	F7	F8	F9	FA	FB	FC	FD	FE	FF

Table 4 — DSC to EBCDIC

Translate Table 4 is invoked when a DSC data stream is detected by the ULTRA II and when Option #10 is set to (B) EBCDIC.

During an unformatted operation, printing begins with the first data byte and continues until the last data byte is printed, or until a valid EM character is received. Each print line is left justified. At the end of each printout, a CR/LF is sent to allow the printer to start the next printout at the left margin. When an EM appears in the first print position of a print line, a CR/LF is not sent to the printer, because the printer is already positioned at the left margin for the next printout.

In DSC, 16h is a solid vertical line (|) and is translated into an EBCDIC 4Fh and sent to the printer. Some printers display a solid vertical line when a 4Fh is received, and some display a broken vertical line (¦). In DSC, 17h is a broken vertical line and is translated into extended ASCII 6Ah, an eight-bit ASCII character. This is compatible with Xerox laser printers.

The DSC input codes C0h through FFh represent attributes or graphic characters associated with 3278 CRTs. The characters will be translated into a space (EBCDIC 40h). This emulates the function of a 3287 printer.

Seven locations in the DSC to EBCDIC table are used to perform functions. The following chart indicates the function that will be performed upon the receipt of each DSC input value:

Input value	Function
00h	Null
01h	EM (End of Message)
02h	FF (Form Feed)
03h	NL (New Line)
05h	CR (Carriage Return)
10h	Space
1Bh	¢ (Trigger 1 character default)

Table 4 — DSC to EBCDIC

LS		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
MS		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	0	05 NULL	05 EM	05 FF	05 NL	60 -	05 CR	ED	EE	6E >	4C <	AD [	BD]	5D)	4D (	D0 }	C0 {
16	1	05 SP	7E =	7D '	7F "	61 /	E0 \	4F |	6A ¦	6F ?	5A !	5B $	05 ¢	43	44	45	46
32	2	F0 0	F1 1	F2 2	F3 3	F4 4	F5 5	F6 6	F7 7	F8 8	F9 9	47	48	7B #	7C @	6C %	6D
48	3	50 &	60 -	4B .	6B ,	7A :	4E +	5F	49	51	52	53	A1 ~	54	79	55	56
64	4	57	58	59	62	63	64	65	66	67	68	69	70	CE	CF	DD	DE
80	5	75	76	77	78	80	8A	8B {	8C <	8D (*	8E +*	8F	90	9A	98)	9C	9D)*
96	6	9E +	9F	A0 _*	AA	AB	AC	41	AE	AF	B0 0*	B1 1*	B2 2*	B3 3*	B4 4*	B5 5*	B6 6*
112	7	B7 7*	B8 8*	B9 9*	BA	BB	BC	42	BE	BF	CA	CB	CC	CD	DF	DB	DC
128	8	81 a	82 b	83 c	84 d	85 e	86 f	87 g	88 h	89 i	91 j	92 k	93 l	94 m	95 n	96 o	97 p
144	9	98 q	99 r	A2 s	A3 t	A4 u	A5 v	A6 w	A7 x	A8 y	A9 z	E1	EA	EB	EC	EF	FE
160	A	C1 A	C2 B	C3 C	C4 D	C5 E	C6 F	C7 G	C8 H	C9 I	D1 J	D2 K	D3 L	D4 M	D5 N	D6 O	D7 P
176	B	D8 Q	D9 R	E2 S	E3 T	E4 U	E5 V	E6 W	E7 X	E8 Y	E9 Z	FA	FB	FC	FD	5E ;	5C *
192	C	40 SP	40 SP	40 SP	40 SP	40 SP	40 SP	40 SP	40 SP	40 SP	40 SP	40 SP	40 SP	40 SP	40 SP	40 SP	40 SP
208	D	40 SP	40 SP	40 SP	40 SP	40 SP	40 SP	40 SP	40 SP	40 SP	40 SP	40 SP	40 SP	40 SP	40 SP	40 SP	40 SP
224	E	40 SP	40 SP	40 SP	40 SP	40 SP	40 SP	40 SP	40 SP	40 SP	40 SP	40 SP	40 SP	40 SP	40 SP	40 SP	40 SP
240	F	40 SP	40 SP	40 SP	40 SP	40 SP	40 SP	40 SP	40 SP	40 SP	40 SP	40 SP	40 SP	40 SP	40 SP	40 SP	40 SP

* indicates a superscript character.

Table 5 — SCS to EBCDIC

Translate Table 5 is invoked when an SCS data stream is detected by the ULTRA II and when Option #10 is set to (B) EBCDIC.

Thirteen locations in the SCS to EBCDIC table are used to perform functions. The following chart indicates the function that will be performed upon the receipt of each SCS input value:

Input value	Function
05h	HT (Horizontal Tab)
08h	GE (Graphic Escape)
0Bh	VT (Vertical Tab)
0Ch	FF (Form Feed)
0Dh	CR (Carriage Return)
15h	NL (New Line)
16h	BS (Backspace)
19h	EM (End of Message)
1Eh	IRS (Interchange Record Separator)
25h	LF (Line Feed)
28h	SA (SCS Set Attribute)
2Bh	ESC (SCS Escape)
35h	TRN (Transparency)
4Ah	¢ (Trigger 1 character default)

Table 5 — SCS to EBCDIC

LS		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
MS		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	0	00	01	02	03	04	05 HT	06	07	05 GE	09	0A	05 VT	05 FF	05 CR	0E	0F
16	1	10	11	12	13	14	05 NL	05 BS	17	18	05 EM	1A	1B	1C	1D	05 IRS	1F
32	2	20	21	22	23	24	05 LF	26	27	28	29	2A	05 ESC	2C	2D	2E	2F
48	3	30	31	32	33	34	05 TRN	36	37	38	39	3A	3B	3C	3D	3E	3F
64	4	40 SP	41	42	43	44	45	46	47	48	49	05 ¢	4B .	4C <	4D (	4E +	4F !
80	5	50 &	51	52	53	54	55 1/2	56 1/4	57	58	59	5A !	5B $	5C *	5D)	5E ;	5F \
96	6	60 -	61 /	62	63	64	65	66	67	68	69	6A ¦	6B ,	6C %	6D -	6E >	6F ?
112	7	70	71	72	73	74	75	76	77	78	79 `	7A :	7B #	7C @	7D '	7E =	7F "
128	8	80	81 a	82 b	83 c	84 d	85 e	86 f	87 g	88 h	89 i	8A	8B (	8C <	8D (*	8E +*	8F
144	9	90	91 j	92 k	93 l	94 m	95 n	96 o	97 p	98 q	99 r	9A	9B)	9C	9D)*	9E +	9F
160	A	A0 _*	A1 ~	A2 s	A3 t	A4 u	A5 v	A6 w	A7 x	A8 y	A9 z	AA	AB	AC	AD [	AE >	AF
176	B	B0 0*	B1 1*	B2 2*	B3 3*	B4 4*	B5 5*	B6 6*	B7 7*	B8 8*	B9 9*	BA	BB	BC	BD]	BE	BF _
192	C	C0 {	C1 A	C2 B	C3 C	C4 D	C5 E	C6 F	C7 G	C8 H	C9 I	CA	CB	CC	CD	CE	CF
208	D	D0 }	D1 J	D2 K	D3 L	D4 M	D5 N	D6 O	D7 P	D8 Q	D9 R	DA	DB	DC	DD	DE	DF
224	E	E0 \	E1	E2 S	E3 T	E4 U	E5 V	E6 W	E7 X	E8 Y	E9 Z	EA	EB	EC	ED	EE	EF
240	F	F0 0	F1 1	F2 2	F3 3	F4 4	F5 5	F6 6	F7 7	F8 8	F9 9	FA	FB	FC	FD	FE	FF

* indicates a superscript character.

Table 6 — ASCII to EBCDIC

Translate Table 6 is used to convert ASCII alternate host data sent to a printer using the EBCDIC character set. It is invoked when an ASCII data stream is detected by the ULTRA II and when Option #10 is set to (B) EBCDIC.

This table is also used to translate and download the configuration report (created in ASCII) to an EBCDIC printer when Option #10 is set to (B) EBCDIC. If this table is modified by the user, the configuration report sent to the printer will be affected.

Input value   **Function**

     09h   Tab

Table 6 — ASCII to EBCDIC

LS		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
MS		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	0	00	01	02	03	37	2D	15	2F	16	05	25	0B	0C	0D CR	0E	0F
16	1	10	11	12	13	3C	3D	32	26	18	19	3F	27	22	1D	1E	1F
32	2	40 SP	5A !	7F "	7B #	5B $	6C %	50 &	7D '	4D (	5D)	5C *	4E +	6B ,	60 -	4B .	61 /
48	3	F0 0	F1 1	F2 2	F3 3	F4 4	F5 5	F6 6	F7 7	F8 8	F9 9	7A :	5E ;	4C <	7E =	6E >	6F ?
64	4	7C @	C1 A	C2 B	C3 C	C4 D	C5 E	C6 F	C7 G	C8 H	C9 I	D1 J	D2 K	D3 L	D4 M	D5 N	D6 O
80	5	D7 P	D8 Q	D9 R	E2 S	E3 T	E4 U	E5 V	E6 W	E7 X	E8 Y	E9 Z	AD [	E0 \	BD]	B5 ^	6D _
96	6	79 `	81 a	82 b	83 c	84 d	85 e	86 f	87 g	88 h	89 i	91 j	92 k	93 l	94 m	95 n	96 o
112	7	97 p	98 q	99 r	A2 s	A3 t	A4 u	A5 v	A6 w	A7 x	A8 y	A9 z	C0 {	4F		D0 }	A1 ~	07
128	8	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -
144	9	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -
160	A	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -
176	B	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -
192	C	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -
208	D	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -
224	E	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -
240	F	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -	60 -

COAX HOST CONFIGURATION

General Information

This section describes how to configure the ULTRA II using a host-connected terminal. A local copy sent to the ULTRA II while in coax host configuration mode will alter the configuration selections listed in *Section 3 — Configuration Options*. Changes can also be made to the PFSs described in *Section 4 — Programmable Function Strings* and to the translate tables described in *Section 5 — Translate Tables*.

All configuration option sequences take the following format:

Trigger 1 (the cent sign ¢ is the default) - question mark (?) - option # - equals sign (=) - valid option parameter selection - terminator (;). No spaces are allowed in the command sequence.

For example, if Trigger 1 is the default cent sign (¢), the following sequence will set the number of lines per page (Option #2) to 51:

   ¢?2=51;

The cent sign (¢) is Trigger 1; the question mark (?) indicates that the following character sequence is a configuration option command; the numeral two (2) indicates that the configuration option to be defined is Option #2; the equals sign (=) is used to separate the option number from the valid option parameter value; the numeral fifty-one (51) is the value of the option parameter; and the semicolon (;) is the terminator.

Valid option parameters will be one of the following, depending upon the option:

   ▲ A decimal numeric value

   ▲ A two-character hexadecimal value

   ▲ The letter value of an option parameter (A- E)

   ▲ A "Y" for YES or an "N" for NO

After the user's selections are keyed on the screen, press the local copy key on the terminal. The ULTRA II will interpret each command and store the

new selections in its nonvolatile FLASH memory. This is a form of permanent storage that will hold the selections even when the unit is powered off.

The command sequences will not be printed. They will affect only the configuration of the ULTRA II.

Multiple Option Selections

The user can change the parameters of more than one option in a single line. Only one terminator per line is necessary to download option values. To download several option parameters on a single line, the user must separate each sequence with a comma (,) after each valid option parameter value.

The following example illustrates multiple command selection, where Trigger 1 is the default cent sign (¢). It sets the column width (Option #1) to 80, turns off local copy null line suppression (Option #4) and sets output (Option #10) to EBCDIC mode:

¢?1=80,4=N,10=B;

Multiple lines may be used to download configuration option parameters. Each line must have its own trigger and its own terminator.

Download Error Messages

Errors in command sequences will result in the ULTRA II sending a download error message to the printer.

DOWNLOAD ERROR - BAD OPTION FIELD VALUE

An invalid option number will result in the following message:

DOWNLOAD ERROR - BAD OPTION FIELD VALUE

If this message is printed, no change will take effect. The user must resend the command sequence with a valid option number. If the user was sending multiple command sequences to the ULTRA II, all valid option numbers will be changed, but the invalid option numbers will remain unchanged. A General Configuration Report must be printed to determine which of the options in the command sequences were valid and which were incorrect.

DOWNLOAD ERROR - BAD DATA FIELD VALUE

An invalid option parameter (a value outside the valid range for the option) will result in the following message. The example shown indicates that the parameter value for Option #45 was not in the valid range for that option:

> **DOWNLOAD ERROR - BAD DATA FIELD VALUE**
> **45=X**
> **X THROWN AWAY**

In the event that this message is printed, the user must resend the command sequence for Option #45 with a parameter value in the valid range for that option.

DOWNLOAD ERROR - BAD FIELD SEPARATOR

An invalid separator message indicates that the option number and the parameter value were not separated by an equals sign (=):

> **DOWNLOAD ERROR - BAD FIELD SEPARATOR**

Downloading Programmable Function Strings

PFS downloading commands take the following format:

Trigger 1 (the cent sign ¢ is the default) - percent sign (%) - PFS # - hexadecimal data pair(s) - percent sign (%). Note that the percent sign both initiates and terminates the downloading sequence. No spaces are allowed.

For example, if Trigger 1 is the default cent sign (¢), the following sequence will define the PFS 0 — Power On Sequence as the hexadecimal pairs 31h and 32h:

> **¢%03132%**

The cent sign (¢) is Trigger 1; the first percent sign (%) indicates that the following character sequence is a PFS configuration command; the numeral zero (0) indicates that the PFS to be defined is PFS 0; the numerals 31 and 32 are the hexadecimal pairs that will be sent to the printer when this PFS is invoked; and the second percent sign (%) is the terminator.

To replace the definition of a PFS, download a new definition. To delete a PFS, replace the definition with a space (the ASCII space character is 20h).

For example, the following sequence deletes the contents of PFS 0:

¢%020%

PFSs are restricted to a maximum of 76 characters.

Note: If the user intends to download PFS definitions within the data streams of print jobs, Option #1 — Column Width should be set to 0 (infinite line length), Option #2 — Lines Per Page should be set to 0 (infinite page length), and Option #15 — Bold Print Emulation should be set to C (none). Otherwise, unpredictable formatting errors could occur. Refer to Section 8 — DisplayWrite 370 Support for more information.

Multiple Function Strings

Programmable Function Strings may be set up so they will automatically execute additional PFSs. By including a plus sign (+) as the last character in a PFS, the ULTRA II will send that PFS *plus* the following PFS to the printer. For example, if PFS 3 is defined as:

[xx][xx][xx]+ (where [xx] represents a hexadecimal pair)

whenever PFS 3 is executed, the contents of both PFS 3 and PFS 4 will be sent to the printer.

By including a plus sign (+) *and* a PFS number as the last two characters in a PFS, the ULTRA II will send that PFS *plus* PFS *n* to the printer. For example, if PFS 2 is defined as:

[xx][xx][xx]+7 (where [xx] represents a hexadecimal pair)

whenever PFS 2 is executed, the contents of both PFS 2 and PFS 7 will be sent to the printer.

Downloading Translate Tables

All spaces, nulls and carriage control characters (CR, NL, LF, FF) will be ignored during translate table downloading. This allows the user to separate entries for easier reading, and it prevents the data from becoming corrupted by host forms control.

Note: If the user intends to download translate tables within the data streams of print jobs, Option #1 — Column Width should be set to 0

(infinite line length), Option #2 — Lines Per Page should be set to 0 (infinite page length), and Option #15 — Bold Print Emulation should be set to C (none). Otherwise, unpredictable formatting errors could occur. Refer to Section 8 — DisplayWrite 370 Support for more information.

Downloading an Entire Translate Table

Downloading an entire translate table will use the following format:

Trigger 1 (the cent sign ¢ is the default) - exclamation point (!) - translate table # - all 256 hexadecimal data pairs in the table, in order. The following example illustrates downloading the contents of Translate Table 1, where Trigger 1 is the default cent sign (¢) and where xx...xx represents the 256 values of a translate table:

¢!1xx...xx

Downloading a Single Translate Table Value

Downloading a change to a single translate table position value will use the following format:

Trigger 1 (the cent sign ¢ is the default) - exclamation point (!) - translate table # - hexadecimal position # - hexadecimal value - semicolon (;). The following example illustrates changing the value of Translate Table 1, position 16 to a value of 99h, where Trigger 1 is the default cent sign (¢):

¢!11699;

TRANSPARENCY MODES

General Information

Most ASCII and EBCDIC printers have features that are not available on IBM printers. If the user's host application is aware that the destination of the data may be a non-IBM printer attached to a protocol converter, the application can take advantage of the printer's advanced features. To activate a particular printer feature, the application will send a transparent command in the data stream. (Refer to the printer user's manual for a list of available printer commands.)

A transparent printer command, or transparency, consists of a trigger (character code) followed by the hexadecimal command that will activate a particular printer feature. The trigger alerts the protocol converter that the data that follows it is a printer command that should be sent directly to the printer without translation.

If the appropriate form of transparency is activated, the ULTRA II will recognize the trigger and respond appropriately to that form of transparency. The ULTRA II can use standard IBM 35h, Xerox 36h and Xerox Metacode transparency. The ULTRA II provides its own version of transparency, called pseudo transparency mode (PTM). It also is capable of supporting MD-Laser and AGILE LaserPage pseudo transparency.

Note: If the user or the user's application embeds transparent or pseudo transparent strings in the data stream, Option #1 — Column Width should be set to 0 (infinite line length), Option #2 — Lines Per Page should be set to 0 (infinite page length), and Option #15 — Bold Print Emulation should be set to C (none). Otherwise, unpredictable formatting errors may occur. For more information, refer to Section 8 — DisplayWrite 370 Support.

IBM 35 Hex Transparency Mode

This form of transparency is valid only in SCS data streams. In IBM 35h transparency, the trigger character is 35h, and it indicates the start of the transparent data stream. The 35h is followed by a count byte that indicates the length, in bytes, of the transparent data stream, not counting the count byte itself. The count byte is followed by the actual data to be sent. For instance, the following code will send a Xerox 4045 printer reset command (Esc+X) using 35h transparency:

35031B2B58

This includes the trigger (35h), the count byte (03h), and the three bytes for Esc+X (1Bh, 2Bh, 58h).

The user can generate any possible eight-bit command or data byte that is to be sent to the printer. There is a one-to-one correspondence between what is received by the ULTRA II and what is sent to the printer.

