SPERRY UNIVAC
COMPUTER SYSTEMS

!#

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PUBLICATIONS UPDATE

System 80

Processor

Operator Reference

UP-8880 Rev. 1-A

This Library Memo announces the release and availability of Updating Package A to "SPERRY UNIVAC System 80 Processor Operator Reference", UP-8880 Rev. 1.

This update provides information to ensure the integrity of disk files when system power is turned off.

Copies of Updating Package A are now available for requisitioning. Either the updating package only or the complete manual with the updating package may be requisitioned by your local Sperry Univac representative. To receive only the updating package order, UP-8880 Rev. 1-A. To receive the complete manual, order UP-8880 Rev. 1.

LIBRARY MEMO ONLY	LIBRARY MEMO AND ATTACHMENTS	THIS SHEET IS:
Mailing Lists BZ, CZ (less DE, GZ, HA) and MZ	Mailing Lists DE, GZ, HA, 28U and 29U (Package A to UP-8880 Rev. 1, Covers and 10 pages plus Memo)	Library Memo for UP-8880 Rev. 1-A
		RELEASE DATE: February, 1982

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PUBLICATIONS REVISION

System 80

Processor

Operator Reference

UP-8880 Rev. 1

This Library Memo announces the release and availability of "SPERRY UNIVAC® System 80 Processor Operator Reference", UP-8880 Rev. 1.

This manual provides new and revised information for initial setup and operation of the System 80 processor complex. Information is limited to hardware operation up to implementation of software. Reference is made to subsequent manuals required to continue with software or maintenance.

Additional copies may be ordered by your local Sperry Univac representative.

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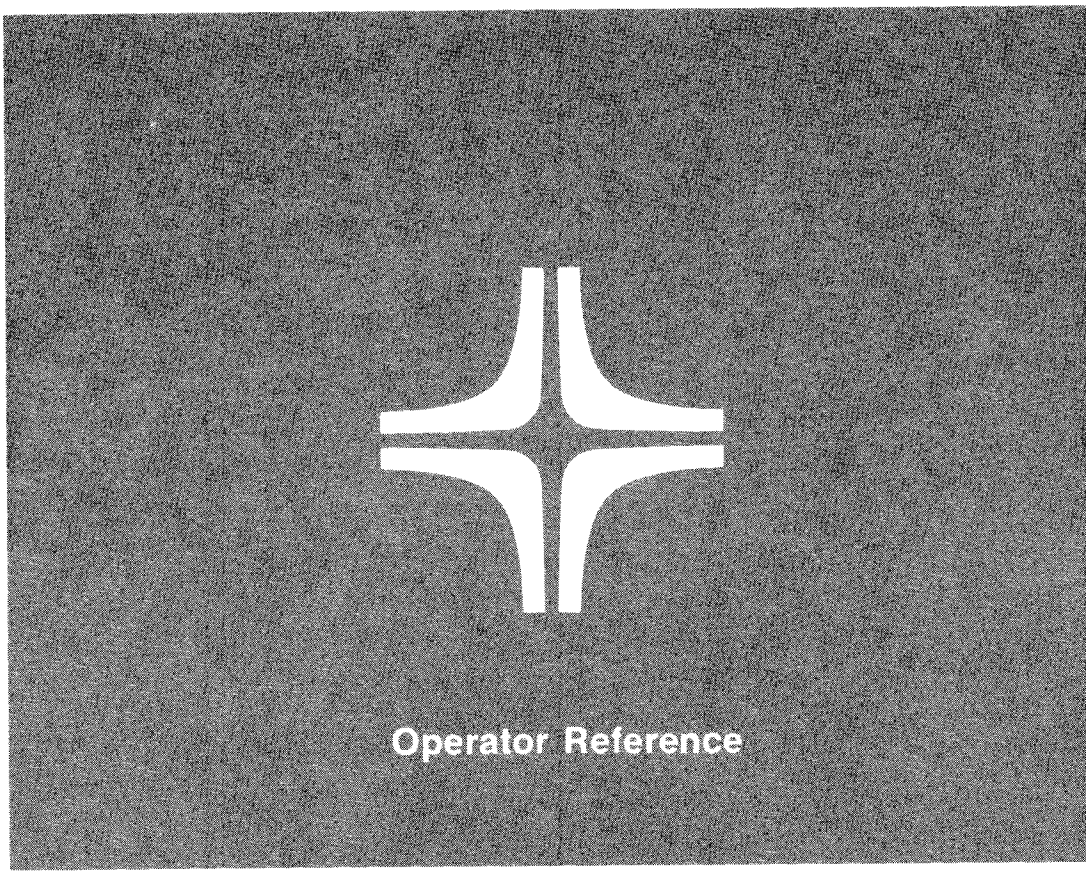
		RELEASE DATE: September, 1981

Processor



Environment: System 80

SPERRY UNIVAC

This document contains the latest information available at the time of preparation. Therefore, it may contain descriptions of functions not implemented at manual distribution time. To ensure that you have the latest information regarding levels of implementation and functional availability, please consult the appropriate release documentation or contact your local Sperry Univac representative.

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Compliance is based upon a system configuration that includes Sperry Univac peripherals/subsystems so labeled, and cables furnished by Sperry Univac or built to Sperry Univac specifications and assembly procedures.

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1. Introduction

This manual contains information and procedures for operating the SPERRY UNIVAC System 80 Processor and central processing equipment that includes the console workstation and diskette drives (Figure 1-1). The processor has extended capabilities and can be used for a wide range of computing requirements. The following central processor components include operator controls:

- Processor power supply
- Console workstation
- Diskette drives

Additional peripheral devices integrated with the processor include workstations, disk drives, diskette drives, communications devices, magnetic tape subsystems, printers, card readers, and card punches. Operating procedures are provided in this manual for the processor, console workstation, and diskette drives. Related Sperry Univac documents of interest to the operator on the system and its peripheral subsystems are listed in Table 1-1.

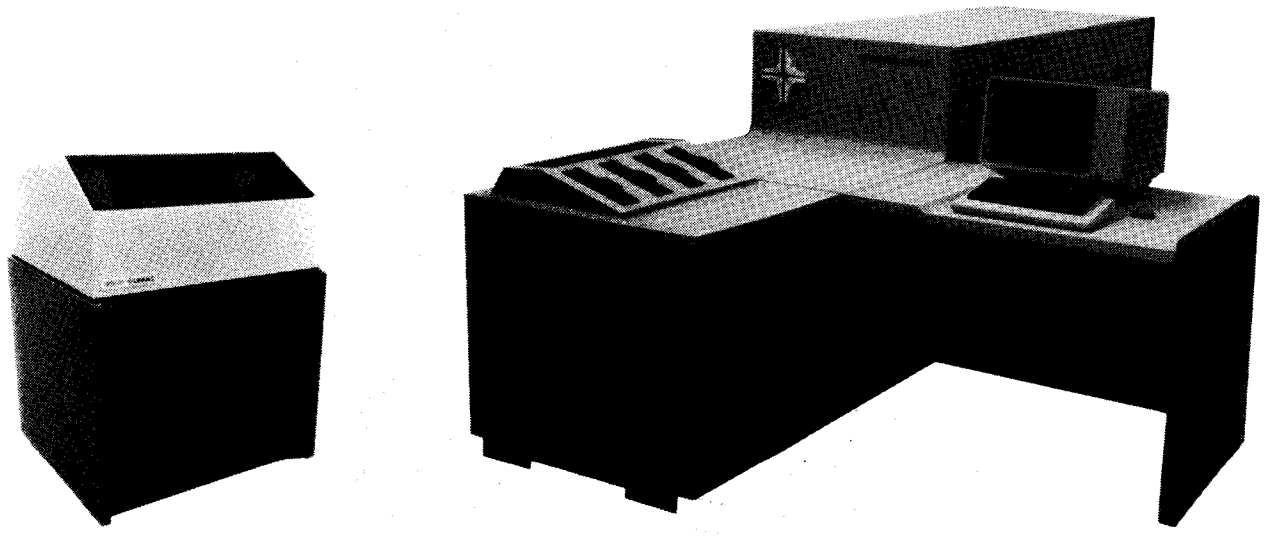


Figure 1—1. SPERRY UNIVAC System 80 Processor System

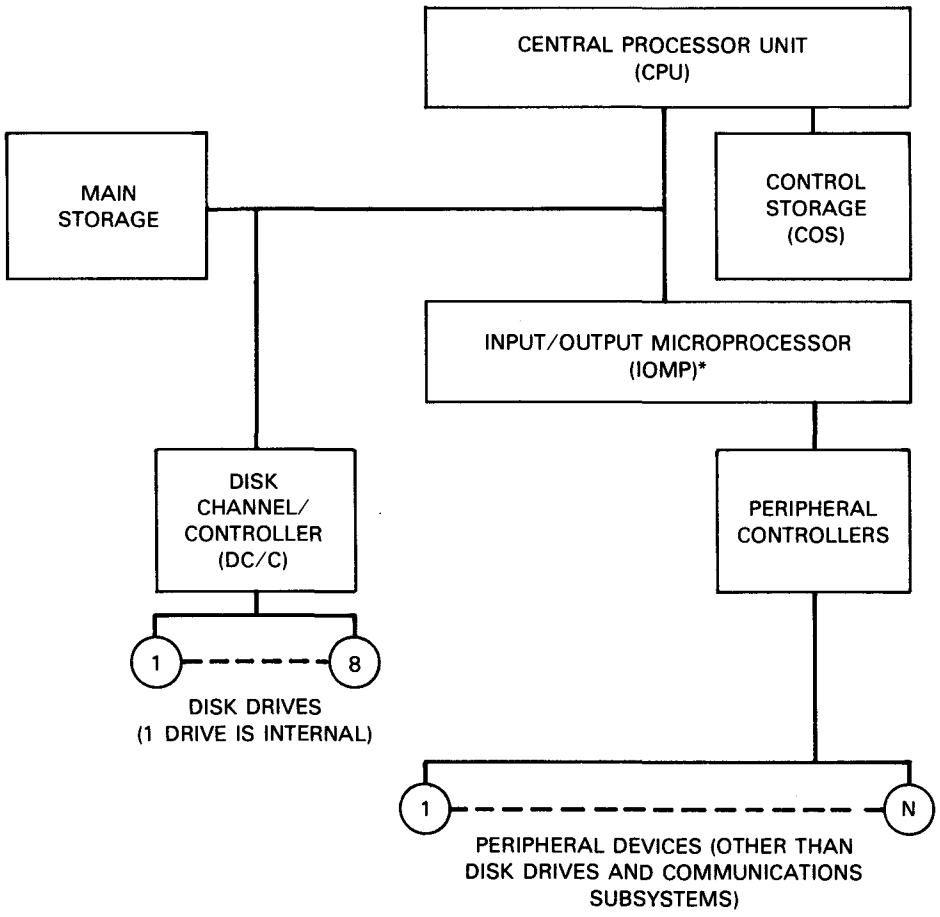
Table 1—1. Sperry Univac Related Documents

Document Number*	Title
UP-8250	0776 printer subsystem operator reference
UP-8386	0608 card punch subsystem operator reference
UP-8429	0719 card reader subsystem operator reference
UP-8915	OS/3 operator maintenance guide
UP-8609	UNISERVO 10, type 0871, magnetic tape subsystem operator reference
UP-8859	System operations handbook operator reference
UP-8908	0789 printer subsystem operator reference
UP-8917	8417 disk subsystem operator reference
UP-8919	8419 disk subsystem operator reference
UP-8910	Workstation operator reference
UP-8376	System operations summary
UP-8915	Operator maintenance guide
UP-8742	I/O integrated controllers programmer reference
UP-8882	0798 printer subsystem operator reference
UP-9160	0797 printer subsystem operator reference

*Current version

1.1. SYSTEM DESCRIPTION

The processor operates in concert with control storage, I/O controllers, and peripheral subsystems located within and outside the processor cabinet (Figure 1-2). Microcodes in control storage cause the processor to execute instructions that activate selected peripheral devices and perform required computing functions. All activity is initiated by the operator at the console workstation.



*The IOMP is optional.

Figure 1—2. Relationship of Processor Primary Functions with Peripheral Devices in a Maximum Configuration

1.1.1. Central Processor Unit

The central processor unit (CPU) provides the data path, registers, and associated control logic for instruction executions, system control, and I/O channel support. The data path consists of two arithmetic logic units (ALUs) having independent access to two register stacks. One register stack is 32 words long (4 bytes per word) and the other is 64 words long, for use of high-speed storage.

Characteristics of the processor complex of interest to the operator are:

- Operations through the console workstation
- Simplified main power turn on/turn off
- More flexibility with less operating steps via diskettes.

1.1.2. Control Storage

Control storage (COS) consists of two modular units having microinstructions to control operations of the processor. The COS module includes one kiloword of read-only storage with resident microdiagnostics for the processor and capabilities for performing an initial microprogram load (IMPL). The IMPL loads the remaining COS from an internal fixed-head disk (the primary source) or from a diskette (the secondary source for performing an IMPL). The COS word is 32 bits wide plus 4 parity bits. COS has a maximum capacity of 32K words.

1.1.3. Main Storage

The main storage processor (MSP) controls the main storage unit for preprocessing main storage addresses and converting them from relative to absolute addresses. Protection logic ensures data and program protection in the system; data is aligned by the main storage unit. Error correction also is provided for main storage data and includes double-digit detection and single-bit error correction on storage access for the MSP.

The main storage unit (MSU) stores data in word format. The MSU has at least 262K bytes available for data storage and can be expanded in increments of 262K bytes up to 1048K bytes. The MSU also contains additional space for error detection and error correction.

1.1.4. Input/Output Microprocessor

System peripheral devices other than disk drives communicate with the processor via an optional multiplexer-type input/output microprocessor (IOMP). The IOMP, used with maximum expansion of the system, supports devices having low or medium data transfer rates, including workstations, diskette drives, printers, card readers, a card punch, and a magnetic tape subsystem. The IOMP is emulated, when not included, to accommodate lower expansion configurations. Data throughput may be at the rate of up to 200 kilobytes per second.

1.1.5. Controllers

Controllers provide the logic and control circuits to operate I/O devices. Controllers accept commands from the processor (through programming), from the console workstation by the operator, or from operator controls on the device. Commands are decoded in the controller and operations are initiated for selected I/O devices.

Controllers adapt the particular characteristics of each device to conform with I/O channel requirements. The information is then supplied to each external device via the processor I/O interface. When multiple devices share the channel, the controller synchronizes data transfers through the interface and channel.

1.1.5.1. Disk Channel/Controller

The disk channel/controller (DC/C) controls read, write, and search operations on disk surfaces. The resident disk drive located within the processor cabinet (as well as up to seven external disk drives) is controlled by the DC/C.

The DC/C provides error correction codes and performs diagnostics to check disk drive integrity. Up to 1.2 megabytes per second of data flow can be transferred by the DC/C.

1.1.5.2. Peripheral Controllers

Controllers for peripheral devices include:

- Workstation controller
- Diskette controller
- Paper peripheral controller
- Magnetic tape controller

Access to an additional controller port allows inclusion in the system of additional workstation controllers, additional paper peripheral controllers, or interface with a remote printer.

