

 SPERRY RAND

UNIVAC

8411/8414

DIRECT ACCESS
SUBSYSTEMS

OPERATORS
REFERENCE

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1. INTRODUCTION

1.1. SCOPE

This manual contains the information and procedures required for efficient operation of the UNIVAC 8411 and 8414 Direct Access Subsystems. Turnon, turnoff, and operating procedures are identical for each subsystem.

The manual consists of the following basic sections:

- Operator's Responsibilities
- Controls and Indicators
- Operation

1.2. PURPOSE

The UNIVAC 8411/8414 Direct Access Subsystems are disc storage devices which provide millisecond, random access or sequential access to large data files. The minimum configuration for each subsystem consists of one Type 5024-00 Control Unit and one UNIVAC 8411 disc drive unit, or one Type 5024-02 Control Unit and two UNIVAC 8414 disc drive units. The maximum configuration for each subsystem contains eight disc drive units and one control unit. The basic subsystem configuration is shown in Figure 1-1.

The UNIVAC 8411 Direct Access Subsystem uses a six-disc, interchangeable magnetic disc pack capable of storing 7.25 million eight-bit bytes. (See Figure 1-2.)

The UNIVAC 8414 Direct Access Subsystem uses an eleven-disc, interchangeable magnetic disc pack capable of storing 29.17 million eight-bit bytes. (See Figure 1-3.)