IBM 35h is activated when Option #53 is set to "Yes". If Option #53 is set to "No, then the trigger, the count byte and all of the otherwise transparent characters will be printed normally, as indicated by the active translate table (*see Section 5 — Translate Tables*). *Refer to Section 10 — SCS Data Streams* for more information on IBM 35h transparency.

Metacode Transparency Mode

Metacode is a variation of 35h transparency, with the exception that this transparency mode is handled directly by the printer, rather than by the ULTRA II. Metacode is used by some Xerox printers (the Xerox 4235, for example).

The data seen by the ULTRA II and the printer are identical when this type of data is detected. If Option #58 is set to "Yes," the ULTRA II will send the 35h and the count byte directly to the printer without any translation, rather than removing them from the data stream. It also sends the remaining bytes in the transparent packet without any translation.

For example, the character string 35h, 02h, 41h, 41h would be output to the printer in 35h transparency as two characters: 4141. In Metacode transparency, all four characters would be sent to the printer: 35024141.

If Option #58 is set to "No," then the trigger, the count byte and all of the otherwise transparent characters will be printed normally, as indicated by the active translate table (*see Section 5 — Translate Tables*).

Xerox 36 Hex Transparency Mode

This form of transparency is identical to 35h transparency, except that the trigger character is 36h. Xerox applications typically use 36h instead of 35h to send data directly to the printer.

If Option #5 is set to "Yes," the ULTRA II detects the trigger, picks up the count byte and starts "passing through" the remaining data. If Option #5 is

set to "No," then the trigger, the count byte and all of the otherwise
transparent data will be printed normally, as indicated by the active translate
table (*see Section 5 — Translate Tables*).

Pseudo Transparency Mode

The ULTRA II has its own form of transparency, called pseudo transparency
mode (PTM). Unlike IBM 35h and Xerox 36h transparency, pseudo
transparency can be used in both DSC and SCS data streams.

This type of transparency has two forms: Trigger 1 + Trigger 2 (or two-
trigger) and Trigger 1 + count byte (or one-trigger). In either trigger method,
the only valid characters following the trigger sequence are the numerals 0-9
and the letters A-F.

The type of pseudo transparency selected is determined by Option #30 —
Pseudo Transparency Mode Selection. The default is (A) Trigger 1 + Trigger
2. If the user selects (B), Trigger 1 + Count Byte PTM will be used.

Trigger 1 + Trigger 2 PTM

In the two-trigger mode, the user selects the trigger using any two
characters that are not commonly found together in the printable data stream
(*see Section 3 — Configuration Options* and refer to Options 32-35 for
information on restrictions on the selection of triggers). The default trigger
characters are a cent sign and a dollar sign (¢$).

In this method, no count byte is required. Rather, all pairs of bytes following
the trigger are combined and printed until terminated with an invalid
character (valid characters are 0-9 and A-F).

*Note: The system may insert a NL command (an invalid character) in the
data stream. This will terminate two-trigger pseudo transparency.*

In the following examples, the cent sign-dollar sign sequence (¢$) is used as
the trigger. Note that the cent sign (an invalid character) is also used as the
terminator.

To send one ASCII escape character requires five input characters — the
first trigger (¢), the second trigger ($), the hexadecimal ASCII escape
character (1Bh) and an invalid character/terminator (¢):

   ¢$1B¢

To send the Xerox 4045 reset sequence requires nine characters — the first trigger (¢), the second trigger ($), the hexadecimal reset sequence (1Bh, 2Bh and 58h) and an invalid character/terminator (¢).

¢$1B2B58¢

Trigger 1 + Count Byte PTM

In the one-trigger mode, the user selects the trigger using any single character that is not commonly found in the printable data stream (*see Section 3 — Configuration Options* and refer to Options 32 and 34 for information on restrictions on the selection of triggers). The default trigger is a cent sign (¢).

The one-trigger mode requires a count byte following the trigger that tells the ULTRA II how many pairs of additional characters will follow the count byte (the count byte is not included in the count).

To send 1 ASCII escape character requires five input characters — the trigger (¢), the hexadecimal count byte (01h) and the hexadecimal ASCII escape character (1Bh):

¢011B

To send the Xerox 4045 reset sequence requires nine characters — the trigger (¢), the hexadecimal count byte (03h) and the hexadecimal reset sequence (1Bh, 2Bh and 58h):

¢031B2B58

MD-Laser Pseudo Transparency

The ULTRA II is capable of supporting "continuous escape," a form of pseudo transparency offered in Maersk Data products. It is triggered by SCS Trigger 1 (see Option #34) followed by C2h. If Option #55 is set to "Yes," when this sequence is detected in the data stream, the ULTRA II will pass the subsequent hexadecimal pairs of data to the printer without translation until terminated when SCS Trigger 1 is encountered again. Spaces and control codes in between the Trigger 1 characters are ignored.

When in use, the ULTRA II begins checking for valid pairs of hexadecimal characters. When the ULTRA II detects an asterisk, it combines the two bytes prior to the asterisk to form a count byte, and it combines the two

bytes after the asterisk to form a repeat byte. The ULTRA II then sends out the repeat byte to the printer the number of times indicated by the count byte. This provides some compression of graphic data.

Here are some examples (using the default Trigger 1) that show the output sent to the printer upon receiving input from the coax host when using MD-Laser pseudo transparency:

Host Input to ULTRA II	ASCII Output
¢C2616263¢	abc
¢C2 61 62 63¢	abc
¢C2 41 02*42 05*43¢	ABBCCCCC

If Option #55 is set to "No," the default, then the trigger and all of the otherwise transparent characters will be printed normally, as indicated by the active translate table (*see Section 5 — Translate Tables*).

Laserpage Pseudo Transparency

The ULTRA II is capable of supporting Laserpage, a software product that allows IBM AFP data streams to be printed to Xerox and Hewlett-Packard laser printing systems. Laserpage uses a transparency mode similar to Trigger 1 + Trigger 2 PTM, but with repeat count capabilities.

If Option #59 is set to "Yes," when the ULTRA II detects Trigger 1 followed by Trigger 2 in the data stream, it begins checking for valid pairs of hexadecimal characters. When the ULTRA II detects an asterisk, it combines the two bytes prior to the asterisk to form a count byte, and it combines the two bytes after the asterisk to form a repeat byte. The ULTRA II then sends out the repeat byte to the printer the number of times indicated by the count byte. This provides some compression of graphic data. Normal pseudo transparency then resumes.

Here are some examples (using the defaults for Trigger 1 and Trigger 2) that show the output sent to the printer upon receiving input from the coax host when using AGILE Laserpage pseudo transparency:

Host Input to ULTRA II	ASCII Output
¢$616263¢	abc
¢$4102*4205*43¢	ABBCCCCC

If Option #59 is set to "No," the default setting, then the trigger and all of

the otherwise transparent characters will be printed normally, as indicated by the active translate table (see Section 5 — Translate Tables).

Other Pseudo Transparency Mode Considerations

In Trigger 1 + Trigger 2 pseudo transparency mode, PTM is terminated with any character outside the valid range of values (the valid range is 0-9 and A-F). Option #31 — Discard PTM Terminating Delimiter gives users the option of either printing or discarding the terminating character. To discard the terminator, set Option #31 to "Yes." To print the terminator, use "No," the default value.

Option #39 — Non-Transparency Trigger 1 Output determines the character that will be output to the printer when Option #30 — Pseudo Transparency Mode Selection is set to (A) Trigger 1 + Trigger 2 and when Trigger 1 is encountered in the data stream followed by a character other than Trigger 2. The default output character is 9Bh, which has no affect on printed output, but the user may set the value to any two-character hexadecimal value.

DISPLAYWRITE 370 SUPPORT

General Information

DisplayWrite 370 is a word processing application that provides the capability to bold, underline or overstrike text. DisplayWrite 370 printing features are supported by the ULTRA II when Option #15 is set either to (A) 3287 printer emulation or (B) DisplayWrite 370 emulation.

To access these features, the user should read and understand *Section 4 — Programmable Function Strings.* The PFSs that are utilized by the DisplayWrite printing features are:

      3   DisplayWrite 370 Overstriking On

      4   DisplayWrite 370 Overstriking Off

      5   DisplayWrite 370 Underlining On

      6   DisplayWrite 370 Underlining Off

      9   DisplayWrite 370 Bolding On

      A   DisplayWrite 370 Bolding Off

Each of these PFSs must be defined by the user for the target printer before the respective DisplayWrite feature is implemented. Refer to the printer user's manual for the appropriate control sequences for each of these functions. *For instructions on programming PFSs, refer to Section 4 — Coax Host Configuration or Section 15 — Alternate Host Configuration.*

Document Formatting Information

With DisplayWrite 370 enabled (when Option #15 — Bold Print Emulation is set either to (A) 3287 printer emulation or (B) DisplayWrite 370 emulation), the data stream is handled in quite a different way than when DisplayWrite is disabled.

When DisplayWrite is OFF, the data stream is sent to the printer a character at a time as it is received. In this mode, it is permissible for the user to embed printer-specific escape sequences or PFS commands in the data stream with predictable results. However, users with laser printers will be unable to

achieve bolding of text unless they invoke a bold font.

When DisplayWrite is ON, each line of text is buffered until a new line (CR/LF) is received, or until the column limit (determined by Option #1 — Column Width) is reached, whichever comes first. No escape sequences should be added to the data stream by the user when DisplayWrite is ON, because these escape sequences will be added to the column count, and because they will come into conflict with the escape sequences being sent to the printer by the ULTRA II. In other words, the user cannot expect to be able to control the printer with escape sequences at the same time that the ULTRA II is trying to control the printer, because conflicts will inevitably occur with unpredictable results.

Similarly, the user should avoid embedding PFS commands in the data stream when DisplayWrite is ON. While these commands are not added to the column count, they can cause formatting problems because they are not buffered along with the text. Rather, they are sent to the printer immediately upon receipt by the ULTRA II. Thus, any PFS command will affect the entire line of text, not just the text that follows the command. For instance, if PFS 8 — DisplayWrite 370 Bolding On and PFS 9 — DisplayWrite 370 Bolding Off are on the same line of text, no text in the line will be bolded, because the printer will receive bold on and bold off commands before any text is sent to the printer.

Note: To avoid unexpected formatting results, Option #1 — Column Width should be set to infinite line length, Option #2 — Lines Per Page should be set to infinite page length, and Option #15 — Bold Print Emulation should be set to C (none) if any of the following are true:

- ▲ the user or the user's application embeds escape sequences in the data stream

- ▲ the user or the user's application embeds transparency or pseudo transparency strings in the data stream

- ▲ the user embeds ULTRA II commands (configuration, translate table or PFS commands) within print jobs.

If DisplayWrite is ON (Option 15-A or 15-B), Option #1 — Column Width should be set to a nonzero value. The ULTRA II will not buffer more than 255 characters per line.

Bolding

If Option #15 is set to (A) or (B), the ULTRA II will enter bold mode (i.e., send PFS 8 to the printer) when a *[character-backspace-same character]* sequence is detected in the data stream. The ULTRA II will exit bold mode (i.e., send PFS 9 to the printer) whenever a *[character-character]* sequence is detected in the data stream while in bold mode.

COAX HOST CONSIDERATIONS

The ULTRA II can process data from a variety of IBM host systems. This section discusses how to ensure compatibility between the ULTRA II and the host system.

System Configuration

The coax host software generation requirements of the ULTRA II are generally the same as the requirements for an IBM 3287 or 3289 printer with SCS support. Except where stated otherwise, the coax host software system requirements are the same as for an IBM 3174, 3274 or 3276 control unit with 3287 or 3289 printers attached.

To function properly, the ULTRA II/printer combination must be defined to the coax host system as a 3287 printer with a 4K maximum physical buffer and/or with whatever other features are required by the application and are supported by the ULTRA II. The ULTRA II does not support 3287-type options such as Program Symbols.

The ULTRA II is classified as a "Category A" device, and it can be attached to IBM 4300 systems with integral Display Printer Adapters (DPA) and to IBM 3174, 3274 and 3276 control units configured with Type A device adapters. The ULTRA II does not emulate a Category B device, and it will not work if attached to a Type B device adapter.

(Devices such as CRTs and printers that connect to IBM ULTRA control units are classified as either Category A or Category B devices. All new control units are configured with Type A device adapters. The Category B devices are those that are supported by IBM 3271 and 3272 control units configured with Type B device adapters. 3274 control units can also be configured with Type B device adapters for support of Category B devices.)

Category A Devices	Category B Devices
3262 Line Printer	3277 Display Station
3278 Display Station	3284 Character Printer
3279 Color Display Station	3286 Character Printer
3287 Character Printer	3288 Line Printer
3289 Line Printer	

VTAM and Network Control Program Requirements

The 3174, 3274 or 3276 control unit to which the ULTRA II is attached must be defined as a type 2 physical unit and the logical unit (type 1 or 3) definition must be included for each ULTRA II to be attached. The following is an example of log mode entry tables for DSC and SCS that may be used with the ULTRA II. If necessary, consult with the Company System Manager regarding specific requirements for the system, environment and applications.

```
DSC2K  MODEENTLOGMODE=DSC2K
                         BIND  USED  FOR  APPLICATION  SESSIONS
FMPROF=X'03'             FUNCTION  MANAGEMENT  PROFILE
TSPROF=X'03'             TRANSMISSION  SERVICES  PROFILE
PRIPROT=X'B1'            PRIMARY  PROTOCOL
SECPROT=X'90'            SECONDARY  PROTOCOL
COMPROT=X'3080'          COMMON  PROTOCOL
RUSIZES=X'8787'          PRI  RUSIZE=1024,  SEC  RUSIZE=1024
PSERVIC=X'030000000000185018507F00'
                         LU  SERVICES  PROFILE

SCS  MODEENT  LOGMODE=SCS
                         BIND  USED  FOR  APPLICATION  SESSIONS
FMPROF=X'03'             FUNCTION  MANAGEMENT  PROFILE
TSPROF=X'03'             TRANSMISSION  SERVICES  PROFILE
PRIPROT=X'B1'            PRIMARY  PROTOCOL
SECPROT=X'90'            SECONDARY  PROTOCOL
COMPROT=X'3080'          COMMON  PROTOCOL
RUSIZES=X'87C6'          PRI  RUSIZE-768,  SEC  RUSIZE=1024
PSNDPAC=X'01'            PRIMARY  SEND  PACING  COUNT
SRCVPAC=X'01'            SECONDARY  RECEIVE  PACING  COUNT
PSERVIC=X'01000000E100000000000000'
                         LU  SERVICES  PROFILE
```

SCS DATA STREAMS

General Information

SNA character string (SCS) controls are EBCDIC codes embedded by the host system in a document and used for formatting the data sent to devices such as printers and CRT displays. The ULTRA II achieves its emulation of IBM printers by translating the SCS codes into PFSs (programmable function strings) that the printer can use to format data.

To use SCS controls, the ULTRA II must be defined to the host computer as an SNA Type 1 logical unit. Type 1 logical units use SCS codes to control data formatting.

Presentation Surface: SNA Character String Definitions

Devices that use SCS data formatting can be represented logically by a two-dimensional area called the presentation surface. The SCS control codes direct the formatting of data on a presentation surface.

The presentation surface can be viewed as a two-dimensional matrix of character positions. Each character position is referenced by line and column coordinates. The presentation surface represents a single page of printed output.

▲ **Presentation Surface Width and Depth** determine the maximum physical dimensions of the page (maximum number of characters per line, maximum number of lines per page).

▲ **Margins** are the logical boundaries within which data will actually be printed. If the data sent by the control unit exceeds these margins, the data may not be printed.

▲ **Maximum Presentation Line** is the number of the last physical line on the page.

▲ **Maximum Presentation Position** is the number of the rightmost character position on the physical page.

▲ **Presentation Position** is the line and column number of the current position on the page. The presentation position indicates where the next character will be printed on the page.

SCS Commands Supported by the ULTRA II

Application programs running on the host computer generate data streams that contain both the data to be printed and the SCS commands that control the positioning of the data on the page, as indicated below. This section discusses how to use the SCS commands supported by the ULTRA II.

Backspace (BS) — 16h

The Backspace command moves the presentation position horizontally one position to the left. If already at the leftmost position, this command results in no operation. Upon receipt of an SCS 16h in the data stream, the ULTRA II will send an ASCII BS (08h) to printer, if the print position is not already at the left margin.

Carriage Return (CR) — 0Dh

The Carriage Return command moves the print position horizontally to the left of the same line. If the print position is already at the left margin, the command is ignored.

End of Message (EM) — 19h

An End of Message generates a new line, except when it occurs in the first printing column, dependent upon the setting of Option 52.

Form Feed (FF) — 0Ch

The Form Feed command moves the presentation position to the top and left margins of the next page.

Horizontal Tab (HT) — 05h

The Horizontal Tab command moves the presentation position horizontally to the next tab stop to the right. The horizontal tab stops are determined by the *Set Horizontal Format* command. Tab commands are translated into the

appropriate number of spaces and sent to the printer. If there are no horizontal tab stops to the right of the current position, the HT is treated as a space character.

Interchange File Separator (IFS) — 1Ch

One of four Interchange Separator Commands used to delimit information strings in SCS data streams. The ULTRA II interprets it as a space.

Interchange Group Separator (IGS) — 1Dh

The ULTRA II interprets this Interchange Separator as a space.

Interchange Record Separator (IRS) — 1Eh

The ULTRA II interprets this Interchange Separator as a new line.

Interchange Unit Separator (IUS) — 1Fh

The ULTRA II interprets this Interchange Separator as a space.

Line Feed (LF) — 25h

The Line Feed command moves the presentation position down to the next line. The column position remains the same. Option #3 — Line Spacing may cause the ULTRA II to move down more than one line.

New Line (NL) — 15h

This command move the print position to the left margin and down one line. The New Line Command is functionally the same as a CR (Carriage Return) command followed by a Line Feed (LF) command.

Null — 00h

The Null command is converted to a space by the ULTRA II.

Set Horizontal Format (SHF) — 2BC1h

The Set Horizontal Format command is used to set left and right margins, horizontal tab stops that are used by the horizontal tab command, and to set

the maximum presentation position for the page. The SHF command has multiple parameters in the following format:

(SHF)(CNT)(MPP)(LM)(RM)(T1)...(TN) Where:

SHF	The Set Horizontal Format command code = 2BC1h
CNT	A Count of the number of bytes in this command string, including the count byte.
MPP	The maximum width of the print line. Default is the line length of the physical device.
LM	The character position of the Left Margin. LM is also the first horizontal tab stop. The LM value must be less than or equal to MPP. The default is 1.
RM	The character position of the Right Margin. The value of the RM must be greater than LM and less than or equal to MPP.
T1-TN	The character positions of the horizontal tab stops, if any. Valid tab stops are less than or equal to the value of MPP. The tab stops do not have to be in any particular order.

