SPERRY UNIVAC
1100 Series

1110 and 1100/40 Systems

Central Group

Operator Reference

SPERRY UNIVAC
COMPUTER SYSTEMS

UP–7904 Rev. 2

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1. Introduction

1.1. GENERAL

The UNIVAC 1110 and SPERRY UNIVAC 1100/40 Systems Central Group consists of the display console, the command/arithmetic unit (CAU), the input/output access unit (IOAU), and main storage units. The CAUs and IOAUs combine in various configurations to form a processor, and the main storage units provide the system's main storage. The display console provides the operator with a means of communicating with the processor. Figure 1–1 shows the 1110 System and Figure 1–2 shows the 1100/40 System.

1.2. SCOPE OF MANUAL

This manual contains operator information and procedures required for operation of the central group only. Operator information for the various peripheral subsystems which may be included in the 1110 and 1100/40 Systems is available in the current versions of the appropriate operator reference or programmer/operator reference manuals. These manuals are listed in the hardware section of the SPERRY UNIVAC 1100 Series Summary of Current Documentation, UP–7893 (current version).

The remaining information in this manual consists of the following four sections:

- Description
- Controls and Indicators
- Operating Procedures
- Operator Performed Maintenance

1.3. OPERATOR RESPONSIBILITIES

The operator is responsible for preparing the central group for operation, and for performing the procedures required for efficient operation. These responsibilities consist of:

- turning power on and off the system as required,
- observing and responding to indications on the operator control panels described in this manual,
- operation of the keyboard and cathode ray tube (CRT) display unit,

- responding to CRT and printer outputs; and
- loading paper in the incremental printer and performing the maintenance procedures described in this manual.

To assume these responsibilities the operator must know the location and function of the operator-oriented controls and indicators, be familiar with the operation of the display console subsystem, and be able to perform the operating and maintenance procedures described in this manual.

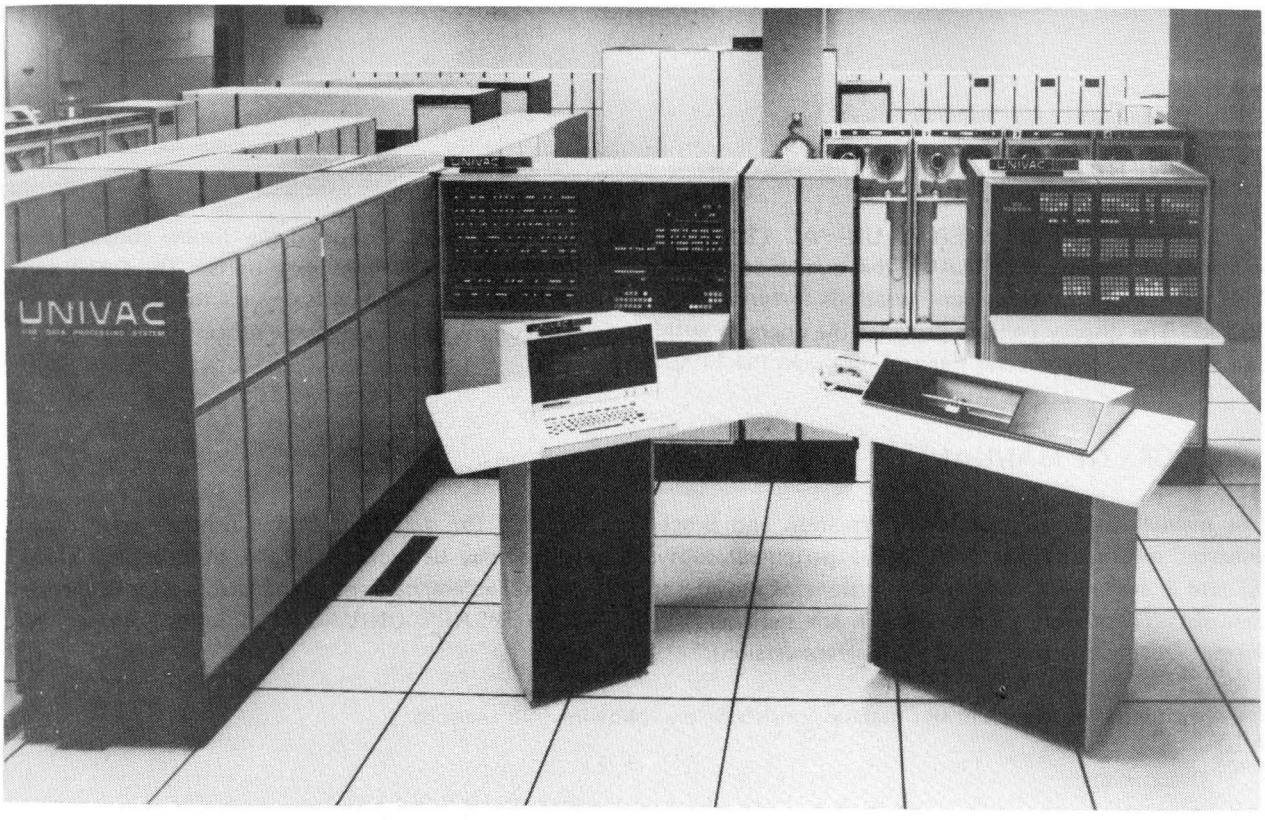


Figure 1–1. UNIVAC 1110 System

Figure 1–2. SPERRY UNIVAC 1100/40 System

2. Description

2.1. GENERAL

The UNIVAC 1110 and SPERRY UNIVAC 1100/40 Systems Central Group forms the heart of the 1110 and 1100/40 Processing Systems. The central group consists of one or more display consoles, one or more command/arithmetic units (CAUs), one or more input/output access units (IOAUs), and two or more main storage units. The CAUs and the IOAUs combine to form a processor, the main storage units provide the necessary system main storage, and the display console provides the principal means of communication between the processor and an operator.

2.2. CONFIGURATION

The 1110 System central group in a unit processing system requires a minimum of one display console, one CAU, one IOAU, 32K words of primary storage, 131K words of extended storage, and one MAI. In a multiprocessing system, the 1110 System central group requires a minimum of one display console, two CAUs, one IOAU, 65K words of primary storage, 262K words of extended storage, and two MAIs.

The 1100/40 System central group in a unit processing system requires a minimum of one display console, one CAU, one IOAU, and 196K words of primary storage. In a multiprocessing system, the 1100/40 System central group requires a minimum of one display console, two CAUs, one IOAU, and 196K words of primary storage.

The 1110 and 1100/40 Systems are built up from combinations of two functionally and physically independent units: a CAU and an IOAU. The minimum systems may be expanded by adding CAUs and/or IOAUs as determined by user requirements. From one to four display consoles may be used depending on the system configuration and individual site requirements. The number of main storage units in a system is determined by user requirements. The central group basic configuration is shown in Figure 2–1.

A description of each of the central group components: the display console, the CAU, the IOAU, and the main storage units, is given in the following subsections.

2.2.1. Display Console

The display console (Figure 2–2) provides the principal means of communications between the 1110 and 1100/40 Systems and an operator. The display console contains either a UNISCOPE 100 or UNISCOPE 200 Display Terminal (display terminal – consisting of a cathode ray tube (CRT) display and keyboard), an incremental printer, and a remote maintenance system interface. Through the CRT display and keyboard the operator has a set of 96 characters, including uppercase and lowercase alphabet, with which to communicate. Besides the character keys, the keyboard has message control, cursor control, and editing keys for the operator's use. The incremental printer provides a hardcopy printout of data from the processor using a set of 64 characters. The remote maintenance system interface provides a remote communications interface to a remote diagnostic center for software and hardware diagnostics.

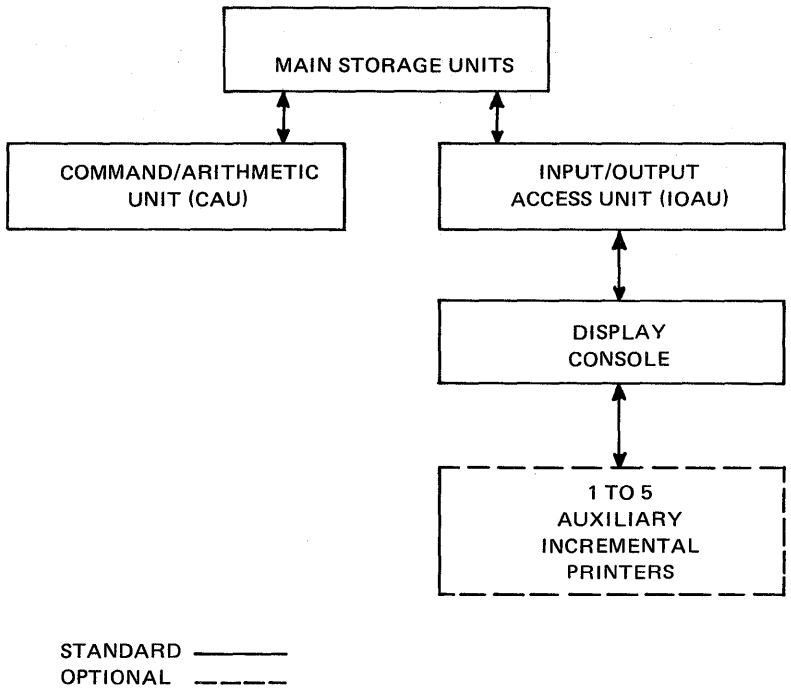


Figure 2–1. UNIVAC 1110 and SPERRY UNIVAC 1100/40 Systems, Central Group Unit Processing Configuration

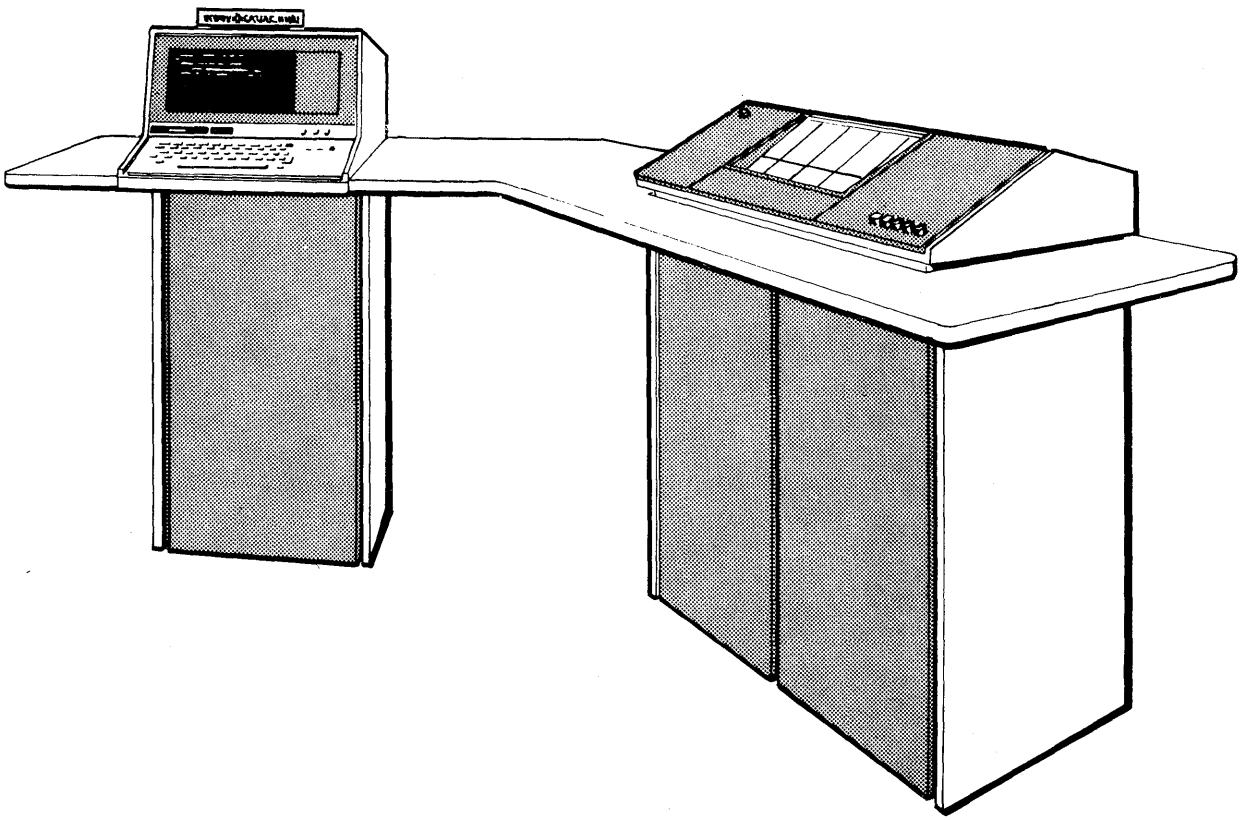


Figure 2–2. UNIVAC 1110 and SPERRY UNIVAC 1100/40 Systems, Display Console

2.2.1.1. Display Terminal

The display terminal with "protected format" capability provides a keyboard and CRT display. The display format is 16 lines with 64 characters per line on the display terminal screen. A full American Standard Code for Information Interchange (ASCII) character set, consisting of 95 characters plus a space, may be displayed. The keyboard on the display terminal provides all the keys and controls required by the operator to generate messages and initiate message transfers. The keyboard layout, shown in Figure 3–6, allows operator entry of the ASCII graphic character set.