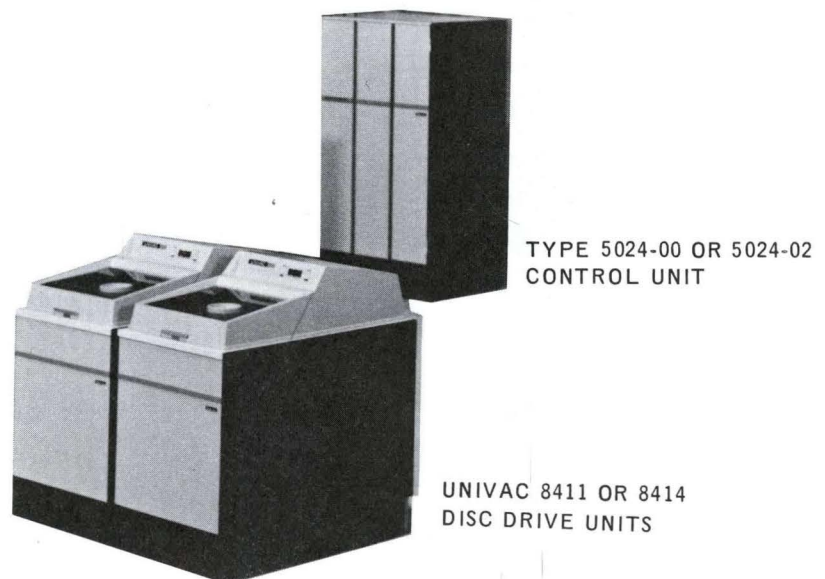


Figure 1-1. UNIVAC 8411 or 8414 Direct Access Subsystem

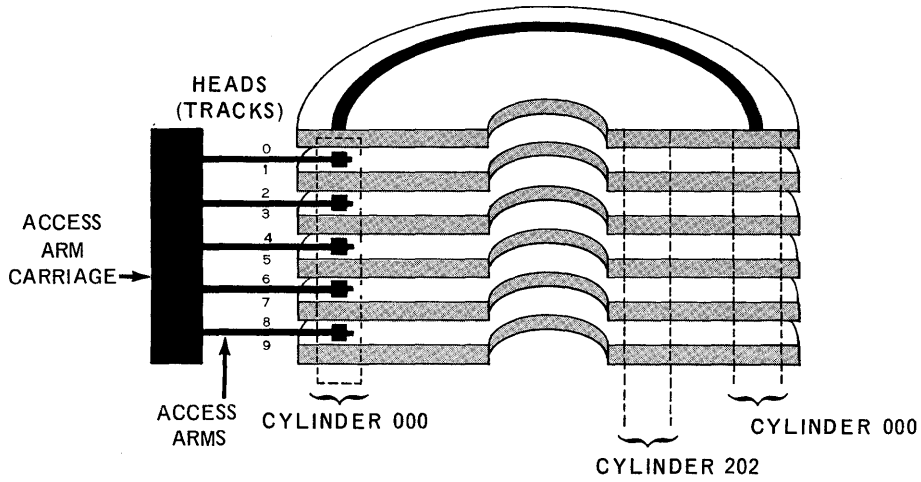


Figure 1-2. Disc Pack of UNIVAC 8411 Direct Access Subsystem

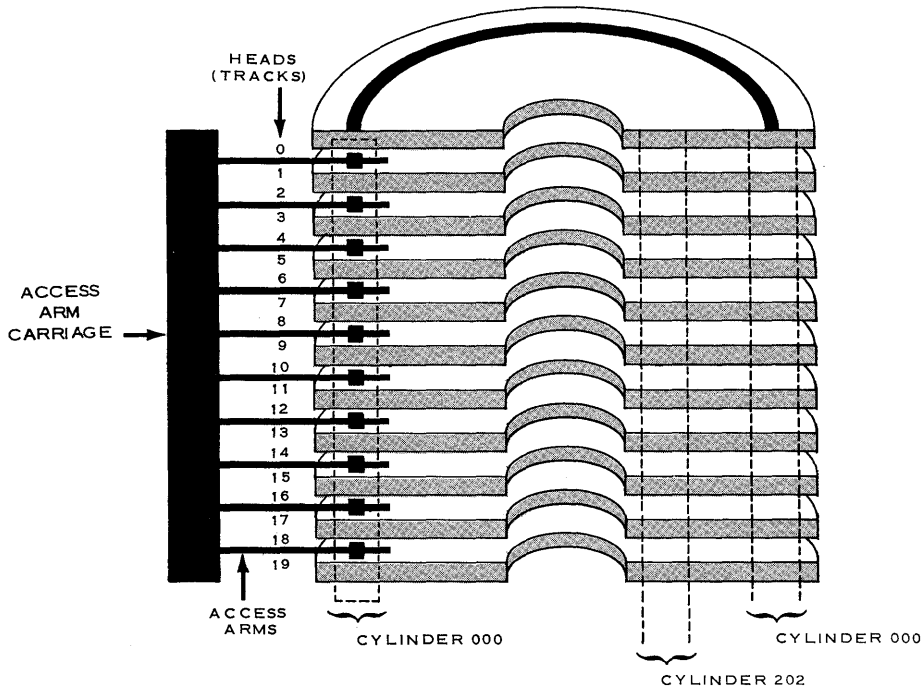


Figure 1-3. Disc Pack of UNIVAC 8414 Direct Access Subsystem

2. OPERATOR'S RESPONSIBILITIES

2.1. GENERAL

The principal responsibility of the operator is knowing how to operate the subsystem as efficiently as possible. To do this, he must be thoroughly conversant with the use of all power controls and indicators located on the operator's control panel of each disc drive and control unit. All controls and indicators of each unit are described in Section 3. Also, the operator must know the correct procedures for turning on and turning off a subsystem, loading and unloading a disc drive unit (inserting and removing disc packs), and starting and stopping disc drive units. Turnon/turnoff, load/unload, and start/stop procedures are outlined in Section 4.

2.2. REQUIREMENTS

The operator is required to make regular checks (as recommended by a Univac field engineer) of the ambient temperature and humidity at the site and to notify him of changes beyond the allowable minimum and maximum ranges. The optimum ambient temperature is 70 degrees Fahrenheit; the minimum is 60 degrees, and the maximum is 88 degrees. The optimum relative humidity is 50 percent; the minimum is 20 percent, and the maximum is 80 percent.

The operator is not required to perform either mechanical or electrical maintenance in a subsystem. All such maintenance, when necessary, must be performed by the Univac field engineer.

3. CONTROLS AND INDICATORS

3.1. GENERAL

All controls and indicators required to operate the UNIVAC 8411 and 8414 Direct Access Subsystems are located on the control unit maintenance, power control, and power distribution panels, and the disc drive unit operator's control and power control panels.

3.2. CONTROL UNIT

The control unit is an integral part of the subsystem. The unit contains a maintenance panel, a power control panel, and a power distribution panel for the subsystem, in addition to power sequencing circuitry.

3.2.1. Maintenance Panel

The control unit maintenance panel (Figure 3-1) is located in the upper left front of the control unit (Figure 3-2) and is accessed by opening the left front panel of the cabinet. The maintenance panel contains an array of switches and associated displays, all but two of which are for the sole use of a Univac field engineer. The only two switches with which an operator must be concerned are the CH X and CH Y rocker switches (Figure 3-1). The respective functions of the two switches are described in Table 3-1.

