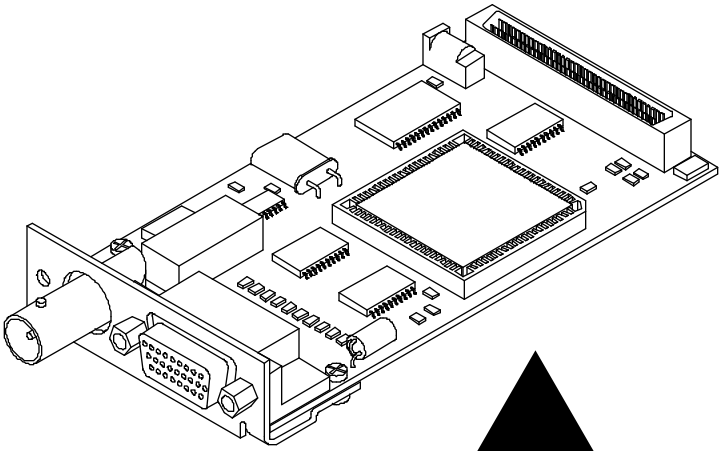
AGILE®

3270 X/ACT

Printer Interface Controller



USER'S MANUAL

PREFACE

About This Manual

This manual covers the installation and use of the AGILE 3270 X/ACT internal printer interface controller. 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 it 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 address below:

AGILE
Attn: Marketing
875 Alfred Nobel Drive
Hercules, CA 94547-1899

AGILE Product Warranty

Standard Warranty

AGILE warrants to the original purchaser that this product will be free from defects in materials and workmanship and in good working order per the functional specifications current at the time of shipment for a period of two (2) years from the date of shipment to the purchaser. AGILE units that fail within the first thirty (30) days from the date of delivery will be treated as an Express Exchange Service (see Optional Warranties and Services) at no extra charge.

Should this product fail to be in good working order at any time during the two-year period, AGILE will, at its absolute discretion, repair or replace this product. AGILE shall have no obligation whatsoever if the product has been damaged due to accident or disaster, or if it has been misused, carelessly handled, defaced, modified or altered, including unauthorized repairs made or attempted, or if the user has failed to provide and maintain a proper environment for the product.

AGILE reserves the right to determine what constitutes warranty repair. Out-of-warranty products will be repaired using AGILE's flat repair rate. All out-of-warranty repaired units have a 90-day Standard Warranty. Units returned for repair and found not defective will, at AGILE's discretion, incur a handling and testing charge. AGILE is not responsible for delays caused by shipping or non-availability of replacement components or other similar causes, events or conditions beyond its reasonable control.

Claims must be reported to AGILE's Technical Support Department at (510) 724-1600, (800) 538-1634, or by FAX at (510) 724-2222. AGILE will assist the customer in verifying the source of the problem.

At AGILE's discretion, a Return Materials Authorization (RMA) number will be issued to the customer. The customer will then carefully package and ship the unit to AGILE (preferably in the original shipping container) with the RMA number on the outside of the box. Shipping costs incurred in sending the unit to AGILE are borne by the customer. Shipping costs incurred in returning the unit to the customer via UPS Ground (or equivalent service with a secondary shipper) are borne by AGILE. Repair parts and replacement products will be furnished on an exchange basis and will be either reconditioned or new. All replaced parts and products become the property of AGILE.

This warranty is the only warranty provided by AGILE. If this product is not in good working order as warranted above, the customer's sole remedy shall be repair or replacement as provided above. This warranty states the purchaser's exclusive remedy for any breach of AGILE's warranty and for any claim, whether in contract or tort, for loss, injury or damages caused by the sale or use of any product and is in lieu of all other warranties, expressed or implied. In no event shall AGILE be responsible for any loss of business, savings or profits, downtime or delay, labor repair or material costs, injury to person or property, or any similar or dissimilar consequential or inconsequential loss or damage resulting from this product, its use, or arising out of any breach of warranty, even if AGILE or an authorized AGILE dealer has been advised of the possibility of such damage, or for any claim by any other party. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply.

All expressed and implied warranties for this product, including the warranties of merchantability and fitness for a particular purpose, are limited in duration to a period of two (2) years from the date of purchase by the original purchaser, and no warranties, whether expressed or implied, will apply after this period. Some states do not allow limitations on how long an implied warranty lasts, so the above limitations may not apply.

This warranty gives the user specific legal rights, and the user may also have other rights which may vary from state to state.

Optional Warranties and Services

Extended Warranty lengthens the Standard Warranty and is available in 12-month increments for a maximum of three (3) years. This extension can effectively lengthen the Standard Warranty to five (5) years. Any Extended Warranty must be purchased prior to the expiration date of the Standard Warranty.

Express Exchange Service provides a next-business-day delivery of a replacement unit. The customer must contact AGILE, and AGILE's Customer Support Department must determine by 2:00 p.m. PST that a replacement unit is required. Express Exchange Service is available in 12-month increments for a maximum total of five (5) years and must be concurrent with Standard or Extended Warranties.

Medallion Support Program extends the AGILE two-year Standard Warranty by one year to three years, plus it includes three years of Express Exchange Service, all at a savings of one-third off the standard price.

FCC Statement

This equipment generates, uses and can radiate radio frequency energy. If it is not installed and used in strict accordance with AGILE's 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 printer with respect to the receiver.
- ▲ Move the printer away from the receiver.
- ▲ Plug the printer into a different outlet so that the 3270 X/ACT 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 3270 X/ACT. 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.)

Warnings

Shock

Never open the printer in which the 3270-X/ACT is installed when the power is on or when it is connected to any power source. Dismantling the 3270-X/ACT may void the warranty.

Notes

Standard Factory Setup

Unless otherwise requested, The 3270-X/ACT is shipped with the following defaults:

- ASCII character set
- Right margin set to column 132
- All menu items set to defaults

IBM Host Considerations

The 3270-X/ACT connects directly to the establishment controller through an IBM category A device adapter. The port designation for the 32700-X/ACT must be configured for a category A device, not as the system printer.

The 3270-X/ACT must be defined to the system as a 3287 printer with a maximum 4K physical buffer size (and/or with other features required by the system and supported by the 3270-X/ACT).

Host parameters must match what the host expects on the channel to which the 3270-X/ACT is attached. The defaults are as follows:

- 4K physical buffer size with no EAB support
- 3440 bytes/buffer logical buffer size

If using SCS data streams, the 3270-X/ACT must be defined to the host as an SNA type 1 logical unit (LU1).

If using DSC data streams, the 3270-X/ACT must be defined to the host as a type 3 logical unit (LU3).

If using a VTAM or another Network Control Program, the 3270-X/ACT must be defined as a type 2 physical unit.

Contents

INTRODUCTION

General Information

The AGILE 3270-X/ACT is a protocol converter that allows Xerox 4510, 4517 and 4520 series printers to be attached to an IBM 3270-type mainframe controller.

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).

IBM Port

The 3270-X/ACT connects directly to the IBM establishment controller, or equivalent CPU with a Display Printer Adapter, through an IBM standard coaxial cable.

3270-X/ACT Features and Specifications

Printers Supported

▲Xerox 4510, 4510 ps, 4517, 4517mp, 4520, 4520 ps

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 at 100 percent print-density (132 x 66 for 8,712 cpp)

Resource Storage Space

▲512K FLASH

▲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 port

Upgradeability

- ▲Firmware upgradeable via coax data stream or parallel input port

Custom Application Support

- ▲XPAF
- ▲XES
- ▲DisplayWrite 370
- ▲GDDM

Product Support

- ▲Toll-free tech support is available from 7:00 a.m. to 4:30 p.m. PST
- ▲Two-year product warranty

INSTALLATION

General Information

This chapter provides information on physically attaching the AGILE 3270-X/ACT to your Xerox printer.

Before Beginning

The following are needed before installing the 3270-X/ACT

- A Xerox 4505, 4505ps, 4510, 4510ps, 4517, 4520, or 4520mp Desktop Laser Printer
- A system that delivers ASCII XES data streams via a standard Centronics port
- A host interface cable — RG62 A/U coaxial cable with BNC connectors on both ends. The length of this cable is not to exceed 5000 feet (1500 meters).
- A ream of paper
- A phillips-head screwdriver
- Additionally, the user or someone in the user's organization should be knowledgeable about the host system.

Selecting a Location

Refer to the user's manual for your particular 4500 series laser printer to ensure that the printer is properly located.

Electrical Requirements

The 3270 -X/ACT requires 5 VDC at 1 amp provided by the printer's power source.
Users with any questions regarding the electrical service available at their site should contact a qualified electrician.

Operating Environment

The 3270-X/ACT operates best within the specified temperature relative humidity tolerances for the particular 4500 series printer in which it is installed.

Unpacking

After removing the 3270-X/ACT from the shipping container, inspect the unit for any damage in shipment. Immediately report any damage to the freight carrier. Save the packing container. ***Do not remove the unit from its antistatic enclosure until it is ready for installation.***

Package Contents

Except when ordered otherwise, the 3270-X/ACT includes the 3270-X/ACT internal PSIO protocol converter and this user's manual. Should either of these items be missing or damaged, contact an AGILE sales representative.

4505/4505ps/4510/4510ps Installation

The following describes and illustrates how to install the 3270-X/ACT in a Xerox 4505, 4505ps., 4510 or 4510ps Desktop Laser Printer. For more information refer to the user's manual for your specific 4500 series printer model

Printer Preparation

- ▲ Turn the printer power off
- ▲ Disconnect the power cord and remove all cables
- ▲ Remove any installed font cards

Opening the Printer

- ▲ Release the rear cover latches by pressing down on the tabs at the top of the cover
- ▲ Remove the rear cover by pulling it towards you and lifting up, to expose the thumbscrews
- ▲ Loosen the thumbscrews by turning them counter clockwise. the thumbscrews ***are not removable.***

CAUTION: Controller boards are sensitive to static electricity. Before proceeding with the removal of your printer's controller board, discharge any static electricity from your body by touching something metal, such as the metal plate on the back of the printer. Do this BEFORE each time you handle the controller board

- Remove the controller board by grasping the handle on the bottom and pulling toward you with firm and even force. Place the controller on the ream of paper

Inserting the 3270-X/ACT

- Locate an available XNIO slot on the controller board. ***NOTE: The 4505/4505ps only has one XNIO slot.***
- With the phillips screwdriver, remove the plate covering the interface port.
- Line up the 3270 X/ACT's connector to the slot on the controller board and slide the coax interface through the port opening so that PSIO is properly aligned.
- Gently press the card straight down onto the controller board until the unit is firmly in place.

CAUTION: DO NOT press the PSIO on to the controller board at an angle, or interface pins could be bent, damaging the unit and causing it to not function properly.

Returning the Printer to Operation

- Slide the controller board back into the printer, aligning the edge of the board in the guide rails
- Push the controller board firmly into place. Make certain that there is no space between the controller board and the printer chassis. They must be flush.
- Turn the thumbscrews clockwise to tighten. ***Do not use tools to tighten, only finger pressure***.
- Replace the rear cover by sliding the tabs on the bottom of the cover into their slots and pushing forward until the tabs on top click into place.
- Reinstall and font cards, following the procedure in your printer's user's manual
- reconnect parallel cables and power cord

4517/4517mp Installation

The following describes and illustrates how to install the 3270-X/ACT in a Xerox 4517 or 4517mp Desktop Laser Printer. For more information refer to the user's manual for your specific 4500 series printer model

Printer Preparation

- ▲ Turn the printer power off
- ▲ Disconnect the power cord and remove all cables
- ▲ Remove any installed font cards

Opening the Printer

- ▲ Loosen the thumbscrews by turning them counter clockwise. the thumbscrews ***are not removable.***

  CAUTION: Controller boards are sensitive to static electricity. Before proceeding with the removal of your printer's controller board, discharge any static electricity from your body by touching something metal, such as the metal plate on the back of the printer. Do this BEFORE each time you handle the controller board

- ▲ Remove the controller board by grasping it and pulling toward you with firm and even force. Place the controller on the ream of paper.