The display terminal internal storage stores the data and formatting and control codes received from the keyboard or the processor for display on the CRT display screen. While data is being displayed, the storage continually refreshes the display to maintain its viewing stability (no flicker).

The protected format capability of the display terminal provides a means of protecting selected data from operator alteration. It permits a "form" to be sent from the processor to the CRT display screen which may then be filled in by the operator without the operator being able to alter the form itself. Either the contents of the complete CRT display screen, including the form, may be transmitted to the processor (by using the keyboard TRANSMIT DISPL key), or just the data inserted by the operator (by using the TRANSMIT UNPROT DISPL key). This second type of transmission permits a reduction of the quantity of data sent to the processor. Each time a protected area is reached, the SUB code (032_8) is inserted to mark omission of the protected data. A summary of the display terminal characteristics is given in Table 2–1.

Table 2–1. Display Terminal Characteristics

Characteristic	Description
Keyboard	
Symbol Set	Alphanumeric, symbolic, and control consisting of: – 95 basic typewriter symbols – space bar – 8 editing keys – 10 cursor control keys
CRT Display	
Viewing Area	UNISCOPE 100 – 10 inches wide by 5 inches high UNISCOPE 200 – 12 inches wide by 8 inches high
Buffer Capacity	1024 characters
Display Format	16 lines, 64 symbols per line
Symbol Set	ASCII character set of 95 characters plus space
Character Generation	Closed stroke, maximum 8 per character
Scan Method	Digital
Regeneration Rate	60 times per second

2.2.1.2. Incremental Printer

The incremental printer provides hardcopy printout of data from the processor (data that may or may not be the same as that displayed on the CRT display screen). The incremental printer will print up to 132 characters per line at a rate of 30 characters per second. The incremental printer will print a 64 character subset of the ASCII code. A summary of the incremental printer characteristics is given in Table 2–2.

Table 2–2. UNIVAC Incremental Printer Characteristics

Characteristic	Description
Maximum Line Length	132 characters
Character Spacing	10 per inch
Line Spacing	6 per inch (single space)
Printing Speed	30 characters per second
Carriage Return Time	385 milliseconds or less

2.2.1.3. Display Console Control Logic

The display console control logic is housed in the incremental printer cabinet. The control logic controls the flow of data between the processor and the display console and can operate on any IOAU channel. The control logic interfaces between the IOAU and the display console's display terminal and incremental printer.

2.2.1.4. Remote Maintenance System Interface

The remote maintenance system (RMS) interface located in the display console consists of a serializer/staticizer. The RMS interface is connected to a remote site through a Bell Telephone Company 201 Series Modem, or industry standard equivalent. The RMS permits diagnostic maintenance from the remote site.

Data transfers between the display console and the RMS at a remote site are bit-serial over a toll-switched voice-message network (DDD) via the modem.

The remote site can select any system data, via the display console, available to the operator on site. To establish contact with the remote site, the display console operator types a message necessary to have the processor select the RMS. The operator then dials the telephone number of the remote site and is answered by someone there. When ready, the RMS is switched, by the remote site, to data mode and the diagnostic data transfers begins. When finished, the RMS is switched out of data mode and the telephone call terminated.

2.2.2. Command/Arithmetic Unit

The command/arithmetic unit (CAU) is housed in a double cabinet which contains both logic circuitry and power supplies. The logic portion of the cabinet is divided into two major sections: control and arithmetic. The power supply portion of the cabinet contains ac and dc power supplies and controls.

The control section contains the hardware necessary to decode and translate the instructions, and delegate the various tasks to be performed to the proper functional units in an orderly manner. All functional sections are linked by the control section and all operations are performed under its directions.

The arithmetic section handles the actual arithmetic operations: addition, subtraction, multiplication, division, and shifting. The arithmetic section receives operands from the general register stack (GRS) and/or storage and instructions from the control section. From these inputs, the arithmetic section performs the necessary arithmetic computations, temporarily stores the results in accumulator registers, and signals the control section that the computations are complete. While the arithmetic section is performing the arithmetic computations it is operating as a functional unit, independent of the control section. When the arithmetic section signals the control section that it is through with the computations, it again comes under the direction of the control section.

2.2.3. Input/Output Access Unit

The input/output access unit (IOAU) is housed in a single cabinet which contains both logic circuitry and power supplies. The IOAU provides control and data paths between main storage and peripheral subsystems, and operates under the direct control of the CAUs. When the IOAU receives its instructions from the CAU's control section, it performs the necessary data transfers independent of control and will not interfere with the execution of instructions in the CAU. The ac and dc power panels are located within the cabinet, and a maintenance panel is located on the front of the cabinet.

2.2.4. Main Storage Units

Main storage units consist of a cabinet containing storage modules, logic control circuitry, and power supplies. All controls and indicators on or within the main storage units are for Sperry Univac customer engineer use only.

2.3. OPTIONAL FEATURES

The number of CAUs, IOAUs, display consoles, and main storage units, in the system are optional to the extent described in 2.2.

2.4. INTERFACE

The display console communicates with the processor via the IOAU and may be connected to any internally specified index (ISI) channel. The ASCII character set is used in all communication. Output data to the display console is on a full 36-bit word basis with one 7-bit character as the least significant bits of each quarter word. Half-word parity is checked for all output data transfers from the IOAU. Input data from the display console is transmitted one 7-bit character at a time. A parity bit is transmitted with each character. External interrupts are generated by the display console whenever parity errors are detected, invalid functions are received, printer faults occur, the MESSAGE WAITING key on the keyboard is pressed, or an end-of-message status code occurs.

3. Controls and Indicators

3.1. GENERAL

Operating controls and indicators of the UNIVAC 1110 and the SPERRY UNIVAC 1100/40 Systems are located on the display console, CAU, and the IOAU. The main storage units do not contain any operator controls and indicators (see 3.5).

The controls and indicators of the display console are located in the incremental printer cabinet, on the incremental printer, and on the display terminal. Housed in the printer cabinet are ac and dc power controls for the display console. Located on the incremental printer are switches and indicators for operation of the printer. The display terminal contains circuit breakers and switches controlling power to the unit, controls for adjusting the display, indicators for informing the operator of messages from the processor, plus the keyboard with which the operator can respond to or initiate messages to or from the processor.

Several panels of controls and indicators located on the processor (CAU and IOAU) are related to operation of the system. These consist of ac and dc power panels, located on both the CAU and the IOAU cabinets, and the maintenance panel located on the IOAU.

The functions and indications of the controls and indicators for the display console, CAU, and the IOAU are detailed in the following subsections.

3.2. DISPLAY CONSOLE

The operator can communicate with the 1110 and 1100/40 Systems by using the display console. The display console contains the display terminal for two-way communications and the incremental printer for hardcopy output. The display console power control panels require infrequent attention by the operator. Other controls such as the keyboard and status indicators are used during normal operation.

3.2.1. Display Console Controls and Indicators

The display console controls and indicators located in the incremental printer cabinet are the ac and dc power panels shown in Figures 3–1 and 3–2, respectively. By means of the controls on these panels the operator turns on or turns off display console power. These panels are accessible via a right door (ac power panel) and a left door (dc power panel) at the rear of the incremental printer cabinet. A description of the display console power controls is given in Table 3–1.

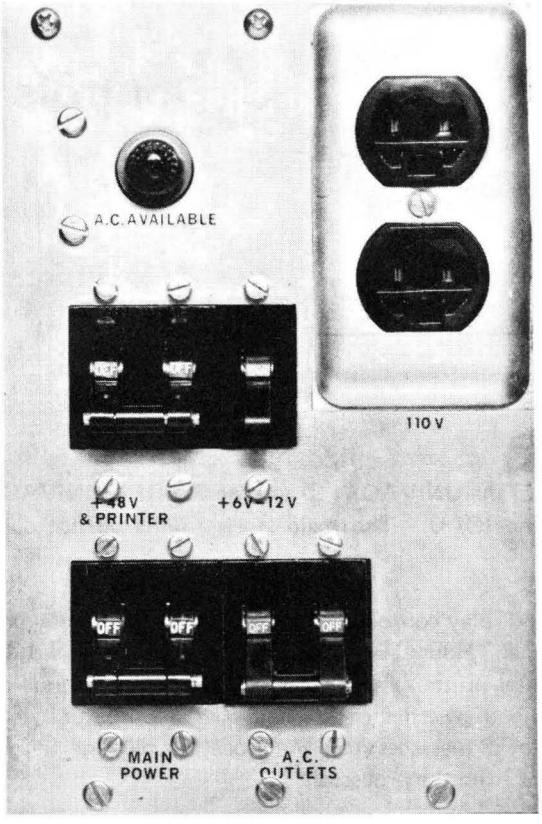


Figure 3–1. Display Console AC Power Panel

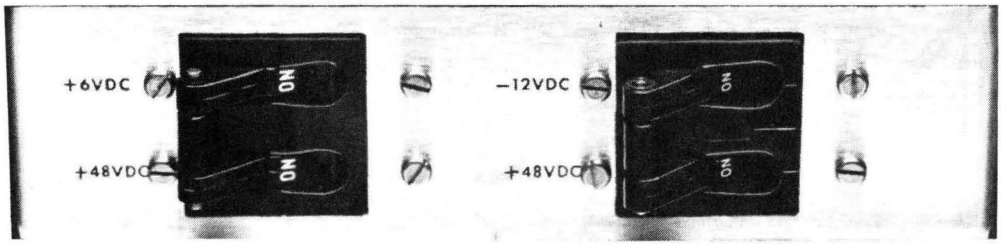


Figure 3–2. Display Console DC Power Panel

Table 3–1. Display Console AC and DC Power Panel Controls

Control/Indicator	Function
AC Power Panel:	
AC AVAILABLE indicator	Indicates ac power is applied to the cabinet.
MAIN POWER circuit breaker	Switches main ac power to the unit.
+48V & PRINTER circuit breaker	Switches ac power to +48VDC supply and printer.
+6V and −12V circuit breaker	Switches ac power to +6VDC and −12VDC supplies.
AC OUTLETS circuit breaker	Switches ac power to ac outlets.
DC Power Panel:	
+6VDC circuit breaker	Switches dc power to logic circuits.
−12VDC circuit breaker	Switches dc power to logic circuits.
+48VDC circuit breaker	Switches dc power to printer.
+48VDC circuit breaker	Switches dc power to printer.

3.2.2. Incremental Printer Controls and Indicators

Five switches and indicators with which the operator controls and observes printer operation are located on the lower right front of the incremental printer enclosure (Figure 3–3). A phase control knob with which the operator adjusts print timing in order to eliminate cut-off letters is located under the incremental printer access cover, on the left end of the printer mechanism (see Figure 4–3). In addition, a Summary Fault indicator located near the top left front of the incremental printer enclosure lights if a fault condition is detected by the system partitioning unit (SPU) or by the status summary panel on the IOAU if a SPU is not present. When this indicator lights, the operator should check the SPU or the IOAU status summary panel and notify the Sperry Univac customer engineer of the fault condition. A description of the incremental printer controls and indicators is given in Table 3–2.