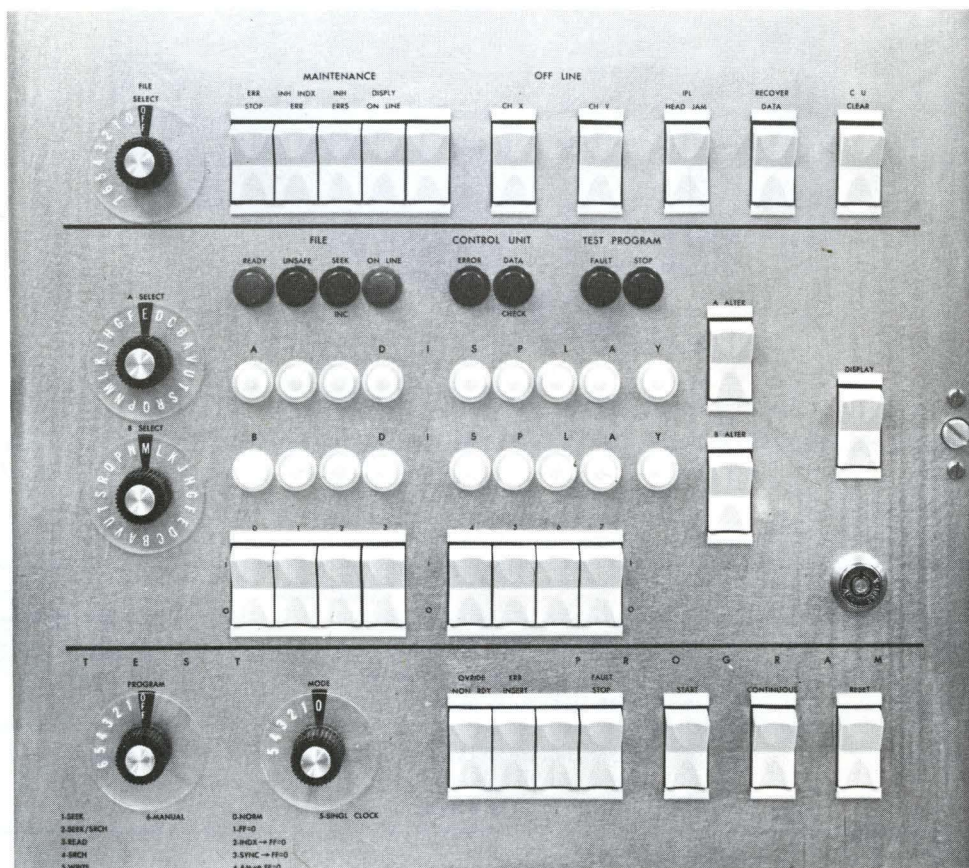


Figure 3-1. Control Unit Maintenance Panel, Controls and Indicators

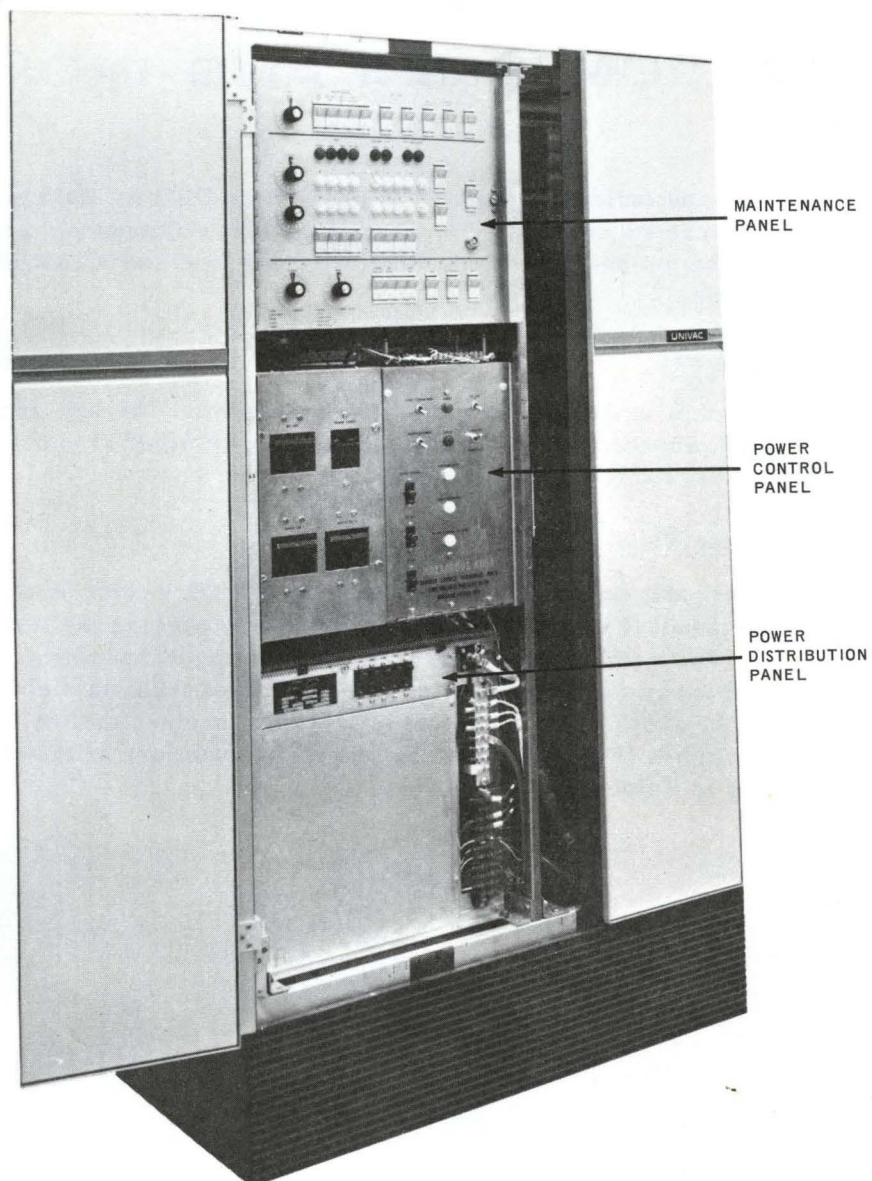


Figure 3-2. Maintenance and Power Panels of the UNIVAC 5024-00 or 5024-02 Control Unit

CONTROL	FUNCTION
OFF LINE CH X switch	Locks out selector channel CH X when top is pressed (local mode); permits access to selector channel CH X when bottom is pressed (remote mode).
CH Y switch	Locks out selector channel CH Y when top is pressed (local mode); permits access to selector channel CH Y when bottom is pressed (remote mode).

Table 3-1. Control Unit Maintenance Panel, Controls

3.2.2. Power Control Panel

The control unit power control panel (Figure 3-3) is located in the center left front of the cabinet (Figure 3-2). The power control panel is accessed by opening the left front panel of the cabinet. The function of each of the controls and indicators is described in Table 3-2.

