

77653380



**CONTROL DATA®
CARTRIDGE DISK DRIVE
MODEL 9427H**

**GENERAL DESCRIPTION
OPERATION
INSTALLATION AND CHECKOUT
THEORY OF OPERATION
DIAGRAMS
MAINTENANCE
MAINTENANCE AIDS
PARTS DATA
WIRE LISTS**

MAGNETIC PERIPHERALS INC.
 A subsidiary of
CONTROL DATA CORPORATION

HARDWARE MAINTENANCE MANUAL

REVISION RECORD

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PREFACE

This Manual provides the information needed to install, operate and maintain the Cartridge Disk Drive (Model 9427H) and is intended to be used as a guide by customer engineers and operators who require detailed information about the Cartridge Disk Drive's operations.

It is written to reflect the recommended service-replacement level of subassemblies and printed-circuit-board level by trained qualified customer engineers.

Certain adjustments must be made under dynamic conditions. If the Field Test Exerciser is not utilized for the adjustments appropriate provisions must be made in the computer system for such dynamic alignments.

Oscilloscope trace representations are typical waveforms. Some minor variations may be observed on individual units in actual practice.

The total content of the Manual is comprised of nine sections, each having a unique publication number, and is contained in one volume. The manual's publication number is that of the Table of Contents and front matter (77653380). This number, along with the unit HPC number, should be used when making reference to the Cartridge Disk Drive Product Manual.

The following table identifies the content of each volume:

<u>SECTION NUMBER/TITLE</u>	<u>PUBLICATION NUMBER</u>
1 General Description	77614951
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3 Installation & Checkout	77614953
4 Theory of Operation	77614954
5 Diagrams	77653381
6 Maintenance	77641952
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*The I/O board documentation, device specifications and option switch settings are contained in the Hardware Product Configuration (HPC) documentation package. The package is located in front of the product manual.

OPERATOR SAFETY INSTRUCTIONS

1. The power cord must be plugged into a power outlet. This outlet must be readily accessible to the operator in case of emergency.
2. To operate this unit, the operator must depress the start/stop pushbutton switch located at the front of the disk unit.
3. This unit must be serviced only by qualified technical personnel after removing power cord from outlet.
4. In case of emergency, operator must remove power cord from outlet and contact the proper technical service office.

SICHERHEITS - GEBRAUCHSANWEISUNG

1. Das Anschlusskabel ist in die Steckdose, die in der nahe des Geraetes montiert ist, einzustecken. Der Netzstecker muss leicht und gefahrlos zugaenglich sein.
2. Zur Inbetriebnahme, sowie zum Ausschalten des Geraetes, wird der Start-Stop Druck Schalter an der Vorderseite betaeigt.
3. Das Geraet darf nur von Fachpersonal nachdem Ziehen des Netzsteckers geoefnet werden.
4. Im Falle eines technischen Defektes, ist der Netzstecker zu ziehen und der Technische Dienst zu verstaendigen.

WARNING

This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

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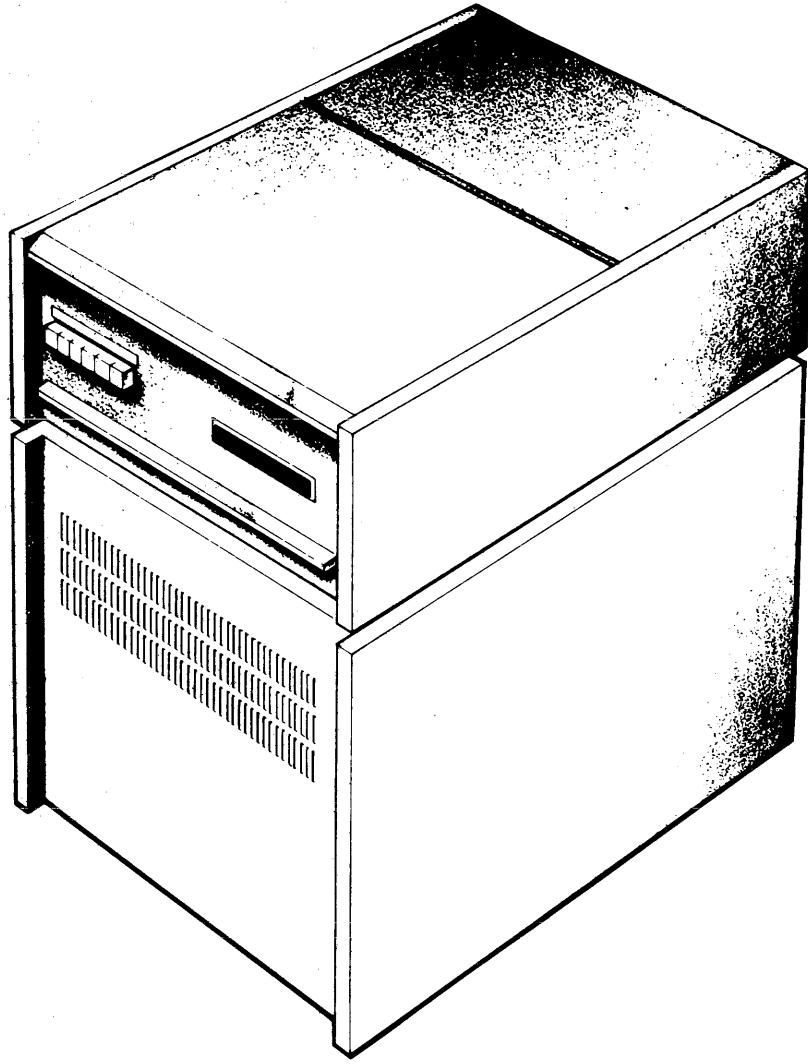


FIGURE 1-1. MODEL 9427 CARTRIDGE DISK DRIVE (CABINET MOUNT)

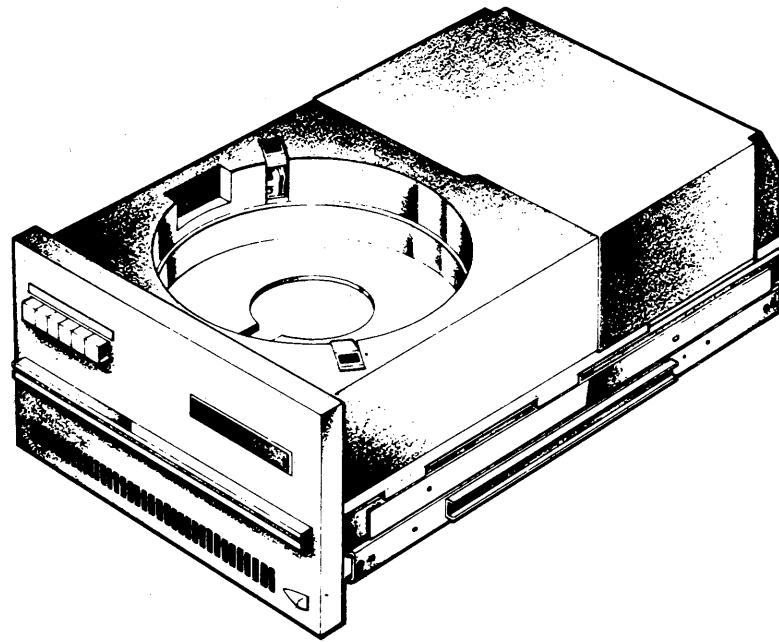


FIGURE 1-2. MODEL 9427 CARTRIDGE DISK DRIVE (RACK MOUNT)

1.1 INTRODUCTION

This manual applies to the CONTROL DATA MODEL 9427H Cartridge Disk Drive. The 9427H Cartridge Disk Drive is designed to interface with and provide peripheral storage capabilities for data processing systems.

1.2 PURPOSE AND USE OF EQUIPMENT

The baseline 9427H is a voice coil actuated cartridge disk drive unit that directs the read/write heads to a desired location on a spinning disk surface, data is written or retrieved by selection of an appropriate head and activating the read/write control circuitry. 9427H uses a single removable disk cartridge, CDC 848 type, and a fixed disk which doubles the data storage capacity.

The 9427H is suitable for mounting in a standard 19-inch (482.6 mm) rack with 10-1/2-inch (266.7 mm) panel space and is also available in a cabinet. The deck contains the voice coil, analog and digital circuit boards in the interface card cage, the power supply power amplifier, the cartridge receiver, the spindle and drive motor, filter, air blower and cooling system.

The 9427H can be configured to utilize single sectored or multisected cartridges. The read recovery circuitry will allow operation with or without missing clock patterns, frequently found in variable sector formats.

1.3 EQUIPMENT CONFIGURATION

The equipment consists of the Baseline unit and its options.

1.3.1 BASELINE CONFIGURATION

The baseline 9427H includes the following features:

- Power supply, 60/50 Hz 100-250 VAC
- Multiple (hard) sectors or soft sector (missing Clock electronic sectoring) capability
- Sector addressing
- 200 tracks per inch
- Write protection
- Daisy chain interface
- Variable interface
- 2400 r/min spindle speed
- Straddle-erase heads
- Elco I/O cable connector

1.3.2 OPTIONS

The options available for the 9427H are as follows:

- Rack mounting
- Cabinet mounting
- 100 tracks per inch
- Fixed disk
- 1500 r/min spindle speed
- Fault (maintenance) board
- Pre-erase heads
- Elco, 3M, Winchester, and Amp I/O cable connector
- Brake Option

1.3.3 DISK FEATURES

- Cartridge Configuration

9427H uses a CDC 848 cartridge or any equivalent cartridge certified for 200 tpi operation or a CDC 847 or any approved equivalent IBM 5440 cartridge for 100 tpi heads.

- Disk Configuration

In addition to the removable cartridge, the standard 9427H also employs a fixed disk; thereby providing for storage of up to 12 million bytes unformatted and providing a total of 4 recording surfaces.

1.3.4 OPERATIONAL CHARACTERISTICS

Operational characteristics of the 9427H are listed in Table 1-1.

TABLE 1-1. OPERATIONAL CHARACTERISTICS

Characteristics	Values
TRACK DENSITY	100 tpi or 200 tpi
ACCESSING TIME	
Maximum access time	60 ms
Track-to-track access time	7.5 ms
Average access time	35 ms
SPINDLE SPEED	2400 r/min or 1500 r/min (+48 -67 r/min or +30 -42 r/min with input frequency +0.5 -1.0 Hz and input voltage +10% -15%)
LATENCY TIME	12.5 ms (at 2400 r/min) (20 ms at 1500 r/min)
RECORDING	
Mode	Double Frequency
Density (nominal)	1530 bpi (outer track) 2200 bpi (inner track)
Bit rate (nominal)	2.50 MHz (1.56 MHz at 1500 r/min)
Tracks per cylinder	2 (4 with fixed-disk option)
Cylinders per unit (200 TPI)	406 (numbered 0 through 405) 408 (numbered 0 through 407, optional)
Cylinder per unit (100 TPI)	203 (numbered 0 through 202) 204 (numbered 0 through 203, optional)
Sectors	1,2,3,4,5,6,8,10,12,15,16,20,24,25,29, 30,32,40,48,50,60,64 hard or missing-clock soft sectoring
Units per controller I/O channel	4 maximum, in daisy-chain configuration

TABLE 1-1. OPERATIONAL CHARACTERISTICS (CONTINUED)

Characteristics	Values
DATA CAPACITY	
Bits per track	62,500 nominal
Bits per cylinder	125,000 nominal (250,000 with fixed-disk option)
Bits per unit	50,000,000 nominal (1,000,000,000 with fixed-disk option)
CARTRIDGE DISK	
Disk per cartridge	1
Usable recording surfaces per disk cartridge	2
Disk surface diameter	14 inches
Recording diameters	Track 407 (inner), 9.067 in (230.3 mm) Track 0 (outer), 13.137 in (333.7 mm) nominal
Disk surface coating	Magnetic oxide
READ/WRITE HEADS	(Standard CDC ramp-loading straddle erase and pre-erase available)
PHYSICAL (RACK-MOUNTED UNIT)	
Panel height	10.31 in (261.9 mm) (mounts on 10.5 in (266.7 mm) centers in relay rack)
Panel width	18.94 in (481.1 mm) (for 19-inch (482.6 mm) rack)
Depth	30.63 in (778 mm) (see section 3 for required rack depth)
Weight	140-175 lbs (63.5-79.4 kg)
Shipping Weight	190-225 lbs (86.2-102.1 kg)
PHYSICAL (CABINET MOUNTED UNIT)	
Height	34 in (863.6 mm)
Width	18.5 in (469.9 mm)
Depth	29.75 in (755.7 mm)
Weight	220-255 lbs (99.8-115.7 kg)
Shipping Weight	250-285 lbs (113.4-129.3 kg)
AIR FILTER	0.3 Micron 99%
ELECTRICAL	
Input power source	
60-Hz units	100-250 Volts rms in 10-Volt increments (+10%, -15%, 59-60.6 Hz, single phase)
50-Hz units	100-250 Volts rms in 10-Volt increments (+10%, -15%), 49-50.5 Hz, single phase

TABLE 1-1. OPERATIONAL CHARACTERISTICS (CONTINUED)

Characteristics	Values																																		
ELECTRICAL (cont'd)																																			
Input Current	<p>The following current readings are made at 50 Hz and nominal line voltage with accessor performing worst-case (maximum power) repeat seeks.</p> <table> <thead> <tr> <th>Volts</th> <th>Amps</th> </tr> </thead> <tbody> <tr><td>100</td><td>5.6</td></tr> <tr><td>110</td><td>5.0</td></tr> <tr><td>120</td><td>4.6</td></tr> <tr><td>130</td><td>4.3</td></tr> <tr><td>140</td><td>4.0</td></tr> <tr><td>150</td><td>3.8</td></tr> <tr><td>160</td><td>3.6</td></tr> <tr><td>170</td><td>3.3</td></tr> <tr><td>180</td><td>3.2</td></tr> <tr><td>190</td><td>3.0</td></tr> <tr><td>200</td><td>2.9</td></tr> <tr><td>210</td><td>2.7</td></tr> <tr><td>220</td><td>2.6</td></tr> <tr><td>230</td><td>2.5</td></tr> <tr><td>240</td><td>2.4</td></tr> <tr><td>250</td><td>2.3</td></tr> </tbody> </table>	Volts	Amps	100	5.6	110	5.0	120	4.6	130	4.3	140	4.0	150	3.8	160	3.6	170	3.3	180	3.2	190	3.0	200	2.9	210	2.7	220	2.6	230	2.5	240	2.4	250	2.3
Volts	Amps																																		
100	5.6																																		
110	5.0																																		
120	4.6																																		
130	4.3																																		
140	4.0																																		
150	3.8																																		
160	3.6																																		
170	3.3																																		
180	3.2																																		
190	3.0																																		
200	2.9																																		
210	2.7																																		
220	2.6																																		
230	2.5																																		
240	2.4																																		
250	2.3																																		
Power Factor	Surge current during spindle start is 2.6 times the above value and lasts 5 seconds.																																		
Power (Nominal)	0.8																																		
Power (Maximum)	310 Watts, 1050 BTU/hr. 465 Watts, 1590 BTU/hr.																																		
INPUT/OUTPUT CONNECTIONS	Two connectors on the I/O panel at the rear of the unit. Refer to applicable I/O board schematic in HPC Configuration for the pin assignments. A terminator is required if the unit is the last (or only) unit connected to the controller. The terminator consists of DIP-packaged register networks which plug into the I/O board or an optional plug-in terminator.																																		
ENVIRONMENTAL (Operating)	<p>Temperature: 60 to 90°F (15.6 to 32.2° C) with 12°F/hr maximum rate of change</p> <p>Humidity: 10 to 80% (no condensation)</p> <p>Altitude: Zero to 10,000 feet (3048 m)</p>																																		

2.1 INTRODUCTION

This section provides the instructions and information required to operate the Model 9427H unit.

2.2 CONTROLS AND INDICATORS

Figure 2-1 depicts the locations of the controls and indicators. All switches and indicators are preassembled on a printed circuit board and mounted behind the control panel assembly. The control panel contains separate write protect switches and indicators for fixed and removable disks. ACTIVE (seeking, reading or writing) and READY indicators are also mounted on this panel. A functional description of the controls and indicators is given in Table 2-1.

2.3 OPERATING PRECAUTIONS

The following precautions and practices should be observed while operating unit to obtain best performance and reliability of the equipment:

1. Keep the access door closed to prevent unnecessary entry of atmospheric dust.
2. If a pinging or scratching sound (caused by head-to-disk contact) is heard and persists, stop the unit by using the Stop and Power Down procedure of this section and then call the customer service engineer.

Appropriate steps should be taken to safeguard valuable data until the head-to-disk contact can be remedied. Such steps may include leaving the unit powered down, replacing the data cartridge with a scratch cartridge, and/or immediate transfer of the data that is on the fixed disk.

3. To prevent damage and/or data loss, follow the Disk Cartridge Installation procedure of this section.
4. The operator should not attempt to override any interlocks in the system.

2.3.1 POWER UP FOR ON-LINE OPERATION

NOTE: Steps 1,2, 3, & 5 to be performed by maintenance personnel only.

1. Using a 5/32 Allen driver, place tool into holes of front and rear end panels and remove panels by loosening hardware.
2. Verify connection of all power and I/O cables.
3. Verify installation of properly jumpered voltage adjust plug, P12 (see Section III for jumper information).
4. Verify that START/STOP switch is in STOP position (out).
5. Using Figure 6-11, actuate DC circuit breakers CB2 and CB3. Actuate circuit breaker CB1 and verify operation of blower motor.
6. Depress START/STOP switch and verify START/STOP indicator illuminates.
7. Verify that FAULT indicator remains off.

NOTE: If FAULT indicator illuminates perform step 1 through 3 of Fault Operating Instruction Paragraph 2.4.

8. Approximately 65 seconds after START/STOP switch is depressed, READY is sent to the controller and the READY indicator illuminates. Disk drive is now ready to receive Seek, Read, Write and Erase commands from controller.

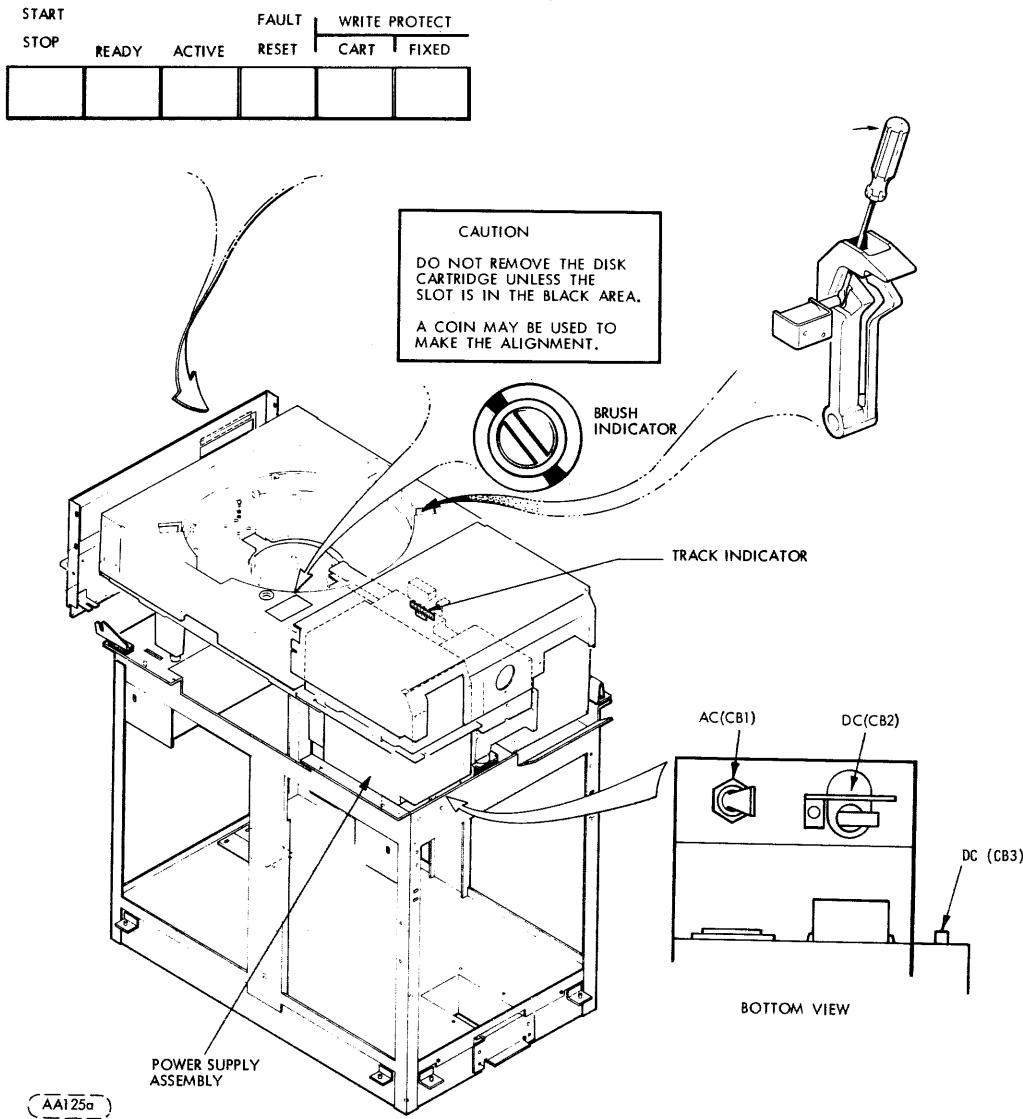


FIGURE 2-1. CONTROLS AND INDICATORS

2.3.2 WRITE PROTECT

Write protection can be initiated either by the operator or controller.

- Operator Initiated Write Protect - Depress desired W/PROT switch (W/PROT CART or W/PROT FIXED) and verify that appropriate W/PROT lamp illuminated. Selected disk is now protected against controller Write or Erase command.
- Controller Initiated Write Protect (optional) - A disk may be protected by the controller itself providing that the Unit Select and Write Protect lines are active. Whichever disk is selected by the high-order Head Select line will then be protected from Write or Erase commands.

TABLE 2-1. CONTROLS AND INDICATORS

Control or Indicator	Function
Power Assembly	
AC circuit breaker (CB1)	Provides AC power circuit protection, and main power switching.
DC circuit breaker (CB2)	Provides \pm 35 VDC circuit protection along with thermal protection for all DC circuits.
DC circuit breaker (CB3)	Provides + 11 VDC logic circuit protection.
Power receptacles	Provides connection for input power
Voltage Adjust Plug, P12 (Refer to Installation and Checkout Section for adjustment connections)	Provides a means of selecting input voltage to transformer in power supply.
Control Panel	
START/STOP indicator/switch	<p>Start switch energizes spindle motor and initiates the first seek mode provided the following conditions are met:</p> <ul style="list-style-type: none"> 1. Circuit breakers are ON. 2. Disk cartridge cover properly installed. 3. Cartridge hold-down switches are closed. <p>Depressing the alternate action START/STOP switch at any time after the start cycle is initiated will cause the machine to stop unless a Stop Override signal is present from the controller. In this case, the machine will continue to run until the Stop Override signal is removed. (This is to prevent stopping during a read, write, or seek operation.)</p> <p>When the switch is depressed to stop machine, the indicator light remains illuminated until the disk rotation has stopped.</p>

TABLE 2-1. CONTROLS AND INDICATORS (CONTINUED)

Control or Indicator	Function
	Control Panel
	The interlock solenoids energize at this time to permit access to the cartridge.
	NOTE
	The first seek mode is completely automatic and requires approximately 65 seconds to complete. The unit can be reset at any time after initiation of the start sequencing. In the event of a potentially damaging fault during this mode, the heads will automatically go into emergency retract and the machine will stop.
READY indicator	Illuminates when the unit is up to speed, the heads are loaded and the unit is ready for use. Extinguished during any fault, emergency retract, or stop operation.
ACTIVE indicator	Illuminates when the unit is actively engaged in any mode, i.e., direct (forward or reverse) seek, return to zero seek or read/write/erase.
FAULT indicator/switch	Indicator illuminates when any fault exists with the exception of a line power failure. In the event of a momentary line power drop, the unit heads will go into an emergency retract and the unit will stop. However, the unit will restart automatically when the power returns to normal. In the event of a non-damaging fault, i.e., more than one head selected, simultaneous read and write and etc., the fault indicator will be illuminated and the unit will report the condition to the controller.

TABLE 2-1. CONTROLS AND INDICATORS (CONTINUED)

Control or Indicator	Function
Control Panel	
FAULT indicator/switch (continued)	<p>A Return-To-Zero-Seek command will reset the fault latch and extinguish the fault indicator. The unit can be reset by the FAULT switch if a momentary non-damaging fault has occurred.</p> <p>Pressing the FAULT switch clears the fault logic and extinguishes the indicator. A persistent fault, however, will not permit a reset.</p>
W/PROT CART indicator/switch	<p>This alternate-action switch remains slightly depressed, and is lit when on. When on, writing and erasing of data on the cartridge disk is inhibited.</p>
W/PROT FIXED indicator/switch	<p>This alternate-action switch remains slightly depressed and is lit when on. When on, writing and erasing of data on the fixed disk is inhibited.</p>
Cartridge Receiver	
Brush indicator	<p>Indicates the position of the brush motor.</p> <div style="text-align: center; margin-top: 10px;">  CAUTION </div> <p>Do not remove the disk cartridge unless the slot is in the black area.</p> <p>A coin may be used to make the alignment.</p>
Carriage Assembly	
Track indicator	<p>Vernier scale located on the side of the carriage over read/write heads (see Figure 2-1). Readable only when electronics cover is removed. Movable zero mark identifies hundreds and tens digits of track number. The coincident moveable vernier identifies the units digit of the track number.</p>

2.3.3 STOP AND POWER DOWN

Disk drive can be stopped by front panel switches provided STOP OVERRIDE is not commanded by controller.

NOTE: In the event STOP OVERRIDE is commanded when the START/STOP switch is depressed to STOP, the disk drive will continue operating. When STOP OVERRIDE is dropped by the controller, the unit will execute a normal stop sequence.

1. Depress START/STOP switch and verify the following actions occur:
 - a. READY lamp extinguishes and controller Ready goes off.
 - b. START indicator extinguishes and pack locks open after spindle stops rotating.
2. Remove Cartridge (if desired) in accordance with Disk Cartridge Removal (Normal) procedure.

NOTE: Step 3 to be performed by maintenance personnel only.

3. Set main circuit breaker CB1 of "off,"

2.4 FAULT OPERATING INSTRUCTION

If FAULT indicator illuminates during operation or power up proceed as follows:

1. Depress FAULT switch. If lamp extinguishes, normal operation can be resumed. If FAULT lamp remains illuminated, proceed to step 2.
2. Depress START/STOP switch to STOP and allow spindle to stop rotating, then depress START/STOP switch to START. If FAULT lamp extinguishes, normal operation can be resumed. If lamp remains illuminated proceed to step 3.
3. Power down equipment in accordance with Stop and Power Down procedure. Call customer service engineer.

2.5 INPUT/OUTPUT LINES

Complete operations of the disk drive with the exception of power up, power down and start/stop can be performed by the controller. Input/Output signals exchanged between disk drive and controller and their functions are explained in Table 2-2.

2.6 DISK CARTRIDGE HANDLING AND STORAGE

The following practices should be observed when handling or storing disk cartridges. Refer to the manufacturer's instructions for more detailed maintenance and cleaning instructions, or refer to section 6 of this manual.

1. The cartridge dust cover should be on the cartridge while it is out of the disk receiver. This will insure a positive dust seal and immobilize the disk inside.
2. Cartridges can be stored flat or on the edge. Several can be stacked on top of one another. However, undue heavy loading should be avoided.

TABLE 2-2. INPUT/OUTPUT LINES

Signal	Function
	Input Lines
CYL STR (Cylinder Strobe)	Gates the cylinder address into the unit. The contents of the cylinder address lines are valid only when the Cylinder Strobe is true.
CYL AD/0 - CYL AD/8 (Cylinder Address Bits 2^0 - 2^8)	Nine lines that carry the cylinder address to the track address when gated by the Cylinder Strobe.
RTZS (Return to Zero Seek)	Causes carriage to return to cylinder 000.
HS/0 - HS/1 (Head Select)	Selects one of the two recording heads (two lines for four heads with fixed disk option). The line(s) contain the binary address of the desired head and must be held constant during a read or write operation.
Wr (Write Data/Clock)	Transmits double frequency encoded data and clock signals to the unit.
Write Gate	Enables write current during a write operation.
Erase Gate	Enables the erase current during a write operation.
Read Gate	Enables read data and clock information during a read operation.
Unit Select	Four select lines (one per unit) are used to select a unit to be accessed. The appropriate lines must remain active during any exchange with the controller, except when monitoring interrupts such as seek complete or seek error lines. A unit may be continuously selected for test purposes by actuating the desired Unit Select switch (SW1-1 through SW1-4) on the I/O board.
Wr Prot (Write Protect)	Prevents accidental destruction of previously written data by never allowing write or erase current to be on when write protect line is true.

