UNISYS

PUBLICATIONS REVISION

Operating System/3 (OS/3)

System 80 Models 8/10/20 Processor and Central Peripherals Operating Guide

UP-9608 Rev.1

This Library Memo announces the release and availability of *System 80 Models 8/10/20 Processor and Central Peripherals Operating Guide,* UP-9608 Rev. 1.

This System 80 models 8/10/20 are powerful, flexible data processing systems. These systems feature integrated hardware and the advanced Unisys Operating System/3 (OS/3).

This manual provides hardware-oriented information for the operation of the System 80 models 8/10/20 central processing equipment and peripheral devices. It is intended for the system operator and describes the operation of all equipment that may be used in a minimum system configuration. This includes descriptions of controls and indicators, procedures such as power on and power off, and basic error recovery routines.

This revision documents operating procedures for the:

- 8480 disk storage unit
- 0770 II line printer

It also includes procedures that explain how to provide a detailed error description when requesting corrective maintenance for models 10 and 20

Destruction Notice: If you are going to OS/3 Release 11.0, use this revision and destroy all previous copies. If you are not going to OS/3 Release 11.0, retain the copy you are now using and store this revision for future use.

Copies of UP-9608 will be available for 6 months after the release of 11.0. Should you need additional copies of this edition, you should order within 90 days of the release of 11.0. When ordering the previous edition of a manual, be sure to identify the exact revision desired and indicate that it is needed to support an earlier release.

Additional copies may be ordered through your local Unisys representative.

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Mailing Lists MBZ, MCZ (less MDE, MGZ, MHA), MMZ, MB00, MB01, M28U, and M29U	Mailing Lists MBA8, MDE, MGZ, MHA, and MBW (252 pages plus Memo)	Library Memo for UP-9608 Rev.1 RELEASE DATE: September 1987

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PUBLICATIONS UPDATE

System 80 Models 8/10/20

Processor and Central Peripherals Operating Guide

UP-9608 Rev. 1-A

This Library Memo announces the release and availability of Update A to *System 80 Models 8/10/20 Processor and Central Peripherals Operating Guide,* UP-9608 Rev. 1.

The System 80 models 8/10/20 are each powerful, flexible data processing systems. These systems feature integrated hardware and the advanced Unisys Operating System/3 (OS/3).

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This update documents operating procedures for the 8494 disk subsystem, new error messages that may be generated during initial microprogram loading or initial program loading, and additional minor corrections.

Copies of Update A are now available. You can order the update only, or the complete manual with the update, through your local Unisys representative. To receive only the update, order UP-9608 Rev.1-A. To receive the complete manual, order UP-9608 Rev.1.

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Using This Manual

Purpose

This manual provides hardware-oriented information for the operation of the System 80 models 8, 10, and 20 central processing equipment and peripheral devices. It is intended for the system operator and describes the operation of all equipment that may be used in a minimum system configuration. Unless otherwise indicated, the information in this manual applies to all three models: 8, 10, and 20.

Organization of This Manual

This manual has three sections:

- Section 1. Introduction

  Explains system operator responsibilities and describes the minimum system configuration for the model 8 and for the models 10/20. This section also lists those manuals that describe operating procedures for peripheral equipment used on expanded versions of the models 8/10/20.

- Section 2. Controls and Indicators

  Illustrates and describes all operating controls of the processor and peripherals.

- Section 3. Operation

  Describes how to turn on power to the system, set up the peripheral devices for operation, and initiate system operation.

- Appendix A. System 80 Models 10/20 Operator's Maintenance Procedures

  Explains how to provide a detailed error description to a Unisys customer service engineer when corrective maintenance is required on the models 10/20.

- Appendix B. List of Acronyms

  Lists acronyms found throughout the manual.

After initial operation of the system has begun, the operator should refer to the *OS/3 Operations Handbook*, UP-8859 for instructions on using the system software.

Contents

FIGURES (cont)

TABLES

1. Introduction

This manual contains information and procedures for operating a minimum configuration of the System 80 models 8/10/20 processors and associated central peripheral devices (Figures 1-1, 1-2). The models 10/20 processor has extended capabilities over the model 8 processor, and can be used for a much wider range of computing requirements.

1.1. OPERATOR RESPONSIBILITIES

As a system operator, you are responsible for system startup and operator maintenance. To assume these responsibilities, you must first be familiar with the location and function of all controls, indicators, and circuit breakers accessible to you. You must also be familiar with diagnostic and remote maintenance procedures described in the appropriate operator reference manuals for the peripheral devices.

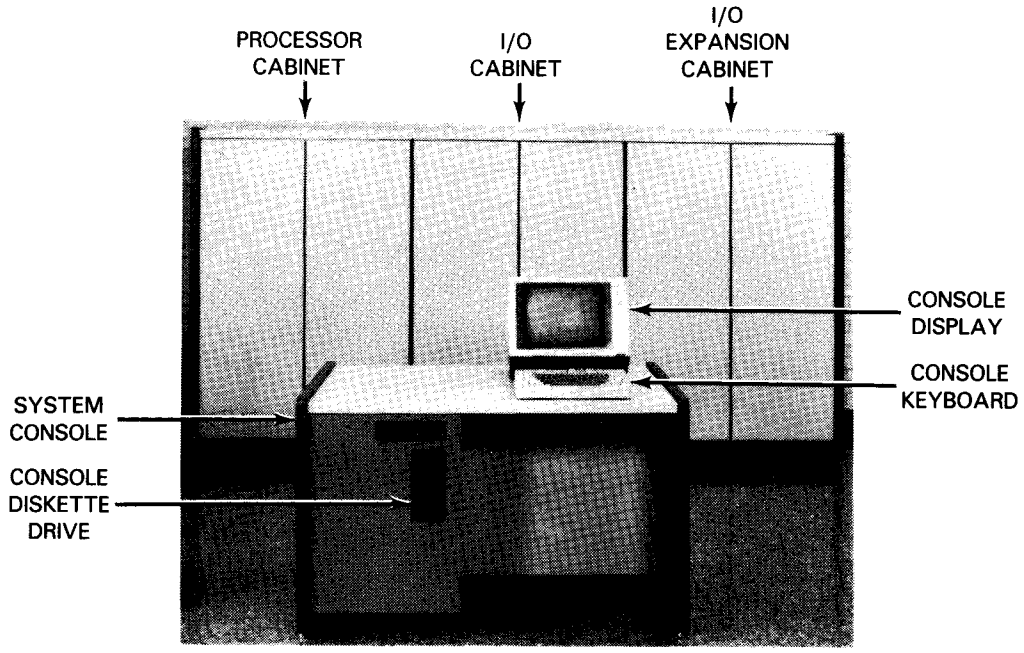


Figure 1-1. System 80 Model 8 Central Processor

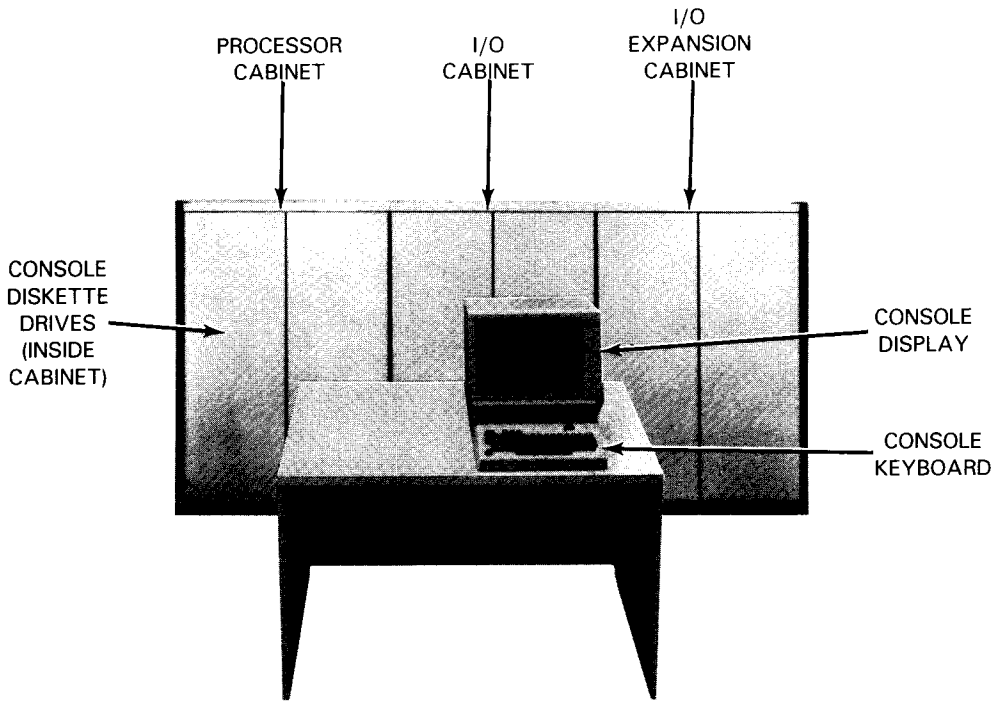


Figure 1-2. System 80 Models 10/20 Central Processor

Central hardware components of a minimum system configuration that have operator controls (for which you have partial responsibility) include:

- Processor power supplies
- Processor operator/maintenance panel
- System console
- Diskette drives
- Disk drives
- Printers

Other documents describing operating procedures for peripheral equipment used on the expanded versions of the system are listed in Table 1-1.

Information presented in this manual is intended only to guide the operator in preparing the equipment for using the OS/3 software. Instruction manuals relative to OS/3 are listed in the OS/3 library, or they are available through a customer representative.

Descriptive details on functional characteristics of the processor, I/O cabinet, and I/O expansion cabinet can be found in current versions of the hardware manuals listed in Table 1-2.

Table 1-1. System 80 Models 8/10/20 Operator Related Manuals

Document Number*	Title
UP-8896	0608 Card Punch, Operator Reference
UP-7921	0716 Card Reader, Operator Reference
UP-8617	0719 Card Reader, Operator Reference
UP-8361	8416/8418 Disk Subsystems, Operator Reference
UP-8242	8430 Disk Subsystem, Operator Reference
UP-8343	8433 Disk Subsystem, Operator Reference
UP-8917	8417 Disk Subsystem, Operator Reference
UP-8919	8419 Disk Subsystem, Operator Reference
UP-10004	8470 Disk Subsystem, Operator Reference
UP-11626	2200/200 Systems and System 80 5074/8494 Disk Subsystem Operations Guide ←
UP-8910	Workstation, Operator Guide
UP-9710	System Console, Operator Maintenance Guide
UP-7938	0770 Printer, Operator Reference
UP-9013	0770 Printer, Operator Recovery Summary
UP-11894	0770 II Printer Subsystem, Operator Reference
UP-8250	0776 Printer, Operator Reference
UP-8908	0789 Printer, Operator Reference
UP-9041	0791 Correspondence Quality Printer, Operator Reference
UP-9160	0797 Printer, Operator Guide
UP-8882	0798 Printer, Operator Guide
UP-8609	0871 Magnetic Tape Subsystem, Operator Reference
UP-8207	UNISERVO 10 and 14 Magnetic Tape Subsystems, Operator Reference
UP-7882	UNISERVO 12/16 Magnetic Tape Subsystems, Operator Reference
UP-7956	UNISERVO 20 Magnetic Tape Subsystem, Operator Reference
UP-8903	UNISERVO 22/24 Magnetic Tape Subsystems, Operator Reference
UP-10009	UNISERVO 26/28 Magnetic Tape Drives, Operator Reference
UP-9381	3782 Streaming Magnetic Tape Subsystem, Operator Reference

(continued)

Table 1-1. System 80 Models 8/10/20 Operator Related Manuals (cont)

Document Number*	Title
UP-9164	8406 Double-Sided Diskette Subsystem, Operator Guide
UP-8358	Universal Terminal System (UTS) 400, Operator Guide
UP-7788	UNISCOPE Display Terminal, Operator Reference
UP-11536	SVT 1121 User Guide

* Refer to current version.

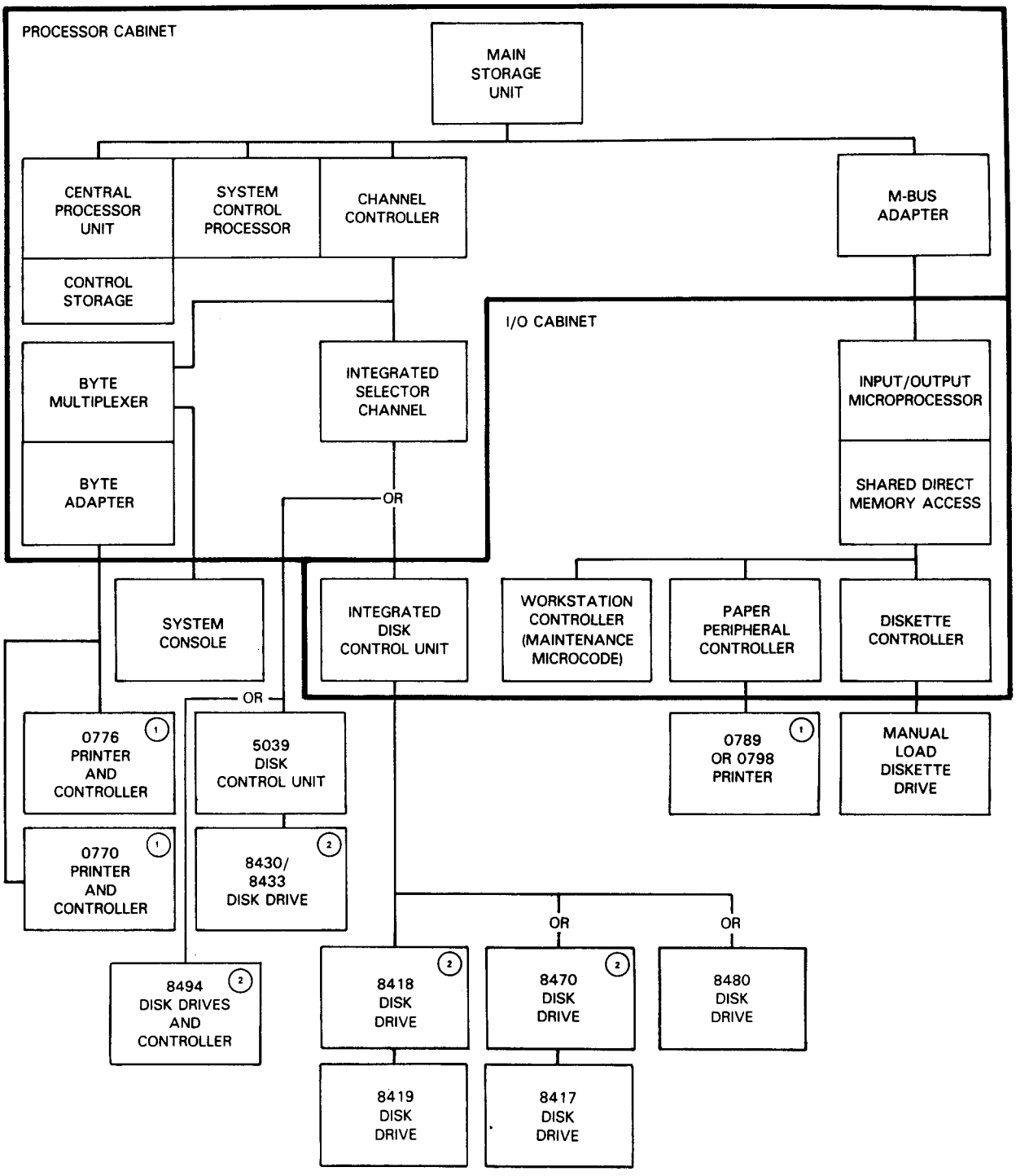
Table 1-2. System 80 Models 8/10/20 Processor Description Manuals

Document Number*	Title
UP-9386	System 80 Model 8 System Description
→ UP-12443	System 80 Models 10/20 Capabilities Overview
→ UP-9607	System 80 Models 8/10/20 Processor Complex Controllers, Programming Reference Manual, Volume 1: Controllers of the Selector Channel and Byte Multiplexer
UP-9692	System 80 Models 8/10/20 Processor, Programmer Reference Manual
→ UP-9732	System 80 Models 8/10/20 Processor Complex Controllers, Programming Reference Manual, Volume 2: Controllers and Communications Channels of the I/O Processor

* Refer to current version.

1.2. SYSTEM CONFIGURATION

The model 8 minimum system configuration is illustrated in Figure 1-3; Figure 1-4 illustrates the models 10/20 minimum system configuration. Operating information in this manual is confined to the minimum system. Operating procedures for equipment other than that shown in Figures 1-3 and 1-4 are described in the appropriate manuals listed in Table 1-1.

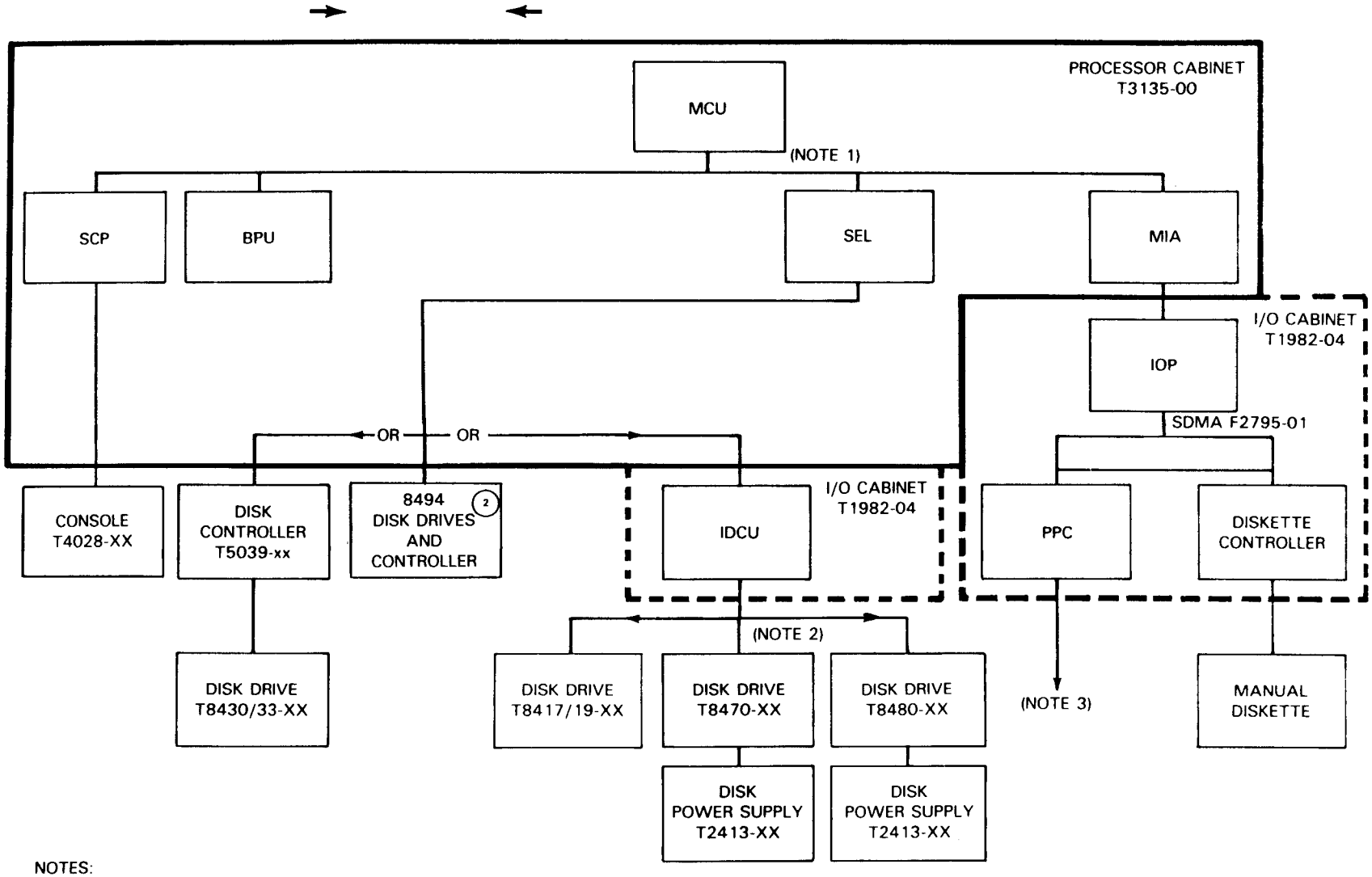


NOTES:

1 One type 0770, 0776, 0789, or 0798 printer with maximum aggregate data rate of 1500 lines per minute (lpm) is required.

2. At least 50 MB is required from two disk drives type 8418, 8419, 8430/8433 or 8494, or from one disk drive type 8417, 8470, or 8480.

Figure 1-3. System 80 Model 8 Minimum Configuration



NOTES:

1. 2MB minimum memory for model 10. 4MB minimum memory for model 20.
2. Minimum disk configuration 50MB on one drive or at least two drives of the following types: 8419, 8430, 8433, 8494.
3. PPC required if required line printer is not configured on SEL.

Figure 1-4. System 80 Models 10/20 Minimum Configuration

1.3. CONSOLE

You perform all communication with the system at the system console with the console keyboard and display (Figures 1-1, 1-2). The console keyboard and display have different characteristics from workstations used throughout the system. You should be familiar with these characteristics, the keyboard used with the system console (described in 2.2.3), as well as with operating procedures (3.3). The system console display characteristics are listed in Table 1-3 (model 8) and Table 1-4 (models 10/20).

Table 1-3. Model 8 System Console Display Characteristics

Parameter	Characteristics
Display screen	12-inch monochrome cathode ray tube (CRT)
Display format	80-character lines, 25 lines
Display area	8.25 inches (210 mm) wide x 6 inches (150 mm) high
Character size	0.08 inch (2 mm) wide x 0.12 inch (3 mm) high
Character set	26 alphabetic and 10 numeric
Display color	Green
Cursor blinking	Underline (–) blinking
Display background	Normal/pale tone/blink
Display method	Raster scanning
Character formation	7 x 9 dot matrix
Code	JIS 7-channel code
Communications protocol	Total 10 bits, consisting of 7 data, 1 start, 1 stop, and 1 parity bit
Interface circuit	Current loop
Parity check	Vertical parity check; receiving data with erroneous parity causes buzzer to sound and data to be displayed with a 7 x 9 dot matrix mark
Cursor control	■ Cursor home ■ New line ■ Carriage return ■ Cursor up, down, left, and right ■ Cursor position assignment
Edit	■ Clear ■ Line delete
Key-in	■ Data input via keyboard to controller ■ Data returned from controller is displayed on screen.

Table 1-4. Models 10/20 System Console Display Characteristics

Parameter	Characteristics
Display screen	12-inch monochrome cathode ray tube (CRT)
Display format	80-character lines, 25 lines
Display area	8.25 inches (210 mm) wide x 6 inches (150 mm) high
Character size	0.08 inch (2 mm) wide x 0.12 inch (3 mm) high
Character set	26 alphabetic, 10 numeric, and 77 symbolic
Display color	Green
Cursor blinking	Full dot blinking
Display background	Normal/pale tone/blink
Display method	Raster scanning
Character formation	7 x 9 dot matrix
Code	JIS 7-channel code
Communications protocol	■ Full duplex ■ 9600 bps ■ Synchronous start-stop ■ Total 10 bits, consisting of 7 data, 1 start, 1 stop, and 1 parity bit
Interface circuit	Current loop
Parity check	Vertical parity check; receiving data with erroneous parity causes buzzer to sound and data to be displayed with a 7 x 9 dot matrix mark
Cursor control	■ Cursor home ■ Cursor left and right ■ Cursor position assignment
Edit	■ Clear ■ Line delete
Key-in	■ Data input via keyboard to controller ■ Data returned from controller is displayed on screen.

1.4. CONSOLE DISKETTE DRIVE

The manual diskette drive in the system console operates similarly to freestanding diskette drives with manual loading capabilities, such as the Type 8422 Diskette Drive. The characteristics of the diskette drive in the system console are listed in Tables 1-5 (model 8) and 1-6 (models 10/20).

Table 1-5. Model 8 Console Diskette Drive Characteristics

Parameter	Characteristics
Sheet	1 diskette sheet
Recording format	128 bytes per sector, 26 sectors per track
Recording surface	1
Tracks per surface	1 index track, 74 data tracks, 2 space tracks
Storage capacity	246K bytes per sheet
Transfer rate	31.25K bytes per second
Recording method	FM, bit serial
Recording density	3268 bits/inch (bpi) maximum 48 tracks/inch (tpi)
Revolution speed	360 rpm
Headload time	50 ms

Table 1-6. Models 10/20 Console Diskette Drive Characteristics

Parameter	Characteristics	Characteristics
Sheet	1 diskette sheet	1 diskette sheet
Recording format	128 bytes per sector, 26 sectors per track	256 bytes per sector, 26 sectors per track, 52 sectors per cylinder
Recording surface	1	2
Tracks per surface	1 index track, 74 data tracks, 2 spare tracks	1 index track, 74 data tracks, 2 spare tracks
Storage capacity	246K bytes per sheet	1M bytes per sheet
Transfer rate	31.25K bytes per second	62.5K bytes per second
Recording method	FM, bit serial	MFM, bit serial
Recording density	3268 bits/inch (bpi) maximum 48 tracks/inch (tpi)	6536 bits/inch (bpi) maximum 48 tracks/inch (tpi)
Revolution speed	360 rpm	360 rpm
Headload time	50 ms	50 ms

2. Controls and Indicators

This section describes the switches, controls, and indicators used to operate minimum configurations of the System 80, models 8, 10, and 20 processing systems. You have access only to those switches and controls described in this section. Access to other switches and controls inside the processor cabinets, or inside cabinets of peripheral devices not described here, is limited to authorized customer engineers.

This section also describes the peripheral devices included in a minimum configuration. A minimum configuration contains:

- At least two disk drives from types 8418, 8419, 8430/8433 or 8494; or one disk drive from types 8417, or 8470/80 ←
- A manual load diskette drive (the autoload drive is also described for convenience to the operator)
- A system console
- One printer selected from types 0770, 0776, 0789, and 0798

2.1. PROCESSOR CONTROLS AND INDICATORS

Most operator functions are performed at the system console (2.2). This lets you access the processor and system for performing specific computing functions.

Power for the processor and system is normally controlled at the system console (after primary power has been turned on at the wall switch or circuit breaker panel at the site installation) and at the processor cabinet circuit breakers. Contact installation personnel for site power control location. This manual describes procedures for system power turn on for the processor and peripherals.

2.1.1. System Control Panel

The system control panel contains controls and indicators used for operator maintenance during system operation. On the model 8, the system control panel is located on the system console. On the models 10/20, the system control panel is physically attached to the console keyboard.

If you are unable to correct a fault and service is required, inform the customer engineer of the indicator conditions. A toll-free number is available for remote assistance and diagnostics. If you are a model 8 user, see the *Model 8 Operators Maintenance Guide*, UP-9710. Appendix A of this manual contains operator maintenance procedures for the models 10/20.

The system control panels are shown in Figure 2-1 (model 8) and Figure 2-2 (models 10/20). Controls and indicators for the models 8/10/20 are listed and described in Table 2-1.

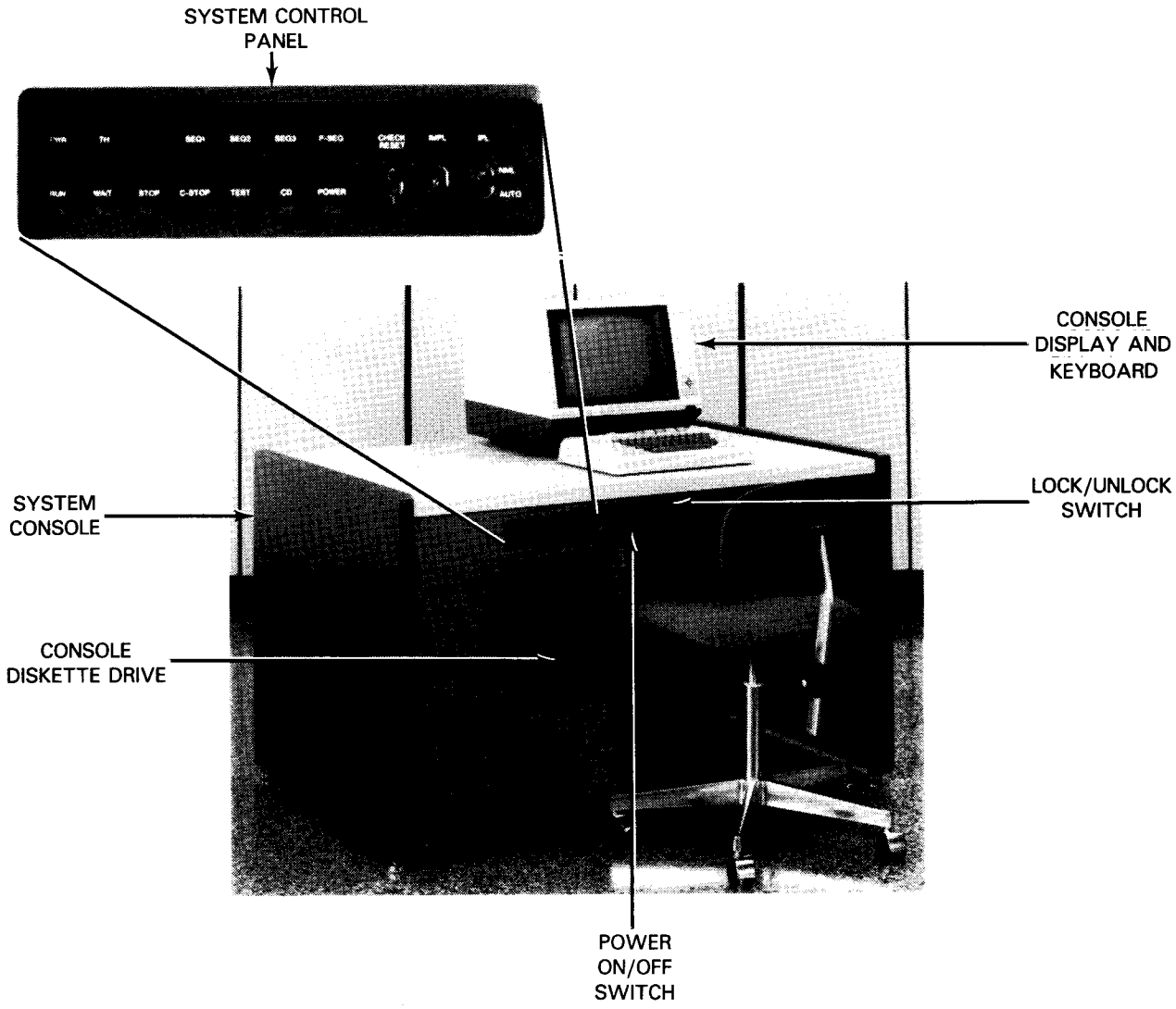


Figure 2-1. Model 8 System Control Panel

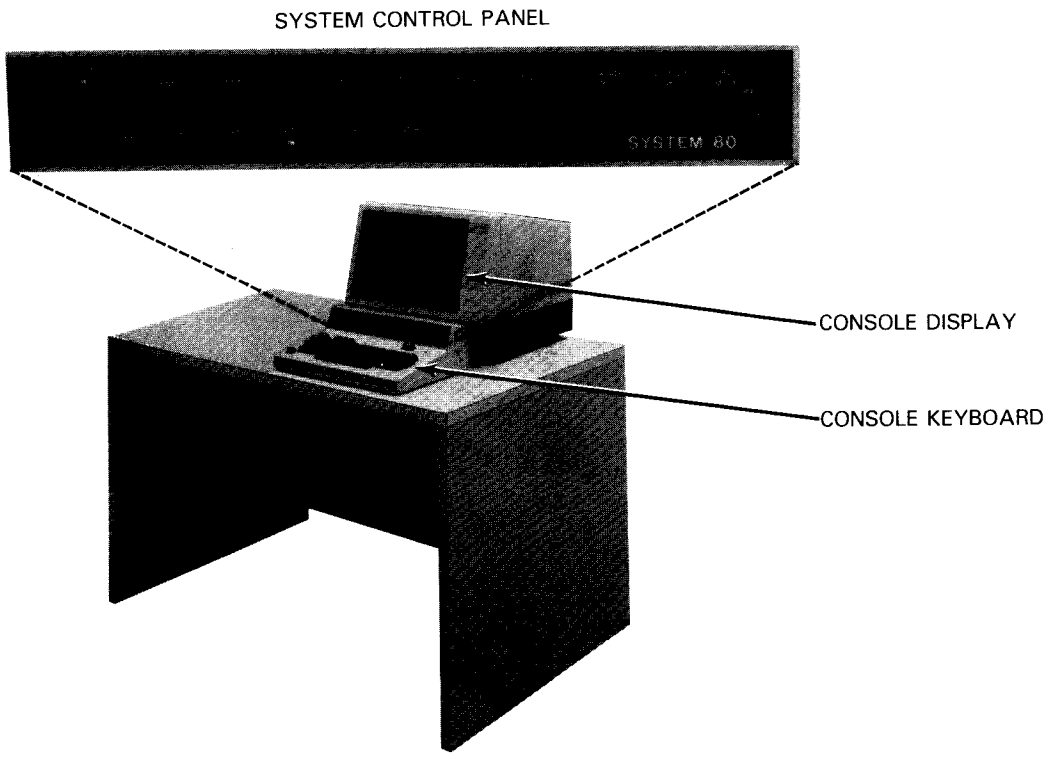


Figure 2-2. Models 10/20 System Control Panel

Table 2-1. System Control Panel, Controls and Indicators

<table>
<tr><th>Control/Indicator</th><th>Function</th></tr>
<tr><td>PWR check indicator</td><td>Indicator lights and alarm buzzer sounds in console display when a fault is detected in any of the DC power supplies in the processor. System power is turned off with this indication. Actuating the CHECK RESET switch silences the buzzer, but the indicator remains lit until the fault is corrected.</td></tr>
<tr><td>RUN indicator</td><td>Indicates the system is operating in run state. The manual frame is displayed on the console display screen and indicates the processor state.</td></tr>
<tr><td>TH early warning indicator</td><td>Indicator lights and alarm buzzer sounds in console display when the processor cabinet cooling fan motor rotation drops below the required speed. Because internal cabinet temperature rises shortly after fan speed is reduced, system power is turned off. Actuating the CHECK RESET switch silences the buzzer, but the indicator remains lit until the fault is corrected.</td></tr>
<tr><td>STOP indicator</td><td>Indicates the processor is in stop state. This state is also indicated on the manual frame on the console display.</td></tr>
<tr><td>SEQ1, SEQ2, and SEQ3 indicators</td><td>All three indicators light when power is turned on or when an initial microprogram load (IMPL) starts. The indicators extinguish when the power-on self tests are confirmed normal. If a fault is detected, the alarm buzzer sounds and the lit indicators display the fault as follows:
<table>
<tr><th>SEQ1</th><th>SEQ2</th><th>SEQ3</th><th>Indication</th></tr>
<tr><td colspan="4">During power-on sequence:</td></tr>
<tr><td>●</td><td>●</td><td>●</td><td>Power sequencing on</td></tr>
<tr><td>○</td><td>●</td><td>●</td><td>ROM/RAM operation verified</td></tr>
<tr><td>○</td><td>○</td><td>●</td><td>Diskette drive operation verified</td></tr>
<tr><td>○</td><td>○</td><td>○</td><td>0.5-second timer verified</td></tr>
<tr><td colspan="4">During system operation:</td></tr>
<tr><td>●</td><td>●</td><td>○</td><td>ROM parity error</td></tr>
<tr><td>●</td><td>○</td><td>●</td><td>RAM parity error</td></tr>
<tr><td>●</td><td>○</td><td>○</td><td>Message output</td></tr>
<tr><td>○</td><td>●</td><td>○</td><td>Diskette drive error</td></tr>
<tr><td>○</td><td>○</td><td>●</td><td>Line not correctly connected (model 8 only)</td></tr>
</table>
LEGEND:
● Indicator lit
○ Indicator extinguished</td></tr>
<tr><td>WAIT indicator</td><td>Indicates the processor is in wait state</td></tr>
<tr><td>C-STOP indicator</td><td>Indicator lights and alarm buzzer sounds in console display when the system is in check-stop state. In this state, the system control panel continues to function normally and contents of registers in the system processors are displayed at the processor cabinet for the customer engineer. Actuating the CHECK RESET switch silences the buzzer. A system reset extinguishes the C-STOP indicator.</td></tr>
</table>

(continued)

Table 2-1. System Control Panel, Controls and Indicators (cont)

Control/Indicator	Function
TEST indicator	Indicates the processor is in test state when lit, and extinguishes when the following conditions have been corrected: ■ Processor control is in step state. ■ Processor check-stop control is not in normal state. ■ The address stop mode is verified. ■ The input/output processor is in offline mode. (model 8 only) ■ A specified input/output controller is in offline mode. (model 8 only) ■ The system power margin switch is not in normal state. ■ The processor is set to a special diagnostic (DIAG) mode.
CD indicator	The carry-detect condition from a remote console modem indicates the remote console is online with the processor. The indicator extinguishes when the remote console disconnects from online mode.
P-SEQ indicator	Indicates the power-on sequence is in progress. The indicator lights when the POWER switch on the system console is turned on and is extinguished when the power-on sequence completes successfully.
POWER indicator	Indicates the power-on sequence has completed successfully and remains lit while power is on.
CHECK RESET switch	Actuating the switch silences the alarm buzzer in the console display.
IMPL switch	Initiates initial microprogram loading. If an error occurs during IMPL, the SEQ1, SEQ2, or SEQ3 indicator lights. The configuration control frame is displayed on the console display screen when IMPL completes normally.
IPL NML/AUTO switch	Specifies normal (NML) or automatic (AUTO) initial program load (IPL). NML position allows a stop state to occur in the processor after power is turned on and awaits a manual IPL by the operator. AUTO position allows a normal program reset to occur continuously after power turn on and starts an IPL. Input/output addresses of devices performing the IPL are stored on the console diskette and read in at IMPL.
LOCK/UNLOCK switch (model 8 only)	In LOCK position, certain operations on the system are ignored, even if specified by the operator. These are: ■ Any input command other than: ESC, H/ESC, X/EXC, or T ■ An IMPL performed with the IMPL switch
POWER ON/OFF switch	Initiates system power-on sequence and applies operating power to console diskette drive, as well as to system peripheral devices having their power switches turned on. If the IPL/NML/AUTO switch is set to AUTO, an IPL is performed automatically with power on. The P-SEQ indicator extinguishes if power-on sequence is normal.

2.1.2. Primary Power Control

The processor rear cabinet door contains a cutout at the lower end section for operator access to the MAIN POWER circuit breaker. When input primary power is available from the site installation electrical power panel, set the MAIN POWER circuit breaker to the ON (up) position to supply primary power for the system.

In addition to the processor cabinet, the I/O cabinet and I/O expansion cabinet also have a MAIN POWER circuit breaker accessible to the operator through a cutout at the lower rear section of each cabinet. You are responsible for setting both circuit breakers to the ON (up) position for connecting primary power circuits. Some systems do not include an I/O expansion cabinet.

2.1.3. I/O Maintenance Panel

The I/O cabinet contains a maintenance panel that requires operator access when directed by the customer engineer. The panel is located at the upper rear section, inside the I/O cabinet. You can access this panel by opening the rear doors of the I/O cabinet. For maintenance, note which indicators are lit and forward this information to the customer service engineer. Switch settings are changed only at the direction of the customer service engineer. The maintenance panel is illustrated in Figure 2-3.

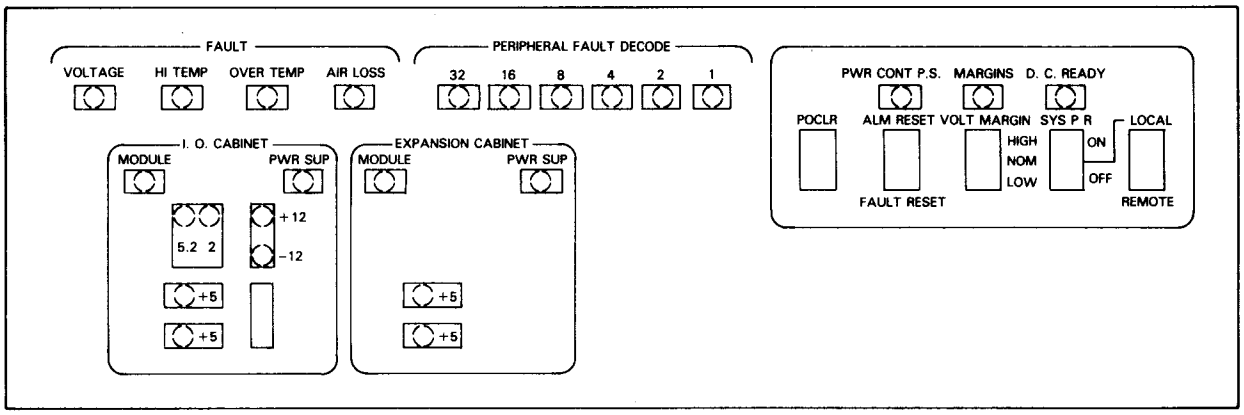


Figure 2-3. I/O Maintenance Panel

2.2. CONSOLE DISPLAY CONTROLS AND INDICATORS

Normally, you initiate and terminate system operations from the display screen and keyboard; therefore, you should be thoroughly familiar with their use. The console display operates differently from local workstations. Figure 2-4 shows the model 8 console display and keyboard, and Figure 2-5 shows the models 10/20 console display and keyboard.

2.2.1. Screen Display Switch

The screen display pushbutton switch (Figures 2-4 and 2-5) turns on the display presentation for use by the operator.

2.2.2. Console Display Operator Controls

Most operator controls for the console display are located on the keyboard.

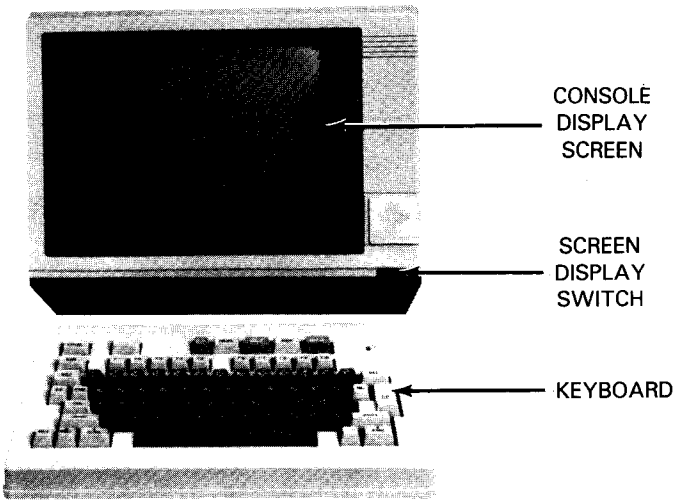


Figure 2-4. Model 8 Console Display and Keyboard

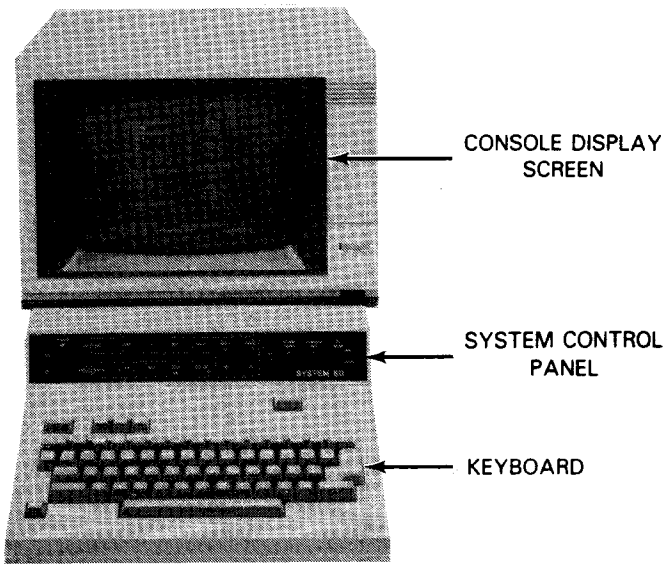


Figure 2-5. Models 10/20 Console Display and Keyboard

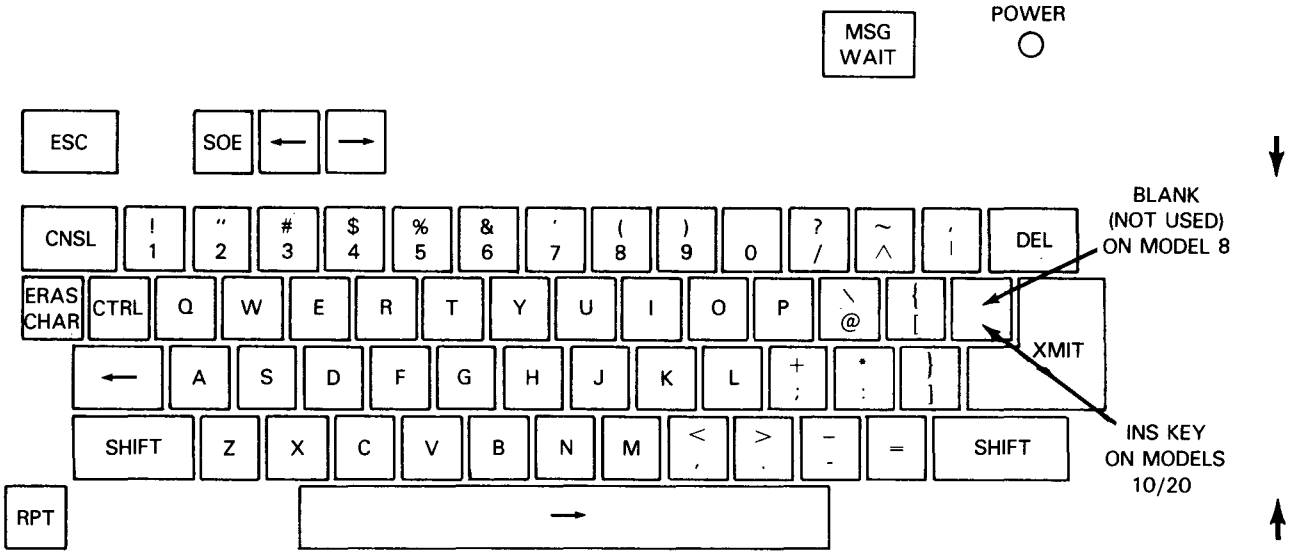
2.2.3. Keyboards

The keyboard for the console display can be moved about the system console, as in any standard workstation throughout the system. There are eight basic keyboards; one for each nation supplied by Unisys. The keyboard layout for each of these national keyboards is illustrated in Figure 2-6. The keyboard control keys are listed and described in Table 2-2.

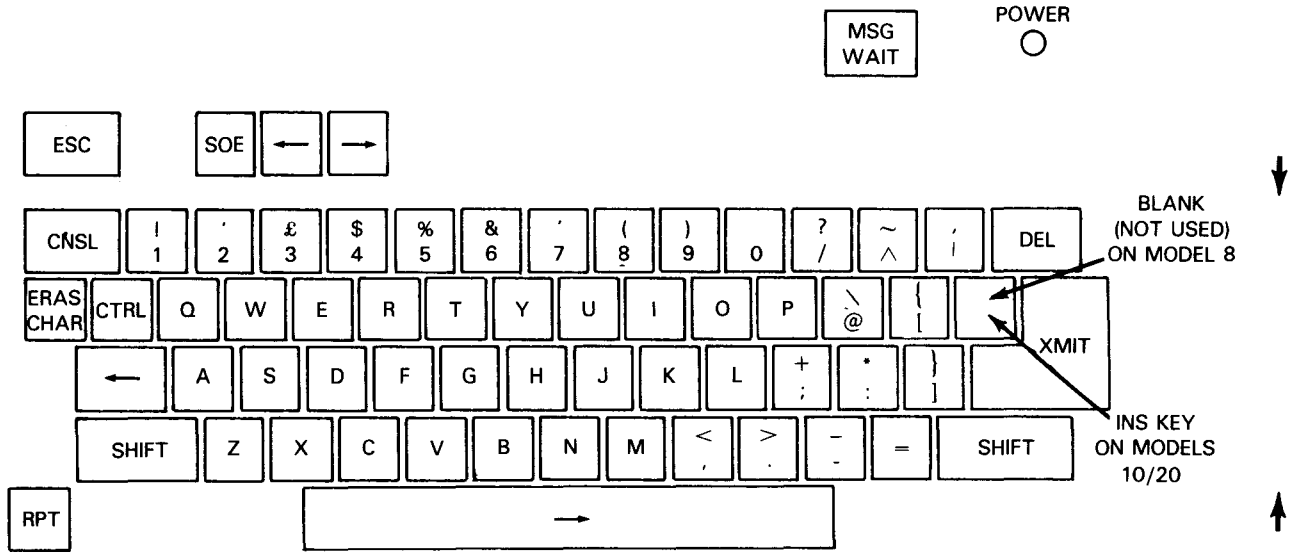
NOTE: *The blank key is not used on model 8 keyboards; on models 10/20 keyboards, this key is labeled INS and functions as an insert character key.*

2.2.4. Power Switch

The console display power ON/OFF switch is located near the lower right front corner of the console display. Once turned on, power for the console display is controlled with the POWER ON/OFF switch on the system console.

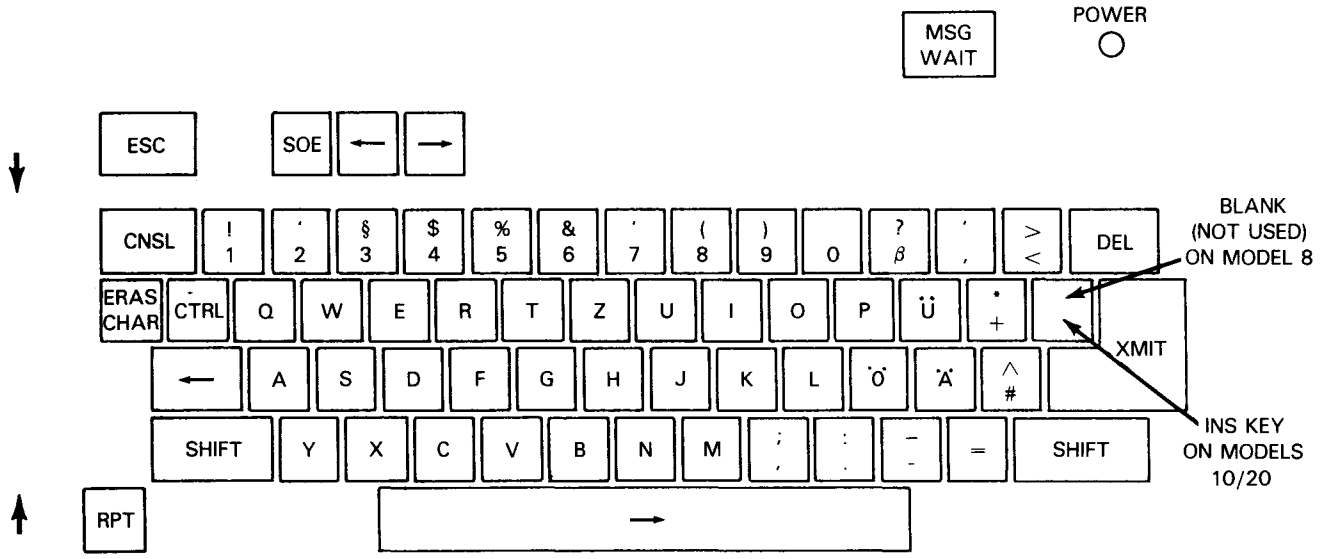


United States

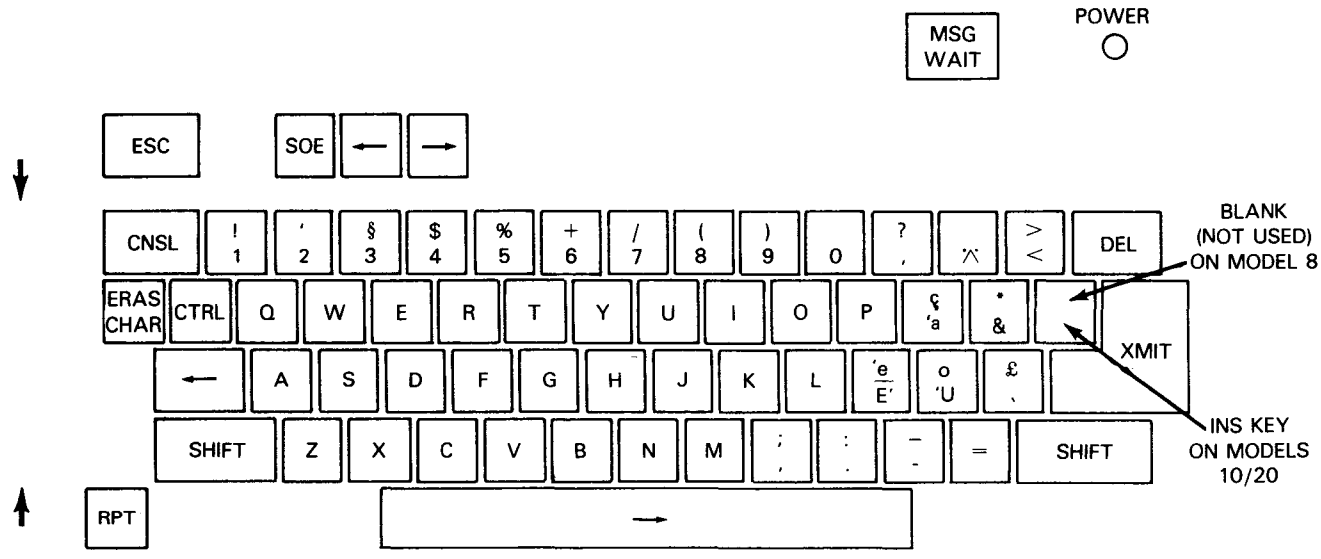


United Kingdom

Figure 2-6. National Keyboard Layouts (Part 1 of 4)

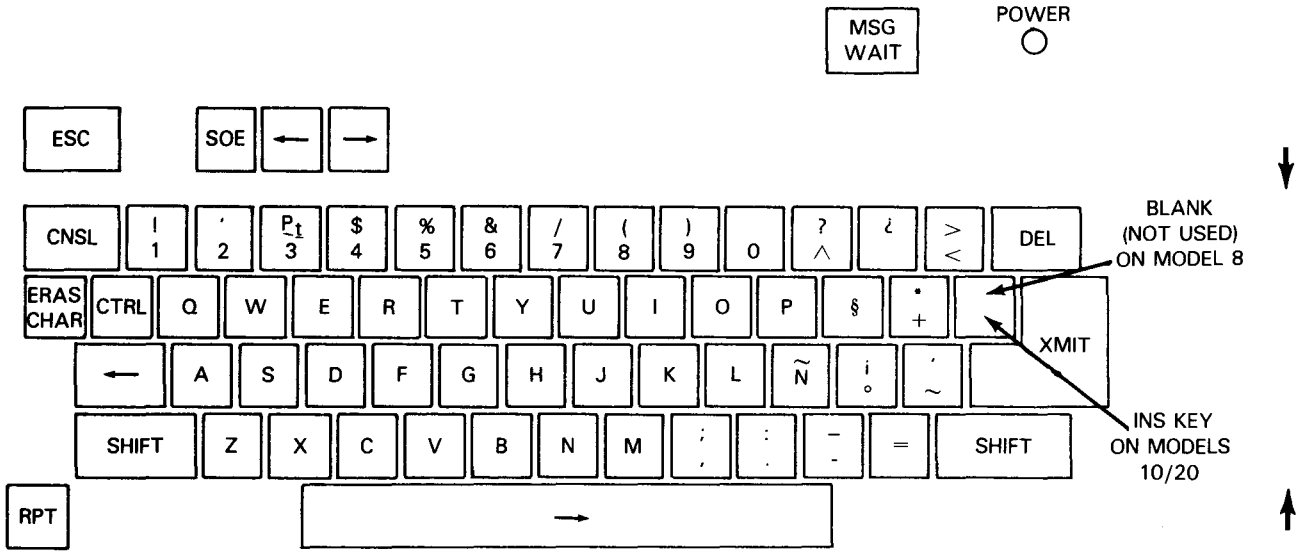


Germany

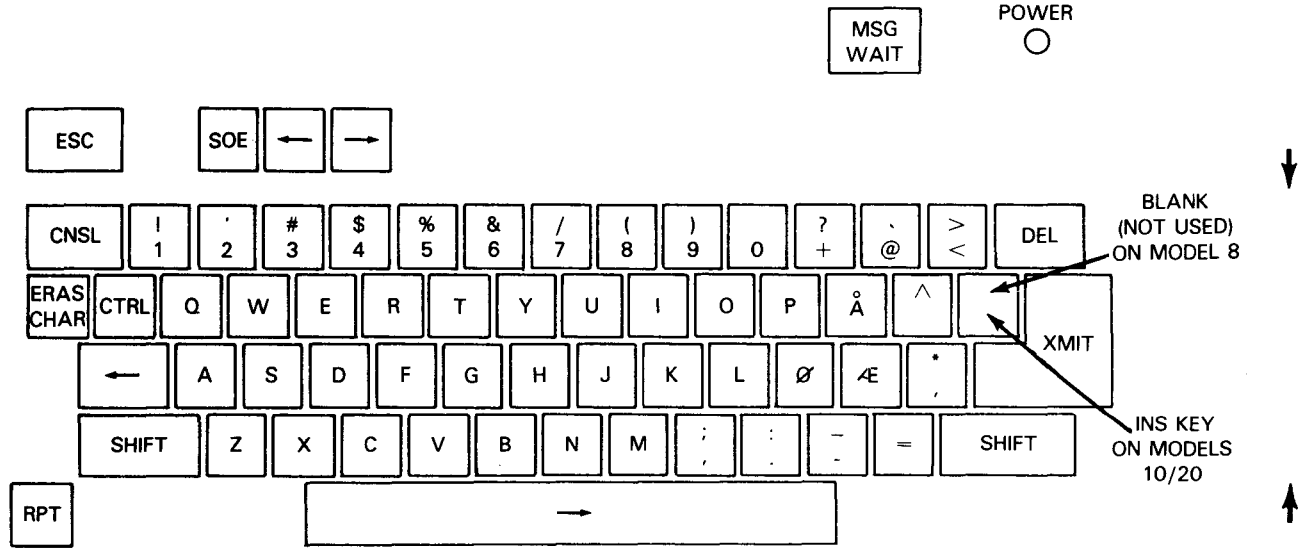


France

Figure 2-6. National Keyboard Layouts (Part 2 of 4)

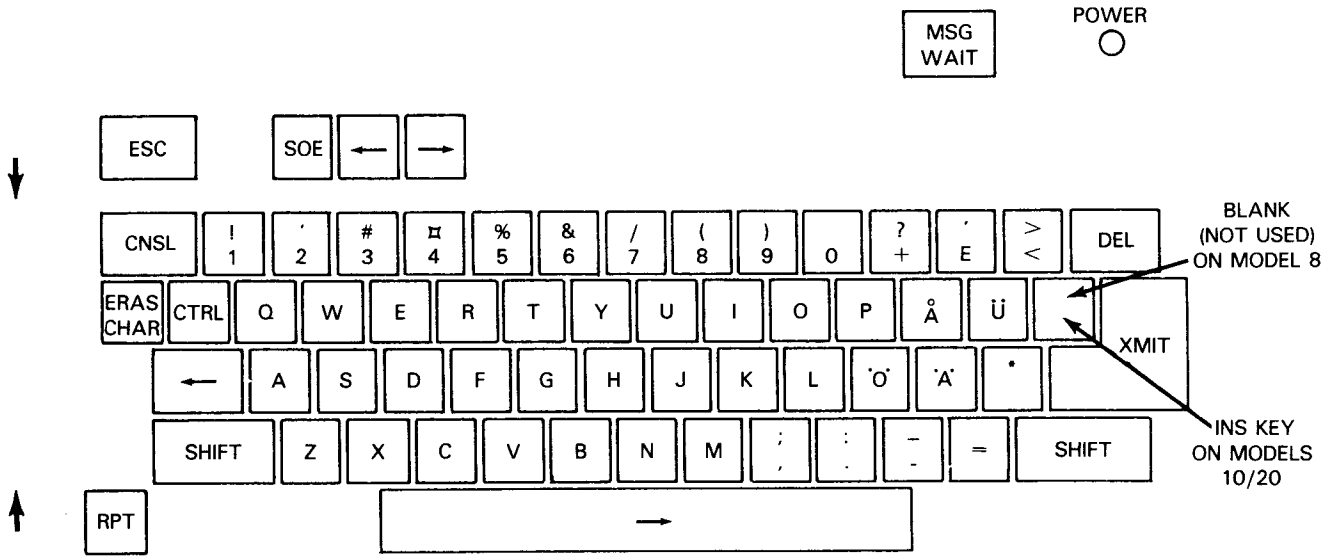


Spain

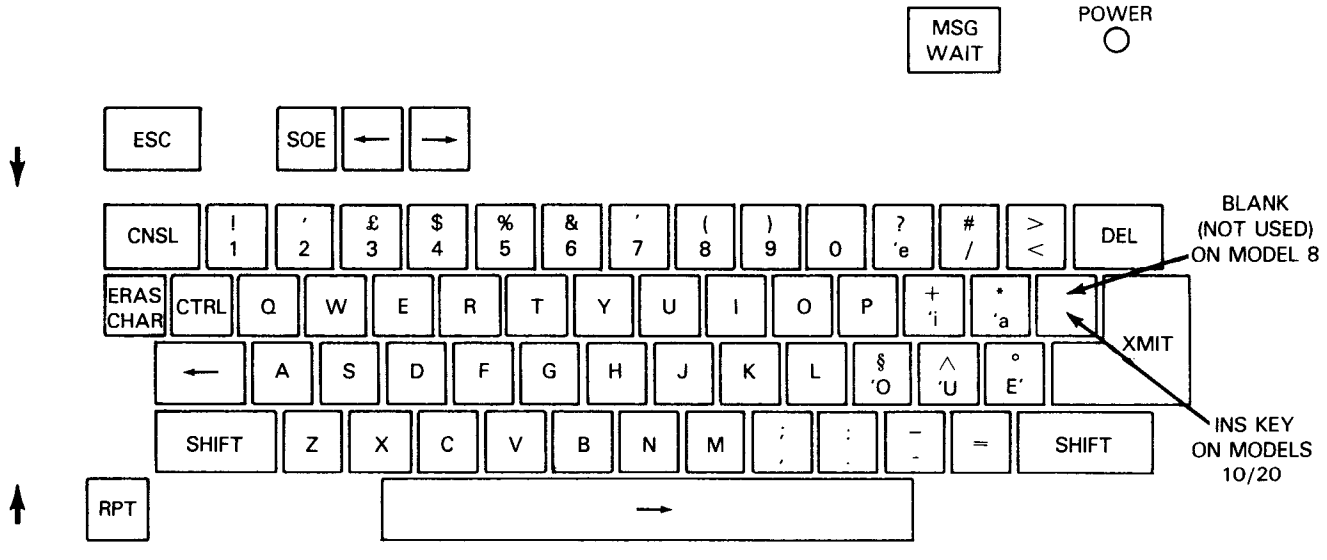


Denmark or Norway

Figure 2-6. National Keyboard Layouts (Part 3 of 4)



Sweden or Finland



Italy

Figure 2-6. National Keyboard Layouts (Part 4 of 4)

Table 2-2. Keyboard Control Keys

Key	Function
MSG WAIT	Pressing the message-wait key causes an attention-interrupt function to be reported to the program.
POWER indicator	Lights when operating power is turned on to the console display.
ESC	Pressing the enter-system-command-sequence key causes the console display to enter into console input mode to allow commands keyed on the keyboard to enter the processor.
SOE	Pressing the start-of-entry key causes the SOE mark to be displayed in the cursor position. Characters keyed in with the keyboard begin at this point.
←	Pressing either cursor-left key causes the cursor to move one column to the left. If the key is pressed when the cursor is currently positioned next to the SOE mark, no movement of the cursor occurs.
→	Pressing either cursor-right key causes the cursor to move one column to the right. If the key is pressed when the cursor is currently positioned on the 80th column, the cursor returns to the next position of the SOE mark on the same line.
CNSL	Pressing the console-mode key enables the console display to enter the program-frame function.
DEL	Pressing the delete key terminates the saving or display of data during frame processing. For the model 8, this key is inoperative during program-frame mode. For models 10/20, pressing this key during program-frame mode deletes a character.
INS	This key is not used in frame processing. It is blank and is not used on model 8 systems. On the models 10/20 the INS key functions as an insert character key.
ERAS CHAR	Pressing the erase-character key inserts a space at the cursor position and moves the cursor one column to the right.
CTRL	Pressing the control key along with the character Y causes a maintenance-related message to be displayed.
XMIT	Pressing the transmit key after a read command was issued, (while operating in input mode) causes data that is displayed from the SOE character to the end-of-data display to be supplied to the processor.
SHIFT	Pressing either shift key causes characters etched on the upper half of the keyboard keys to be entered for processing.
RPT	Pressing the repeat key in conjunction with another key causes the operation of that key to be repeated approximately 15 times per second.

2.3. 8420/8422 DISKETTE DRIVES

Freestanding diskette drives may be either automatic (8420) or manual (8422) feed types. You use a minimum of controls and indicators to operate either type. The condition of diskette drives and other peripherals (e.g., hopper empty, stacker full) is usually displayed as a message on the console display screen.

2.3.1. Diskette Drive Indicator

The manually loaded diskette drive uses an indicator on the push-bar latch release (Figure 2-7) to indicate that the particular drive is operating. The indicator is lit while the drive is reading or writing data on the diskette. The console diskette drive (Figures 2-1, 2-2) is a manually loaded type.

2.3.2. FEED Switch and Indicator

The automatically loaded diskette drive uses the FEED switch and indicator, located near the hopper (Figure 2-8), when you initiate a manual-feed cycle through the loader. An unload/load cycle may occur automatically by a programmed command or when you press the FEED switch, provided there is no active command for the diskette drive. The indicator lights when the diskette is loading into or from the reader mechanism.

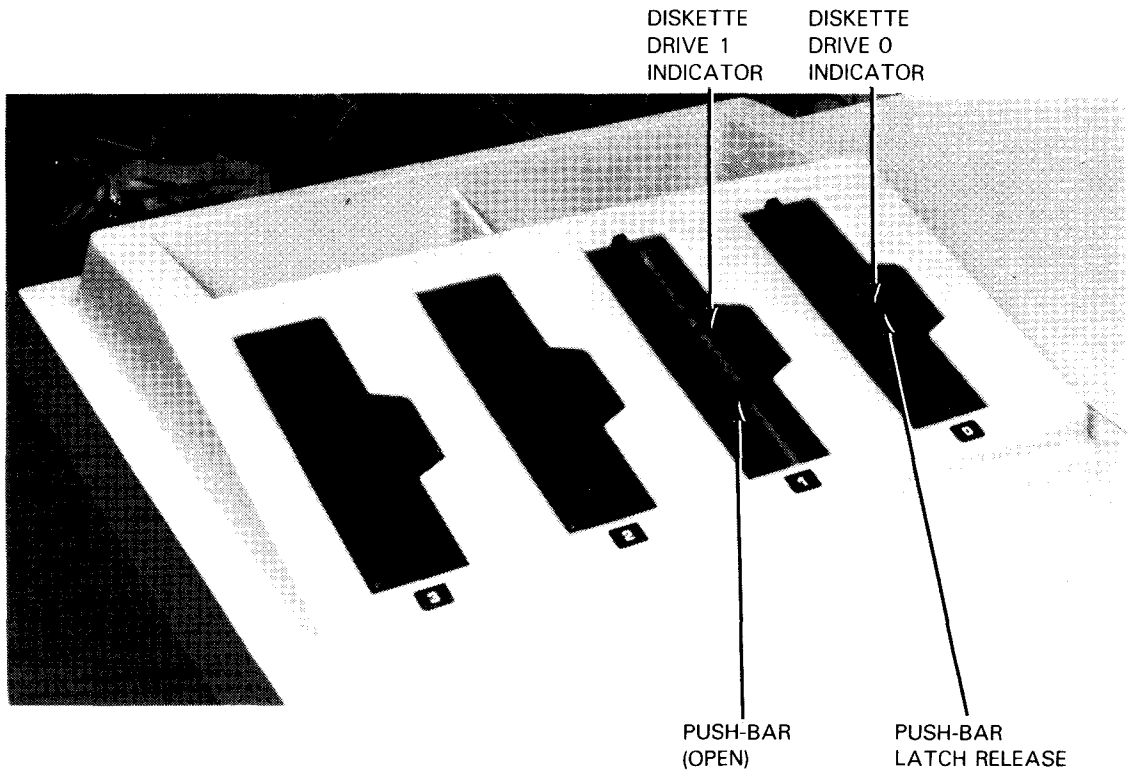


Figure 2-7. Indicators on Manually Loaded Diskette Drives

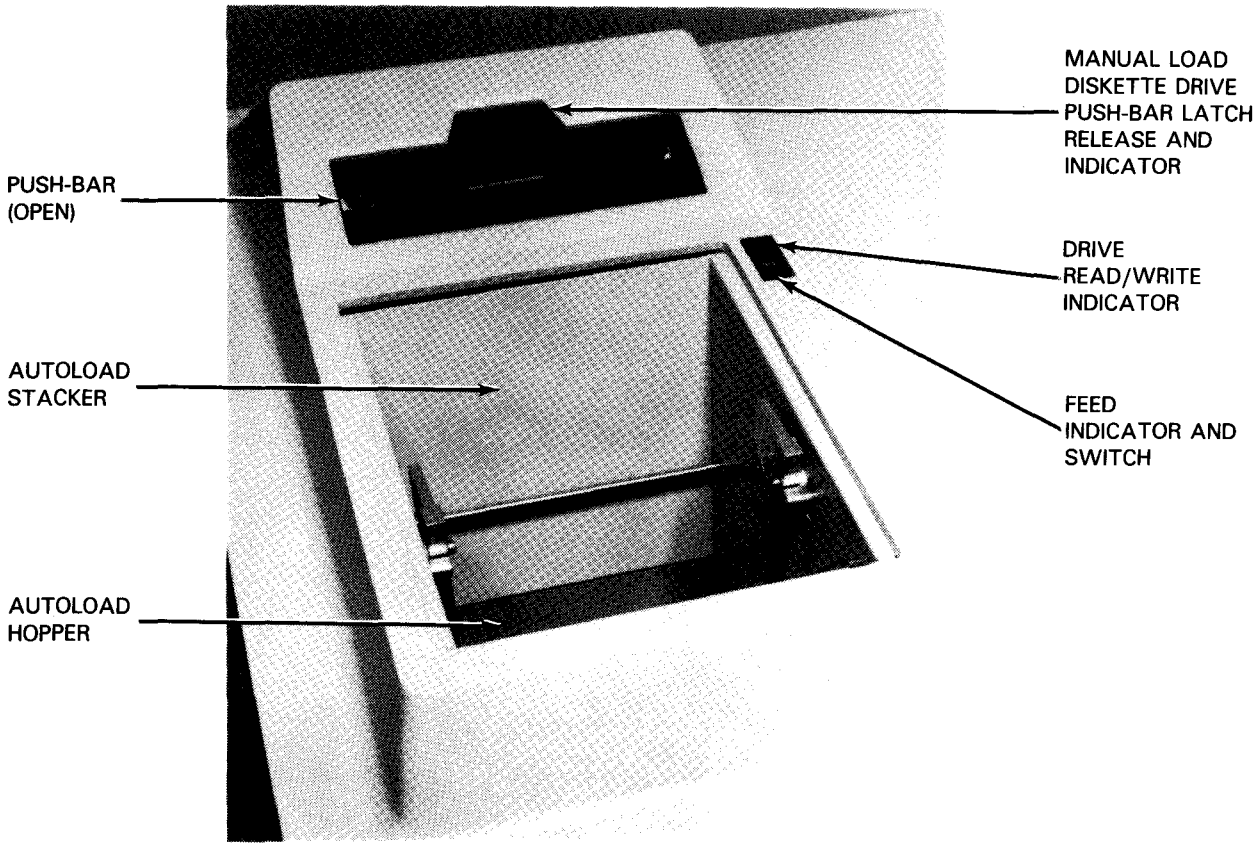


Figure 2-8. Autoload Diskette Drive Switch and Indicators

The FEED indicator remains lit while a diskette feed cycle is in progress. It is extinguished when the diskette drive returns to ready status, which presents an attention condition to the processor. However, if the indicator remains lit, a malfunction has occurred during operation and further attention is required to determine the nature of the malfunction. (See screen display for error message.)

2.3.3. Drive Read/Write Indicator

The automatically loaded diskette drive uses a red LED indicator, located near the FEED switch (Figure 2-8) to inform you that a read or write operation is in progress. The indicator remains lit while the diskette drive is active.

2.3.4. Diskette Power Control Panel

The autoload and manual load diskette drives have an identical power control panel located at the rear section on the lower right corner of the cabinet. The power control panel is illustrated in Figure 2-9, and the controls and indicators are listed and described in Table 2-3.

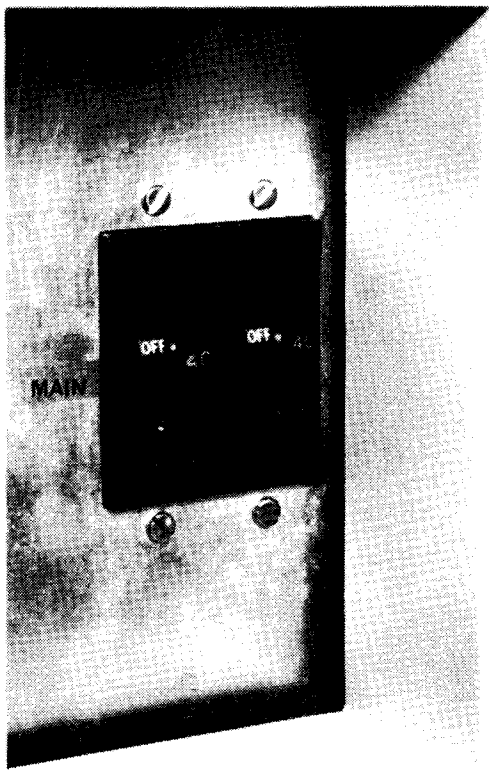


Figure 2-9. Diskette Drive Power Control Panel

Table 2-3. Diskette Drive Power Control Panel

Control/Indicator	Function
AC ON indicator	Lights when primary power for the diskette drive is turned on with the MAIN circuit breaker.
MAIN circuit breaker	Turns on primary power from an external power source to the diskette drive.
PWR ON/RESET-PWR OFF switch	Initiates power-on sequence for power supplies in the diskette drive cabinet. PWR ON/RESET (up) position initiates power on and resets error conditions. PWR OFF (down) position turns off power for the diskette drive.
LOCAL/REMOTE switch	Selects power control source for operating the diskette drive. LOCAL (up) position allows power to be turned on locally with the PWR ON/RESET-PWR OFF switch. REMOTE (down) position allows power to be turned on or off at the processor. The PWR ON/RESET-PWR OFF switch must remain in PWR ON/RESET position and MAIN circuit breaker in on (up) position.
16 VAC cartridge fuse	Protects 16-volt ac power source; fuse is replaced only by the customer engineer.
52 VAC cartridge fuse	Protects 52-volt ac power source; fuse is replaced only by the customer engineer.

2.4. DISK DRIVES

The minimum System 80 models 8/10/20 configuration requires at least 50 MB storage capacity. This requirement can be satisfied with a single integrated 8417/8419, 8470, or 8480 disk drive. The requirement can also be satisfied by any combination of 8430/8433 disk drives with their freestanding control unit type 5039 or by using the 8494 disk drive subsystem. For the model 8 only, the requirement can be satisfied by 8418 integrated disk drives.

Basic operating procedures for each disk drive type are included in this manual. Complete operating procedures are provided in the applicable operator reference listed in Table 1-1.

2.4.1. 8416/8418 Disk Drives

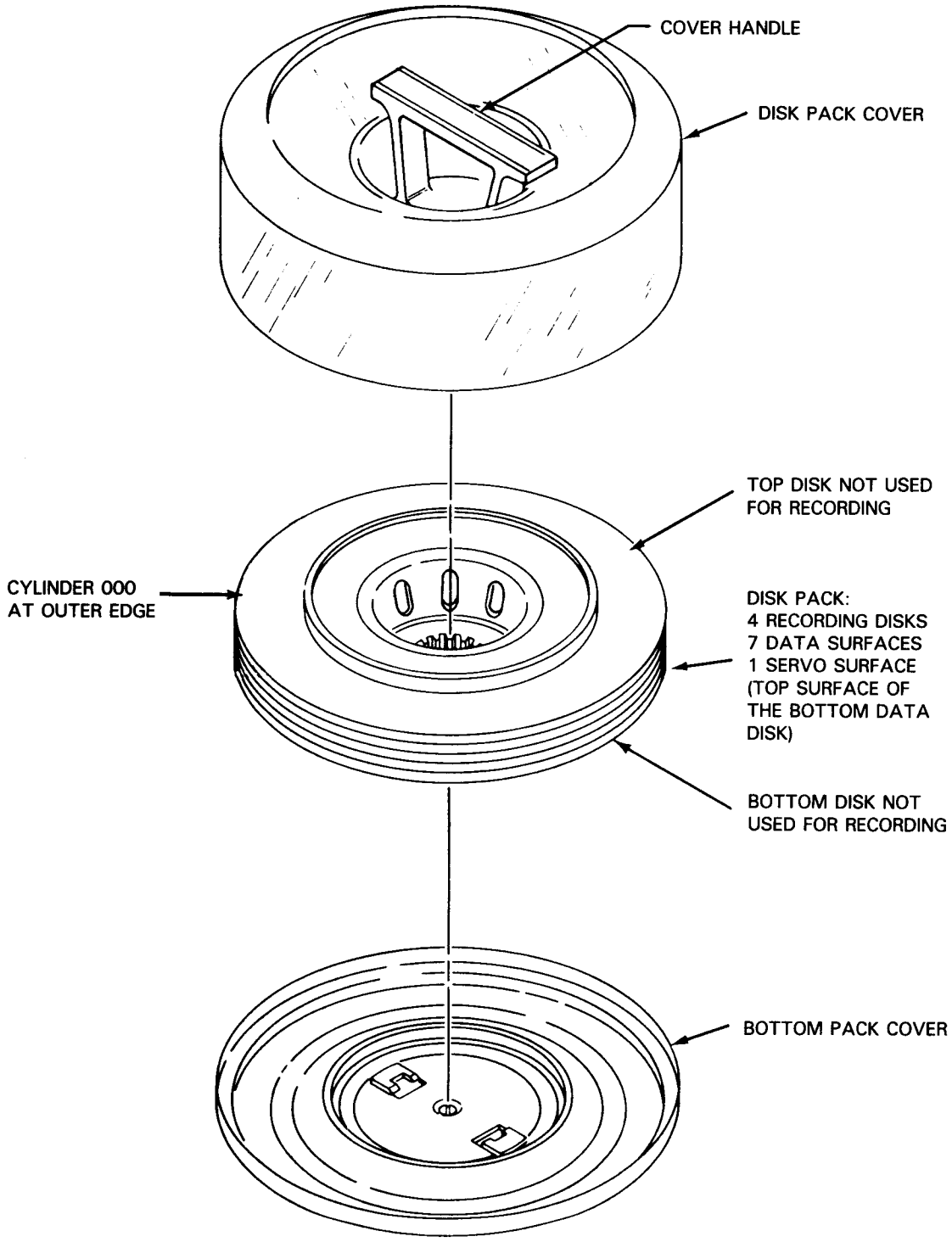
The 8416 and 8418 disk drives have similar operating characteristics and use the same integrated controller. However, only the 8418 disk drive can be used as a system resident (SYSRES) device.