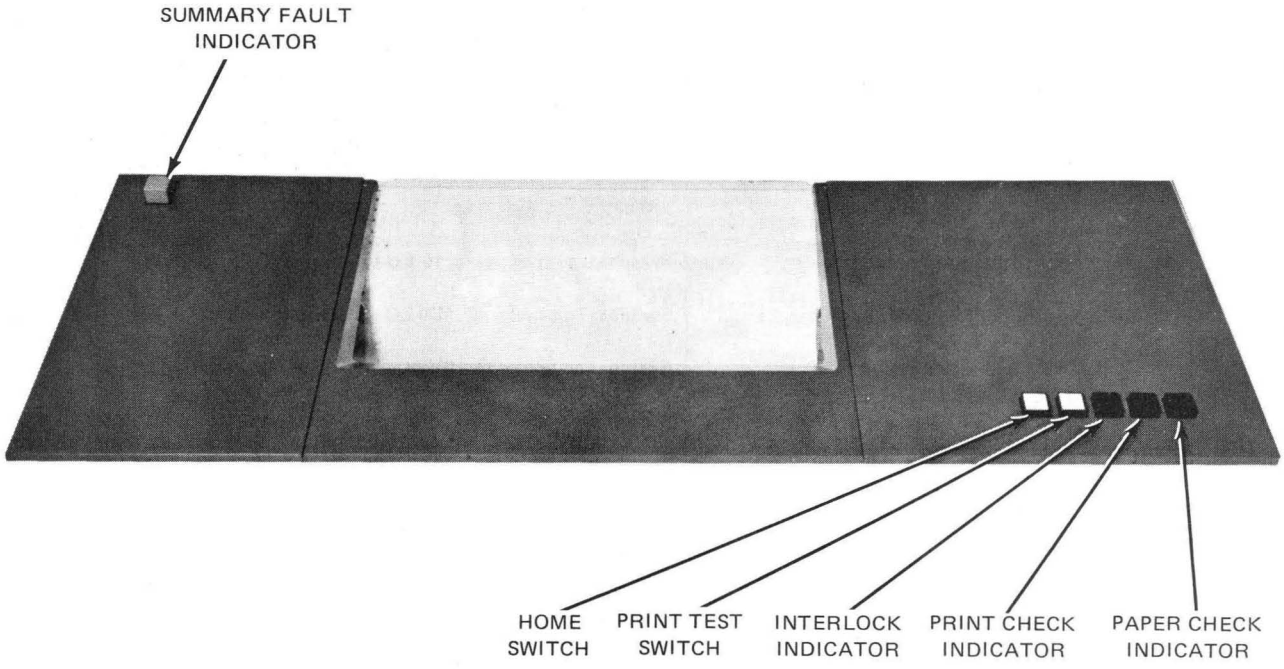


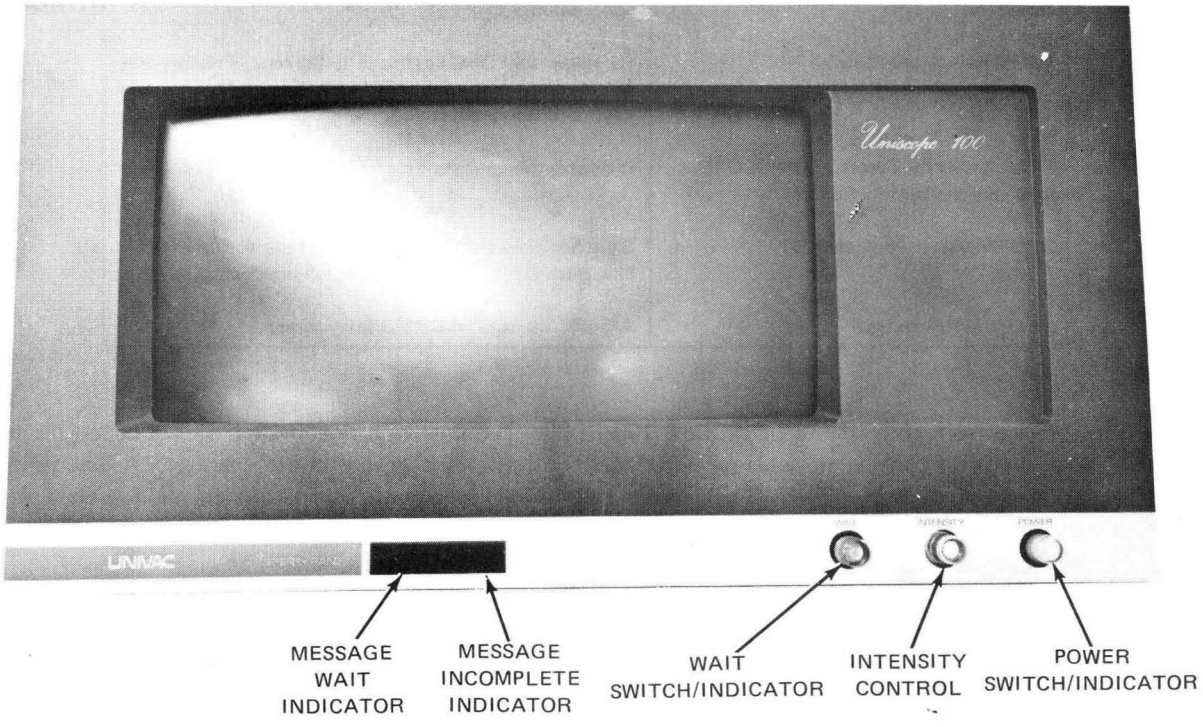
Figure 3–3. Incremental Printer, Front View

Table 3–2. Incremental Printer Controls and Indicators

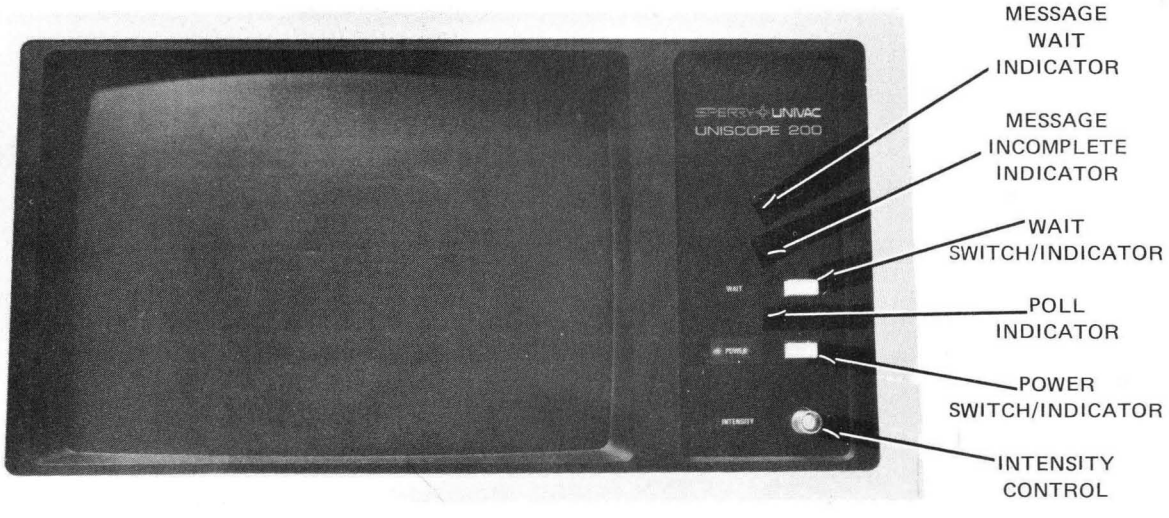
Control/Indicator	Function
HOME switch	Moves paper to start of next form (four lines past the perforations).
PRINT TEST switch	Causes the incremental printer to print a row of E's.
INTERLOCK indicator	Indicates that the cover is not closed properly.
PRINT CHECK indicator	Indicates that the print actuator fuse or the line feed fuse is blown, or that loss of air, power up master clear, or loss of +48VDC supply voltage has been detected.
PAPER CHECK indicator	Indicates that the paper supply is out.
Phase Control lever	Adjusts print wheel timing to eliminate cut-off letters. (This adjustment is used to compensate for different thicknesses of paper.)
Summary Fault indicator	Indicates to the operator that the SPU or IOAU has detected a fault condition in either a CAU, IOAU, or a storage unit. The type and location of the fault must be determined at the SPU or the IOAU status summary panel.

3.2.3. Display Terminal Non-Keyboard Controls and Indicators

Figure 3–4 shows a front view of the UNISCOPE 100 and 200 Display Terminals. Located at the lower edge of the UNISCOPE 100 Display Terminal front panel and on the right side of the UNISCOPE 200 Display Terminal front panel are the non-keyboard indicators, controls, and control/indicator combinations accessible to the operator. A description of their function is given in Table 3–3.



a. UNISCOPE 100 Display Terminal, Front View



b. UNISCOPE 200 Display Terminal, Front View

Figure 3–4. UNISCOPE Display Terminals, Front View

Table 3–3. Display Terminal, Visible Front Panel Controls and Indicators

Control/Indicator	Function
MESSAGE WAIT indicator	Indicates that the processor has requested a message. It remains lit until a message is received by the processor.
MESSAGE INCOMPLETE indicator	This indicator is not used in the display console application.
WAIT switch/indicator	Indicates that the keyboard is locked. Pressing the switch unlocks the keyboard. Indicator is lit when the keyboard is locked.
POLL indicator (Used on UNISCOPE 200 Display Terminal only)	Indicates the completion of a poll or incoming message.
POWER switch/indicator	Switches power to the unit (alternate action – push ON, push OFF). Indicator is lit when power is on.
INTENSITY control	Adjusts intensity of CRT display screen.

Figure 3–5 shows a front view of the UNISCOPE 100 Display Terminal with the removable front panel (faceplate) removed. With the front panel removed, four additional controls are accessible to the operator. A description of their function is given in Table 3–4. There are no additional operator controls under the faceplate of the UNISCOPE 200 Display Terminal.

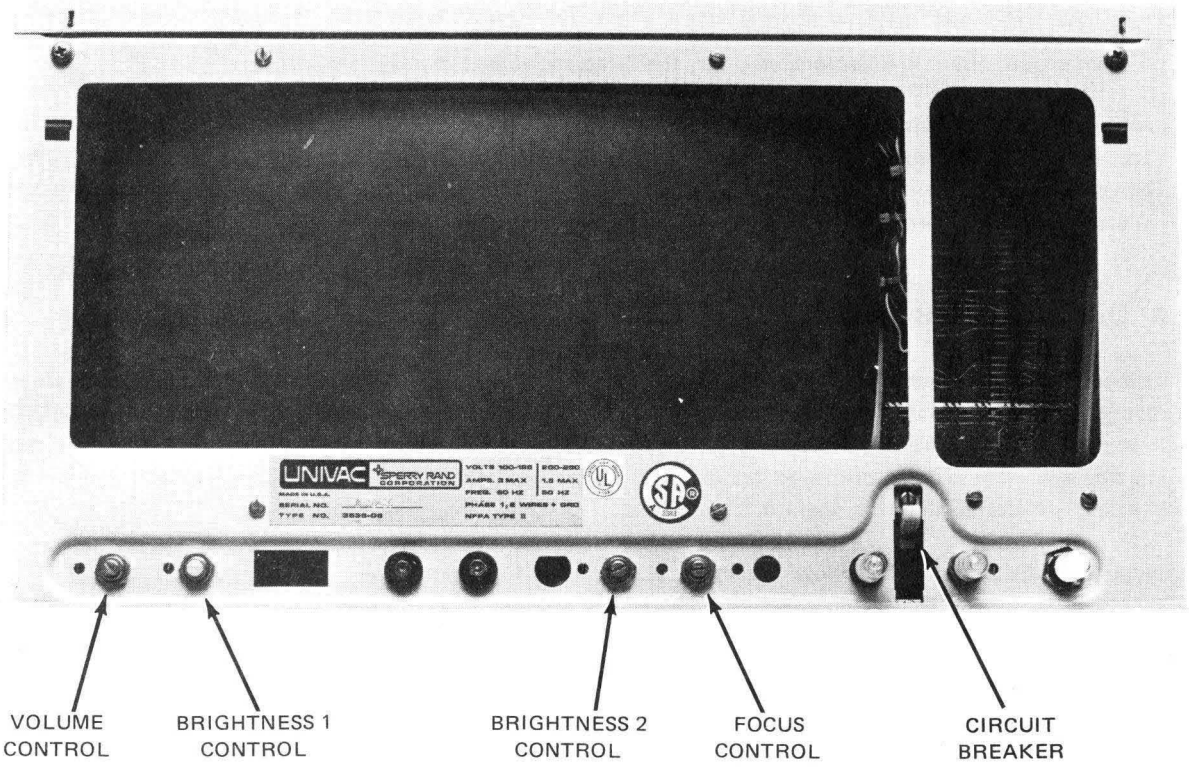


Figure 3–5. UNISCOPE 100 Display Terminal, Front View with Faceplate Removed

Table 3–4. UNISCOPE 100 Display Terminal, Hidden Front Panel Controls

Control/Indicator	Function
VOLUME control	Controls the volume of the audible alarm that sounds under any of three conditions: 1. Cursor moves to eighth position from end of line (sound is momentary). 2. Cursor moves to last line of CRT display (sound is momentary). 3. MESSAGE WAITING indicator is lit (sound is pulsating until a message has been received by the processor).
BRIGHTNESS 1 control	Used with the Brightness 2 control to obtain a balanced display screen intensity. This control is to be used by the Sperry Univac customer engineer only.
BRIGHTNESS 2 control	See Brightness 1 control.
FOCUS control	Adjusts the focus of the CRT display screen.
Circuit Breaker	Main power protection for the display terminal. For use only by the Sperry Univac customer engineer.

Two additional non-keyboard, limited access controls are provided in both display terminals. These controls are for Sperry Univac customer engineer use only, and are as follows:

- A main power circuit breaker located under the faceplate of each display terminal.
- An enable/disable switch located under the right front corner of each display terminal keyboard. In one position, the high voltage is turned off blanking the CRT display screen and the keyboard is disabled. The unit remains logically operable from the interface, thus providing the user with a degree of security against unauthorized operation. In the other position, the display terminal operates normally.

3.2.4. Display Terminal Keyboard

The keyboard is the operator's interface with the display terminal and processor. The keyboard allows the operator to initiate communications with the processor and respond to messages from the processor. When the character keys are pressed, to compose messages that will be transmitted to the processor, the data is supplied to the display terminal storage. The data is displayed on the CRT display screen to allow the operator to edit and verify the data before it is transmitted at the operator's command.

The keyboard is divided into the following sections according to function:

- Message control keys
- Cursor control keys
- Editing keys
- Special function keys (not used in this application)
- Alphanumeric/Symbolic (character) keys

The keys and their arrangement on the keyboard are shown in Figure 3–6.