Inserting the 3270-X/ACT

- ▲ Locate an available XNIO slot on the controller board.
- ▲ With the phillips screwdriver, remove the plate covering the interface port.
- ▲ Line up the 3270 X/ACT's connector to the slot on the controller board and slide the coax interface through the port opening so that PSIO is properly aligned.

▲ Gently press the card straight down onto the controller board until the unit is firmly in place.

CAUTION: DO NOT press the PSIO on to the controller board at an angle, or interface pins could be bent, damaging the unit and causing it to not function properly.

Returning the Printer to Operation

▲ Slide the controller board back into the printer, aligning the edge of the board in the guide rails

▲ Push the controller board firmly into place. Make certain that there is no space between the controller board and the printer chassis. They must be flush.

▲ Turn the thumbscrews clockwise to tighten. ***Do not use tools to tighten, only finger pressure***.

▲ Reinstall and font cards, following the procedure in your printer's user's manual

▲ Reconnect parallel cables and power cord

4520/4520mp Installation

The following describes and illustrates how to install the 3270-X/ACT in a Xerox 4520 or 4520mp Desktop Laser Printer. For more information refer to the user's manual for your specific 4500 series printer model.

Printer Preparation

▲ Turn the printer power off

▲ Remove any installed high-capacity feeders

▲ Disconnect the power cord and remove all cables

▲ Remove any installed font cards

Opening the Printer

▲ Loosen the thumbscrews by turning them counter

clockwise. the thumbscrews ***are not removable.***

CAUTION: Controller boards are sensitive to static electricity. Before proceeding with the removal of your printer's controller board, discharge any static electricity from your body by touching something metal, such as the metal plate on the back of the printer. Do this BEFORE each time you handle the controller board

- Using the thumbscrews, slowly pull the controller board out until it stops or until the P clamp is exposed. DO NOT pull the board farther than the built-in stop.
- Disconnect the J205, J206, J207 and J208 cable connectors by gently wiggling the connectors back and forth.

CAUTION: DO NOT pull the connections out with excessive force, or interface pins could be bent, damaging the unit and causing it to not function properly.

- Using the phillips-head screwdriver, remove the screw holding the P-clamp in place.
- Release the shielded wire and set the P-clamp and screw aside.
- Remove the controller board by lifting up slightly and pulling toward you.
- Place the controller board on a flat, clean surface.

Inserting the 3270-X/ACT

- Locate an available XNIO slot on the controller board.
- With the phillips-head screwdriver, remove the plate covering the interface port.
- Line up the 3270 X/ACT's connector to the slot on the controller board and slide the coax interface through the port opening so that PSIO is properly aligned.

▲ Gently press the card straight down onto the controller board until the unit is firmly in place.

CAUTION: DO NOT press the PSIO on to the controller board at an angle, or interface pins could be bent, damaging the unit and causing it to not function properly.

Returning the Printer to Operation

▲ Slide the controller board back into the printer, aligning the edge of the board in the guide rails.

▲ Reconnect the P-clamp and J205, J206, J207 and J208 connections.

▲ Push the controller board firmly into place. Make certain that there is no space between the controller board and the printer chassis. They must be flush.

▲ Turn the thumbscrews clockwise to tighten. ***Do not use tools to tighten, only finger pressure***.

▲ Replace the rear cover by sliding the tabs on the bottom of the cover into their slots and pushing forward until the tabs on top click into place.

▲ Reinstall and font cards, following the procedure in your printer's user's manual

▲ reconnect parallel cables, feeders and power cord

Connections

The following section describes and illustrates how to make the required and optional physical connections between the 3270-X/ACT and the other components of the system. Approved cables are listed in the following chart:

3270-X/ACT 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 3270-X/ACT. 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 3270-X/ACT.

3270-X/ACT Connection to Parallel Input

Connect the device end of the AGILE parallel cable to the appropriate port on the parallel input source host. Secure the cable using the screws provided. Then connect the 3270-X/ACT end of the cable to the proper input port of the 3270-X/ACT. The FCC requires all alternate host interface cables to be properly shielded.

Connection Tests

TROUBLESHOOTING

General Information

This section describes how to print various reports. These reports are used to test the connections between the 3270 X/ACT and the other components of the user's system, and to troubleshoot problems encountered in sending properly formatted documents to the printer. This section also describes how to contact AGILE technical support and how to upgrade the 3270 X/ACT firmware EPROM.

Connection Tests

The following tests will verify that proper connections have been made between the 3270 X/ACT, the coax host, the printer and the parallel input.

Printer Test

One of the features of the 3270 X/ACT is a printer test that can be used to verify the connection between the printer and the 3270 X/ACT. To perform this test,.

The printer will begin printing a continuous stream of the EBCDIC or ASCII character sets from SPACE through DELETE, followed by a CR/LF.

Allow the printer to output several pages of data, then verify that all of the pages are formatted identically. To end the printer test,

A sample printer test can be found in the Appendix.

If the report does not print:

- ▲ Check that both the 3270 X/ACT and the printer are connected to a power source, powered on and on line.
- ▲ Verify that the 3270 X/ACT is securely connected to the printer and in the proper port (refer to Section 2 — Installation).
- ▲ Verify that the RG 62 A/U coaxial cable is securely connected to the 3270 X/ACT.
- ▲ The 3270 X/ACT may be configured incorrectly (refer to Section 4 — Configuration Options).

- 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 garbage:

- The 3270 X/ACT may be incorrectly configured for ASCII or EBCDIC (the default is ASCII). This setting is determined by configuration Option #10. Refer to Section 4 — Configuration Options for information on changing the settings of configuration options.

General Configuration Report

This report will print out a list of all of the 3270 X/ACT configuration options, including programmable function strings, along with their current settings and the current firmware version number. This report is useful for finding the causes of various printing and formatting problems. This test should also be printed before and after changing any configuration options.

To print the report, XXXXXXXXXXXXXXXXX. A sample report with all default values selected is included in the Appendix.

Coax Host Verification

After successfully completing a General Configuration Report, verify the host connection to the 3270 X/ACT by sending a Local Copy or a typical host-generated print transaction to the printer (one or two pages). 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 3270 X/ACT and the coax host are securely connected with an RG62 A/U coax cable.
- Make certain that the 3270 X/ACT is defined to the system as a 3287 printer with a 4K physical buffer size.
- Confirm that the 3270 X/ACT is defined to the system as an LU1 if using SCS data streams, or as an LU3 if using DSC data streams.
- If using VTAM or another Network Control Program, make certain that the 3270 X/ACT 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.
- ▲ Print the document again using the 3270 X/ACT Auto Buffer Report.

Auto Buffer Report

An Auto Buffer Report is a tool useful for diagnostics, and it will sometimes be requested by AGILE technical support for diagnosing printing problems. An Auto Buffer Report will automatically output a buffer dump of the data that the 3270 X/ACT receives along with a printout of the host print job being sent to the printer.

To print using the buffer dump feature, XXXXXXXXXXXXXXXX

After the Auto Buffer Report has printed, XXXXXXXXXXXXXXX. A sample Auto Buffer Report can be found in the Appendix.

Translate Table Report

Some formatting problems may be caused by inappropriate changes to the translate tables, especially changes made to values that perform special functions. A translate table report allows the user to compare the current values in the table being used to translate the document to the values in the original table. This report should be printed before and after making any changes to the translate tables. For information on determining the active translate table, refer to Section 7 — Translate Tables.

To print a Translate Table Report, XXXXXXXXXXXX

After the report has finished printing, XXXXXXXXXX. A sample Translate Table Report with all default values selected can be found in the Appendix.

Contacting AGILE Technical Support

Before contacting AGILE technical support, print out each of the reports described earlier in this chapter, and check them for potential sources of problems. If the problem persists after making the obvious corrections, please have the following information available before calling AGILE:

3270 X/ACT serial number (found on top of card): _____

Firmware version number _____
(found in the printed reports of the 3270 X/ACT):

Cluster controller model #: _____

SCS or DSC mode: _____

Coax host cable type and length: _____

Parallel interface: _____

AGILE toll-free technical support is available between the hours of 7:00 a.m. and 4:30 p.m. PST. For Express Exchange Service customers who would like next-business-day replacement of a unit, AGILE technical support must be contacted early enough so that the need for a replacement unit can be determined before 2:00 p.m. PST. Refer to page xii for warranty information.

Call (800) 538-1634, or FAX (510) 724-2222.

The AGILE Bulletin Board System

To upload files that do not print correctly, or to download information, call the AGILE BBS:

1. Load the communications software.

2. Set up the modem:

- Baud rate: Fastest setting available (AGILE supports speeds of up to 28.8 with both V.FC and V.34 modems)
- Data bits: 8
- Stop bits: 1
- Parity: None

3. Dial 15107248073. If using a line with *Call Waiting*, dial *70,15107248073 to disable *Call Waiting*.

4. As prompted by the bulletin board, enter the following:

- First name
- Last name
- "Y" to confirm name
- Password
- Re-enter password
- "C" to continue
- Company name
- Voice phone number

5. Now answer a few questions about your system:

- Hot keys (Y/N) allow options to be selected without pressing Enter
- Color menus — "A" = auto-detect
- Default editor mode — "F" = full screen (if the user has ANSI terminal emulation); "L" = line edit (if the user does not have ANSI terminal emulation)
- Protocol for file transfers — the preferred file transfer protocol is ZMODEM ("Z"), but the user may also use any of the other protocols displayed on the screen.

6. The bulletin board will then ask if you want to display the Bulletin menu (Y/N), inform you that you have no personal mail, and after you press Enter, will display the Main menu.

7. To download a file, perform the following steps:

- Press "F" to display the File menu
- Press "L" to List files
- Press "1" to go to File area 1 (AGILE software download area)
- Press "M" to Mark the file
- Type the number of the file to be downloaded
- Press "D" to Download the file
- Press "D" to confirm the download
- Perform the local download procedure according to our communications software instructions

8. After downloading the file, press Enter, then exit the bulletin board with the following steps:

- ▲ Press "S" to Stop downloading and exit the Download menu
- ▲ Press "Q" to Quit to the Main menu
- ▲ Press "G" to Goodbye and Logoff
- ▲ Press "Y" to confirm the Logoff

CONFIGURATION OPTIONS

General Information

This section describes each of the parameters of the General Configuration Options that the user can select to adapt the 3270 X/ACT to the user's specific environment.

Configuring the 3270 X/ACT 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 3270 X/ACT configuration will not have to be modified, because it is already set up for the most common environments.

Before changing any of the configuration settings, the user should print a General Configuration Report that will display the current settings. A General Configuration Report can be generated by sending an *ECHO D* (XES2PCL configuration) or *ECHO d* (coax configuration) command to the 3270 X/ACT when the unit is in normal operating mode. Sample reports are found in the Appendix.

In general, there are two ways to configure the options of the 3270 X/ACT. It can be configured from the coax host or parallel input. Both of these methods are described in a subsequent section.

Configuration Option Descriptions

1 — Column Width

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 3270 X/ACT 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. Refer to Section 12 — DisplayWrite 370 Support for more information:

- 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 3270 X/ACT commands (configuration, translate table or PFS commands) within print jobs

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

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 3270 X/ACT 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. Refer to Section 12 — DisplayWrite 370 Support for more information:

- 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 3270 X/ACT commands (configuration, translate table or PFS commands) within print jobs

3 — Line Spacing

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 3270 X/ACT are multiplied by the value of this option. The default is 1 (single spacing).