Up to 32 peripheral devices, excluding disk drives and communications devices, can be connected in a maximum configuration system (1.2).

1.1.6. Console Workstation

The operator maintains control of system operation via the console workstation, using the keyboard and video display screen. The operator keys in messages to the processor and operating system, and response messages are indicated on 24 lines of the display screen. An additional 25th line indicates system status or operating mode.

Indicators inform the operator when the console workstation power is on, if the audible alarm is on, and if the keyboard is in shift state. By pressing the appropriate keys, the operator can switch to any one of five operating modes:

- *system console mode* to communicate with system software for console workstation operations;
- *system control mode* for system control operations; e.g., initial microprogram load (IMPL), initial program load (IPL), or operation of any of the nine system control keys;
- *workstation mode* for operation as any other standard workstation distributed throughout the system;
- *system response mode* to respond to messages received from software and to send additional queries or messages to software; and
- *maintenance mode* for communications with the Sperry Univac customer engineer during maintenance.

Operation as a console workstation is described in this manual only to the extent of its differences from a standard workstation. Operating procedures for workstations are described in the workstation operator reference, UP-8910 (current version). Additional information on use of the console workstation is provided in the system operations handbook operator reference, UP-8859 (current version).

1.1.7. Diskette Drives

The diskette drives are mounted in a cabinet attached to the processor cabinet and may consist of up to two autoload and two manual load drives; up to four manual load drives; or up to three manual load and one autoload drives. Each autoload diskette drive has a feed capability for sequentially processing up to 20 diskettes without operator intervention.

The diskettes and drives may serve as a direct access storage device. The 8-inch (20.32 cm) removable and interchangeable diskette storage media operate with two heads on the diskette drive that come in contact simultaneously with the diskette media. Reading and writing are performed on single-sided or dual-sided diskettes.

1.2. CONFIGURATION

The maximum system configuration is illustrated in Figure 1-3. Information in this manual is confined to the console workstation, diskette drives, and the processor main power circuit breaker. Operating procedures for other peripheral equipment shown in Figure 1-3 are available in the appropriate operator reference manuals (Table 1-1).

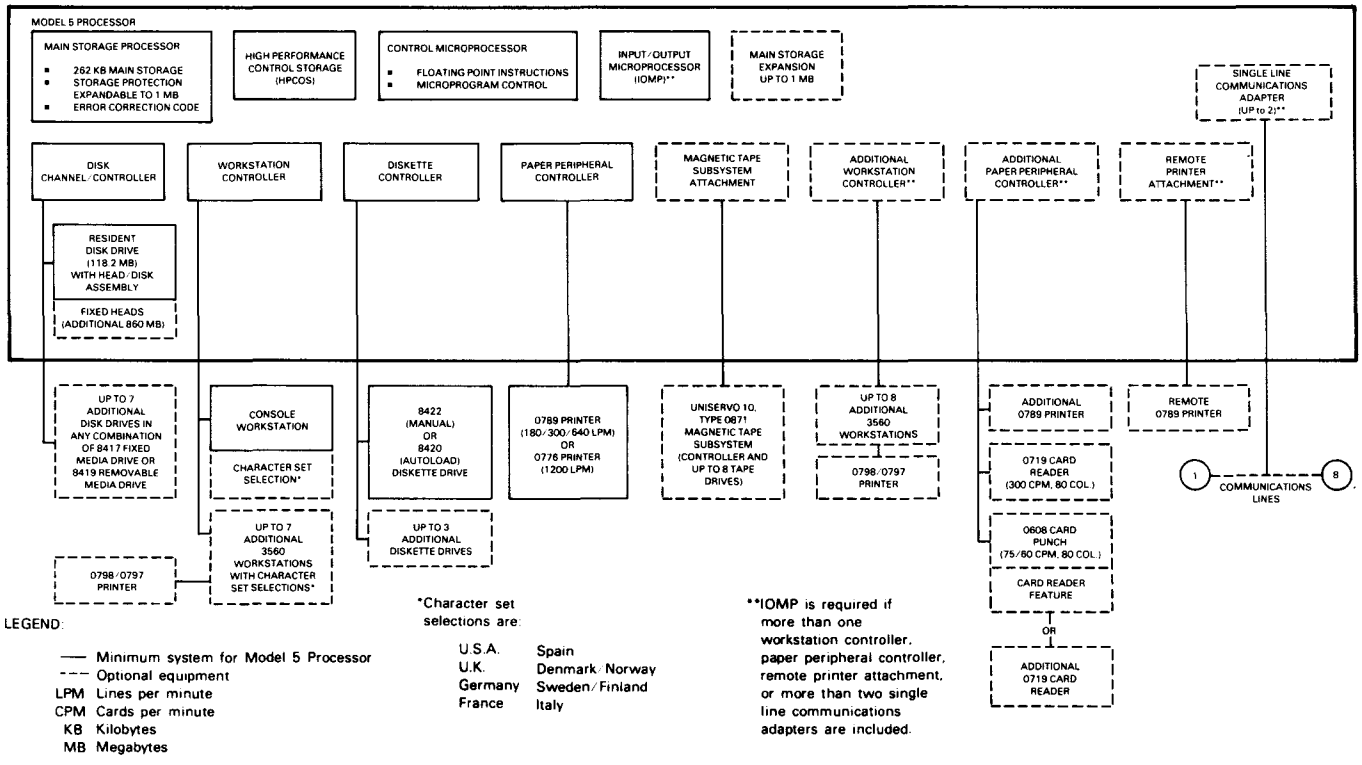


Figure 1—3. Maximum System Configuration

2. Operator Responsibility

The operator is responsible for preparing the processor for operation and for performing duties required for efficient operation. To assume these responsibilities, the operator must first know the location and function of all operator controls, indicators, and circuit breakers used on the equipment. The system operator must also be familiar with the diagnostic and remote maintenance procedures, as described in the operator maintenance guide, UP-8915 (current version).

In addition, the operator must:

- Turn power on and off for the processor, as required.
- Load and unload the diskette drives associated with operation of the processor.
- Operate the console workstation in system console mode to communicate with the processor.
- Correct faults caused by power interruptions.
- Turn off or reset the processor main circuit breaker when required.

The operator must be familiar with the operating procedures of the peripheral subsystems used with the processor complex. The susbsystems include:

- 8417 disk drive
- 8419 disk drive
- Workstations
- 0776, 0789, 0797, and 0798 printers
- 0719 card reader
- 0608 card punch
- UNISERVO 10, type 0871, magnetic tape drive
- Diskette drives and autoloader

Table 1-1 lists documents describing operating procedures for these subsystems.

3. Controls and Indicators

This section describes the switches, controls, and indicators used to operate the console workstation, processor, and diskette drives (Figure 3-1). The operator does not have access to switches or controls inside the processor cabinet. Access to internal controls is limited to, and maintenance is performed by, authorized Sperry Univac customer engineers.

CAUTION

Do not open any processor cabinet doors. Air inside the cabinet has been purged to prevent damage to the internal disk drive and to protect the electronic circuitry.

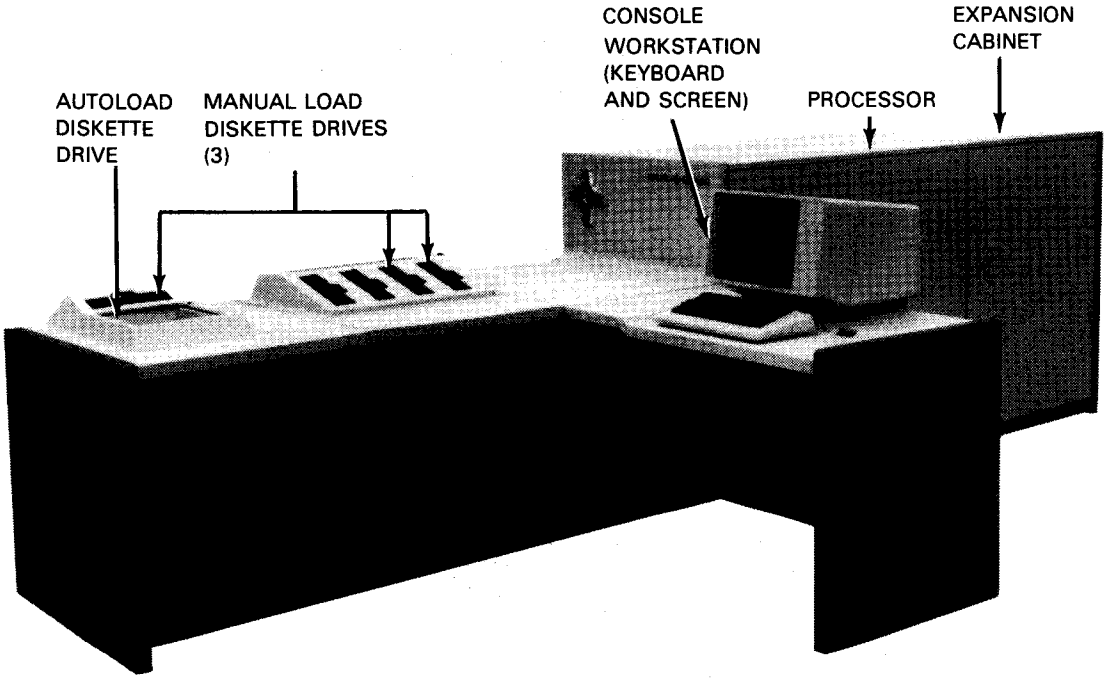


Figure 3—1. Processor with Console Workstation and Diskette Drives

3.1. SYSTEM POWER CONTROL

System power is controlled by sequencing circuits that apply power to the processor and all attached peripheral devices in sequence, instead of simultaneously. This prevents large current demand surges in the installation power system. Power is turned on first with the MAIN POWER circuit breaker and then the SYS PWR ON/OFF switch.

3.1.1. Power Circuit Breakers

The MAIN POWER circuit breaker is located at the rear of the processor cabinet (Figure 3-2). All power to the system is removed when this circuit breaker is tripped to the OFF (down) position. This circuit breaker is left in the ON position for normal operation.

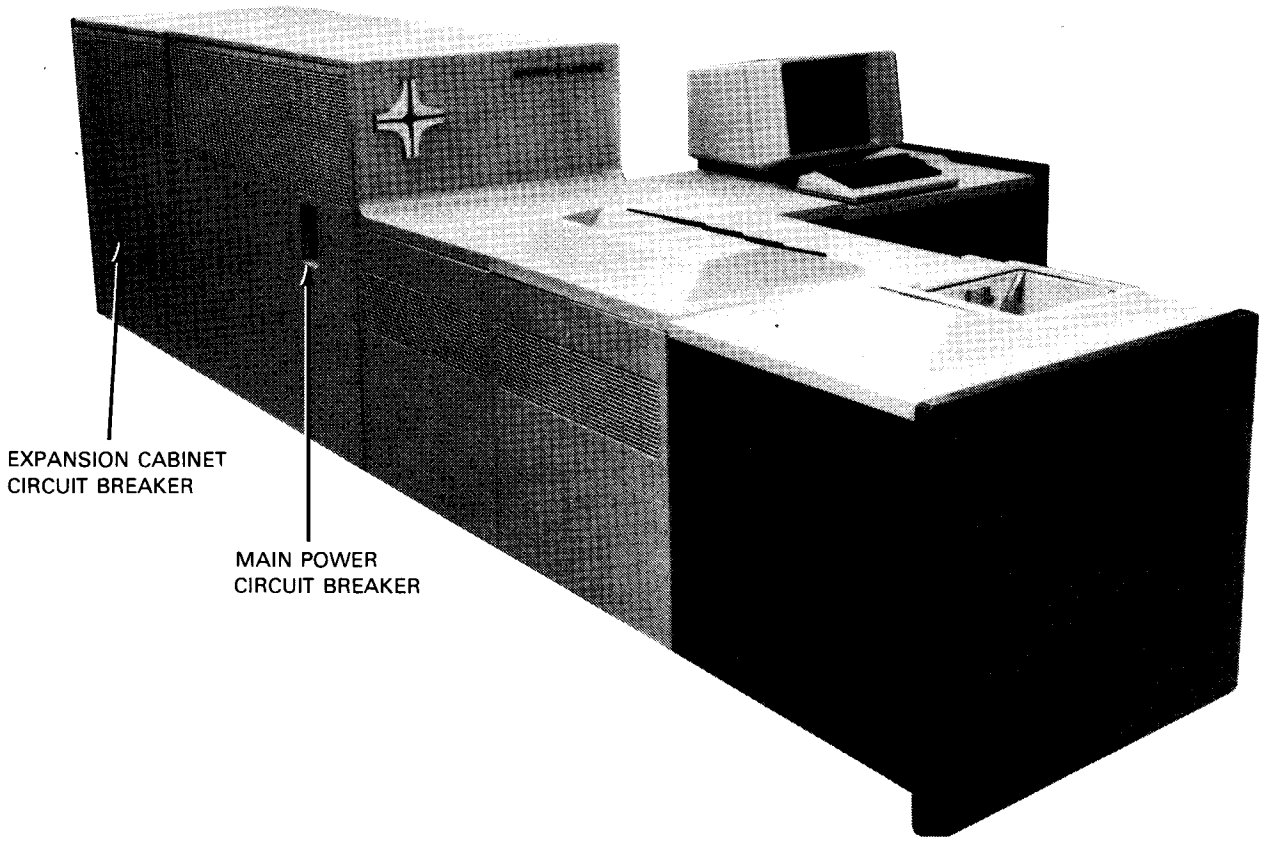


Figure 3—2. Circuit Breakers at Rear of Processor Cabinet

The expansion cabinet also has a circuit breaker located at the rear of its cabinet (Figure 3-2). This circuit breaker protects circuits in that cabinet from excessive current flow and must also be left in the ON position for normal operation.

3.1.2. SYS PWR ON/OFF Switch

The SYS PWR ON/OFF switch, located on the console table below and to the right of the display screen (Figure 3-3), is used by the operator to turn power on and off for the entire processor complex, including all attached peripheral devices integrated with the processor by internal controllers. The MAIN POWER circuit breaker (Figure 3-2) must be in the ON (up) position before power can be applied by the SYS PWR ON/OFF switch.

To ensure disk file integrity when turning power off to the entire processor system, first make certain that the type 8417 or 8419 disk subsystem is in file protect mode or that the power at that subsystem has been turned off.

Normally, the MAIN POWER circuit breaker is left in the ON (up) position and power is controlled with the SYS PWR ON/OFF switch. The display screen lights (after a slight delay) when the switch is set to the ON position to indicate that power is on.

