Lucent Technologies
Bell Labs Innovations

3B21D Computer

Routine Maintenance Tasks

254-303-101
Issue 3
April 1999

Notice

Every effort was made to ensure that the information in this IP was complete and accurate at the time of publication. However, information is subject to change.

This IP describes certain hardware, software, features, and capabilities of Lucent Technologies products. This IP is for information purposes; therefore, caution is advised that this IP may differ from any configuration currently installed.

Mandatory Customer Information

The 3B21D computer is used as the administrative module (AM) in various switching system applications and is not provided as a stand-alone product. Therefore, the application documentation is responsible for providing mandatory customer information.

For example, to find mandatory customer information for ***Interference Information: Part 15 of FCC Rules***, refer to the *5ESS*® Switch Product Specification IP.

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Acknowledgment

Developed by Lucent Technologies Customer Training and Information Products.

How Are We Doing?

Title: 3B21D Computer Routine Maintenance Tasks

Identification No.: 254-303-101 Issue 3, Revised: Date: September 1999

Lucent Technologies welcomes your feedback on this information product (IP). Your comments can be of great value in helping us improve our IPs.

1. Please rate the effectiveness of this IP in the following areas:

	Excellent	Good	Fair	Poor	Not Applicable
Ease of Use					////////////////////
Clarity					////////////////////
Completeness					////////////////////
Accuracy					////////////////////
Organization					////////////////////
Appearance					////////////////////
Examples					
Illustrations					
Overall Satisfaction					////////////////////

2. Please check the ways you feel we could improve this IP:

- ☐ Improve the overview/introduction
- ☐ Improve the table of contents
- ☐ Improve the organization
- ☐ Include more figures
- ☐ Add more examples
- ☐ Add more detail
- ☐ Make it more concise/brief
- ☐ Add more step-by-step procedures/tutorials
- ☐ Add more troubleshooting information
- ☐ Make it less technical
- ☐ Add more/better quick reference aids
- ☐ Improve the index

Please provide details for the suggested improvement. _____

_____

3. What did you like most about this IP?

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4. Feel free to write any comments below or on an attached sheet.

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About This Information Product

Purpose

The Routine Maintenance Tasks is an information product (IP) that provides the routine maintenance procedures used to maintain the Lucent Technologies 3B21D computer. The procedures range from cleaning the printers and tape drives to verifying processor power and cooling units. The maintenance philosophy and a preventive maintenance schedule are also provided.

Audience

The audience for this IP is primarily the craft or maintenance personnel. Although anyone interested in the *UNIX** Real-Time Reliable (RTR) operating system and the 3B21D computer will find it useful. The primary audience for this IP includes the following:

- Software developers
- Hardware developers
- Training course developers
- System administrators
- 3B21D computer documentation users.

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Reason for Reissue

This IP is being reissued to incorporate new information for 3B21D computers and to bring the IP into compliance with new Lucent Technologies documentation standards. The reasons for reissue are as follows:

- In ''About This Information Product,''
  - — change Customer Information Product to Information Product.
  - — update the ''Reason for Reissue'' section by adding reasons why the IP is being updated.
  - — change the six-digit IP numbers of the Input/Output Message Manuals to nine-digit numbers in Table 1.
- In Chapter 2, ''Clean Digital Audio Tape (DAT) Drive,'' modify Step 5 to develop and follow a local procedure to track the number of times each cleaning cassette has been used.
- In Chapter 12, ''Perform System Demand Diagnostics,'' rewrite the procedure and change the tables for clarity. All tasks associated with trouble clearing or schedules with a frequency to be performed ''as required'' have been deleted. Also, the step to run demand diagnostics on the direct user interface controller (DUIC) has been deleted.
- In Chapter 17, ''Test Processor Cabinet Alarms,'' update the ''Reference IPs'' section by changing the six-digit IP numbers to nine-digit numbers.
- In Chapter 18, ''Verify Operator Interface,'' reorganize the chapter for clarity and to provide separate procedures for Model 577 receive-only printer (ROP) and Model 602 ROP.
- In Chapter 19, ''Verify and Test 3B21D Computer CU KS-23884,L1 Fan Unit Alarms,'' add text for locating the fan tray controller.
- In Table of Contents, revise contents.
- In Glossary, revise entries.
- In Index, revise entries.
- In all chapters, remove the use of diff marks in the final IP.

How to Use This Information Product

General

This IP is composed of independent chapters and reference information. Each chapter contains procedures for accomplishing a set of tasks. Each chapter may also contain supplementary procedures for clearing faults uncovered while performing the primary task. In such cases, these supplementary procedures are referenced from the main procedure as appropriate.

The chapters in this IP are organized as follows:

- Chapter 1 — Maintenance Philosophy and Preventive Maintenance Schedule
- Chapter 2 — Clean Digital Audio Tape (DAT) Drive
- Chapter 3 — Clean KS-23909,L10 9-Track Tape Drive
- Chapter 4 — Clean KS-23909,L21 9-Track Tape Drive
- Chapter 5 — Clean Model 577 ROP Assembly
- Chapter 6 — Clean Model 602 ROP Assembly
- Chapter 7 — Fuse Data
- Chapter 8 — Install Model 577 ROP Paper
- Chapter 9 — Install Model 602 ROP Paper
- Chapter 10 — Load 9-Track Tape into KS-23909,L10 Tape Drive
- Chapter 11 — Load 9-Track Tape into KS-23909,L21 Tape Drive
- Chapter 12 — Perform System Demand Diagnostics
- Chapter 13 — Remove 9-Track Tape from KS-23909,L10 Tape Drive
- Chapter 14 — Remove 9-Track Tape from KS-23909,L21 Tape Drive
- Chapter 15 — Replace Model 577 ROP Ribbon
- Chapter 16 — Replace Model 602 ROP Ribbon
- Chapter 17 — Test Processor Cabinet Alarms
- Chapter 18 — Verify Operator Interface
- Chapter 19 — Verify and Test 3B21D Computer CU KS-23884,L1 Fan Unit Alarms
- Chapter 20 — Verify Processor Power and Cooling Units
- Glossary
- Index.

TOP Users

This section is intended for those users familiar with Task Oriented Practice (TOP) documentation. If you are unfamiliar with TOP, you can skip this section.

This IP has the same purpose as the TOP IP it replaces. It contains procedures you can use to perform routine maintenance on the 3B21D computer. The structure has been changed to make finding and using the procedures easier. The following list explains the relationship between the TOP IP elements and the elements in this IP. Refer to the ''Glossary'' for an expansion of the following TOP acronyms.

- IXL The equivalent to an IXL is the overall table of contents of this IP. Locate your task in the overall table of contents and go to the page number indicated.
- NTP The equivalent to NTPs are the chapters of this IP. Chapters are equivalent to NTPs in the sense that they both give procedures for accomplishing a single task. NTPs give the major steps of a procedure and then reference to DLPs for the detailed level procedures. In turn the DLPs may reference TAPs, TADs, or other DLPs for further information. Chapters differ in that they contain ALL the information necessary to accomplish the task. The information may be contained in the main procedure (major steps), related subprocedure(s) (detailed level procedures), and any supplementary procedure(s) (mostly procedures for clearing troubles uncovered during routine tasks).
- DLP In most instances, the equivalent to DLPs are the subprocedures, supplementary procedures, and in some cases, chapters.
- TAP In most instances, the equivalent to TAPs are the subprocedures, supplementary procedures, and in some cases, chapters.
- TAD In most instances, the equivalent to TADs are the subprocedures and supplementary procedures. However, in the previous TOP volume the fuse data for the 3B21D computer processor cabinet was located in a TAD but is now located in Chapter 7 of this IP. Also, much of the information in this section was previously in TAD-100.
- CKL No equivalent for CKL.
- TNG The equivalent for TNG are the sections ''About This Information Product'' and ''How to Use This Information Product.''
- DPL No equivalent for DPL.

Using Procedures in This IP

The procedures in this IP are easy to use for both the experienced and inexperienced user. Steps requiring a more complicated action have ''subprocedures'' that provide detailed instructions.

- If you know how, you can perform the action described in the main procedure step, skip (or ''bypass'') the subprocedure steps, and continue to the next main procedure step.
- If you need help, perform the steps detailed in the subprocedure.

Each subprocedure is set off from the main procedure by double bold horizontal lines that mark the beginning of the subprocedure and double narrow horizontal lines that mark the ending.

Figure 1 shows how bypassing works. If you know how to remove the moving head disk (MHD) from service (Step **3**), you can perform the action (without having to read Steps **3.1** and **3.2**), and then skip to Step **4**. If you do not know how to remove the MHD from service, you should read and perform the instructions given in Steps **3.1** and **3.2**, and then continue to Step **4**.

Using Supplementary Procedures

Some IPs contain subprocedures that are used multiple times in the overall main procedure. Rather than repeating, these subprocedures are provided one time at the end of the chapter in a section called ''Supplementary Procedures.''

Numbering Conventions

The first step in a main procedure or supplementary procedure is Step **1** as shown in Figure 1; for example:

1. Verify mate moving head disk (MHD).

The first step in a subprocedure is **X.1**. The **X** varies depending on where in the main procedure the subprocedure step occurs. For example, if we added a subprocedure step after the main procedure Step **3**, the first number of the subprocedure would be **3.1**.

1. Verify mate moving head disk (MHD).
2. Check MHD light-emitting diodes (LEDs).
3. If in service, remove MHD from service.

REMOVE 1G-BYTE MHD FROM SERVICE PROCEDURE:

Double bold lines indicate start of subprocedure.

3.1. At MHD under test, operate **ROS/RST** switch to **ROS** position.

Response: The Green **ROS** LED lights.

The Green **RQIP** LED lights.

NOTE:
If the green RQIP LED begins to flash and then extinguishes, the request to go out of service was not accepted by the system. Check the receive-only printer (ROP) or maintenance TTY (MTTY) for messages.

3.2. Wait for the unit to go out of service.

Response: The Amber **OOS** LED lights.

The Green **RQIP** LED extinguishes.

RMV COMPLETED message received at the ROP and/or MTTY.

Maintenance terminal display page unit indicators show **OOS** or **OOS MAN**.

Double narrow lines indicate end of subprocedure.

3.3. **STOP! YOU HAVE COMPLETED THE REMOVE 1G-BYTE MHD FROM SERVICE PROCEDURE.**

4. Test MHD power alarms.
5. Restore power to MHD.

Figure 1. Sample of Subprocedure Bypassing

Conventions Used

Command, Filename, and Display Notations

The input messages contained in this IP are listed in both Program Documentation Standard (PDS) and Man-Machine Language (MML) format. For example, a step instructing the user to enter an input message to the system would include both formats as follows:

- If PDS, enter **VFY:MHD** *b***!**
- If MML, enter **VFY:MHD=***b***;**

The following notations are used to show commands and filenames in the text and displays.

NOTE:
System filenames and command names are case-sensitive, so you must enter them exactly as they are shown.

- Command names in text appear in **bold** type; for example, the **/usr/bin/ls** command. Command names in headings appear in **bold** type.
- Filenames and form names in text appear in *italic* type; for example, the */usr/lib/uucp/System* file or the *scsdbody* form. Filenames and form names in headings appear in ***bold-italic*** type.
- Text that you enter, such as a command or response to a prompt, appears in **bold** type; for example, the **ls -la** command. The convention of making text that you enter **bold** overrides other conventions; for example, enter **scsdbody** for the form name.
- Variables that appear in a command line or file appear in *italic* type; for example, **grep** *username* **/etc/passwd**. In this example, *username* is a variable indicating a user's name is required.
- System or output messages appear in `constant width` type; for example, `Please enter your password.` Also, screen displays, program code listings, and file listings are shown in `constant width` type. Input messages are shown in **bold** type.
- Comments and explanations within a display are indented and shown in *italic* type. These are for information only and will not appear on your screen.
- A line in a file or on the computer screen that is too long to be shown as it actually appears in this IP will be shown with a backslash (\) at the end of the first line. This indicates the next line should be read as a continuation of the current line.
- Square brackets around an argument on a command line indicate that the argument is optional; for example, the **lpstat** [**-t**] command. In this example, the **-t** argument is optional and can be omitted.

- A vertical bar (|) between words in an argument on a command line indicates that one of the arguments is to be selected.
- The key identified on your keyboard as Return, Enter, or a bent arrow (↵) is referred to as the Return key. Occasionally, representations of this Return key will be boxed; for example, Return.
- There is an implied Return at the end of each command and menu response that you enter. Some examples do not explicitly show the Return. Where you may be expected to enter a Return (as in the case where you are accepting a menu default), the symbol <CR> is shown to indicate that you are to press the Return key.
- Key combinations appear in a hyphenated format; for example, Ctrl-d. Press and hold down the first key of a key combination while pressing the second key.
- Ellipses (three dots) on a command line indicate that the previous argument can be repeated; for example, **ls** [*file* ...]. In this example, multiple files can be listed after the command.
- References to manual pages are followed by their manual page location number in parentheses; for example, **mount**(1M).

Hexadecimal Notation

Hexadecimal (base 16) numbers are denoted with a **0x** prefix; for example, 0x00A is decimal 10.

Equipment Locations

A coordinate numbering system is used to identify Equipment Locations (EQLs) in units and cabinets. The origin is the lower left front of the cabinet or unit. Vertical increments are measured in inches. Horizontal increments are measured in eighths of an inch. The coordinate location of a circuit pack is expressed as the horizontal and vertical location of the center lines of the connector into which the circuit pack is inserted. The location of a unit in a cabinet is identified by the placement of the lower left corner of the unit in the cabinet.

For example, a connector at EQL 004-080 is located 4 inches above the origin and 10 inches (80 x 0.125 = 10.0) to the right of the origin.

Safety Labels

Safety labels are reminders used to assure the safety of personnel and to minimize service interruptions, loss of data, and damage to equipment, products, and software.

Three types of safety labels are used in Lucent Technologies documentation. The three types, in descending order of priority, are as follows:

1. **DANGER** indicates the presence of a hazard that **will** cause death or severe personal injury if the hazard is not avoided.
2. **WARNING** indicates the presence of a hazard that **can** cause death or severe personal injury if the hazard is not avoided.
3. **CAUTION** indicates the presence of a hazard that **will** or **can** cause minor personal injury or property damage if the hazard is not avoided.

This IP contains safety labels in the form of WARNING and CAUTION statements.

Related Information Products

Table 1 lists by IP number and Select Code the Lucent Technologies IPs supporting the 3B21D computer. IPs with Select Codes have been converted to nine-digit IP numbers.

Table 1. Lucent Technologies Documentation

New IP Number	Old Select Code	Title
254-303-100	-	3B21D Computer Growth/Retrofit Tasks
254-303-101	-	3B21D Computer Routine Maintenance Tasks
254-303-102	-	3B21D Computer Trouble Clearing Tasks
254-303-103	303-007	3B20D and 3B21D Computers *UNIX* RTR Operating System Processor Recovery Messages Guide
254-303-104	303-010	3B20D and 3B21D Computers *UNIX* RTR Operating System Recent Change and Verify Manual
254-303-105	304-045	3B21D Computer Hardware Reference Manual
254-303-106	304-046	3B20D and 3B21D Computers *UNIX* RTR Operating System System Maintenance Manual
254-303-107	303-072	3B20D and 3B21D Computers *UNIX* RTR Operating System Software Troubleshooting Guide
254-303-110	303-080	3B20D and 3B21D Computers *UNIX* RTR Operating System PDS Input Messages Manual
254-303-111	303-081	3B20D and 3B21D Computers *UNIX* RTR Operating System PDS Output Messages Manual
254-303-112	303-082	3B20D and 3B21D Computers *UNIX* RTR Operating System MML Input Messages Manual
254-303-113	303-083	3B20D and 3B21D Computers *UNIX* RTR Operating System MML Output Messages Manual

IP references will not include full titles; for example, ‘‘Refer to 254-303-105, *Hardware Reference Manual*, for more information.’’

How to Comment on This Information Product

Lucent Technologies welcomes your comments on this IP. Your comments will aid us in improving the quality and usefulness of Lucent Technologies documentation. Please use the Feedback Form provided at the front of this IP. If the Feedback Form is missing, mail your comments to the following address:

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Winston-Salem, NC 27106-4606

Maintenance Philosophy and Preventive Maintenance Schedule

1

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Maintenance Philosophy and Preventive Maintenance Schedule

1

Introduction

Maintenance in this information product (IP) is limited to procedures for replacing easily identifiable faulty circuit packs and power units. In some instances, trouble-locating procedure (TLP) options are used in routine diagnostic tests. In these instances, when the diagnostics fail, the output message will list the causes of the fault with the most likely cause first. Circuit packs are replaced one at a time in the order listed. The diagnostic is repeated after each replacement. If the TLP output message indicates the same fault, the last circuit pack is reinstalled and the next circuit pack is replaced. If the TLP output message indicates new faults, the new circuit pack could be worse than the original circuit pack. In this case, reinstall the original and proceed with the next circuit pack on the original list.

Assumptions

Users of this IP should be familiar with the following subjects and activities:

- Replacing one circuit pack at a time by first powering down the unit, replacing the circuit pack, powering up the unit, and repeating diagnostics.
- Wearing a properly-grounded antistatic wrist strap when installing or removing circuit packs.
- Handling circuit packs by edges and faceplate to avoid damaging contacts and deforming components.

- Operation of the terminal to include mode changing, page manipulation, and message conventions.
- Tagging faulty circuit packs with the office location, cabinet or frame number, mounting location, diagnostic phase and test that failed, and date removed.
- All test equipment is functioning properly.
- A replacement unit or circuit pack is known to be good.
- Burned out light-emitting diodes (LEDs) are replaced, when found.
- Audible alarms are retired without instruction.

Preventive Maintenance

Preventive (routine) maintenance is performed on a specific schedule to ensure that the system continues to operate properly. These routine procedures should be performed during periods of light processor activity since most procedures require the unit to be removed from service which leaves the system in simplex operation. The recommended scheduled maintenance is shown in Table 1-1. Unscheduled Maintenance procedures are shown in Table 1-2.

Table 1-1. Preventive Scheduled Maintenance

Task	Chapter	Frequency
Clean Digital Audio Tape (DAT) Drive	2	After 25 hours of operation or monthly, whichever comes first
Clean KS-23909,L10 9-Track Tape Drive	3	After 8 hours of operation or monthly, whichever comes first
Clean KS-23909,L21 9-Track Tape Drive	4	After 8 hours of operation or monthly, whichever comes first
Clean Model 577 ROP Assembly	5	Annually
Clean Model 602 ROP Assembly	6	Annually
Perform System Demand Diagnostics	12	Weekly*
Test Processor Cabinet Alarms	17	Annually
Verify Operator Interface	18	Semiannually
Verify and Test 3B21D Computer CU KS-23884,L1 Fan Unit Alarms	19	Semiannually
Verify Processor Power and Cooling Units	20	Quarterly

* Some system demand diagnostics are performed monthly. See Chapter 12 for details.

Table 1-2. Unscheduled Maintenance

Task	Chapter	Frequency
Install Model 577 ROP Paper	8	As required
Install Model 602 ROP Paper	9	As required
Replace Model 577 ROP Ribbon	15	As required
Replace Model 602 ROP Ribbon	16	As required

Clean Digital Audio Tape (DAT) Drive

2

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Clean Digital Audio Tape (DAT) Drive

2

Procedure

Use the following procedure to clean the digital audio tape (DAT) drive components:

1. Refer to your DAT drive cleaning schedule for the appropriate cleaning times. You should have a schedule based on the following:
   - Clean after 25 hours of operation or monthly, whichever comes first.
   - Clean when the front panel indicators show a ‘‘caution.’’ This is when the top indicator (drive) alternately flashes green and amber and the bottom indicator (cartridge) is a steady green. The DAT drive front panel controls are shown in Figure 2-1.

2. Obtain the required cleaning cartridge [*HP** Part Number (P/N) C5709A or equivalent].

   This cleaning cartridge can be purchased through Hewlett Packard Company or through Hewlett Packard authorized resellers. Up-to-date information on ordering can be obtained by using any of the following methods:
   - going to Web site http://www.hp.com/ and clicking on ‘‘Online Stores’’
   - calling HP at 1-800-826-4111 and asking for the nearest authorized reseller
   - calling HP at 1-800-613-2222 and placing an order.

* Registered trademark of Hewlett-Packard Company.

Ordering via the HP Web site is not intuitive, and only experienced online shoppers should attempt to order using the Web site. If you order from the Web site, use the ''HP Business Store'' or ''HP Commerce Center.'' After clicking on the ''HP Business Store,'' enter C5709A (part number) in the ''Quick Search'' area.

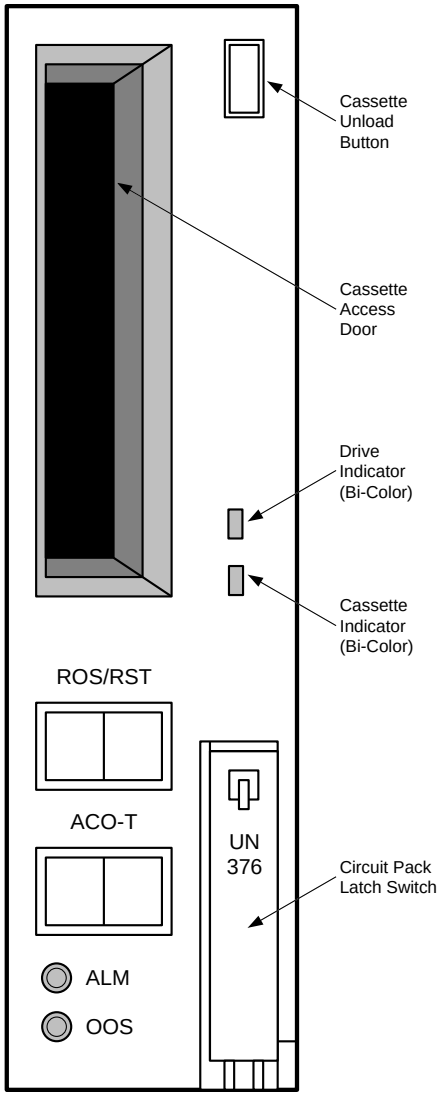

Figure 2-1. DAT Drive – Front View

3. Remove the DAT cartridge (if one is currently loaded in the DAT drive).

REMOVE DAT PROCEDURE:

WARNING:
To protect the media, always remove the cartridge tape before turning off power to the DAT drive.

3.1. Press the **UNLOAD** button on the DAT drive. The cartridge unload sequence completes as follows:

- The tape rewinds to the beginning of partition (BOP) for Partition 0.
- If write enabled, a copy of the tape log held in the drive random access memory (RAM) is written back to the tape.

  NOTE:
  You can write-protect DAT cartridge tapes by sliding the tab on the rear of the cartridge so that the hole is **open**.

- The tape rewinds to the beginning of media (BOM).
- The drive unthreads the tape from the drive mechanism and ejects the DAT cartridge partially out of the loading door.