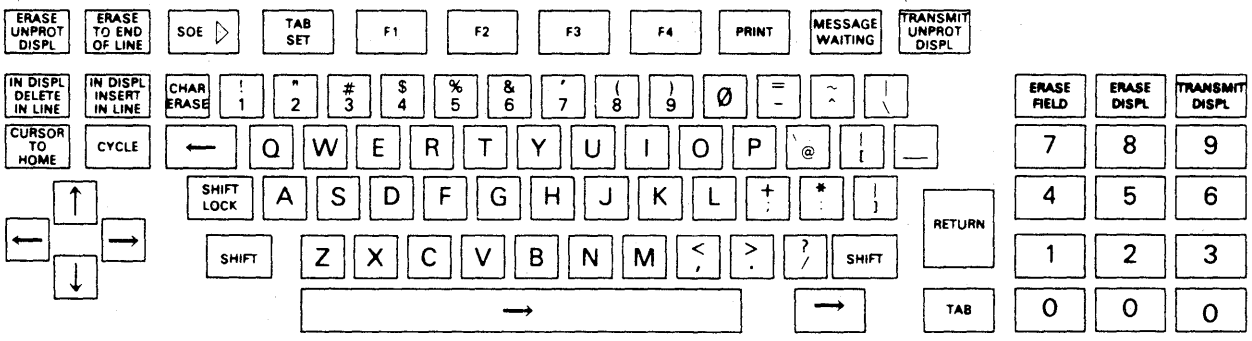


Figure 3–6. Display Terminal Keyboard

The message control keys control the location, transmission, and reception of messages. The cursor control keys are used to compose or edit messages on the CRT display screen. The cursor (⌐ for UNISCOPE 100 terminal, ◪ for UNISCOPE 200 terminal) is always part of the CRT display. The editing keys enable the operator to correct or change data that has been input from the keyboard or received from the processor. Processor stored data is not changed when the display is edited; the changed data must be returned to the processor with instructions to change the file data as indicated in the edited transmission. The alphanumeric/symbolic (character) keys are similar to the keys of the basic typewriter keyboard. These keys enable the operator to generate a message from a repertoire of 95 characters plus a space. These characters are displayed on the CRT display screen and stored in the display terminal's storage using the American Standard Code for Information Interchange (ASCII). Table 3–5 describes the functions of each key in each of these sections.

Table 3–5. Display Terminal Keyboard Functions (Part 1 of 3)

Key	Function
Message Control Keys	
SOE ▷	This key places the start of entry symbol (▷) on the CRT display screen. The SOE character designates the character position at which a message will start when the TRANSMIT DISPL or TRANSMIT UNPROT DISPL key is pressed. One or more SOE characters may be present in any message. The SOE character may be within a protected area.
TRANSMIT UNPROT DISPL	When pressed, this key results in the transmission of only the unprotected data displayed on the CRT display screen and located between the SOE character closest to the left of the cursor, and the cursor. The keyboard will lock until the processor releases it.
TRANSMIT DISPL	When pressed, this key results in both protected and unprotected data to be transmitted to the processor.
PRINT	The PRINT key is not functional in the display console application.
MESSAGE WAITING	When pressed, this key signals the processor with an external interrupt indicating that a message is coming from the display terminal. The program can then hold up output and thus avoid disrupting the operator's message.
Cursor Control Keys	
CURSOR TO HOME	This key repositions the cursor to the first character position (home) on the CRT display. The "home" position is at the top line, left margin. If this position is protected, the cursor will move right to the first unprotected character. If all positions are protected, the cursor will return to "home" and the keyboard will lock.
RETURN	This key is similar to the carriage return key on a typewriter keyboard. The RETURN key moves the cursor down one line and to the left margin (carriage return). If this position is protected, the cursor moves right to the first unprotected character position. Automatic cursor return is generated following the last character of each line without pressing the RETURN key.
→ (Space Bar)	This key moves the cursor forward (to the right) one space (or to the first unprotected character) each time it is pressed. The cursor does not stop over a protected character.
↑ ← → ↓ (4 Keys)	Each scan key moves the cursor in the direction of the arrow on the key one character position (or to next unprotected position) at a time, repeating as long as the key is pressed. When the cursor reaches the end of a line, it moves to the first character position of the next lower line (scan right) or the last character position of the next line up (scan left). When the cursor reaches the top line or bottom line (scan up or down), it moves to the same column position in the top or bottom line, as appropriate.

Table 3–5. Display Terminal Keyboard Functions (Part 2 of 3)

Key	Function
	Cursor Control Keys (continued)
TAB	This key is a special cursor positioning key that moves the cursor forward until a special tab-stop character code is detected in the display terminal storage. If a tab-stop character is detected, the cursor stops at the first unprotected character position beyond it. If no tab-stop character is found or only protected tab-stop characters are found, the cursor returns to the home position.
TAB SET	This key places tab-stop codes into the display terminal storage for use with the TAB key. The cursor indicates the position for setting a tab stop. A tab stop must be set, either manually or by the processor, wherever one is desired; a tab stop in one line does not have any affect in any other line. Tab stops are transmitted with data and must be reset for each new screen format unless program provision is made to retain them.
← (Backspace)	This key moves the cursor to the first unprotected character position to the left each time it is pressed; it does not repeat if the key is held. When the cursor reaches the left end of the line, this key moves the cursor to the last character position of the previous line.
	Editing Keys
CHAR ERASE	This key erases the character under the cursor and enters a space in that position of the CRT display screen. The cursor moves to the first unprotected character position to the right.
ERASE TO END OF LINE	This key replaces with spaces all characters from and including the cursor position to the end of the line. The cursor remains in the same position. In protected format use, this key replaces with spaces all characters from the cursor to the end of the unprotected field in which the cursor is positioned or to the end of the line on the screen, whichever comes first. The key is inoperative when the cursor is located in the protected field.
ERASE UNPROT DISPL	When pressed, this key removes all unprotected data from the cursor to the end of the CRT display screen.
IN DISPL INSERT IN LINE	When the keyboard is in the uppercase mode (SHIFT key is pressed), the "insert in display" function is activated. Then, when this key is pressed, that part of the data from the cursor to the end of the CRT display screen is moved to the right one space, leaving a space under the cursor. Characters at the end of the lines in the data being moved are shifted to the beginning of the next line; the character in the last position on the CRT display screen is lost. In protected format use, only the data within one unprotected field is affected. When the keyboard is in the lowercase mode, the "insert in line" function is activated. The part of the line from the cursor to the end of the line is moved to the right one space each time this key is pressed, leaving a space under the cursor; the character in the last position of the line is lost. In protected format use, only the data within the unprotected field is affected; any character at the right limit of the field is lost.
IN DISPL DELETE IN LINE	This key causes the deletion of the character in the cursor position, and all the characters to the right of the cursor shift one position to the left (the cursor does not move). If the keyboard is in lowercase mode, only the characters in the line containing the cursor move to the left, and a space is inserted at the end of the line. If the keyboard is in uppercase mode (SHIFT key is pressed), all the characters from the cursor to the end of the CRT display screen shift to the left, and a space is inserted in the last position in the CRT display screen. (Characters in the first position of each line are moved to the last position of the previous line.) In protected format use, this key limits the code sequence to one unprotected field rather than to the end of the line or of the CRT display screen. This permits the operator to shift several lines within one unprotected field, but does not allow the shifting of more than one unprotected field at a time.

Table 3–5. Display Terminal Keyboard Functions (Part 3 of 3)

Key	Function
	Editing Keys (continued)
CYCLE	The CYCLE key causes the next character or function chosen by the operator to be repeated as long as both it and the other key are pressed together. The CYCLE key operates with all keys except ERASE, DELETE, INSERT, SHIFT, LOCK, PRINT, RETURN, MESSAGE WAITING, TRANSMIT, CURSOR TO HOME, TAB, TAB SET, SOE, and special function keys.
ERASE FIELD	When pressed, this key replaces with spaces all data from the cursor to the end of the unprotected field (or the end of the display if the end of the display occurs first) within which the cursor is positioned. If, at the end of a transmission, the processor leaves the cursor positioned within a protected field, this key does not cause the cursor to move; and the erase-to-end-of-field function does not occur. The cursor must be moved into an unprotected field before the ERASE FIELD key functions.
ERASE DISPL	When pressed, this key replaces with spaces all the data, protected and unprotected, between the cursor position and the end of the display.
	Character Keys
Alphanumeric Keys	These keys provide the English alphabet in upper and lower case letters, and digits 0–9. The keys are arranged like those of a standard typewriter.
Punctuation and special characters	These keys provide the punctuation marks and some special characters found on a standard typewriter, plus several extra characters not common to standard typewriters.
SHIFT (2 Keys)	When pressed, the SHIFT key, shifts the keyboard from lowercase mode to uppercase mode. In uppercase mode, the symbol characters are generated in place of the numerals. The SHIFT key must be held while the character key is pressed, when it is released, the mode shifts back to lowercase.
SHIFT LOCK	When pressed, the SHIFT LOCK key locks the keyboard in uppercase mode; this key is released when the SHIFT key is pressed momentarily.

3.3. COMMAND/ARITHMETIC UNIT

The command/arithmetic unit (CAU) has two panels of controls and indicators related to operation of the processor. Descriptions of these two panels; an ac power panel and a dc power panel, their controls and indicators and their functions are given in paragraphs 3.3.1 and 3.3.2.

3.3.1. AC Power Panel

The CAU's ac power panel is located behind the front enclosure of the CAU cabinet. It consists essentially of circuit breakers for supplying ac power to sections of the CAU. Figure 3–7 shows the ac power panel and Table 3–6 lists the function of each control and indicator on the panel.

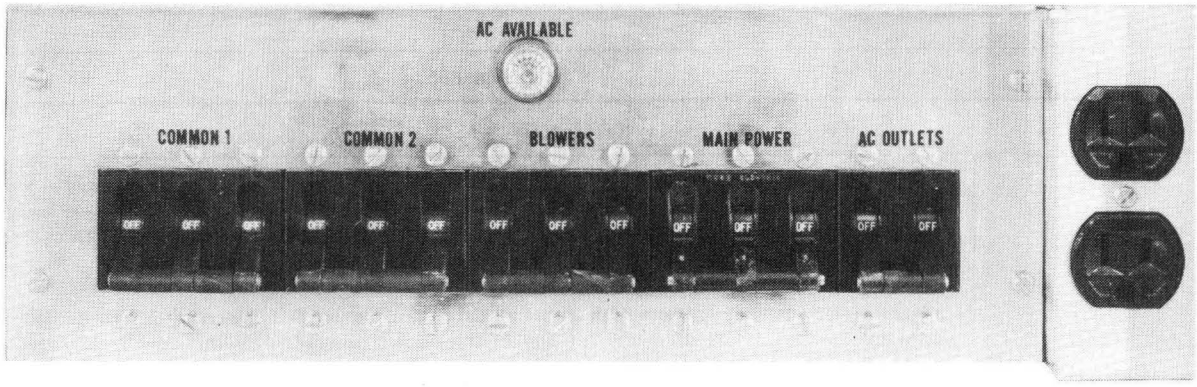


Figure 3–7. CAU AC Power Panel

Table 3–6. CAU AC Power Panel Controls and Indicators

Control/Indicator	Function
AC AVAILABLE indicator	Indicates that ac power is present at the cabinet.
Circuit Breakers:	
COMMON 1	Switches common 1 dc power supply.
COMMON 2	Switches common 2 dc power supply.
BLOWERS	Switches blower power.
MAIN POWER	Switches main ac power to the unit.
AC OUTLETS	Switches power to ac outlets.
AC Outlets	Provides convenient source of 115 volts ac.

3.3.2. DC Power Panel

The CAU's dc power panel is located behind the front enclosure of the CAU cabinet. It includes controls and indicators relating to abnormal conditions, running time, and dc power supplies. Figure 3–8 shows the dc power panel and Table 3–7 lists the function of each control and indicator on the panel.