TABLE 2-2. INPUT/OUTPUT LINES (CONTINUED)

Signal	Function
Input Lines	
Stop Ov (Stop Override)	After the unit has been started, a STOP OVERRIDE command along with UNIT SELECT will maintain the unit in a selected ON-LINE condition until the UNIT SELECT falls, even if the front panel START/STOP switch is set to STOP.
Output Lines	
On Cyl (On Cylinder)	Indicates that heads have reached the desired address. The On Cylinder condition will also be indicated when a seek error occurs.
Rd Data (Read Data)	Transmits digital information read from the disk to controller.
Rd Clk (Read Clock)	Carries clock signals read from the disk.
Index	Provides a sector 0 reference pulse from the unit to the controller. This pulse occurs once for each revolution of the disk.
Sector	The gated sector is from the cartridge if heads 0 or 1 are selected and is from the fixed disk (if installed) when heads 2 or 3 are selected. Two separate sector transducers are used as in the case of index and only one driver is used.
Sker (Seek Error)	Indicates that the unit was unable to complete a seek operation. A RTZS command from the controller clears the Seek Error condition and returns the heads to cylinder 00.
Ad Int. (Address Interlock)	Indicates that illegal address has been sent.
Ad Ack (Address Acknowledge)	Indicates that address received is legal.

TABLE 2-2. INPUT/OUTPUT LINES (CONTINUED)

Signal	Function
Output Lines	
Fault	<p>Indicates that the unit has one or more fault conditions. Write and erase currents are inhibited by the presence of any of the following conditions:</p> <ul style="list-style-type: none"> 1. More than one head selected. 2. Read and Write gates true at the same time. 3. Read and Erase gates true at the same time. 4. Erase and no write driver on. 5. Write and no erase driver on. 6. Write, or erase gate and not On Cylinder. 7. Low voltage situation that could cause a loss in control of write and erase currents. 8. Fixed disk heads are selected with no fixed disk option installed. 9. Emergency retract condition.
Ready	Present if the disk cartridge is installed, spindle motor speed, heads loaded, DC voltages within margin, no fault condition exists, unit selected, and terminator is present and has power.
Wr Stat	Indicates the unit is inhibited from writing on the Disk. This signal is present whenever the control panel WRITE PROTECT switch is on and the associated disk is selected, or when the controller Write protect is true.
SA/0 - SA/5 (Sector Address)	Six lines that carry the sector address for the selected disk.
Density (optional)	When negative true, the unit is operating in a 200 tpi mode; when not, unit is operating in 100 tpi mode.

2.7 DISK CARTRIDGE INSTALLATION

The disk cartridge must be stored in the same environment as the Model 9427H for 60 minutes immediately preceding its use. Make certain disk cartridge has been cleaned and maintained in accordance with accepted preventive maintenance procedures. Refer to Figure 2-2 for the following procedure.

1. Raise cartridge access door on cabinet.

NOTE: Power must be on and START/STOP lamp must be off to release lock on hold-down arms.

2. Pull back hold-down arms.
3. To separate dust cover from the disk cartridge, hold cover release button to left while lifting cartridge handle.
4. Disengage dust cover from disk cartridge. Set cover aside.

Do not make abusive contact between the disk cartridge and the spindle.

CAUTION Make certain that the read/write heads are fully retracted and the disk cleaning brushes are completely out of the cartridge area. Remove any dust from magnetic chuck.

5. Place disk cartridge onto spindle hub (ensure head opening is toward read of machine).
6. Rotate cartridge slowly back and forth until cartridge detents.
7. Push handle down to seat cartridge.
8. Place dust cover (removed in step 4) open end down over cartridge.
9. Position hold-down arms over cartridge and dust cover.
10. Close cartridge access door.
11. Press START/STOP switch to apply power to spindle motor.

NOTE: If the spindle motor will not rotate, disk cartridge is not installed properly.

2.8 DISK CARTRIDGE REMOVAL

2.8.1 NORMAL REMOVAL

Refer to Figure 2-2 for the following procedure.

1. Depress START/STOP switch to STOP (in).
2. Raise cartridge access door after START/STOP indicator extinguishes.

CAUTION If START/STOP lamp is still illuminated after 2 1/2 minutes and brushes are not fully retracted (brush indicator not retracted position) contact the Customer Engineer.

3. Pull back hold-down arms (arms will not move until cartridge is stopped).
4. Remove cartridge dust cover.
5. Push and hold cover release button to left with thumb and lift cartridge handle.
6. Lift cartridge clear of spindle.
7. Place dust cover in position on cartridge and fold over top handle.

NOTE: The handle may be swung out to carry the cartridge, but do not push the cover release button.

8. Close access door if another cartridge is not to be installed.

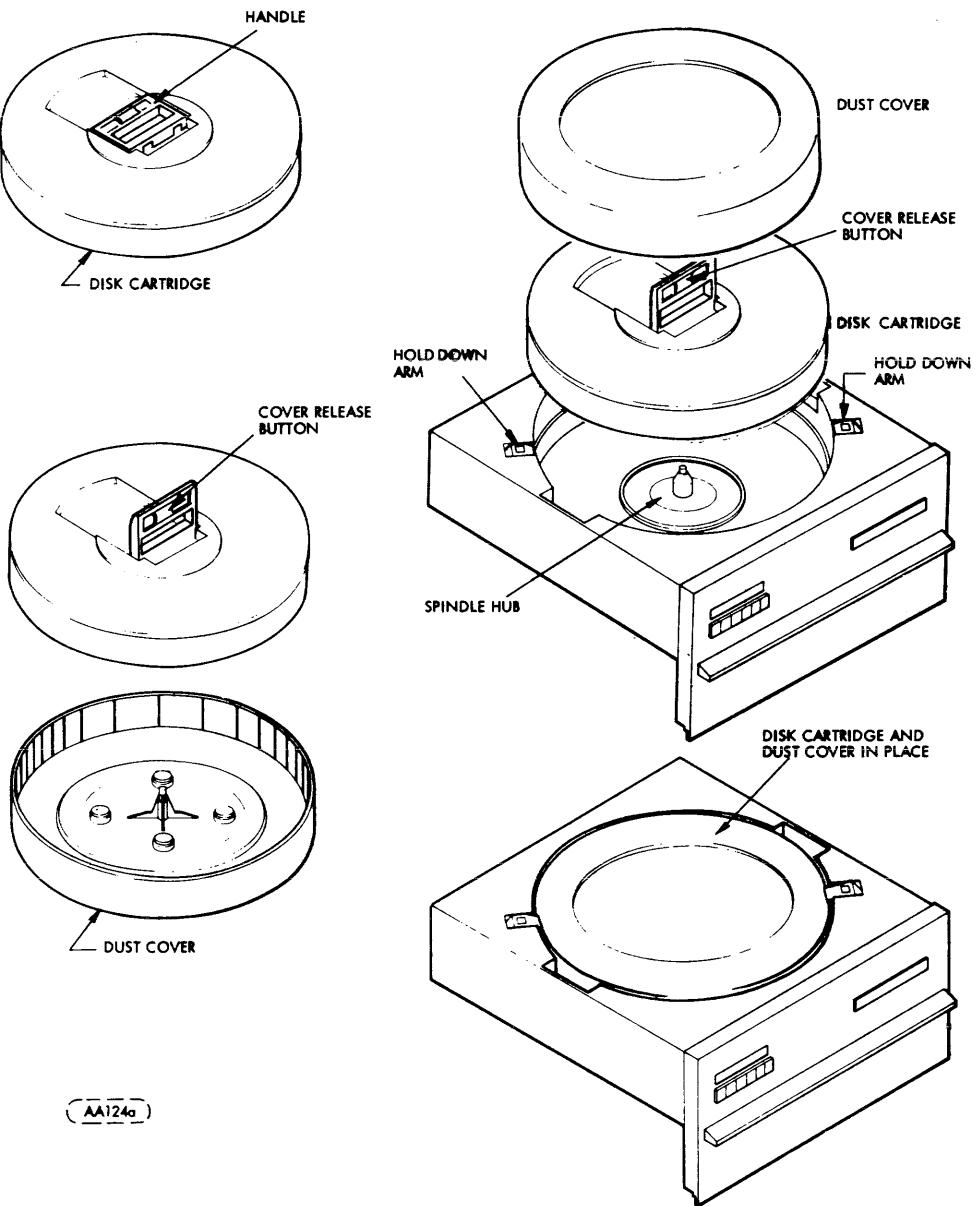


FIGURE 2-2. DISK CARTRIDGE INSTALLATION

2.9 POWER FAILURE OR EMERGENCY STOP REMOVAL

Refer to Figure 2-2 for the following procedure.

NOTE: This procedure to be performed only by the Customer Engineer.

1. Wait approximately 3 minutes for cartridge to stop spinning.
2. Raise cartridge access cover.

CAUTION If START/STOP lamp is not extinguished after waiting 3 minutes and brushes are not fully retracted, open top cover, and manually retract heads and brushes.

3. Release pack locks by inserting a flat head screwdriver (or similar object) into hole on top of pack lock. Press solenoid plunger into solenoid and tilt pack lock, (see Figure 2-1).

4. Remove cartridge dust cover.
5. Push and hold cover release button with thumb and lift cartridge handle.
6. Lift cartridge clear of spindle.
7. Place dust cover in position on cartridge and fold over top handle.

NOTE: The handle may be swung out to carry the cartridge but do not push the cover release button.

8. Close the access door if another cartridge is not to be installed.

3.1 INTRODUCTION

This section provides the information and procedures necessary to install and check-out the 9427H disk drive.

3.2 UNPACKING

During unpacking, exercise care so that any tools being used do not cause damage to the drive. As the drive is unpacked, inspect it for possible shipping damage. All claims for this type of damage should be filed promptly with the transporter involved. If a claim is filed for damages, save the original packing materials.

After the drive is unpacked perform the following procedure:

1. Clean the unit thoroughly.

CAUTION

While performing the following steps do not position the carriage manually. Such action could cause the Read/Write heads to load, causing damage to the heads and disk.

2. Remove four shipping brackets (5 pieces), cabinet mount only.
3. Remove three mounting bolts securing unit to plywood base, rack mount units only.
4. For those units that required AC and DC ground connected during shipping but separate during operation, remove green jumper wire on rear of unit. Jumper wire is connected between AC ground on power supply and electronics cover below velocity transducer cap.
5. Remove electronics cover.
6. Remove the carriage lock pin and store it on the magnet as shown in Figure 3-1.
7. Re-install electronic cover.

3.3 SPACE ALLOCATION

Figure 3-2 and 3-3 show base cabinet and rack mount unit overall dimensions for determining space allocation.

3.4 LEVELING AND ALIGNING BASE CABINET UNIT

Position the cabinet in its operational location and level as follows:

1. Install jack screws provided in plastic container.
2. Lower jack screws in base cabinet until casters no longer contact floor.
3. Adjust jack screws as necessary until unit is level.

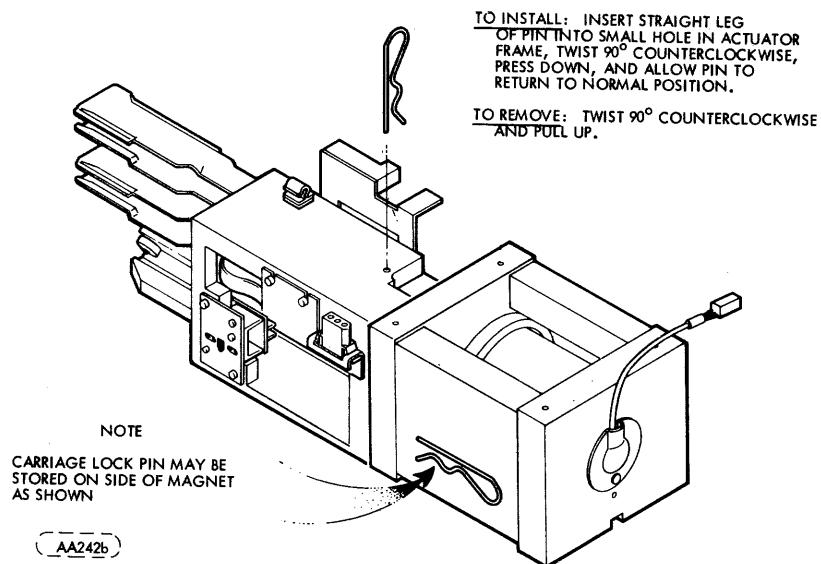


FIGURE 3-1. CARRIAGE LOCK PIN LOCATION

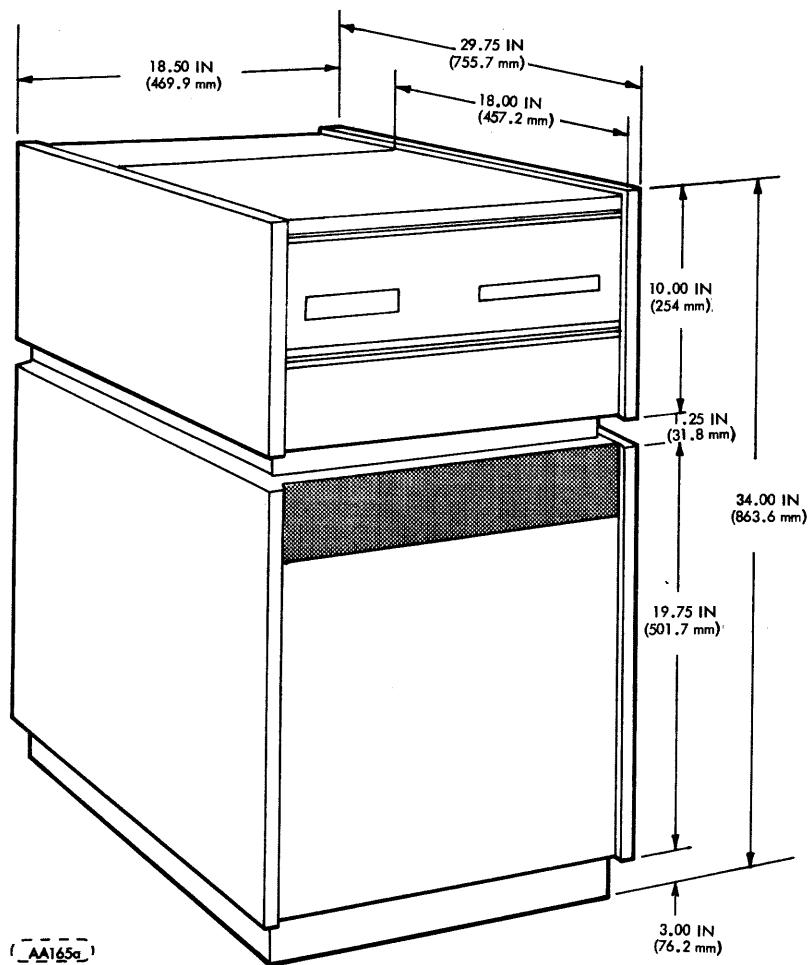


FIGURE 3-2. BASE CABINET DIMENSIONS

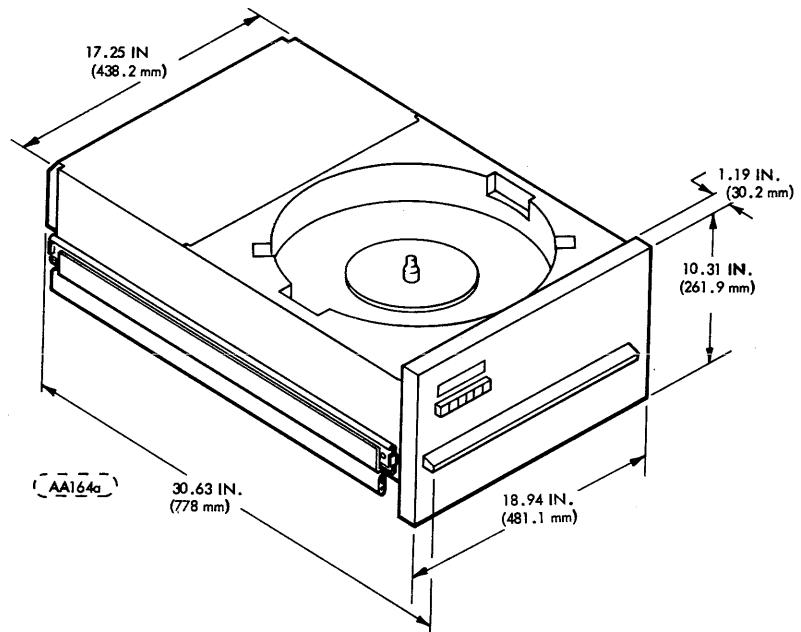
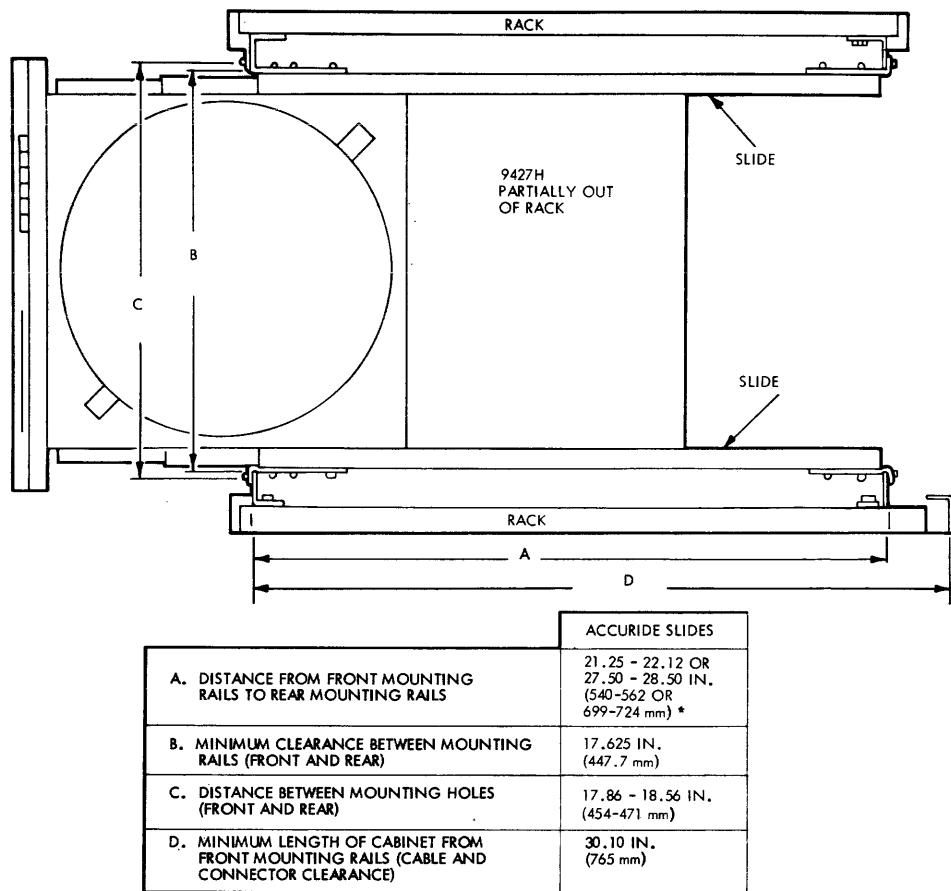


FIGURE 3-3. RACK MOUNT UNIT OVERALL DIMENSIONS



*These limits may be increased by 1.00 IN. (25.4 mm) on the high ends, but the slide extension will be correspondingly reduced.

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FIGURE 3-4. RACK MOUNT SLIDES DIMENSIONS

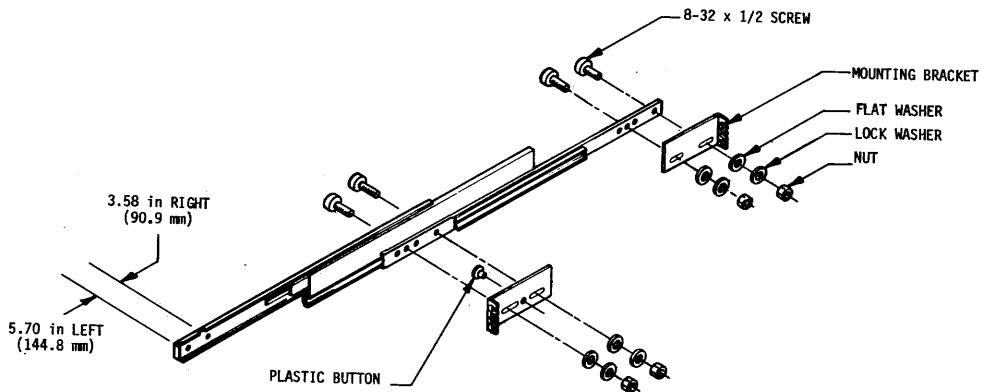


FIGURE 3-5. SLIDE AND BRACKET ASSEMBLY

3.5 INSTALLATION OF RACK MOUNT SYSTEM WITH ACCURIDE SLIDES

The Accuride slides are constructed of three longitudinal members forming two pairs of telescoping channels, one pair above the other. The intermediate member is a vertically double channel, such that it constitutes the moving member of the lower pair of channels as well as the stationary member of the upper pair. The slides and brackets plus attaching hardware and loose unit parts mentioned in the following steps make up an installation kit that is shipped with the unit. The installation kit for units equipped with Accuride slides includes a triangular or wedgeshaped knob that must be added to the unit as a means of releasing the latch mechanism that secures the unit into the rack. Read and understand these instructions before attempting assembly. Also verify that all hardware is included in the kit.

1. Install plastic slide mounts item (18) and plastic keyed slide mounts item (19) at the sides of the unit as shown in Figure 3-6. Mounting hardware for each of these items consists of two 8-32 x 5/8 inch (31.8 mm) pan head machine screws (4) and two No. 8 internal tooth lock washers (8). Place item (26) on ribbon cable directly behind keyed slide-mount on unit's left side.

NOTE

For correct orientation of the unkeyed mounts, the V Groove channels in the mounts should open downward. The flat side of the keyed mounts should be inboard and pointing downward, see Figure 3-6.

2. Install plastic stabilizers item ⑩ at the sides of the unit as shown in Figure 3-6. Mounting hardware for each of these items consists of two 8-32 x 1/2 in. (12.7 mm) pan head machine screws ⑪, two No. 8 internal tooth lock washers ⑫, and two No. 8 flat washers ⑬.

NOTE

The stabilizers should be mounted with their key extended downward. Leave the stabilizers slightly loose at this time.

3. Adjust then rack so that the dimensions correspond to those shown in Figure 3-4.
4. Accompanying each slide member is a bag of hardware consisting of two mounting brackets, four flat washers, four nuts and four binding-head slotted 8-32 x 1/2 screws. Using Figure 3-5, install mounting brackets to each slide. Slides can be identified by the distance from the front of the slide to the edge of the slot (Figure 3-5).
5. Adjust and secure the front mounting brackets such that the front of the flange of the bracket is flush with the front end of the slide.

NOTE

If necessary, the flanges may be located as much as one inch (25.4 mm) ahead of the slide ends in order to accomodate certain rack dimensions. Maximum extension of the unit out of the rack will be correspondingly reduced, however.

6. If necessary to meet cabinet dimensions, reverse the orientation of the rear mounting brackets of the slides. Adjust and secure the rear mounting brackets to agree with dimension "A" as set up in Step 3. In all cases, make sure that the white plastic button in each front bracket is inserted in one of the two holes provided that will be on top when bracket installation is complete. (The plastic button acts as a bearing between the stationary and moving parts of the slide. If necessary, remove buttons from incorrect holes and insert into the proper holes.)
7. Install the slides into the rack cabinet at the desired location (see Figure 3-4). making sure the slides are horizontal and equidistant from the base of the cabinet. Position the slides in the rack so that the distance between the insides of the uppermost sections of the slides is 16.45 ± 0.303 inches (418 ± 0.76 mm).

NOTE

The correct mounting hardware for the above step is twelve 10-32 x 5/8 inch (15.9 mm) pan head screws (6), twelve No. 10 flat washers (7), twelve 10-32 hex machine nuts (1), and twelve lock washers (21). Install the screws through the brackets and washers into the vertical rails, and then install nuts and lockwashers on the other side of the rails.

8. Pull the slides out to their full extension, approximately 29 inches (737 mm). The intermediate catch at 18 inches (457 mm) must be released on both slides. The slides will again lock at full extension.
9. Set the 9427H on top of the slides, making sure all four plastic mounts are resting on the uppermost edge of the slides and that the keys of the front mounts engage the notches in the slides.
10. Place Loctite (Grade C) on 8-32 x 5/16 (7.94 mm) pan head screws (12) and install through each slide into keyed mount-slide.
11. Adjust the stabilizers, installed in Step 2, as required to prevent wobbling and provide smooth operation of slides. Tighten the stabilizers securely.
12. Install knob assembly item (3) and latch assembly item (16) together and in the unit as shown in Figure 3-6.

NOTE

Hardware used to attach the knob assembly to the latch assembly consists of one each 8-32 x 5/8 inch (15.9 mm) pan head machine screw (4), No. 8 internal tooth lock washer (14), 8-32 x 1/4 inch (6.4 mm) spacer (9), and 8-32 hex machine nut (10). Reference: Figure 3-6.

Hardware for installation of the latch assembly in the unit consists of two 8-32 x 5/8 inch (15.9) pan head machine screws (4), two No. 8 lock washers (14), and two No. 8 flat washers (17). These screws should be left slightly loose at this time.

13. Adjust the latch so that it catches the front rail of the rack, securely holding the unit in the retracted position, when the drive is pushed completely into the rack, and so that the latch-releases easily when the knob is pushed to the left.

NOTE

By loosening the proper pair of screws on the latch assembly, the latch can be moved either forward and aft or left and right to meet this requirement.

14. Determine whether the installation requires use of a cable fender (13) at the rear of the unit. This fender is for the purpose of holding cables away from the ventilation outlet opening in the power supply and is not required if no cables threaten to encroach on the opening.

15. If required, install the fender of Step 14 using two 8-32 x 5/16 inch (7.9 mm) pan head machine screws (5), two No. 8 spring lock washers (14), and two 8-32 type U speed nuts (15) (attached to the electronics cover on either side of the power supply ventilation outlet).

CAUTION

The cable fender must not be used as a handle. It will break off!

3.6 SECTOR OPTION CONVERSION PROCEDURE

Adjust sensor mount for required sector option as follows:

1. Depress Start/Stop switch to Stop (out) and wait for spindle to stop rotating (Start/Stop lamp extinguished).
2. Set main circuit breaker to Off position.
3. Remove front door panel (base cabinet only).
4. Remove module bottom cover.
5. Loosen the sensor mount screw (see Figure 3-7).
6. Lift rear of sensor mount and place the guide pin in the sensor mount hole selected in Table 3-1.
7. Tighten the sensor mount screw.
8. Perform the fixed-disk Index/Sector Transducer Check and Adjustment in Section 6 of Maintenance Manual.
9. Install module bottom cover.
10. Install front door panel (base cabinet only).
11. Open top cover (base cabinet only).
12. Remove electronics cover.
13. Remove clamp and card cage cover.
14. Using card extractor, remove sector PWA.
15. Locate sector PWA diagram on Sheet 2 of your device specification and switch selections located in your HPC document package 83449XXX.
16. Using sector PWA diagram and Table 3-1, determine present setting of S4 switch. Press present switch setting to Off position and press switch setting for new requirement to On position. Only one switch of S4 one through six can be in the On position.
17. Change switch positions on sector PWA diagram.
18. Carefully install sector PWA insuring that all pins are engaged.
19. Install card cage cover and clamp.
20. Install electronics cover.
21. Close top cover (base cabinet only).
22. Place unit on-line and verify operation with system software.