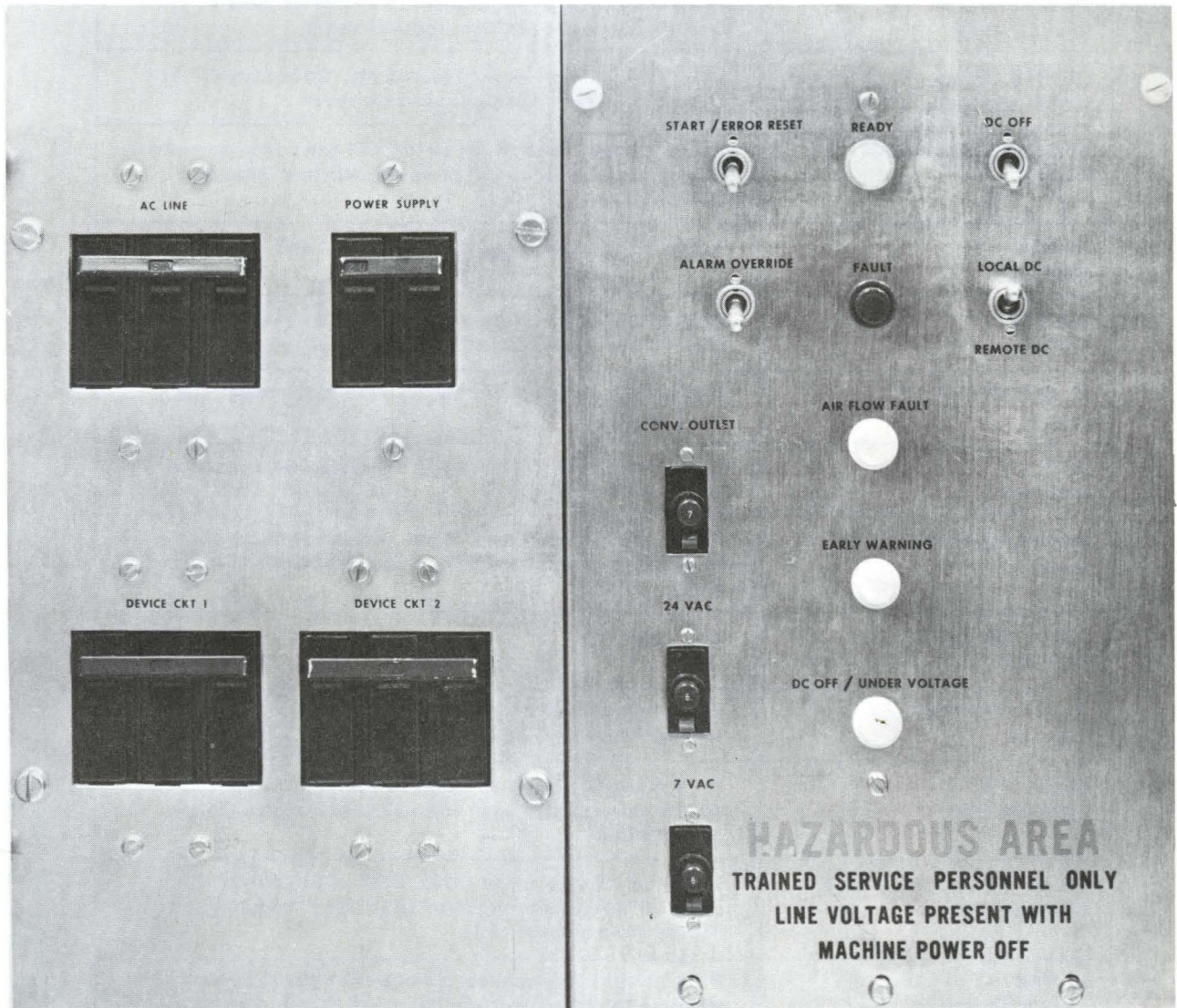


Figure 3-3. Control Unit Power Control Panel, Controls and Indicators

CONTROL/INDICATOR	FUNCTION
AC LINE circuit breaker	In up position, applies ac power to subsystem; in down position, removes ac power.
POWER SUPPLY circuit breaker	In up position, applies ac power to power supply; in down position, removes ac power from power supply.
DEVICE CKT 1 circuit breaker	In up position, applies ac power to disc drive units 4 through 7; in down position, removes power.
DEVICE CKT 2 circuit breaker	In up position, applies ac power to disc drive units 0 through 3; in down position, removes power.
START/ERROR RESET switch	Initiates power on cycle in control unit when held momentarily in up position if local dc/remote dc switch in local dc position.
READY indicator	Lights when power is available in control unit.
DC OFF switch	Disconnects dc power from subsystem when held momentarily in up position.
ALARM OVERRIDE switch	Disconnects audible alarm (fault) when held momentarily in up position.
FAULT indicator	Lights when fault is detected in subsystem (after audible alarm is turned off).
LOCAL DC/REMOTE DC switch	Places subsystem in local power sequencing mode when in up position; in down position, places subsystem in remote mode.
AIR FLOW FAULT indicator	Not used
EARLY WARNING indicator	Lights when temperature in unit rises to 130°F; subsystem shuts down automatically when temperature reaches 160°F.
CONV. OUTLET circuit breaker	When pressed, applies ac power to convenience outlet; switch opens (button pops out) when convenience outlet is overloaded.
DC OFF/UNDERVOLTAGE indicator	Lights to indicate any of CB01, CB02, CB03, CB04, CB05 circuit breakers in open (down) position or if control unit powers down automatically.
24 VAC circuit breaker	When pressed (in), applies 24 volts of ac power to relay switches in control unit; switch opens (button pops out) when circuit is overloaded.
7 VAC circuit breaker	When pressed, applies 7 volts of ac power for lamps in control unit; switch opens (button pops out) when circuit is overloaded.

Table 3-2. Control Unit Power Control Panel, Controls and Indicators

3.2.3. Power Distribution Panel

The control unit power distribution panel (Figure 3-4) is located below the power control panel. The power distribution panel is accessed by opening the left front panel of the cabinet (Figure 3-2). The function of each of the circuit breakers is described in Table 3-3.

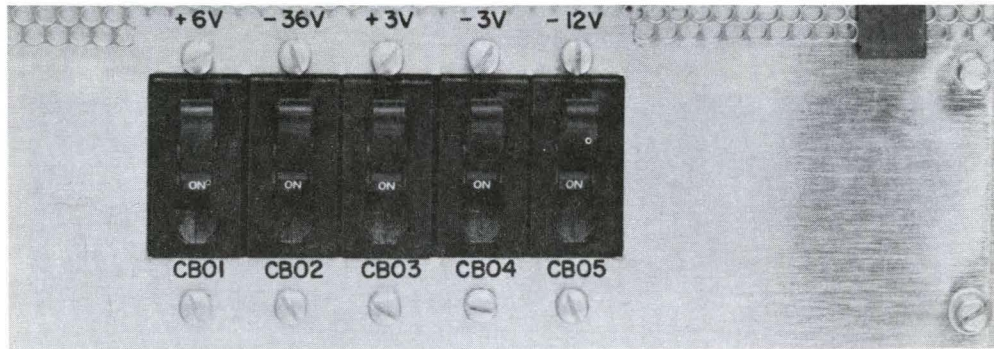


Figure 3-4. Control Unit Power Distribution Panel, Controls

CONTROL/INDICATOR	FUNCTION
CB01 circuit breaker	When closed (up position), supplies +6V of dc power for disc file control unit logic system. If the current exceeds 50 amperes, the circuit breaker trips to the OFF (down) position, causing automatic turnoff of power.
CB02 circuit breaker	When closed (up position), supplies -36V of dc power for disc drive unit read/write heads. If the current exceeds 5 amperes, the circuit breaker trips to the OFF (down) position, causing automatic turnoff of power.
CB03, CB04, CB05 circuit breaker	When closed (up position), supply +3V, -3V, and -12V of dc power for special logic circuits of disc file control unit. If the current exceeds the rated amperes, the circuit breaker trips to the OFF (down) position, causing automatic turnoff of power.

Table 3-3. Control Unit Power Distribution Panel, Controls

3.3. DISC DRIVE UNIT

The disc drive unit contains two control panels, the operator's control panel and the power control panel.

3.3.1. Operator's Control Panel

The disc drive unit operator's control panel for either subsystem (Figure 3-5) is located on the top front of each disc drive unit. Each control and indicator, and its function, is described in Table 3-4.