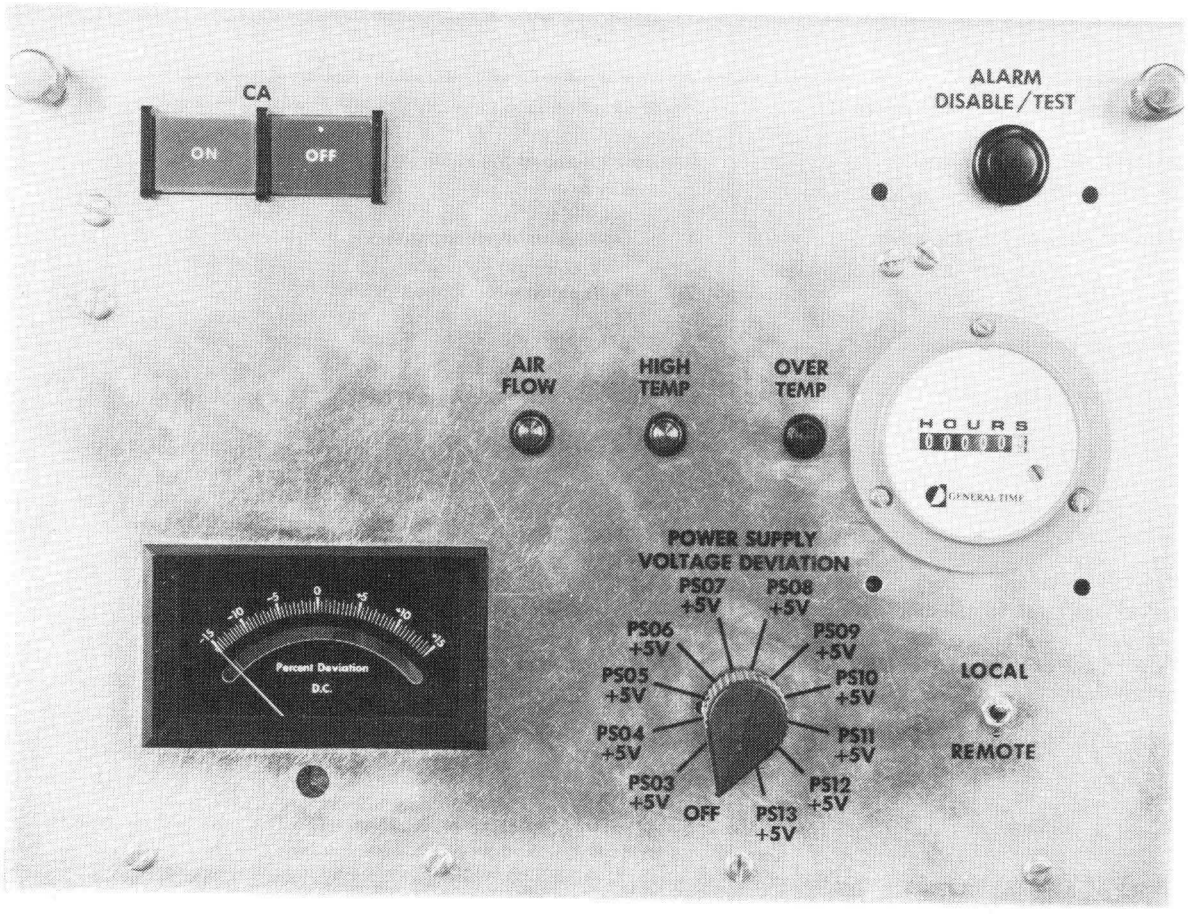


Figure 3–8. CAU DC Power Panel

Table 3–7. CAU DC Power Panel Controls and Indicators

Control/Indicator	Function
Audio Alarm (not visible on panel)	Warns of abnormal conditions (low air flow or high temperature).
ALARM ADJ potentiometer (at rear of assembly)	Controls volume of the audio alarm.
ALARM DISABLE/TEST switch	1. Disables alarm when operating. 2. Tests alarm when not operating.
Abnormal condition indicator lamps:	
AIR FLOW	Indicates insufficient air flow in cabinet. Alarm sounds with it.
HIGH TEMP	Indicates temperature over 125°F in cabinet. Alarm sounds with it.
OVER TEMP	Indicates temperature over 135°F in cabinet. The dc power supplies automatically shut off and cannot be turned on again until the condition is corrected.
RUNNING TIME HOURS indicator	Shows, approximately, total dc power-on time.
POWER SUPPLY VOLTAGE DEVIATION rotary switch	Selects power supply to be checked for voltage deviation.
Meter	Shows, as % DEVIATION DC, a selected power supply's deviation from its nominal output.
ON, OFF switches	Switches CAU's dc power supplies. The ON switch must be held until indicator lights to allow power-up sequence.
LOCAL/REMOTE switch	Allows CAU's dc power to be switched at the IOAU power panel (when set at REMOTE).

3.4. INPUT/OUTPUT ACCESS UNIT

The input/output access unit (IOAU) has three panels of controls and indicators related to operation of the processor. Descriptions of these three panels; an ac power panel, a dc power panel, a maintenance and operator's panel, and their controls and indicators with their functions are given in the following paragraphs.

3.4.1. AC Power Panel

The IOAU's ac power panel is located behind the rear enclosure of the IOAU power cabinet. It consists essentially of circuit breakers for supplying ac power to various sections of the IOAU. Figure 3–9 shows the ac power panel and Table 3–8 lists the function of each control and indicator on the panel.

3.4.2. DC Power Panel

The IOAU's dc power panel is located behind the rear enclosure of the IOAU power cabinet. It includes controls and indicators relating to abnormal conditions, running time, and dc power supplies. Figure 3–10 shows the dc power panel and Table 3–9 lists the functions of each control and indicator on the panel.

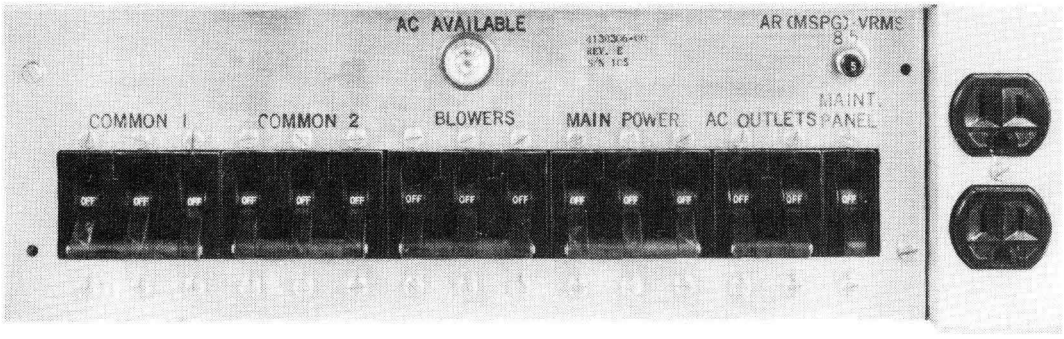


Figure 3–9. IOAU AC Power Panel

Table 3–8. IOAU AC Power Panel Controls and Indicators

Control/Indicator	Function
AC AVAILABLE indicator	Indicates that ac power is present at the cabinet.
Circuit Breakers:	
COMMON 1	Switches common 1 dc power supply.
COMMON 2	Switches common 2 dc power supply.
BLOWERS	Switches blower power.
MAIN POWER	Switches main ac power to the unit.
AC OUTLETS	Switches power to ac outlets.
MAINT PANEL	Switches power to the maintenance panel.
Popout type (marked "5")	Protects secondary winding in a transformer providing maintenance panel power.
AC Outlets	Provides convenient source of 115 volts ac.

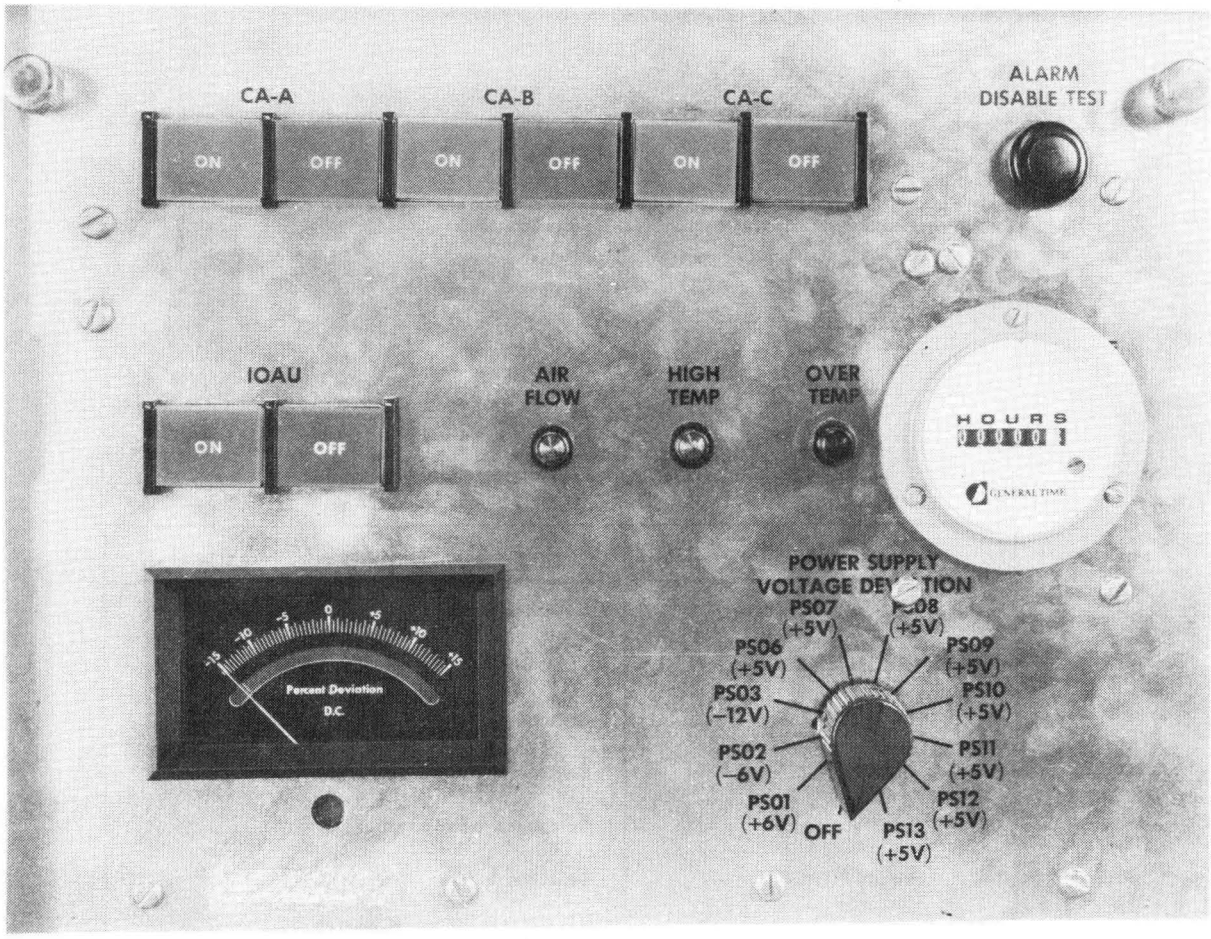


Figure 3–10. IOAU DC Power Panel

Table 3–9. IOAU DC Power Panel Controls and Indicators

Control/Indicator	Function
Audio Alarm (not visible on panel)	Warns of abnormal conditions (low air flow or high temperature).
ALARM DISABLE/TEST switch	1. Disables alarm when operating. 2. Tests alarm when not operating.
Abnormal condition indicator lamps:	
AIR FLOW	Indicates insufficient air flow in cabinet. Alarm sounds with it.
HIGH TEMP	Indicates temperature over 125°F in cabinet. Alarm sounds with it.
OVER TEMP	Indicates temperature over 135°F in cabinet. The dc power supplies automatically shut off and cannot be turned on again until the condition is corrected.
RUNNING TIME HOURS indicator	Shows, approximately, total dc power-on time.
POWER SUPPLY VOLTAGE DEVIATION rotary switch	Selects power supply to be checked for voltage deviation.
Meter	Shows, as % DEVIATION DC, a selected power supply's deviation from its nominal output.
*CA-A ON, OFF switches	Switches dc power in CAU-A when the CAU LOCAL/REMOTE switch is set at REMOTE.
CA-B ON, OFF switches	Same as above for CAU-B when configured.
CA-C ON, OFF switches	Not functional.
IOAU ON, OFF switches	Switches IOAU's dc power supplies.

*The term CA is equivalent to the term CAU.

3.4.3. Processor Maintenance Panel

The processor maintenance panel is used by the operator and the Sperry Univac customer engineer to control and monitor processor operation. The panel is situated in the front of the IOAU cabinet and is essentially divided into two panels; a right side maintenance panel (operator/maintenance panel), and a left side maintenance panel. The following paragraphs describe only those controls and indicators of interest to the operator.

3.4.3.1. Maintenance Panel, Right Side

The right side maintenance panel (operator/maintenance panel) is shown in Figure 3–11. The right side maintenance panel provides the operator with visual indication and control over certain aspects of processor operation.