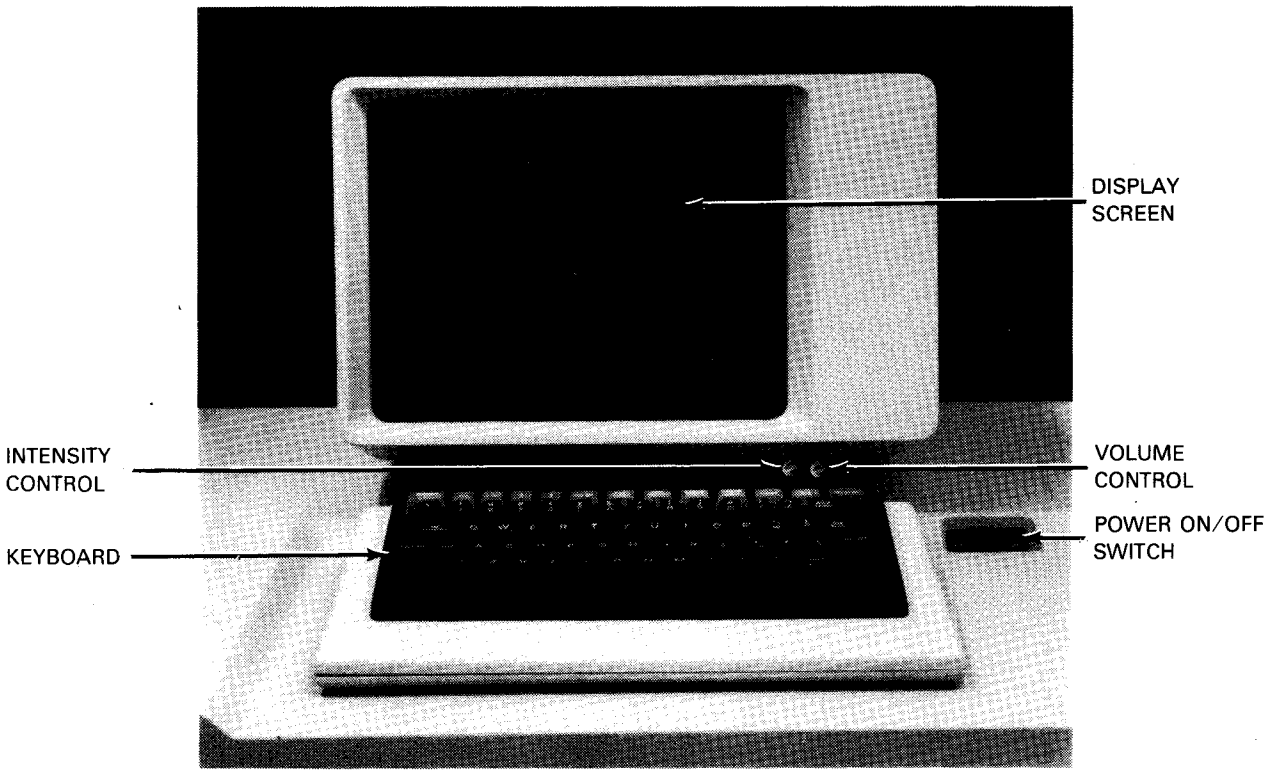


Figure 3—3. Console Workstation and POWER ON/OFF Switch

3.1.3. POCLR Switch

The POCLR (power-on clear) switch is located beneath the console table to the right (Figure 3-4). The pushbutton switch allows the operator to clear the entire system in event of a check stop, without losing the control page. When diagnosing a problem, the operator presses this switch to clear the screen and return to an initial program load (IPL) condition.

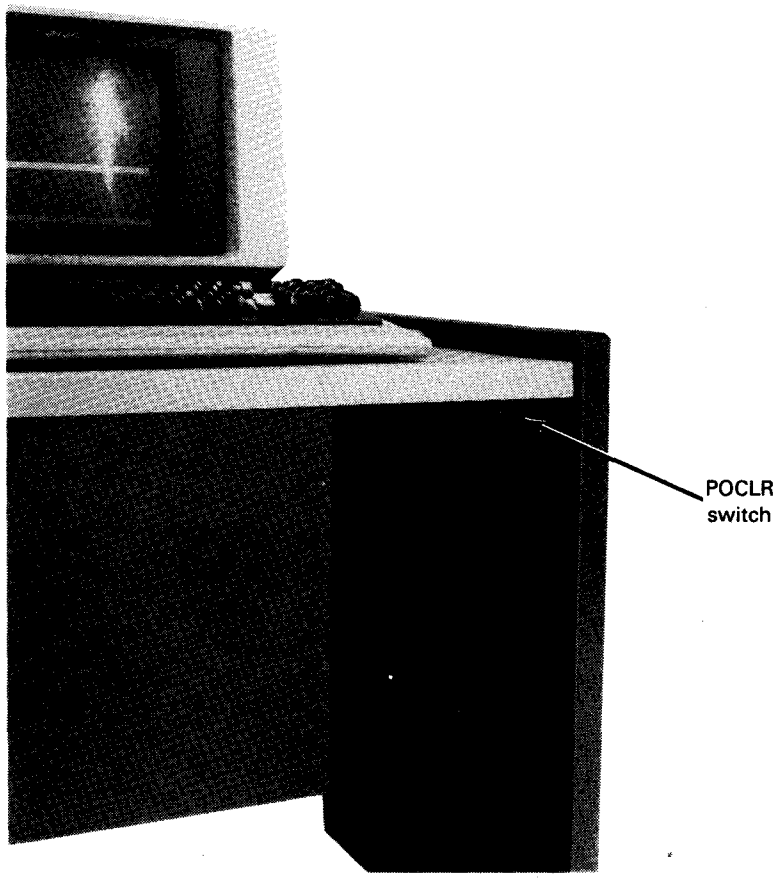


Figure 3—4. Location of POCLR Switch on Console Table

3.2. CONSOLE WORKSTATION

The display screen and keyboard are the major areas of operation of the console workstation (Figure 3-3). The operator initiates and terminates operations at the console workstation; therefore, the operator should be thoroughly familiar with the functions of the console workstation.

3.2.1. INTENSITY Control

The brightness of the console workstation display screen (Figure 3-3) is controlled by the INTENSITY control located below the screen, near the right edge. Intensity should be set for comfortable viewing of displayed characters.

3.2.2. VOLUME Control and Audible Alarm

The console workstation has an audible alarm to alert the operator of erroneous keyboard operation, a system message display on the screen, and other console workstation operations. The audible alarm volume is controlled by the operator with the VOLUME control.

The audible alarm also sounds when:

- an improper key is pressed, thus inhibiting input to the processor;
- the cursor enters the eighth character position from the end of the line (including the last line); or
- the cursor enters the last line on the screen (regardless of the character position on the line).

3.2.3. Keyboards

The console workstation can include any of a variety of standard keyboards, or an enlarged Katakana keyboard, that incorporates a dedicated numeric key pad. The keyboard is movable about the console table for operating convenience. An example of a keyboard layout without a numeric pad is illustrated in Figure 3-5.

The keyboard for the console workstation contains four groups of keys (mode control, system control, software function, and typewriter) that perform unique functions. These are described in 3.2.3.1 through 3.2.3.4.

3.2.3.1. Mode Control Keys

The operator can switch the console workstation to any one of five modes by pressing the proper keys. Mode selection is made by first pressing and holding the FUNCTION SHIFT key (Figure 3-5) while the key representing the desired mode also is pressed.

Table 3-1 lists the five operating modes and their respective keys. Three of these modes (console workstation, system control, and maintenance) are unique to the console workstation. The remaining two modes (system response and workstation) allow the console workstation to operate as a standard workstation. Additional information on the effects of switching to any of the five modes is described in 4.3.2.1.

Table 3—1. Mode Control Keys

Keyboard Key	Mode Selection with FUNCTION SHIFT Key Pressed
CONSOLE (C)	Selects console workstation mode. Provides communication between operator and system software for console workstation operation.
SYS CNTL (D)	Selects system control mode. Provides communication between operator and processor for system control functions (Table 3-2). A console-reset command from the workstation controller also causes the console workstation to enter system control mode.
MAINT (S)	Selects maintenance mode. Provides communication between Sperry Univac customer engineer and system hardware for maintenance functions.
SYS MODE (\ @)	Selects system response mode for workstation operations. Allows operator to communicate with software and receive system messages with alerts for special operator action.
W/S MODE (| [)	Selects workstation mode. Allows operator to operate console workstation as standard workstation.

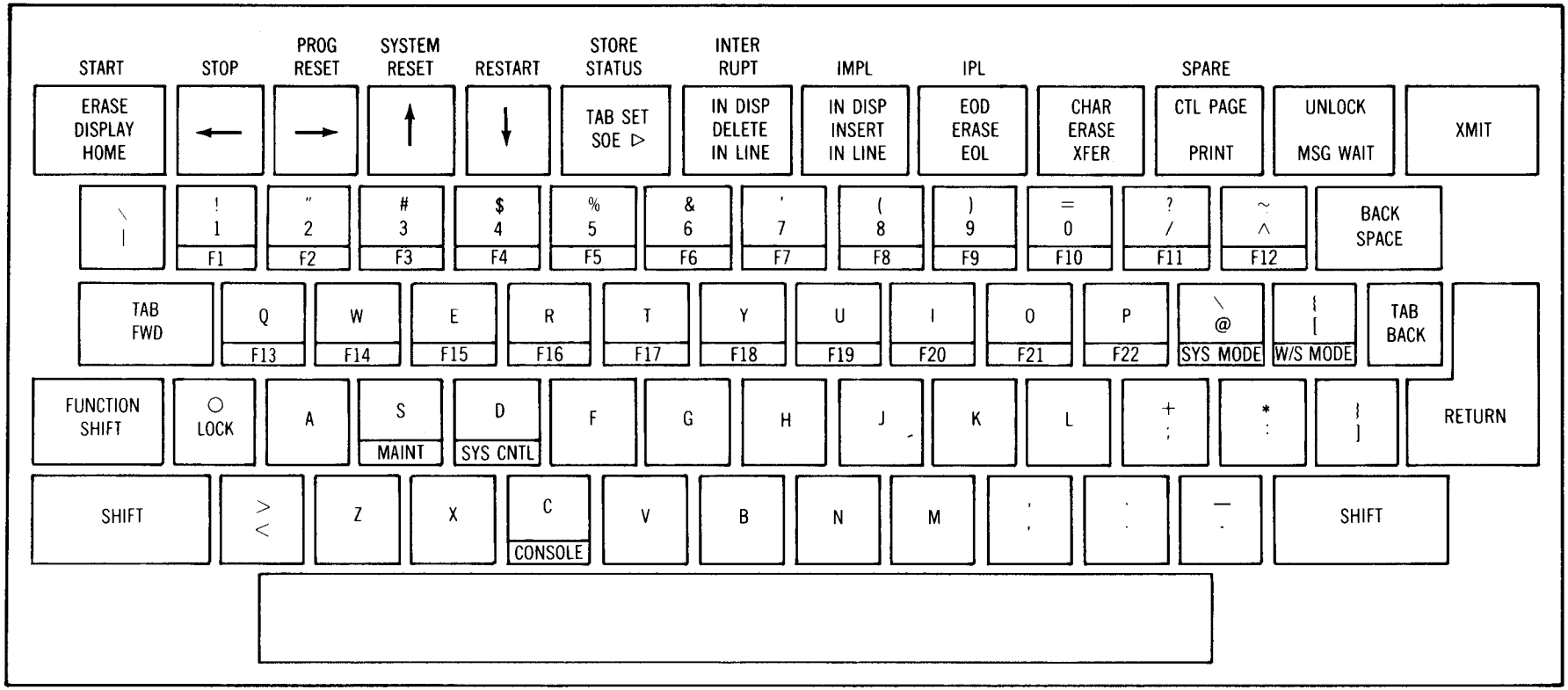


Figure 3—5. Typical Console Workstation Keyboard

3.2.3.2. System Control Keys

The console workstation supports nine system control functions that can be performed only when operating in system control mode (3.2.3.1). Nine keys unique to console workstation operation, located on the top row of the keyboard, are used with the FUNCTION SHIFT key for system control operations. These keys and their functions are listed in Table 3-2.

Table 3—2. System Control Keys

Key*	Function
START (ERASE DISPLAY HOME)	Causes processor to enter operating state. The key is effective only when processor is in stop state. The effect is unpredictable when stop state is entered by system reset.
STOP (↤)	Causes processor to enter stop state. The key is effective only when processor is in operating state. In certain cases, such as a machine malfunction that prevents the processor from completing an instruction, the STOP key has no effect.
PROG RESET (↤)	Causes the program reset function to be performed. This key is effective while system power is on, and causes the processor to enter stop state.
SYSTEM RESET (↟)	Causes system-clear reset function to be performed. This key is effective while power is on in the system. It also places the processor in stop state.
RESTART (↟)	Generates a restart interrupt operation. This key is effective in operating as well in the stop state, but not in check stop or load states.
STORE STATUS (TAB SET SOE ▷)	Initiates store-status function. This key is effective in both stop state and operating state.
INTERRUPT (IN DISP DELETE IN LINE)	Generates an interrupt request. The interruption is taken when the processor is enabled for this condition and is in operating state. Otherwise, the interrupt request remains pending.
IMPL (IN DISP INSERT IN LINE)	Selects initial microprogram load (IMPL) sequence.
IPL (EOD ERASE EOL)	Selects initial program load (IPL) sequence.

*With FUNCTION SHIFT key pressed.

3.2.3.3. Software Function Keys

Special messages defined by software are sent from the console workstation when MSG WAIT and keys F1 through F22 on the keyboard are pressed while the FUNCTION SHIFT key is also pressed. The keys and their codes are listed in Table 3-3.

The software function keys are used in data management software to control specific functions. Keys F1 through F12 are used to cause the program to perform specified actions, according to particular operations of the software. Keys F13, F14, F16, F18, and F20 through F22 are used by your Sperry Univac customer engineer. Keys F15, F17, and F19 are used to control data management displays on the screen as follows:

- F15 is used to indicate the end-of-file and no further input is supplied.
- F17 temporarily stops the continuing sequence of display for closer observation at a point of interest.
- F19 replaces the current screen display with the next display portion. This function is useful when the display was stopped with the F17 key or if less than a full display is presented on the screen.

Additional information on the software function keys is presented in the OS/3 consolidated data management macroinstructions user guide/programmer reference, UP-8826 (current version).

Table 3—3. Software Function Keys and Code Values

Key	Octal Value	Hexadecimal Value	ASCII Character
MSG WAIT	007	07	BEL
F1	067	37	7
F2	107	47	G
F3	127	57	W
F4	147	67	G
F5	040	20	Space
F6	041	21	!
F7	042	22	-
F8	043	23	#
F9	044	24	$
F10	045	25	%
F11	046	26	&
F12	047	27	'
F13	050	28	(
F14	051	29	)
F15	052	2A	°
F16	053	2B	+
F17	054	2C	,
F18	055	2D	-
F19	056	2E	.
F20	057	2F	/
F21	060	30	0
F22	061	31	|

3.2.3.4. Keyboard Typewriter Keys

The keyboard typewriter keys, numeric keys, and Katakana/English keys (depending on the keyboard selection) operate in standard typewriter fashion. These keys are the same used in the standard workstation and are described in the workstation operator reference, UP-8910 (current version).

3.3. DISKETTE DRIVES

Diskette drives attached to the processor cabinet (console diskette drives) may be either automatic or manual feed types. With either type, operation is facilitated, and a minimum of controls and indicators are used by the operator. Most indications of diskette drive and conditions (e.g., hopper empty, stacker full) are displayed as messages on the console workstation screen.