TABLE 3-1. SECTOR OPTION CONVERSION

SECTORS REQUIRED						SENSOR MOUNT	RING
						HOLE #	HOLES
29 or SOFT SECTOR						1	29
40	20	10	5			2	40
48	24	12	6	3		3	48
50	25					4	50
60	30	15				5	60
64	32	16	8	4	2	6	64
56	28	14	7			7	56
72	36	18	9			8	72
$\div 1$	$\div 2$	$\div 4$	$\div 8$	$\div 16$	$\div 32$	DIVISION COUNT	
1	6	5	4	3	2	PWA SW4 SWITCH SETTING	

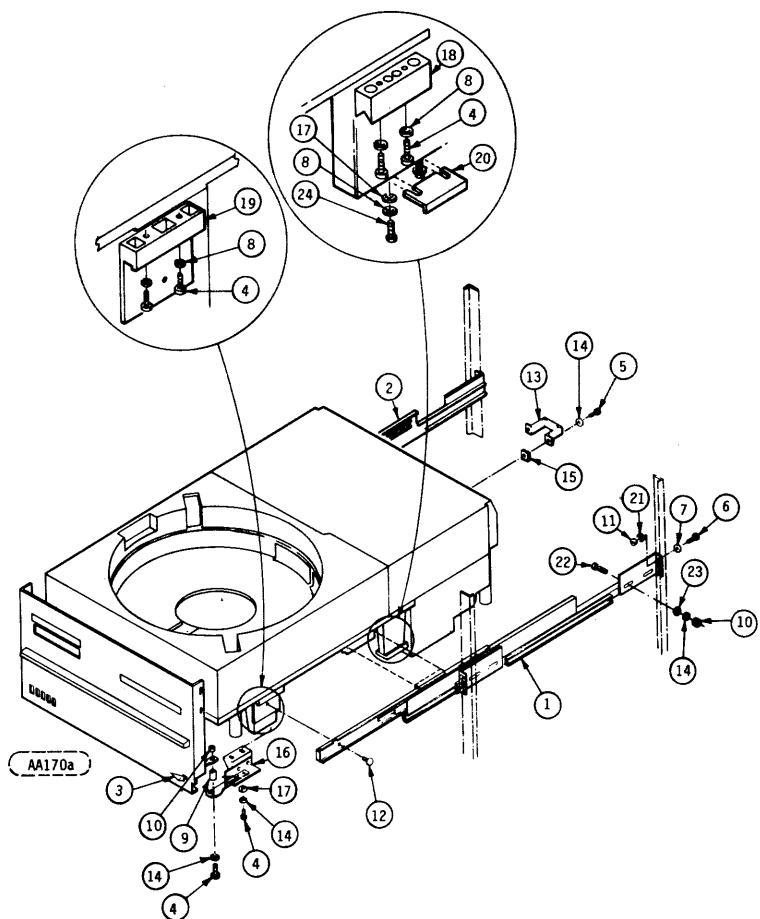


FIGURE 3-6. RACK ASSEMBLY MOUNTING

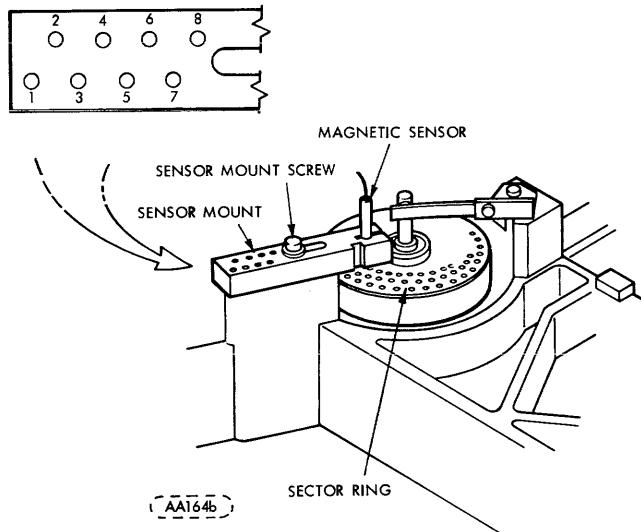


FIGURE 3-7. SECTOR OPTION CONVERSION

3.7 HZ-R/MIN CONVERSION

If Hz-r/min conversions are desired, they are available in standard option kits from the manufacturer. Depending on the specific conversion. Some or all of the following modifications may be required.

- Physical change of Drive Pulley and Belt.
- Physical change of R/W/E Board
- Physical change of Head Option Components.
- Physical relocation of jumpers in voltage adjust plug.

If Hertz conversion is required, refer to Table 3-2 for appropriate belt and pulley for desired Hertz. Refer to Maintenance Section 6.6.23 for conversion procedure.

TABLE 3-2. HZ CONVERSION PULLEY AND BELT CONFIGURATION

Hz	r/min	PULLEY NO.	PULLEY DIA.	BELT NO.	BELT LENGTH
50	2400	77599705	2.881 in. (73.2 mm)	75722940	30.375 in. (772 mm)
60	2400	77599706	2.404 in. (61.1 mm)	75722930	29.625 in. (753 mm)
50	1500	77599707	1.761 in. (44.7 mm)	75722920	28.625 in. (727 mm)
60	1500	77599708	1.479 in. (37.6 mm)	75722910	28.125 in. (714 mm)

3.8 CABLING AND CONNECTION

Unit Intracabling - Inspect the cabling in the cabinet for agreement with Figure 3-2. Check for proper seating of connectors and logic cards.

3.8.1 INPUT/OUTPUT CABLES

All input/output cables exit at the rear of the disk drive. Refer to applicable I/O board schematic in HPC package located in front of manual for connector pin/signal assignments for these cables. If an external terminator assembly is used in A2J2, the DIP terminators must be removed from the I/O board. If daisy chaining is used, the terminator is installed in A2J2 or the DIP terminators are installed in the last unit of the chain. Refer to Figure 3-9. for a typical daisy chain configuration. The function of each signal name is described in Section 2, Table 2-2.

CAUTION

Refer to I/O option diagrams in HPC package located in front of manual for assignments of I/O signals to each terminal on the I/O board connector. Be sure the terminals on the I/O cable from the controller and/or daisy-chained unit have the correct configuration and the correct assignments. BE ESPECIALLY CAREFUL WHEN UTILIZING 3M TYPE I/O CABLES, SINCE THERE IS NO MECHANICAL "KEY" TO PREVENT PLUGGING THE CONNECTOR IN 180 DEGREES FROM THE PROPER POSITION, WHICH WILL RESULT IN DAMAGE TO THE CIRCUITRY. Check to make sure that the I/O cable lead terminating at terminal (1) on a 3M I/O board is a ground lead from the controller and/or daisy-chained unit. Terminal (1) on all 3M I/O board connectors is a ground lead, and is located as shown in Figure 3-10. Utilize the same precautions when relocating adapter boards for 3M to Elco, to 3M to Winchester connectors. Adapter boards with the blue strip lead are marked for proper connection into the 3M connectors on the I/O board. The connector designation and pin sequence is marked on one side of each connector.

3.8.2 GROUNDING OPTION

The disk drive is shipped with logic (DC) ground and chassis (AC) ground connected together--see Figure 3-11 (A)--at the front left hand corner of the power supply. If the system configuration requires the separation of these grounds, perform the following procedures.

1. Open top cover (base cabinet only).
2. Remove electronics cover.
3. Open power supply cover assembly.
4. Rearrange spacers to configuration shown in Figure 3-11(B).
5. Close power supply cover.
6. Install electronics cover.
7. Close top cover.

3.8.3 POWER CABLES

The AC power cable plugs into the bottom of the power supply assembly. On cabinet units, the power cable should exit the unit through the AC entry plate located on the bottom front area of the frame (see Figure 3-13).

3.9 INPUT POWER REQUIREMENTS

Refer to the equipment specification in HPC package listed in front of manual. Ascertain that P12 is jumpered according to Figure 3-12.

CAUTION

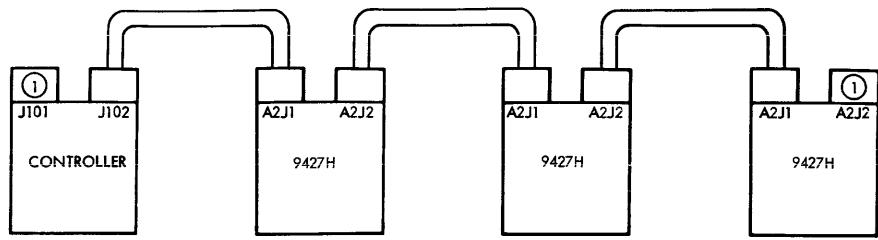
When units are field configured for any line voltage other than 120 V, 60 Hz, 4.6 Amp or 120/240 V, 60 Hz, 16 Amp, the CSA monogram must be removed because unit no longer complies with requirements of the Canadian Standards Association.

3.10 ENVIRONMENT

Operating and storage environment of the unit is as follows:

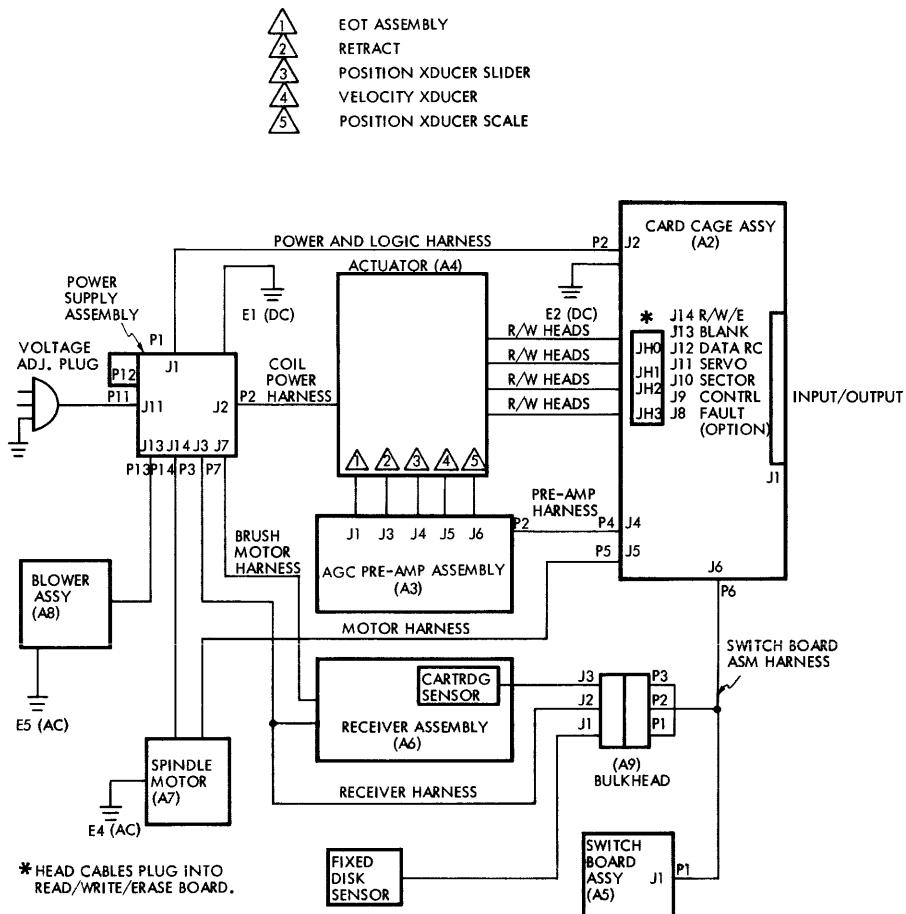
Operating status - 60 to 90°F (15.6 to 32.2°C) (12°F/hr maximum fluctuation)
10 to 80% relative humidity (provided there is no condensation)

Non-operating status - -30 to +150°F (-34.4 to 65.6°C)
5 to 95% relative humidity (providing there is no condensation)



(AA226c) NOTES: 1. TERMINATOR.
2. MAXIMUM OF FOUR UNITS.
3. MAXIMUM CABLE LENGTH FROM CONTROLLER TO LAST UNIT IS 50 FEET(15.24 M)

FIGURE 3-8. DAISY CHAIN CONFIGURATION



(AA232a)

FIGURE 3-9. SIMPLIFIED INTRACABLING DIAGRAM

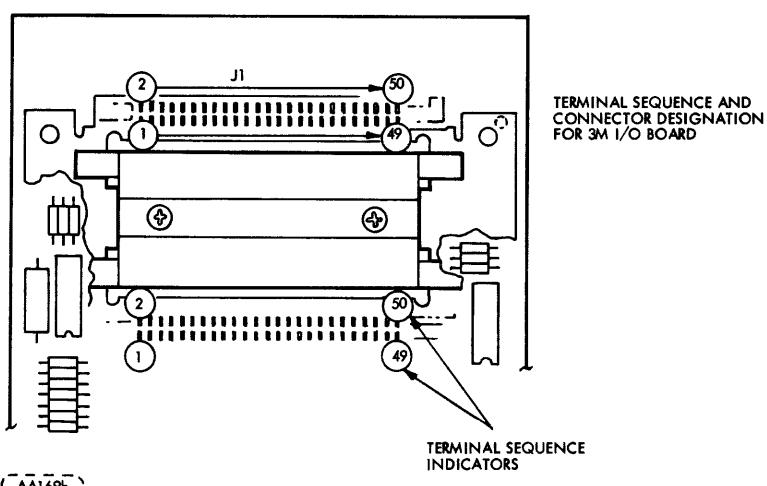


FIGURE 3-10. 3M I/O BOARD CONNECTOR TERMINAL ASSIGNMENTS

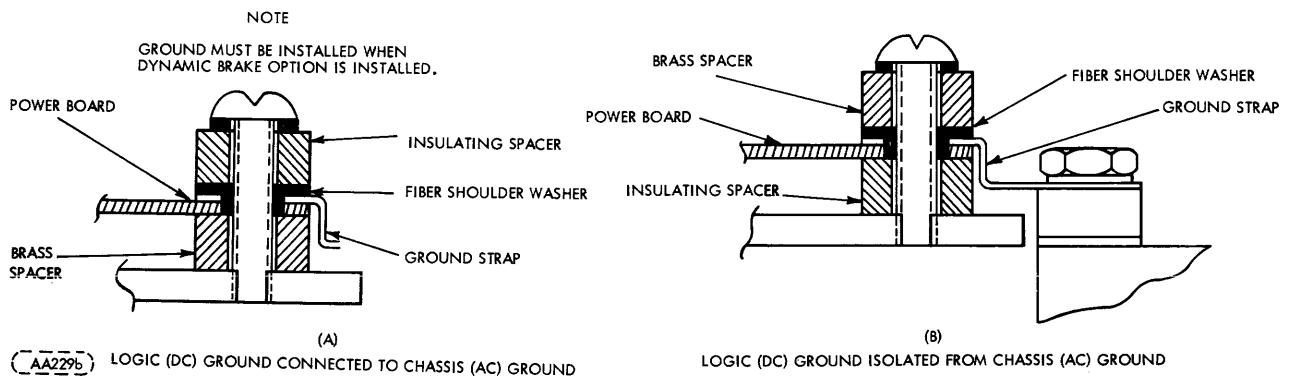
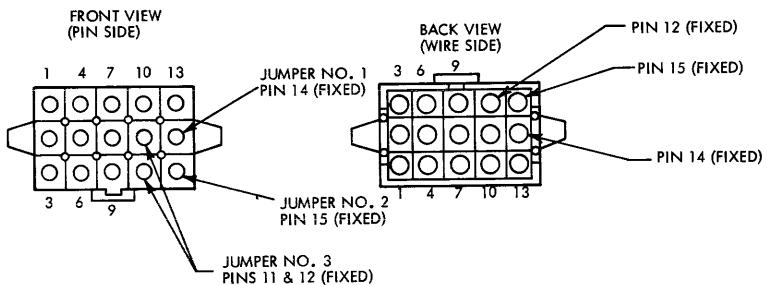


FIGURE 3-11. GROUNDING OPTION



NOTE: For proper pin configuration use above illustration.
Ignore pin numbering on connector.

VOLTAGE	JUMPER #1		JUMPER #2	
	FIXED PIN	MOVEABLE PIN	FIXED PIN	MOVEABLE PIN
100	14	4	15	7
110	14	3	15	7
120	14	2	15	7
130	14	1	15	7
140	14	6	15	8
150	14	5	15	8
160	14	4	15	8
170	14	3	15	8
180	14	2	15	8
190	14	1	15	8
200	14	6	15	9
210	14	5	15	9
220	14	4	15	9
230	14	3	15	9
240	14	2	15	9
250	14	1	15	9

(AA231a)

FIGURE 3-12. VOLTAGE ADJUSTMENT PLUG P12 AND ADJUSTMENT TABLE

3.11 OPTION SWITCHES

Various modes of operation are made possible by option switches located on the Sector, Data Recovery, Control and I/O boards. These switches are factory set to customer requirements.

The unique settings of the switches (and their locations) are shown in the switch specifications in the HPC package located in the front of the manual.

3.12 INITIAL CHECKOUT AND STARTUP PROCEDURE

This procedure should be used to make the first power application to the unit. The procedure assumes that the preceding procedures and requirements of this section have been performed and satisfied.

1. Check that the power supply assembly circuit breakers is OFF.
2. Open top cover.
3. Grasp and turn spindle. Spindle should rotate with little resistance.
4. Wipe spindle surface and hub clean using gauze dampened with media cleaning solution.

CAUTION

Do not position the carriage manually. Such action could cause the read/write heads to load and be damaged.

5. Use a vacuum cleaner to remove any dust or dirt from interior of cartridge receiver.
6. Check that START/STOP switch is off.
7. Make certain that input power cable is connected to correct external AC power source, and P12 jumper plug is correctly jumpered and in place. (See Figure 3-12 for Jumper Installation information.)

NOTE

When units have a daisy chain configuration for AC power, prior to connecting the AC cable the proper phasing should be verified at device end for each device.

8. If external AC power to the unit is protected by circuit breaker, set circuit breaker to ON position.
9. Set power supply assembly circuit breakers to ON position and check that blower starts.
10. Pull back cartridge hold-down arms.
11. Install disk cartridge (refer to Disk Cartridge Installation procedure in Section 2).
12. Inspect and clean disk cartridge as specified in Preventative Maintenance portion of Section 6.
13. Press START switch to apply power to spindle motor.
14. Spindle drive motor and disk cleaner brush motor starts.
15. Assure READY light is illuminated in a maximum of 70 seconds.
16. Allow device and pack to reach thermal stabilization (20 minutes).
17. Run diagnostics.
18. If diagnostics fail, troubleshoot or make any necessary adjustments and rerun diagnostics. (See Section 6 for all Check and Adjustment procedures and Section 7 for Maintenance aids.)
19. Installation complete.

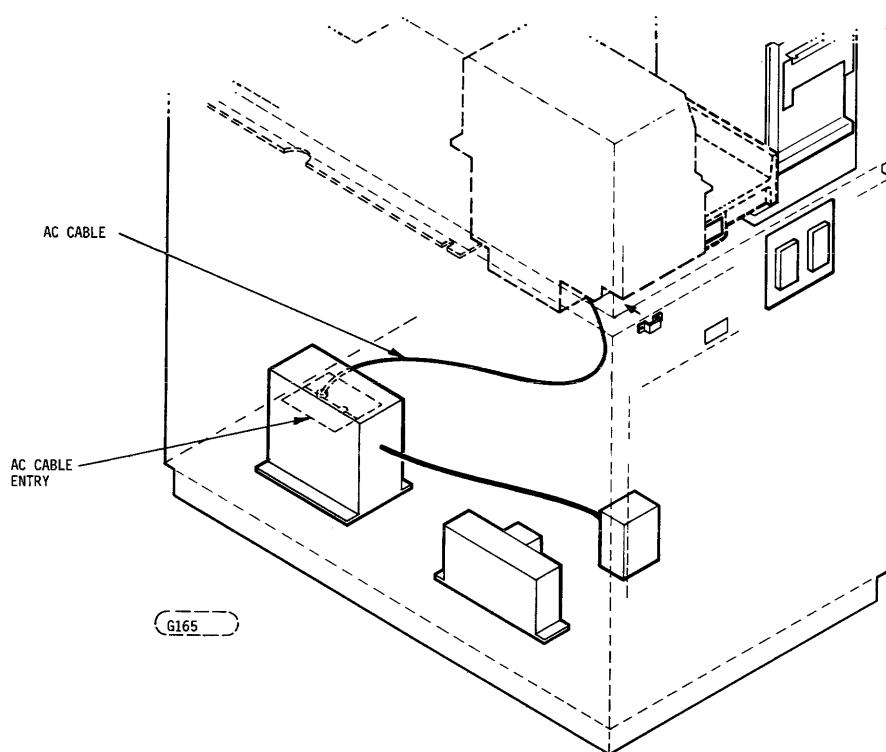
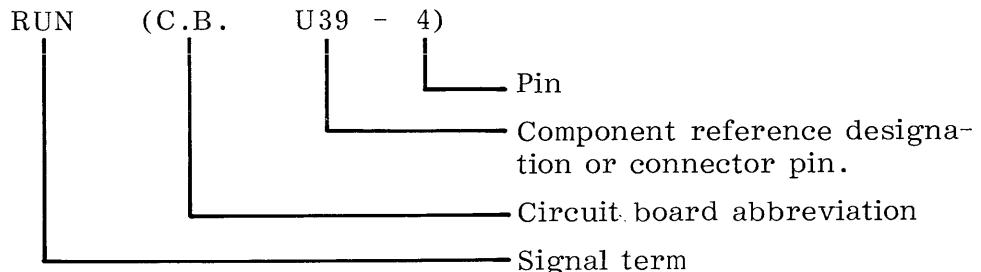


FIGURE 3-13. AC POWER CABLE EXIT

4.1 INTRODUCTION

The theory of operation is described in terms of the major junctions that the disk drive performs during normal and emergency operation and the circuitry and hardware involved in the performance of these functions. Signal origins and destinations and component locations are shown in parenthesis. For example, if the signal term RUN is referred to, it would appear as follows:



Circuit board abbreviations used in this description are as follows:

C.B. = Control Board	S.B. = Servo Board
S.C. = Sector Board	R/W/E = Read/Write/Erase Board
D.R. = Data Recovery Board	I.P. = Inductosyn Preamplifier Board
P.B. = Power Board	

4.1.1 DISK DRIVE

Disk drive is achieved through a belt driven spindle. The spindle is rotated at 1500 or 2400 r/min (depending on r/min option installed) by the disk drive motor.

4.1.2 ACTUATOR

The actuator consists of the carriage, carriage track, magnet assembly, and cam mount. The actuator is the device that supports and moves the read/write heads. Lateral forward and reverse movement of the carriage on the carriage track is controlled by the servo signal. (P.B. J2-1, J2-2) The basic signal is developed in the servo board and processed by a power amplifying stage mounted on the power amplifier board (power supply). The power amplifier output current is applied to the voice coil positioner (part of carriage). The signal causes an electric field about the voice coil positioner. This electric field interacts with the permanent magnetic field of the magnet assembly, which moves the voice coil either into or out of the permanent magnetic field. Current polarity to the voice coil determines the direction of motion, while current amplitude determines the acceleration and velocity of the motion.

The voice coil positioner is a bobbin-wound coil that is free to slide in and out of the forward face of the magnet assembly. Fastened to the positioner is a head/arm receiver which holds the two (four with fixed disk option) read/write heads. The head/arm receiver mounts on the carriage and bearing assembly that moves along the carriage track on ball bearing rollers. Movement of the positioner in or out of the magnet causes the same motion to be imparted to the entire carriage assembly. This linear motion is the basis for positioning the read/write heads to particular cylinder of tracks on the disk. (Refer to paragraph 4.6 for detailed information on read/write head loading and unloading.)

The actuator contains a optical switch for detecting each end of travel. A negative-going pulse is generated by these optical switches at forward and reverse end of travel.

4.1.3 HEAD/ARM ASSEMBLIES

Two head/arm assemblies (four with fixed disk option) are mounted on the carriage. A head/arm assembly consists of a read/write and erase coil package (head assembly) mounted at the end of a supporting arm structure. The head assembly, which includes a cable and plug, is mounted on a gimbal ring which in turn is mounted on a floating arm. This method of mounting allows the head assembly to pivot (independent of the arm) tangentially and radially relative to a data track on the disk surface. Such motion is required to compensate for possible irregularities in the disk surface.

The arm structure consists of a floating arm secured to a heavier fixed arm. The end of the fixed arm opposite the head installs in the carriage assembly. The floating arm is the mounting point for the head and is necessarily flexible so that it can respond during loading and unloading.

The freedom and mobility of the head are necessary elements to insure proper functioning with interchangeable disk cartridges. Vertical motion by a disk surface (due to warpage or imperfection) is countered by a move in the opposite direction by the gimballed head and/or floating arm. As a result, flight height remains nearly constant.

4.2 OPERATIONS

Refer to the applicable schematic, block diagram, intercabling diagram flow chart and timing charts for the following discussion.

4.2.1 POWER UP/FIRST SEEK

When the main circuit breaker, CB1 (power supply) is actuated, an initial reset, CLEAR (C.B. U39-12) is generated which clears all latches. After approximately 60 ms (+5 V supply settling time) CLEAR disappears. At this time, provided the pack locks are closed and no faults exist, the disk drive can be started by de-pressing the START/STOP push button.

Actuating the START/STOP pushbutton generates RUN (C.B. U39-4) which, in turn, energizes the spindle motor and start relay, starts the brush cycle, initiates the spindle motor start delay, illuminates the start indicator, and latches the disk cartridge in place. After approximately 4 seconds the start motor relay is de-energized and the start capacitor is removed from the motor start winding.

During the brush cycle, the disk brushes are passed across the entire surface of the disk to remove any foreign particles. When the brushes reach the end of travel, the motor is mechanically reversed and the brushes move outboard until they reach the home position, at which time the brush motor is de-energized by the closure of a SPDT switch (Cartridge Receiver A6SW3). The closure of this switch generates BRUSH CYCLE COMPLETE (C.B. U32-12). BRUSH CYCLE COMPLETE clocks K1 flip-flop control (C.B. U18) provided spindle speed is within 20% of nominal value.

The completion of the brush cycle is followed by a 50 second servo delay, after which Servo Enable (C.B. A10) initiates the operation called first seek. The function of first seek is to calibrate the disk cylinders or tracks with the track counter (S.B. U11, U12, U13). This is accomplished by driving the read/write heads inboard until they reach forward end of travel (FEOT) then out-board until the first even-numbered cylinder is crossed. The first even-numbered cylinder encountered is identified as track 408 and each succeeding track crossed decrements the track counter until track 000 is reached, at which time, ON CYL (S.B. B20) is generated. ON CYL initiates READY (C.B. A8) and assuming the unit is selected (reference daisy chain configuration) the controller is notified that first seek is complete.

4.2.2 OPERATIONAL SEEK

Refer to Figure 4-2 for the following discussion.

If, at the completion of first seek, data is to be read from or written on the disk, an operational seek is performed. To initiate an operational seek, the address of the desired track is strobed into the disk drive of nine (9) lines (S.B. B2-B10).

The number of tracks that the read/write head has to travel from its present track to the selected track is determined by calculating the difference between the track address (S.B. U4, U5, U6, U15) and the track counter (S.B. U18, U19, U20). The absolute value of this digital difference is applied to a D/A converter (S.B. U39) whose output provides an analog signal to the voice coil for movement of the read/write head to the desired track. Voice coil movement, hence read/write head movement during an operational seek consists of two modes: (1) coarse and (2) fine. During the coarse mode the voice coil is driven at a velocity determined by the number of tracks remaining in the seek.

The fine mode is employed to bring the carriage to a stop without overshoot when the desired cylinder is reached. Figure 4-3 shows the D/A converter output and the velocity profile for a typical long seek. During the first part of the seek the carriage is accelerated by the maximum output of amplifier AR4 (S.B.) until it reaches maximum velocity. From this point on, the carriage is driven at a constant velocity (coast) until it is 128 cylinders from the desired destination at which time it decelerates uniformly until it reaches the last track. Upon reaching the last track the system switches to the fine mode and the position signal from the encoder is utilized to bring the carriage to the center of the track. Approximately 2 ms after the head has settled within 200 microinches of the selected track center, ON CYL (S.B. B20) is generated. SKER (S.B. B16) is generated if the carriage goes beyond either end of travel (FEOT or REOT) or if ON CYL is not present 0.5 seconds after the initiation of SERVO EN, C.A. STROBE or RTZS. A SERVO INH automatically removes power from the voice coil by forcing an inhibit on the servo output multiplexer (S.B. U42).