Note: All parameters are single byte binary numbers.

Set Line Density (SLD) — 2BC6h

The Set Line Density command is used to set the vertical line spacing to 6 or 8 lines per inch. The ULTRA II accepts this command and sends the proper programmable function string to the printer. If the assigned PFS is empty, the command is ignored, and no data is output to the printer.

Set Vertical Format (SVF) — 2BC2h

The Set Vertical Format command is used to set top and bottom page margins, vertical tab stops that are used by the vertical tab command, and to set the maximum presentation line for the page. The SVF command has multiple parameters in the following format:

(SVF)(CNT)(MPL)(TM)(BM)(T1)...(TN) Where:

SVF   The Set Vertical Format command code = 2BC2h

CNT   A Count of the number of bytes in this command
     string, including the count byte.

MPL   The length of the page. 1-127 are valid.

TM   The line number of the Top Margin for the page.
     TM is also the first vertical tab stop. The TM value
     will be set to the default value of 1.

BM   The line number of the Bottom Margin of the page.
     When this line number is exceeded, the printer
     automatically skips to the next page. BM must be
     less than or equal to MPL. The default value
     is MPL.

T1-TN   The line numbers of the vertical tab stop settings, if
     any. Valid tab stops are greater than or equal to TM
     and less than or equal to BM. The tab stops must be
     listed in ascending order.

Note: All parameters are single byte binary numbers.

Transparent (TRN) — 35h

The Transparent command indicates the start of transparent data. This data
is not scanned for SCS control codes. The command is followed by a count
byte that indicates the number of bytes of transparent data to follow. The
command has the following format:

  (**TRN**)(**CNT**) Where:

  TRN   is the Transparent command code 35h.

  CNT   is a single binary byte denoting the number of bytes
      in the transparent block. The Count value does not
      include the count byte.

The Transparent command is especially important because it gives the user
the ability to generate any possible 8 bit command or data byte to be output
to the attached device. Many of the extended 8 bit ASCII command codes
used by printers and plotters must be transmitted as transparent data

streams because they cannot be generated or passed through the IBM system without being modified. Each byte of data is sent to the printer without translation. For example, the following 8 bit EBCDIC codes are the RESET command for a Xerox laser printer:

35031B2B58

35 is the transparent command code, **03** is the count of the data bytes to be sent to the attached device, and **1B**, **2B** and **58** are the three bytes to be sent to the attached device.

Vertical Channel Select (VCS) — 04h

Vertical Channel Select send a CR/LF to the printer.

Vertical Tab (VT) — 0Bh

The Vertical Tab command moves the presentation position down to the next vertical tab stop position. The vertical tab stops are determined by the Set Vertical Format command. If no vertical tab stop exists below the current line, the VT is treated as a line feed.

SCS Command Summary

SCS Command	Code	Description
Backspace (BS)	16h	Move PP left 1 position
Carriage Return (CR)	0Dh	Move PP to left margin
End of Message (EM)	19h	End of Message
Form Feed (FF)	0Ch	Skip to next page
Horizontal Tab (HT)	05h	Move PP right to next tab stop
Interchange File Sep. (IFS)	1Ch	Space
Interchange Group Sep. (IGS)	1Dh	Space
Interchange Record Sep. (IRS)	1Eh	New line
Interchange Unit Sep. (IUS)	1Fh	Space
Line Feed (LF)	25h	Move PP down to next line
New Line (NL)	15h	Send CR/LF to printer
Null	00h	Space
Set Horizontal Format (SHF)	2BC1h	Set horizontal margins and tabs
Set Line Density (SLD)	2BC6h	Set vertical line spacing
Set Vertical Format (SVF)	2BC2h	Set vertical margins and tabs
Transparency (TRN)	35h	Pass following data (after the count byte) without translation
Vertical Channel Select (VCS)	04h	Send CR/LF to printer
Vertical Tab (VT)	0Bh	Move PP down to next vertical tab

SNA Printer Exception Conditions/Sense Codes

Exception conditions in SNA are reported by sending a negative response to the sender of the data. The negative response contains a sense code that describes the type of exception condition that occurred. Some of these conditions are errors, and some are just temporary exceptions.

The following is a list of SNA sense codes that can be sent to the host as the result of an exception condition involving a printer. Sense codes are made up of two bytes of information. The first byte describes the class of exception that occurred (10h for Request Errors, 08h for Request Reject). The second byte describes the specific condition.

Request Errors = 10h

05h = Parameter Error. This indicates an invalid SCS parameter in the data stream. This condition is usually the result of a programming error in the software that is building the SCS data stream. It may also be caused by sending an unsupported SCS command.

Request Reject = 08h

01h = Resource Not Available. Either the printer is configured for local use, or an outbound pacing overrun has occurred. This is a network configuration problem that should be referred to the systems programmer.

02h = Intervention Required. Either the printer is out of paper, or a paper jam has occurred. This condition is temporary and can be cleared by the remote terminal operator.

11h = Break. The operator pressed the cancel switch while the printer was in the middle of a chain of data. The chain may be restarted under host software control.

14h = Bracket Bid Reject — (RTR to Follow). The printer is temporarily busy doing a Local Copy. The printer will send an RTR command when it is no longer busy, then printing can continue.

1Ch = Request Not Executable. The requested function cannot be executed because of a permanent error condition in the printer.

31h = LU Component Disconnected. The device is powered off, or the coaxial cable is not connected to the ULTRA control unit. If the ULTRA II is

powered on and connected, it may be necessary to power down and power up to reestablish communication between the ULTRA II and the system.

DSC DATA STREAMS

General Information

The DSC (Data Stream Compatibility) character set is found in non-SNA environments. It has a limited number of control characters, which are explained below.

Carriage Return (CR) — 05h

This command moves the presentation position to the left margin.

End of Message (EM) — 01h

The End of Message command terminates printing, and it may also send a new line to the printer, depending upon the setting of Option # 51 — DSC EM Generates CR/LF in Infinite Line Length and Option #57 — DSC NL at EM Even if in Column 1, and upon whether or not the current print position is column 1. Here is a table listing all of the possible results:

OPTION 51	OPTION 57	COLUMN	RESULT
N	N	1	No new line
N	N	>1	Send new line
N	Y	1	Send new line
N	Y	>1	Send new line
Y	N	1	No new line
Y	N	>1	Send new line
Y	Y	1	Send new line
Y	Y	>1	Send new line

Form Feed (FF) — 02h

The Form Feed command moves the presentation position to the top and left margins of the next page.

New Line (NL) — 03h

The New Line command moves the presentation position to the next line and left margin of the page. If the line count exceeds the bottom margin, the ULTRA II will send an FF to the printer, and the print position will be the left and top margins of the next page.

XEROX APPLICATIONS

General Information

The ULTRA II also supports Xerox transparency, triggered by 36h in the data stream. Refer to Option #5 in *Section 3 — Configuration Options* and to *Section 7 — Transparency Modes* for details on Xerox 36h transparency.

Other special Xerox features supported include UDKs (user-defined keys), XPAF (Graphic Windows and EBCDIC font downloads) and Metacode. ULTRA II implementation of these features is described below.

User-Defined Keys (UDKs)

Xerox Corporation produces a number of printers that have very sophisticated font and graphic capabilities. The ULTRA II offers special support for Xerox printers in XDPM mode, also referred to as XES mode or UDK mode. XES mode is the native Xerox print mode for Xerox 2700, 3700, 4030, 4045 and 4213 printers. The XDPM mode on the Xerox 4235 also provides the XES command set.

Commands that control these printers are always preceded by an escape character. The escape character is sometimes not a legal character in a mainframe environment. Therefore, UDKs (or user-defined keys) were implemented to allow any one of 256 different characters to be assigned as the escape character. The ULTRA II keeps track of which character is currently being used as the UDK.

Note: The character assigned as the UDK should be different than the character assigned as pseudo transparency Trigger 1. Otherwise, unpredictable results may occur. For more information refer to Section 7 — Transparency Modes.

XPAF Support

XPAF (Xerox Printer Access Facility) accepts Advanced Function Printing Data Stream (AFPDS) data and converts it for use by Xerox printers (4030, 2700, 4045, 3700, etc.). When installed for use with one of these printers, XPAF expects to see a 3287-like device (such as the ULTRA II) at the end of the coax cable.

These data types are sometimes corrupted by host system forms control. The ULTRA II takes this fact into consideration and strips away any forms control that might corrupt these data types.

The ULTRA II is capable of supporting two important XPAF features. These are EBCDIC fonts and EBCDIC graphic windows. Originally intended for EBCDIC printers, these sequences can be sent to an ASCII printer when attached to the ULTRA II.

The ULTRA II's support of XPAF allows the protocol converter to be in ASCII output mode at all times. This is an important feature to ULTRA II users that require the alternate host port for PC-type data.

The ULTRA II contains special translate tables to accommodate this feature. (These are not related to the user-definable translate tables referred to elsewhere in this manual. They are located in ROM and are unchangeable.) When either a font or graphic window is detected, these translate tables are in effect. At the end of the font or graphic window, the translate table is switched back to the one that was in effect before the graphic window or font was detected.

Xerox Graphic Window Support

When the ULTRA II sees `Esc` gw, a graphic window is being processed. The `Esc` (UDK) is the user-defined key. *Please refer to the Xerox Printer Programmer Reference for further information on this escape sequence.*

If the user's application requires this feature, and if the user would like to use the printer in ASCII mode, this option should be set to "Yes." Refer to Option #60 in Section 3 — Configuration Options.

Note: If the ULTRA II is in EBCDIC output mode (see Option #10), Option #60 must be set to "No".

Allow EBCDIC Font Downloading

When the ULTRA II sees `Esc` +A or `Esc` +F, a font download is being processed. The (UDK) is the user-defined key. The `Esc` (UDK) is the user-defined key. *Please refer to the Xerox Printer Programmer Reference for further information on this escape sequence.*

If the user's application requires this feature, and if the user would like to use the printer in ASCII mode, this option should be set to "Yes." Refer to

Option #62 in *Section 3 — Configuration Options*.

Note: *If the ULTRA II is in EBCDIC output mode (see Option #10), Option #62 must be set to "No".*

Metacode Support

Some Xerox printers are capable of accepting Metacode data. The Xerox 4235 is a Metacode-capable printer, for example. The data seen by the ULTRA II and the printer are identical when this type of data is detected. Metacode data is triggered by a 35h in the data stream, immediately followed by a count byte, then the data itself. The data is not translated in this sequence. Additional information can be found in Section 9 — Transparency Modes. *Please refer to the Xerox Printer Programmer Reference for further information on this escape sequence.*

Refer to Option #58 in *Section 3 — Configuration Options*. Users with applications that require a Metacode-capable printer should set this option to "Yes."

INTRODUCTION TO XES

THE FOLLOWING SECTION REFERS TO THE OPTIONAL XES TO PCL TRANSLATION OPTION THAT IS AVAILABLE ON THE ULTRA II.

YOU MUST HAVE XEROX ESCAPE SEQUENCES IN YOUR PRINT DATA STREAM IN ORDER TO USE THE FUNCTIONS DESCRIBED HEREIN.

General Information

The AGILE ULTRA II is available with a high-speed translation module that accepts data streams designed for Xerox Escape Sequence (XES/UDK) printers and converts them for printing to PCL5 printers.

The basic printer emulation is that of a Xerox 4213 Model II, firmware revision 2.1Y, although the ULTRA II also offers expanded support for some Xerox 2700, 3700, 4045, 4235 (in XPDM mode) and 4700 series printers Supported XES commands are described in *Section 15 — XES Commands*.

XES emulation switching commands (=MCK=) are used to ensure that PostScript, PCL and other non-XES data is passed through without translation.

Configuration of the XES translation module in the ULTRA II is performed with a menu driven PC/MS DOS program (XEDIT).

ULTRA II XES   Features and Specifications

Key Benefits

▲ Allows XES users to print documents to N-series printers

▲ Users can still print PostScript and PCL data without device reconfiguration

▲ Supports any host capable of sending ASCII or EB-CDIC XES data streams

▲ Supports forms, vector and raster graphics

▲ Font storage in both portrait and landscape orientations. XES fonts can be downloaded to the printer or stored in the ULTRA II and are automatically converted to PCL5

▲ Supports international character sets and user-specified translation tables

▲ Shrink mode allows printing of documents that print edge-to-edge on XES printers on non-edge-to-edge PCL printers

Printers Supported

▲ PCL 5 support required for XES emulation

Printer Emulation

▲ Xerox 4213 Model II, firmware revision 2.1Y, with some limitations and some additions

Forms and Graphics Support

▲ Forms downloading

▲ Vector graphics

▲ Raster graphics

Font Support

▲ Titan10iso-P/-L

▲ Titan12iso-P/-L

▲ XCP14iso-P/-L

Font Storage

▲ 512K FLASH RAM

▲ 256K FLASH RAM (Optional)

▲ Fonts are desixilized and compressed, yielding a 2:1 storage space advantage

Page Conversion Methods

▲ Offset method compensates for 1/4-inch upper and left margins imposed by PCL; useful for printing on forms

▲ Shrink method compensates by reducing the page up to 87.5%; signature, logo and barcode fonts can be configured not to shrink

Configuration

▲ PC/MS-DOS menu-driven configuration program (XEDIT)

Diagnostics

▲ Xerox Data Monitor Mode emulation

▲ Configuration/Status page

XES COMMANDS

General Information

XES commands are used to control the functions of Xerox printers running in XES mode (also known as UDK, XDPM or 2700 mode). The ULTRA II interprets each supported command and converts it into the PCL5 printer language. This section lists each XES command supported by the ULTRA II and describes how each is implemented by the II for use with PCL5 printers.

XES is an acronym for Xerox Escape Sequence. It is called an escape sequence because each command in the set is preceded by an escape character. The escape character is a trigger that indicates that the data that follows it is not data to be printed but a command to be executed by the printer.

The escape character is an ASCII 1Bh (27 decimal). Some systems are unable to transmit this character directly to the printer, so the user-defined key (UDK) is provided as a substitute.

User-Defined Keys

The user may define a substitute character for the escape character if the escape character on the host does not transmit properly. The substitute escape character is known as the user-defined key, or UDK. To define a UDK, enter the following at the start of a job:

=UDK=*character*

Thereafter, until the end of the job, or until the user specifies otherwise, the printer recognizes the selected character as the escape character.

For example, to define the asterisk (*) as the UDK:

=UDK=*

Thereafter, instead of using ⎣Esc⎦+B, use *+B, and etc.

Selecting a UDK

When selecting a UDK, the trigger =UDK= must be entered in uppercase, exactly as shown. Any printable character may be used as the UDK, except:

▲ uppercase U

▲ uppercase D

▲ uppercase K

▲ comma (,)

▲ null (0)

▲ space (20h)

▲ equal sign (=)

The UDK selected should also be one that is not required for printing, since the UDK cannot be printed. As such, the user should not select *any* alphanumeric character. None of the control characters listed above are allowed to be assigned as the UDK.

Emulation Change

The ULTRA II will ordinarily receive XES data, convert it to PCL5 data and send that data stream to the printer. However, the user may also need to send PCL, PostScript or another non-XES data stream to the printer without translation. To do so, the user must first use the XES command for changing printer emulation modes. To change emulation modes, XES uses the "Mode Change Keyword" command, which takes the following format to change to PCL and PostScript emulations, respectively:

=MCK= EMULATE/PCL/END ⏎

=MCK= EMULATE/POSTSCRIPT/END ⏎

Note: <u>IMPORTANT</u> - the =MCK= character sequence MUST be followed with a space character!

Note: Even when the XES translation portion of the ULTRA II enters pass-through mode, the EBCDIC conversion portion continues to operate normally. For more information on passing EBCDIC or ASCII data

through, see Section 7 — Transparency Modes.

It makes no difference to the ULTRA II which emulation name follows "EMULATE." Any emulation except for the three below will cause the ULTRA II to enter passthrough mode. When the ULTRA II receives one of the following commands, it will change back to XES-to-PCL5 translation:

=MCK= EMULATE/2700/END ⏎

=MCK= EMULATE/XDCS/END ⏎

=MCK= EMULATE/XES/END ⏎

A space is required immediately after the command sequence =MCK=.

An emulation change is always temporary, and will revert back to the default mode after a power off/on.

Note: Changing emulation modes may cause the printer to erase all downloaded fonts from memory. In such cases, the user will need to download the fonts to the printer after executing an emulation change. Alternatively, the printer can be configured with Context Saving enabled. For more information, see your printer manual.

The ULTRA II also supports the =MCK= commands "SAVE" and "RESTORE." The =MCK= command "NVRAM" results in no operation.

=MCK= SAVE/END ⏎

will save the current emulation (either PCL or passthrough) to the ULTRA II's memory until the printer is powered off.

=MCK= RESTORE/END ⏎

will change the emulation to the emulation stored using the "SAVE" command above.

=MCK= RESET/END ⏎

will change the emulation to the default power-on emulation.

XES Command Format

XES commands take the following format:

▲ The escape character ⎡Esc⎤ (1Bh or a user-defined key)

▲ The instruction, sometimes preceded by a plus sign (+)

▲ User-entered variables, if required for the command

▲ An optional comma (,) is used to print a Configuration/Status Page (Job Status Sheet) after the print job

▲ An optional comment to be printed on the Configuration/Status Page

▲ A line end (either CR, LF, NL or CR/LF) is sometimes required

Line Endings

The symbol ⎡←⎤ is used in these instructions to indicate a line end if the command requires a line end. However, the user must use either a carriage return, line feed, new line or carriage return/line feed as the actual line ending. The line ending must be defined as an ULTRA II configuration parameter. Refer to *Section 15 — Alternate Host Configuration* for information on defining the line ending to be used.

Types of Escape Sequences

There are two types of escape sequences:

▲ Job Control Commands

▲ Non-Job Control Commands

Job Control Commands

A job control command either sets job boundaries or formats the printed

output in some way. Job control commands are used to reset the printer, start a print job, or load fonts, graphics or forms. An optional comment of up to 132 characters, if preceded by a comma, will be printed on a Configuration/Status Page upon the receipt of the next job control command. All jobs should begin and end with one or more job control commands.

A job control command always includes a plus (+) symbol following the escape character, and it always includes an instruction. It may include an optional comma inserted when the user wants a Configuration/Status Page, an optional comment printed on the status sheet and a line end. Occasionally it includes a user-entered variable.