3.2. Remove and properly store the cartridge.

4. Gently insert the cleaning cartridge into the DAT drive loading door. The drive automatically ‘‘grabs’’ the cartridge, loads it, cleans the DAT heads, and, after approximately 20 to 30 seconds, ejects the cleaning cartridge when the cleaning operation is complete. If the cartridge is ejected after only approximately 14 seconds, this means that the cartridge has reached the end of its useful life and no cleaning has occurred; therefore, the media caution signal should be displayed on the front panel (the drive indicator flashes amber). When this happens, discard the cartridge and repeat the cleaning operation with a new cleaning cartridge.
5. If a local procedure exists to track the number of times a cleaning cartridge has been used, follow that procedure and skip to Step **7**; otherwise, continue to Step **6** to create a local procedure.

6. Develop a local procedure, such as keeping a logbook or using the label on the *HP* P/N C5709A, to track the number of times each cleaning cartridge has been used. The date of usage should be recorded to provide a history of use.

   NOTE:
   The *HP* P/N C5709A has a label that can be used for tracking the number of times a cartridge has been used. An equivalent cartridge may not have a label that can be used for tracking usage.

7. Remove the cleaning cartridge from the drive loading door and record the date of usage per local procedure. After 25 uses, discard the cartridge.
8. If appropriate, load a DAT cartridge into the DAT drive.

LOAD DAT PROCEDURE:

8.1. Gently insert the DAT cartridge into the drive loading door. The drive automatically ''grabs'' the cartridge and completes the loading.

WARNING:
Do not ''jam'' the cartridge into the drive. Very little force is required; too much insertion force can damage the drive mechanism.

The cartridge loading sequence automatically completes as follows:

- The drive threads the tape and rewinds it to the BOM.
- The tape advances to the BOP for Partition 0.
- The reference area is checked to determine the tape format (DDS, audio, and so on).
- If the cartridge tape is blank, the drive leaves it at the BOP for Partition 0 and waits for the next command.
- If the error rate is high, a *caution* is signaled on the front panel indicators by lighting the cartridge indicator green and alternately flashing the drive indicator green and amber.
- The system area on the tape is accessed, and the tape log is read into the drive.
- The drive rewinds to the BOP and goes on-line.

9. **STOP! YOU HAVE COMPLETED THIS PROCEDURE.**

Clean KS-23909,L10 9-Track Tape Drive

3

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Clean KS-23909,L10 9-Track Tape Drive

3

Procedure

Use the following procedure to clean the Storage Tek (STK) (KS-23909,L10) 9-track tape drive components. The tape drive should be cleaned after 8 hours of operation or monthly, whichever comes first.

1. Obtain the required cleaning supplies, including:
   - Lint-free cloth (#94211400-LMSI) or equivalent
   - Foam swabs (#12218463-LMSI) or equivalent
   - Cleaning solution of 90 percent isopropyl alcohol and distilled water.
2. Open the tape drive door (if closed).

3. Remove the tape reel (if loaded).

REMOVE KS-23909,L10 9-TRACK TAPE REEL PROCEDURE:

3.1. Set the tape unit off-line by pressing the **RESET** button. (If in the diagnostic mode, press the **DIAG** button.)

3.2. Depending on what is displayed, perform one of the following:

- If beginning of tape (BOT) is displayed, press the **RWD/UNL** button.
- If OFFLINE is displayed, press and hold the **RESET** button and press the **RWD/UNL** button.

  The tape will rewind to the BOT with REW/UNLD indicated as it rewinds.

3.3. Wait for the READY indicator to display.

3.4. Open the loading door.

3.5. Press the center of the supply hub to release the tape reel.

3.6. Remove the tape reel and close the loading door.

4. Remove power from the tape drive (if the power is on).

5. Using the tape cleaning solvent, foam swabs, and lint-free cloth, clean the tape drive components.

CLEAN KS-23909,L10 9-TRACK TAPE DRIVE COMPONENTS PROCEDURE:

5.1. Clean the read/write head assembly. Remove all traces of dirt and oxide by wiping the recording surface in the same direction as the tape moves across the head. Clean until you cannot detect any trace of debris on a clean cloth.

WARNING:
Be careful when cleaning the sapphire tape cleaner – the edges are extremely sharp and could injure your hand.

5.2. Clean the sapphire tape cleaner. Remove all traces of debris, especially on the front edge of the tape cleaner. Clean until you cannot detect any trace of debris when you use a clean cloth on the tape cleaner.

5.3. Clean the remaining tape path components. Remove all traces of debris from the contact surfaces of the roller guides, tension arm roller, and the surface of the tachometer roller.

5.4. Clean any dirt or oxide that may have accumulated around the take-up reel and supply reel areas.

NOTE:
After cleaning, allow the solvent to dry on the tape path at least 30 seconds before loading a tape.

6. After the components are dry, load the tape reel.

LOAD KS-23909,L10 9-TRACK TAPE REEL PROCEDURE:

6.1. If the power is off, restore power to the tape drive and wait for the end of the power-on sequence.

6.2. Ensure that either a write-enable ring is installed on the tape reel to permit writing or is removed to prevent overwriting of existing data, depending on the tape used.

6.3. Open the loading door.

6.4. Place the tape reel on the self-centering supply hub, and push the tape reel until it locks on the hub. If a write-enable ring is used, place the write-enable ring side toward the casting.

6.5. Close the loading door.

The unit automatically starts the threading process and checks that the reel is not inverted. The tape is threaded to the take-up spool, tensioned, and advanced to the BOT. The display should indicate `LOCATING` followed by `LOADING`. When `BOT` is indicated, the load sequence is complete.

7. **STOP! YOU HAVE COMPLETED THIS PROCEDURE.**

Clean KS-23909,L21 9-Track Tape Drive

4

Contents

Clean KS-23909,L21 9-Track Tape Drive

4

Procedure

Use the following procedure to clean the *HP** (KS-23909,L21) 9-track tape drive components. The tape drive should be cleaned after 8 hours of operation or monthly, whichever comes first.

1. Obtain the required cleaning supplies, including:
   - Lint-free cloth (#94211400-LMSI, Valley Forge, PA) or equivalent
   - Foam swabs (#12218463-LMSI, Valley Forge, PA) or equivalent
   - Cleaning solution of 90 percent isopropyl alcohol and distilled water.
2. Open the tape drive door (if closed).

* Registered trademark of Hewlett-Packard Company.

3. Remove the tape reel (if loaded).

REMOVE KS-23909,L21 9-TRACK TAPE REEL PROCEDURE:

3.1. Take the tape unit off-line by pressing the **ON LINE** button.

3.2. Press the **REW/UNLD** button.

3.3. Wait for the NO TAPE indicator to display.

3.4. Open the tape loading door.

NOTE:
If you open the door before the unload cycle completes, the supply hub fingers may not completely retract. To manually retract the hub fingers, push and hold the tape lock/unlock lever and turn the supply hub counterclockwise.

3.5. Remove the tape reel.

3.6. Close the tape loading door.

4. Remove power from the tape drive (if the power is on).

5. Using the tape cleaning solvent, foam swabs, and lint-free cloth, clean the tape drive components.

CLEAN KS-23909,L21 9-TRACK TAPE DRIVE COMPONENTS PROCEDURE:

5.1. Clean the read/write head assembly. Remove all traces of dirt and oxide by wiping the recording surface in the same direction as the tape moves across the head. Clean until you cannot detect any trace of debris when you rub the read/write head assembly with a clean cloth.

WARNING:
Be careful when cleaning the sapphire tape cleaner – the edges are extremely sharp and could injure your hand.

5.2. Clean the sapphire tape cleaner. Remove all traces of debris, especially on the front edge of the tape cleaner. Clean until you cannot detect any trace of debris on a clean cloth.

5.3. Clean the remaining tape path components. Remove all traces of debris from the contact surfaces of the roller guides, tension arm roller, and the surface of the tachometer roller.

5.4. Clean any dirt or oxide that may have accumulated around the take-up reel and supply reel areas.

NOTE:
After cleaning, allow the solvent to dry from the tape path at least 30 seconds before loading a tape.

6. After the components are dry, load the tape reel.

LOAD KS-23909,L21 9-TRACK TAPE REEL PROCEDURE:

6.1. Open the loading door.

6.2. Slide the tape reel, with the free end to the right, over the center of the supply hub until the rollers retain the reel.

6.3. Manually thread the tape following the tape path to the take-up reel.

6.4. Secure the end of the tape on the take-up reel and rotate the take-up reel two turns.

6.5. Close the loading door.

7. **STOP! YOU HAVE COMPLETED THIS PROCEDURE.**

Clean Model 577 ROP Assembly

5

Contents

Clean Model 577 ROP Assembly

5

Procedure

Use the following procedure to clean Model 577 receive-only printer (ROP):

1. Obtain the needed cleaning supplies, including:
   - Vacuum cleaner with soft brush attachment
   - Lint-free cloth
   - Mild, nonabrasive detergent solution.
2. Take the ROP off-line by pressing the **ON LINE** button.

   Response: The `OFFLINE` message appears in the display window.
3. Open the top cover of the ROP.
4. Remove the paper from the ROP.
5. Turn off the power by pressing the **POWER** switch to **OFF**.
6. Clean the top cover and outside surfaces of the ROP using a mild, nonabrasive cleaner.

   CAUTION:
   The print head gets very hot during operation. If the unit has been printing recently, allow the print head to cool for 15 minutes so that it reaches a safe temperature. Otherwise, EXTREME CAUTION is advised to avoid contact that could inflict burns.

7. Remove the ROP ribbon.

REMOVE MODEL 577 ROP RIBBON PROCEDURE:

7.1. Referring to the lower close-up view in Figure 5-1, disengage the ribbon from the vertical rectangular notches in the ribbon guides on the immediate right and left sides of the print head.

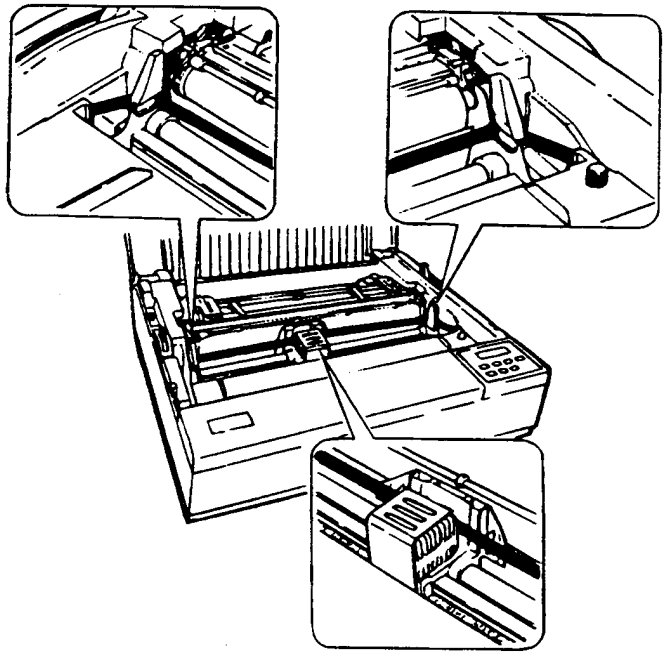


Figure 5-1. Model 577 ROP Ribbon Threading

7.2. Remove the ribbon from the striking area between the print head and the shiny vertical plate next to the platen.

7.3. Carefully unhook the ribbon from both the left and right ribbon guides. See Figure 5-1.

7.4. With the exposed ribbon disengaged from the ribbon path, grasp the ribbon cartridge and pull up to unseat the cartridge.

8. Using a vacuum cleaner with a soft brush attachment, thoroughly clean the ROP carriage to remove any debris.
9. Install the ROP ribbon.

INSTALL MODEL 577 ROP RIBBON PROCEDURE:

9.1. Unbox the new ribbon cartridge, and remove and discard the plastic wrapping. A folded plastic glove is included in the box to protect your hand from ink smears while installing the ribbon cartridge.

NOTE:
The ribbon cartridge has alignment pins on its left and right edges. These alignment pins fit into matching notches in the walls of the ROP.

9.2. Turn the ribbon advance knob clockwise, as shown by the curved arrow on the cartridge, until all slack is removed from the ribbon.

NOTE:
Make sure the power is off and the print head has cooled down. To make ribbon installation easier, slide the print head to the center carriage position before performing the next step.

9.3. Holding the cartridge in position as shown in Figure 5-2, hook the left side of the ribbon around the left ribbon guide and the right side around the right ribbon guide (as shown in the top two close-up views in Figure 5-2).

9.4. Thread the ribbon into the striking area between the print head and the shiny vertical plate next to the platen (as shown in the lower close-up view in Figure 5-2).

9.5. Draw the cartridge toward you and seat it into place. When correctly installed, the cartridge lies flat with the two pins on each edge resting in corresponding notches in the walls.

If the cartridge does not properly seat on the right side, turn the ribbon advance knob (Figure 5-3) until the small black ribbon drive blade slides into the cross-shaped hole in the bottom of the cartridge (Figure 5-4).

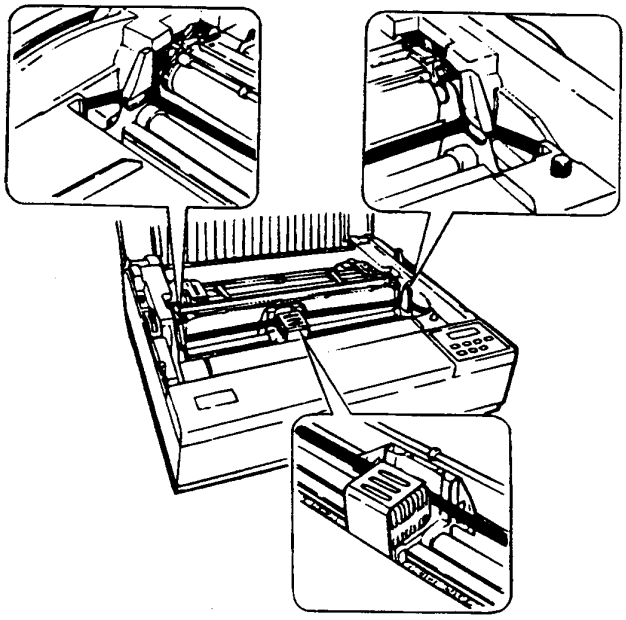


Figure 5-2. Model 577 ROP Ribbon Threading

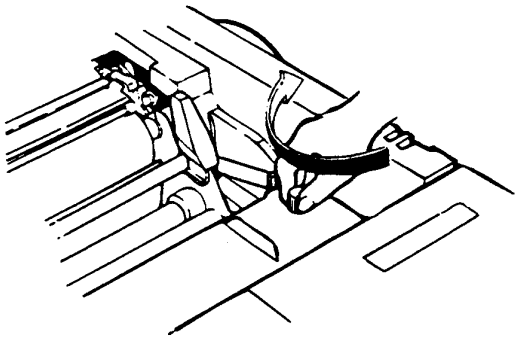


Figure 5-3. Removing Ribbon Slack

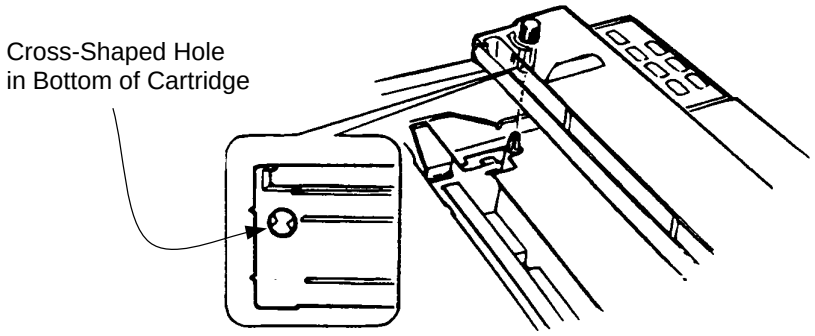


Figure 5-4. Aligning Ribbon Drive Blade

9.6. Turn the ribbon advance knob clockwise, as shown by the curved arrow on the cartridge (Figure 5-3), until all slack in the ribbon is removed and the ribbon aligns itself in the striking area between the print head and the shiny vertical plate next to the platen. The ribbon should also align itself in the notches in the left and right main ribbon cartridge guides. If not, adjust accordingly.

9.7. The ribbon guides at the immediate left and right sides of the print head have vertical rectangular notches the width of the ribbon. Verify that the ribbon now lies correctly in these guide notches. See the lower close-up view in Figure 5-2.

If needed, remove any slack in the ribbon with the ribbon advance knob.

10. Turn on the ROP power by pressing the **POWER** switch to **ON**.

11. Install the paper into the ROP.

INSTALL PAPER IN MODEL 577 ROP PROCEDURE:

11.1. Ensure that the ROP is in the off-line state. See Figure 5-5. If `OFFLINE` does not appear in the display window, press the **ON LINE** button.

Response: The `OFFLINE` message appears in the display window.

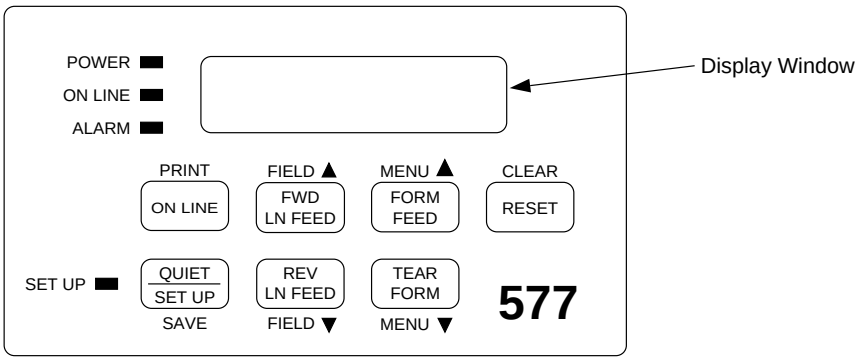


Figure 5-5. Model 577 ROP Control Panel

11.2. Place a stack of paper beneath the ROP, and guide the edge of the top sheet through the slot in the ROP stand.

11.3. Feed the paper up through the slot in the bottom of the ROP. See Figure 5-6.

11.4. Ensure that the paper select lever is in the rear (tractor drive) position (marked with an image of fanfold paper on the top cover). See Figure 5-7.

11.5. With the top cover open, raise the paper bail and guide the paper over the platen toward the rear of the ROP. See Figure 5-7.

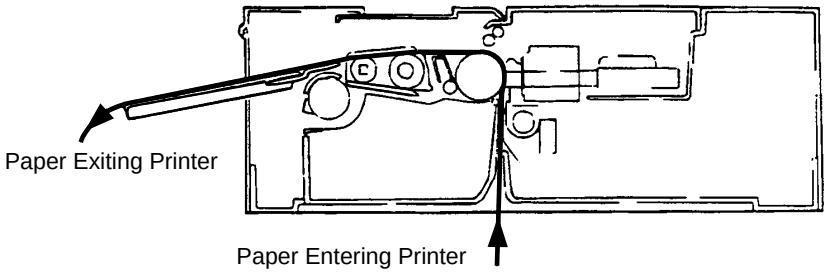


Figure 5-6. Paper Path for Bottom Feed, Rear Exit

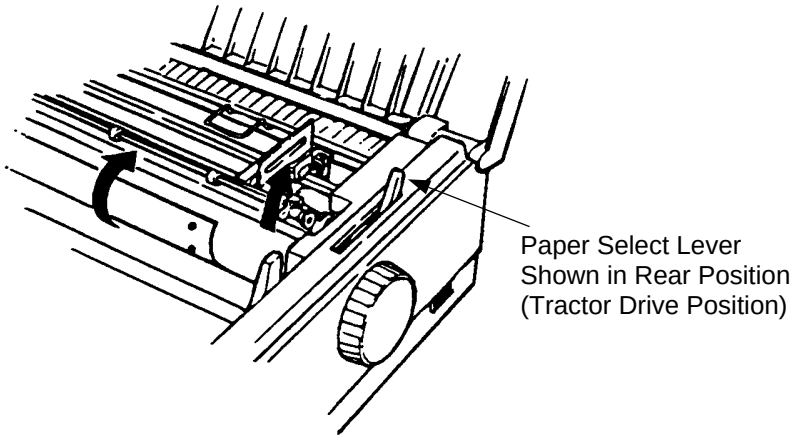


Figure 5-7. Routing of Bottom Feed Paper

11.6. Lower the paper bail over the paper.

11.7. If the tractor spacing does not match the paper width, adjust the tractors as follows. See Figures 5-8 and 5-9.

a. Move the tractor lever to the **Loose** position on the tractor that is to be moved.

b. Slide the tractor to the appropriate position.

c. Clamp the tractor in place by setting the tractor lever to the **Lock** position.

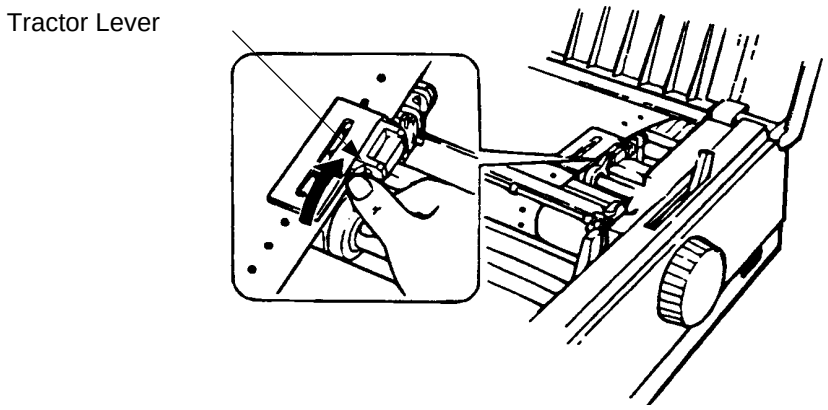


Figure 5-8. Tractor Lever in Lock Position

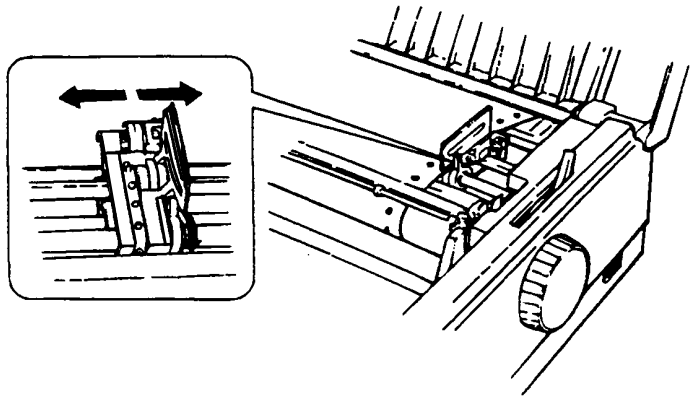


Figure 5-9. Tractor Lever in Loose Position

11.8. Open the covers of the main tractors, and install the paper so that the perforations along the edges of the paper fit over the tractor pins. See Figure 5-9. If necessary, turn the tension adjustment wheel to align the tractor pins with the perforations in the paper. See Figure 5-10.