4 — Local Copy Null Line Suppression

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

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 11 — 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

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

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

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

Some printer types (such as Xerox 4045s) can accept EBCDIC data. This option determines whether the 3270 X/ACT outputs data in the (A) ASCII or (B) EBCDIC character set. A third option, (C), will have the 3270 X/ACT send coax host data to the printer in EBCDIC and alternate host data in ASCII. The default value is (A).

Note: Option C is useful only for users with an alternate host and a Xerox printer capable of changing on line from XES mode to HP PCL emulation. These printers include the models 4030, 4045-160, 4187, 4213 and 4235. If the user selects option C, the printer must be configured by the user to start in XES mode using the EBCDIC character set. Additionally, PFS B — Coax Host PFS must be programmed with the =MCK= command to change to

XES mode, and PFS C — Alternate Host PFS must be programmed with the =MCK= command to change to the HP PCL emulation. Refer to the Xerox printer programmer reference for detailed information on changing emulations on line. Refer to Section 6 — Programmable Function Strings for information about PFSs.

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

Determines how the 3270 X/ACT 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 12 — DisplayWrite 370 Support.

Note: To avoid unexpected formatting results, this option should be set to C (none) if any of the following are true. Refer to Section 12 — DisplayWrite 370 Support for more information:

- 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 3270 X/ACT commands (configuration, translate table or PFS commands) within print jobs
- Option #1 — Column Width is set to 0 (infinite line length)

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

The host should be informed when a problem is detected at the printer or the protocol converter. This option determines whether or not the 3270 X/ACT transmits an Intervention Required message to the coax host when a

printer fault (e.g., out of paper) is reported by a parallel-attached printer. The default value is "Yes."

In the event of a parallel printer error, the PRINTER READY light on the 3270 X/ACT front panel will go out, and the CHECK light will go on.

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. After the error condition is cleared, the 3270 X/ACT informs the system, 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

This option determines how many minutes the 3270 X/ACT will wait after receiving a parallel 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

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 11 — Transparency Modes for more information.

31 — Discard PTM Terminating Delimiter

Determines whether or not the 3270 X/ACT, 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 11 — Transparency Modes for more information.

32 — DSC Trigger 1

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 11 — Transparency Modes for more information. This character is also used as a trigger for configuring the 3270 X/ACT, 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

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 3270 X/ACT for other purposes. The default value is a DSC dollar sign ($) 1Ah. Refer to Section 11 — Transparency Modes for more information.

34 — SCS Trigger 1

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 11 — Transparency Modes for more information. This character is also used as a trigger for configuring the 3270 X/ACT, 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

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 3270 X/ACT for other purposes. The default value is an SCS dollar sign ($) 5Bh. Refer to Section 11 — Transparency Modes for more information.

36 — Reserved

This option is reserved.

37 — Reserved

This option is reserved.

38 — Reserved

This option is reserved.

39 — Non-Transparency Trigger 1 Output

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 11 — 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

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

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 3270 X/ACT 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 15 — DSC Data Streams for more information.

52 — SCS EM Always Generates CR/LF

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 3270 X/ACT 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 14 — SCS Data Streams for more information.

53 — IBM 35 Hex Transparency

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 11 — 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.

54 — Reserved

This option is reserved

55 — MD-Laser Support

Determines whether or not the 3270 X/ACT 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 11 — 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.

56 — Reserved

This option is reserved.

57 — DSC NL at EM Even If in Column 1

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 3270 X/ACT 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 15 — DSC Data Streams for more information.

58 — Metacode Support

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." Refer to Section 11 — Transparency Modes and Section 16 — 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 12 — DisplayWrite 370 Support for more information.

59 — Laserpage Support

Determines whether or not the 3270 X/ACT 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 11 — 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.

60 — Xerox Graphic Window Support

Determines whether or not the 3270 X/ACT supports Graphic Windows, a feature of Xerox printers. The default is value "No." Refer to Section 16 — 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

Determines whether or not the 3270 X/ACT supports the downloading of Xerox EBCDIC fonts. The default value is "Yes." Refer to Section 16 — 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.

3270 X/ACT Configuration Options Table

The following table lists the 3270 X/ACT General Configuration Options, the valid range of values for each option, the default value for each option, and the values that can be selected from the 3270 X/ACT front panel. All values that cannot be selected from the front panel, including programmable function strings and translate table values, must be downloaded from either the coax host or from an alternate host.

#	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 Transparancy	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		

#	Configuration Description	Valid Range	Default Value
29	Reserved		
30	Transparancy	A,B	A
31	Discard Transparancy Delimiter	Y,N	N
32	DSC Transparancy Trigger 1	HEX	1B
33	DSC Transparancy Trigger 2	HEX	1A
34	SCS Transparancy Trigger 1	HEX	4A
35	SCS Transparancy Trigger 2	HEX	5B
36	Reserved		
37	Reserved		
38	Reserved		
39	Transparancy Trigger 1 Output	HEX	9B
40	Reserved		
41	Reserved		
42	Reserved		
43	Reserved		
44	Reserved		
45	Reserved		
46	Reserved		
47	Reserved		
48	Reserved		
49	C0 05 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 Transparancy	Y,N	N
54	Reserved		
55	MD-Laser Supported	Y,N	N
56	Reserved		

#	Configuration Description	Valid Range	Default Value
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 3270 X/ACT Options

The 3270 X/ACT 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 table lists the options of the 3270 X/ACT 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 3270 X/ACT to implement special features found on a variety of printers. These features include bolding, underlining, overstriking, etc.

The 3270 X/ACT 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 3270 X/ACT looks up the contents of PFS 9 — 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 ¢&9 *[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 9 — Coax Host Configuration for information on programming PFSs.

The user may also want to use the 3270 X/ACT PFSs in a way not anticipated by AGILE. For instance, if the user's printer can double underline, and if the user would like to use double underlining instead of single underlining, PFS 5 — Underlining On and PFS 6 — Underlining Off can be replaced with the printer's escape sequences for double underlining on and off, respectively.

PFS Table

The following table shows the default function of each PFS along with its access number:

PFS#	Default Function
0	Power On Sequence
1	
2	
3	
4	
5	
6	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 3270 X/ACT 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 3270 X/ACT to send a PFS to the printer; and n is the number of the PFS to send. Here are some examples:

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

¢&2set 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 12 — 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 3270 X/ACT 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 3270 X/ACT 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 3270 X/ACT 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 3270 X/ACT.

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 3270 X/ACT. 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 3270 X/ACT. 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.

3270 X/ACT begins a bracketed coax host print job. The Begin Bracket PFS is also sent to the printer when a ¢&E *[Trigger 1-ampersand-E]* that the user has embedded in the data stream is encountered by the 3270 X/ACT.

TRANSLATE TABLES

General Information

The data stream from the coax host or alternate host is not sent directly through the 3270 X/ACT 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 3270 X/ACT 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 3270 X/ACT, the corresponding character from the appropriate translate table is substituted, and that value is sent to the printer.

The 3270 X/ACT 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	DSC to APL
8	SCS to APL
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 9 — Coax Host Configuration and Section 10 —

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 3270 X/ACT determines the appropriate translation table to use based upon both the user's configuration of the 3270 X/ACT and the data stream it receives.

The output (ASCII or EBCDIC) is determined by the user's configuration of the 3270 X/ACT using configuration Option #10. Option #11 determines if APL output is supported for DSC data streams when Option #10 is configured for ASCII output and when Option #20 is configured for EAB support.

The input is detected by analysis of the data stream by the 3270 X/ACT. When an EBCDIC character from the host arrives at the 3270 X/ACT, it may be either DSC or SCS data. See Section 14 — SCS Data Streams and Section 15 — DSC Data Streams for more information. The table to be used is selected by the 3270 X/ACT 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), 4 (EBCDIC output) or 7 (APL output).
- If the coax host data stream is in SCS format, the appropriate translate table is 2 (for ASCII output), 5 (EBCDIC output) or 8 (APL output).

Output:

- If the 3270 X/ACT is configured for ASCII output, the appropriate translate table is 1, 2 or 3.
- If the 3270 X/ACT is configured for EBCDIC output, the appropriate translate table is 4, 5 or 6.
- If the 3270 X/ACT is configured for APL output (refer to Options 10, 11 and 20), the appropriate translate table is 7 or 8.

Reading Translate Tables

A Translate Table Report, with the default values of the tables selected, can be found in the Appendix. The user can print the current values of the tables at any time by setting dip switch B7 in the ON (down) position, pressing the RESET button and then the CANCEL button on the 3270 X/ACT front panel.

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 3270 X/ACT. 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 3270 X/ACT.

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 3270 X/ACT 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 3270 X/ACT 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
36h5Fh	¬	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 3270 X/ACT will send a form feed whenever a form feed is received. If set to a non-zero value, the 3270 X/ACT 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 3270 X/ACT is included, and a description of the functions performed by each table is provided.

Table 1 — DSC to ASCII

This translate table is invoked when a DSC data stream is detected by the 3270 X/ACT 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

Translate Table 2 is invoked when the 3270 X/ACT 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 -

Translate 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 3270 X/ACT detects an ASCII data stream and when Option #10 is set to (A) ASCII or (C) Switchable.

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.

Translate 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 3270 X/ACT and when Option #10 is set to (B) EBCDIC or (C) Switchable.

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 /	ED \	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	EB 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 3270 X/ACT and when Option #10 is set to (B) EBCDIC or (C) Switchable.

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 3270 X/ACT 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 either to (B) EBCDIC or (C) Switchable. 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 -

Table 7 — DSC to ASCII APL

This table is invoked by the 3270 X/ACT when a DSC data stream is detected by the 3270 X/ACT and when Option #10 is set to (A) ASCII, Option #11 is set to "Yes" and Option #20 is set either to (B) 2K with EAB or (D) 4K with EAB.

Five locations in the DSC to ASCII APL 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)

Table 7 — DSC to ASCII APL

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	FF	05 CR	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
16	1	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	05	FF	FF	FF	FF
32	2	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
48	3	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
64	4	FF	A1	E7 <	EB	E9	F0	F1	F2	F3	F5	F7	A0	AD	C2	AC -	5B [
80	5	AE >	AF o	B0	B1	B2	B3	B4	B6	5C \	B8	F9	C3	A9	5D]	BE	7C |
96	6	7D }	A3 A	A4 B	A5 C	A6 D	A7 E	A8 F	F8 G	AA H	AB I	FF	FF	FF	FF	FF	FF
112	7	7B {	BA J	BB K	C0 L	C1 M	BD N	BC O	C4 P	C5 Q	C6 R	FF	FF	FF	FF	F6	FF
128	8	FC	FF	C7 S	C8 T	C9 U	D0 V	D1 W	D2 X	D3 Y	D4 Z	FF	FF	FF	FF	FF	FF
144	9	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
160	A	FF	FF	E6	9B	ED	EE	FB	FD	EF	E1	CA	CB	5E	E4	CC	CF
176	B	FF	FF	9E	21 !	FF	FF	DC	DD	FF	FF	DE	DF	FF	B5 ~	EA	EB
192	C	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
208	D	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
224	E	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
240	F	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF

COAX HOST CONFIGURATION

General Information

This section describes how to configure the 3270 X/ACT using a host-connected terminal. A local copy sent to the 3270 X/ACT while in coax host configuration mode will alter the configuration selections listed in Section 5 — Configuration Options. Changes can also be made to the PFSs described in Section 6 — Programmable Function Strings and to the translate tables described in Section 7 — Translate Tables.