The 8416 disk drive uses a single disk pack that can be removed by the operator. Disk packs used on the 8416 disk drive are similar in appearance to those used on the 8418 disk drive (Figure 2-10). However, the disk characteristics on the 8416 disk drive use 411 cylinders total per pack, with cylinder 410 located on the inner edge of the disk. Disk packs cannot be interchanged between disk drive types, but are interchangeable between disk drives of the same type.

The disk pack weighs approximately eight pounds and is removed with the disk pack cover. The bottom pack cover is always attached when the pack is removed; it must be detached when reinstalling the pack.

CAUTION

8416 and 8418 disk packs are not interchangeable with each other or any other disk pack types. The disk drive and disk pack could be severely damaged if you interchange them.



NOTE:

Each cylinder position intersects a disk data surface to establish a track location.

Figure 2-10. Disk Pack and Covers for 8416/8418 Disk Drives

8416 Disk Drive Operator Control Panel

The 8416 disk drive operator control panel, located on the right of the cabinet top, is illustrated in Figure 2-11. Operator controls and indicators are listed and described in Table 2-4.

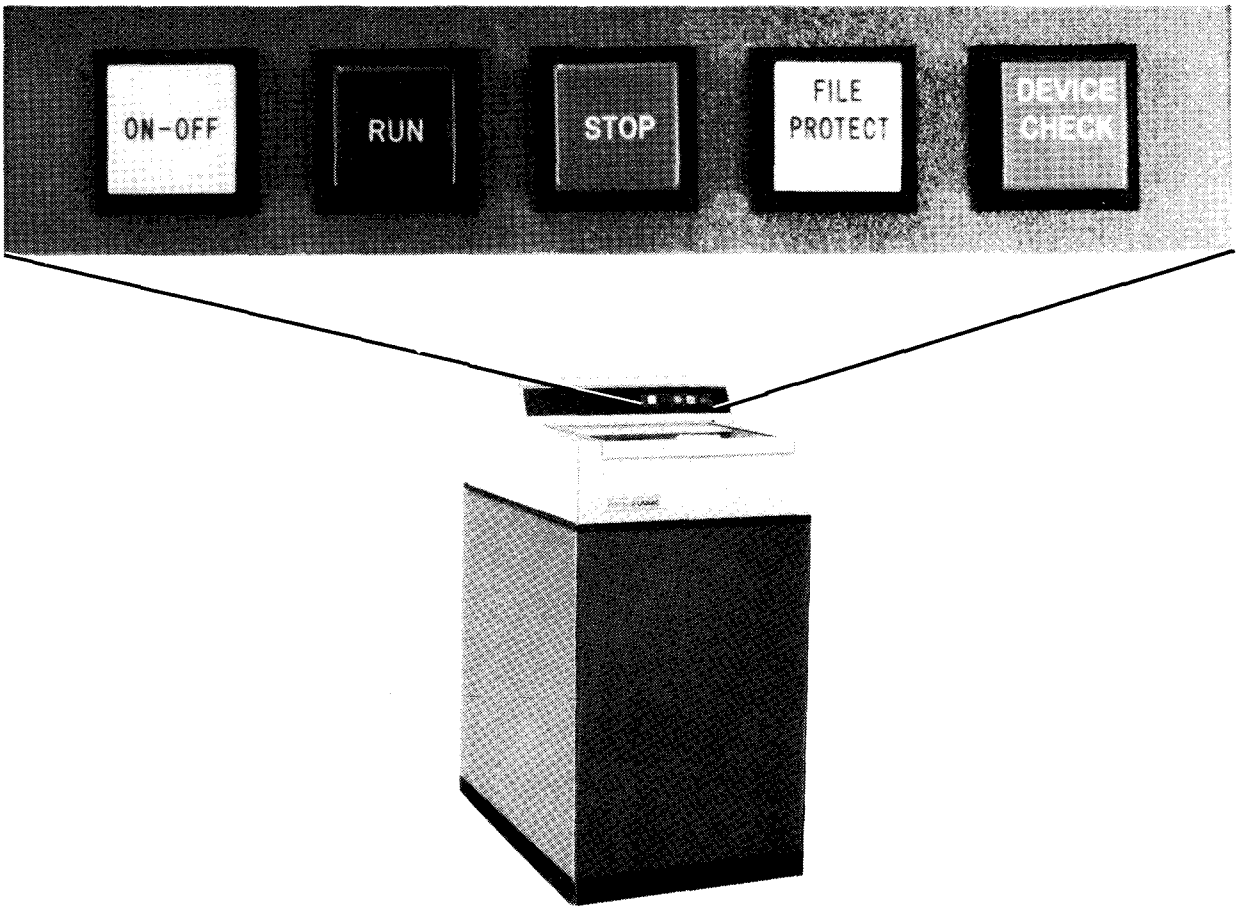


Figure 2-11. 8416 Disk Drive Operator Control Panel

Table 2-4. 8416 Disk Drive Controls and Indicators

Control/Indicator	Function
ON-OFF switch/indicator	Initiates power-on sequence in disk drive and loads read/write heads into disk pack after disk pack has reached operating speed. Pressing the switch/indicator when lit (ON) causes power sequence to turn off, heads to retract before power is turned off, and a dynamic brake to stop the drive motor. If heads do not retract, the drive motor does not stop.
RUN switch/indicator	Places the disk drive in online mode if pressed after the disk pack is rotating at operating speed. The RUN switch/indicator lights when online mode is established.
STOP switch/indicator	Inhibits communication between the disk drive and processor, causes run condition to stop, and extinguishes RUN switch/indicator. Holding the STOP switch/indicator in the pressed position allows a lamp test to be performed for all switch/indicators on the operator control panel.
FILE PROTECT switch/indicator	When lit, write operations are inhibited. If an operation is in progress when the FILE PROTECT switch/indicator is pressed, the operation is completed prior to activating, the FILE PROTECT function.
DEVICE CHECK indicator	When lit, an unsafe condition is present in the disk drive. The RUN switch/indicator extinguishes and STOP switch/indicator lights. The unsafe latch circuit is reset when the condition is cleared and the ON-OFF switch/indicator is pressed to OFF condition, then back to ON.

8418 Disk Drive Operator Control Panel

The 8418 disk drive operator control panel, located on the right rear section of the cabinet top cover, is illustrated in Figure 2-12. Operator controls and indicators are listed and described in Table 2-5.

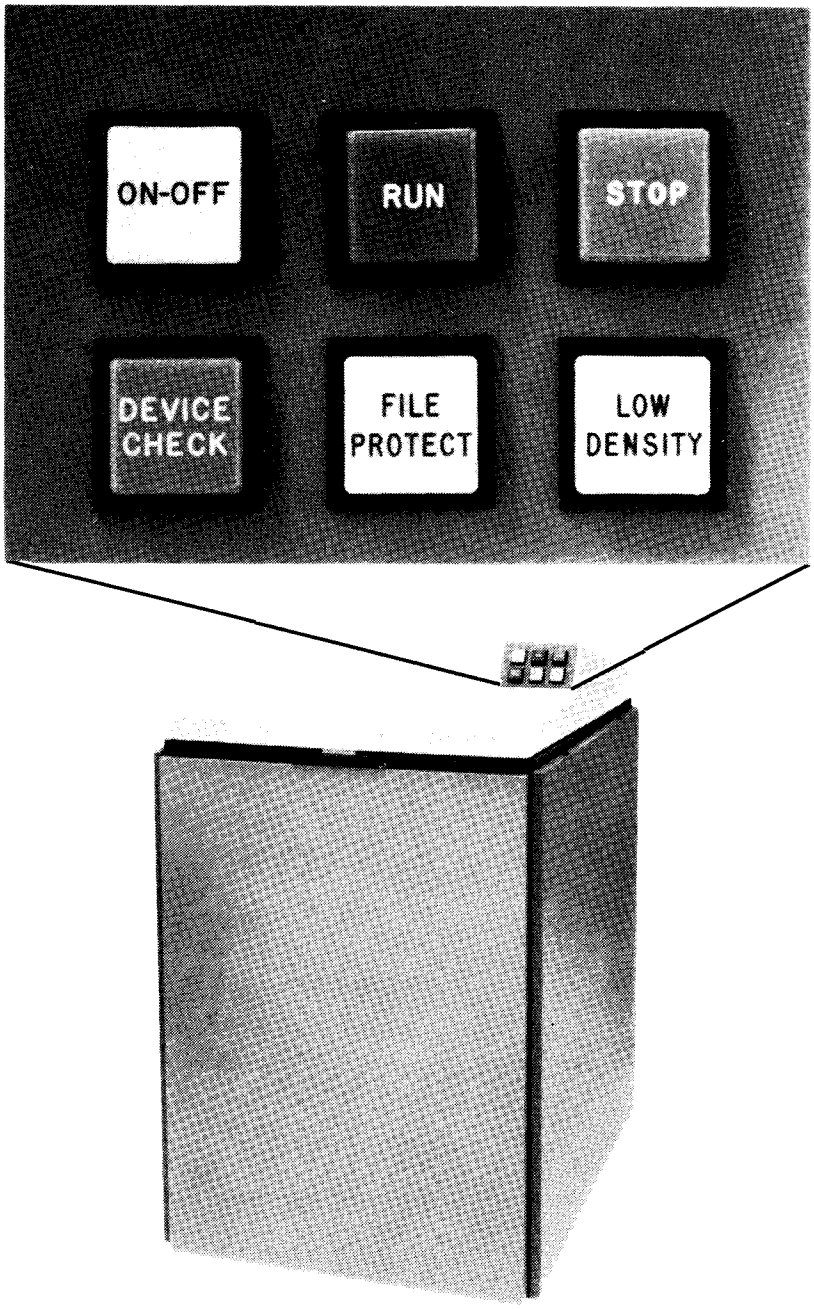


Figure 2-12. 8418 Disk Drive Operator Control Panel

Table 2-5. 8418 Disk Drive Controls and Indicators

Control/Indicator	Function
ON-OFF switch/indicator	Applies power to the drive motor. When set to OFF, the ON-OFF indicator blinks until the spindle has stopped. If the cover is not closed or a disk pack is not mounted when the ON-OFF switch is pressed to ON, the ON-OFF indicator is not lit and the STOP indicator blinks. When the cover is closed after the switch is pressed ON, the normal power-on sequence continues. If the drive motor temperature increases, a thermal switch turns off power to the motor until the drive motor has cooled to a safe level. While the thermal switch is open, the ON-OFF switch/indicator remains lit if in the ON position, or goes out if in the OFF position, but power to the motor remains off until the motor has cooled.
RUN switch/indicator	Lights when pressed if ON-OFF indicator is lit and: 1. disk pack is loaded; 2. cover is closed; 3. drive spindle is at operating speed; 4. heads are loaded at track 00; and 5. DEVICE CHECK indicator goes out. If these conditions are met, the RUN indicator lights and the STOP indicator goes out. At this point, the ON-OFF and RUN indicators are both lit and the disk drive is ready for system operation. If the RUN switch is pressed and released before these conditions are met, the STOP indicator goes out as soon as the RUN switch is released and the RUN indicator lights only after all these conditions have been satisfied.
STOP switch/indicator	Lights to indicate ac power is applied to this disk drive. When pressed, indicator lights and removes the communication link between the processor and the subsystem. When pressed and held, provides a lamp test for all operator panel lamps. The STOP switch/indicator blinks if a disk pack is not mounted or the cover is not closed when the ON/OFF switch is pressed ON. Certain error conditions that cannot be reset by the system cause the RUN indicator to go out and DEVICE CHECK and STOP indicators to light. If an operation is in progress when the STOP switch is pressed, that operation continues to completion before the switch function is activated.

(continued)

Table 2-5. 8418 Disk Drive Controls and Indicators (cont)

Control/Indicator	Function
DEVICE CHECK indicator	Lights when conditions are detected within the disk device that might affect normal operation of the unit. The condition must be cleared before normal drive operation can be resumed. Conditions causing DEVICE CHECK indications are soft unsafes, hard unsafes, and early warning temperature. Soft unsafes are those that can usually be reset by the system. If the soft unsafe cannot be cleared by recovery procedures initiated by the system, the unsafe is considered to be hard. A hard unsafe requires operator intervention at the disk drive. To reset a hard unsafe condition, the operator turns the disk drive off and then on again. If the DEVICE CHECK recurs immediately, corrective maintenance is required; contact the customer engineer. The DEVICE CHECK indicator is lit for any early warning temperature indication or any unsafe condition (soft or hard). A hard unsafe causes the disk drive to go offline. When the disk drive goes offline, the RUN indicator goes out and the STOP indicator and DEVICE CHECK indicator are both lit. A DEVICE CHECK condition cannot be cleared by pressing the RUN or STOP switches. While the DEVICE CHECK condition exists, the affected disk drive cannot be placed in the RUN state.
FILE PROTECT switch/indicator	When lit, write operations are inhibited. If an operation is in progress when the FILE PROTECT switch is pressed, that operation continues to completion before the FILE PROTECT function is activated.
LOW DENSITY switch	Used only on types 8418-04/05 disk drives. When LOW DENSITY mode is in effect, reading and writing is compatible with 8418-02/03 cache. Reading and writing can be done on these tracks. Types 8418-02/03 operate exclusively in this mode and do not require this switch. This switch allows disk packs to be interchanged between disk drives having different track capacities.

2.4.2. 8417/8419 Disk Drives

The 8417 and 8419 disk drives have similar operating characteristics; therefore, the same integrated controller is used for both.

The 8417 disk drive uses nonremovable disk packs. The 8419 disk drive uses removable disk packs (Figure 2-13) that are interchangeable only between disk drives of the same type.

CAUTION

8419 disk packs are not interchangeable with other disk pack types. The disk drive and disk pack could be severely damaged if you interchange disk pack types.

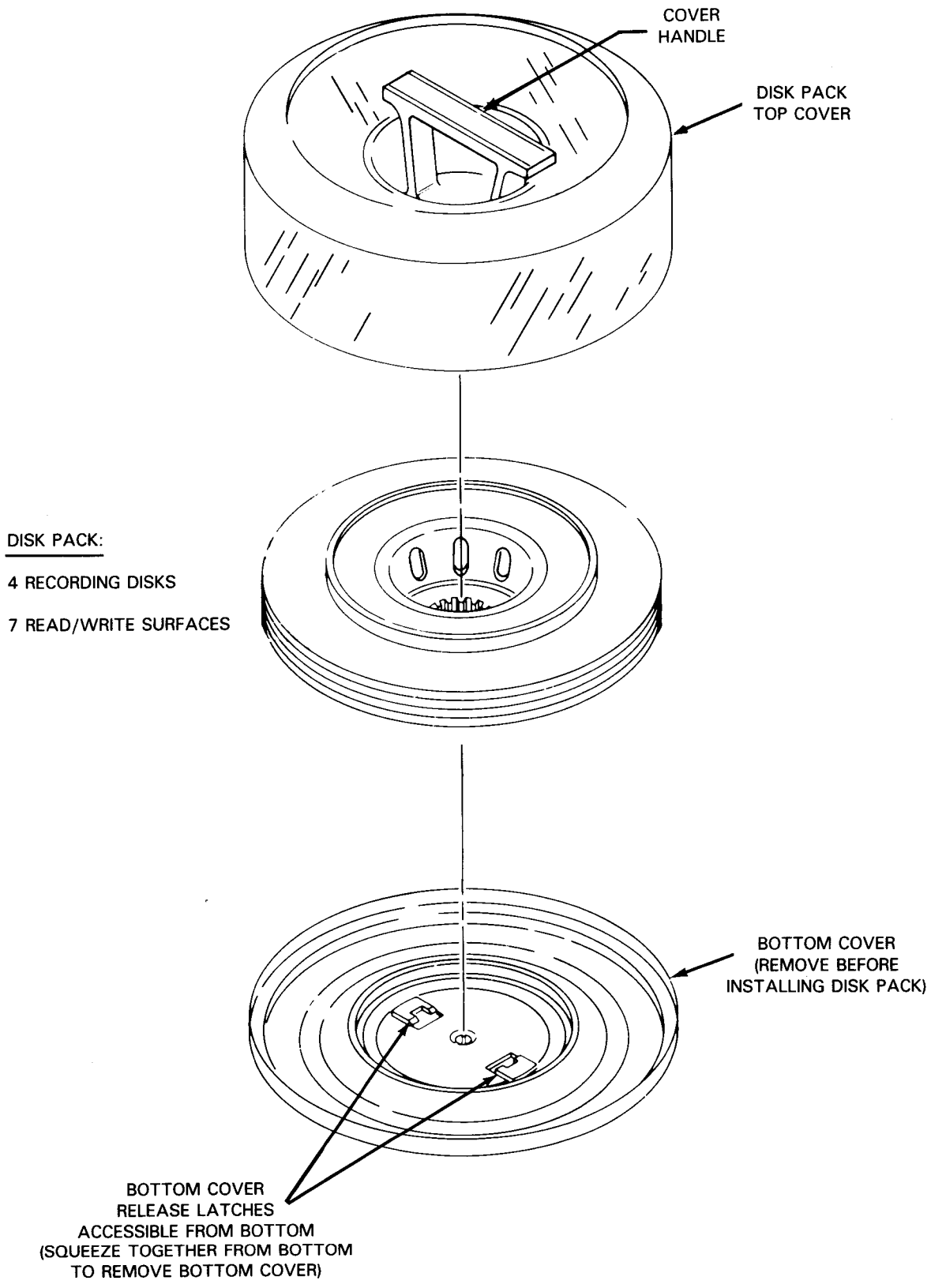


Figure 2-13. 8419 Disk Pack with Dust Cover (Top and Bottom)

8417 Disk Drive Operator Control Panel

The 8417 disk drive operator control panel, located on the upper portion of the cabinet front, is illustrated in Figure 2-14. Each disk drive cabinet can contain up to three disk drives, each having its own operator control panel. Operator controls and indicators are listed and described in Table 2-6.

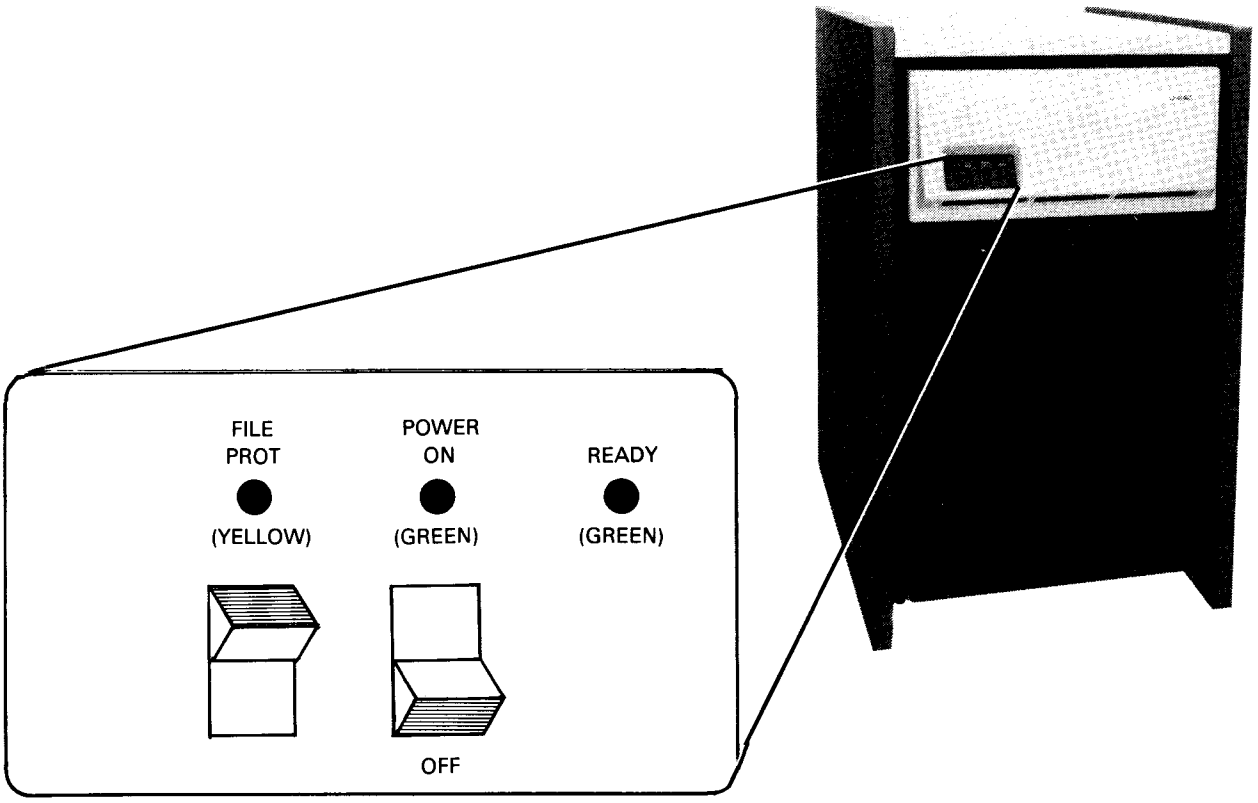


Figure 2-14. 8417 Disk Drive Operator Control Panel

Table 2-6. 8417 Disk Drive Controls and Indicators

Control/Indicator	Function
FILE PROT switch/indicator	ON position: ■ Write-protect status is generated and write circuits in the drive are disabled. If a write command is received, an UNSAFE condition is generated along with the write-protect status. ■ Yellow indicator lights. OFF position: ■ Write protect status is disabled and write circuits may be activated with a write command. ■ Indicator extinguishes.
POWER ON/OFF switch/indicator	ON position: ■ AC power is applied to the power supply and DC voltages are turned on. When all DC voltages are present and within required limits, a DC-Power-OK status is generated to release the disk motor brake and turn on the motor. ■ A power-on reset is generated and all counters and control flip-flops are initialized. ■ When disk speed reaches 80 percent of required operating speed, the read/write heads are positioned to cylinder 0, and online status occurs. ■ READY indicator lamp lights. OFF position: ■ Read/write heads are returned to the disk landing zone. ■ The motor brake is applied to stop disk rotation. ■ POWER ON indicator extinguishes. ■ READY indicator extinguishes.
READY indicator	When lit, indicates that disk drive has reached online status (refer to POWER ON/OFF switch function), and the disk drive is ready for operation.

8419 Disk Drive Operator Control Panel

The 8419 disk drive operator control panel, located on the right rear section of the cabinet top cover, is illustrated in Figure 2-15. Operator controls and indicators are listed and described in Table 2-7.

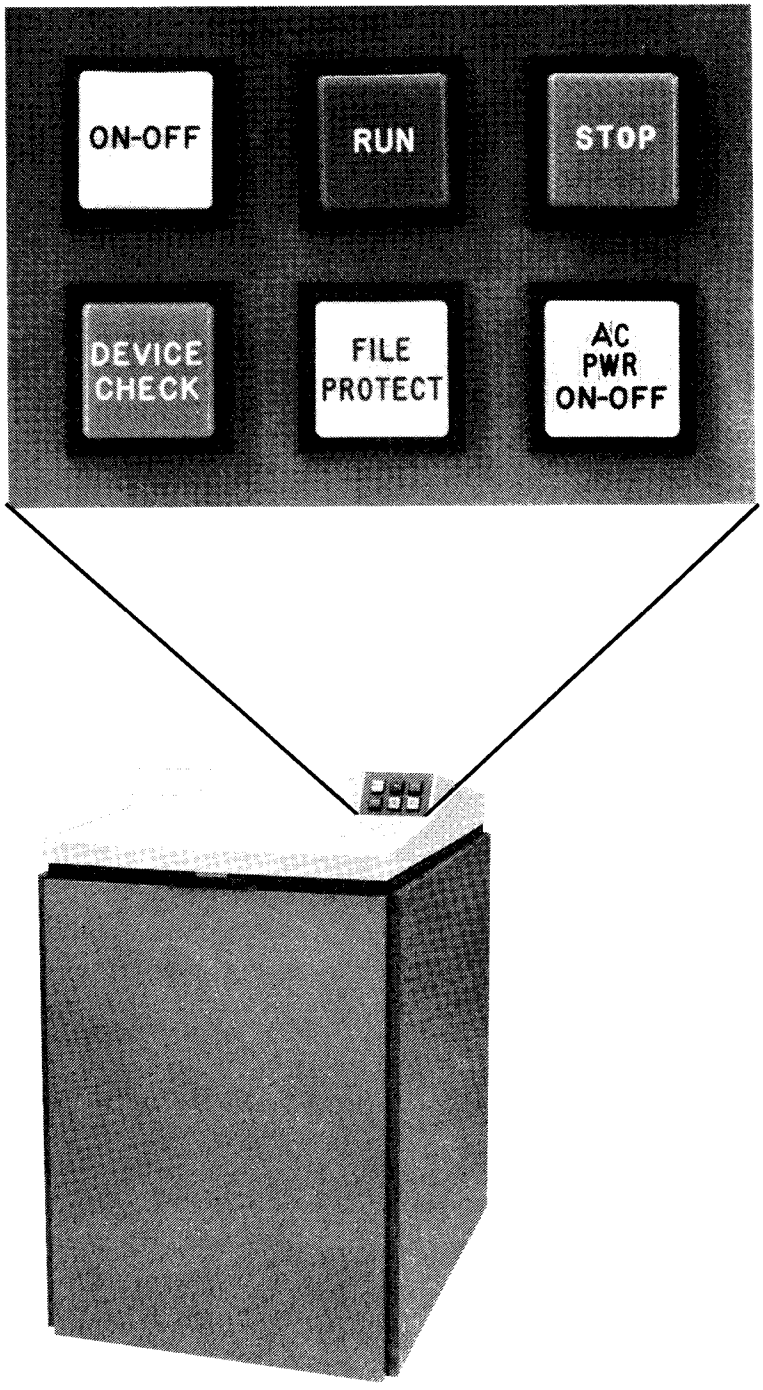


Figure 2-15. 8419 Disk Drive Operator Control Panel

Table 2-7. 8419 Disk Drive Operator Controls and Indicators

Control/Indicator	Function
ON-OFF switch/indicator	When pressed for ON condition: 1. Indicator lights. 2. Power is enabled to the disk drive motor. 3. When disk pack reaches proper rotation speed for operation, read/write heads are positioned to cylinder 0. The disk drive remains in stop state (STOP indicator lit) until RUN switch/indicator is pressed. NOTE: Pressing the ON/OFF switch/indicator to the ON position will have no effect unless the disk subsystem is in local mode of operation (maintenance), AC PWR ON-OFF switch is set to ON (indicator lit), and a disk pack is installed. When pressed to OFF condition: 1. The ON-OFF switch/indicator blinks until the disk pack stops rotating. 2. The disk drive reverts to stop condition without waiting for disk pack to stop rotating. 3. The read/write heads return to the retracted position. 4. The disk drive motor turns off after read/write heads are retracted. NOTE: The OFF conditions occur immediately if module-select condition is inactive or if in stop condition. The ON-OFF switch does not complete all the functions for the ON condition: ■ if interlocks for pack-in-place or cover-closed conditions are active; or ■ if any circuit breaker or the AC PWR ON/OFF switch is set to OFF position. If the ON-OFF switch is set for ON condition when the cabinet top cover is raised or if no disk pack is mounted, the functions for the ON condition occur after the disk pack is mounted and cover is closed. Until then, the STOP switch/indicator blinks continuously. NOTE: If the operator cycles the disk drive motor with the ON-OFF switch more than five times from full stop to full speed to full stop, etc., a thermal switch in the motor turns off power until the motor cools to a safe operating temperature. The ON-OFF switch indicator lights and extinguishes as the switch position is changed, but the run state is not entered until the motor cools.

(continued)

Table 2-7. 8419 Disk Drive Operator Controls and Indicators (cont)

Control/Indicator	Function
RUN switch/indicator	When pressed with the disk pack mounted, top cover closed, disk pack rotating at required speed, and read/write heads in load position with no device check, upon release of the switch/indicator, the following should take place: 1. RUN switch/indicator lights. 2. STOP switch/indicator extinguishes. 3. Generate attention status. 4. The DC/C accesses the disk drive for positioning, reading, or writing by enabling the selected online condition. However, if the file-protect function is active, the disk drive is available only for head positioning and reading.
STOP switch/indicator	When pressed and released: 1. Disk drive enters stop state with an inactive selected online condition upon completion of the current operation. 2. RUN switch/indicator is extinguished if currently in run state. 3. STOP switch/indicator lights. When pressed and held, the switch/indicator provides a test for all indicators on the operator control panel. The switch/indicator blinks continuously if the ON-OFF switch/indicator is pressed while either a disk pack is not yet mounted or the top cover is not closed. Soft unsafe conditions do not cause the STOP switch/indicator to light. Hard unsafe conditions always light the switch/indicator.
DEVICE CHECK indicator	Indicator lights if any unsafe condition occurs. The safety circuit is reset and the indicator extinguished by pressing the ON-OFF switch/indicator to OFF condition, then pressing it again for ON condition. Soft unsafe conditions may be reset as described in 3.2.4. If the DEVICE CHECK indicator remains lit after reset is attempted, service is required by the customer engineer. Pressing the RUN or STOP switch/indicators does not clear a device check condition. The disk drive is prevented from entering a run condition if a device check condition is present.
FILE PROTECT switch/indicator	When pressed, the switch/indicator lights, write operation is inhibited, and the DC/C is notified of a selected-file-protect condition upon completing the current operation. The FILE PROTECT switch/indicator does not change state if a module-select condition is active unless the STOP switch/indicator is lit.
AC PWR ON-OFF switch/indicator	This alternate action switch/indicator controls primary power to the disk drive. When the switch is set to ON position, the switch/indicator lights and the dc power supply and cabinet fans are turned on. Power for the disk drive motor is controlled with the ON-OFF switch/indicator after the AC PWR ON-OFF switch is set to ON (lit) position.

2.4.3. 8430/8433 Disk Drives

The 8430 and 8433 disk drives use the same freestanding control unit, type 5039, located near the disk drives (Figure 2-16). Any combination of disk drive types can be used to satisfy the 50 MB storage capacity requirement for System 80 models 8/10/20.

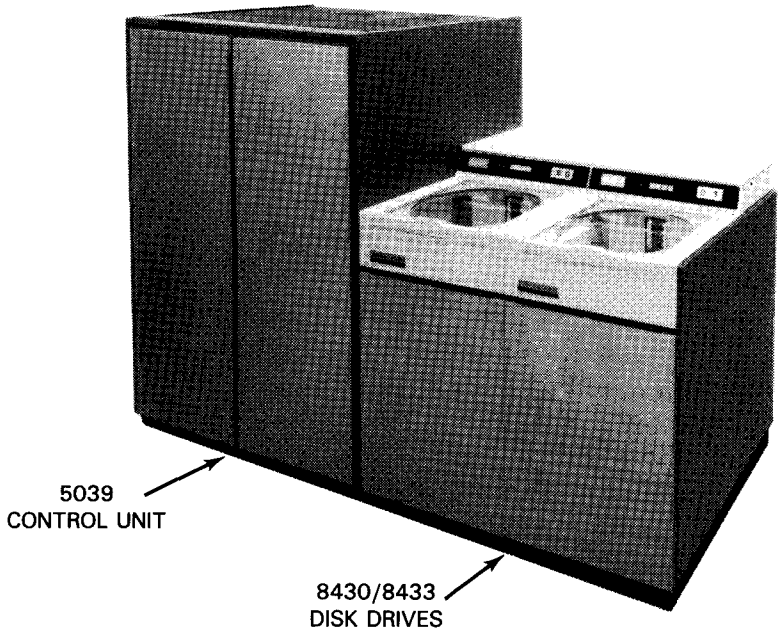


Figure 2-16. 8430/8433 Disk Subsystem

The 8430 and 8433 disk drives are similar in construction, except that the 8430 disk drive uses a disk pack capable of storing up to 100 MB, whereas the 8433 disk pack is capable of storing, up to 200 MB. Disk packs (Figure 2-17) weigh approximately 20 pounds. They are not interchangeable between 8430 and 8433 disk drives, but are interchangeable within the same disk drive type.

CAUTION

The 8430 and 8433 disk packs are not interchangeable with each other or with any other disk pack types. The disk drive and disk pack could be severely damaged if you interchange disk pack types.

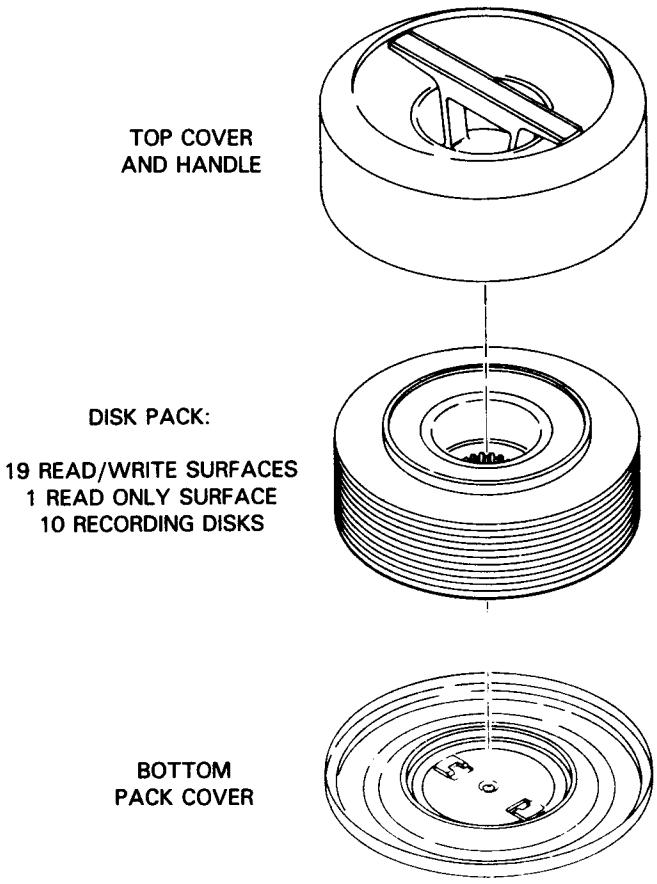


Figure 2-17. Disk Pack and Covers for 8430/8433 Disk Drives

8430/8433 Disk Drives Operator Control Panel

The operator control panel for either the 8430 or 8433 disk drive is illustrated in Figure 2-18. The operator controls and indicators are listed and described in Table 2-8.

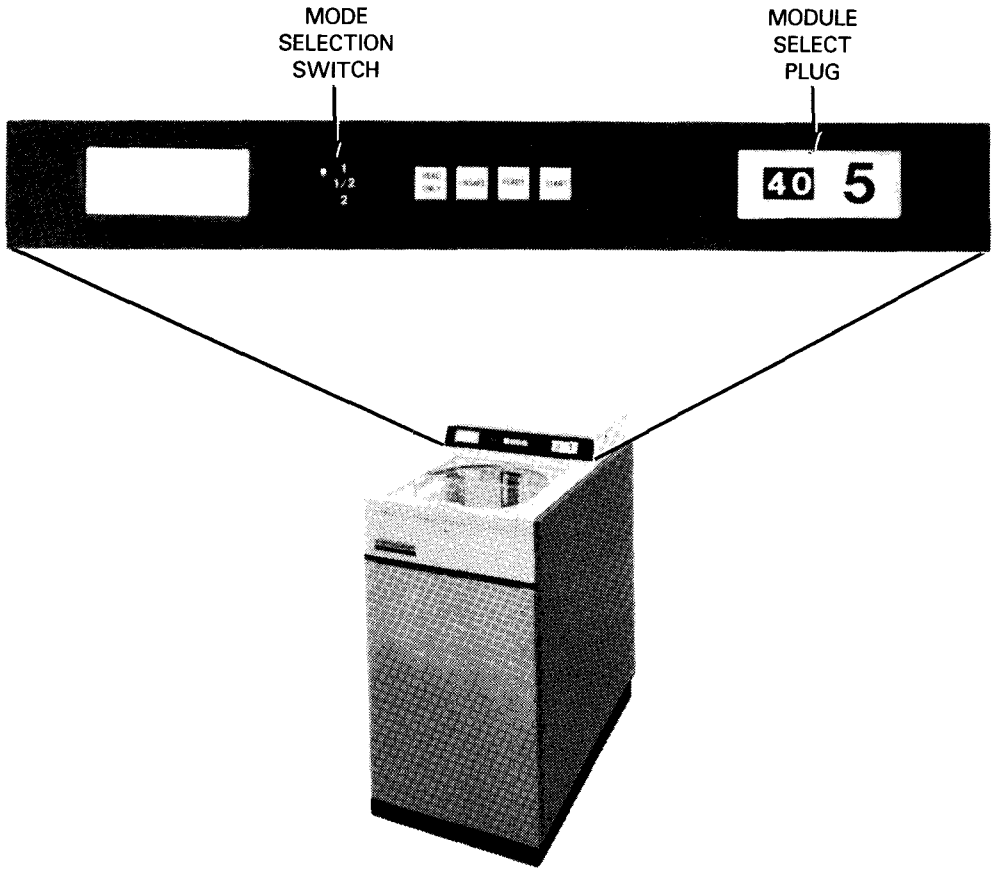


Figure 2-18. 8430 or 8433 Disk Drive Operator Control Panel

Table 2-8. 8430/8433 Disk Drives Controls and Indicators

Control/Indicator	Function
START switch/indicator	Switch functions only when source power is available, enabling signals are supplied, a disk pack is installed, and the operator access cover is closed. In the backlighted START position, the switch enables power to the spindle motor, initiating the brush cycle. At 70 percent of speed, the sequence-enable signal is provided for the next drive to start. At full speed, the heads are loaded. In the off (stop) position, the heads are unloaded, power is removed from the spindle motor, and the drive comes to a halt.
READ ONLY switch/indicator	In the backlighted READ ONLY position, the switch prohibits execution of write commands. In the off (read/write) position, the switch permits execution of both read and write commands.
Mode Selection switch (used with dual access feature)	
1/2 (Middle Position)	Accesses 1 and 2 of the disk storage unit are enabled, permitting dynamic operation from two control units.
1 (Up Position)	Access 1 is enabled, and access 2 is disabled.
2 (Down Position)	Access 2 is enabled, and access 1 is disabled.
READY indicator	When lit, indicates the power-on sequence is complete, the module select plug is installed, and the disk storage unit is ready to accept commands.
UNSAFE indicator	When lit, indicates the drive safety circuits detected an unsafe condition, and blocks the disk storage unit from accepting commands or performing write operations. (Certain unsafe conditions also cause the heads to retract from the pack.)
Module select plug	Provides a logical address for the disk unit within a subsystem. The module select plug is removable and can be interchanged with only a plug from the same type of disk unit. The 8430 and 8433 disk unit plugs *cannot* be interchanged.

5039 Control Unit Operator Control Panel

The 5039 control unit is equipped with a power control panel, maintenance panel, and operator control panel. You can use the operator control panel; the other two panels are for use only by the customer service engineer.

The operator control panel is located on top of the maintenance panel, near the hinged end of the gate assembly. A latch releases the gate to swing it open. The operator control panel contains backlighted pushbutton switches and indicators illustrated in Figure 2-19. The switches and indicators are listed and described in Table 2-9.

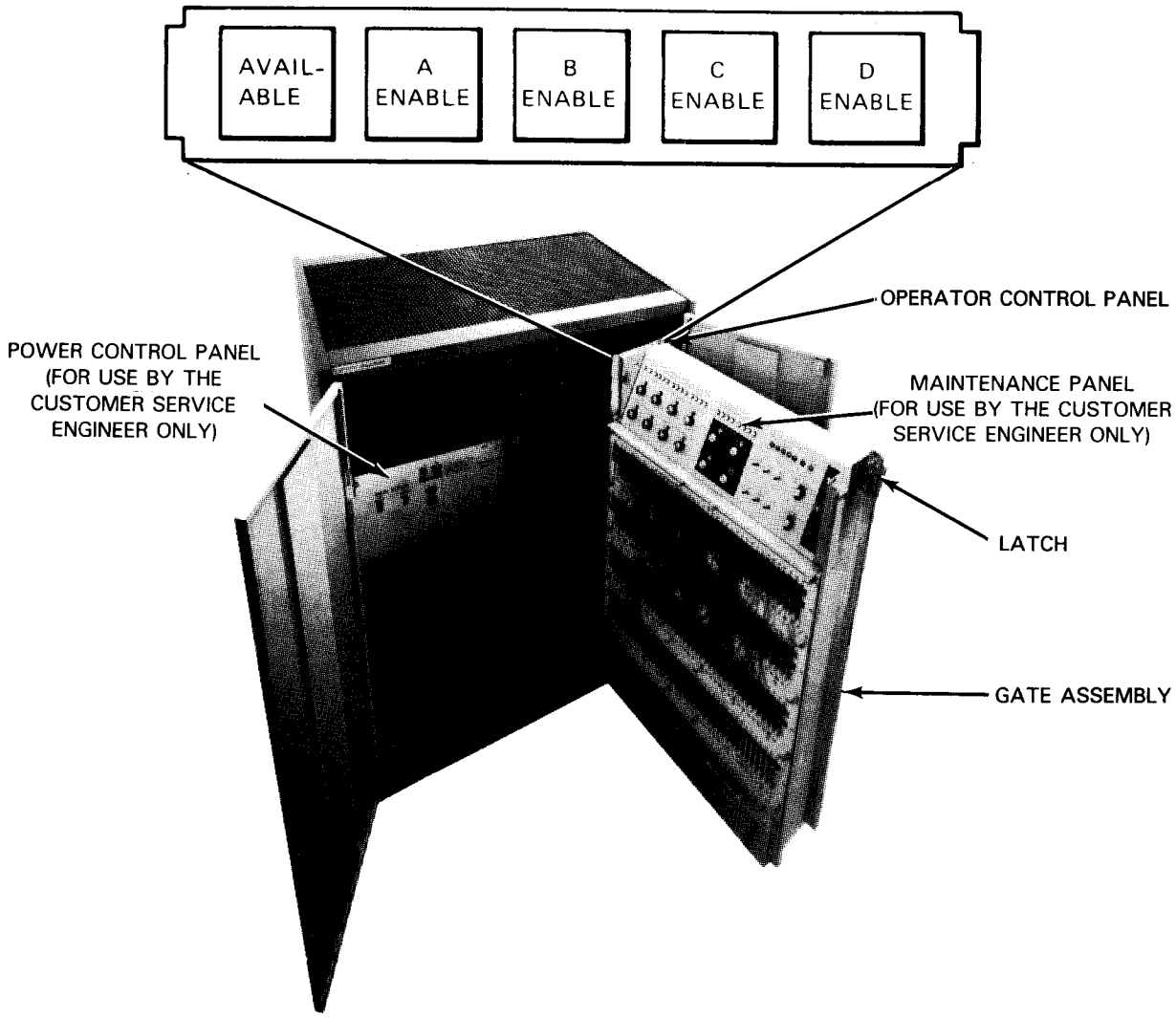


Figure 2-19. 5039 Control Unit Operator Control Panel

Table 2-9. 5039 Control Unit Controls and Indicators

Control/Indicator	Function
ENABLE switches	There is one switch for each channel interface (e.g., ENABLE A, ENABLE B, etc). In the backlighted ENABLE position, the switch establishes an online mode for the control unit and associated disk drives after a software stop or wait state at the processor. In the off (Disable) position, the switch establishes an offline condition for the control unit and associated disk drives after a software stop or wait state at the processor.
AVAILABLE indicator	When on, indicates that control-unit is on; there is no internal check that prevents it from operation, and at least one channel interface is enabled.

2.4.4. 8470 Disk Drive

The 8470 disk drive is a high capacity, random access storage device using nonremovable disk packs. The drive may be equipped with fixed heads, as well as with the standard movable heads, depending on optional features. Another feature permits shared access by two controllers for dual access and simultaneous read/read and read/write operations on either of two disk drives.

The operator control panel for the 8470 disk drive is illustrated in Figure 2-20. The controls and indicators are listed and described in Table 2-10.

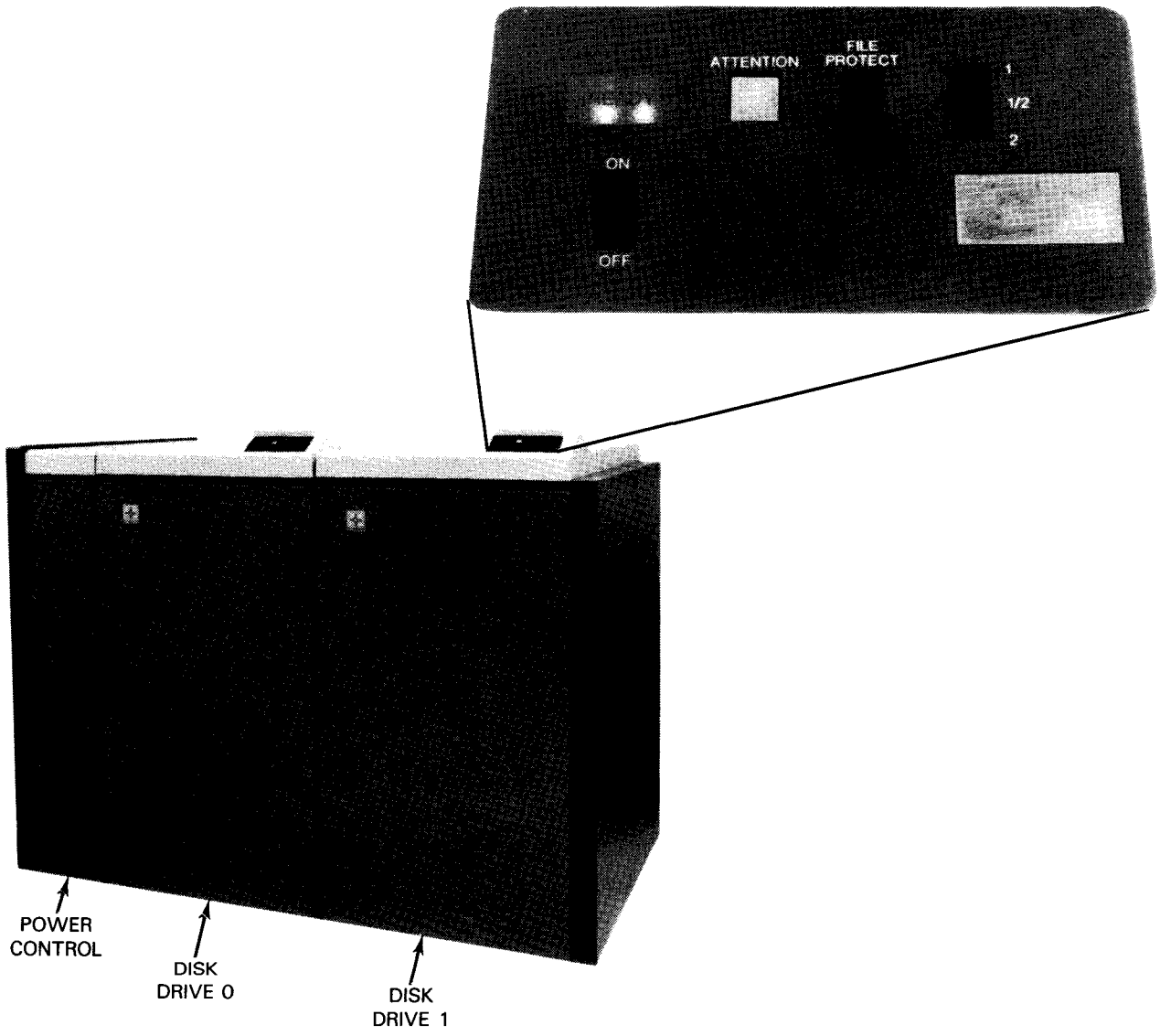


Figure 2-20. 8470 Disk Drive Operator Control Panel

Table 2-10. 8470 Disk Drive Controls and Indicators

Switch/Indicator	Function
ON/OFF switch	ON position connects power to the spindle drive motor. The READY indicator flashes on and off while the spindle drive motor is getting up to operating speed. When the drive is up to operating speed, the heads move to cylinder zero and the READY indicator stops flashing and remains lit. In OFF position, the READY indicator extinguishes, the heads move to the landing zone, and power to the spindle drive motor is turned off. NOTE: If the drive motor is cycled on and off more than twice within a short time interval (from full stop to full speed), the thermal switch in the motor may turn off the motor until it has cooled to a safe level. A READY state cannot be achieved until the motor cools.
READY indicator	Flashes on and off in approximately 1-second intervals when power is applied to the disk drive using the ON/OFF switch. When the disk pack is up to operating speed and the heads are located at cylinder zero, the READY indicator stops flashing and remains lit. When the ON/OFF switch is set to OFF, the READY indicator extinguishes. The READY indicator also flashes on and off for an early temperature warning condition or when a permanent fault occurs.
ATTENTION momentary-on switch	Moves the heads to cylinder zero, resets the address register, and sends the ATTENTION signal to the controller.
FILE PROTECT switch	The up position inhibits write operations, and the disk drive notifies the controller. File protect function is enabled immediately if the disk drive is not selected, or at the end of any current operation.
1, 1/2, 2 switch (used with dual access feature)	Allows the operator to select access paths from controllers 1, 2, or both (1/2).
1/2 (middle position)	Enables access paths 1 and 2, permitting operation from two controllers (dual port).
1 (up position)	Only access path 1 is enabled. Access path 2 is disabled.
2 (down position)	Only access path 2 is enabled. Access path 1 is disabled.

2.4.5. 8480 Disk Storage Unit

The 8480 disk storage unit is a fixed media, random access device with up to 1964 MB storage capacity. The disk storage unit contains 4 head disk assemblies and 4 separate disk drives.

The operator control panel (Figure 2-21) is organized into 4 functional groupings of switches and indicators which are accessible through a cutout in the upper right front door panel. The controls and indicators are listed and described in Table 2-11.

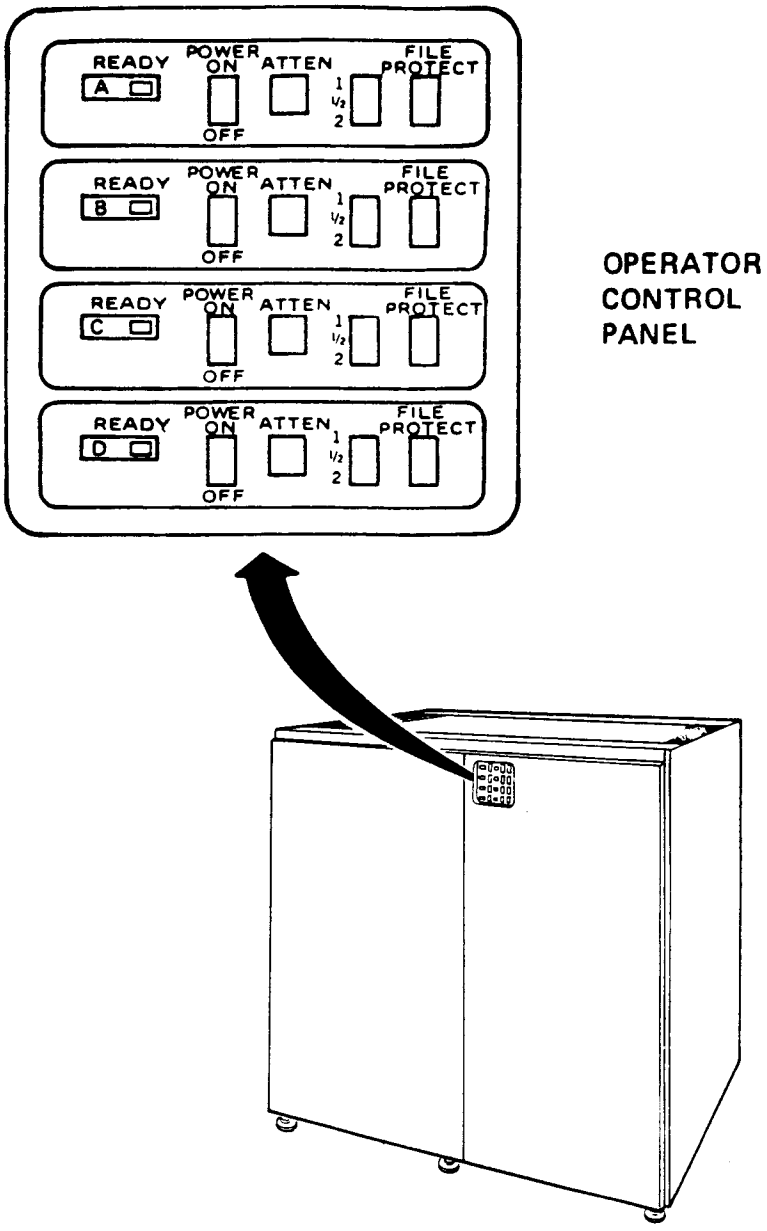


Figure 2-21. 8480 Disk Storage Unit Operator Control Panel

Table 2-11. 8480 Disk Storage Unit Controls and Indicators

Switch/Indicator	Function
READY indicator	Indicates drive unsafe, drive powering up, drive offline, or drive online
POWER ON/OFF switch	Spindle motor START/STOP switch
ATTEN switch	Generates an interrupt signal to the storage control unit
1, 1/2, 2 switch	Port select switch
FILE PROTECT switch	Read only mode switch

2.4.6. 8494 Disk Drive Subsystem

The 8494 disk drive subsystem is housed in a single cabinet. The subsystem consists of a minimum of one disk control unit and two 8-inch modular drives. (The subsystem can have a maximum of two control units and eight drives.) Each drive is a random access, fixed medium drive with 368 MB storage capacity.

Two panels in the subsystem cabinet contain controls and indicators: the cabinet operator control panel located in the upper right corner of the disk cabinet, and an operator control panel located on each disk drive. Figure 2-21a shows the control and indicator panel locations in the disk subsystem cabinet.

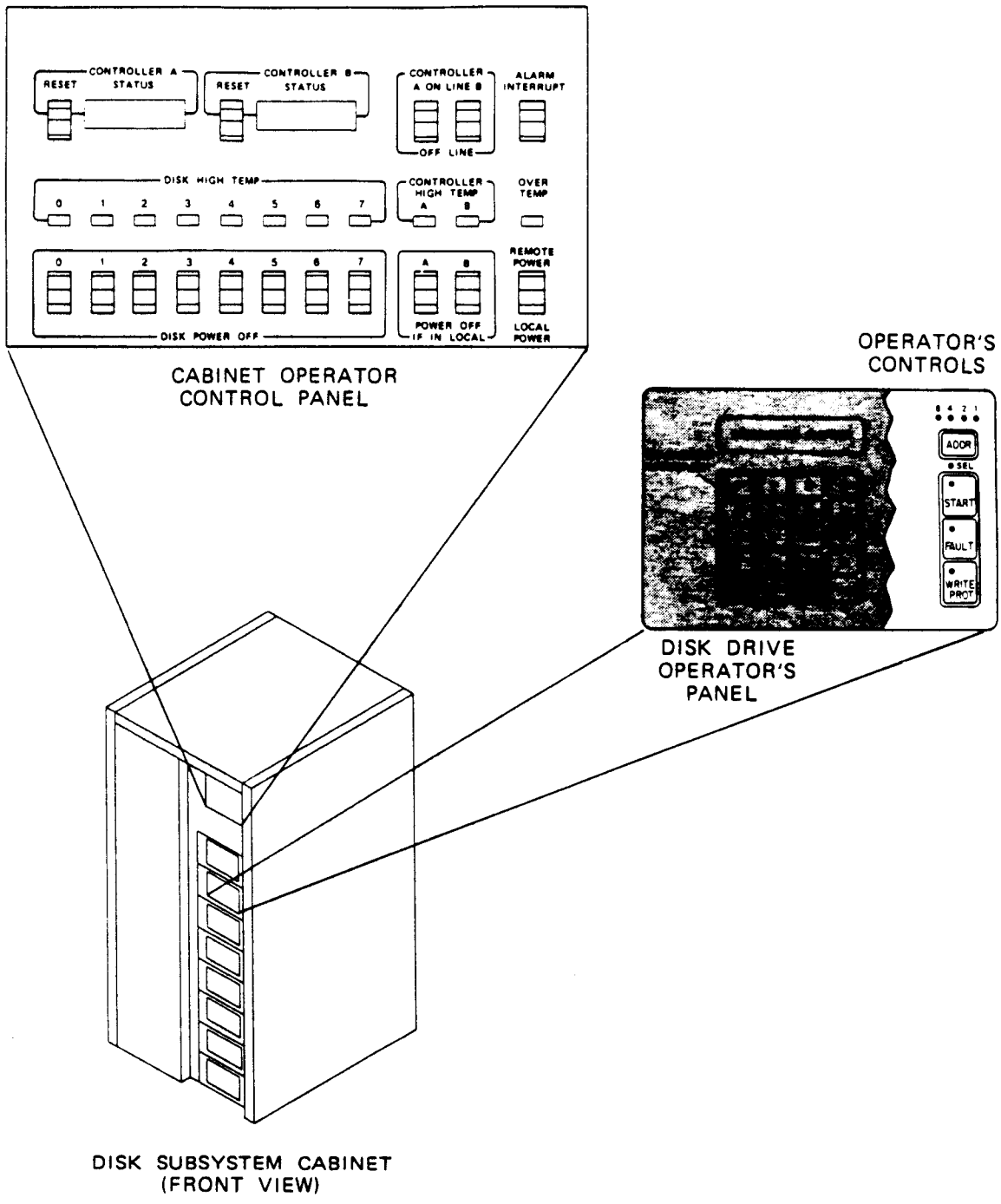


Figure 2-21a. 8494 Disk Cabinet and Disk Drive Operator's Panels

The cabinet operator control panel is on the right front of the cabinet behind the door. When the door is closed, only the controller A and B four-digit hexadecimal status indicators are visible through a cutout in the right door. Figure 2-21b shows this control panel. The cabinet operator control panel controls and indicators are listed and described in Table 2-11a.

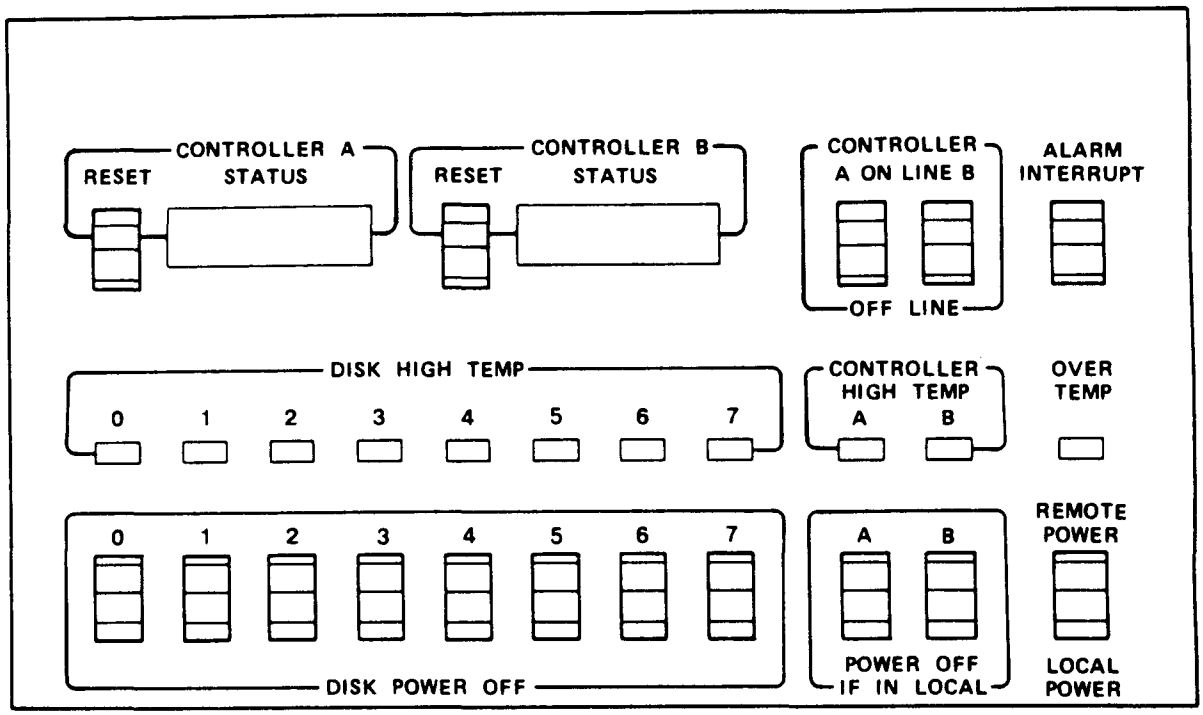


Figure 2-21b. 8494 Disk Cabinet Operator Control Panel

Table 2-11a. 8494 Disk Cabinet Controls and Indicators

Control/Indicator	Function
CONTROLLER A STATUS indicators	This indicator shows the status of control unit A. The indictors are a four digit hexadecimal display.
CONTROLLER A RESET switch	This switch resets control unit A and starts the power-on sequence.
CONTROLLER B STATUS indicators	This indicator shows the status of control unit B. The indicators are a four digit hexadecimal display.
CONTROLLER B RESET switch	This switch resets control unit B and starts the power on sequence.
CONTROLLER A ONLINE/OFFLINE switch	This switch puts control unit A offline without interfering in the operation of the channel and the other control unit.
CONTROLLER B ONLINE/OFFLINE switch	This switch puts control unit B offline without interfering in the operation of the channel and the other control unit.

(continued)

Table 2-11a. 8494 Disk Cabinet Controls and Indicators (cont)

Control/Indicator	Function
ALARM INTERRUPT switch	This switch silences the audible alarm that was activated by a high temperature condition.
DISK HIGH TEMP indicators	These eight indicators, when lit, show that the corresponding disk drive has a high temperature problem.
CONTROLLER A,B HIGH TEMP indicators	These two indicators, when lit, show one of the control units has a high temperature problem.
OVERTEMP indicator	This indicator shows a control unit or disk drive has reached an over temperature condition. The power is automatically removed from the component with the over temperature condition.
DISK POWER OFF switches	These switches control ac power to each of the eight disk drives.
POWER OFF A,B switch	These switches remove dc power from control unit A or B if the REMOTE POWER/LOCAL POWER switch is in the LOCAL position.
REMOTE POWER/ LOCAL POWER switch	In the REMOTE position, the host controls dc power if the REMOTE Power Sequencing feature is installed. In the LOCAL position, dc power is controlled from the subsystem cabinet.

8494 Disk Drive Operator Panel

Each disk drive has its own operator panel, as illustrated in Figure 2-21c. This panel is located behind the right front door of the disk subsystem cabinet. The operator panel consists of two areas: an operator's control and display area, and a diagnostics control and display area. The operator's controls and indicators are described and listed in Table 2-11b. (The diagnostics control and display area are not listed here because only a Unisys Customer Engineer uses them.)

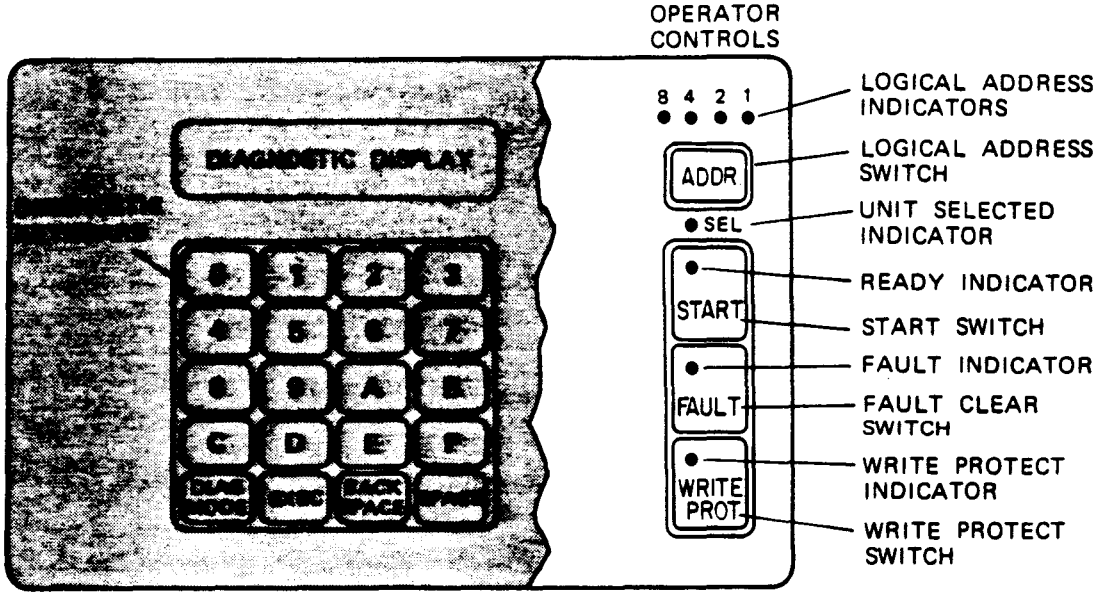


Figure 2-21c. 8494 Disk Drive Operator Panel

Table 2-11b. 8494 Disk Drive Controls and Indicators

Control/Indicator	Function
8 4 2 1 indicators	Logical address indicators. These four indicators are located above the ADDR switch. They display the disk drive logical address in a binary value (0 - 15). The logical address is stored in memory when dc power is removed.
ADDR switch	Logical address switch. This switch establishes the logical address of the disk drive. This switch must be pressed for 2 to 3 seconds to advance the logical address. Pressing it longer causes the address to increment continuously.
SEL indicator	Unit selected indicator. This indicator lights when the disk drive is selected by a disk control unit.
START switch	The START switch is an alternate action start/stop switch. When the switch is set to *on,* the power up sequence is initiated and the READY indicator starts flashing rapidly.
READY indicator	The READY indicator is part of the START switch. It flashes rapidly until the power on sequence is completed, then it remains steadily lit. It flashes slowly when the disk drive power is turned off until disk rotation stops.
FAULT switch	This switch clears the fault indication if the problem that caused the indication is no longer present.
FAULT indicator	The FAULT indicator is part of the FAULT switch. It lights when a fault condition occurs in the disk drive. This indicator can be cleared by one of the following actions: ■ Pressing the FAULT (fault clear) switch ■ Receipt of a fault clear command from the disk control unit ■ Drive power up operation
WRITE PROT switch	The WRITE PROT (write protect) switch places the disk drive in the write protect mode (write operations are disabled).
WRITE PROT indicator	The WRITE PROT (write protect) indicator is part of the WRITE PROT switch. It lights when the disk is in write protect mode.

2.5. PRINTERS

A selection of one of four printers is required for a minimum System 80 models 8/10/20. The printers are:

- 0776 high performance line printer
- 0789 line printer
- 0798 character printer
- 0770 II line printer

Each of these printers is described here for initial operator reference. Additional details you may require are provided in their respective operator reference manuals (Table 1-1).

NOTE: *The 0770 line printer is also supported on a minimum System 80 models 8/10/20. If you need information on this printer, refer to the* 0770 Printer Operator Reference, *UP-7938.*

2.5.1. 0776 Printer

The 0776 printer (Figure 2-22) is a high speed impact type printer using a rotating print band and 136 print hammers. This printer may be in any of three versions (Figure 2-22b and c).

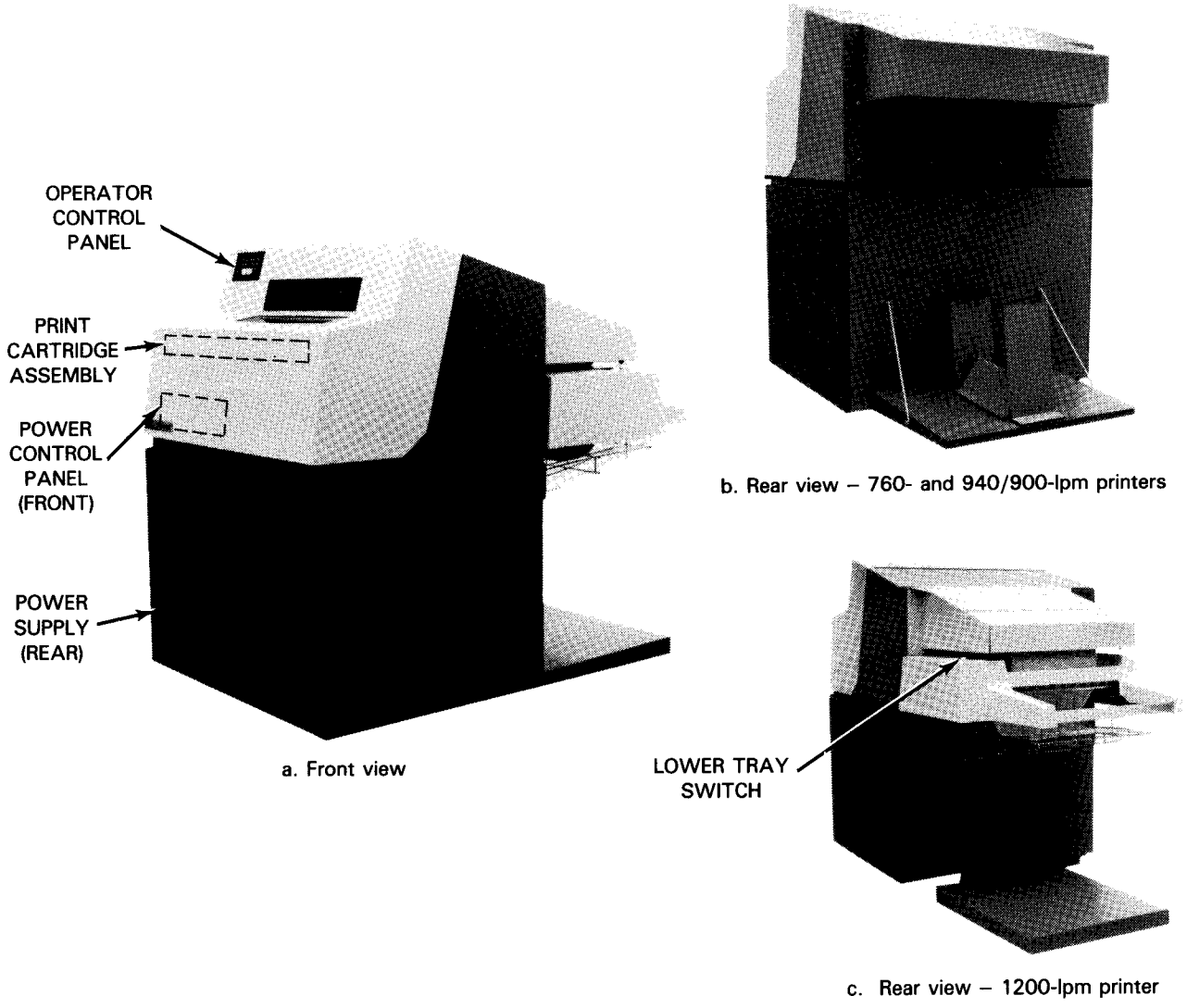


Figure 2-22. 0776 Printer, Front and Rear Views

0776 Printer Power Control

Power for the 0776 printer is initially controlled from its power control panel and power supply panel. The power control panel is illustrated in Figure 2-23. Its controls and indicators are listed and described in Table 2-12. The power supply is illustrated in Figure 2-24. Its circuit breakers are listed and described in Table 2-13.

WARNING

The 0776 printer casework is designed to reduce noise level. For your protection against hazardous high noise levels, operate the printer with the top cover and paper well doors closed. (However, the paper well doors must remain open when accommodating forms longer than 17 inches (43.2 cm)).

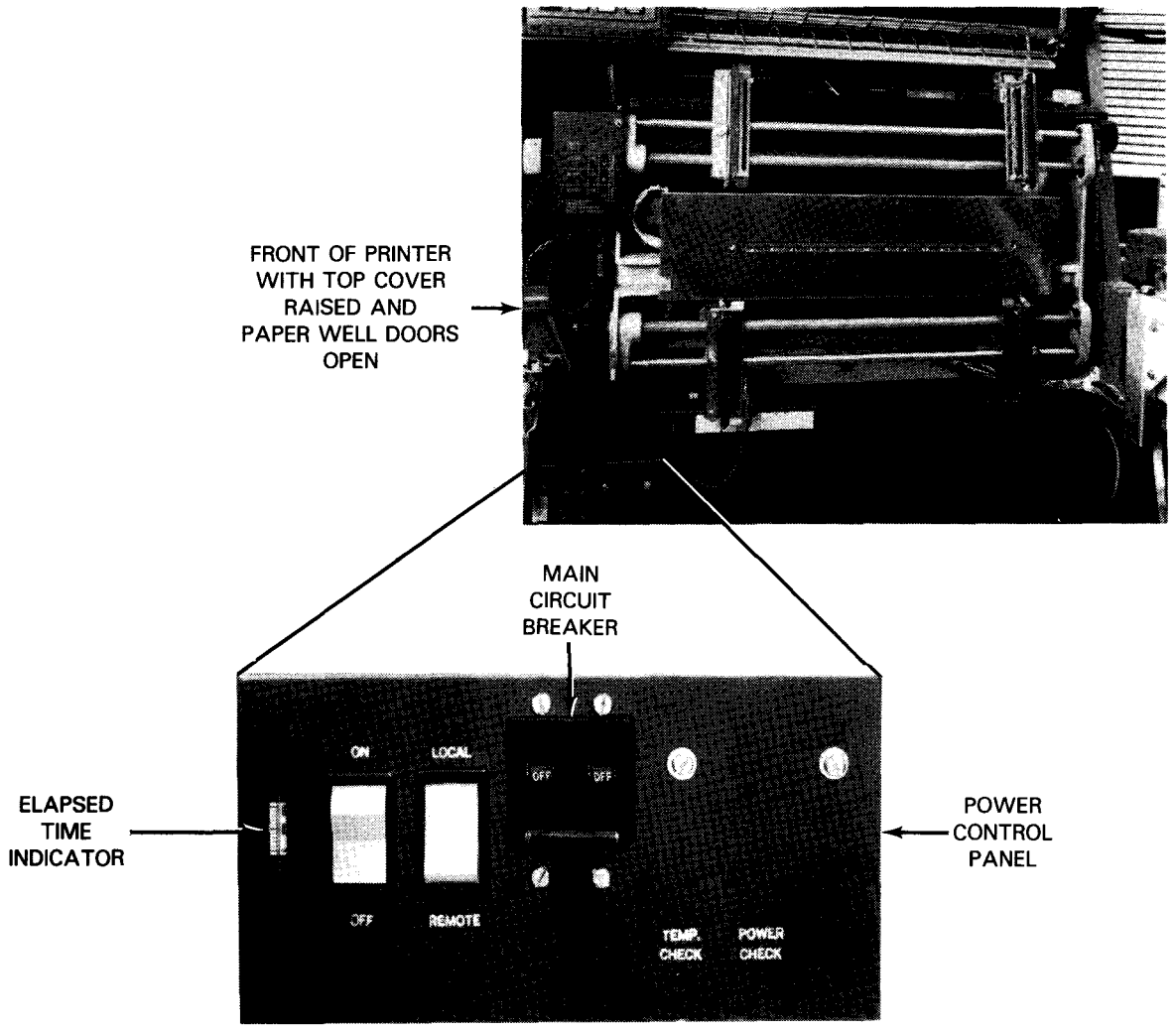


Figure 2-23. 0776 Printer Power Control Panel

Table 2-12. 0776 Printer Power Control Panel, Controls and Indicators

Control/Indicator	Function
ON/OFF rocker switch	When pressed to ON position, initiates printer power-up sequence (if TEMP CHECK or POWER CHECK indicators not lit). When power is fully up, either RUN or STOP indicators light. When pressed to OFF position, printer powers-down and is placed in not ready status.
LOCAL/REMOTE rocker switch	When set to LOCAL, power is controlled by ON/OFF switch. When set to REMOTE, power turn on/turn off is controlled by system processor. When set to LOCAL and power off, momentarily pressing ON/OFF switch to ON position (provided no temperature or power check conditions exist) cycles power-up sequence and places printer online (provided ON LINE/OFF LINE switch located on maintenance panel is set to ON LINE).
CB1 main power circuit breaker switch	Provides ac input power circuit protection for printer.
TEMP. CHECK indicator	Indicates above normal temperature exists in electronics module or surge resistor. The +26 Vdc supply is not energized.
POWER CHECK	Indicates dc power failure. Indicator may flash on and off briefly during indicator power-up sequence.
Elapsed time indicator	Indicates time (in hours) that power has been applied to printer.

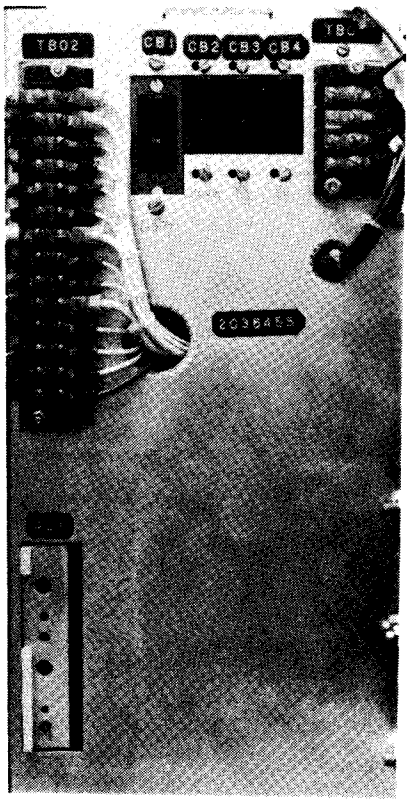


Figure 2-24. 0776 Printer DC Power Supply Panel

Table 2-13. 0776 Printer DC Power Supply Panel, Circuit Breakers

Circuit Breaker	Function
CB1	Provides circuit protection for 65 Vdc power supply.
CB2	Provides circuit protection for 26 Vdc power supply.
CB3	Provides circuit protection for 25 Vac power control circuits and ribbon drive motors.
CB4	Provides circuit protection for 5 Vdc power supply.

0776 Printer Operator Control Panel

The 0776 printer operator control panel is accessible on the front of the printer at the upper left corner. No covers need be opened to operate the control panel. Switches behind the printer are accessed only in special conditions and not during normal operation. The operator control panel is illustrated in Figure 2-25. Its controls and indicators are listed and described in Table 2-14.