3.3.1. Diskette Drive Indicator

The manually loaded diskette drive uses an indicator on the push-bar latch release (Figure 3-6) to indicate that the particular drive is operating. The indicator light is on while the drive is reading or writing data on the diskette.

3.3.2. FEED Switch and Indicator

The automatically loaded diskette drive uses the FEED switch and indicator, located near the hopper (Figure 3-7), when the operator initiates a manual-feed cycle through the loader. An unload/load cycle may occur automatically by a programmed command or when the operator presses 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.

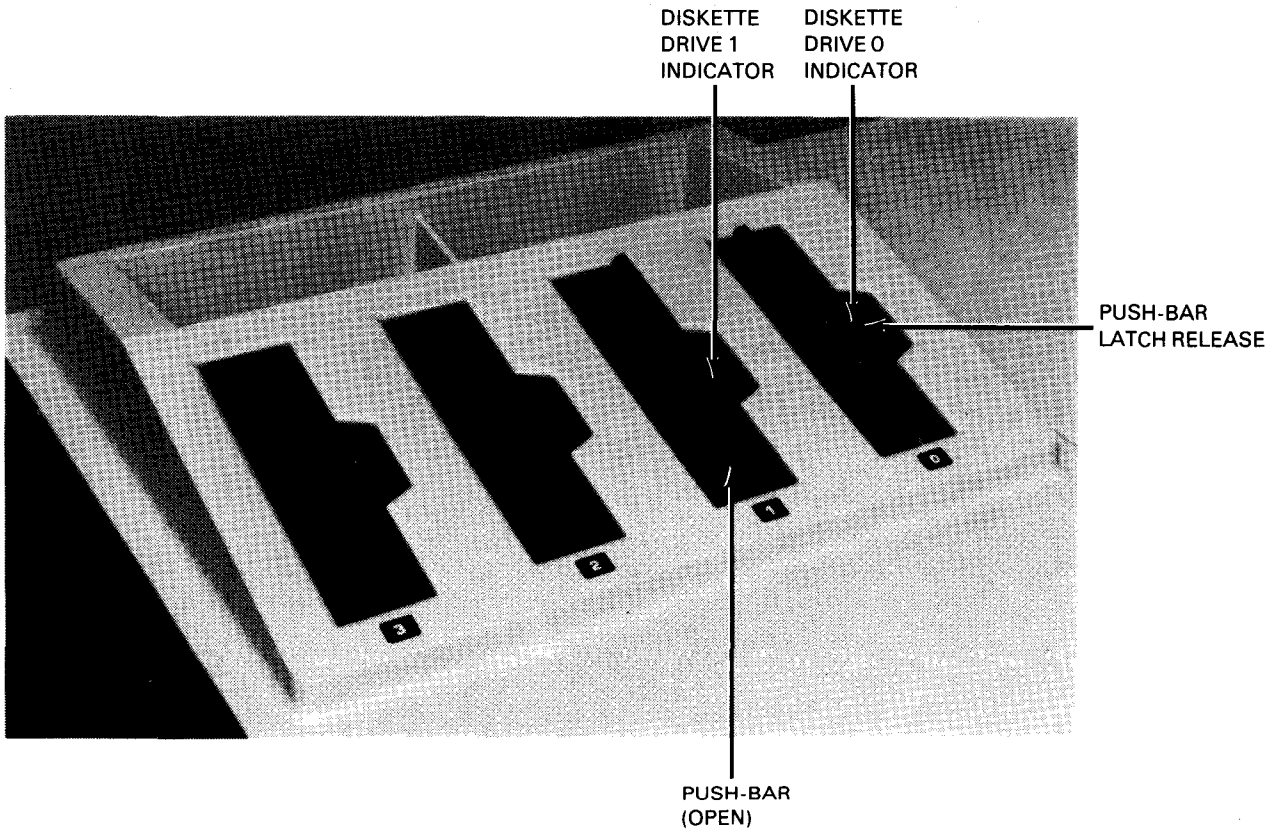


Figure 3—6. Indicators on Manually Loaded Diskette Drives

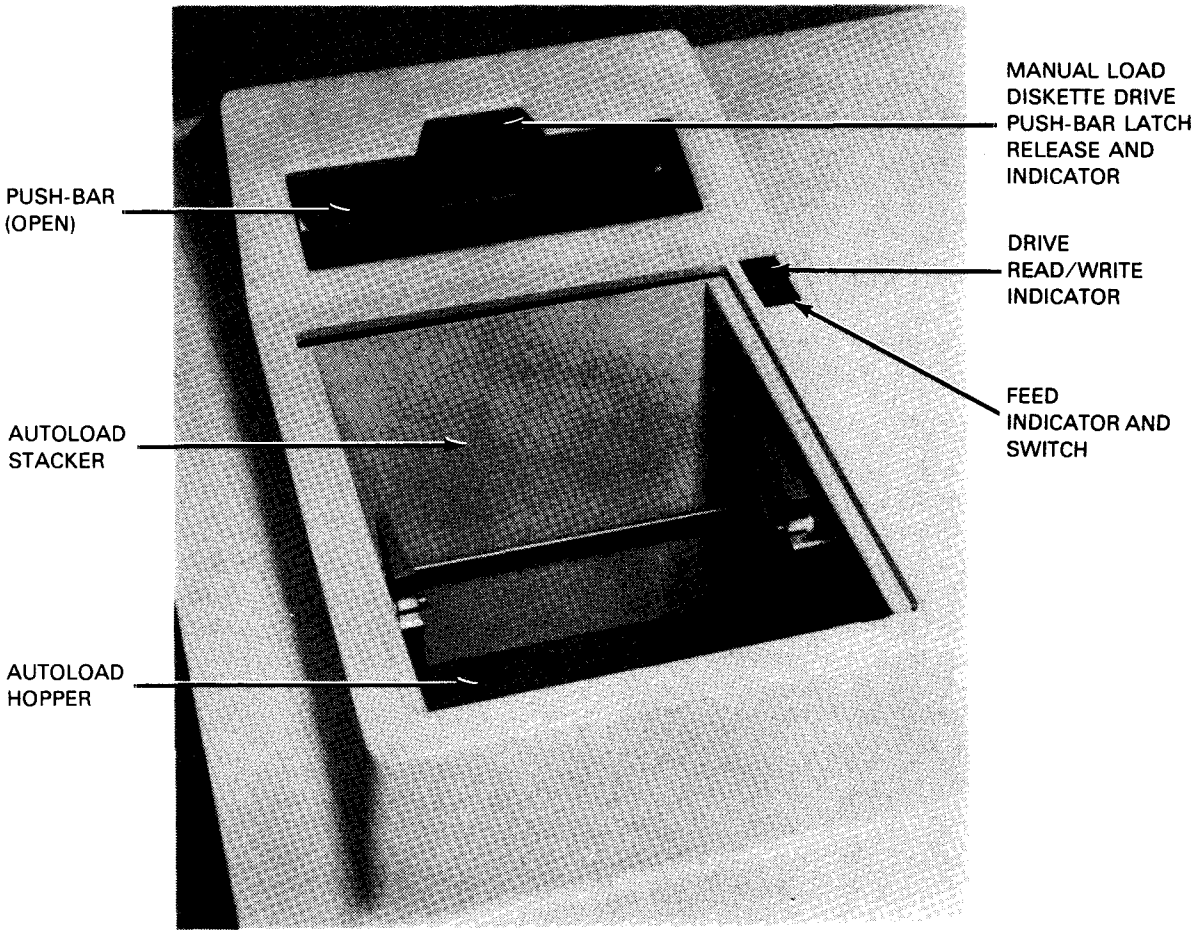


Figure 3—7. Autoload Diskette Drive Switch and Indicators

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, it informs the operator that a malfunction has occurred during operation and further attention is required to determine the malfunction. (See screen display for error message.)

3.3.3. Drive Read/Write Indicator

The automatically loaded diskette drive uses a red LED indicator, located near the FEED switch (Figure 3-7) to inform the operator that a read or write operation is in progress. The indicator remains lit while the diskette drive is active.

4. Operation

This section provides information for turning power on or off for the processor and console peripheral devices (console workstation and diskette drives). In addition, information is provided for initiating operation of this equipment.

Operating procedures described here are limited to use of the central hardware. Utilization of software is provided in procedures of appropriate software documents, as well as in the system operations handbook operator reference, UP-8859 (current version). Reference should be made to these documents while studying the operating procedures.

4.1. POWER TURN ON/TURN OFF

Automatic power sequencing circuits simplify power turn on/turn off of the processor and integrated peripheral equipment. Any external, wall-mounted circuit breaker should be turned on before equipment power is turned on.

NOTE:

Power turn on/turn off for the processor and integrated peripheral equipment does not affect power to peripheral devices with controllers that are not integrated with the processor. Power for these devices is turned on or off at the device.

4.1.1. Turn-On Procedure and Power-On Test

Normally, power is turned on at the console table with the SYS PWR ON/OFF switch located near the console workstation (Figure 3-3).

If power is to be turned on from a complete turn-off condition, proceed as follows:

1. Set the MAIN POWER circuit breaker (Figure 3-2) at rear of the processor cabinet to ON position.

2. If an expansion cabinet is used, set the circuit breaker at the rear of that cabinet (Figure 3-2) to ON position.

3. Set the SYS PWR ON/OFF switch on the console table to ON position. Allow a few moments for power-on confidence tests to be performed, during which time system messages are displayed indicating that initial microprogram loading (IMPL) and initial program loading (IPL) are occurring. Upon completion of the IPL, the screen should display the message illustrated in Figure 4-1.

   NOTE:

   Each time power is turned on, a resident diagnostic microprogram is executed in the console workstation controller. If an error exists in the system, further processing is halted and the console workstation becomes inoperative. (Refer to 4.3.)

4. Set the INTENSITY control on the console workstation for a comfortable viewing level of the screen. The system software is now ready for your use implementing the default supervisor and devices addressed on the display screen. Refer to 4.3 if other selections are desired. Press the XMIT key on the keyboard to continue operation with software. (Refer to system operations handbook operator reference, UP-8859 (current version).)

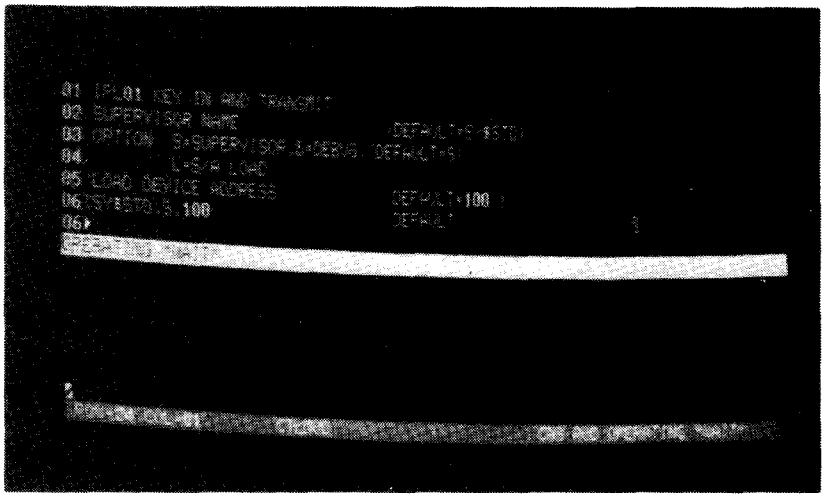


Figure 4—1. Console Workstation Display after Power Turn On and Initial Phase of IPL

NOTE:

The MAIN POWER circuit breaker and expansion cabinet circuit breaker are left in the ON position and power is controlled with the SYS PWR ON/OFF switch in subsequent power turn-on procedures. Thus, Steps 1 and 2 can be dropped after initial power is turned on.

4.1.2. Turn-Off Procedure

To turn off power to the processor and integrated peripheral equipment, proceed as follows:

CAUTION

To ensure disk file integrity when removing power from the processor and integrated peripheral equipment, first make certain that the type 8417 or type 8419 disk subsystem is either in file protect mode or that the power at that subsystem has been turned off.

1. Enter the command via the keyboard:

   SJ SHUT

   This command records the system shutdown, and a shutdown message is displayed.

2. Set the SYS PWR ON/OFF switch on the console table (Figure 3-3) to the OFF position. Note that the display screen is turned off.

NOTE:

Step 3 need not be performed unless complete power turn off is desired due to an emergency or if the procedure is performed as a normal site requirement for the processing center.

3. Set the circuit breakers at the rear of the processor cabinet and expansion cabinet (if included) (Figure 3-2) to the OFF (down) position.

CAUTION

Do not open cabinet doors to operate other circuit breakers. Air has been purged in the processor cabinet to maintain efficient operation of the internal disk drive.

4.1.3. Power Loss Conditions

In the event of power loss to the processor, due to a tripped circuit breaker or any other manner of power cutoff, integrated peripheral devices having power controlled individually will remain with power on and return to normal online operation when power is restored to the processor. This occurs because these peripheral devices are connected to an ac power wall receptacle for primary power.

If power is turned off for individual peripheral devices, the devices 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. The operator 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 end of power outage.

- UNISERVO 10, type 0871, tape drive

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

4.2. DISKETTE DRIVE OPERATION

Diskette drives may be manually loaded or autoloaded types. A few precautions taken when handling diskette media will 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.

- Replace the diskette into 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.

4.2.1. Manual Load Diskette Drive

To operate a manual load diskette drive, proceed as follows:

1. Insert the diskette media into the drive selected for operation via the console workstation or by programming. Note that the diskette label on the jacket faces toward the left and the jacket slot inserts first (Figure 4–2a).
2. Push the diskette down below the media slot opening to engage the drive mechanism.
3. Close the push-bar by moving it under the push-bar latch release and locking it closed. Operation may now begin with the diskette media. The indicator on the push-bar (Figure 4–2b) lights when reading or writing takes place.
4. After operation with the installed diskette media is complete, press the push-bar latch release to open the push-bar and cause the diskette media to pop up. Lift out the diskette media.

4.2.2. Autoload Diskette Drive

Operation of the autoload diskette drive is simplified since the operator loads the diskette media and removes all diskettes upon completion. Each diskette is automatically loaded into the drive mechanism when a command is sent from the processor. However, occasions may arise when a diskette becomes jammed in the drive mechanism. The operator is responsible for clearing the jam.