Before any configuration changes can be made through the controller coax port, dip switch B7 must be set in the ON (down) position, and then the RESET button on the 3270 X/ACT front panel must be pressed.

After all configuration changes have been made, set dip switch B7 in the OFF (up) position and press the RESET button on the 3270 X/ACT front panel. Check that the configuration is correct by pressing the TEST button on the 3270 X/ACT front panel to print out a General Configuration Report.

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 3270 X/ACT will interpret each command and store the new selections in its non-volatile, battery-backed RAM. 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 3270 X/ACT.

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.

Resetting All Options to Factory Defaults

To reset all options to factory preset default values, send the following command to the 3270 X/ACT:

¢?0;

where the cent sign (¢) is Trigger 1 (the default).

Note: This command will reset all General Configuration options, all programmable function strings and all translate tables to their factory presets. All modifications to any parameters will be lost.

Download Error Messages

Errors in command sequences will result in the 3270 X/ACT sending a download error message to the printer.

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 3270 X/ACT, 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.

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.

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. The custom banner (PFS D) is entered as text, rather than as pairs of hexadecimal 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 12 — 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 3270 X/ACT 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 3270 X/ACT 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 12 — 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 3270 X/ACT will recognize the trigger and respond appropriately to that form of transparency. The 3270 X/ACT can use standard IBM 35h, Xerox 36h and Xerox Metacode transparency. The 3270 X/ACT 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 12 — 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 3270 X/ACT 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 7 — Translate Tables). Refer to Section 14 — 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 3270 X/ACT. Metacode is used by some Xerox printers (the Xerox 4235, for example).

The data seen by the 3270 X/ACT and the printer are identical when this type of data is detected. If Option #58 is set to "Yes," the 3270 X/ACT 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 7 — 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 3270 X/ACT 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 7 — Translate Tables).

Pseudo Transparency Mode

The 3270 X/ACT 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 5 — 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 5 — 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 3270 X/ACT 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 3270 X/ACT 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 3270 X/ACT 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 3270 X/ACT begins checking for valid pairs of hexadecimal characters. When the 3270 X/ACT 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 3270 X/ACT 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 3270 X/ACT	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 7 — Translate Tables).

Laserpage Pseudo Transparency

The 3270 X/ACT 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 3270 X/ACT detects Trigger 1 followed by Trigger 2 in the data stream, it begins checking for valid pairs of hexadecimal characters. When the 3270 X/ACT 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 3270 X/ACT 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 3270 X/ACT	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 7 — Translate Tables).

Other Pseudo Transparency Mode Considerations

Some applications insert unnecessary spaces before pseudo transparency trigger character(s). Option #13 — Suppress Spaces Before PTM Packets will tell the 3270 X/ACT to delete any spaces or null characters in between a PTM trigger and the text that precedes the trigger. To delete unnecessary space characters, set Option #13 to "Yes." The default setting is "No."

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 3270 X/ACT 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 6 — 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 9 — Coax Host Configuration or Section 10 — 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 3270 X/ACT. In other words, the user cannot expect to be able to control the printer with escape sequences at the same time that the 3270 X/ACT 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 3270 X/ACT. Thus, any PFS command will affect the entire line of text, not just the text that follows the command. For instance, if PFS 9 — DisplayWrite 370 Bolding On and PFS A — 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 3270 X/ACT 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 non-zero value. The 3270 X/ACT will not buffer more than 255 characters per line.

Overstriking

If Option #15 is set to (A) or (B), the 3270 X/ACT will enter overstrike mode (i.e., send PFS 3 to the printer) when a *[character-backspace-different character]* sequence is detected in the data stream. The 3270 X/ACT will exit overstrike mode (i.e., send PFS 4 to the printer) whenever a *[character-character]* sequence is detected in the data stream while in overstrike mode.

Underlining

If Option #15 is set to (A) or (B), the 3270 X/ACT will enter underline mode (i.e., send PFS 5 to the printer) when a *[character-backspace-underscore]* sequence is detected in the data stream. The 3270 X/ACT will exit underline mode (i.e., send PFS 6 to the printer) whenever a *[character-character]* sequence is detected in the data stream while in underline mode.

Bolding

If Option #15 is set to (A) or (B), the 3270 X/ACT will enter bold mode (i.e., send PFS 9 to the printer) when a *[character-backspace-same character]* sequence is detected in the data stream. The 3270 X/ACT will exit bold mode (i.e., send PFS A to the printer) whenever a *[character-character]* sequence is detected in the data stream while in bold mode.

COAX HOST CONSIDERATIONS

The 3270 X/ACT can process data from a variety of IBM host systems. This section discusses how to ensure compatibility between the 3270 X/ACT and the host system.

System Configuration

The coax host software generation requirements of the 3270 X/ACT 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 3270 X/ACT/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 3270 X/ACT. The 3270 X/ACT does not support 3287-type options such as Program Symbols.

The 3270 X/ACT 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 3270 X/ACT 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 3270 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 3270 X/ACT 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 3270 X/ACT to be attached. The following is an example of log mode entry tables for DSC and SCS that may be used with the 3270 X/ACT. 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
```

APL Support

APL is supported only for DSC data streams when the 3270 X/ACT is outputting data using the ASCII character set. When using APL, the DSC log mode entry table above will be the same except for the last line, "PSERVIC=X'… ." A change must be made to the byte following the "X'03." The second byte (00) must be changed to another value, depending upon the device for which the user's application was written. The following table indicates the appropriate replacement value.

00 = For applications written for a device with old APL and without Extended Data Stream capability.

20 = For applications written for a VSCS printer (VM only).

40 = For applications written for a device with new APL.

80 = For applications written for a device with Extended Data Stream capability.

C0 = For applications written for a device with new APL and Extended Data Stream capability.

Extended Attribute Buffer Support

The 3270 X/ACT supports the Extended Attribute Buffer (EAB) feature found in many IBM 3287 printers. EAB is supported only for DSC data streams and only when the printer attached to the 3270 X/ACT is using the ASCII character set. This feature "extends" the number of characters available for transmission to the printer. These characters are found in the following Translate Table:

7 DSC to ASCII APL

To use this feature, the 3270 X/ACT must have Option #10 — Output in ASCII or EBCDIC set to (A) ASCII; Option #11 — APL Output must be set to "Yes;" and Option #20 — Physical Buffer Size must be set to (B) 2K with EAB or (D) 4K with EAB. Also refer to the APL Support section above.

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 3270 X/ACT 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 3270 X/ACT 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 3270 X/ACT

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 3270 X/ACT.

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 3270 X/ACT will send an ASCII BS (08h) to printer, if the print position is not already at the left margin.

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 3270 X/ACT interprets it as a space.

Interchange Group Separator (IGS) — 1Dh

The 3270 X/ACT interprets this Interchange Separator as a space.

Interchange Record Separator (IRS) — 1Eh

The 3270 X/ACT interprets this Interchange Separator as a new line.

Interchange Unit Separator (IUS) — 1Fh

The 3270 X/ACT 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 3270 X/ACT to move down more than one line.

Null — 00h

The Null command is converted to a space by the 3270 X/ACT.

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 3270 X/ACT 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 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
SCS Command	Code	Description
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 Line Density (SLD)	2BC6h	Set vertical line spacing
Set Horizontal Format (SHF)	2BC1h	Set horizontal margins and tabs
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 3270 control unit. If the 3270 X/ACT is powered on and connected, it may be necessary to power down and power up to reestablish communication between the 3270 X/ACT 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 3270 X/ACT 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 3270 X/ACT also supports Xerox transparency, triggered by 36h in the data stream. Refer to Option #5 in Section 5 — Configuration Options and to Section 11 — 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. 3270 X/ACT 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 3270 X/ACT 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 3270 X/ACT 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.

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 3270 X/ACT) at the end of the coax cable.

These data types are sometimes corrupted by host system forms control. The 3270 X/ACT takes this fact into consideration and strips away any

forms control that might corrupt these data types.

The 3270 X/ACT 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 3270 X/ACT.

The 3270 X/ACT's support of XPAF allows the protocol converter to be in ASCII output mode at all times. This is an important feature to 3270 X/ACT users that require the alternate host port(s) for PC-type data.

The 3270 X/ACT 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 to the one in effect before the graphic window or font was detected.

Xerox Graphic Window Support

When the 3270 X/ACT sees (UDK/Esc)gw, a graphic window is being processed. The (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 5 — Configuration Options.

Note: If the 3270 X/ACT is in EBCDIC output mode (see Option #10), Option #60 must be set to "No."

Allow EBCDIC Font Downloading

When the 3270 X/ACT sees (UDK/Esc)+A or (UDK/Esc)+F, a font download is being processed. The (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 5 — Configuration Options.

Note: If the 3270 X/ACT 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 3270 X/ACT 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 11 — Transparency Modes. Please refer to the Xerox printer programmer reference for further information on this escape sequence.

Refer to Option #58 in Section 5 — Configuration Options. Users with applications that require a Metacode-capable printer should set this option to “Yes.”

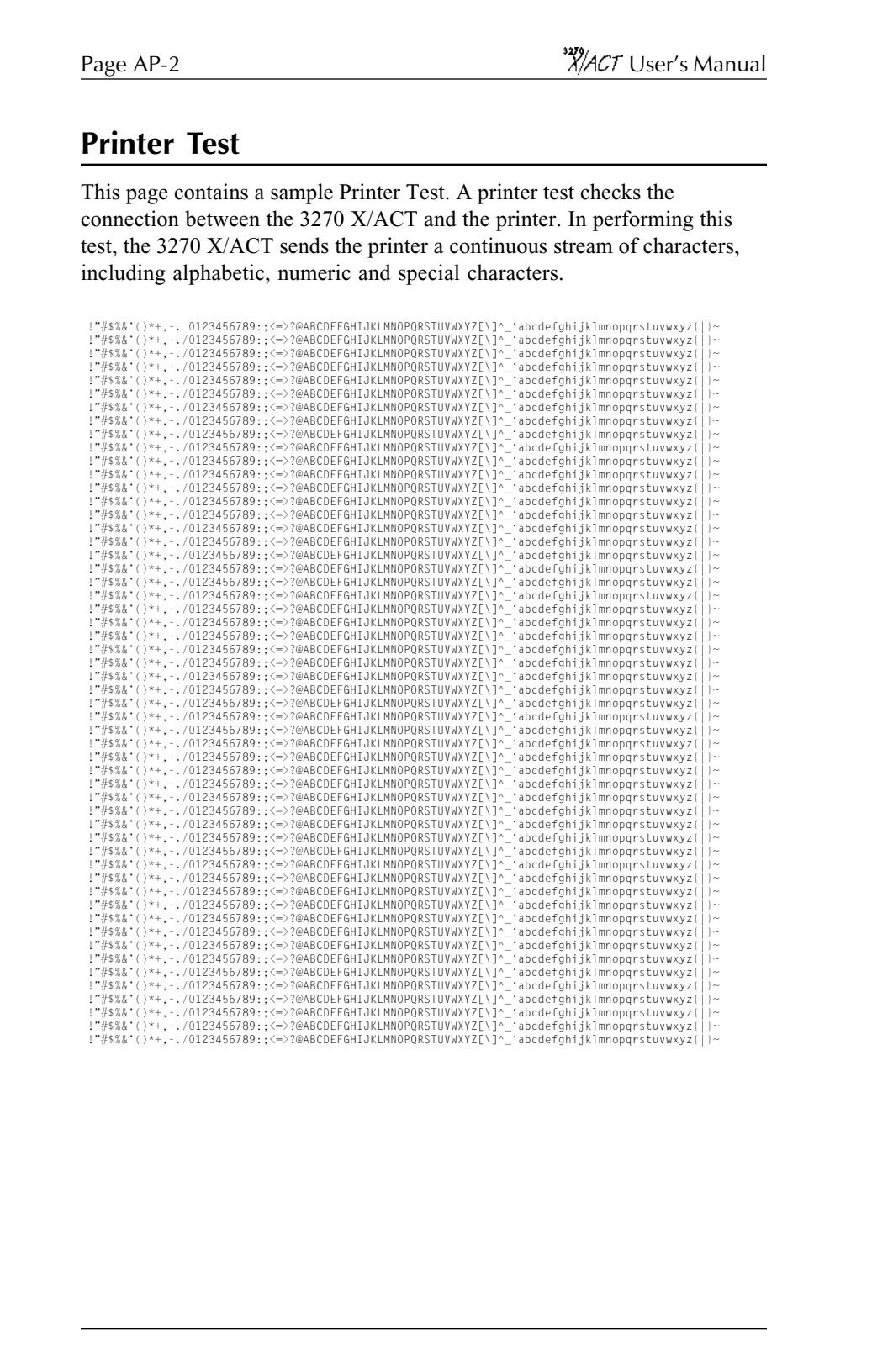
APPENDIX

General Information

The Appendix contains samples of the General Configuration Report, Printer Test, Auto Buffer Report and Translate Table Report.

Printer Test

This page contains a sample Printer Test. A printer test checks the connection between the 3270 X/ACT and the printer. In performing this test, the 3270 X/ACT sends the printer a continuous stream of characters, including alphabetic, numeric and special characters.



Auto Buffer Report

This page and the next two pages contain a sample Auto Buffer Report. This report is useful for analyzing data streams, and it will sometimes be requested by AGILE technical support when diagnosing printing problems. The data presented by this report is a buffer dump of the data that the 3270 X/ACT receives, along with a printout of the host print job being sent to the printer.

SSA