These controls and indicators can be grouped into the following categories:

- System controls and indicators
- CAU controls and indicators

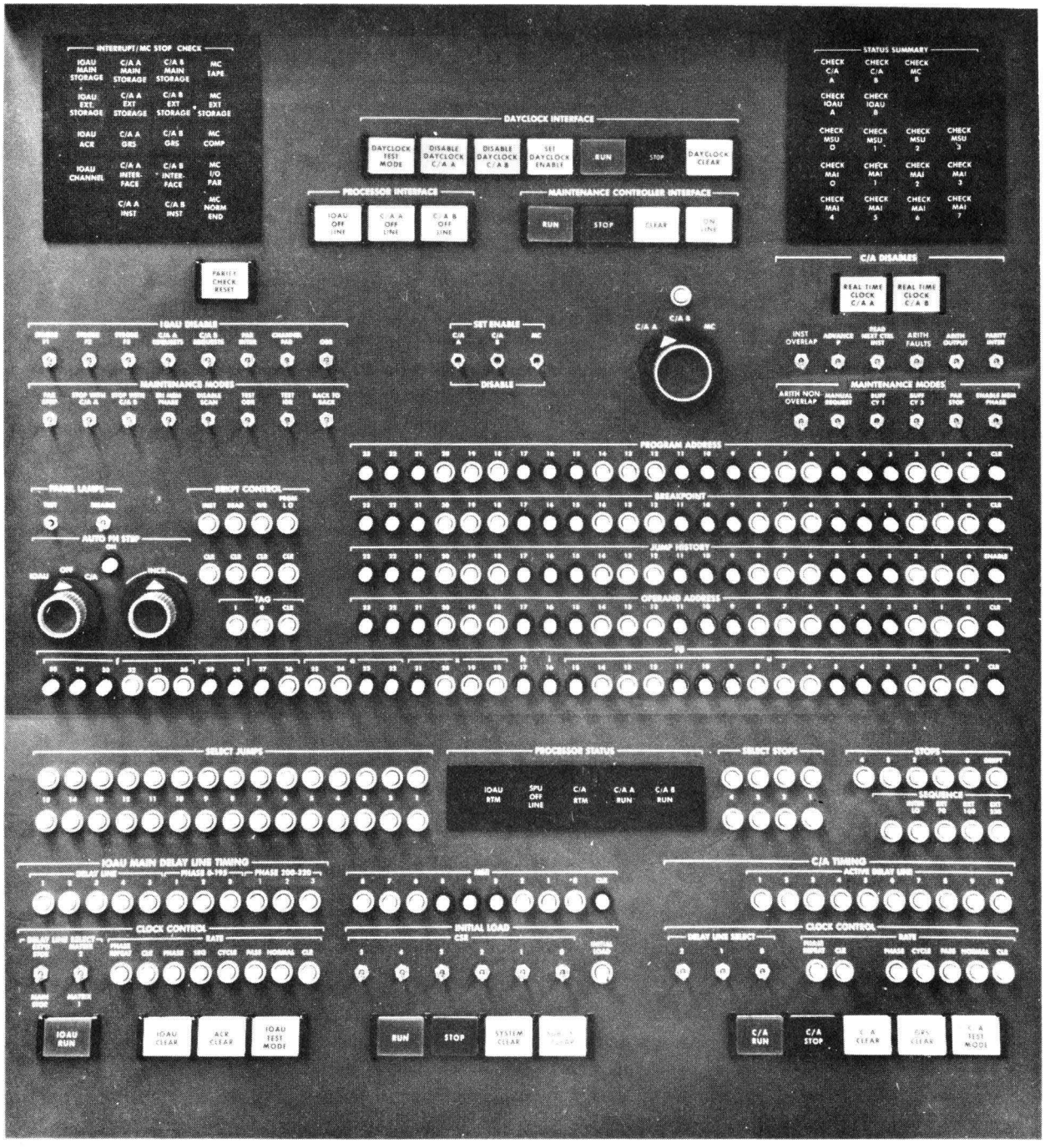


Figure 3–11. Maintenance Panel, Right Side

- Registers
- Condition indicators
- Miscellaneous controls and indicators

A description of the function of the controls and indicators in each category is given in the following paragraphs. In the accompanying tables each control/indicator is listed according to its label on the panel, and in a left-to-right, top-to-bottom order within the table.

3.4.3.1.1. System Controls and Indicators

System controls and indicators are those that affect two or more units of the system. The system controls and indicators are located at the bottom and center of the right side maintenance panel. Table 3–10 lists these controls and indicators and their functions. These switches are operable only if the selected CAU's SET ENABLE/DISABLE switch is set to DISABLE.

3.4.3.1.2. CAU Controls and Indicators

The controls and indicators in this grouping are used to control or monitor the operation of either CAU. The CAU controls and indicators are located at the right upper center of the right side maintenance panel. Table 3–11 lists these controls and indicators and their functions.

3.4.3.1.3. Registers

This grouping includes a number of registers, located in the center on the right side maintenance panel, used to control and/or monitor program operation. Table 3–12 lists these registers and their functions. The registers marked with an asterisk do not require operator intervention, but are useful in describing an error condition to the Sperry Univac customer engineer.

Table 3–10. Maintenance Panel, System Controls and Indicators

Control/Indicator	Function
RUN momentary contact switch	Starts the selected CAU, which will command the IOAU to run. Then software will command the other CAU to run. (CAU A or B must be selected via the rotary selector switch, item 2 of Table 3–14.)
STOP momentary contact switch	Stops both CAUs.
SYSTEM CLEAR momentary contact switch	Simultaneously clears both CAUs, the IOAU, the access control registers, and the general register stacks (GRS). It does not clear peripheral subsystems. (Functions only if the CAU is in a stop mode.)
SUBSYS CLEAR momentary contact switch	Clears the IOAU and puts an I/O CLEAR signal on 24 channels. (Functions only if the CAU is in a stop mode.)

Table 3–11. Maintenance Panel, CAU Controls and Indicators

Control/Indicator	Function
REAL TIME CLOCK *C/A A, C/A B; two switch/indicators	Disables the real time clocks in CAU A, B. The indicator is lit when disabled.
C/A A, C/A B, MC; multi-position rotary switch	Selects a CAU (MC is used by the Sperry Univac customer engineer only) to be affected by the next operator/maintenance panel function performed by the operator. That is, all listed operator controls and indicators except; STOP, SYSTEM CLEAR, SUBSYS CLEAR, REAL TIME CLOCK, CSR, DAYCLOCK INTERFACE, PARITY CHECK RESET, and PROCESSOR STATUS (except C/A RTM) interface the CAU selected by this switch.
SELECT JUMPS, 15 set switch/indicators and 15 clear switches	Allows manual setting or clearing of the 15 "jump" flip-flops in the selected CAU. Their state determines whether a program jump is to be taken by a JK (Jump on Keys; f = 74, j = 4) instruction. When a jump is set the indicator lights.
SELECT STOPS, four set switch/indicators and four clear switches	Allows manual setting or clearing of the four "stop" flip-flops in the selected CAU. Their state determines if a program stop is to be made by the HKJ (Halt on Keys and Jump; f = 74, j = 5) instruction. When a jump is set the indicator lights.
STOPS, six indicators	Displays which stop has occurred in the selected CAU.
CSR (Channel Select Register), six toggle switches	Specifies an initial load channel (sent to both CAUs). On an initial load command from the maintenance panel (or SPU during automatic recovery) the channel select signals will be gated into the CSR of the selected CAU.
INITIAL LOAD, momentary contact switch	Signals the selected CAU to receive the CSR value (above).

*The term C/A is equivalent to the term CAU.

Table 3–12. Maintenance Panel, Registers

Registers	Function
PROGRAM ADDRESS, 24 set switch/indicators and 1 clear switch	A 24-bit register that specifies the absolute address location of the next instruction word that is to be executed by the selected CAU.
BREAKPOINT*, 24 set switch/indicators and 1 clear switch	A 24-bit register that specifies the program address set up for a break-point stop. It may also be an operand address for a read or write stop.
JUMP HISTORY*, 24 set switch/indicators and 1 clear switch	A 24-bit register that specifies the last jumped-from address by the selected CAU.
OPERAND ADDRESS*, 24 set switch/ indicators and 1 clear switch	A 24-bit register that specifies the operand associated with the instruc-tion in F0 of the selected CAU.
F0*, 36 set switch/indicators and 1 clear switch	A 36-bit register that specifies the current instruction word in the selected CAU.
MSR, nine set switch/indicators and one clear switch	A 9-bit register that specifies the current value in the module select register (MSR) of the selected CAU.

*Does not require operator intervention.

3.4.3.1.4. Condition Indicators

Indicators in this grouping indicate occurrence of various errors and air flow or temperature faults in system units. These indicators are located at the top of the right side maintenance panel. The INTERRUPT/MC STOP CHECK indicators are used by the operator only in describing an error or fault condition to the Sperry Univac customer engineer. Table 3–13 lists these indicators and their functions.

Table 3–13. Maintenance Panel, Condition Indicators

Indicators	Function
INTERRUPT/MC STOP CHECK, 19 indicators	Light to show that a parity error exists in a logic section, or to show a maintenance controller stop. The maintenance controller (MC) indicators are of concern to the Sperry Univac customer engineer only and are not listed in this table.
STOR	Indicates any storage parity error that occurs during a request to storage. There are separate indicators for the IOAU, CAU A, and CAU B.
OFF LINE REQUEST	Indicates an offline request. There are separate indicators for the CAU A, CAU B, and IOAU.
IOAU ACR	Indicates an access control register (ACR) parity error during a CAU request or a normal I/O transfer.
C/A GRS	Indicates CAU GRS parity errors. There are separate indicators for CAU A and CAU B.
IOAU CHANNEL	Indicates incorrect parity detected on an input data word, external interrupt status word, or externally specified index identification on an I/O channel, even if the interrupt is disabled by the PAR INTER switch. This indicator will not light if CHANNEL PAR switch is enabled or if channel parity testing is inhibited by patch card option.
C/A INTERFACE	Indicates a parity error detected on a CAU interface with the IOAU. There are separate indicators for CAU A and CAU B.
C/A INST	Indicates that a CAU had detected an invalid instruction. There are separate indicators for CAU A and CAU B.
STATUS SUMMARY, 17 indicators	Indicates that one or more system units have an insufficient air flow or high temperature condition. Indicators will be lit only while a fault exists. There are separate indicators for CHECK C/A A and B, CHECK IOAU A and B, CHECK MS, CHECK MSU 0 through 3, and CHECK MAI 0 through 7. These indicators will be inactive when an SPU is present.

3.4.3.1.5. Miscellaneous Controls and Indicators

The remaining right side maintenance panel controls and indicators of concern to the operator are included in the miscellaneous group. Table 3–14 lists these devices and their functions. Those devices not requiring operator intervention, but useful in determining processor status, are marked with an asterisk.

Table 3–14. Maintenance Panel, Miscellaneous Controls and Indicators (Part 1 of 2)

Control/Indicator	Function
DAYCLOCK INTERFACE	
DISABLE DAYCLOCK C/A A, C/A B, two switch/indicators	Disables the IOAU day clock update and day clock interrupt to the CAU. If either of the two is lit, the other CAU update and interrupt will still be enabled, i.e. the day clock update to MSR plus 00216_8 and the day clock interrupt at MSR plus 00217_8 will occur in the other CAU. If both are lit, the IOAU will not update 00216_8 and no day clock interrupt will occur.
SET DAYCLOCK ENABLE, alternate action switch/indicator	Provides protection against accidental disruption of the day clock. It must be enabled in order to START, STOP, CLEAR, or SET the day clock manually. Indicator lights when enabled.
RUN, switch/indicator	Starts the day clock; it stays lit while the day clock is running.
STOP, switch/indicator	Stops the day clock; it stays lit while the day clock is stopped.
DAYCLOCK CLEAR, switch	Clears the day clock; it is disabled by day clock logic while the day clock is running.
PARITY CHECK RESET, switch	Clears all of the parity check flip-flops associated with the parity error indicators located in the INTERRUPT/MC STOP CHECK display (see Table 3–13). It is always operable, i.e. not disabled by the RUN, NORMAL RATE condition.
PANEL LAMPS, two toggle switches	
TEST	Tests maintenance panel lamps and drivers. Each of its two ON positions enables all of the lamps and drivers on one half of the panel.
DISABLE	Disables all lamp drivers on the maintenance panel.
PROCESSOR STATUS, five indicators	
IOAU RTM*	Indicates that the SPU has commanded the IOAU to the real time mode.
SPU OFF LINE*	Indicates that the SPU has been commanded to the offline condition for this processor.
C/A RTM*	Indicates the SPU has commanded the selected CAU to the real time mode.
C/A A RUN*	Indicates that the C/A A run flip-flop is in the set condition.
C/A B RUN*	Indicates that the C/A B run flip-flop is in the set condition.

*Does not require operator intervention.

Table 3–14. Maintenance Panel, Miscellaneous Controls and Indicators (Part 2 of 2)

Control/Indicator	Function
SET ENABLE/DISABLE, two switches	
C/A A	Places CAU A in test mode. When switch is set to ENABLE position; the C/A RUN, C/A STOP, C/A CLEAR, and GRS CLEAR switches are enabled; and the SYSTEM CLEAR, SUBSYSTEM CLEAR, STOP, and RUN switches are disabled. This switch also activates the maintenance panel lamps so that they may be set and cleared by the operator.
C/A B	Same as for C/A A except for C/A B.

3.4.3.2. Maintenance Panel, Left Side

The left side maintenance panel is shown in Figure 3–12. It consists of nine "roller panel" data displays. Ten different sets of data can be selected for each of the nine displays through use of the 10-position rotary switches. The left side maintenance panel is normally used by the Sperry Univac customer engineer only. Individual sites may provide operator procedures using certain registers to accomplish dump procedures and analyze system failures.