4.2.3 RETURN-TO-ZERO SEEK (RTZS)

When RTZS is commanded by the controller, the track counter (S.B. U18, U19, U20) is set to 408 and the address register (S.B. U4, U5, U6, U15) is reset to zero. However, the invert line (U6-3) to the address register is set for non-inverting operation. As a result the address register indicates a cylinder address of 424. Consequently the difference between the track counter and address register is 16 (424-408). Since counting by the track counter and address register

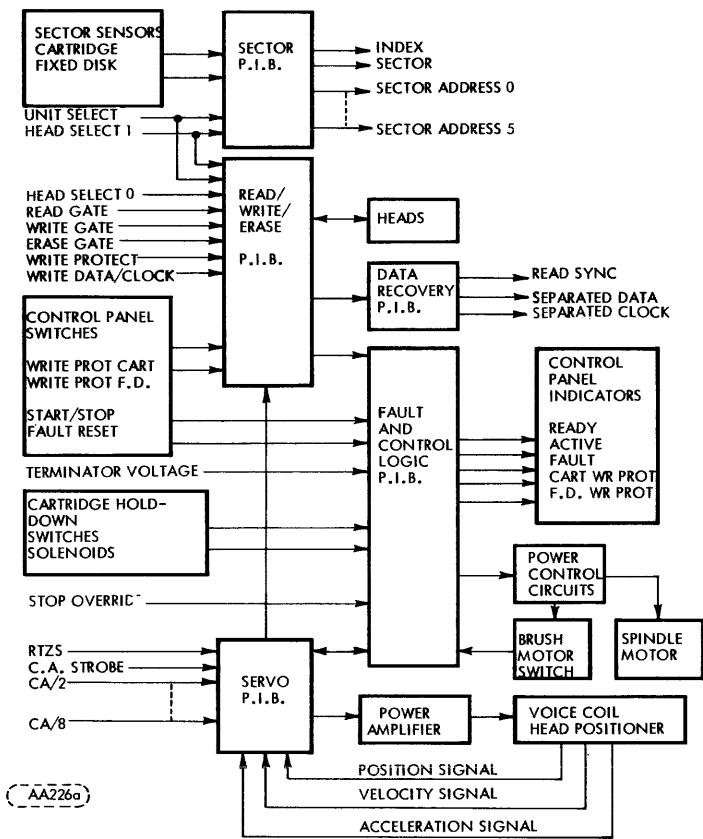


FIGURE 4-1. MODEL 9427H BLOCK DIAGRAM

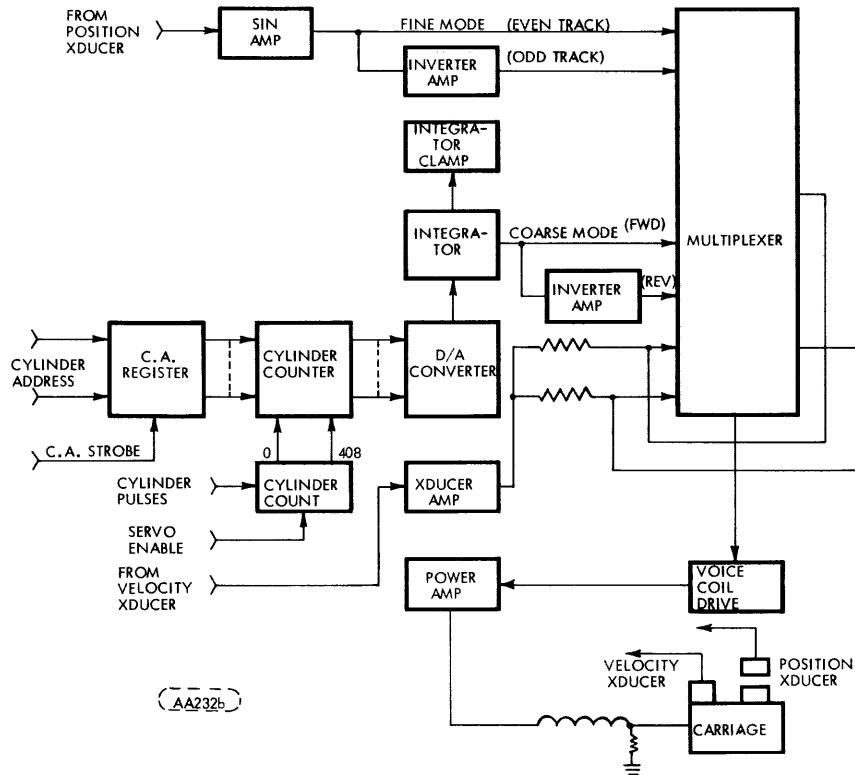


FIGURE 4-2. SERVO SYSTEM BLOCK DIAGRAM

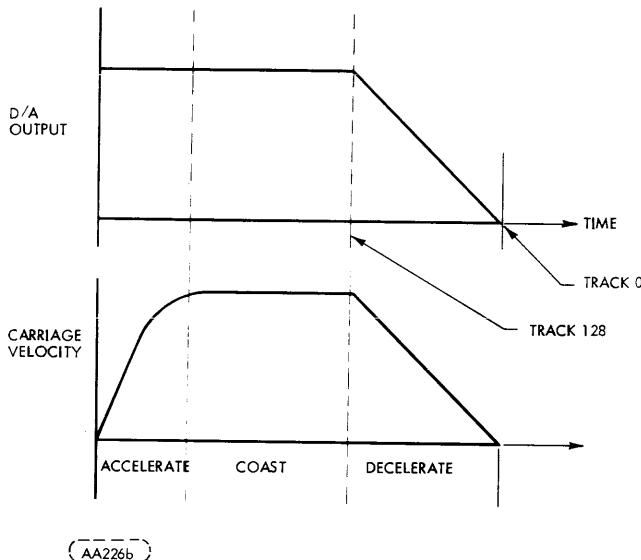


FIGURE 4-3. SEEK VELOCITY PROFILE

is inhibited, the difference is held constant, resulting in the carriage being driven at a constant speed of approximately 16 ips (406 mm/sec). When the forward end of travel (FEOT) is reached, the address register is shifted back to the normal inverter mode thereby establishing an address of 000. This causes the carriage to reverse direction and as soon as the first even-numbered track is encountered the count inhibit signal is removed from the track counter, allowing it to count down normally from 408 to 000 as described in First Seek.

4.2.4 WRITE/ERASE DATA

Writing on any one of four recording surface (2 cartridge and 2 fixed disk) requires that the disk drive be able to select the desired read/write head. Selections of the heads is accomplished by means of two input lines termed HS/0 and HS/1 (Head Select 0 and 1). The logic condition of HS1 determines whether the cartridge or fixed disk is selected while the logic condition of line HS0 determines whether the upper or lower surface of the disk is selected.

Once the disk surface and read/write head has been selected, a write function is initiated by the controller commanding UNIT SELECT and WRITE GATE. These two controller inputs generate a write line term W/E INA (R/W/E B4) and a write enable term WR EN (R/W/E B2). With the logic thus conditioned by these signals, WR DATA and CLOCK applied to the disk drive (R/W/E A3) then can be recorded. With WR EN at a high level, incoming data and clock pulses (R/W/E A3) will clock the write data flip-flop (R/W/E U10). As a result the outputs of the flip-flop will be a composite of frequency encoded data and clock which alternately switch a voltage dependent current source (R59-R70) through two power transistors (R/W/E Q6, Q7). The outputs of these transistors drive write current through one half of the head winding then the other via head select circuits (R/W/E U14, U16).

Recording on tracks 256 or greater requires a reduction in write current due to bit density. When the read/write head is moved to track 256 or greater for purposes of writing, ZONE (S.B. A20) is generated, causing (R/W/E U11-2) to go to ground thereby reducing the current to the read/write heads.

An erase function is initiated by the controller commanding a UNIT SELECT (C.B. B9) and ERASE GATE (C.B. A12). These two controller commands generate terms ER EN (C.B. B26) and W/E/INH (C.B. A24). Term ER EN turns on a transistor switch (R/W/E U11) in series with the selected erase winding via erase diodes (R/W/E U17 - Diode matrix) and the +15 V center tap voltage.

4.2.5 READ DATA

To initiate a read operation, READ GATE and UNIT SELECT are commanded by the controller. The read head output is processed by differentiation of the recorded flux reversals as follows: The signal is amplified by a linear low noise differential amplifier (R/W/E AR2) and differentiated by AR1 (R/W/E). The resulting differentiated signal simultaneously drives a cross-over detector (R/W/E U2) and isolation stage (R/W/E Q12, Q13) which provides a monitor for the differentiated analog signal at the I/O connector.

Cross-over detection is achieved by a dual differential receiver (R/W/E U2) which digitizes the differentiated signal by generating positive and negative edges for each analog zero cross-over point. This digitized double frequency information (R/W/E A6) is coupled to the data recovery circuitry where phase and frequency tracking is established.

Phase and frequency tracking of the double frequency data is accomplished by means of a digital phase lock loop (Figure 4-4). The loop is comprised of a comparator, current pump, voltage controlled oscillator, data window generator, reference signal generator and acquisition detector.

Initially, the comparator (D.R. U27) derives a phase error signal between the pulsed data (double frequency data) and the out-of-lock reference signal. This TTL signal is applied to the current pump (D.R. Q1, 2, 3, 10, 11, 12) where it is integrated to develop a DC level (Vc).

Vc passes the AC component which is controlled by the value of R38 and the current from the bidirectional pump (D.R. Q10, Q11). The resultant voltage, Vre, corresponds to the input data frequency and the superimposed square waveform is utilized for phase synchronism.

The current pump output corrects the VCO (D.R. Q4-Q9) bringing its output to a nominal 5 MHz for a 2.5 MHz data rate (2400 r/min disk speed). Since the phase locked oscillator is a closed loop, the current pump drives the DC level (Vc) to reach a steady state when the signal at the comparator is a square waveform. Frequency synchronism is achieved at this point. When the loop is locked at its center frequency, the component of Vc is symmetrical.

At the beginning of the lock procedure, the disparity between the data window (D.R. U23-2) and pulsed data (D.R. U23-1) triggers a fixed time out signal, FT TRACK (D.R. B23) which increases the current available in the current pump, thereby increasing the rate of VCO correction.

After frequency and phase synchronization have been achieved the double frequency pulse data is decoded into SEP DATA (D.R. A4, B4, A5, B5) and SEP CLOCK (D.R. A3, B3, A2, B2).

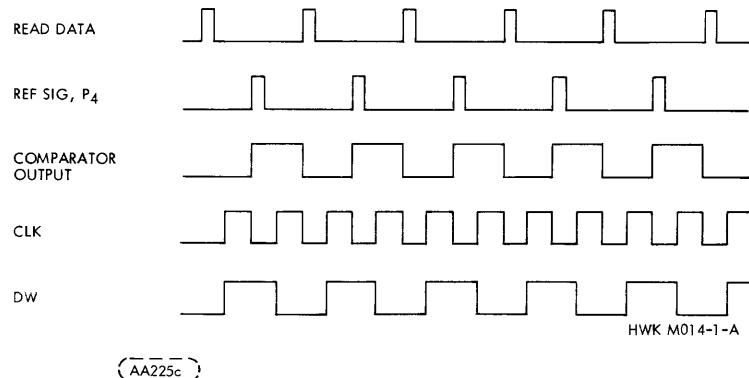
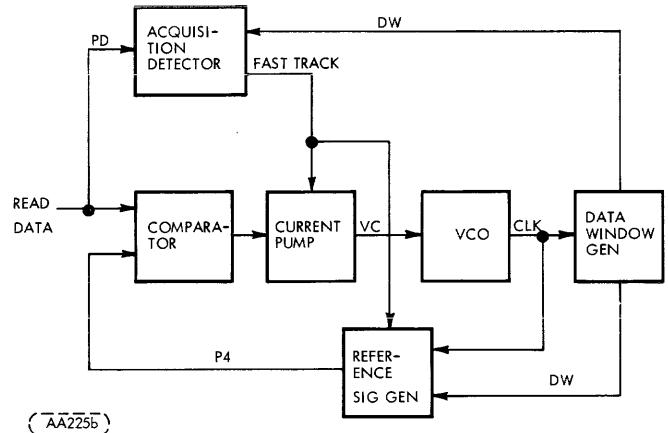


FIGURE 4-4. DIGITAL PHASE - LOCK LOOP AND TIMING DIAGRAM

4.3 SECTORING

The sectoring system is capable of producing all standard sectoring formats. This is accomplished by moving the sensor over the desired row of holes on the sector ring and selecting the desired prescaling factor using S3 (S.C.). Refer to Section 2 (Operation) for switch setting and resulting prescaling factor.

Refer to Figure 4-5 for the following discussion.

Monitoring the position of the disk comes under the function known as sectoring. Position information is derived from pulse trains generated by two magnetic sensors. One sensor (for reading cartridge sectors) is mounted in the receiver area and senses notches on the disk armature plate. The other sensor (for reading fixed disk sectors) is mounted beneath the drive motor pulley and senses chemically milled holes in the sector ring. Both sensors generate negative-going pulses which indicate the center of the notch or hole. The pulse trains generated by these two sensors are separated into index and sector pulses by the sector board.

4.3.1 FIXED DISK

Index pulses are separated from sector pulses by two NOR gates (S.C. U26-3 U26-4) and a one-shot multivibrator (S.C. U32). The separated pulses drive the prescaling counter (S.C. U33) and the sector address counter (S.C. U17). The counters are reset by receiving an index pulse and incremented by receiving a sector pulse. The count of the sector pulses is utilized to generate a six-bit sector address field (S.C. B2, B3, B6, B8, B11, B14). The sector address and index pulses are outputted upon command of the controller.

The index pulse can be transmitted at one of two times depending on the setting of SW1-1 and 2 (S.C.). If both switches are open, the index pulse output will appear simultaneously with the next sector pulse (DELAYED INDEX). If both switches are closed, the index pulse will appear at the output simultaneously with the input (DIRECT INDEX).

4.3.2 CARTRIDGE DISK

Cartridge disk index and sector pulse processing is handled, with minor exceptions, in the same manner as described for the fixed disk. Index and sector pulses are sensed from the Cartridge armature plate by the index/sector transducer and fed to the Sector board at A22. Index pulses are separated from sector pulses by two NOR gates (S.C. U19-3, U19-4) and a one-shot multivibrator (S.C. U25). The separated pulses drive the prescaling counter (S.C. U14) which divides the separated sector pulses by 32, 16, 8, 4, 2 or 1. The count of the sector pulses is utilized to generate a six-bit sector address field (S.C. B2, B3, B6, B8, B11, B14). The sector address and index pulses are output upon command of the controller. Delayed and direct index pulses are provided for the cartridge disk the same as the fixed disk.

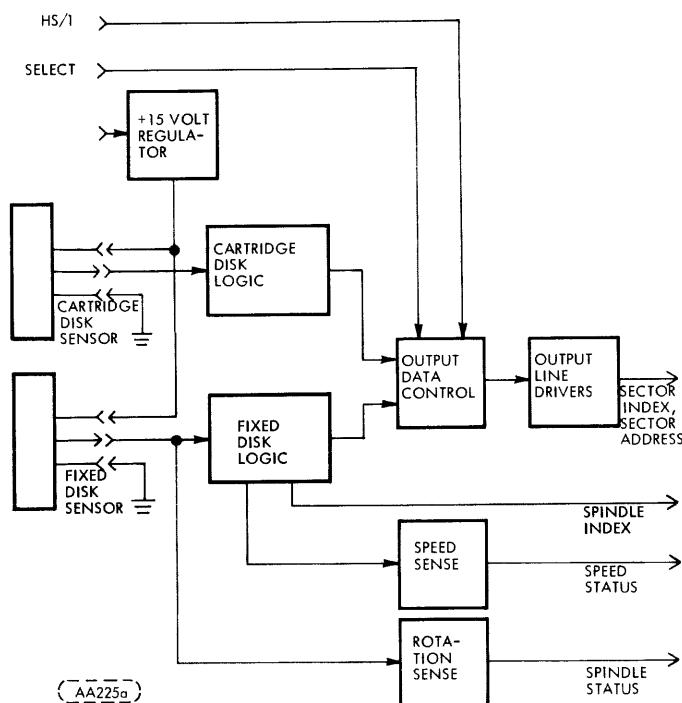


FIGURE 4-5. SECTOR SYSTEM BLOCK DIAGRAM

4.3.3 SOFT SECTOR

Under certain circumstances it is desirable to operate the disk drive with only a single sector. This mode of operation is called soft sector. Cartridges used for soft sector have only a single notch to be detected by the sensor. The single pulse generated each revolution by this notch will always be interpreted by the sector board as a sector pulse. The configuration of two switches SW1-2 and SW2-7 (S.C.) effectively substitutes this sector pulse for the missing index pulse.

Data received from the controller in the soft sector mode will be in a format containing a unique 8-bit pattern for identification of the start of a sector address.

4.4 FAULT DETECTION

Fault conditions in the disk drive are divided into two classes:

- (1) damaging and (2) non-damaging.

4.4.1 DAMAGING FAULTS

Damaging faults are those which will cause damage to the read/write head or to disk surfaces. These faults will occur as a result of subnormal spindle speed or supply voltage failure on the servo or inductosyn pre-amp boards.

To provide protection for the heads and media, the spindle speed (C.B. B8, U11-8) and the servo board supply voltages (C.B. A27, A30, B27, B30, U11-13) are continuously monitored. Any reduction in spindle speed below the set tolerance level or the occurrence of any non-transient voltage fault will set the emergency retract latch causes the disk drive to generate the term FAULT (C.B. U35-13, U14-10) illuminate the fault lamp (C.B. U15-6), retract the heads via K1 relay and switch the unit out of the run mode (C.B. U24-6, U31-9). The emergency retract latch can only be reset after the fault condition is cleared and the START/STOP switch is returned to the STOP position or with a power up clear (C.B. U18-10).

4.4.2 NON-DAMAGING FAULTS

Non-damaging faults are those that are not dangerous from the point of equipment safety but are those that will lead to degraded operation (i.e., read and write failures). These non-damaging faults are read/write head current faults, command faults and voltage failures.

A current fault (R/W/E B7) will occur under one of the following conditions:

1. Write current but no erase current
2. Erase current but no write current
3. More than one head selected for a write/erase operation
4. Excessive current leakage on the write driver output line during a read.

A current fault sets the fault latch (C.B. B20, U35-13). The fault latch will also set, if an attempt to write is made when the heads are not on cylinder or an attempt is made to read at the same time write or erase is enabled. Other conditions that will generate Fault signals are attempting to select heads 2 or 3 when there is no fixed disk or when there is a voltage failure in the read/write, data recovery or sectoring circuitry. The term, FAULT, generated by any of the above fault condition inhibits write and erase and disables the READY line (optional) to the controller. A FAULT will also illuminate a front panel indicator and enables a fault line to the controller. Non-damaging faults can be reset by the front panel FAULT RESET pushbutton, or by the controller RTZS command (option).

4.5 WRITE PROTECTION

Data on the cartridge or fixed disk may be protected by depressing the appropriate front panel WRITE PROTECT switch. The signal developed by WRITE PROTECT switch is gated with HS/1 (C.B. A20, U7-5, 6 or U7-1, 2) and assuming that the protected head is selected, write protected status (C.B. U21-6) will be enabled. This status will occur whether or not the unit is selected (reference daisy chain configurations). If the unit is selected (C.B. U43-6) PROT STAT (C.B. B21) will be transmitted to the controller.

The controller can initiate write protection by commanding Unit Select and WR PROT (C.B. B23, U7-13). These signals condition the write protect logic and illuminate the appropriate WRITE PROTECT indicator. The indicator will remain illuminated as long as the unit is selected, the appropriate heads are selected and the controller initiated WR PROT is in effect.

4.6 HEAD LOADING

The read/write heads must be loaded to the disk surfaces before exchanging data with the controller. The heads must be retracted from load position and driven clear of the disk when power is removed from the unit or the disk velocity falls below a predetermined r/min.

Head loading amounts to allowing spring pressure of the floating arm (part of head/arm assembly) to move the aerodynamically shaped head face toward the disk surface. When the cushion of air caused by the spinning disk is encountered, it resists any further approach by the head. Spring pressure is designed to just equal the opposing cushion pressure (function of disk r/min) at the required height. As a result, the head flies. However, if the spring pressure exceeds the cushion pressure, which would happen if the disk cartridge lost enough speed, the head stops flying and contacts the disk surface, causing damage to the head and the disk surface.

The floating arm is designed to maintain a constant loading force. While the heads are retracted, head cams on the cam mount bear against the floating arm cam surfaces. The cams counter the loading force and force the heads to the unloaded position. As the carriage moves forward, the cam surface rides off the cam just after the read/write head moves out over the disk surface. The loading force now moves the head face toward the air layer on the surface of the spinning disk until the opposing forces achieve a state of equilibrium. The heads are thus loaded and the carriage is forced to continue toward the spindle until the forward end of travel (FEOT) signal occurs.

4.7 HEAD RETRACT

Two situations will cause the read/write heads to be moved back past the loading ramp. These two situations are normal and emergency retract.

4.7.1 NORMAL RETRACT

Normal retract will occur when the START/STOP switch is returned to the STOP position. This causes the disabling of SERVO EN (C.B. A10). When SERVO EN goes to zero, the address register (S.B. U4, U5, U6, U15) is set to 424 as in RTZS. However, the track counter (S.B. U18, U19, U20) is set to 440. Since counting is inhibited under this circumstance, the carriage will move outboard at a constant

rate of 16 ips (406 mm/sec). When the carriage contacts the reverse stop microswitch, (A4SW1), REV STOP (P.A. J2-12) is generated. One-half second after the occurrence of REV STOP the power amplifier is disabled.

4.7.2 EMERGENCY RETRACT

In the event of a damaging power failure or the spindle motor velocity drops below the tolerance limit, an emergency retract is initiated. Either of these conditions de-energizes the voice coil relay (P.B. K1). The openings of K1 initiates a 0.5 second delay which allows the carriage, by means of spring loaded effect of the voice coil connections to move to a position away from the unloading ramp. After the delay, triac, Q5 (P.B.) discharges a 100,000 Uf Capacitor (P.B.) through the voice coil thus unloading and retracting the heads.

4.8 CYLINDER LOCATING AND POSITIONING

The system for locating and counting tracks (cylinders) on the disk is comprised of a position encoder or transducer and an up/down counters.

4.8.1 CYLINDER LOCATIONS

Cylinder locations are determined by counting the zero crossings of the COS signal from a reference point using an up/down counter system (S.B. U18, U19, U20). A cylinder is defined as the space between two transitions of COS. Whenever the transitions occur a clock pulse (S.B. U32-11 & 6) is generated, causing the cylinder counter to count up or down depending on the state of the up/down signal (S.B. U30-5 & 6). The state of the up/down signal is determined by the logical levels of SIN and COS just prior to the clock pulse. By examining the wave forms in Figure 4-6, it can be seen that whenever the expression SIN COS is true, the count will be down and whenever the expression is false, the count will be up. An odd numbered cylinder is defined as one where the slope of SIN signal is positive displacement and an even numbered track is one where the slope of SIN is negative for positive displacement. Initial location of the track is established during FIRST SEEK.

4.8.2 CYLINDER POSITIONING

The position encoder or transducer, schematically depicted in Figure 4-7 is a capacitively coupled linear displacement transducer. The encoder has two elements. One element (the scale) is rigidly mounted while the other element (the slider) is attached to the carriage-assembly and moves parallel to the scale as the read/write heads are moved in and out. Both the scale and the slider has 0.005 in (0.127 mm) strips of copper, spaced 0.005 in (0.127 mm) apart, which function as plates of a capacitor. The voltage is applied to the copper strips on the scale so that the voltage on adjacent strips is 180° out of phase.

As the slider moves parallel to the scale a sinusoidally 50 kHz signal is coupled to the slider. The amplitude of the sinusoid at any given point is a function of distance of the slider strips with respect to the scale strips with zero crossings occurring every 0.005 in (0.127 mm) (see Figure 4-8). This signal is phase demodulated and peak detected on the I.P. Board. The SIN & COS signal is used to generate clock pulses for counting tracks. The phase relationship of these signals determine the direction of travel of the carriage. The zero crossings of the SIN signal are aligned to coincide with the center of the cylinder locations on the disk.

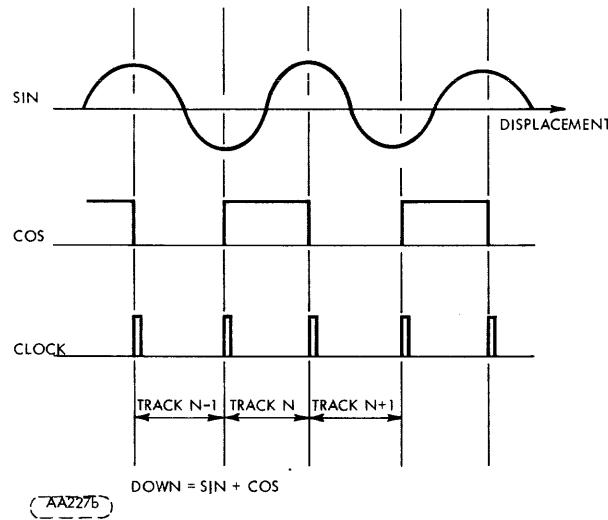


FIGURE 4-6. COUNTING LOGIC

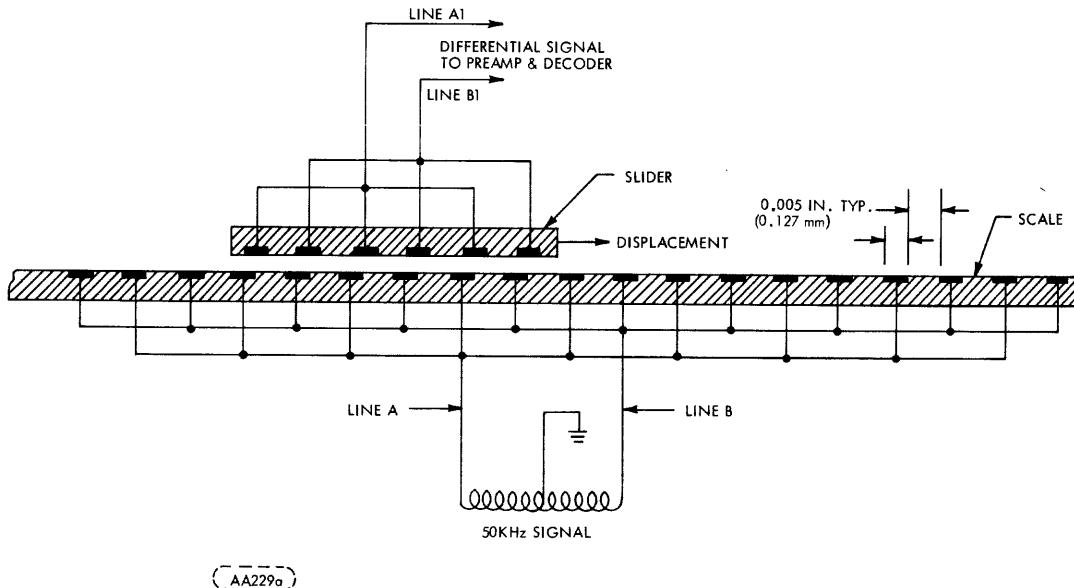


FIGURE 4-7. CAPACITIVELY COUPLED LINEAR DISPLACEMENT TRANSDUCER

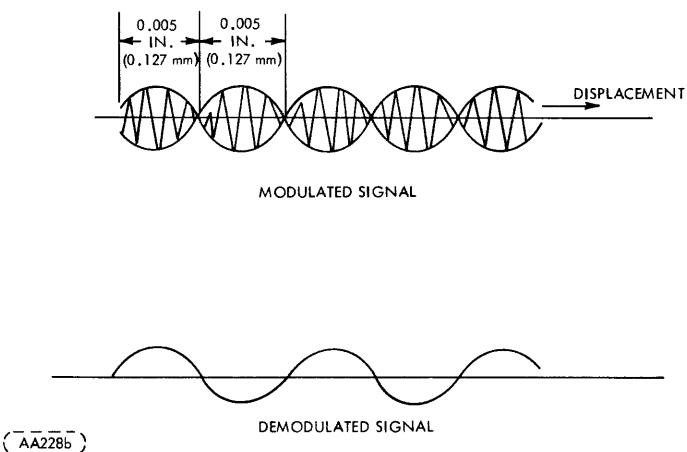


FIGURE 4-8. POSITION TRANSDUCER SIGNAL

5.1 INTRODUCTION

This section contains the intracabling diagram, a key to the logic diagram symbology, a Table of commonly used Integrated Circuits, Printed Circuit Board documentation, and electrical schematics.

Input/Output (I/O) Board documentation is included in the Hardware Product Configurator (HPC) Document Package located in front of the manual. It may be desirable to insert the I/O Board portion in front of this Section.

Also included in the HPC package is a "Device Specification" which defines the correct switch settings for the option selection switches which are located on circuit boards and the terminator resistor values on the I/O Board. The value specified determines the Resistor Module (RM) installed on the I/O Board. The RM Part Numbers are listed in parts Data, Section 8. In addition, documentation describing Special Options, Special Printed Circuit Boards, and other customer unique features is included in the HPC package.

5.2 INTRACABLING DIAGRAM

The intracabling diagram (Figure 5-1) details the cable connection between each major assembly and the mother board. Sheet 2 of Figure 5-1 is to be used when tracing signals between the Fault Isolation Retention Module (FIRM) and the unit.