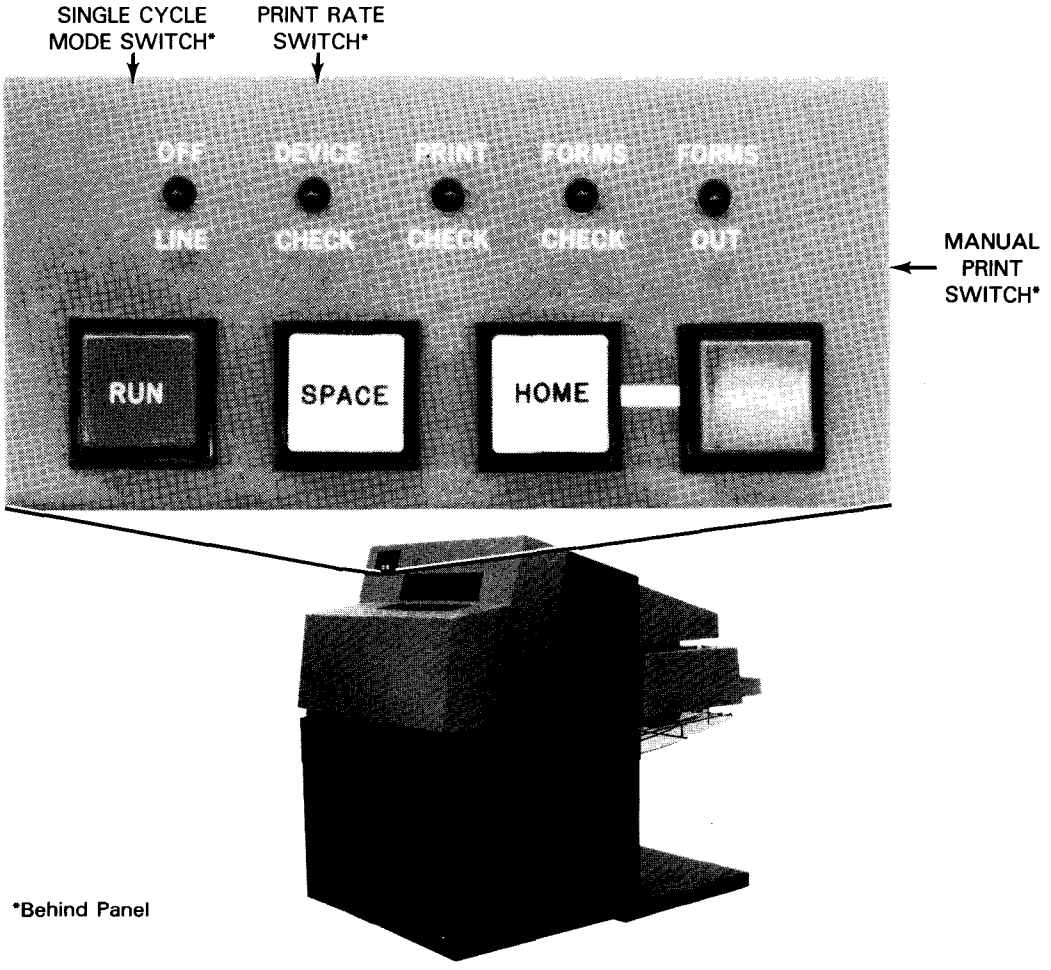


Figure 2-25. 0776 Printer Operator Control Panel

Table 2-14. 0776 Printer Operator Control Panel, Controls and Indicators

Control/Indicator	Function
OFF LINE indicator	Indicates ON LINE/OFF LINE switch located on maintenance panel in electronics module in OFF LINE position. Printer does not respond to any commands addressed to it. Commands addressed to it are propagated down the signal bus.
DEVICE CHECK indicator	Indicates one or both of the following conditions: ■ Print carriage assembly open ■ Air flow through module blower or forms advance motor blower slowed below adequate volume required for proper cooling (may indicate a dirty filter or blower malfunction)
PRINT CHECK indicator	Indicates one or more of the following conditions: ■ Actuator circuit malfunction ■ Broken or slowed print band ■ Print line or load code buffer parity error
FORMS CHECK indicator	Indicates one or more of the following conditions: ■ Continuously fed forms for over 1.2 seconds with no intervening stop ■ Forms feeding mechanism required too much time to decelerate to stop ■ Form jam or torn paper. The forms LED sensor, located at the top of the upper right-band tractor plate, did not detect either the presence of forms (torn paper) or paper motion (jam) for the equivalent of 8 print lines at 6 lines per inch (11 print lines at 8 lines per inch). ■ Vertical format buffer parity error
FORMS OUT indicator	Indicates 8 inches (20.32 cm) or less of forms remain below print line
RUN switch/indicator	Momentary pushbutton switch. When operated during stop state (STOP indicator lit) and control not active, initiates the following sequence: 1. When pressed, clears all check conditions except those activated by an interlock switch or forms low condition that require operator intervention. 2. When released, if all check conditions clear, RUN indicator lights and STOP indicator extinguishes. 3. Attention status generated. Program notified (by way of its status) that control is ready to accept all commands. Pressing and releasing this switch with printer in RUN state results in no action. Pressing and releasing this switch with printer in stop state, and all conditions failing to clear, results in: 1. No attention status generated. 2. Partial clearing of check condition. 3. Printer remains in stop state.

(continued)

Table 2-14. 0776 Printer Operator Control Panel, Controls and Indicators (cont)

Control/Indicator	Function
Audible alarm	Forms stacker full; alarm remains on until forms are removed and stacker tray is raised (applies to the 1200-lpm printer only).
SPACE switch	Momentary pushbutton switch for operator use only during stop state. Form advances one line each time this switch is momentarily pressed. Holding switch pressed advances form until switch is released.
HOME switch/indicator	Momentary pushbutton switch for operator use only during stop state. Form advances under control of vertical format buffer (VFB) to next home (or setup) position in VFB. If VFB and load code buffer are not loaded, form does not advance. The switch/indicator is lit when the VFB is in home position. Pressing this switch while STOP switch is pressed initializes VFB to home paper position without advancing form. VFB address register is cleared to initial position.
STOP switch/indicator	Momentary pushbutton switch. Pressing this switch when printer is in run state stops printer. A control executing a command, or holding pending status, delays entry to stop state until completion of command and transfer of status to channel. Printer can be placed in stop state by any of the following conditions: ■ Forms out ■ Forms check ■ Carriage open ■ Actuator check ■ Loss of cooling air (1200 LPM printer has a separate air vane switch, which monitors air flow to the paper feed motor) ■ Type speed check ■ Stacker full (1200-lpm printer only) ■ Single cycle mode (advance complete) Lamp test performed by pressing STOP switch with printer in stop state. All indicator lamps on operator control panel illuminate.
Print rate switch	An interlock switch that slows print rate to one-half speed when printer front top hood raised to reduce acoustic noise level.
Manual print switch	Three-position switch effective only with printer in stop state to check print actuators and print alignment prior to a print run. Center Position: Normal position to permit printer to operate with top hood closed. In Position (momentary switch): When pressed and released, printer prints image of band once and advances form one line. If held in, printer continues printing until switch is released, provided backboard jumper is installed (contact the customer engineer). Out Position (manually pulled out): Switch remains out, printer prints image of band for each line and advances forms until switch set to normal (center) position.
Single cycle print switch	In the up position, subsequent commands are executed until the next paper feed advance completes, at which time the machine assumes the stop mode. Each time the RUN switch is pressed, the printer executes the next command and then, following any paper advance, returns to stop the mode. The top cover must be raised and must remain open to access and continue single cycle operation. When the cover is closed, single cycle mode is disabled and normal operation is restored.

Lower Tray Switch

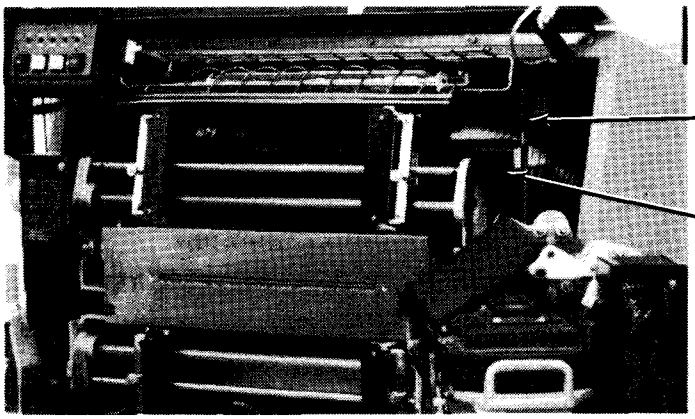
The Lower Tray switch is located on the forms stacker hood at the rear section of the 1200-lpm printer (Figure 2-22c). Hold the switch in the pressed position to lower the stacker tray, thus facilitating forms removal. You can raise the tray manually.

CAUTION

Do not attempt to manually lower the tray by pushing it down or damage may result to the printer.

Internal Adjustments of 0776 Printer

You adjust internal controls when changing or loading forms. Access the controls by raising the top cover of the printer cabinet. The controls are illustrated and described in Figure 2-26.



Location: Upper right front of paper handling assembly

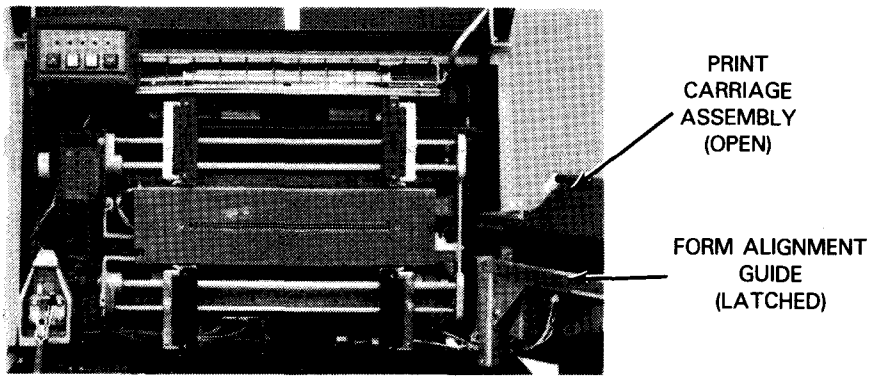
Form thickness lever	Permits adjustment for various form thicknesses by varying gap at print head. Print phasing control should be adjusted, if necessary, after adjusting form thickness lever. (Earlier versions of the printer have a form thickness control knob instead of a lever.)

CAUTION

The numbers on the control lever bracket/knob do not pertain to parts of multipart forms. They are intended only as an aid to help operators repeat settings for previously positioned forms. For example, 6 does NOT mean a 6-part forms position.

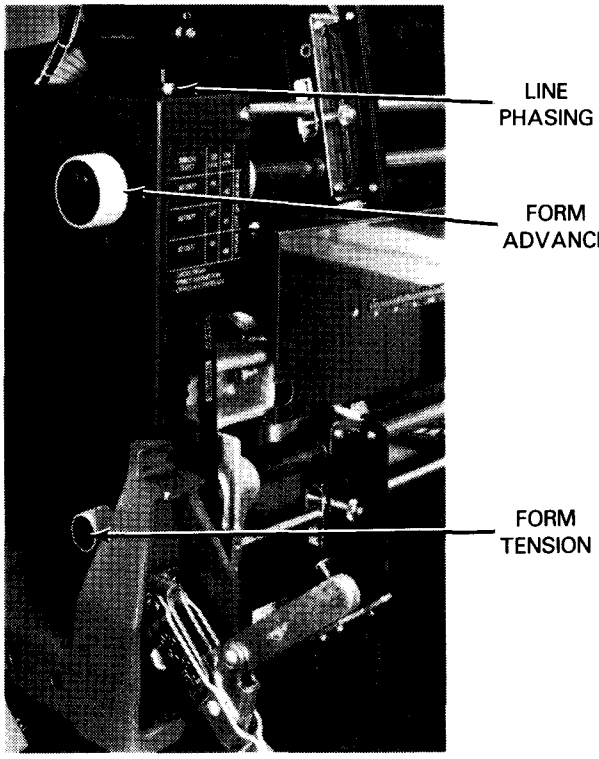
Horizontal form adjustment	Permits vernier horizontal adjustment (= 1/4 inch or 6.35 mm) of tractors for final column positioning of form. (Tractors move in unison.)

Figure 2-26. Internal Adjustments of 0776 Printer (Part 1 of 5)



Location: Paper handling assembly

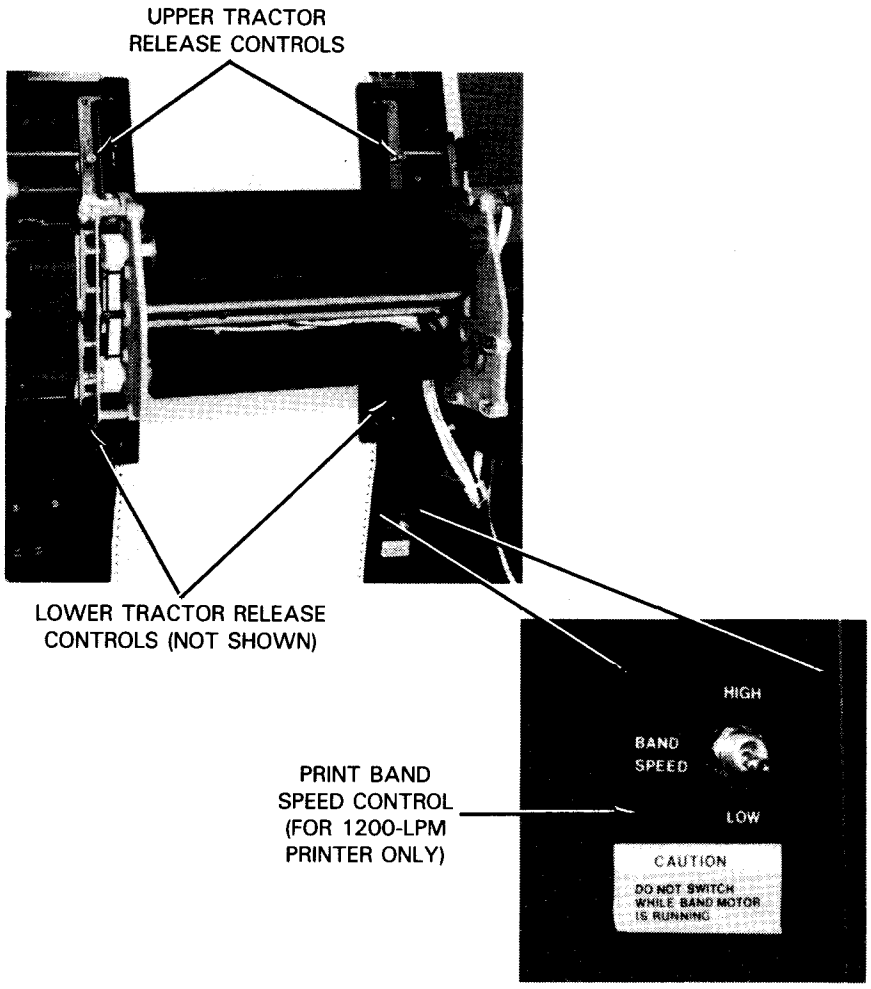
Form alignment guide	Allows alignment of form for printing in proper columns and line positions. Forms alignment guide is magnetically latched to printer carriage assembly and placed against print head before form alignment. After use, guide is manually returned to latched position on print carriage assembly.



Location: Upper left front

Line-phasing control	Allows line position adjustment (± 1/2 line) to assist in setup. Can be adjusted in stop mode or while printing during the initial setup procedure.
Form advance control	Disengages tractor shaft from tractor drive so that proper line position can be selected by adjusting tractors and form.
Form tension control	Permits adjustment of form tension between upper and lower set of tractors. Push in lightly to disengage from paper feed mechanism.

Figure 2-26. Internal Adjustments of 0776 Printer (Part 2 of 5)



	Location: Front of paper handling assembly
Tractor release controls (four knurled wheel controls, one for each tractor)	Controls on each of four tractors provide coarse adjustment of form with respect to print line by allowing each tractor to be individually positioned horizontally on tractor shaft.
Print band speed control (1200-lpm printer only)	Permits selection of a lower print band speed for optimum print quality.

Figure 2-26. Internal Adjustments of 0776 Printer (Part 3 of 5)

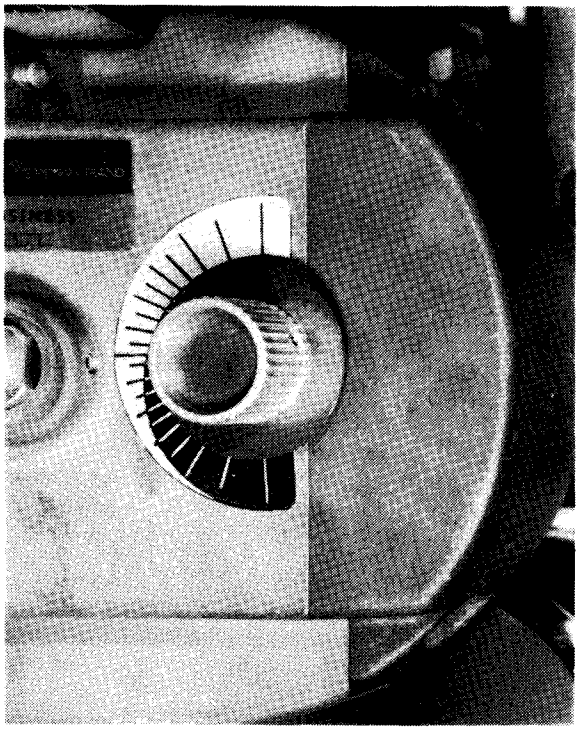
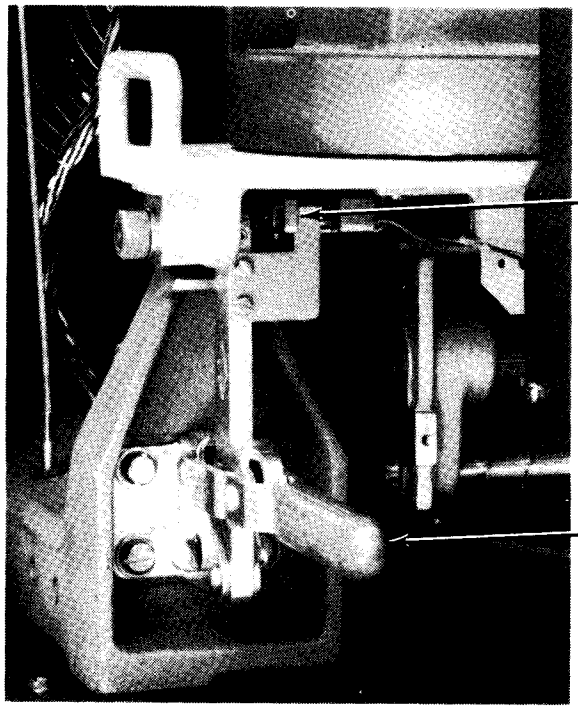
	 Location: Print cartridge assembly, right front, top view
Print phasing control	Permits vernier horizontal adjustment of printer character in a column so that character is centered on hammer when printing.

Figure 2-26. Internal Adjustments of 0776 Printer (Part 4 of 5)



Location: Upper left front of paper handling assembly

Print carriage assembly latch	Allows print carriage assembly to be securely held in operating position.
Print carriage assembly interlock switch	When print carriage assembly is open, prevents operation of printer by notifying printer controller logic in processor of condition. Printer automatically placed in stop mode and DEVICE CHECK indicator on processor operator/maintenance panel lights.

NOTE:

Other interlock switches are included in printer (such as thermal interlocks, no-air-flow-in-plenum interlock, paper feed motor air vane switch (1200-lpm printer only), etc), but not described since they are primarily maintenance-type interlocks.

Figure 2-26. Internal Adjustments of 0776 Printer (Part 5 of 5)

2.5.2. 0789 Printer

The 0789 printer is an impact type printer using a rotating print band and 132 print hammers. The 0789 can print in rates of 180, 300, or 640 lines per minute (lpm). The printer, with front top cover closed, is illustrated in Figure 2-27.

NOTE: The rear top cover is not opened by the operator.

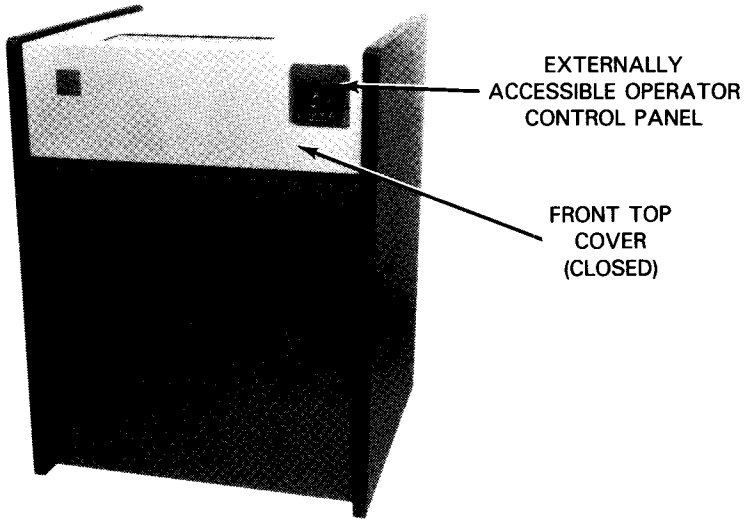


Figure 2-27. 0789 Printer with Cover Closed

Main Power Switch

The 0789 printer power switch is located beneath the top cover on the front at the right of the frame (Figure 2-28). The switch is a rocker type that controls ac power to the printer.

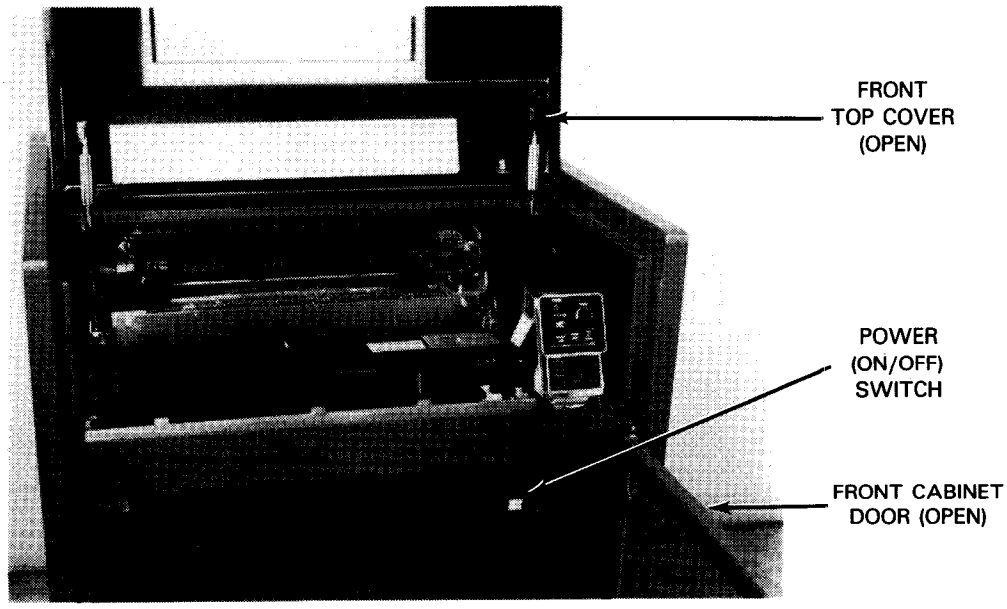


Figure 2-28. 0789 Printer Power Switch

0789 Printer Operator Control Panel

The operator control panel is divided into two sections: one is accessible with the front top cover closed, and both sections are accessible with the top cover open. The covered section is used only when internal operations are required, such as installing forms. The full panel is illustrated in Figure 2-29. The operator controls and indicators are listed and described in Table 2-15.

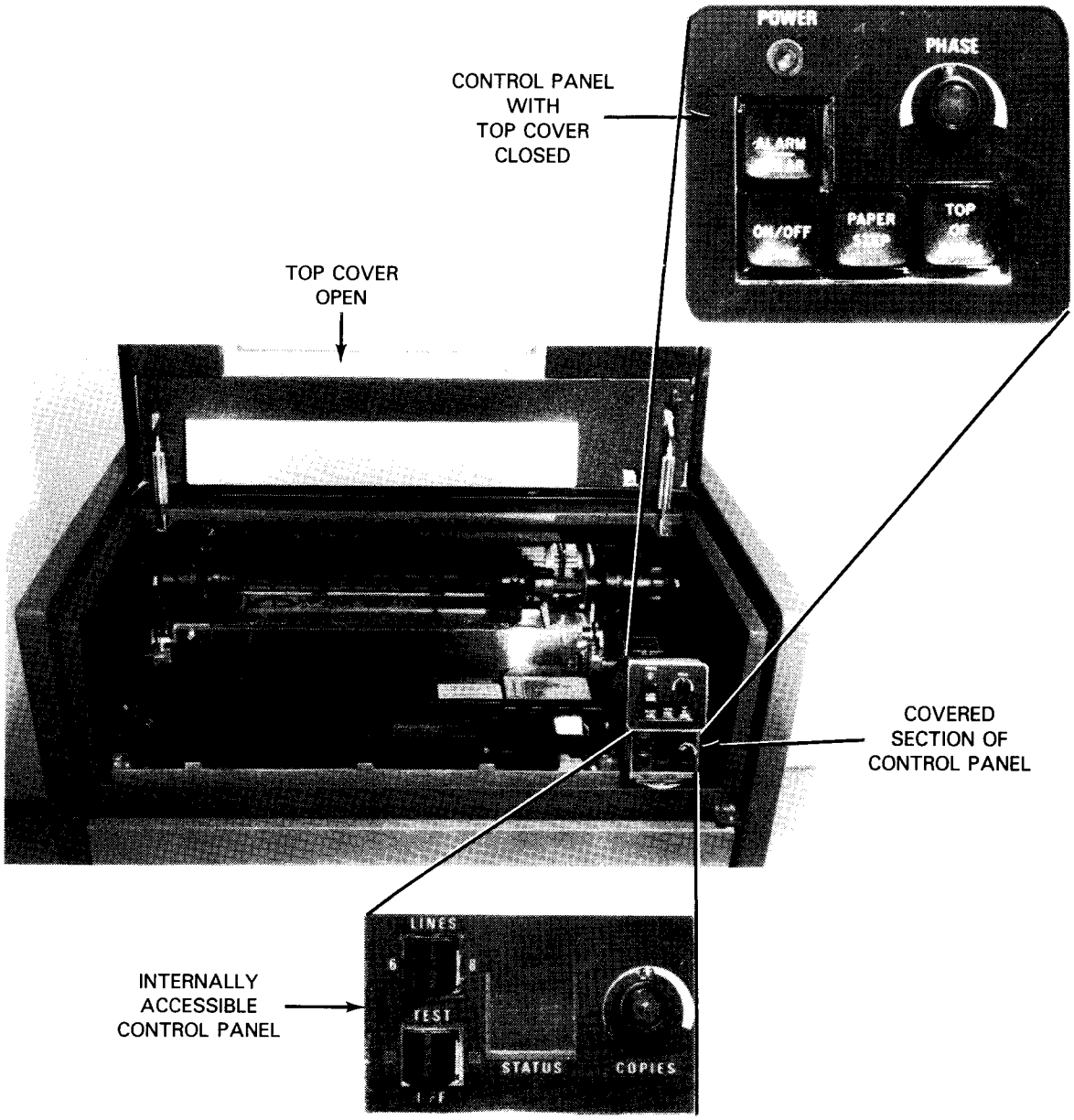


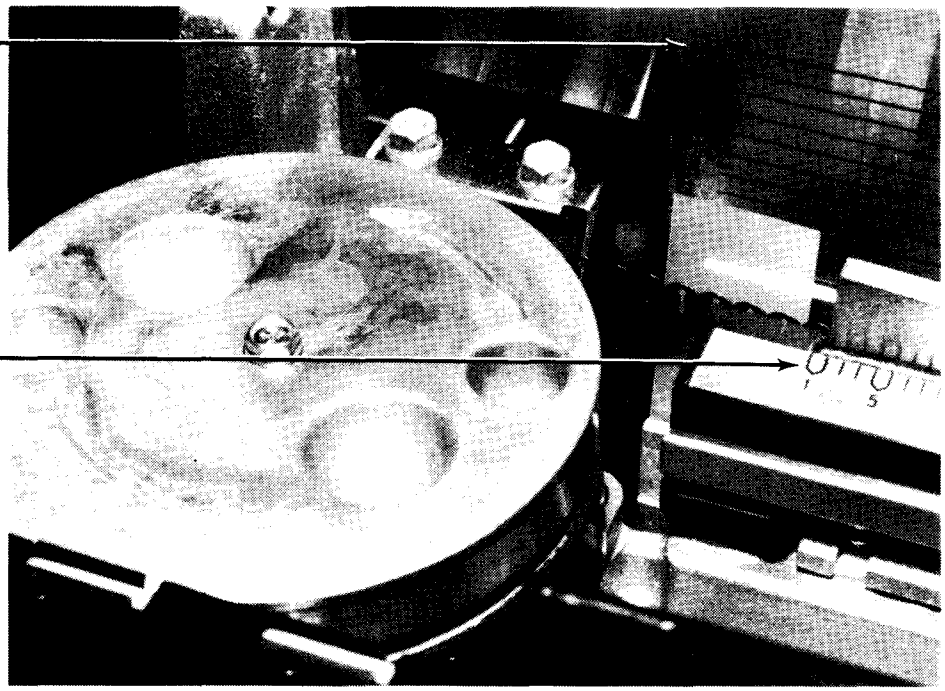
Figure 2-29. 0789 Printer Operator Control Panel

Table 2-15. 0789 Printer Operator Control Panel, Controls and Indicators

Control/Indicator	Function
Externally Accessible	
ON/OFF LINE switch/indicator	Lights when printer is in ready condition and online. Pressing switch alternately places the printer in the online and offline mode. If the TEST switch is set to either the left or right position, pressing the ON/OFF LINE switch alternately places the printer in and out of self-test mode. The ON/OFF LINE indicator is lit when the printer is in the self-test mode; however, the READY signal remains inactive.
ALARM/CLEAR switch/indicator	Lights during power up or to indicate a fault condition. A specific error condition is identified by the STATUS indicator display. Pressing this switch clears printer logic.
PAPER STEP switch	Momentary switch used to advance the forms one line at a time when printer is in offline mode. When pressed and held, printer feeds the forms continuously until the switch is released.
TOP OF FORM switch	Momentary switch used to advance the forms to the top-of-form position of the next form.
PHASE control	Potentiometer used to maintain equal density at the left and right sides of the characters.
POWER indicator	Lights when main power switch is set to 1 (on) position and power is turned on.
Internally Accessible	
LINES 6/8 switch	A 2-position switch that enables the selection of either 6 or 8 lines per inch vertical printing density.
TEST/OFF switch	A 3-position switch for exercising the printer self-test function. The center OFF position disables the self-test function. Setting the switch to the right ▨ position and pressing the ON/OFF LINE switch causes the printing at half speed of a 132-column sliding pattern; setting the switch to the left ▥ position and pressing the ON/OFF LINE switch causes the printing of a fixed vertical pattern. The ON/OFF LINE switch must be pressed to stop either pattern.
STATUS display	A 2-digit alphanumeric readout display code indicating either the major function being performed by the printer or an existing fault condition.
COPIES control	A potentiometer that varies hammer drive to optimize print quality when printing on forms of various thicknesses. The lowest setting should be used whenever possible to maximize ribbon, band, and print hammer life.

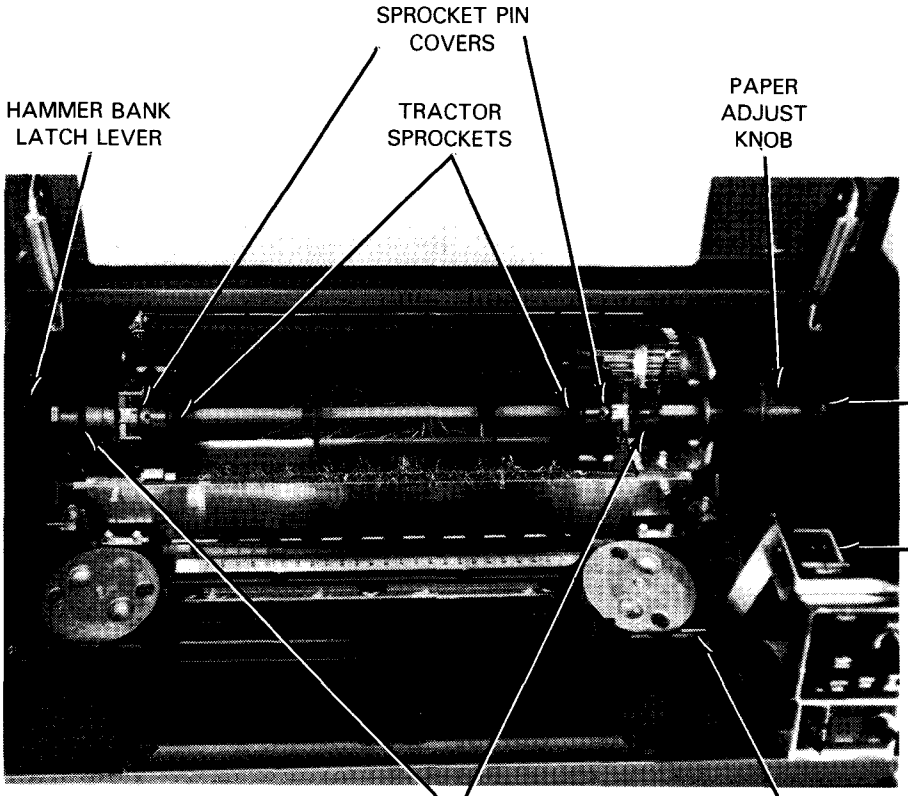
Internal Adjustments of 0789 Printer

When you need to setup new forms or make printing adjustments to overcome print faults, use the internal controls that are accessed by raising the printer cabinet top cover. The controls are illustrated and described in Figure 2-30.



Top of form index scale (6 lpi)	Permits alignment of form to position where first line is to be printed on the form. Alignment scale for printing density of 6 lines per inch (lpi) is to the left of the form (illustrated), and density of 8 lpi is to the right.
Forms alignment scale	Permits alignment of form to position where the first column (left margin) is to be printed.

Figure 2-30. Internal Adjustments of 0789 Printer (Part 1 of 2)



Tractor sprocket locks	The split-knob tractor sprocket locks, located outside of each tractor, are squeezed to release the tractors and move them in the desired direction.
Hammer bank latch lever	The lever is lifted to move the print hammer bank to the rear and allow manual feed of forms.
Sprocket pin covers	Prevent forms from slipping from the tractor sprocket pins during operation.
Tractor sprockets	Pinwheel sprockets located above the print area engage perforations along outer edges of forms to move the forms.
Paper adjust knob	Permits manual vertical adjustment of paper after releasing paper feed release lever.
Paper feed release lever	When flipped open (red side or numeral 0 is exposed), releases drive mechanism to permit vertical adjustment of forms for line positioning or top-of-forms positioning. When closed, the clutch is engaged with the square drive shaft.
Print band tension lever	Releases tension on print band idler pulley wheel for removing and replacing print band. The lever is moved toward the rear of the printer to release print band tension.
FORMS LENGTH SELECT switch	Permits operation with different form lengths. Once set, forms move to top of forms to accommodate the form being printed each time the TOP OF FORMS switch is pressed.

Figure 2-30. Internal Adjustments of 0789 Printer (Part 2 of 2)

2.5.3. 0798 Printer

The 0798 printer is a high-speed dot matrix type printer capable of printing in either direction on 132-character lines. The printer may be used as the primary system printer in a minimum system.

Power Switch and Audible Alarm

The 0798 printer power switch is located on the top right section of the casework (Figure 2-31). The switch applies primary power to the printer when set to the 1 (on) position. Power is turned off when the switch is in the 0 position.

Setting the switch to the 1 position automatically initiates a power-on confidence (POC) test on the printer. During the test, the print head moves out of home position, then returns to home position. The test is completed when the print head moves upon receiving a print command.

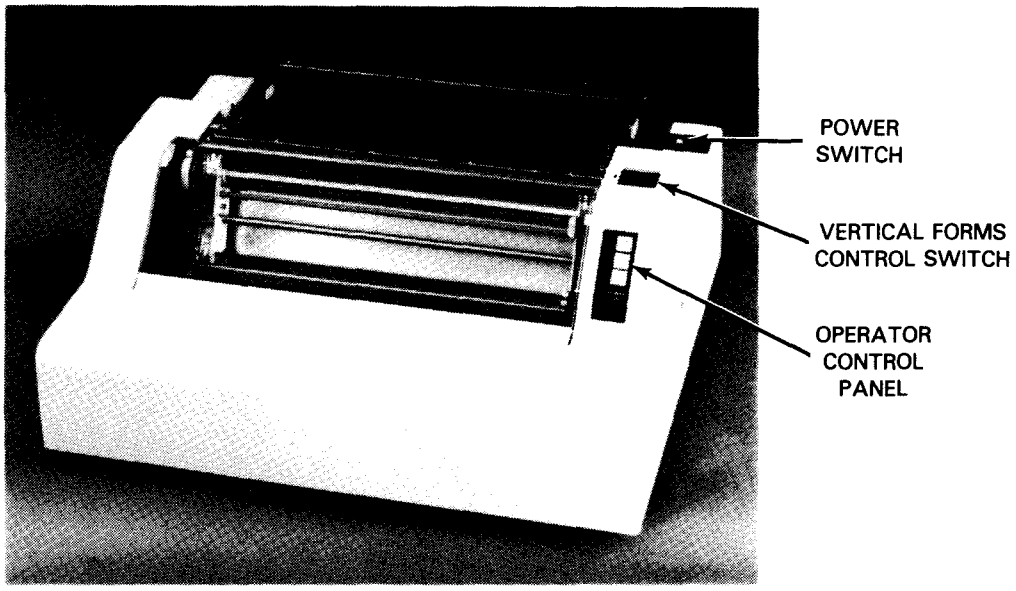


Figure 2-31. 0798 Printer

If a malfunction is detected during POC test, the audible alarm sounds and the POWER ON indicator flashes until the power switch is returned to 0 position (off). The same alarm indications are presented if faults occur during operation for feed problems or print head motion.

The audible alarm also sounds when the paper supply is low, as detected by paper-end detectors. The alarm sounds for approximately 3 seconds, then stops.

0798 Printer Operator Control Panel

The operator control panel, located at the right-front section of the printer, allows quick access to primary functions required by the operator. The operator control panel is illustrated in Figure 2-32. The switch/indicators are listed and described in Table 2-16.

Operating Adjustments of 0798 Printer

Controls and adjustments to set up and operate the 0798 printer are located inside and outside the casework. Internal adjustments are accessed by raising the top cover. The controls and adjustments are illustrated and described in Figure 2-33.

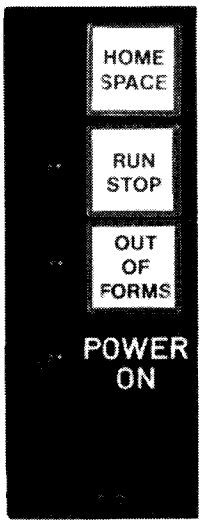
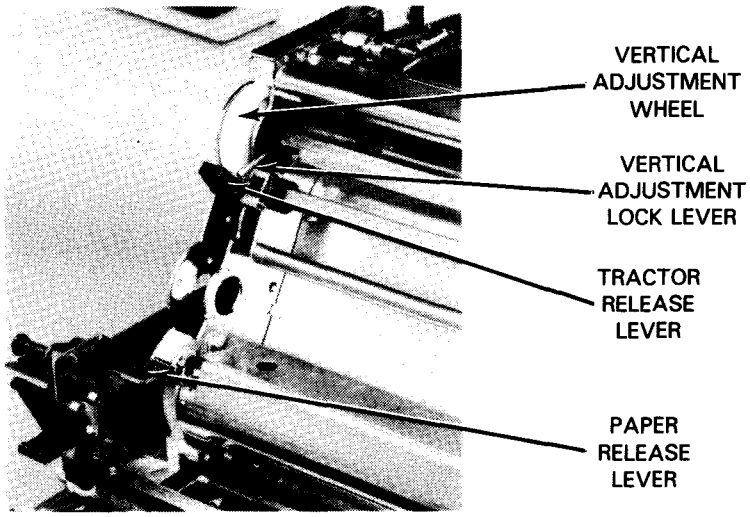


Figure 2-32. 0798 Printer Operator Control Panel

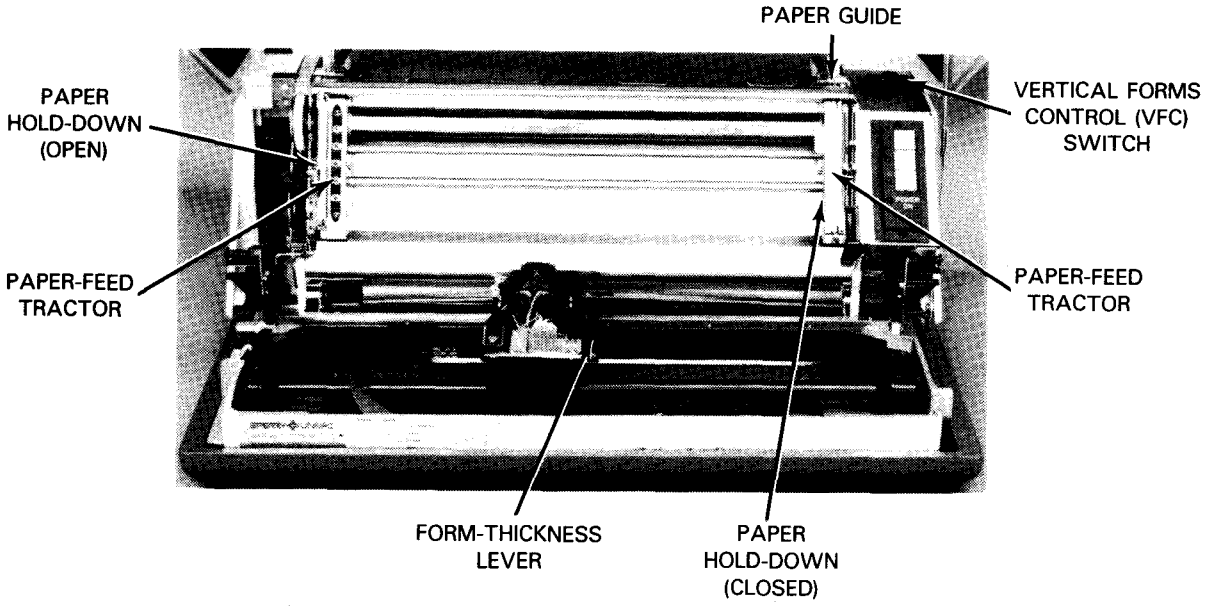
Table 2-16. 0798 Printer Controls and Indicators

Control/Indicator	Function
HOME SPACE switch	Pressing this switch momentarily causes a line feed. When the switch is pressed and held, the printer performs a form feed. If the printer is operating without forms control (VFC switch in 0 black position), holding the switch in the pressed position causes a continuous paper feed until the switch is released.
RUN STOP switch and indicator	Pressing this switch connects the printer to the controlling data source. The associated indicator lights. Pressing the switch again returns the printer to an offline state. The indicator goes off.
OUT OF FORMS switch and indicator	The indicator associated with this switch lights when the end of the last form is near. An audible alarm also sounds, and printing may stop. If printing stops, the switch can be pressed and held in position to continue printing to the end of the form. With some host controllers, printing continues until the last line on the form is printed, without the OUT OF FORMS switch being pressed.
POWER ON indicator	This indicator lights whenever primary power is applied to the printer. The indicator and an audible alarm alternately flash and sound at 0.5-second intervals in the event of a paper-feed or print head motion malfunction.



Vertical adjustment lock lever	Combination of functions: ■ Without 6/8 lpi feature: – Up position unlocks the vertical adjustment wheel. – Down position selects 6 lpi operation. ■ With 6/8 lpi feature: – Up position selects 8 lpi operation. – Center position unlocks vertical adjustment wheel. – Down position selects 6 lpi operation.
Vertical adjustment wheel	Permits forms to be moved forward or backward to set up for printing. The wheel is unlocked with the vertical adjustment lock lever.
Tractor release lever	Releases paper-feed tractor at each side of the printer so that both tractors may be moved along a metal guide bar to accommodate paper width. Paper-feed tractors are locked when lever is in down position.
Paper release lever	When pressed down, the paper feed path is open to permit forms to be fed into or removed from the printer. The feed path is closed when the lever is in up position.

Figure 2-33. Operating Adjustments of 0798 Printer (Part 1 of 5)



Paper-feed tractors and paper hold-downs

Tractors (2) at both ends of forms fit into sprockets on the form, while the form is held to the tractors with the paper hold-downs (2).

Paper guide

Allows forms to move evenly across the top of printer and stacks properly on the printer stand

Vertical forms control (VFC) switch

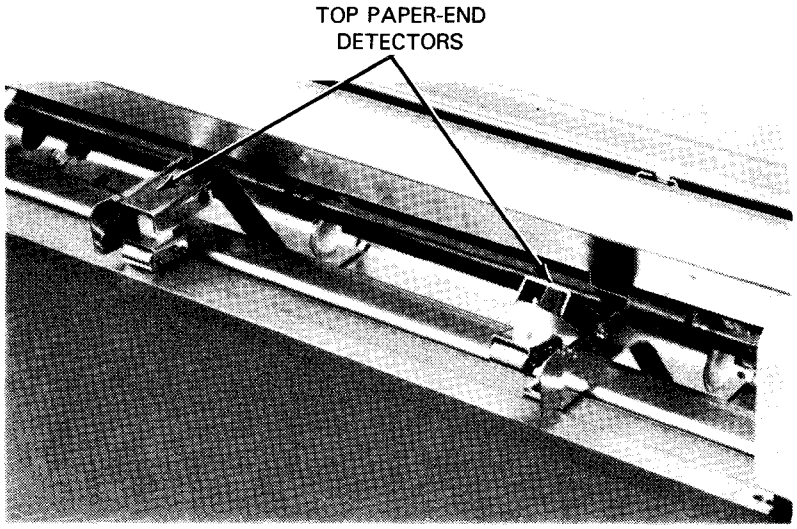
16-position switch controls operation for any of 7 standard form lengths with or without a 6-line skip-perforation step. The switch also permits operation without forms control function. Switch settings and standard form lengths are as follows:

Switch Position	Centimeters	Inches	Remarks
Black O	---	---	No forms control
Black M	---	---	Not used
Black 1	8.9	3.5	
Black 2	10.2	4.0	Switch positions 1
Black 3	14.0	5.5	through 7 provide
Black 4	21.6	8.5	a 6-line skip between forms
Black 5	25.4	10.0	
Black 6	27.9	11.0	
Black 7	30.5	12.0	
Red 1	8.9	3.5	A perforation skip
Red 2	10.2	4.0	between forms is
Red 3	14.0	5.5	not provided in the
Red 4	21.6	8.5	red switch positions
Red 5	25.4	10.0	
Red 6	27.9	11.0	
Red 7	30.5	12.0	

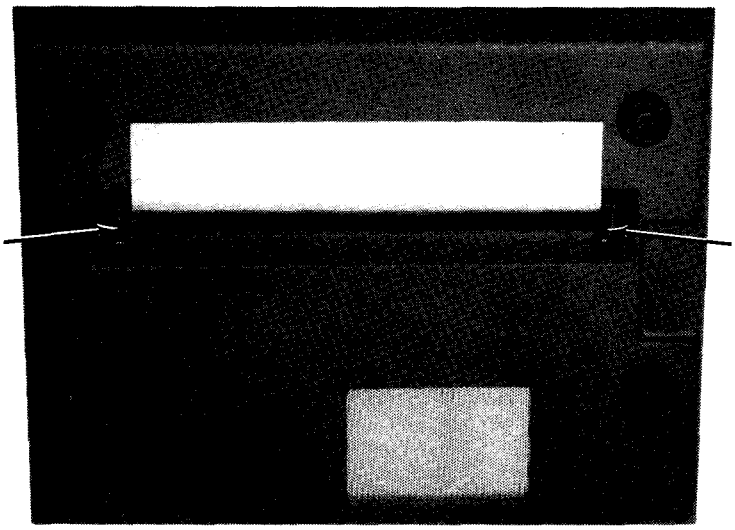
Form-thickness lever

Permits adjustment of space between platen and print head where paper is fed to be printed. Adjustment is required for multipart forms to assure clean and readable print on each page of the multipart form.

Figure 2-33. Operating Adjustments of 0798 Printer (Part 2 of 5)

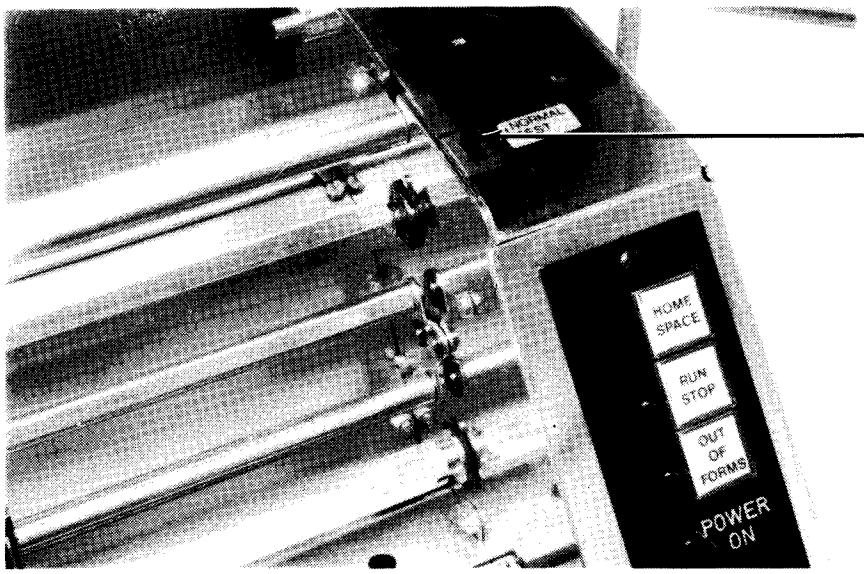


Top paper-end detectors	Accommodates rear loading of paper forms to indicate when paper needs to be replenished. OUT OF FORMS indicator lights and audible alarm sounds for 3 seconds. The processor is notified to stop supplying information, causing the printer to stop when the last line on the form is printed.

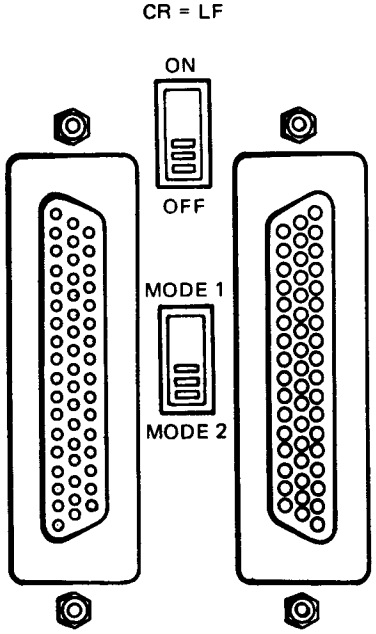


Bottom paper-end detectors	Same as top paper-end detectors, except accommodate bottom loading of paper forms when using print stand.

Figure 2-33. Operating Adjustments of 0798 Printer (Part 3 of 5)

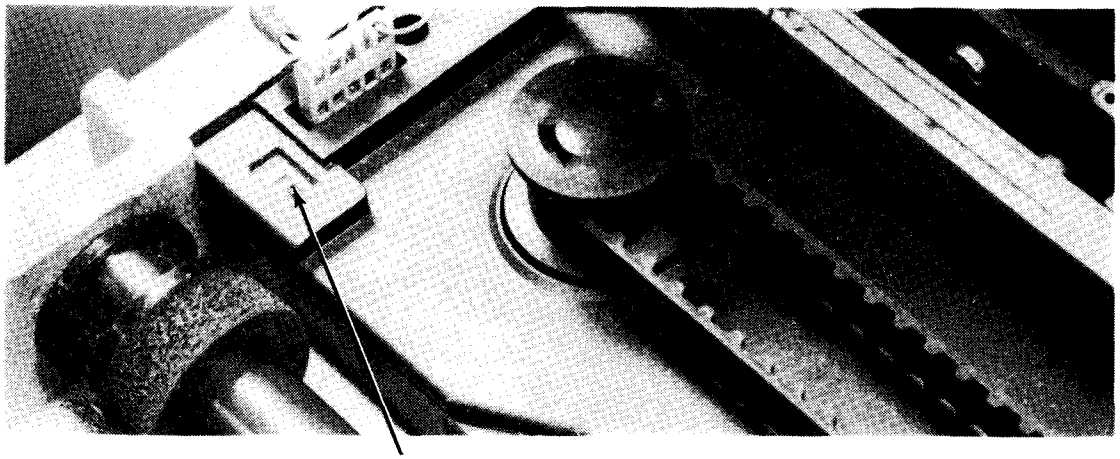


Self-test switch	Two-position slide switch, under the top cover, used for printer self-tests. A test pattern is printed to check electronics and mechanical functions of the printer.



CR=LF selection switch	Located at the rear of the printer if the required optional feature is installed. The switch permits operation with an automatic line feed (LF) upon receiving a carriage return (CR) command. When the switch is set to OFF position, line feed does not occur automatically after CR, and the printer is ready to overprint the line just completed.
MODE 1/ MODE 2 selection switch	Permits operating at either mode selection to accommodate the particular installation requirements.

Figure 2-33. Operating Adjustments of 0798 Printer (Part 4 of 5)



Compressed density selection switch	Located near the left front of the frame if the compressed density feature is installed, the switch causes printing to occur at 10 characters per inch when set to the right position. Setting the switch to the left position causes printing to occur at a density of 14 characters per inch.

Figure 2-33. Operating Adjustments of 0798 Printer (Part 5 of 5)

2.5.4. 0770 II Printer

The 0770 II printer (Figure 2-34) is a microprocessor-controlled, high-speed impact line printer used in conjunction with a host system. It operates at speeds up to 2000 lines per minute (lpm).

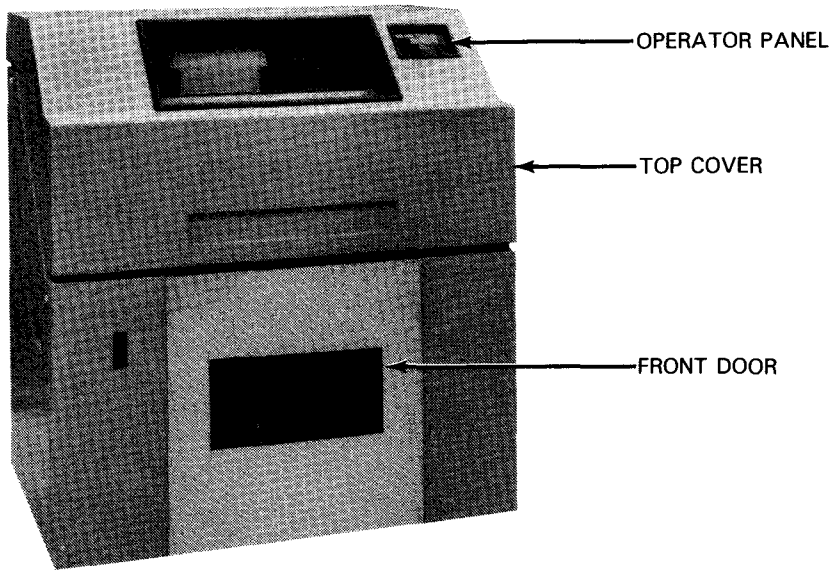


Figure 2-34. 0770 II Printer

0770 II Power Switch/Circuit Breaker

The MAIN AC POWER switch/circuit breaker (Figure 2-35) is on the left front of the printer. It turns off ac power to the printer. As a switch, it is used only for manual emergency turnoff. As a circuit breaker, it automatically turns power off if an electrical overload occurs.

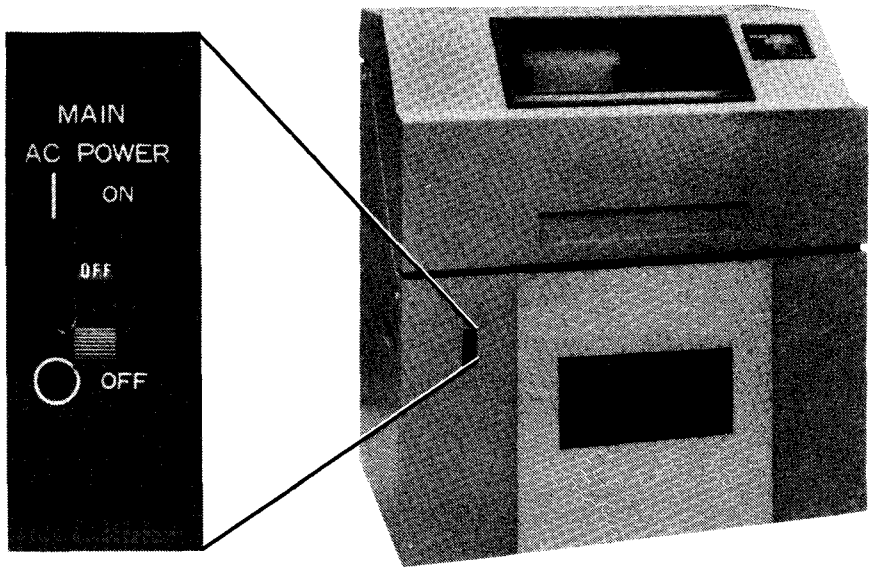


Figure 2-35. MAIN AC POWER Switch/Circuit Breaker

0770 II Power Control

- **Local Power Turn-on**

1. Set the MAIN AC POWER switch/circuit breaker on the front of the printer to ON. The AC IN indicator on the auxiliary operator panel lights.

2. Set the REMOTE/LOCAL switch on the auxiliary operator panel to LOCAL.

4. Set the POWER ON/OFF switch on the auxiliary operator panel to ON.

   - Power is applied directly to the printer.

   - The power-on clear test starts and the operator panel indicators light for about two seconds.

   - At the completion of the power-on clear test, the POWER ON indicator on the operator panel lights and the print band position is displayed on the operator panel error display.

- **Local Power Turnoff**

  1. If the ON LINE light on the operator panel is lit, press the STOP switch on either the operator panel or rear operator panel.

  2. Set the REMOTE/LOCAL switch on the auxiliary operator panel to LOCAL.

  3. Set the MAIN AC POWER switch/circuit breaker to OFF.

- **Remote Power Turn-on**

  1. Set the MAIN AC POWER switch/circuit breaker on the front of the printer to ON. The AC IN indicator on the auxiliary panel lights.

  2. Set the REMOTE/LOCAL switch on the auxiliary operator panel to REMOTE.

     - A signal from the host can now apply power to the printer.

     - When power is applied, the power-on clear test starts and the operator panel indicators light for about two seconds.

     - At the completion of the power-on clear test, the POWER ON indicator on the operator panel lights and the print band position is displayed on the operator panel error display.

- **Remote Power Turnoff**

  1. If the ONLINE light on the operator panel is lit, press the STOP switch on either the operator panel or the rear operator panel.

  2. Set the REMOTE/LOCAL switch on the auxiliary operator panel to REMOTE. (A signal from the host can now remove power from the printer.)

0770 II Operator Panel

The operator panel (Figure 2-36) is in the upper right-hand corner of the printer. Most of the frequently used controls and indicators are on this panel. Table 2-17 describes the function of each control and indicator on the panel.

The panel functions in either of two operating modes - the online mode for normal operation and the offline mode for setup and maintenance. Consequently, many of the controls and indicators have dual functions, depending on the operating mode.

- **Online Mode**

  In this mode, the panel provides the controls and indicators for normal operation, a 4-digit error display, and five graphic display indicators.

- **Offline Mode**

  In this mode, you can use the panel to enter various test routines and to establish operational parameters.

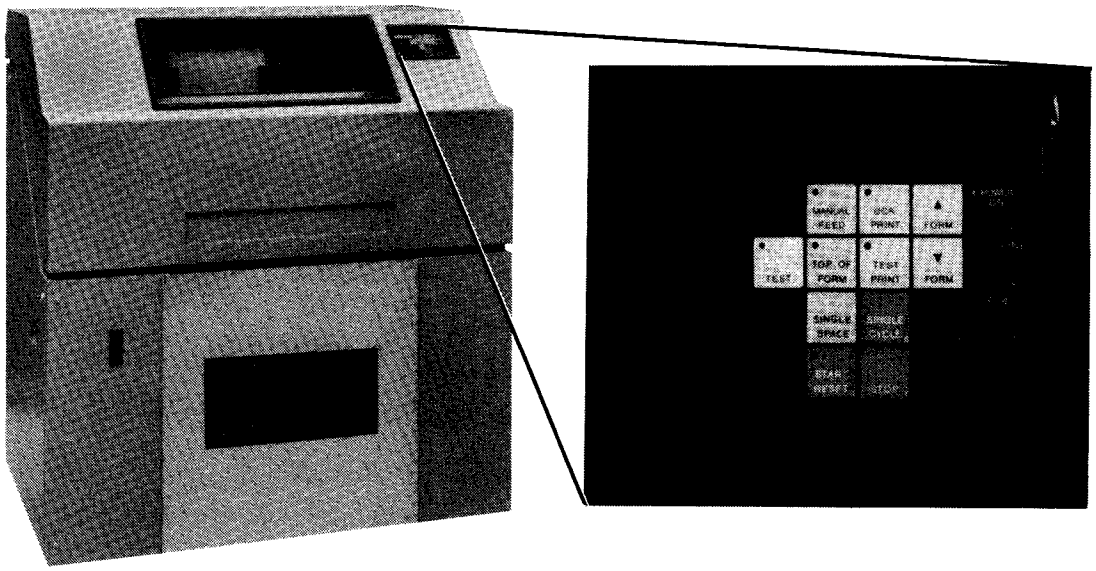


Figure 2-36. 0770 II Operator Panel

Table 2-17. 0770 II Operator Panel Controls and Indicators

Control/Indicator	Function
Error display	Four-digit hexadecimal display In the online mode, displays error conditions causing printer to stop. (A label on the ribbon cover lists error conditions.) In the offline mode: • The two most significant digits show the program status. • The two least significant digits show the operator-keyed input.
E.O.F. indicator	Lights when supply of forms is low.
GATE OPEN indicator	Lights when the band gate is unlatched. Also displays error code E002
STACKER indicator	Lights when the stacker is full or a stacker jam exists. Also displays error code E007
JAM indicator	Lights when a form jam or torn form condition exists. Also displays error code E004
RIBBON indicator	Lights when a ribbon overskew or fold condition exists. Also displays error code E005
TEST switch and indicator	Alternately sets the front operator panel as a maintenance panel and an operator panel. The indicator lights when the panel is a maintenance panel. This switch is operational only when the printer is in the offline mode.
MANUAL FEED switch and indicator	Alternately applies and removes forms tractor holding tension. The indicator lights when tension is removed, permitting manual forms alignment. The following switches are inoperative when the indicator is ON: SINGLE SPACE TEST PRINT FORM UP FORM DOWN This switch is operational only when the printer is in the STOP state.

(continued)

Table 2-17. 0770 II Operator Panel Controls and Indicators (cont)

Control/Indicator	Function
TOP OF FORM switch and indicator	When the MANUAL FEED indicator is off, the TOP OF FORM switch advances the form to the print line defined by address 0 in the forms control buffer (FCB). When the MANUAL FEED indicator is on, the TOP OF FORM switch sets the electronic pointer to FCB address 0. The TOP OF FORM indicator is ON when the FCB is loaded and the FCB pointer is at address 0. This switch, which is duplicated on the rear operator panel, is operational only when the printer is in the STOP state.
SINGLE SPACE switch	Momentary operation advances form one print line; continuous operation advances form repeatedly one line at a time until switch is released. This switch is operational only when the printer is in the STOP state and the MANUAL FEED indicator is off.
START RESET switch and RUN indicator	This switch causes the printer to enter the RUN state and the RUN indicator to light. It is effective only when all previous error conditions have been corrected. ON or OFF LINE printing operations can take place only when the RUN indicator is lit. The RUN indicator lights only when the following conditions are met: • All previous error conditions are corrected. • The START RESET switch was activated since the last STOP switch activation. The RUN indicator goes out when one or more of the following conditions are met: • The STOP switch is activated. • A RAISE COVER command is issued. • An operator intervention (E.O.F., GATE OPEN, STACKER JAM, or RIBBON) indicator is lit. • Any error condition is displayed on the ERROR DISPLAY. The START RESET switch and RUN indicator are duplicated on the rear operator panel.

(continued)

Table 2-17. 0770 II Operator Panel Controls and Indicators (cont)

Control/Indicator	Function
OCR PRINT switch and indicator	This switch reduces the maximum throughput from 2000 lpm to 1500 lpm by decreasing the print band speed. Reduced throughput is used for critical print quality applications. The indicator lights when maximum throughput is 1500 lpm. The switch is operational only when the band gate is open.
TEST PRINT switch and indicator	When both the ON LINE and MANUAL FEED indicators are off, this switch alternately turns its associated indicator on and off. When the indicator is on, code bdxx appears on the four-digit display. (xx is the two-digit cartridge identification code (CID) for the installed print band as listed in UP-11895.) When forms are loaded and the RUN indicator is on, the printer continuously prints a sliding ripple pattern in all 136 print positions. Printing stops and the bdxx display turns off when: • the TEST PRINT switch is operated; or • the printer enters the STOP state. When forms are not loaded, the RUN indicator is off and no printing occurs. Within a few seconds after the TEST PRINT switch is operated, the TEST PRINT indicator turns off and the bdxx display is replaced by error display E003 (end of form).
SINGLE CYCLE switch	Places the printer in the RUN state for one print command. The printer then returns to the STOP state. This switch is used at the beginning of a job to assist in forms alignment, and at the end of the last form to complete the printing. This switch is operational only when the printer is online.
STOP switch	Places the printer in the STOP state and turns the RUN indicator off upon completion of the current operation. When the switch is held down, the ribbon drive motors and paper puller energize. The STOP state is a prerequisite for all manual operations. This switch is duplicated on the rear operator panel.
▲ FORM SWITCH	Each momentary switch activation moves the form up 0.0067 inch (0.17 mm). When the switch is held down, the form moves up continuously. This switch is operational only when: • the printer is in the STOP state; and • the MANUAL FEED indicator is off.

(continued)

Table 2-17. 0770 II Operator Panel Controls and Indicators (cont)

Control/Indicator	Function
▼ FORM switch	Each momentary switch activation moves the form down 0.0067 inch (0.17 mm). When the switch is held down, the form moves down continuously. This switch is operational only when: • the printer is in the STOP state; and • the MANUAL FEED indicator is off.
POWER ON indicator	Lights when the power-on sequence is complete
ON LINE indicator	Lights when the ON LINE/OFF LINE switch on the auxiliary operator panel is set to ON LINE
FCB indicator	Lights when the FCB is loaded with format data

0770 II Rear Operator Panel

For maximum convenience, there is a rear operator panel (Figure 2-37) on the left rear of the printer. It duplicates some of the operator panel controls and indicators. Table 2-17 describes these items.

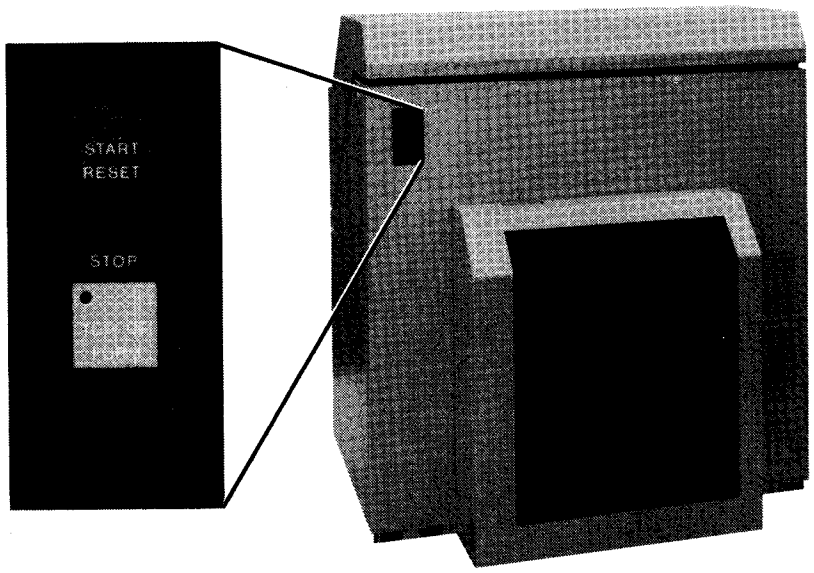


Figure 2-37. 0770 II Rear Operator Panel

0770 II Auxiliary Operator Panel

The auxiliary operator panel (Figure 2-38) is on the left side of the printer. It provides additional controls and an indicator used during normal operation. Table 2-18 describes the function of each control and indicator on the panel.

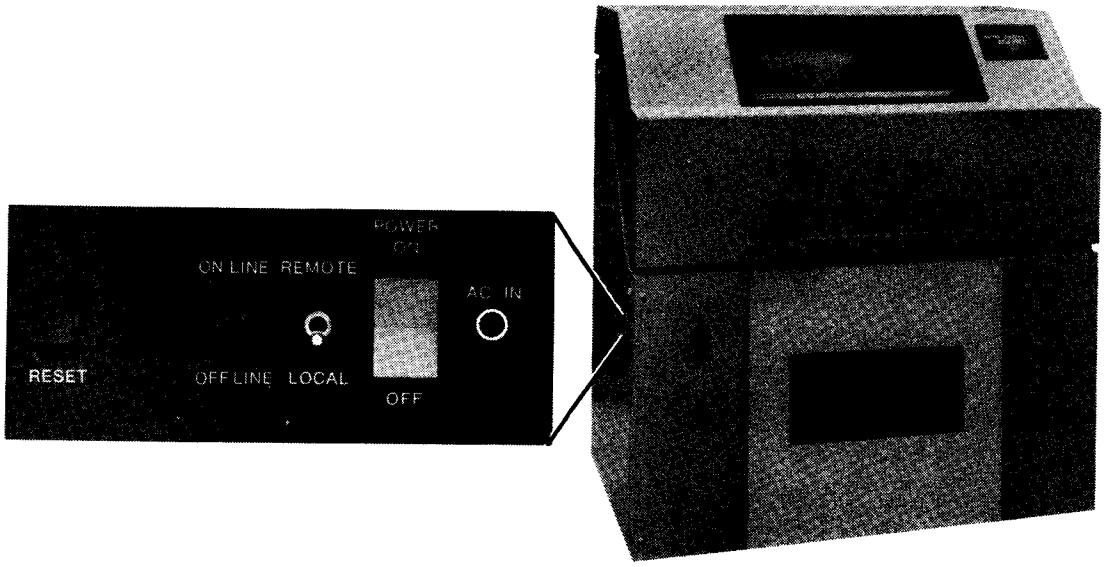


Figure 2-38. 0770 II Auxiliary Operator Panel

Table 2-18. 0770 II Auxiliary Panel Controls and Indicators

Control/Indicator	Function
RESET switch	Resets any error conditions and puts the printer in the STOP state. The forms control buffer is loaded with default data. The overall function of this switch is that of a general clear. This switch is operational only when the ON LINE/OFF LINE switch is set to OFF LINE.
ON LINE/ OFF LINE switch	Connects the printer to the channel and lights the ON LINE indicator on the operator panel. (When the switch is set to OFF LINE, the printer is logically disconnected from the channel.)
REMOTE/LOCAL switch	Selects location for power application: REMOTE Power for printer is turned on at the processor. LOCAL Power for printer is turned on at the printer. This switch is operational only when the MAIN AC POWER switch/circuit breaker is set to ON.
POWER ON/OFF switch	Applies primary power to the printer. When the switch is first set to ON: • dc power sources are turned on; • the POWER ON indicator on the operator panel lights; and • the printer executes the POWER ON CLEAR self-test routine. This switch is operational only when: • the MAIN AC POWER switch/circuit breaker is set to ON; and • the LOCAL/REMOTE switch is set to LOCAL.
AC IN indicator	Lights when the MAIN AC POWER switch/circuit breaker is set to ON

0770 II Operator Subpanel

The operator subpanel (Figure 2-39) is in the upper right-hand corner of the printer and is accessible only when the front cover is raised. It contains the following infrequently accessed control and indicator:

Control/Indicator	Function
HIGH SKIP ON/OFF switch	Sets form skipping to 100 inches per second (ips). This is the normal setting. If excessive vertical spacing is encountered, forms handling is improved by setting this switch to OFF. This will reduce the maximum printer throughput.
LINE COUNTER x1000 indicator	This electromechanical counter counts and records the number of lines printed in increments of 1000. It resets to zero at a count of one billion. The count is retained when the printer is turned off.

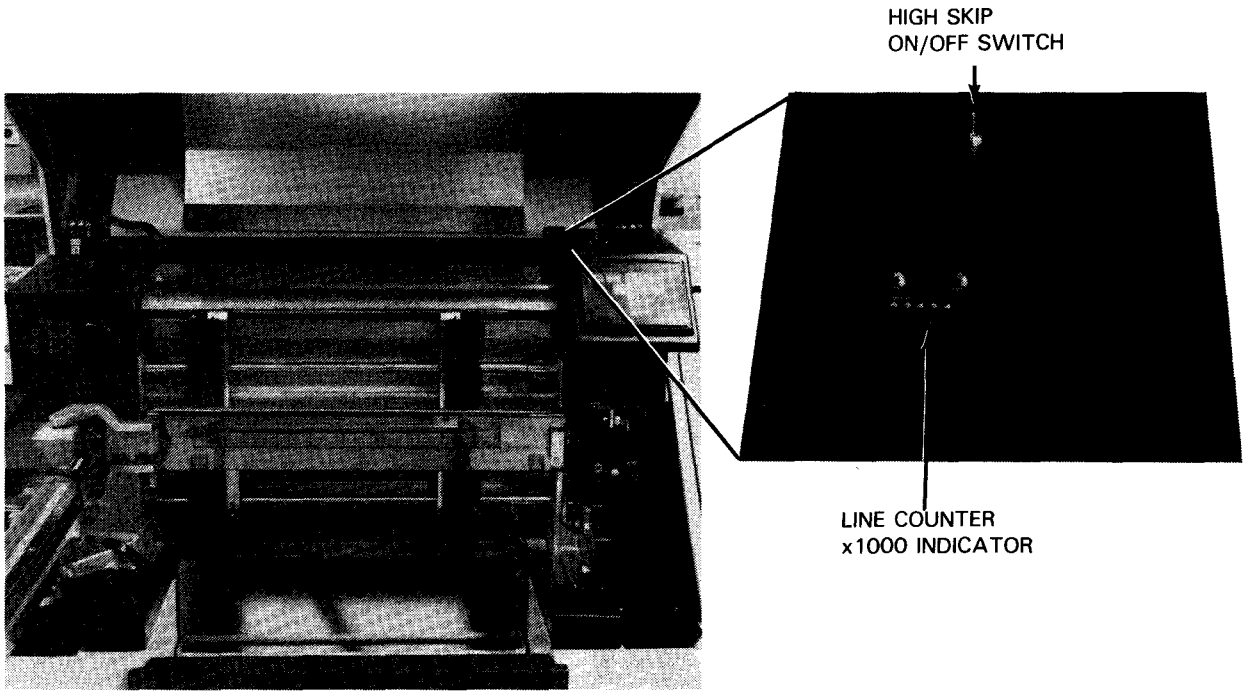
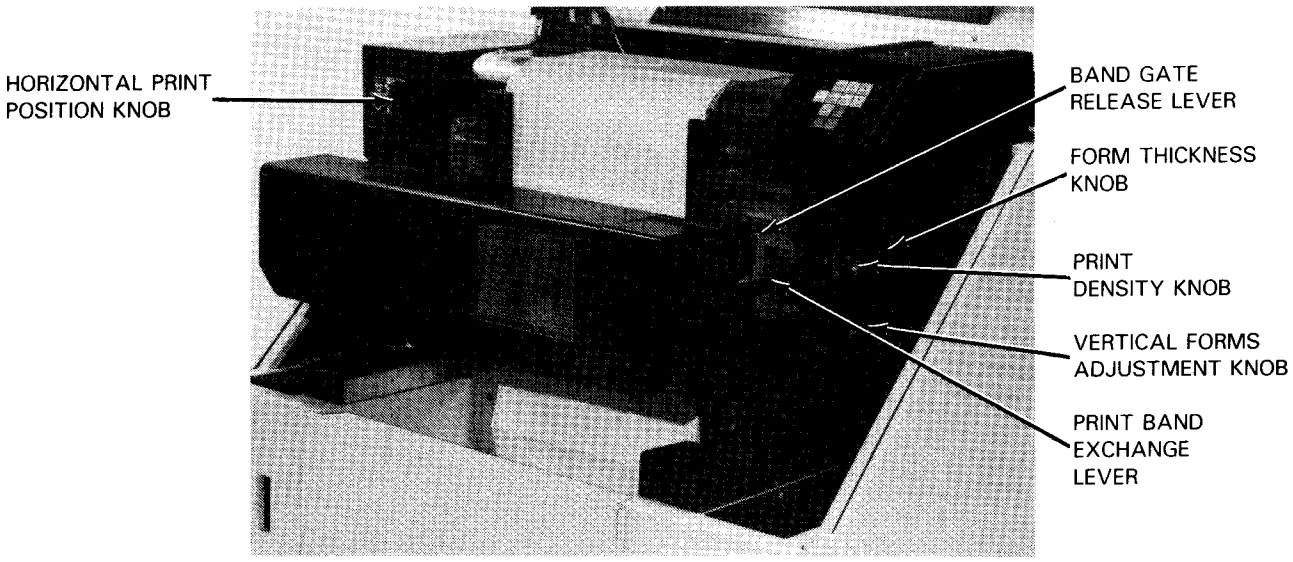
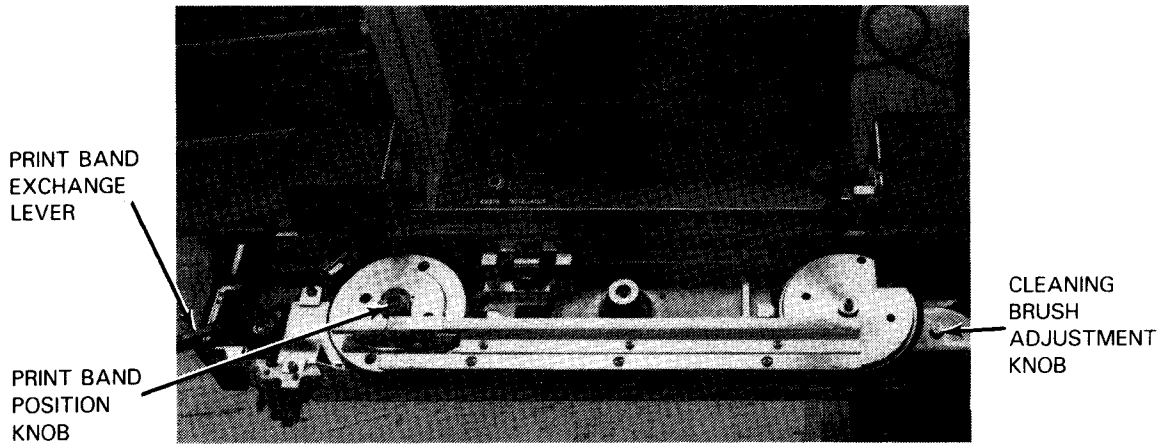


Figure 2-39. 0770 II Operator Subpanel

Figure 2-40 shows the mechanical controls accessed by raising the top cover. Figure 2-41 shows the controls accessed by opening the rear door. These controls are shown in more detail in the *0770 II Printer Subsystem Operator Reference*. Use these controls to make operational adjustments.



a. Overall view



b. Band gate (open)

Figure 2-40. 0770 II Front Mechanical Controls

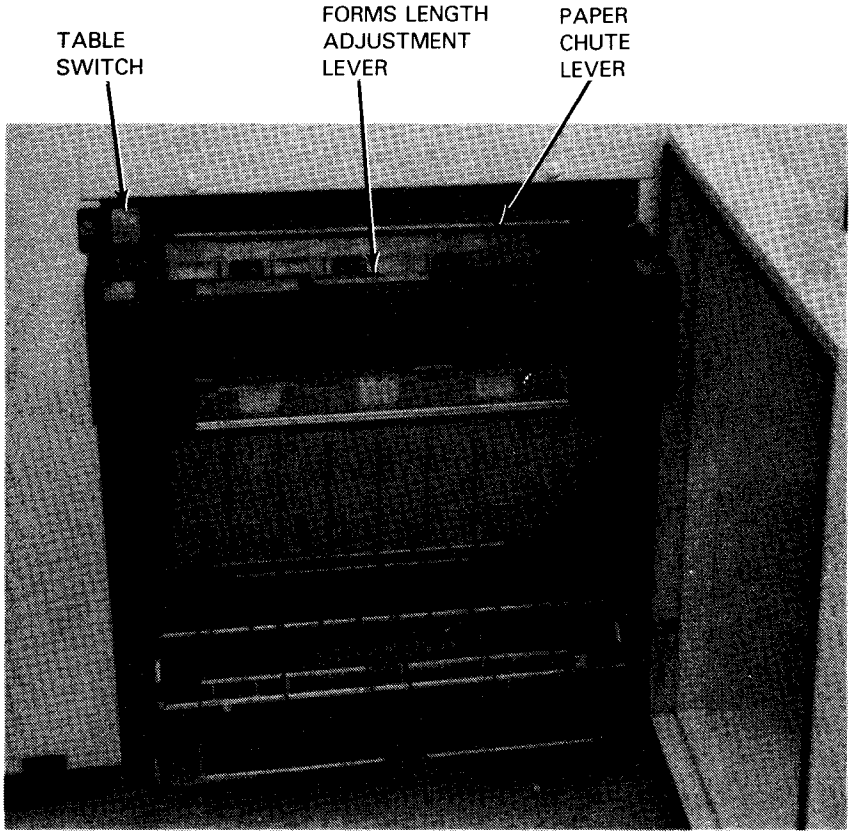


Figure 2-41. 0770 II Rear Mechanical Controls

- **Horizontal Print Position Knob**

  The horizontal print position knob lets you:

  - Adjust the horizontal position of the form by moving all four tractors at the same time
  - Adjust for different form widths by moving the two right tractors only

  NOTE: After making this adjustment, make sure the form feeds properly through the print mechanism.