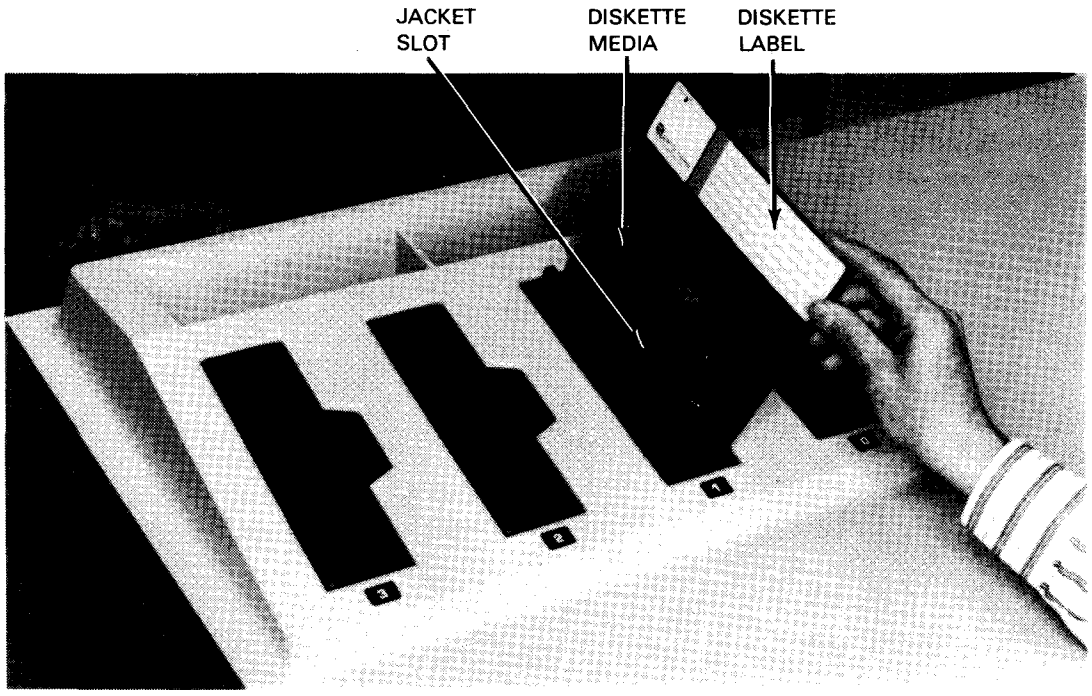
4.2.2.1. Normal Operation

To operate an autoload diskette drive, proceed as follows:

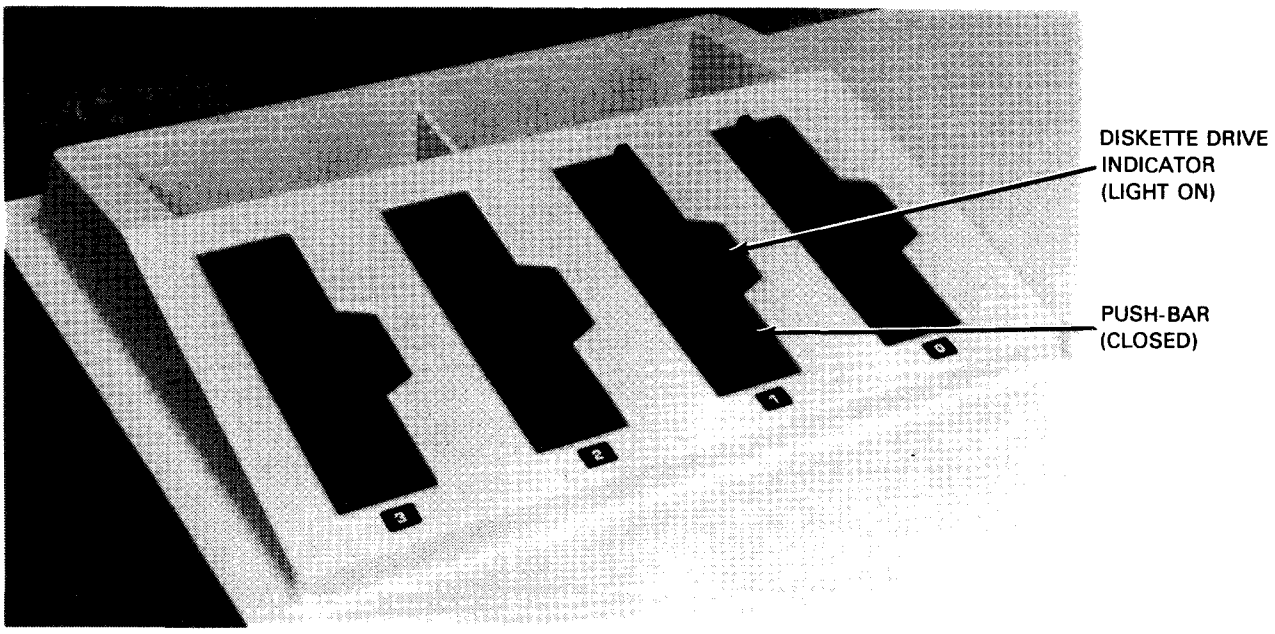
1. Install the diskette media into the hopper with all labels facing the operator and the jacket slot of each diskette at the bottom (Figure 4–3a). Diskettes must be placed in proper sequence in the hopper so that the first diskette is nearest to the drive mechanism and the last is nearest to the hopper 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 4–3b).

   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.



a. Inserting the diskette media in a manual load drive



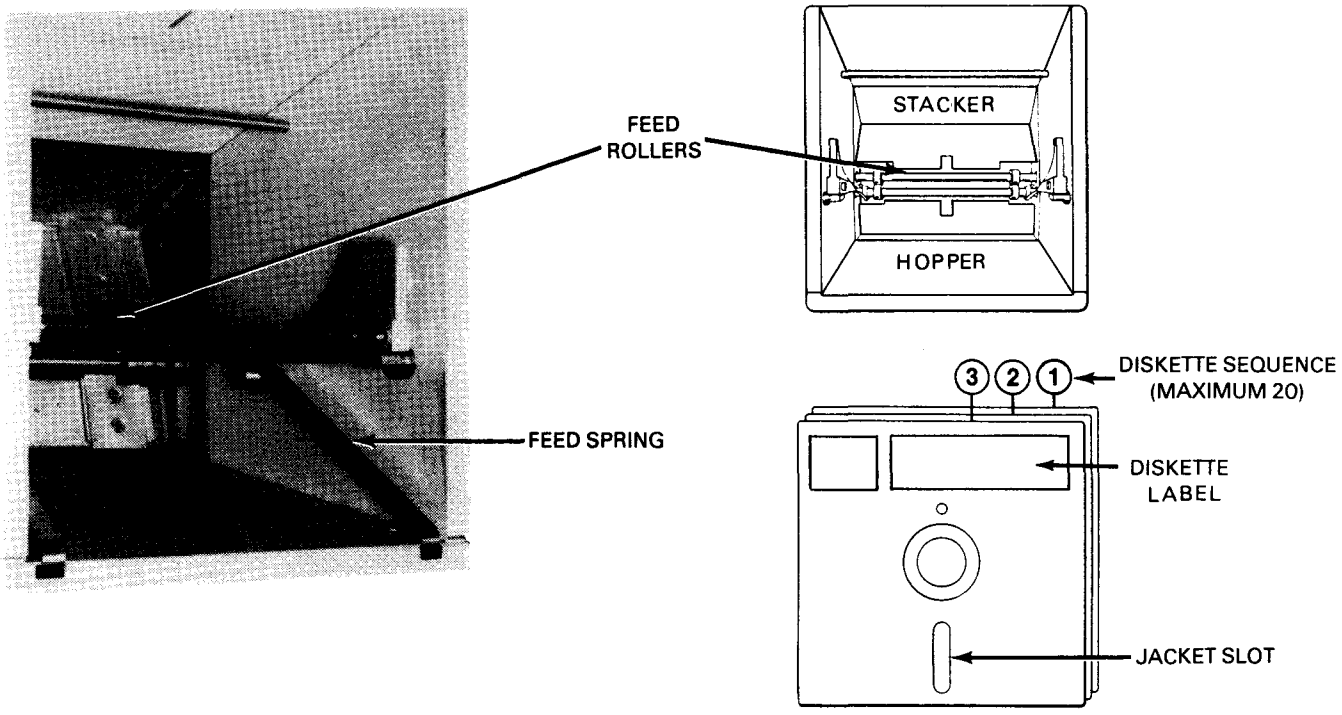
b. Diskette media installed and push-bar closed

Figure 4—2. Manual Load Diskette Drive Operation

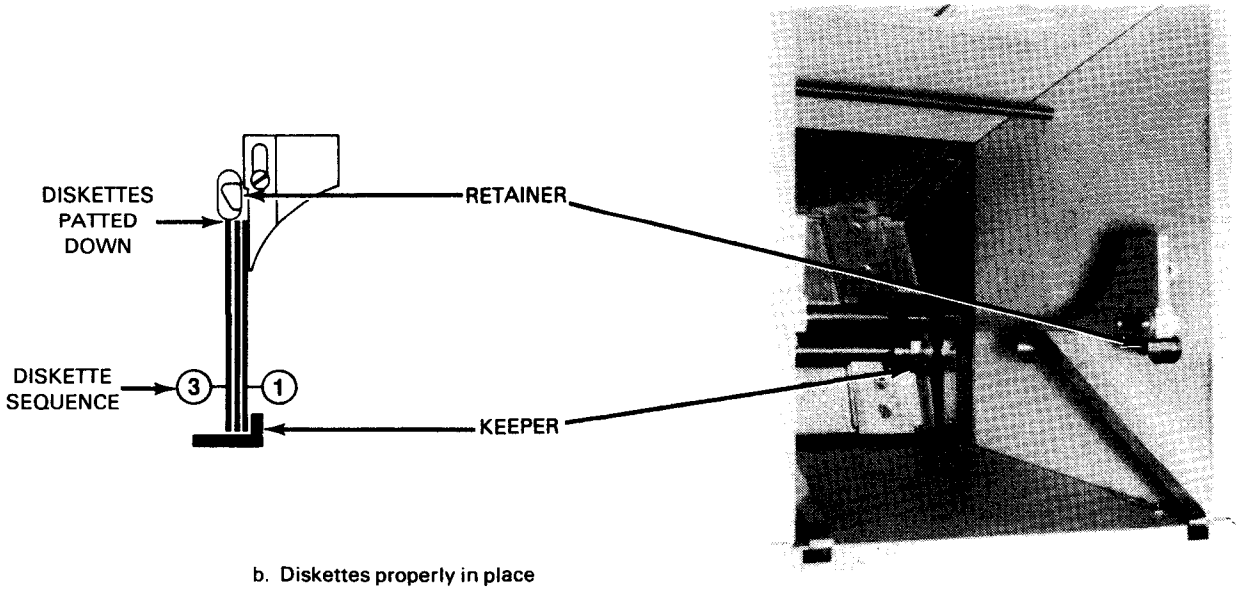
3. Press the bottom of the diskettes against the keepers at the bottom and on each side of the hopper (Figure 4-3b).

NOTE:

When properly inserted, diskettes are pressed against the keepers by a feed spring 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.



a. Hopper/stacker bin and diskette sequence



b. Diskettes properly in place

Figure 4—3. Autoload Diskette Drive Operation

4.2.2.2. Manual Feed through Autoload Drive

When no feed command is supplied by the program and you wish to feed a diskette through the autoload drive or unload a diskette from the drive, press the FEED switch (Figure 3-7). The drive mechanism becomes activated 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 wish 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.

4.2.2.3. Suspended Operation

The FEED indicator 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 is defective. These problems are corrected by your Sperry Univac customer 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.

4.2.2.4. Clearing Jams

A diskette may be 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 4–4a).

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 4–4b).

4. Note the location of the jammed diskette (Figure 4–4c) and select either of the following procedures:

CAUTION

If one diskette is jammed in the feed rollers and another in the reader mechanism (Figure 4—4c), 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 4–4d), 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 in 4.2.3. 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 4–4b) manually until the reader door opens.

(2) Lift out the diskette from the reader mechanism (Figure 4–4e) and examine the diskette jacket for wrinkles or tears. Replace the diskette as directed in 4.2.3, if necessary.

5. Raise the hopper/stacker bin to its operating position (Figure 4–4a).

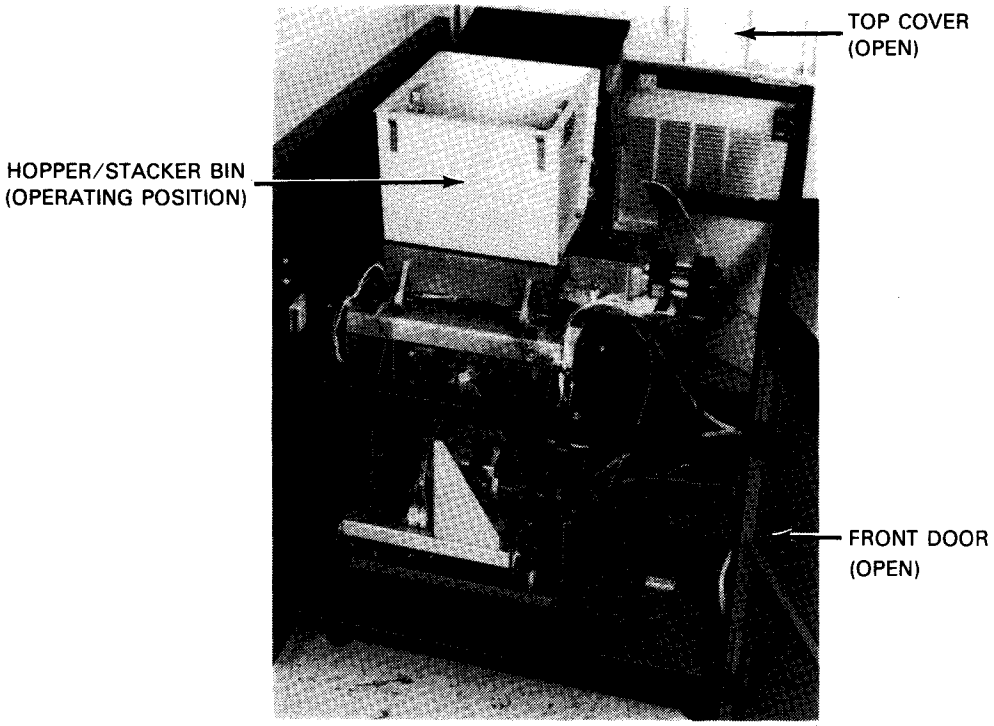
6. Close the front cabinet door, then the top cover. The diskette drive recycles to home position when the door interlocks are engaged and power is restored.