For example, the command to start printing a document:

   ⎡Esc⎤ **+P,***comment*⏎

Non-Job Control Commands

Simple commands consist of the escape character and one or two other characters.

For example, the command for centering a line of text is:

   ⎡Esc⎤ **q**

Commands with user-entered variables are used to set parameters such as line spacing or margin width. They may include punctuation marks that serve as delimiters and alphanumeric characters such as comments or file names. Some require a line end.

For example, the command for setting margins is:

⎡Esc⎤ **m***H,T,B,L,R*⏎

where *H,T,B,L,R* represent the variables for page height, top, bottom, left and right margins, respectively.

Configuration/Status Page

Some XES commands provide for an optional Configuration/Status Page (Job Status Page) to be printed after the print job in which the command occurs. The Configuration/Status Page is printed if the command is followed

immediately by a comma (,) or if an error is detected either during the print job or during power-up.

The ULTRA II enables the user to determine the conditions in which a Configuration/Status Page will be printed. Refer to *Section 15 —Alternate Host Configuration* for information on specifying the conditions in which a Configuration/Status Page will be printed.

The Configuration/Status Page includes the following information:

> ▲ The error number and error type, if any errors were detected

> ▲ The names of any simulated, resident or downloaded fonts

> ▲ The names of any downloaded forms

> ▲ An optional comment, if one was entered

> ▲ The current configuration

A sample Configuration/Status Page can be found in *Section 16 — Service and Reference.*

Optional Comment

With some XES commands, the operator has the option of including comments on the print job's Configuration/Status page by inserting a message after the comma in the command line. This comment can be up to 132 characters long.

The comment will always be printed by the ULTRA II if a Configuration/ Status Page is printed.

Job Boundary Commands

A job boundary is a command function that tells the printer where the job begins and ends, and it tells the printer what type of data the job contains. The command to start printing a document is the "Print Job" command. The command to end a document is the "Reset" command.

Print Job

▲ **COMMAND:** ⌨Esc⌨ **+P,***optional comment* ⌨↵⌨
▲ **RANGE:** 132 Characters for optional comment

The "Print Job" command marks a job boundary, purges the last page buffer and begins printing. Printing is allowed using only one font orientation; an orientation change causes a new job, because it is an implied job boundary. This command will cause a Configuration/Status Page to print if: 1) an error occurs and the Configuration/Status Page switch is enabled, or 2) the previous command included a comma. An optional comment of up to 132 characters, if entered, will be printed on the Configuration/Status Page.

Print Job (Mixed Orientation)

▲ **COMMAND:** ⌨Esc⌨ **+Q,***optional comment* ⌨↵⌨
▲ **RANGE:** 132 Characters for optional comment

Printing is allowed using multiple font orientations; an orientation change causes a new job because it is an implied job boundary.

This command is interpreted as if it were a "Print Job" command.

Reset

▲ **COMMAND:** ⌨Esc⌨ **+X**⌨↵⌨
▲ **RANGE:** N/A

The "Reset" command ends all types of jobs, marks a job boundary, tells the printer that any data that follows it is part of a new job, and returns the printer to its start-up state. All format parameters are reset to their default settings, and all font and form assignments are erased. If several documents are to be printed with the same parameters, the "Print Job" command should be used at the beginning of each document, but the "Reset" command should not be used.

If "Reset" is used to exit Data Monitor mode, and if Data Monitor mode was introduced with a UDK, the same UDK must be used to introduce a Reset. For example, if Data Monitor mode was introduced as follows:

=UDK=**+D

then Reset must be introduced as follows:

*+X ⏎

Miscellaneous Commands

Print Multiple Copies (Collated)

▲ **COMMAND:**   Esc **+C#,***optional comment*   ⏎
▲ **RANGE:**   **132 Characters for optional comment**

This command currently is interpreted by the ULTRA II as "Print Multiple Copies (Non-Collated)."

Print Multiple Copies (Non-Collated)

▲ **COMMAND:**   Esc **+E#,***optional comment*   ⏎
▲ **RANGE:**   **2-999**

This command causes multiple copies of the document to be printed, where # is the number of copies. The number of copies may not exceed 999; if a numeral greater than 999 is entered, only one copy will be printed.

This command will cause a Configuration/Status Page to print if: 1) an error occurs and the Configuration/Status Page switch is enabled, or 2) the previous command included a comma. An optional comment of up to 132 characters, if entered, will be printed on the Configuration/Status Page.

This command currently is interpreted by the ULTRA II as "Print Job."

Paper Tray

▲ **COMMAND:**   Esc **c#** ⏎
▲ **RANGE:**   **0-A**

This command selects the paper source drawer, where # is the number of the drawer (1 through A). The ULTRA II does not support automatic tray switching.

Output Tray

▲ **COMMAND:** Esc **zr#**
▲ **RANGE:** **0-9**

This command selects an output tray, where # is a value of 0 (top output tray) or 1-9 (high capacity stacker).

Offset

▲ **COMMAND:** Esc **o**
▲ **RANGE:** **N/A**

This command tells the printer, if it has offset stacking capability, to offset the stacking of each document. Offset can be changed on a page-by-page basis, and is controlled by the last command preceding the form feed.

Duplex Start

▲ **COMMAND:** Esc **zyd#** ↵
▲ **RANGE:** **0-2,550**

This command enables duplex printing for documents that will be bound on the side of the page. If a value is entered for #, the left and right margins on the second side of the page will be shifted to the left by the amount specified in 1/300" units.

The command must be entered before any printable data on the first page to be printed duplex. Duplexing is ended with the Duplex Stop command.

The ULTRA II supports this command in both portrait and landscape orientations. The "Shift" parameter is not supported, and its use results in no operation.

Duplex Invert Start

▲ **COMMAND:** Esc **zyf** ↵
▲ **RANGE:** **0-3,300**

This command enables duplex printing for documents that will be bound on the top of the page. If a value is entered for #, the top and bottom

margins on the second side of the page will be shifted up by the amount specified in 1/300" units.

The command must be entered before any printable data on the first page to be printed duplex. Duplexing is ended with the Duplex Stop command.

The ULTRA II supports this command in both portrait and landscape orientations. The "Shift" parameter is not supported, and its use results in no operation.

Duplex Stop

▲ **COMMAND:** ⎡Esc⎤**zye**⎡↵⎤

▲ **RANGE:** **N/A**

This command ends duplexing for subsequent pages.

Duplex Side Select

▲ **COMMAND:** ⎡Esc⎤**zyi#**

▲ **RANGE:** **1-2**

This command selects the side of the page where the next image will be placed on a duplex page, in effect causing a form feed that allows the user to skip a page at any point in a duplex document.

Comment

▲ **COMMAND:** ⎡Esc⎤**zya,*comment*⎡↵⎤**

▲ **RANGE:** **N/A**

This command enables comments to be entered into a coded document. The comments do not appear in printed output or on the status sheet.

Operator Text Message

▲ **COMMAND:** ⎡Esc⎤**+H,*message*⎡↵⎤**

▲ **RANGE:** **132 characters for optional message**

This command is used on the Xerox 4235 printer to display a message on the user interface screen and to hold printing until the "Continue" button is

pressed on the console. The ULTRA II will neither display the message nor hold printing, but it will ensure that the message is not printed.

Font Commands

This section describes commands that affect fonts.

Font Load

▲ **COMMAND:** [Esc] **+F,***comment*[↵]
▲ **RANGE:**   **132 characters for optional comment**

The "Font Load" command is a job boundary command that erases all previously downloaded fonts and starts downloading a new set of fonts. Up to 121 fonts may be downloaded and up to 255 stored in the ULTRA II FLASH RAM, if font size and available memory permit. This command will also delete the current merge page from memory.

Font Unload

▲ **COMMAND:** [Esc] **+U,***comment*[↵]
▲ **RANGE:**   **132 characters for optional comment**

The "Font Unload" command is a job boundary command that deletes all previously downloaded fonts.

Font Add

▲ **COMMAND:** [Esc] **+A,***comment*[↵]
▲ **RANGE:**   **132 characters for optional comment**

The "Font Add" command is a job boundary command that adds fonts to those already downloaded without erasing any previously downloaded fonts. Up to 121 fonts may be downloaded.

Font Delete

▲ **COMMAND:** [Esc] **+B,***comment*[↵]
▲ **RANGE:**   **132 characters for optional comment**

The "Font Delete" command is a job boundary command that deletes specified fonts from those already downloaded, where *fontname* is the name of the font entered exactly as it appears on the Configuration/Status Page, and where each *fontname* is separated by a comma. This command also deletes the current merge page from memory. Printer default or system fonts cannot be deleted.

Font ID Assignment

▲ **COMMAND:** [Esc] **+#*fontname*** [↵]

▲ **RANGE:**   **0-9**

This command assigns an ID number to a font, where # is a numeral between 0 and 9, and where *fontname* is the name of the font entered exactly as it appears on the Configuration/Status Page. Once assigned, the ID number is used to call up a font in storage. This is not a job boundary.

When the user implements this command, the assigned font (resident in the ULTRA II's FLASH memory) is downloaded to the printer.

Font Change

▲ **COMMAND:** [Esc] **#**

▲ **RANGE:**   **0-9**

The "Change Font" command causes all subsequent data to be printed in the new font until a "Reset" or another "Change Font" command is received, where # is the ID of the font as assigned by the job command "Font ID Assignment."

Page Formatting Commands

This section describes the commands that control page formatting, including margins, tabs, line spacing and measurement units. Margins, tabs and page size settings are dependent upon the unit of measurement selected by the "Units" commands directly below.

Units — 1/60"

▲ **COMMAND:** [Esc] **zg**

▲ **RANGE:**   **N/A**

This command sets the unit of measurement for the purpose of setting page size, margins and tabs to 1/60". This is the default value, but the default value can be changed using XEDIT.

Units — 1/300"

▲ **COMMAND:** ⎡Esc⎤ **zf**
▲ **RANGE:**   **N/A**

This command sets the unit of measurement for the purpose of setting page size, margins and tabs to 1/300". The default value is 1/60", but it can be changed using XEDIT.

Margins

▲ **COMMAND:** ⎡Esc⎤ **mH,T,B,L,R** ⎡↵⎤
▲ **RANGE:**   **See chart**

The "Margins" command is used to set page height and all margins, where:

H is the vertical size of the paper, measured from the top edge to the bottom edge of the physical page. In 1/60" units, 11.0" paper is 660. 8.5" paper is 510.

T is the top margin, measured from the top edge of the page to the baseline of the first line of text. In 1/60" units, a 2.0" margin is 120.

B is the bottom margin, measured from the bottom edge of the page to the baseline of the last line of text on the page. In 1/60" units, 1.5" bottom margin is 90.

L is the left margin, measured from the left edge of the page to the left edge of the first character in each line on the page. In 1/60" units, a 1.75" left margin is 105.

R is the right margin, measured from the left edge of the page to the right edge of the last character in each line on the page. In 1/60" units, a 1.0" right margin is 450 on a 8.5" portrait page.

The following chart shows maximum H,T,B,L,R values that will still print on the physical page specified. Values are shown in both 1/60" and 1/300" for letter and tabloid paper in both portrait (P) and landscape (L)

orientations.

		Letter(8.5"x11")					Tabloid(11"x17")			
1/60	H	T	B	L	R	H	T	B	L	R
P	660	40	40	24	486	1020	40	40	24	0
L	510	24	24	40	620	1020	24	24	40	0
		Letter(8.5"x11")					Tabloid(11"x17")			
1/300	H	T	B	L	R	H	T	B	L	R
P	3300	198	198	120	2430	5100	198	198	120	2880
L	2550	120	120	198	3102	3300	120	120	198	4902

Once margins have been set using this command, margin settings can be changed using the Margin Top, Bottom, Left and Right commands below.

Note: Because XES commands use absolute placement values rather than page size commands, the ULTRA II will accept ranges outside the physical area of the page. However the user should be aware that some data might be left off the printed page.

Margin Top

▲ **COMMAND:** [Esc] **zn#** [↵]
▲ **RANGE:** See *Margins* command

This command changes the setting of the top margin, measured from the top of the page, where # is the margin value expressed either in 1/60" or 1/300" units.

Margin Bottom

▲ **COMMAND:** [Esc] **zq#** [↵]
▲ **RANGE:** See *Margins* command

This command changes the setting of the bottom margin, measured from the bottom of the page, where # is the margin value expressed either in 1/60" or

1/300" units.

Margin Left

▲ **COMMAND:** $\boxed{\text{Esc}}$ **zk#** $\boxed{\leftarrow}$
▲ **RANGE:**   See *Margins* command

This command changes the setting of the left margin, measured from the left edge of the page, where # is the margin value expressed either in 1/60" or 1/300" units.

Margin Right

▲ **COMMAND:** $\boxed{\text{Esc}}$ **zm#** $\boxed{\leftarrow}$
▲ **RANGE:**   See *Margins* command

This command changes the setting of the right margin, measured from the left edge of the page, where # is the margin value expressed either in 1/60" or 1/300" units.

Tabs Horizontal

▲ **COMMAND:** $\boxed{\text{Esc}}$ **t$\#_1$,$\#_2$,...$\#_{64}$** $\boxed{\leftarrow}$
▲ **RANGE:**   See *Margins* command

This command sets the horizontal tabs, where $\#_n$ is the value of the tab expressed in 1/60" or 1/300" units. As many as 64 horizontal tab values may be entered.

For example, using a 1/60" unit of measure, to set tab stops at 0.75", 3.0" and 4.5", enter:

   $\boxed{\text{Esc}}$ **t5,180,270** $\boxed{\leftarrow}$

The following list outlines the rules for setting horizontal tab stops:

▲ Default tab stops begin at 1.1" from the left side of the page and are at every 0.44" thereafter.

▲ Tabs may be entered in any order.

▲ If more than 64 tab values are entered, the excess tabs will be deleted, starting with the rightmost tab value.

▲ The maximum tab position is 815 (13.58").

▲ Tabs cannot be set beyond margins.

▲ If the page orientation is changed, the tab settings must also be changed.

▲ Tab settings remain valid until the "Reset" or "Clear Horizontal Tabs" commands are sent.

Tabs Clear Horizontal

▲ **COMMAND:** ⌷Esc⌷ **d**

▲ **RANGE:** **N/A**

This command clears all horizontal tab settings.

Tabs Vertical

▲ **COMMAND:** ⌷Esc⌷ **v#$_1$,#$_2$,...#$_{64}$** ⌷↵⌷
▲ **RANGE:** **See *Margins* command**

This command sets the vertical tabs where #$_n$ is the value of the tab expressed either in 1/60" or 1/300" units. As many as 64 vertical tab values may be entered.

For example, using a 1/60" unit of measure, to set tab stops at 1.0", 1.5", 2.3" and 7.0", enter:

⌷Esc⌷ **v60,90,138,420** ⌷↵⌷

The following list outlines the rules for setting vertical tab stops:

▲ Default tab stops in portrait orientation are every inch from the top of the page.

▲ Default tab stops in landscape orientation are every six lines.

▲ Tabs may be entered in any order.

▲ If more than 64 tab values are entered, the excess tabs will be deleted, starting with the bottommost tab value.

▲ The maximum tab position is 840 (14.0").

▲ If the page orientation is changed, the tab settings must also be changed.

▲ Tab settings remain valid until the "Reset" or "Clear Horizontal Tabs" commands are sent.

Tabs Clear Vertical

▲ **COMMAND:** Esc **e**

▲ **RANGE:**   **N/A**

This command clears all vertical tab settings.

Justification Start

▲ **COMMAND:** Esc **j**

▲ **RANGE:**   **N/A**

The "Start Justification" command will cause the space between words to be expanded or compressed so that each line of text will fit exactly between the left and right margins. Spaces can be expanded to 300 percent or compressed to 60 percent of their normal width. If the command is in the middle of a line, that is where justification will start, i.e., spaces before the command are not adjusted.

The user must provide line ending and hyphenation decisions when justifying text. In other words, the appearance of a line of text, when justified, may be unsatisfactory if too many or too few words occur on a line. It is the user's responsibility to insert line endings where appropriate to ensure that the appearance of the line of text is satisfactory.

Justification Stop

▲ **COMMAND:** [Esc] **k**

▲ **RANGE:** **N/A**

This command will end text justification. The line of text in which this command is found will be the last line justified.

Justification Unlimited

▲ **COMMAND:** [Esc] **zj**

▲ **RANGE:** **N/A**

The "Justification Unlimited" command (forced justification) will cause the space between words to be expanded or compressed so that each line of text will fit exactly between the left and right margins, regardless of how few characters are on the line. Spaces can be compressed to 60 percent of their normal width. Unlike the "Start Justification" command, there is no maximum distance between words. If the command is in the middle of a line, that is where justification will start, i.e., spaces before the command are not adjusted.

The user must provide line ending and hyphenation decisions when justifying text. In other words, the appearance of a line of text, when justified, may be unsatisfactory if too many or too few words occur on a line. It is the user's responsibility to insert line endings where appropriate to ensure that the appearance of the line of text is satisfactory.

Center

▲ **COMMAND:** [Esc] **q**

▲ **RANGE:** **N/A**

Receipt of this command anywhere within a line of text will center that line between the left and right margins. If the line is too long to be printed within the margins, it will extend equally into the left and right margins.

Line Spacing

▲ **COMMAND:**   `Esc` **i#**

▲ **RANGE:**   **0-4**

This command sets the line spacing, where # is a numeral between 0 and 4.

▲ 0 = single spacing

▲ 1 = 1.5 line spacing

▲ 2 = double spacing

▲ 3 = triple spacing

▲ 4 = 0.5 line spacing

Line spacing rules:

▲ If a line spacing command is found in the middle of the line, the new spacing begins with the next line.

▲ The largest font on the line determines spacing (to avoid overstriking the previous line).

▲ When 0.5 line spacing is used, the previous line is overstruck.

Line Spacing Absolute

▲ **COMMAND:**   `Esc` **ip#** `↵`

▲ **RANGE:**   **N/A**

This command adjusts the amount of space between lines of text, where # is a numeral expressed in 1/300". Unlike "Line Spacing," in which the amount of space between lines is based upon the font size, "Line Spacing Absolute" sets line spacing pixel by pixel. The command takes effect on the line after which it occurs.

Note: The printer will always print at least one line of text per page regardless of the value of this parameter.