- **Band Gate Release Lever**

  The band gate release lever lets you swing open the band gate. Operate this lever only when the printer is in the STOP state.

  When the band gate opens, the GATE OPEN indicator on the control panel lights and error code E002 is displayed.

- **FORM THICKNESS Knob**

  The FORM THICKNESS knob lets you set the clearance between the print hammers and the print band. There are seven different settings. In general, you set it to 1 for single-part forms, 4 for 4-part forms, and so forth.

- **Print Density Knob**

  The print density knob lets you adjust the print hammer impact force. It is a continuous adjustment graduated from position A to position D. Position A allows the highest impact and position D the lowest.

  Move the knob toward position A for thick forms or when the ribbon is near the end of its life; move it toward position D for thin forms or when a new ribbon is being used.

  A label on the ribbon cover provides suggested setting information.

- **Print Band Exchange Lever**

  The print band exchange lever lets you control the print band tension. Move it to TAKE-OFF before removing the band. Move it to SET-UP after installing a new band.

- **Vertical Forms Adjustment Knob**

  The vertical forms adjustment knob lets you position the form vertically. You usually use it to set the TOP OF FORM position.

  Use this knob only when the printer is in the STOP state and the MANUAL FEED indicator is ON.

- **PRINT BAND POSITION Knob**

  The PRINT BAND POSITION knob lets you set the print band height. When the knob is turned UP, the band slews up on the pulleys. When the knob is turned DOWN, the band slews down.

  The print band position is monitored and displayed on the ERROR DISPLAY during RESET or POWER ON CLEAR operations.

- **TABLE Switch**

  The TABLE switch lets you position the forms stacker tray.

Switch Position	Stacker Tray Position
UP	Highest
DOWN	Lowest
OFF	Moves down automatically as printed forms accumulate

- **Forms Length Adjustment Lever**

  The forms length adjustment lever lets you set the distance between the rear paddles and the stacker front. This setting depends on the length of the forms. Pull the lever toward you to unlatch the paddle assembly. The adjustment is correct when the two scale settings match the form length.

- **Paper Chute Adjustment Lever**

  The paper chute adjustment lever lets you set the chute to any one of three positions for best forms stacking. Use the down position for single-part forms and either the middle or up position for multipart forms.

3. Operation

This section describes procedures for operating a minimum configuration of the System 80 models 8/10/20 processor and system. The procedures begin with initial power turn-on, ← and continue with normal daily operating procedures.

Operating procedures for peripheral devices not described in this manual are included in the operator reference manual for individual devices listed in Table 1-1. As an operator, you must become familiar with operating controls and indicators on the processor and peripheral devices before attempting to operate the system. Full operation requires use of the OS/3 operating system described in the appropriate software manuals listed in the OS/3 system library, or available from a customer representative.

3.1. SYSTEM POWER CONTROL

Power for the system is normally controlled with the POWER ON/OFF switch located on the system console (Figures 2-1 and 2-2). This switch activates a power sequencing circuit that energizes the processor, I/O cabinet, and (if used) I/O expansion cabinet, as well as each integrated peripheral device. Energizing the equipment sequentially instead of simultaneously prevents large current demand from the site power system.

Power sequencing can occur with the POWER ON/OFF switch at the system console only if primary power circuit breakers have first been turned on. Primary power remains on at all times, and system power is turned on for daily operation with the POWER ON/OFF switch at the system console.

Freestanding peripheral equipment not integrated with the processor cannot be turned on with the POWER ON/OFF switch at the system console. Power for these subsystems must be turned on at the device (including its control unit, where applicable). To turn on power and operate these subsystems, refer to the applicable operator reference manual listed in Table 1-1.

Devices integrated with the processor that may be turned on with the POWER ON/OFF switch at the system console are listed in Table 3-1. Freestanding, unintegrated subsystems are listed in Table 3-2.

Table 3-1. Integrated Peripheral Equipment

Type No.	Function
8416	Disk drive
8418	Disk drive
8417	Disk drive
8419	Disk drive
8470	Disk drive
8480	Disk drive
UNISERVO 10 (Type 0871)	Magnetic tape drive
0608	Card punch
0719	Card reader
UNISERVO 22	Magnetic tape drive
3782	Streaming tape drive
0425	Printer*
0445	Printer*
0471	Printer*
0472	Printer*
0789	Printer (and remote attachment, if used)
0798	Printer
8420	Autoload diskette drive
8422	Manual load diskette drive
3560 (model 1)	Workstation
3561 (model 2)	Workstation
3612	Workstation
0791	Printer (connected to model 2 workstation)
0797	Printer (connected to model 2 workstation)
3389	Magnetic stripe reader (connected to model 2 workstation)
8406	Diskette drive (connected to model 2 workstation)

* Supported via the 3612 workstation

Table 3-2. Freestanding Peripheral Subsystems

Type No.	Function
0776	Printer and controller
0770	Printer and controller
0716	Card reader and controller
UNISERVO 22/24 5058	Magnetic tape drives Controller
UNISERVO 10/14 5045	Magnetic tape drives Controller
UNISERVO 12/16 5017	Magnetic tape drives Controller
8430/8433 5039	Disk drives Controller
8494	Disk drives
UNISERVO 12/16/20 5034	Magnetic tape drives Controller
UNISERVO 22/24/26/28 5055	Magnetic tape drives Controller

3.1.1. Processor and I/O Initial Power Turn-On/Off

You can turn on initial power for the processor, I/O, and I/O expansion cabinets at their respective cabinet circuit breaker panels. The rear door of each cabinet has a cutout to access the circuit breakers for that cabinet. Set all circuit breakers on each cabinet to the ON (up) position, and allow them to remain in that position except in an emergency.

NOTE: *The AC POWER indicators on the circuit breaker panels of the I/O cabinet and I/O expansion cabinet are lit when power is available from the external circuit breaker wall panel. However, the AC POWER indicator on the circuit breaker panel of the processor cabinet will light only when the circuit breakers of the processor cabinet are set to the ON position. With all circuit breakers set to ON, the POWER ON indicator should be lit on each cabinet.*

You can normally perform power turn-off with the POWER ON/OFF switch on the system console. However, in an emergency, or upon direction of the customer service engineer, you can turn off primary power for the processor, I/O, and I/O expansion cabinets with the POWER ON circuit breaker on each cabinet. You can also perform emergency power off at the external circuit breaker wall panel. Power to all peripheral devices is also turned off when you perform emergency power turn-off.

Loading System Operation Diskette

To complete the initial power turn-on procedure, load the diskette containing microcode for system operation into the diskette drive so it is available for system power turn-on (3.1.3). This diskette must be loaded before you can perform an initial microprogram load (IMPL) for normal power-on sequencing of the system.

You can initialize the system operation diskette to contain your site's requirements for console mode, keyboard type, automatic recovery, and auto IPL device address by selecting the option you want from one of the configuration control frames. Refer to 3.3.7 for information on using the configuration control frames on the model 8 and on the models 10/20.

Load the system operation diskette into the diskette drive in the same manner as in freestanding manually loaded diskette drives (see the procedures in 3.2.1). Note that the loading procedures for model 8 and models 10/20 are the same but the physical location of the diskette drives is different on the respective systems. The model 8 diskette drive is located on the system console; on the models 10/20, the diskette drive is located in the processor cabinet (see Figures 1-1 and 1-2).

Once installed, the system operation diskette may remain in place for normal system operation.

Loading System Resident Programs

The system resident (SYSRES) disk pack contains programs for operation with the OS/3 software system. You must ensure that the SYSRES disk pack is loaded and made available for system power turn-on (3.1.3).

The particular disk drive assigned for SYSRES may be any of the following types:

- 8417
- 8418 (model 8 only)
- 8419
- 8430
- 8433
- 8470
- 8480
- 8494

The type your system uses depends on the system configuration and on the address assignment made in software. The 8417, 8470, 8480, and 8494 disk drives use self-contained disk packs that are not accessible to the operator for installation or removal. The 8418, 8419, 8430, and 8433 disk drives all use removable disk packs, for which the operator is responsible.

Determine which disk drive is used for SYSRES in your system. If your system uses a non-removable type 8417, 8470, 8480, or 8494 disk drive for SYSRES, you are not required to load the disk drive. If your SYSRES is a type 8418, 8419, 8430, or 8433 disk drive, load the SYSRES disk pack into the disk drive that has been assigned in software as the SYSRES disk drive. Section 3.2.2 describes the procedures you use to load each type of disk that can be used as a SYSRES volume.

You must load the SYSRES so you can perform an initial program load (IPL) for normal power-on sequencing of the system. Upon completion of initial power turn-on for all peripherals, the system power can be turned on; a normal IMPL and IPL are performed automatically each time system power is turned on.

3.1.2. Peripheral Devices Initial Power Turn-On/Off

Integrated peripheral devices (Table 3-1) are turned on initially at their circuit breaker panels; then power is controlled at the POWER ON/OFF switch at the system console. After initial power turn-on, the circuit breakers remain in the ON position unless an emergency occurs at the device, or unless directed by the customer service engineer.

NOTE: Some integrated peripheral devices may contain circuit breakers inside their cabinets and are not accessible to the operator. These circuit breakers were turned on upon installation and remain on. Operating power is controlled at their operator control panel and at the system console.

Freestanding peripheral subsystems (Table 3-2), including a separate control unit on some subsystems, have power turned on initially at their circuit breaker panels. Subsequent power turn-on/off may then be controlled at their own power control or operator control panels.

Initial Power Turn-On

To turn on power initially for peripheral equipment that may be used in a minimum system configuration, proceed as follows:

1. On diskette drives, at the power control panel (Figure 2-9):
   a. Set MAIN circuit breaker to ON (up) position and note that the AC ON indicator lights.
   b. Set PWR ON/RESET-PWR OFF switch to PWR ON/RESET (up) position.
   c. Set LOCAL/REMOTE switch to REMOTE (down) position.
2. On the 8417, 8418, and 8419 disk drives, set the MAIN POWER circuit breaker, located at the lower rear section of the cabinet, to the ON (up) position. ←
3. On the 8430 and 8433 disk subsystems, circuit breakers and switches controlling primary power have been turned on during installation. Primary power control is not accessible to the operator. In an emergency, you can turn off power at the wall switch that supplies power to the subsystem. In normal operation, power is controlled at the system console with the POWER ON/OFF switch.

4. On the 8470 disk drive, primary power is turned on at the controller sequencer panel circuit breakers. These are not accessible to the operator; however, you can control power with the ON/OFF switch at each disk drive operator control panel. Normally, the ON/OFF switch remains at the ON position and operating status of the disk drive is returned to online condition. Power turn off is normally performed by the customer service engineer. The operator should place the disk drive in the offline condition at the end of an operating day.

5. On the 8480 disk drive, primary power is turned on at the controller sequencer panel circuit breakers. These are not accessible to the operator; however, you can control power to each disk drive with the ON/OFF switch on the operator control panel.

6. On the 8494 disk drive subsystem, primary power is turned on at the subsystem power panel circuit breaker at the back of the cabinet. Power to controllers A/B and to each disk drive can be selected from the cabinet operator panel switches.

7. On the 0776 printer, first, on the power control panel (Figure 2-23):

   a. Set MAIN circuit breaker to ON (up).

   b. Set ON/OFF switch to ON (press top half).

   c. Set LOCAL/REMOTE switch to REMOTE (press bottom half). Then, on the power supply panel (Figure 2-24), set circuit breakers CB1, CB2, CB3, and CB4 to ON (up) positions.

8. On the 0789 printer, set the power switch (Figure 2-28) to the 1 position.

9. On the 0798 printer, set the power switch to the 1 position.

   NOTE: A power-on confidence (POC) test is automatically performed on the 0798 printer each time the POWER ON/OFF switch is set to 1 (on) position. In addition, the POWER ON indicator lights, and the print head moves to the home position. In some systems (EIA RS-232 interface), the alarm sounds rapidly three times, then stops. If the POC test detects a malfunction, the POWER ON indicator flashes and the alarm sounds until the power switch is returned to the off position. If the fault does not appear to be operational, contact the customer service engineer.

10. On the 0770 II printer, set the MAIN AC POWER switch/circuit breaker on the front of the printer (Figure 2-35) to ON. On the auxiliary operator panel (Figure 2-38):

    a. Set the POWER ON/OFF switch to ON.

    b. Set the ON LINE/OFF LINE switch to ON LINE.

11. On the console display, set the POWER ON/OFF switch at the rear of the console display to the ON position.

Settings for initial power turn-on are now complete, and subsequent power turn-on or off may be controlled at the system console with the POWER ON/OFF switch.

Device Power Turn-Off

If you want to turn off power at a specific peripheral device, be sure to first press the STOP switch on the device before turning off power to the device. If a STOP switch is not provided on the device, but the means for placing the unit offline is accessible to the operator, then the device should be placed offline before turning power off. Primary power is not turned off at the circuit breakers except in an emergency.

NOTE: If a device is to remain off for an extended time, it should be removed from the software systems list of available equipment.

CAUTION

Failure to press the STOP switch, or to place the device offline prior to turning off power to the device, may cause power transients and disturb processor operation.

3.1.3. Normal System Power Turn-On/Off

Power sequencing circuits designed into the system greatly simplify power turn-on/off procedures for the operator. Power sequencing circuits turn on power for each unit in the system in sequence instead of simultaneously, thereby preventing a high current surge at the site.

System Power Turn-On

After primary power has been initially turned on at the processor, I/O cabinet, and I/O expansion cabinet, as well on all peripheral equipment, operating power for the system is normally sequenced on from the system console.

Proceed as follows for normal system power turn-on:

CAUTION

Data files on disks must be protected before system power is turned on, or portions of recorded data may be erased.

1. a. On 8416, 8418, 8419, 8470, and 8480 disk drives (Figures 2-11, 2-12, 2-15, 2-20, and 2-21 respectively), press the FILE PROTECT switch and note that the associated indicator lights.

   b. On 8417 disk drive (Figure 2-14), press FILE PROT switch and note that the associated indicator lights.

   c. On 8430 and 8433 disk drives (Figure 2-18), press READ ONLY switch/indicator and note that it lights.

   d. On each 8494 disk drive (Figure 2-21c), press the WRITE PROT switch and note that the associated indicator lights. ←

CAUTION

If power is turned on manually for the disk drives, the first disk drive in the subsystem train must be turned on and must reach operating speed before the second and subsequent disk drives are also turned on in the same manner. Failure to turn on disk drives in proper sequence may result in power failure or equipment damage.

2. Set the IPL/NML/AUTO switch on the system console (Figure 2-1 or 2-2) to AUTO position to automatically initiate an IPL.

3. Set the POWER ON/OFF switch on the system console (Figure 2-1 or 2-2) to ON position. Note that indicators on the system console (Figure 2-1 or 2-2) light and extinguish as listed in Table 3-3.

Table 3-3. Power-On Indicators on System Console

	PWR	TH	SEQ1	SEQ2	SEQ3	P-SEQ	STOP	POWER
Prior to Power On	●	●	○	○	○	○	○	○
During Power Up	○	○	●	●	●	●	●	○
Power On Complete	○	○	●	●	●	○	●	●
Self-Tests Complete	○	○	○	○	○	○	○	●

LEGEND:

● = Indicator lit

○ = Indicator extinguished

NOTE:

During power-on sequence, the system is automatically reset and cleared of erroneous conditions that may occur by power transients.

System power is now turned on for all processor complex cabinets, as well as for peripheral devices that may be included in a minimum system configuration. Refer to the applicable peripheral operator reference manual (Table 1-1) for power turn on in other peripheral equipment used with the system.

With system power on, you may now proceed to set up peripheral equipment for operation with the system (3.2). Following peripheral setup, operation continues at the console workstation (3.3) to perform system self-tests, load the programs, and prepare the system for operation with software.

NOTE: If the power-on sequences fail to complete, refer to procedures in 3.1.4 for handling power-on sequence failure.

System Power Turn-Off

To turn system power off after daily operations, proceed as follows:

CAUTION

Data files on disks must be protected before system power is turned off, or portions of recorded data may be erased.

1. a. On 8416, 8418, 8419, 8470, and 8480 disk drives (Figures 2-11, 2-12, 2-15, 2-20, and 2-21 respectively), press the FILE PROTECT switch and note that the associated indicator lights.

   b. On 8417 disk drive (Figure 2-14), press the FILE PROT switch and note that the associated indicator lights.

   c. On 8430 and 8433 disk drives (Figure 2-18), press the READ ONLY switch/indicator and note that it lights.

   d. On each 8494 disk drive (Figure 2-21c), press the WRITE PROT switch and note the associated indicator lights. ←

2. Set the POWER ON/OFF switch on the system console (Figures 2-1 or 2-2) to OFF position. Note that the POWER indicator extinguishes.

NOTE: The PWR indicator on the system console remains lit after system turn off to indicate that primary power is available for subsequent power-on sequencing.

System power now sequences down for the processor equipment and peripheral devices connected to the power sequencing circuit. Freestanding peripheral subsystems that are not controlled by the POWER ON/OFF switch at the system console must be turned off separately. (Refer to the appropriate manuals in Table 1-1.)

NOTE: Some site installations use a wall switch or external circuit breakers to turn power on or off. At those sites, be sure to perform step 1 of 3.1.3 (turn off) before turning off power at the wall switch or circuit breakers. When resuming operation, turn on system power as directed in 3.1.3 after the wall switch is turned on.

3.1.4. Power Fault Conditions

During system power-on sequence (3.1.3), if a malfunction occurs in any power supply in the processor, I/O cabinet, I/O expansion cabinet, or in any peripheral device connected to power sequencing circuits, power turn-on does not complete for the system, and fault indications are presented on the system control panel and on the console display screen (Figure 2-1). Power failure can also occur during operation in any of the power supplies, or it can be due to a power loss condition at the site.

Power-On Sequence Failure

In the event that system power turn-on sequence does not complete due to a possible failure, examine the system console indicators for guidance to the possible cause. If you cannot correct the problem, note the indications presented on the system console and the console display screen; these indications should all be forwarded to the customer service engineer when calling for maintenance. Indications presented on the I/O maintenance panel, inside the I/O cabinet (Figure 2-3), should also be noted and forwarded when placing the call for maintenance.

With a power fault, the PWR indicator lights on the system console (Figures 2-1 or 2-2), and the buzzer sounds in the console display. In addition, the POWER indicator fails to

light on the system console indicating that system power did not sequence properly. Silence the buzzer by activating the CHECK RESET switch on the system console, then follow the fault procedures listed in Table 3-4.

Table 3-4. Power Fault Conditions

Indication	Cause	Remedy
All indicators on system console are lit.	1. Console display power ON/OFF switch at rear of unit is OFF.	Set power ON/OFF switch to ON.
	2. Console display power supply is faulty.	Contact the customer engineer.
P-SEQ indicator lit, but POWER indicator extinguished on system console.	1. POWER circuit breaker on processor cabinet set to OFF.	Set circuit breaker to ON. If problem persists, contact the customer engineer.
	2. A power supply in the processor cabinet is faulty, or its main power is off.	Contact the customer engineer.
	3. A power supply controlled by power sequencing in the I/O cabinet is faulty, or its main power is off.	
The console display screen is blank, but its power ON/OFF switch is set to ON.	Screen display switch on console display (Figure 2-3) is not actuated.	Press and release the display switch on the console display. If a display is not presented on the screen, contact the customer engineer.
The message: FDD NRDY AT ID CHECK is displayed on the console display screen	1. The console diskette drive power is not turned on, or its power supply is faulty.	Turn on power for the diskette drive as directed in step 1 of 3.1.2. If the problem persists, contact the customer engineer.
	2. A diskette has not been loaded into the console diskette drive.	Load the diskette media as directed in 3.2.1. (manual load drive). If the problem persists, contact the customer engineer.

If you cannot correct the problem with procedures described in Table 3-4, note the indications presented by the SEQ1, SEQ2, and SEQ3 indicators on the system console. These indicators present the functional areas that have been checked and verified for operation. The indications and their meanings for power-on sequence are listed in Table 3-5.

Table 3-5. Power-On Sequence Check Indicators

Indication			Meaning
SEQ1	SEQ2	SEQ3	
●	●	●	Power is sequencing on.
○	●	●	Read-only memory (ROM) and random access memory (RAM) were checked and are operating.
○	○	●	Operation of console diskette drive is verified.
○	○	○	Operation of 0.5-second timer is verified.

LEGEND:

● = Indicator lit
○ = Indicator extinguished

Upon correction of a power fault, proceed to console operation procedures (3.3). System self-tests are now in progress and their results are displayed on the system console, as well as on the indicators listed in Table 3-5. The self-tests are a continuing process of the power-on sequence, which also includes initial microprogram loading (IMPL) and initial program load (IPL).

Site Power Loss

Occasionally, external power at the site may be temporarily turned off or interrupted during operation. When primary power is restored, you must sequence power-on again as described for normal system power turn-on in 3.1.3. Be sure to perform step 1 of the procedure to protect the disks prior to turning on system power in step 2.

Peripheral devices may react differently if power is interrupted during operation. For example, if power is turned off on some devices, those devices may react to power outage as follows:

- 0776 printers, 0608 card punch, and 0719 card reader:

  The device enters power-off state when power is restored to the system. You must turn on power at the device with the POWER ON/OFF switch.

- 0789 printer:

  The 0789 printer enters power-on state when power is restored to the system. If the printer was operating in offline mode, the printer enters run state upon restoration of power.

- UNISERVO® 10 (type 0781) tape drives:

  If the tape drive was in run state before system power loss, the drive reenters run state upon restoration of power.

- 8470 disk subsystem:

  On the 8470 disk drive, the READY indicator flashes after power is turned on (until the disk reaches operating speed), then the indicator remains lit.

CAUTION

Failure to turn on the disk drives in proper sequence may result in power failure or equipment damage.

Since restoration of power activates power-on sequencing, self-tests are also performed on the system. Conditions for power-on failure (3.1.4) should be referenced, if required, as well as system self-test messages (3.3).

3.2. PERIPHERAL SETUP AND OPERATION

Peripheral devices using removable media must be prepared for system operation. In these preparations, you must load:

- Diskettes into diskette drives
- Disk packs into disk drives (where disk packs are removable)
- Cards into card readers and card punches
- Magnetic tape into tape drives
- Paper forms into printers

Since this manual provides descriptions only for the minimum system configuration, refer to instructions presented in individual manuals (Table 1-1) for setup and operation of peripheral devices not described here.

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3.2.1. Loading Diskette Media

Diskette drives may be of manually loaded or autoloaded types. Take the following precautions when handling diskette media to assure long, trouble-free operation:

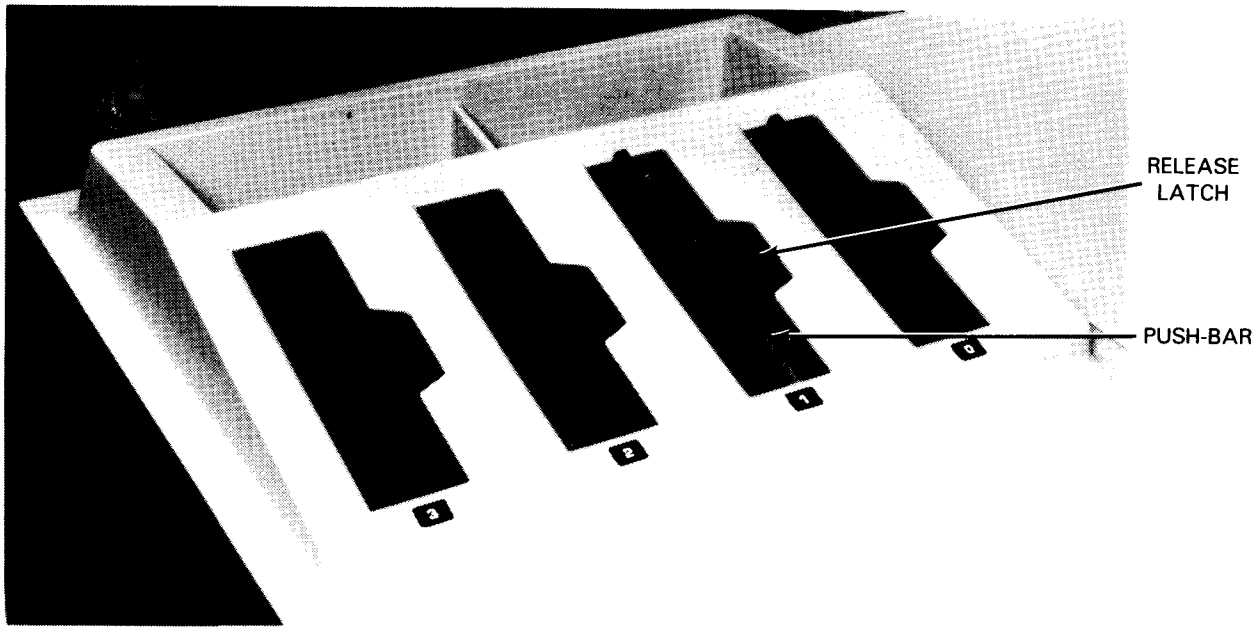
- Writing pressure may damage the diskette; therefore, avoid writing on the diskette envelope.
- Do not bend or attach paper clips to the diskette.
- Do not clean or touch the diskette surface.
- Put the diskette in its protective envelope when it is removed from the diskette drive.
- If the diskette envelope is torn or bent out of shape, replace the envelope.
- Avoid placing diskettes near excess heat or storing them in direct sunlight.
- Be careful to avoid placing the diskette near any magnetic object or near any magnetic field.

Manual Load Diskette Drive Operation

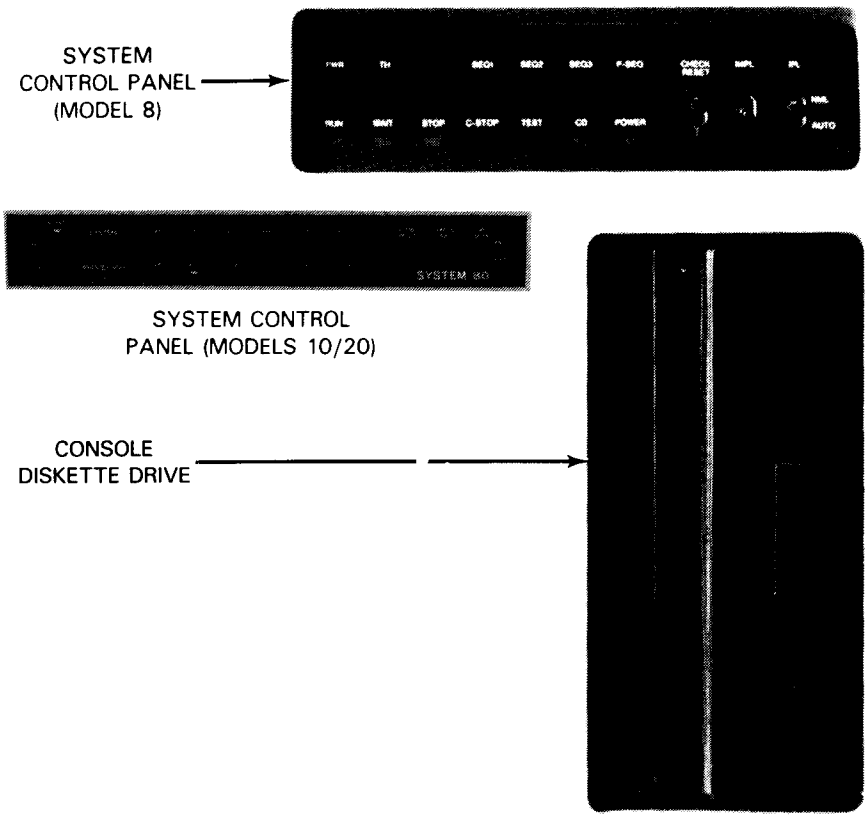
Manual load diskette drives may be loaded from the top on freestanding drives (Figure 3-1a) or from the side where the diskette drive is mounted in another device, such as the diskette drive on the model 8 system console (Figure 3-1b), or the diskette drive in the models 10/20 processor cabinet. To load a manual load diskette drive for operation, proceed as follows:

1. If the diskette slot is closed, press the release latch (Figure 3-1b) to open the push bar.
2. Insert the diskette media into the drive (Figure 3-1c). Note that the diskette label on its jacket faces toward the left, and the jacket slot inserts first.
3. Push the diskette well into the media slot, beyond the slot opening, to engage the drive mechanism.
4. Close the media slot by moving the push bar over the opening until it latches closed (Figure 3-1b).
5. Operation may now begin with the diskette media. Note that the indicator on the push bar flashes on when reading or writing on the diskette.
6. Except for the system diskette drive, you can remove a diskette upon completion of the operation by pressing the release latch that causes the diskette to pop up for removal.

NOTE: Do not remove the diskette from the system diskette drive.

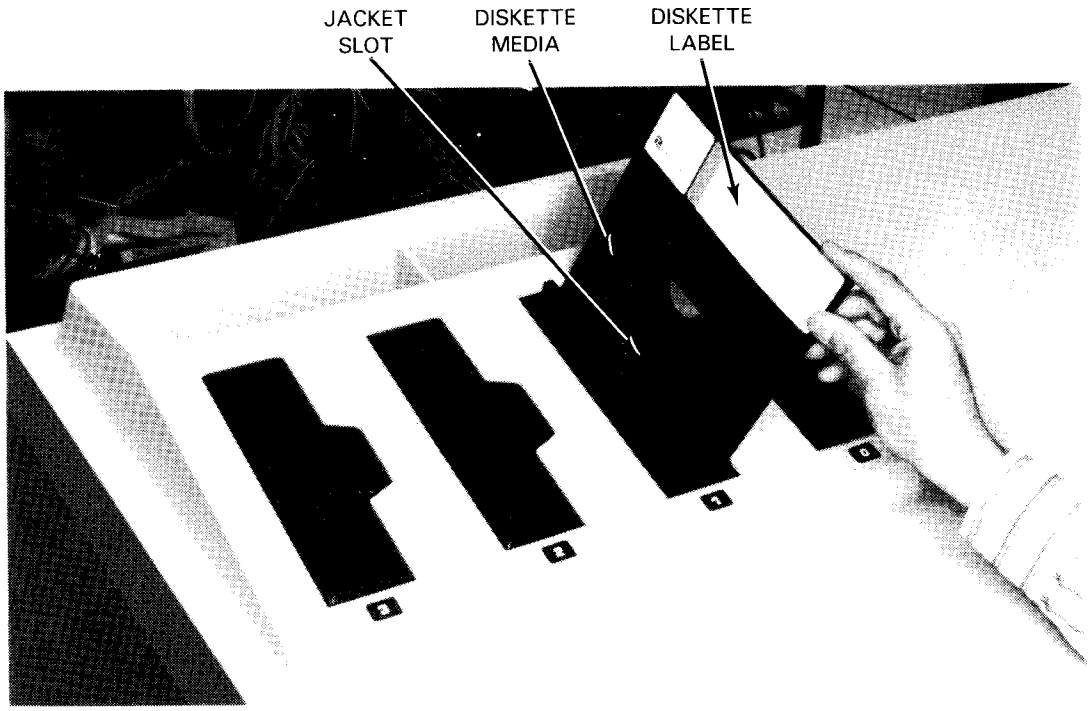


a. Freestanding diskette drive



b. Console diskette drive

Figure 3-1. Loading Diskette into Manual Load Drives (Part 1 of 2)



c. Inserting diskette media

Figure 3-1. Loading Diskette into Manual Load Drives (Part 2 of 2)

Autoload Diskette Drive Operation

To load an autoload diskette drive for operation, proceed as follows:

1. Install the diskette media into the hopper with all labels facing you and the jacket slot of each diskette at the bottom (Figure 3-2a). Place diskettes in proper sequence in the hopper so that the first diskette is nearest to the drive mechanism and the last is nearest to the hopper front (toward the operator).

2. When diskettes are in the hopper, pat them down so they are all even and the leading diskette is beneath the retainers and behind the keepers on each side as well as top and bottom of the hopper (Figure 3-2b).

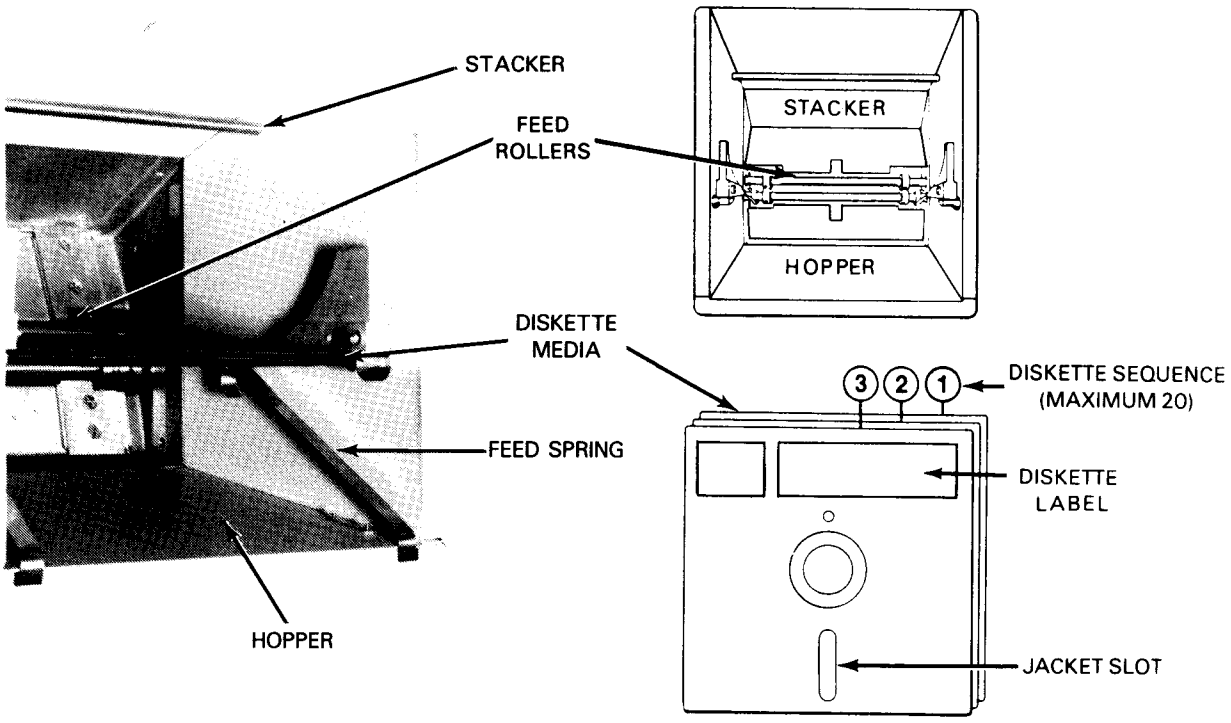
   NOTE: The hopper and stacker each have a capacity of 20 diskettes. An empty hopper sensor or full stacker sensor halts operation when either of these conditions exists.

3. Press the bottom of the diskettes against the keepers at the bottom and on each side of the hopper (Figure 3-2b).

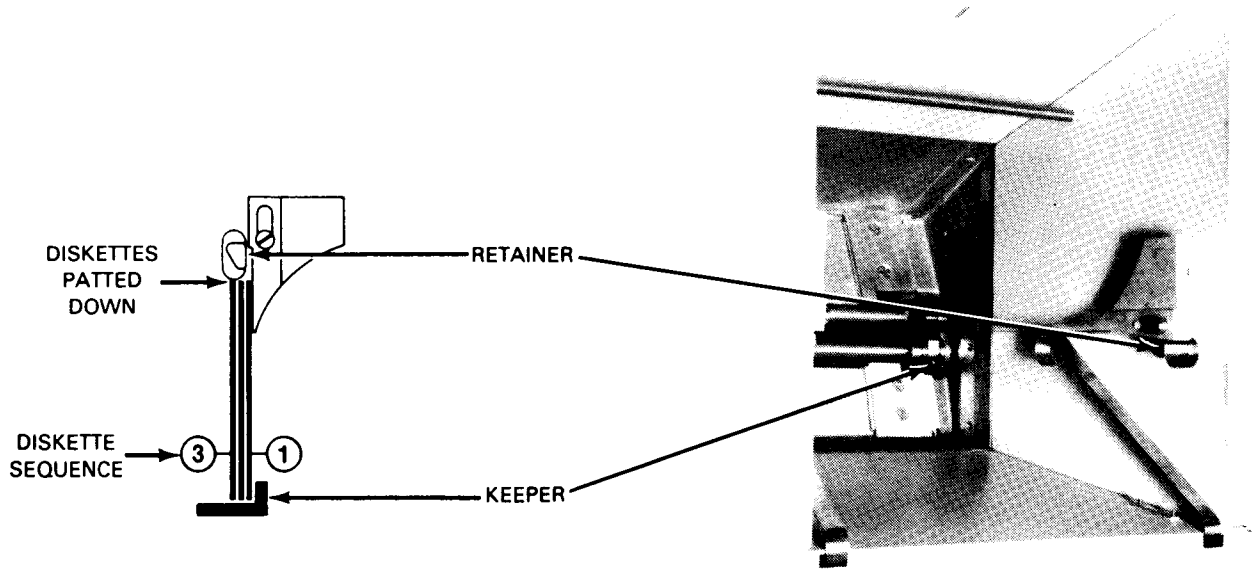
   NOTE: When properly inserted, diskettes are pressed against the keepers by two feed springs in the hopper. If diskettes are not adjacent to the keepers, the hopper-empty sensor does not engage and diskettes do not feed into the feed rollers.

When no feed command is supplied by the program and you want to feed a diskette through the autoload drive or unload a diskette from the drive, press the FEED switch (Figure 2-8). This activates the drive mechanism and the diskette currently in the reader mechanism is fed into the stacker while the next diskette in the hopper is fed into the reader. Remove all diskettes from the hopper before pressing the FEED switch if you want to remove only the diskette from the reader.

NOTE: The FEED indicator remains lit while a diskette is loading into or unloading from the reader mechanism. This occurs whether the operation is initiated manually with the FEED switch or by program.



a. Hopper/stacker bin and diskette sequence



b. Diskettes properly in place

Figure 3-2. Loading Diskettes into Autoload Drive

3.2.2. Loading Disk Media

Some disk pack types can be removed from the disk drive and replaced by the operator; other disk pack types are permanently loaded by the customer engineer. For replaceable disk packs, follow these precautions to prevent damage to disk media:

- Disk packs must be protected from damage by handling and extreme environment according to instructions provided by the disk manufacturer.
- A disk pack should be conditioned to room temperature before loading it into the disk drive.
- When loading the disk pack, do not drop it onto the disk drive spindle or the first threads of the spindle may be damaged.
- Be sure that the disk pack cover is completely released from the disk pack before attempting its removal from the disk well; an abrupt upward pull can damage threads on the drive shaft lock.
- When mounting a disk pack, avoid excessive loading torque; extra clockwise turning to ensure that the disk pack is locked on the shaft is not necessary and may damage the spindle threads.
- When unloading a disk pack, do not attempt to lift the disk pack from the spindle until it is fully disengaged, or thread damage may result.
- When releasing the disk pack from the drive spindle, stop rotating the disk pack cover handle (counterclockwise for removal) when you hear one or two clicks. Continuous clicking is unnecessary and may damage the spindle threads.
- After removal, store the disk pack in the same environment as the disk drive.

8416 Disk Drive Operation

Procedures for loading and removing the disk pack on the 8416 disk drive are as follows:

- Loading the disk pack:

  1. Press the ON-OFF switch/indicator on the 8416 disk drive operator control panel (Figure 2-11) and note that the switch/indicator is extinguished.
  2. Press the cover latch (Figure 3-3a) and allow the disk pack well cover to spring open. Push the cover straight back to fully expose the drive spindle.
  3. Remove the disk pack bottom cover (Figure 3-3b) by squeezing the bottom release latches.

CAUTION

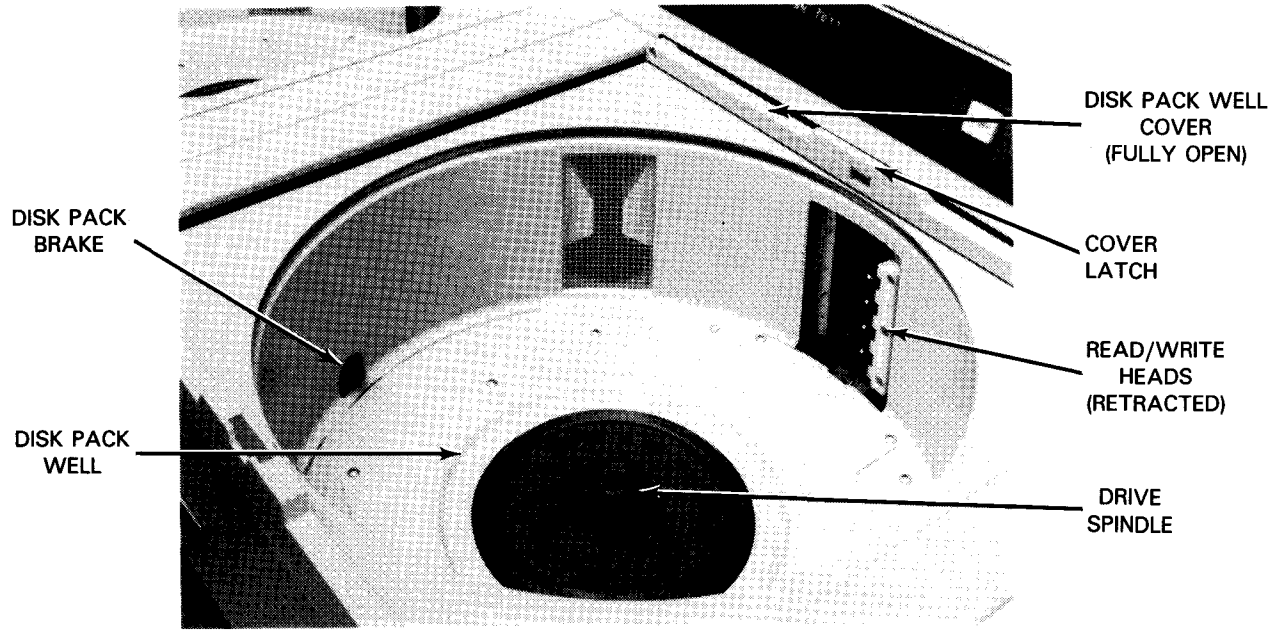
Do not forget to remove the disk pack bottom cover (step 3) before inserting the disk pack into the well, or the cover will become firmly entrenched in the well and will require service from the customer service engineer.

4. Place the disk pack on the drive spindle (Figure 3-3a). While pressing down on the top cover, turn the handle (Figure 3-3c) clockwise until it reaches a full stop.

5. Lift off the disk pack top cover from the mounted disk pack (Figure 3-3d), and close and latch the cover.

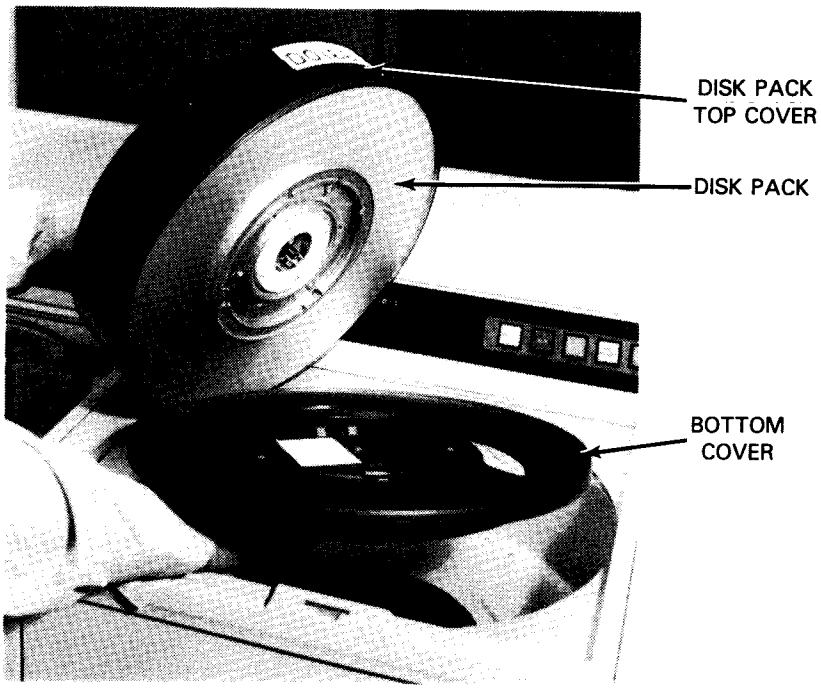
6. Reassemble the disk pack top and bottom covers, and place them on top of the disk drive cabinet (Figure 3-3e).

7. Press the ON-OFF switch/indicator and RUN switch/indicator on the 8416 disk drive operator control panel; note that both switch/indicators light. (RUN switch/indicator is delayed 30 seconds.) If writing is to be done on the disks, press the FILE PROTECT switch/indicator to extinguish it.

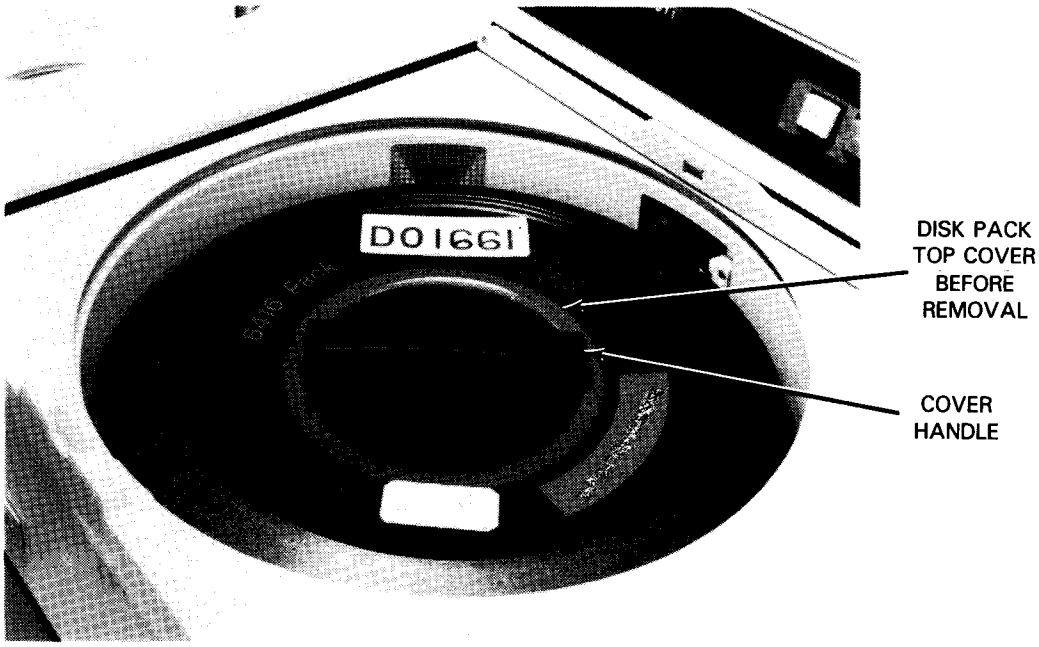


a. Disk pack well open to receive disk pack

Figure 3-3. Loading Disks on 8416 Disk Drive (Part 1 of 3)

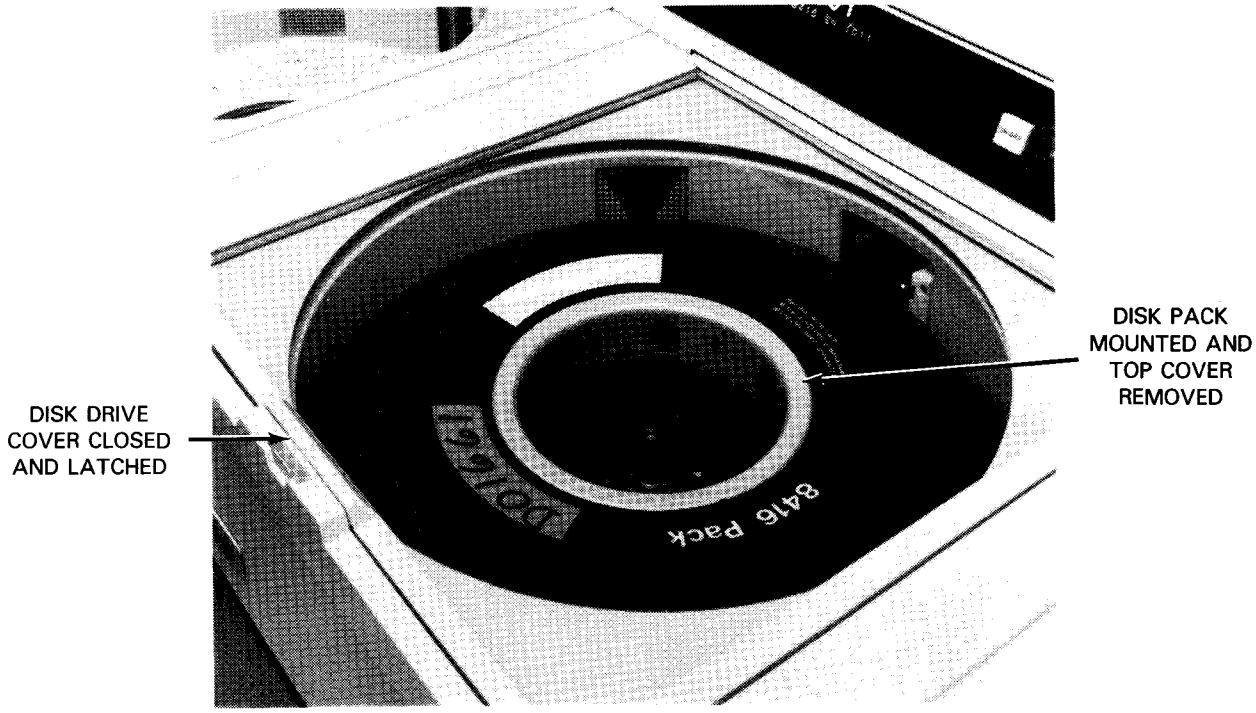


b. Removing bottom cover from disk pack

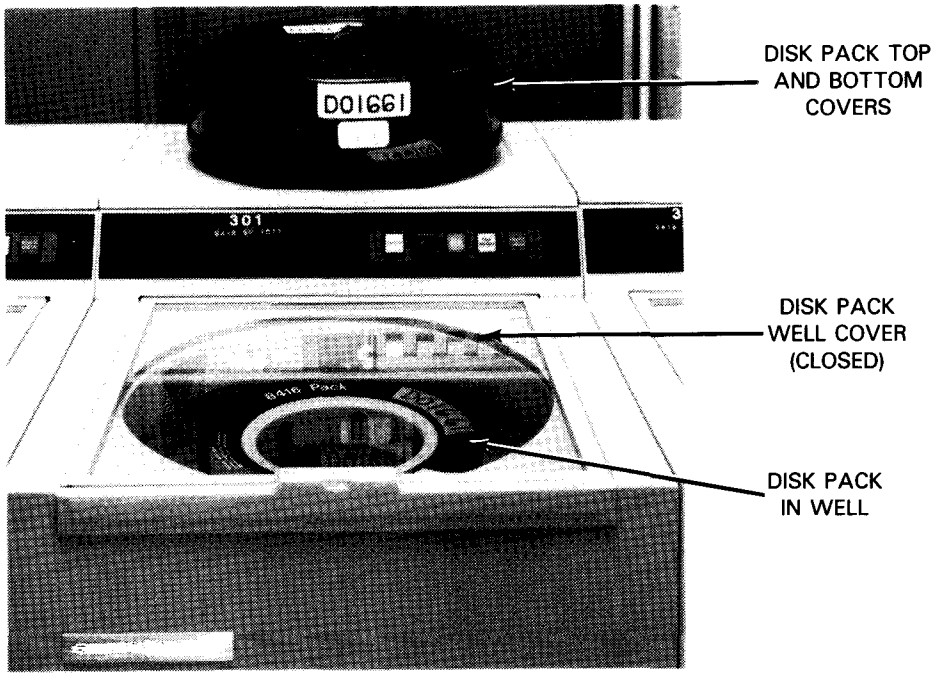


c. Disk pack with top cover inside well

Figure 3-3. Loading Disks on 8416 Disk Drive (Part 2 of 3)



d. Disk pack mounted and cover closed



e. Top and bottom covers removed from disk pack

Figure 3-3. Loading Disks on 8416 Disk Drive (Part 3 of 3)

The disk pack is now mounted, and the drive is ready for operation after notifying software. Use the following procedure to remove a disk pack:

- Removing the disk pack on 8416 disk drive:

  1. Press the STOP switch/indicator on the operator control panel (Figure 2-11); note that it lights. Then press the ON-OFF switch/indicator.

  2. Wait approximately 30 seconds until the disk pack stops rotating.

  NOTE: The disk pack well cover (Figure 3-3e) remains locked until disk pack rotation stops.

  3. Press the cover latch and slide the cover fully open.

  4. Disengage the disk pack bottom cover from the top cover by squeezing the latches on the bottom cover.

  5. Place the top cover over the disk pack in the well (Figure 3-3c), and turn the cover handle clockwise two full turns to fasten the cover securely to the disk pack.

  6. Lift out the disk pack by the top cover handle (Figure 3-3b) and attach the bottom cover by squeezing the two bottom latches to lock the bottom cover to the top cover.

  7. Store the disk pack with covers in a designated area.

  8. Close and latch the disk pack well cover.

8418 Disk Drive Operation

Procedures for loading and removing the disk pack on an 8418 disk drive are as follows:

- Loading the disk pack:

CAUTION

Follow these precautions when loading a disk pack:

1. *Do not drop the disk pack onto the disk drive spindle; damage may result to the first threads on the spindle.*

2. *Be sure that the disk pack top cover (Figure 2-10) is completely released from the disk pack before attempting removal; a sudden upward pull applied to the drive shaft lock can damage the threads.*

3. *Avoid excessive loading torque; extra twisting of the top cover handle to ensure that the disk pack is tightly locked on the shaft is not necessary and can damage the spindle threads.*

Proceed as follows to load a disk pack:

1. Press the well cover latch on top of the disk drive unit to allow the well cover to spring upward (Figure 3-4a).

CAUTION

To reduce contamination of the well area by airborne particles, close the well as soon as possible upon loading the disk pack.

2. Lift the disk to be mounted by its top cover handle. Squeeze the two bottom cover latches to remove the bottom cover (Figure 2-10).

CAUTION

Do not forget to remove the disk pack bottom cover (step 2) before inserting the disk pack into the well, or the bottom cover will become firmly entrenched in the well and require service from the customer service engineer.

3. While still holding the disk pack by its top cover handle, carefully lower the disk pack straight down into the well to engage the spindle drive gear (Figure 3-4b).

4. Set the disk pack carefully in the well so that the drive gear in the well engages the disk pack engaging gear (Figure 2-10). When the disk pack is firmly seated, carefully rotate the disk pack (by the cover handle) in a clockwise direction until rotation stops. *Do not overtighten.*

5. Lift out the disk pack top cover.

6. Close and latch the well cover. Store the disk pack top and bottom covers in the disk pack storage basket on top of the disk drive, or in any designated storage location.

7. Set the mode of operation for the disk drive by pressing the FILE PROTECT switch/indicator on the operator control panel (Figure 2-12). When the FILE PROTECT switch/indicator is lit, the disk drive will operate in read-only mode and recorded data cannot be erased.

CAUTION

If the FILE PROTECT switch/indicator is extinguished, the disk drive is in write mode and recorded data will be erased, depending on the location of the read/write heads.

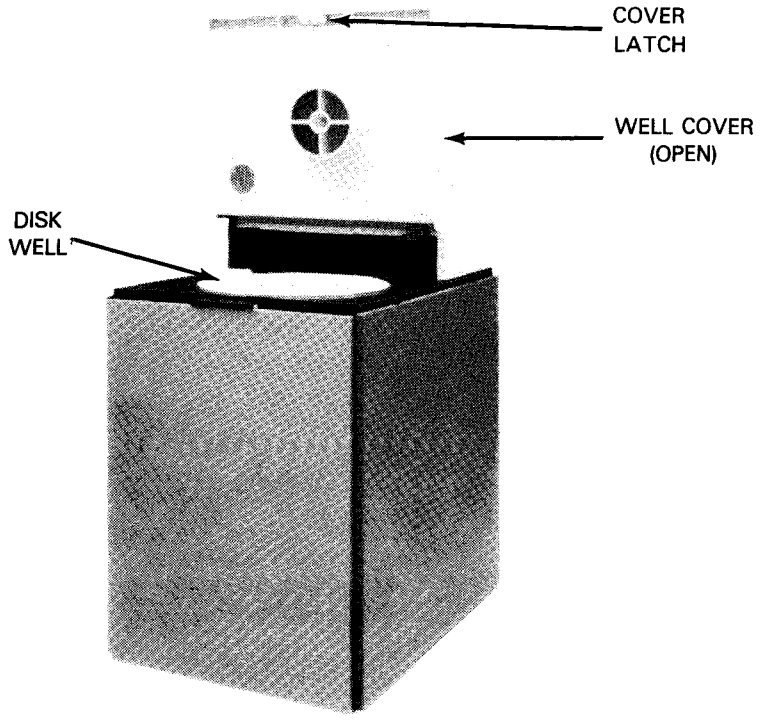
NOTE: The operating mode can be changed any time, but the change is not effective until the current operation is complete.

8. Press the ON-OFF switch/indicator, then the RUN switch/indicator on the operator control panel. Note that the ON-OFF switch/indicator lights and the STOP switch/indicator extinguishes. The RUN switch/indicator lights when the disk pack rotation reaches operating speed and the read/write heads have been positioned to cylinder 0.

NOTE: It is not necessary to wait for the disk pack to reach full operating speed before pressing the RUN switch/indicator. By pressing the ON-OFF then the RUN switch/indicators in sequence, the disk drive immediately switches from stop state (STOP switch/indicator extinguished) and automatically enters run state (RUN switch/indicator lit) when the proper speed is reached.

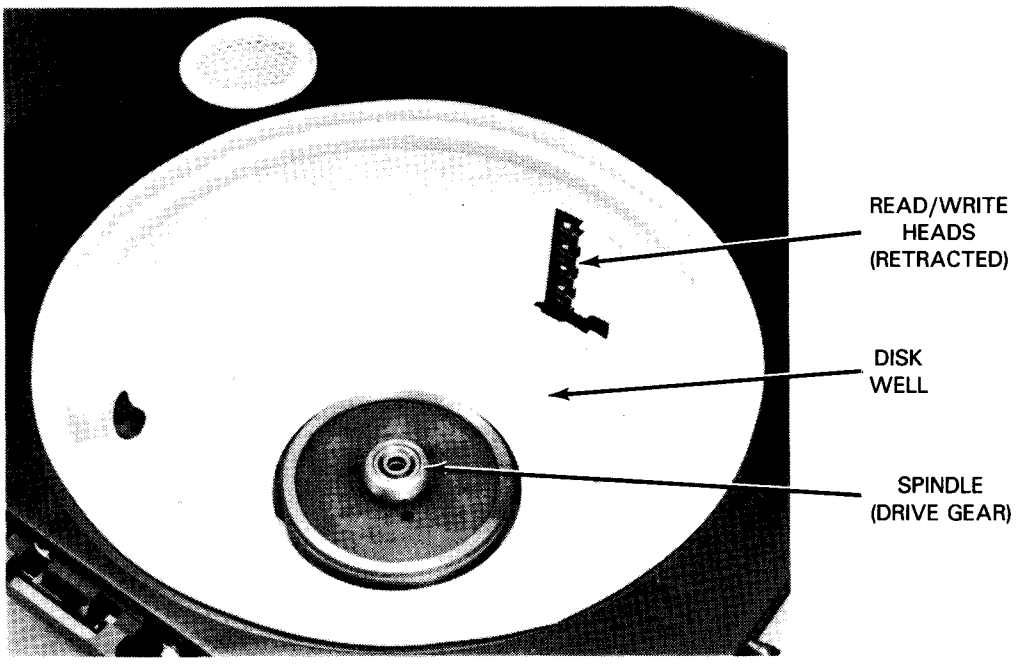
9. As with all peripheral equipment, place the disk drive on the system list of available resources by entering the proper command at the processor.

NOTE: The disk drive may be placed offline to prevent communications with the disk channel/controller by pressing the STOP switch/indicator. In that event, note that the STOP switch/indicator lights and the RUN switch/indicator extinguishes.



a. Disk drive well cover open

Figure 3-4. Loading Disks on 8418 Disk Drive (Part 1 of 2)



b. Disk drive well with disk pack removed

Figure 3-4. Loading Disks on 8418 Disk Drive (Part 2 of 2)

- Removing the disk pack on 8418 disk drive:

CAUTION

Follow these precautions when unloading a disk pack:

1. *When releasing the disk pack from the drive spindle, stop rotating the disk pack cover handle (counterclockwise for removal) when one or two clicks are heard. Continuous clicking is unnecessary and may damage the spindle threads.*

2. *Do not attempt to lift the disk pack from the spindle until the disk pack is completely disengaged from the drive or damage may result to the spindle threads.*

3. *Store the removed disk pack in an environment the same as that of the disk drive.*

Proceed as follows to remove a disk pack:

1. Press the STOP and then the ON/OFF switch/indicators on the operator control panel (Figure 2-12). Note that the STOP switch/indicator lights and the ON/OFF switch/indicator flashes until the disk pack stops.

   NOTE: The well cover remains locked until the disk pack stops rotating.

2. When the disk pack stops, press the cover latch on the well cover (Figure 3-4a) to open the cover.

3. Obtain the disk pack cover identified with the pack currently in the disk well.

4. Carefully lower the disk pack top cover over the disk pack in the well, until it is resting on the pack.

5. Turn the disk pack top cover by its handle counterclockwise until you hear one or two clicks.

6. Hold the disk pack top cover handle firmly, and carefully lift out the disk pack from the well.

CAUTION

Be sure to fit the bottom cover securely (step 7) to create a tight dust seal. Close the well cover as soon as possible after you remove the disk pack to prevent dust from entering the well.

7. While holding the disk pack raised, attach the bottom cover by squeezing the latches on the bottom cover, then fit the bottom cover firmly to the top cover and release the latches to secure the top and bottom covers.

8. Close and latch the well cover, and store the sealed disk pack in a designated location.

8417 Disk Drive Operation

The 8417 disk drive uses nonremovable disks located inside the cabinet; they are not accessible to the operator. The only requirement for a normal 8417 disk drive setup is that switches be set on the operator control panel (Figure 2-14).

CAUTION

Do not attempt to open the disk drive cabinet and slide out the drawer or a head crash will result due to improper preconditions. The drawer should be opened only by a customer service engineer.

To set the 8417 disk drive for operation, proceed as follows:

1. Ensure that the POWER ON/OFF switch on the operator control panel (Figure 2-14) is set to the ON position. Note that the POWER ON indicator and READY indicator are lit.

2. If no writing is to be performed on the disk, set the FILE PROT switch to the ON (up) position to inhibit writing and protect recorded data.

CAUTION

Be sure that the READY indicator is lit on the first disk drive turned on before turning power on for the next disk drive. Failure to turn power on for each disk drive in this sequence may result in input power failure or equipment damage.

3. Repeat steps 1 and 2 for each disk drive in the cabinet.

8419 Disk Drive Operation

Procedures for loading and removing the disk pack on the 8419 disk drive are as follows:

- **Loading Disk Pack**

CAUTION

Follow these precautions when loading a disk pack:

1. *Do not drop the disk pack onto the disk drive spindle; damage may result to the first threads on the spindle.*

2. *Be sure that the disk pack top cover (Figure 2-13) is completely released from the disk pack before attempting removal; a sudden upward pull applied to the drive shaft lock can damage the threads.*

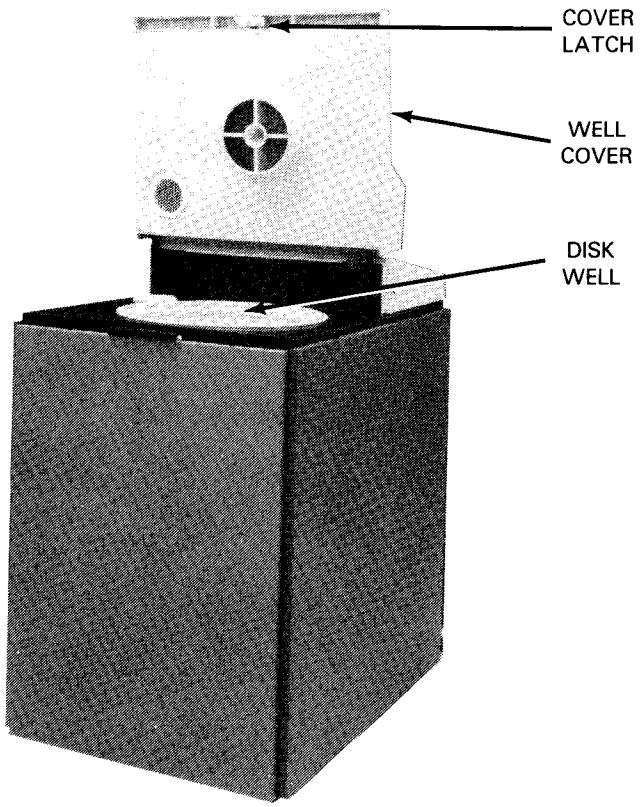
3. *Avoid excessive loading torque; extra twisting of the top cover handle to ensure that the disk pack is tightly locked on the shaft is not necessary and can damage the spindle threads.*

Proceed as follows to load a disk pack:

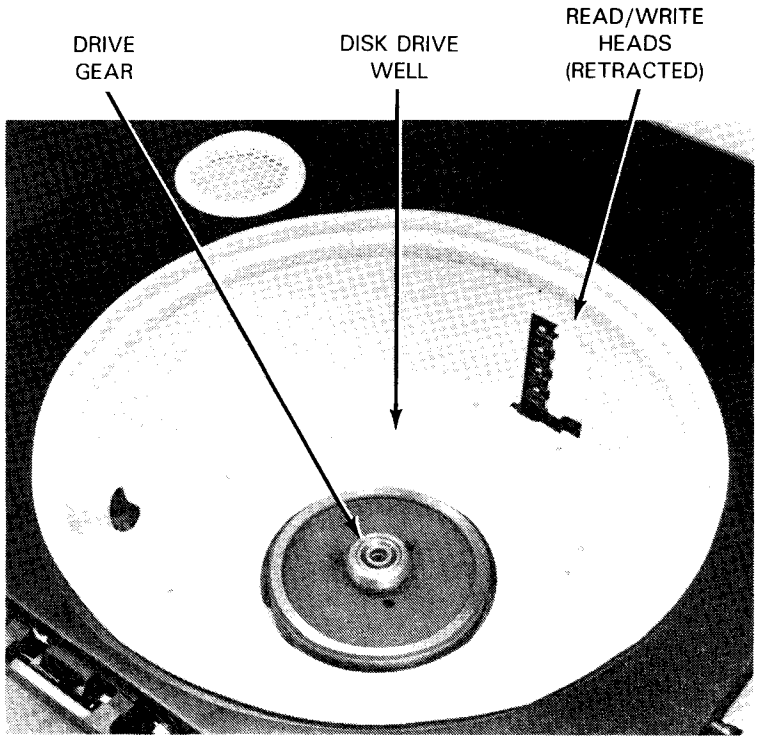
1. Press the cover latch on top of the disk drive unit to allow the well cover to spring upward (Figure 3-5a).

CAUTION

To reduce contamination of the well area by airborne particles, close the well cover as soon as possible after loading the disk pack.



a. Disk drive well cover open



b. Disk drive well with disk pack removed

Figure 3-5. Loading Disks on 8419 Disk Drive

2. To mount the disk pack, lift it by its top cover handle. Squeeze the two bottom cover latches to remove the bottom cover (Figure 2-13).

3. While still holding the disk pack by its top cover handle, carefully lower the disk pack straight down into the well to engage the drive gear (Figure 3-5b).

4. Set the disk pack carefully in the well so that the drive gear in the well engages the disk pack engaging gear. When the disk pack is firmly seated, carefully rotate the disk pack (by the cover handle) in a clockwise direction until rotation stops. *Do not overtighten.*

5. Lift out the disk pack top cover.

6. Close and latch the disk drive cover. Store the disk pack top and bottom covers in the disk pack storage basket on top of the disk drive, or in any designated storage location.

7. Set the mode of operation for the disk drive by pressing the FILE PROTECT switch/indicator on the operator control panel. When the FILE PROTECT switch/indicator is lit, the disk drive will operate in read-only mode and recorded data cannot be erased. If the FILE PROTECT switch/indicator is extinguished, the disk drive is in write mode and recorded data will be erased, depending on the location of the read/write heads.

   NOTE: The operating mode can be changed at any time, but the change is not effective until the current operation is complete.

8. Press the ON-OFF switch/indicator, then the RUN switch/indicator on the operator control panel. Note that the ON-OFF switch/indicator lights and the STOP switch/indicator extinguishes. The RUN switch/indicator lights when the disk pack rotation reaches operating speed and the read/write heads have been positioned to cylinder 0.

   NOTE: It is not necessary to wait for the disk pack to reach full operating speed before pressing the RUN switch/indicator. By pressing the ON-OFF then the RUN switch/indicators in sequence, the disk drive immediately switches from stop state (STOP switch/indicator extinguished) and automatically enters run state (RUN switch/indicator lit) when the proper speed is reached.

9. Place the disk drive unit on the system list of available resources by entering the proper command at the processor.

   NOTE: The disk drive unit may be placed offline to prevent communications with the disk channel/controller by pressing the STOP switch/indicator. In that event, note that the STOP switch/indicator lights and the RUN switch/indicator extinguishes.

- **Remove Disk Pack**

CAUTION

Follow these precautions when unloading a disk pack:

1. *When releasing the disk pack from the drive spindle, stop rotating the disk pack cover handle (counterclockwise for removal) when one or two clicks are heard. Continuous clicking is unnecessary and may damage the spindle threads.*

2. *Do not attempt to lift the disk pack from the spindle until the disk pack is completely disengaged from the drive or damage may result to the spindle threads.*

3. *Store the removed disk pack in an environment the same as that of the disk drive.*

To remove a disk pack from the drive, proceed as follows:

1. Remove the disk drive unit from the system list of available resources by entering the proper command at the processor.

2. Press the STOP then the ON-OFF switch/indicators on the operator control panel. Note that the STOP switch/indicator lights and the ON-OFF switch/indicator flashes until the disk pack stops rotating.

   NOTE: A solenoid-operated latch prevents the disk drive unit top cover from opening until the disk pack stops rotating.

3. When the disk pack stops rotating, press the latch on the disk drive top cover and allow the cover to swing fully open.

4. Obtain the disk pack top cover identified with the disk pack in the drive well.

5. Carefully lower the top cover over the disk pack in the well until it is resting on the pack.

6. Rotate the top cover (by its handle) in a counterclockwise direction until one or two clicks are heard.

7. Carefully lift out the disk pack (by the cover handle) from the drive well.

CAUTION

The bottom cover for the disk pack should fit securely (step 8) to create a positive dust seal. Also, the disk drive unit top cover must be closed securely as soon as possible after removing the disk pack to reduce contamination of the well area by airborne dust particles.

8. While holding the disk pack raised, attach the bottom cover by squeezing the release latches to fit the cover; then release the latches to secure the bottom cover onto the top cover with the disk pack.

9. Close the disk drive top cover and store the disk pack with covers in a designated location.

8430 and 8433 Disk Drives Operation

The 8430 and 8433 disk drives use removable disk packs that are loaded and unloaded in the same manner for both drives. Disk packs are interchangeable within the same disk drive type, but are not interchangeable between both types. A disk pack used on the 8430 disk drive cannot be used on 8433 disk drives, and vice versa.

Procedures for loading and removing a disk pack on an 8430 or 8433 disk drive are as follows:

- Loading the disk pack:

CAUTION

Follow these precautions when loading disk packs:

1. *Do not drop the disk pack onto the disk drive spindle, or the first threads may be damaged.*

2. *Be sure that the disk pack top cover is completely released from the disk pack before attempting to remove the top cover.*

   A sudden upward pull can damage the threads of the drive shaft lock if the top cover is not fully removed.

3. *Avoid excessive tightening on the spindle. Extra clockwise twisting of the disk pack top cover after the disk pack is locked on the spindle is not necessary and can damage the threads.*

Proceed as follows to load a disk pack:

1. Press to release the disk drive well cover latch and allow the cover to spring open (Figure 3-6a). Slide the cover back fully to expose the entire disk pack well area.

2. Lift the disk pack to be installed by its top cover handle, and remove the bottom cover by squeezing the bottom cover latches.

CAUTION

Do not forget to remove the disk pack bottom cover (step 2) before inserting the disk pack into the well, or the bottom cover will become firmly entrenched in the well and will require service from the customer service engineer.

3. Carefully place the disk pack into the well and on the spindle to engage the threads. When the disk pack is seated, turn the disk pack top cover handle clockwise until it reaches a full stop. The disk pack top cover disengages from the pack when the disk pack is firmly mounted on the spindle.

4. Lift out the disk pack top cover (Figure 3-6b).

5. Place the disk pack top and bottom covers on the temporary storage location on top of the disk drive cabinet.

6. Close and latch the disk drive well cover.

7. Press the FILE PROTECT switch/indicator on the operator control panel (Figure 2-18) and note that the switch/indicator lights to operate in read mode.

CAUTION

If the FILE PROTECT switch/indicator is extinguished, the disk drive is in write mode and recorded data may be erased.

8. Press the START switch/indicator on the operator control panel and note that the switch/indicator lights.

a. Disk pack well closed

Figure 3-6. Loading Disks on 8430 or 8433 Disk Drive (Part 1 of 2)

b. Disk pack well with disk pack installed

Figure 3-6. Loading Disks on 8430 or 8433 Disk Drive (Part 2 of 2)

- Removing the disk pack from the disk drive:

CAUTION

Follow these precautions when removing a disk pack from a disk drive:

1. *When releasing the disk pack from the drive spindle, stop rotating the disk pack cover handle (counterclockwise for removal) when one or two clicks are heard. Continuous clicking is unnecessary and may damage the spindle threads.*

2. *Do not attempt to lift the disk pack from the spindle until the disk pack is completely disengaged from the drive or damage may result to the spindle threads.*

3. *Store the removed disk pack in an environment the same as that of the disk drive.*

1. Press the START switch/indicator on the operator control panel (Figure 2-18), and note that the switch/indicator extinguishes.

   NOTE: The disk drive well cover remains locked until the disk pack stops rotating.

2. When the disk pack stops rotating, press the cover latch (Figure 3-6a) to allow the well cover to spring open. Slide the cover back fully to expose the disk pack in the well (Figure 3-6b).

3. Obtain the disk pack cover identified with the disk pack in the drive well.

4. Carefully lower the disk pack top cover over the disk pack in the well, until it is resting on the pack.

5 Turn the disk pack top cover, by its handle, in a counterclockwise direction until you hear one or two clicks.

6. Hold the disk pack top cover handle firmly, and lift the disk pack from the well.

CAUTION

Be sure to fit the bottom cover securely to the top cover (step 7) when the disk pack is removed to form a tight dust seal. Close the disk well as soon as possible to prevent dust from entering the well.

7. While holding the disk pack raised, attach the disk pack bottom cover by squeezing the latches on the bottom cover, then release the latches to secure the bottom cover to the disk pack top cover.

8. Close the disk well cover and store the covered disk pack in a designated location.

8470 Disk Drive Operation

The 8470 disk drive uses nonremovable disks located inside the cabinet; they are not accessible to the operator. The only requirement for a normal 8470 disk drive setup is that switches be set on the operator control panel (Figure 2-20).

To set the 8470 disk drive for operation, proceed as follows:

1. Set the ON/OFF switch on the operator control panel (Figure 2-20) to the ON position. Note that the READY indicator blinks while the internal disks are reaching operating speed. The READY indicator remains lit at full operating speed.

2. If no writing is to be performed on the disk, set the FILE PROTECT switch to the up position to inhibit writing and protect recorded data.

3. If the disk drive is configured for dual access from two controllers, set the 1 - 1/2 - 2 switch to the 1/2 (center) position. Otherwise, set the switch to either the 1 or 2 position, depending on which access the disk drive is configured to.

8480 Disk Drive Operation

The 8480 disk drive uses four nonremovable disks located inside the cabinet; they are not accessible to the operator. The only requirement for a normal 8480 disk drive setup is that switches be set on the operator control panels that correspond to each disk drive (Figure 2-21).

To set the 8480 disk drives for operation, perform the following procedure for each disk drive:

1. Set the ON/OFF switch on the operator control panel for the disk drive (Figure 2-21) to the ON position. Note that the READY indicator blinks while the internal disks are reaching operating speed. The READY indicator remains lit at full operating speed.

2. If no writing is to be performed on the disk, set the FILE PROTECT switch to the up position to inhibit writing and protect recorded data.