7. Place the jammed diskettes in proper sequence with diskettes removed from the hopper.

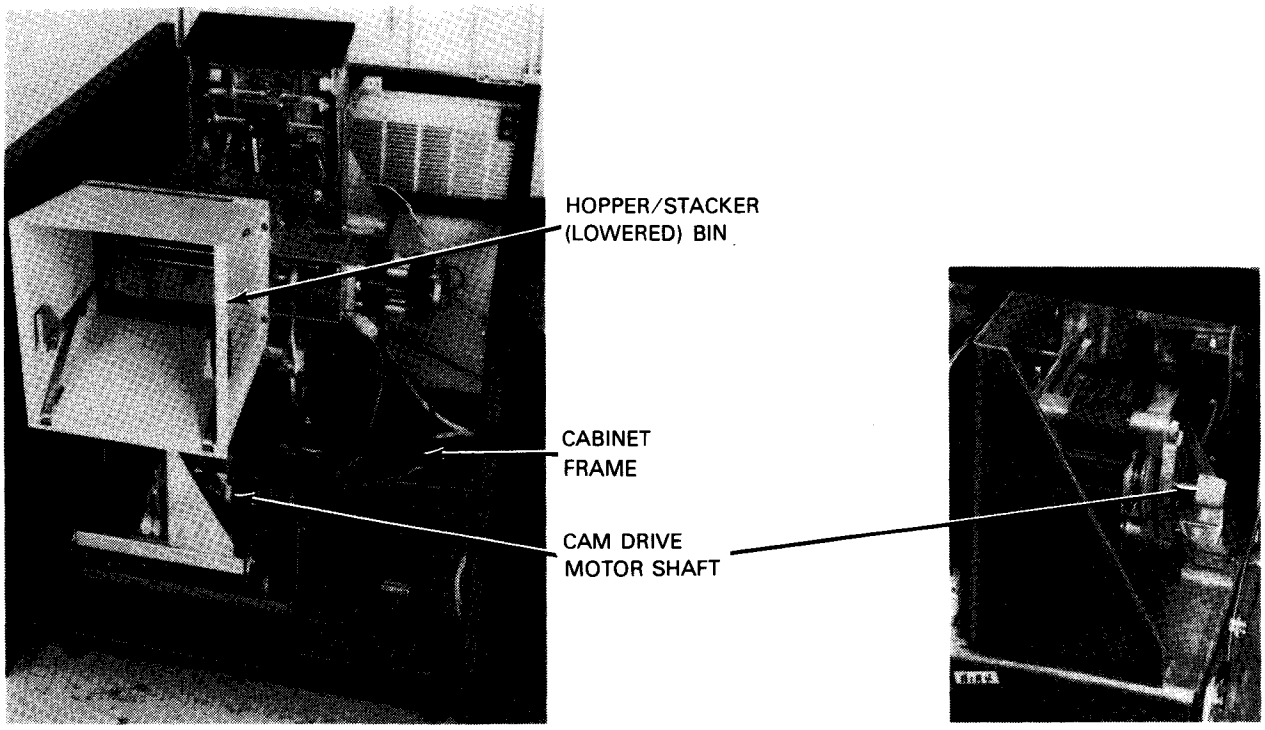
NOTE:

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.

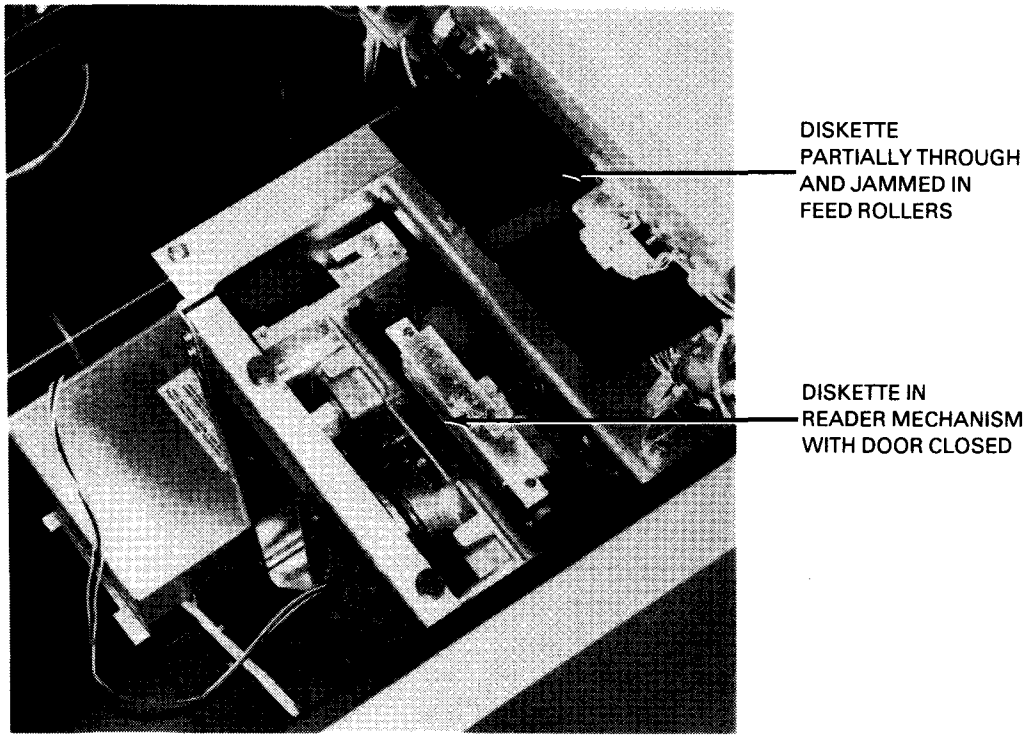


a. Diskette media removed and cabinet doors open

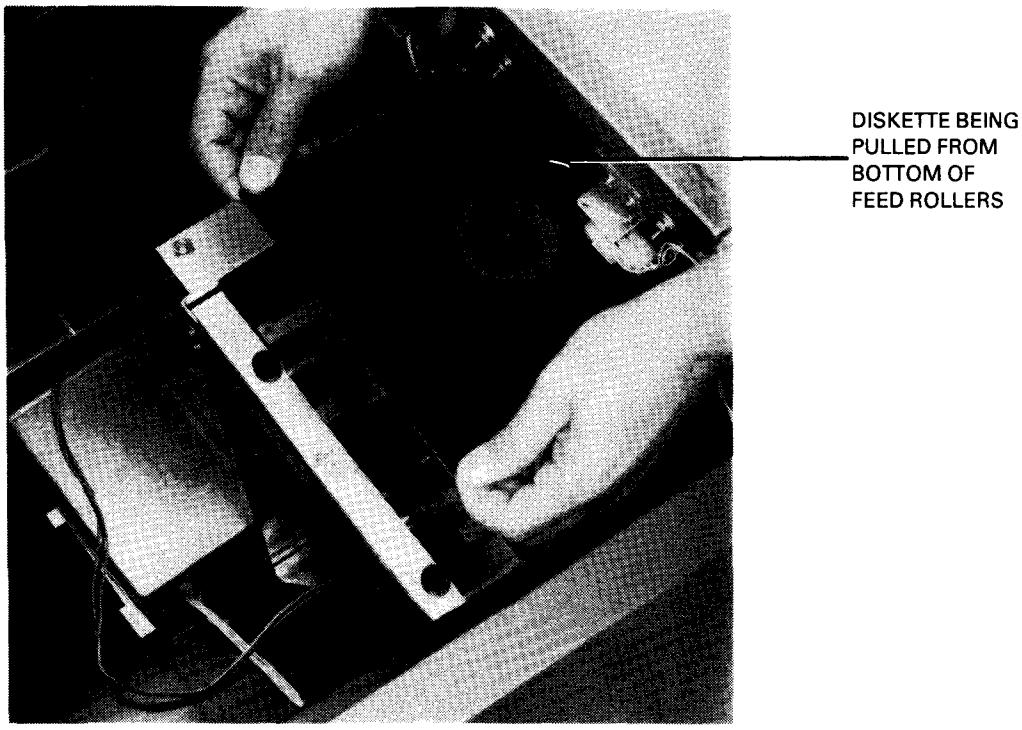


b. Hopper/stacker bin lowered to access jammed diskette

Figure 4—4. Clearing Jams in Autoload Diskette Drive (Part 1 of 3)

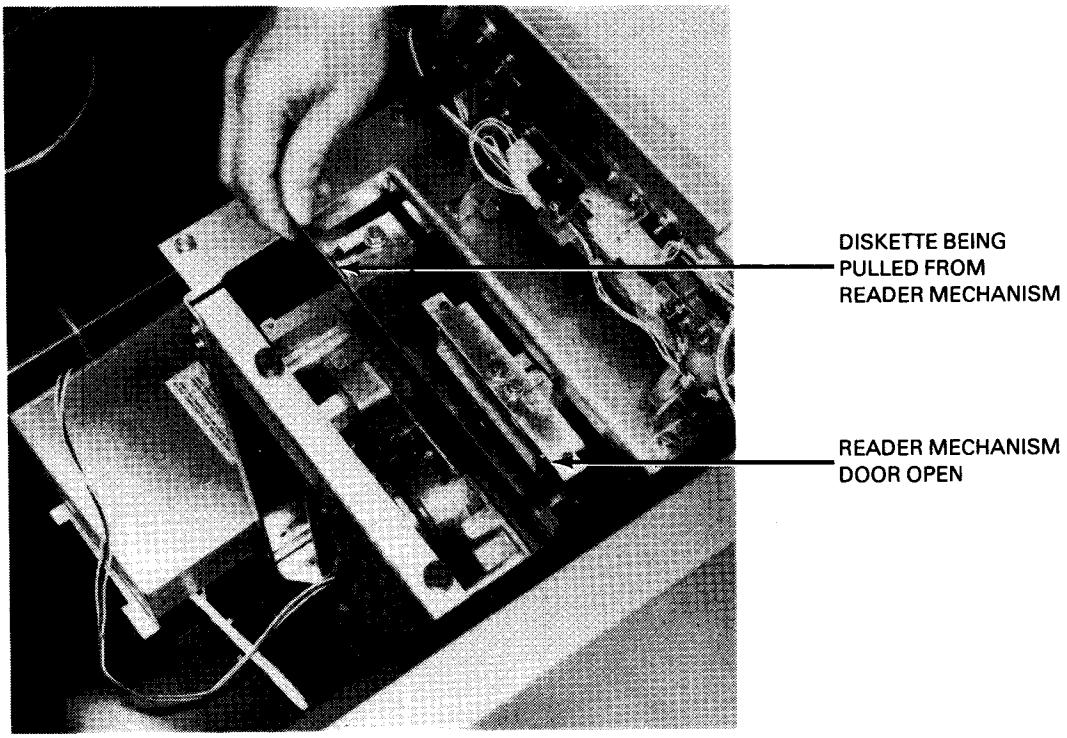


c. Jammed diskettes in feed rollers and reader mechanism



d. Removing jammed diskette from feed rollers

Figure 4—4. Clearing Jams in Autoload Diskette Drive (Part 2 of 3)



e. Removing jammed diskette from reader mechanism

Figure 4—4. Clearing Jams in Autoload Diskette Drive (Part 3 of 3)

4.2.3. Replacing Damaged Diskette

Diskettes are replaced 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 probably will 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 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 4.2.1.
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 4.2.1.
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.

4.2.4. Cleaning Diskette Heads

The operator is required to periodically clean the read/write heads on diskette drives. Cleaning should be performed routinely each month or more often if read error rates are abnormally high.

Head cleaning is performed with cleaning diskettes that have been provided with the system. Two cleaning diskettes are provided with each kit. The kit can also be obtained from your Sperry Univac sales representative, using Sperry Univac 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 (current version). 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 4-3a). Be sure that the top of the diskette is beneath the retainers on each side of the hopper (Figure 4-3b) 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 (current version). 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.

4.3. CONSOLE WORKSTATION OPERATION

The console workstation operates in one of five modes selectable by the operator. The mode is selected by pressing the FUNCTION SHIFT key while also pressing the key for the mode desired. The keys and associated modes are listed in Table 3-1 and described in 3.2.3.1.

Information in this manual is directed for operation in console workstation and system control modes. Information on workstation and system response modes is included where operation in those modes is affected at the console workstation. Additional information on system response and workstation modes can be found in the workstation operator reference, UP-8910 (current version). Operation in maintenance mode is used by Sperry Univac customer engineers and is not described here.

4.3.1. Display Formats

Depending on which of the five operating modes is selected, the display screen of the console workstation presents a display in:

- Format 1 - Workstation or system response modes.
- Format 2 - Console workstation, system control, or maintenance modes.

Figure 4-5 illustrates the screen display layouts for Format 1 and Format 2. Further discussion of the display areas is provided in 4.3.1.1 through 4.3.1.4.

The Format 2 display is comprised of twenty-four 80-character lines, plus a 25th line for system indicator. These lines contain the following type of information.

- Console messages (lines 1 through 16)

  Are available for console workstation messages from the system software and for transmitting messages when operating in console workstation mode.

- System state message (line 17)

  Is available to display system messages describing the current operating mode of the processor. Is displayed in a protected reverse video field.

- Maintenance messages (lines 18 through 23)

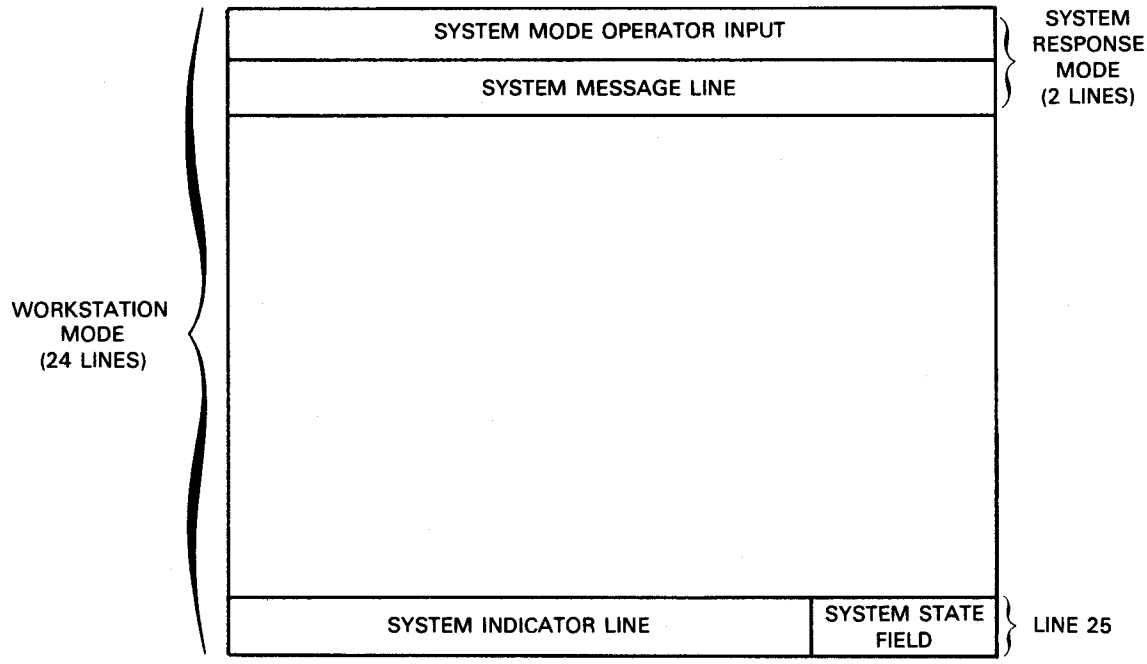
  Display maintenance messages received from the system microcode; they are generally of use to the Sperry Univac customer engineer.