Character Spacing Absolute
_____

▲ **COMMAND:**   ⌜Esc⌝**qzs#C**⌜↵⌝

▲ **RANGE:**   **N/A**

This command adjusts the amount of space between characters of text, where # is a numeral expressed in 1/300", and where *C* is the character to be spaced. Normally, the amount of space between characters is based upon the font. "Character Spacing Absolute" sets character kerning pixel by pixel.

For example, to space the characters A, B and C 0.75" apart from one another on a line, enter:

⌜Esc⌝**zs225ABC**⌜↵⌝

This command will remain in effect until another ⌜Esc⌝zs#*C*⌜↵⌝ command is entered. To return to font-based spacing, enter any negative number for the # parameter, or use ⌜Esc⌝+X⌜↵⌝ (Reset).

Forms Creation Commands

This section describes the commands used in the creation of forms. The unit of measure in forms creation commands is always 1/300", regardless of the setting determined by the "Units" commands ⌜Esc⌝zf and ⌜Esc⌝zg.

Some of the commands in this section are dependent upon the orientation of the page and its point of origin. The following illustrations show the differences between portrait and landscape orientations. Note that the x coordinate is always the shorter page dimension, and the y coordinate is always the longer page dimension. In portrait orientation, the origin is at the lower left corner of the page. In landscape orientation, the origin is at the top left corner of the page.

Note: Unlike XES printers, page orientation must first be set correctly for the ULTRA II to use these commands.
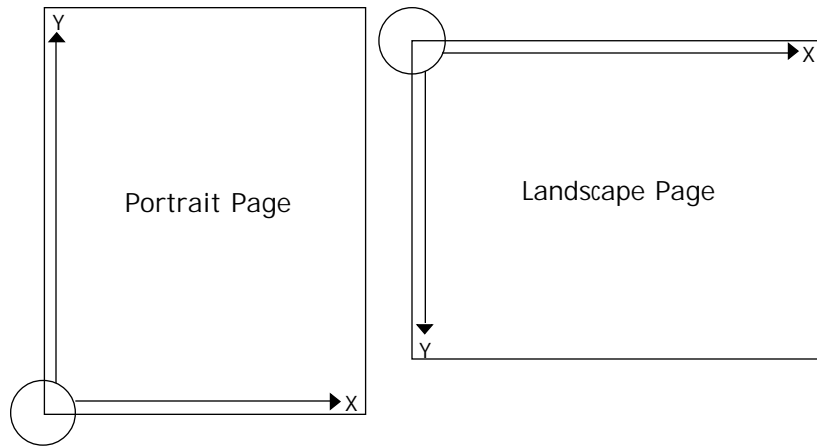
Baseline Placement Absolute

▲ **COMMAND:**   `Esc` **za#$_1$,#$_2$** `↵` **text** `↵`

▲ **RANGE:**   **See Below**

This command places the baseline of any character of text in any specified location on the page relative to the page origin, where #$_1$ is the x (short edge) coordinate and #$_2$ is the y (long edge) coordinate. If using a portrait font, this command is identical to "Text Placement Absolute." If using a landscape font, this command uses the bottom left corner of the character cell as the origin.

Text Placement Absolute

▲ **COMMAND:**   `Esc` **a#$_1$,#$_2$** `↵` **text** `↵`

▲ **RANGE:**   **See Below**

This command will place text anywhere on the page relative to the page origin, where #$_1$ is the x (short edge) coordinate and #$_2$ is the y (long edge) coordinate. If using a landscape font, this command uses the top left corner of the character cell as the origin.

For example, to place text on a landscape orientation page 1.0" to the right of the origin and 2.5" down from the origin, use the following command:

`Esc` **a300,750** `↵` *text* `↵`

Text Placement Relative

▲ **COMMAND:** ⎡Esc⎤ $rC_1\#C_2$

▲ **RANGE:** See Below

This command will place text anywhere on the page relative to the current print position, where # is the distance in 1/300" that the text is to be moved, where C_2 is any printable, non-numeric character or a space (this acts as a command terminator and is not printed), and where C_1 is one of the following alphabetic characters:

▲ **u** for up

▲ **d** for down

▲ **l** for left

▲ **r** for right

Line Draw (X or Y)

▲ **COMMAND:** ⎡Esc⎤ $x(or\ y)X,Y,L,W,S$ ⎡↵⎤

▲ **RANGE:** See Below

To draw a line parallel to the x (short edge) axis, enter:

⎡Esc⎤ **xX,Y,L,W,S** ⎡↵⎤

To draw a line parallel to the y (long edge) axis, enter:

⎡Esc⎤ **y***X,Y,L,W,S* ⎡↵⎤

where X and Y specify the starting point of the line, where L is the length of the line expressed in dots, where W is the width of the line expressed in dots (with a minimum value of 2), and where S is the line shading (any value between 0 and 15 is accepted, where 15 is solid black).

For example, if the user would like to draw a line on a portrait orientation page, parallel to the y axis, that starts 1.75" over from the x origin and 0.25" up from the y origin, and that is 6.0" long and 1/50" wide:

⎡Esc⎤ **y525,75,1800,6** ⎡↵⎤

The page orientation is determined by the first font on the page, so be certain to specify a font before using this command.

To draw a line on a landscape orientation page, parallel to the x axis, that starts 5.0" down from the x origin and 1.5" over from the y origin, and that is 4.0" long and 1/100" wide:

    ⎡Esc⎤ **x1500,150,1200,3**⎡↵⎤

Document Enhancement Commands

This section describes the commands for bolding, underlining, overstriking, subscripting and superscripting text.

Bold Start

    ▲ **COMMAND:**   ⎡Esc⎤ **b**

    ▲ **RANGE:**   **N/A**

This command begins bolding for every character printed subsequently. A bold effect is produced by printing every character twice, with the second character moved slightly to the right. This command requires extra page composition formatting and should be used with moderation; bold fonts are preferred when a lot of bold text is needed.

Bold Stop

    ▲ **COMMAND:**   ⎡Esc⎤ **p**

    ▲ **RANGE:**   **N/A**

This command ends bolding.

Overstrike Start

    ▲ **COMMAND:**   ⎡Esc⎤ **zo*C***

    ▲ **RANGE:**   **N/A**

The "Start Overstriking" command will cause one character to be printed over another character, where *C* is the character to be used for

overstriking. Overstriking continues until the command to cancel it is received. This command requires extra page composition and should be used with moderation.

Overstrike Stop

▲ **COMMAND:** ⌷Esc⌷**zp**

▲ **RANGE:** **N/A**

This command or a "Font Change" command will stop overstriking.

Subscript Start

▲ **COMMAND:** ⌷Esc⌷**l**

▲ **RANGE:** **N/A**

The "Start Subscripting" command lowers the baseline of subsequent characters. When using a smaller font for the subscripted text, the user must call the font after the subscript command, because the distance that the baseline is lowered is determined by the font in use. This command cannot be used to further lower text that is already subscripted. If underlining and subscript are to be used together, refer to the "Start Underlining" command for information on how the two commands interact.

Superscript Start

▲ **COMMAND:** ⌷Esc⌷**h**

▲ **RANGE:** **N/A**

The "Start Superscripting" command raises the baseline of subsequent characters. When using a smaller font for the superscripted text, the user must call the font after the superscript command, because the distance that the baseline is raised is determined by the font in use. This command cannot be used to further raise text that is already superscripted. If underlining and superscript are to be used together, refer to the "Start Underlining" command for information on how the two commands interact.

Sub/Superscript Stop

▲ **COMMAND:**   〔Esc〕**s**

▲ **RANGE:**   **N/A**

This command will stop either superscripting or subscripting. Superscripting and subscripting will also be stopped upon receipt of carriage control characters CR, LF or FF.

Underline Start

▲ **COMMAND:**   〔Esc〕**u**

▲ **RANGE:**   **N/A**

The "Start Underlining" command causes all subsequent characters, including tabs and spaces, to be underlined until a "Stop Underlining" command is received. The thickness of the underline is determined by the size of the last font in use at the end of the line.

The underline position is not changed by a "Start Subscripting" or "Start Superscripting" command. If the user would like the underline to follow a subscript down or follow a superscript up, the original underline command must be stopped, and a new "Start Underline" command must be entered after the subscript or superscript command. This procedure will establish a new baseline position for the underline.

Underline Stop

▲ **COMMAND:**   〔Esc〕**w**

▲ **RANGE:**   **N/A**

This command will stop underlining.

Merge Page Load

▲ **COMMAND:**   〔Esc〕**+M**〔↵〕

▲ **RANGE:**   **N/A**

The "Merge Page Load" command is a job boundary command that erases any previously stored page and stores a new page to be merged with other

pages. A separate command enables the merging of this page with another to produce a composite page. This command must be used after using either the "Font Load" command or the "Font Delete" command, because either of those commands will delete the current merge page from memory.

Merge Page Unload

▲ **COMMAND:**   Esc **+V** ⏎

▲ **RANGE:**   **N/A**

The "Merge Page Unload" command is a job boundary command that erases any previously stored merge page.

Form ID Assignment

▲ **COMMAND:**   Esc **+#*formname*.FRM** ⏎

▲ **RANGE:**   **0-9**

This command assigns a number to one of up to ten forms which can then be recalled for merging into a variable document, where # is the number (0-9) to be assigned and *formname.*FRM is the name of the form to which the number is being assigned. This command is placed anywhere on the variable page after the Print Job command and before the first Form Merge Start command.

Form Merge Start

▲ **COMMAND:**   Esc **zb#**

▲ **RANGE:**   **0-9**

This command invokes a form with an assigned identification number for merging with a text document, where # is the form ID number.

Cycleforms

▲ **COMMAND:**   Esc **zx*form₁,form₂,...form₆₄*** ⏎

▲ **RANGE:**   **1-64**

This command enables repeated merging of a set of forms at specified

intervals in a job consisting of multiple variable pages, where $form_1$, $form_2$ and $form_n$ are the names of the forms as they are stored on disk. The commas are used not only to separate form names, but can also be used to indicate any variable pages in which merging is not to occur. This command is placed after the Print Job command in the first series of variable pages to be merged.

Form Merge Stop

▲ **COMMAND:** ⌨Esc **zh#**

▲ **RANGE:**   **0-9**

This command stops the merging of a form with a variable page, where # is the number (0-9) of the form to be stopped.

Page Merge Start

▲ **COMMAND:** ⌨Esc **ze**

▲ **RANGE:**   **N/A**

This command will cause the page in which it occurs and all subsequent pages to merge with a page stored in memory. Merging continues until either a "Page Merge Stop" or a Reset" command is received.

Page Merge Stop

▲ **COMMAND:** ⌨Esc **zd**

▲ **RANGE:**   **N/A**

This command will allow the page in which it occurs to merge, but all subsequent pages will not be merged with a page stored in memory.

Graphic Window

▲ **COMMAND:** ⌨Esc **gwM(M_x/M_y),I,R,name/F;X,Y,S_x,S_y** ⏎

▲ **RANGE:**   **See Below**

This command defines an area on the page for graphics, where:

M is the degree of magnification. If only one value for M is entered, the

magnification is proportional. If two values are entered, the magnification will be different for the x and y directions. 0 or 1 will result in no magnification, 2 will double the magnification, 3 will triple the magnification and 4 will quadruple the magnification.

I indicates the type of graphics the window will contain, and whether the graphics will be printed reversed. 0 indicates raster data, 1 indicates reversed raster data, 2 indicates vector or macro data, and 3 indicates reversed raster or macro data.

R indicates the degree of rotation, if any, of the graphic window. 0 specifies no rotation, 1 specifies 90º counterclockwise rotation, 2 specifies 180º counterclockwise rotation, and 3 specifies 270º counterclockwise rotation.

name is the name of the window (up to seven characters).

/F is replaced with /s for storage only, or with /p for storage and printing.

X, Y are the coordinates for the origin of the graphic window.

S_x, S_y indicate the size of the graphic window, measured in pixels from the origin of the graphic window.

Fields prior to the semicolon are optional, although blank fields must still be separated by a comma. Fields after the semicolon are required.

This command may be placed anywhere in a document where graphics are desired.

Graphic Delete

▲ **COMMAND:** ⌨Esc⌨ **+B,***optional comment*⏎
 *graphicname***.GRA**⏎

▲ **RANGE:** **132 characters for optional comment**

This command will delete graphic files from the hard disk. Fonts and forms may also be deleted with this command.

Graphic Window Repeat (Currently not supported)

▲ **COMMAND:** ⌨Esc⌨ **gr***M(M_x/M_y)***,***I***,***R***,,***name/F***;***X***,***Y***,***X_n***,***Y_n*⏎

▲ **RANGE:** **See Below**

This command will be supported in subsequent revisions of XES to PCL. The command copies a graphic window and places it on the page, where:

M is the degree of magnification. If only one value for M is entered, the magnification is proportional. If two values are entered, the magnification will be different for the x and y directions. 0 or 1 will result in no magnification, 2 will double the magnification, and 4 will quadruple the magnification.

I indicates the type of graphics the window will contain, and whether the graphics will be printed reversed. 0 indicates raster data, 1 indicates reversed raster data, 2 indicates vector or macro data, and 3 indicates reversed raster or macro data.

R indicates the degree of rotation, if any, of the graphic window. 0 specifies no rotation, 1 specifies 90º counterclockwise rotation, 2 specifies 180º counterclockwise rotation, and 3 specifies 270º counterclockwise rotation.

name is the name of the window (up to seven characters).

/F is replaced with /s for storage only, or with /p for storage and printing.

X, Y are the coordinates for the origin of the duplicate window.

X_n, Y_n are the coordinates of other duplicate windows if more than one is to be made on the page.

Fields prior to the semicolon are optional, although blank fields must still be separated by a comma. Fields after the semicolon are required.

This command may be placed anywhere in a document where graphics are desired.

Graphic Line

▲ **COMMAND:** $\boxed{\text{Esc}}$ **gl***T;X₁,Y₁,X₂,Y₂,Xₙ,Yₙ* $\boxed{\leftarrow}$

▲ **RANGE:**   **T=1-15**

This command draws lines between any two points within a graphic window, where:

T is the thickness of the line. Value should be an odd number

X_1, Y_1 are the coordinates of the first point in the line.

X_2, Y_2 are the coordinates of the second segment endpoint.

X_n, Y_n are the coordinates of the next segment endpoint.

Graphic Arc

▲ COMMAND: [Esc] ga$T;X,Y,r,S_2,E_2,S_n,E_n$ [↵]

▲ RANGE: See Below

This command draws arcs and circles within a graphic window, where:

T is the thickness of the line in pixels (no more than one-half the size of r)

X, Y are the coordinates of the center of the arc.

r is the radius of the arc.

S_2 is the starting point of the arc expressed in degrees.

E_2, is the endpoint of the arc expressed in degrees.

S_n, E_n are additional pairs of starting and ending points, as required.

Where degrees are expressed, 0 degrees is at 3 o'clock, and rotation occurs in a counterclockwise direction.

Graphic Box

▲ COMMAND: [Esc] gb$T;X_1,Y_1,X_2,Y_2$ [↵]

▲ RANGE: See Below

This command draws a rectangle by defining two sets of right angles that form diagonal corners of the rectangle within a graphic window, where:

T is the thickness of the line in pixels.

X_1, Y_1 are the coordinates of the origin of the graphic box as measured from the top left corner of the graphic window.

X_2, Y_2 are the coordinates of the opposite diagonal corner of the graphic

box.

Graphic Pie Chart

▲ **COMMAND:** $\boxed{\text{Esc}}$ **gf**$T;X,Y,r,\%_1/F_1/O_1,\%_n/F_n/O_n$$\boxed{\hookleftarrow}$

▲ **RANGE:** See Below

This command creates a complete pie chart, including fill patterns. It can also offset single slices from the rest of the pie chart.

T is the thickness of the line.

X, Y are the coordinates of the center of the pie chart as measured in pixels from the origin of the graphic window.

r is the radius of the pie chart.

$\%_1$ is the percentage of the pie to be taken up by the first pie slice.

$/F_1$ is the number of the fill pattern selection for the first pie slice.

$/O_1$ is the offset of the first pie slice measured in pixels from the center of the pie, if the slice is to be offset.

$\%_n/F_n/O_n$ are the parameters of all other slices in the pie.

Character Reassignment

▲ **COMMAND:** $\boxed{\text{Esc}}$ **+T** $\boxed{\hookleftarrow}$
    datarecord $\boxed{\hookleftarrow}$

▲ **RANGE:** N/A

This command transmits new character assignments from the host to storage on the hard disk of the printer. The table can then be accessed with the Language command.

Load Translation Table

▲ **COMMAND:** $\boxed{\text{Esc}}$ **zt**

▲ **RANGE:**　　**N/A**

This command is identical to Character Reassignment except that it is not a job boundary command.

Language

▲ **COMMAND:**　[Esc]**zl#**[↵]

▲ **RANGE:**　　**See Below**

This command switches the printer from the current character table to another character table, where # is the number of the table selected.

0　U.S. English
1　U.K. English
2　French
3　Dutch
4　Spanish
5　Italian
6　Danish
7　Norwegian
8　Finnish
9　German
A　Swedish
B　Belgian
C　French Canadian
D　Portuguese
E　Latin American
F　The Default Language
G　The Special Table (3274)
H　User-defined Table

Belgian and Portuguese are EBCDIC tables and are not supported by the ULTRA II. It will use The Default Table instead. The ULTRA II supports language tables only for ISO character set fonts. Fonts that do not support the ISO character set will not be remapped based upon language and will always use their built-in character set.

The fonts built in to Xerox printers that are simulated by the II do not support the ISO character set and therefore do not support language selection. If the user needs language support for these fonts, the user must either download or install in the ULTRA II's flash memory the real versions

of these fonts using XEDIT. Language is supported only if Character Set is set to ASCII.

Data Monitor (Currently not supported)

▲ **COMMAND:**   Esc +D

▲ **RANGE:**   N/A

This command will be supported in later revisions of the ULTRA II code. It will print the hexadecimal codes representing all characters received by the printer. This allows the user to analyze data being sent from the host. Data

Control Codes

In the ASCII coding scheme, all bytes with values less than 20h represent control functions. The following table describes the control codes.

BEL	07	Bell — The ULTRA II will send a BELL character to the printer
BS	08	Backspace — Causes the printer to move the print position one space to the left, only if it is the first code in the print line
HT	09	Horizontal Tab — Causes the print position to be moved horizontally to a predetermined location on the page. If there is no tab stop set to the right of the current position, a space is performed
LF	25	Line Feed — Makes the print position to be moved down on line-height. The code may be used as a valid line-ending code, performing both the carriage return and line feed functions, as well as a command terminator.