3. If the disk drive is configured for dual access from two controllers, set the 1 - 1/2 - 2 switch to the 1/2 (center) position. Otherwise, set the switch to either the 1 or 2 position, depending on which access the disk drive is configured to.

8494 Disk Drive Operation

The 8494 disk subsystem uses nonremovable disks located inside the cabinet; they are not accessible to the operator. A minimum of one controller and two disk drives can be configured. (The cabinet may be configured with a maximum of two controllers and eight disk drives.)

To set the 8494 disk subsystem for operation, perform the following procedure for each disk drive:

1. Set the DISK POWER OFF switches on the cabinet operator control panel (Figure 2-21b) to the on (up) position for each disk drive in the subsystem.

2. Set the POWER OFF A,B switches on this control panel to the on (up) position.

3. Observe that the READY indicator on the START switch on the operator panel (Figure 2-21c) for each disk drive is flashing. This indicates the power up sequence is in progress.

4. Observe that the READY indicator for each disk drive stops flashing and remains lit. This indicates the drives are ready for use. (The time required for the power up sequence is approximately 5 seconds delay for each drive after logical 0 drive. So logical drive 3 delays power up by 15 seconds.)

5. The CONTROLLER STATUS indicators on the cabinet operator control panel should be 0000 to indicate a successful power up sequence, and the FAULT indicators on each disk drive operator panel should be off.

3.2.3. Operation Setup for Printers

To setup printers for operation, you must load print forms, install or replace the inked ribbon, and install or replace the print bands. These procedures are described for printers used in a minimum configuration of System 80 models 8/10/20.

0776 Printer Forms Loading, Removal, and Advance

To load forms into the 0776 printer, proceed as follows:

1. Press to light the STOP switch/indicator on the printer operator control panel (Figure 2-25).

2. Allow for maximum form adjustment on the printer when forms are initially loaded by setting the HORIZ FORM ADJ control (Figure 3-7a) so that both retaining rings on the tractor supports are spaced evenly with their respective side castings.

3. Open the front paper well door at the bottom of the printer cabinet. Remove any forms or forms container presently in the paper well compartment. Also remove printed forms from the stacker at the rear of the printer.

4. Raise the top hood of the printer.

5. Press down on latch lever to release carriage assembly (Figure 3-7). Swing carriage assembly fully open (assembly hinged at right side).

6. Unclamp four form tractors (Figure 3-7c) by loosening knurled locking screw on each tractor and turning counterclockwise (Figure 3-7d).

7. Open four tractor pressure plates (Figure 3-7d) and swing up hinged portion of paper rack.

8. Place supply of forms to be loaded into paper well compartment so that form print surface faces operator. If new forms are to be added to existing forms in the printer, perform the following steps a through f. Otherwise, proceed to step 9.

   NOTE: Optimum performance on the 0776 printer is produced on single-part, 20-pound bond stock. Satisfactory performance can also be realized on 18-pound bond, provided the relative humidity does not drop below 40 percent and the roller adjustment lever (in the stacker, Figure 3-7h) has been properly set. Forms handling problems may increase when forms are made of less than 18-pound paper or if recycled paper is used. These problems can be minimized by avoiding multiline skips or paper advances whenever possible.

   a. Line up top edge of new forms against bottom edge of old forms, and tape securely.

   b. Close tractor pressure plates.

   c. Close and lock print carriage assembly.

d. Close paper well door of printer cabinet.

e. Press and release RUN switch. RUN indicator lights.

f. Close top hood.

9. Place form on upper left tractor pins.

10. Close pressure plate on upper left tractor.

NOTE: If form being loaded contains alignment ticks, perform step 11; otherwise, go directly to step 12.

11. To load form provided with alignment ticks:

a. Unlatch form alignment guide from print carriage assembly (Figure 2-26) and place across print head.

b. Adjust upper left tractor until vertical tick on form corresponds to proper column on column indicator (Figure 3-7e).

c. Lock upper left tractor by turning tractor knurled locking screw clockwise.

d. Adjust upper right tractor until form mates with tractor pins.

e. Close upper right tractor pressure plate.

f. Proceed to step 13.

12. To load form not provided with alignment ticks:

a. Adjust upper right tractor until form engages tractor pins.

b. Close upper right tractor pressure plate.

c. Unlatch form alignment guide from print carriage (Figure 2-26) and place across print head.

d. Press and turn form advance knob until bottom edge of form guide aligns with intended bottom of line to be printed (Figure 3-7f).

e. Adjust two upper tractors to shift form horizontally until correct column indication block is centered on intended position in first column.

f. Remove all horizontal slack from form by adjusting two upper tractors.

g. Secure both tractors by turning knurled locking screw on each tractor clockwise.

h. Proceed to step 13.

13. Adjust and secure two lower tractors so that form is held in correct vertical position.

14. Press and turn form tension knob (Figure 2-26) until slight tension is felt over curvature of print head.

CAUTION

Do not deform or tear form sprocket holes when adjusting form tension.

15. If form alignment guide was used for aligning form, retract and latch guide (magnetically) to print carriage assembly.

16. On form provided with horizontal tick, press and turn form advance knob (Figure 3-7) until horizontal alignment tick at edge of form is aligned with line on print head (Figure 3-7e). Make certain form extends beyond paper light emitting diode (LED) sensor on upper tractor.

17. Move form thickness control lever (Figure 3-7c) to proper location for form used.

NOTE: *You can adjust the print gap (i.e., distance between hammer face and type face) using the form thickness control to compensate for use of forms with various thicknesses. The range of the control is such that a 6-part form with a maximum pack thickness of 0.018 inch (0.457 mm) can be printed without any degradation in quality. At the operator's discretion, other forms that exceed the maximum pack thickness can be made workable by manipulation of the form thickness control with the print phasing control on the print cartridge assembly. However, we do not recommended this, and if you decide to do this, reduced print quality may result. For assistance in determining the correct settings for special forms, contact the customer service engineer.*

18. If operating a 760- or 940/900-lpm printer, close and lock the print carriage assembly. If operating a 1200-lpm printer, leave the print carriage assembly open.

19. Feed form through internal guide assembly (Figure 3-7g). On the 760- or 940/900-lpm printer, pass form through rear exit slot in hood and fold between rear and front paper guides to paper shelf. On the 1200-lpm printer, perform the following steps:

    a. Manually raise forms stacker output tray (Figure 3-7h) by pulling up evenly at front center of tray. Be certain that tray is fully raised against its upper stop position. Pull finger assemblies to their extreme open position.

    b. Pull roller adjustment handle as far toward front of forms stacker as possible to open roller gap to its widest position.

c. Fold forms along natural fold line (line along which paper was originally folded in its carton), and feed forms through throat of forms stacker until forms rest on output tray and paper contacts rear finger assembly.

d. Push front finger assembly toward rear of forms stacker until front fingers contact edge of paper.

NOTE: Output tray may lower slightly during this operation.

Forms should now be evenly aligned between front and rear finger assemblies. View forms from side of forms stacker to check alignment.

e. Accumulate at least a forms length of paper on top of forms stacker, then push roller adjustment handle toward rear of forms stacker, increasing pull force just enough so that forms are fed into forms stacker. Then push roller adjustment handle an additional 1/4 inch (6.3 mm), so that pull force is slightly increased. This adjustment should be made with care, as too much or too little tension can cause improper folding and stacking. Single-part forms generally require greater movement of the roller adjustment handle than heavier forms.

f. Check throat of forms stacker to ensure that the fold line of the forms is parallel to the edge of the forms stacker casework. If not parallel, rotate the forms stacker to the right or left until the condition is corrected.

g. Proceed to step 20.

20. Close paper well door at front of printer cabinet. If form exceeds 17 inches (43.18 cm) in length, leave door open.

21. If operating a 760- or 940/900-lpm printer, proceed directly to step 22. If operating a 1200-lpm printer, first close and lock print carriage assembly, then proceed to step 22.

22. Press and hold the STOP switch (Figure 2-25) and then press the HOME switch. Release the HOME switch first, and then the STOP switch. The HOME indicator lights, but no forms motion is initiated (operator home procedure).

23. Press and release RUN switch. RUN indicator lights.

24. If further minor adjustment is required, adjust HORIZ FORM ADJ knob (Figure 3-7a) for side-to-side character placement.

CAUTION

Do not adjust form advance or tension controls while form is in motion (to prevent possible tearing of form).

To remove forms, perform the following steps:

1. Detach the last printed form from the unprinted forms.

2. Allow the forms stacker to stack the remaining printed forms. If operating a 1200-lpm printer, perform steps 3 and 4; otherwise, proceed to step 5.

3. Press the LOWER TRAY switch (See 2.5.1 and Figure 2-22c), lowering the stacker output tray until the top of the forms is beneath the lower tip of the finger assemblies.

CAUTION

Do not attempt to push tray down. To do so may damage the equipment.

4. Release the LOWER TRAY switch to stop the tray motion.

5. Lift the right and left edges of the stack of printed forms, slide the stack to the front of the forms stacker, and remove the forms.

To advance forms manually to the home position, proceed as follows:

1. Momentarily press STOP switch (Figure 2-25). If in run state, printer stops printing and STOP indicator lights.

2. Momentarily press HOME switch. Form advances to next home or setup position. HOME indicator lights when home position is obtained.

To establish a home position on the form that is synchronized with the vertical format buffer, proceed as follows:

1. Press and hold SPACE switch until form reaches desired home position. Release switch.

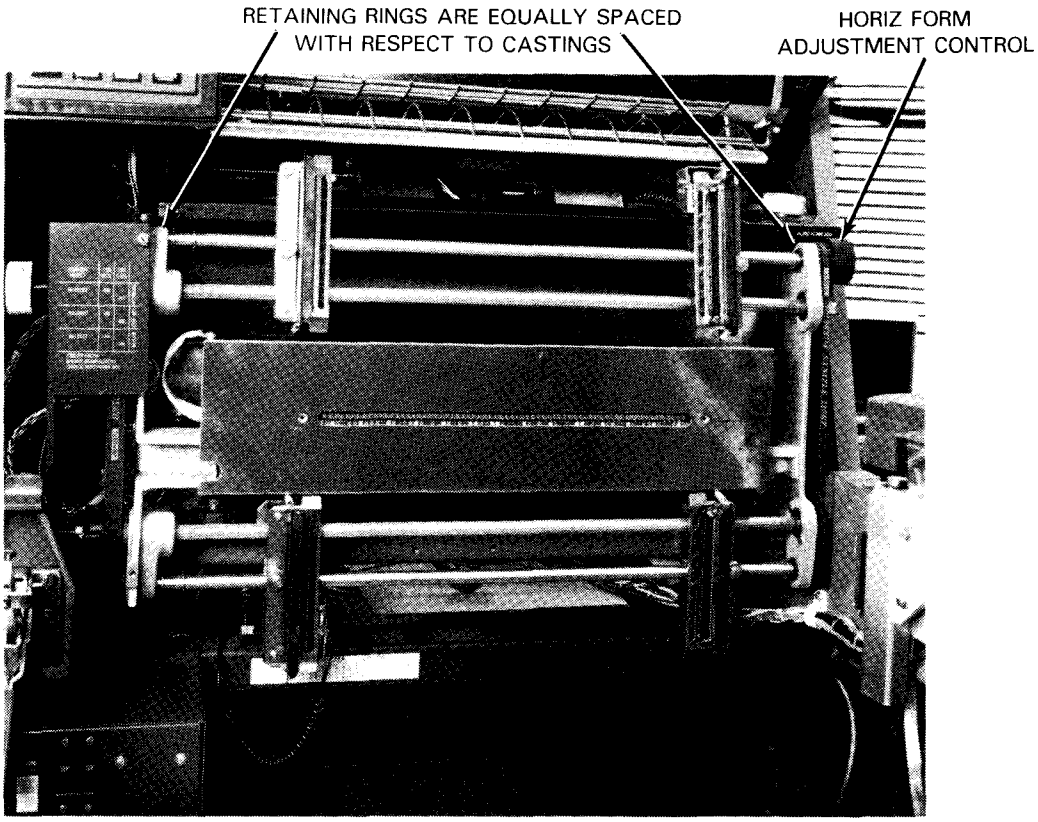
2. Press and hold STOP switch, then press HOME switch. This initializes vertical format buffer with no advance of form.

3. Press RUN switch. Printer enters run state if no error conditions exist. Program and form are now synchronized; HOME and RUN indicators light.

To establish a home position without moving the form (that is, synchronized with the vertical format buffer), proceed as follows:

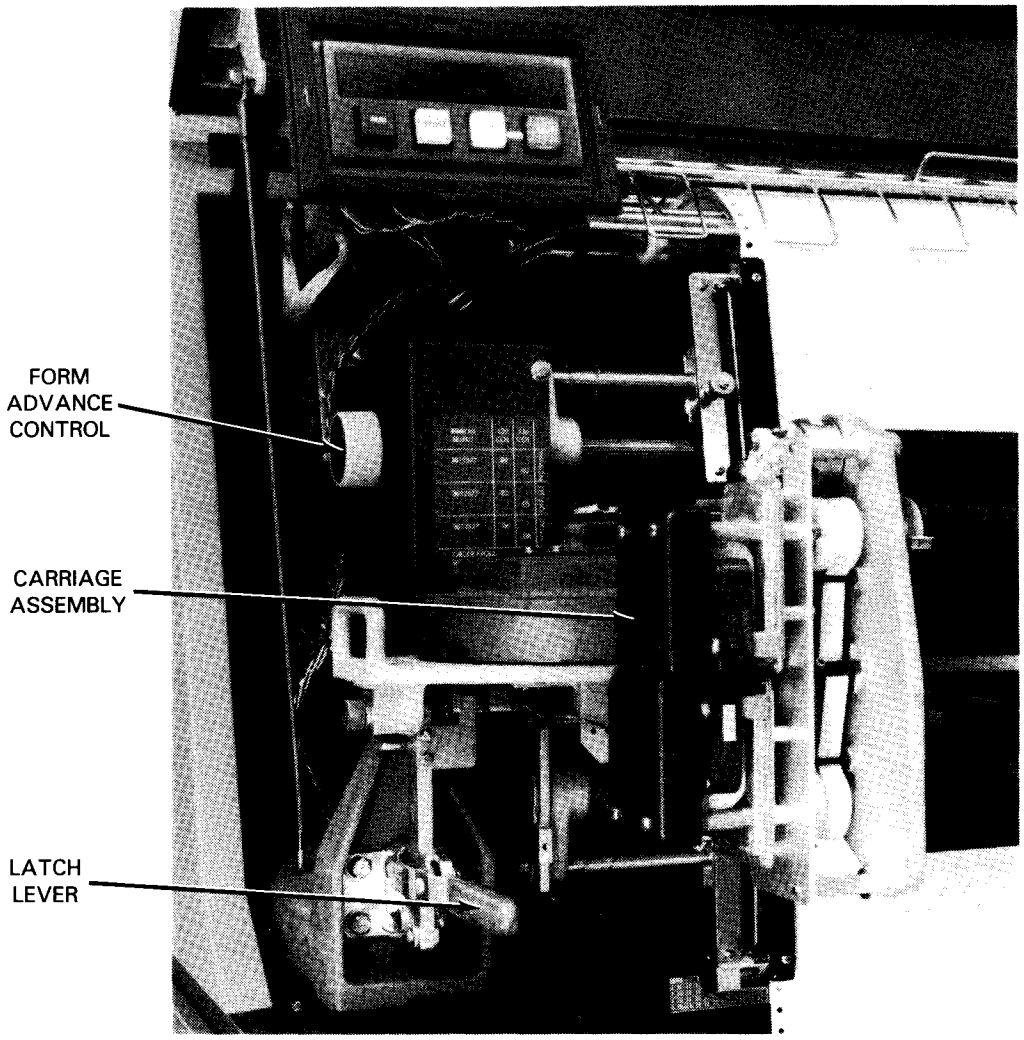
1. Momentarily press STOP switch. STOP indicator lights if not already lit.

2. Press and hold STOP switch, and then momentarily press HOME switch. Release STOP switch. The vertical format buffer is now initialized to home paper position without advancing form. HOME indicator lights to indicate vertical format buffer is in home position.



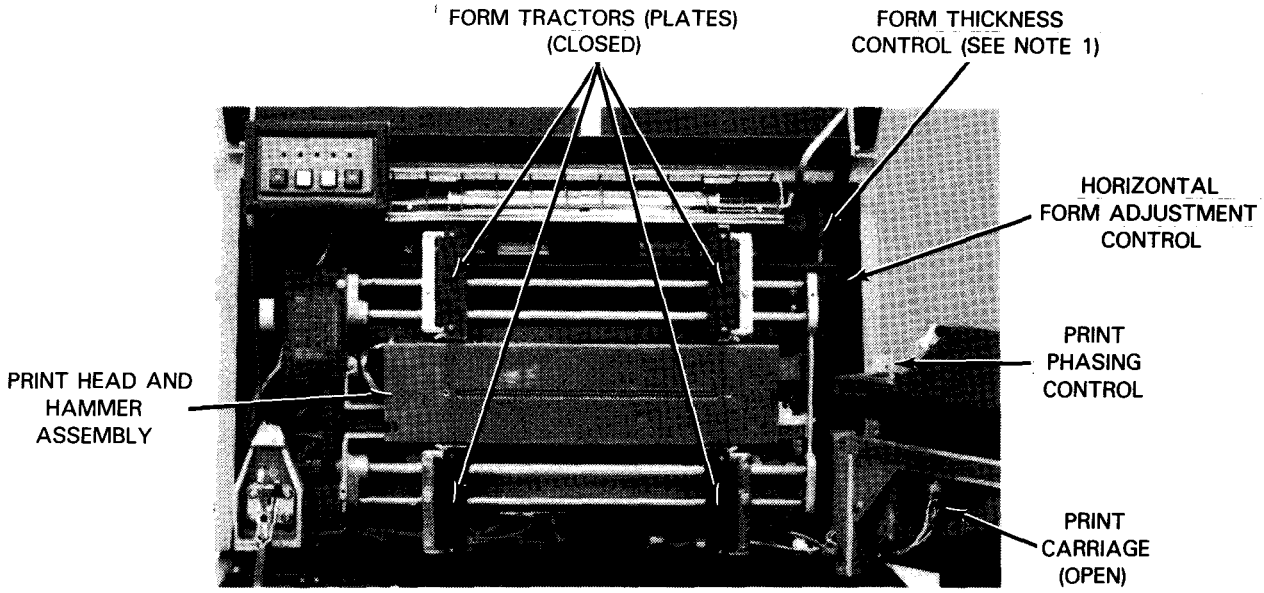
a. Preliminary adjustments for forms loading

Figure 3-7. Forms Loading on 0776 Printer (Part 1 of 7)



b. Print carriage assembly, closed

Figure 3-7. Forms Loading on 0776 Printer (Part 2 of 7)



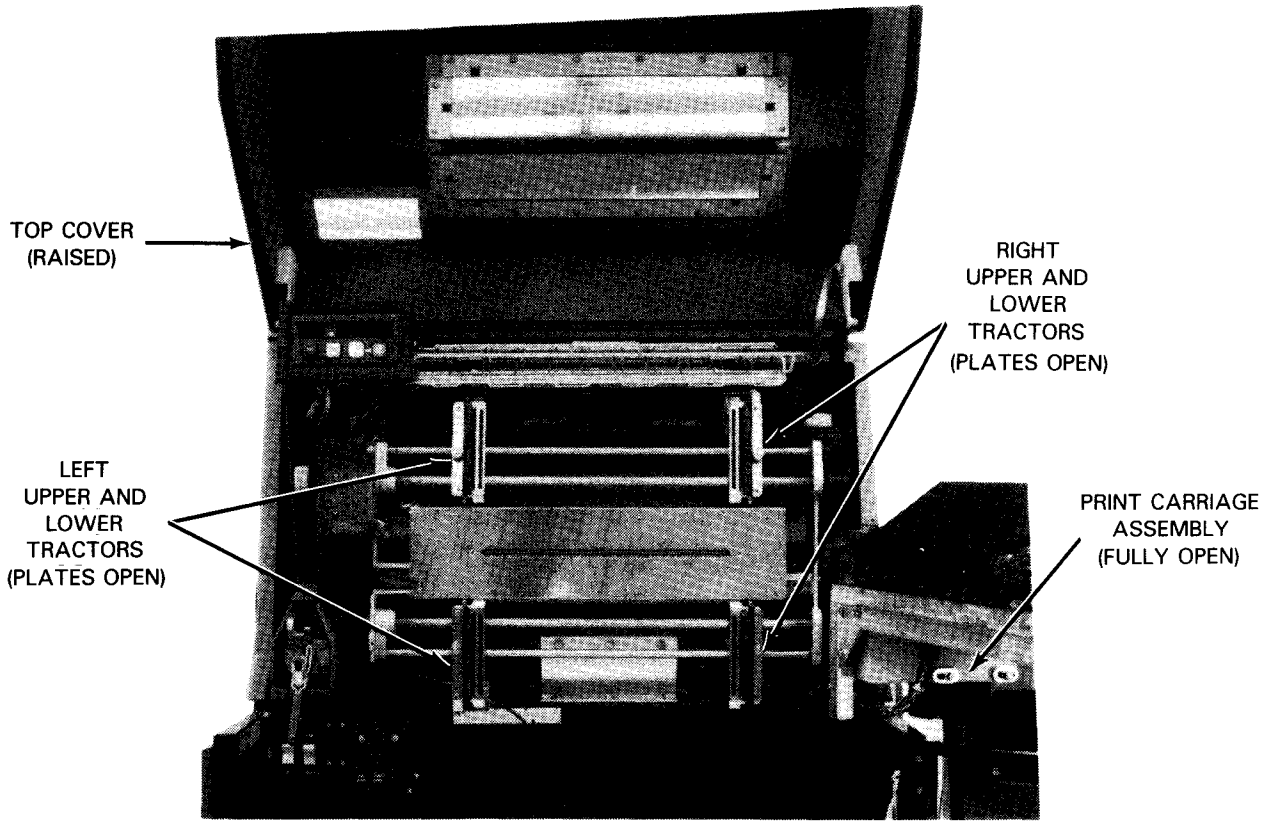
NOTES:

1. Some versions of the printer have a knob instead of a lever for form thickness adjustment.

2. Control electronics, located in lower bay, are accessed from rear.

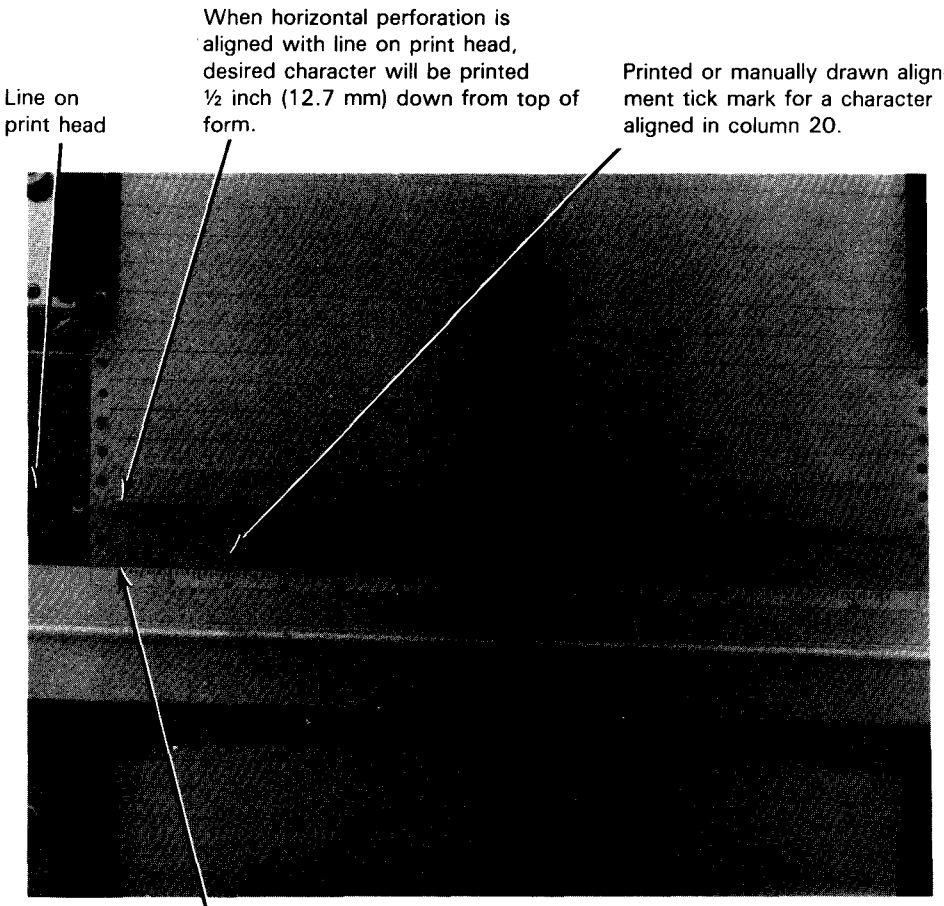
c. Form tractor plates closed

Figure 3-7. Forms Loading on 0776 Printer (Part 3 of 7)



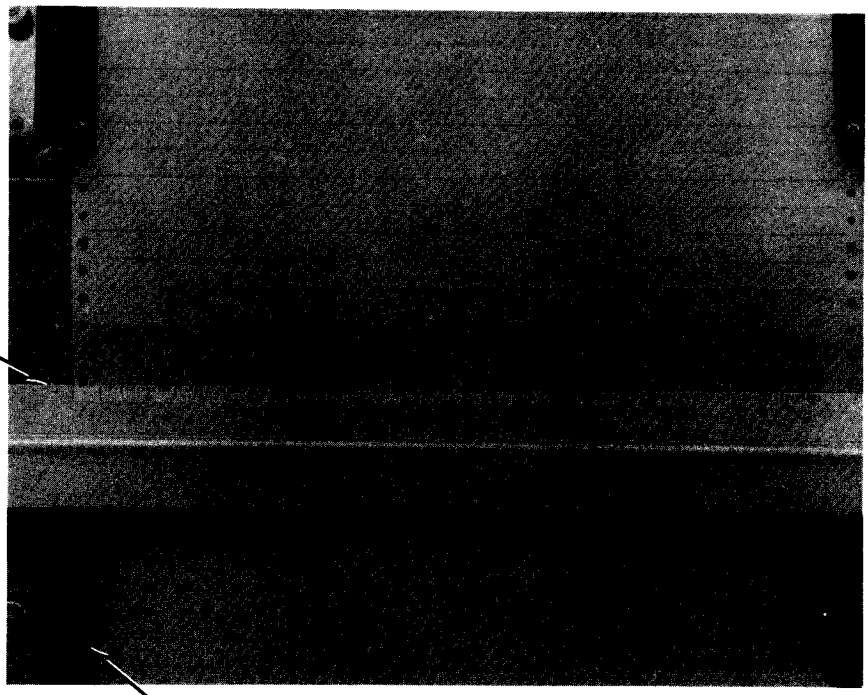
d. Form tractor plates and carriage open to receive forms

Figure 3-7. Forms Loading on 0776 Printer (Part 4 of 7)



e. Form alignment tick locations

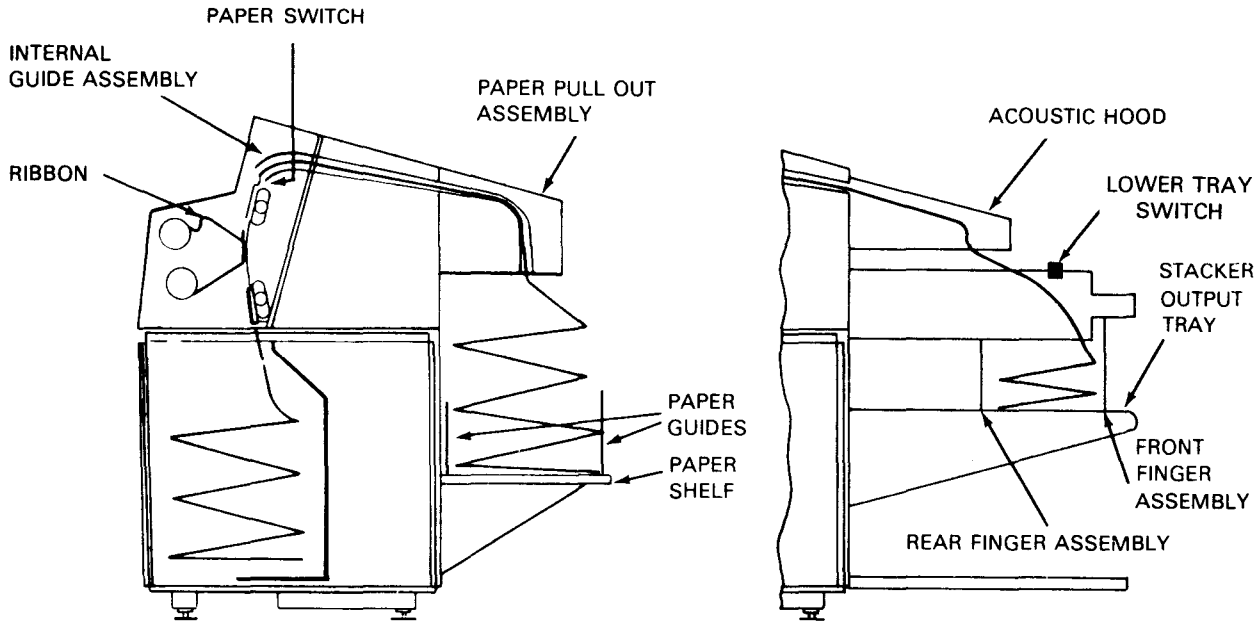
Figure 3-7. Forms Loading on 0776 Printer (Part 5 of 7)



*Repeatable tractor position – the inner edge of the lower left-hand tractor can be used as reference mark to point to column indicator on form alignment guide. This is used to preposition tractors to known location for same type of form. The first time a common form is used and set in proper position, a notation should be made at lower left-hand tractor location so that in future usages of this form the tractors can be prepositioned.

f. Form alignment without alignment tick

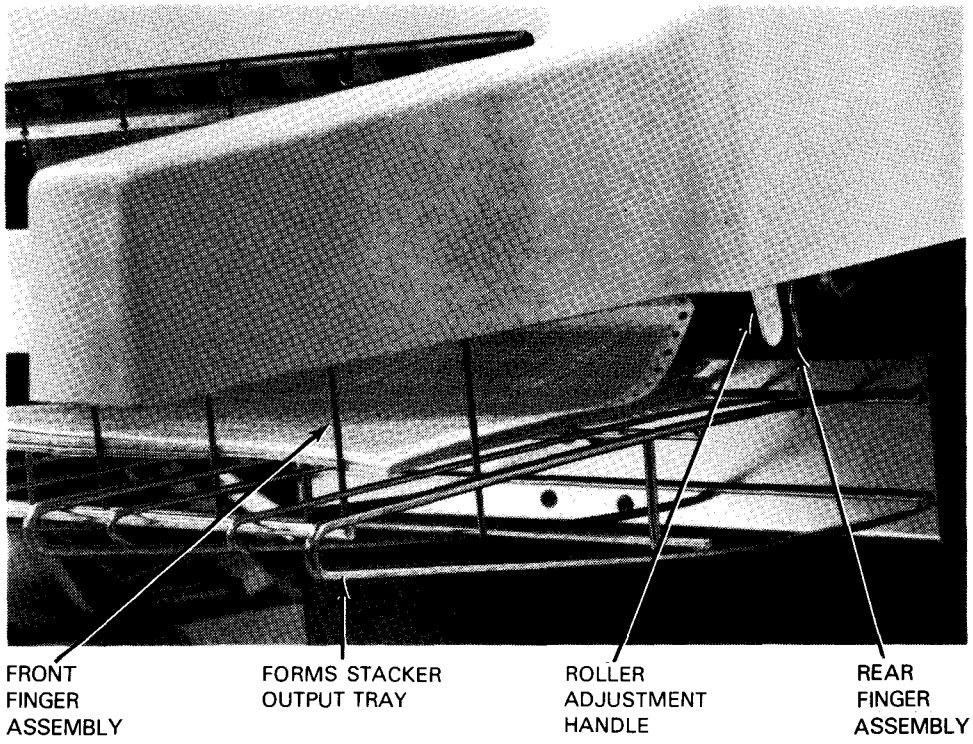
Figure 3-7. Forms Loading on 0776 Printer (Part 6 of 7)



760- and 940/900-lpm printers

1200-lpm printer

g. Form feed paths



h. Forms stacker on 1200-lpm printer

Figure 3-7. Forms Loading on 0776 Printer (Part 7 of 7)

0776 Printer Ribbon Installation

If no ribbon is installed on the 0776 printer, or printing appears light or faded, you must install a new ribbon. Before you start, be sure the printer is offline and power for the printer is turned off. Wear the pair of plastic gloves provided with each new ribbon for protection against ribbon ink. Open the front hood before proceeding, and replace the ink ribbon as follows:

1. Push downward on latch lever, locking print carriage assembly. Swing print carriage assembly to fully open position (Figure 3-8a).

2. Open ribbon shield by pulling right-hand side of shield from magnetic latch. Swing shield back (Figure 3-8b).

3. Remove spring-loaded roller from support by grasping roller and pushing it against support to release spring.

4. Wearing plastic gloves provided with new ribbon, remove upper take-up spool from upper spool holder (Figure 3-8c).

5. Remove lower spool from lower takeup spool holder (Figure 3-8d) by pushing spool toward spring-loaded spool holder.

6. With both take-up spools disengaged, remove ribbon from around print carriage assembly and discard ribbon (Figure 3-8d).

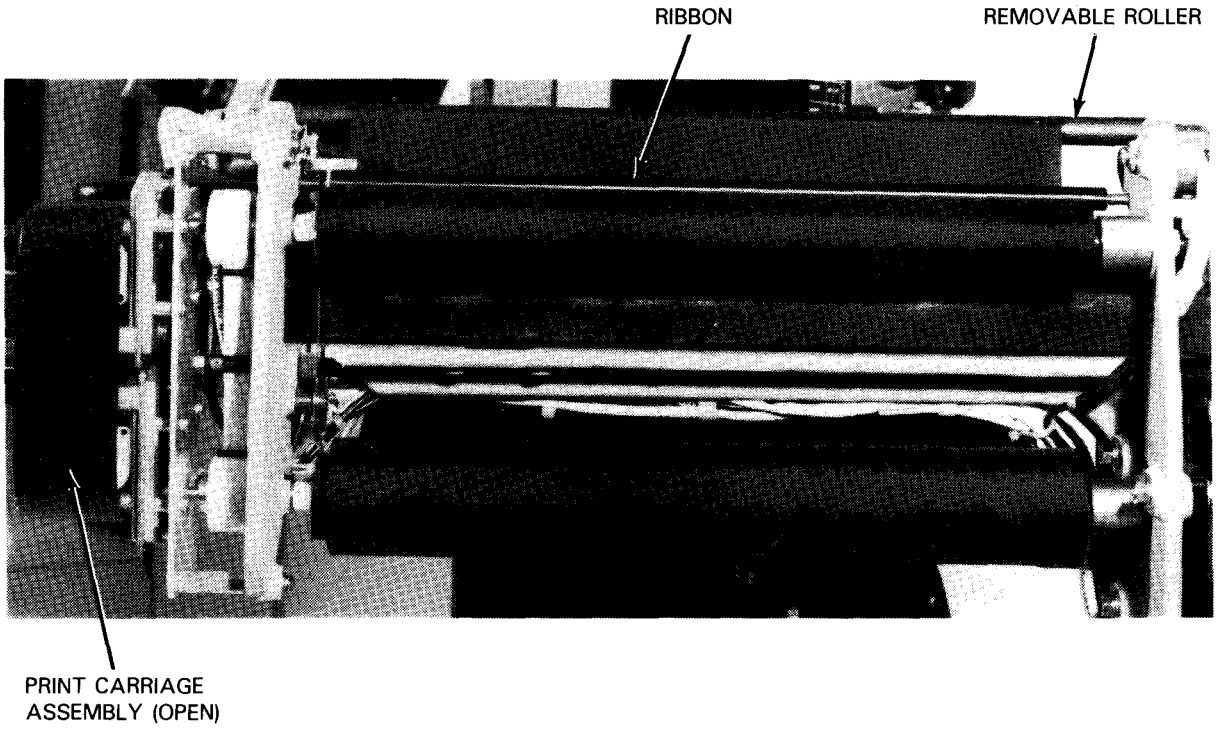
7. Install new ribbon on lower and upper take-up spools in the reverse manner that old ribbon was removed. Follow ribbon threading path shown in Figure 3-8e.

8. Replace roller over ribbon.

9. Take up slack in ribbon by turning ribbon rolls. Make certain ribbon edge passes inside ribbon light-emitting diode (LED) (Figure 3-8b).

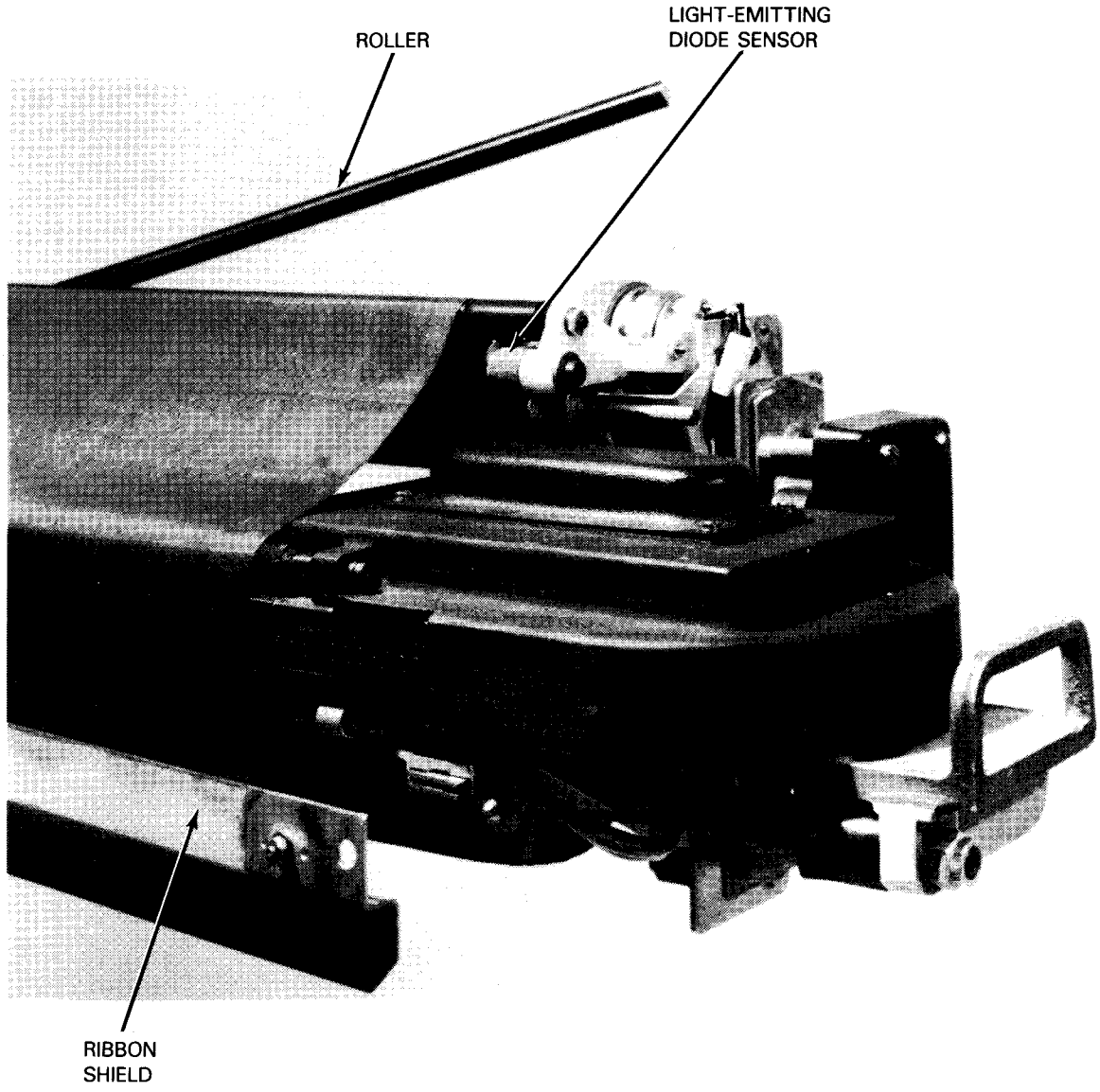
10. Close ribbon shield.

11. Close print carriage assembly and lock print carriage assembly latch.



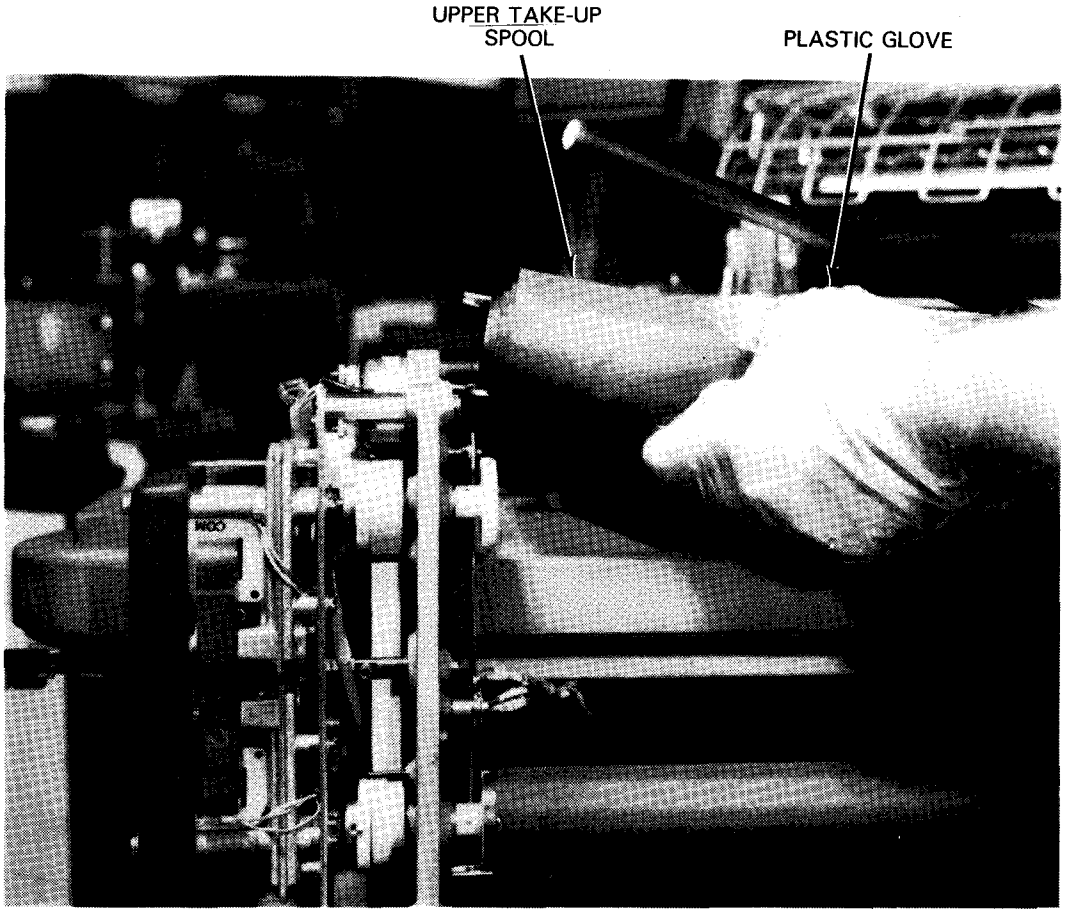
a. Print carriage assembly open and removable roller in place

Figure 3-8. Ribbon Installation on 0776 Printer (Part 1 of 4)



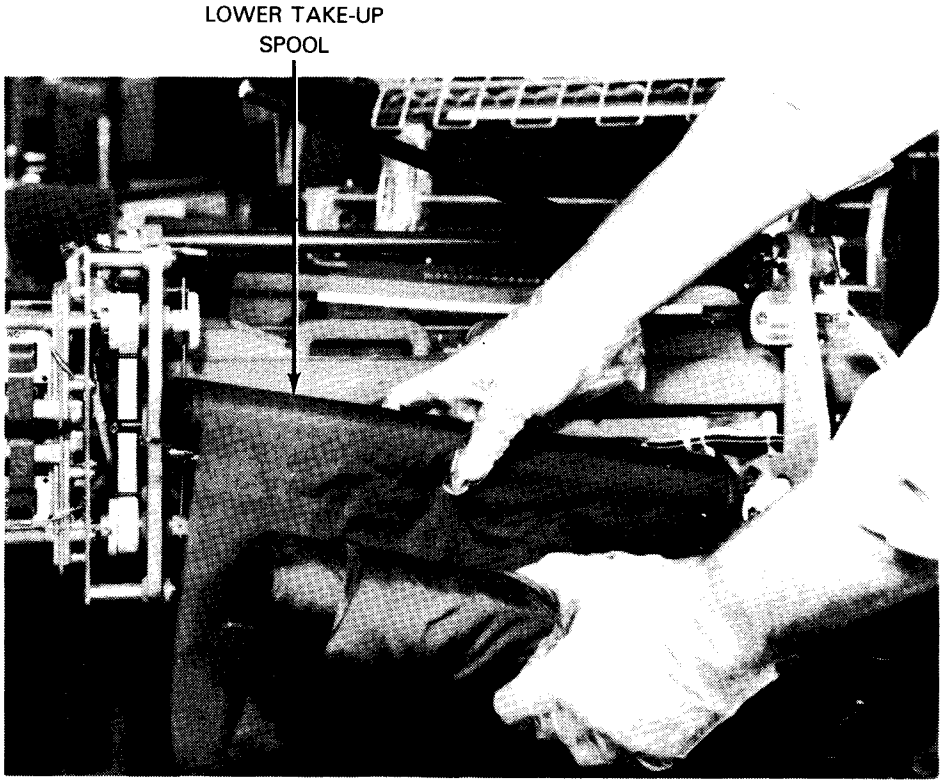
b. Ribbon shield open

Figure 3-8. Ribbon Installation on 0776 Printer (Part 2 of 4)

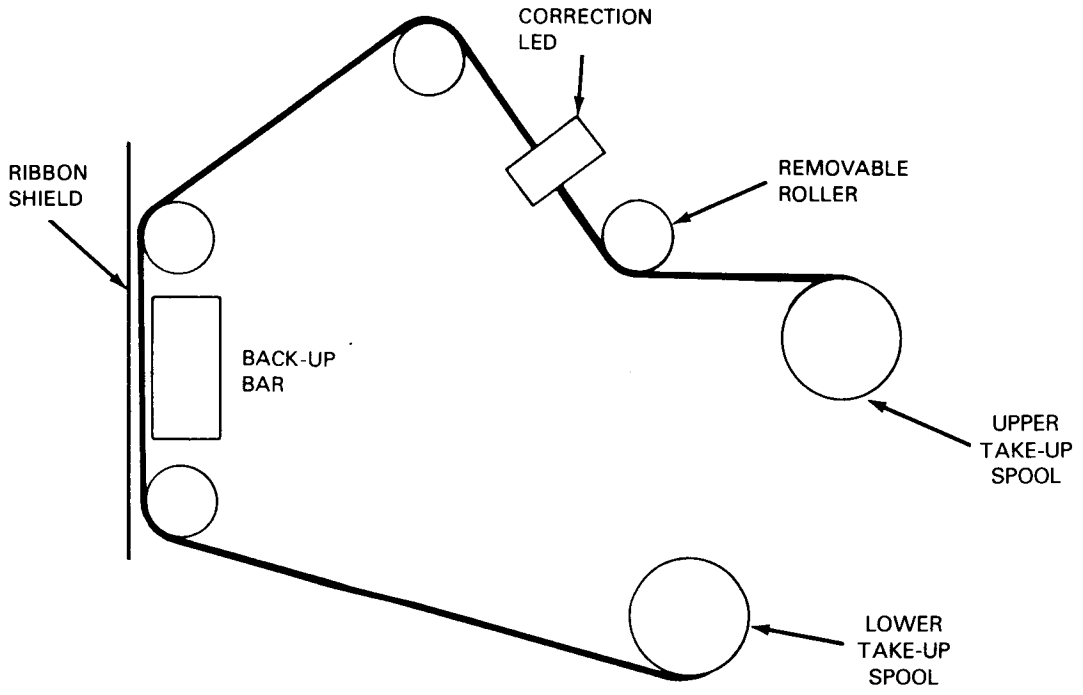


c. Remove upper take-up spool

Figure 3-8. Ribbon Installation on 0776 Printer (Part 3 of 4)



d. Removing upper and lower take-up spools



e. Printer ribbon threading path

Figure 3-8. Ribbon Installation on 0776 Printer (Part 4 of 4)

0776 Printer Print Band Cartridge Installation and Phasing Adjustment

If you want to install or replace the 0776 printer print band cartridge with one having a different type font, be sure that power to the printer is turned off. Proceed as follows:

1. Raise the printer cabinet top hood fully.

2. Remove the ribbon from the upper take-up spool holder, as specified in steps 1 through 4 of the procedure in this section to install the 0776 printer ribbon.

3. Remove the lower spool from the lower take-up spool holder (Figure 3-8d), then cradle the lower spool between the ribbon roll and spring-loaded roller (Figure 3-8a) so that the ribbon does not pass along the print band. Perform step 4 that follows to replace the present print band cartridge; otherwise proceed to step 5 to install a print cartridge if none is installed.

4. Loosen the two thumbscrews (Figure 3-9) holding the print cartridge assembly to the carriage, then grasp the two handles on the cartridge and lift the cartridge up from the carriage assembly.

5. Install a print band cartridge by aligning the two holes on the cartridge with the two alignment pins on the carriage assembly, then lower the cartridge down onto the carriage (Figure 3-9).

6. Fasten the cartridge by hand-tightening the two thumbscrews.

7. Visually check the cartridge to be sure it is fully seated.

8. Replace the ribbon removed in steps 2 and 3, then close the ribbon shield.

9. Close the carriage assembly and secure it by raising the print carriage assembly latch.

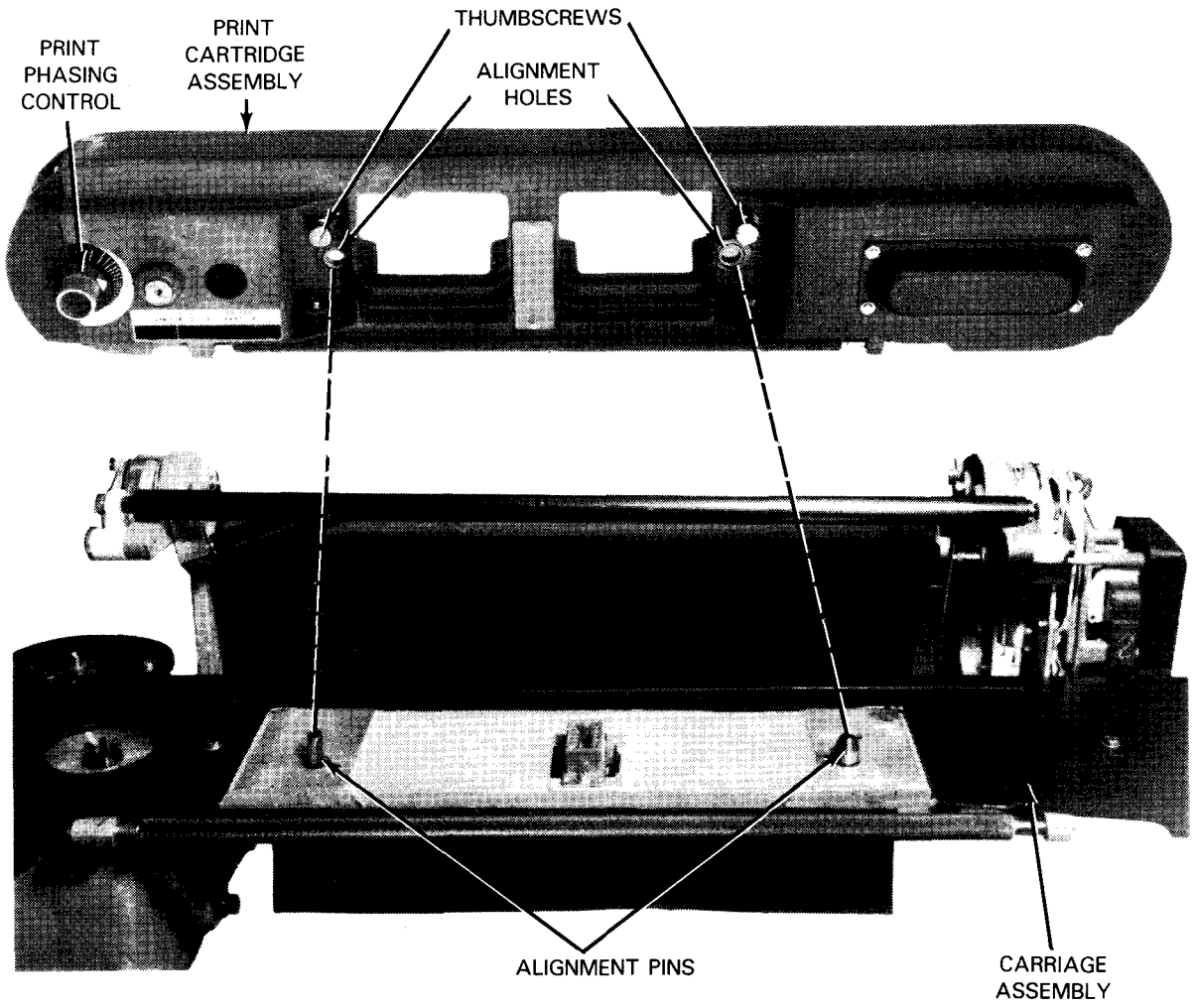


Figure 3-9. Print Cartridge Installation on 0776 Printer

Adjust the print phasing control on the print cartridge to eliminate clipping on either side of printed characters. Examine the last part of a printed multipart form for evidence of clipping. To adjust for correct print phasing, proceed as follows:

1. Turn on power to the printer and allow printing to occur (preferably on multipart forms).

2. Adjust the print phasing control (Figure 3-9) until characters are printed uniformly over the entire surface. If necessary, stop the printer and examine the last printed form of a multipart form for evidence of clipping.

NOTE: Changing the thickness of the form and print band speed requires an adjustment of the print phasing control. If you cannot obtain the correct phasing setting by setting the control near either limit of its rotation range, notify the customer service engineer.

0789 Printer Print Band Installation

To install a print band on the 0789 printer, proceed as follows:

1. Set the POWER ON/OFF switch to the 0 (off) position (Figure 2-28).

2. Raise the hammer bank latch handle (Figure 3-10a) to move the hammer bank away from the print band path.

3. Raise the print band cover to open it.

4. Firmly move the band release lever toward the hammer bank to release the band pulleys.

5. Place the print band (Figure 3-10b) over the pulleys with the print characters facing out and upright (ripple edge of print band is on top). Then, carefully insert the print band around the left pully between the ribbon mask and the forms alignment scale.

6. While holding the band in position around the left pulley, slide it over the right pulley, between the pulley and ribbon mask, and between the pulley and band sensor.

   NOTE: The ribbon mask extends from the left to the right pulleys. Be sure the print band is inserted between the entire ribbon mask and both pulleys.

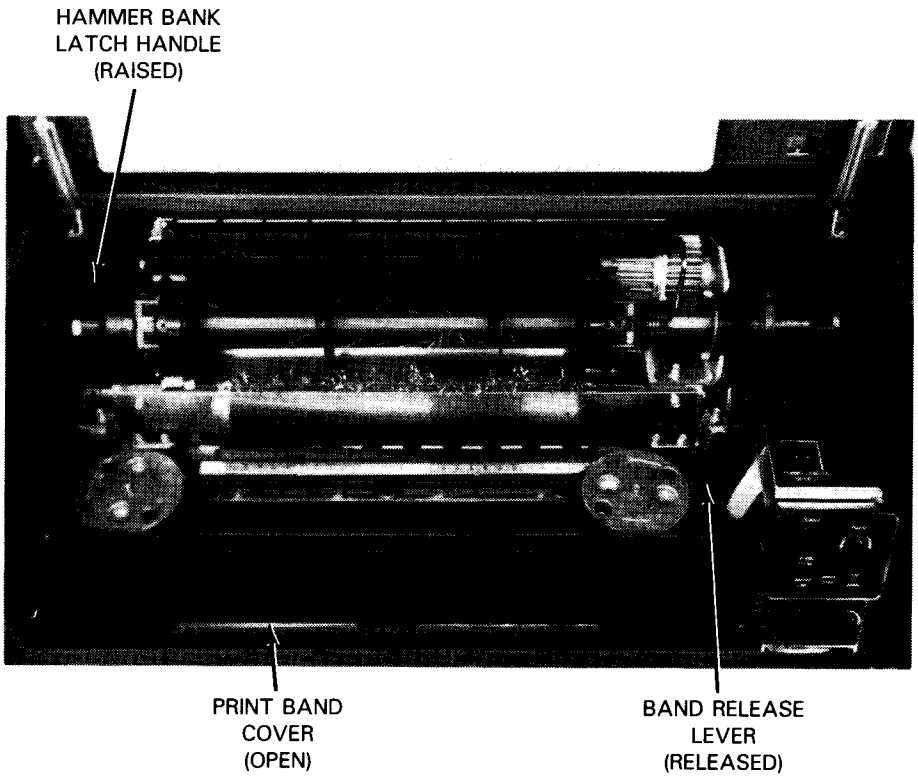
7. Continue to move the band down until it rests on the right edge guide bearing.

8. Move the band release lever (Figure 3-10c) away from the hammer bank to engage the band pulleys.

9. Rotate either pulley counterclockwise until the print band is seated on the left edge and right edge guide bearings (Figure 3-10b).

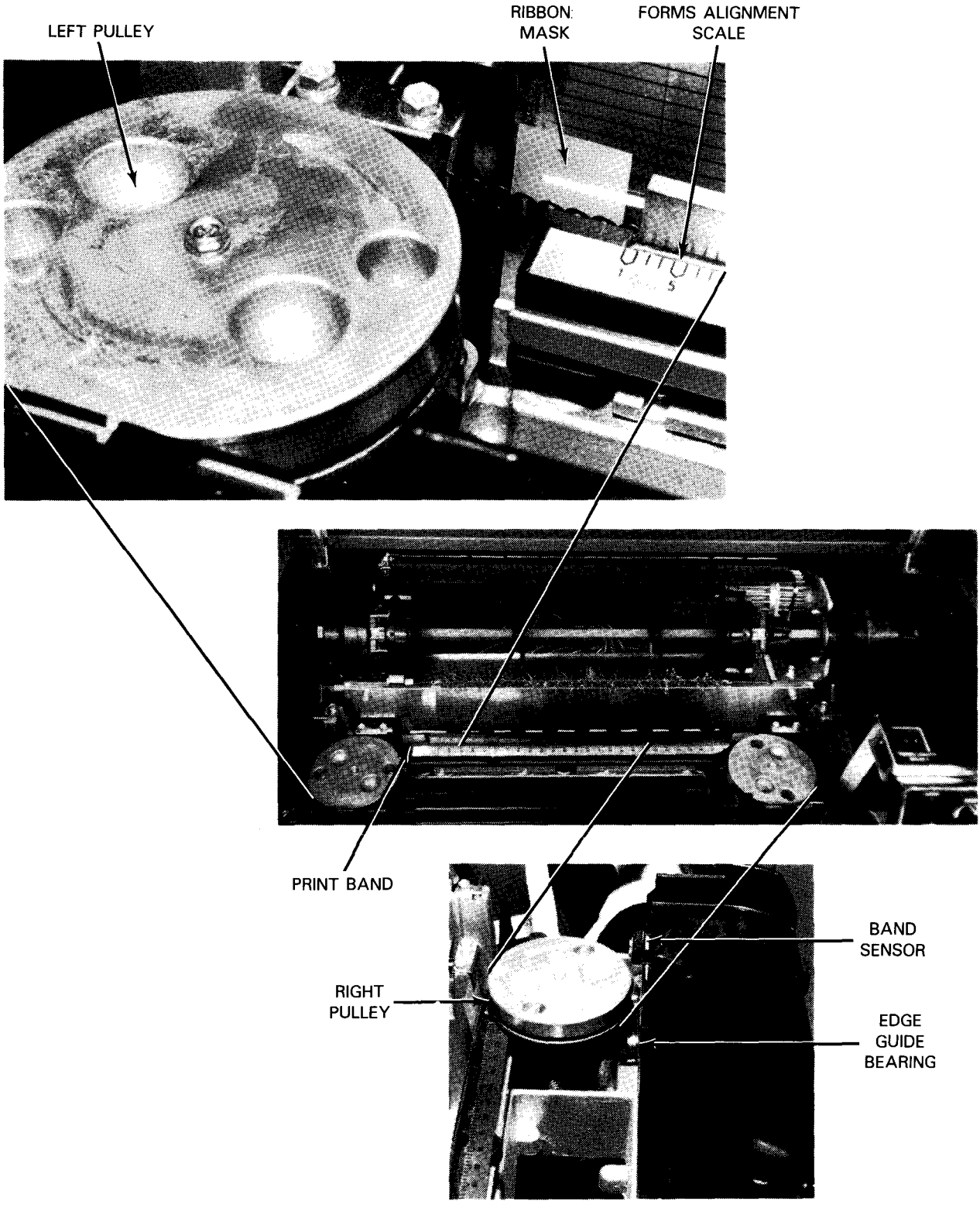
10. Close the print band cover (Figure 3-10d).

    NOTE: Allow the hammer bank latch handle to remain raised to install the inked ribbon and for paper installation.



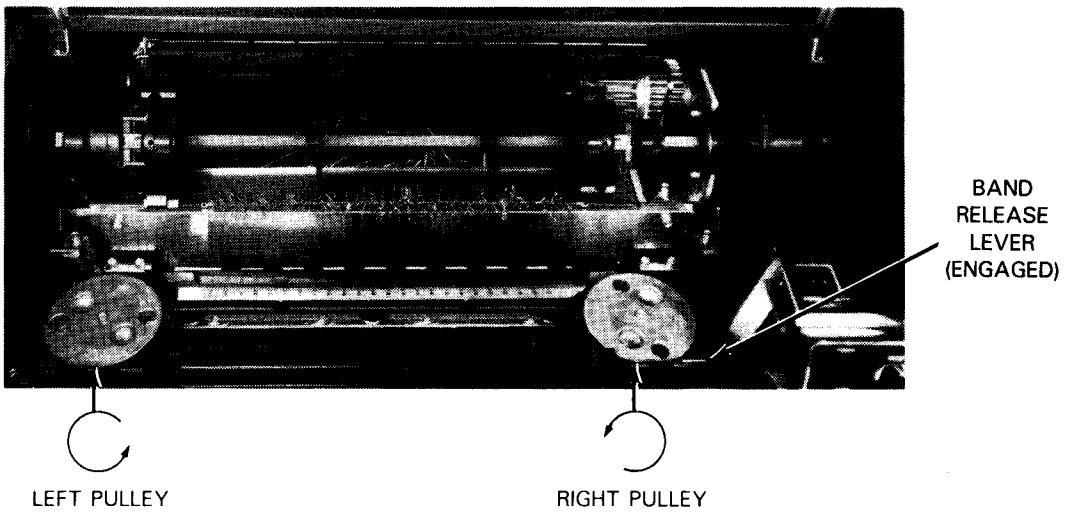
a. Printer prepared to receive print band

Figure 3-10. Print Band Installation on 0789 Printer (Part 1 of 3)

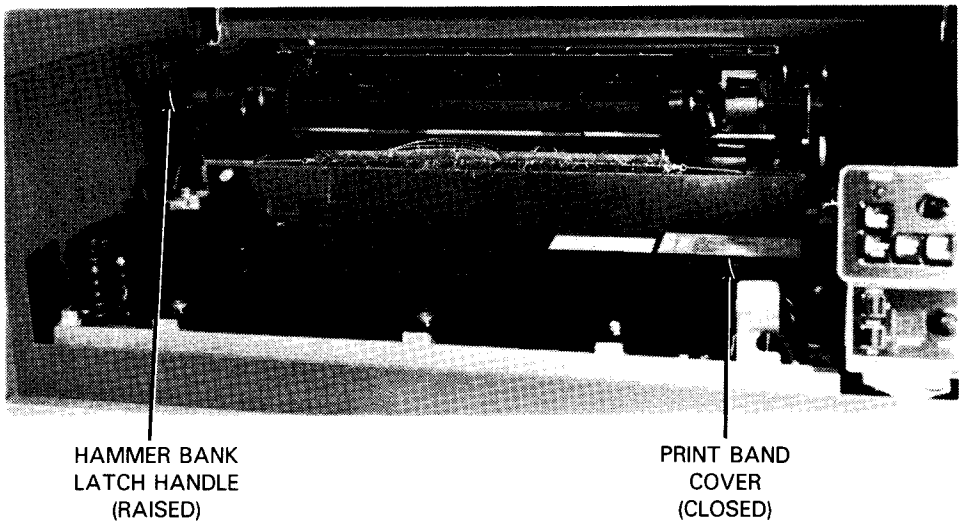


b. Print band locations

Figure 3-10. Print Band Installation on 0789 Printer (Part 2 of 3)



c. Print band seated and engaged



d. Print band installed and cover closed

Figure 3-10. Print Band Installation on 0789 Printer (Part 3 of 3)

0789 Printer Ribbon Installation

To install an inked ribbon on the 0789 printer, proceed as follows:

1. Make certain the power switch shown in Figure 2-28, is set to the 0 (off) position and the hammer bank latch handle (Figure 3-10d) is in the raised position before installing the inked ribbon.

2. Open the pinch roller arm assembly (Figure 3-11a) by moving the rollers toward you.

3. Note the two ribbon cartridge locating pins on which the ribbon cartridge is to be mounted.

4. Place the ribbon cartridge (Figure 3-11b) over the two locating pins, with the ribbon loop lying on the print band cover.

5. Insert the ribbon between the pinch roller and ribbon drive roller, then around the first ribbon guide.

6. While pulling the ribbon lightly at the first ribbon guide to remove slack, slide the ribbon cartridge firmly to the left until it snaps in place (Figure 3-11c).

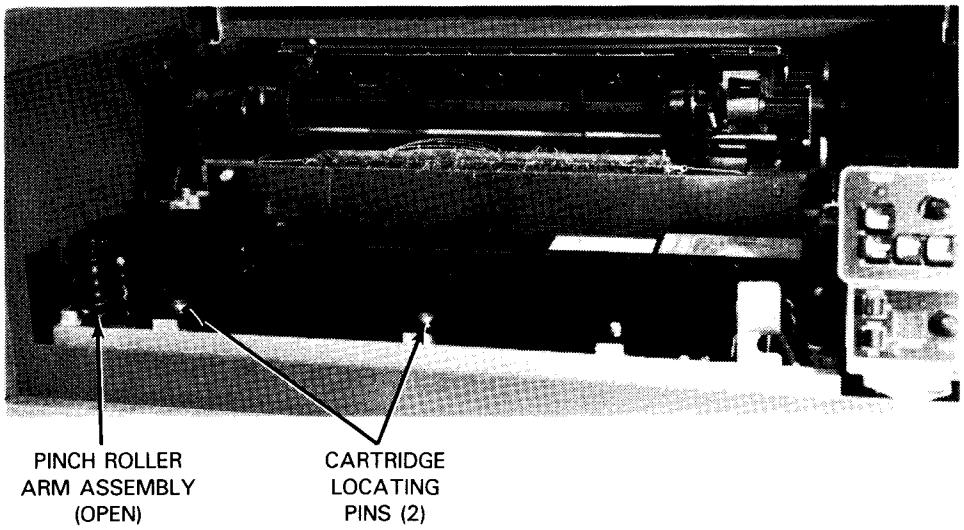
7. Close the pinch roller arm assembly.

8. Place the ribbon around the second ribbon guide, then insert it between the ribbon mask and print band.

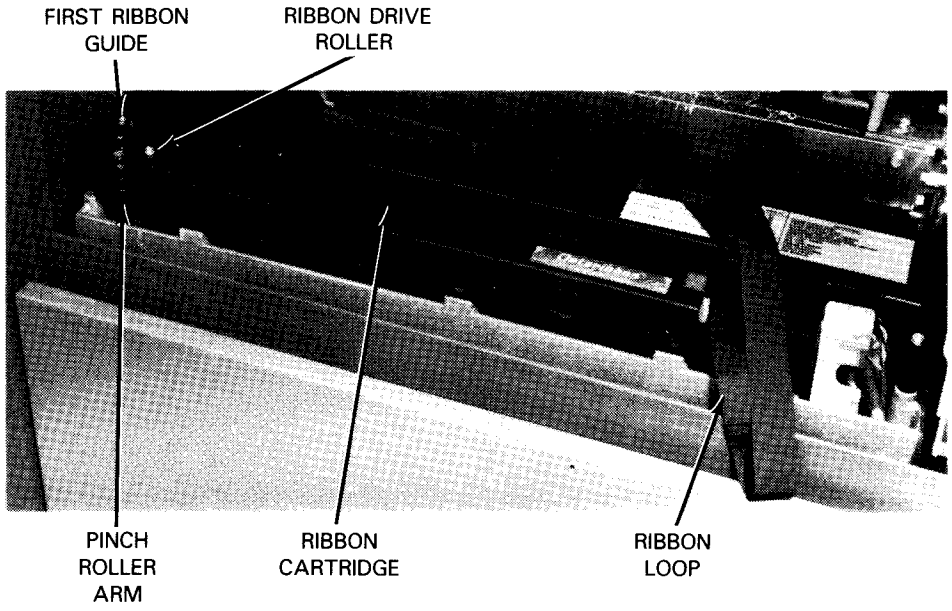
9. Pass the ribbon around the third and fourth ribbon guides.

   NOTE: Refer to Figure 3-11d for the entire ribbon path. Check to assure that there are no folds or twists in the entire exposed section of ribbon.

10. Open the print band cover and turn either pulley counterclockwise (Figure 3-11e) to remove all ribbon slack. Then close the print band cover.

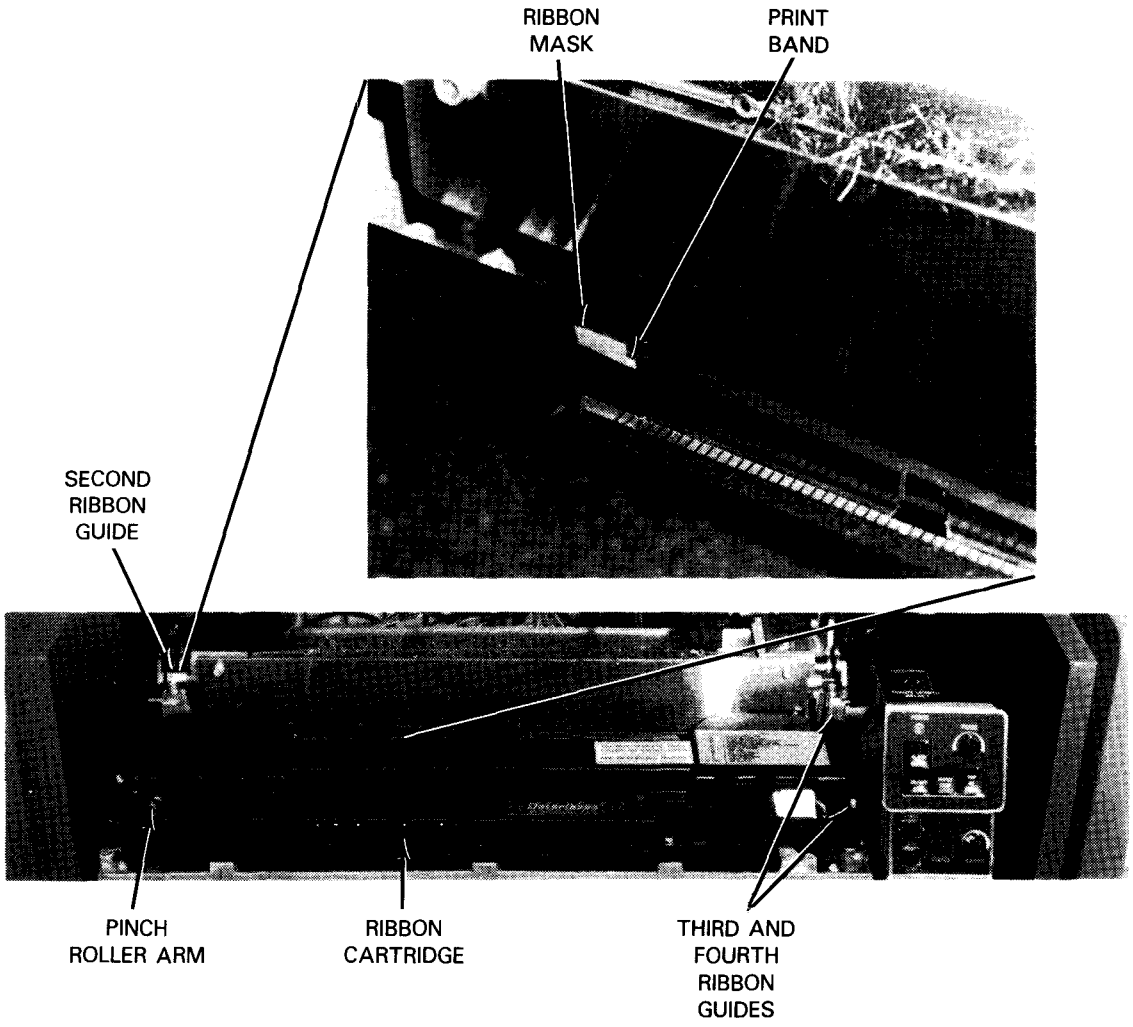


a. Preparing to install the ribbon



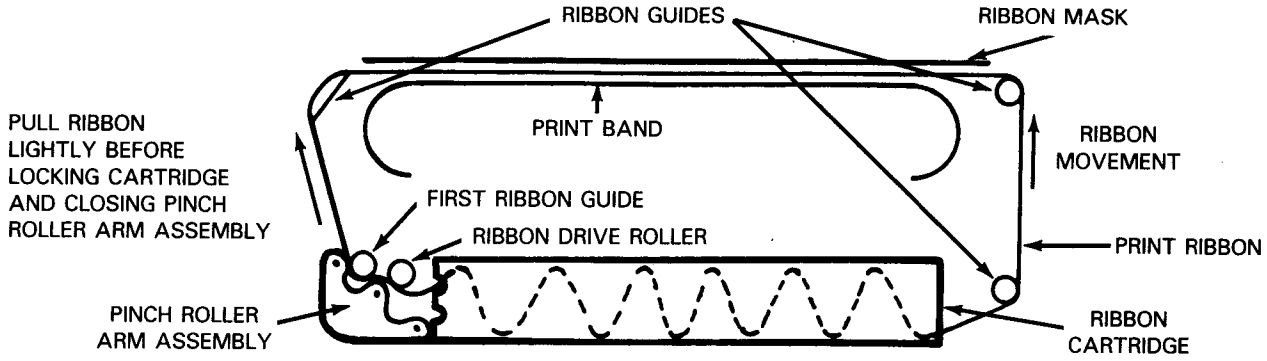
b. Threading ribbon around the first ribbon guide

Figure 3-11. Ribbon Installation on 0789 Printer (Part 1 of 3)

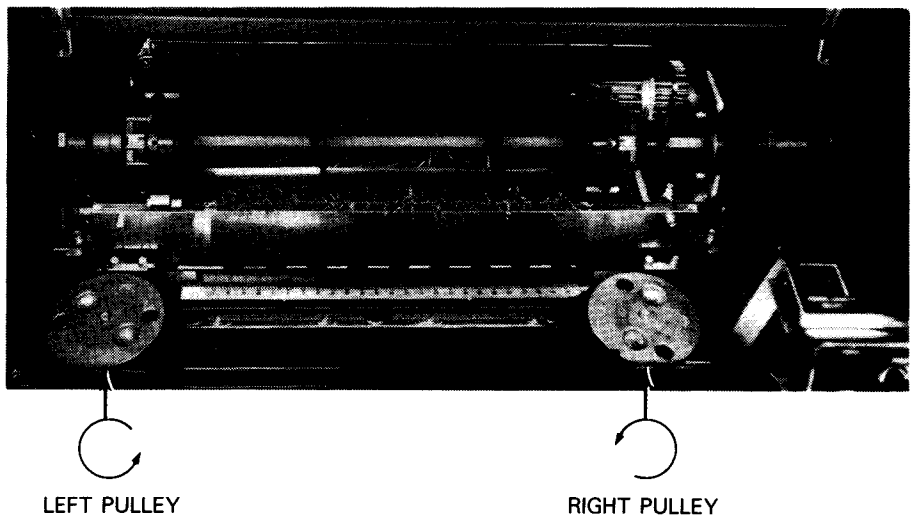


c. Threading ribbon around the print band

Figure 3-11. Ribbon Installation on 0789 Printer (Part 2 of 3)



d. Diagram of ribbon threading path



e. Removing slack with print band pulleys

Figure 3-11. Ribbon Installation on 0789 Printer (Part 3 of 3)

0789 Printer Forms Loading

To install paper forms on the 0789 printer, proceed as follows:

1. Open the front cabinet door of the printer. Reach into the upper right corner of the paper storage compartment (Figure 2-28) and set the power switch to the 1 (on) position.

2. Check that the POWER indicator (Figure 2-29) on the operator control panel is lit. The ALARM/CLEAR switch/indicator should light momentarily and extinguish after approximately 3 seconds.

   NOTE: If the ALARM/CLEAR switch/indicator remains lit, raise the front top cover and note the numbers displayed on the STATUS indicator window. Refer to operator setup revovery (3.2.4) to recover operation.

3. Press the ONLINE/OFFLINE switch/indicator to extinguish the indicator (offline mode).

WARNING

To avoid injury, stay clear of moving parts when power is on.

4. Press the TOP OF FORM switch to electrically set the printer for printing at the beginning of a form.

5. Flip open the paper feed release lever (Figure 3-12a) to expose the red side of the lever for the adjustment position.

   NOTE: On some printers, only the numeral 0 appears in red when the paper feed release lever is flipped open.

6. Check that the hammer bank handle is in the raised position to allow space between the hammer bank and print band.

7. Squeeze the sprocket locks on the left and right sprockets to slide the sprockets along the square drive shaft to accommodate the form width.

8. Center the two support guides on the square drive shaft so they are spaced equally between the left and right sprockets.

9. Swing open both sprocket covers (Figure 3-12b).

10. Reach under the print mechanism, through the front door opening, and swing down the paper throat guide.

11. Prepare the cardboard forms container for efficient paper feed as follows:

    a. Cut off the container top approximately 2 inches (5.08 cm) from the top edge. Remove the spacers.

    NOTE: Insert a spacer between the forms and the container to avoid cutting the forms.

    b. Locate the first form leading edge (Figure 3-12c) and cut the container diagnally on both sides.

    c. Cut across the container front to meet the side diagonal cuts.

12. Place the container of forms into the forms compartment (Figure 3-12d) so that the printing surface of the form faces you when it feeds into the print mechanism.

13. Slide the paper leading edge up through the open throat, over the sprockets, and partly through the paper exit support.