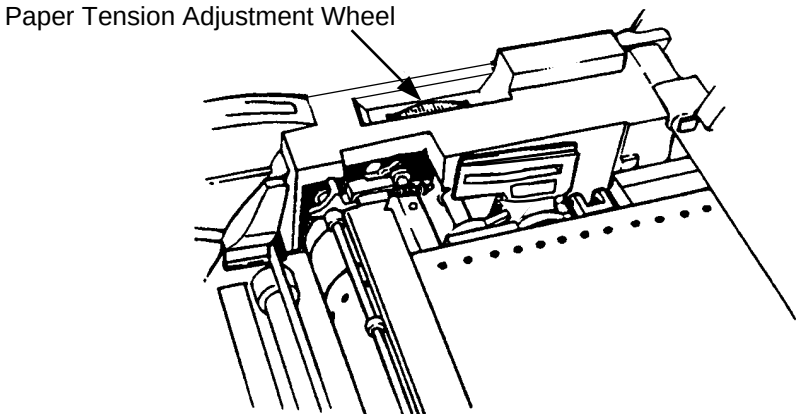


Figure 5-10. Paper Tension Adjustment Wheel

11.9. Close the main tractor covers, and advance the paper to the printing position. See Figure 5-11.

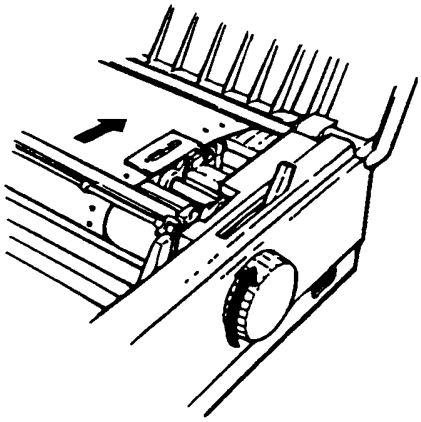


Figure 5-11. Paper Installed and Main Tractor Covers Closed

11.10. Set the ‘‘Top of Form’’ function by pressing and holding the **RESET** button while pressing the **TEAR FORM** button on the control panel.

NOTE:
The ‘‘Top of Form’’ function works only if the ROP attribute field **74** is enabled.

12. **STOP! YOU HAVE COMPLETED THIS PROCEDURE.**

Clean Model 602 ROP Assembly

6

Contents

Clean Model 602 ROP Assembly

6

Procedure

Use the following procedure to clean Model 602 receive-only printer (ROP):

1. Obtain the needed cleaning supplies, including:
   - Vacuum cleaner with soft brush attachment
   - Lint-free cloth
   - Mild, nonabrasive detergent solution.
2. Deselect the ROP by pressing the **SEL/MENU** button.

   Response: The **SEL** lamp extinguishes.
3. Open the top cover of the ROP.
4. Remove the paper from the ROP.
5. Turn off the power by setting the **POWER** switch to **OFF**.
6. Clean the top cover and outside surfaces of the ROP using a mild, nonabrasive cleaner.

   CAUTION:
   The print head gets very hot during operation. If the unit has been printing recently, allow the print head to cool for 15 minutes so that it reaches a safe temperature. Otherwise, EXTREME CAUTION is advised to avoid contact that could inflict burns.

7. Remove the ROP ribbon.

REMOVE MODEL 602 ROP RIBBON PROCEDURE:

7.1. Verify that the **POWER** switch is set to **OFF**.

7.2.

CAUTION:
The print head may be hot. If necessary, wait a few minutes for the print head to cool before continuing to the next step.

Slide the print head to the center of the carriage as shown in Figure 6-1.

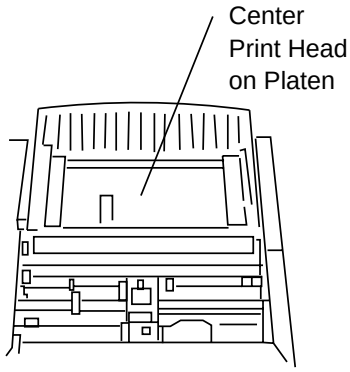


Figure 6-1. Print Head Position

7.3. Grasp the ribbon cartridge and pull up to unseat the cartridge as shown in Figure 6-2.

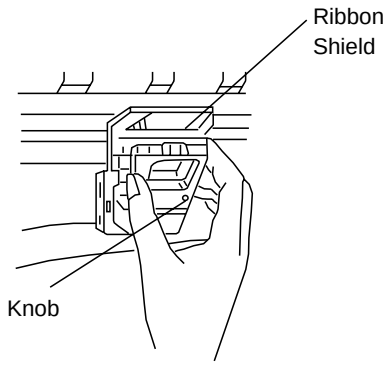


Figure 6-2. Model 602 ROP Ribbon Cartridge

8. Using a vacuum cleaner with a soft brush attachment, thoroughly clean the ROP carriage to remove any debris.
9. Install the ROP ribbon.

INSTALL MODEL 602 ROP RIBBON PROCEDURE:

9.1. Set the ROP **POWER** switch (located at the left side of the ROP) to **OFF**.

9.2. Open the ROP access cover by grasping the tabs at either end and tilting back. See Figure 6-3.

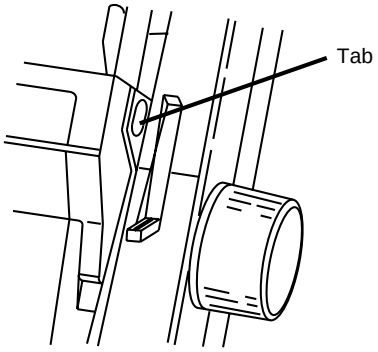


Figure 6-3. ROP Access Cover Tabs Location

CAUTION:
The print head may be hot. If necessary, wait a few minutes for the print head to cool before continuing to the next step.

9.3. Slide the print head to the center of the carriage as shown in Figure 6-4.

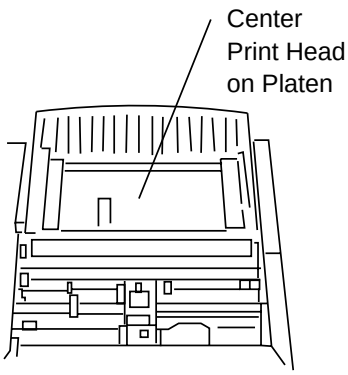


Figure 6-4. Print Head Position

9.4. Unbox the new ribbon cartridge, and remove and discard the plastic wrapping.

NOTE:
Be sure to leave the clear plastic ribbon shield on the ribbon cartridge.

9.5. Holding the cartridge in position as shown in Figure 6-5, with the knob facing up and the ribbon shield facing the platen, fit the grooves on either side at the back end of the ribbon cartridge over the pins on the ribbon plate.

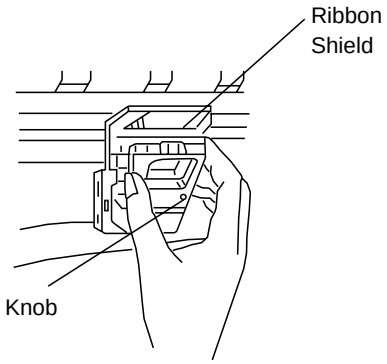


Figure 6-5. Placement of the Ribbon Cartridge

9.6. Lower the front of the ribbon cartridge over the print head until it snaps into place as shown in Figure 6-6.

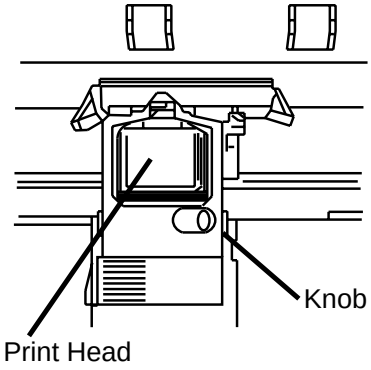


Figure 6-6. Inserting the Ribbon Cartridge

9.7. Turn the ribbon advance knob clockwise, as shown by the curved arrow on the cartridge, until all slack in the ribbon is removed.

10. Turn on the ROP power by pressing the **POWER** switch to **ON**.
11. Install the paper into the ROP.

INSTALL PAPER IN MODEL 602 ROP PROCEDURE:

11.1. Ensure that the ROP is deselected (**SEL** light is off). See Figure 6-7. If the ROP is not deselected, press the **SEL** button.

Response: The **SEL** light goes off.

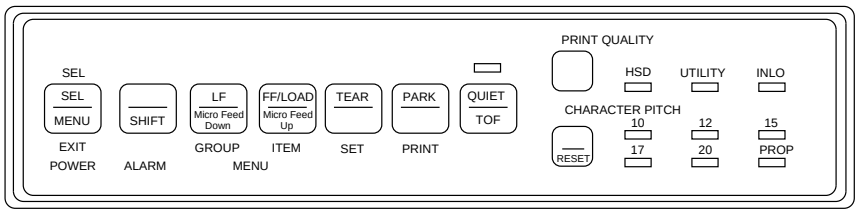


Figure 6-7. Model 602 ROP Control Panel

11.2. Move the paper select lever to the rear position. See Figure 6-8.

11.3. Grasp the front edge of the paper separator and pull up to access the tractors. See Figure 6-9.

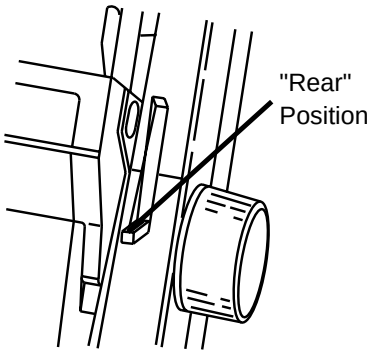


Figure 6-8. Model 602 Paper Select Lever

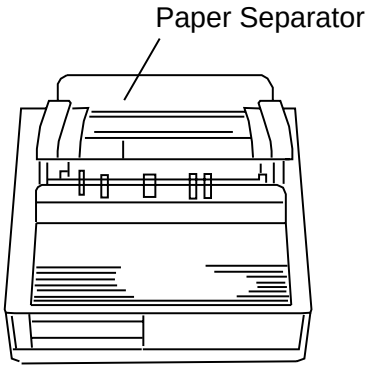


Figure 6-9. Model 602 Paper Separator

11.4. Locate the tractors. See Figure 6-10.

11.5. Pull up on both of the lock levers to release the tractors, and swing open the tractor covers. See Figure 6-11. Position the right-hand tractor for the width of the paper you are loading.

NOTE:
The movement of the left tractor is limited to ensure that the paper will always contact the paper sensor when loaded.

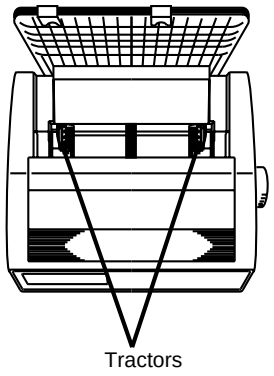


Figure 6-10. Model 602 Paper Tractors

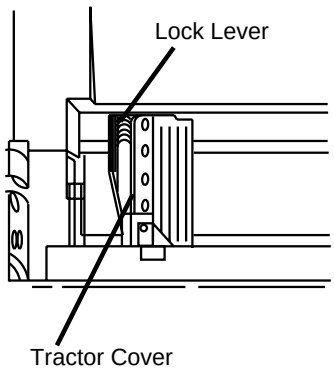


Figure 6-11. Model 602 Paper Lock Levers

11.6. Place a stack of paper beneath the ROP, and pull the paper through the opening between the ROP and the rear cover. See Figure 6-12. Place the first two holes in the paper on each side over the tractor pins.

NOTE:
An equal number of paper holes must be engaged on either tractor to ensure that the paper feeds properly.

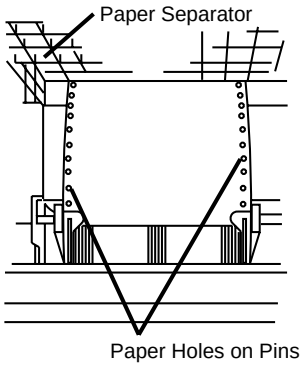


Figure 6-12. Model 602 Paper Alignment

11.7. Close the tractor covers, and adjust the left tractor to properly position the edge of the paper. See Figure 6-13.

NOTE:
The reference marks on the ROP indicate the left edge position for the two most common paper sizes.

11.8. Lock the left tractor in place by pushing back on the lock lever.

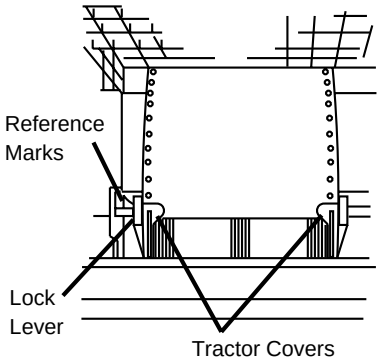


Figure 6-13. Model 602 Paper Edge Reference Marks

11.9. Adjust the right tractor to allow the paper holes to be centered on the pins.

CAUTION:
If the paper is stretched too tight or left too loose, it may jam in the ROP.

11.10. Lock the right tractor in place by pushing back on the lock lever.

11.11. Close the rear cover, and swing the wire feed guide over to rest on the pull-up roller assembly. See Figure 6-14. The wire feed guide keeps the paper from curling back into the ROP.

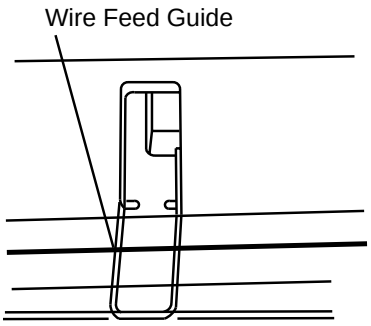


Figure 6-14. Model 602 Wire Feed Guide

11.12. Push the **FF/LOAD** button.

Response: The paper automatically feeds onto the ROP, and the **ALARM** light goes off. The print head moves back and forth gently firing the pins to sense the paper thickness and setting the print head gap.

11.13. The baseline for the Top of Form (TOF) on the paper is indicated by the red line on the clear plastic paper shield. See Figure 6-15 for the location of the red line.

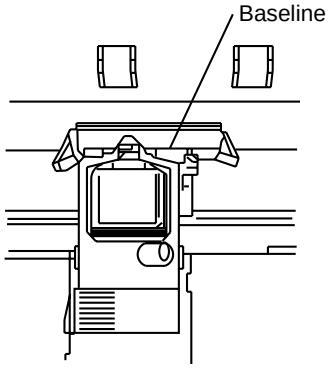


Figure 6-15. Model 602 TOF Indicator

NOTE:
The ROP must be deselected (**SEL** light is off) in order to set the TOF.

11.14. Use the control panel to adjust the TOF setting, if necessary. See Figure 6-16. To set the TOF further down the page, press and hold the **SHIFT** button while pressing the **FF/LOAD** button to advance the paper up in micro increments. To set the TOF further down the page, press and hold the **SHIFT** button while pressing the **LF** button to advance the paper down in micro increments.

11.15. Press the **SEL** button (**SEL** light comes on). The ROP is now selected and ready to receive data.

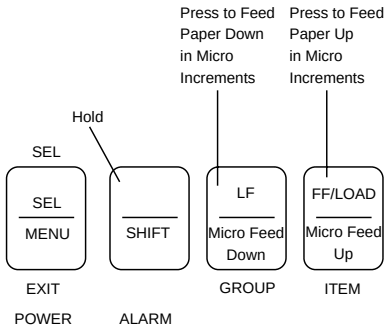


Figure 6-16. Model 602 Control Panel TOF Buttons

12. **STOP! YOU HAVE COMPLETED THIS PROCEDURE.**

Fuse Data

7

Contents

Fuse Data

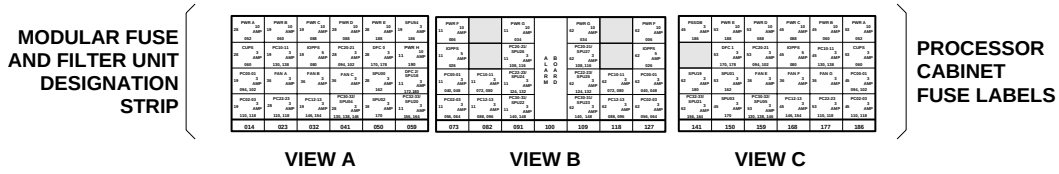
7

Introduction

This chapter contains fuse data for the fuses located in the processor cabinet. Figure 7-1 illustrates the label information (View A, View B, and View C) on the J5D003FJ-1 modular fuse and filter unit located at equipment location (EQL) 69.

Fuse Data Illustrations

The fuse data information includes the EQL of each column of four fuses, the name and location of the unit protected by the fuse, and the current rating of the fuse.

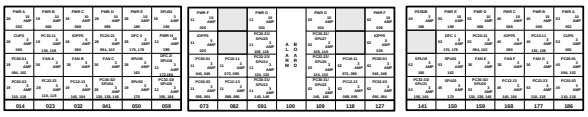


PWR A 28 10 AMP 052	PWR B 19 10 AMP 060	PWR C 19 10 AMP 088	PWR D 28 10 AMP 088	PWR E 28 10 AMP 188	SPU54 19 3 AMP 186	D
CUPS 28 3 AMP 060	PC10-11 19 3 AMP 130, 138	IOPPS 19 5 AMP 080	PC20-21 28 3 AMP 094, 102	DFC 0 28 3 AMP 170, 178	PWR H 11 10 AMP 190	C
PC00-01 19 3 AMP 094, 102	FAN A 36 3 AMP	FAN B 36 3 AMP	FAN C 36 3 AMP	SPU00 28 3 AMP 162	DFC 2/ SPU18 11 3 AMP 172,180	B
PC02-03 19 3 AMP 110, 118	PC22-23 28 3 AMP 110, 118	PC12-13 19 3 AMP 146, 154	PC30-32/ SPU04 28 3 AMP 130, 138, 146	SPU02 19 3 AMP 170	PC32-33/ SPU20 11 3 AMP 156, 164	A
014	023	032	041	050	059	

VIEW A

Figure 7-1. Processor Cabinet Fuse Assignments (Sheet 1 of 3)

MODULAR FUSE AND FILTER UNIT DESIGNATION STRIP



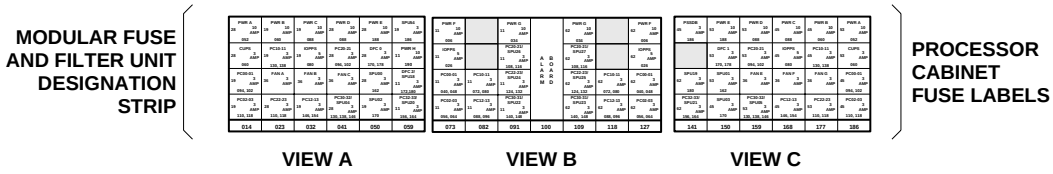
PROCESSOR CABINET FUSE LABELS

VIEW A VIEW B VIEW C

PWR F 11 10 AMP 006		PWR G 11 10 AMP 034		PWR G 62 10 AMP 034		PWR F 62 10 AMP 006	D
IOPPS 11 5 AMP 026		PC20-21/ SPU26 11 3 AMP 108, 116		PC20-21/ SPU27 62 3 AMP 108, 116		IOPPS 62 5 AMP 026	C
PC00-01 11 3 AMP 040, 048	PC10-11 11 3 AMP 072, 080	PC22-23/ SPU24 11 3 AMP 124, 132	ALARM BOARD	PC22-23/ SPU25 62 3 AMP 124, 132	PC10-11 62 3 AMP 072, 080	PC00-01 62 3 AMP 040, 048	B
PC02-03 11 3 AMP 056, 064	PC12-13 11 3 AMP 088, 096	PC30-31/ SPU22 11 3 AMP 140, 148		PC30-31/ SPU23 62 3 AMP 140, 148	PC12-13 62 3 AMP 088, 096	PC02-03 62 3 AMP 056, 064	A
073	082	091	100	109	118	127	

VIEW B

Figure 7-1. Processor Cabinet Fuse Assignments (Sheet 2 of 3)



PSSDB 45 3 AMP 186	PWR E 53 10 AMP 188	PWR D 53 10 AMP 088	PWR C 45 10 AMP 088	PWR B 45 10 AMP 060	PWR A 53 10 AMP 052	D
	DFC 1 53 3 AMP 170, 178	PC20-21 53 3 AMP 094, 102	IOPPS 45 5 AMP 080	PC10-11 45 3 AMP 130, 138	CUPS 53 3 AMP 060	C
SPU19 62 3 AMP 180	SPU01 53 3 AMP 162	FAN E 36 3 AMP	FAN F 36 3 AMP	FAN G 36 3 AMP	PC00-01 45 3 AMP 094, 102	B
PC32-33/ SPU21 62 3 AMP 156, 164	SPU03 45 3 AMP 170	PC30-32/ SPU05 53 3 AMP 130, 138, 146	PC12-13 45 3 AMP 146, 154	PC22-23 53 3 AMP 110, 118	PC02-03 45 3 AMP 110, 118	A
141	150	159	168	177	186	

VIEW C

Figure 7-1. Processor Cabinet Fuse Assignments (Sheet 3 of 3)

Install Model 577 ROP Paper

8

Contents

Install Model 577 ROP Paper

8

Procedure

Use the following procedure to install paper in Model 577 receive-only printer (ROP):

1. Ensure that the ROP is off-line. If `OFFLINE` does not appear in the display window, press the **ON LINE** button. See Figure 8-1.

   Response: The `OFFLINE` message appears in the display window.

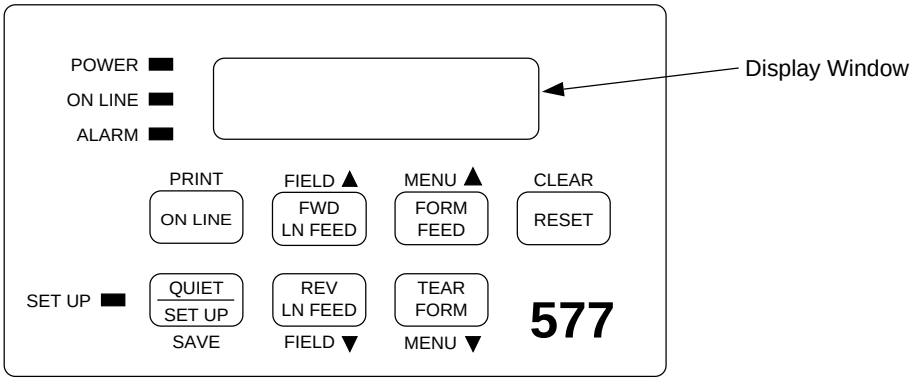


Figure 8-1. Model 577 ROP Control Panel

2. Place a stack of paper beneath the ROP.

3. Guide the edge of the top sheet through the slot in the ROP stand.
4. Feed the paper up through the slot in the bottom of the ROP. See Figure 8-2.
5. Ensure that the paper select lever is in the rear (tractor drive) position (marked with an image of fanfold paper on the top cover). See Figure 8-3.
6. With the top cover open, raise the paper bail and guide the paper over the platen toward the rear of the ROP. See Figure 8-3.