5.3 CIRCUIT BOARD DOCUMENTATION

Each of the following circuit board figures consists of an assembly drawing and parts list, a connector diagram, and a schematic diagram.

<u>CIRCUIT BOARD TITLE</u>	<u>BOARD IDENT. NO.</u>	<u>FIGURE NO.</u>
Control Board Assembly	95207509	5-15
Sector Board Assembly	75883201	5-16
Servo Board Assembly	77831401	5-17
Data Recovery Board Asm.	75297105	5-18
Data Recovery Board Asm.	75886537	5-18
Read/Write Erase (2400 r/min)	75891100	5-19
Read/Write Erase (1500 r/min)	75880500	5-19
AGC Servo Preamp Bd Asm	77658600	5-20
Power Supply Board No. 1	77830321	5-21
Power Supply Board No. 2	77830330	5-22
Spindle Motor Brake Asm	75866206	5-23
Switch Board Assembly	75299103	5-24
Switch Board Assembly	75299102	5-24
Component Board - Mother	75870203	(For reference only 5-1)

5.3.1 CONNECTION DIAGRAMS

Logic signals can be traced throughout the unit by using the circuit board connector diagrams. Each diagram lists the sheet number(s) of the accompanying schematic and the next connector diagram(s) figure number on which the signal can be found.

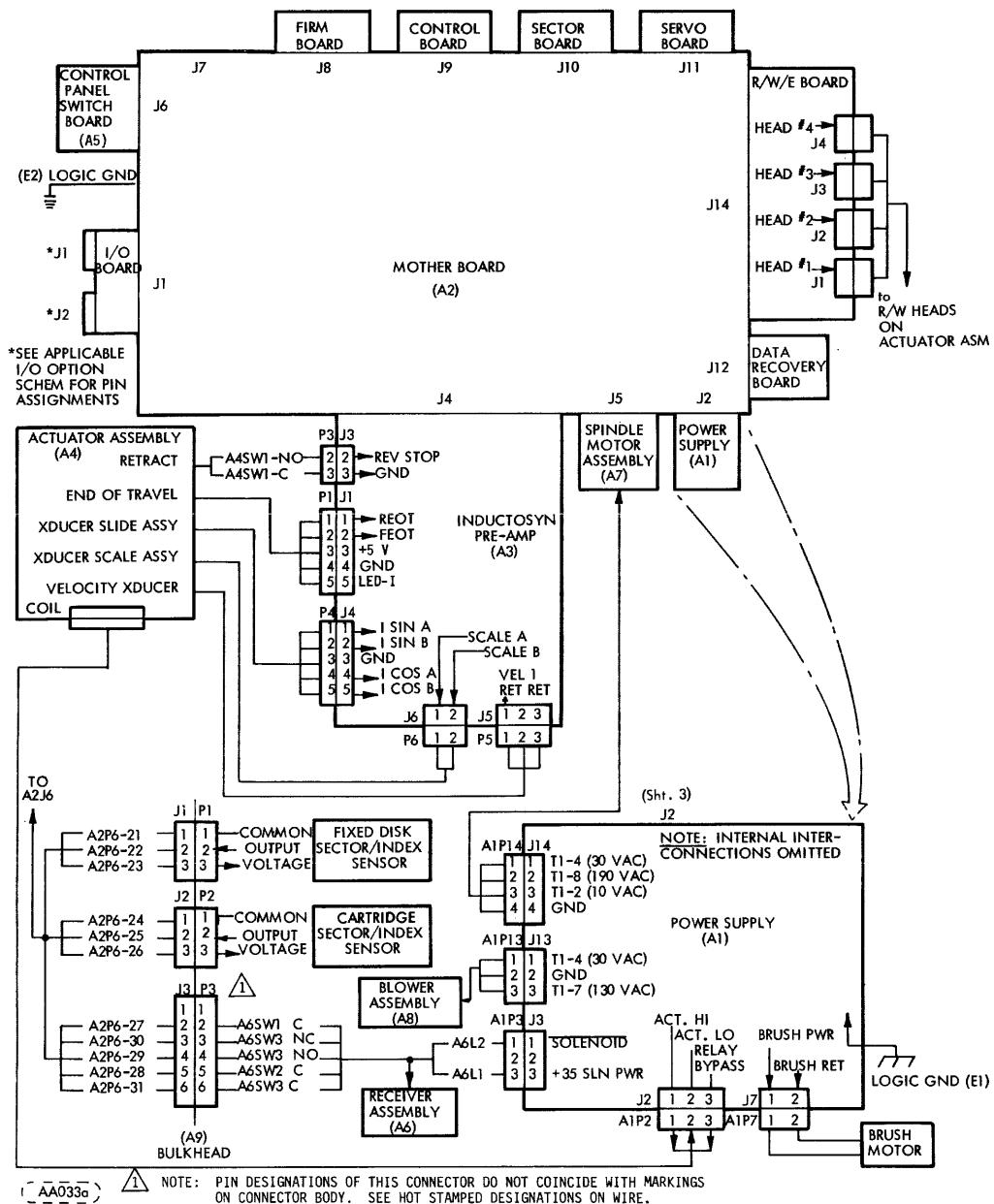


FIGURE 5-1. DETAILED INTRACABLING DIAGRAM (SHEET 1 OF 2)

FIRM BOARD

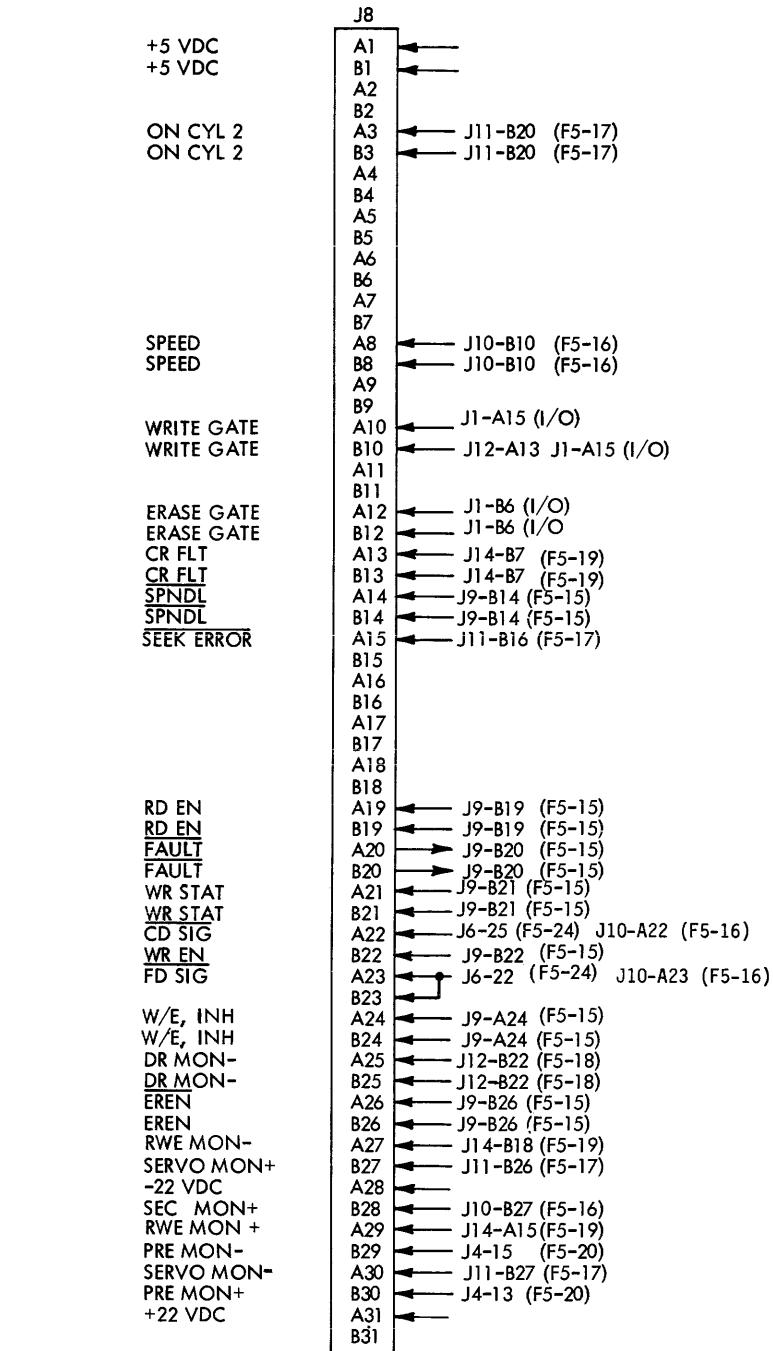
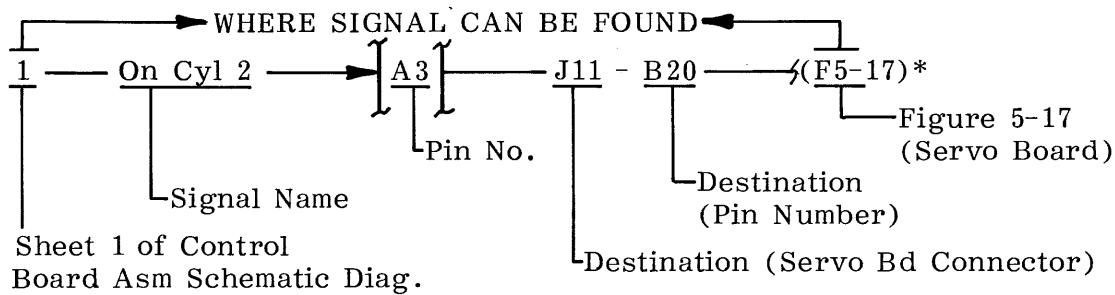


FIGURE 5-1. DETAILED INTRACABLING DIAGRAM (SHEET 2 OF 2)

EXAMPLE: Figure 5-15 Control Board Assembly



*(I/O)

I/O Board (refer to HPC package Located in front of manual)

5.3.2 SCHEMATIC DIAGRAMS

Multiple sheet (SET of pages) circuit board schematics are sequentially numbered (1, 2, 3 etc) in the upper right-hand corner of each schematic sheet. Symbology for sheet to sheet connections and board to board connections are as follows:

- Sheet to Sheet ON PAGE example:

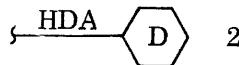


1 = Signal "from" sheet 1 of SET

D = ON sheet reference (from sh 1 of set)

HDA = Signal name (from sh 1 of set, location \boxed{D})

- Sheet to Sheet OFF PAGE example:



2 = Signal "to" sheet 2 of SET

D + OFF sheet reference (to sheet 2 of set)

HDA = Signal name (to sheet 2 of set, location \boxed{D})

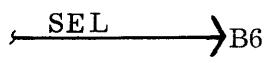
- Board to Board ON PAGE example:



B6 = Pin Location of board connector
(Ref Para. 5.3.1)

SEL = Signal name (Ref Para. 5.3.1)

- Board to Board OFF PAGE example:



B6 = Pin location of board connector
(Ref para. 5.3.1)

SEL = Signal name (Ref para. 5.3.1)

5.4 MAJOR ELECTRICAL DIAGRAMS

Figure Title	Figure Number
AC-DC Power Distribution:	
● Without Dynamic Brake	5-25
● With Dynamic Brake	5-26
● Without Dynamic Brake and Special RFI Filters	5-27
● Without Dynamic Brake and with Filters & Power Input Assembly	5-28
● With Dynamic Brake and Spl RFI Filters	5-29
Baseplate Electronics	5-30

5.5 LOGIC DIAGRAM SYMBOLOGY

5.5.1 GENERAL INFORMATION

Logic symbols are drawn with inputs on the left and outputs on the right whenever space and layout permit.

Power supply connections, discrete timing components, etc., may be shown connected to the top or bottom of the symbol. Unused pins and unused elements need not be shown. Figure 5-2 illustrates functionally equivalent symbols.

5.5.2 GENERAL SIGNAL ANNOTATION

S = Set input to bistable device

R = Reset (Clear) input to bistable device

G = Gate input has no direct action on circuit, but must be present before inputs (and/or outputs) are able to function. If more than one gate is used a numeric suffix is added (G1, G2, etc.).

D = Identifies a signal which requires the presence of another signal to perform its function.

C = Strobe pulse. Usually used to gate "D" inputs into a bistable device.

T = Toggle input. Bistable device changes state each time "T" assumes its specified state.

J = J output conditioned by leading edge of dynamic toggle (G).

K = K output conditioned by leading edge of dynamic toggle (G).

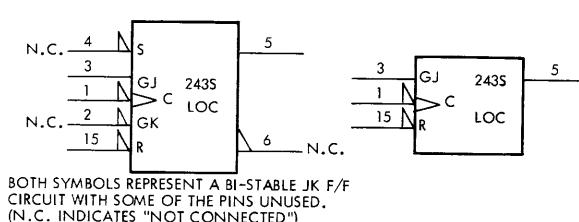


FIGURE 5-2. FUNCTIONALLY EQUIVALENT SYMBOLS

5.5.3 SYMBOLOGY

Logic Symbols are described in Table 5-1.

TABLE 5-1. LOGIC SYMBOLOGY

	INDICATES NON-STANDARD LOGIC LEVELS
	INDICATES NON-LOGIC (ANALOG) SIGNALS
	TEST POINT
	INDICATES TWO OR MORE LINES WHICH CARRY THE SAME INFORMATION (USUALLY DIFFERENTIALLY)
	WIRED "AND" CIRCUIT
	DYNAMIC INPUT ACTIVE DURING THE TRANSITION FROM LOW TO HIGH STATE
	DYNAMIC INPUT ACTIVE DURING THE TRANSITION FROM HIGH TO LOW STATE
	COMMON CONTROL BLOCK INPUTS TO THE COMMON CONTROL BLOCK AFFECT EVERY TERM IN THE ARRAY. INPUTS TO EACH TERM AFFECT ONLY THAT TERM.
	LIGHT EMITTING DIODE
	TRIAC

(AA142c)

5.5.4 FUNCTION SYMBOLOGY

Function symbols are as described in Table 5-2.

TABLE 5-2. FUNCTION SYMBOLS

	GATE INPUT
	OSCILLATOR
	AMPLIFIER
	"AND" GATE
	"OR" GATE
	"EXCLUSIVE OR"
	FUNCTION GENERATOR
	LEVEL CONVERSION
	SCHMITT TRIGGER
	SINGLE SHOT
	SUMMING CIRCUIT
	THRESHOLD (ANALOG OUTPUT) OR COMPARATOR (BINARY OUTPUT) PRODUCES A CHANGE IN THE OUTPUT SIGNAL WHEN INPUT EXCEEDS A PREDETERMINED LEVEL " m ".
	DATA INPUT
	CONTROL or CLOCK INPUT
X → Y	DECODER
# ↗ A	DIGITAL TO ANALOG CONVERTER
mVR	VOLTAGE REGULATOR OUTPUT VALUE " m "
MUX	MULTIPLEXER
SR	SHIFT REGISTER
CNTR	COUNTER
ALU	ARITHMETIC LOGIC UNIT
RCVR	RECEIVER
(M)	ANNOTATION RESTRICTING THE NUMBER OF COINCIDENT INPUTS OR OUTPUTS GROUPED BELOW IT ACCORDING TO M. EXAMPLE: (≤ 1) MEANS ONLY ONE OR LESS COINCIDENT INPUT OR OUTPUT BELOW ALLOWED.

(AA142d)

5.5.5 ABBREVIATIONS

ADR	=	ADDRESS
AMP	=	AMPLIFIER
CART	=	CARTRIDGE
CNT	=	COUNT
COM	=	COMMON
CUR	=	CURRENT
CYL	=	CYLINDER
DIFF	=	DIFFERENCE
E	=	ERASE
EN	=	ENABLE
EOT	=	END OF TRAVEL
FWD	=	FORWARD
HD	=	HEAD
LD	=	LOAD
NC	=	NORMALLY CLOSED
NO	=	NORMALLY OPEN
PWR	=	POWER
R	=	READ
REV	=	REVERSE
RTZS	=	RETURN TO ZERO SEEK
SEL	=	SELECT
T	=	TRACK
T.A.	=	TRACK ADDRESS
VEL	=	VELOCITY
W	=	WRITE

5.5.6 IC INDEX AND CROSS REFERENCE

Refer to Table 5-3 for a cross-reference between CDC element number and manufacturer type.

TABLE 5-3. INTEGRATED CIRCUIT INDEX & CROSS REFERENCE

CDC DESIGNATION		MANUFACTURING DESIGNATION	
ELEMENT	PART NUMBER	TYPE	FUNCTION
4001	15135000	4001	CMOS QUAD 2 INPUT NOR
4002	15133000	4002	CMOS DUAL 4 INPUT NOR
4008	15133100	4008	CMOS 4 BIT ADDER
4011	15133200	4011	CMOS QUAD 2 INPUT NAND
4012	15133300	4012	CMOS DUAL 4 INPUT NAND
4013	15133400	4013	CMOS DUAL "D" FLIPFLOP
4019	15133500	4019	CMOS QUAD AND-OR-SELECT
4023	15133700	4023	CMOS TRIPLE 3 INPUT NAND
4024	15133800	4024	CMOS 7 STAGE BINARY COUNTER
4029	15134100	4029	CMOS PRESETTABLE UP-DOWN COUNTER
4030	15134200	4030	CMOS QUAD EXCLUSIVE OR
4035	15134300	4035	CMOS SHIFT REGISTER
4047	15134600	4047	CMOS RESETTABLE RETRIGGERABLE ONE-SHOT
4049	15134700	4049	CMOS HEX INVERTER BUFFER
4050	15134800	4050	CMOS HEX BUFFER
4053	15135100	4053	CMOS BIDIRECTIONAL ANALOG MUX
4528	15135400	4528	CMOS DUAL RESETTABLE RETRIGGERABLE ONE-SHOT
195	15104300	9602	TTL DUAL RETRIGGERABLE ONE-SHOT
175	15104800	7474	TTL DUAL "D" FLIPFLOP
146S	15109200	74S04	TTL HEX INVERTER
243S	15109400	74S112	TTL DUAL J-K FLIPFLOP
175S	1519700	74S74	TTL DUAL "D" FLIPFLOP
140L	15112300	74L00	TTL QUAD 2 INPUT NAND
146L	15112700	74L04	TTL HEX INVERTER
341	15126600	LM339	QUAD COMPARATOR
327	15132600	MC1468	DUAL 15 VOLT REGULATOR
195L	15150700	96L02	TTL DUAL RETRIGGERABLE ONE-SHOT
146	36187100	7404 /9016	TTL HEX INVERTER
209	36187900	7453	TTL 4 WIDE 2 INPUT AND-OR-INVERT
140H	36188700	74H00	TTL QUAD 2 INPUT NAND
141	50250700	7410 /9003	TTL TRIPLE 3 INPUT NAND
173H	50251700	3004	TTL QUAD 2 INPUT NAND
149H	50251800	3021	TTL QUAD EXCLUSIVE OR
140S	50254600	74S00	TTL QUAD 2 INPUT NAND
141S	50254700	74S10	TTL TRIPLE 3 INPUT NAND
208S	50254900	74S20	TTL DUAL 4 INPUT NAND
140	51651900	7400 /9002	TTL QUAD 2 INPUT NAND
146	51701800	7404 /9016	TTL HEX INVERTER
158	51761500	74161 /9316	TTL 4 BIT BINARY COUNTER

(AA156a)

5.5.7 CIRCUIT TYPES AND WAVEFORMS

Figure 5-3 illustrates a typical integrated circuit. Figures 5-4 through 5-14 illustrates the various types of circuits and associated waveforms.

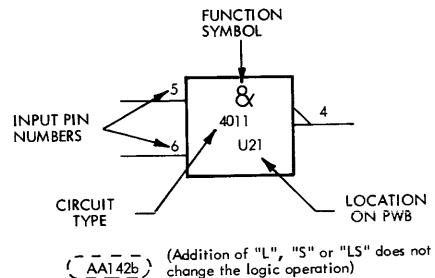


FIGURE 5-3. TYPICAL INTEGRATED CIRCUIT

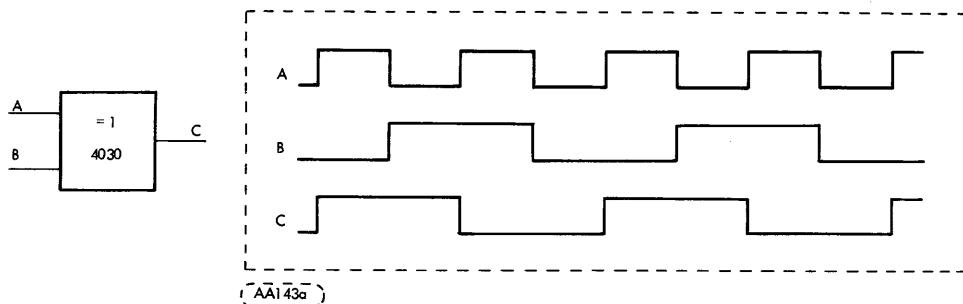


FIGURE 5-4. EXCLUSIVE OR

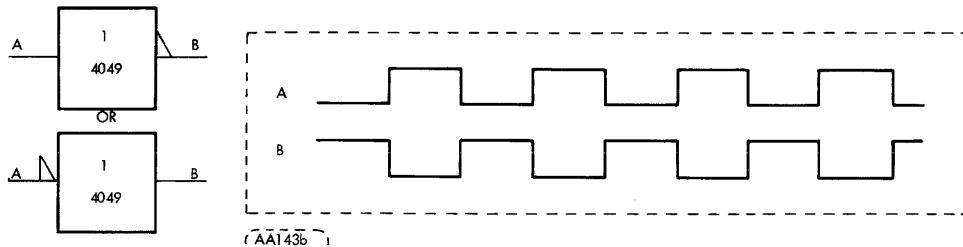


FIGURE 5-5. INVERT

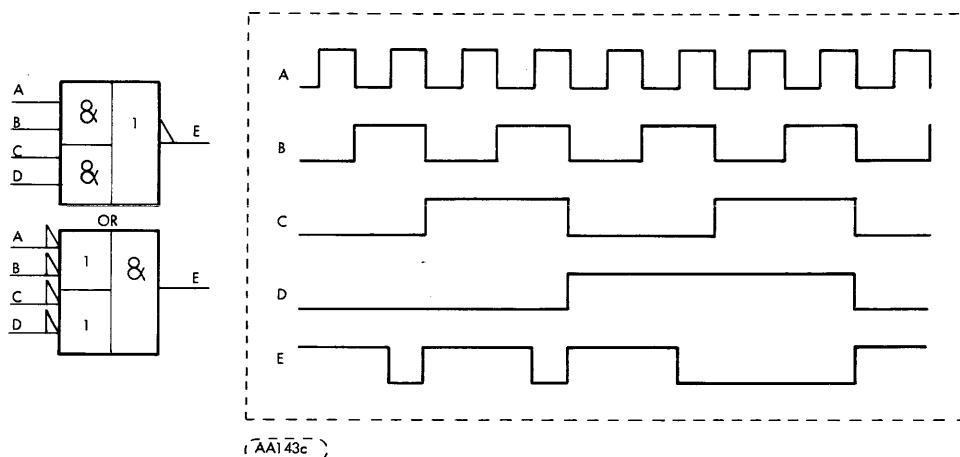


FIGURE 5-6. AND-OR-INVERT

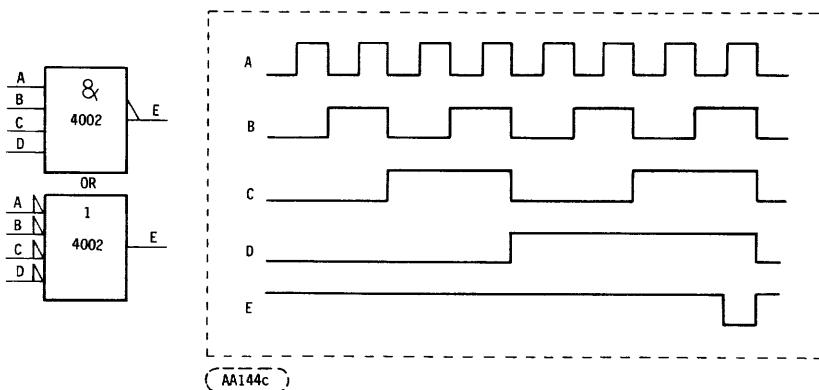
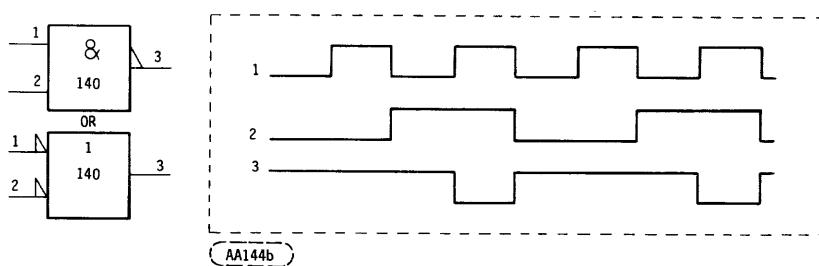
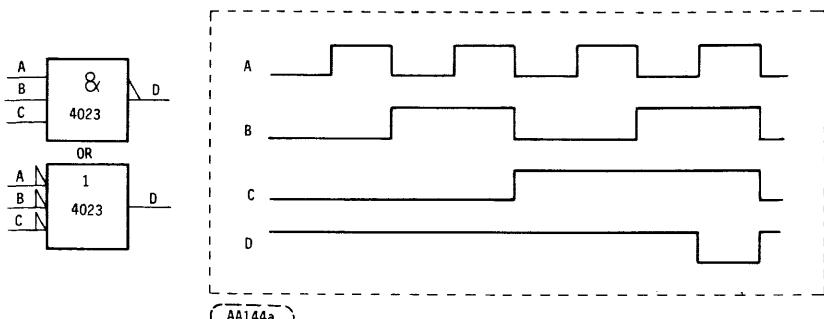


FIGURE 5-7 POSITIVE NAND NEGATIVE NOR

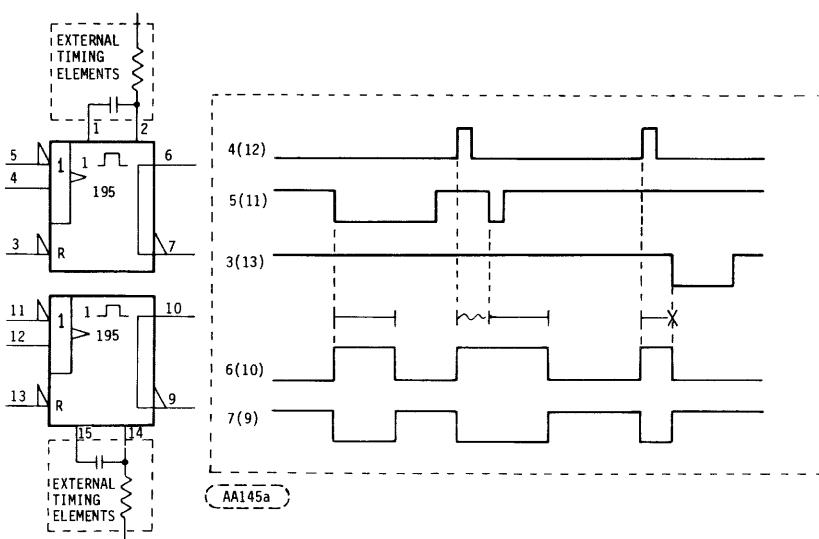


FIGURE 5-8. RETRIGGERABLE, RESETTABLE, MONOSTABLE MULTIVIBRATOR (ONE SHOT)