14. Align the form sprocket holes over the right sprocket pins and close the right sprocket cover.

15. Squeeze the right sprocket lock to slide the sprocket and form to fit the left sprocket holes over the left sprocket pins, then close the left sprocket cover.

    NOTE: Be certain that the left sprocket holes locked on the left sprocket are matched with the holes locked on the right sprocket. If the holes are not matched, the forms will skew.

16. Simultaneously squeeze both sprocket locks to move the form left or right and align the first column to be printed on the form with the desired position on the forms alignment scale. Tension the forms horizontally before releasing the sprocket locks.

    NOTE: The forms will tear at the sprocket holes if you overtension the forms with the sprockets.

17. Move the paper container slightly in either direction to align the container with the paper feeding position on the print mechanism, then close the paper throat guide and front cabinet door.

    NOTE: Selection of the 6 or 8 lpi top-of-form index scale for paper alignment is determined by the line density you want to print. Line density is selected with the LINES 6/8 switch on the operator control panel. Paper adjustment for either density is described in step 18.

18. Turn the paper adjust knob (Figure 3-12e) to move the paper vertically and align the paper perforation with the applicable top-of-form index scale. For example, if you set the paper perforation at 6 on the 8 lpi scale, the first printed line will be 6 lines below the paper perforation.

NOTE: The top-of-form index scale for 8 lpi is to the right of the form, and the scale for 6 lpi is to the left of the form.

19. Lower the hammer bank latch handle (Figure 3-12f) and be certain it is locked in position.

20. Close the paper feed release lever to the lock position, which conceals the red side (or red numeral 0) of the lever.

NOTE: On some printers the numeral 1 becomes visible in locked position.

21. Set the FORMS LENGTH SELECT switch to accommodate the form length to be printed.

22. Press the ALARM/CLEAR switch/indicator (Figure 3-12g) to extinguish the indicator.

23. Set the TEST switch to the (left) position.

24. Press the ONLINE/OFFLINE switch/indicator to print several lines, then press the switch again to stop printing.

25. Examine the printing registration of the entire printed area. Adjust the PHASE control as required to correct for nonprinting of character sides.

NOTE: Clockwise rotation of the PHASE control improves the right side of printed characters, and counterclockwise improves the left side. Set the control to balance both sides.

26. Set the COPIES control as low as possible for good print quality on all sheets of multiple-copy forms. If a single-part form is to be printed, set the COPIES control fully counterclockwise.

NOTE: Lower settings of the COPIES control allow increased life of the inked ribbon, print band, and print hammers.

27. Press the TOP OF FORMS switch to begin printing data on a new form.

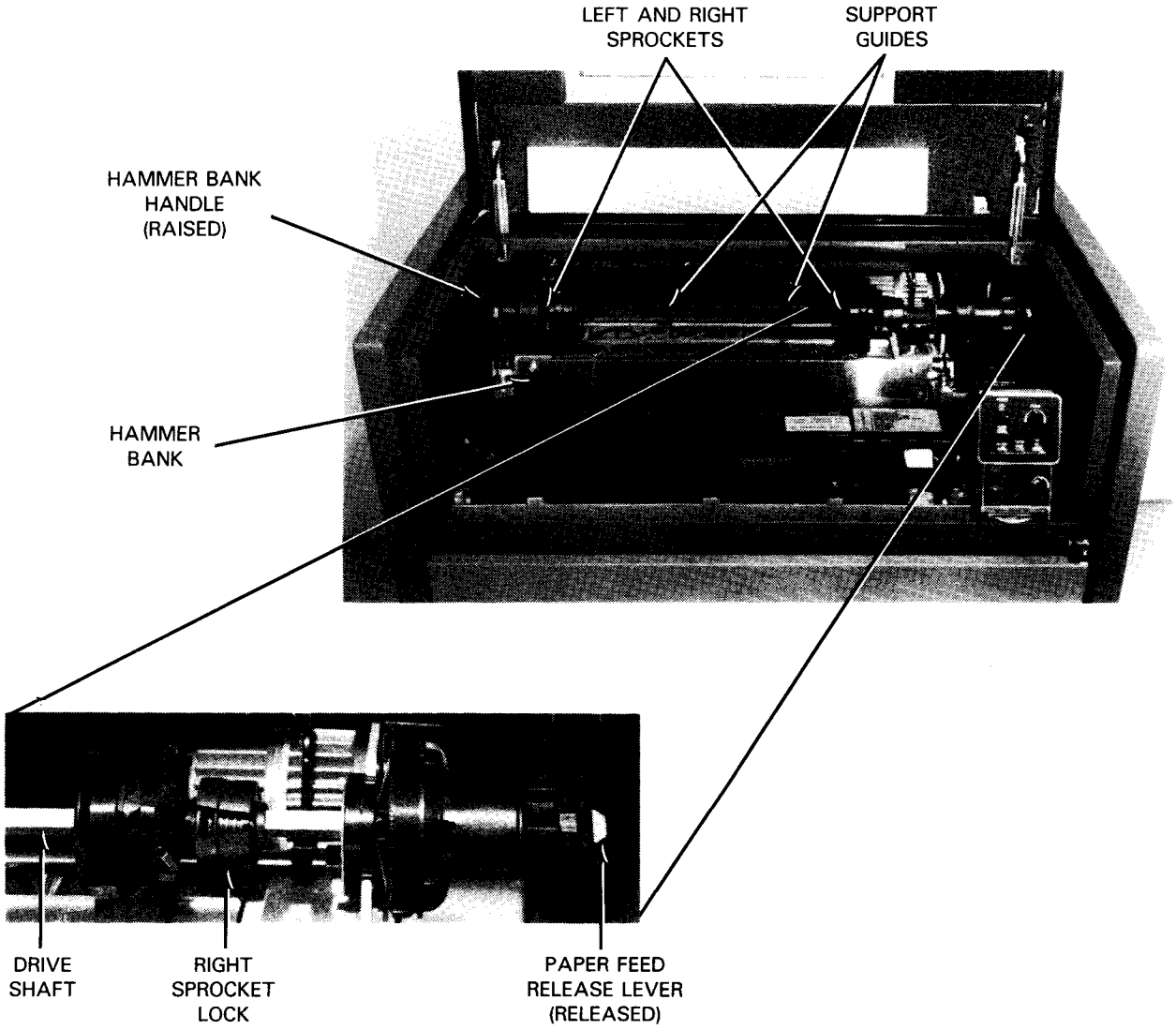
28. Set the TEST switch to OFF (center) position.

29. Close the front cabinet door and front top cover.

30. Open the rear cabinet door (Figure 3-12h) and set the forms stacker guide to accommodate even stacking for the form size to be printed. Then, close the cabinet door.

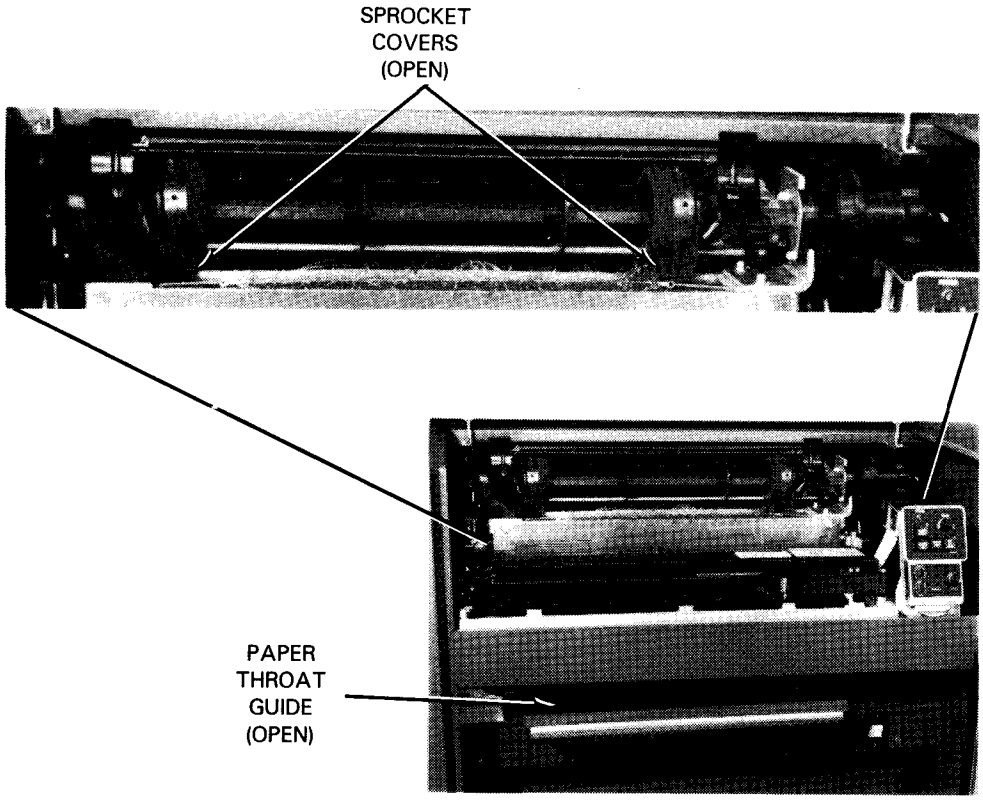
NOTE: Check to be certain that all the cabinet doors and covers remain closed to hold the noise level down when the printer is operating.

31. Press the ONLINE/OFFLINE switch/indicator to light the indicator and receive data from the host system.

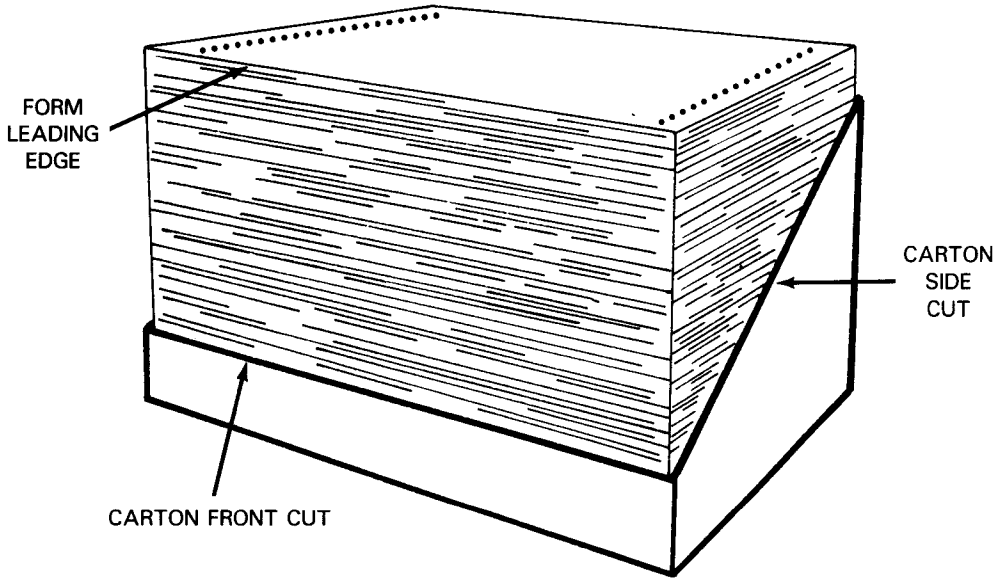


a. Preparing the printer for loading forms

Figure 3-12. Forms Loading on 0789 Printer (Part 1 of 5)

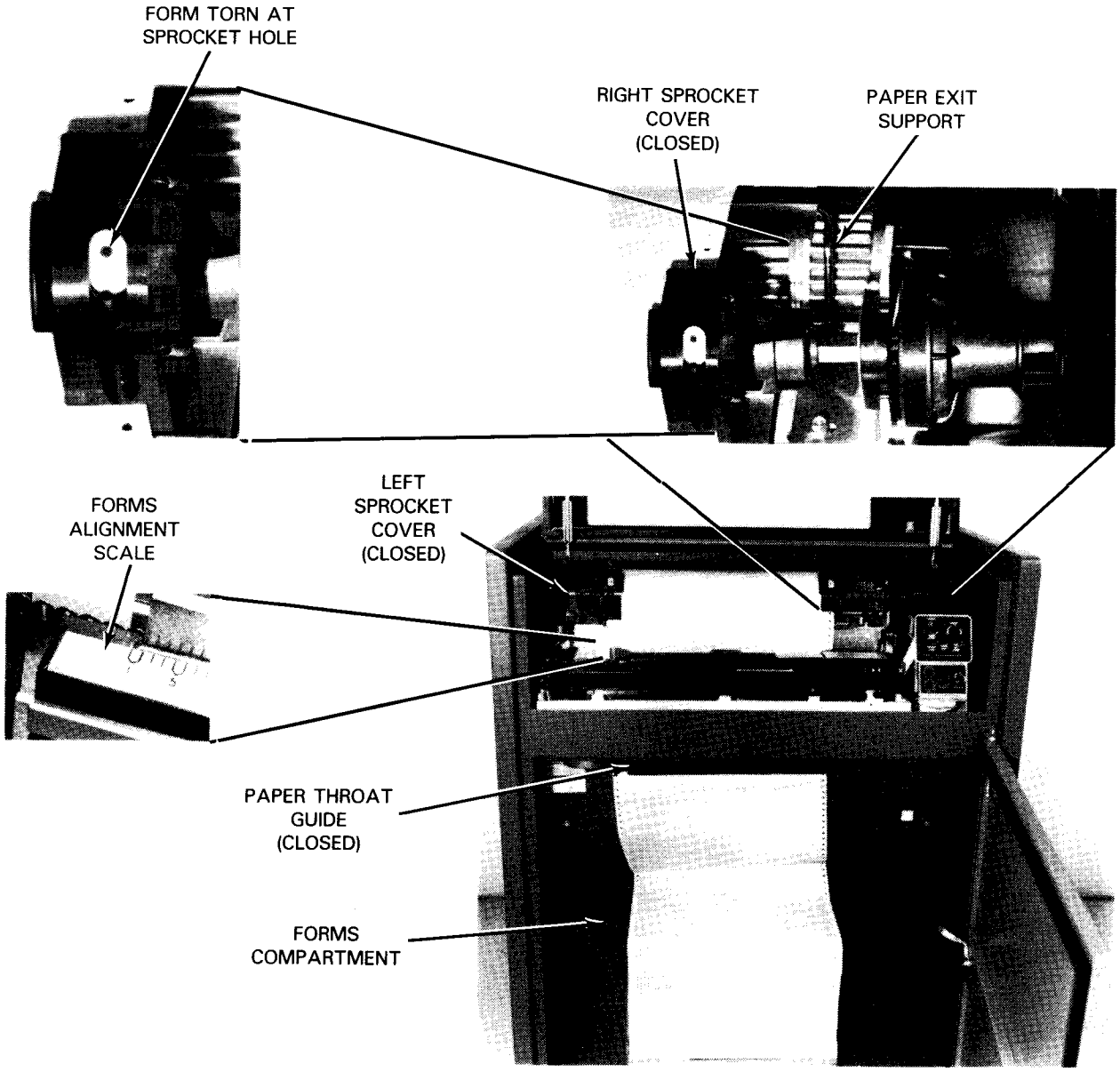


b. Opening the paper path



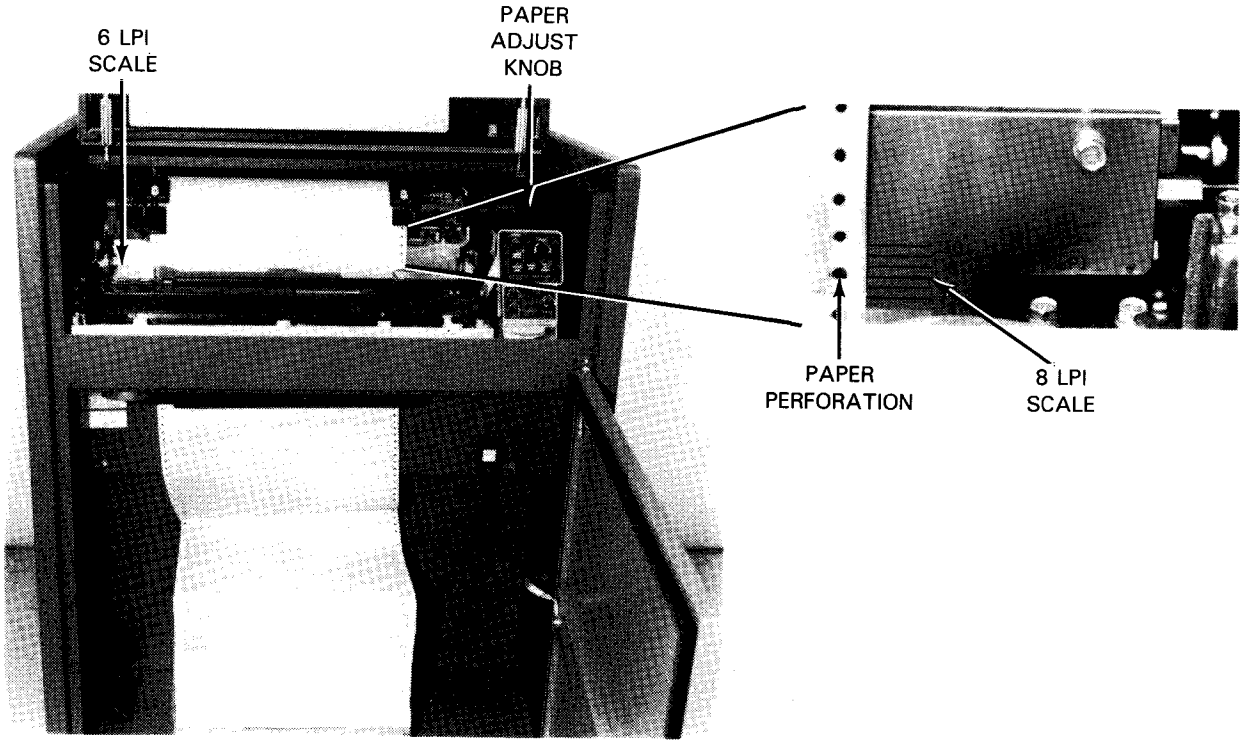
c. Forms container prepared for use on printer

Figure 3-12. Forms Loading on 0789 Printer (Part 2 of 5)

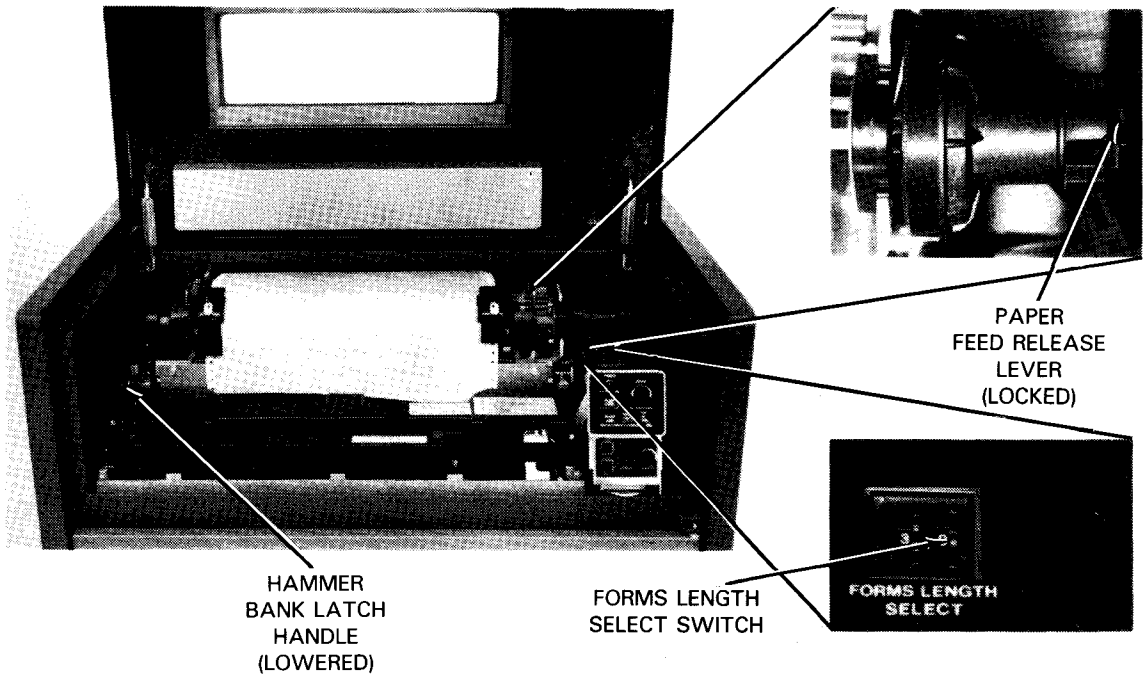


d. Threading paper through the printer

Figure 3-12. Forms Loading on 0789 Printer (Part 3 of 5)

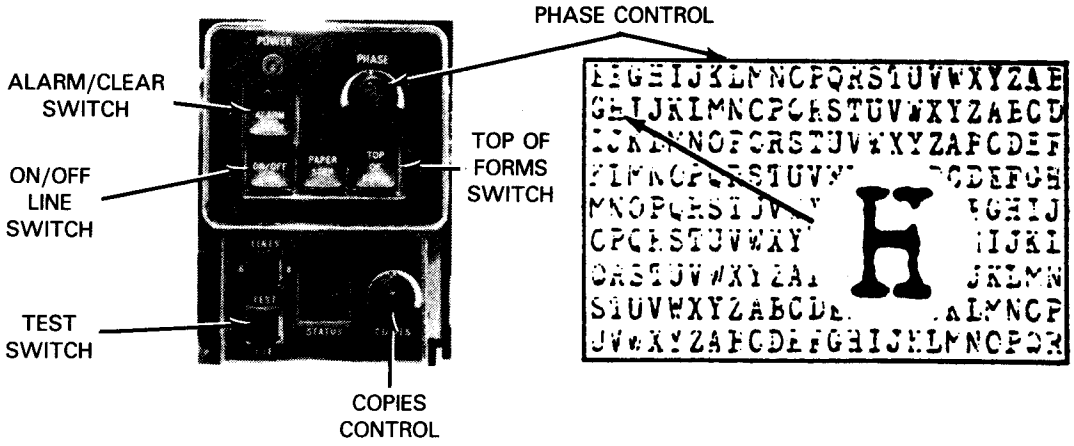


e. Adjusting for desired line density in printing

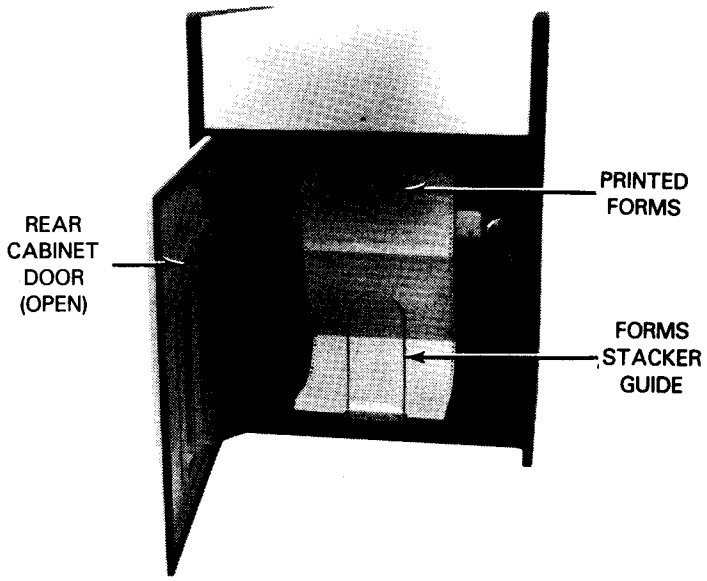


f. Selecting forms length to accommodate paper to be printed

Figure 3-12. Forms Loading on 0789 Printer (Part 4 of 5)



g. Adjusting for balanced printed characters



h. Setting the forms stacker to receive forms

Figure 3-12. Forms Loading on 0789 Printer (Part 5 of 5)

0798 Printer Forms Loading, Thickness Adjustment, and Self-Test

The 0798 printer prints on 6-part standard size forms measuring 14.9 by 11 inches (37.8 by 27.9 cm), as well as on various other sizes. Form widths of 1.6 to 15.0 inches (4 to 38 cm) can also be used. Pack thickness for multipart forms should not exceed 0.018 inch (0.46 mm). Paper forms for the printer can be obtained from a number of supply firms.

CAUTION

If the printer has been shipped and installed without a ribbon, be sure to install a ribbon (3.2.3) before operating the printer. The inked ribbon provides lubrication for the printing needles in the print head and extends the print head file. Do not operate the printer (even with multipart forms) without a ribbon or with a ribbon other than one approved or furnished by Unisys.

To install forms on the 0798 printer and adjust for forms thickness, proceed as follows:

1. Initial power to the 0798 printer has been turned on (3.1.2); therefore, extinguish the RUN/STOP switch/indicator (Figure 2-32) by pressing it, then open the clear plastic cover by raising it.

2. Move the paper release lever down (Figure 2-33).

   NOTE: If a printer stand is included with the printer, feed paper in from the bottom. If the printer is placed on a desk or table for operation, feed paper in from the rear.

3. Open the left and right paper-end detectors for the top and bottom feeds by pressing the latch spring toward the center (Figure 3-13), then raise the paper-end detectors.

4. Open the paper hold-downs for each paper-feed tractor (Figure 2-33) to expose the tractor teeth.

5. Thread the paper through the printer for rear feed or bottom feed, as illustrated in Figure 3-14.

   NOTE: If your printer includes the optional forms-parting bar, be sure the paper passes beneath the bar before feeding the paper to the paper-feed tractors. The bar rises when you raise the tractor-release lever.

6. Raise the tractor-release lever and adjust the paper feed tractors to the paper size, if necessary. The paper-feed tractors are adjusted to accommodate the holes at the edges of the paper.

7. Fit the holes on both edges of the paper over the tractor teeth and close both paper hold-downs.

8. Carefully spread the tractors so that the paper is flat (avoid tearing the paper at the tractor holes), then move the tractor release lever down to lock the tractors in place.

9. Close the paper-end detectors according to the paper feed path as follows:

   a. If your printer is fed from the rear, close the left and right top paper-end detectors.

   b. If your printer is fed from the bottom, close the left and right bottom paper-end detectors. However, if paper width does not reach the right bottom paper-end detector, leave it open.

   NOTE: Paper-end detectors not in use should remain open during operation (bottom detectors for rear feed, or top detectors for bottom feed).

10. Raise the paper release lever (Figure 2-33).

11. Unlock the vertical adjustment lock lever (Figure 2-33) by raising it or moving it to center position; turn the vertical adjustment wheel forward to check that paper feeds smoothly. Then lock the vertical adjustment lock lever.

CAUTION

Be sure the vertical adjustment lock lever is fully engaged to the 6 lpi (down) or 8 lpi (up, if feature is included) or excessive wear will occur to the vertical adjustment gear teeth during operation.

12. Set the vertical forms control (VFC) switch (Figure 2-33) to accommodate the desired form length. Then, hold the HOME/SPACE switch down (Figure 2-32) for at least 1 second to advance the paper to the first line on the form, as set by the VFC switch.

13. Unlock the vertical adjustment lock lever (Figure 2-33), then turn the vertical adjustment wheel to set the first line for printing directly with the print head.

    NOTE: Form perforations must be aligned with the top of the parting bar to effectively use the forms parting bar (optional).

14. Set the vertical adjustment lock lever to the 6 lpi (or 8 lpi, if included) position.

15. Position the paper supply so that it will feed smoothly into the printer.

16. Close the clear plastic cover and press the RUN/STOP switch/indicator (Figure 2-32) to light the indicator, begin operation, and receive commands and data from the host controller.

17. Guide the printed paper across the top of the printer, over the paper guide, and onto the rear shelf of the printer stand. Start the forms folding at the creases on the rear shelf. Check during operation that paper stacks properly. If the printer remains unattended during operation, allow printed paper to fall at least 10 inches (2.5 meters) below the printer stand or table.

18. When printing is complete, or if printing is to be stopped for any reason, press the RUN/STOP switch/indicator to extinguish the indicator. On some systems, the RUN/STOP switch/indicator is operated remotely by the host controller.

NOTE: *Do not open the clear plastic cover during operation. A safety switch stops the printer when the cover is opened, then restarts when the cover is closed. However, paper does not advance when the cover is opened; consequently, the next line is printed over the previous line and both lines are lost. If necessary, press the RUN/STOP switch first, then open the cover, make required adjustments, close the cover, and finally, press the RUN/STOP switch to resume printing.*

To adjust the 0798 printer for forms thickness with multipart forms and perform a self-test, proceed as follows:

1. Press the RUN/STOP switch/indicator (Figure 2-32) to extinguish the indicator, then raise the printer top cover.

2. Adjust the form-thickness lever (Figure 2-33) to change the spacing between the platen and print head. The lever is moved slightly toward the paper for darker printing or away from the paper for lighter printing. Adjustment should result in clear readable print on each part of a multipart form.

3. Close the printer top cover.

4. Perform a self-test on the printer as follows:

   a. Set the power switch (Figure 2-32) to the 0 (off) position.

   b. Raise the printer top cover to reach the self-test switch (Figure 2-33).

   c. Move the self-test switch toward the front of the printer (test position).

   d. Close the top cover and clear plastic cover.

   e. Set the power switch to the 1 (on) position.

   f. Press the RUN/STOP switch/indicator to begin the self-test.

   g. When sufficient self-test printout is obtained, press the RUN/STOP switch/indicator.

   h. Set the power switch to the 0 position.

   i. Raise the top cover, move the self-test switch toward the rear of the printer (normal), then close the top cover and clear plastic cover.

5. Examine the printout from the self-tests and repeat steps 1 through 4 until clear print quality is obtained on each part of the multipart form.

6. To use the forms parting bar to detach the multipart forms, proceed as follows:

   a. Lift the parts to be removed on the open (right) side.

   b. Tear the forms at the perforations on the left side.

   c. Move the form to the forms parting bar and tear the forms across the perforation at the bottom of the forms.

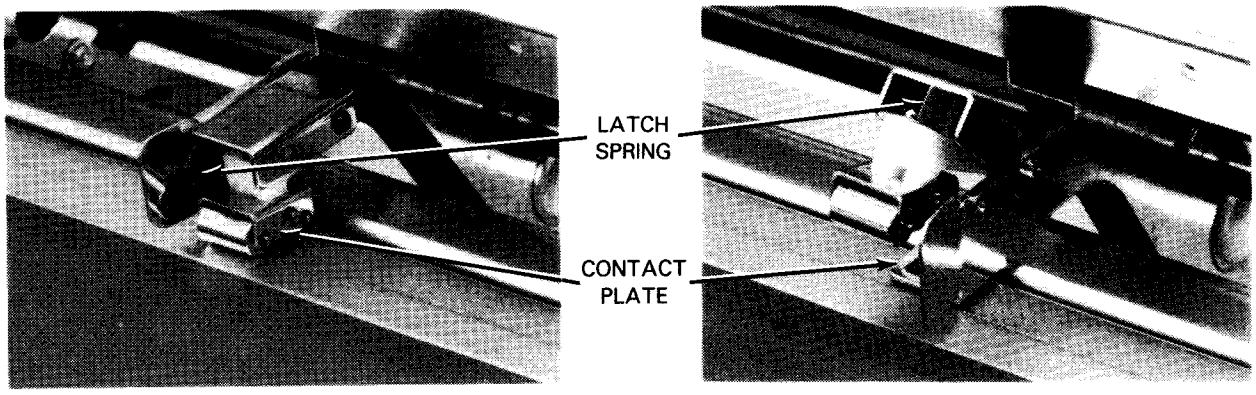
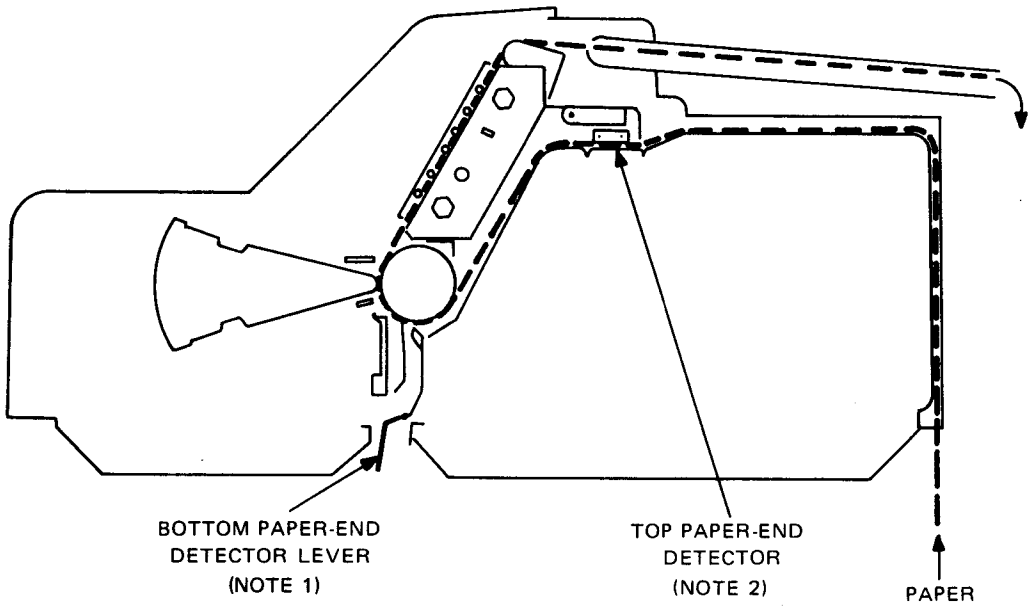
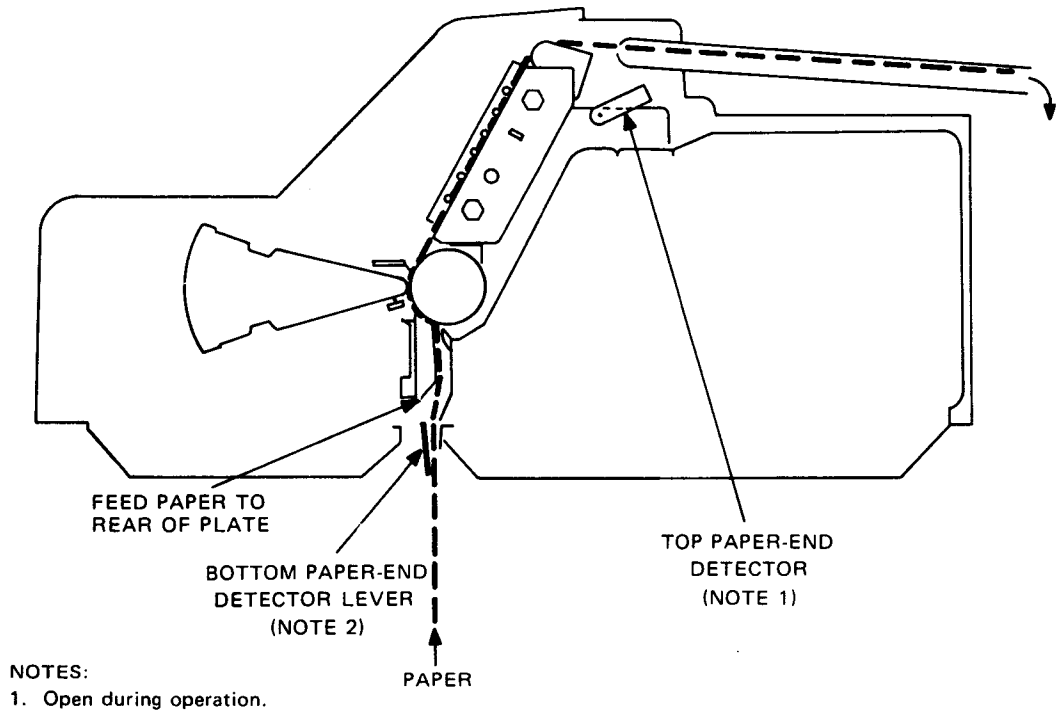


Figure 3-13. Top Paper-End Detectors on 0798 Printer



a. Inserting paper from rear of printer



NOTES:
1. Open during operation.
2. Closed during operation

b. Inserting paper from bottom of printer

Figure 3-14. Paper Threading Paths on 0798 Printer

0798 Printer Ribbon Installation

You should replace the ribbon on the 0798 printer when printing quality is smudged or faint. Proceed as follows to change the inked ribbon:

1. Press the RUN/STOP switch/indicator (Figure 2-32), and note that the indicator extinguishes.

2. Open the printer top cover. Move the paper release lever (Figure 2-33) to the down position.

   NOTE: Wear plastic gloves when handling the inked ribbon.

3. Remove the old ribbon and take-up spool, and disconnect the ribbon from the empty spool.

4. Note the diagram for ribbon threading, located above the ribbon spool spindle on the right side of the printer. Install the new ribbon and thread it as illustrated on the diagram.

5. Connect the hook located on the end of the ribbon to the empty spool. Wind the ribbon on the spool for one complete turn of the spool.

6. Install the spool on the take-up spindle. Be sure that the ribbon eyelet is located between the spool and forked arm. Close the top cover and press the RUN/STOP switch/indicator to resume operation.

CAUTION

Inspect paper supply carefully for hole-punch residue (chad). Excessive chad can damage the printer mechanism.

■ Loading Forms

Load forms with the printer power on. Proceed as follows:

1. Press the STOP switch on the operator panel.
2. Open the top cover and front door.
3. Pull the band gate release lever to open the band gate and ribbon separator.
4. Swing the band gate and ribbon separator fully open.
5. Prepare cardboard box of forms (Figure 3-15) for use as follows:
   a. Cut off the top of the box about 1 inch (2.54 cm) below the top edge.
   b. Remove the cardboard spacers from the top of the box.

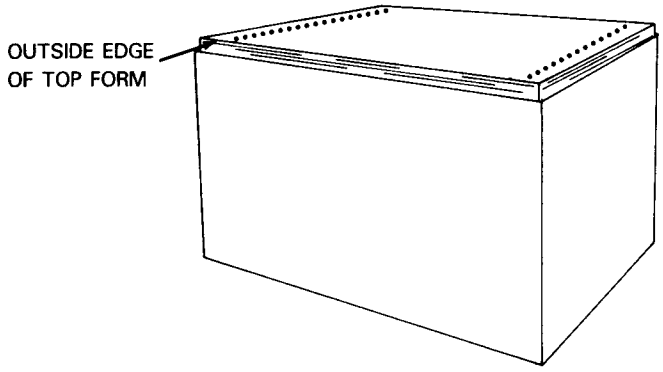


Figure 3-15. Recommended Cut of 0770 II Forms Box

6. Put the box of forms in the hopper so the print surface faces out.
7. Open the upper and lower left tractors (Figure 3-16) by snapping them out.

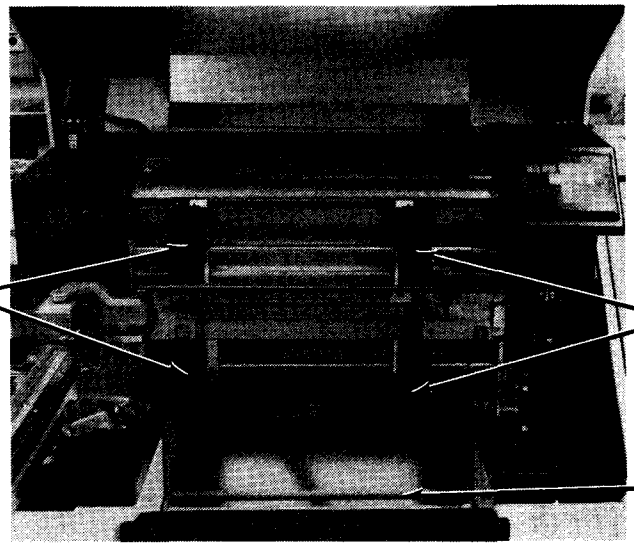


Figure 3-16. 0770 II Printing Area

8. Locate the starting edge of the first sheet and raise it above all four tractors. Make sure the forms are on the inboard side of the horizontal bar (Figure 3-16) between the hopper and the lower tractors. Engage the form sprocket holes on the left tractors and close both tractors. It is probably more convenient to work with the upper tractor first.

9. Open the upper and lower right tractors.

10. Press in and turn the horizontal print position knob to set the upper and lower right tractors to the width of the form.

11. Engage the form sprocket holes on the right tractors and close both tractors.

12. Press the MANUAL FEED switch to release tractor tension (indicator lit).

13. Turn the vertical forms adjustment knob (Figure 2-40a) so the form perforation is about 0.25 inch (0.635 cm) above the red print position line located between the upper and lower tractors.

14. Press the MANUAL FEED switch to restore tractor tension (indicator out).

15. Position the box in the hopper so the forms do not bind as they are drawn into the printing area.

16. Close the ribbon separator and band gate.

17. Turn the horizontal print position knob to adjust the position of the form in reference to the column scale on the ribbon separator.

18. Adjust the FORM THICKNESS knob according to the number of parts of the forms installed.

19. Set the print density knob according to forms thickness and ink ribbon condition.

20. Open the rear door and set the TABLE switch to DOWN to lower the stacker tray.

NOTE: If the new forms being loaded are of a different size from those used in the previous run, set the forms stacker to accommodate the different size as described later in this section.

21. Check that the MANUAL FEED indicator is not lit.

22. Press the TOP OF FORM switch on the rear operator panel to feed the forms into the stacker tray.

23. Start the first fold of the new forms so the forms fold in a natural direction.

24. Position the two vertical side guides close enough to the printed forms to prevent paper lean but not so close that they pinch the forms.

25. Set the TABLE switch to UP to raise the stacker tray.

26. Set the TABLE switch to OFF to set the stacker tray for automatic operation.

27. Close the rear door.

28. Press the START RESET switch on the operator panel.

    a. Printer enters RUN state.

    b. RUN indicator lights.

29. The printer is now ready for operation in either the online or offline mode.

    a. Set the ONLINE/OFFLINE switch to OFFLINE and press the TEST PRINT switch to print a sliding ripple pattern in all 136 positions.

    b. Set the ONLINE/OFFLINE switch to ONLINE to set the printer to receive data from the host.

30. If a fine vertical forms adjustment is required, press the STOP switch on the operator panel to enter the STOP state, make the fine adjustment by using the up and down FORM switches; then repeat steps 27 and 28 to check the results.

NOTE: *If you want to verify forms setup while the printer is online, press the SINGLE CYCLE switch to print one line only. This automatically places the printer in the STOP state. To return to the RUN state, repeat step 27.*

31. Close the top cover and the front door.

- **Removing Unused Forms**

Remove unused forms with the printer power on. Proceed as follows:

1. Press the STOP switch on the operator panel.
2. Open the top cover and front door.
3. Pull the band gate release lever to open the band gate.
4. Swing the band gate and ribbon separator fully open.
5. Press the MANUAL FEED switch to release tractor tension.
6. Press the TOP OF FORM switch until the desired tear line perforation is above the upper tractors.
7. Separate the forms along the perforation.
8. Open the upper and lower set of tractors and let the forms drop into the hopper.
9. Press the MANUAL FEED switch to restore tractor tension.
10. Press the STOP or TOP OF FORM switch to discharge the forms remaining in the printer.
11. Remove the forms from the hopper.
12. Open the rear door and remove any forms from the stacker.

The printer is now ready for forms loading as described earlier in this section.

■ Removing Printed Forms

Remove printed forms with the printer power on. Proceed as follows:

1. Press the STOP switch on the operator panel.
2. Open the top cover.
3. Press the TOP OF FORM switch until the desired tear line perforation is above the upper tractors.
4. Separate the forms along the perforation.
5. Press the STOP or TOP OF FORM switch to discharge the printed forms into the stacker.
6. Open the rear door and remove the forms from the stacker.

Replacing Ink Ribbons on the 0770 II Printer

Replace the ink ribbon on the 0770 II printer (Figure 3-17) when printing is too light.

NOTE: After removing the old ribbon, inspect the ribbon feed and print band running paths; vacuum as needed.

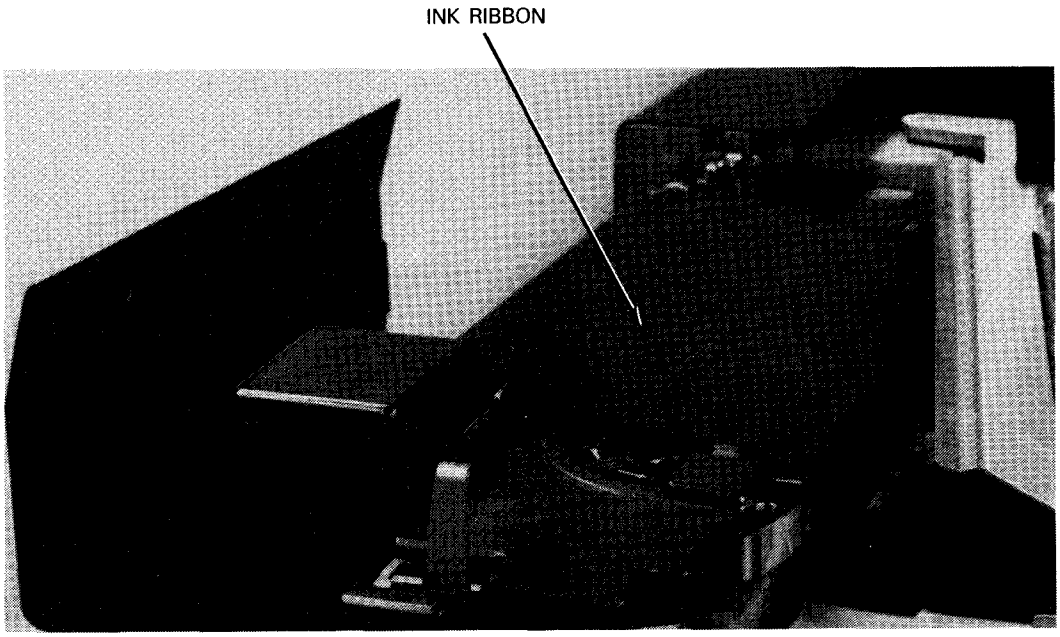


Figure 3-17. Installed Ribbon on 0770 II Printer

Remove and replace the ribbon with printer power on. Proceed as follows:

1. Press the STOP switch on the operator panel.

2. Open the top cover.

3. Pull the band gate release lever to open the band gate and ribbon separator.

4. Swing the band gate fully open and swing the ribbon separator away from the band gate.

5. Open the band gate cover to expose the ribbon.

6. Put on the vinyl gloves packed with the new ribbon. Do not unwrap the new ribbon at this time.

7. Remove the old ribbon by:

   a. Removing the ribbon upper take-up spool from the spool holder by pushing the spool sideways toward the spring-loaded spool holder (pivot end of band gate) (Figure 3-18).

   b. Removing the ribbon lower take-up spool from the spool holder in the same manner as the upper spool (step 7a).

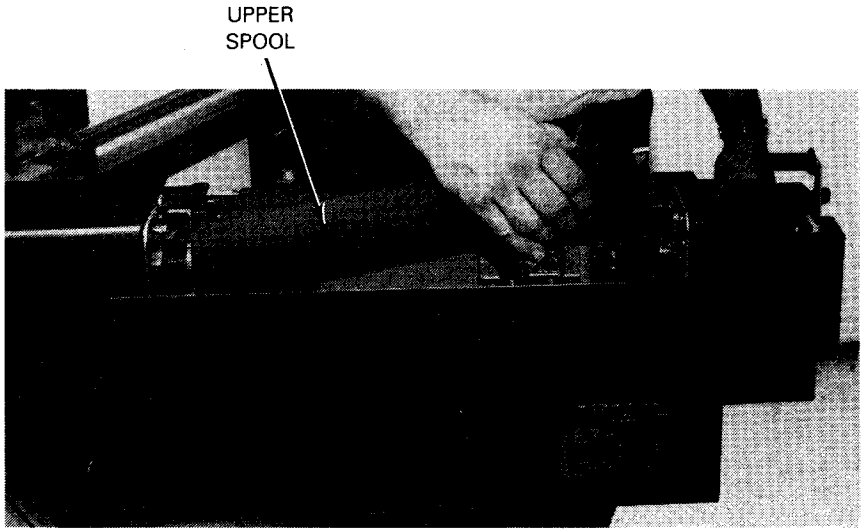


Figure 3-18. Removing Ribbon on 0770 II Printer

8. Discard the old ribbon.

9. Carefully unpack the new ribbon and remove the protective pads from the take-up spool ends.

10. Install the new ribbon on the lower spool holders and then on the upper spool holders (reversing the process for removing the old ribbon). Install the full ribbon spool on the lower spool holder. Make sure the key groove on both take-up spools engages properly with the projection on the upper and lower spool holders (Figure 3-19).

CAUTION

To prevent damage to the ribbon when power is turned on, make sure it is fully stretched.

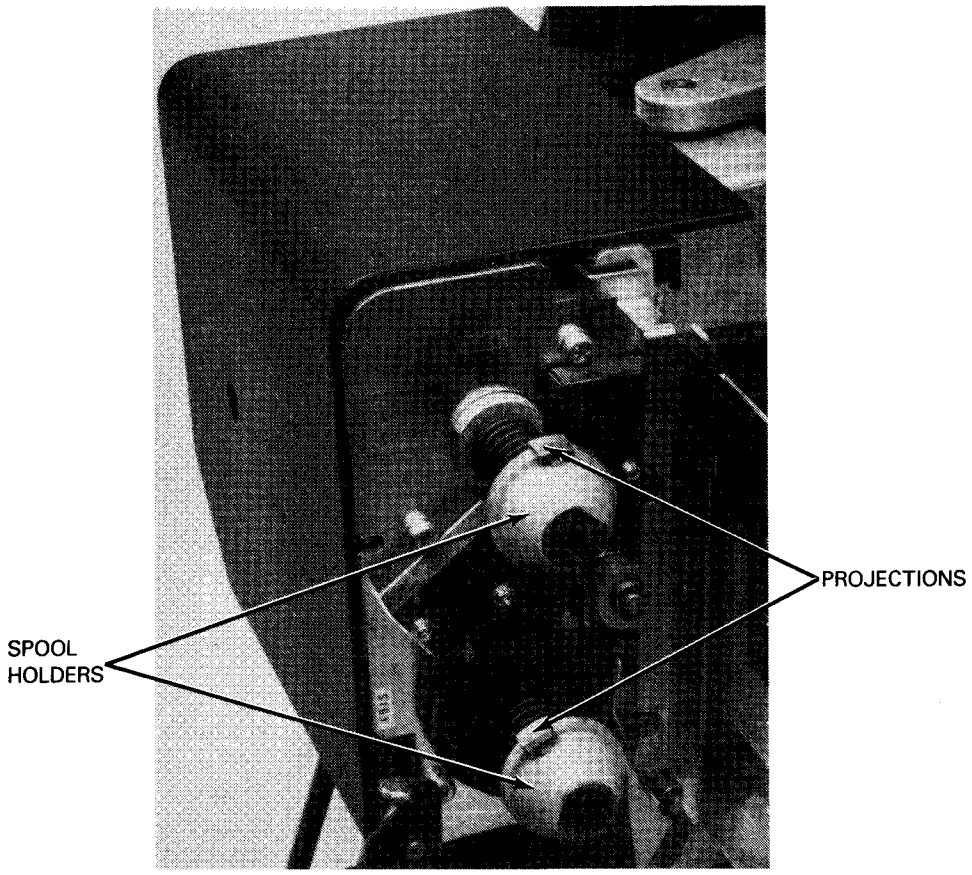


Figure 3-19. 0770 II Printer Ink Ribbon Spool Holders

11. Make sure the ribbon path and reversing bar are as shown in Figure 3-20.

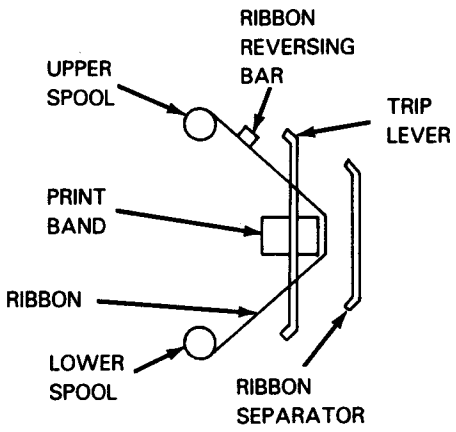


Figure 3-20. 0770 II Printer Ribbon Path and Reversing Bar Location

12. Check for proper ribbon movement while pressing and holding the STOP switch.

13. Close the band gate cover.

14. Close the ribbon separator and band gate.

15. Close the top cover.

Replacing Print Bands on 0770 II Printer

WARNING

To prevent personal injury or equipment damage, do not install a folded, creased, or torn print band.

When it is necessary to install a print band, proceed as follows:

1. Remove the ink ribbon as described in steps 2 through 8 of the procedure for replacing ink ribbons.

2. Remove the band cover (Figure 3-21) by loosening the knurled knob in the center of the cover.

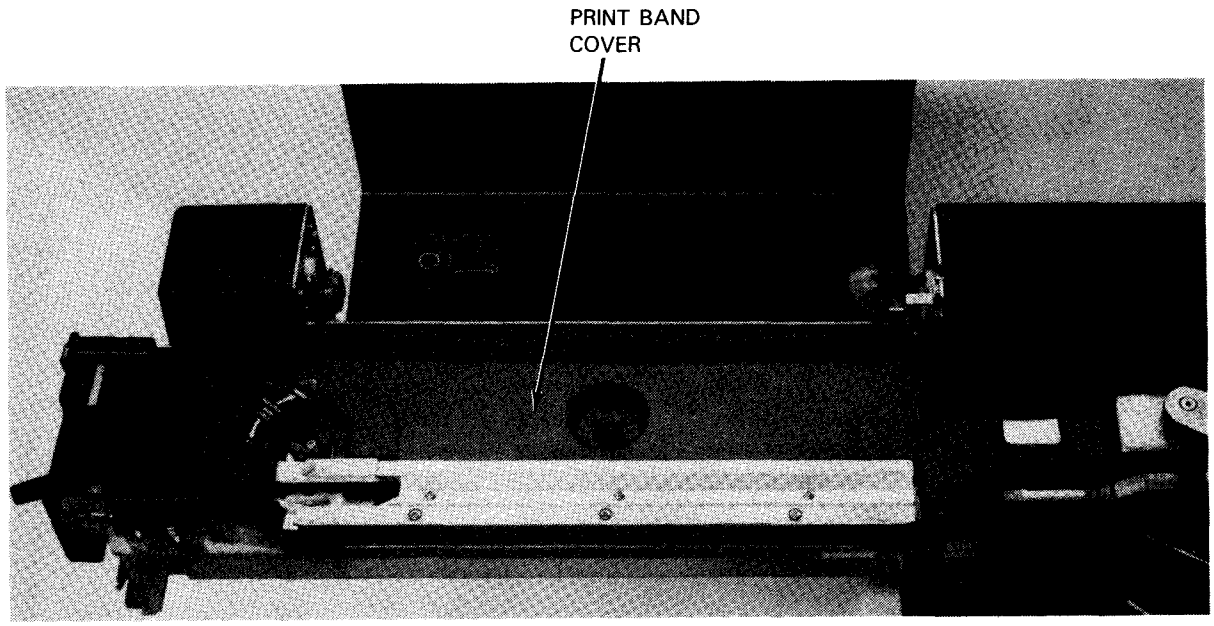


Figure 3-21. 0770 II Printer Print Band Cover

3. Set the print band exchange lever to TAKE OFF to release band tension.

4. Set the cleaning brush adjustment knob (Figure 3-22) to the BAND RELEASE position by pressing the knob in and rotating it counterclockwise.

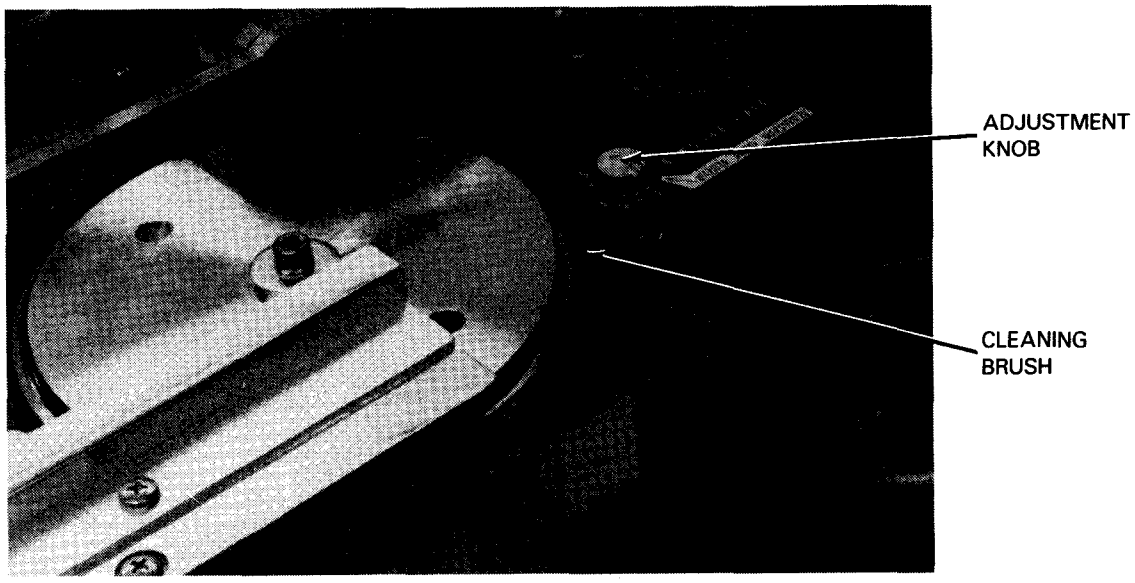


Figure 3-22. 0770 II Printer Print Band Cleaning Brush Assembly

5. Carefully lift the band and remove it from the band driven pulley, band position sensor, guide, and band drive pulley (Figure 3-23).

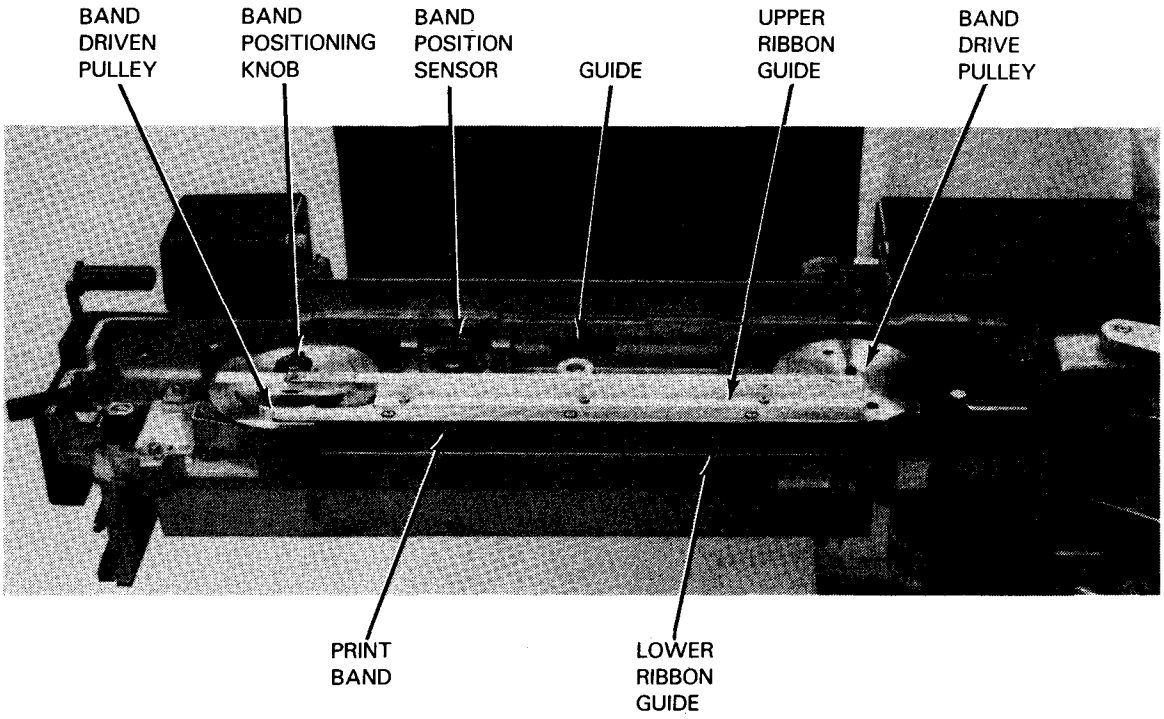


Figure 3-23. Installed 0770 II Print Band

6. Position the new print band so the characters are on the upper half of the band.

7. Carefully install the new band over the driven pulley, position sensor, guide, and drive pulley.

8. Make sure the band does not touch either the upper or lower ribbon guides. Raise or lower the band as needed.

9. Set the print band exchange lever to SET UP to restore band tension.

10. Push in and turn the cleaning brush adjustment knob clockwise while manually rotating the band driven pulley until the cleaning brush (Figure 3-22) makes contact with the print band. Use this knob to adjust the brush-to-band contact pressure to ensure proper band cleaning action.

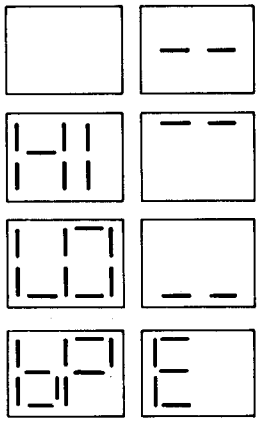
11. Manually rotate the band driven pulley to ensure free band rotation.

12. Replace the band cover.

13. Install the ribbon as described in steps 10 through 14 of the procedure for replacing ink ribbons earlier in this section.

14. Turn printer power on.

15. Determine the position of the print band by checking the operator panel error display.



Correctly positioned band (momentary display)

Band too high

Band too low

Adjust or replace band positioning sensor

16. If either a HI or LO error indication is displayed, adjust the band height by turning the BAND POSITIONING knob. If the positioning sensor error indication is displayed, contact your service representative.

NOTE: The print band height may be adjusted without going through the power-on sequence by pressing the F and 7 switches on the operator panel, then performing steps 15 and 16.

Setting Up Forms Stacker on 0770 II Printer

The forms stacker (Figure 3-24) can be set to handle a variety of form lengths:

- Forms 8 to 14 inches (20 to 35 cm) long
- Forms shorter than 8 inches (20 cm)
- Forms longer than 14 inches (35 cm) and up to 20 inches (50 cm)

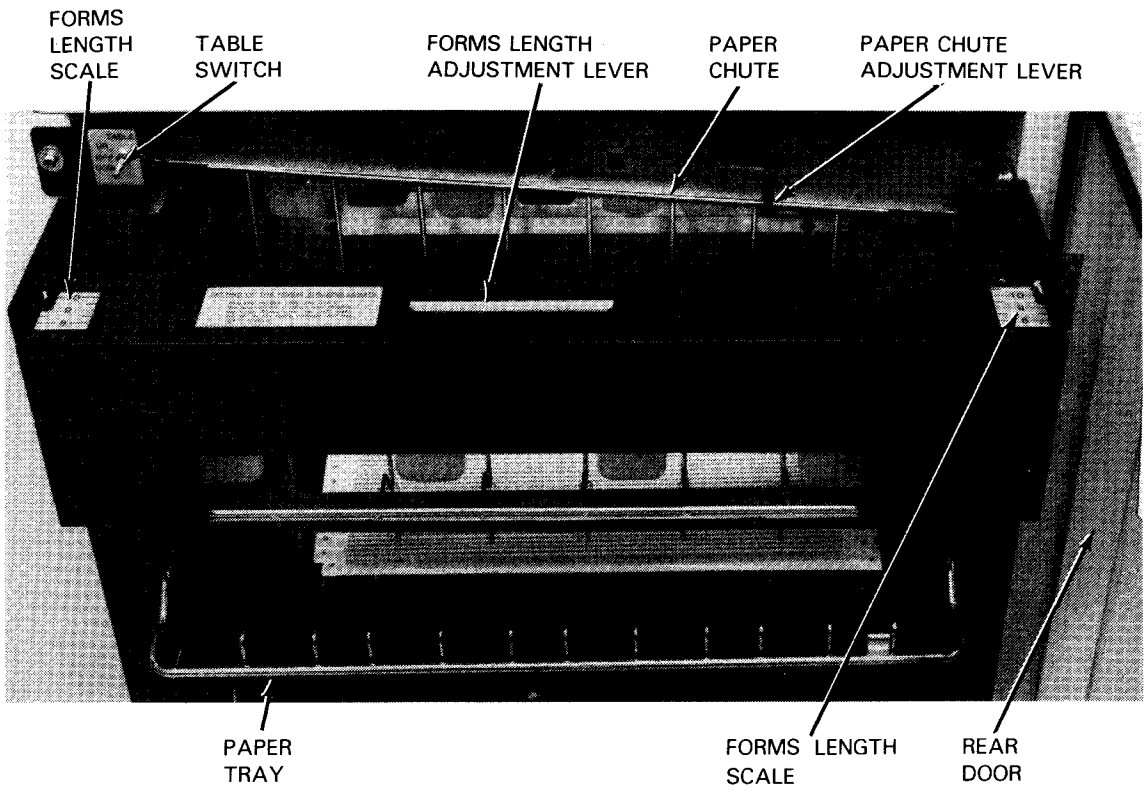


Figure 3-24. 0770 II Printer Forms Stacker

Adjust the forms stacker with printer power on. Proceed as follows:

1. Press the STOP switch on the rear operator panel.
2. Open the rear door.
3. Set the TABLE switch to DOWN.
4. Remove any printed forms from the paper tray.
5. Using the forms length adjustment lever:
   - For forms 8 to 14 inches (20 to 35 cm) long, set the scales to match the forms.
   - For forms shorter than 8 inches (20 cm), set the scales to 8.
   - For forms longer than 14 inches (25 cm) and up to 20 inches (50 cm), set the scales to 14.
6. Using the PAPER CHUTE ADJUSTMENT lever, set the paper chute as follows:
   - Single-part forms - down
   - 2- to 4-part forms - middle
   - 5- or 6-part forms - up

7. Press the TOP OF FORM switch on the rear operator panel two or three times to advance the new forms into the stacker area.

8. Fold the forms onto the paper tray.

9. If you are installing forms less than 8 inches (20 cm) long, skip to step 16.

10. If you are installing forms longer than 14 inches (35 cm), skip to step 15.

11. If you are installing forms 8 to 14 inches (20 to 35 cm) long, go on to the next step.

12. Set the TABLE switch to UP.

13. When the paper tray reaches the top, set the TABLE switch to OFF for automatic operation.

14. Now skip to step 16.

15. Attach the two paper tray extensions as shown in Figure 3-25.

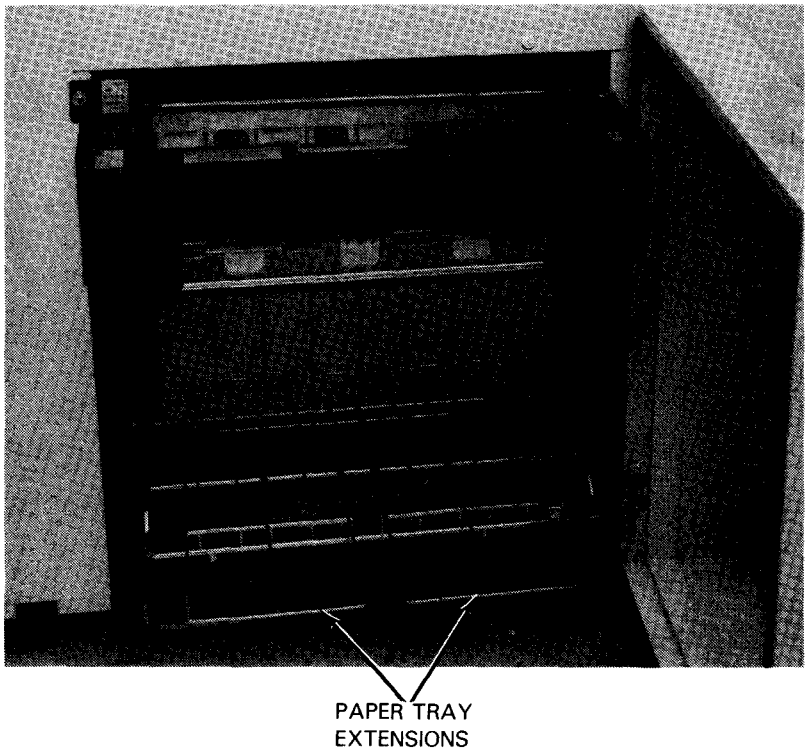


Figure 3-25. 0770 II Printer Paper Tray Extensions

16. If the installed forms are no longer than 14 inches (35 cm), close the rear door. Otherwise, it must remain open to accommodate the paper tray extensions.

3.2.4. Peripheral Operation Recovery

Certain conditions may occur during setup or operation of peripheral equipment that may halt further operation. In most cases, you can restore operating performance of the equipment and continue with the procedures. However, when operation cannot be restored, place the faulty-unit offline, contact the customer service engineer, and describe the condition or related displays accurately.

Diskette Drive Jam

The FEED indicator (Figure 2-8) remains lit if autoload operation does not complete successfully. The autoload operation may be suspended if:

- A diskette jam occurred because:

  1. A diskette did not load fully into the drive mechanism and is detected by the jam sensor.

  2. After a diskette is loaded into the drive mechanism, a second diskette becomes partly loaded into the drive and is detected by the jam sensor.

  3. When an unload cycle is initiated, the diskette remains in the drive and fails to engage the exit rollers.

  4. Upon completion of an unload cycle, a diskette does not completely eject from the exit rollers and is detected by the jam sensor.

- The diskette drive did not reach the ready condition because:

  1. A diskette does not load into the drive mechanism.

  2. A diskette was incorrectly loaded into the hopper and is oriented in the wrong direction for loading into the drive mechanism.

  3. A defect has occurred in the drive mechanism such as: the motor is not turning, the belt slipped off the pulley, or a light-emitting diode (LED) is defective. These problems are corrected by the customer service engineer.

- The hopper is empty. If a feed cycle is completed when the hopper is empty, the diskette currently in the drive mechanism is unloaded and the FEED indicator remains lit.

If a diskette is jammed in the feed rollers or reader mechanism or in both, proceed as follows to correct either of these jams:

1. Remove all diskettes from the hopper and stacker, but keep each diskette group separated to allow continuation of the operation when the jam is cleared.

2. Raise the top cover and open the front cabinet door (Figure 3-26a).

   NOTE: Power is removed from the diskette drive when the top cover is raised.

3. Tilt the hopper/stacker bin forward and allow it to rest on the cabinet (Figure 3-26b).

4. Note the location of the jammed diskette (Figure 3-26c) and select either of the following procedures:

CAUTION

If one diskette is jammed in the feed rollers and another in the reader mechanism (Figure 3-26c), remove the diskette from the feed rollers first. Otherwise, the diskette in the feed rollers may be damaged when the one in the reader mechanism is removed.

a. A feed roller jam is cleared as follows:

(1) While holding both ends of the diskette (Figure 3-26d), carefully pull it evenly through the bottom of the feed rollers.

(2) Examine the diskette jacket for wrinkles or tears. If necessary, replace the diskette as directed later in this section. A wrinkled or torn jacket may prevent proper feeding into the reader mechanism.

(3) Proceed to step 5 if only a feed roller jam occurred. Otherwise, continue with clearing a jam in the reader mechanism.

b. A reader mechanism jam is cleared as follows:

(1) Turn the cam drive motor shaft (Figure 3-26b) manually until the reader door opens.

(2) Lift out the diskette from the reader mechanism (Figure 3-26e) and examine the diskette jacket for wrinkles or tears. Replace the diskette as directed later in this section, if necessary.

5. Raise the hopper/stacker bin to its operating position (Figure 3-26a).

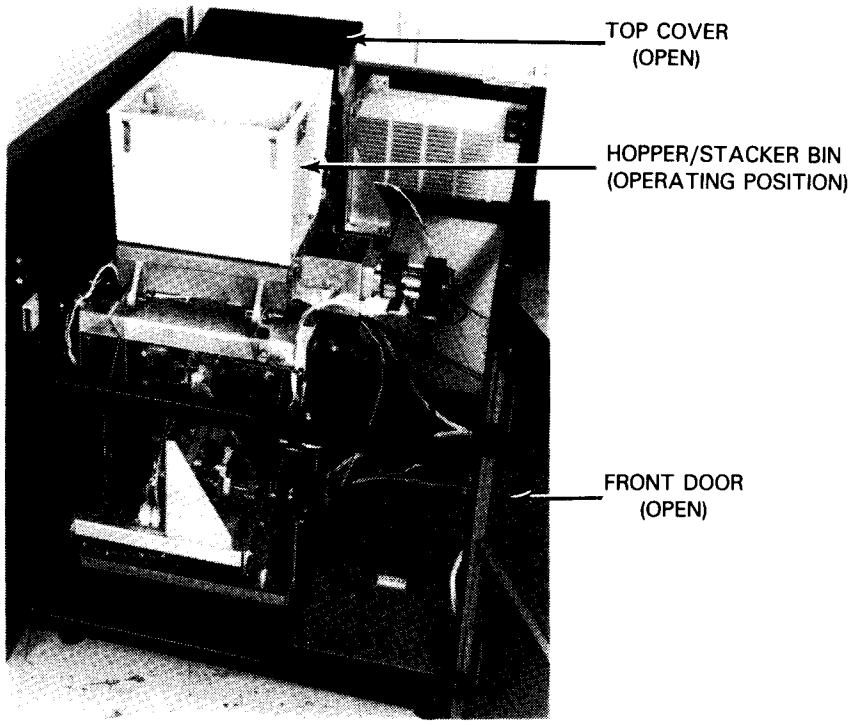
6. Close the front cabinet door, then the top cover. The diskette drive recycles to home position when the door interlocks are engaged and power is restored.

7. Place the jammed diskettes in proper sequence with diskettes removed from the hopper.

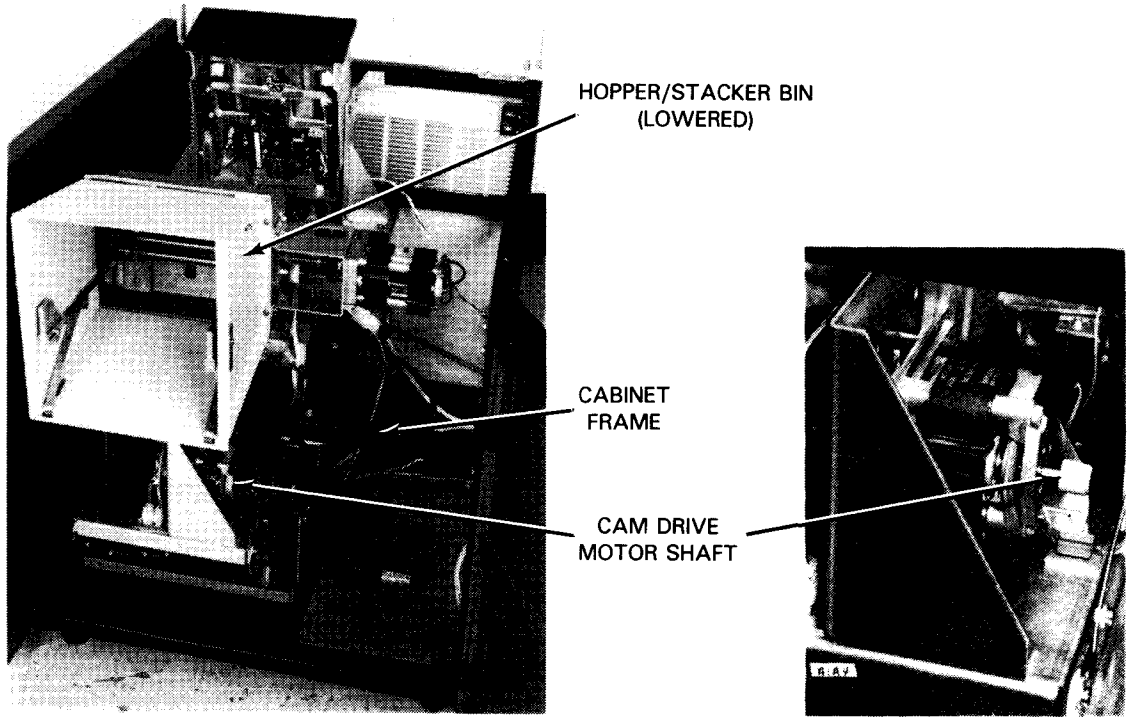
NOTE: When a dual jam occurs, the diskette removed from the reader mechanism precedes the one removed from the feed rollers.

8. Replace the diskettes removed from the hopper and stacker (step 1) into the hopper/stacker bin and resume operation.

NOTE: If a fault cannot be corrected and the customer service engineer must be contacted, remove the diskette drive from the list of available resources at the system console; turn power off for faulty drive at the power control panel (Figure 2-9) until operation is restored.