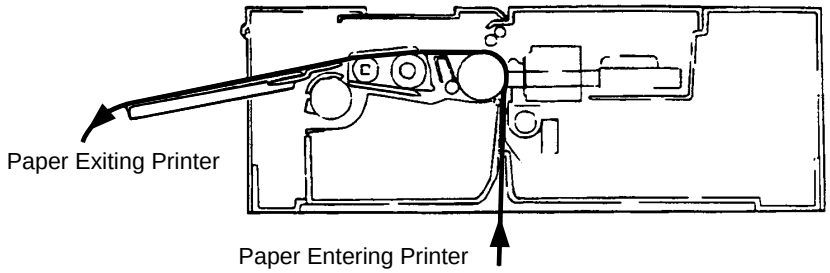


Figure 8-2. Paper Path for Bottom Feed, Rear Exit

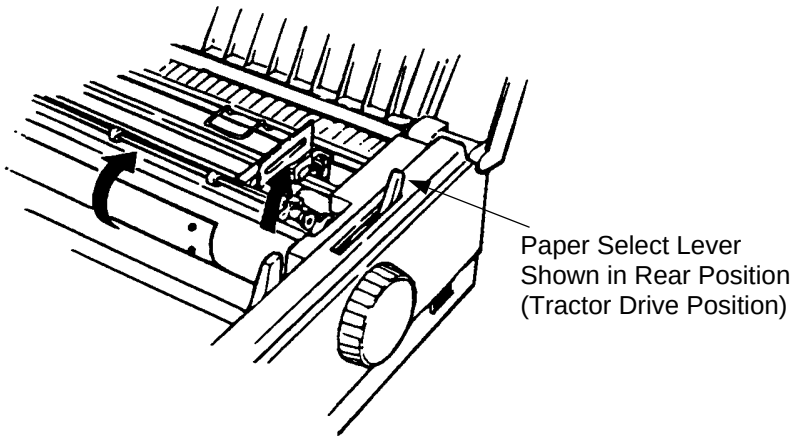


Figure 8-3. Routing of Bottom Feed Paper

7. Lower the paper bail over the paper.

8. If the tractor spacing does not match the paper width, adjust the tractors as follows. See Figures 8-4 and 8-5.
    a. Move the tractor lever to the **Loose** position on the tractor that is to be moved.
    b. Slide the tractor to the appropriate position.
    c. Clamp the tractor in place by moving the tractor lever to the **Lock** position.

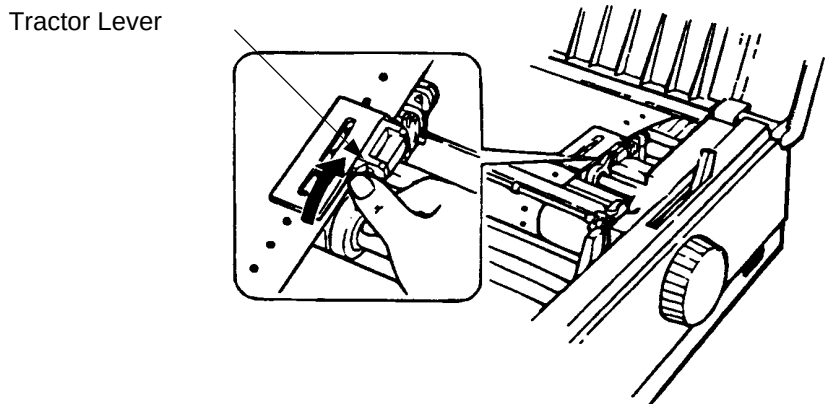


Figure 8-4. Tractor Lever in Lock Position

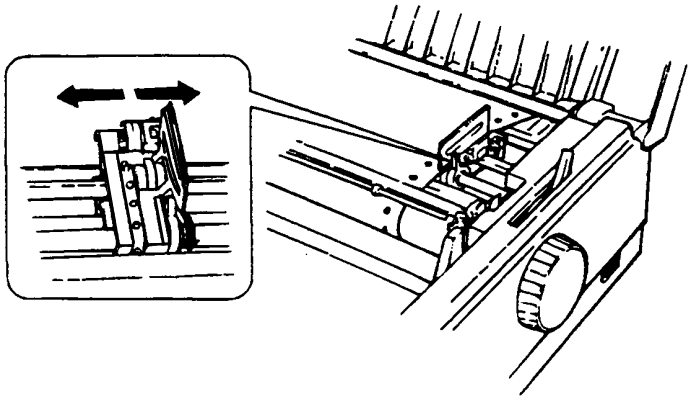


Figure 8-5. Tractor Lever in Loose Position

9. Open the covers of the main tractors, and install the paper so that the perforations along the edges of the paper fit over the tractor pins. See Figure 8-3. If necessary, turn the tension adjustment wheel to align the tractor pins with the perforations in the paper. See Figure 8-6.

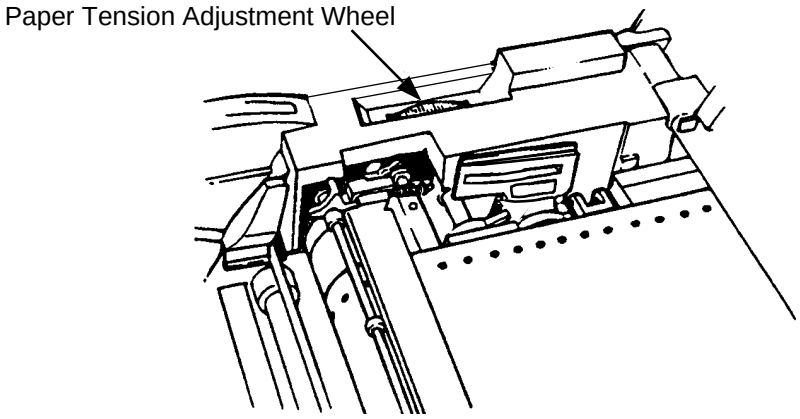


Figure 8-6. Paper Tension Adjustment Wheel

10. Close the main tractor covers, and advance the paper to the printing position. See Figure 8-7.

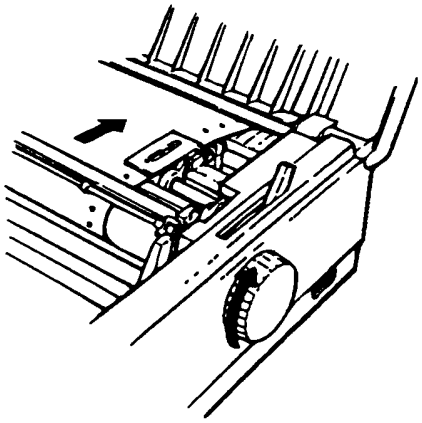


Figure 8-7. Paper Installed and Main Tractor Covers Closed

11. Set the ‘‘Top of Form’’ function by pressing and holding the **RESET** button while pressing the **TEAR FORM** button on the control panel.

    NOTE:
    The ‘‘Top of Form’’ function works only if the ROP attribute field **74** is enabled.

12. **STOP! YOU HAVE COMPLETED THIS PROCEDURE!**

Install Model 602 ROP Paper

9

Contents

Install Model 602 ROP Paper

9

Procedure

Use the following procedure to install paper in Model 602 receive-only printer (ROP):

1. Ensure that the ROP is deselected (**SEL** light is off). See Figure 9-1. If the ROP is not deselected, press the **SEL** button.

   Response: The **SEL** light goes off.

2. Move the paper select lever to the rear position. See Figure 9-2.
3. Grasp the front edge of the paper separator and pull up to access the tractors. See Figure 9-3.

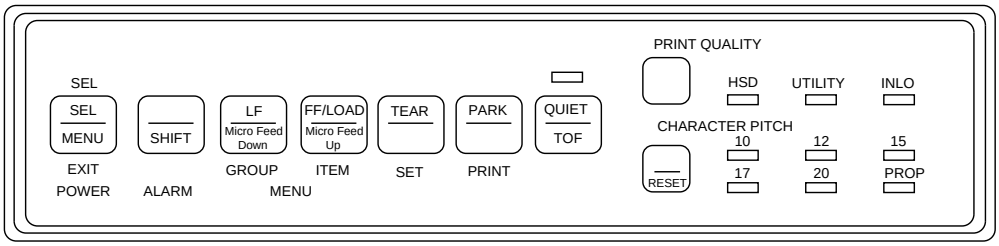


Figure 9-1. Model 602 ROP Control Panel

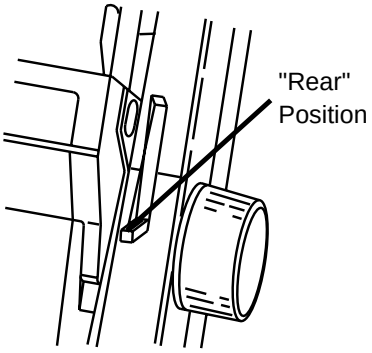


Figure 9-2. Model 602 Paper Select Lever

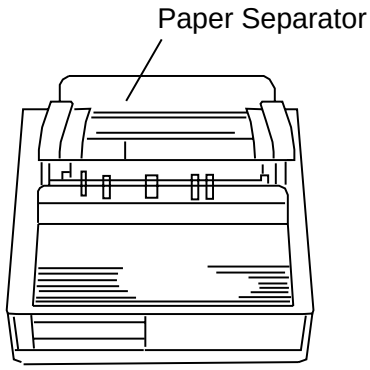


Figure 9-3. Model 602 Paper Separator

4. Locate the tractors as shown in Figure 9-4.
5. Pull up on both of the lock levers to release the tractors, and swing open the tractor covers. See Figure 9-5. Position the right-hand tractor for the width of the paper you are loading.

NOTE:
The movement of the left tractor is limited to ensure that the paper will always contact the paper sensor when loaded.

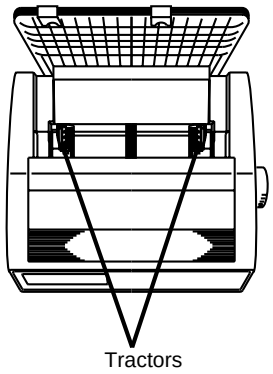


Figure 9-4. Model 602 Paper Tractors

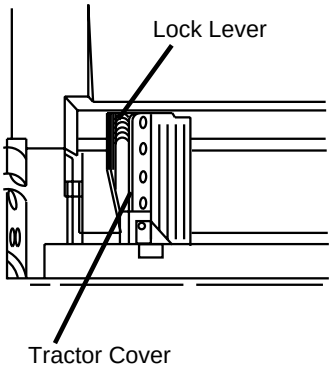


Figure 9-5. Model 602 Paper Lock Levers

6. Place a stack of paper beneath the ROP, and pull the paper through the opening between the ROP and the rear cover. Place the first two holes in the paper on each side over the tractor pins. See Figure 9-6.

NOTE:
An equal number of paper holes must be engaged on either tractor to ensure that the paper feeds properly.

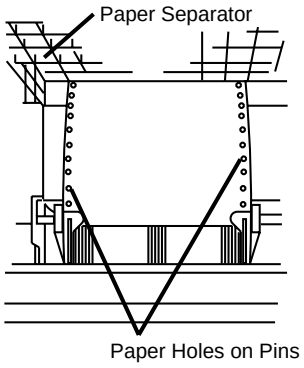


Figure 9-6. Model 602 Paper Alignment

7. Close the tractor covers, and adjust the left tractor to properly position the edge of the paper as shown in Figure 9-7.

   NOTE:
   The reference marks on the ROP indicate the left edge position for the two most common paper sizes.

8. Lock the left tractor in place by pushing back on the lock lever.

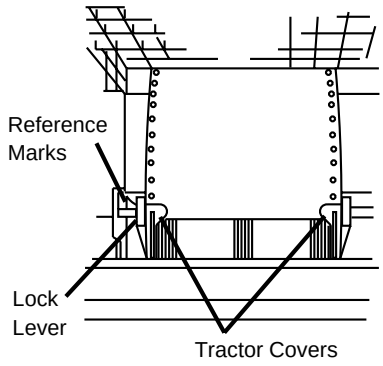


Figure 9-7. Model 602 Paper Edge Reference Marks

9. Adjust the right tractor to allow the paper holes to be centered on the pins.

   CAUTION:
   If the paper is stretched too tight or left too loose, it may jam in the ROP.

10. Lock the right tractor in place by pushing back on the lock lever.

11. Close the rear cover, and swing the wire feed guide over to rest on the pull-up roller assembly. See Figure 9-8. The wire feed guide keeps the paper from curling back into the ROP.

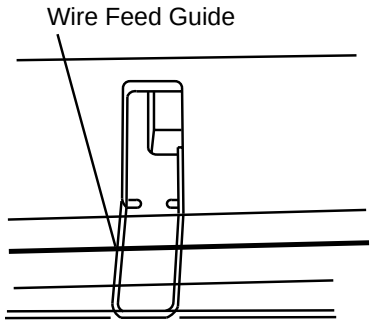


Figure 9-8. Model 602 Wire Feed Guide

12. Push the **FF/LOAD** button.

    Response: The paper automatically feeds onto the ROP, and the **ALARM** light goes off. The print head moves back and forth gently firing the pins to sense the paper thickness and setting the print head gap.

13. The baseline for the Top of Form (TOF) on the paper is indicated by the red line on the clear plastic paper shield. See Figure 9-9 for the location of the red line.

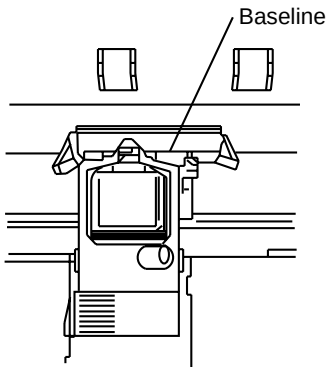


Figure 9-9. Model 602 TOF Indicator

NOTE:
The ROP must be deselected (**SEL** light is off) in order to set the TOF.

14. Use the control panel to adjust the TOF setting, if necessary. See Figure 9-10. To set the TOF further down the page, press and hold the **SHIFT** button while pressing the **FF/LOAD** button to advance the paper up in micro increments. To set the TOF further down the page, press and hold the **SHIFT** button while pressing the **LF** button to advance the paper down in micro increments.
15. Press the **SEL** button (**SEL** light comes on). The ROP is now selected and ready to receive data.

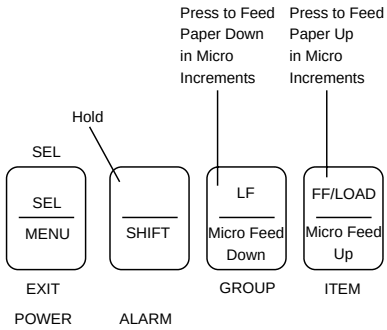


Figure 9-10. Model 602 Control Panel TOF Buttons

16. **STOP! YOU HAVE COMPLETED THIS PROCEDURE!**

Load 9-Track Tape into KS-23909,L10 Tape Drive

10

Contents

Load 9-Track Tape into KS-23909,L10 Tape Drive

10

Introduction

This procedure is used to load a 9-track tape reel into the Storage Tek (STK) (KS-23909,L10) tape drive unit. Since the tape unit is designed for automatic threading, it is not necessary to manually thread the tape except under fault conditions. However, the procedure for manual loading is included following the ‘‘Automatic Loading Procedure’’ section.

Automatic Tape Loading Procedure

Use the following procedure to automatically load the 9-track tape into the tape drive unit:

1. If the power is off, restore power to the tape drive and wait for the end of the power-on sequence.
2. Ensure that either a write-enable ring is installed on the tape reel to permit writing or removed to prevent overwriting of existing data, depending on the tape used.
3. Open the loading door.
4. Place the tape reel on the self-centering supply hub, and push the tape reel until it locks on the hub. If a write-enable ring is used, be sure to place the write-enable ring side toward the casting.

5. Close the loading door.
6. Press the **LD/ONL** button and the unit automatically starts the threading process and checks that the reel is not inverted. The tape is threaded to the take-up spool, tensioned, and advanced to the **LD POINT**. The display should indicate `LOCATING` followed by `LOADING`. When `ONLINE` and `LD POINT` are displayed, the load sequence is complete.
7. **STOP! YOU HAVE COMPLETED THIS PROCEDURE.**

Manual Tape Loading Procedure

Use the following procedure to manually load the 9-track tape and thread the tape through the tape path to the take-up reel:

1. If the tape unit power is on, remove power from the drive.
2. To ‘‘write-enable’’ the tape, install the enable ring on the tape reel to permit writing to the tape. To write-protect the tape, leave the enable ring off.
3. Open the tape unit loading door.
4. Place the tape reel on the self-centering supply hub (upper hub), and operate the supply hub latch to secure the tape. The side of the tape on which the enable ring is installed goes toward the casting.
5. Thread the tape through the tape path to the take-up reel.
6. Wind about two turns of the tape on the take-up reel so that the tape is pulled through when the take-up reel is rotated.
7. Close the loading door.
8. Turn on the power to the tape unit. The unit will automatically sense that the tape is loaded and threaded and will search for the beginning of tape (BOT).
9. **STOP! YOU HAVE COMPLETED THIS PROCEDURE.**

Load 9-Track Tape into KS-23909,L21 Tape Drive

11

Contents

Load 9-Track Tape into KS-23909,L21 Tape Drive

11

Procedure

Use the following procedure to load a 9-track tape reel into the *HP** Model 88781A (KS-23909,L21) tape drive unit:

1. Ensure that either a write-enable ring is installed on the tape reel to permit writing or removed to prevent overwriting of existing data, depending on the tape used.
2. Open the loading door.
3. Slide the tape reel, with the free end to the right, over the center of the supply hub until the rollers retain the reel.
4. Manually thread the tape following the tape path to the take-up reel.
5. Secure the end of the tape on the take-up reel, and rotate the take-up reel two turns.
6. Close the loading door.
7. The display should indicate `LOADING`. When `ONLINE` and `BOT` are displayed, the load sequence is complete.
8. **STOP! YOU HAVE COMPLETED THIS PROCEDURE.**

* Registered trademark of Hewlett-Packard Company.

Perform System Demand Diagnostics

12

Contents

Perform System Demand Diagnostics

12

Introduction

This chapter contains procedures for performing system demand diagnostics. The procedures are as follows:

1. Run demand diagnostics on the control unit (CU).
2. Run demand diagnostics on the input/output processor (IOP).
3. Run demand diagnostics on the disk file controller (DFC 2 version). (See Note.)
4. Run demand diagnostics on the disk file controller (DFC 3 version). (See Note.)
5. Run demand diagnostics on the magnetic tape (MT).

Requirement: In this chapter, all subprocedure steps ***must*** be performed; for example, the main procedure Step **1** and subprocedures Steps **1.1** through **1.4**, main procedure Step **2** and subprocedures Steps **2.1** through **2.4**, etc.

NOTE:
Two versions of the DFC (DFC 2 and DFC 3) are supported on the 3B21D computer, and diagnostics are different for each version. The DFC 2 version supports the TN2116/UN373 hardware. The DFC 3 version supports the UN580 hardware.

Procedures

1. Run demand diagnostics on the control unit (CU).

RUN DEMAND DIAGNOSTICS ON CU PROCEDURE:

Requirement: CU 1 must be active and CU 0 must be standby prior to beginning this procedure. If CU 1 is not active, make CU 1 active by entering one of the following appropriate input messages:

- If MML, enter **SW:CU;**

  Response: `SW CU 1 COMPLETED`

- If PDS, enter **SW:CU!**

  Response: `SW CU 1 COMPLETED`

1.1. At terminal, type in the first (or next) command from Table 12-1 [Man-Machine Language (MML)] or Table 12-2 [Program Documentation Standard (PDS)], one at a time, starting with Item No. 1 and ending with the last Item No. After entering each command for the CU, continue to Step **1.2**.

Table 12-1. CU Supplementary Diagnostic Phases (MML)

Item No.	Unit	Subunit	Phase	Diagnostic Type	Frequency	Command (Note 1)	Check Box
1	CU 0	CC 0	6	DEMAND	Weekly	DGN:CU=0,CC=0:PH=6;	
2	CU 0	CC 0	60	DEMAND	Weekly	DGN:CU=0,CC=0:PH=60;	
3	CU 0	CC 0	65	DEX, DEMAND	Weekly (Note 2)	DGN:CU=0,CC=0:PH=65;	
4	CU 0	CC 0	90	DEMAND	Monthly (approx. 40-min. test)	DGN:CU=0,CC=0:PH=90;	
5	CU 0	MASC 0	45	DEX, DEMAND	Weekly	DGN:CU=0,MASC=0:PH=45;	
6	CU 0	MASC 0	46	DEX, DEMAND	Weekly	DGN:CU=0,MASC=0:PH=46;	
7	CU 0	MASC 0	48	DEX, DEMAND	Weekly	DGN:CU=0,MASC=0:PH=48;	
8	CU 0	MASC 0	50	DEMAND	Weekly	DGN:CU=0,MASC=0:PH=50;	
9	CU 0	MASC 0	51	DEMAND	Weekly	DGN:CU=0,MASC=0:PH=51;	
10	CU 0	MASC 0	52	DEMAND	Weekly	DGN:CU=0,MASC=0:PH=52;	
11	CU 0	MASC 0	53	DEMAND	Weekly	DGN:CU=0,MASC=0:PH=53;	
12	CU 0	MASC 0	95	DEMAND	Monthly (Note 2)	DGN:CU=0,MASC=0:PH=95;	
13						RST:CU=0;	
14						SW:CU;	
15	CU 1	CC 0	6	DEMAND	Weekly	DGN:CU=1,CC=0:PH=6;	
16	CU 1	CC 0	60	DEMAND	Weekly	DGN:CU=1,CC=0:PH=60;	
17	CU 1	CC 0	65	DEX, DEMAND	Weekly (Note 2)	DGN:CU=1,CC=0:PH=65;	
18	CU 1	CC 0	90	DEMAND	Monthly (approx. 40-min. test)	DGN:CU=1,CC=0:PH=90;	
19	CU 1	MASC 0	45	DEX, DEMAND	Weekly	DGN:CU=1,MASC=0:PH=45;	
20	CU 1	MASC 0	46	DEX, DEMAND	Weekly	DGN:CU=1,MASC=0:PH=46;	
21	CU 1	MASC 0	48	DEX, DEMAND	Weekly	DGN:CU=1,MASC=0:PH=48;	
22	CU 1	MASC 0	50	DEMAND	Weekly	DGN:CU=1,MASC=0:PH=50;	
23	CU 1	MASC 0	51	DEMAND	Weekly	DGN:CU=1,MASC=0:PH=51;	
24	CU 1	MASC 0	52	DEMAND	Weekly	DGN:CU=1,MASC=0:PH=52;	
25	CU 1	MASC 0	53	DEMAND	Weekly	DGN:CU=1,MASC=0:PH=53;	
26	CU 1	MASC 0	95	DEMAND	Monthly (Note 2)	DGN:CU=1,MASC=0:PH=95;	
27						RST:CU=1;	

Notes:

1. Refer to the Diagnostics chapter in 254-303-106, *System Maintenance Manual*, for additional information on running demand diagnostics.
2. A manual observation is required while running the diagnostic command. Refer to the appropriate section about requesting supplementary phases in the Diagnostics chapter in 254-303-106.