```
Agile 6287UltraVersion 46.00 - 8344 -
Dip A:80 Dip B:00
     x0 x1 x2 x3 x4 x5 x6 x7 x8 x9 xA xB xC xD xE xF
0000 00 00 00 00 00 00 00 00 00 00 00 00 1F 10 00 00
0010 00 15 00 50 07 81 03 05 50 00 00 00 00 00 00 00
0020 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0030 00 00 FF 00 FF 00 FF 00 FF 00 FF 00 FF 00 FF 00
0040 00 00 00 00 00 00 00 00 00 00 04 31 74 CC 00 00
0050 F0 AC A0 A8 AD 00 00 00 00 00 00 F0 00 00 00 00
         M  A  I  N
0060 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 F8

0070 A0 B2 14 24 20 20 10 AC 80 88 8D 10 AC 84 8D 94
      A  S  /  4  0  0     M  a  i  n     M  e  n  u
0080 F0 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

00D0 00 00 00 00 00 00 00 00 00 00 00 00 00 F0 B2 98 92
                                              S  y  s
00E0 93 84 8C 34 F0 00 F0 B2 21 20 22 20 22 29 28 F0
      t  e  m  :           S  1  0  2  0  2  9  8
00F0 F0 B2 84 8B 84 82 93 10 8E 8D 84 10 8E 85 10 93
         S  e  l  e  c  t     o  n  e     o  f     t
0100 87 84 10 85 8E 8B 8B 8E 96 88 8D 86 34 F0 00 00
      h  e     f  o  l  l  o  w  i  n  g  :
0190 00 00 00 00 00 F0 21 32 00 B4 92 84 91 10 93 80
                     1  .     U  s  e  r     t  a
```

```
01A0 92 8A 92 F0 00 00 00 00 00 00 00 00 00 00 00 00
       s  k  s
01E0 00 00 00 00 00 F0 22 32 00 AE 85 85 88 82 84 10
                      2  .     O  f  f  i  c  e
01F0 93 80 92 8A 92 F0 00 00 00 00 00 00 00 00 00 00
       t  a  s  k  s
0230 00 00 00 00 00 F0 23 32 00 A6 84 8D 84 91 80 8B
                      3  .     G  e  n  e  r  a  l
0240 10 92 98 92 93 84 8C 10 93 80 92 8A 92 F0 00 00
          s  y  s  t  e  m     t  a  s  k  s
0280 00 00 00 00 00 F0 24 32 00 A5 88 8B 84 92 33 10
                      4  .     F  i  l  e  s  ,
0290 8B 88 81 91 80 91 88 84 92 33 10 80 8D 83 10 85
       l  i  b  r  a  r  i  e  s  ,     a  n  d     f
02A0 8E 8B 83 84 91 92 F0 00 00 00 00 00 00 00 00 00
       o  l  d  e  r  s
02D0 00 00 00 00 00 F0 25 32 00 AF 91 8E 86 91 80 8C
                      5  .     P  r  o  g  r  a  m
02E0 8C 88 8D 86 F0 00 00 00 00 00 00 00 00 00 00 00
       m  i  n  g
0320 00 00 00 00 00 F0 26 32 00 A2 8E 8C 8C 94 8D 88
                      6  .     C  o  m  m  u  n  i
0330 82 80 93 88 8E 8D 92 F0 00 00 00 00 00 00 00 00
       c  a  t  i  o  n  s
0370 00 00 00 00 00 F0 27 32 00 A3 84 85 88 8D 84 10
                      7  .     D  e  f  i  n  e
0380 8E 91 10 82 87 80 8D 86 84 10 93 87 84 10 92 98
       o  r     c  h  a  n  g  e     t  h  e     s  y
0390 92 93 84 8C F0 00 00 00 00 00 00 00 00 00 00 00
       s  t  e  m
03C0 00 00 00 00 00 F0 28 32 00 AF 91 8E 81 8B 84 8C
                      8  .     P  r  o  b  l  e  m
03D0 10 87 80 8D 83 8B 88 8D 86 F0 00 00 00 00 00 00
          h  a  n  d  l  i  n  g
0410 00 00 00 00 00 F0 29 32 00 A3 88 92 8F 8B 80 98
                      9  .     D  i  s  p  l  a  y
0420 10 80 10 8C 84 8D 94 F0 00 00 00 00 00 00 00 00
          a     m  e  n  u
0460 00 00 00 00 F0 21 20 32 00 B4 92 84 91 10 92 94
                   1  0  .     U  s  e  r     s  u
0470 8F 8F 8E 91 93 10 80 8D 83 10 84 83 94 82 80 93
       p  p  o  r  t     a  n  d     e  d  u  c  a  t
0480 88 8E 8D F0 00 00 00 00 00 00 00 00 00 00 00 00
       i  o  n
04B0 00 00 00 00 F0 21 21 32 00 AF A2 10 B2 94 8F 8F
                   1  1  .     P  C     S  u  p  p
04C0 8E 91 93 10 93 80 92 8A 92 F0 00 00 00 00 00 00
       o  r  t     t  a  s  k  s
```

```
0550 00 00 00 00 F0 29 20 32 00 B2 88 86 8D 10 8E 85
                    9  0  .     S  i  g  n     o  f
0560 85 F0 00 00 00 00 00 00 00 00 00 00 00 00 00 00
      f
05F0 F0 B2 84 8B 84 82 93 88 8E 8D 10 8E 91 10 82 8E
        S  e  l  e  c  t  i  o  n     o  r     c  o
0600 8C 8C 80 8D 83 F0 00 00 00 00 00 00 00 00 00 00
      m  m  a  n  d
0640 F0 11 11 11 08 C0 00 00 00 00 00 00 00 00 00 00
        =  =  =  >
06D0 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 F0

06E0 F0 A5 23 11 A4 97 88 93 F0 00 F0 A5 24 11 AF 91
        F  3  =  E  x  i  t           F  4  =  P  r
06F0 8E 8C 8F 93 F0 00 F0 A5 29 11 B1 84 93 91 88 84
      o  m  p  t           F  9  =  R  e  t  r  i  e
0700 95 84 F0 00 F0 A5 21 22 11 A2 80 8D 82 84 8B F0
      v  e           F  1  2  =  C  a  n  c  e  l
0710 00 F0 A5 21 23 11 B4 92 84 91 10 92 94 8F 8F 8E
           F  1  3  =  U  s  e  r     s  u  p  p  o
0720 91 93 F0 00 00 00 00 00 00 00 00 00 00 00 00 00
      r  t
0730 F0 A5 22 23 11 B2 84 93 10 88 8D 88 93 88 80 8B
        F  2  3  =  S  e  t     i  n  i  t  i  a  l
0740 10 8C 84 8D 94 F0 00 00 00 00 00 00 00 00 00 00
        m  e  n  u
0780 F8 0D A2 0C 10 A2 AE AF B8 B1 A8 A6 A7 B3 10 A8
        (  C  )     C  O  P  Y  R  I  G  H  T     I
0790 A1 AC 10 A2 AE B1 AF 32 10 21 29 28 20 33 10 21
      B  M     C  O  R  P  .     1  9  8  0  ,     1
07A0 29 29 21 32 00 00 00 00 00 00 00 00 00 00 00 00
      9  9  1  .
07C0 00 00 00 00 00 00 00 00 00 00 00 00 00 00 F8 00 00

07D0 F0 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
```

SSA

Translate Table Report

The following pages contain a sample Translate Table Report, with all default values indicated. This report should be printed before and after making any modifications to the translate tables.

```
Agile 3270 X/ACT 46.00 - 8344 -
     DSC    (COAX)       TO ASCII........
 MSN->      0X 1X 2X 3X 4X 5X 6X 7X 8X 9X AX BX CX DX EX FX
  LSN-v      |-------------------------
         X0|05 05 30 26 2D 2D 2D 2D 61 71 41 51 20 20 20 20
         X1|05 3D 31 2D 2D 2D 2D 2D 62 72 42 52 20 20 20 20
         X2|05 27 32 2E 2D 2D 2D 2D 63 73 43 53 20 20 20 20
         X3|05 22 33 2C 2D 2D 2D 2D 64 74 44 54 20 20 20 20
         X4|2D 2F 34 3A 2D 2D 2D 2D 65 75 45 55 20 20 20 20
         X5|05 5C 35 2B 2D 2D 2D 2D 66 76 46 56 20 20 20 20
         X6|2D 7C 36 5E 2D 2D 2D 2D 67 77 47 57 20 20 20 20
         X7|2D 99 37 2D 2D 2D 2D 2D 68 78 48 58 20 20 20 20
         X8|3E 3F 38 2D 2D 2D 2D 2D 69 79 49 59 20 20 20 20
         X9|3C 21 39 2D 2D 2D 2D 2D 6A 7A 4A 5A 20 20 20 20
         XA|5B 24 2D 5E 2D 2D 2D 2D 6B 2D 4B 2D 20 20 20 20
         XB|5D 05 7E 7E 2D 2D 2D 2D 6C 2D 4C 2D 20 20 20 20
         XC|29 2D 23 2D 2D 2D 2D 2D 6D 2D 4D 2D 20 20 20 20
         XD|28 2D 40 60 2D 2D 2D 2D 6E 2D 4E 2D 20 20 20 20
         XE|7D 2D 25 27 2D 2D 2D 2D 6F 2D 4F 3B 20 20 20 20
         XF|7B 2D 5F 2D 2D 2D 2D 2D 70 2D 50 2A 20 20 20 20