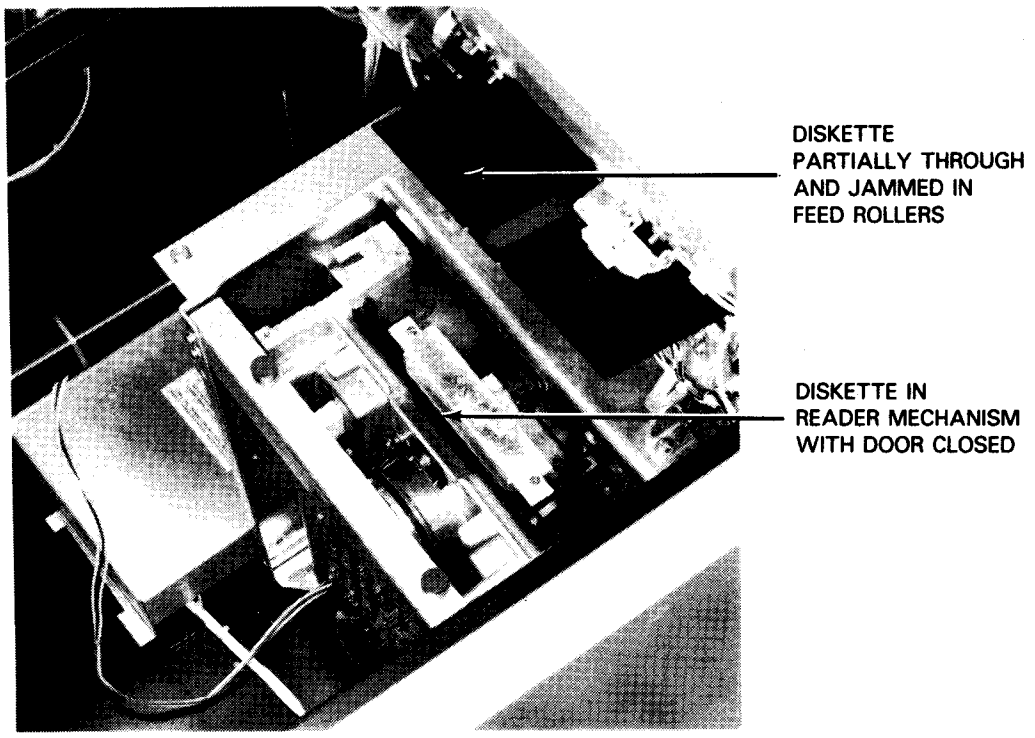


a. Diskette media removed and cabinet doors open

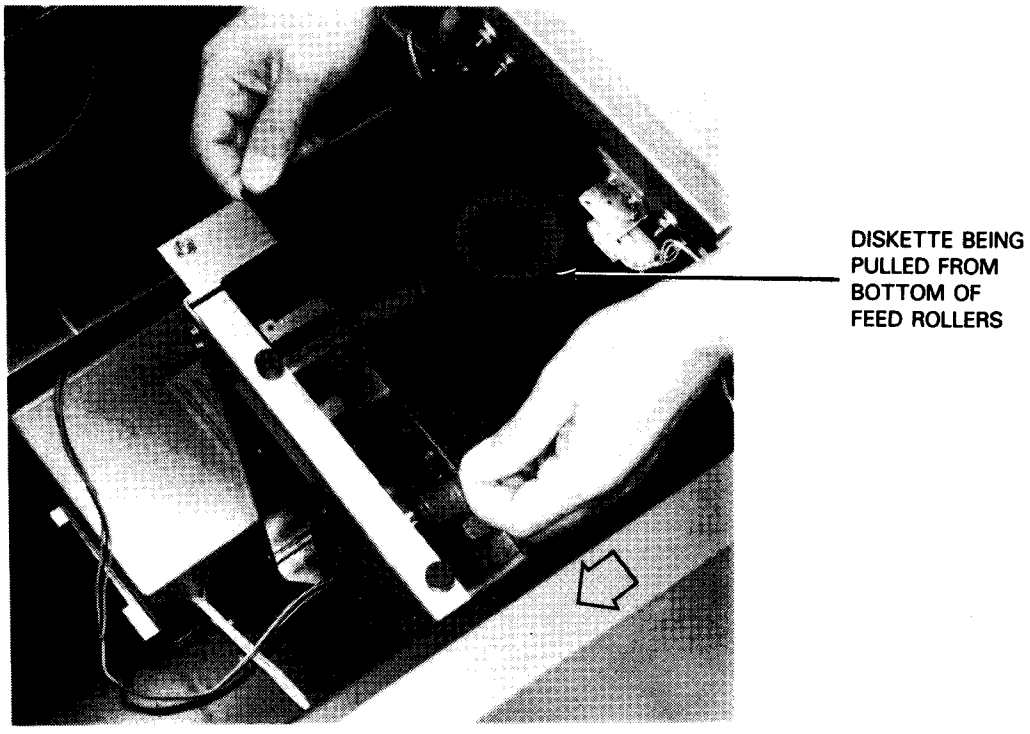


b. Hopper/stacker bin lowered to access jammed diskette

Figure 3-26. Clearing Jams in Autoload Diskette Drive (Part 1 of 3)

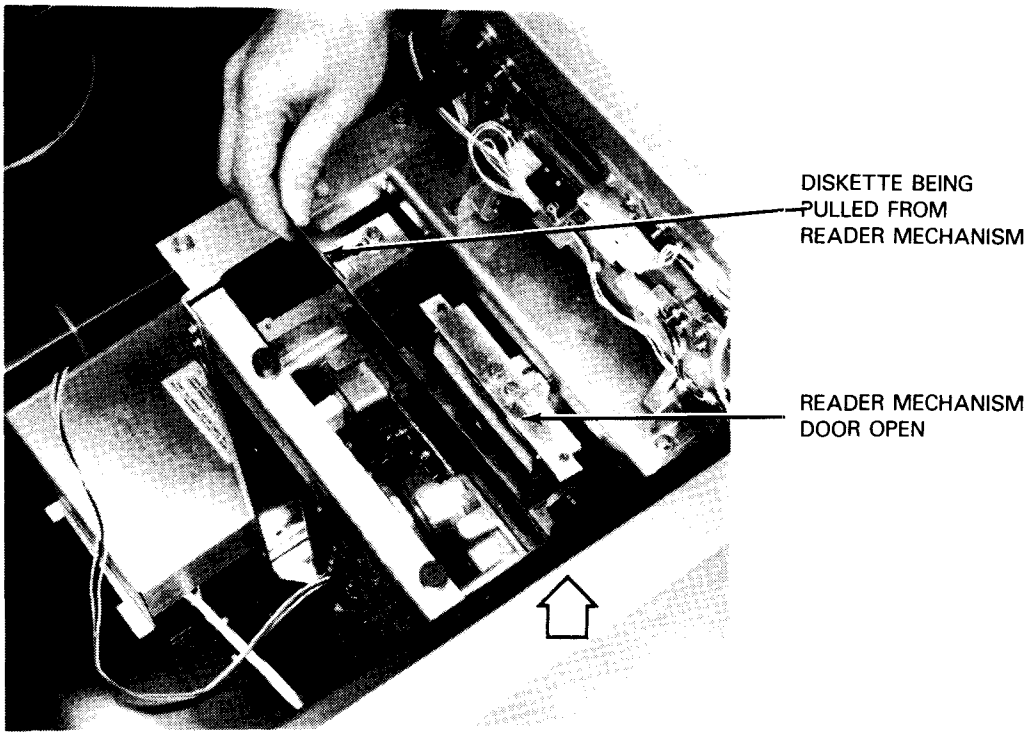


c. Jammed diskettes in feed rollers and reader mechanism



d. Removing jammed diskette from feed rollers

Figure 3-26. Clearing Jams in Autoload Diskette Drive (Part 2 of 3)



e. Removing jammed diskette from reader mechanism

Figure 3-26. Clearing Jams in Autoload Diskette Drive (Part 3 of 3)

Damaged Diskette Replacement

Replace a diskette with a new diskette when the diskette jacket is wrinkled or torn or the diskette is bent. Operating with a damaged diskette in the autoload diskette drive will probably cause a diskette jam, because the diskette does not feed properly through the hopper or may not enter the reader mechanism during an autoload cycle. Proceed as follows to replace a damaged diskette.

1. Straighten the jacket wrinkle or bend as straight as possible without cracking the diskette. If the jacket is torn, carefully tape the loose ends together without allowing adhesive on the tape to contact the diskette. Use additional paper fragments, if necessary.

CAUTION

If adhesive on patching tape sticks to the diskette, the diskette will not turn during operation and may overload and damage the diskette drive motor. Check that the diskette moves freely within its jacket after repairing a damaged jacket.

2. Insert the damaged diskette into the manual diskette drive, as directed in 3.2.1.

3. Read out the contents on the damaged diskette into a buffer or storage device.

4. Remove the damaged diskette from the manual diskette drive, as directed in 3.2.1.

5. Insert a new unused diskette into the manual diskette drive.

6. Write out the contents in storage onto the new diskette.

7. Remove the diskette from the manual diskette drive.

8. Mark the diskette jacket of the new diskette with the same designations noted on the old diskette.

9. Place the new diskette in the same sequence location of the pack from which the damaged diskette was removed. Check for proper operation and readout of the new diskette, then discard the old diskette.

Diskette Head Cleaning

You must periodically clean the read/write heads on diskette drives. Perform the cleaning routinely each month, or more often if read error rates are abnormally high.

Perform head cleaning with cleaning diskettes that have been provided with the system. Two cleaning diskettes are provided with each kit. The kit can be obtained from the sales representative, using part number 2893177-00. Kits can also be obtained from:

Innovative Computer Products
Tarzana, California 91356
(part number FD-08)

Proceed as follows to clean the diskette read/write heads:

1. Obtain the special cleaning diskette and remove the perforated tab on the diskette jacket to clean the dual read/write heads (read/write on both sides of diskette).

2. Using the cleaning solution provided with the kit, dispense a fair amount of solution through the large cutouts on both sides of the jacket onto the cleaning material inside the jacket.

CAUTION

The cleaning material should be saturated, but not excessively enough to cause the cleaning solution to drip inside the machine.

3. Depending on whether a manual load diskette drive or autoload diskette drive is to be cleaned, proceed to the pertinent steps:

   a. Manual load diskette drive:

      (1) Insert the diskette down below the media slot opening to engage the reader mechanism.

      (2) Close the push-bar by moving it under the push-bar release to lock it closed.

      (3) Perform the diskette diagnostic routine from the console workstation keyboard, as directed in the *OS/3 Operator Maintenance Guide*, UP-8915. Allow the diskette to operate in the reader mechanism for 15 to 30 seconds.

      (4) Press the push-bar latch release to open the push-bar and allow the cleaning diskette to rise.

      (5) Lift out the cleaning diskette from the diskette drive. Mark the diskette jacket to indicate cleaning has been performed.

   b. Autoload diskette drive:

      (1) Remove all diskettes from the hopper/stacker bin. Separate hopper diskettes from those in the stacker to return to proper sequence after cleaning is complete.

      (2) Install the cleaning diskette in the hopper with the jacket slot at the bottom (Figure 3-2a). Be sure that the top of the diskette is beneath the retainers on each side of the hopper (Figure 3-2b) and the bottom of the diskette is against the keepers.

      (3) Press the FEED switch on the diskette drive to allow the cleaning diskette to enter the reader mechanism.

      (4) Perform the diskette diagnostic routine from the console workstation keyboard, as directed in the *OS/3 Operator Maintenance Guide*, UP-8915. Allow the diskette to operate in the reader mechanism for 15 to 30 seconds.

      (5) Press the FEED switch on the diskette drive to unload the cleaning diskette from the reader mechanism.

      (6) Remove the cleaning diskette from the stacker. Mark the diskette jacket to indicate that cleaning has been performed.

      (7) Replace the diskettes that were removed in step (1); that is, put them back into the hopper/stacker bin. Be sure to maintain the proper sequence in the hopper and stacker.

   NOTE: Each cleaning diskette may be reused for further cleaning until it becomes discolored, or for approximately 15 diskette cleanings.

The operator response to an indicated fault on an 8416/8418 disk drive is limited to observing the indication and, in most cases, making one or more efforts to restart the halted operation.

Indicator lamps can be tested by pressing the STOP switch/indicator. All the lamps should be lit while the STOP switch is held pressed. If an indicator does not light, but the proper function occurs, notify the customer service engineer of the condition so it can be corrected at a convenient time.

The DEVICE CHECK indicator is lit when conditions are detected within the drive that might affect normal operation. A DEVICE CHECK (as indicated by the RUN indicator going out and DEVICE CHECK and STOP indicators being lit) caused by a hard unsafe must be cleared before normal drive operation can be resumed. A DEVICE CHECK indicator lit and accompanied by an EARLY WARNING indication at the processor is a signal for operations to be terminated as soon as possible before the temperature problem in the disk drive results in a thermal trip condition.

Table 3-6 lists the disk drive malfunctions that may be corrected by the operator. If the malfunction persists after operator intervention, contact the customer service engineer.

Table 3-6. 8416/8418 Disk Drive Recovery

Fault Indication	Probable Cause	Operator Action
No indicator lit on operator control panel.	Loss of power within subsystem	1. Ensure circuit breakers on subsystem ac power box are in the on (up) position. Reset if necessary. 2. Ensure that the main dc circuit breakers at the processor power control panel are set to their on (up) position. Reset if necessary.
DEVICE CHECK indicator remains lit, RUN indicator off, STOP indicator lit.	Electrical or mechanical malfunction detected	1. Hard unsafe detected, To reset, turn disk unit off and then back on. If DEVICE CHECK remains lit, notify the customer engineer. 2. Overheating condition detected. Check if EARLY WARNING indicator is lit at processor. Check air flow and air filters. Check for excessive recycling of disk drive motors. Allow time for cooling and restart disk unit. **CAUTION** If a suspected disk pack or disk unit malfunction requires substitution of the disk pack or disk unit due to a recurring malfunction, do not continue to substitute disk packs or disk units after the first replacement. A read/write head and/or disk pack crash during a previous operation may cause damage to the heads or disk pack, which can cause further damage and eventually disable the entire subsystem if substitutions continue. Contact the customer engineer.
Power loss	Circuit breaker tripped	Set circuit breaker to the OFF position, then reset to the ON position. If circuit breaker trips again, contact the customer engineer.

If you cannot correct a failure or fault indication as directed, and must contact the customer service engineer, place the faulty disk drive offline until operation can be restored. To place a disk drive offline, proceed as follows:

1. At the processor console, provide the operating system with the address of the disk drive to be placed offline.

2. Press the STOP switch/indicator. Note that the RUN indicator is extinguished and the OFF indicator remains lit after you release the STOP switch.

CAUTION

If a suspected disk pack or disk drive malfunction requires substitution of the disk pack or disk drive due to a recurring device-check condition, do not substitute disk packs or disk drives after the first replacement. A read/write head or disk pack crash during a previous operation might have damaged the replacement disk pack, which (in turn) damaged the read/write heads in the replacement disk drive. Further replacements will cause further damage and eventually disable the entire subsystem, if continued. Contact the customer service engineer at once when the second disk pack or disk drive, known to be previously operative, presents a malfunction indication.

8417 Disk Drive Recovery

Operator response to an indicated fault on the 8417 disk drive is limited to observing indications and attempting to restart operation. If the POWER ON or READY indicators are not lit, ensure that the MAIN POWER circuit breaker is in the ON (up) position and then attempt to turn on power to the affected disk drive.

If the fault condition persists, contact the customer service engineer.

Operator response to an indicated fault on an 8419 disk drive is limited to observing the indication and, in most cases, making one or more efforts to restart the halted operation.

You can test indicator lamps by pressing the STOP switch/indicator. All the lamps should be lit while you press and hold the STOP switch. If an indicator does not light, but the proper function occurs, notify the customer service engineer of the condition so it can be corrected at a convenient time.

The DEVICE CHECK indicator is lit when conditions are detected within the drive that might affect normal operation. Some are considered soft unsafe conditions and recovery procedures are initiated by the system software. Hard unsafe conditions are indicated by the DEVICE CHECK and STOP indicators remaining lit. A hard unsafe must be cleared by the operator before normal drive operation can be resumed.

Table 3-7 lists the disk drive malfunctions that you may be able to correct. If the malfunction persists after you take corrective action, contact the customer service engineer.

Table 3-7. 8419 Disk Drive Recovery

Fault Indication	Probable Cause	Operator Action
No indicator lit on operator control panel	Loss of power within subsystem	Ensure that the MAIN POWER circuit breaker is in ON (up) position.
DEVICE CHECK indicator remains lit, STOP indicator lit	1. Electrical or mechanical malfunction detected	Hard unsafe detected. To reset, turn disk unit off and then back on.
	2. Damaged disk pack	Substitute suspected damaged disk with another disk pack. **CAUTION** If a suspected disk pack or disk drive unit malfunction requires substitution of, the disk pack or disk drive unit due to a recurring device-check condition, do not continue to substitute disk packs or disk drive units after the first replacement. A read/write head or disk pack crash during a previous operation may cause further damage and eventually disable the entire subsystem if substitutions continue. Contact the customer engineer.

8430/8433 Disk Subsystem Recovery

Operator response to an indicated fault on an 8430/8433 disk subsystem is limited to observing the indication and, in most cases, making one or more efforts to restart the halted operation. Table 3-8 lists the fault indications you can observe, the causes, and recommended actions you can take.

The table does not call out faults resulting solely from burned out indicator bulbs and/or lamp drivers. If the indicator does not light, but the proper function occurs, notify the customer service engineer of the condition so it can be corrected at a convenient time.

Table 3-8. 8430/8433 Disk Subsystem Recovery

Indication	Probable Cause	Operator Action
Control unit AVAILABLE indicator off (and no communication with processor)	Control unit-channel interface disabled.	1. Attempt to enable interface with ENABLE switch. 2. Notify the customer engineer.
READY indicator off	Disk storage unit is turned off, system power is down, seek incomplete occurred, or module select plug is removed.	1. Check module select plug for proper installation. 2. Restart drive with START switch. 3. Notify the customer engineer.
UNSAFE indicator on	One of several possible unsafe conditions in drive.	1. Restart drive with START switch. UNSAFE indicator will go out and stay off if problem is corrected. 2. Notify the customer engineer.

If you cannot restore a disk drive or the entire subsystem to operation and must notify the customer service engineer, remove the drive or subsystem from the list of available resources at the system console. In addition, place the faulty unit offline.

To place a disk drive offline, proceed as follows:

1. At the system console, provide the operating system with the address of the drive to be placed offline.

2. At the disk drive, press the START switch to its unlatched position. Note that the START and READY indicators extinguish.

To place an entire subsystem offline, proceed as follows:

1. At the system console, provide the operating system with the addresses of the control units and disk drives to be placed offline.

2. At the control unit, press the ENABLE switch for each channel interface to its unlatched position. Note that the ENABLE and AVAILABLE indicators extinguish.

3. At each disk drive, press the START switch to its unlatched position. Note that the START and READY indicators extinguish.

8470 Disk Drive Recovery

If a fault is indicated on the 8470 disk drive, your response is limited to observing indications and attempting to restart the operation. The customer service engineer performs recovery procedures for the cache storage unit. Table 3-9 lists and describes operator recovery and fault remedy conditions for the disk drive. The switch/indicators referenced in Table 3-9 are located on the 8470 disk drive operator control panel (Figure 2-20).

NOTE: Remove the faulty disk drive from the software system list of available resources at the system console if a disk drive becomes inoperative.

Table 3-9. 8470 Disk Drive Recovery

Indication	Probable Cause	Operator Action
READY indicator does not flash after ON/OFF switch is set to ON position.	The disk drive did not reach ready condition for operating status.	Leave ON/OFF switch to ON position and contact the customer engineer.
READY indicator continues to flash beyond 60 seconds after ON/OFF switch is set to ON.	The disk drive requires longer than the normal warm-up time to reach operating status.	
READY indicator begins flashing or extinguishes after being lit steadily.	A fault has occurred in the disk drive and the disk drive power is turned off automatically.	
Smoke, burning odor, or abnormal noise emanating from the disk drive.	An emergency fault condition has occurred in the disk drive.	Set ON/OFF switch on the operator control panel to OFF position and contact the customer engineer.
READY indicator begins flashing after being lit steadily.	A potential operating fault may exist in the disk drive, but power is not turned off.	Continue operation to the next available termination point. Contact the customer engineer.
The audible alarm sounds.	An early temperature warning in the disk drive.	1. Terminate the operation as soon as possible. 2. Set ON/OFF switch on operator control panel to OFF. 3. Contact the customer engineer.

8480 Disk Drive Recovery

If a fault is indicated on the 8480 disk drive, your response is limited to observing indications and attempting to restart the operation. The customer engineer performs recovery procedures for the cache storage unit. Table 3-9 lists and describes operator recovery and fault remedy conditions for the disk drive. The switch/indicators referenced in Table 3-9 are located on the 8480 disk drive operator control panel (Figure 2-21).

NOTE: Remove the faulty disk drive from the software system list of available resources at the system console if a disk drive becomes inoperative.

8494 Disk Drive Recovery

If a fault is indicated on the 8494 disk drive, your response is limited to observing indications and attempting to restart the operation. Table 3-9a lists and describes operator recovery and fault remedy conditions for the disk drive. The switch/indicators referenced in Table 3-9a are located on each 8494 disk drive operator control panel (Figure 2-21c).

NOTE: Remove the faulty disk drive from the software system list of available resources at the system console if a disk drive becomes inoperative.

Table 3-9a. 8494 Disk Drive Recovery

Indication	Probable Cause	Operator Action
READY indicator does not flash after power is turned on.	The disk drive did not reach ready condition for operating status.	Leave ON/OFF switch to ON position and contact the customer engineer.
READY indicator continues to flash beyond the power up time after power was turned on.	The disk drive requires longer than the normal warm-up time to reach operating status.	
READY indicator begins flashing or extinguishes after being lit steadily.	A fault has occurred in the disk drive and the disk drive power is turned off automatically.	
READY indicator begins flashing after being lit steadily.	A potential operating fault may exist in the disk drive, but power is not turned off.	
The audible alarm sounds.	An early temperature warning in the disk drive.	1. Terminate the operation as soon as possible. 2. Set ON/OFF switch on operator control panel to OFF. 3. Contact the customer engineer.

Some faults occur during the self-tests that are performed after each disk drive is turned on. During these tests, the logical address, READY, FAULT, and WRITE PROT indicators on the disk drive operator's panel (Figure 2-21c) light. After approximately four seconds, the FAULT indicator extinguishes, indicating successful completion of the self-tests. If the READY and FAULT indicators remain on constantly, the disk drive failed the self-tests. The four logical address indicators will indicate which self-test failed. Table 3-9b lists and describes the self-test failures.

Table 3-9b. 8494 Disk Drive Self-Test Failures

Indication	Probable Cause	Operator Action
Logical address indicators 8, 4, 2, and 1 (X indicates the light is on and 0 indicates the light is off)		
XXXX	RAM test failure	Contact your Unisys Customer Engineer
XXXO	ROM test failure	Contact your Unisys Customer Engineer
XXOX	I/O chip test failure	Contact your Unisys Customer Engineer
XXOO	Peripheral Chip test 1 failure	Contact your Unisys Customer Engineer
XOXX	Peripheral chip test 2 failure	Contact your Unisys Customer Engineer
XOXO	Motor MPU test failure	Contact your Unisys Customer Engineer

0776 Printer Recovery

Indicators on the operator control panel of the 0776 printer (Figure 2-25) show the faulty conditions that may occur on the printer during operation. Table 3-10 lists the fault indications and required recovery procedures.

If the printer is to remain inoperative for an undetermined length of time, remove the printer from the list of available resources for software at the system console.

Table 3-10. 0776 Printer Recovery

Indication	Probable Cause	Operator Action
No indicator lit, no motors or blowers operating	No power to printer.	Check main power circuit breaker (power control panel) under top hood. If switch is tripped, reset. If no tripped, check main power source.
DEVICE CHECK indicator lit, STOP switch/indicator lit	1. Print carriage assembly not closed or installed properly. 2. No air or reduced air flow through module (or, if a 1200-lpm printer, through paper feed motor).	Check installation of print carriage assembly. Check module fans. On a 1200-lpm printer, check belt on paper feed cooling motor and determine if hose is off.
TEMP CHECK indicator lit, DEVICE CHECK indicator lit, STOP switch/indicator lit	1. Air flow within printer restricted. 2. Temperature within printer exceeds 134.6° F (57° C).	Determine if blower is operating or if air is circulating within printer. Determine that ambient temperature is not excessive and that printer floor-level fresh air intakes are not obstructed. Press and release RUN switch/indicator. Observe that DEVICE CHECK indicator and STOP switch/indicator are extinguished. Restart program. If error condition persists or reoccurs, notify the customer engineer. ←
PRINT CHECK indicator lit, STOP switch/indicator lit	Failure in print head actuator circuits or print band.	Faulty actuator circuit or incorrect print band timing. Restart program, or if desirable to continue printing from this line, press and release RUN switch/indicator (the line will be overprinted). If error persists, notify the customer engineer. ←
FORM CHECK indicator lit, STOP switch/indicator lit	Form jammed or ripped.	Remove torn or jammed form from printer. Note location of torn or jammed form with respect to printed data so that convenient restart point can be established. Reload forms as described in 3.2.3. ← Press and release RUN switch/indicator. Observe that FORM CHECK indicator and STOP switch/indicator are extinguished. Reenter program at proper point. If error persists, notify the customer engineer. ←

(continued)

Table 3-10. 0776 Printer Recovery (cont)

Indication	Probable Cause	Operator Action
FORMS OUT indicator lit, STOP switch/indicator lit	Paper form required in printer.	Reload forms as described in 3.2.3. Press and release RUN switch/indicator. Observe that FORMS OUT indicator and STOP switch/indicator are extinguished. Reenter program at proper point.
POWER CHECK indicator (power control panel) lit, DEVICE CHECK indicator lit, STOP switch/indicator lit	1. Power supply output voltage low. 2. One or more power supplies not operating.	Notify the customer engineer. Check circuit breakers (power supply control panel) behind rear panel door of printer. Reset any tripped circuit breaker. If breaker trips again, notify the customer engineer.

0789 Printer Self-Tests and Recovery

The 0789 printer is equipped with a series of self-testing capabilities and a STATUS display that can test all essential functions of the printer. The STATUS display indicates a numerical code that is related to a faulty condition. The codes and required operator actions are listed in Table 3-11.

When performing self-tests, if a function cannot be completed, note the STATUS display code. Follow the procedure listed for that code in Table 3-11, then resume with the self-tests. If the printer is to remain inoperative for an extended time, remove the printer from the list of available resources for software at the system console.

Proceed as follows to perform self-tests on the 0789 printer:

1. Press the ONLINE/OFFLINE switch/indicator (Figure 3-27) to extinguish the indicator (offline).

2. Raise the top cover and set the LINES 6/8 switch to 6 position for 6 lines per inch (lpi) printing density.

3. Press the PAPER STEP switch several times while noting that the paper advances one line each time the switch is pressed.

4. Press and release the TOP OF FORM switch and note that the form slews to the top position of the next form without wrinkling or tearing.

5. Set the TEST switch to the  (right) position for the sliding pattern (Figure 3-28a).

6. Press the ON/OFF switch/indicator for a full page of sliding pattern printout, then press the ONLINE/OFFLINE switch/indicator to halt printing.

7. Examine the sliding pattern printout for good print registration. All letters and symbols should be legible and all columns printed.

8. Set the TEST switch to the  (left) position for the fixed-character pattern (Figure 3-28b).

9. Press the ONLINE/OFFLINE switch/indicator for a full page of fixed-character pattern, then press the ONLINE/OFFLINE switch/indicator again to halt printing.

10. Examine the fixed-character pattern printout for proper registration of the entire printed character. Balance the PHASE control, if necessary, for even printing density on the left and right sides of the characters.

11. Set the COPIES control to minimum setting (counterclockwise) for best print quality on the number of forms being printed. If you are printing on single-part forms, set the control fully counterclockwise.

12. Set the LINES 6/8 switch to 8 position to print at 8 lpi.

13. Press the ONLINE/OFFLINE switch/indicator for a few lines of printing at 8 lpi. Then, press the switch again to halt printing.

14. Examine the printed copy to ensure that line spacing at 8 lpi is satisfactory.

15. Set the FORMS LENGTH SELECT switch for different form lengths, and press the TOP OF FORM switch for each length selected. Note that the paper moves to the length selected with the FORMS LENGTH SELECT switch for each position of the switch.

16. Set the TEST switch to the OFF (center) position, then press the ONLINE/OFFLINE switch/indicator to light the indicator and receive data for printing. Close the printer top cover.

NOTE: If the printer does not operate as directed, note the number displayed on the STATUS indicator (Figure 3-27) and refer to Table 3-11.

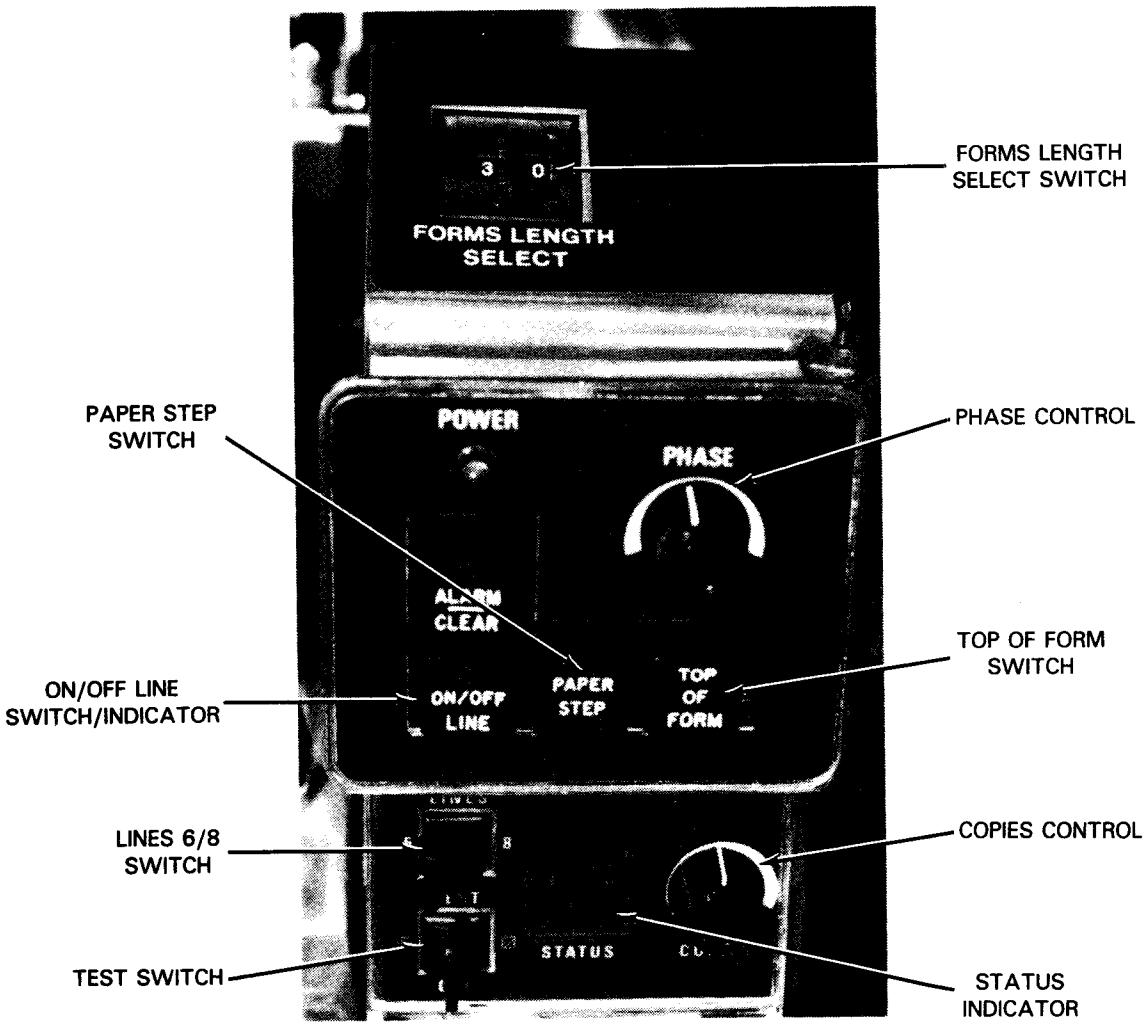
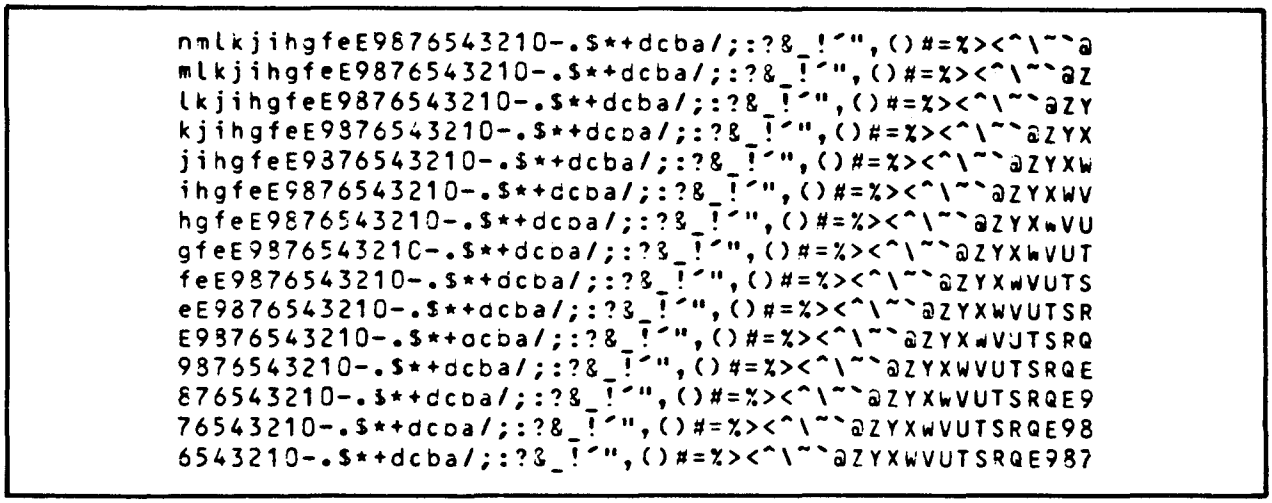
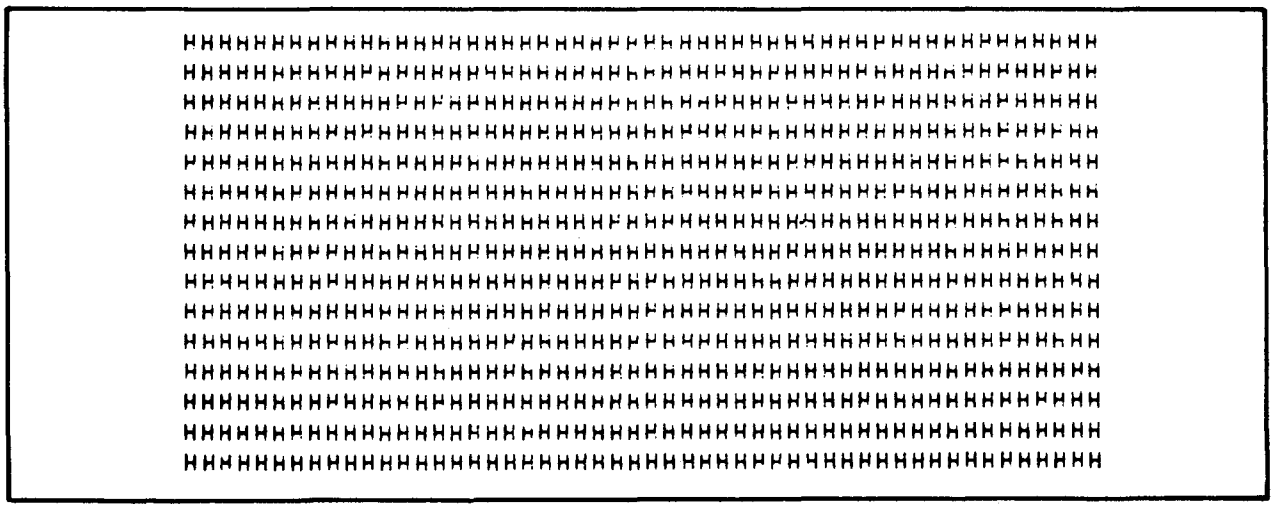


Figure 3-27. 0789 Printer Self-Test Controls



a. Sliding pattern printout



b. Fixed-character pattern printout

Figure 3-28. 0789 Printer Test Patterns

Table 3-11. 0789 Printer Recovery

STATUS Display	Probable Cause	Operator Action
01	Paper low	1. Unload paper from stacker. 2. Reload new supply of forms (3.2.3). 3. Press ALARM/CLEAR switch/indicator (Figure 2–29). 4. Reenter program at proper point.
02	Paper not moving properly	1. Check if sprocket pins are fit into sprocket holes on form (3.2.3), steps 13 through 16. 2. Check paper for alignment, binding, or tears along the feed path. 3. When trouble is corrected, press ALARM/CLEAR switch/indicator (Figure 2–29) to continue operation. If trouble persists, contact the customer engineer and report status code 02.
03	Print band cover open or band release lever not engaged	1. Raise hammer bank latch handle (Figure 3–12a). 2. Open print band cover (Figure 3–10a). 3. Engage band release lever by moving it away from the hammer bank. 4. Close the print band cover (cover closes fully when band release lever is engaged). 5. Lower the hammer bank latch handle (Figure 3–12a). 6. Press the ALARM/CLEAR switch/indicator (Figure 2–29) and retry the operation.
04	Hammer bank open	Lower the hammer bank latch handle (Figure 3–12a).
05	PROM does not match print band	Contact the customer engineer and report status code 05.
06	Inked ribbon not moving properly or jammed	1. Refer to 3.2.3 to remove and reinstall a new inked ribbon. 2. Press ALARM/CLEAR switch/indicator (Figure 2–29) and retry the operation.
→ 08	Forms length not defined correctly	1. Set FORMS LENGTH SELECT switch (Figure 3–27) according to the form length used in paper installation. 2. Set the LINES 6/8 switch according to the line density to be printed. 3. Press the ALARM/CLEAR switch/indicator (Figure 2–29). 4. Retry the operation. If the condition persists (same STATUS display), contact the customer engineer and report status code 08.

(continued)

Table 3-11. 0789 Printer Recovery (cont)

STATUS Display	Probable Cause	Operator Action
10	Vertical format not loaded into memory	1. Press the ALARM/CLEAR switch/indicator (Figure 2–29). 2. Reload the vertical format data at the host system. 3. Retry the operation. If the condition persists, contact the customer engineer and report status code 10.
17	Print band not synchronized	1. Set 1/0, switch (power on/off), shown in Figure 2–28, to 0 (off), then back to 1 (on) position. 2. Press ALARM/CLEAR switch/indicator (Figure 2–29). 3. Reenter the program at the proper point and resume operation. If the condition persists, contact the customer engineer and report the status code displayed on the STATUS indicator.
21	Printing inhibited	
22	Interface cable not properly connected	Contact the customer engineer and report status code 22.
24	Data error caused eight consecutive overprints	1. Press ALARM/CLEAR switch/indicator (Figure 2–29). 2. Retry the operation. If the problem persists, contact the customer engineer and report the status code displayed on the STATUS indicator.
25	Format code error. Host system sent illegal control character	
33	Integrity error indicated in data RAM	1. Set 1/0 switch (power on/off), shown in Figure 2–28, to 0 (off), then back to 1 (on) position. 2. Press ALARM/CLEAR switch/indicator (Figure 2–29) 3. Retry the operation. If the fault persists, contact the customer engineer and report the status code displayed on the STATUS indicator.
34	Integrity error indicated by an illegal RAM entry	
35	Parity error in band image ROM	1. Press ALARM/CLEAR switch/indicator (Figure 2–29). 2. Retry the operation. If the fault persists, contact the customer engineer and report the status code displayed on the STATUS indicator.
37	Parity error in data RAM	

(continued)

Table 3-11. 0789 Printer Recovery (cont)

STATUS Display	Probable Cause	Operator Action
40	Print band not moving at required speed	1. Set 1/0 switch (power on/off), shown in Figure 2–28, to 0 (off), then back to 1 (on) position. 2. Press ALARM/CLEAR switch/indicator (Figure 2–29). 3. Retry the operation. If the fault persists, contact the customer engineer and report the status code displayed on the STATUS indicator.
41	Paper feed motor or printing mechanism inoperative	
42	Odd print hammers malfunctioning	
43	Even print hammers malfunctioning	
44	+12 volt power supply inoperative	
45	–9 volt power supply inoperative	
46	Power to operate print hammers low or not available	
47	+38 volt power supply inoperative	1. Set 1/0 switch (power on/off), shown in Figure 2–28, to 0 (off), then back to 1 (on) position. 2. Press ALARM/CLEAR switch/indicator (Figure 2–29). 3. Retry to print. If the fault persists, contact the customer engineer and report the status code displayed on the STATUS indicator.
48	Print band sensor inoperative	
49	Excessive current detected in print band drive motor	
50	System status fault indication	
66	Printing inhibited during self test	
→ 67	Printer in self-test mode	1. Press the ON/OFF LINE switch/indicator (Figure 3–27). 2. When printing stops, set the TEST switch to center position. 3. Press the ON/OFF LINE switch/indicator to light the indicator and receive data.

(continued)

Table 3-11. 0789 Printer Recovery (cont)

STATUS Display	Probable Cause	Operator Action
76	Printing inhibited while operating online with host system	1. Press ON/OFF LINE switch/indicator (Figure 3–27). 2. When printing stops, press ALARM/CLEAR switch/indicator (Figure 2–29). 3. Retry to print online. If the problem persists, contact the customer engineer and report status code 76.
77	Printer operating online	This is a normal STATUS display while the printer is operating online with the host system.
88	Printer operating offline	This is a normal STATUS display while the printer is operating offline and not receiving data from the host system.
P	Fault condition exists in printer power supply	1. Allow printer to automatically turn power off. 2. Set 1/0 switch (power on/off), shown in Figure 2–28, to 0 (off), then back to 1 (on). 3. Note if POWER indicator (Figure 2–29) lights. If it does, press the ALARM/CLEAR switch/indicator and resume operation. If the POWER indicator does not light, set the 1/0 switch (power on/off) to 0 (off) position and contact the customer engineer, reporting status code P.
H	Internal overheating has reached overtemperature condition	1. Allow printer to automatically turn power off. 2. Set the 1/0 switch (power on/off), shown in Figure 2–28, to 0 (off) position. 3. Open all printer cabinet doors and raise the top cover. Allow approximately 30 minutes for the printer to cool. 4. After the printer has cooled, set the 1/0 switch (power on/off) to 1 (on) position. 5. Note if the POWER indicator (Figure 2–29) lights. If it does, press the ALARM/CLEAR switch/indicator and resume operation. If the POWER indicator does not light, set the 1/0 switch (power on/off) to 0 (off) position and contact the customer engineer, reporting status code H. NOTE: If power turns off again after operating for a short time, and status code H is displayed, set the 1/0 switch to 0 (off) position and contact the customer engineer, reporting status code H.
C	Error in printer timing clock	1. Allow printer to automatically turn power off. 2. Set the 1/0 switch (power on/off), shown in Figure 2–28, to 0 (off), then back to 1 (on) position. 3. Press ALARM/CLEAR switch/indicator (Figure 2–29). 4. Resume operation. If the problem persists or repeats, contact the customer engineer and report status code C.

(continued)

Table 3-11. 0789 Printer Recovery (cont)

STATUS Display	Probable Cause	Operator Action
HP	Parity error in printer internal microcode	1. Set 1/0 switch (power on/off), shown in Figure 2–28, to 0 (off), then back to 1 (on) position. 2. Press ALARM/CLEAR switch/indicator (Figure 2–29). 3. Retry to resume operation. If the fault persists, contact the customer engineer and report status code HP.

0770 II Printer Recovery

Table 3-12 lists the error indications that are displayed on the operator panel and that the operator can correct. These indications, along with those requiring correction by trained maintenance personnel, are also listed on the outside of the ribbon cover.

WARNING

To avoid exposure to unnecessary hazards and discomfort, close all doors and panels before operating your printer. While it is necessary to keep the rear door open whenever the paper tray extensions are installed, Unisys does not recommend you do so unnecessarily.

Table 3-12. 0770 II Printer Recovery

Error Indication		Probable Cause	Operator Action
Code	Name		
E002	Gate Open	Band gate open	Close band gate.
E003	End of Form	Out of forms	Replace forms.
		Forms incorrectly installed	Install forms correctly.
E004	Forms Check	Jamming due to damaged forms	Check paper feed adjustments, particularly tractor settings..
		Excessive vertical spacing	If condition persists, set the HIGH SKIP switch to OFF.
E005	Ribbon Check	Ribbon life expired	Replace ribbon.
		Ribbon incorrectly installed	Install ribbon correctly.
E007	Stacker Check	Stacker full	Remove printed forms and adjust stacker table.
		Forms jammed or misfolded in stacker	Clear stacker of jam. If error persists, check stacker adjustments.
		Stacker incorrectly adjusted	Check stacker adjustments.
		Printing on horizontal perforation	Adjust horizontal print position knob.
		Forms feed holds elongated	Adjust tractor assembly.
			Adjust FORM THICKNESS knob.

3.3. CONSOLE DISPLAY OPERATION

This section tells how to operate the console display after you have performed the power-on procedures described in 3.1.3.

3.3.1. Power-On Self-Tests

When power is turned on and no power fault conditions (3.1.4) occur, the system continues running self-tests. On the model 8, the console display screen displays the following message to indicate that testing continues:

. .
. . **HEALTH CHECK RUNNING**

The models 10/20 console display screen displays this message to indicate testing:

. .
→ . . **SYSTEM 80 MOD 10/20 PWR ON SEQUENCE START (MODxx)**

where xx is 10 or 20

During the testing cycle, the self-test program checks system status on:

- P-bus (model 8) and L-bus (models 10/20) error detection circuit, in which:
  - A parity error is generated and transmitted to test the service microprogram
  - Data with a reversed P-bus or L-bus data line parity is sent to the processor to test for normal return of parity errors
  - The SVP executes functions having illegal sequences to the processor and confirms their detection (models 10/20 only)
- System hard-core memory for abnormal status in the:
  - Processor
  - Channel controller (model 8 only)
  - Byte multiplexer (model 8 only)
  - Main storage unit
  - System functions.

- The processor cycle operation, which places the processor in check-stop state to perform tests (model 8 only) on:
  - Read-only memory (ROM)
  - Scratch memory (SM)
  - Constant memory (KM)
  - Stack register (STK)
- Error check circut tests (models 10/20 only):
  - The SVP activates the compulsory faults with an error insert function and confirms proper detection.

Upon completing this test, the processor status and the preceding system hard-core check are repeated. If an error occurs, the processor remains in check-stop state and testing stops.

During power-on self-testing, if an error is detected, any of the error messages listed in Table 3-13 (model 8) and Table 3-14 (models 10/20) may be displayed on the console display screen. Actuate the CHECK RESET switch on the system console (Figure 2-1) to silence the alarm buzzer. Then set the POWER ON/OFF switch to OFF and then again to ON position to initiate a new power-on sequence. If the problem persists, contact the customer service engineer and describe the error message on the console display screen. ←

Table 3-13. Model 8 Self-Test Error Messages

Message	Meaning
** PA P/E NOT OCCURRED PA = x AR=yy [IOP=n] where: x = processor address yy = contents of service internal register n = IOP address	An unexpected error has occurred during the processor address parity error generation test.
** DPE {Ø-7 / 8-15} NOT OCCURRED PA= x AR=yy [IOP=n] where: x = processor address yy = contents of service internal register n = IOP address	An unexpected error has occurred during the processor bus data parity error generation test.
** PA=x {CPU / MSU / CHC / B-MUX / ISC / D-MUX / SF} ERROR	There is an error in the status reported from the processor (CPU), main storage unit (MSU), channel controller (CHC), byte multiplexer (B-MUX), integrated selector channel (ISC), D-multiplxer channel (D-MUX), or software function (SF) after power is turned on to the model 8.
CPU H-STOP FUNC ERROR	The processor is not in hardware stop state.
** CPU CYCLE {ROM / SM / KM / STK / REG} {CANNOT START / ERROR} ** STATUS=zz ..... z where: zz .....z = contents of status in processor	The processor read-only memory (ROM), search memory (SM), constant memory (KM), or stack register (STK REG) cycle cannot start operation or it contains an error. Therefore, operation cannot end normally.

Table 3-14. Models 10/20 Self-Test Error Messages

NOTE: See the notes at the end of Table 3-14 for an explanation of the variables that appear in messages described in the table.

Message	Meaning
** PA P/E NOT OCCURRED PA = x AR=YY [IOP=n]	An unexpected error has occurred during the processor address parity error generation test.
** DPE {Ø-7 / 8-15} NOT OCCURRED PA= x AR=YY [IOP=n]	An unexpected error has occurred during the processor bus data parity error generation test.
** PA=x{BPU / MMU / SEL / IOP / MIA} ERROR ** STATUS=zz.....z ERLGØ =mm.....m ERLG1 =mm.....m ERLG2 =mm.....m	There is an error in the status reported from the processor (BPU, MMU, SEL, IOP, MIA) after power turn-on on the models 10/20.
BPU H-STOP FUNC ERROR	The processor is not in hardware stop state.
** MMU DPE #Ø-#1 NOT OCCURRED	There is an error in the data parity of MMU.
** MMU UAM NOT OCCURRED	There is an error in the invalid sequence test of MMU.
** MMU ESE NOT OCCURRED	There is an error in the invalid sequence test of ECC 1-bit failure.
** MMU EME NOT OCCURRED	There is an error in the invalid sequence test of ECC 2-bit failure.
BPU POC ERROR STATUS = zz...z TIME OVER	The error check circuit test of BPUs didn't terminate within 5 seconds.
BPU POC ERROR STATUS = zz...z LS (A4) = pp...p	The status 'MLOG' occurred in the error check circuit test of BPU.
SEL NOqq POC ERROR STATUS = zz...z LBOUL = mm...m TIME OVER	The error check circuit test of SEL didn't terminate within 2 seconds.
SEL NOqq POC ERROR STATUS = zz...z LBOUL = mm...m	The status 'ED' occurred in the error check circuit test of SEL.

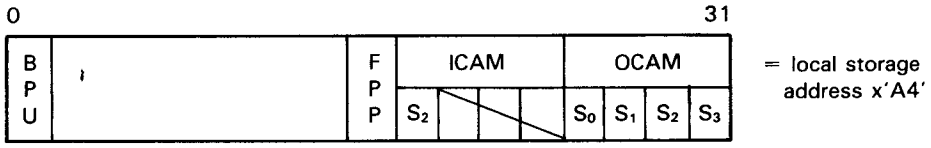
(continued)

Table 3-14. Models 10/20 Self-Test Error Messages (cont)

Message	Meaning
SEL NOqq POC ERROR STATUS = zz...z REPLY DATA = mm...m	The status 'ED' occurred in the execution of SIO, AIO, and HIO of the error check circuit test of SEL.
S-BUS ERR yy STATUS = uu	An S-BUS protocol error occurred in the error check circuit test of SEL.
L-BUS ERR yy	An L-BUS protocol error occurred in the error check circuit test of SEL.
SEL NOqq LOAD ERROR	An error occurred in the error check circuit test of SEL while loading SEP microprogram to SEL.
PA = x BPU ERROR STATUS = zz...z ERLOG = mm...m	Unexpected status bits were reported from the BPU in the status register check test of the BPU.
PA = x SEL ERROR STATUS = zz...z ERLG = mm...m	Unexpected status bits were reported from SEL in the status register check test of SEL.

Notes:

#0-#1	=	bit location
mm...mm	=	contents of error register of each processor
n	=	IOP address
pp...p	=	area of failure indication which may be the BPU, the floating point processor (FPP), the instruction cache, or the operand cache (see figure below)



qq	=	SEL#
uu	=	S-Bus status
x	=	processor address
yy	=	contents of service internal register
zz	=	contents of status in processor

3.3.2. Initial Microprogram Loading

After system power is turned on and the self-tests complete successfully, the system automatically begins initial microprogram loading (IMPL). The service processor (SVP), within the processor cabinet, initiates IMPL to the processing unit and the input/output (I/O) processors.

NOTE: The term input/output processor (I/O processor) is system independent and refers to both the model 8 input/output microprocessor (IOMP) and the models 10/20 input/output processor (IOP).

The SVP writes data stored on the diskette into the processing unit and I/O processors. If an error occurs during IMPL, an error message pertaining to IMPL is displayed. If you cannot correct the error, contact the customer engineer and forward the error message. Table 3-15 lists model 8 IMPL error messages. Table 3-16 lists models 10/20 IMPL error messages.

NOTE: The system continues to operate with an incorrect IMPL, but results are unpredictable.

Table 3-15. Model 8 IMPL Error Messages

Message	Meaning
CPU IMPL FILE CANNOT BE FOUND	The file read from the diskette for IMPL was either not correct or none was available.
CPU IMPL FAIL2-XX where: XX=Ø1 P-bus error Ø3 log request Ø4 CPU check-stop Ø5 WDT runout	A P-bus error occurred during IMPL.
CPU IMPL FAIL4-YY where: YY=8Ø not ready 4Ø time over 2Ø seek error 1Ø ID not found Ø8 CRC error Ø4 overrun Ø2 record not found Ø1 sector over	An error occurred in the diskette drive while reading IMPL data from the diskette,
CPU IMPL FAIL8 ADRS = xxxx EXP = xxxxxxxxxxxxxxxxxxx OBS = xxxxxxxxxxxxxxxxxxx	A mismatch was detected when data that was written into the processor for IMPL was read and compared with data for IMPL on the diskette.

NOTE:

The system continues to operate with an incorrect IMPL, but results are unpredictable.

When the models 10/20 system power is turned on, the service processor (SVP) performs IMPL to the following:

- BPUs
- SELs
- I/O processors

Table 3-16 explains the error messages displayed if a failure occurs.

Table 3-16. Models 10/20 IMPL Error Messages

Message	Meaning
`BPU IMPL ff FILE NOT FOUND` where `ff` = file name	The BPU IMPL file is not on the FDD.
`BPU IMPL ff L-BUS ERR xx` where `ff` = file name `xx` = L-BUS error code (see Note 1)	An L-BUS error occurred during IMPL.
`BPU IMPL ff FDD ERR yy` where `ff` = file name `yy` = FDD error code (see Note 2)	An FDD error occurred while reading the IMPL data from the diskette drive.

`BPU IMPL ff COMPARE ERR`
`ADRS = xxxx`
`EXP = xxxxxxxx`
`OBS = xxxxxxxx`
	A mismatch was detected when data that was written into the processor for IMPL was read and compared with data for IMPL on the diskette.

`SEL NOnn IMPL ff FILE NOT FOUND` where `nn` = SEL number `ff` = file name	The SEL IMPL file does not exist on FDD0.
`SEL NOnn IMPL ff L-BUS ERR xx` where `nn` = SEL number `ff` = file name `xx` = L-BUS error code (see Note 1)	An L-BUS error occurred during IMPL.
`SEL NOnn IMPL ff FDD ERR yy` where `nn` = SEL number `ff` = file name `yy` = FDD error code (see Note 2)	An FDD error occurred while reading the IMPL data from the FDD.

(continued)

Table 3-16. Models 10/20 IMPL Error Messages (cont)

Message	Meaning
SEL NOnn IMPL ff COMPARE ERR ADRS = xxxx EXP = xxxxxxxx OBS = xxxxxxxx where nn = SEL number ff = file name	A compare error occurred during a data compare check.
IOPn IMPL ff FILE NOT FOUND where n = IOP number ff = file name	The IOP IMPL file is not on FDD0.
IOPn IMPL ff L-BUS ERR xx where n = IOP number ff = file name xx = L-BUS error code (see Note 1)	An L-BUS error occurred during IMPL.
IOPn IMPL ff FDD ERR yy where n = IOP number ff = file name yy = FDD error code (see Note 2)	An FDD error occurred while reading the IMPL data from the FDD.
IOPn IMPL ff FAILED POC where n = IOP number ff = file name	An IOP power on confidence failure occurred during an IOP check.
IOPn IMPL ff ILLEGAL RECORD FOUND IN IOML FILE where n = IOP number ff = file name	An illegal record exists in the IOML file.
IOPn IMPL ff COMPARE ERR ADRS = xxxx EXP = xxxxxxxx OBS = xxxxxxxx	A compare error occurred during a data compare check.

(continued)

Table 3-16. Models 10/20 IMPL Error Messages (cont)

Note 1 xx = one of the following L–BUS error codes:

- 80: BPE : Input data parity error
- 40: IOV : SS time over
- 20: DPE : Output data parity error
- 10: PAE : Processor address parity error
- 08: BTOV: BAU time over
- 04: ISAC: Invalid SAC
- 02: SACE: SAC time over error
- 01: ISSC: Illegal Slave Sync

Note 2 yy = one of the following FDD error codes:

- 80: NRDY: Not ready
- 40: TMOV: SEEK time over
- 20: SEKE: SEEK error
- 10: IDNF: ID not found
- 08: CRCE: CRC error
- 04: OVRN: Over run
- 02: NRDF: Not Record Found
- 01: SECO: Sector over

3.3.3. Initial Program Loading

Upon completion of an IMPL, if the IPL/NML/AUTO switch (model 8) or the IPL/MNL/AUTO switch (models 10/20) is set to AUTO on the system console, the system automatically initiates an initial program load (IPL) . The IPL initiates loading of programs into main storage and is part of a normal power-on sequence. You can then proceed with normal operation using the system resident (SYSRES) integrated disk subsystem.

If an IPL does not complete successfully, an IPL error message is displayed on the screen. If you cannot correct the problem, contact the customer service engineer and forward the error message. Table 3-17 lists model 8 IPL error messages and their meanings. Table 3-18 lists models 10/20 IPL error messages and their meanings.

NOTE: The I/O device to perform the IPL has its address stored on the diskette, and the address is specified on the configuration control frame.

Table 3-17. Model 8 IPL Error Messages

Message	Meaning
P-BUS FUNC ERR (IPL/STSRB)	The IPL command to the processor was not executed correctly.
SYSTEM RESET TIME OUT	System reset did not occur before an IPL was initiated.
IOP ADRS NOT EXIT	The I/O device address recorded on the diskette that is to perform an IPL is illegal. The specified I/O processor does not exist in the system configuration.

NOTE:

The I/O device to perform the IPL has its address stored on the diskette, and the address is specified on the configuration control frame.

Table 3-18. Models 10/20 IPL Error Messages

Message	Meaning
L-BUS FUNC ERR (IPL/REGR1)	The BPU IPL command was not executed normally.
SYSTEM RESET TIME OUT	System reset was not performed normally before IPL.
IPL TIME OUT ERR CODE = x DEVICE ADRS=yyy SIO CC = x AIO CC = x DS = xx CS = xx SN(x) DEV ADRS = xxx	System reset was performed normally, but IPL was not performed normally. This message is also displayed when the I/O device that is to perform AUTO IPL is not in the READY state.
CHANNEL ADRS NOT EXIST ADRS = xxx	The I/O device address recorded on the flexible disk sheet as the AUTO IPL device is illegal (the specified I/O processor does not exist in the system).

3.3.4. Processor Error at Power On

When you reset the system with a power-on sequence, the system processors are initialized. An IPL is performed if the IPL/NML/AUTO switch (model 8) or the IPL/MNL/AUTO switch (models 10/20) is set to AUTO on the system console. However, if this initialization does not complete as normal due to some error, the faulty processor reports the error to the service (SVP) processor via the processor bus (P-bus) on the model 8, or via the L-bus on the models 10/20.

Upon receiving an error report, the SVP inhibits further error reports until the error is corrected and the system is reset. A processor error during power-on, IMPL, or IPL causes one of the following messages to be displayed for the operator:

- Model 8 message:

P-BUS IT MASK
TBL=XXYYZZPPSSSSSSSS:XXYYZZPPSSSSSSSS:XXYYZZPPSSSSSSSS

- Models 10/20 message:

L-BUS IT MASK
TBL=XXYYZZPPSSSSSSSS:XXYYZZPPSSSSSSSS:XXYYZZPPSSSSSSSS

where:

P-BUS IT MASK or **L-BUS IT MASK**

Is the masked log request that is masked when the operator presses the IMPL switch on the system control panel, and is unmasked by resetting the system.

XX

Is the error code, as follows:

Model 8:		Models 10/20:	
01	P-bus error	01	L-Bus error
03	Log request	03	Log request
04	CPU check stop	04	BPU check stop
05	WDT runout		

YY

Is the processor address, as follows:

Model 8:		Models 10/20:	
00	CPU	00	BPU
40	Channel controller 0	20	MMU
50	Channel controller 1	50	IOP0
70	D-multiplexer	60	IOP1
80	Main storage unit 0	70	MIA
90	Main storage unit 1	80	SEL1
E0	System function	90	SEL2
F0	Service processor	A0	SEL3
		B0	SEL4
		C0	SEL5
		D0	SEL6
		F0	Service processor

ZZ

Model 8:

Is the low order 2 bits of the IOP address.

Models 10/20:

Is the L-bus subfunction.

PP

Is the contents of the SVP external register 62, as follows:

bit 7 CPU check stop
6 Log request
5 Processor address parity error
4 BAU timeover
3 ED mask
2 CPU stop
1 BAU error free
0 Not used on model 8; is the MSC receive bit for models 10/20

SSSSSSSS

Is the processor status.

3.3.5. System Console Operations Control

The system console (Figure 2-1) is the operating center to control system operations and maintenance. The basic units comprising the system console are:

- System control processing unit (SCP)
- System control panel
- Console display
- System diskette drive

Power for the system is controlled at the system console, while the system control panel continuously monitors the operating state of the system. The system diskette drive is used for providing microcodes during initial microprogram load (IMPL), as well as for storage of diagnostic programs and logout required by the customer service engineer.

There are seven basic ways that you can use the system console. It functions as:

1. Operator console

   This is the normal operating function in which you communicate with the system; it is under program control.

2. System control

   You can start and stop the system with this function, change the system configuration when required, initiate program load (IPL), and perform other similar basic operations.

3. System control panel

   This function indicates system status for your use, as well as for the customer service engineer.

4. System supervision

   This function collects error information that may be reported by the system processing units. These include the main storage unit (MSU), central processing unit (CPU), channel controller (CHC), input/output processors (IOP or IOMP), byte-multiplexer (MUX), system control processor (SCP), D-multiplexer (D-MUX), and selector channels (SELS). Note that the CHC and B-MUX exist only on the model 8.

5. Maintenance console

   The customer service engineer uses this function to perform maintenance and diagnostics for each component of the computer system.

6. System automatic recovery

   You can perform an automatic error recovery from an erroneous IPL with this function. The system reverts to check stop state to inform you when this function is required (3.3.4).

7. Remote maintenance

   This function allows the customer service engineer to perform maintenance remotely from the maintenance center at the system console.

3.3.6. Keyboard Command Control

Use the keyboard to input commands to the processor and communicate with the system. When you press the ESC key, a command input mode is initiated. You can enter commands by pressing the appropriate key while also pressing and holding the ESC key.

NOTE: On the model 8, the LOCK/UNLOCK switch (Figure 2-1) must be set to the UNLOCK position before operator commands can be entered through the keyboard.

Two basic commands that you will use often are the RUN and STOP commands. You can select other commands relating to specific frame selections (3.3.7) as required.

Run Command

Enter the RUN command by pressing the ESC then the R character key. The command switches the processor from stop state to operation state to begin executing software instructions.

The RUN command can be accepted only when the processor is already in stop state (STOP indicator is lit). When the RUN command is accepted, the STOP indicator or the system console (Figure 2-1) is extinguished and the RUN indicator lights.

Stop Command

To enter the STOP command, press the ESC key then the S character key. The command switches the processor from operating state to stop state to perform functions while in stop state.

The STOP command can be accepted only when the processor is in run state (RUN indicator is lit). When the STOP command is accepted, the RUN indicator on the system console (Figure 2-1) is extinguished and the STOP indicator lights.

3.3.7. Console Display Screen Frames

There are seven basic display frames presented on the console display screen. The frames are applicable to specific operating modes of the console display. There are generally four operating modes. These operating modes, their related display frames, and the keys pressed to enter each frame are listed in Table 3-19.

You must be familiar with these functions in order to communicate and operate with the system. Later subsections describe uses for the display frames. The customer service engineer uses the maintenance frame and remote processing frame for maintenance.

Table 3-19. Console Modes and Display Frames

Console Mode	Display Frame	Key Input
Operator Console Mode	Console frame	CNSL
System Control Mode	Configuration control Manual frame Alter/display frame	ESC and C ESC and M ESC and A
Maintenance Console Mode	Maintenance frame	ESC and P
Remote Maintenance Mode	Remote processing frame (teleprocessing)	ESC and T
Index	Index frame	ESC and I

Manual Frame

You can enter and display the manual frame on a screen (Figure 3-29 for the model 8, Figure 3-30 for the models 10/20) by pressing the ESC and M keys on the keyboard (Figure 2-6). Use the manual frame to manually perform an initial program load (IPL), and to debug programs or operations.

The functions that you can perform in manual frame are listed for menu selection in the frame display. Select the functions by pressing the character key listed with the function, along with the new line key (Figure 2-6). The menu selections are as follows:

- **PROG LOAD (program load)**

  This function performs an IPL according to the menu selection.

  - N key (NORMAL)

    Pressing the N key (models 8/10/20) after an initial program reset normal condition allows an IPL to be performed from the assigned I/O device.

  - G key (NORMAL NO RESET)

    Pressing the G key (models 10/20 only) performs an IPL without resetting the system.

  - C key (CLEAR)

    Pressing the C key (models 8/10/20) after an initial program reset clear condition allows an IPL to be performed from the assigned I/O device.

    NOTE: The difference between a normal and clear IPL, is that the CPU registers are cleared or validated, or the main memory is cleared or validated.

```
  ENTER.          .
PROG LOAD (000-FFF)              CONTROL
N NORMAL                         U RUN
G NORMAL (NO RESET)              Q STOP
C CLEAR

                                 RESET
T IMPL                           L SYSTEM
 0 ALL       2 DMUX              B BPU
 1 BPU

                                 COMPUTE CTRL
ADR STOP (0-FFFFFFFF)            P NORMAL
M NORMAL                         S STEP
I STOP IA
A STOP ANY                       CHECK CTRL
                                 H NORMAL
                                 K STOP
W SENSE SW (0000-1111)
  -0000-                         V STORE STATUS
                              SNAP=FF010002 01800000
BPU STATUS=S                 HPR=99000000  00000000
INS=81100102A0C8   PSW=00000000  00000000  RLR=0000000
```

Figure 3-29. Model 8 Manual Frame Display

```
  ENTER.          .
PROG LOAD (000-FFF)              CONTROL
N NORMAL                         U RUN
G NORMAL (NO RESET)              Q STOP
C CLEAR

                                 RESET
T IMPL                           L SYSTEM
 0 ALL       2 DMUX              B BPU
 1 BPU       3 SEL

                                 COMPUTE CTRL
ADRS STOP(0-FFFFFFFF)            P NORMAL
M NORMAL                         S STEP
I STOP  IA
A STOP  ANY                      CHECK CTRL
                                 H NORMAL
                                 K STOP
W SENSE SW(0000-1111)
 -0000-                          V STORE STATUS

BPU STATUS=S
INS=17FCC39FE3FC   PSW=00000000 00000000        RLR=00000000
```

Figure 3-30. Models 10/20 Manual Frame Display

- **T IMPL**

  This function performs an IMPL for the processor you specify. The choices are as follows:

  - ALL
  - BPU
  - DMUX
  - SEL (model 10/20 only)

- **ADR STOP**

  The address stop function stops the processor at that frame from accessing the assigned main storage location. Main storage address is assigned by keying in the eight digits 0-FFFFFFFF (hexadecimal) after a selected menu character, as follows:

  - M key (NORMAL)

    Causes the address stop function and trace function to be released.

  - I key (STOP IA)

    The assigned address is taken as a relative address and the processor is set to stop state when the address entered is reached. At the same time, macroinstructions are fetched from the processor. The higher two digits, and eight hexadecimal digits form the SPR key for assigning the relocation register; the lower seven digits are the relative address. The memory key is assigned by bits 0 to 5. The byte address is assigned by bits 8 to 31. The instruction address is compared to the SPR key address only when the value of the assigned SPR key coincides with the current PSW SPR key.

  - A key (STOP ANY)

    The assigned address is taken as an absolute address, and the processor is set to stop state when the address is referenced.

    When the address stop control is in STOP IA or STOP ANY state, the TEST indicator on the system control panel (Figure 2-1) is lit, and the stop identification with stop address is indicated on the console display screen, except when in program frame.

    An absolute address must be assigned with a double-word boundary on the model 8, or with a word boundary on the models 10/20. The byte address in the lower three bits is ignored, and the system stops when accessing the double-word (model 8) or word (models 10/20) boundary. ←

- **W key (SENSE SW)**

  The sense switch (-0000-) is four bits long; the switch state can be set by pressing the W key and following it with 1's and 0's for the 4-bit state. The sense switch setting can be read out by a program using the read-sense-switch instruction (0000-1111). In addition, contents of the sense switch can be changed by program load or with the write-sense-switch instruction.

- **CONTROL**

  You can start or stop the processor according to the manual frame currently displayed.

  - U key (RUN)

    Pressing the U character key permits processor input, and the processor changes from stop to operation state.

  - Q key (STOP)

    Pressing the Q character key also permits processor input, but the processor changes from operation to stop state.

- **RESET**

  You can reset the system or processor.

  - L key (SYSTEM)

    Pressing the L key resets the system.

  - B key (BPU)

    Pressing the B key resets the processor only.

- **COMPUTE CTRL**

  This function allows you to execute an instruction in either normal speed or in step form.

  - P key (NORMAL)

    Pressing the P character key causes the processor to execute instructions continuously at normal speed.

  - S key (STEP)

    The processor is placed in step mode and stops after executing one macroinstruction when the S character key is pressed. This mode does not affect input/output operation, and execution of all instructions may be in step form. The TEST indicator is lit on the system control panel while in step mode.

- **CHECK CTRL**

You can cause the processor to enter stop state by using the check control function when a machine-check condition occurs:

- H key (NORMAL)

  Pressing the H character key releases the stop on the check control function, and a check stop does not occur.

- K key (STOP)

  Pressing the K character key stops the processor if a machine check is detected. The TEST indicator is lit on the system control panel when a check STOP is selected.

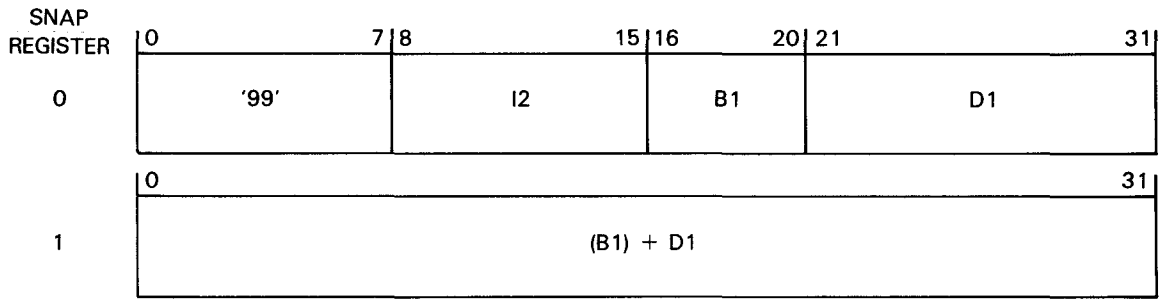
- V key (STORE STATUS)

  Pressing the V character key allows the store-status function to be used for input. The processor internal state is evacuated once to scratch memory in the processor. Later, a logout is made of data in main memory. The main memory address is assigned by control register 15. The format is the same as for a processor logout.

- **HPR**

The HPR (halt and proceed) display is a stop indication. With an HPR command, the HPR command image, operand 1 address, and the current program state word (PSW) during execution of HPR are respectively stored in SNAP registers 0, 1, 2, and 3. This also creates a stop state.

SNAP registers 0 and 1 have the following formats during HPR stop:



The HPR stop condition is released when the processor is changed from stop to operation state. The HPR stop condition is not indicated for this or any other reason. However, contents of the SNAP register remain unchanged until a subsequent setting is made.

Contents of the SNAP register may be sent to main storage, while maintaining the operating state, when the HPR command causes the stop state. During execution of the HPR command, the current PSW, which was stored in SNAP registers 2 and 3, can be seen only on the alter/display frame of the console display screen.

Note that in the manual frame display (Figures 3-29, 3-30), the menu characters flicker for address stop control (ADR STOP), compute control (COMPUTE CTRL), and check control (CHECK CTRL). The address of the address stop control (ADR STOP) is indicated below the address stop control menu, and the sense switch (W SENSE SW) state is indicated with its corresponding bits, below the sense switch menu.

The processor state condition is indicated at the bottom of the manual display frame. If the processor is in the operating or stop state, the current PSW, stop condition, and instructions are displayed.

Alter/Display Frame

You can enter the alter/display frame (Figure 3-31) on the screen by pressing the ESC and A keys on the keyboard (Figure 2-6). Among other capabilities with this function, you can also:

- Display stored contents of registers in main storage and the processor
- Convert addresses from relative to absolute
- Perform operations in hexadecimal form.

```
                        ENTER.
                       DISPLAY    CONTENTS
                       ADDRESS

M MEMORY ABSOL         ______     --------    --------
R MEMORY RELTV         ______     --------    --------
K STORAGE KEY          ______      -------    --------
S SUPER REGS           ______      -------    --------
U USER REGS            ______      -------    --------
F FLOATING REGS        ______      -------    --------
C CTRL REGS            ______     --------    --------
N SNAP REGS            ______     --------    --------
P PSW                  ______     --------    --------
T ADRS TRANS           ______     --------    --------

                     STORE ADDRESS

                       ------

INS=XXXXXXXXXXXX  PSW=XXXXXXXX XXXXXXXX RLR=XXXXXXXX
```

Figure 3-31. Models 8/10/20 Alter/Display Frame

Perform each function displayed in the alter/display frame in three steps:

1. Select the character for the specific function to be performed and press the appropriate key on the keyboard.

2. Key in the display address in hexadecimal.

3. Press the XMIT key on the keyboard.

The display is one word, consisting of eight characters, with each four bits in hexadecimal. Following this display, the information in the frame is stored, and the store address is displayed.

To change the contents that were stored following the display (store mode), or to confirm the stored address:

1. Key in the display address characters (in hexadecimal) in the same manner as new data would be entered.

2. Press the XMIT key on the keyboard to add 4 (4 bytes = 1 word) to the store address.

   NOTE: If you press the XMIT key without entering new data, the data is not stored, but 4 is added to the store address.

After a total of 64 is added to the store address in main storage, the store address remains in that condition while the next 16 words are displayed. The address is incremented to accommodate the next 16 words that are displayed.

For the general, control, and snap registers, 0 is displayed again as the store address when the total exceeds 15.

For the floating point register, 0 is displayed again as the store address when the total exceeds 7.

During store mode, computing is in hexadecimal, but the following characters are subject to special control. With each of the following characters, contents of corresponding main storage and register do not change because of this condition, and the store address does not advance. The characters subject to change are:

- + addition:

  A hexadecimal value entered after the + sign is added to contents at the store address, with the result displayed on the screen.

- - subtraction:

  A hexadecimal value entered after the - sign is subtracted from contents at the store address, with the result displayed on the screen.

- L left 1-bit shift:

  Contents at the store address are shifted one bit to the left and the result is displayed on the screen.

- R right 1-bit shift:

  Contents at the store address are shifted one bit to the right and the result is displayed on the screen.

To regain the store display during store mode, press the DEL key on the keyboard. This permits you to select from the menu presented on the alter/display frame.

The alter/display frame is effective only when the processor is in stop state. If you select the alter/display frame while in any other state, the alter/display frame is displayed, but the KEY-IN ERROR message is displayed upon attempting to select a menu and the selection is not made.

In addition, if the processor is operating in step mode (selected with the COMPUTE CTRL menu while operating in manual frame) during store operation, the processor enters stop state after executing the command. At the same time, the alter/display frame is updated to indicate the latest information.

You can perform the following operations by menu selections with the alter/display frame:

- **MEMORY ABSOL**

  You can select absolute addressing of main storage by pressing the M character key. The absolute address is keyed in with a maximum of six hexadecimal characters following the M key, then the XMIT key is pressed. Contents of the 16 words follow the absolute address that was entered and are displayed on the frame. The keyed in byte address is converted to a word boundary by changing the two lower bits to 0, causing one byte to be displayed by this word address. The store byte address must always store the data in the word unit at the word boundary.

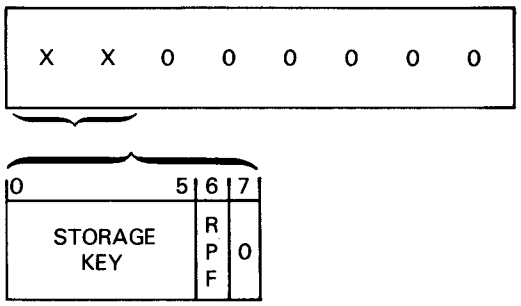
- **MEMORY RELTV**

  You can select relative addressing of main storage by pressing the R character key. The relative address is keyed in with a maximum of six hexadecimal characters following the R key, then the XMIT key is pressed. The entered relative address is converted to an absolute addition of the current PSW SPR key. Contents of the 16 words of main storage following the converted absolute address are displayed.

  As in absolute address keyin, the relative keyed-in byte address is also converted to a word boundary by changing the lower two bits to 0, causing one word to be displayed by this byte address. The store byte address again must always store data in the word unit at the word boundary.

- **STORAGE KEY**

  You can select the storage key by pressing the K character key for that menu selection. The storage key is keyed in with a maximum of six hexadecimal characters for the actual address, then the XMIT key is pressed. Two characters are displayed on the frame for a total of eight bits, consisting of six bits of storage key for the assigned page, plus one bit read protection flag, plus one zero bit, as follows:



  where:

  RPF = Read protection flag

All of the following registers and memory can be altered except the snap registers. The cursor appears in the alter area of the frame after data that was requested appears. If no data is to be altered or data altering is complete, press the DEL key to move the cursor to the menu area of the frame. The processor must be in stop mode to use this frame. A KEY-IN ERROR message is displayed if an entry is made but the processor is not in the stop state. Addition, subtraction, L left 1-bit shift, and R right 1-bit shift can be used to alter data.

- **SUPER REGS**

  You can select the supervisor general register by pressing the S character key, then the XMIT key. Contents of the 16-word supervisor general register are displayed on the frame.

- **USER REGS**

  You can select the user general register by pressing the U character key, then the XMIT key. Contents of the 16-word user register are displayed on the frame.

- **FLOATING REGS**

  You can select the floating point general register by pressing the F character key, then the XMIT key. Contents of the floating point register 4-words are displayed on the frame.

- **CTRL REGS**

  You can select the control register by pressing the C character key, then the XMIT key. Contents of the 16-word control register are displayed on the frame.

- **SNAP REGS**

  You can select the snap register by pressing the N character key, then the XMIT key. Contents of the 16-word snap register are displayed. The store function is ignored for this register; therefore, the snap register can be displayed but cannot be used to store.

- **PSW**

  You can select the current program status word by pressing the P character key, then the XMIT key. The program status word (PSW) and the relocation register are displayed on the frame.

- **ADRS TRANS**

  You can convert relative addresses to absolute addresses for display by pressing the T character key, then the XMIT key.

Configuration Control Frame (Display)

Enter the configuration control display frame by pressing the ESC then C keys on the keyboard. This frame is used to display and update the following displayed contents:

- Console connection and operation mode configuration
- Central processor unit, input/output processor, and main storage system control processor configuration
- Additional functions for each processor
- Automatic recovery mode
- Input/output address for an I/O device used for automatic IPL
- Other contents

The model 8 display configuration control frame is illustrated in Figure 3-32. Figure 3-33 illustrates the models 10/20 display configuration control frame.