VT	0B	Vertical Tab — Causes the print position to be moved vertically to a predetermined location on the page/
FF	0C	Form Feed — Causes the printer to eject the current page and begin a new page. This occurs only if the printable character has been placed on the page
CR	0D	Carriage Return — Causes the printer to return to the first print position of the current line. It may also be used as a valid line ending, perform in both the carriage return and the line feed functions.
ESC	1B	Escape — This character gives subsequent codes different meanings.

XEDIT CONFIGURATION

General Information

XEDIT is a menu-driven, MS/PC DOS-based utility that enables users to change the default configuration of the AGILE's line of XES translation products, including the X/TRA series, 3270 series and ULTRA II. Configuration changes made with this software will be saved in the unit's permanent, nonvolatile storage, even when power has been disconnected from the unit.

Getting Started

Loading XEDIT

Start by connecting the XES translator to the host system and to the printer as described in *Section 2 — Installation*. Then load and run XEDIT. If the user's 3.5" high-density disk drive has a letter designation other than A, or if the user is running the software after installing it on a hard drive, substitute the appropriate letter and subdirectory name for A in these instructions.

    At the A:> prompt, type: `XEDIT (ENTER)`

About XEDIT

After a few seconds, the XEDIT program will load, and the "About XEDIT" screen will appear.

After reading the information presented, mouse users can clear this dialog box by pressing the left mouse button after moving the mouse pointer either to *OK* or to the *Close* button in the upper left corner of the dialog box. Keyboard users can close this dialog box either by pressing s to close or d to accept *OK* (the highlighted choice).

This screen also can be displayed by the user at any time during configuration by selecting *About*, found under the *Help* menu. When selected from the *Help* menu, this dialog box will also provide users with information about the amount of remaining memory available in the user's computer.

Next, the user will see the following screen:

Select Port

This dialog box enables the user to indicate to which parallel port the unit to be configured is connected, either *LPT1, LPT2, LPT3 or FILE*. If the user is uncertain as to which port the unit is connected, the user can select Search, and the program will find the port. If there is more than one unit connected to the computer, the user must indicate which one is to be configured. The *Search* choice will find the unit connected to the lowest numbered port.

Mouse users can simply move the mouse pointer to the appropriate choice and press the left mouse button, then move the mouse pointer to *OK* and press the left mouse button. Select *Cancel* or click on the *Close* button to exit without making any changes.

Keyboard users can use the arrow keys to move among the choices, and tab will enable the user to highlight either *OK* or Cancel and to select one or the other by pressing □□□□□ .

An error message will be displayed if the unit is either powered down or disconnected from the designated port. The error must be corrected before configuration can continue.

After the port has been selected, XEDIT will automatically put the unit into Configuration Mode (Mode F on X/TRA products and the ULTRA II). After exiting XEDIT, the unit will automatically perform a power-on Reset and return to Normal Operating Mode.

XEDIT Main Screen

After selecting the appropriate port, the program will display the main screen of XEDIT. Users can navigate through the menus and other choices in XEDIT either with a mouse or with keyboard commands. Using a mouse, standard graphical user interface elements, such as pull-down menus, can be activated by moving the mouse pointer to the choice and pressing the left mouse button to select it.

The following diagram shows the choices available from the main menu bar of XEDIT:

Keyboard Commands

F10=Menu

With the keyboard, the user can access the menu bar by pressing the 0 function key. The specific menu can then be chosen by using the arrow keys to highlight its name. Then, the *Enter* key or the down arrow key can be used to accept the highlighted choice and to display its submenu names.

Alternatively, menus can be accessed by holding down the *Alt* key l and pressing the letter highlighted in the menu bar (e.g., l-*F* for the *File* menu):

File Menu .... [Alt] F
Configure Menu .... [Alt] C
Resources Menu .... [Alt] R
Preferences Menu .... [Alt] P
Help Menu .... [Alt] H

To move from the highlighted menu name to a specific submenu, use the arrow keys to highlight the submenu name, then press the *Enter* key ⏎ to accept the highlighted choice. Alternatively, the user can type the highlighted letter of the submenu name to access the submenu.

Esc=Cancel/Previous Menu

The *Escape* key ⎋ can be used at any time to cancel the current selection or to exit a menu or dialog box.

Enter=OK/Select Item

The *Enter* key ⏎ is used to select the item that is currently highlighted on the screen, whether it is a menu name or an option in a dialog box.

Alt-X=Exit

The XEDIT configuration program can be exited from the main screen by holding down the *Alternate* key ⎇ and pressing X.

F1=Help

Context sensitive help is available at any time by pressing the F1 function key.

Arrow and Tab Keys

The arrow keys and the TAB key can be used to move among various choices in the dialog boxes.

Other Keyboard Commands

The following keyboard commands are also available from the XEDIT main screen:

Current Resources Directory .... Alt D

Install Settings Now .... Alt I

Computer Memory Available .... Alt M

Undo Settings.. Alt U

File Menu

This menu contains the options *Select Port, Resources Directory* and *Exit*.

```
┌──────────────────────────────────────────────────────────────────┐
│         AGILE XES Configuration Program Version 1.95               │
│ File  Configure  Resources  Preferences  Help                     │
│┌────────────────────────┐          ┌────────────────────────────┐ │
││ Select Port            │          │ Configuration to edit:   0 │ │
││ Resources Directory    │          │ Default powerup config: 0  │ │
││ Exit            Alt-X  │          └────────────────────────────┘ │
│└────────────────────────┘                                         │
│                                                                    │
│                                                                    │
│                                                                    │
│                                                                    │
│                                                                    │
│                                                                    │
│                                                                    │
│                                                                    │
│ F1=Help  Alt-X=Exit  Enter=OK/Select Item  Esc=Cancel/Previous Menu  F10=Menu │
└──────────────────────────────────────────────────────────────────┘
```
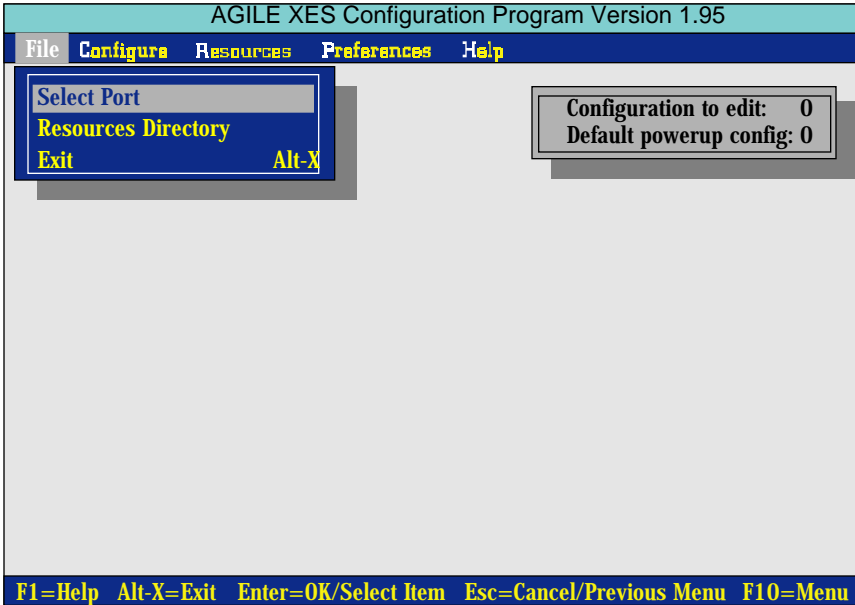
Select Port

This option performs the same function as the port selection screen that was displayed when the user first loaded the program. It enables the user to choose the parallel port to which the unit to be configured is attached, either *LPT1, LPT2 LPT3, or FILE*. The default is *LPT1*.

Resources Directory

The *Resources Directory* will list resources currently installed in the unit, including the XES to PCL operational software, up to ten configurations and as many fonts as the available memory will store. It will also display in hexadecimal notation the   unit's memory in bytes that each resource consumes, and the location in memory where each resource resides.
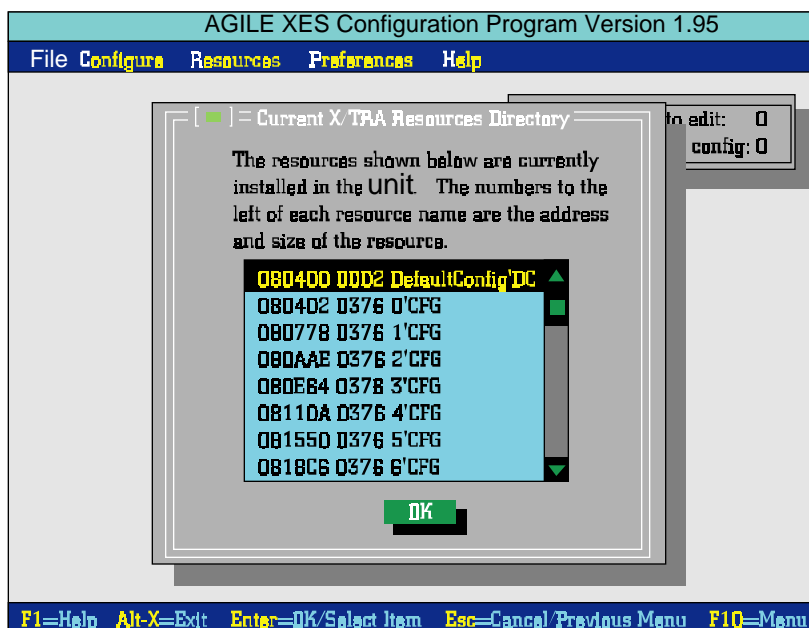
This option is normally used only when the user has been asked by the Xerox Product Support Centre to report the contents of the directory.

The following illustration shows the default resources directory screen:

Exit — Alt-X

The user can select this option to exit the XEDIT software program. XEDIT also can be exited from the XEDIT main screen simply by holding down the *Alt* key and pressing *X*.

Configure Menu

This menu contains the options *Select Configuration to Edit, Change Default Configuration, Text Generation, Printer Setup, Margins Portrait, Margins Landscape, Tabs* and *Other Options*, and it includes the commands *Undo Settings, Install Settings Now, Install As New Configuration*, and *Delete Configuration.*

Select Configuration to Edit

To perform the configuration procedure, the user must first select the

AGILE XES Configuration Program Version 1.95

File Configure Resources Preferences Help

Select Configuration to Edit
Change Default Configuration
Text Generation   ▶
Printer Setup   ▶
Margins, Portrait   ▶
Margins, Landscape   ▶
Tabs   ▶
Other Options   ▶
Undo Settings   Alt-U
Install Settings Now   Alt-I
Install As New Configuration
Delete Configuration

Configuration to edit: 0
Default powerup config: 0

F1=Help Alt-X=Exit Enter=OK/Select Item Esc=Cancel/Previous Menu F10=Menu

configuration to be modified. *Select Configuration* enables this selection by displaying a dialog box wherein the user can choose the number of the configuration to be edited. The number selected is constantly displayed in the box in the upper right corner of the screen next to the entry *Configuration to edit:*.

The unit can store up to ten configurations. Each configuration can be defined and later invoked (using the XES Page Format Select command) for a specific type of print job.

Each unit is shipped with eight configurations. Each consists of the options listed as defaults in this section. The difference between each of them consists primarily of each of the possible combinations of the following three variables, as indicated in the chart that follows:

1. Size Correction (*Shrink or Offset*)
2. Page Orientation (*Portrait or Landscape*)
3. Emulation Mode (*XES or Passthrough*)

Configuration	Size Correction	Orientation	Emulation
0	Shrink	Portrait	XES Mode
1	Shrink	Landscape	XES Mode
2	Offset	Portrait	XES Mode
3	Offset	Landscape	XES Mode
4	Shrink	Portrait	Passthrough
5	Shrink	Landscape	Passthrough
6	Offset	Portrait	Passthrough
7	Offset	Landscape	Passthrough

Page orientation implies the following set of parameters in the default configuration (discussed later in this section):

Orientation	Portrait	Landscape
Font Selection	Titan10iso-P	XCP14iso-L
Page Length	3300	2550
Top Margin	200	120
Bottom Margin	200	120
Left Margin	120	200
Right Margin	2430	3100
Top Margin, 2nd Page*	200	120
Bottom Margin, 2nd Page*	200	120
Left Margin, 2nd Page*	120	200
Right Margin, 2nd Page*	2430	3100
Horizontal Tabs*	17 set	23 set
Vertical Tabs*	15 set	11 set

NOTE: * above indicates feature is not supported.

In addition, all configurations have *Top Offset* and *Left Offset* settings of -75. Finally, all configurations have *Job Sheet* settings of *Power/Error*, with the error level set to *Parse*.

Change Default Configuration

From among the ten possible configurations, the user can select one to use as the default, or powerup, configuration. The default is Configuration 1, but the user can choose any configuration from *0-7*. The number selected is constantly displayed in the box in the upper right corner of the screen next to *Default powerup config.:*.

Text Generation

Text Generation options include *Font Selection, Font Rotation, Language, Character Set, Line Spacing, Absolute Line Spacing* and *Justification,* as indicated in the following illustration:

Font Selection

Font Selection is used to select the default font from among those installed in or native to the unit. The default font for configurations with a portrait orientation is *Titan10iso-P*. The default font for configurations with a landscape orientation is *XCP14iso-L*.

The font selected here will be the font used by the printer until an XES Font Change command is received by the unit.

Font Rotation

Font Rotation gives users the option of activating a feature that allows a font installed in one orientation (portrait or landscape) to be available for printing in both orientations. This option is *Active* by default.

Language

Language is used to select the language used by the printer (*U.S. English* is the default). The user also can choose *U.K. English, French, Dutch, Spanish, Italian, Danish, Norwegian, Finnish, German, Swedish, French Canadian* and *Latin American*. Theses ASCII character sets, and the ISO character set, can be found listed in *Section 5 — Service and Reference*.

These choices are equivalent to those available on the Xerox 4213 Model II printer, with the exception of *Belgian* and *Portuguese*, which are

EBCDIC fonts. EBCDIC is not supported by the unit.

Character Set

Character Set options include *ASCII, ISO* and *PC.* The default is *ASCII.*

These choices are equivalent to those available by setting dip switches on the Xerox 4045-160 printer.

Line Spacing

Line Spacing provides the choices of *Absolute, Half, Single, 1 1/2, Double, 2 1/2* or *Triple. Single* spacing is the default.

This option is equivalent to the XES Line Spacing command.

Absolute Line Spacing

Absolute Line Spacing is used to specify a value for spacing when *Absolute* has been selected under *Line Spacing.* The value can be entered in inches, 1/300 inches or 1/60 inches, depending upon the setting of *Measurement Setting for Entries* under the *Preferences* menu. If inches, the user can enter a value between *0.000* and *14.000.* In 1/300 inches, the user can enter an integer value between *0* and *4200.* In 1/60 inches, the user can enter an integer value between *0* and *840.* The default is *0.*

This option is equivalent to the XES Line Spacing Absolute command.

Justification

Justification choices are *Off, Normal* and *Forced.* The default is *Off.*

The Forced option is equivalent to the XES Justification Unlimited command, *Normal* is equivalent to the Justification Start command, and *Off* is equivalent to the Justification Stop command.

Printer Setup

This menu enables the user to specify choices about the printer, including *Input Tray Selection, Input Paper Size, Input Tray Map, Output Tray Selection, Output Tray Map, Two-Up Printing, Duplex, Page Length Portrait, Page Length Landscape, Size Correction, Top Offset, Left Offset, Minimum Top Coordinate* and *Minimum Left Coordinate*. This illustration displays these choices:
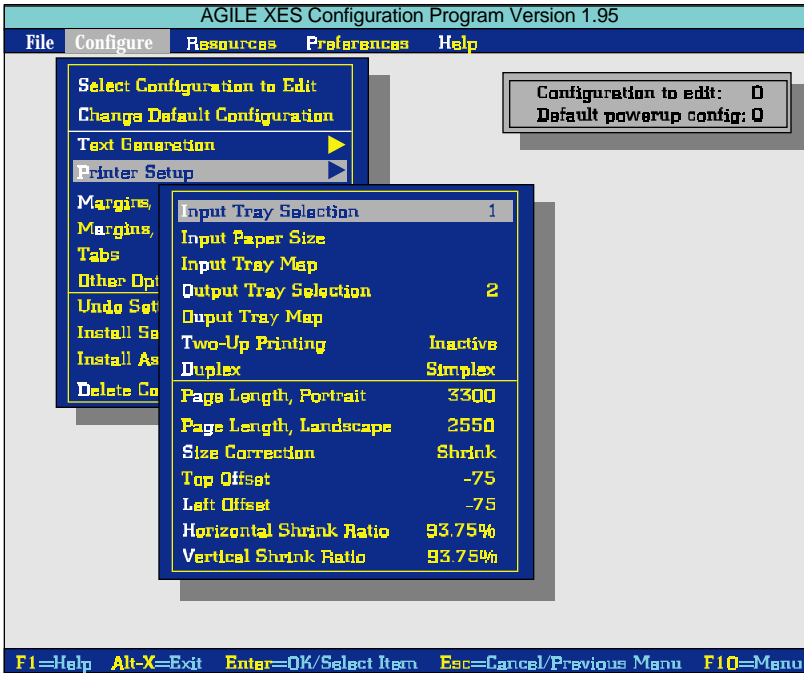
Input Tray Selection

The *Input Tray Selection* is used to select the default input tray (*0-A*). The default is *1*.

This option is equivalent to the XES Paper Tray command.

Input Paper Size

The *Input Tray Selection* is used to choose a paper size for each input tray (*0-A*). The default is *Letter* for each tray. To change the paper size selection, first choose the tray number for which the paper size is to be changed. A dialog box will then be displayed with the choices *Letter,*

Executive, Folio, Legal, Ledger, A6, A5, A4, A3 and envelope sizes *Monarch, Com10, Intl DL, Intl C5* and *Intl B5*. Choose the paper size appropriate for each tray. Each paper size designation is displayed with its measurement.

Input Tray Map

The *Input Tray Selection* is used to match the XES input tray number (*0-A*) to the PCL5 input tray number. For example:

The XES command for tray selection is ⎡Esc⎤c#, where # is the input tray number (0-A). The PCL5 command for tray selection is s&1#H, where # is the input tray number. The following chart illustrates how tray mapping could function if the user has replaced a Xerox 4213 printer (running in XES mode) with a Xerox N-series printer (running in PCL5 mode). The PCL5# is the value sent to the 4500 in the PCL5 source paper drawer select command.