Table 12-2. CU Supplementary Diagnostic Phases (PDS)

Item No.	Unit	Subunit	Phase	Diagnostic Type	Frequency	Command (Note 1)	Check Box
1	CU 0	CC 0	6	DEMAND	Weekly	DGN:CU 0,CC 0:PH 6!	
2	CU 0	CC 0	60	DEMAND	Weekly	DGN:CU 0,CC 0:PH 60!	
3	CU 0	CC 0	65	DEX, DEMAND	Weekly (Note 2)	DGN:CU 0,CC 0:PH 65!	
4	CU 0	CC 0	90	DEMAND	Monthly (approx. 40-min. test)	DGN:CU 0,CC 0:PH 90!	
5	CU 0	MASC 0	45	DEX, DEMAND	Weekly	DGN:CU 0,MASC 0:PH 45!	
6	CU 0	MASC 0	46	DEX, DEMAND	Weekly	DGN:CU 0,MASC 0:PH 46!	
7	CU 0	MASC 0	48	DEX, DEMAND	Weekly	DGN:CU 0,MASC 0:PH 48!	
8	CU 0	MASC 0	50	DEMAND	Weekly	DGN:CU 0,MASC 0:PH 50!	
9	CU 0	MASC 0	51	DEMAND	Weekly	DGN:CU 0,MASC 0:PH 51!	
10	CU 0	MASC 0	52	DEMAND	Weekly	DGN:CU 0,MASC 0:PH 52!	
11	CU 0	MASC 0	53	DEMAND	Weekly	DGN:CU 0,MASC 0:PH 53!	
12	CU 0	MASC 0	95	DEMAND	Monthly (Note 2)	DGN:CU 0,MASC 0:PH 95!	
13						RST:CU 0!	
14						SW:CU!	
15	CU 1	CC 0	6	DEMAND	Weekly	DGN:CU 1,CC 0:PH 6!	
16	CU 1	CC 0	60	DEMAND	Weekly	DGN:CU 1,CC 0:PH 60!	
17	CU 1	CC 0	65	DEX, DEMAND	Weekly (Note 2)	DGN:CU 1,CC 0:PH 65!	
18	CU 1	CC 0	90	DEMAND	Monthly (approx. 40-min. test)	DGN:CU 1,CC 0:PH 90!	
19	CU 1	MASC 0	45	DEX, DEMAND	Weekly	DGN:CU 1,MASC 0:PH 45!	
20	CU 1	MASC 0	46	DEX, DEMAND	Weekly	DGN:CU 1,MASC 0:PH 46!	
21	CU 1	MASC 0	48	DEX, DEMAND	Weekly	DGN:CU 1,MASC 0:PH 48!	
22	CU 1	MASC 0	50	DEMAND	Weekly	DGN:CU 1,MASC 0:PH 50!	
23	CU 1	MASC 0	51	DEMAND	Weekly	DGN:CU 1,MASC 0:PH 51!	
24	CU 1	MASC 0	52	DEMAND	Weekly	DGN:CU 1,MASC 0:PH 52!	
25	CU 1	MASC 0	53	DEMAND	Weekly	DGN:CU 1,MASC 0:PH 53!	
26	CU 1	MASC 0	95	DEMAND	Monthly (Note 2)	DGN:CU 1,MASC 0:PH 95!	
27						RST:CU 1!	

Notes:

1. Refer to the Diagnostics chapter in 254-303-106, *System Maintenance Manual*, for additional information on running demand diagnostics.
2. A manual observation is required while running the diagnostic command. Refer to the appropriate section about requesting supplementary phases in the Diagnostics chapter in 254-303-106.

1.2. Is all tests passed (ATP) `MESSAGE COMPLETE` output message received?

- If **yes**, continue to Step **1.3**.
- If **no**, refer to 254-303-102, *3B21D Computer Trouble Clearing Tasks*, to clear trouble.

1.3. Have all scheduled demand diagnostics (all Item Nos. in Table 12-1 or Table 12-2) been completed for both CUs?

- If **yes**, continue to Step **1.4**.
- If **no**, return to Step **1.1**.

1.4. **STOP! YOU HAVE COMPLETED CU DEMAND DIAGNOSTICS.**

2. Run demand diagnostics on the input/output processor (IOP).

RUN DEMAND DIAGNOSTICS ON IOP PROCEDURE:

Requirement 1: The maintenance teletypewriter (MTTY) and receive-only printer (ROP) must be connected to IOP 1, and both switches must be set to the **AUTO** position on the port switch at equipment location (EQL) 19-186 prior to beginning this procedure.

Requirement 2: All IOPs must be active prior to beginning this procedure.

Requirement 3: CU 1 must be active and CU 0 must be standby prior to beginning this procedure. If CU 1 is not active, make CU 1 active by entering one of the following appropriate input messages:

- If MML, enter **SW:CU;**

  Response: `SW CU 1 COMPLETED`

- If PDS, enter **SW:CU!**

  Response: `SW CU 1 COMPLETED`

2.1. At terminal, type in the first (or next) command from Table 12-3 (MML) or Table 12-4 (PDS), one at a time, starting with Item No. 1 and ending with the last Item No. After entering each command for the IOP unit, continue to Step **2.2**.

Table 12-3. IOP Supplementary Diagnostic Phases (MML)

Item No.	Unit (Notes 1 and 2)	Phase (Note 3)	Diagnostic Type	Frequency	Command (Notes 3 and 5)	See Note(s)	Check Box
1					RMV:CU=0;	4	
2	IOP 0	16	DEMAND	Weekly	DGN:IOP=0:PH=16,CU=0;	6	
3					RST:CU=0;	4	
4					SW:CU;	4	
5					RMV:CU=1;	4	
6	IOP 0	16	DEMAND	Weekly	DGN:IOP=0:PH=16,CU=1;		
7					RST:IOP=0;	4	
8					SW:PORTSW;	4,7	
9	IOP 1	16	DEMAND	Weekly	DGN:IOP=1:PH=16,CU=1;		
10					RST:CU=1;	4	
11					SW:CU;	4	
12					RMV:CU=0;	4	
13	IOP 1	16	DEMAND	Weekly	DGN:IOP=1:PH=16,CU=0;		
14					RST:IOP=1;	4	
15	If IOP 2 and 3 are not equipped, execute Item No. 16 and stop. If IOP 2 is equipped, go to Item No. 17 and execute Item Nos. 17 through 23.						
16					RST:CU=0;	4	
17	IOP 2	16	DEMAND	Weekly	DGN:IOP=2:PH=16,CU=0;		
18					RST:CU=0;	4	
19					SW:CU;	4	
20					RMV:CU=1;	4	
21	IOP 2	16	DEMAND	Weekly	DGN:IOP=2:PH=16,CU=1;		
22					RST:IOP=2;	4	
23	If IOP 3 is not equipped, execute Item No. 24 and stop. If IOP 3 is equipped, go to Item No. 25 and execute Item Nos. 25 through 31.						
24					RST:CU=1;	4	
25	IOP 3	16	DEMAND	Weekly	DGN:IOP=3:PH=16,CU=1;		
26					RST:CU=1;	4	
27					SW:CU;	4	
28					RMV:CU=0;	4	
29	IOP 3	16	DEMAND	Weekly	DGN:IOP=3:PH=16,CU=0;		
30					RST:IOP=3;	4	
31					RST:CU=0;	4	

Notes:

1. IOP basic units 0 and 1 will always be equipped.
2. IOP 2 and 3 Growth Units may not be equipped in your system. If not equipped, you may skip Item Nos. 17 through 24 and/or 25 through 31.
3. IOP diagnostic Phase 1 is no longer supported because it does not add any significant fault detection capability to the current set of IOP diagnostics. Therefore, IOP diagnostic Phase 1 should not be attempted.
4. After entering commands for Item Nos. 1, 3, 4, 5, 7, 8, 10, 11, 12, 14, 16, 18, 19, 20, 22, 24, 26, 27, 28, 30, and 31, observe the `MESSAGE COMPLETED` output message.
5. Refer to the Diagnostics chapter in 254-303-106, *System Maintenance Manual*, for additional information on running demand diagnostics.
6. For Item No. 2, the diagnostic command will not run if the MTTY is configured through the IOP being diagnosed.
7. For Item No. 8, make sure the ROP is on-line and **SW:PORTSW;** is complete before running the **DGN:IOP=1:PH=16,CU=1;** command.

Table 12-4. IOP Supplementary Diagnostic Phases (PDS)

Item No.	Unit (Notes 1 and 2)	Phase (Note 3)	Diagnostic Type	Frequency	Command (Notes 3 and 5)	See Note(s)	Check Box
1					RMV:CU 0!	4	
2	IOP 0	16	DEMAND	Weekly	DGN:IOP 0:PH 16,CU 0!	6	
3					RST:CU 0!	4	
4					SW:CU!	4	
5					RMV:CU 1!	4	
6	IOP 0	16	DEMAND	Weekly	DGN:IOP 0:PH 16,CU 1!		
7					RST:IOP 0!	4	
8					SW:PORTSW!	4,7	
9	IOP 1	16	DEMAND	Weekly	DGN:IOP 1:PH 16,CU 1!		
10					RST:CU 1!	4	
11					SW:CU!	4	
12					RMV:CU 0!	4	
13	IOP 1	16	DEMAND	Weekly	DGN:IOP 1:PH 16,CU 0!		
14					RST:IOP 1!	4	
15	If IOP 2 and 3 are not equipped, execute Item No. 16 and stop. If IOP 2 is equipped, go to Item No. 17 and execute Item Nos. 17 through 23.						
16					RST:CU 0!	4	
17	IOP 2	16	DEMAND	Weekly	DGN:IOP 2:PH 16,CU 0!		
18					RST:CU 0!	4	
19					SW:CU!	4	
20					RMV:CU 1!	4	
21	IOP 2	16	DEMAND	Weekly	DGN:IOP 2:PH 16,CU 1!		
22					RST:IOP 2!	4	
23	If IOP 3 is not equipped, execute Item No. 24 and stop. If IOP 3 is equipped, go to Item No. 25 and execute Item Nos. 25 through 31.						
24					RST:CU 1!	4	
25	IOP 3	16	DEMAND	Weekly	DGN:IOP 3:PH 16,CU 1!		
26					RST:CU 1!	4	
27					SW:CU!	4	
28					RMV:CU 0!	4	
29	IOP 3	16	DEMAND	Weekly	DGN:IOP 3:PH 16,CU 0!		
30					RST:IOP 3!	4	
31					RST:CU 0!	4	

Notes:

1. IOP basic units 0 and 1 will always be equipped.
2. IOP 2 and 3 Growth Units may not be equipped in your system. If not equipped, you may skip Item Nos. 17 through 24 and/or 25 through 31.
3. IOP diagnostic Phase 1 is no longer supported because it does not add any significant fault detection capability to the current set of IOP diagnostics. Therefore, IOP diagnostic Phase 1 should not be attempted.
4. After entering commands for Item Nos. 1, 3, 4, 5, 7, 8, 10, 11, 12, 14, 16, 18, 19, 20, 22, 24, 26, 27, 28, 30, and 31, observe the `MESSAGE COMPLETED` output message.
5. Refer to the Diagnostics chapter in 254-303-106, *System Maintenance Manual*, for additional information on running demand diagnostics.
6. For Item No. 2, the diagnostic command will not run if the MTTY is configured through the IOP being diagnosed.
7. For Item No. 8, make sure the ROP is on-line and **SW:PORTSW!** is complete before running the **DGN:IOP 1:PH 16,CU 1!** command.

2.2. Is ATP `MESSAGE COMPLETE` output message received?

- If **yes**, continue to Step **2.3**.
- If **no**, refer to 254-303-102, *3B21D Computer Trouble Clearing Tasks*, to clear trouble.

2.3. Have all scheduled demand diagnostics (all Item Nos. in Table 12-3 or Table 12-4) been completed for all IOPs using both CU helper units?

- If **yes**, continue to Step **2.4**.
- If **no**, return to Step **2.1**.

2.4. **STOP! YOU HAVE COMPLETED IOP DEMAND DIAGNOSTICS.**

3. Run demand diagnostics on the disk file controller (DFC 2 version).

RUN DEMAND DIAGNOSTICS ON DFC (USING DFC 2 VERSION) PROCEDURE:

Two versions of the DFC (DFC 2 and DFC 3) are supported on the 3B21D computer, and diagnostics are different for each version. The DFC 2 version supports the TN2116/UN373 hardware. The DFC 3 version supports the UN580 hardware. This procedure will run demand diagnostics on the DFC 2 version.

Requirement 1: All DFCs must be active with all moving head disks (MHDs) in service prior to beginning this procedure.

Requirement 2: CU 1 must be active and CU 0 must be standby prior to beginning this procedure. If CU 1 is not active, make CU 1 active by entering one of the following appropriate input messages:

- If MML, enter **SW:CU;**

  Response: `SW CU 1 COMPLETED`

- If PDS, enter **SW:CU!**

  Response: `SW CU 1 COMPLETED`

3.1. At terminal, type in the first (or next) command from Table 12-5 (MML) or Table 12-6 (PDS), one at a time, starting with Item No. 1 and ending with the last Item No. After entering each command for the DFC unit, continue to Step **3.2**.

Table 12-5. DFC Supplementary Diagnostic Phases for DFC 2 Version (MML)

Item No.	Unit (Note 1)	Phase	Diagnostic Type	Frequency	Command (Note 3)	See Note(s)	Check Box
1					VFY:MHD=a;	4,5,6	
2					VFY:MHD=a1;	4,5,6	
3	Execute Item No. 3 only if MHD is equipped.				VFY:MHD=a2;	4,5,6	
4	Execute Item No. 4 only if MHD is equipped.				VFY:MHD=a3;	4,5,6	
5					RMV:CU=0;	5	
6	DFC 0	14	DEX, DEMAND	Weekly	DGN:DFC=0:PH=14;		
7	DFC 0	15	DEMAND	Weekly	DGN:DFC=0:PH=15,CU=0;	2	
8					RST:CU=0;	5	
9					SW:CU;	5	
10					RMV:CU=1;	5	
11	DFC 0	14	DEX, DEMAND	Weekly	DGN:DFC=0:PH=14;		
12	DFC 0	15	DEMAND	Weekly	DGN:DFC=0:PH=15,CU=1;	2	
13					RST:DFC=0;	5	
14					VFY:MHD=b;	4,5,6	
15					VFY:MHD=b1;	4,5,6	
16	Execute Item No. 16 only if MHD is equipped.				VFY:MHD=b2;	4,5,6	
17	Execute Item No. 17 only if MHD is equipped.				VFY:MHD=b3;	4,5,6	
18	DFC 1	14	DEX, DEMAND	Weekly	DGN:DFC=1:PH=14;		
19	DFC 1	15	DEMAND	Weekly	DGN:DFC=1:PH=15,CU=1;	2	
20					RST:CU=1;	5	
21					SW:CU;	5	
22					RMV:CU=0;	5	
23	DFC 1	14	DEX, DEMAND	Weekly	DGN:DFC=1:PH=14;		
24	DFC 1	15	DEMAND	Weekly	DGN:DFC=1:PH=15,CU=0;	2	
25					RST:CU=0;	5	
26					RST:DFC=1;	5	

Notes:

1. DFC basic units 0 and 1 will always be equipped.
2. A ''REPORT DIAMON ERROR X'74'' will be output if DFC Phase 15 is pinned out in */diag/dpt/pu/dfcs3* when DFC Phase 15 is attempted unless Information Modification Request (IMR) 588414 is installed. This IMR unpins Phase 15 in */diag/dpt/pu/dfcs3* allowing it to run.
3. Refer to the Diagnostics chapter in 254-303-106, *System Maintenance Manual*, for additional information on running demand diagnostics.
4. The a, a1, a2, and a3 are odd-numbered MHDs (MHD 1, 3, 5, etc., if equipped). The b, b1, b2, and b3 are even-numbered MHDs (MHD 0, 2, 4, etc., if equipped).
5. After entering commands for Item Nos. 1 through 5, 8, 9, 10, 13 through 17, 20, 21, 22, 25, and 26, observe the `MESSAGE COMPLETED` output message.
6. Prior to executing a verify command on an MHD, ensure that all MHDs are active and in the duplex state. Verify MHD status on the DFC 0 and 1 status page at the MTTY display.

Table 12-6. DFC Supplementary Diagnostic Phases for DFC 2 Version (PDS)

Item No.	Unit (Note 1)	Phase	Diagnostic Type	Frequency	Command (Note 3)	See Note(s)	Check Box
1					VFY:MHD a!	4,5,6	
2					VFY:MHD a1!	4,5,6	
3	Execute Item No. 3 only if MHD is equipped.				VFY:MHD a2!	4,5,6	
4	Execute Item No. 4 only if MHD is equipped.				VFY:MHD a3!	4,5,6	
5					RMV:CU 0!	5	
6	DFC 0	14	DEX, DEMAND	Weekly	DGN:DFC 0:PH 14!		
7	DFC 0	15	DEMAND	Weekly	DGN:DFC 0:PH 15,CU 0!	2	
8					RST:CU 0!	5	
9					SW:CU!	5	
10					RMV:CU 1!	5	
11	DFC 0	14	DEX, DEMAND	Weekly	DGN:DFC 0:PH 14!		
12	DFC 0	15	DEMAND	Weekly	DGN:DFC 0:PH 15,CU 1!	2	
13					RST:DFC 0!	5	
14					VFY:MHD b!	4,5,6	
15					VFY:MHD b1!	4,5,6	
16	Execute Item No. 16 only if MHD is equipped.				VFY:MHD b2!	4,5,6	
17	Execute Item No. 17 only if MHD is equipped.				VFY:MHD b3!	4,5,6	
18	DFC 1	14	DEX, DEMAND	Weekly	DGN:DFC 1:PH 14!		
19	DFC 1	15	DEMAND	Weekly	DGN:DFC 1:PH 15,CU 1!	2	
20					RST:CU 1!	5	
21					SW:CU!	5	
22					RMV:CU 0!	5	
23	DFC 1	14	DEX, DEMAND	Weekly	DGN:DFC 1:PH 14!		
24	DFC 1	15	DEMAND	Weekly	DGN:DFC 1:PH 15,CU 0!	2	
25					RST:CU 0!	5	
26					RST:DFC 1!	5	

Notes:

1. DFC basic units 0 and 1 will always be equipped.
2. A ''REPORT DIAMON ERROR X'74'' will be output if DFC Phase 15 is pinned out in */diag/dpt/pu/dfcs3* when DFC Phase 15 is attempted unless Information Modification Request (IMR) 588414 is installed. This IMR unpins Phase 15 in */diag/dpt/pu/dfcs3* allowing it to run.
3. Refer to the Diagnostics chapter in 254-303-106, *System Maintenance Manual*, for additional information on running demand diagnostics.
4. The a, a1, a2, and a3 are odd-numbered MHDs (MHD 1, 3, 5, etc., if equipped). The b, b1, b2, and b3 are even-numbered MHDs (MHD 0, 2, 4, etc., if equipped).
5. After entering commands for Item Nos. 1 through 5, 8, 9, 10, 13 through 17, 20, 21, 22, 25, and 26, observe the `MESSAGE COMPLETED` output message.
6. Prior to executing a verify command on an MHD, ensure that all MHDs are active and in the duplex state. Verify MHD status on the DFC 0 and 1 status page at the MTTY display.

3.2. Is ATP `MESSAGE COMPLETE` output message received?

- If **yes**, continue to Step **3.3**.
- If **no**, refer to 254-303-102, *3B21D Computer Trouble Clearing Tasks*, to clear trouble.

3.3. Have all scheduled demand diagnostics (all Item Nos. in Table 12-5 or Table 12-6) been completed for both DFCs using both CU helper units?

- If **yes**, continue to Step **3.4**.
- If **no**, return to Step **3.1**.

3.4. **STOP! YOU HAVE COMPLETED DFC 2 DEMAND DIAGNOSTICS.**

4. Run demand diagnostics on the disk file controller (DFC 3 version).

RUN DEMAND DIAGNOSTICS ON DFC (USING DFC 3 VERSION) PROCEDURE:

Two versions of the DFC (DFC 2 and DFC 3) are supported on the 3B21D computer, and diagnostics are different for each version. The DFC 2 version supports the TN2116/UN373 hardware. The DFC 3 version supports the UN580 hardware. This procedure will run demand diagnostics on the DFC 3 version.

Requirement 1: All DFCs must be active with all MHDs in service prior to beginning this procedure.

Requirement 2: CU 1 must be active and CU 0 must be standby prior to beginning this procedure. If CU 1 is not active, make CU 1 active by entering one of the following appropriate input messages:

- If MML, enter **SW:CU;**

  Response: `SW CU 1 COMPLETED`

- If PDS, enter **SW:CU!**

  Response: `SW CU 1 COMPLETED`

4.1. At terminal, type in the first (or next) command from Table 12-7 (MML) or Table 12-8 (PDS), one at a time, starting with Item No. 1 and ending with the last Item No. After entering each command for the DFC unit, continue to Step **4.2**.

Table 12-7. DFC Supplementary Diagnostic Phases for DFC 3 Version (MML)

Item No.	Unit (Note 1)	Phase (Note 2)	Diagnostic Type	Frequency	Command (Notes 2 and 3)	See Note(s)	Check Box
1					VFY:MHD=a;	4,5,6	
2					VFY:MHD=a1;	4,5,6	
3	Execute Item No. 3 only if MHD is equipped.				VFY:MHD=a2;	4,5,6	
4	Execute Item No. 4 only if MHD is equipped.				VFY:MHD=a3;	4,5,6	
5					RMV:CU=0;	5	
6	DFC 0	15	DEMAND	Weekly	DGN:DFC=0:PH=15,CU=0;		
7					RST:CU=0;	5	
8					SW:CU;	5	
9					RMV:CU=1;	5	
10	DFC 0	15	DEMAND	Weekly	DGN:DFC=0:PH=15,CU=1;		
11					RST:DFC=0;	5	
12					VFY:MHD=b;	4,5,6	
13					VFY:MHD=b1;	4,5,6	
14	Execute Item No. 14 only if MHD is equipped.				VFY:MHD=b2;	4,5,6	
15	Execute Item No. 15 only if MHD is equipped.				VFY:MHD=b3;	4,5,6	
16	DFC 1	15	DEMAND	Weekly	DGN:DFC=1:PH=15,CU=1;		
17					RST:CU=1;	5	
18					SW:CU;	5	
19					RMV:CU=0;	5	
20	DFC 1	15	DEMAND	Weekly	DGN:DFC=1:PH=15,CU=0;		
21					RST:CU=0;	5	
22					RST:DFC=1;	5	

Notes:

1. DFC basic units 0 and 1 will always be equipped.
2. A ''REPORT DIAMON ERROR X'74'' will be output if DFC Phase 15 is pinned out in */diag/dpt/pu/dfcs3* when DFC Phase 15 is attempted unless Information Modification Request (IMR) 588414 is installed. This IMR unpins Phase 15 in */diag/dpt/pu/dfcs3* allowing it to run.
3. Refer to the Diagnostics chapter in 254-303-106, *System Maintenance Manual*, for additional information on running demand diagnostics.
4. The a, a1, a2, and a3 are odd-numbered MHDs (MHD 1, 3, 5, etc., if equipped). The b, b1, b2, and b3 are even-numbered MHDs (MHD 0, 2, 4, etc., if equipped).
5. After entering commands for Item Nos. 1 through 5, 7, 8, 9, 11 through 15, 17, 18, 19, 21, and 22, observe the `MESSAGE COMPLETED` output message.
6. Prior to executing a verify command on an MHD, ensure that all MHDs are active and in the duplex state. Verify MHD status on the DFC 0 and 1 status page at the MTTY display.