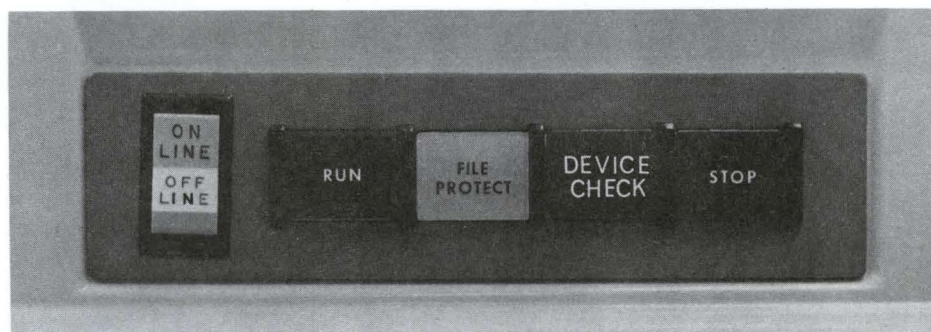


Figure 3-5. Disc Drive Unit Operator's Control Panel, Controls and Indicators

CONTROL/INDICATOR	FUNCTION
ON LINE/OFF LINE switch	When pressed to OFF LINE position, disc drive unit is removed from control of the control unit; access is blocked until switch is returned to ON LINE position.
RUN switch/indicator	When pressed (with ac and dc power applied from the control unit and disc pack in place), disc drive unit motor is energized, accessor mechanism moves heads to cylinder 0, and upper half of indicator lights; lower half of indicator lights to signify disc drive unit in use; pressing STOP switch/indicator or removing power from unit turns off indicator.
FILE PROTECT indicator	When lit, signifies write operation on disc file is inhibited; setting FILE PROTECT switch to OFF position turns off indicator.
DEVICE CHECK indicator	When lit, signifies detected fault (loss of ac power) resulting in intervention; indicator is turned off by pressing RUN switch/indicator (after fault has been corrected); fault detection automatically locks unit out of subsystem.
STOP switch/indicator	When pressed, disc drive unit motor is de-energized and indicator is lit; also turns off RUN indicator.

Table 3-4. Disc Drive Unit Operator's Control Panel, Controls and Indicators

3.3.2. Power Control Panel

The disc drive unit power control panel (Figure 3-6) for either subsystem is located behind the front panel of the cabinet (Figure 3-7) and is accessed by removing the front panel. (Press both circular latches located in the top half of the front panel and lift the panel up and out of the cabinet frame to reveal the control panel.) The power control panel contains one circuit breaker and one indicator. In the ON position, ac power is applied to the unit; the indicator lights when power is present. In the OFF position, ac power is shut off from the unit; the unit shuts down and the indicator turns off. The unit shuts down automatically and the circuit breaker goes to the OFF position if an overload occurs anywhere in the unit. The DEVICE CHECK indicator also lights if ac power is lost or the unit shuts down. The time meter and convenience outlet are for engineering maintenance of the unit (to be performed only by the Univac field engineer).