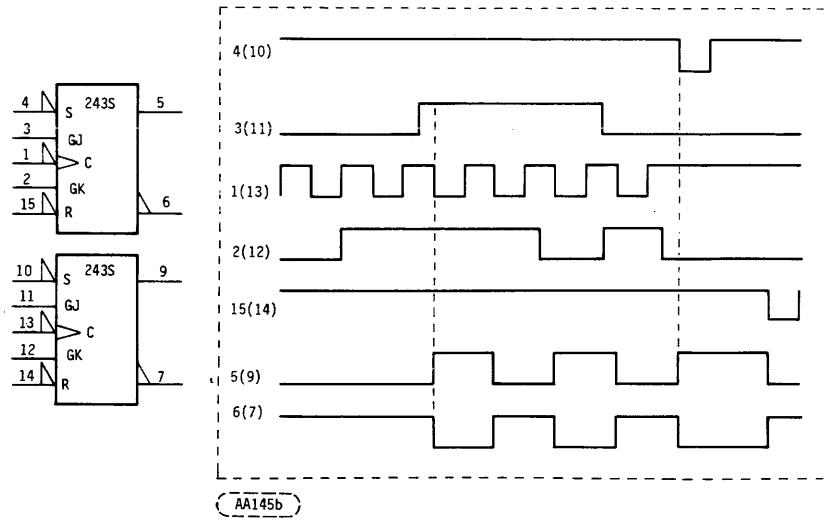


FIGURE 5-9. 'JK' TYPE F/F

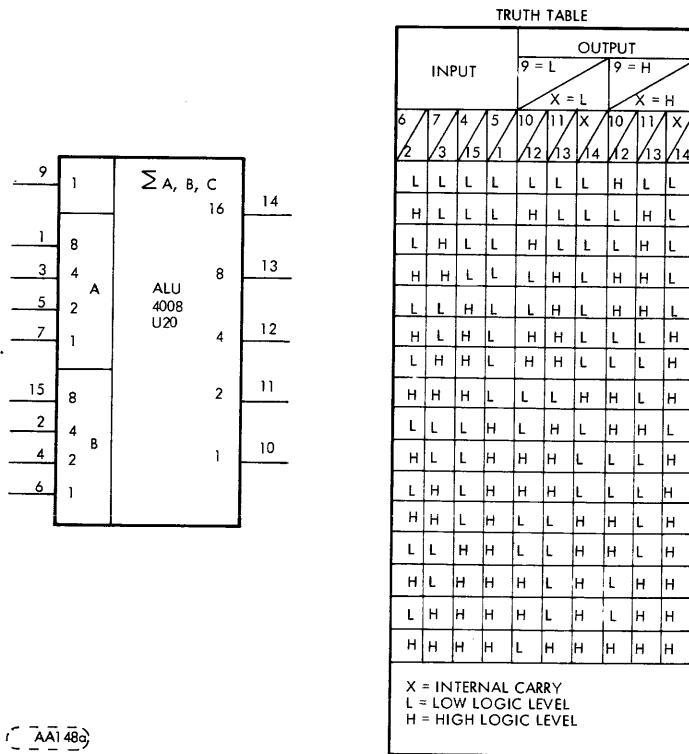


FIGURE 5-10. ADDER

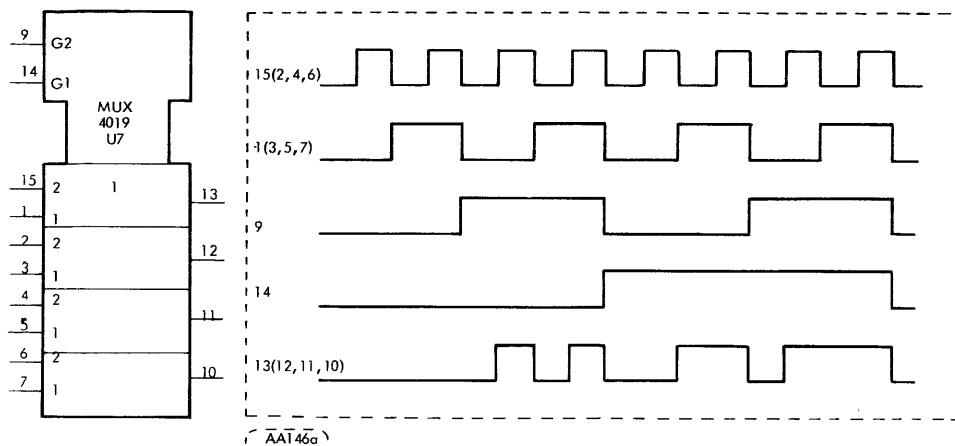


FIGURE 5-11. QUAD 2 X 1 MULTIPLEXER

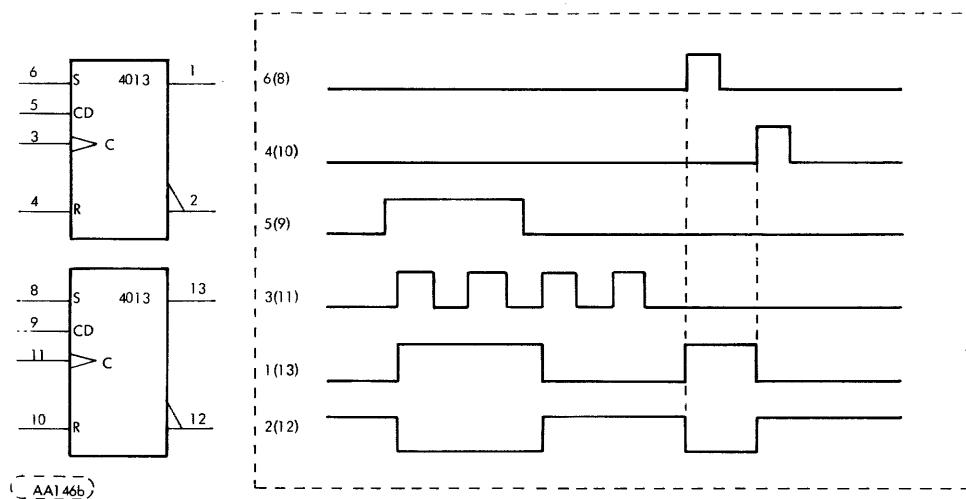


FIGURE 5-12. 'D' TYPE F/F

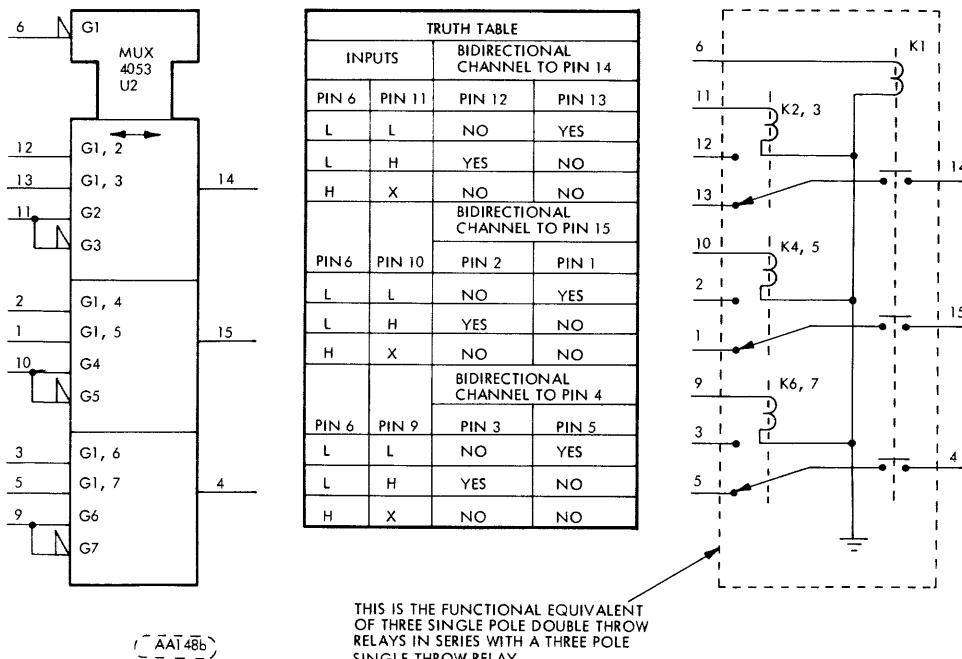


FIGURE 5-13. BIDIRECTIONAL ANALOG MULTIPLEXER

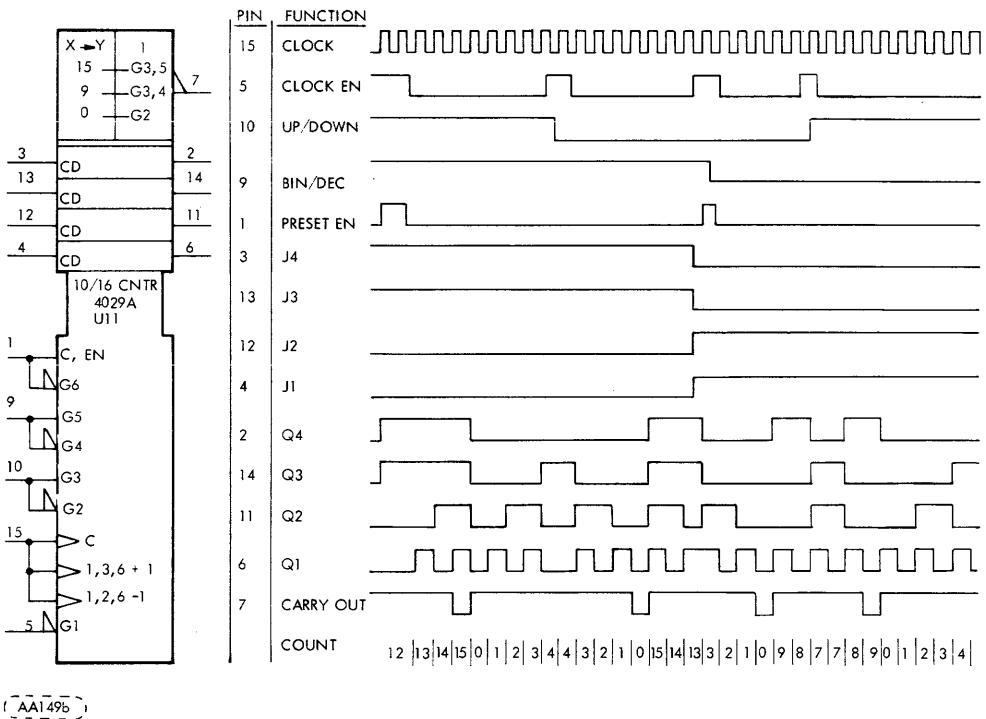
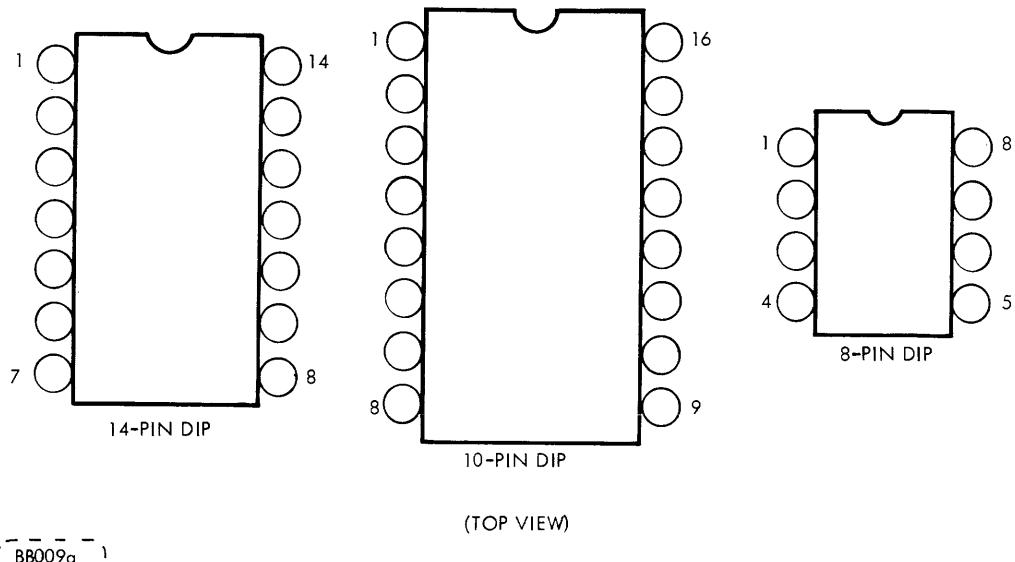
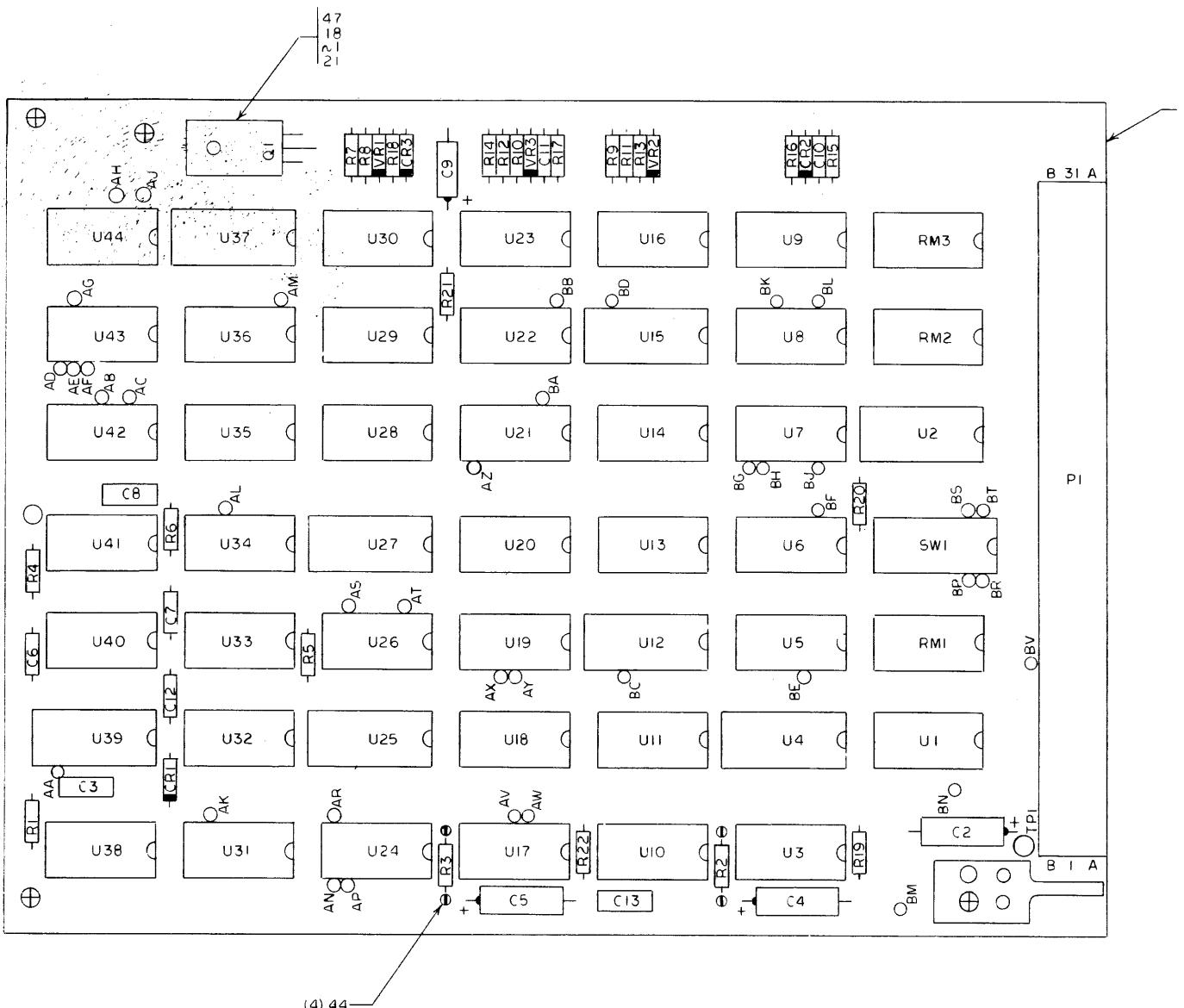


FIGURE 5-14. DECIMAL/BINARY UP/DOWN PRESETTABLE COUNTER

5.5.8 IC PACKAGE LAYOUT

The pin locations for typical Integrated Circuit (IC) packages are shown below.





CAP	ITEM	P.L.
C1	—	
C2	32	
C3	36	
C4	32	
C5	32	
C6	37	
C7	37	
C8	36	
C9	33	
C10	34	
C11	34	
C12	34	
C13	36	
C14	—	
C15	—	
C16	—	

REG	PL ITEM	
VR1	16	
VR2	17	
VR3	17	

TSTR	P L ITEM	Q 1	18
------	-------------	-----	----

RES	PL ITEM
R1	28
R2	43
R3	45
R4	30
R5	30
R6	31
R7	22
R8	22
R9	23
R10	23
R11	26
R12	26
R13	24
R14	24
R15	27
R16	29
R17	27
R18	29
R19	25
R20	25
R21	25
R22	38
R23	—
R24	—

PL DIODE	ITEM	
CRI 1	13	
CRI 2	13	
CRI 3	13	
CRI 4	—	
CRI 5	—	

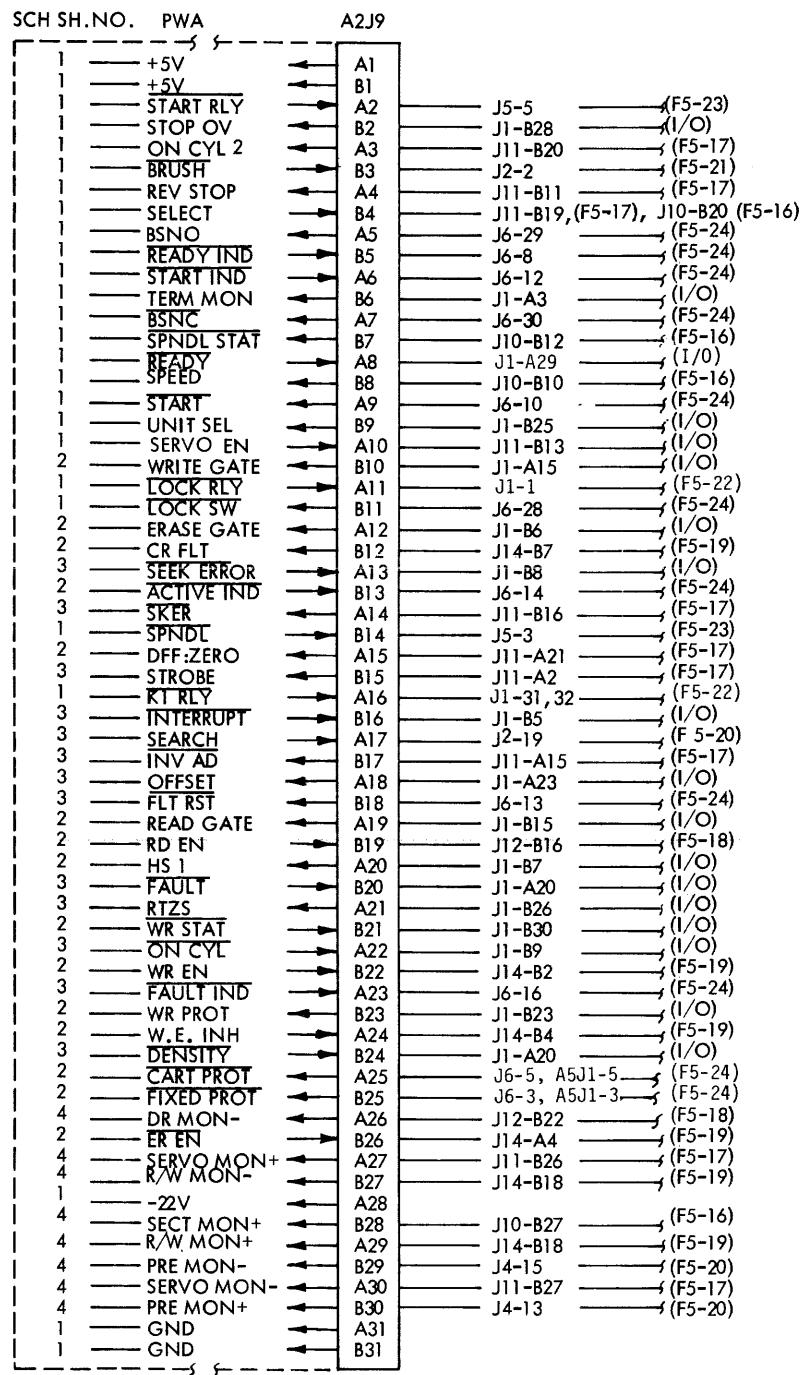
PL ITEM	RES MOD	RMI	RM2	RM3
		15	15	14

FIGURE 5-15. CONTROL BOARD ASSEMBLY (SHEET 1 OF 7)

<u>ITEM NO.</u>	<u>IDENTIFICATION NUMBER</u>	<u>DRAWING TITLE</u>
1	75297509	PWA , Control Board
2	75892420	PWB, Control Board
2	77836070	PWB Socket Connector
3	15134700	IC CMOS 4049B
4	15134800	IC CMOS 4050B
5	15135000	IC CMOS 4001B
6	15133700	IC CMOS 4023B
7	15133300	IC CMOS 4012B
8	15126600	IC LM339
9	51768200	IC Dual
10	15133200	CMOS 4011B
11	15133400	CMOS 4013B
12	15134600	IC 4047 CMOS 1 Shot
13	51736700	Diode 1N914A
14	75009901	Res Pac 2% 1.0K (13)
15	75009993	Res Pac 2% 10K (7)
16	50240107	Volt Reg 5.6 V 5%
17	50240101	Diode Zener 3.3V
18	75752400	Transistor Power
19	83452205	Switch-8 Position
21	93640012	Stud-Self Clinching
22	94360344	Res 1/4W 1% 2.87K
23	94360187	Res 1/4W 1% 80.6
24	94360287	Res 1/4W 1% 806
25	94360300	Res 1/4W 1% 1.00K
26	94360317	Res 1/4W 1% 1.50K
27	94360346	Res 1/4W 1% 3.01K
28	94360596	Res 1/4W 1% 1.00 Meg
29	94360500	Res 1/4W 1% 100K
30	94360457	Res 1/4W 1% 39.2K
31	92512629	Res 2.2M Ohm 1/4W 1
32	24504353	Cap 10V 20% 33UF
33	24504329	Cap 35V 20% 1.0UF
34	92496211	Cap Non-Elect 470 PF
36	92496046	Capacitor .1UF .50V
37	92496219	Capacitor 2200 PF
38	94360532	Res 1/4W 1% 215K
39	92498021	Terminal, Swaged
40	83479901	Key, Inject. Mold
41	10125703	Scr Flat Hd
42	75312701	Spec-Adhesive, Epoxy
43	92512000	Resistor Test Sel.
44	77612165	Terminal, Slotted
44	75732602	Pin-Wire Wrap-Intch
45	94357500	Resistor Test Sel
47	92583002	Nut Lock

FIGURE 5-15. CONTROL BOARD ASSEMBLY (SHEET 2 OF 7)

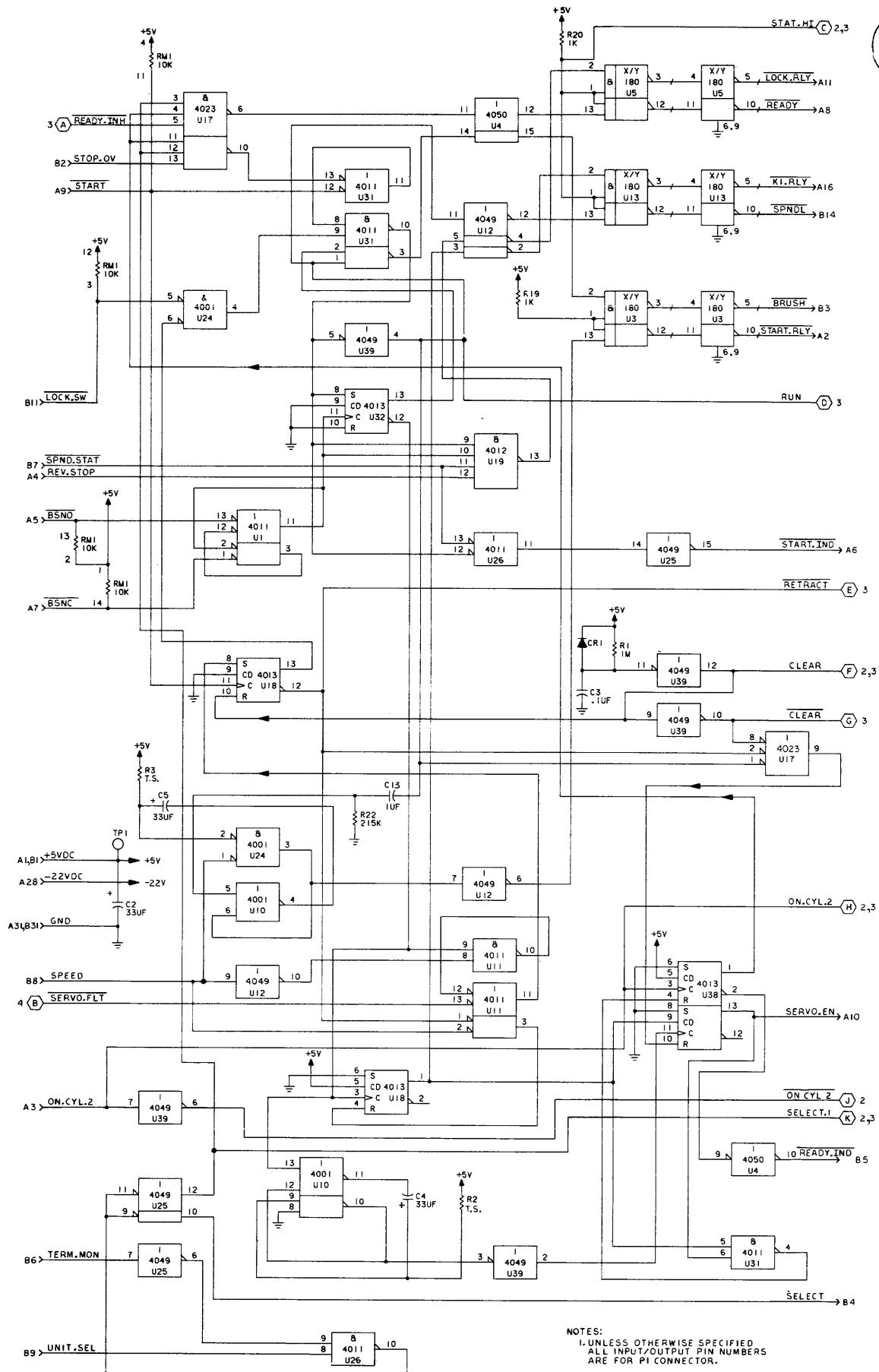
CONTROL BOARD



(AA092a)

FIGURE 5-15. CONTROL BOARD

(SHEET 3 OF 7)



NOTES:
1. UNLESS OTHERWISE SPECIFIED
ALL INPUT/OUTPUT PIN NUMBERS
ARE FOR PI CONNECTOR.