     SCS    (COAX/ALT) TO ASCII........
 MSN->      0X 1X 2X 3X 4X 5X 6X 7X 8X 9X AX BX CX DX EX FX
  LSN-v      |-------------------------
         X0|20 20 20 20 20 26 2D 2D 2D 2D 2D 2D 7B 7D 5C 30
         X1|20 20 20 20 2D 2D 2F 2D 61 6A 7E 2D 41 4A 2D 31
         X2|20 20 20 20 2D 2D 2D 2D 62 6B 73 2D 42 4B 53 32
         X3|20 20 20 20 2D 2D 2D 2D 63 6C 74 2D 43 4C 54 33
         X4|05 20 20 20 2D 2D 2D 2D 64 6D 75 2D 44 4D 55 34
         X5|05 05 05 05 2D 2D 2D 2D 65 6E 76 2D 45 4E 56 35
         X6|20 05 20 20 2D 2D 2D 2D 66 6F 77 2D 46 4F 57 36
         X7|20 20 1B 20 2D 2D 2D 2D 67 70 78 2D 47 50 58 37
         X8|05 20 05 20 2D 2D 2D 2D 68 71 79 2D 48 51 59 38
         X9|20 05 20 20 2D 2D 2D 60 69 72 7A 2D 49 52 5A 39
         XA|20 20 20 20 05 21 7C 3A 2D 2D 2D 2D 2D 2D 2D 2D
         XB|05 20 05 20 2E 24 2C 23 2D 2D 2D 2D 2D 2D 2D 2D
         XC|05 20 20 20 3C 2A 25 40 2D 2D 2D 2D 2D 2D 2D 2D
         XD|05 20 20 20 28 29 5F 27 2D 2D 5B 5D 2D 2D 2D 2D
         XE|20 05 20 20 2B 3B 3E 3D 2D 2D 2D 2D 2D 2D 2D 2D
         XF|20 20 20 20 7C 5E 3F 22 2D 2D 2D 2D 2D 2D 2D 2D
```

DSC (COAX) TO EBCDIC.....

MSN-> / LSN-v	0X	1X	2X	3X	4X	5X	6X	7X	8X	9X	AX	BX	CX	DX	EX	FX
X0	05	05	F0	50	57	75	9E	B7	81	98	C1	D8	40	40	40	40
X1	05	7E	F1	60	58	76	9F	B8	82	99	C2	D9	40	40	40	40
X2	05	7D	F2	4B	59	77	A0	B9	83	A2	C3	E2	40	40	40	40
X3	05	7F	F3	6B	62	78	AA	BA	84	A3	C4	E3	40	40	40	40
X4	60	61	F4	7A	63	80	AB	BB	85	A4	C5	E4	40	40	40	40
X5	05	E0	F5	4E	64	8A	AC	BC	86	A5	C6	E5	40	40	40	40
X6	ED	4F	F6	5F	65	8B	41	42	87	A6	C7	E6	40	40	40	40
X7	EE	6A	F7	49	66	8C	AE	BE	88	A7	C8	E7	40	40	40	40
X8	6E	6F	F8	51	67	8D	AF	BF	89	A8	C9	E8	40	40	40	40
X9	4C	5A	F9	52	68	8E	B0	CA	91	A9	D1	E9	40	40	40	40
XA	AD	5B	47	53	69	8F	B1	CB	92	E1	D2	FA	40	40	40	40
XB	BD	05	48	A1	70	90	B2	CC	93	EA	D3	FB	40	40	40	40
XC	5D	43	7B	54	CE	9A	B3	CD	94	EB	D4	FC	40	40	40	40
XD	4D	44	7C	79	CF	9B	B4	DF	95	EC	D5	FD	40	40	40	40
XE	D0	45	6C	55	DD	9C	B5	DB	96	EF	D6	5E	40	40	40	40
XF	C0	46	6D	56	DE	9D	B6	DC	97	FE	D7	5C	40	40	40	40

SCS (COAX/ALT) TO EBCDIC.....

MSN-> / LSN-v	0X	1X	2X	3X	4X	5X	6X	7X	8X	9X	AX	BX	CX	DX	EX	FX
X0	00	10	20	30	40	50	60	70	80	90	A0	B0	C0	D0	E0	F0
X1	01	11	21	31	41	51	61	71	81	91	A1	B1	C1	D1	E1	F1
X2	02	12	22	32	42	52	62	72	82	92	A2	B2	C2	D2	E2	F2
X3	03	13	23	33	43	53	63	73	83	93	A3	B3	C3	D3	E3	F3
X4	04	14	24	34	44	54	64	74	84	94	A4	B4	C4	D4	E4	F4
X5	05	05	05	05	45	55	65	75	85	95	A5	B5	C5	D5	E5	F5
X6	06	05	26	36	46	56	66	76	86	96	A6	B6	C6	D6	E6	F6
X7	07	17	27	37	47	57	67	77	87	97	A7	B7	C7	D7	E7	F7
X8	05	18	05	38	48	58	68	78	88	98	A8	B8	C8	D8	E8	F8
X9	09	05	29	39	49	59	69	79	89	99	A9	B9	C9	D9	E9	F9
XA	0A	1A	2A	3A	05	5A	6A	7A	8A	9A	AA	BA	CA	DA	EA	FA
XB	05	1B	05	3B	4B	5B	6B	7B	8B	9B	AB	BB	CB	DB	EB	FB
XC	05	1C	2C	3C	4C	5C	6C	7C	8C	9C	AC	BC	CC	DC	EC	FC
XD	05	1D	2D	3D	4D	5D	6D	7D	8D	9D	AD	BD	CD	DD	ED	FD
XE	0E	05	2E	3E	4E	5E	6E	7E	8E	9E	AE	BE	CE	DE	EE	FE
XF	0F	1F	2F	3F	4F	5F	6F	7F	8F	9F	AF	BF	CF	DF	EF	FF

DSC (COAX) TO ASCII APL....

MSN-> / LSN-v	0X	1X	2X	3X	4X	5X	6X	7X	8X	9X	AX	BX	CX	DX	EX	FX
X0	05	FF	FF	FF	FF	AE	7D	7B	FC	FF	FF	FF	FF	FF	FF	FF
X1	05	FF	FF	FF	A1	AF	A3	BA	FF	FF	FF	FF	FF	FF	FF	FF
X2	05	FF	FF	FF	E7	B0	A4	BB	C7	FF	E6	9E	FF	FF	FF	FF
X3	05	FF	FF	FF	E8	B1	A5	C0	C8	FF	9B	21	FF	FF	FF	FF
X4	FF	FF	FF	FF	E9	B2	A6	C1	C9	FF	ED	FF	FF	FF	FF	FF
X5	05	FF	FF	FF	F0	B3	A7	BD	D0	FF	EE	FF	FF	FF	FF	FF
X6	FF	FF	FF	FF	F1	B4	A8	BC	D1	FF	FB	DC	FF	FF	FF	FF
X7	FF	FF	FF	FF	F2	B6	F8	C4	D2	FF	FD	DD	FF	FF	FF	FF
X8	FF	FF	FF	FF	F3	5C	AA	C5	D3	FF	EF	FF	FF	FF	FF	FF
X9	FF	FF	FF	FF	F5	B8	AB	C6	D4	FF	E1	FF	FF	FF	FF	FF
XA	FF	FF	FF	FF	F7	F9	FF	FF	FF	FF	CA	DE	FF	FF	FF	FF
XB	FF	05	FF	FF	A0	C3	FF	FF	FF	FF	CB	DF	FF	FF	FF	FF
XC	FF	FF	FF	FF	AD	A9	FF	FF	FF	FF	5E	FF	FF	FF	FF	FF
XD	FF	FF	FF	FF	C2	5D	FF	FF	FF	FF	E4	B5	FF	FF	FF	FF
XE	FF	FF	FF	FF	AC	BE	FF	F6	FF	FF	CC	EA	FF	FF	FF	FF
XF	FF	FF	FF	FF	5B	7C	FF	FF	FF	FF	CF	EB	FF	FF	FF	FF

SCS (COAX/ALT) TO ASCII APL....

MSN-> / LSN-v	0X	1X	2X	3X	4X	5X	6X	7X	8X	9X	AX	BX	CX	DX	EX	FX
X0	FF	FF	FF	FF	8A	CE	FF	FF	B5	F1	A0	B0	7B	7D	FF	FF
X1	FF	FF	FF	FF	A3	BA	FF	5E	AF	FF	AF	B1	FF	FF	FF	FF
X2	FF	FF	FF	FF	A4	BB	C7	9B	FF	FF	2D	B2	E2	FF	FF	FF
X3	FF	FF	FF	FF	A5	C0	C8	FF	FF	FF	E0	B3	2B	2B	FF	FF
X4	FF	FF	FF	FF	A6	C1	C9	FF	FF	FF	6E	B4	FF	FF	FF	FF
X5	05	05	05	05	A7	BD	D0	FF	FF	FF	FF	FF	FF	FF	FF	FF
X6	FF	05	FF	80	A8	BC	D1	FF	FF	FF	FF	B6	92	91	FF	FF
X7	FF	FF	1B	81	F8	C4	D2	FF	FF	FF	FF	5C	AC	A9	FF	FF
X8	FF	FF	05	82	AA	C5	D3	E4	FF	FF	FF	B8	FF	FF	FF	FF
X9	FF	05	FF	83	AB	C6	D4	FF	FF	FF	FF	FF	FF	FF	FF	FF
XA	FF	FE	FF	84	05	EC	FF	FF	A1	F2	AD	F9	CA	9E	EA	FF
XB	05	FF	05	85	8B	FF	FF	FF	E6	F3	C2	C3	CB	21	EB	FB
XC	05	FF	FF	86	8C	FF	FF	FF	E7	90	AC	A9	FF	DC	EC	FC
XD	05	FF	FF	87	8D	FF	FF	FF	E8	F5	5B	5D	CC	DD	ED	FD
XE	FF	05	FF	88	8E	FF	FF	FF	E9	F6	AE	BE	FF	DE	EE	E1
XF	FF	FF	FF	89	8F	F4	FF	FF	F0	F7	9F	7C	CF	DF	EF	FF

EBCDIC FONT DOWNLOAD TABLE - DSC.

MSN-> / LSN-v	0X	1X	2X	3X	4X	5X	6X	7X	8X	9X	AX	BX	CX	DX	EX	FX
X0	00	00	3F	31	00	00	00	00	61	71	41	51	00	00	00	00
X1	00	7E	40	00	00	00	00	00	62	72	42	52	00	00	00	00
X2	0C	00	5B	30	00	00	00	00	63	73	43	53	00	00	00	00
X3	05	00	5C	34	00	00	00	00	64	74	44	54	00	00	00	00
X4	00	33	5D	38	00	00	00	00	65	75	45	55	00	00	00	00
X5	00	00	5E	7D	00	00	00	00	66	76	46	56	00	00	00	00
X6	00	00	5F	00	00	00	00	00	67	77	47	57	00	00	00	00