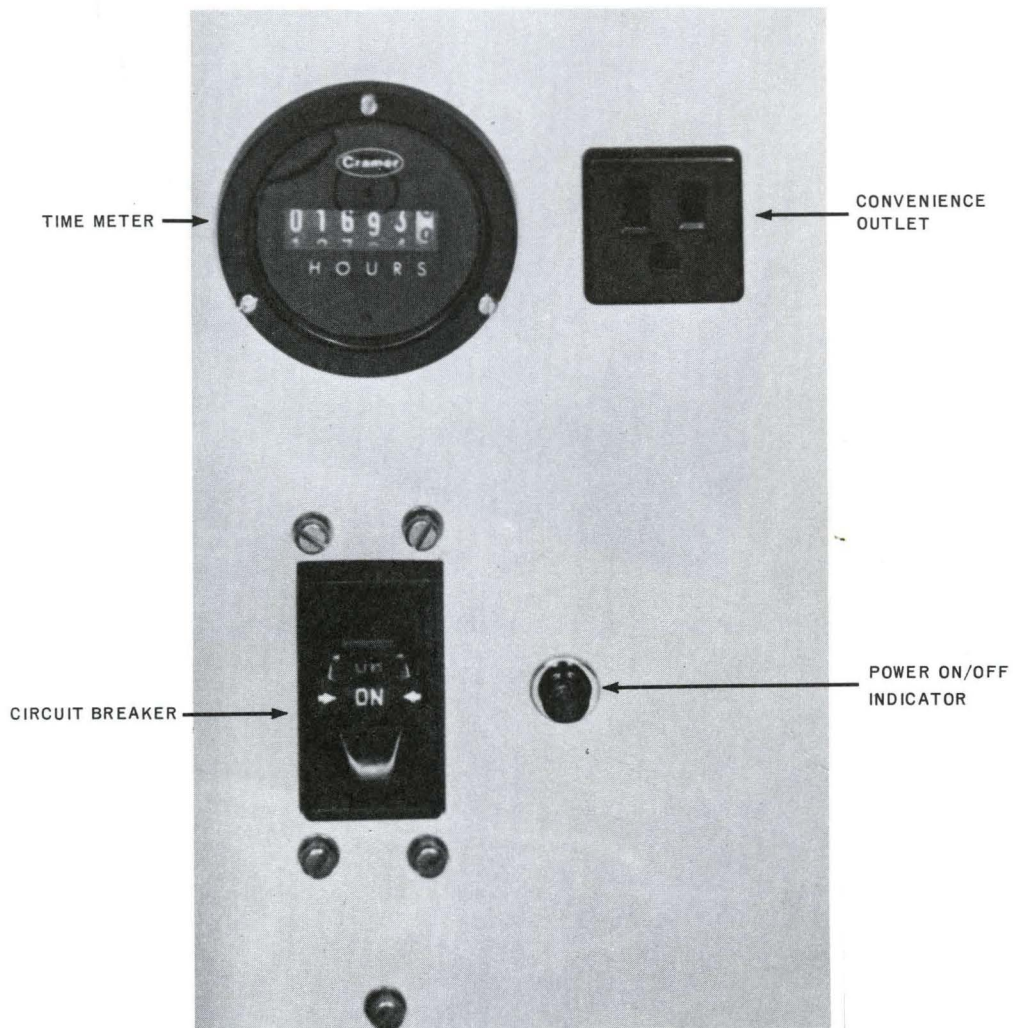


Figure 3-6. Disc Drive Unit Power Control Panel, Control and Indicator

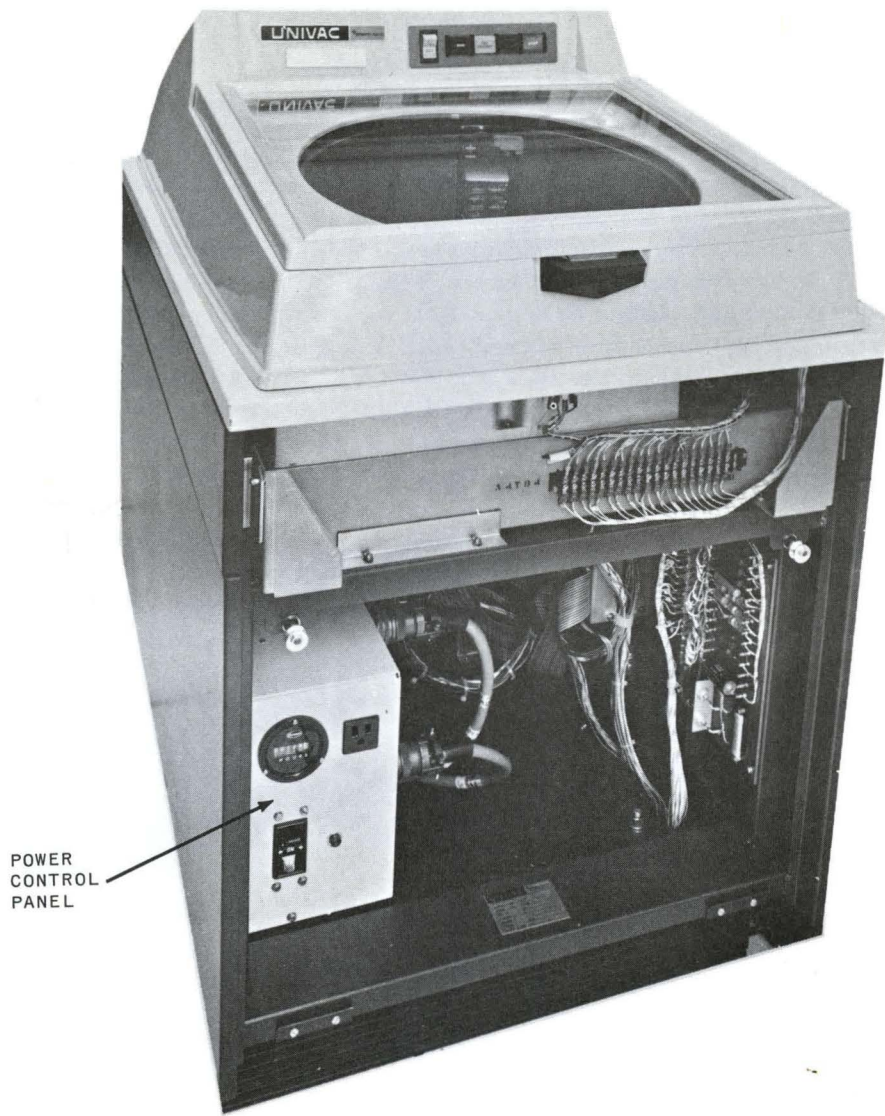


Figure 3-7. UNIVAC 8411 or 8414 Disc Drive Unit, Access to Power Control Panel

4. OPERATION

4.1. GENERAL

Operation of the UNIVAC 8411/8414 Direct Access Subsystems involves turning power on and off, as required, at the control unit; loading and unloading (inserting and removing disc packs); starting and stopping the disc drive unit(s); and observing and responding to any subsystem fault condition that may occur during daily operation. All operating procedures are identical for both subsystems.

4.2. TURNON OF SUBSYSTEM POWER

The Univac field engineer usually turns on the subsystem initially from a completely turned-off condition. Once this is done, the subsystem is partially turned off; that is, the subsystem is placed offline.

4.2.1. Turnon of Completely Turned-Off Subsystem

Turn power on in the subsystem from a completely turned-off condition in the following order:

- At the control unit:
 - (1) Ensure that the bottom half of each CH X and CH Y rocker switch (Figure 3-1) is pressed if operation is to be online (remote mode); press top half of each switch CH X and CH Y if operation is to be offline (local mode).
 - (2) Set AC LINE circuit breaker on the power control panel (Figure 3-3), to up position (on).
 - (3) Set POWER SUPPLY circuit breaker to up position (on).
 - (4) Set DEVICE CKT 2 circuit breaker to up position (on) to make power available to disc drive units 0 through 3.
 - (5) Set DEVICE CKT 1 circuit breaker to up position (on), to make power available to disc drive units 4 through 7.
 - (6) Set CB01, CB02, CB03, CB04, and CB05 circuit breakers, located on the power distribution panel (Figure 3-4), to up position (on).
 - (7) Press 24 VAC circuit breaker (Figure 3-3).
 - (8) Press 7 VAC circuit breaker.
 - (9) Set LOCAL DC/REMOTE DC switch to REMOTE DC position if operation is to be from processor (online).
 - (10) The READY indicator located on power control panel, when lit, signifies that all operating ac power is present in control unit.

- At the disc drive unit:
 - (1) Remove front panel of cabinet to expose power control panel (Figure 3-7).
 - (2) Set ac power circuit breaker to ON position. Power on/off indicator (Figure 3-6) lights; STOP indicator lights on operator's control panel (Figure 3-5); all other indicators are off.
 - (3) Replace front panel of cabinet.

The subsystem (control unit and disc drive unit) is ready for operation when all power is present, as shown by the turned-on power indicators on the control panels of the subsystem.

4.2.2. Turnon of Partially Turned-Off Subsystem

Before turning on a partially turned-off subsystem, ensure that maintenance is not being performed. Turn on power in the subsystem, from a partially turned-off condition, as follows:

- At the control and disc drive units:
 - (1) Ensure that the CH X and CH Y rocker switches, located on control unit maintenance panel (Figure 3-1), are pressed to on (bottom) position.
 - (2) Ensure that the LOCAL DC/REMOTE DC switch located on the control unit power control panel (Figure 3-3), is in REMOTE DC position.
 - (3) Check the disc drive unit(s) operator's control panel (Figure 3-5) to ensure that the STOP indicator is lit and all other indicators are turned off.

Illumination of the READY indicator on the power control panel of the control unit signifies that ac power is present in the unit; illumination of the STOP indicator on the operator's control panel of the disc drive unit signifies that power is present in the unit.

4.2.3. Disc Drive Unit Operating Procedures

With all ac and dc subsystem power present, start operation of a disc drive unit according to the following procedures. The disc drive unit must be loaded before operation can begin.

4.2.3.1. Loading Disc Drive Unit(s)

Load a disc drive unit (insert disc pack) as follows:

- (1) Press the ON LINE/OFF LINE rocker switch on the operator's control panel (Figure 3-5) to the OFF LINE position.
- (2) Open the spring-loaded, plexiglass unit cover by pressing down the latch located on the front of the shroud; the cover springs up without manual assistance (Figure 4-1).
- (3) Ensure that the file protect ON/OFF rocker switch, located in the disc pack well (Figure 4-2), is in the ON position if a read-only operation is desired, or in the OFF position if a write or read/write operation is desired.