Table 12-8. DFC Supplementary Diagnostic Phases for DFC 3 Version (PDS)

Item No.	Unit (Note 1)	Phase (Note 2)	Diagnostic Type	Frequency	Command (Notes 2 and 3)	See Note(s)	Check Box
1					VFY:MHD a!	4,5,6	
2					VFY:MHD a1!	4,5,6	
3	Execute Item No. 3 only if MHD is equipped.				VFY:MHD a2!	4,5,6	
4	Execute Item No. 4 only if MHD is equipped.				VFY:MHD a3!	4,5,6	
5					RMV:CU 0!	5	
6	DFC 0	15	DEMAND	Weekly	DGN:DFC 0:PH 15,CU 0!		
7					RST:CU 0!	5	
8					SW:CU!	5	
9					RMV:CU 1!	5	
10	DFC 0	15	DEMAND	Weekly	DGN:DFC 0:PH 15,CU 1!		
11					RST:DFC 0!	5	
12					VFY:MHD b!	4,5,6	
13					VFY:MHD b1!	4,5,6	
14	Execute Item No. 14 only if MHD is equipped.				VFY:MHD b2!	4,5,6	
15	Execute Item No. 15 only if MHD is equipped.				VFY:MHD b3!	4,5,6	
16	DFC 1	15	DEMAND	Weekly	DGN:DFC 1:PH 15,CU 1!		
17					RST:CU 1!	5	
18					SW:CU!	5	
19					RMV:CU 0!	5	
20	DFC 1	15	DEMAND	Weekly	DGN:DFC 1:PH 15,CU 0!		
21					RST:CU 0!	5	
22					RST:DFC 1!	5	

Notes:

1. DFC basic units 0 and 1 will always be equipped.
2. A ''REPORT DIAMON ERROR X'74'' will be output if DFC Phase 15 is pinned out in */diag/dpt/pu/dfcs3* when DFC Phase 15 is attempted unless Information Modification Request (IMR) 588414 is installed. This IMR unpins Phase 15 in */diag/dpt/pu/dfcs3* allowing it to run.
3. Refer to the Diagnostics chapter in 254-303-106, *System Maintenance Manual*, for additional information on running demand diagnostics.
4. The a, a1, a2, and a3 are odd-numbered MHDs (MHD 1, 3, 5, etc., if equipped). The b, b1, b2, and b3 are even-numbered MHDs (MHD 0, 2, 4, etc., if equipped).
5. After entering commands for Item Nos. 1 through 5, 7, 8, 9, 11 through 15, 17, 18, 19, 21, and 22, observe the `MESSAGE COMPLETED` output message.
6. Prior to executing a verify command on an MHD, ensure that all MHDs are active and in the duplex state. Verify MHD status on the DFC 0 and 1 status page at the MTTY display.

4.2. Is ATP `MESSAGE COMPLETE` output message received?

- If **yes**, continue to Step **4.3**.
- If **no**, refer to 254-303-102, *3B21D Computer Trouble Clearing Tasks*, to clear trouble.

4.3. Have all scheduled demand diagnostics (all Item Nos. in Table 12-7 or Table 12-8) been completed for both DFCs using both CU helper units?

- If **yes**, continue to Step **4.4**.
- If **no**, return to Step **4.1**.

4.4. **STOP! YOU HAVE COMPLETED DFC 3 DEMAND DIAGNOSTICS.**

5. Run demand diagnostics on the magnetic tape (MT).

RUN DEMAND DIAGNOSTICS ON MT PROCEDURE:

Requirement 1: All DFCs must be active with all MT units to be diagnosed in service prior to beginning this procedure.

Requirement 2: Obtain the appropriate tape (9-track or DAT) for the MT unit being diagnosed.

5.1. At terminal, type in the first (or next) command from Table 12-9 (MML) or Table 12-10 (PDS), one at a time, starting with Item No. 1 and ending with the last Item No. After entering each command for the MT unit, continue to Step **5.2**.

Table 12-9. MT Supplementary Diagnostic Phases (MML)

Item No.	Unit (Note 1)	Phase	Diagnostic Type	Frequency	Command (Notes 1, 2, 3, and 4)	Check Box
1					Install write-enabled tape on MT *a*.	
2	MT *a*	90	DEMAND	Weekly	DGN:MT=*a*:PH=90;	
3					Uninstall the tape from MT *a*.	
4					Install the tape removed in Item No. 3 (write protected) on MT *a*.	
5	MT *a*	91	DEMAND	Weekly	DGN:MT=*a*:PH=91;	
6					Uninstall the tape from MT *a*.	
7					RST:MT=*a*;	

Notes:

1. The *a* indicates the MT unit number.
2. Refer to the Diagnostics chapter in 254-303-106, *System Maintenance Manual*, for additional information on running demand diagnostics.
3. The same tape written to in Item No. 2 (Phase 90) must be used in Item No. 5 (Phase 91).
4. After performing Item Nos. 1, 3, 4, 6, and 7, a normal response from that action is expected.

Table 12-10. MT Supplementary Diagnostic Phases (PDS)

Item No.	Unit (Note 1)	Phase	Diagnostic Type	Frequency	Command (Notes 1, 2, 3, and 4)	Check Box
1					Install write-enabled tape on MT *a*.	
2	MT *a*	90	DEMAND	Weekly	DGN:MT *a*:PH 90!	
3					Uninstall the tape from MT *a*.	
4					Install the tape removed in Item No. 3 (write protected) on MT *a*.	
5	MT *a*	91	DEMAND	Weekly	DGN:MT *a*:PH 91!	
6					Uninstall the tape from MT *a*.	
7					RST:MT *a*!	

Notes:

1. The *a* indicates the MT unit number.
2. Refer to the Diagnostics chapter in 254-303-106, *System Maintenance Manual*, for additional information on running demand diagnostics.
3. The same tape written to in Item No. 2 (Phase 90) must be used in Item No. 5 (Phase 91).
4. After performing Item Nos. 1, 3, 4, 6, and 7, a normal response from that action is expected.

5.2. Is ATP `MESSAGE COMPLETE` output message received?

- If **yes**, continue to Step **5.3**.
- If **no**, refer to 254-303-102, *3B21D Computer Trouble Clearing Tasks*, to clear trouble.

5.3. Have all scheduled demand diagnostics (all Item Nos. in Table 12-9 or Table 12-10) been completed for all MT *a* units?

- If **yes**, continue to Step **5.4**.
- If **no**, return to Step **5.1** and repeat Item Nos. 1 through 6 in Table 12-9 or Table 12-10 for each MT *a* unit.

5.4. **STOP! YOU HAVE COMPLETED MT DEMAND DIAGNOSTICS.**

Remove 9-Track Tape from KS-23909,L10 Tape Drive

13

Contents

Remove 9-Track Tape from KS-23909,L10 Tape Drive

13

Procedure

Use the following procedure to remove a 9-track tape reel from the Storage Tek (STK) (KS-23909,L10) tape drive unit:

1. Set the tape unit off-line by pressing the **RESET** button. (If in the diagnostic mode, press the **DIAG** button.)
2. Depending on what is displayed, do one of the following:
   - If beginning of tape (`BOT`) is displayed, press the **RWD/UNL** button.
   - If `OFFLINE` is displayed, press and hold the **RESET** button and press the **RWD/UNL** button.

   The tape rewinds with `REW/UNLD` displayed.
3. Wait for the **READY** indicator to display.
4. Open the loading door.
5. Press the center of the supply hub to release the tape reel.
6. Remove the tape reel and close the loading door.
7. **STOP! YOU HAVE COMPLETED THIS PROCEDURE.**

Remove 9-Track Tape from KS-23909,L21 Tape Drive

14

Contents

Remove 9-Track Tape from KS-23909,L21 Tape Drive

14

Procedure

Use the following procedure to remove a 9-track tape reel from the *HP** Model 88781A (KS-23909,L21) tape drive unit:

1. Take the tape unit off-line by pressing the **ON LINE** button.
2. Press the **REW/UNLD** button.
3. Wait for the **NO TAPE** indicator to display.
4. Open the tape loading door.

   NOTE:
   If you open the door before the unload cycle completes, the supply hub fingers may not completely retract. To manually retract the hub fingers, push and hold the tape lock/unlock lever and turn the supply hub counterclockwise.

5. Remove the tape reel.
6. Close the tape loading door.
7. **STOP! YOU HAVE COMPLETED THIS PROCEDURE.**

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Replace Model 577 ROP Ribbon

15

Contents

Replace Model 577 ROP Ribbon

15

Procedure

Use the following procedure to replace the ribbon in Model 577 receive-only printer (ROP):

1. Disengage the ribbon from the vertical rectangular notches in the ribbon guides on the immediate right and left sides of the print head. See the lower close-up view in Figure 15-1.
2. Remove the ribbon from the striking area between the print head and the shiny vertical plate next to the platen.
3. Carefully unhook the ribbon from both the left and right ribbon guides. See Figure 15-1.
4. With the exposed ribbon disengaged from the ribbon path, grasp the ribbon cartridge and pull up to unseat the cartridge.
5. Unbox a new ribbon cartridge. Remove and discard the plastic wrapping, but save the folded plastic glove that is included in the box. Use the plastic glove to protect your hand from ink smears while installing the ribbon cartridge.

   NOTE:
   The ribbon cartridge has two alignment pins on its left and right edges. These alignment pins fit into matching notches in the walls of the ROP.

6. Turn the ribbon advance knob clockwise, as shown by the curved arrow on the cartridge, until all slack is removed from the ribbon.

   NOTE:
   Make sure the power is off and the print head has cooled down. To make ribbon installation easier, slide the print head to the center carriage position before performing the next step.

7. Holding the cartridge in position as shown in Figure 15-1, hook the left side of the ribbon around the left ribbon guide and the right side around the right ribbon guide. See the top two close-up views in Figure 15-1.
8. Thread the ribbon into the striking area between the print head and the shiny vertical plate next to the platen as shown in the lower close-up view in Figure 15-1.
9. Draw the cartridge toward you and seat it into place. When correctly installed, the cartridge lies flat with the two pins on each edge resting in corresponding notches in the walls.

   If the cartridge does not properly seat on the right side, turn the ribbon advance knob (Figure 15-2) until the small black ribbon drive blade slides into the cross-shaped hole in the bottom of the cartridge. See Figure 15-3.

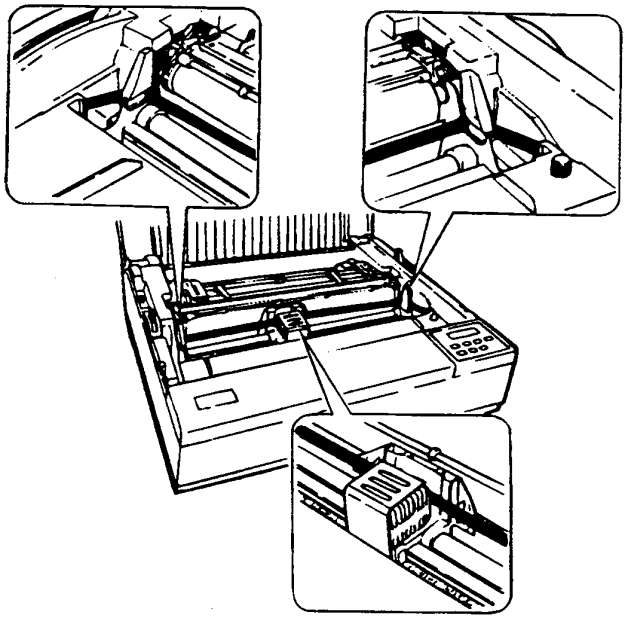

Figure 15-1. Model 577 ROP Ribbon Threading

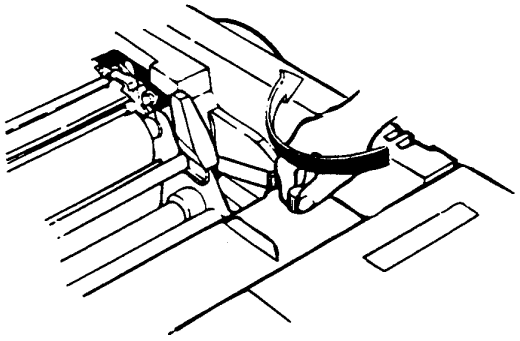

Figure 15-2. Removing Ribbon Slack

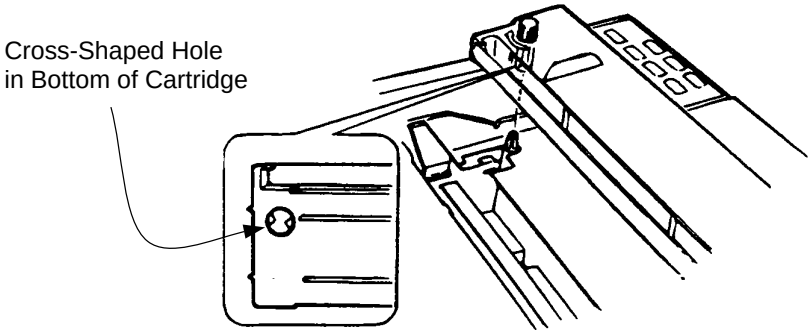

Figure 15-3. Aligning Ribbon Drive Blade

10. Turn the ribbon advance knob clockwise, as shown by the curved arrow on the cartridge (Figure 15-2), until all slack in the ribbon is removed and the ribbon aligns itself in the striking area between the print head and the shiny vertical plate next to the platen. The ribbon should also align itself in the notches in the left and right main ribbon cartridge guides. If not, adjust accordingly.
11. The ribbon guides at the immediate left and right sides of the print head have vertical rectangular notches the width of the ribbon. Verify that the ribbon now lies correctly in these guide notches. See the lower close-up view in Figure 15-1.

    If needed, remove any slack in the ribbon with the ribbon advance knob.
12. **STOP! YOU HAVE COMPLETED THIS PROCEDURE.**

Replace Model 602 ROP Ribbon

16

Contents

Replace Model 602 ROP Ribbon

16

Procedure

Use the following procedure to replace the ribbon in Model 602 receive-only printer (ROP).

1. Verify that the ROP **POWER** switch (located at the left side of the ROP) is set to **OFF**.
2. Open the ROP access cover by grasping the tabs at either end and tilting back. See Figure 16-1.

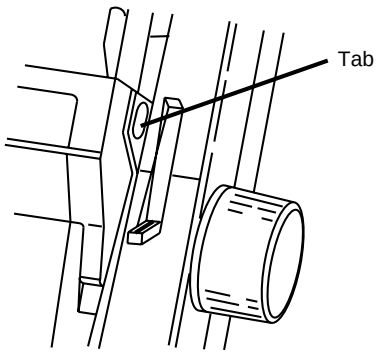

Figure 16-1. ROP Access Cover Tabs Location

CAUTION:
The print head may be hot. If necessary, wait a few minutes for the print head to cool before continuing to the next step.

3. Slide the print head to the center of the carriage as shown in Figure 16-2.

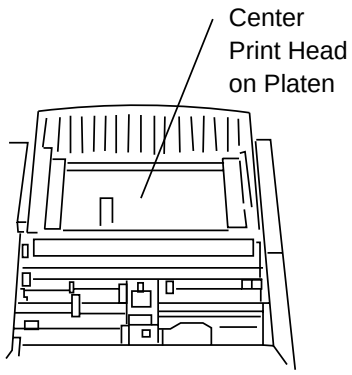

Figure 16-2. Print Head Position

4. Grasp the ribbon cartridge and pull up to unseat it as shown in Figure 16-3.

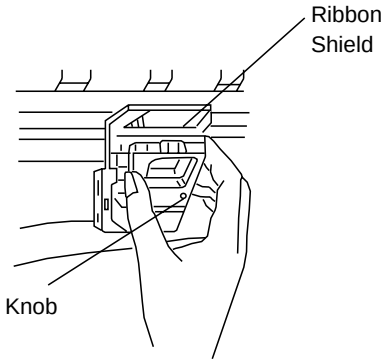

Figure 16-3. Model 602 ROP Ribbon Cartridge

5. Unbox the new ribbon cartridge, and remove and discard the plastic wrapping.

   NOTE:
   Be sure to leave the clear plastic ribbon shield on the ribbon cartridge.

6. Holding the cartridge in position as shown in Figure 16-4, with the knob facing up and the ribbon shield facing the platen, fit the grooves on either side at the back end of the ribbon cartridge over the pins on the ribbon plate.

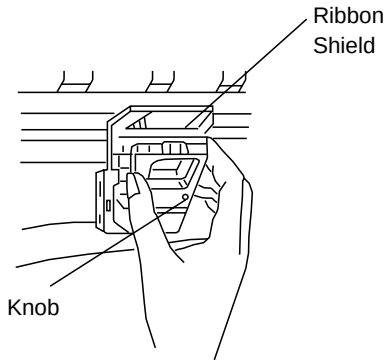

Figure 16-4. Placement of the Ribbon Cartridge

7. Lower the front of the ribbon cartridge over the print head until it snaps into place as shown in Figure 16-5.

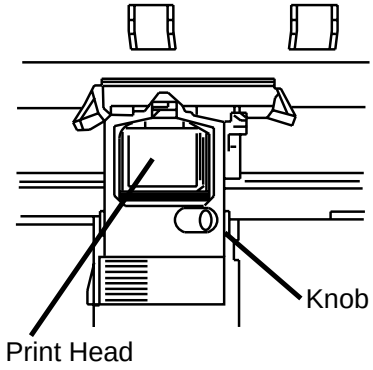

Figure 16-5. Inserting the Ribbon Cartridge

8. Turn the ribbon advance knob clockwise, as shown by the curved arrow on the cartridge, until all slack in the ribbon is removed.
9. Close the ROP access cover.
10. Turn on the printer power by pressing the **POWER** switch to **ON**.
11. **STOP! YOU HAVE COMPLETED THIS PROCEDURE!**

Test Processor Cabinet Alarms

17

Contents

Test Processor Cabinet Alarms

17

Introduction

This chapter describes the procedure for verifying the system software alarm signal distributor (SD) points for the MAJOR and MINOR system alarms.

NOTE:
Clear all alarm conditions before proceeding with the test procedure described in this chapter.

Audible Alarms

For many applications, alarms are generated via the system software alarm SD points from the scan point and signal distributor controller (SCSDC) [UN33, input/output processor (IOP) unit]. The MAJOR alarm SD point is SD13. The MINOR alarm SD point is SD14.

The SD points are tested via the input commands described in Steps **1** through **4** of the procedure.

Reference IPs

The following is a list of helpful reference IPs:

- 254-303-110, *3B20D and 3B21D Computers **UNIX** RTR Operating System PDS Input Messages Manual*
- 254-303-111, *3B20D and 3B21D Computers **UNIX** RTR Operating System PDS Output Messages Manual*
- 254-303-112, *3B20D and 3B21D Computers **UNIX** RTR Operating System MML Input Messages Manual*
- 254-303-113, *3B20D and 3B21D Computers **UNIX** RTR Operating System MML Output Messages Manual*
- 254-303-106, *3B20D and 3B21D Computers **UNIX** RTR Operating System System Maintenance Manual*.

Procedure

1. At the maintenance teletypewriter (MTTY), enter the appropriate input message:
   - If MML, enter **ORD:SCSD:UNIT=0:DATA,PT=13,OPR=OPERATE;**
   - If PDS, enter **ORD:SCSD;UNIT 0,PT(13),OPR OPERATE!**

   Response: An audible MAJOR alarm is activated.

2. At the MTTY, enter the appropriate input message:
   - If MML, enter **ORD:SCSD:UNIT=0:DATA,PT=13,OPR=RELEASE;**
   - If PDS, enter **ORD:SCSD;UNIT 0,PT(13),OPR RELEASE!**

   Response: The audible MAJOR alarm is retired.

3. At the MTTY, enter the appropriate input message:
   - If MML, enter **ORD:SCSD:UNIT=0:DATA,PT=14,OPR=OPERATE;**
   - If PDS, enter **ORD:SCSD;UNIT 0,PT(14),OPR OPERATE!**

   Response: An audible MINOR alarm is activated.

4. At the MTTY, enter the appropriate input message:
   - If MML, enter **ORD:SCSD:UNIT=0:DATA,PT=14,OPR=RELEASE;**
   - If PDS, enter **ORD:SCSD;UNIT 0,PT(14),OPR RELEASE!**

   Response: The audible MINOR alarm is retired.

5. **STOP! YOU HAVE COMPLETED THIS PROCEDURE.**

Verify Operator Interface

18

Contents

Verify Operator Interface

18

Introduction

This chapter contains the procedure for verifying the maintenance teletypewriter (MTTY), the receive-only printer (ROP), and the port switch unit. The main procedures involved are as follows:

- Verify the MTTY (inspect, check features, verify video options, and check display pages).
- Verify the ROP — Model 577 or Model 602 (inspect, check attributes, and perform self-tests).
- Test the port switch and scanner-distributor buffer (PSSDB) unit.

If trouble occurs when verifying the operator interface, refer to 254-303-102, *3B21D Computer Trouble Clearing Tasks*.

Procedure

1. Inspect the MTTY.

INSPECT KS-23996 TERMINAL PROCEDURE:

1.1. Set the terminal **ON/OFF** power switch to **OFF**.

1.2. Inspect the external cabling of the terminal for any loose or damaged connections. Are any cables damaged and/or connections loose?

- If **yes**, continue to Step **1.3**.
- If **no**, go to Step **1.4**.

1.3. Tighten the loose connections and replace the damaged cables.

1.4. Set the terminal **ON/OFF** power switch to **ON**.

Response: The green light-emitting diodes (LED) to the left of the **ON/OFF** switch lights, and the terminal performs a self-test.

1.5. Operate the **NORM DISP** key.

2. Inspect the MTTY display pages.

INSPECT DISPLAY PAGES PROCEDURE:

2.1. Operate the **NORM DISP** key.

2.2. If not in the command mode, operate the **CMD/MSG** key.

Response: The cursor moves to line 4.

2.3. Type the commands listed in Table 18-1 and others listed on the page index for your application; verify that the corresponding page is displayed.

2.4. Was each page displayed?

- If **yes**, **STOP! YOU HAVE COMPLETED THIS SUBPROCEDURE.**
- If **no**, refer to 254-303-102, *3B21D Computer Trouble Clearing Tasks*.

Table 18-1. Display Pages and Corresponding Commands

Command	Page Displayed
100	PAGE INDEX
101	STATUS SUMMARY AREA
102	COMMON PROCESSOR DISPLAY
103	C/D UPDATE
104	OPERATING SYSTEM STATUS PAGE
105	CRAFT FM 01
106	CRAFT FM 01
107	SYSTEM UPDATE
109	FIELD UPDATE
110	DISK FILE SYSTEM ACCESS INDEX
120	DISK FILE SYSTEM ACCESS
121	DFC PERFORMANCE

3. Determine if the ROP is Model 577 or Model 602.
   - If ROP is Model 577, continue to Step **4**.
   - If ROP is Model 602, go to Step **7**.
4. Inspect Model 577 ROP.