XES #	4213 Tray(s)	PCL5 #
0	HCF, 1, 2	5
1	1 (upper)	1
2	2 (lower)	3
3	HCF	5
4	1	1
5	1, 2	1
6	HCF, 2	5
7	HCF, 1	5
8	n/a	4
9	Bypass	2
A	n/a	4

Output Tray Selection

The *Output Tray Selection* chooses the default output tray (*1 or 2*). The default value is *1*.

This option is equivalent to the XES Output Tray command.

Output Tray Map

The *Output Tray Selection* is used to match the XES output tray number (*1-2*) to the PCL5 output tray number.

Two-up Printing

AGILE XES translators do not support the XES Margins Double Page
command used for printing two logical pages on one physical page. The
XES command referred to is: [Esc] m<H,T$_1$,B$_1$,L$_1$,R$_1$>,m<T$_2$,B$_2$,L$_2$,R$_2$>[↵].

Two logical pages on one physical page may be accomplished with an
AGILE unit by following the procedure below:

> 1) Set the margins for the size of the first logical page.
>
> 2) Print the text for the first page. DO NOT EXCEED the
>   margins or physical size of the paper.
>
> 3) Set the margins for the second logical page.
>
> 4) Set absolute text placement to the print position of the first
>   character of the second two-up page.
>
> 5) Print the text for the second page.
>
> 6) Form Feed to the next physical page or side.

NOTE: The margin settings for a second page in XEDIT are not
supported and have no effect.

To test the procedure, enter the following source code.

Print Test Data

```
        =UDK=~
  ~X
  =UDK=~
  ~m480,10,10,10,335
  Line 1  Page 1
  Line 2  Page 1
  Line 3  Page 1
  Line 4  Page 1
  Line 5  Page 1
  Line 6  Page 1
  ▼       ▼

  Line 47 Page 1
  Line 48 Page 1
  Line 49 Page 1
  Line 50 Page 1

  ~m480,10,10,355,690
  ~a50,1775
  Line 1  Page 2
  Line 2  Page 2
  Line 3  Page 2
  ▼       ▼

  Line 47 Page 2
  Line 48 Page 2
  Line 49 Page 2
  Line 50 Page 2

  ~X
```

The resulting output should look like this:

```
Line 1  Page 1                        Line 1  Page 2
Line 2  Page 1                        Line 2  Page 2
Line 3  Page 1                        Line 3  Page 2
Line 4  Page 1                        Line 4  Page 2
Line 5  Page 1                        Line 5  Page 2
Line 6  Page 1                        Line 6  Page 2
Line 7  Page 1                        Line 7  Page 2
Line 8  Page 1                        Line 8  Page 2
Line 9  Page 1                        Line 9  Page 2
Line 10 Page 1                        Line 10 Page 2
Line 11 Page 1                        Line 11 Page 2
Line 12 Page 1                        Line 12 Page 2
Line 13 Page 1                        Line 13 Page 2
Line 14 Page 1                        Line 14 Page 2
Line 15 Page 1                        Line 15 Page 2
Line 16 Page 1                        Line 16 Page 2
Line 17 Page 1                        Line 17 Page 2
Line 18 Page 1                        Line 18 Page 2
Line 19 Page 1                        Line 19 Page 2
Line 20 Page 1                        Line 20 Page 2
Line 21 Page 1                        Line 21 Page 2
Line 22 Page 1                        Line 22 Page 2
Line 23 Page 1                        Line 23 Page 2
Line 24 Page 1                        Line 24 Page 2
Line 25 Page 1                        Line 25 Page 2
Line 26 Page 1                        Line 26 Page 2
Line 27 Page 1                        Line 27 Page 2
Line 28 Page 1                        Line 28 Page 2
Line 29 Page 1                        Line 29 Page 2
Line 30 Page 1                        Line 30 Page 2
Line 31 Page 1                        Line 31 Page 2
Line 32 Page 1                        Line 32 Page 2
Line 33 Page 1                        Line 33 Page 2
Line 34 Page 1                        Line 34 Page 2
Line 35 Page 1                        Line 35 Page 2
Line 36 Page 1                        Line 36 Page 2
Line 37 Page 1                        Line 37 Page 2
Line 38 Page 1                        Line 38 Page 2
Line 39 Page 1                        Line 39 Page 2
Line 40 Page 1                        Line 40 Page 2
Line 41 Page 1                        Line 41 Page 2
Line 42 Page 1                        Line 42 Page 2
Line 43 Page 1                        Line 43 Page 2
Line 44 Page 1                        Line 44 Page 2
Line 45 Page 1                        Line 45 Page 2
Line 46 Page 1                        Line 46 Page 2
Line 47 Page 1                        Line 47 Page 2
Line 48 Page 1                        Line 48 Page 2
Line 49 Page 1                        Line 49 Page 2
Line 50 Page 1                        Line 50 Page 2
```

Duplex

Duplex gives the user the options of *Simplex* printing, *Side-to-Side* duplex printing or *Head-to-Toe* duplex printing. The default value is Simplex.

Simplex is equivalent to the XES Duplex Stop command, *Side-to-Side* is equivalent to the Duplex Start command, and *Head-to-Toe* is equivalent to the Duplex Invert Start command.

Page Length (Portrait, Landscape)

Page Length enables the user to specify a page length between 0 and 14 inches. The value can be entered in inches, 1/300 inches or 1/60 inches, depending upon the setting of *Measurement Setting for Entries* under the *Preferences* menu. If inches, the user can enter a value between *1.000* and *14.000.* In 1/300 inches, the user can enter an integer value between *300* and *4200.* In 1/60 inches, the user can enter an integer value between *60* and *840.* The default value for portrait is *3300* (300ths inch). The default for landscape is *2550.*

The *Page Length* option is equivalent to the *H* parameter of the XES Margins and Margins Double Page commands.

Size Correction

Size Correction accounts for the difference in printable area between XES and PCL5 printers. XES printers can print to the edge of the page, while PCL5 printers can print only to within about 1/4 inch of the page edge. Further, the page origin on a PCL5 printer is 1/4 inch down and to the right from the top left corner, whereas an XES printer page origin is at the top left corner. To correct for these differences between the two printer types, the user can choose between *None, Offset, Auto Offset* and *Shrink*. The default configurations have values of *Shrink* or *Offset*.

None will print the XES document to the PCL5 printer without compensating for the differences in origin or printable area. Because of the difference in page origins, the output will start 1/4 inch down and to the right from where it would print on an XES printer. This selection ensures that no text is lost or clipped at the upper and left edges of the page, but text may be lost or clipped at the bottom and right edges. Further, because of the difference in positioning on the page, this choice is inappropriate for printing on preprinted forms. It is useful, however, for those PCL5 printers that can print to the edge of the page.

Offset corrects for the differences in page origins. If selected by the user, negative values entered under *Top Offset* and *Left Offset* (below) will shift the printed output on the page up and to the left by the amount specified. If set to -1/4 inch, the user can ensure that the effective page origin is the same as that of an XES printer. However, if the document sends text to the edges of the page, this text will be lost or clipped. This choice is appropriate for printing on preprinted forms if the XES document does not use the outside 1/4 inch of the page.

Shrink will reduce the vertical and horizontal distance between the origins of all text characters on the page to 93.75%. This is the amount necessary to fit all output on the page, even if the document prints edge-to-edge on an XES printer. This choice will ensure that no characters are lost or clipped, but it is unsuitable for printing on preprinted forms. The effective page origin is 1/4 inch down and to the right of the upper left corner of the page.

Top Offset

Top Offset specifies the amount of shift if *Offset* is selected (or active because of the *Auto Offset* algorithm) under *Size Correction*. Negative values move printed output up; positive values move printed output down. The value can be entered in inches, 1/300 inches or 1/60 inches, depending upon the setting of *Measurement Setting for Entries* under the *Preferences* menu. If inches, the user can enter a value between *-1.000* and *1.000*. In 1/300 inches, the user can enter an integer value between

-300 and *300.* In 1/60 inches, the user can enter an integer value between *-60* and *60.* The default value is *-75* (300ths inch).

Left Offset

Left Offset specifies the amount of shift if *Offset* is selected (or active because of the *Auto Offset* algorithm) under *Size Correction.* Negative values move printed output left; positive values move printed output right. The value can be entered in inches, 1/300 inches or 1/60 inches, depending upon the setting of *Measurement Setting for Entries* under the *Preferences* menu. If inches, the user can enter a value between *-1.000* and *1.000.* In 1/300 inches, the user can enter an integer value between *-300* and *300.* In 1/60 inches, the user can enter an integer value between *-60* and *60.* The default value is *-75* (300ths inch).

Minimum Top Coordinate

The *Minimum Top Coordinate* setting is used if *Auto Offset* has been selected under *Size Correction* in the *Printer Setup* menu. The unit uses this value to determine if the origin of the first character is in the printable area of the page. The value entered by the user should normally be 1/4 inch, since this is the area at the top of the page that cannot be addressed by PCL5 printers. The default is *75* (300th inch). This value may need to be increased if the origin of the character is within the printable area, but the height of the character is such that the character is clipped when printed.

The value can be entered in inches, 1/300 inches or 1/60 inches, depending upon the setting of *Measurement Setting for Entries* under the *Preferences* menu. If inches, the user can enter a value between *0.000* and *14.000.* In 1/300 inches, the user can enter an integer value between *0* and *4200.* In 1/60 inches, the user can enter an integer value between *0* and *840.*

Minimum Left Coordinate

The *Minimum Left Coordinate* setting is used if *Auto Offset* has been selected under *Size Correction* in the *Printer Setup* menu. The unit uses this value to determine if the origin of the first character is in the printable area of the page. The value entered by the user should normally be 1/4 inch, since this is the area on the left edge of the page that cannot be addressed by PCL5 printers.

Margins (Portrait, Landscape)

These settings determine the area of the page in which characters can be printed. The menu choices are indicated in the following illustration:

Top Margin

The *Top Margin* setting determines the number of inches from the top edge of the page to the baseline (origin) of the first line of text. The value can be entered in inches, 1/300 inches or 1/60 inches, depending upon the setting of *Measurement Setting for Entries* under the *Preferences* menu. If inches, the user can enter a value between *0.000* and *14.000*. In 1/300 inches, the user can enter an integer value between *0* and *4200*. In 1/60 in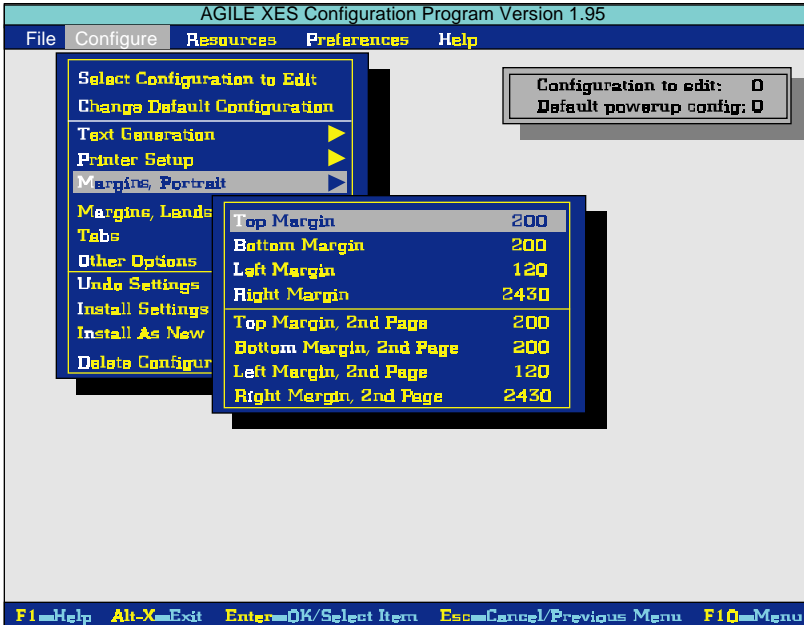ches, the user can enter an integer value between *0* and *840*. The default value for portrait pages is *200* (300ths inch); the default value for landscape pages is *120* (300ths inch).

Bottom Margin

The *Bottom Margin* setting determines the number of inches from the bottom edge of the page to the baseline (origin) of the last line of text. The value can be entered in inches, 1/300 inches or 1/60 inches, depending upon the setting of *Measurement Setting for Entries* under the *Preferences* menu. If inches, the user can enter a value between *0.000* and *14.000*. In 1/300 inches, the user can enter an integer value between

0 and *4200*. In 1/60 inches, the user can enter an integer value between *0* and *840*. The default value for portrait pages is *200* (300ths inch); the default value for landscape pages is *120* (300ths inch).

Left Margin

The *Left Margin* setting determines the number of inches from the left edge of the page to the left edge (origin) of the first character in each line on the page. The value can be entered in inches, 1/300 inches or 1/60 inches, depending upon the setting of *Measurement Setting for Entries* under the *Preferences* menu. If inches, the user can enter a value between *0.000* and *14.000*. In 1/300 inches, the user can enter an integer value between *0* and *4200*. In 1/60 inches, the user can enter an integer value between *0* and *840*. The default value for portrait pages is *120* (300ths inch); the default value for landscape pages is *200* (300ths inch).

Right Margin

The *Right Margin* setting determines the number of inches from the left edge of the page to the right edge of the last character in each line on the page. The value can be entered in inches, 1/300 inches or 1/60 inches, depending upon the setting of *Measurement Setting for Entries* under the *Preferences* menu. If inches, the user can enter a value between *0.000* and *14.000*. In 1/300 inches, the user can enter an integer value between *0* and *4200*. In 1/60 inches, the user can enter an integer value between *0* and *840*. The default value for portrait pages is *2430* (300ths inch); the default value for landscape pages is *3100* (300ths inch).
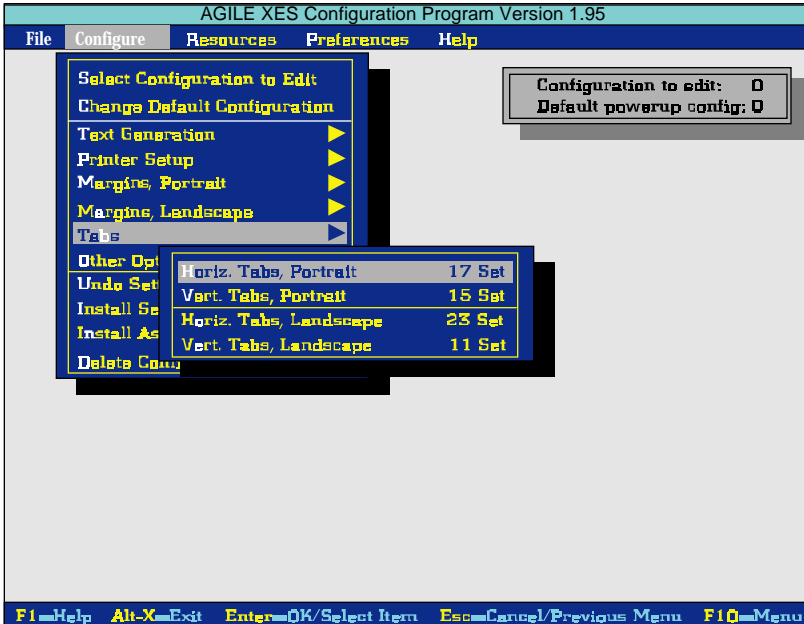
Tabs (Portrait, Landscape)

The Tabs menu enables the user to set *Horizontal Tabs* and *Vertical Tabs* for both portrait and landscape pages, as indicated by the illustration below. These options are equivalent to the XES Tabs Horizontal and Tabs Vertical commands, respectively.

Selecting any of the four tab setting choices will cause XEDIT to display the following dialog box (the *Horizontal Tabs, Portrait* dialog box is illustrated):

To enter a new tab value, mouse users can move the mouse pointer to any of the fields indicated by underscore characters, press the left mouse button, and then type the value of the tab location. Keyboard users can use t, u or n to move to any of these fields, then type the value of the tab location.

Up to 64 values can be entered, in any order. Duplicate entries are automatically reconciled, and XEDIT will automatically place the entries in their correct order.

Values can be entered in inches, 1/300 inches or 1/60 inches, depending
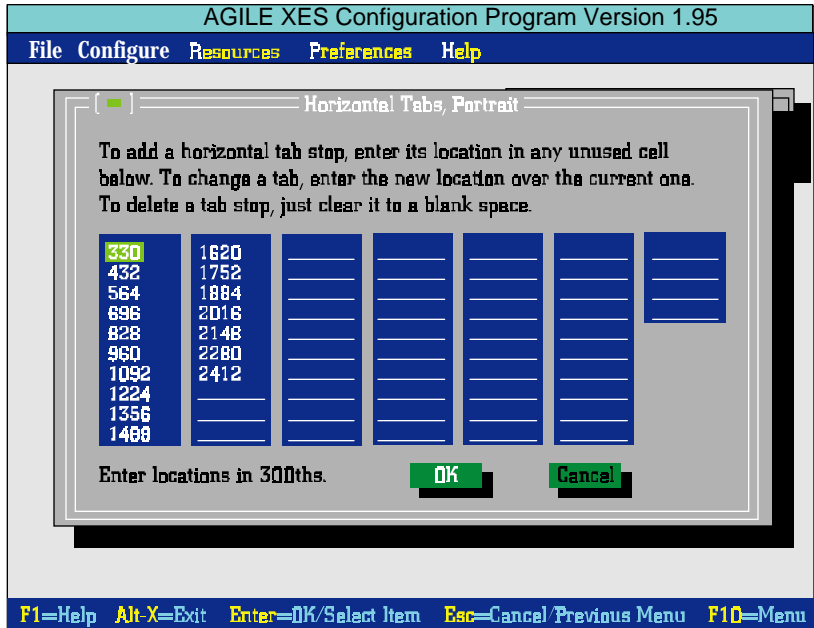
upon the setting of *Measurement Setting for Entries* under the *Preferences* menu. If inches, the user can enter a value between *0.000* and *14.000*. In 1/300 inches, the user can enter an integer value between *0* and *4200*. In 1/60 inches, the user can enter an integer value between *0* and *840*.

Delete tab settings by highlighting the value to be deleted, and then pressing the space bar. After entering and/or deleting values, use the mouse to select *OK* to accept the choices.