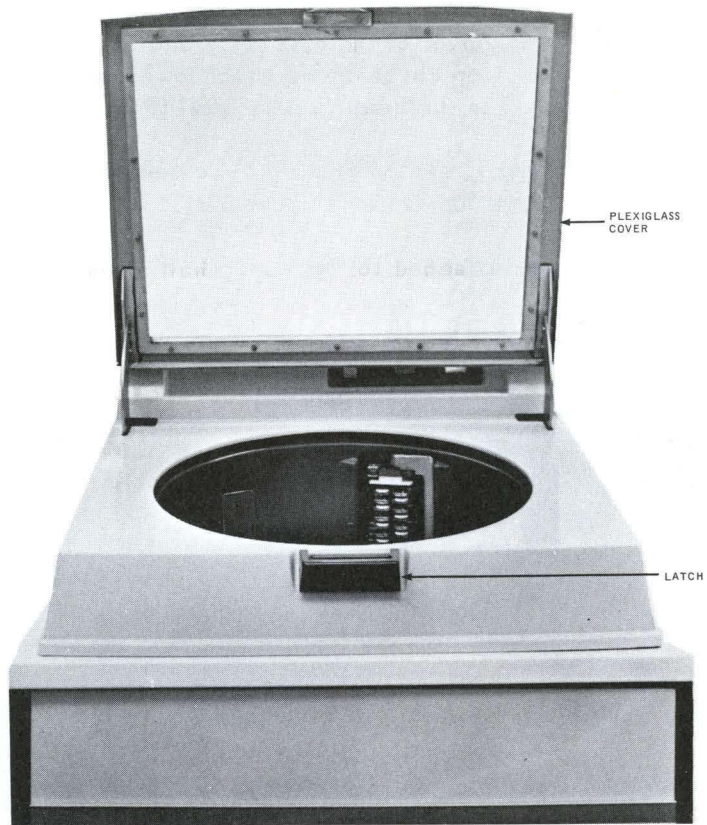


Figure 4-1. Disc Drive Unit with Plexiglass Unit Cover Open

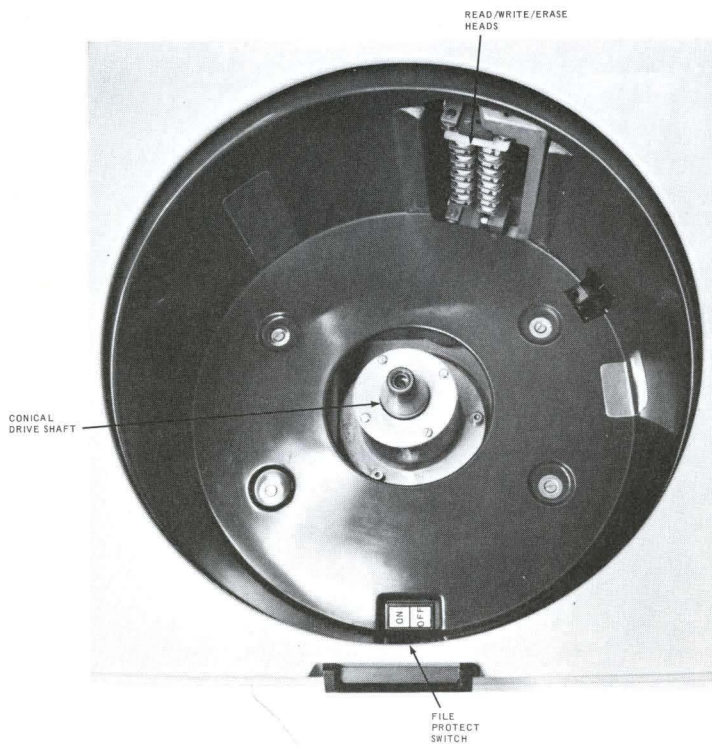


Figure 4-2. Disc Pack Well

- (4) Remove the bottom cover of the disc pack and grasp the handle of the protective, plexiglass top cover of the pack; lower the pack gently onto the conical drive shaft in the center of the well (Figure 4-2).
- (5) When the disc pack is seated firmly on the conical drive shaft, spin the pack clockwise until rotation stops (Figure 4-3).
- (6) The disc is firmly attached to the drive shaft when it can no longer be rotated clockwise; lift the protective cover from the pack and close the unit cover (press gently but firmly until a click is heard at the latch).