- Maintenance input (line 24)

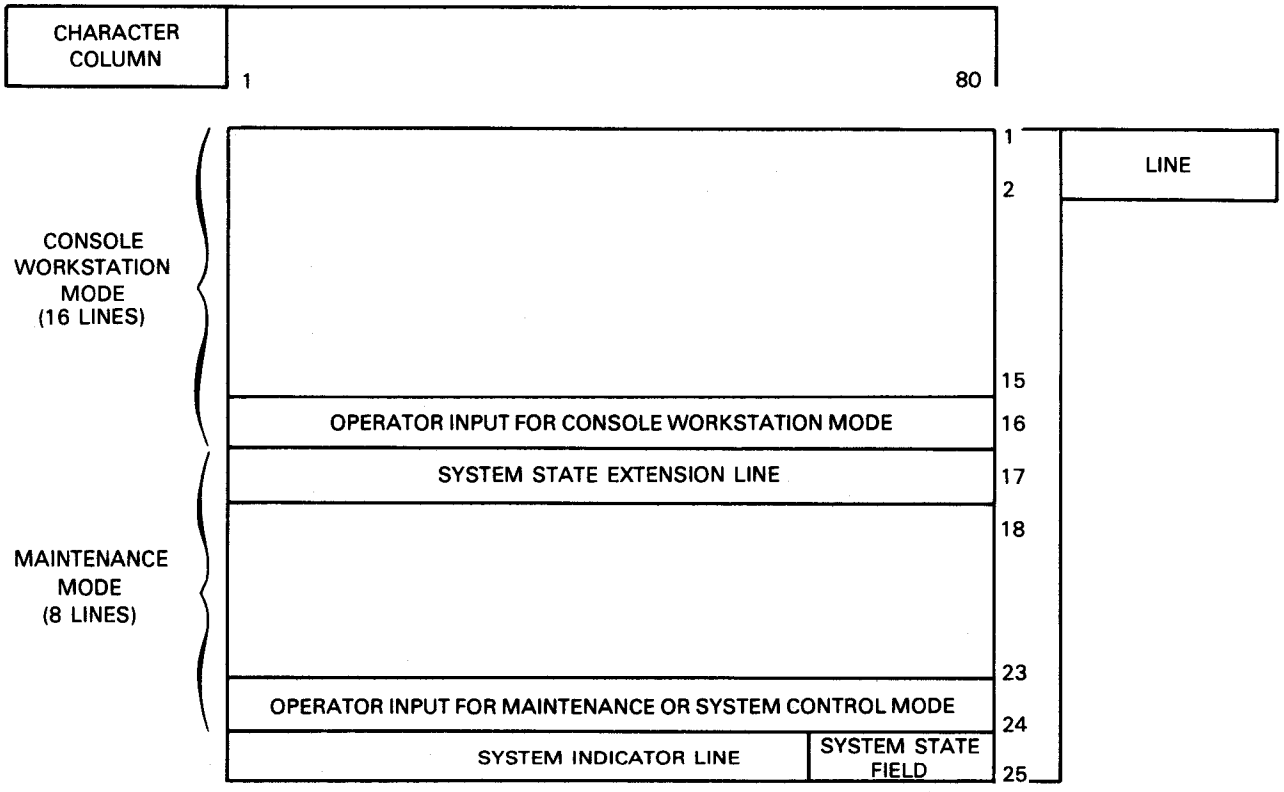
  Is used for transmitting messages from the maintenance mode to the system microcode when the console workstation is operating in system control mode or maintenance mode.

- System indicator (line 25)

  Indicates the console workstation operating mode, the type of message received, console required message indication, and an abbreviated system state message. The system state field uses 20 characters or less to describe the current operating mode of the processor.



a. Format 1: Workstation and System Response Modes



b. Format 2: Console-Workstation, System Control, and Maintenance Modes

Figure 4—5. Console Workstation Screen Display Formats

4.3.1.1. Workstation Mode Display Area

When the console workstation is operating in Format 1, messages are processed and displayed in the same manner as for a workstation. If the console workstation is set to operate in system response mode or in Format 2 when a workstation-mode transmission is attempted, the message is rejected with an invalid command header.

NOTE:

Format 1 displays are described in the workstation operator reference, UP-8910 (current version).

4.3.1.2. Console Workstation Mode Display Area

When operating in Format 2, a console message is displayed in a location specified by software on lines 1 through 16. If the console workstation display area is overflowed, the message causing the overflow, and subsequent console messages, will overlay previously written console messages.

The cursor is displayed in the same manner in Format 1 and Format 2. The first data character of a message is placed at the current cursor location, and each succeeding character is displayed sequentially. The cursor advances as each character of a message is received, and may overlay a previous display.

After a console message is written, the cursor remains displayed on the right side of the last character, or in a display location determined by a command involving cursor movement. This command may be within the text of the console message. Software may position messages in any location within the console message area.

If the console workstation is switched to operate in Format 1 and a console message is received, the message is written and held in an off-display buffer. If the message requires an operator response, the message

CONS REQ

is written on the system indicator line (line 25).

If an operator response is not required, the message

CONS MSG

is written on the system indicator line.

In either case, switching to operate in Format 2 using the C and FUNCTION SHIFT keys allows the message to be displayed and clears the display on the system indicator line. These two messages are not displayed when operating in Format 2.

4.3.1.3. Operator Input Lines

The operator may input a message from the console workstation from one of three locations:

1. System mode operator input (line 1, Format 1)

   When the console workstation is switched to operate in system response mode in Format 1, the operator input is displayed on line 1. This function is further described in the workstation operator reference, UP-8910 (current version).

2. Maintenance mode operator input (line 24, Format 2)

   The maintenance mode operator line, located on line 24 of Format 2, is used by the Sperry Univac customer engineer.

3. Console workstation operator input line (Format 2)

   When the operator is required to respond to a software message while operating in console workstation mode, system software sets up an operator input line within the first 16 lines of Format 2.

4.3.1.4. System Indicator Line and System State Field

The 25th line of the workstation screen display is reserved as an indicator display line. All fields are contained in the 80-character line length. The fields are displayed in reverse video.

The format of the system indicator line is as follows. Descriptions of the four fields are included.

operating mode	standard workstation functions	MAINT. MSG CONS REQ CONS MSG	system state
1 12	13 50	51 60	61 80

- Characters 1–12: Operating mode field

  Specify the operating mode currently in use, except when operating in Format 1 (which is not applicable). Operating modes of the console workstation specified are:

  - Console workstation mode
  - System control mode
  - Maintenance mode

- Characters 13–50: Workstation functions field

  Consist of three subfields that specify standard workstation functions. These are described in the workstation operator reference, UP-8910 (current version).

- Characters 51–60: Indicator field

  Display one of three indicators as follows:

  1. MAINT MSG

     Indicates that a maintenance message has been written into the maintenance message area's off-display buffer while the console workstation was in Format 1. To view the message, the operator must switch to one of the Format 2 operating modes (see Figure 4–5). Changing to Format 2 or arrival of a console message clears or overwrites this indicator.

2. CONS REQ

   Indicates that a console message was received from the system and requires an operator response. This message is written when a command for an operator response is embedded in the message, and the console workstation is not operating with Format 2. With this indicator, all workstation and system response mode functions, as well as mode change requests other than maintenance, console mode, or system control mode are inhibited. The operator must request a change to console workstation mode to respond to this console message. Switching to console workstation mode clears the indicator.

3. CONS MSG

   Indicates that a console message was written into the console message area's off-display buffer while the console workstation was in Format 1. This message does not require operator response. Changing to Format 2 or arrival of a maintenance message clears or overwrites the indicator.

- Characters 61–80: System state field and system state extension line (line 17)

The system state field indicates the processor state and presents diagnostic information. When the size of the message does not fit within the system state field, part of the message is displayed in the system state extension line (line 17) in reverse video, as well as in the system state field of the system indicator line (line 25). The system state field on line 25 and the system state extension on line 17 may display one of the following eight indications:

1. OPERATING *RUNNING* (line 25)

   Indicates the normal state of the processor during execution of programs.

2. OPERATING *WAIT* (line 25)

   Indicates the processor was in wait state for a longer period than 1 millisecond.

3. STOPPED INST=xxxxxxxxxx ADRS=xxxxxx (line 17)
   STOPPED (line 25)

   Indicates the processor is in stop state but is enabled for an instruction step or the stop is a result of a PER diagnostic wait. For the instruction step, the next instruction to be executed and its address are displayed. For a PER wait, the instruction causing the PER stop and its address are displayed on Line 17.

4. STOPPED *HPR OPI=xxxxxx INST=xxxxxxxxxxxx ADRS=xxxxxx (line 17)
   STOPPED (line 25)

   This indication is similar to the STOPPED INST condition except that in this condition the state was entered by execution of a halt-and-proceed (HPR) instruction. The HPR instruction, the address of the first operand, and the address of the HPR instruction are displayed on line 17.

5. LOAD (line 25)

   Indicates that an initial microprogram load (IMPL) or initial program load (IPL) sequence is in progress. This indication occurs because:

   a. System power is turned on (4.1.1).

   b. The IMPL and FUNCTION SHIFT keys were pressed simultaneously. Press and hold FUNCTION SHIFT, then press IMPL key.

   c. The IPL and FUNCTION SHIFT keys were pressed simultaneously. Press and hold FUNCTION SHIFT, then press IPL key.

6. LOAD *ERROR STOP* (IMPL/IPL) (line 17)
   LOAD (line 25)

   Indicates an error stop, but not a nonrecoverable error, was encountered during an IMPL or IPL sequence. An error code is also displayed. Table 4-1 lists the error codes displayed for an erroneous IMPL and IPL.

7. TEST (line 25)

   Indicates that a maintenance function is being performed on the processor, I/O channels, or control storage.

8. *CHECK STOP* (line 17)

   Indicates a machine malfunction that can only be removed by a processor reset sequence.

Indicating conditions relative to the system state field are as follows:

- If the console workstation is in Format 2, the system state message is written on line 17 of the display.

- If in Format 1, the system state message is written in the off-display buffer, and MAINT MSG indicator is displayed on line 25 (this line).

- If an ESC (escape) sequence is detected in a message directed to the system state field, the console workstation clears the maintenance message area.

- No commands other than ESC are allowed in the system state message.

- The system microcode clears the system state field and system state message before a new message can be written on this line.

- The first 20 characters of a system state message are always written on the system state field of the system indicator line.

NOTE:

Additional information on display messages concerning operator and programmer errors, and operator responses to these errors, is contained in current versions of the system operations handbook operator reference, UP-8859, and the OS/3 operator maintenance guide, UP-8915.

Table 4—1. IMPL and IPL Error Code Displays

IMPL Display* (hexadecimal)	Meaning
00 CCDD	Load requested via nonconfigured device
01 CCDD SS	Channel/device error
02 EEEE GGGG	Check sum error (any record)
03 EEEE GGGG	Check sum error (overall)
04 AAAA	COS addressing errors
CHECK STOP	Processor errors
05 MMMM MMMM	Load allow mask error
06 AAAA	Addressing range errors:
07	First record is not START
08	Two START records
09	Exceeding record count (no END record)
0A CCDD	BRANCH record not via disk
0C	IMPL key not pressed in response to "LOAD *ERROR STOP* IMPL message

IPL Display** (hexadecimal)	Meaning
00 CCDD	Load requested via nonconfigured device
01 CCDD SS	Channel/device error
02 EEEE GGGG	Check sum error (any record)
03 EEEE GGGG	Check sum error (overall)
04 AAAAAA	Main storage addressing errors
CHECK STOP	Processor error
05 MMMM MMMM	Load allow mask error
06 AAAAAA	Addressing range errors:
07	First record is not START
08	Two START records
09	Exceeding record count (no END record)
0A CCDD	BRANCH record not via disk
0C	IPL key not pressed in response to "LOAD *ERROR STOP* IPL message
0D	Logical record size not less than or equal to physical record size

*All displays preceded by "LOAD *ERROR STOP*IMPL" message
**All displays preceded by "LOAD *ERROR STOP* IPL" message

LEGEND:

AAAAAA	Address	GGGG	Check sum from record
CC	Channel number	MMMM MMMM	Input mask
DD	Device number	SS	Device status
EEEE	Calculated check sum		

4.3.2. Operation

The system is controlled by operations performed at the console workstation. After the operator is familiar with basic operating procedures as directed in this manual, further information on additional keyboard inputs and displays relative to system software are provided in current versions of the system operations handbook operator reference, UP-8859, and in various software user manuals supplied with the system.

4.3.2.1. Mode Selections

One of the five operating modes listed in Table 3-1 is selected by pressing and holding the FUNCTION SHIFT key and pressing the appropriate key for the mode desired. If the operator attempts to switch to the mode currently in operation, an audible alarm sounds as a reminder that the mode change request has been ignored. The operating conditions that occur for each of the five mode selections are described in 4.3.2.1.1 through 4.3.2.1.5.

4.3.2.1.1. Console Workstation Mode

When operating in a mode other than this mode and the CONSOLE (C) key and the FUNCTION SHIFT key are pressed, a REQUEST CONSOLE MODE message is transmitted to the workstation controller. If the mode change request to a higher priority mode (Table 4-2) is made, any message or message block currently being received or transmitted is interrupted. A send-immediate sequence is initiated and the REQUEST CONSOLE MODE message is sent to the workstation controller. After completion of the sequence, the interrupted message or message block is retransmitted.

Table 4—2. Operating Mode Priority List

Priority	Key	Mode
1 (high)	S	Maintenance
2	D	System control
3	C	Console workstation
4	\ @	System response
5 (Low)	{ [	Workstation

If the mode change request is to a lower priority mode (Table 4-2), the request is placed below the current mode communications queue.

A keyboard lock condition does not affect selection of this mode.

When the console workstation receives the ENTER CONSOLE MODE message from the workstation controller, it will:

1. Change the display format to console workstation format (Format 2, Figure 4-5) and save the current status of the workstation format. Also, if presently operating in workstation mode, the current cursor display location and the locked/unlocked status of the keyboard are saved.

2. Write the console workstation mode indicator in protected reverse video on the system indicator line of the display (line 25).

3. Clear the CONS MSG, CONS REQ, or MAINT MSG indications, if displayed.

4. Clear the 24th line of the display to spaces.

5. Display current contents of the system state extension line (line 17) and maintenance mode lines (lines 18–23), as well as the console workstation message area (lines 1–16).

6. Place the keyboard in a locked or unlocked condition, based on status of the console lock status flag.

7. Place the cursor at the display location, based on status of the last received console-write message. If no console-write message is received, the cursor is placed in home position (first display location on the screen).

4.3.2.1.2. System Control Mode

When operating in a mode other than this mode and the SYS CNTL (D) key and the FUNCTION SHIFT key are pressed, the REQUEST SYSTEM CONTROL MODE message is sent to the workstation controller. In addition, all other functions described for the console workstation mode selection (4.3.2.1.1) are performed except Items 6 and 7 (Figure 4–6). The console workstation will then:

1. Place the start-of-entry (SOE) character at the first display location of the 12th line.

2. Place the cursor at the second display location of the 24th line.

3. Unlock the keyboard, if it is locked.

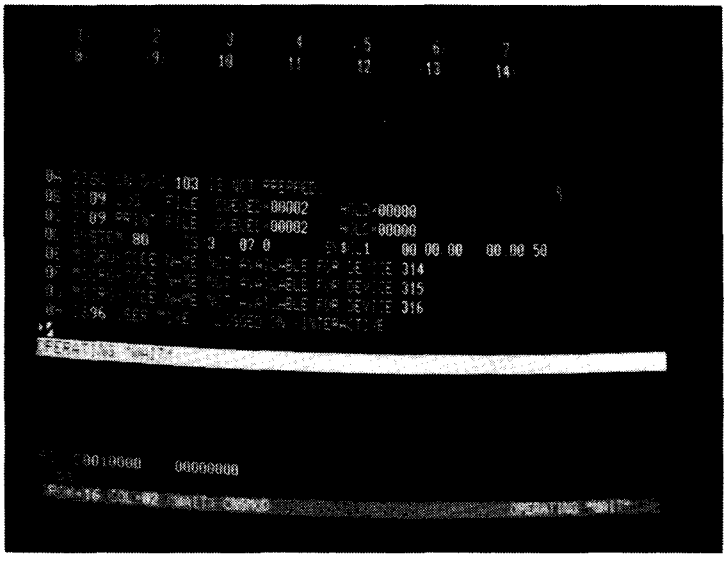


Figure 4—6. Display Screen for System Control Mode

4.3.2.1.3. Maintenance Mode

When operating in a mode other than this mode and the MAINT (S) key and the FUNCTION SHIFT key are pressed, the REQUEST MAINT MODE message is sent to the workstation controller. Any message or message block currently being received or transmitted is interrupted when this request is made. In addition, all other functions described for the console workstation mode selection are performed except items 6 and 7. The three items listed for system control mode are also performed, and the current contents of the system state line, maintenance mode lines, and console workstation message area are displayed on the screen.