3.5. MAIN STORAGE UNITS

There are no operator controls and indicators located on the main storage units. All controls and indicators located on these units are for Sperry Univac customer engineer use only. If an audible alarm sounds at a main storage unit, do not attempt to disable the alarm; however, call the Sperry Univac customer engineer and continue the current runs to completion in an orderly manner.

CAUTION

Do not remove power when an audible alarm sounds at a specific main storage unit cabinet; this would cause a loss of storage contents. Call the Sperry Univac customer engineer immediately!

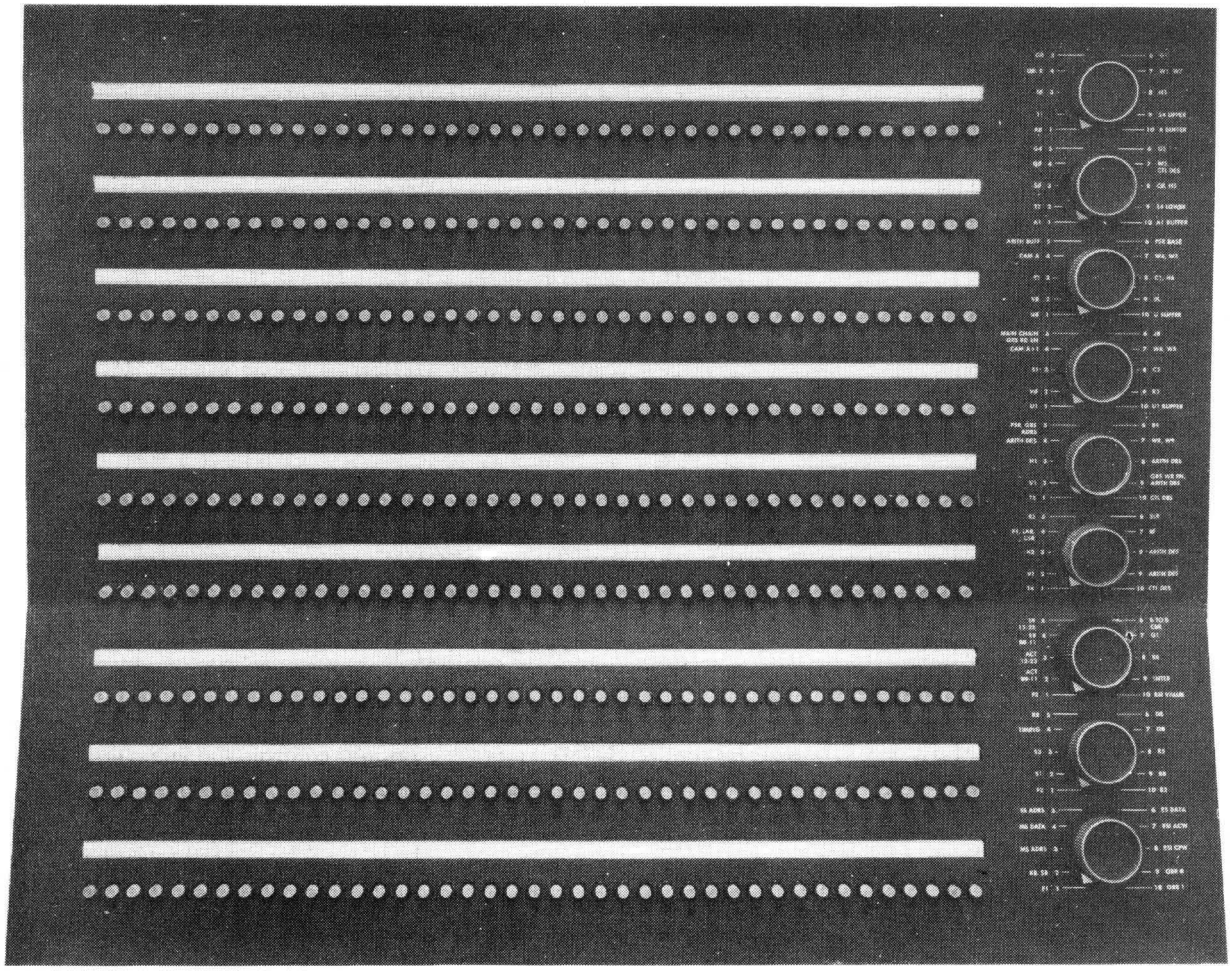


Figure 3–12. Maintenance Panel, Left Side

4. Operating Procedures

4.1. GENERAL

Operation of the UNIVAC 1110 and the SPERRY UNIVAC 1100/40 Systems Central Group includes turning power on and off (as required), form loading, printing phase control adjustment, and observing and responding to any fault conditions that occur during daily operation.

4.2. POWER ON

Before the central group is turned on, the settings of the LOCAL/REMOTE switch on the CAU dc power panels (Figure 3–8) should be observed. If the operator is required to initiate system operation from a completely shutdown condition, the following procedures should be performed.

4.2.1. Command/Arithmetic Unit Power On

The procedure for turning CAU power on is as follows:

1. Before attempting to turn power on at the CAU make certain that all cabinet panels are in place and that maintenance work is not being done on the unit.

2. Observe that the AC AVAILABLE indicator on the ac power panel (Figure 3–7) is lit. If the indicator is not lit, notify the Sperry Univac customer engineer.

3. Set the COMMON 1, COMMON 2, and BLOWERS circuit breakers on the ac power panel to ON (up).

4. Set the MAIN POWER circuit breaker on the ac power panel to ON (up).

5. Press the ON switch on the dc power panel (Figure 3–8). The ON switch must be pressed and held until the indicator lights up. This allows time for the dc power up sequence. (If the LOCAL/REMOTE switch is set to REMOTE, this step is accomplished at the IOAU's dc power panel.)

NOTE:

If power drops due to an overcurrent condition in a dc power supply, the COMMON breakers (set in step 3) must be dropped in order to reset the "popout" type circuit breaker located on the power supply. All power supplies are separately protected against short circuits.

4.2.2. Input/Output Access Unit Power On

The procedure for turning IOAU power on is as follows:

1. Before attempting to turn power on at the IOAU make certain that all cabinet panels are in place and that maintenance work is not being done on the unit.

2. Observe that the AC AVAILABLE indicator on the ac power panel (Figure 3–9) is lit. If the indicator is not lit, notify the Sperry Univac customer engineer.

3. Set the COMMON 1, COMMON 2, and BLOWERS circuit breakers on the ac power panel to ON (up).

4. Set the MAIN POWER circuit breaker on the ac power panel to ON (up).

5. Observe that the "popout" type circuit breaker (marked "5") on the ac power panel is "in".

6. Set the MAINT PANEL circuit breaker on the ac power panel to ON (up).

7. Press the IOAU ON switch on the dc power panel (Figure 3–10). The ON switch must be pressed and held until the indicator lights up. This allows time for the dc power up sequence. (See the Note following Step 5 of 4.2.1.)

8. If the LOCAL/REMOTE switch on either of the CAU dc power panels is set to REMOTE, the corresponding CA-A or CA-B, ON/OFF switch on the IOAU's dc power panel must be pressed and held until the indicator lights. This accomplishes remote switching of CAU dc power.

4.2.3. Display Console Power On

The procedure for turning display console power on is as follows:

1. Before attempting to turn power on at the display console make certain that all covers and panels are in place and that maintenance work is not being done on the subsystem.

2. Set the +6VDC, the −12VDC, and both +48VDC circuit breakers on the display console dc power panel (Figure 3–2) to ON.

3. Observe that the AC AVAILABLE indicator on the display console ac power panel (Figure 3–1) is lit. If the indicator is not lit, notify the Sperry Univac customer engineer.

4. Set the +48V & PRINTER and the +6V and −12V circuit breakers on the display console ac power panel to ON (up).

5. Set the MAIN POWER circuit breaker on the display console ac power panel to ON (up).

6. Press the POWER switch/indicator located on the front of the display terminal (Figure 3–4). This indicator is lit when power in on.

4.3. POWER OFF

Before turning power off at the units of the central group, ensure that no processor operations are in progress; then remove power from the units according to the procedures given below.

4.3.1. Command/Arithmetic Unit Power Off

Press the OFF switch located on the dc power panel (Figure 3–8). The CAU's dc power is removed and the ON indicator extinguishes.

NOTE:

If the CAU's LOCAL/REMOTE switch is set at REMOTE, the CAU's dc power is removed via the IOAU's dc power panel.

The CAU is now in a standby condition. If power is to be fully removed from all cabinet circuitry, set the MAIN POWER circuit breaker on the ac power panel (Figure 3–7) to OFF (down).

4.3.2. Input/Output Access Unit Power Off

Press the IOAU OFF switch located on the dc power panel (Figure 3–10). The IOAU's dc power is removed and the ON indicator extinguishes.

The IOAU is now in a standby condition. If power is to be fully removed from all cabinet circuitry, set the MAIN POWER circuit breaker on the ac power panel (Figure 3–9) to OFF (down).

4.3.3. Display Console Power Off

To remove power from components of the display console, proceed as follows:

- Display Terminal Power Off

  Press the POWER switch/indicator located on the front of the display terminal (Figure 3–4). The indicator extinguishes when power is off.

- Incremental Printer and Display Console Logic Power Off

  Set the MAIN POWER circuit breakers on the display console ac power panel (Figure 3–1) to OFF (down).

4.4. FORM LOADING

The incremental printer accepts continuous paper forms having edge perforations on 1/2 inch centers for sprocket feeding. Tractors with appropriate pins on an endless belt are used to engage the sprocket holes at both edges of the form. The left-hand tractor is fixed while the right-hand tractor is adjustable to accept forms from 3-5/8 inches to 14-7/8 inches wide. To load forms, proceed as follows:

1. Raise the incremental printer access cover (Figure 4–1).

2. Lift the hinged pressure plates on the right and left tractors (Figure 4–1).

3. Lift the old form off the sprockets; slide it through to the rear of the incremental printer.

4. If forms of the same width are to be loaded, disregard this step. If forms of a different width are to be loaded, release the right tractor by loosening the knurled knob associated with it (Figure 4–2) and reposition to the approximate width of the new form.

5. Feed forms up through the bottom of the mechanism and engage the pins on the left-hand tractor with sprocket holes in the form. (If a form 11 inches in length is being loaded, see the following note.) Close the left-hand pressure plate.

   NOTE:

   When a form length of 11 inches is loaded, the horizontal perforated line between forms is to be located between two specific pins in each tractor. The color of these pins (black) is in contrast to the remaining pins on the tractors and can be easily identified. These pins can be brought to a visible position by using the knob associated with the tractor driving shaft. The knob is located on the right side of the mechanism (see Figure 4–2, TRACTOR ROTATION KNOB) and permits continuous rotation of the shaft by hand when the knob is pulled to the right. Locating the form in this manner allows use of the HOME switch on the incremental printer's front panel, or the FF (forms feed) character from the processor, to advance the paper from any present position to a new position four lines past the next row of perforations.

6. If forms of the same width are being loaded, engage the pins on the right-hand tractor with sprocket holes in the form, and close the right-hand pressure plate. If forms of a different width are being loaded, move the right-hand tractor laterally until the pins accommodate the holes in the form (the lateral tension should be as much as possible without tearing the sprocket holes); tighten the knurled knob and close the right-hand pressure plate.

7. Close the incremental printer access cover.

8. Enter a line of print using the PRINT TEST switch on the incremental printer front panel. If the printed characters are not uniform perform the phase control adjustment described in paragraph 4.5.