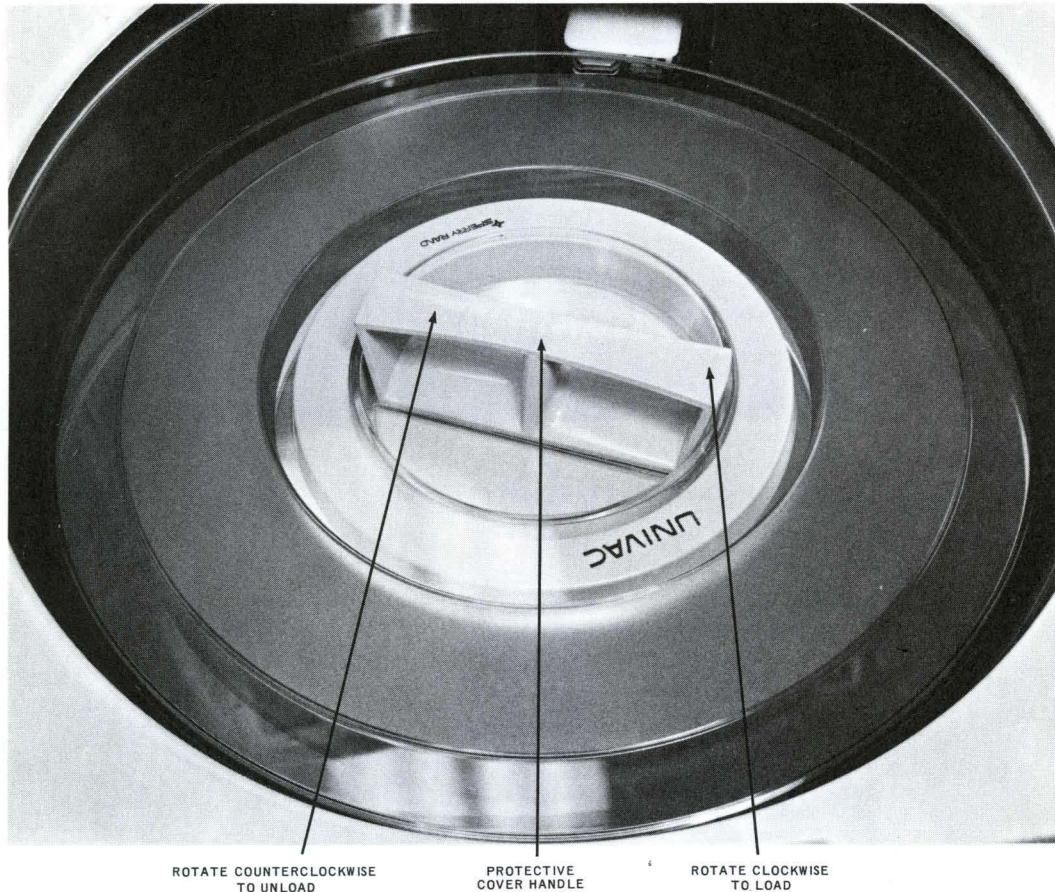


Figure 4-3. Disc Pack Seated in Well of Disc Drive Unit

4.2.3.2. Starting Disc Drive Unit(s)

A disc drive unit normally is ready for operation after loading. It can be assumed in this description that the intended operation is a part of a daily operational program and that the unit is in a partially turned-off condition (READY and STOP indicators lit).

■ Start the disc drive unit as follows:

- (1) Check the CH X and CH Y switches, located on the control unit maintenance panel (Figure 3-1), to ensure that they are online (press bottom of each switch) if the processor is to operate with the subsystem; check the ON LINE/OFF LINE switch on the disc drive unit operator's control panel (Figure 3-5) for online or offline operation.
- (2) Press the RUN switch/indicator, located on the disc drive unit operator's control panel; the top half of the indicator lights; the STOP indicator turns off; all other indicators are off.
- (3) Observe that the bottom half of the RUN indicator lights when the read/write heads are positioned at track 0 of the disc pack; illumination indicates that the unit is fully operational and ready for reading or writing.
- (4) Press the ON LINE/OFF LINE rocker switch to ON LINE.

4.2.3.3. Stopping Disc Drive Unit(s)

Stop operation of a disc drive unit by pressing the STOP switch/indicator located on the disc drive unit operator's control panel. The RUN indicator turns off and the STOP indicator lights. Wait until the disc pack stops rotating then remove the pack according to the procedure in 4.2.3.4.

4.2.3.4. Unloading Disc Drive Unit(s)

Unload a disc drive unit (remove disc pack) as follows:

- (1) Open the plexiglass unit cover by pressing down the latch on the front of the shroud; the cover springs open (Figure 4-1).
- (2) Seat the plexiglass cover on the disc pack.
- (3) Grasp the handle of the disc pack cover and turn the pack counterclockwise (Figure 4-3) until a click is heard; lift disc pack off the conical drive shaft and out of the unit.

4.3. TURNOFF OF SUBSYSTEM POWER

Only partial turnoff of power in the subsystem is necessary at the close of regular, day-to-day operation. Complete power turnoff becomes necessary only when maintenance is to be performed or when the subsystem will not be in use for an extended period. Partial and complete subsystem power turnoff procedures are described in the following paragraphs.

4.3.1. Partial Turnoff of Subsystem

At the end of daily operation, ac power controls, located on the control unit power control panel, usually can be left in the up position (on) because ac power sequencing is turned on and off when the processor is turned on and off (if in remote condition). The indicators of the disc drive unit(s) need only be observed to ensure that the STOP indicator(s) is lit. The ac power ON/OFF circuit breaker (Figure 3-6), located on the disc drive unit power control panel, must not be placed in the OFF position unless the subsystem is to be turned off completely.

4.3.2. Complete Turnoff of Subsystem Power

Complete turnoff of power in the subsystem is virtually a reversal of the procedure for turnon from a completely turned-off condition. Turn off power as follows:

- (1) Press STOP switch on all disc drive unit operator's control panels.
- (2) Raise DC OFF switch to up position (off) on the control unit.
- (3) Remove ac power from the disc drive unit by resetting the ac power circuit breaker, located on the power control panel, to the OFF position; the power on/off indicator and STOP indicators turn off.
- (4) Set to the down position all switches itemized in steps (2) through (5) of the procedure for turning on a completely turned-off subsystem. (See 4.2.1 and Figures 3-6 and 3-7.)
- (5) Release the 24 VAC and 7 VAC circuit breakers, located on the control unit power control panel, by pressing latch under each circuit breaker.

The subsystem is in a completely turned-off condition when all of the power switches itemized in the turnoff procedure are in the down position; all indicators also are turned off.

4.4. FAULT CORRECTION AND RECOVERY

Operator response to an indicated subsystem fault is described in the following paragraphs.

4.4.1. Control Unit

Refer to Table 4-1 for operator action to be taken in the event of an indicated subsystem fault.

4.4.2. Disc Drive Unit

A fault condition, in either the disc drive unit or the control unit, causes the DEVICE CHECK indicator to light (Table 3-4) and the disc drive unit to halt operation. If the indicator lights, notify the Univac field engineer.

INDICATION	CAUSE	OPERATOR ACTION
READY (lit)	Power on in unit	None.
READY (off)	No power in unit	Raise and release START/ERROR RESET switch; check that all power switches and circuit breakers on control unit panels are positioned correctly (up or in); if all are positioned and READY remains off, notify Univac field engineer.
Alarm bell (ringing)	Fault in subsystem	Raise and release ALARM OVERRIDE switch; FAULT indicator lights; notify Univac field engineer.
EARLY WARNING (lit) Alarm bell (ringing)	Temperature rises to 130°F in unit; unit shuts down automatically at 160°F	Check for clogged air vents; notify Univac field engineer if indicator remains lit.
CB01 +6V (off) CB02 -36V (off) CB03 +3V (off) CB04 -3V (off) CB05 -12V (off)	Overcurrent or overvoltage; unit shuts down automatically when any circuit breaker opens (to OFF position)	Reset circuit breaker; if breaker reopens, turn power off and notify Univac field engineer.
24 VAC (out)	Overloaded relay	Reset circuit breaker; if breaker reopens, turn power off and notify Univac field engineer.
7 VAC (out)	Current overload	Reset circuit breaker; if breaker reopens, turn power off and notify Univac field engineer.

Table 4-1. Operator Remedial Action at Power Control Panel of Control Unit