X7	00	00	60	00	00	00	00	00	68	78	48	58	00	00	00	00
X8	00	37	7B	00	00	00	00	00	69	79	49	59	00	00	00	00
X9	00	00	7C	00	00	00	00	00	6A	7A	4A	5A	00	00	00	00
XA	00	00	00	00	00	00	00	00	6B	00	4B	00	00	00	00	00
XB	00	00	00	00	00	00	00	00	6C	00	4C	00	00	00	00	00
XC	32	00	00	00	00	00	00	00	6D	00	4D	00	00	00	00	00
XD	39	00	00	00	00	00	00	00	6E	00	4E	00	00	00	00	00
XE	00	00	35	00	00	00	00	00	6F	00	4F	00	00	00	00	00
XF	00	00	36	00	00	00	00	00	70	00	50	00	00	00	00	00

SCS (COAX/ALT) TO EBCDIC APL...

MSN-> / LSN-v	0X	1X	2X	3X	4X	5X	6X	7X	8X	9X	AX	BX	CX	DX	EX	FX
X0	00	10	20	30	40	50	60	70	80	90	A0	B0	C0	D0	E0	F0
X1	01	11	21	31	41	51	61	71	81	91	A1	B1	C1	D1	E1	F1
X2	02	12	22	32	42	52	62	72	82	92	A2	B2	C2	D2	E2	F2
X3	03	13	23	33	43	53	63	73	83	93	A3	B3	C3	D3	E3	F3
X4	04	14	24	34	44	54	64	74	84	94	A4	B4	C4	D4	E4	F4
X5	05	05	05	05	45	55	65	75	85	95	A5	B5	C5	D5	E5	F5
X6	06	05	26	36	46	56	66	76	86	96	A6	B6	C6	D6	E6	F6
X7	07	17	27	37	47	57	67	77	87	97	A7	B7	C7	D7	E7	F7
X8	05	18	05	38	48	58	68	78	88	98	A8	B8	C8	D8	E8	F8
X9	09	05	29	39	49	59	69	79	89	99	A9	B9	C9	D9	E9	F9
XA	0A	1A	2A	3A	05	5A	6A	7A	8A	9A	AA	BA	CA	DA	EA	FA
XB	05	1B	05	3B	4B	5B	6B	7B	8B	9B	AB	BB	CB	DB	EB	FB
XC	05	1C	2C	3C	4C	5C	6C	7C	8C	9C	AC	BC	CC	DC	EC	FC
XD	05	1D	2D	3D	4D	5D	6D	7D	8D	9D	AD	BD	CD	DD	ED	FD
XE	0E	05	2E	3E	4E	5E	6E	7E	8E	9E	AE	BE	CE	DE	EE	FE
XF	0F	1F	2F	3F	4F	5F	6F	7F	8F	9F	AF	BF	CF	DF	EF	FF

ASCII (ALT) TO ASCII.....

MSN-> / LSN-v	0X	1X	2X	3X	4X	5X	6X	7X	8X	9X	AX	BX	CX	DX	EX	FX
X0	00	10	20	30	40	50	60	70	80	90	A0	B0	C0	D0	E0	F0
X1	01	11	21	31	41	51	61	71	81	91	A1	B1	C1	D1	E1	F1
X2	02	12	22	32	42	52	62	72	82	92	A2	B2	C2	D2	E2	F2
X3	03	13	23	33	43	53	63	73	83	93	A3	B3	C3	D3	E3	F3
X4	04	14	24	34	44	54	64	74	84	94	A4	B4	C4	D4	E4	F4
X5	05	15	25	35	45	55	65	75	85	95	A5	B5	C5	D5	E5	F5
X6	06	16	26	36	46	56	66	76	86	96	A6	B6	C6	D6	E6	F6
X7	07	17	27	37	47	57	67	77	87	97	A7	B7	C7	D7	E7	F7
X8	08	18	28	38	48	58	68	78	88	98	A8	B8	C8	D8	E8	F8
X9	09	19	29	39	49	59	69	79	89	99	A9	B9	C9	D9	E9	F9
XA	0A	1A	2A	3A	4A	5A	6A	7A	8A	9A	AA	BA	CA	DA	EA	FA
XB	0B	1B	2B	3B	4B	5B	6B	7B	8B	9B	AB	BB	CB	DB	EB	FB
XC	0C	1C	2C	3C	4C	5C	6C	7C	8C	9C	AC	BC	CC	DC	EC	FC
XD	0D	1D	2D	3D	4D	5D	6D	7D	8D	9D	AD	BD	CD	DD	ED	FD
XE	0E	1E	2E	3E	4E	5E	6E	7E	8E	9E	AE	BE	CE	DE	EE	FE
XF	0F	1F	2F	3F	4F	5F	6F	7F	8F	9F	AF	BF	CF	DF	EF	FF

ASCII (ALT) TO EBCDIC.....

MSN-> / LSN-v	0X	1X	2X	3X	4X	5X	6X	7X	8X	9X	AX	BX	CX	DX	EX	FX
X0	00	10	40	F0	7C	D7	79	97	60	60	60	60	60	60	60	60
X1	01	11	5A	F1	C1	D8	81	98	60	60	60	60	60	60	60	60
X2	02	12	7F	F2	C2	D9	82	99	60	60	60	60	60	60	60	60
X3	03	13	7B	F3	C3	E2	83	A2	60	60	60	60	60	60	60	60
X4	37	3C	5B	F4	C4	E3	84	A3	60	60	60	60	60	60	60	60
X5	2D	3D	6C	F5	C5	E4	85	A4	60	60	60	60	60	60	60	60
X6	15	32	50	F6	C6	E5	86	A5	60	60	60	60	60	60	60	60
X7	2F	26	7D	F7	C7	E6	87	A6	60	60	60	60	60	60	60	60
X8	16	18	4D	F8	C8	E7	88	A7	60	60	60	60	60	60	60	60
X9	05	19	5D	F9	C9	E8	89	A8	60	60	60	60	60	60	60	60
XA	25	3F	5C	7A	D1	E9	91	A9	60	60	60	60	60	60	60	60
XB	0B	27	4E	5E	D2	AD	92	C0	60	60	60	60	60	60	60	60
XC	0C	22	6B	4C	D3	E0	93	4F	60	60	60	60	60	60	60	60
XD	0D	1D	60	7E	D4	BD	94	D0	60	60	60	60	60	60	60	60
XE	0E	1E	4B	6E	D5	B5	95	A1	60	60	60	60	60	60	60	60
XF	0F	1F	61	6F	D6	6D	96	07	60	60	60	60	60	60	60	60

EBCDIC FONT DOWNLOAD TABLE - SCS.

MSN-> / LSN-v	0X	1X	2X	3X	4X	5X	6X	7X	8X	9X	AX	BX	CX	DX	EX	FX
X0	00	00	00	00	00	31	00	00	00	00	00	00	00	00	00	3F
X1	00	00	00	00	00	00	33	00	61	6A	00	00	41	4A	00	40
X2	00	00	00	00	00	00	00	00	62	6B	73	00	42	4B	53	5B
X3	00	00	00	00	00	00	00	00	63	6C	74	00	43	4C	54	5C
X4	00	00	00	00	00	00	00	00	64	6D	75	00	44	4D	55	5D
X5	00	05	00	00	00	00	00	00	65	6E	76	00	45	4E	56	5E
X6	00	00	00	00	00	00	00	00	66	6F	77	00	46	4F	57	5F
X7	00	00	00	00	00	00	00	00	67	70	78	00	47	50	58	60
X8	00	00	00	00	00	00	00	00	68	71	79	00	48	51	59	7B
X9	00	00	00	00	00	00	00	00	69	72	7A	00	49	52	5A	7C
XA	00	00	00	00	00	00	00	38	00	00	00	00	00	00	00	00
XB	00	00	00	00	30	00	34	00	00	00	00	00	00	00	00	00
XC	0C	00	00	00	00	00	35	00	00	00	00	00	00	00	00	00
XD	00	00	00	00	39	32	36	00	00	00	00	00	00	00	00	00
XE	00	00	00	00	7D	00	00	7E	00	00	00	00	00	00	00	00
XF	00	00	00	00	00	00	37	00	00	00	00	00	00	00	00	00

ASCII (ALT) TO EBCDIC APL...

MSN-> / LSN-v	0X	1X	2X	3X	4X	5X	6X	7X	8X	9X	AX	BX	CX	DX	EX	FX
X0	FF	FF	FF	FF	FF	FF	FF	FF	FF	9C	A0	B0	53	65	A3	8F
X1	FF	FF	DB	FF	FF	FF	FF	FF	FF	D6	8A	B1	54	66	FE	90
X2	FF	FF	FF	FF	FF	FF	FF	FF	FF	C6	FF	B2	AB	67	C2	9A
X3	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	41	B3	BB	68	FF	9B
X4	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	42	B4	57	69	78	FF
X5	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	43	80	58	FF	FF	9D
X6	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	44	B6	59	FF	8B	9E
X7	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	45	FF	62	FF	8C	9F
X8	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	46	B8	63	FF	8D	FF
X9	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	47	FF	64	FF	8E	BA
XA	FF	FF	FF	FF	FF	FF	FF	FF	40	FF	48	51	CA	FF	EA	FF
XB	FF	FF	C3	FF	FF	B7	FF	C0	FF	72	49	52	CB	FF	EB	FB
XC	FF	FF	FF	FF	FF	BD	FF	BF	FF	FF	AC	56	FF	DC	EC	FC
XD	FF	FF	A2	FF	FF	71	FF	D0	FF	FF	AA	55	CC	DD	ED	FD
XE	FF	FF	FF	FF	FF	FF	A4	FF	FF	DA	AE	BE	50	DE	EE	FF
XF	FF	FF	FF	FF	FF	FF	FF	FF	FF	AF	A1	FF	CF	DF	EF	FF