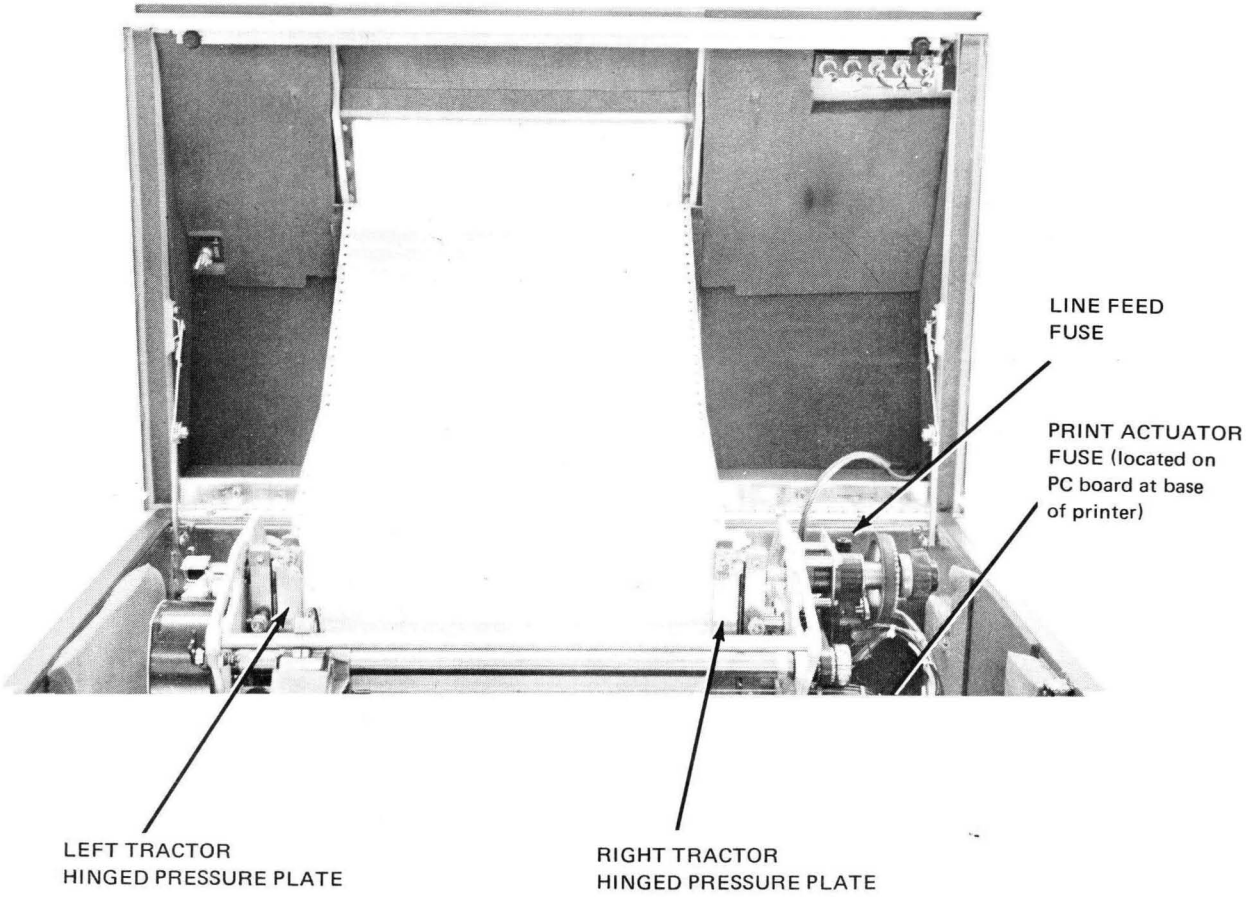


Figure 4–1. Incremental Printer with Access Cover Raised

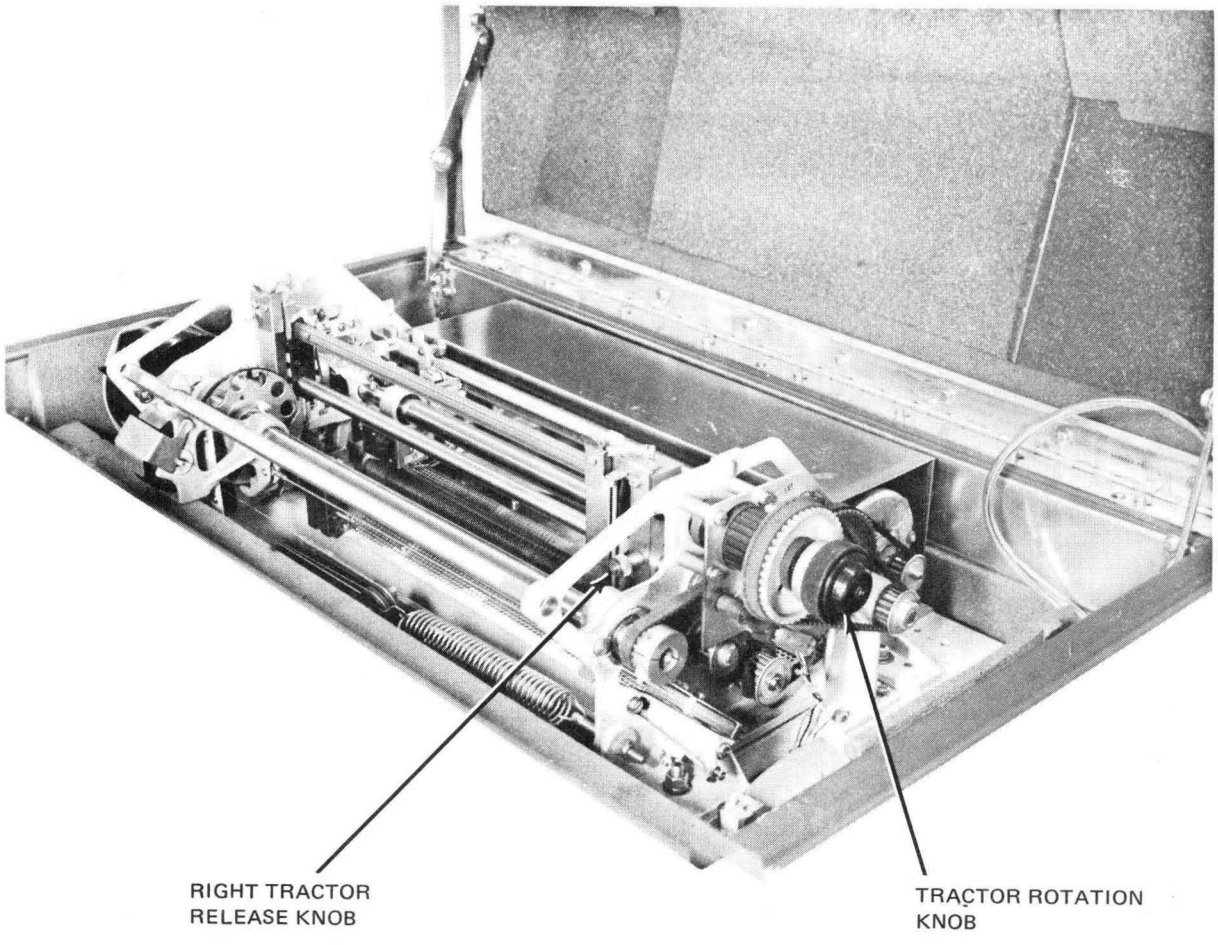


Figure 4–2. Incremental Printer Mechanism, Right Side

4.5. PRINTING PHASE CONTROL

A phasing control knob is located on the left side of the printer mechanism (Figure 4–3) and can be rotated through 180 degrees. This control is used to time the moment of printing so that printed characters are not clipped at the top or the bottom. This adjustment is normally required if the thickness of the paper is changed.

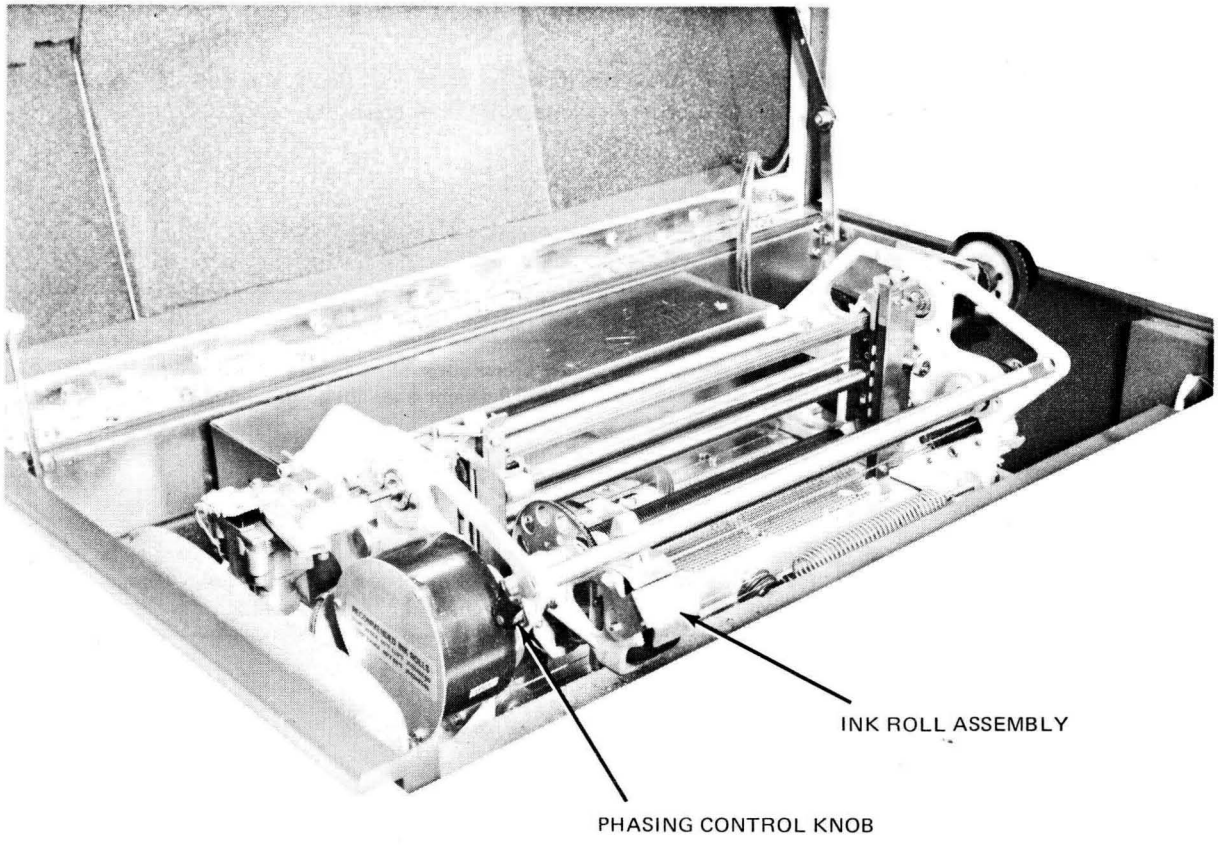


Figure 4–3. Incremental Printer Mechanism, Left Side

4.6. RECOVERY PROCEDURES

Certain indicators on the incremental printer, the CAU, or the IOAU indicate a need for operator action. These indications and the recommended operator recovery procedures are given in 4.6.1 and 4.6.2.

If the display terminal or maintenance panel seems to be malfunctioning, call the Sperry Univac customer engineer.

4.6.1. Incremental Printer Recovery

If any of the incremental printer control panel indicators listed in Table 4–1 light, the operator should restore normal operation by performing the appropriate recovery procedure given in this table.

Table 4–1. Incremental Printer Recovery Procedures

Indication	Probable Cause	Recovery Procedure
INTERLOCK indicator lit	Printer cover open	Press the incremental printer access cover to make sure that the associated interlock is closed. If the INTERLOCK indicator does not go out, notify the Sperry Univac customer engineer.
PAPER CHECK indicator lit	Low paper supply	Load forms as described in 4.4.
PRINT CHECK indicator lit	Blown fuse	Either the print actuator fuse or the line feed fuse is blown (see Figure 4–1). Replace the blown fuse; if normal operation is not restored, call the Sperry Univac customer engineer.

4.6.2. CAU/IOAU Air Flow and High Temperature Recovery

If an air flow, or a high or over temperature condition occurs in either a CAU or an IOAU cabinet, the operator should perform the recovery procedures listed in Table 4–2.

Table 4–2. CAU/IOAU Air Flow and High Temperature Recovery Procedures

Indications	Probable Cause	Recovery Procedure
Audio Alarm sounds	Loss of air or high temperature condition	Check the dc power panel AIR FLOW and HIGH TEMP indicators to determine which condition exists and proceed according to either of the two following indications.
AIR FLOW indicator lit	Insufficient air flow in the cabinet	Operator should ensure that cabinet ventilation openings are clear. If there are no obstructions, check for clogged air filters. (Alarm sounds with this indicator.)
HIGH TEMP indicator lit	Cabinet temperature exceeds 125°F	Ensure that cabinet ventilation openings are clear. If there are no obstructions, check for clogged air filters. If HIGH TEMP condition persists, turn power off the unit and notify the Sperry Univac customer engineer. (Alarm sounds with this indicator.)
OVER TEMP indicator lit	Cabinet temperature exceeds 135°F	The dc power supplies automatically shut off and cannot be turned on again until the condition is corrected. Remove cause of OVER TEMP condition (blocked ventilation openings or clogged air filter). After sufficient cooling time has elasped, dc power can be restored by tripping the main breaker and going through the power up sequence.

5. Operator Performed Maintenance

5.1. GENERAL

Operator performed maintenance is limited to changing of the ink roll located in the typewheel cartridge of the incremental printer.

5.2. INK ROLL REPLACEMENT

The ink roll must be changed when the incremental printer no longer makes a satisfactory impression. This operation does not require the use of tools. The procedure for changing the ink roll is as follows:

1. Open the incremental printer access cover (Figure 4–1).
2. Raise the hinged cover for the ink roll (Figure 4–3).
3. Grasp ends of the shaft upon which the ink roll rotates and withdraw in direction of operator.
4. Replace ink roll by slipping the shaft out of the old ink roll and into a new ink roll.

NOTE:

The useful life of the ink roll can be extended by rotating the old ink roll 180° on its shaft and reusing.

5. Return shaft and the ink roll to the carriage by reversing step 3.
6. Lower the hinged cover for the ink roll.
7. Close the incremental printer access cover and perform the display console power-on procedure in 4.2.3.

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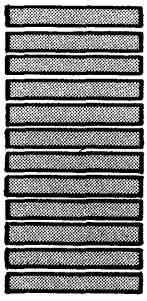

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