FIGURE 5-15. CONTROL BOARD ASSEMBLY (SHEET 4 OF 7)

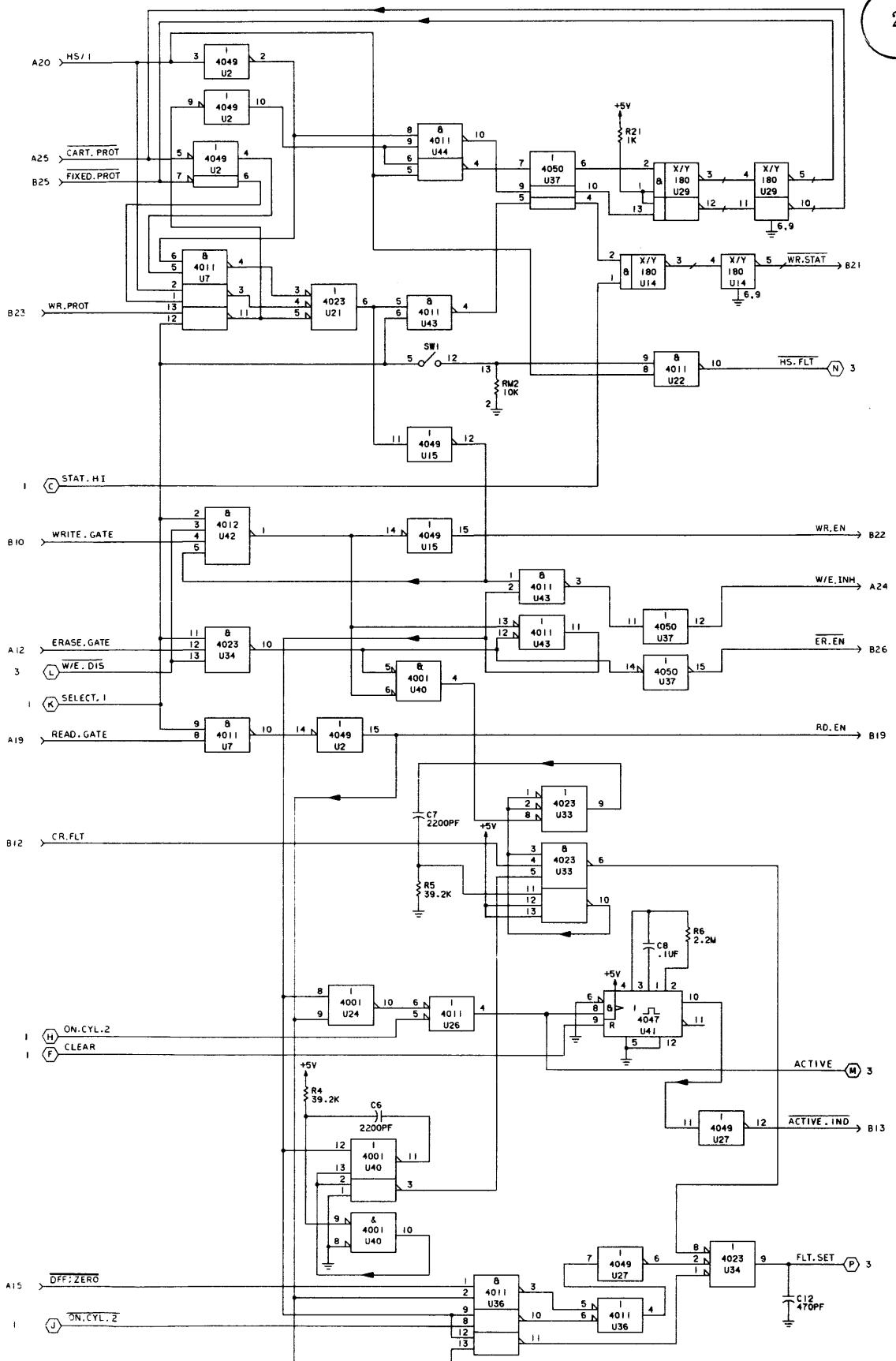


FIGURE 5-15. CONTROL BOARD ASSEMBLY (SHEET 5 OF 7)

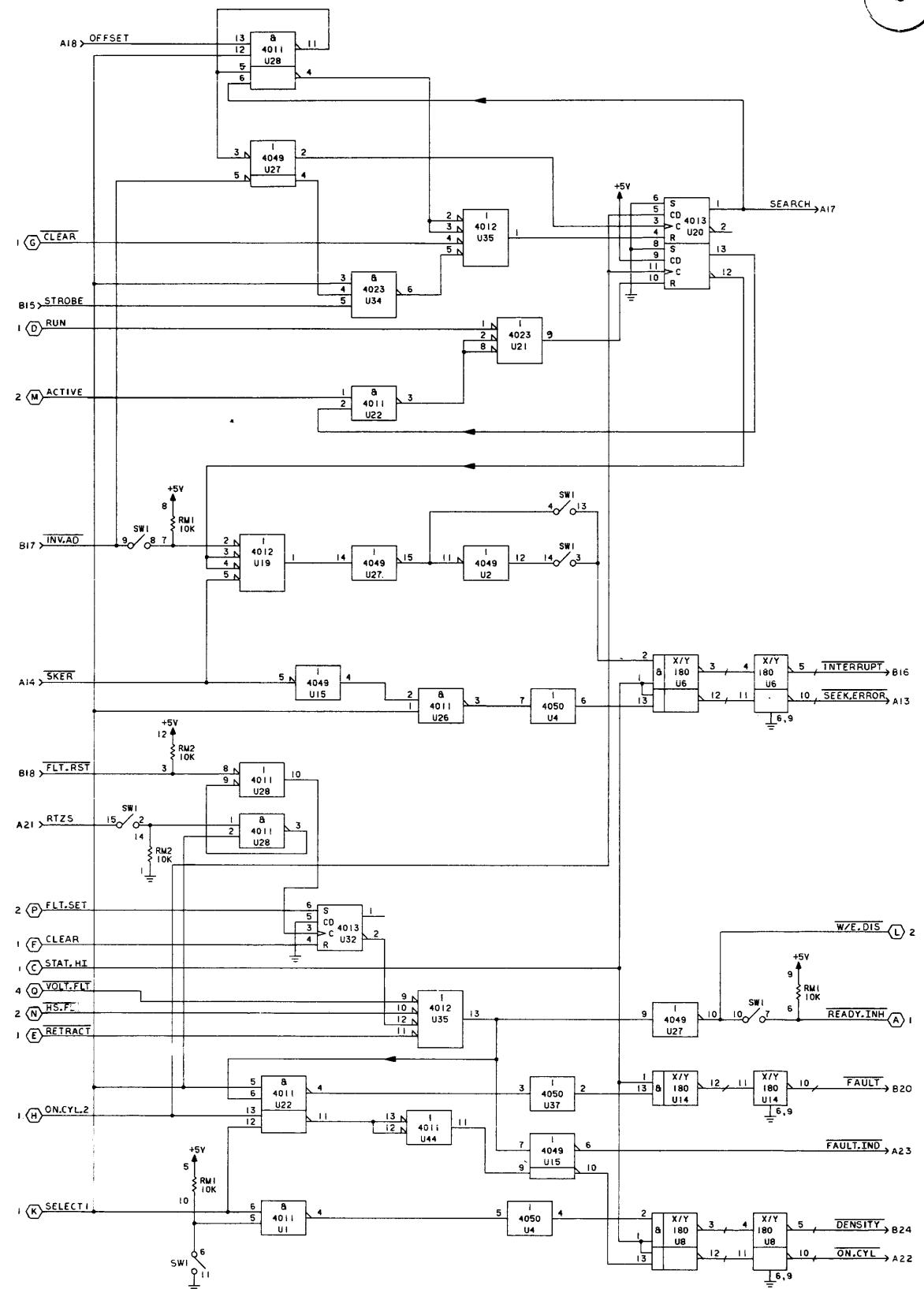


FIGURE 5-15. CONTROL BOARD ASSEMBLY (SHEET 6 OF 7)

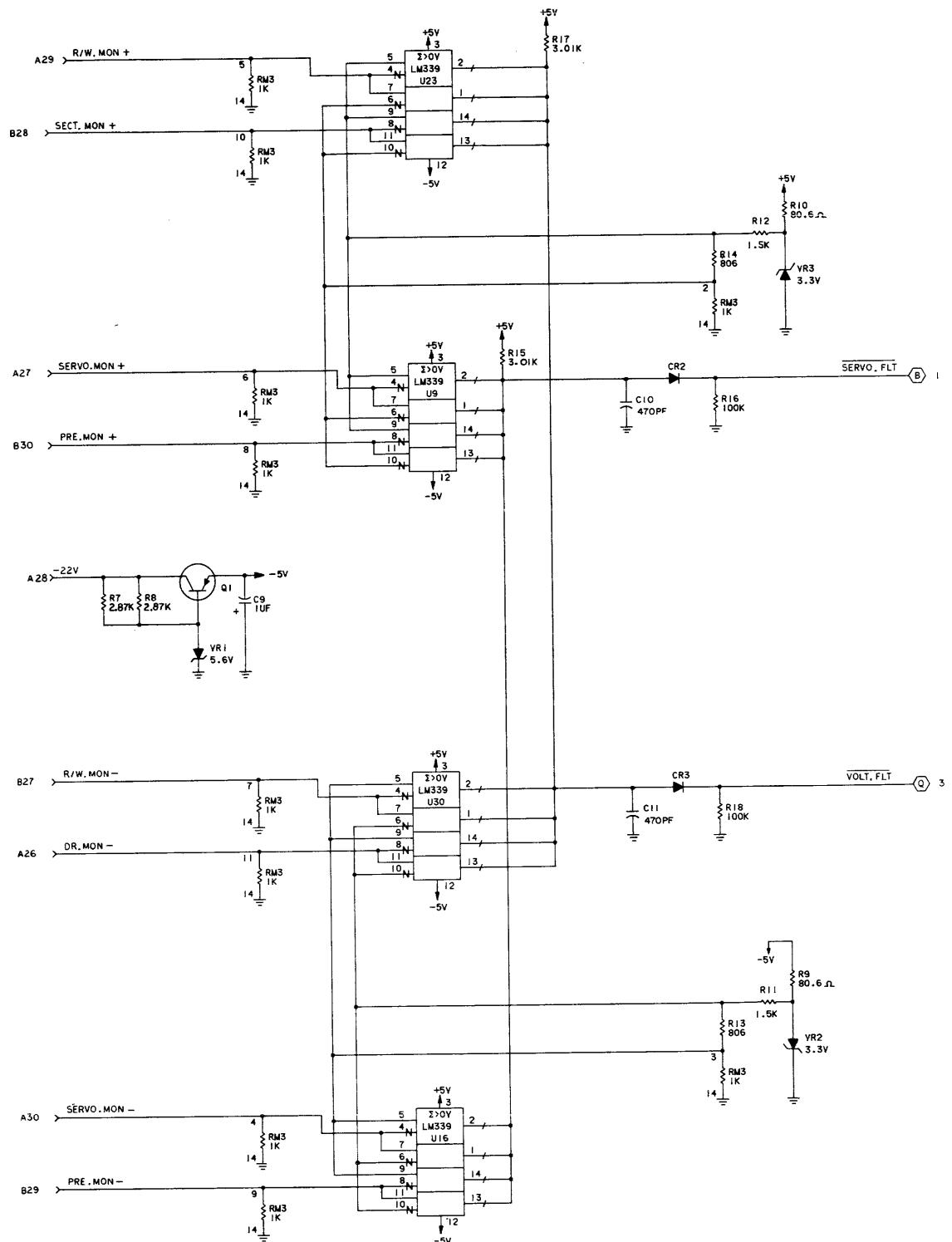


FIGURE 5-15. CONTROL BOARD ASSEMBLY (SHEET 7 OF 7)

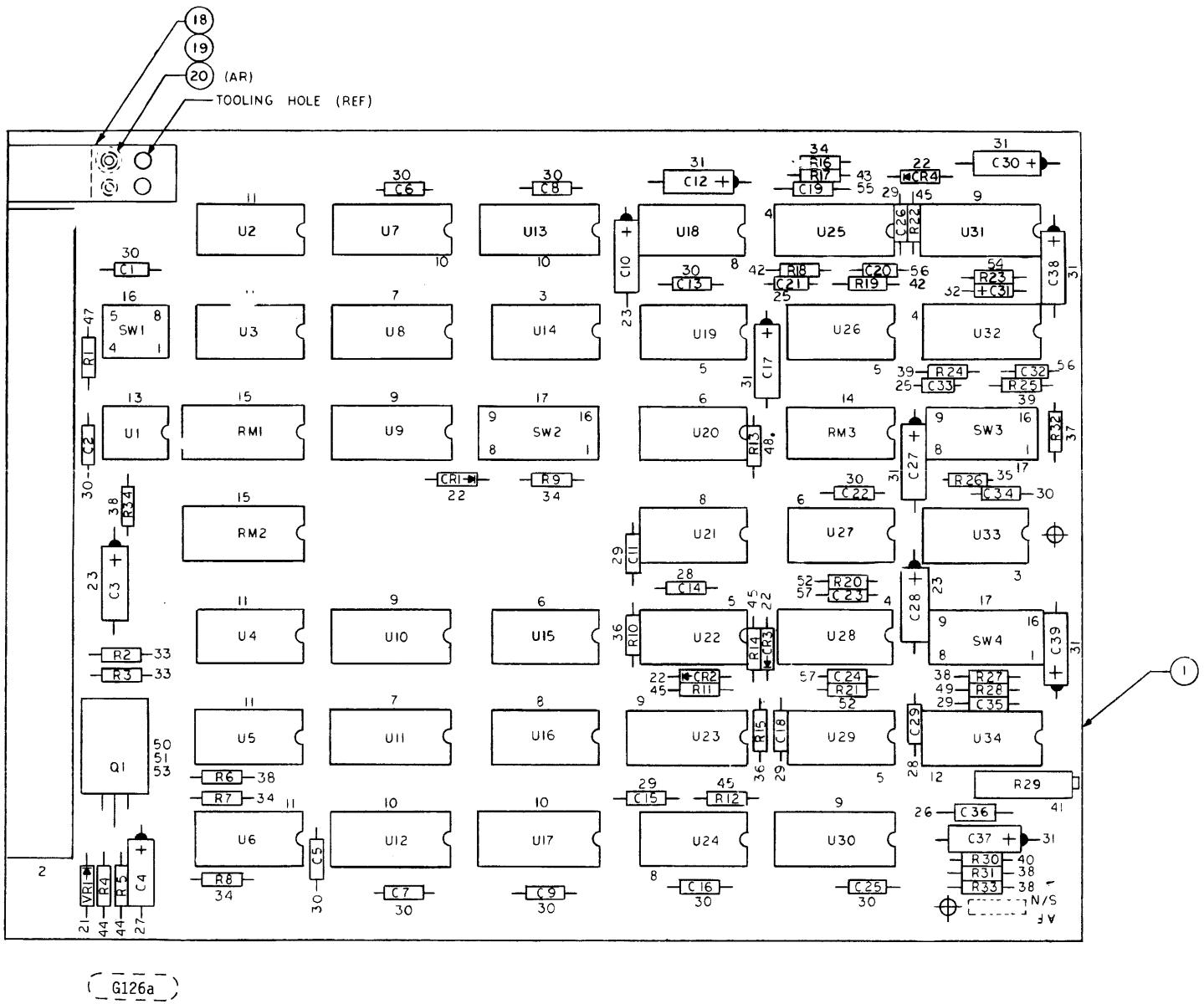


FIGURE 5-16. SECTOR BOARD ASSEMBLY (SHEET 1 OF 8)

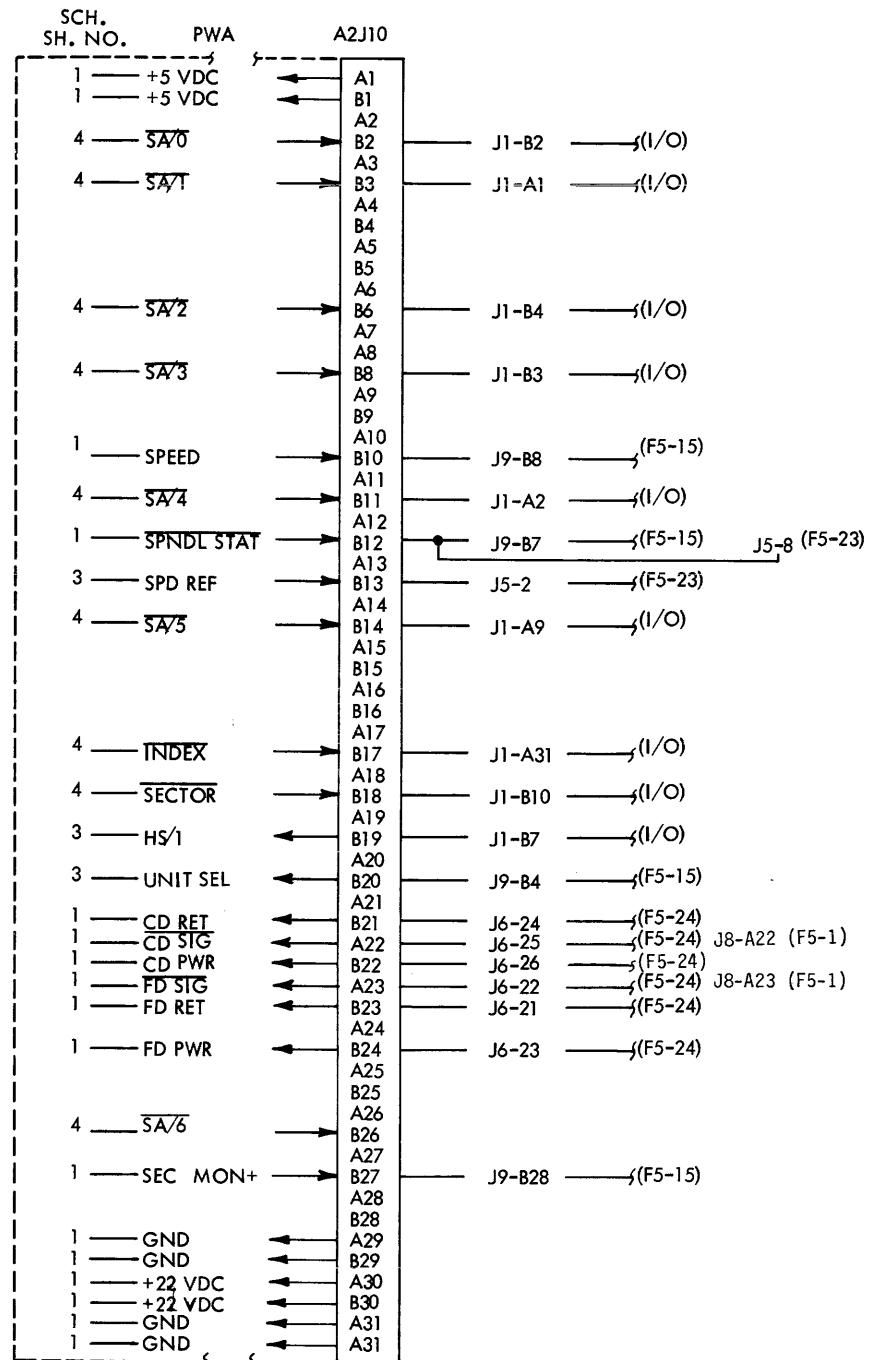
<u>ITEM NO.</u>	<u>IDENTIFICATION NO.</u>	<u>DRAWING TITLE</u>
1	75883201-8	PWA , Sector Level 3
2	75883101-0	PWB Sector Level 3
3	77836070-1	PWB Socket Connector
4	15133800-1	IC CMOS 4024B
5	15164435-8	IC 4538B
6	15135000-6	IC CMOS 4001B
7	15133400-0	IC CMOS 4013B
8	15133500-7	IC CMOS 4019B
9	15133200-4	IC CMOS 4011B
10	15134700-2	IC CMOS 4049B
11	15134100-5	IC CMOS 4029B
12	51768200-1	IC Dual
13	15150700-1	IC, 96 L02
14	15112100-1	IC NE555
15	75009993-9	Res Pac 2% 10K (7)
16	75738605-7	Resistor Module 150
17	83452201-3	Switch-4 Position
18	83452205-4	Switch-8 Position
19	83479701-1	Key, Inject Mold
20	10125703-8	Scr Flat Hd
21	75312701-8	Spec-Epoxy Adhesive
22	50240118-5	Diode Zener 16V
23	51736700-9	Diode 1N914A
24	24504353-4	Cap 10V 20% 33UF
25	94227256-8	Cap 500V 2% 2000
26	15164040-6	Cap 4700
27	24504329-4	Cap 35V 20% 1.0 UF
28	92496205-3	Cap 100V 10% 100
29	92496215-2	Cap 100V 10% 1000
30	92496227-7	Cap 100V 20% .01UF
31	92427039-0	Cap Electro 6.8MF 35
32	17706704-8	Cap 10V 10% 2.2UF
33	94360328-2	Res 1/4W 1% 1.96K
34	94360224-3	Res 1/4W 1% 178
35	94360534-5	Res 1/4W 1% 226K
36	94360416-5	Res 1/4W 1% 14.7K
37	17705946-6	Res 1/4W 5% 2.7Meg
38	24500067-4	Res 1/4W 5% 1.5K
39	94360458-7	Res 1/4W 1% 40.2K
40	94360420-7	Res 1/4W 1% 16.2K
41	77612042-0	Res VAR 3/4W 10% 100K

FIGURE 5-16. SECTOR BOARD ASSEMBLY (SHEET 2 OF 8)

<u>ITEM NO.</u>	<u>IDENTIFICATION NO.</u>	<u>DRAWING TITLE</u>
42	94360487-6	Res 1/4W 1% 80.6K
43	94360400-9	Res 1/4W 1% 10.0K
44	94360300-1	Res 1/4W 1% 1.00K
45	94360454-6	Res 1/4W 1% 36.5K
47	94360100-5	Res 1/4W 1% 10.0
48	17705936-7	Res 1/4W 5% 1.0 Meg
49	94360468-6	Res 1/4W 1% 51.1K
50	75752300-6	Transistor Power
51	93640012-6	Stud-Self Clinching
52	94360463-7	Res 1/4W 1% 45.3K
52	75732602-0	Pin-Wire Wrap, Intch
53	92583002-8	Nut Lock
54	94360447-0	Res 1/4W 1% 30.9K
55	94240429-4	Cap 50V 10% 820
56	94227261-8	Cap 500V 2% 3300
57	77612395-2	Cap 50V 5% 1000

FIGURE 5-16. SECTOR BOARD ASSEMBLY (SHEET 3 OF 8)

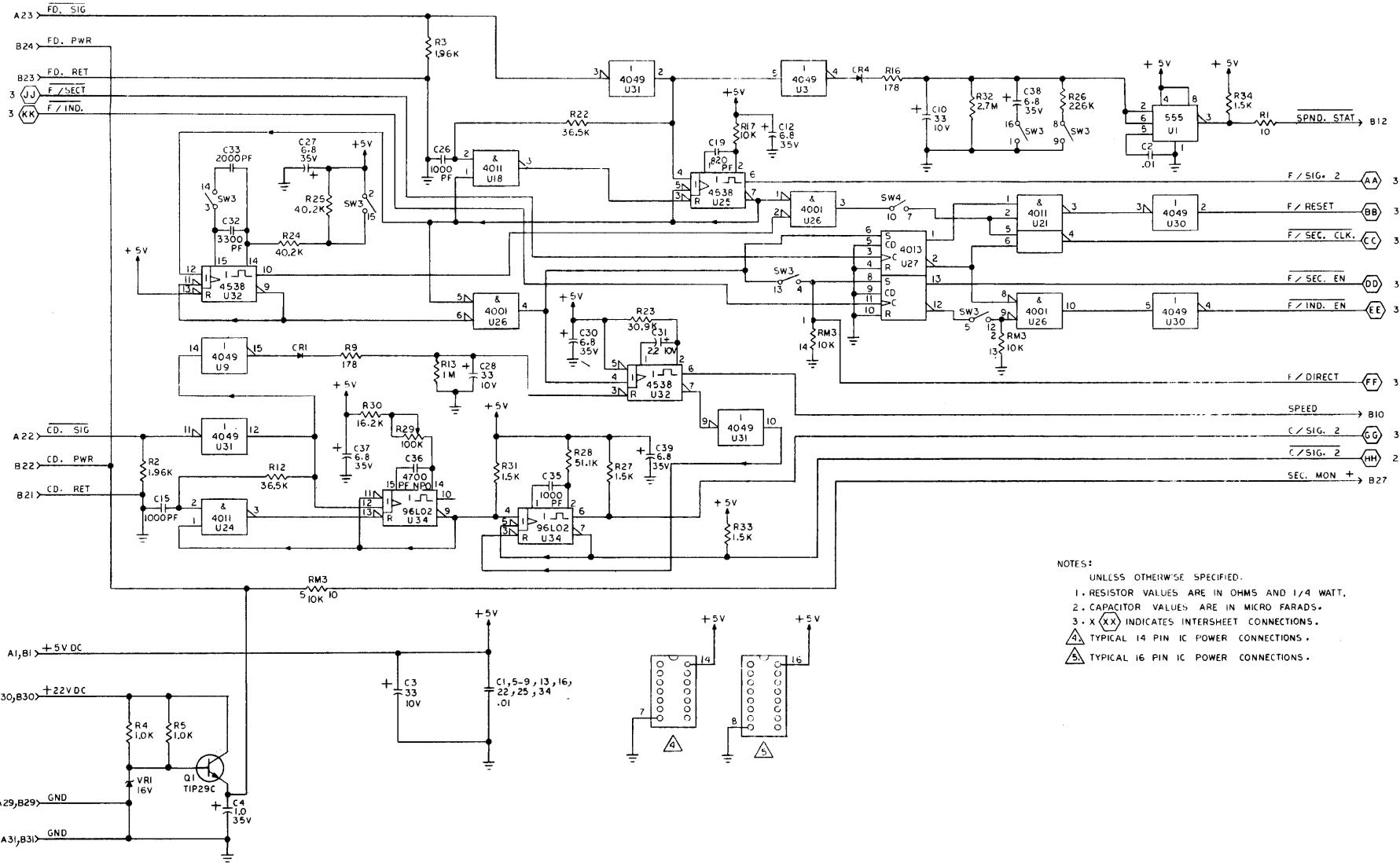
SECTOR BOARD



(AA091b)

FIGURE 5-16. SECTOR BOARD ASSEMBLY (SHEET 4 OF 8)

FIGURE 5-16. SECTOR BOARD ASSEMBLY (SHEET 5 OF 8)



NOTES:

UNLESS OTHERWISE SPECIFIED.

1. RESISTOR VALUES ARE IN OHMS AND 1/4 WATT.
2. CAPACITOR VALUES ARE IN MICRO FARADS.
3. X INDICATES INTERSHEET CONNECTIONS.

▲ TYPICAL 14 PIN IC POWER CONNECTIONS.

△ TYPICAL 16 PIN IC POWER CONNECTIONS.