```
 EDIT  THE  CUSTOM  TEST  DATA  Y/N......
MSN->      0X  1X  2X  3X  4X  5X  6X  7X  8X  9X  AX  BX  CX  DX  EX  FX
 LSN-v      |-------------------------------
         X0|00  00  00  00  00  00  00  00  00  00  00  00  00  00  00  00
         X1|00  00  00  00  00  00  00  00  00  00  00  00  00  00  00  00
         X2|00  00  00  00  00  00  00  00  00  00  00  00  00  00  00  00
         X3|00  00  00  00  00  00  00  00  00  00  00  00  00  00  00  00
         X4|00  00  00  00  00  00  00  00  00  00  00  00  00  00  00  00
         X5|00  00  00  00  00  00  00  00  00  00  00  00  00  00  00  00
         X6|00  00  00  00  00  00  00  00  00  00  00  00  00  00  00  00
         X7|00  00  00  00  00  00  00  00  00  00  00  00  00  00  00  00
         X8|00  00  00  00  00  00  00  00  00  00  00  00  00  00  00  00
         X9|00  00  00  00  00  00  00  00  00  00  00  00  00  00  00  00
         XA|00  00  00  00  00  00  00  00  00  00  00  00  00  00  00  00
         XB|00  00  00  00  00  00  00  00  00  00  00  00  00  00  00  00
         XC|00  00  00  00  00  00  00  00  00  00  00  00  00  00  00  00
         XD|00  00  00  00  00  00  00  00  00  00  00  00  00  00  00  00
         XE|00  00  00  00  00  00  00  00  00  00  00  00  00  00  00  00
         XF|00  00  00  00  00  00  00  00  00  00  00  00  00  00  00  00
```

GLOSSARY

A

A/B switch	A switch that allows input devices to share a printer.
AFP	Advanced Function Printing.
AFPDS	Advanced Function Printing Data Stream.
Alternate host	Input devices other than the coax host that can use the printers attached to the ULTRA, such as PCs, network servers, print sharing devices and even other protocol converters.
APL	A Programming Language.
ASCII	American Standard Code for Information Interchange. A 7-bit standard character code used for interchanging data between communications equipment.

B

Backspace	Moves the print position one column to the left.
Battery-backed RAM	A non-volatile temporary means of storage. The ULTRA uses it to store configuration parameters.
Baud rate	A unit for measuring serial data transmission speed.
Binary	A base 2 numbering system.
Bit	A binary digit. The smallest unit of binary information. Either a 0 or a 1.
BM	Bottom margin.
BNC connector	A type of coaxial cable end.
Bold	A typestyle in which the strokes of the characters are thicker than normal.
Bottom margin	The last line on which the ULTRA will allow a character to be printed.

Break	An interruption of a transmission.
BS	Backspace.
Buffer	A block of internal memory that stores information until it is ready to be used.
Byte	A unit of information consisting of eight binary bits. Character codes are often represented in bytes.

C

C0 05 header	Two DSC characters that some applications send to the printer.
Carriage Return	A control character that (unless set to be interpreted as a line end) causes the printer to begin printing at the left margin of the current line.
Centronics	The printer manufacturer that produced the parallel interface that is now the industry standard. Also used to refer to the interface itself.
CICS/VS	Customer Information Control System/ Virtual System.
Cluster controller	A down-line processor that collects data from a number of low-speed devices, then transmits the concentrated data over a single communications channel.
CNT	Count. The number of bytes in a command string.
Coax	Coaxial cable. The type of cable used to interface the ULTRA with the controller. Standard RG62 A/U coax is recommended for use in the 3270 IDS.
Column	The vertical members of one line of an array.
Configuration	To assemble a collection of hardware and software into a system and to adjust each of the parts so they all work together.
Control code	A byte of information representing a print instruction (e.g., a tab).

Control Unit	The portion of the CPU that directs the step-by-step operation of the entire computing system.
Count byte	A byte that indicates the number of bytes to follow in an escape sequence.
CPI	Characters per inch.
CR	Carriage return.
CR/LF	Carriage return/line feed.
CRT	Cathode ray tube. A video display terminal.
CTS	Clear to send. A hardware handshaking method in serial interfacing.

D

Data bits	Word length. The number of data bits in a word.
Data stream	Information transmitted between the host system and the ULTRA.
DB-25	A plug with 25 male or female pins, most commonly used with an RS-232-C serial interface.
Decimal	A base 10 numbering system.
Default	Formatting configurations that are present and are used automatically when no other information is available.
Delimit	To mark the beginning and end of a character string.
Diagnostic	A routine designed to verify the operation of a system and to find a malfunction in a device.
Dip switch	Dual In-line Package switch. Used on the ULTRA rear panel to modify the functions of the unit.
DisplayWrite 370	An IBM word processing application that supports bolding, underlining and overstriking.
DPA	Display printer adapter.

DSC	Data stream compatible. A pre-SNA protocol.

E

EAB	Extended Attribute Buffer. A feature found in many IBM printers that extends the number of characters available for transmission to the printer.
EBCDIC	Extended Binary Coded Decimal Interchange Code. An eight bit character code.
EC	Establishment controller.
EM character	End of message marker.
Emulation	A hardware or software product imitating the function of another hardware or software product.
End of Message	A character that represents the last character of a message.
EPROM	Erasable programmable read-only memory. The storage medium for the ULTRA firmware.
Esc	Escape control character. A non-graphic (unimaged) code that signals the transmission of control information to the ULTRA.
Establishment controller	See "cluster controller."
Exception condition	A printing problem in an SNA environment.
Extended ASCII	Some printer manufacturers have implemented their own version of 8 bit transmission. Extended ASCII allows 128 additional characters to be displayed by the printer.

F

FCC	Federal Communications Commission.
FF	Form feed.

Firmware	The pre-programmed EPROMs installed in the ULTRA (the internal software).
Flow control	Serial communication handshaking.
Form feed	A control code that instructs the printer to process the current page and print it; a page end. The physical transport of paper to the beginning of a new page.

G

GDDM	Graphical Data Display Manager. An IBM graphics software product.
GML	Graphic Machine Language.
Graphic Windows	A feature of Xerox printers.

H

Handshaking	An exchange of signals between two devices in a computer network, as a prelude to data exchange. The method of flow control used in serial interfacing.
Hardware	Any physical device in a computer network.
Hewlett-Packard	A California company that produces a wide range of computer equipment and peripherals.
Hexadecimal	A base 16 numbering system. Numbers are represented using digits 0-9 and letters A-F.
Horizontal tab	Moves the presentation position horizontally to the next tab stop to the right.
Host	The system that transmits information to the ULTRA. IBM coax host.
HP	Hewlett-Packard.
HPGL	Hewlett-Packard Graphics Language. A language used to transfer graphic information to an HP or HP-compatible plotter.

HT	Horizontal tab.

I

IBM	The world's largest manufacturer of computing equipment.
IBM 35 Hex transparency	A standard form of transparency used in SCS data streams.
Idle	Available for use but not in actual operation.
IFS	Interchange file separator.
IGS	Interchange group separator.
Infinite line length	An ULTRA feature that allows printing past the default of 132 characters per line for printers that support this capability.
Infinite page length	An ULTRA setting that allows the host application to perform page control.
Initialization	To preset to proper starting values.
Input	The introduction of data from an input device to the computer's main memory.
Input device	A unit used to enter data.
Interchange separator	An SCS command used to delimit information strings in SCS data streams (IFS, IGS, IRS, IUS).
Interface	The method by which different types of devices are linked to each other for communication (e.g., serial, parallel, coax).
Intervention required	The message sent to the host system when an error condition exists at the printer (e.g., paper jam).
Invalid character	In hexadecimal, any character other than numerals 0-9 and letters A-F.
IR	Intervention required.
IRS	Interchange record separator.
IUS	Interchange unit separator.

L

Laserpage	An AGILE mainframe software product that allows high-resolution AFP-generated text and graphics to be printed on Xerox and Hewlett-Packard printers without installing IBM PSF.
Least significant digit	The digit representing the least value (e.g., in 1024, the 4 is the least significant).
LED	Light emitting diode. Emits light when voltage is applied. Used on the ULTRA front panel to indicate modes.
Left margin	The number of the first column at which a character can be printed on a page.
LF	Line feed.
Line density	Vertical spacing, or the number of lines per inch that can be printed on a page.
Line Feed	A control code that advances the print position down by one line.
LM	Left margin.
Local Copy	A screen print operation from a coax-attached terminal that goes directly through the controller to the ULTRA and the printer.
Log mode entry	Interface information required by the host for each attached device.
Logical buffer	RAM used to display a displayable or printable image.
Logical Unit Number	A number assigned to a physical device for identification purposes.
LU1	Logical Unit Type 1 (SCS compatible).
LU3	Logical Unit Type 3 (DSC compatible).

M

Mainframe	A large, expensive computer generally used for information processing in large businesses, colleges and other

	organizations. The largest, fastest and most expensive class of computers.
Margin	The number of spaces between the edges of a page and the beginning of text.
Maximum presentation line	The number of the last physical line on the page.
Maximum presentation position	The number of the rightmost character position on the physical page.
Metacode	A Xerox printer command code.
Mode	A method of controlling the ULTRA using a pushbutton on the front panel. The mode number is indicated by a seven-segment LED.
Most significant digit	The digit representing the greatest value (e.g., in 1024, the 1 is the most significant).
MPL	Maximum presentation line.
MPP	Maximum presentation position.

N

National semiconductor	A manufacturer of electronic components.
New Line	A printer operation consisting of a carriage return (CR) and a line feed (LF).
NL	New line.
Normal operating mode	The ULTRA mode in which host data may be accepted.
Null	X'00.' Output by the ULTRA as a space.
Null line	A line in the data stream containing only null characters.

O

One-trigger	A form of pseudo transparency that uses a single trigger character followed by a count byte that indicates the length of the escape sequence.

Option	An ULTRA configuration parameter for which the user can make a choice.
Output	Data transferred from a computer's internal storage to an output device.
Output device	A unit that takes data output from a computer and presents it in the form desired by the user.
Overstrike	A DisplayWrite 370 function in which two characters may be printed in the same presentation position.

P

PA1	Program attention key 1.
PA2	Program attention key 2.
Page control	The method by which page boundaries (margins) are determined. Page control may be done either by the host application or by the ULTRA.
Parallel interface	8 bits of a byte are transmitted simultaneously through 8 parallel wires.
Parity	A bit added to a data word that is used for error checking. Simple parity can be either odd or even.
PFS	Programmable function string.
Plotter	An output unit that graphs data by automatically controlled pens.
POR	Power on reset.
Power on reset	The method by which a peripheral device announces to the host that it is ready.
Presentation line	The number of the line that is the current presentation position.
Presentation position	The line and column number of the current position on the page.
Presentation surface	Represents a single page of printed output.

Print screen	A PC keyboard command that will print the text currently displayed on the screen.
Printer	An output device that produces hard copy output.
Program attention key	Found on displays and printers, these keys inform the host of operator actions.
Programmable function string	An instruction string used by the ULTRA to activate printer features.
Protocol	A set of rules governing the format of data and the control of information interchange between two communicating devices.
Protocol converter	A device that takes input in one data communications format and outputs the data in another communications format.
Pseudo transparency	A form of transparency used by the ULTRA and available in both SCS and DSC data streams. One-trigger and two-trigger methods are provided.
PSF	Print Services Facility.
PTM	Pseudo transparency mode.

R

RAM	Random access memory. Used for temporary storage of information.
Rasterizer	A device that converts an image sequentially line by line, instead of by vector.
Reset	To return components to a specified static state.
RG62 A/U	Standard coaxial cable interface used by host systems.
Right margin	The last column at which data can be printed on a page.
RM	Right margin.
ROM	Read-only memory.

RTS	Ready to send. A hardware handshaking method in serial interfacing.

S

SCS	SNA character string. EBCDIC control codes that are used to format data.
Sense codes	An SNA code that describes an exception condition.
Serial interface	A type of interface in which bytes are transmitted one bit at a time over a single wire, and which can function over great distances.
Set horizontal format	The SCS command that describes left and right margins and horizontal tab stops.
Set vertical format	The SCS command that describes top and bottom margins and vertical tab stops.
SHF	Set horizontal format.
SLD	Set line density.
Slow poll mode	A device connected to an establishment controller may enter this mode when communication with the EC has ceased.
SNA	System network architecture. An IBM communication standard.
Space	A print position where no character is printed.
Stop bits	A bit or group of bits that indicates the end of a data word and defines the space between data words.
SVF	Set vertical format.
System printer	The printer designated as the primary printer in a mainframe environment.

T

T1-Tn	The character positions of the horizontal or vertical tab settings, if any.
Tab	A carriage control that specifies output columns and rows.
Terminator	A character or sequence of characters that indicates the end of a data string that is variable in length.
Timer	A configuration option that determines how long an idle host or alternate host controls an output port.
TM	Top margin.
Top margin	The topmost position on a page where a character can be printed.
Translate tables	Look-up tables used by the ULTRA to translate data input into the desired data output.
Transparency	A method of embedding unprinted printer control code escape sequences in a host data stream using normally printable characters.
Trigger	The character(s) that indicates the beginning of a transparent command.
TRN	Transparency.
Two-trigger	A type of pseudo transparency that uses a sequence of two normally printable characters as the trigger, and which is ended with a terminator.

U

UDK	User-defined key. Feature used in Xerox laser printers to define a substitute escape character.

V

VCS	Vertical channel select.

Vertical channel select	An SCS command that the ULTRA outputs as one or more CR/LF sequences.
Vertical Tab	Moves the presentation position down to the next vertical tab stop.
VS	Virtual system.
VT	Vertical tab.
VTAM	Virtual telecommunications access method.

W

Word length	The number of data bits in a word.

X

XDPM	Xerox Decentralized Print Mode.
Xerox	A large manufacturer of computers, printers, peripherals and other electronic equipment.
Xerox 36 Hex transparency	A form of transparency used by some Xerox applications in which the trigger is X'36.'
XES	The native print mode for Xerox 2700, 3700, 4030, 4045 and 4213 printers. Also available on 4235 printers in XDPM mode.
XON/XOFF	Serial communication handshake protocol using ASCII DC1/DC3 character codes. A “software” handshake protocol.
XPAF	Xerox Printer Access Facility.

Z

Zeta	A plotter manufacturer.