INSPECT MODEL 577 ROP PROCEDURE:

4.1. At the ROP control panel, press the **ON LINE** button. See Figure 18-1.

Response: The **ON LINE** indicator extinguishes, and the `OFFLINE` message appears in the display window.

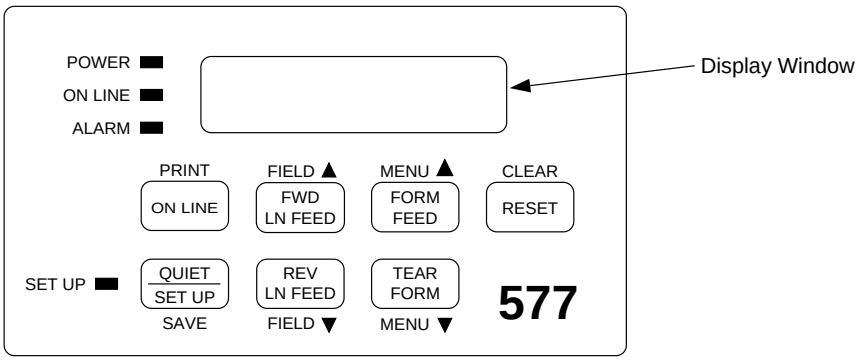

Figure 18-1. Model 577 ROP Control Panel

4.2. Set the ROP **POWER** switch to the **OFF** position.

4.3. Inspect the ROP external cabling for damaged or loose connections.

4.4. Were cables damaged or loose connections found?

- If **yes**, continue to Step **4.5**.
- If **no**, go to Step **4.6**.

4.5. Tighten any loose connections and/or replace damaged cables.

4.6. Open the ROP cover lid and look inside.

4.7. Does the ROP need cleaning?

- If **yes**, continue to Step **4.8**.
- If **no**, go to Step **4.9**.

4.8. Clean the ROP.

NOTE:
See Chapter 5 for details on how to clean Model 577 ROP.

4.9. Close the ROP cover lid.

4.10. Set the ROP **POWER** switch to **ON**.

4.11. Continue to Step **5**.

5. Check Model 577 ROP attributes.

CHECK MODEL 577 ROP ATTRIBUTES PROCEDURE:

5.1. At the ROP control panel, press the **ON LINE** button to remove the ROP from service and place it off-line. See Figure 18-1.

Response: The **ON LINE** indicator extinguishes, and the `OFFLINE` message appears in the display window.

5.2. Press and hold the **RESET** button, then press the **QUIET/SETUP** button to enter the configuration mode.

Response: The `USER NUMBER 0` message appears in the display window, and the **SET UP** indicator lights.

NOTE:
If a user number other than `0` appears in the display window, change the user number to **0** by pressing the **FORM FEED** button to advance the display one number or by pressing the **TEAR FORM** button to back up one number.

5.3. Press the **FWD LN FEED** button to activate the FIELD mode.

5.4. Press the **ON LINE** button to print a list of attribute settings.

Response: The attribute listing prints, and the ROP enters the off-line state.

5.5. Compare the printed attribute list with Table 18-2.

5.6. If values need to be changed, press and hold the **RESET** button and then press the **QUIET/SETUP** button to enter the configuration mode.

NOTE:
The long list is accessed from the configuration mode.

5.7. Press the **FWD LN FEED** button to activate the FIELD mode.

5.8. Step forward through the field list by pressing the **FWD LN FEED** button, or step backward by pressing the **REV LN FEED** button. When the desired field appears in the display window, press the **FORM FEED** or **TEAR FORM** button until the desired attribute setting (menu item) is displayed. Repeat as necessary to check/change any remaining attributes.

NOTE:
The last menu item displayed before moving to another field or exiting SETUP is used as the working value for that attribute.

5.9. Press the **QUIET/SETUP** button to perform the following:

- Save all working attribute values to nonvolatile memory
- Exit the FIELD mode
- Return the ROP to the off-line state.

Response: The **SET UP** indicator goes off, and the `OFFLINE` message appears in the display window.

5.10. Press the **ON LINE** button to return the ROP to the on-line state.

Response: The `ON LINE` message appears in the display window.

5.11. Continue to Step **6**.

Table 18-2. Model 577 ROP Option List

Field	Function	Menu Item and Name	Appears in Display Window
--	Select user number	No. 0	
00	Emulation mode	02 DEC Emulation	0-00/DEC
01	Emulation level	01 LA210 mode	0-01/LA210
02	EEPROM store	02 Enable	0-02/Enable
10	Form length	66 Lines	0-10/66 Lines
12	Line spacing	01 6 LPI	0-12/6 LPI
13	Character pitch	01 10 CPI	13/12 CPI
14	Print quality	01 DP	0-14/DP
17	Left margin	2/10 inch	0-17/2/10inch
18	Right margin	82/10 inch	0-18/82/10inch
19	Print direction	02 Bidirectional	0-19/Bidirect.
21	Font for zero	02 Slashed zero	0-21/Slash zero
22	Skip perforation	01 None	0-22/None
23	Wraparound	02 Autowrap	0-23/Wrap
24	Data error	01 Reverse question mark	0-24/Reverse ?
25	LQ CG selection	01 Built-in CG	0-25/Built-in
26	Define GL, G0	01 U.S. ASCII	26/U.S. ASCII
27	Define G1	01 U.S. ASCII	27/U.S. ASCII
28	Define GR, G2	01 U.S. ASCII	28/U.S. ASCII
29	Define G3	01 U.S. ASCII	29/U.S. ASCII
31	Alarm tone	01 On	0-31/ALtone on
33	Top margin	01 None	0-33/None
34	TDF position	01 Disable	0-34/None
35	Switch tone	01 Enable	0-35/SWtone on
36	Auto Answerback Message	01 Disable	0-36/None
40	Interface	02 RS232C	0-40/RS-232C
41	Data bits	01 7 bits	0-41/7 bits
42	Protocol	05 XON/XOFF (ON/OFFLINE & PE)	0-42/ON/OFF&PE
43	Stop bits	01 1 bit	0-43/1 bit
44	Parity	04 Even	0-44/Even
45	Baud rate	05 1200 BPS	0-45/1200 BPS
46	RTS	01 ON/OFFLINE	0-46/ON/OFFLINE
47	OFFLINE deselect	01 Deselect	0-47/Deselect
50	PE detection	01 PE Valid	0-50/PE Valid
62	Overrun buffer	03 1024 Bytes	0-62/1024 byte
63	Initial state	01 ONLINE	0-63/ONLINE
70	A.S.F.	01 Disable	0-70/Disable
71	Auto loading	02 Disable	0-71/Disable
72	FF speed	01 12 IPS	0-12 IPS

Table 18-2. Model 577 ROP Option List (Contd)

Field	Function	Menu Item and Name	Appears in Display Window
73	On-line paper feed	02 Enable	0-Enable
74	Reset + TEAR FORM	01 Normal	0-Normal
80	Automatic CR on LF	01 LF only	0-80/LF only
81	Automatic LF on CR	01 CR only	0-81/CR only
82	CAN code	01 Normal	0-82/Normal
90	Hex dump	01 Normal mode	0-90/Normal
91	Test print pattern	02 Sliding pattern	0-91/Slide
92	Test print character	H	0-92/H

6. Perform Model 577 ROP self-tests.

PERFORM MODEL 577 ROP SELF-TESTS PROCEDURE:

6.1. Verify that the ROP is powered up.

6.2. Ensure the ROP is off-line. If the `OFFLINE` message does not appear in the display window, press the **ON LINE** button at the ROP control panel. See Figure 18-1.

Response: The **ON LINE** indicator extinguishes, and the `OFFLINE` message appears in the display window.

CAUTION:
The ROP should not be on-line without paper installed. If you attempt to print without paper in the ROP, damage to the print head could occur.

6.3. Load continuous paper wide enough for 136 columns of printing at 10 characters per inch (at least 14 inches wide), using the bottom feed, rear exit paper path. Refer to Chapter 8 for details on how to install paper in Model 577 ROP.

6.4. At the ROP control panel, verify that the ROP is still in the off-line state (`OFFLINE` message appears in the display window). See Figure 18-1. If the ROP is not off-line, press the **ON LINE** button.

6.5. Press and hold the **RESET** button, then press the **QUIET/SETUP** button.

Response: The `USER NUMBER 0` message appears in the display window, and the **SET UP** indicator lights.

6.6. Press and release the **REV LN FEED** button repeatedly until the display window shows field `91` (test print pattern).

6.7. Press the **ON LINE** button to activate test printing.

Response: The ROP prints a test pattern until the **ON LINE** button is pressed again.

6.8. Press the **ON LINE** button again to stop printing the test pattern.

6.9. Verify the accuracy of the test printout.

6.10. If the test printout is NOT satisfactory, replace the ROP and repeat from Step **6.2**. Refer to 254-303-102, *3B21D Computer Trouble Clearing Tasks*, for details on how to replace Model 577 ROP.

6.11. Press the **QUIET/SETUP** button to perform the following:

- Exit the FIELD mode
- Return the ROP to the off-line state.

Response: The **SET UP** indicator extinguishes, and the `OFFLINE` message appears in the display window.

6.12. If appropriate, remove the wide paper and install paper that was in the ROP previously. See Chapter 8 for details on how to install paper in Model 577 ROP.

6.13. Press the **ON LINE** button to return the ROP to the on-line state.

Response: The `ON LINE` message appears in the display window.

6.14. Go to Step **10**.

7. Inspect Model 602 ROP.

INSPECT MODEL 602 ROP PROCEDURE:

7.1. At the ROP control panel, press the **SEL/MENU** button. See Figure 18-2.

Response: The **SEL** indicator extinguishes.

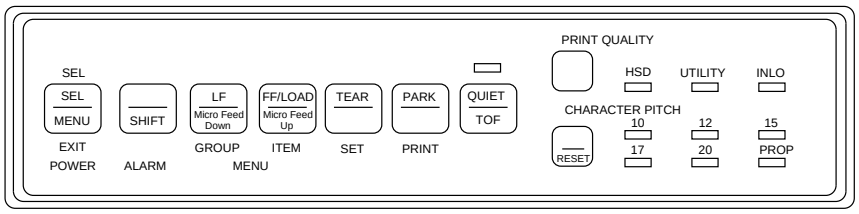

Figure 18-2. Model 602 ROP Control Panel

7.2. Set the ROP **POWER** switch to the **OFF** position.

7.3. Inspect the ROP external cabling for damaged or loose connections.

7.4. Were cables damaged or loose connections found?

- If **yes**, continue to Step **7.5**.
- If **no**, go to Step **7.6**.

7.5. Tighten any loose connections and/or replace damaged cables.

7.6. Open the ROP cover lid and look inside.

7.7. Does the ROP need cleaning?

- If **yes**, continue to Step **7.8**.
- If **no**, go to Step **7.9**.

7.8. Clean the ROP.

NOTE:
See Chapter 6 for details on how to clean Model 602 ROP.

7.9. Close the ROP cover lid.

7.10. Set the ROP **POWER** switch to **ON**.

7.11. Continue to Step **8**.

8. Check Model 602 ROP attributes.

CHECK MODEL 602 ROP ATTRIBUTES PROCEDURE:

8.1. At the ROP control panel, press and hold the **SHIFT** button and then press the **SEL** button to deselect the ROP (no data can be received). See Figure 18-2.

Response: The **SEL/MENU** indicator displays **MENU**.

8.2. Press and hold the **PRINT QUALITY** button and then press the **SHIFT** button to print all current menu settings.

Response: The ROP prints all current menu settings regardless of emulation and options engaged.

8.3. Compare the printout of current settings with Table 18-3. Note that the default settings are shown in ***bold italics***.

8.4. If values need to be changed, press the **GROUP** button to scan through the groups of listings. See Table 18-3 for a summary of the Groups, Items, and Settings.

Response: Each time the **GROUP** button is pressed, a line will print showing the next item within the group.

NOTE:
To go back one group, press and hold the **SHIFT** button and then press the **GROUP** button.

8.5. After the desired Group has been selected, press the **ITEM** button to scan through the items for a particular group.

Response: Each time the **ITEM** button is pressed, a line will print showing the next setting for that item.

NOTE:
To go back one item, press and hold the **SHIFT** button and then press the **ITEM** button.

Table 18-3. Model 602 ROP Default Settings and Options List

Group	Item	Setting
Printer Control	Emulation Mode	***IBM* PPR***, *Epson*† FX, ML
Font	Print Mode	***Utility***, NLQ Courier, NLQ Gothic, HSD
	Pitch	***10 cpi***, 12 cpi, 15 cpi, 17.1 cpi, 20 cpi
	Proportional Spacing	***No***, Yes
	Style	***Normal***, Italics
	Size	***Single***, Double
Symbol Sets	Character sets	***Set I***, Set II
	Language Set	***American***, French, German, British, Danish I, Swedish, Italian, Spanish I, Japanese, Norwegian, Danish II, Spanish II, Latin American, French Canadian, Dutch, Publisher
	Zero Character	***Slashed***, Unslashed
	Code Page	***USA***, Canada French, Multilingual, Portugal, Norway
Rear Feed	Line Spacing	***6 LPI***, 8 LPI
	Form Tear-Off	***Off***, 500ms, 1 sec, 2 sec
	Skip Over Perforation	***No***, Yes
	Page Length	***11***, 11 2/3, 12, 14, 17, 3, 3.5, 4, 5.5, 6, 7, 8, 8.5
	Gap Control	Auto Gap, Semi Auto Gap, 1, 2, 3, 4, 5, 6, 7, 8, 9
Bottom Feed	Line Spacing	***6 LPI***, 8 LPI
	Form Tear-Off	***Off***, 500ms, 1 sec, 2 sec
	Skip Over Perforation	***No***, Yes
	Page Length	***11***, 11 2/3, 12, 14, 17, 3, 3.5, 4, 5.5, 6, 7, 8, 8.5
	Gap Control	***Auto Gap***, Semi Auto Gap, 1, 2, 3, 4, 5, 6, 7, 8, 9
Top Feed	Line Spacing	***6 LPI***, 8 LPI
	Bottom Margin	
	Form Tear-Off	***Off***, 500ms, 1 sec, 2 sec
	Page Length	***11***, 11 2/3, 12, 14, 17, 3, 3.5, 4, 5.5, 6, 7, 8, 8.5
	Gap Control	***Auto Gap***, Semi Auto Gap, 1, 2, 3, 4, 5, 6, 7, 8, 9
	Wait Time	***1 sec***, 2 sec, 500ms

* Registered trademark of International Business Machines Corporation.
† Registered trademark of Epson Kabushiki Kaisha.

Table 18-3. Model 602 ROP Default Settings and Options List (Contd)

Group	Item	Setting
Set-Up	Graphics	***Uni-directional***, bi-directional
	Receive Buffer Size	***64K***, 1 Line, 32K
	Paper Out Override	***No***, Yes
	Print Registration	***0***, 0.05 mm Left, 0.10 mm Left, 0.15 mm Left, 0.20 mm Left, 0.25 mm Left, 0.25 mm Right, 0.20 mm Right, 0.15 mm Right, 0.10 mm Right, 0.05 mm Right
	Operator Panel Function	***Full Operation***, Limited Operation
	Reset Inhibit	***No***, Yes
	Print Suppress Effective	***Yes***, No
	Auto LF	***No***, Yes
	Auto CR	***No***, Yes
	SI Select Pitch (10 CPI)	***17.1 CPI***, 15 CPI
	SI Select Pitch (12 CPI)	***20 CPI***, 12 CPI
	Time Out Print	***Valid***, Invalid
	Auto Select	***No***, Yes
	Print Head Gap Adjust	***0***, -1, +1
Parallel I/F	I-Prime	***Buffer Print***, Buffer Clear, Invalid
	Pin 18	***+5V***, Open
Serial I/F	Parity	***None***, Odd, Even
	Protocol	***Ready/Busy***, X-on/X-off
	Diagnostic Test	***No***, Yes
	Busy Line	***SSD-***, SSD+, DTR, RTS
	Baud Rate	19200 bps, ***9600 bps***, 4800 bps, 2400 bps, 1200 bps, 600 bps, 300 bps
	DSR Signal	***Valid***, Invalid
	DTR Signal	***Ready on Power Up***, Ready on Select
	Busy Time	***200ms***, 1 sec

8.6. After the desired Group and Item have been selected, press the **SET** button to change the setting for the item.

8.7. Press the **PRINT** button to print out a listing of current settings for each item, group by group.

Response: A printout should reflect any setting changes made.

CAUTION:
If in the Menu Mode and the ROP is turned off without first exiting the Menu Mode, any changes made will be lost.

8.8. Press the **SEL/MENU** button to save any setting changes, and return the ROP to the Selected Mode (ready to receive data).

Response: The **SEL/MENU** indicator displays **SEL**.

8.9. Continue to Step **9**.

9. Perform Model 602 ROP self-tests.

PERFORM MODEL 602 ROP SELF-TESTS PROCEDURE:

9.1. Does Model 602 ROP need to have paper loaded?

- If **yes**, continue to Step **9.2**.
- If **no**, go to Step **9.3**.

CAUTION:
The ROP should not be on-line without paper installed. If you attempt to print without paper in the ROP, damage to the print head could occur.

9.2. Load paper in the ROP. See Chapter 9 for details on how to load paper in Model 602 ROP.

9.3. Verify that the ROP **POWER** switch is set to **OFF**.

9.4. Press and hold the **LF** button for several seconds and then set the **POWER** switch to **ON** to run a font test. See Figure 18-2.

Response: The ROP provides a printout containing samples of available typefaces.

NOTE:
If the ROP simply turns on without starting to print, the **LF** button was not held down long enough.

9.5. Set the **POWER** switch to **OFF**.

9.6. Press and hold the **QUIET** button for several seconds and then set the **POWER** switch to **ON** to run a rolling ASCII test.

Response: The ROP provides a continuous printout of all 96 ASCII characters.

NOTE:
If the ROP simply turns on without starting to print, the **LF** button was not held down long enough.

9.7. Press the **SEL** button to stop the ROP from printing.

9.8. Continue to Step **10**.

10. Test the port switch and scanner-distributor buffer (PSSDB) unit.

TEST PSSDB PROCEDURE:

10.1. At the PSSDB [equipment location (EQL) 45-186], verify that both the PSSDB ''A'' switch and ''B'' switch are in the **AUTO** position. See Figure 18-3.

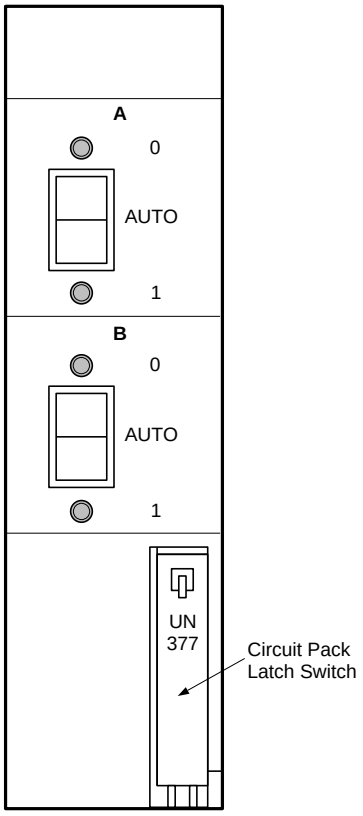

Figure 18-3. Port Switch and Scanner-Distributor Buffer Unit

10.2. Note which LED, **0** or **1**, is lighted on the ‘‘A’’ switch and ‘‘B’’ switch.

10.3. At the terminal, enter the appropriate input message:

- If PDS, enter **SW:PORTSW!**
- If MML, enter **SW:PORTSW;**

Responses: The system displays the following messages:

```
SW PORTSW COMPLETED FOR ROP
SW PORTSW COMPLETED FOR MTTY
```

10.4. Did the LEDs on the ‘‘A’’ switch of the PSSDB change states?

- If **yes**, continue to Step **10.5**.
- If **no**, replace the PSSDB. Refer to 254-303-102, *3B21D Computer Trouble Clearing Tasks*, for details and then repeat from Step **10.1** of this procedure.

10.5. Did the LEDs on the ‘‘B’’ switch of the PSSDB change states?

- If **yes**, **STOP! YOU HAVE COMPLETED THIS SUBPROCEDURE.**
- If **no**, replace the PSSDB. Refer to 254-303-102, *3B21D Computer Trouble Clearing Tasks*, for details and then repeat from Step **10.1** of this procedure.

11. Test the PSSDB ‘‘A’’ switch (terminal switch).

TEST PSSDB ‘‘A’’ SWITCH PROCEDURE:

11.1. At the PSSDB (EQL 45-186), verify that both the PSSDB ‘‘A’’ switch and ‘‘B’’ switch are in the **AUTO** position.

11.2. Operate the ‘‘A’’ switch to the **1** position.

11.3. Did LED **1** of the ‘‘A’’ switch light?

- If **yes**, go to Step **11.5**.
- If **no**, continue to Step **11.4**.

11.4. Replace the PSSDB and repeat from Step **11.1**.

NOTE:
Refer to 254-303-102, *3B21D Computer Trouble Clearing Tasks*, for details on how to replace the PSSDB.

11.5. Operate the ‘‘A’’ switch to the **0** position.

11.6. Did LED **0** of the ‘‘A’’ switch light?

- If **yes**, continue to Step **11.7**.
- If **no**, go to Step **11.4**.

11.7. Operate the ‘‘A’’ switch to the **AUTO** position.

12. Test the PSSDB ‘‘B’’ switch (ROP switch).

TEST PSSDB ‘‘B’’ SWITCH PROCEDURE:

12.1. At PSSDB (EQL 45-186), verify that both the PSSDB ‘‘A’’ switch and ‘‘B’’ switch are in the **AUTO** position.

12.2. Operate the ‘‘B’’ switch to the **1** position.

12.3. Did LED **1** of the ‘‘B’’ switch light?

- If **yes**, go to Step **12.5**.
- If **no**, continue to Step **12.4**.

12.4. Replace the PSSDB and repeat from Step **12.1**.

NOTE:
Refer to 254-303-102, *3B21D Computer Trouble Clearing Tasks*, for details on how to replace the PSSDB.

12.5. Operate the ‘‘B’’ switch to the **0** position.

12.6. Did LED **0** of the ‘‘B’’ switch light?

- If **yes**, continue to Step **12.7**.
- If **no**, go to Step **12.4**.

12.7. Operate the ‘‘B’’ switch to the **AUTO** position.

13. **STOP! YOU HAVE COMPLETED THIS PROCEDURE.**

Verify and Test 3B21D Computer CU KS-23884,L1 Fan Unit Alarms

19

Contents

Verify and Test 3B21D Computer CU KS-23884,L1 Fan Unit Alarms

19

Procedure

Use the following procedure to verify and test the 3B21D computer control unit (CU) (KS-23884,L1) fan unit alarms.

1. Locate the fan unit fan tray controller (FTC) which is in the back of the cabinet on the right side at equipment location (EQL) 036-006. Are there any light-emitting diodes (LEDs) lit on the fan unit FTC?

   - If **yes**, refer to 254-303-102, *3B21D Computer Trouble Clearing Tasks*, to clear trouble.
   - If **no**, continue to Step **2**.