4.3.2.1.4. System Response Mode

When operating in a mode other than this mode and the SYS MODE (\ @) key and the FUNCTION SHIFT key are pressed, the REQUEST SYSTEM RESPONSE MODE message is sent to the workstation controller. If the mode change request is to a higher priority mode (Table 4-2), then any message (a message having no text) or message block (defined as 128 bytes or less) currently being received or transmitted is interrupted. A send-immediate sequence is then initiated and the REQUEST SYSTEM RESPONSE MODE message is sent to the system. Upon completion of the sequence, the interrupted message or block is retransmitted.

If the mode change request is to a lower priority mode, the REQUEST SYSTEM RESPONSE MODE message is placed at the bottom of the current mode communications queue for subsequent transmission.

When the console workstation receives the software message to enter response mode, it will:

1. Change to the workstation mode and restore status of the previous operation (either system response or workstation mode).

2. Continue to operate in system response mode as a standard workstation.

4.3.2.1.5. Workstation Mode

When operating in a mode other than this mode and the W/S MODE ({ [) key is pressed (without pressing FUNCTION SHIFT key), a REQUEST WORKSTATION MODE message is transmitted to system software. Any message currently being received or transmitted when this mode is selected will be completed before the control message is transmitted.

The W/S MODE key function is not affected by keyboard lock.

When the console workstation receives the control message from system software, the console workstation will:

1. Change to workstation format display (Format 1, Figure 4-5) and restore status of the previous workstation operating mode (either system response or workstation mode).

2. Continue to operate in workstation mode (Figure 4-7).

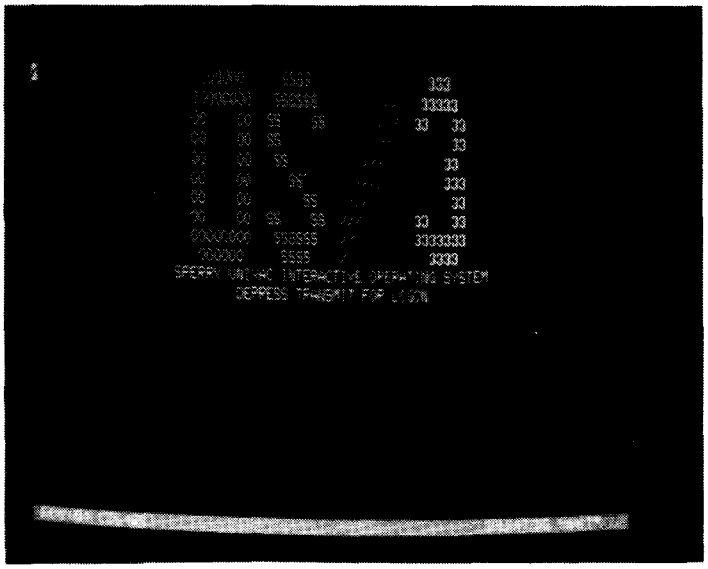


Figure 4—7. Display Screen for Workstation Mode

4.3.2.2. IMPL and IPL

After power is turned on, the system is automatically conditioned to initiate an IMPL as the final step of a successful power-on sequence. The IMPL function loads microcode into the processor control storage.

Upon completion of an IMPL, the system automatically initiates an IPL. The IPL initiates loading of programs into main storage, and it is part of a normal power-on sequence. Normal operation may then proceed using the system resident (SYSRES) integrated disk subsystem. Other devices can also be selected. (Refer to 4.3.2.2.2 and 4.3.2.2.3.)

4.3.2.2.1. IMPL or IPL Errors

If an error occurs during an IMPL or IPL sequence, as indicated by the LOAD *ERROR STOP* message displayed on the console workstation screen, you may repeat the sequence to attempt successful completion. If the error persists, note the error code displayed with the message, and refer to the OS/3 system messages manual, UP-8076 (current version), for the code meaning. Proceed as directed in the error code.

If an error occurs and the *CHECK STOP* message is displayed on the console screen, a hardware error is indicated. Refer to the operator maintenance guide, UP-8915, to perform the required diagnostics. If applicable, then press the POCLR pushbutton switch on the console table (Figure 3-4). Pressing this switch resets the system as well as the display screen. Contact your Sperry Univac customer engineer if you cannot clear the error.

If an error occurs during an IPL and the STOPPED *HPR* message with code is displayed, refer to the OS/3 message manual, UP-8076 (current version), for the code meaning and perform the appropriate action. If the error code again persists, record the message and refer to the operator maintenance guide, UP-8915 (current version).

Upon successful completion of the IMPL and IPL, an IPL display (Figure 4-1) is presented on the console screen. You merely need to press the XMIT key to use the SYSRES device and resume opertion with software. (Refer to the system operations handbook, UP-8859 (current version).) Otherwise, proceed with manual selection for an IPL, as discussed in 4.3.2.2.3.

4.3.2.2.2. Manual IMPL Selection

If you wish to enter only into the IMPL stage to determine if that sequence is correct or to select a device other than that used for SYSRES, proceed as follows:

1. Press and hold the FUNCTION SHIFT key, then press the SYS CNTL (D) key to switch to system control mode. Note that Format 2 (Figure 4–5b) is displayed on the screen.

   NOTE:

   To perform an independent IMPL without proceeding automatically to IPL, you first need to enter system control mode as directed in step 1.

2. Press and hold the FUNCTION SHIFT key, then press the IMPL (IN DISP/INSERT/IN LINE) key. Note that the display (Figure 4–8) indicates:

   ```
   IMPL=CDD?
   ```

   where C is the channel number for IMPL and DD is the device number for IMPL.

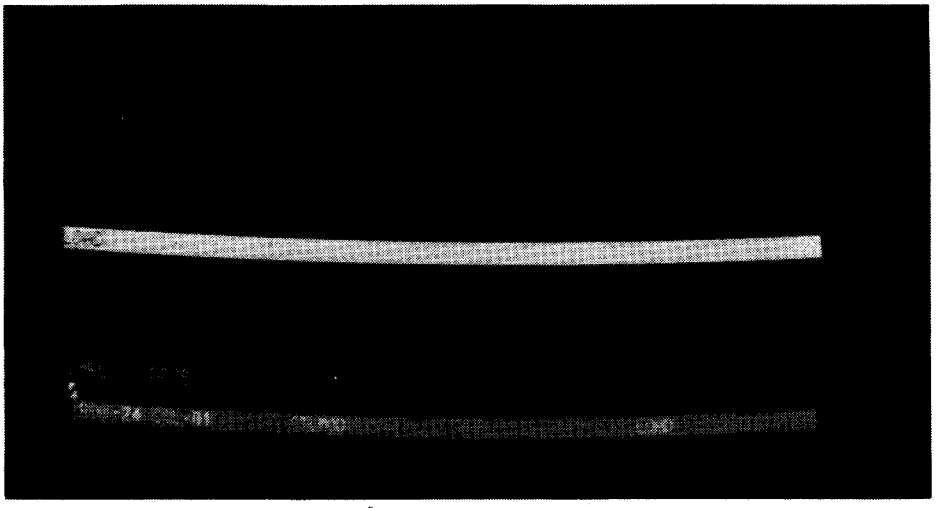


Figure 4—8. Display Screen for IMPL

3. Enter the channel and device numbers (in hexadecimal) through the keyboard according to the actual physical unit number assigned to the disk or diskette subsystem. Table 4–3 lists the IMPL and IPL device addresses.

Table 4—3. IMPL and IPL Device Addresses

Device Name	Channel	Subchannel	Device
SYSRES disk drive*	1	0	0
All other types 8417 and 8419 disk drives	1	0	1–7
Diskette drive	3	2	0–3

*SYSRES disk drive is automatically assigned for the IMPL and IPL unless a different device address is entered.

4. Press the XMIT key on the keyboard. The display illustrated in Figure 4–8 is again displayed upon successful completion of this phase. If a diskette subsystem is to be used for a second IMPL phase, enter the device number for phase 2 as directed in step 3 for phase 1, then press the XMIT key. The IPL display (Figure 4–1) should again be presented on the screen when IMPL phase 2 is completed. You are now ready to enter IPL either automatically by pressing the XMIT key or manually as directed in 4.3.2.2.3.

4.3.2.2.3. Manual IPL Selection

Manual IPL selection is made when:

- manual IMPL is completed and manual IPL selection is required;
- a STOPPED *HPR* with an unrecoverable error code is displayed;
- the error code in an IPLnn message directs manual selection; or
- a LOAD *ERROR STOP* message is displayed during a manually initiated IPL and the manual IPL selection must be restarted.

CAUTION

Be sure that no job is active before initiating a manual IPL. Otherwise, the SYSRES volume table of contents (VTOC) may become unrecoverable and a new SYSRES VTOC will have to be generated.

To manually select an alternate IPL, proceed as follows:

1. Enter system control mode by pressing the FUNCTION key and SYS CONT (D) key simultaneously. Note that the display screen indicates the following message on line 17:

```
IPL=CDD?
```

NOTE:

*If the message STOPPED *HPR* is displayed instead of IPL=CDD?, refer to the OS/3 message manual, UP-8076 (current version), according to the displayed hpr code, and continue as directed in the message. If you wish to perform a system dump to further analyze the problem, press the FUNCTION key and RESTART key simultaneously.*

2. Key in the three digits required to identify the physical IPL unit number, as listed in Table 4–3.

   NOTE:

   To use SYSRES, key in digits 100 for the IPL load device selection.

3. Press the XMIT key. Note that the following message is displayed:

```
IPL=CDD?
CYL=CCC?
```

4. Press the XMIT key to proceed into interactive IPL. Note that the display as illustrated in Figure 4–1 is presented, except the SY$STD,S, device is identified by the three digits entered in step 2. The default device number is 100 (SYSRES disk subsystem). If an IPL error occurs, refer to 4.3.2.2.1 to recover, then continue in the interactive IPL stage.

5. Press the FUNCTION key and CSL (C) key simultaneously to enter console workstation mode for interactive IPL operation. During and following interactive IPL, the commands you use and messages displayed on the screen are the same as those described in the System 80 operations handbook operator reference, UP-8859 (current version).

   NOTE:

   If your system uses the standard supervisor (SY$STD) and you wish to default to the supervisor, merely press the XMIT key and skip step 6. Perform step 6 to key in an alternate supervisor.

6. Key in the alternate supervisor name, load option, and device address, beginning at the cursor (▭) position, using the following format:

```
nnnnnn,o,did
```

   where:

   `nnnnnn`
   Is the alternate supervisor name. (SY$STD is the default standard supervisor.)

   `o`
   Is the loading option. You may use one of the following:

   S for normal supervisor load (default load)

   D for supervisor debugging (Refer to the supervisor concepts and facilities manual, UP-8831 (current version).)

   L for a special supervisor used with a stand-alone program

   `did`
   Is the load device address, as listed in Table 4–3.

CAUTION

Be sure that a response is made for all statements that require it before pressing the XMIT key (step 7). If the procedure is not correctly performed, questions and answers are lost and require the entire IPL procedure to be restarted.

7. Press the XMIT key. If no error message is displayed, proceed to step 8. If the system state line is displaying an error message, determine the error type from the following messages and proceed as directed in the message:

   - IPLnn followed by an IPL03 information message, where nn is the error code identifying the error.

     Refer to the OS/3 messages manual, UP-8076 (current version), and continue as directed in the message. If the error persists, refer to the operator maintenance guide, UP-8915 (current version).

   - STOPPED *HPR* with an hpr instruction code.

     Refer to the manuals indicated for an IPLnn error.

   - *CHECK STOP* message.

     A hardware failure is indicated. Refer to the operator maintenance guide, UP-8915, for diagnostics. Then press the POCLR pushbutton switch on the console table and repeat the manual IPL selection beginning with step 4.

8. Press the FUNCTION key and CSL (C) key simultaneously to enter into console mode again. The IPL procedure is now complete and messages from the OS/3 operating system appear. The first message requires you to enter the current date. Refer to the System 80 operations handbook operator reference, UP-8859 (current version), to continue operating with the system software.

4.3.2.3. Operator Initiated Input

In addition to responding to system messages displayed on the console workstation, the operator is required to initiate messages to the system. To initiate an input message from the console workstation, proceed as follows:

1. Switch to console workstation mode, if not presently operating in that mode, by pressing and holding the FUNCTION SHIFT key and pressing the CONSOLE (C) key. Note that the console display switches to Format 2 (Figure 4-5).

2. Press the MSG WAIT key to request software for an input capability and to unlock the keyboard. Note that an operator input line is set up within the first 16 lines of the display area. The keyboard is now unlocked.

3. Use the forward (→), backward (←), up (↑), and down (↓) keys to position the cursor at the start-of-entry (SOE) symbol set up on the display screen for the operator.

4. Key in the desired message, then press the XMIT key to send the message to the system. If further communications with the system is required, respond by keying the required message and follow the message by pressing the XMIT key.

4.3.3. Operator Maintenance

Maintenance by the operator is confined to procedures performed at the console workstation to determine the location of hardware malfunctions. The type of maintenance that these procedures perform are described in 4.3.3.1 and 4.3.3.2.

CAUTION

Do not open any cabinet doors or panels in the processor complex. The inside air has been purged and is continuously filtered to prevent damage to the internal disk drive. Contact your Sperry Univac customer engineer if access to internal components is required.

4.3.3.1. System Diagnostics and Error Log

The system is provided with comprehensive diagnostic software and an error log that rapidly isolate hardware malfunctions and assist the operator in verifying functionality. The system operator may desire to periodically verify proper operation of the system, or to run system diagnostics and error log retrieval when hardware malfunctions are suspected. Information regarding operation of system diagnostics and error log is contained in the operator maintenance guide, UP-8915 (current version).

4.3.3.2. Remote Maintenance

The system is equipped with a remote maintenance interface capability that allows the operator or a Sperry Univac customer engineer to remotely analyze suspected hardware malfunctions. The operator may perform this remote analysis periodically or be requested to run remote tests at various times. Information on remote maintenance is contained in the operator maintenance guide, UP-8915 (current version).

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