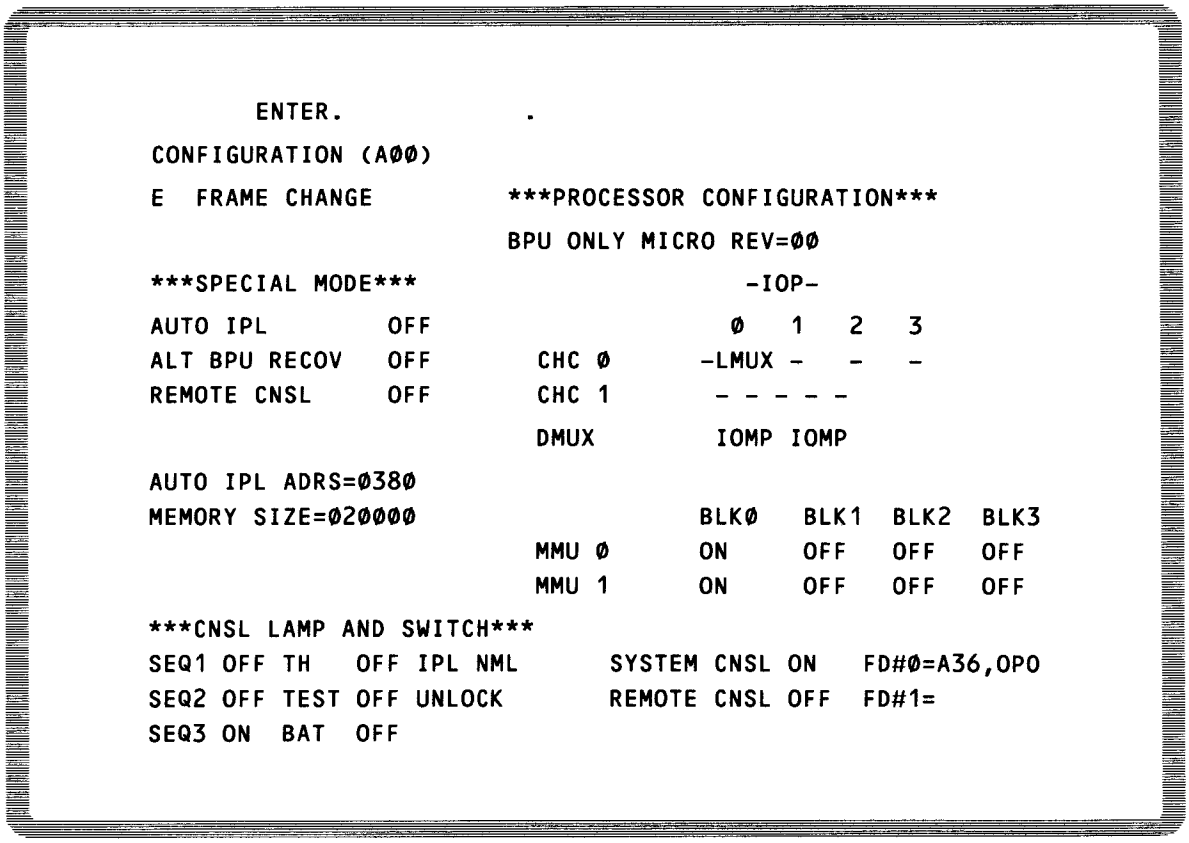


Figure 3-32. Model 8 Display Configuration Control Frame

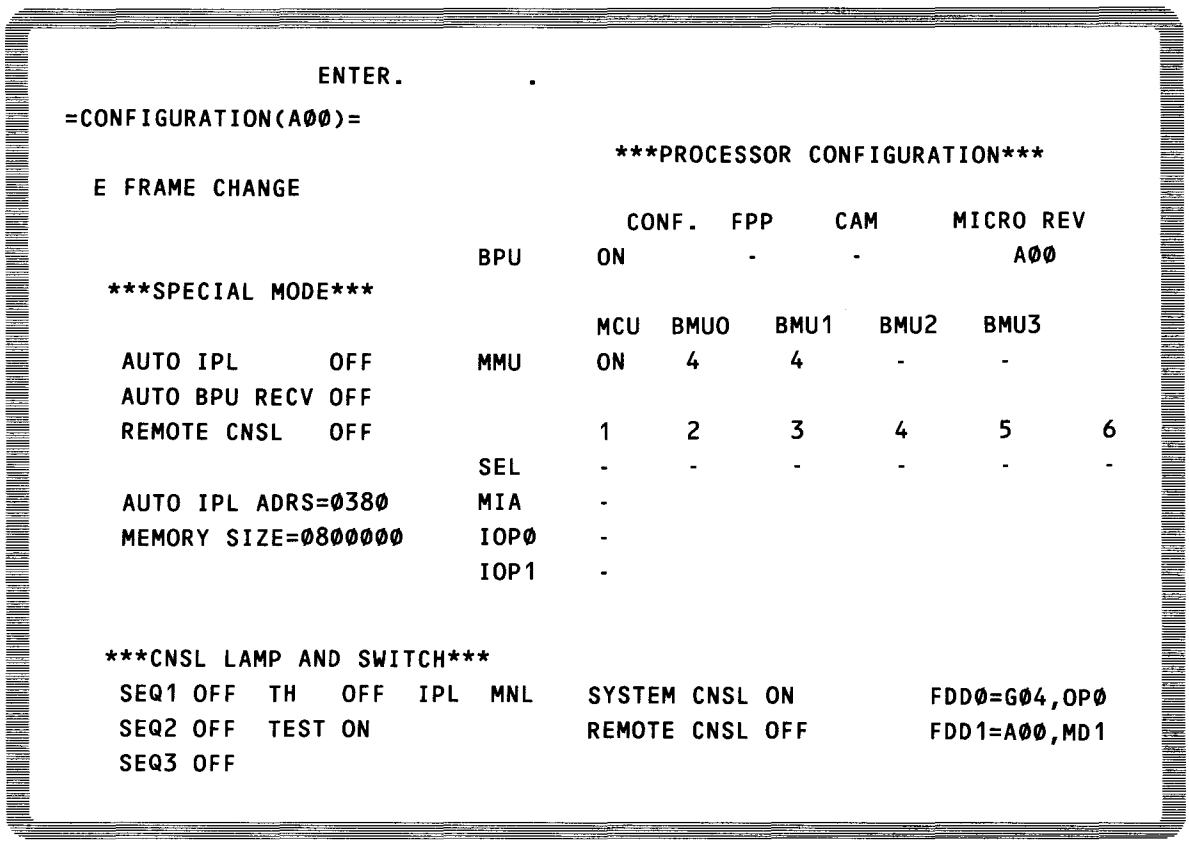


Figure 3-33. Models 10/20 Display Configuration Control Frame

The menus displayed on the configuration control display frames are as follows:

NOTE: These menus pertain to both the model 8 and models 10/20 frames except where noted.

- **E FRAME CHANGE**

  Displays the configuration select frame on the console display screen.

- **AUTO IPL ON/OFF**

  This indicates the operating mode for an IPL.

  - ON

    Is displayed when the IPL NML/AUTO switch on the system control panel (Figures 2-1 and 2-2) is set to AUTO position.

  - OFF

    Is displayed when the IPL NML/AUTO switch on the system control panel is set to NML position.

- **AUTO BPU RECOV**

  This indicates whether automatic recovery for the processor is selected by the configutation select frame.

  - ON

    Is displayed when automatic processor recovery (ABR) mode is selected by the configuration select frame.

  - OFF

    Is displayed when ABR is not selected. This mode can be selected from the configuration control change frame.

- **REMOTE CNSL**

  This indicates whether a connection to a remote console via communications line is permitted.

  - ON

    Is displayed if connection to a remote center is selected by the configuration select frame.

  - OFF

    Is displayed if a connection is not permitted. This mode can be selected from the configuration control change frame.

- **AUTO IPL ADRS=XXXX**

  This indicates the address of the channel and I/O device used for automatic IPL. The address is indicated only if automatic IPL is assigned, and the I/O address can be assigned with the configuration control change frame.

- **MEMORY SIZE=XXXXXX**

  where:

  XXXXXX =capacity of loaded area in main storage

This indicates the size of main memory in the system, which varies from 1 to 8 megabytes on the model 8, from 2 to 8 megabytes on the model 10, and from 4 to 16 megabytes on the model 20.

- *****CNSL LAMP AND SWITCH*****

  The lamp conditions on the system control panel, master console, and remote console are displayed. ←

- **MMU**

  This indicates the main memory (storage) unit state. The capacity of storage loaded into the main storage unit is displayed. A capacity of one block (BLK) is one megabyte. The portion actually loaded from BLK0 to BLK3 is indicated by the ON display.

- **CHC#0/1 DMUX (model 8 only)**

  Indicates the system channels and their configurations (number of USELs, LMUXs, and IOMPs).

- **SEL (models 10/20 only)**

  Indicates whether selector channels 1 through 6 are configured on the models 10/20.

- **MIA (models 10/20 only)**

  Indicates whether an MIA is present on the models 10/20.

- **IOP0 (models 10/20 only)**

  Indicates whether IOP0 is present on the models 10/20.

- **IOP1 (models 10/20 only)**

  Indicates whether IOP1 is present on the models 10/20.

- **FDD#0/1**

  The name and subnumber of files used on diskette drives 0 and 1. If no diskette drive is included, NRD is indicated as the file name. The files are displayed as follows:

  XXX,YYY - Model 8
  XXXX,YYY - Models 10/20

  where:

  XXX or XXXX = revision
  YYY = type of programs, as follows:

  OP = operational; the system program is stored.

  MD = microdiagnostics; diagnostic program is stored.

  DP = functional diagnostics; function diagnostic program is stored.

- **SYSTEM/REMOTE CNSL**

  Indicates the state of the system and remote console displays.

Configuration Control Frame (Change)

Enter the configuration control change frame from the configuration control display frame (Figures 3-32 and 3-33). Press the E, then the XMIT keys on the keyboard while the configuration control display frame is presented on the console workstation screen.

The configuration control change frame (Figures 3-34 and 3-35) is used to recover operation by changing existing configuration conditions. Other changes affecting the existing configuration may also be performed for purposes other than operator recovery. Each of the menu presentations is as follows:

```
   ENTER.              .
= CONFIGURATION SELECT (AØØ)=
  E FRAME CHANGE                          -CONSOLE MODE-
  - SET ADRS-                          M SELECT MODE  (Ø-1) - MO -
  A AUTO IPL DEVICE (ØØØ-FFF) -38Ø-    G DEFAULT MODE (Ø-1) - MO -
  - SVP FUNC -                         O REMOTE OFF
                                       N REMOTE ON
  L CLEAR SVP LOG                      S USER ID ALPH
  V FDD COPY                           J USER ID NUMERIC
  - ABR CTRL -                         U REMOTE IS COUPLER (Ø=YES 1=NO)
  R RESET ABR MODE                     Z REMOTE BAUD RATE (Ø=3ØØ 1=12ØØ)
  H SET ABR MODE                       *** CONSOLE MODE TABLE ***
  C ABR RETRY COUNT (Ø-F) -3-                SCC         RMT
  K KEYBOARD TYPE (Ø-7)                MØ    MAIN       SPRT
  Ø USA             1 UNITED KINGDOM   M1    MAIN       MAIN
  2 GERMANY         3 SPAIN
  4 FRANCE          5 DENMARK
  6 SWEDEN/FINLAND  7 ITALY
```

Figure 3-34. Model 8 Change Configuration Control Frame

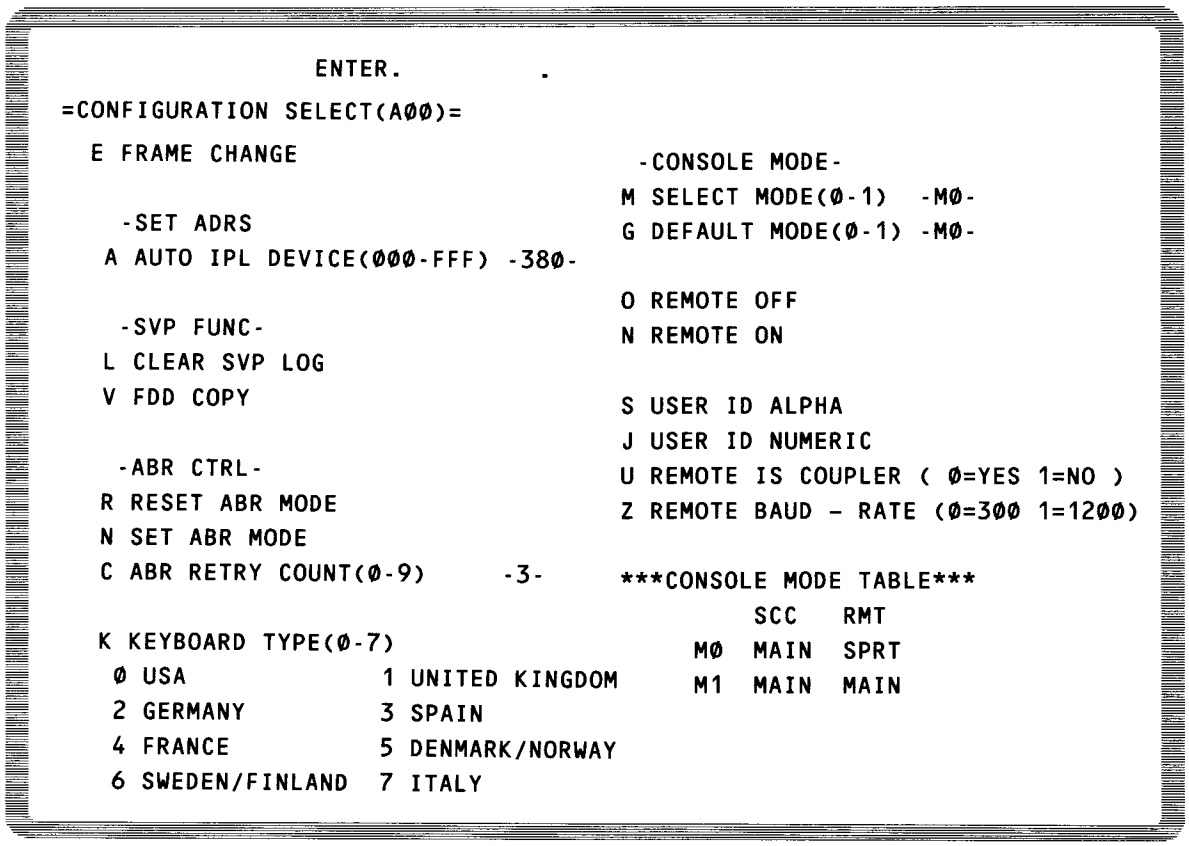


Figure 3-35. Models 10/20 Change Configuration Control Frame

- **AUTO IPL DEVICE**

  Use this menu to assign a channel and device address for automatic IPL. When the IPL NML/AUTO switch (model 8) or the IPL MNL/AUTO switch (models 10/20) on the system console (Figures 2-1 and 2-2) is set to AUTO position, and system power is turned on, normal power-on sequence and IMPL are performed and are automatically followed by an IPL. However, an address must be assigned for the IPL device.

  The operator presses the A key, then enters three hexadecimal characters for the device address, and finally presses the XMIT key to enter the device address for IPL. If these are not entered, an error occurs during address entry and the following message is displayed on the screen:

KEY-IN ERROR

Examples of errors may be:

- Character input of the I/O device does not consist of three hexadecimal characters.
- The I/O processor that was assigned for the device is not in the system.

- **CLEAR SVP LOG**

  Any system state other than normal that occurs during operation is stored on the diskette as logout information. This menu initializes the pointer for the logout information when the operator presses the L then XMIT key.

- **FDD COPY**

  Use this menu to copy FDD data from drive 0 to drive 1 by pressing V, then XMIT.

- **RESET ABR MODE**

  This menu is part of the ABR CTRL pair, which is used for automatic BPU (processor) recovery (ABR). Press the R than XMIT keys to reset the ABR mode. If power-on sequence and IPL operation are completed normally, the ABR mode is automatically reset.

- **SET ABR MODE**

  This menu is also part of the ABR CTRL pair used for automatic processor recovery (ABR). Press the H then XMIT keys to set the ABR mode.

- **ABR RETRY COUNT (0-9)**

  You can select the number of recovery attempted repetitions with this menu. If the processor enters check stop state during ABR mode, the system control processor (SCP) is instructed to attempt recovery before disconnecting the BPU processor. Select the number of recovery attempts by pressing the C key, then entering a hexadecimal character of between 0 and 9, and finally pressing the XMIT key. The selected number of repetitions is displayed next to the menu.

- **KEYBOARD (0-7)**

  Selects the nationality the keyboard is to operate in.

- **SELECT MODE (0-1)**

  This menu is part of the CONSOLE MODE group used by the operator to select the operating mode for the console workstation. Selection is made by pressing the menu M key, then keying in a hexadecimal character between 0 and 3, and finally pressing the XMIT key. The selected mode is displayed next to the menu. The CONSOLE MODE TABLE is displayed on the lower right area of the screen. If an erroneous entry is made for the selected operating mode, the message:

  KEY-IN ERROR

  is displayed on the screen.

- **DEFAULT MODE (0-1)**

  You can select console mode default to occur automatically upon completion of power-on and IMPL. Make this selection by pressing the G character key, and then keying in a hexadecimal character between 0 and 3, and pressing the XMIT key.

- **REMOTE OFF**

  Use this menu to disable a remote console workstation. To select the menu, press the O character key then XMIT key. If the menu is entered while a remote console workstation is operating, the unit is disconnected within 0.5 second.

- **REMOTE ON**

  You can assign authorization for connection to a remote console workstation with this menu by pressing the N character key then XMIT key. This mode must be active for remote console operation.

- **USER ID ALPHA and USER ID NUMERIC**

  Used to set the user identification required for trace. The trace cannot talk to the user if the ID is wrong or not entered.

→ Entries are Saa and Jnnnnnnn,

  where:

  a=alpha character

  n=numeric character

- **REMOTE IS COUPLER**

  Select this if using an acoustic coupler or modem with trace. Entry U0 selects the acoustic coupler; U1 selects the modem.

- **REMOTE BAUD RATE (model 8 only)**

  Selects baud rate of the trace line. Enter Z0 for 300 baud; or Z1 for 1200 baud.

- *****CONSOLE MODE TABLE*****

  Indicates mode of operation for console and remote terminal for various mode settings.

Maintenance Frame

Select the maintenance frame by pressing the ESC key, then the P character key. This frame is used exclusively for maintenance by the customer service engineer.

Index Frame

You can obtain a list of all available frames for the console display by keying in the ESC key, then the I character key.

Console Frame

You will use the console frame during most operations. Display the frame on the console display by pressing the CNSL key. The console frame is used to exchange information between the operator and software operating system.

If an error occurs during keyin at the keyboard, the

KEY-IN ERROR

message is displayed and the frame returns to the state that was present immediately before the erroneous key input.

Types of errors that may occur and result in this message are:

- Error in selecting a menu
- Error in keying (e.g., an incorrect character was entered for the required hexadecimal value)
- An incorrect storage address was entered during alter/display frame
- A menu was selected while the alter/display frame was presented during operation of the processor.

Appendix A: System 80 Models 10/20 Operator's Maintenance Procedures

A.1 INTRODUCTION

This appendix contains procedures that explain to you, the operator, how to provide a detailed error description when requesting corrective maintenance for your System 80 models 10/20. If you are a model 8 user, you can find this information in the *Model 8 Operators Maintenance Guide*, UP-9710. The detailed error description will enable the Unisys customer service engineer to replace the defective part on the first call.

This appendix is arranged in the following subsections:

- A.2. FAULT ISOLATION

  This subsection contains procedures to isolate system malfunctions. Depending on the type of error, you will be asked to run diagnostic tests for additional error definition or to call Unisys for additional information.

- A.3. DIAGNOSTIC TESTS

  This subsection provides diagnostic operating procedures for the central processing complex and peripheral devices. The diagnostic tests isolate the malfunction to the field replaceable unit.

- A.4. ERROR LOGS

  This subsection contains procedures for displaying the error logs, sample error logs, and a description of the error log analysis program.

- A.5. CALLING FOR ASSISTANCE

  This subsection contains procedures for calling Unisys for assistance and connecting the system for remote maintenance.

A.1.1. Applicable Documentation

In addition to this appendix, you need the following manuals to interpret the system messages and error log:

- *OS/3 System Messages*, UP-8076
- *System 80 Operations Handbook*, UP-8859
- *Dump Analysis User Guide/Programmer Reference*, UP-8837

The instructions refer you to the appropriate document, where applicable.

A.1.2 How to Use This Appendix for Fault Isolation

This appendix helps you to isolate two general types of hardware errors:

1. Power turn-on errors
2. Errors during operation

When you detect an error:

1. Refer to subsection A.2. and follow the instructions in the fault isolation procedures. These procedures have you run specific diagnostic programs, display error logs, and call Unisys to report the error and request assistance.

2. Refer to subsection A.3 to load and run the diagnostic tests. This subsection also contains procedures for displaying the status and program status word (PSW).

After you run the diagnostic tests, call Unisys and report the test results. You may also be required to connect your system to Unisys for additional error diagnosing. Subsection A.5 has the procedures for making the remote connection to Unisys.

At certain times a message on the system console requests you to call Unisys and transmit the error log to Unisys. Subsection A.4 explains how to do this.

A.2. FAULT ISOLATION

This subsection contains the procedures to isolate malfunctions.

A.2.1. Fault Categories

You can isolate two general categories of errors (faults):

1. Errors that occur during power turn-on
2. Errors that occur during operation

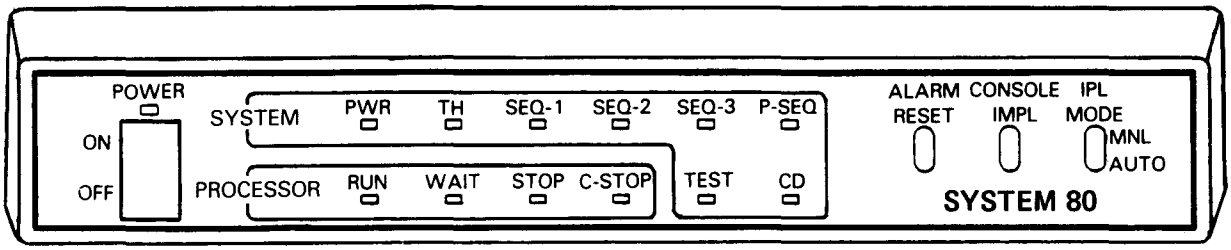
Power turn-on errors usually prevent the system software (OS/3) from loading. If the system software does load, power turn-on errors can degrade system performance.

Operational errors can be caused by either hardware malfunctions or software errors. Operational errors can be either hard errors or soft errors.

A.2.1.1. Power Turn-On Errors

Perform this procedure to help isolate errors that can occur during power turn-on:

1. Check the console indicator panel before you turn power on to verify that the power switch is in the OFF position and that all indicators are off (not lit).



2. Set the console power switch to the ON position. Are the SEQ1, SEQ2, SEQ3, P-SEQ, PWR, TH, and STOP indicators on and all the other indicators off?
   - YES - Proceed to step 8.
   - NO - Proceed to step 3.
3. Are all indicators on?
   - YES - Proceed to step 4.
   - NO - Proceed to step 5.

4. Is console power switch located on the front of the monitor set to the ON position?

   - YES - Call Unisys for assistance using the procedures in A.5.
   - NO - Set the console power switch to the ON position.

5. Is the P-SEQ indicator on and the POWER indicator off?

   - YES - Proceed to step 6.
   - NO - Proceed to step 7.

6. Stop here (system power supply malfunction) and call Unisys for assistance using the procedures in A.5.

7. Is the cursor on the console display screen (the cursor can take about 40 seconds to appear)?

   - YES - Proceed to step 8.
   - NO - Stop here; make sure the console power switch is set to the ON position and call Unisys for assistance using the procedures in A.5.

8. Do the SEQ indicators go off in the following order: SEQ1, SEQ2?

   - YES - Proceed to step 9.
   - NO - Call Unisys to report the malfunction using the procedures in A.5.

9. Do the following messages print on the console display screen:

   SYSTEM 80 MODEL xx PWR ON SEQUENCE START
   SVP IMPL RAM2 START
   SVP IMPL RAM3 START
   SVP IMPL FRM1 START
   SVP IMPL PON START

   - YES - Proceed to step 11.
   - NO - Proceed to step 10.

10. Does the SEQ2 indicator flash on and off?

    - YES - Call Unisys for assistance using the procedures in A.5.
    - NO - Proceed to step 11.

11. Is an error message "** " on the console display screen?

    - YES - Record the error message, run the processor microdiagnostics using the procedure in A.3, and then call Unisys for assistance using the procedures in A.5.
    - NO - Proceed to step 12.

12. Is the "BPU IMPL" or "IMCL" error message on the console display screen?

    - YES - Proceed to step 14.
    - NO - Proceed to step 13.

13. Replace the IMPL diskette in the FDD0 system diskette drive and re-power on the system by pressing the POWER switch on the indicator panel. Does the error occur again?

    - YES - Record the error message, run the processor microdiagnostics using the procedure in A.3, and then call Unisys for assistance using the procedures in A.5.
    - NO - Proceed to step 14.

14. Is a SEL error message on the console display screen?

    - YES - Run the microdiagnostics using the procedure in A.3 and then call Unisys for assistance using the procedures in A.5.
    - NO - Proceed to step 15.

15. Is an IOP error message on the console display screen?

    - YES - Record the error message, run the IOP microdiagnostics using the procedures in A.3, and then call Unisys for assistance using the procedures in A.5.
    - NO - Proceed to step 16.

16. Does the SEQ3 indicator extinguish?

    - YES - Proceed to step 17.
    - NO - Call Unisys for assistance using the procedures in A.5.

17. Does an error message "** " appear on the console display screen?

    - YES - Call Unisys for assistance using the procedures in A.5.
    - NO - Proceed to step 18.

18. Is the IPL MODE switch on the console in the AUTO position?

    - YES - Proceed to step 19 (the system will IPL from the resident IPL device).
    - NO - Proceed to step 22.

19. Does a message on the console display screen indicate that OS/3 is loaded?

    - YES - System power turn-on is complete and you can run OS/3. Proceed to step 24.
    - NO - Proceed to step 20.

20. Is the L-BUS FUNC. ERR (IPL/STSRB) or SYSTEM RESET TIME OUT ERROR message on the console display screen?

    - YES - Call Unisys for assistance using the procedures in A.5.
    - NO - Proceed to step 21.

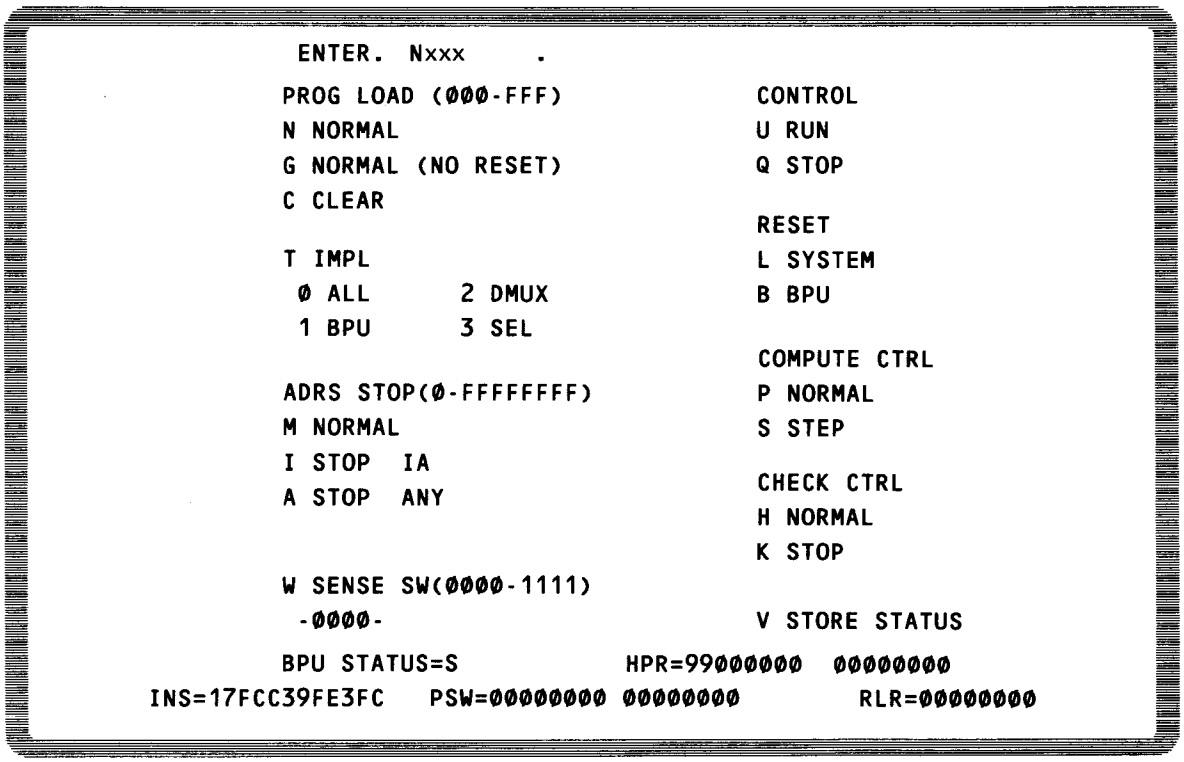
→ 21. Is the IPL TIME OUT or CHANNEL ADRS NOT EXIST message on the console display screen?

    - YES - Proceed to step 22.
    - NO - Call Unisys for assistance using the procedures in A.5.

22. Simultaneously press the ESC and M keys to display the manual frame.

```
 ENTER.          .
PROG LOAD (000-FFF)              CONTROL
N NORMAL                         U RUN
G NORMAL (NO RESET)              Q STOP
C CLEAR
                                 RESET
T IMPL                           L SYSTEM
 0 ALL      2 DMUX               B BPU
 1 BPU      3 SEL
                                 COMPUTE CTRL
ADRS STOP(0-FFFFFFFF)            P NORMAL
M NORMAL                         S STEP
I STOP  IA
A STOP  ANY                      CHECK CTRL
                                 H NORMAL
                                 K STOP
W SENSE SW(0000-1111)
 -0000-                          V STORE STATUS
BPU STATUS=S        HPR=99000000  00000000
INS=17FCC39FE3FC   PSW=00000000 00000000       RLR=00000000
```

23. Key in Nxxx after ENTER (xxx is the IPL device address) and press the XMIT key.



24. Enter the supervisor name and press the XMIT key (or don't enter anything and press the XMIT key, if applicable).

25. Does a message on the console display time/date screen indicate that OS/3 is loaded?

- YES - Run jobs and call Unisys for assistance using the procedures in A.3.
- NO - Run the diagnostic tests using the procedures in A.3 and then call Unisys for assistance using the procedures in A.5.

A.2.1.2. Errors During Operation

You will be notified of operational faults by the C STOP, STOP, and WAIT lights on the indicator panel.

When the C STOP indicator lights, a check (C) stop occurred. A C stop is a hard stop and processing stops.

When the WAIT and STOP indicators light, an HPR stop occurred. An HPR stop can be either a hard or soft stop.

HPR Stop Example

Use the following procedure for an HPR STOP error:

1. Press the ESC and then M keys on the console to display the manual frame.

```
 ENTER.          .
PROG LOAD (000-FFF)              CONTROL
N NORMAL                         U RUN
G NORMAL (NO RESET)              Q STOP
C CLEAR
                                 RESET
T IMPL                           L SYSTEM
 0 ALL      2 DMUX               B BPU
 1 BPU      3 SEL
                                 COMPUTE CTRL
ADRS STOP(0-FFFFFFFF)            P NORMAL
M NORMAL                         S STEP
I STOP  IA
A STOP  ANY                      CHECK CTRL
                                 H NORMAL
                                 K STOP
W SENSE SW(0000-1111)
 -0000-                          V STORE STATUS
BPU STATUS=S          HPR=99000000  00000000
INS=17FCC39FE3FC   PSW=00000000 00000000      RLR=00000000
```

2. Record the BPU STATUS and PSW.

3. Record the HPR code displayed after the entry HPR= and the instruction code displayed after the entry INS=

4. Refer to the *OS/3 System Messages Guide*, UP-8076, to determine the error type and recovery.

5. Refer to the *Dump Analysis User Guide/Programmer Reference*, UP-8837, and obtain a SYSDUMP.

6. Save the SYSDUMP.

7. If you are unable to recover, call Unisys for assistance using the procedures in A.5.

CHECK STOP (C-STOP) Example

Use the following procedure for a CHECK STOP (C-STOP) error.

1. Run the processor microdiagnostics using the procedure in A.3.

2. Call Unisys for assistance using the procedures in A.5.

Sequence Lights SEQ1, SEQ2, SEQ3 Example

If this error occurs, call Unisys for assistance using the procedures in A.5.

A.3. DIAGNOSTIC TESTS

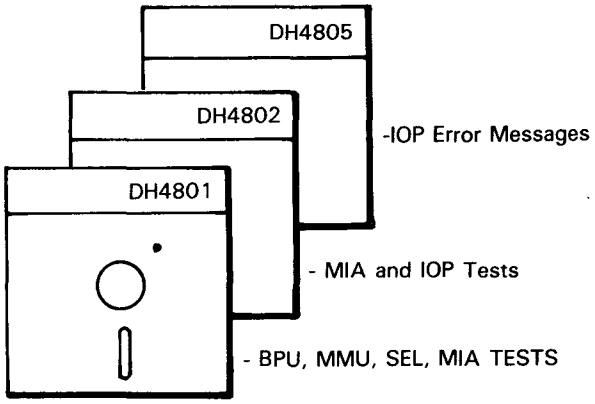
This subsection contains procedures for loading and executing the diagnostic tests. The diagnostic tests consist of offline and online tests.

A.3.1. Offline Diagnostic Tests

The offline diagnostic tests are divided into two groups: microdiagnostic tests and macrodiagnostic tests.

A.3.1.1. Microdiagnostic Tests

The microdiagnostic tests check the processor and IOP printed circuit assemblies for proper operation. The tests are located on three diskettes: DH4801, DH4802, and DH4805.

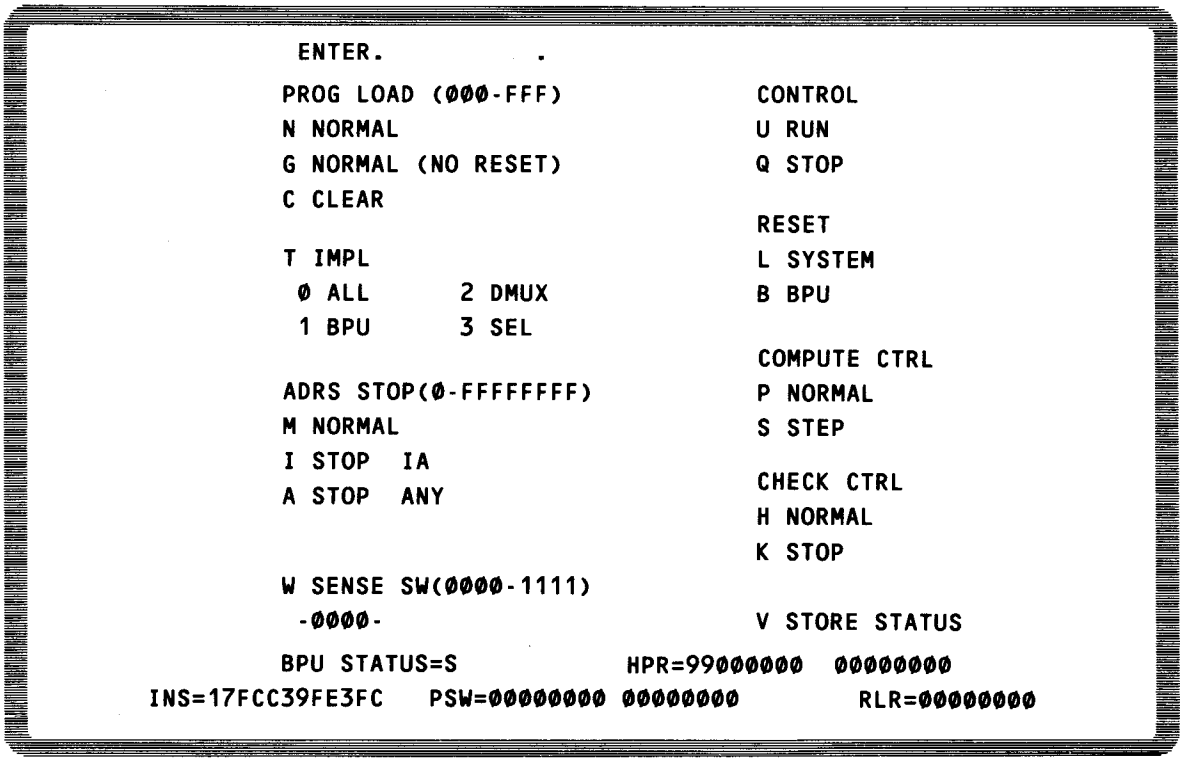


Loading and Running Processor Microdiagnostics

NOTE: Unless otherwise noted, use the system console to perform the following instructions.

1. Open the door of the processor cabinet and locate the system diskette drive FDD1.
2. Insert the diagnostic diskette DH4801 into the system diskette drive FDD1.
3. Close the diskette drive door.

4. Press the ESC and then M keys to display the manual frame.



5. Press the L and XMIT keys to reset the system.

6. Press the ESC and then P keys to display the service frame.

```
        ENTER.          .
=SERVICE FRAME(A1Ø)=
        -PROCESSOR FRAME-           -MICRO DIAG-
        C CTRL FRAME                D MICRO DIAG SELECT
        A ALT/DISP FRAME             Ø ALL (NORMAL)
         Ø BPU                       1 ALL (HEAT RUN)
         1 SEL                       2 MMU
         2 IOP                       3 SEL
         3 MMU                       4 MIA
         4 MIA                       5 BPU
                                     6 IOP
                                     7 ACP

        -ERROR FRAME-
        S SVP LOG INDEX
        L IMPL ERROR                UTILITY FRAME
        H HEALTH CHECK ERROR        Ø SYSTEM JOURNAL
                                    Q SYSTEM CONTROL
                                    P L-BUS
        -ALTERNATE IPL PASS-        M S-BUS
                                    U UTILITY
        N CONSOLE IPL               B MICRO REVISION
```

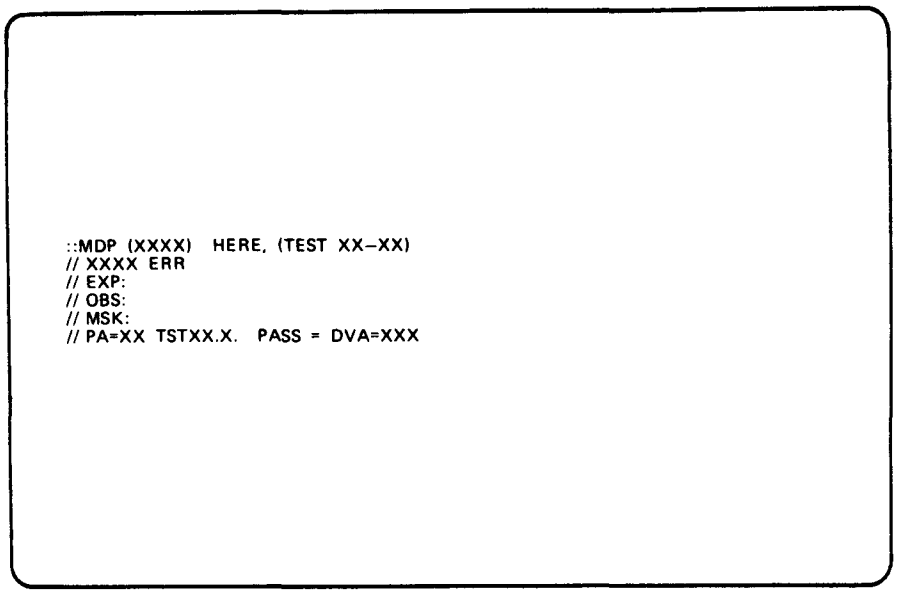
7. Press the D and 0 keys to select the processor microdiagnostics.

8. Press the XMIT key to start the processor microdiagnostic tests.

9. The diagnostic running message prints on the display screen.

```
MICRO DIAG
::MDM (XXX) RUNNING
::MDP (XXXXXXX) HERE, (TEST=XX-XX)
```

10. When an error is detected, an error message prints on the display screen.



11. Record the error and call Unisys to report the error and request further assistance.

Loading and Running IOP Microdiagnostics

NOTE: Unless otherwise noted, use the system console to perform the following instructions.

1. Open the door of the processor cabinet and locate the maintenance diskette drive FDD1.
2. Insert the diagnostic diskette DH4802 into the maintenance diskette drive FDD1.
3. Close the diskette drive door.
4. Press the ESC and then M keys to display the manual frame (see procedure for loading and running processor microdiagnostics).
5. Press the L and then XMIT keys to reset the system.
6. Press the ESC and then P keys to display the service frame (see procedure for loading and running processor microdiagnostics).
7. Press the D and 0 keys to select the IOP microdiagnostics.
8. Press the XMIT key to start the IOP microdiagnostic tests.

9. The console displays the identification of the test and subtest being executed.

10. When an error is detected, the error message is displayed.

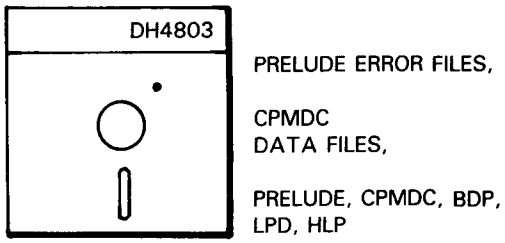
11. Record the error and call Unisys to report the error and request further assistance.

A.3.1.2. Macrodiagnostic Tests

There are two macrodiagnostic tests, the offline macrodiagnostic tests and the offline tape load path diagnostics.

Loading and Running the Offline Macrodiagnostic Tests

The offline macrodiagnostic tests check for proper execution of the processor instruction set and for proper operation of the input/output channels. These tests are located on diskette DH4803.



Use these instructions to load and run the offline macrodiagnostic tests:

NOTE: Unless otherwise noted, use the system console to perform the following instructions.

1. Open the door of the processor cabinet and locate the system diskette drive FDD1.

2. Insert the diagnostic diskette DH4803 into the system diskette drive FDD1.

3. Close the diskette drive door.

4. Press the ESC and then M keys to display the manual frame (see A.3.1.1.).

5. Press the L and XMIT keys to reset the system.

6. Press the ESC and then P keys to display the service frame. (see A.3.1.1.).

7. Press the N and XMIT keys to start the processor macrodiagnostic tests.

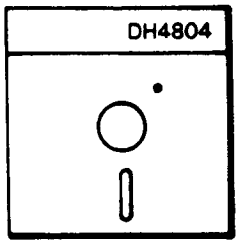
8. The console displays prompts for operator responses. Respond to the messages as they appear.

9. When an error is detected, the error message is displayed.

10. Record the error and call Unisys to report the error and request further assistance.

Loading and Running the Offline Tape Load Path Diagnostics

The offline tape load path diagnostics are located on diskette DH4804. These tests verify the OS/3 load path from tape. You run these diagnostic tests after OS/3 is loaded when problems occur while running the DUMP/RESTORE tape.



Use these instructions to load and run the offline tape load path diagnostics:

1. Insert the diskette DH4804 into the T8420/22 system diskette drive. ←

2. Close the diskette drive door.

3. Press the ESC and then M keys to display the manual frame (see A.3.1.1.).

4. Enter Nxxx (where xxx is the device address of the diskette (eg. C20)) and press the XMIT key. OS/3 IPL messages print on the display screen.

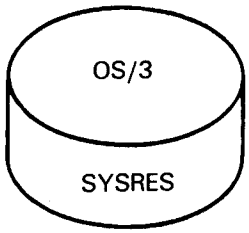
5. Enter the command to run the appropriate test: ONSRVO,L; ONSTPE,L; ON3774,L; or ON5055,L.

6. Respond to the sequence of screens by entering the applicable data.

7. Call Unisys upon completion of the tests using the procedures in A.5.

A.3.2. Online Diagnostic Tests

The online diagnostic tests are contained on the OS/3 (operating system) disk. The online tests check the operation of the peripheral devices. The individual online diagnostic programs are illustrated below.



ONCOM2	COMMUNICATIONS
ONDCU	DCU DISK DRIVES
ONREAD	CARD READER
ONSDSK	DISKETTES
ONSPCH	PUNCH
ONSRDR	IOP CARD READER
ONSRVO	SEL TAPE UNITS
ONSTPE	IOP TAPE UNITS
ONSWRK	WORKSTATIONS
ONTPG	TEST PROGRAM GENERATOR
ONMAIN	DIAGNOSTIC TEST DESCRIPTION
ON3774	STREAMING TAPE
ON5039	8430/8433 DISK DRIVES
ONSPNT	PRINTERS
ONUERL	ERROR LOG
ONELAN	ERROR LOG ANALYSIS
ONHLP	HARDWARE ERROR LOG PRINT
ON5055	SEL TAPE UNIT
ON5074	8494 DISK DRIVES

Loading and Running Online Diagnostics

NOTE: Unless otherwise noted, use the system console to perform the following instructions.

1. Press the CNSL key to display the program frame.
2. Press the MSG WAIT key.
3. Locate the test module from the following list:

Device	Test Module
Communication	ONCOM2
Disk Drives Types 8416, 8417, 8418, 8419, 8470, 8480	ONDCU
Card Reader Type 0716	ONREAD
Diskettes	ONSDSK
Card Punches	ONSPCH
Card Reader Type 0719	ONSRDR
Error Log Analysis	ONELAN

Device	Test Module	
Tape Units U10, U14-5045, U12, U16, U20-5017	ONSERVO	
Tape Units	ON5055	←
Tape Units	ONSTPE	
Workstations	ONSWRK	
Disk Units 8430, 8433(5039 control unit)	ON5039	←
Printers	ONSPNT	
Streaming Tape	ON3774	
Error Log	ONUERL	
Disk Drives Type 8494	ON5074	←

NOTE: Perform step 4 for all peripheral tests except the diskette drive tests. Proceed to step 5 to execute diskette drive tests.

4. Peripheral tests:

STEP	REMARKS
Your Entry - **RV ON XXXXX**	XXXXX = Test Module
Response - Jn Enter Spool Option (Yes, No)	Enter No If Printer Is Available
Your Entry - **Jn Yes**	
Response - Jn ? Program Menu Selection	
1. Remote Maintenance Interface 2. Program Description 3. Tutorial Mode 4. Standard Mode (Default)	
Jn ? Enter Selection Number (Format X.X.X)	
Your Entry - **Jn 4**	
Response - Jn ? Select Options (Enter Option Or ?)	Preselected Options Selected
Your Entry - **Jn Add Unit Cuu Begin**	Start Testing

5. Diskette drive tests:

STEP	REMARKS
Your Entry - **RV ONSDSK**	Diskette Drive Test Module
Response - Jn Enter Spool Option (Yes, No)	Enter No If Printer Is Available
Your Entry - **Jn Yes**	
Response - Jn ? Program Menu Selection 1. Remote Maintenance Interface 2. Program Description 3. Tutorial Mode 4. Standard Mode (Default) Jn? Enter Selection Number (Format X.X.X)	
Your Entry - **Jn 4**	
Response - Jn ? Select Options (Enter Option Or ?)	Preselected Options Selected
Your Entry - **Jn Add Unit Cuu Begin**	Start Testing
Response - Jn Entering Test 1 Diskette Prep Routine Jn Select Type of Prep Desired For Device 3XX Jn (Q=Quick, S=Short, L=Long)	
Your Entry - **Jn L**	
Response - Jn Select Type of Recording Desired Jn (S=Single Density, D=Double Density)	
Your Entry - **Jn D**	
Response - Jn Select Sector Size Jn (256,512,?)	
Your Entry **Jn 512**	Testing Continues

A.4. ERROR LOGS

This subsection contains a brief description of the system error logs and the instructions for transmitting them to Unisys.

NOTE: *This subsection only provides instructions for transmitting the error log to Unisys. For a complete description of the ONUERL program and its options, refer to the* System 80 Operations Handbook, *UP-8859.*

A.4.1. Error Log Types

There are two basic types of errors:

1. Hardware detected errors
2. Operating system (OS/3) detected errors

Hardware Detected Errors (Log Index Frame)

The system microcode usually detects hardware errors. When hardware errors are detected (sixteen possible errors, 8 processor and 8 non-processor), they are recorded in the hardware error log stored on a diskette.

Refer to steps 1 through 3 for instructions to display and interpret data fields in the hardware error log stored on diskette.

1. Press the ESC and then P keys on the console keyboard to display the Service Frame.

```
        ENTER.          .
=SERVICE FRAME(A1Ø)=
        -PROCESSOR FRAME-           -MICRO DIAG-
        C CTRL FRAME                D MICRO DIAG SELECT
        A ALT/DISP FRAME             Ø ALL (NORMAL)
         Ø BPU                       1 ALL (HEAT RUN)
         1 SEL                       2 MMU
         2 IOP                       3 SEL
         3 MMU                       4 MIA
         4 MIA                       5 BPU
                                     6 IOP
                                     7 ACP

        -ERROR FRAME-
        S SVP LOG INDEX
        L IMPL ERROR                UTILITY FRAME
        H HEALTH CHECK ERROR        Ø SYSTEM JOURNAL
                                    Q SYSTEM CONTROL
                                    P L-BUS
        -ALTERNATE IPL PASS-        M S-BUS
                                    U UTILITY
        N CONSOLE IPL               B MICRO REVISION
```

2. Press the S and XMIT keys on the console keyboard to display the SVP Log Index Frame.

*	-	Indicates last error logged
CODE	-	Indicates the unit that reported the error
ID	-	Identifies the error
TOD	-	Date and time when the error occurred
F$STA	-	Status
WRPF	-	Wrap factor indicates the number of times that log has wrapped from M8 to M1 or B8 to B1

```
                              ENTER.          .
=LOG INDEX=
     TOD(ERASE)=00/00/00 00:00:00 (01)
        (FIRST=)08/00/4A 00:23:40 (00)    (LAST)=87/04/06 09:59:01 (00)

        M EXCEPT BPU(1-8)                                  B BPU(1-8)
        TOTAL ERR=54   WRPF=0A                             TOTAL ERR=2B   WRPF=05
   CODE ID    TOD          F$STA                  CODE ID    TOD          F$STA
  M1 20  22  87/04/06  200040:5007077F     B1 00  03  87/04/04  000080:00030000
             08:56:01                                           10:14:47
  M2 C1  34  87/04/06  531040:00000000     B2 00  02  87/04/06  0000C0:89130000
             09:34:51                                           08:33:48
  M3 90  01  87/04/06  900040:A2000000    *B3 00  11  87/04/06  000040:8E130000
             09:58:57                                           08:56:00
 *M4 80  01  87/04/06  800040:A2000000     B4 00  02  87/04/02  000080:08930000
             09:59:01                                           14:21:34
  M5 80  01  87/04/04  800040:A2010000     B5 00  03  87/04/02  000080:00030000
             10:33:32                                           16:18:00
  M6 90  01  87/04/04  900040:A2000000     B6 00  03  87/04/03  000080:00030000
             10:34:28                                           09:46:28
  M7 70  01  87/04/04  700040:C0000000     B7 00  03  87/04/03  000080:00030000
             21:36:24                                           10:22:03
  M8 C1  34  87/04/06  5330C0:00000000     B8 00  12  87/04/03  000040:89130000
             08:33:50                                           11:20:43
```

3. Enter the error log (M1-M8 or B1-B8) for which you want more details and press the E and XMIT keys to display it.

```
                ENTER.          .
 =SEL LOG=
        E FRAME CHANGE
        CODE=90  ID=01  TOD=87/04/06 09:58:57 (00)  F$STA=900040A2000000
        BYTE COUNT=00FB  ERR REG1=00  REG2=00  REG3=00
 ** SEL2 **
-LOGO-  -LOG1-   -LOG2-   -LOG3-    CTRFG 00000000       SKEY,SAD0-2 00009C58
 MAE 0   BSR 0   CCER 0   OPLI 1  SMRR0-F 00000000 00000000 00000000 00000000
 ADV 0   BSB 0   BIPE 0   SELI 0  SMWR0-F 000002B0 0001C5F8 00000000 00000000
 MK0 0   BBI 0   ADER 0   ADRI 0  CURRENT 00000000 00000000 00000000 00000000
 MK1 0   BLB 0   TOV1 0   STAI 0  -1 UCW
 SWD 0  CMTS 0   TOV2 1   SVCI 0  CURRENT 08B10804 0001C5F8 13013860 60000008
 SBF 0   SA0 0    ST0 0   DATI 0    UCW   14000000 00600000 01C600B1 000B0066
 SBB 0   SA1 1    ST1 0   RQIN 0  SEL CNT 66000000 003C0002 66010000 00000000
 SBI 0   SA2 0    ST2 1   MK01 0   AREA   81000001 00011AF2 0000FFFF 0000007F
 CMP 0           MECD     OPLO 1
 MSQ 0  DEVICE    000     HLDO 1  U-ADRS 888F 888E 888D 888C 888B 888A 8889 8888
 ITQ 0  ADDRESS           SELO 1  TRACE  8887 8886 8885 8884 8883 8882 8881 8880
 PDP 0   -B1-H   SKIP 0   ADRO 0         887F 887E 887D 887C 887B 887A 8879 8878
 LSQ 0           RBKW 0   CMDO 0         8877 8876 8875 8874 8873 8872 8871 8870
 DIS 0             RD 0   SVCO 0         886F 886E 886D 886C 8869 8868 8867 8866
 -   0             FM1 1  SUPO 1         8865 8864 8863 8862 885F 885E 885D 885C
 OFI 0           -    0   DATO 0         885B 885A 8859
```

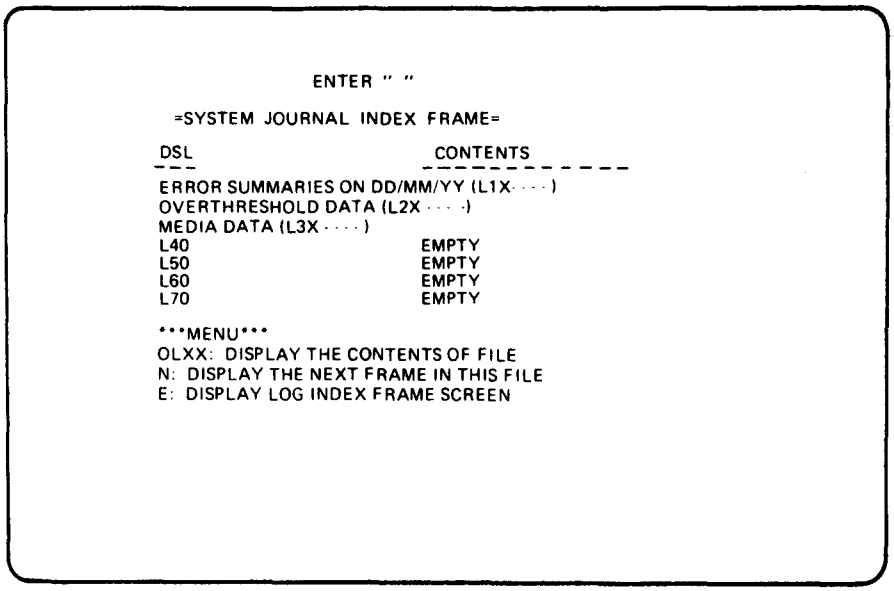
Operating System Detected Errors (System Journal Frame)

When OS/3 detects an error, the error syndrome is stored on the resident operating system disk by the error log program ONUERL. You should periodically transfer the error syndrome data from the operating system disk to the system journal diskette DH4759 using the maintenance diskette drive FDD1 in the processor cabinet.

Refer to steps 1 through 4 for instructions to display and interpret the error log fields.

1. Press the ESC and then P keys on the console keyboard to display the Service Frame.

2. Press the 0 and XMIT keys to display the System Journal Frame.



3. Press the E and XMIT keys to display the Journal Index Frame screen.

```
                ENTER " "

=SYSTEM JOURNAL INDEX FRAME=
     DSL                          CONTENTS
      L10                           EMPTY
      L20                           EMPTY
      L30                           EMPTY
      L40                           EMPTY
      L50                           EMPTY
      L60                           EMPTY
      L70                           EMPTY


      *** MENU ***
      OLXX: DISPLAY THE CONTENTS OF FILE
      N: DISPLAY NEXT FRAME IN THIS FILE
      E: DISPLAY LOG INDEX FRAME SCREEN
```

4a. Press the keyboard keys in this order to display the file contents: O L 1 0. Press the XMIT key.

```
                        ENTER "          "

OS/3  VER. 08/00,  CUST-ID.  MOD-8, XX.  83/07/06,     11.57.08
FLAGS 0080,  CHAR.  33BE0080,  MAIN STOR. 00100000
SYSRES:  101,  PRNTR:  330,  READER:  332,  $Y$ELOG:  101
BIT MAP DATA (IN BITS' ONE BIT=64K.  0=ON LINE, 1=OFF LINE) :
00000000 00000000 11111111 11111111

VER. 48/17 - SENSE SUMMARY DATA AAT:    13.18

DVC LIST:310,311,312,313,314,315,333,330,332,370,371,

100,101,102,107,103,104,105,106,320,321

OVER-THRESHOLD DVC/S:100

SUMMARY SPAN:    00/00/00. to 83/07/06.


TAPE ADDR:              370          371
THRSH. (RECOV):         .050         .050
TOT I/O COUNT:        32615        12073
RECOV. COUNT:             3          203
UNRECOV. COUNT:                       62
SYS RTRY:                 3          264
UNSUC SYS RTRY:                        62
NOISE:                                 21
FOSTMBL CHK:                           27
STD/WVRC:                 3          215
```

4b. Press the keyboard keys in this order to display the over-threshold devices: O L 2 0. Press the XMIT key.

```
          ENTER "        "

BETWEEN   83/06/28  AND  83/07/06, OVER-THRESHOLD DEVICES:

DMA DISK ADDR:          100
THRSH. (REVOC):         .050
TOT. I/O COUNT:        2727
RECOV. COUNT:           318
UNRECOV. COUNT           32
SYS RTRY:               350
UNSUC SYS RTRY:          32
SEEK INCOMP:            264
DTA FLD SYNC:             2
DTA FLD ECC:            .44
RCD NBR MSCOMP:           3
NO RCD (NDX):            55
```

4c. Press the keyboard keys in this order to display the media data: O L 3 0. Press the XMIT key.

```
                ENTER "        "

ERROR ACTIVITY BY VSN.
  DVC     VSN        TIC      TOC      TIC/TOC
  370                  3     32615     0.000092

  371     BUHA82     219      5331     0.04108
          BAU002      42      6202     0.006772
          ONSRVO       2       446     0.004484

  320                  1         2     0.5
          IDC102       5         5           1.0
          CMA010       5        64     0.078125
          XXXXXX       1       696     0.001437
```

NOTE: To display the next frame in the accessed file, enter N and press the XMIT key.

A.4.2. Transmitting the Error Log to Unisys (Remote Support Center)

You should run the error log program every two months, or when you call the Remote Support Center.

Perform the following instructions to execute the error log program.

1. Enter RV ONUERL on the console keyboard.

NOTE: *If the system responds with this message,* "THRESHOLD EXCEEDED. LOAD SYSTEM JOURNAL DISKETTE IN FDD1 AND GO", *insert the system journal diskette DH4806 into system diskette drive FDD1.*

2. Press the G and O keys on the console keyboard.

NOTE: *If the system journal diskette DH4806 is not inserted into system diskette drive FDD1, this message prints on the console display screen:*

FDD1 DISKETTE. VOL1 = XXXXXX, USER LBL = XXXXXXX INVALID DISKETTE. DO YOU WANT TO WRITE ON IT? (Y,N)

Press the N key on the console keyboard. If you enter a Y response, all current data on the diskette in FDD1 is lost.

When you press the N key, the following message prints on the console display screen:

INSERT VALID DISKETTE DH4806 AND TYPE R

Insert DH4806 into system diskette drive FDD1 and press the R key.

The system journal information is now written on the journal diskette in FDD1 and ready for transmission to Unisys. Transmit the error log as soon as possible during a period of low user job activity.

General Modem Procedures

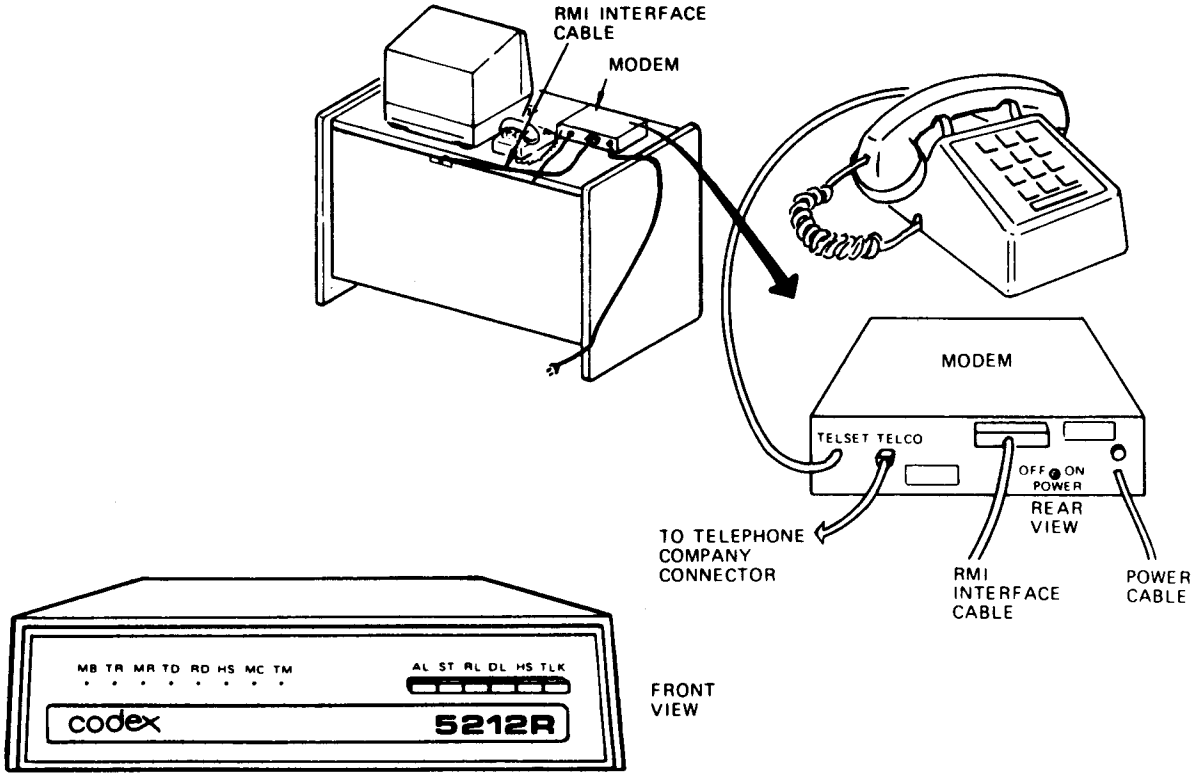
The System 80 models 10/20 use a CODEX 5212R modem. To use this modem, perform the following steps:

1. Locate the modem and place it on the system console near the telephone.

2. Ensure that the data and power cords are connected to the modem and that the power cord is connected to an ac power source.

3. Press the HS switch so that it is pushed in.

4. Press the TLK switch so that it is pushed in. Only the HS and TLK switches should be pushed in.



CODEX 5212R MODEM

Procedure for Transmitting the Error Log to Unisys

Use the following procedure to transmit an error log to Unisys.

NOTE: Unless otherwise noted, use the system console to perform the following instructions.

1. Press the ESC and then C keys to display the Configuration frame.

```
                ENTER.

=CONFIGURATION(A00)=
                                  ***PROCESSOR CONFIGURATION***
  E FRAME CHANGE
                                                 CONF.  FPP     CAM     MICRO REV
                                  BPU     ON             ON      ON       A00
   ***SPECIAL MODE***
                                                 MCU  BMU0   BMU1   BMU2   BMU3
   .AUTO IPL       OFF            MMU     ON    4      4      2      -
    AUTO BPU RECV OFF
    REMOTE CNSL    OFF                        1    2      3      4      5      6
                                  SEL     ON*   ON     ON     ON     -      ON

    AUTO IPL ADRS=0380            MIA     ON
    MEMORY SIZE=0A00000           IOP0    ON
                                  IOP1    ON



   ***CNSL LAMP AND SWITCH***
    SEQ1 OFF  TH   OFF  IPL  MNL          SYSTEM CNSL ON          FDD0=0000OP0
    SEQ2 OFF  TEST ON                     REMOTE CNSL OFF         FDD1=C00,MD1
    SEQ3 OFF
```

2. Press the E and XMIT keys to display the Configuration Select frame.

```
                ENTER.
=CONFIGURATION SELECT(A00)=
  E FRAME CHANGE                          -CONSOLE MODE-
                                         M SELECT MODE(0-1)  -MO-
    -SET ADRS                            B DEFAULT MODE(0-1) -MO-
   A AUTO IPL DEVICE(000-FFF) -380-
                                         O REMOTE OFF
    -SVP FUNC-                           N REMOTE ON
   L CLEAR SVP LOG
   V FDD COPY                            S USER ID ALPHA
                                         J USER ID NUMERIC
    -ABR CTRL-                           U REMOTE IS COUPLER ( 0=YES 1=NO )
   R RESET ABR MODE                      Z REMOTE BAUD - RATE ( =300 =1200)
   N SET ABR MODE
   C ABR RETRY COUNT(0-9)      -3-       ***CONSOLE MODE TABLE***
                                                 SCC    RMT
   K KEYBOARD TYPE(0-7)                      M0  MAIN   SPRT
    0 USA              1 UNITED KINGDOM      M1  MAIN   MAIN
    2 GERMANY          3 SPAIN
    4 FRANCE           5 DENMARK/NORWAY
    6 SWEDEN/FINLAND   7 ITALY
```

3. Press the N and XMIT keys to start the remote connection.

4. Press the M1 and XMIT keys to complete the start of the remote connection.

5. Call the Remote Support Center at the Performance Reporting number entered on the Remote Support sticker described in A.5.

6. When you hear the connect tone, press and release the TLK switch so that it is not pushed in. ←

7. After about 30 seconds, this message from Unisys prints on the display screen:

   ENTER CUSTOMER NUMBER (SHOWN ON REMOTE SUPPORT STICKER)

8. Enter your customer number. The entry form is XXXXXX or XXXXXX-YY where X and Y represent the decimal digits. If your entry is incorrect, this message prints on the display screen:

   KEY ERROR - CUSTOMER NUMBER IS IN THE FORM XXXXXX OR XXXXXX-YY - REENTER

   Reenter your customer number.

   If the error continues, this message prints on the screen:

   CONTACT REMOTE SUPPORT CENTER FOR CORRECT PERFORMANCE DATA TRANSMISSION PROCEDURES

   Contact the Remote Support Center using the telephone number on the Remote Support sticker.

9. If the Remote Support Center can't locate your customer number, this message prints on the display screen:

   XXXXXX-YY IS NOT REGISTERED IN THE FILES

   PLEASE RECHECK THAT YOU HAVE ENTERED THE CUSTOMER NUMBER SHOWN ON THE STICKER

   ENTER THE CORRECT CUSTOMER NUMBER OR ENTER "STOP" AND CONTACT REMOTE SUPPORT CENTER

10. If you keyed in the incorrect customer number, enter the correct number at this time. If the customer number printed on the screen in step 9 is the one shown on the Remote Support sticker, enter "STOP", perform the disconnect procedures in steps 14 through 17, and contact the Remote Support Center.

11. This message prints on the screen if the customer number is found in the Remote Support Center files:

    XXXXXX-YY IS REGISTERED AS site name CORRECT? (Y N)

    If your site name in the message is correct, enter Y. If it is not correct, the customer number is in error, enter N and proceed to step 9.

12. When your customer number is accepted, the Remote Support Center prepares your system for performance data transmission and prints this message on your screen:

    PERFORMANCE DATA IS NOW BEING TRANSMITTED TO REMOTE SUPPORT CENTER

    This message prints on the screen if an error condition occurs:

    ERROR DURING PERFORMANCE DATA TRANSMISSION-CONTACT REMOTE SUPPORT CENTER

    If you receive this error message, terminate the sequence and contact the Remote Support Center using the telephone number listed on the Remote Support sticker. Report the problem and all the error messages to the Remote Support Specialist.

13. After all performance data transmits to the Remote Support Center, this message prints on the screen:

    THE TRANSMISSION IS NOW COMPLETE - THANK YOU

    (Other advisory messages can also be printed on the screen at this time.)

    Approximately 15 seconds after this message, the Remote Support Center automatically disconnects the telephone line.

14. Replace the telephone handset in the telephone cradle. Press the TLK switch on the modem so that it is pushed in.

15. Press the ESC and then C keys to display the Configuration frame.

```
                ENTER.          .

=CONFIGURATION(A00)=
                                        ***PROCESSOR CONFIGURATION***
  E FRAME CHANGE
                                                    CONF.  FPP     CAM     MICRO REV
                                        BPU     ON          ON      ON       A00
   ***SPECIAL MODE***
                                                    MCU  BMU0   BMU1   BMU2   BMU3
    AUTO IPL      OFF                   MMU     ON    4     4      2      -
    AUTO BPU RECV OFF
    REMOTE CNSL   OFF                             1     2      3      4      5      6
                                        SEL     ON*   ON    ON     ON     -      ON

    AUTO IPL ADRS=0380                  MIA     ON
    MEMORY SIZE=0A00000                 IOP0    ON
                                        IOP1    ON



   ***CNSL LAMP AND SWITCH***
    SEQ1 OFF  TH   OFF  IPL  MNL              SYSTEM CNSL ON          FDD0=0000OP0
    SEQ2 OFF  TEST ON                         REMOTE CNSL OFF         FDD1=C00,MD1
    SEQ3 OFF
```

16. Press the E and XMIT keys to display the Configuration Select frame.

```
                ENTER.          .
=CONFIGURATION SELECT(A00)=
  E FRAME CHANGE                              -CONSOLE MODE-
                                             M SELECT MODE(0-1)  -MO-
    -SET ADRS                                B DEFAULT MODE(0-1) -MO-
   A AUTO IPL DEVICE(000-FFF) -380-
                                             O REMOTE OFF
    -SVP FUNC-                               N REMOTE ON
   L CLEAR SVP LOG
   V FDD COPY                                S USER ID ALPHA
                                             J USER ID NUMERIC
    -ABR CTRL-                               U REMOTE IS COUPLER ( 0=YES 1=NO )
   R RESET ABR MODE                          Z REMOTE BAUD - RATE ( =300 =1200)
   N SET ABR MODE
   C ABR RETRY COUNT(0-9)      -3-           ***CONSOLE MODE TABLE***
                                                      SCC   RMT
   K KEYBOARD TYPE(0-7)                          M0   MAIN  SPRT
    0 USA              1 UNITED KINGDOM         M1   MAIN  MAIN
    2 GERMANY          3 SPAIN
    4 FRANCE           5 DENMARK/NORWAY
    6 SWEDEN/FINLAND   7 ITALY
```

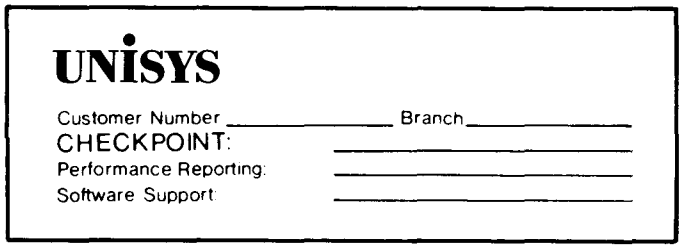
17. Press the O and XMIT keys to return to processing mode.

A.5. CALLING FOR ASSISTANCE

This subsection contains the procedures for contacting Unisys and provides a detailed description of the suspected hardware failure.

A.5.1. Remote Support Sticker

The Remote Support Center sticker (shown below) is mounted on your modem. The sticker contains the telephone numbers to contact Unisys for assistance.



The Remote Support sticker provides this information:

- Your customer number
- Your Unisys branch number
- The Remote Support 800-telephone number
- The performance reporting 800-telephone number
- The software support 800-telephone number

Your customer number is the 5-digit Customer Service Engineering site identification number. The Unisys branch number is the 4-digit branch identification number. (Unisys Customer Service Engineering enters the telephone numbers on the sticker when they install the system.)

A.5.2. General Modem Procedures

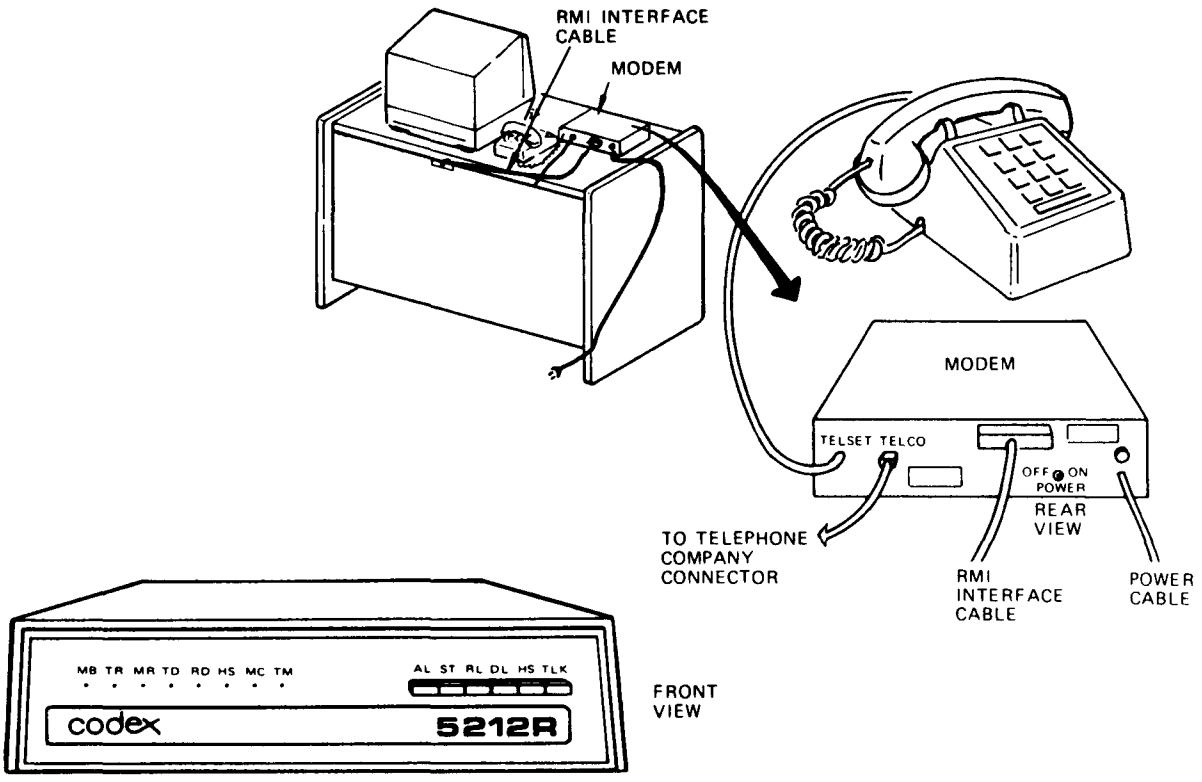
The System 80 models 10/20 use a CODEX 5212R modem. To use this modem, perform the following steps:

1. Locate the modem and place it on the system console near the telephone.

2. Ensure that the data and power cords are connected to the modem and that the power cord is connected to an ac power source.

3. Press the HS switch so that it is pushed in.

4. Press the TLK switch so that it is pushed in. Only the HS and TLK switches should be pushed in.



CODEX 5212R MODEM

A.5.3. Remote Support System

NOTE: These instructions apply only to System 80 models 10/20 systems installed in the continental United States, Canada, and Mexico.

The Remote Support system provides you with technical assistance for hardware problems 24 hours a day, seven days a week.

Perform the following procedure when your system has maintenance problems:

1. Determine whether the problem is hardware or software. If it is a software problem, call the Software Support telephone number listed on the Remote Support sticker

2. If an error message, system error code, or other indication points to a hardware error, contact the Remote Support Center using the telephone number listed on the Remote Support sticker.

NOTE: If remote maintenance service is not available, contact the Unisys customer service engineering office or service point at the telephone number they have provided. Before contacting the Remote Support Center, you must ensure that the diagnostic test media is available.

3. If your system has a hardware malfunction, save the error message printout for support personnel and report the information to Unisys.

4. Locate the following test media before you contact the Remote Support Center (this media is needed during the remote testing):

A. Microdiagnostic Tests

Control Number	Description
DH4801	Central Complex
DH4802	MIA and IOP
DH4805	IOP Error Messages

B. Macrodiagnostic Tests

Control Number	Description
DH4803	Prelude, CPMDC, LPD, HLP, BDP
DH4804	Offline Tape Load Path Diagnostics

5. The Remote Support Specialist may also request this information:

   - Your customer number - located on the sticker
   - Branch number - located on the sticker
   - Your name
   - Customer (site) name
   - Operating system revision level

6. The Remote Support Specialist will discuss the condition with you to determine if remote maintenance can assist in resolving the problem. The following points may be considered in this discussion:

   - If you have run the diagnostic tests, inform the specialist of the results.
   - Inform the specialist of all visible error conditions or console error messages from OS/3.
   - Inform the specialist of your configuration.

7. The specialist uses the information you provide to decide if the remote maintenance capability can help solve the problem.

   - If remote maintenance can't assist, the specialist refers your problem to the customer service engineering office.
   - If remote maintenance can help the problem, troubleshooting begins using the remote support system described in A.5.4.

In all cases, the Remote Support Center informs the customer service engineering office of the status of all calls.

A.5.4. Remote Operation

Remote control of the System 80 models 10/20 can be implemented using the remote support facilities.

The remote support application programs use a telephone communications data path to the System 80 models 10 or 20. During remote operations, the specialist monitors and controls the execution of onsite test routines using remote console operations. After a malfunctioning area has been located, the remote console is used for further isolation of the failure. The information provided by this diagnostic tool allows the specialist to provide comprehensive assistance for onsite problem analysis.

If the specialist determines that the remote capability can help solve the problem, remote operation can occur in this order:

1. The specialist explains the proposed testing sequence to you. Testing can be performed in either the online or offline mode, depending on the type of problem, site production requirements, and system configuration.

   For certain types of system problems, such as intermittent central complex or peripheral errors, the specialist can request the Error Log (ONUERL) program.

2. The specialist notifies you when to push the TLK switch so that it is not pushed in. Do not replace the telephone handset in its cradle. Place the handset on the table. ←

NOTES: 1. *If the remote connection is not established, lift the telephone handset and listen for the specialist. If the specialist is not on the line, terminate the connection and try again.*

2. *During testing, monitor the console screen for messages from the specialist and respond to the messages when they print on the console display screen.*

3. For particular tests, the specialist can request you to load the required test media.

4. When all the required tests have run, the specialist requests you to return to voice mode. Test results can be discussed and procedures for degraded system operation can be suggested.

5. The specialist contacts the local customer service engineering office to ensure that the necessary parts and service personnel are dispatched to your site.

6. Terminate the remote connection.

Appendix B. List of Acronyms

The following acronyms are found throughout this manual:

Acronym	Definition
ABR	automatic processor recovery
B-MUX	byte multiplexer
BPU	basic processing unit
bpi	bits per inch
CD	carry detect
CHAR	character
CHC	channel controller
CNSL	console
CPU	central processor unit
CR	carriage return
CRT	cathode ray tube
CTRL	control
DEL	delete
DIAG	diagnostic
ERAS	erase
ESC	enter system command
HPR	halt and proceed

Acronym	Definition
IDCU	integrated disk control unit
IMPL	initial microprogram load
I/O	input/output
IOP	input/output processor
IPL	initial program load
KM	constant memory
LED	light-emitting diode
LF	line feed
lpi	lines per inch
lpm	lines per minute
MB	megabytes
MCU	memory control unit
MIA	mainframe interface adapter
ms	milliseconds
MSG	message
MSU	main storage unit
MUX	multiplexer
P-bus	processor bus
POC	power-on confidence
PPC	paper peripheral controller
PSW	program storage word
RAM	random access memory
ROM	read-only memory
RPF	read protection flag
rpm	rotations per minute
RPT	repeat

Acronym	Definition
SCP	system control processor
SEL	selector channel
SF	software function
SM	scratch memory
SOE	start of entry
SPR	storage protection program key
STK	stack register
SVP	service processor
SYSRES	system resident program
tpi	tracks per inch
UTS	universal terminal system
VFB	vertical format buffer
VFC	vertical forms control
XMIT	transmit

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UNISYS

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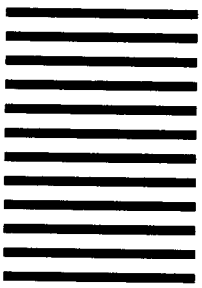

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