2. Test the fan unit alarms by operating the **FAN ALARM TEST/RESET** switch on the FTC at EQL 036-006 to the "**T**" position. Hold for approximately 10 seconds and then release.

   Responses: All FTC LEDs light.
   After approximately 10 seconds, the **S** (Status) LED extinguishes.
   All fans speed up to full speed.

3. Reset the fan unit alarms by operating the **FAN ALARM TEST/RESET** switch on the FTC to the "**R**" position.

   Responses: All other FTC LEDs extinguish.
   All fans return to normal operating speed.

4. **STOP! YOU HAVE COMPLETED THIS PROCEDURE.**

Verify Processor Power and Cooling Units

20

Contents

Verify Processor Power and Cooling Units

20

Introduction

This chapter contains the procedure for verifying processor power and cooling units. The main procedures are as follows:

1. Test the power converters in Processor Units 0 and 1 and in their associated Growth Units, if equipped.
2. Check the cooling fan unit air filters and replace every 6 months.
3. Test the power switch function light-emitting diodes (LEDs) in the processor cabinet.

If the following equipment needs replacement when performing this procedure, refer to 254-303-102, *3B21D Computer Trouble Clearing Tasks*:

- Power unit
- Power switch.

Procedure

1. Test the power converters in Processor Units 0 and 1 and in their associated Growth Unit, if equipped.

TEST POWER UNITS PROCEDURE:

1.1. Using a digital multimeter, measure the voltage at the test jacks on the faceplate of the first item in Table 20-1.

Table 20-1. Power Unit Locations

Item	Power Unit	Test Point Cabinet Location
1	CONVA	28-052
2	CONVB	19-060
3	CONVC	19-088
4	CONVD	28-088
5	CONVE	28-188
6	CONVA	53-052
7	CONVB	45-060
8	CONVC	45-088
9	CONVD	53-088
10	CONVE	53-188
11	CONVF*	xx-006
12	CONVG*	xx-034
13	CONVH*	xx-190

* The xx indicates optional power units that may be located at level 62 or 11 of the processor cabinet.

1.2. At the test jacks on the power unit, does the voltage measure between +4.9 V and +5.1 V?

- If **yes**, go to Step **1.4**.
- If **no**, continue to Step **1.3**.

1.3. Replace the power unit being tested, and repeat from Step **1.1**.

NOTE:
Refer to 254-303-102, *3B21D Computer Trouble Clearing Tasks*, for details on how to replace the power unit.

1.4. Have all the equipped power units listed in Table 20-1 been tested?

- If **yes**, **STOP! YOU HAVE COMPLETED THIS SUBPROCEDURE.**
- If **no**, repeat from Step **1.1** for the next item listed in Table 20-1.

2. Check the cooling fan unit air filters and replace every 6 months. If it has been less than 6 months and the filters are dirty, replace the dirty filters with new filters.

REPLACE PROCESSOR CABINET COOLING FAN UNIT AIR FILTERS PROCEDURE:

NOTE:
The processor cabinet contains two air filters in the J5D003FH-2 cooling fan unit, one directly above the fan unit and one directly below the fan unit. This subprocedure is for replacing both filters.

CAUTION:
Do not vacuum the used air filters. The used air filters should be replaced with new air filters to prevent metal filings from getting into the circuit pack area.

2.1. Obtain the following apparatus or equivalent (filters and retainers can be ordered from Universal Air Filter Company, P.O. Box 853, East St. Louis, IL 62203):

- Two Model UAF 252A1 replacement air filters (comcode 407277193)
- Two label type air filter retainers (comcode 407580513).

2.2. Open the processor cabinet front door to expose two fan unit air filters and four filter retainers.

NOTE:
Two types (a reusable plastic-loop type or single-use label type) of filter retainers may be used on your unit. Four plastic-loop type (two per filter) or two label type (one per filter) retainers hold the filters in place.

2.3. If equipped with the plastic-loop type filter retainers, remove the old air filter by firmly pulling on both filter retainers and sliding filter forward until it clears the filter mounting channels. (Use the same procedure for the upper and lower filters.)

If equipped with the label type filter retainers, remove the old air filter by loosening the filter retainer from the unit and then sliding the filter forward until it clears the filter mounting channels. (Use the same procedure for the upper and lower filters.)

2.4. Insert the new air filter with filter retainer(s) into the filter mounting channel.

NOTE:
If using the label type retainer, write the current date on the label and secure the label around the frame of the filter with the sticky side facing down.

2.5. If using the plastic-loop type retainers, slide the filter backward into the channels until the filter retainers clip into the two slotted areas on the filter housing unit. (Use the same procedure for the upper and lower filters.)

If using the label type retainer, slide the filter backward into the channels completely and then secure the label type retainer to the unit. (Use the same procedure for the upper and lower filters.)

2.6. Repeat Steps **2.3**, **2.4**, and **2.5** for the second filter.

2.7. Close rear cabinet door(s).

2.8. Close front cabinet door(s).

2.9. Dispose of the old air filters per local procedures.

3. Test the power switch function LEDs in the processor cabinet.

TEST POWER SWITCH FUNCTION LEDs IN PROCESSOR CABINET PROCEDURE:

3.1. At each of the circuit packs listed in Table 20-2, operate the **ACO-T** switch.

Table 20-2. Power Units and Associated Switch Location

Power Unit	Power Switch (Circuit Pack)	Test Point Cabinet Location	Notes
CU 0	TN1821	28-060	
CU 1	TN1821	53-060	
DFC 0	UN373/UN580	28-178	
DFC 1	UN373/UN580	53-178	
IOP 0	TN1820	19-080	
IOP 1	TN1820	45-080	
IOP 2	TN1820	11-026	
IOP 3	TN1820	62-026	
MHD 0	UN375	28-162	
MHD 1	UN375	53-162	
MHD 2	UN375	19-170	
MHD 3	UN375	45-170	
MHD *a**	UN375		†
DAT 0	UN376	19-186	
DAT 1	UN376		†

* Where *a* = member number(s) above 3.

† Position specified by application.

3.2. Are all LEDs lighted on the circuit pack?

- If **yes**, go to Step **3.4**.
- If **no**, continue to Step **3.3**.

3.3. Replace the faulty circuit pack. For details, refer to 254-303-102, *3B21D Computer Trouble Clearing Tasks*, and then repeat Step **3.1** in this procedure.

3.4. Return the **ACO-T** switch to normal.

4. **STOP! YOU HAVE COMPLETED THIS PROCEDURE**.

Glossary

A

ACHI
Application Channel Interface.

ACO-T
Alarm Cutoff-Test. A two-position rocker switch.

ACT
Active. A unit is currently in service.

AM
Administrative Module.

ASCII
American Standard Code for Information Interchange.

Asynchronous
A communications method in which time intervals between transmitted characters may be of unequal length and no clock is included with the transmission. Transmission is controlled by start and stop bits at the beginning and end of each character.

ATP
All Tests Pass.

Audit
Validity checks that are performed to assure the proper operation of diagnostic control structure and the accuracy of message and data.

B

Backplane
A large printed wiring assembly (PWA) that distributes DC power and logic signals between hardware modules. Most circuit pack modules plug into the backplane.

Baud Rate
A measure of the speed of data transfer from a computer to a peripheral device (such as a terminal) or from one device to another. Common baud rates are 300, 1200, 4800, and 9600. As a general guide, divide a baud rate by 10 to get the approximate number of English characters transmitted each second.

BOM
Beginning of Media.

BOP
Beginning of Partition.

BOT
Beginning of Tape.

Bus
One or more conductors that transmit control signals, data, or power. A bus usually acts as a common connection between several locations.

C

C/D
Control/Display.

CATP
Conditional All Tests Passed.

CC
Central Control. The control circuitry arithmetic logic unit, rotate and mask unit, general and special registers, maintenance channel, store address translator circuit, and optional cache memory unit that compose the CC.

CCIO
Central Control Input/Output.

CCIOD
Central Control Input/Output Data (bus).

CCITT
Consulative Committee for International Telegraph and Telephone.

CH
Channel.

CKL
Checklist.

Command
An instruction to the *UNIX** system shell program ended by a carriage return. By entering a command, the computer system performs one or more tasks.

CPDP
Common Processor Display Page.

* Registered trademark in the United States and other countries, licensed exclusively through X/Open Company Limited.

CPU
Central Processing Unit. A 32-bit MIPS* R2000A reduced instruction set computing (RISC) microprocessor clocked at 16.67 MHz. The term CPU also refers to the logical processor consisting of the three CPU modules.

CR
Carriage Return.

Craft Interface
The hardware, firmware, and software that allow the user access to the 3B21D computers and provide information about the status of the machine.

CRT
Cathode-Ray Tube. A tube that uses a phosphor coating to display data.

CU
Control Unit. That portion of the computer which is switched in and out of service as a unit. A CU includes a CC, a main store (MAS), a direct memory access (DMA) unit (when equipped), the input/output (IO) channels, and the power control unit.

D

DAP
Display Administration Process. A process that controls the graphic displays on the user terminal. It accepts requests from other processes via messages, changes its internal representation of the displayed page, and then displays it on the terminal.

DAT
Digital Audio Tape.

DCE
Data Communications Equipment.

DCI
Dual Serial Channel Computer Interconnect.

DCN
Device Control Number.

DDSBS
Duplex Dual Serial Bus Selector.

Demand Phase
A phase that has a long execution time and/or requires manual action to complete successfully. To execute a demand phase, the phase number must be specified or included in a range of phases, and the routine exercise (REX) or demand exercise (DEX) options must NOT be specified.

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* Registered trademark of MIPS Technologies, Inc.

DEX
Demand Exercise.

DFC
Disk File Controller. A unit that controls the operation of a portion of the disk storage facility of the *UNIX* Real-Time Reliable (RTR) operating system. This unit interfaces to an input/output (IO) channel and to a moving head disk (MHD) drive.

DFCA
Disk File Controller A (UN373 circuit pack).

DFCB
Disk File Controller B (TN2116 circuit pack).

DGN
Diagnostic.

Differential SCSI
A receiver/driver design for the small computer system interface (SCSI) bus that provides for a maximum bus length of 25 meters (versus 6 meters for the single-ended SCSI bus). The differential SCSI bus is used with the optional 9-track tape drive.

DLP
Detailed Level Procedure. This Task Oriented Practice (TOP) data element provides instructions on how to perform a specific portion (step) of a task.

DMA
Direct Memory Access. A method used to perform high-speed data transfers between memory locations without CPU involvement.

DMAC
Direct Memory Access Controller. The system unit that provides main store (MAS) access control for input/output devices without requiring direct control from the CC.

DML
Data Manipulation Language.

DMQ
Deferred Maintenance Queue.

DPL
Documentation Plan. This Task Oriented Practice (TOP) documentation element lists all of the TOP volumes covering a system. This listing helps you to quickly determine the correct volume to use for a particular category of tasks.

DSCH
Dual Serial Channel. A system component that provides serial interfaces for up to 16 devices.

DTE
Data Terminal Equipment.

DUP
Disk Unit Package.

E

EAI
Emergency Action Interface. The EAI provides an interface between a CU and a serial data link for effecting various manual override functions such as ''force on-line,'' ''stop and switch,'' and so forth. The EAI is part of the maintenance interface.

ECD
Equipment Configuration Database. A database that describes the physical and logical configurations of the 3B21D computers and peripheral hardware. It also contains configuration and control information for the audit and operator interface software systems.

ECD Common Access Functions (ECDFUNC)/Low-Level Access (LLA)
The ECDFUNC and LLA commands are used together to provide kernel (read-only user) access to the ECD.

ECDFUNC
Equipment Configuration Database Common Access Functions.

EIA
Electronic Industries Association.

EIA-232-D
An Electronics Industries Association standard for serial binary communications. The January 1987 revision of this standard replaces the EIA recommended standard RS-232-C. (Refer to RS-232-C.)

EIH
Error Interrupt Handler. A process that keeps track of the source and level of all system initializations. It also maintains the record of each level of processor error interrupts.

EOT
End of Tape (marker).

EQL
Equipment Location.

ESAC
Electronic Systems Assistance Center.

Ethernet
A widely-used base-band local area network specification developed by Xerox, Intel, and DEC. It utilizes coaxial cable and transceivers to interconnect computer equipment.

F

FA
Fuse Alarm.

FFU
Fuse and Filter Unit.

FOFL
Force Off-Line.

FRV
Flashing Reverse Video.

G

GB
Gigabyte. One billion bytes.

Generic
A release of hardware or software.

Grow
The state of a unit while it is being added to the system (grown).

H

HA
Host Adapter.

Host
A computer system that is configured to share resources, such as disks and printers, in a networked environment.

HSD
High-Speed Data Link.

HSDC
High-Speed Data Link Controller.

I

ID
Identification.

IM/OM
Input Messages/Output Messages.

IMR
Information Modification Request.

Incore Database
A database read from a disk that is resident (incore) in the machine.

Initialization
An action taken to provide the system with a known good and operating configuration.

Initialization Level
A value of initialization level counter. The severity of the action taken to recover the system integrity is dependent on the counter value. The higher the value, the more drastic the action taken to recover the system.

Inode
An element of a file system. An inode specifies all properties of a particular file and locates the contents of the file, if any.

Interrupt
A signal, caused by a break or an interrupt character, that normally terminates a process. It is also a signal generated by a hardware condition or a peripheral device.

IO
Input/Output.

IOP
Input/Output Processor. A front-end processor that permits the connection of a variety of data terminals utilizing a variety of line protocols. The IOP contains a peripheral interface controller, an IOP interface, and two microprocessor communities. Each microprocessor community connects to a number of data terminals.

IP
Information Product.

IXL
Task Index List. This Task Oriented Practice (TOP) documentation data element contains an alphabetical listing of tasks covered in the associated TOP volume.

L

LDFT
Load Disk from Tape.

LED
Light-Emitting Diode. A semiconductor that emits visible light.

Link
An entry for an existing file to a directory.

LLA
Low-Level Access.

M

Maintenance Terminal
The terminal that is used for exchange of maintenance information/commands between the maintenance person and the computer. It is also referred to as maintenance cathode ray tube (MCRT) or maintenance teletypewriter (MTTY).

MAN
Manual.

Manual Input Commands
Program Documentation Standards (PDS) and Man-Machine Language (MML) format input commands that allow the user to query and request system services.

MAS
Main Store. The system unit that provides storage for program instructions and data. It is composed of solid-state memory devices and provides up to 4 megabytes of storage.

MASA
Main Store Array. The circuit that provides for the storage of words.

MASB
Main Store Bus.

MASC
Main Store Controller. The circuit that provides control interface between the main store bus (MASB) and the memory devices.

MASK
A line card register for masking out errors noted by the ERROR register.

Mb
Megabit.

MB
Megabyte. When referring to disk drives, a megabyte is 1 million bytes. When referring to main store memory, a megabyte is 2^{20} bytes (1,048,576 bytes).

MC
Microcontrol or Microcontroller. The portion of the CC that controls the sequencing of microstore and decoding of microinstructions. MC provides control signals for the CC circuitry.

MCC
Master Control Center.

MCH
Maintenance Channel. The CC component that provides a serial access between CUs.

MCRT
Maintenance CRT.

MDCT or mdct
Minor Device Chain Table.

Message
The mechanism that transfers data from one process to another.

MHD
Moving Head Disk.

MHDC
Moving Head Disk Controller.

Mirroring
A procedure that associates a special device file (*dev/dsk/mirn*, where *n* is an integer) with a pair of disk partitions.

MIS
Microstore or Microinstruction Store. The portion of the CC that provides memory containing the microprogram used for instruction decoding and overall control of the CC.

MLTS
Microlevel Test Set.

MMGR
Memory Manager.

MML
Man-Machine Language.

MOR
Manual Override.

MSGS file
An ordered list of executable commands used to install changes to the system using field update.

MT
Magnetic Tape.

MTC
Magnetic Tape Controller.

MTTY
Maintenance Teletypewriter.

MTTYC
Maintenance Teletypewriter Controller.

MTU
Magnetic Tape Unit.

N

N/A
Not Applicable.

Network
The hardware and software that connect computer systems, permitting electronic communications between the systems and associated peripherals.

NPH
Network Protocol Handler.

NTP
Nontrouble Procedure. This Task Oriented Practice (TOP) data element contains an ordered listing of all the steps necessary to perform a task.

NTR
No Tests Run.

O

OFL
Off-Line. The unit that is not in active control of the system configuration and execution, but may be actively performing off-line functions; for example, executing diagnostics.

On-Line
The unit that is in active control of the system configuration and execution. Its mate, the off-line CU, may be active (executing diagnostics) but is not in control.

Operating system
A set of programs (or software) that controls the computer system. The nucleus of the *UNIX* Real-Time Reliable (RTR) operating system is the kernel, which manages the resources of the computer. The operating system takes care of such things as IO procedures, process scheduling, and the file system which relieves user programs of these tasks.

OOS
Out of Service.

P

Page
A fixed length, 4-kB block that has a virtual address and can be transferred between main and secondary storage.

Paging
The process by which programs are divided into pages and transferred between main and secondary.

PC
Peripheral Controller.

PDE
Page Descriptor Entry.

PDF
Power Distribution Frame.

PDS
Program Documentation Standard.

PECC
Product Engineering Control Center.

pfile
3B21D computer's executable process file.

PGT
Page Table. A list of physical pages in main memory that belong to a segment. Each member of the list is referred to as a page table entry. The MMGR administers an array of PGTs and allocates a PGT to every segment that resides in main memory.

PRM
Processor Recovery Message.

Process
An executing program with its own input, output, and ''parent'' program that initiated the program.

PROM
Programmable Read-Only Memory.

PSU
Port Switch Unit.

PSSDB
Port Switch and Scanner-Distributor Buffer.

PU
Peripheral Unit.

PWA
Printed Wiring Assembly. A flat board made of multiple layers that holds chips and other electronic components and contains the conductive pathways between them.

Q

Queue
A waiting list usually consisting of processes or tasks waiting for processor time to execute.

R

RAM
Random Access Memory. A type of memory that can be written to or read from in any address location in any order. The contents of RAM are lost when power is removed.

RC/V
Recent Change and Verify. A procedure used for creating or modifying records in the ECD.

RDY
Ready.

ROM
Read-Only Memory. A type of memory in which data is stored permanently. Data can be read from but not written to ROM. Instructions and data used repeatedly without change are often kept in ROM.

Real-Time
Pertains to computation performed while the related physical process is taking place. Results of the computation can be used in guiding the physical process.

REX
Routine Exercise.

RISC
Reduced Instruction Set Computing. A microprocessor architecture that implements a smaller instruction set and, thereby, turns much of the low-level control of the machine over to software. A RISC processor, by using only the simplest instructions that predominate in system kernels and object modules, improves performance by reducing cycles per instruction and time per cycle.

Root
The directory that constitutes the origin of the directory hierarchy in a file system. Specifically, the origin for the file system with the pathname.

ROP
Receive-Only Printer. Output device printer.

ROS
Request Out of Service.

Routine Exercise Phase
The diagnostic phase which is run automatically when the requesting process is REX, when specified in the command line, or when REX or DEX options are used.

ROS/RST
Request Out of Service/Restore. A two-position rocker switch that sends a request via scan points to remove the associated unit from service or to restore the associated unit to service.

RQIP
Request In Progress.

RS-232-C
A recommended standard published by the Electronics Industries Association (EIA) that specifies the mechanical and electrical characteristics of the interface for connecting data terminal equipment (DTE) and data communications equipment (DCE). It defines interface circuit functions and their corresponding connector pin assignments. The standard applies to both asynchronous and synchronous serial, binary data transmission at speeds up to 20 kbps in full- or half-duplex mode. This recommended standard was replaced by the EIA standard EIA-232-D and is functionally compatible with the CCITT Recommendation V.24.

RST
Restore.

RTR
Real-Time Reliable.

RV
Reverse Video.

S

SBUS
Small Computer System Interface Bus.

SC
Scan Point.

SCC
Switching Control Center.

SCCS
Switching Control Center System.

SCSD
Scan Point and Signal Distributor.

SCSDC
Scan Point and Signal Distributor Controller.

SCSDOPT
An ECD record that gives the option name for the SCSD PC in the IOP.

SCSI
Small Computer System Interface. An interface standard (ANSI X3.131-1986) for an input/output bus used to connect peripheral devices and processors (SCSI devices). A SCSI device requests access to (and gains control of) the SCSI bus in order to perform data transfers with other SCSI devices using a well-defined set of commands.

SCSI ID
The bit representation of the SCSI address referring to one of the signal lines DB(7-0).

SD
Signal Distributor.

SDC
Store Data Control.

SDL
Synchronous Data Link.

SDLC
Synchronous Data Link Controller.

Segment
A logically related portion of main memory with consecutive virtual addresses.

Serial Channel
A system component that provides a 16- or 32-bit serial data interface to input/output devices.

SG
System Generation.

SIMM
Single In-line Memory Module.

Single-Ended SCSI
Receiver/driver design for the SCSI bus that allows extremely fast data transfer rates over the bus. The total bus length is limited to 6 meters including PWA wiring and cables. This is the standard SCSI bus used to control disk and cartridge tape modules.

SMD
Storage Module Drive.

SPU
SCSI Peripheral Unit.

SRC
Source (bus).

STBY
Standby. The state of a unit that is operational and available for immediate service. It is either not communicating or is not the active half of a duplex pair of devices.

STF
Some Tests Fail.

STK
Storage Tek.

ST/ON/OFF
Start/On/Off. A three-position rocker switch.

SU
Software Update.

SV
Steady Video.

Synchronous
A communications method in which there is a constant time between successive bits, characters, or events. The timing is achieved by the sharing of a clock signal between the transmitter and receiver.

System Console
A terminal connected to the system console port on the system PPC and typically is used for administrative, control, and maintenance functions for the system.

System Memory
The combination of main store memory and all other memory for the system.

System Update
The procedure used to introduce an entire new generic, as opposed to selected fixes, on the 3B21D computers.

T

TAD
Trouble Analysis Data. This Task Oriented Practice (TOP) data element provides data (such as schematics) that are helpful in clearing troubles or faults.

TAP
Trouble Analysis Procedure. This Task Oriented Practice (TOP) data element contains a procedure for clearing a specific trouble or fault.

TLP
Trouble-Locating Procedure. This Task Oriented Practice (TOP) data element lists the causes of the fault in order of probability (that is, the most likely cause first, the least likely cause last).

TNG
Training. This Task Oriented Practice (TOP) data element instructs users on how to use TOP documentation.

TOF
Top of Form.

TOP
Task Oriented Practice. A programmed document that gives users step-by-step instructions for performing jobs or tasks.

TTY
Teletypewriter.

TTYC
Teletypewriter Controller. The control circuit that interfaces to an IOP and provides communication to two TTYs.

TTYPC
TTY Peripheral Controller.

U

UC
Utility Circuit. The optional system unit that provides address and data matchers and transfer trace capability. This unit is used for software debugging.

UCB
Unit Control Block.

UCL
Unconditional.

ULARP
User-Level Automatic Restart Process.

UNAV
Unavailable.

UNEQ
Unequipped.

V

VOM
Volt-Ohmmeter.

VTOC
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