The following lists show the default portrait and landscape tab stops:

Horizontal U. S. Landscape Letter

330	462	594	726	858	990	1122	1254
1386	1518	1650	1782	1914	2046	2178	2310
2442							

Horizontal U. S. Portrait Letter

330	462	594	726	858	990	1122	1254
1386	1518	1650	1782	1914	2046	2178	2310
2442	2574	2706	2838	2970	3102	3234	

Horizontal. International Landscape A4

313	457	601	745	889	1033	1177	1321
1465	1609	1753	1897	2041	2185	2329	2473

Horizontal International Portrait A4

313	457	601	745	889	1033	1177	1321
1465	1609	1753	1897	2041	2185	2329	2473
2617	2761	2905	3049	3193	3337	3481	

Vertical U. S. Landscape Letter

330	540	750	960	1170	1380	1590	1800
2010	2220	2430					

Vertical U. S. Portrait Letter

330	540	750	960	1170	1380	1590	1800
2010	2220	2430	2640	2850	3060	3270	

Vertical International Landscape A4

287	497	707	917	1127	1337	1547	1757
1967	2177	2387					

Vertical International Portrait A4

300	600	900	1200	1500	1800	2100	2400
2700	3000	3300					

Other Options

This submenu enables the user to change the settings for the following options: *Emulation Mode, Line End, Units of Measure, Uppercase Commands, UDK Character, Job Timeout, Job Sheet* and *Error Level*. These options are shown in the following illustration:
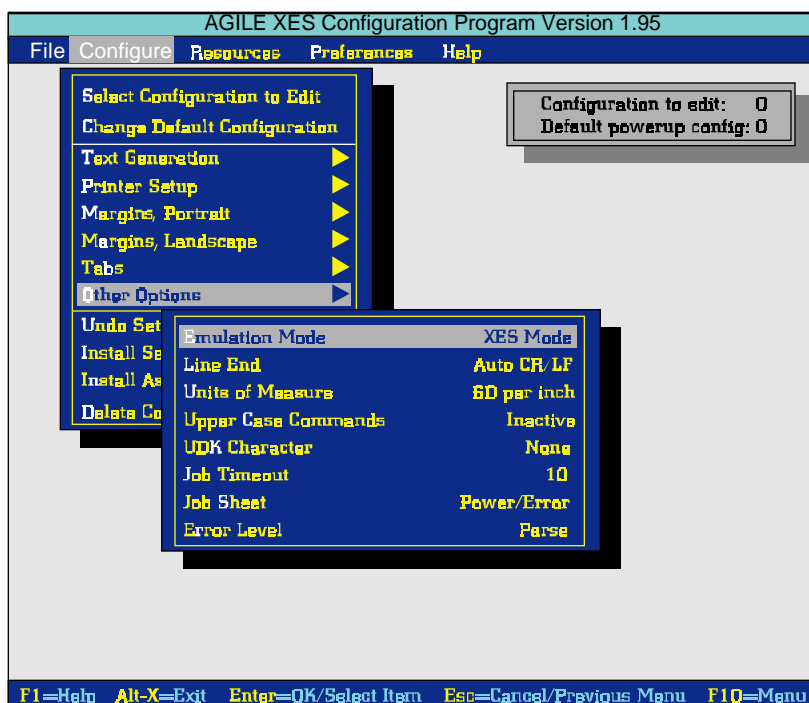
Emulation Mode

This option enables the user to set the configuration either to *XES Mode* or to *Passthrough Mode. XES Mode* is the normal operating mode, enabling XES documents to be printed to the user's PCL5 printer. *Passthrough Mode* enables the user to print other document types, including PCL5 documents, and PostScript documents if the user's printer supports PostScript.

Line End

XES protocol requires that certain printer commands are terminated with a line ending, either a carriage return only (CR), a line feed only (LF) or both (CR/LF). The type of line ending is defined by the user. This option enables the user to indicate to the unit which type of line ending is being used in the user's XES documents to terminate XES commands.

The user can select CR/LF, *CR only*, *LF only* or *Auto CR/LF. Auto CR/LF* is the default, and it tells the X/TRA to accept any line ending as an XES command terminator.

Units of Measure

This option is equivalent to the XES Units commands—1/60 of an inch or "Units"—or 1/300 of an inch "Units". It is used to indicate whether measurements within XES commands in the user's documents are stated in 1/60-inch units or 1/300-inch units. The user can choose *60 per inch* or *300 per inch*. The default is *300 per inch*.

Note: This setting is not related to the setting in *Measurement Units for Entries* under the *Preferences* menu. *Measurement Units for Entries* is used only for measurement units entered within XEDIT.

Uppercase Commands

Normally, XES commands are case sensitive, i.e., they must be entered in upper case or lower case, depending upon the command format. This option, when set to *Active*, enables the user to enter all XES commands in upper case letters. This is the default. When set to *Inactive*, XES commands must be entered according to normal XES protocol.

UDK Character

XES commands may begin with the default escape character (ASCII 1B), or the user can define a substitute character with which to begin XES commands. This is useful if the system is not capable of transmitting the ASCII Escape character. In this dialog box, enter the character that initiates XES commands in the user's documents.

To define the substitute Escape character, simply type in a printable, non-alphanumeric character. If the entered character is unacceptable, an error message will be displayed. The default value is *None*, which means that only the default Escape character can be used to begin XES commands.

Job Timeout

The timeout period defined by the user will determine how long the unit will wait for data before it assumes a job boundary and ejects the current page from the printer. The user may enter a value between 2 and 600 seconds.

Note: The unit must have a smaller timeout setting than the timeout setting for the printer (about two seconds shorter). If the printer times out before the unit, in some cases the last page will not be printed correctly.

Job Sheet

The *Job Sheet* option determines under which conditions the unit will print a Configuration/Status Page. The choices are *None, Always* and all of the possible combinations of *Error, Request* and *Power Up*. The

default for all configurations is *Power/Error*.

If the user selects None, the Configuration/Status Page will not be printed under any conditions, except when the user selects *Mode 4* using the *Mode Selector* button on the top panel of the ULTRA II. If the user selects *Always*, the Configuration/Status Page will be printed upon power up, when requested within a document, when an error condition occurs, and when the user selects *Mode 4*. The other choices restrict the printing of the Configuration/Status Page to a smaller set of conditions.

Error Level

This option is used in conjunction with the *Job Sheet* option. It is used to determine which level of error qualifies as an error for the purpose of printing a Configuration/Status Page. It also determines which errors are reported on the page. The default choice is *Parse*. The user can also choose among *Critical, Fatal, Implementation* and *Superficial*.

If the user chooses *Fatal*, the only errors reported will be those that prevent the document from being printed. *Critical* errors are those that will cause the document to print incorrectly, such as missing fonts or forms. *Parse* errors are those caused by incorrect or incomplete XES commands. *Implementation* errors are due to the unit's implementation of XES commands. *Superficial* errors are those that will not affect printed output. Each choice is inclusive of the choice(s) above it.

Undo Settings — Alt-U

Changes to the configuration of the unit are not installed. *Undo Settings* is a command that will cancel all changes during the current editing session.

This command will not undo *Font* menu commands such as *Load Font, Delete Font, Pack Memory* and *Non-Shrinkable Fonts*, nor will it undo the *Delete Configuration* command until a new congfiguration is loaded using "Load_agl".

Install Settings Now — Alt-I

Changes to the configuration of the unit are not installed Use this command to save any changes to the current configuration. The new configuration must be loaded using "Load_agl" for the changes to take effect.

This command will not affect the *Delete Configuration* command or *Font* menu commands such as *Load Font, Delete Font, Pack Memory* and *Non-Shrinkable Fonts*.

Install As New Configuration

Changes to the configuration of the unit are not installed until the new configuration is loaded using "Load_agl".

Use this command to save changes to the current configuration as a different configuration. When this option is selected, a dialog box is displayed that enables the user to install configuration changes to a different configuration number. Enter any digit between *0* and *9*.

This command is useful for creating two configurations with only minor differences. The user can use the *Select Configuration* option to select a configuration, make a few changes and then use this command to save the edited configuration under a different number.

This command will not affect the *Delete Configuration* command or *Font* menu commands such as *Load Font, Delete Font, Pack Memory* and *Non-Shrinkable Fonts*.
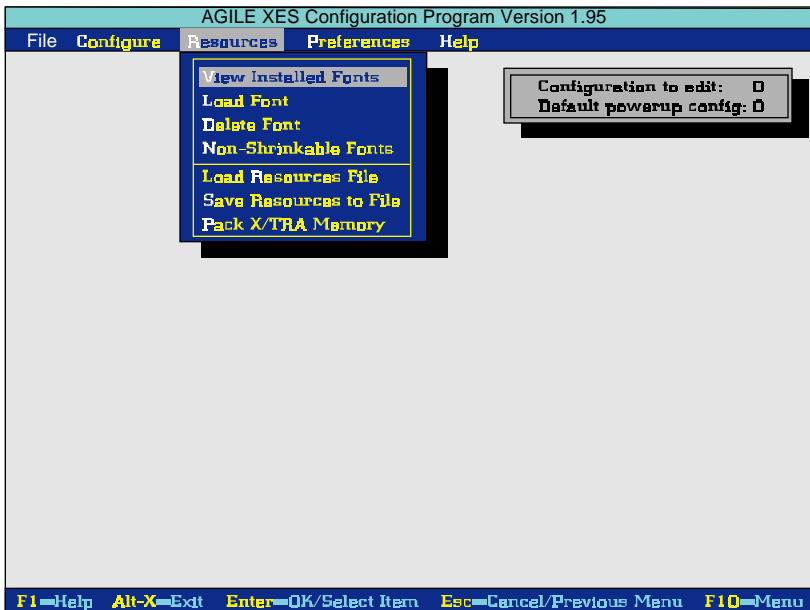
Delete Configuration

The user can free up space in the unit's flash memory by removing from memory any configurations that are not being used. The user can choose any configuration from *0-9*. When the confirmation dialog box is displayed, select *Yes* to continue.

Resources Menu

This menu contains the options *View Installed Fonts, Load Font, Delete Font, Non-Shrinkable Fonts, Load Resources File, Save Resources to File* and *Pack Memory*.

Each unit has approximately 448K of font storage space in its nonvolatile flash memory, depending upon the size of other resources, such as configurations.

View Installed Fonts

View Installed Fonts will display a list of all fonts that the user has defined in the current configuration. Users can display font names for which there is insufficient room on the screen by using the arrow keys.
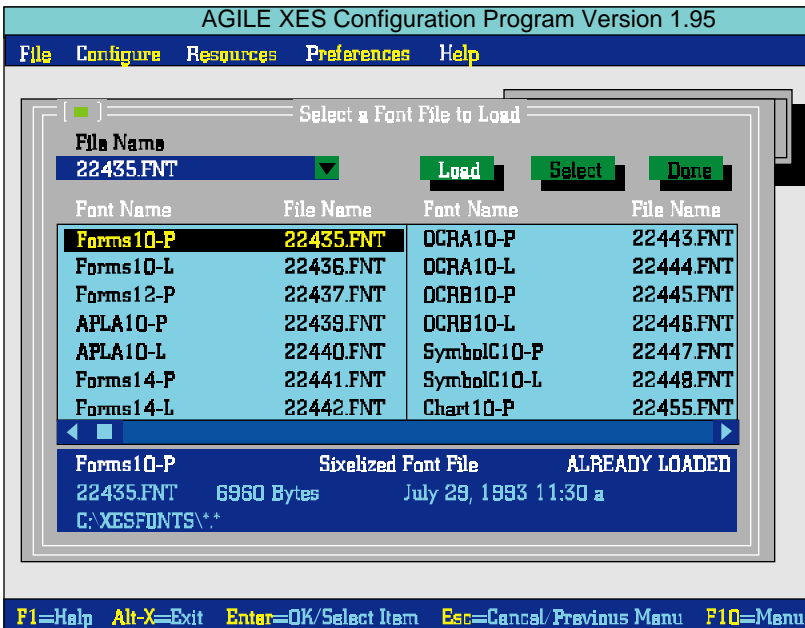
Load Font

Load Font will display a dialog box that will allow the user to add fonts from disk to the current configuration. Loading a font is equivalent to having a font on a cartridge installed in a Xerox 4045-160 printer, with the advantage that the user can choose which fonts are present. All installed fonts are desixelized and compressed to conserve space.

The *Load Font* dialog box is represented with the following illustration:

This dialog box has two areas in which users can enter data, in addition to the *Load* and *Done* buttons. Mouse users can navigate between these four items by moving the mouse pointer to the appropriate item and pressing the left mouse button. Keyboard users can use t to select the appropriate item.

The first step in loading a font is to select the *File Name* box in the upper left corner of the dialog box. Here, the user can enter the letter of the disk drive in which the user's fonts reside by typing the letter of the drive followed by a colon, e.g., `C:`. The default drive is `A:`. The user can also type the entire path, including subdirectory names and the file name, in this box, but the following method may be more convenient:

```
        AGILE XES Configuration Program Version 1.95
File   Configure   Resources   Preferences   Help

  [ ■ ]=========== Select a Font File to Load ==========
    File Name
    22435.FNT              ▼     [ Load ]   [ Select ]   [ Done ]

    Font Name        File Name      Font Name          File Name
    Forms10-P        22435.FNT      OCRA10-P           22443.FNT
    Forms10-L        22436.FNT      OCRA10-L           22444.FNT
    Forms12-P        22437.FNT      OCRB10-P           22445.FNT
    APLA10-P         22439.FNT      OCRB10-L           22446.FNT
    APLA10-L         22440.FNT      SymbolC10-P        22447.FNT
    Forms14-P        22441.FNT      SymbolC10-L        22448.FNT
    Forms14-L        22442.FNT      Chart10-P          22455.FNT
    ◄ ■                                                         ►
    Forms10-P            Sixelized Font File        ALREADY LOADED
    22435.FNT    6960 Bytes       July 29, 1993 11:30 a
    C:\XESFONTS\*.*

F1=Help   Alt-X=Exit   Enter=OK/Select Item   Esc=Cancel/Previous Menu   F10=Menu
```

Once the user has selected the appropriate disk drive in the *File Name* box, the subdirectory and file name can be selected in the *Font Name/File Name* box in the center of the screen. Mouse users can do this by pointing and clicking, and keyboard users can do this using the arrow keys. When the desired font name is highlighted, press ENTER, or select Load, and the file will be loaded into the configuration.

After loading all fonts to be stored in the configuration, select the *Done* button to return to the main screen.

The lowest box on the screen displays information about the currently highlighted font. This information includes the directory/subdirectory in which the font resides, the name of the font, the name of the file, the size of the file in bytes and its creation/modification date. This box will also indicate the format of the file, i.e., whether the file is binary, sixelized or in another format, and whether or not the font has already been loaded into the configuration.

Delete Font

Delete Font will display a dialog box that will enable the user to remove from the current configuration any fonts that the user has installed. Simply highlight the name of the font to be deleted, using the mouse or the arrow keys, press ENTER, or click on *Delete*. When the confirmation dialog box is displayed, select Yes to continue.

Non-Shrinkable Fonts

This dialog box enables the user to list all of the installed, downloaded or printer-resident fonts that will print incorrectly due to space compression caused by using the *Shrink* algorithm. Listing the fonts here will prevent these fonts from having space removed between characters when *Shrink* has been selected *for Size Correction* under *Printer Setup* in the *Configuration* menu. Fonts that may be distorted by shrinking include bar codes, logos and signatures.

Use the mouse to highlight the field in which to enter the font name. Enter the name of the font exactly, including upper and lower case letters, as appropriate. If using both portrait and landscape orientations of a font, both names must be entered separately, even if only one has been installed (because the user has set *Font Rotation* to *Active* under *Text Generation* in the *Configure* menu).

To delete a font entry, simply highlight its name and press ENTER. Exit the dialog box by using the mouse to select *OK*, or press ENTER to accept the choice.

Save Resources to File

The user may select which resources are saved in the resources file. This enables the user to save only those resources that will be shared by other users, or whatever other reason the user may have for saving only some of the resources.

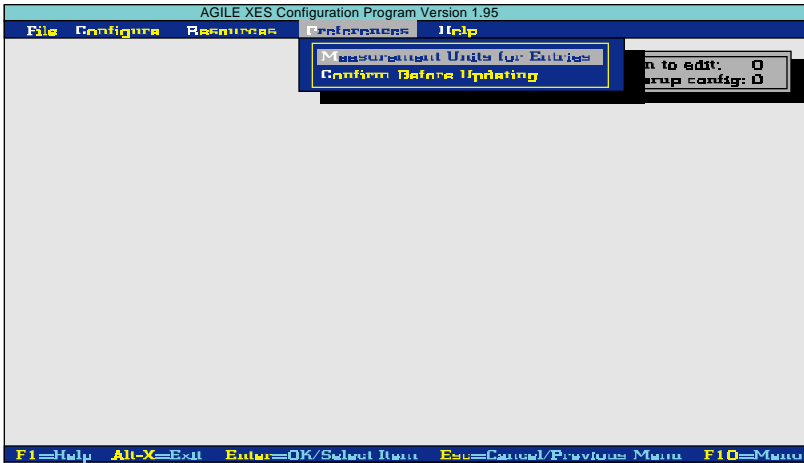The user may enter a description for each resource file saved. When

loading the resources, the comment entered will be displayed (only the first twenty-characters) in case the user has saved different configurations.

Preferences Menu

This menu contains the options *Measurement Units for Entries* and *Confirm Before Updating*.

Measurement Units for Entries

XEDIT asks the user to enter measurements in several dialog boxes during the configuration process. For instance, the user may enter measurements for page size, margins, offsets, absolute line spacing, coordinates and tabs. This option determines whether the user's entries are entered and displayed in inches, 1/60-inch units or 1/300-inch units. The default value is *300ths*.

Regardless of the format in which they are entered and displayed, all measurements are stored by the unit in 1/300-inch units. As such, all values entered as tenths, hundredths or thousandths of inches will be rounded down to the nearest 1/300-inch equivalent.

Note that the numerical entries displayed will change after the user changes the unit of measurement. For instance, a margin of 1.000 in inch units will be displayed as a margin of 300 in 1/300-inch units. The actual margin measurement itself will not be changed simply by changing the unit of measure.

Note: *This setting is not related to the setting in* Units of Measure *under* Other Options *in the* Configure *menu*. Measurement Units for Entries *is used only for measurement units entered within XEDIT.*

Help Menu

The *Help* menu enables the user to look up information on an XEDIT topic out of context. (Context-sensitive help is available at any time by pressing the F1 function key.) The *Help* menu contains the options *Content*s and *About.*

Contents

Contents is a directory of topics available in the on-line help file. Selecting an item in this list will automatically display information about the topic.

After reading the information displayed on the screen, users can either return to the *Contents* menu or get information on other topics, the names of which may be displayed on the screen. Mouse users can simply move the mouse pointer to the topic name and press the left mouse button to select it. The arrow keys can used to highlight the selection, and ENTER to accept the choice.

About

Selecting *About* will display a dialog box with information about XEDIT, including the software version number, its copyright date and the amount of memory available in the user's computer.