FIGURE 5-16. SECTOR BOARD ASSEMBLY (SHEET 6 OF 8)

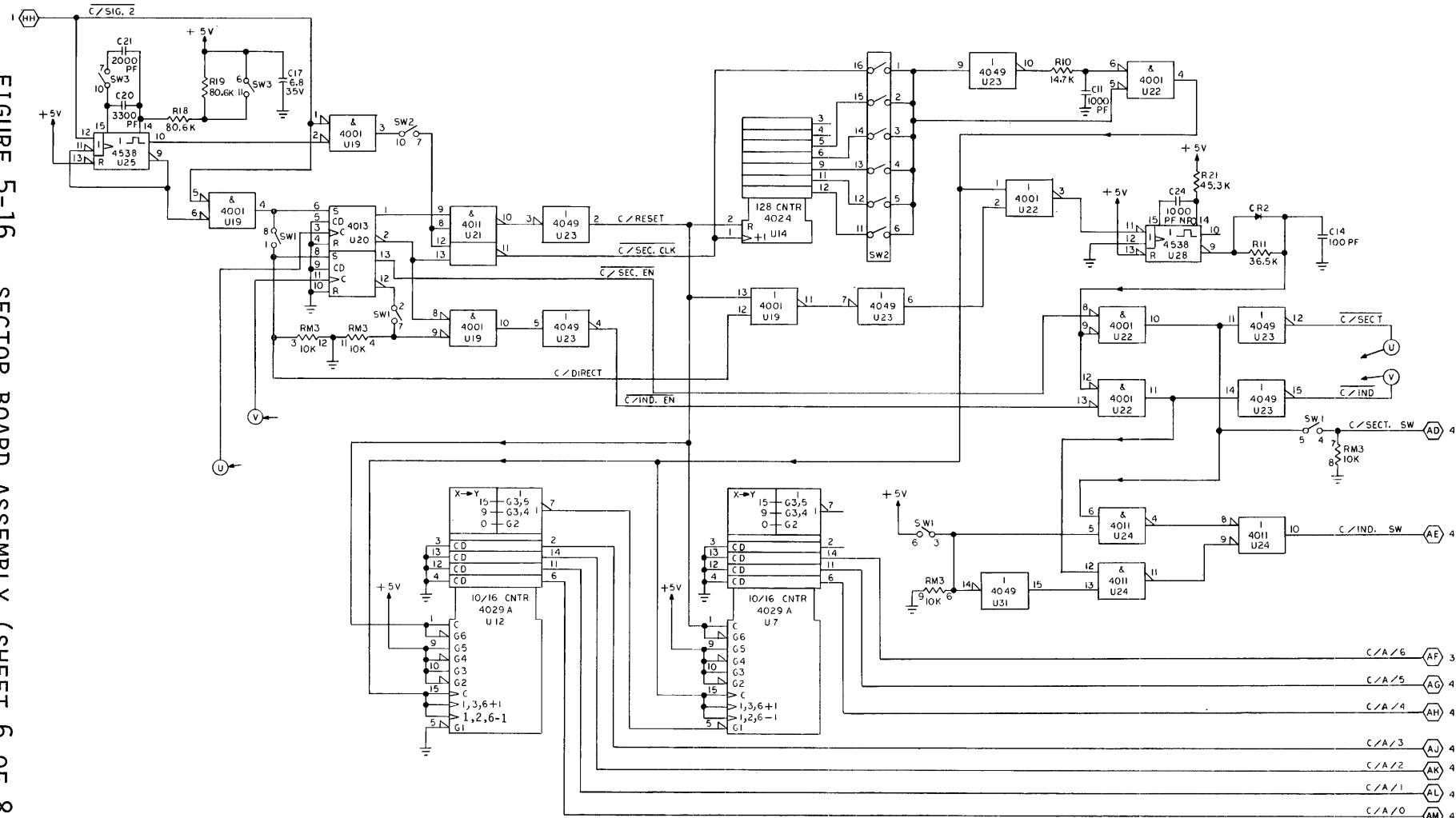


FIGURE 5-16. SECTOR BOARD ASSEMBLY (SHEET 7 OF 8)

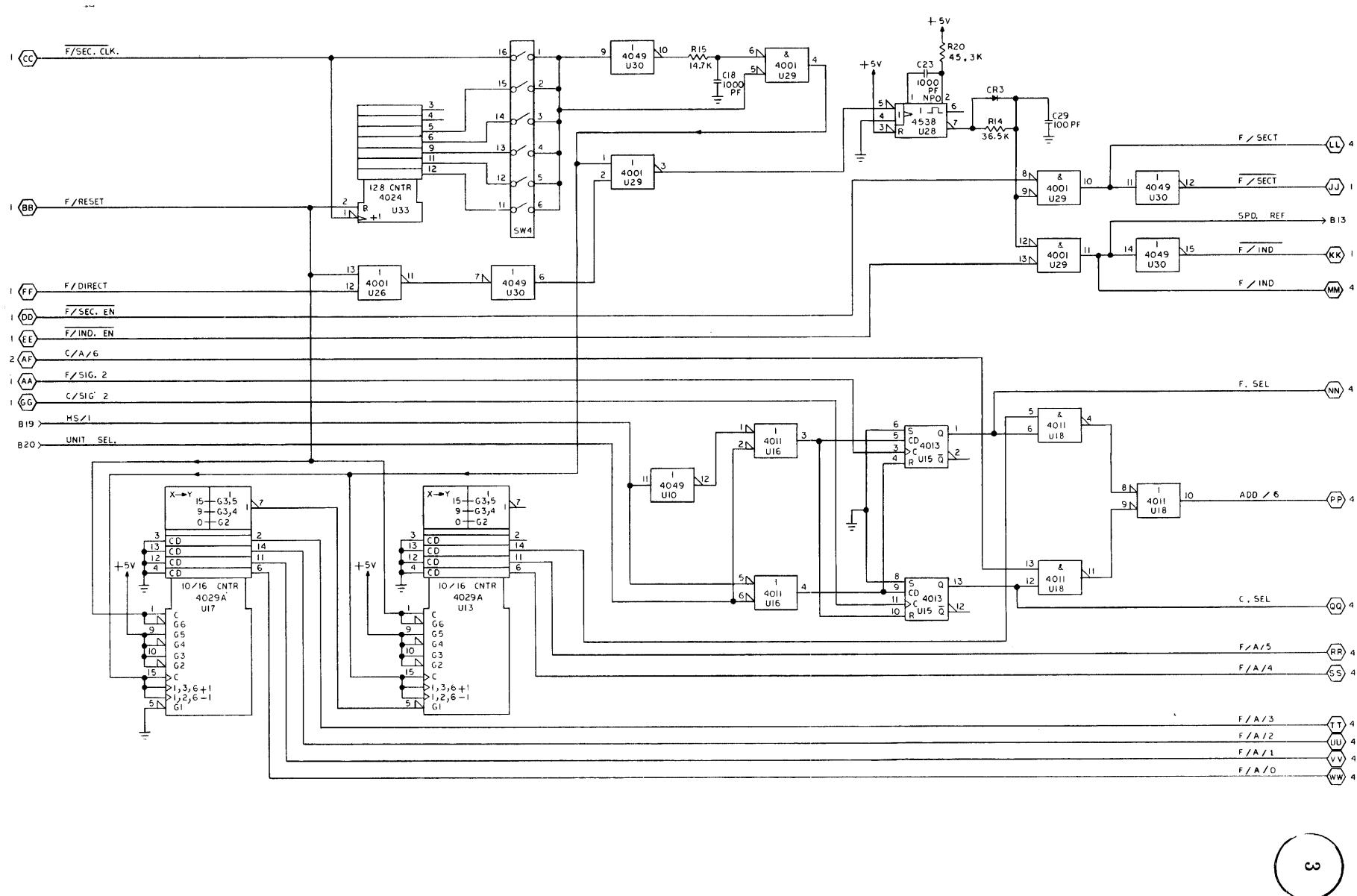
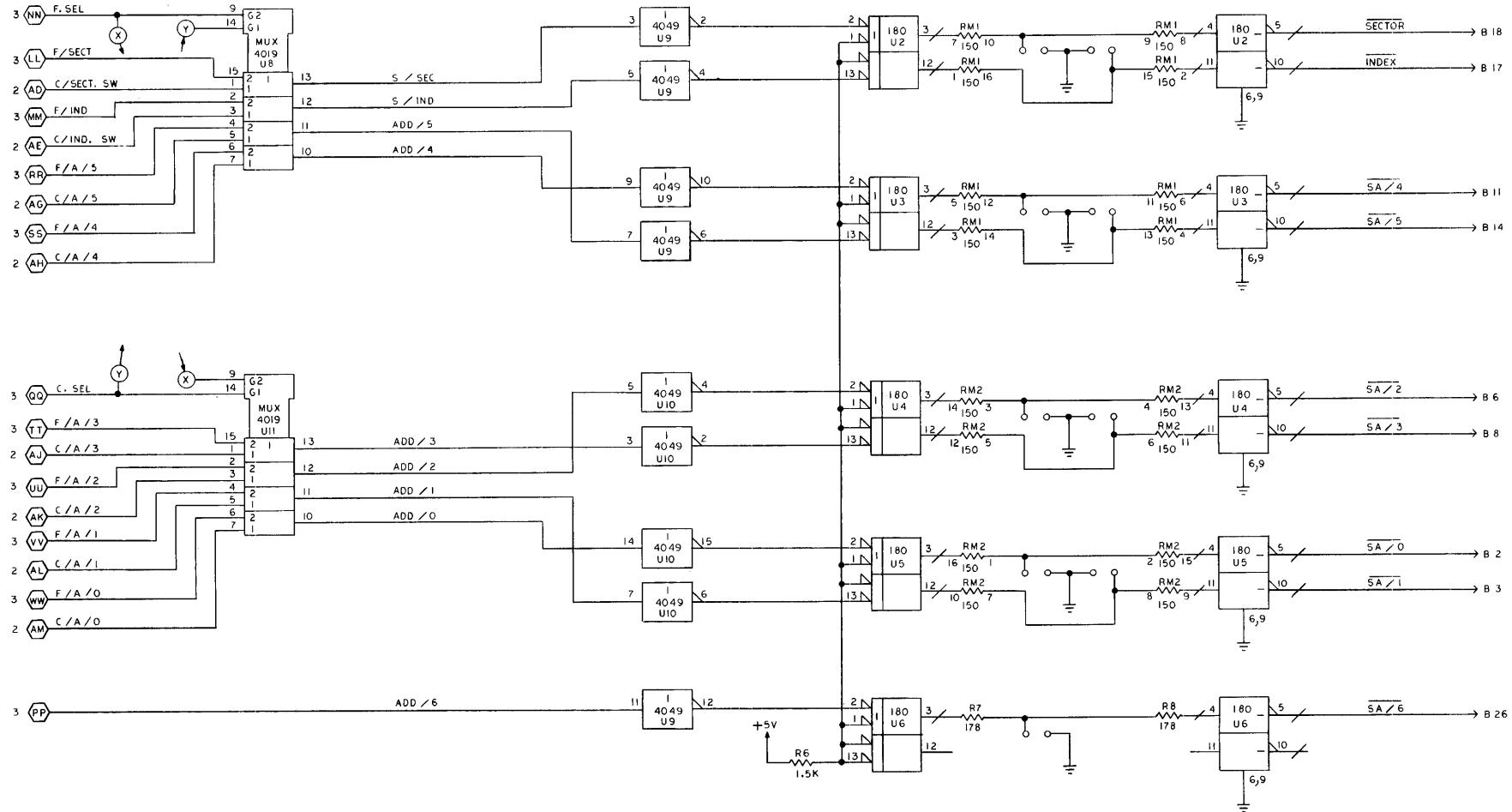


FIGURE 5-16. SECTOR BOARD ASSEMBLY (SHEET 8 OF 8)



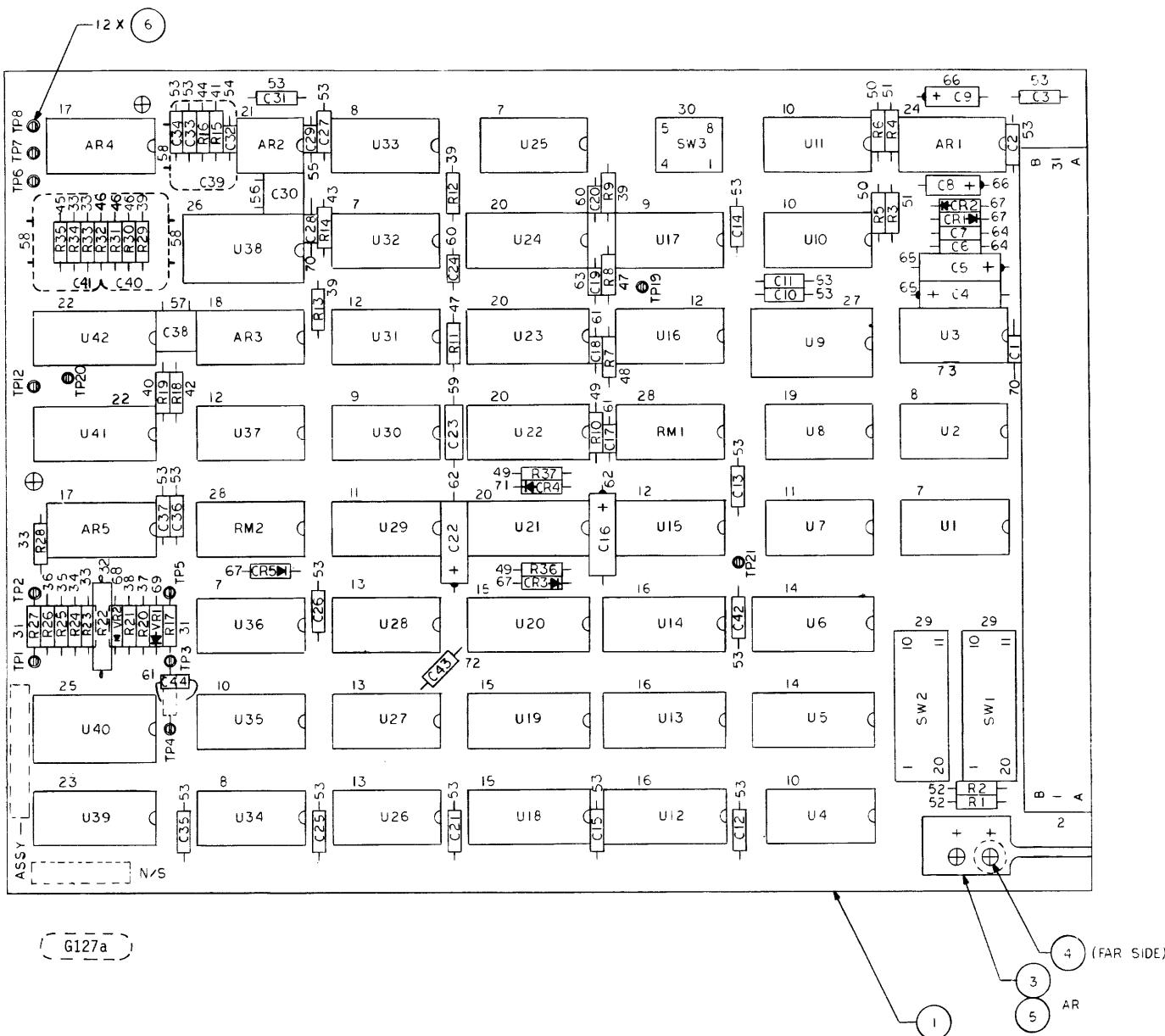


FIGURE 5-17. SERVO BOARD ASSEMBLY (SHEET 1 OF 10)

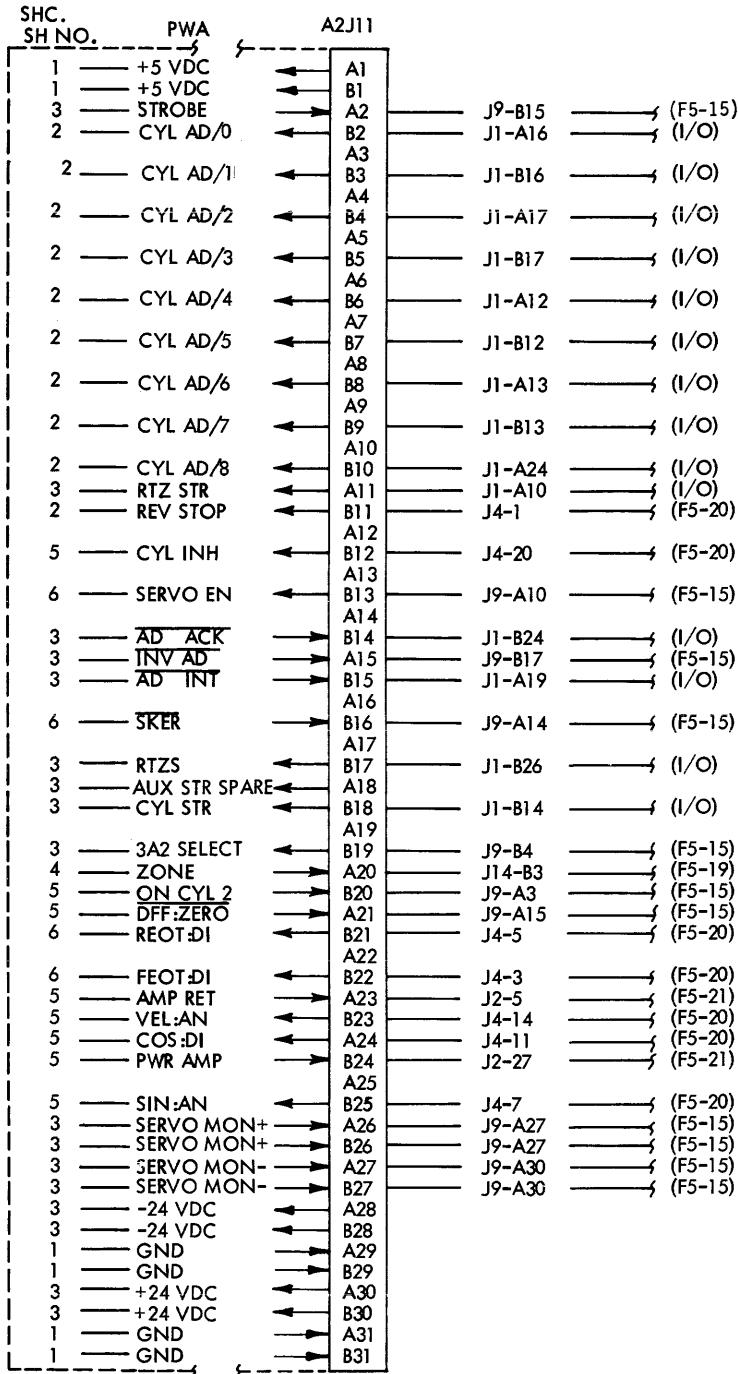
<u>ITEM NO.</u>	<u>IDENTIFICATION NO.</u>	<u>DRAWING TITLE</u>
1	77831401-5	PWA Servo (OEM)
2	77831170-4	PWB Servo
3	77836070-1	PWB Socket Connector
4	83479901-7	Key, Inject Mold
5	10125702-0	Scr Flat Hd
6	75312701-8	Spec-Epoxy Adhesive
6	77612165-9	Terminal, Slotted
6	75732602-0	Pin-Wire Wrap, Intch
7	15144900-6	IC 74LS00
8	15145000-4	IC 74LS02
9	15145100-2	IC 74LS04
10	15145400-6	IC 74LS08
11	15145600-1	IC 74LS10
12	15146300-7	IC 74LS74
13	15146400-5	IC 74LS86
14	15146900-4	IC 74LS175
15	15147000-2	IC 74LS193
16	15148200-7	IC 74LS283PC
17	51812800-4	IC Dual UA747
18	50252900-1	IC 75107
19	51768200-1	IC Dual
20	15150700-1	IC 96L02
21	15156600-7	IC 201A
22	15129400-6	IC AH 5012
23	15164442-4	IC 1408L-8
23	15132702-0	IC D to A Converter - Intch
24	15132600-6	IC Volt Regulator
25	75300900-0	ID Square Root Circu
26	75737000-2	ID Servo Input
27	75737200-8	ID Servo EOT
28	75009935-0	Res Pac 2% 5.1K (13)
29	83452207-0	Switch-10 Position
30	83452201-3	Switch-4 Position
31	94357500-1	Resistor Test Select
32	92577253-5	Res 1/2W 1% 357
33	94360384-5	Res 1/4W 1% 7.50K
34	94360443-9	Res 1/4W 1% 28.0K
35	94360446-2	Res 1/4W 1% 30.1K
36	94360452-0	Res 1/4W 1% 34.8K
37	94360487-6	Res 1/4W 1% 80.6K
38	94360284-7	Res 1/4W 1% 750
39	94360476-9	Res 1/4W 1% 61.9K
40	94360362-1	Res 1/4W 1% 4.42K
41	94360536-0	Res 1/4W 1% 237K
42	94360386-0	Res 1/4W 1% 7.87K
43	94360368-8	Res 1/4W 1% 5.11K
44	94360344-9	Res 1/4W 1% 2.87K
45	94360492-6	Res 1/4W 1% 90.9K
46	94360464-5	Res 1/4W 1% 46.4K
47	94360528-7	Res 1/4W 1% 196K

FIGURE 5-17. SERVO BOARD ASSEMBLY (SHEET 2 OF 10)

<u>ITEM NO.</u>	<u>IDENTIFICATION NO.</u>	<u>DRAWING T ITLE</u>
48	94360480-1	Res 1/4W 1% 68.1K
49	94360520-4	Res 1/4W 1% 162K
50	92512468-7	Res 1/4W 6.8 Ohm
51	94360400-9	Res 1/4W 1% 10.0K
52	94360300-1	Res 1/4W 1% 1.00K
53	92496227-7	Cap 100V 20% .01UF
54	75808520-3	Cap 100V 10% 390
55	75808506-2	Cap 100V 10% 27
56	94227244-4	Cap 100V 2% 560
57	94227247-7	Cap 100V 2% 750
58	94227257-6	Cap 500V 2% 2200
59	75808545-0	Cap 100V 10% 0.047UF
60	75808513-8	Cap 100V 10% 100
61	75808516-1	Cap 100V 10% 180
62	24504369-0	Cap 15V 20% 10UF
63	75808518-7	Cap 100V 10% 270
64	92496217-8	Cap 100V 20% 1500
65	24504339-3	Cap 35V 20% 6.8UF
66	24504329-4	Cap 35V 20% 1.0UF
67	51736700-9	Diode 1N914A
68	50240105-2	Diode, Silicon
69	50240106-0	Diode, Sil Zener 5.1V
70	75808533-6	Cap 100V 10% 4700
71	50241400-6	Diode Special
72	94240425-2	Cap 50V 10% 270
73	15148500-0	IC 74LS14

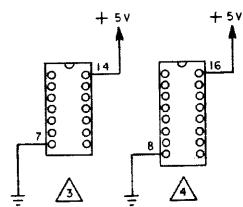
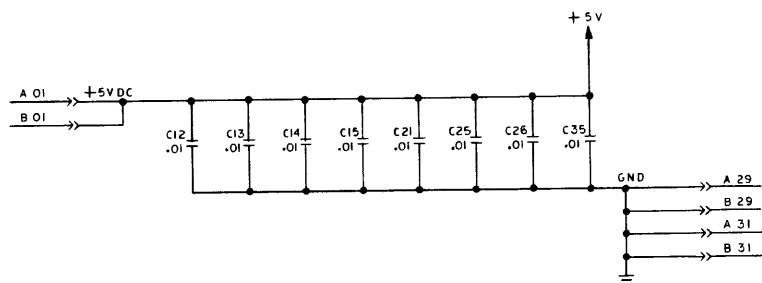
FIGURE 5-17. SERVO BOARD ASSEMBLY (SHEET 3 OF 10)

SERVO BOARD



(AA091a)

FIGURE 5-17. SERVO BOARD ASSEMBLY (SHEET 4 OF 10)



NOTES:
UNLESS OTHERWISE SPECIFIED
1. RESISTOR VALUES ARE IN
OHMS, $1/4$ W, $\pm 1\%$.
2. CAPACITOR VALUES ARE IN
MICROFARADS.
 3. TYPICAL POWER CONNECTIONS
FOR 14 PIN DIPS.
 4. TYPICAL POWER CONNECTIONS
FOR 16 PIN DIPS.
5. XXX INDICATES INTERSHEET
CONNECTION BY SHEET NUMBER,
ZONE AND SIGNAL IDENTIFIER.
 6. QUIET GROUND

FIGURE 5-17. SERVO BOARD ASSEMBLY (SHEET 5 OF 10)

FIGURE 5-17. SERVO BOARD ASSEMBLY (SHEET 6 OF 10)

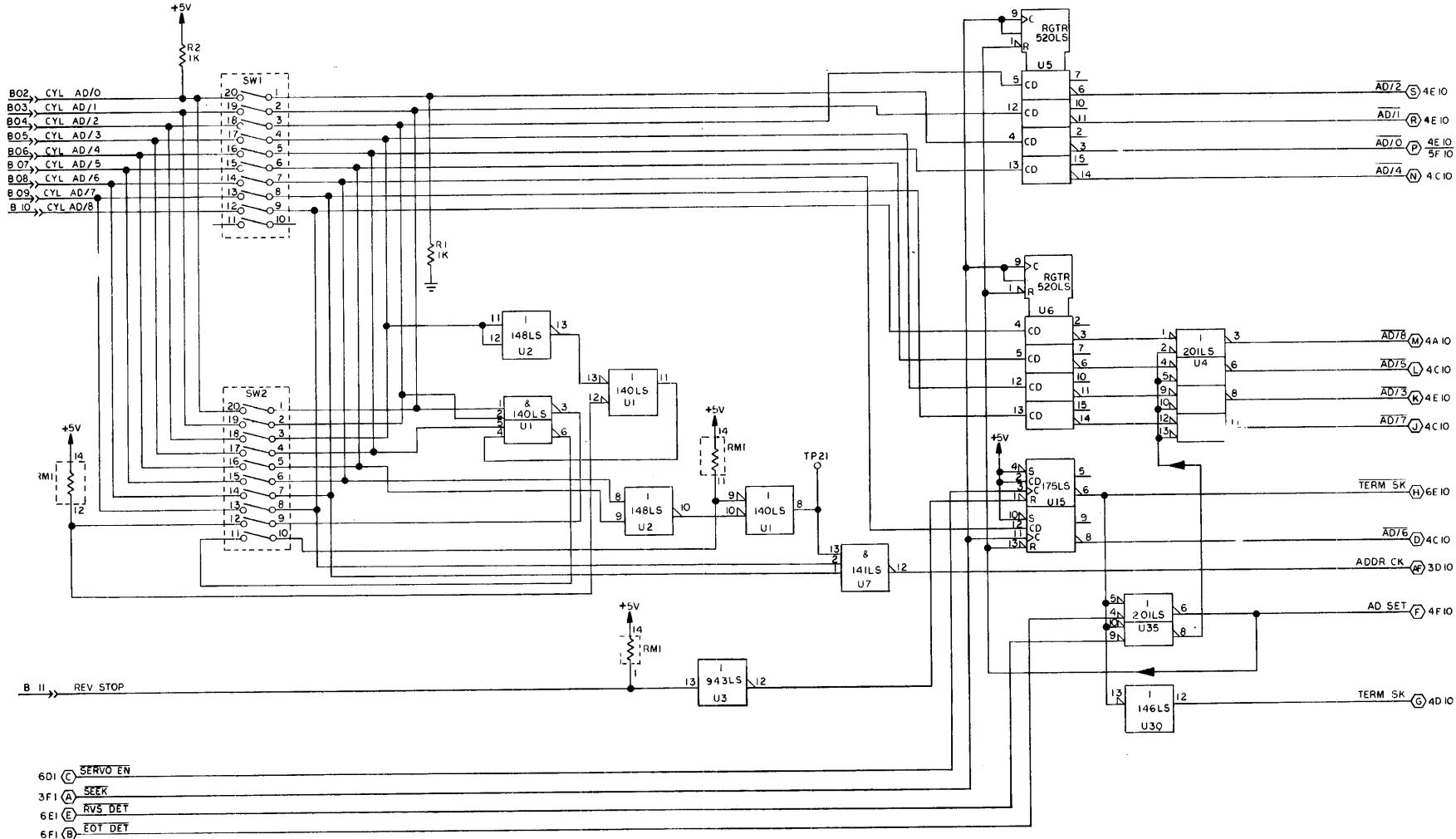


FIGURE 5-17. SERVO BOARD ASSEMBLY (SHEET 7 OF 10)

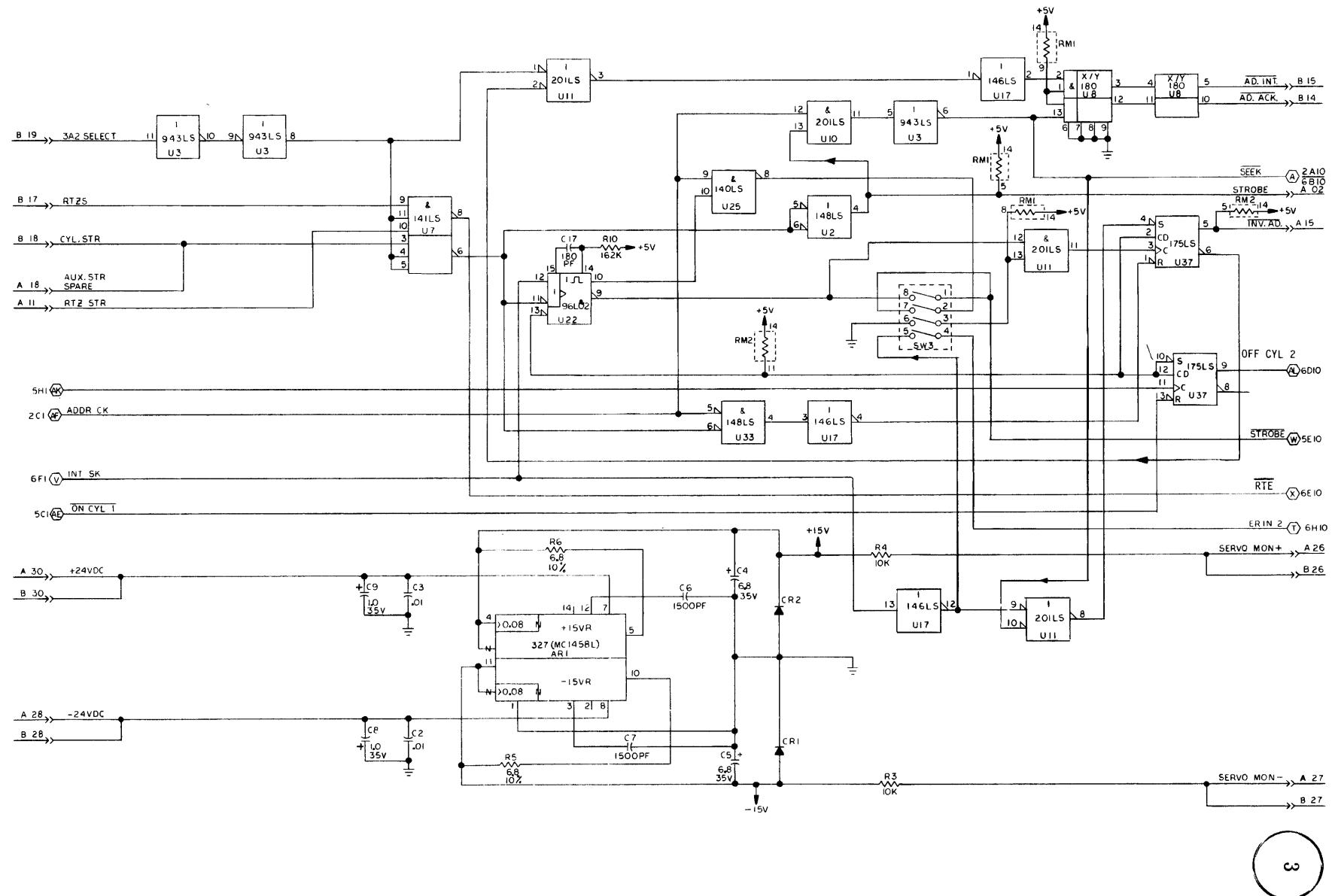


FIGURE 5-17. SERVO BOARD ASSEMBLY (SHEET 8 OF 10)

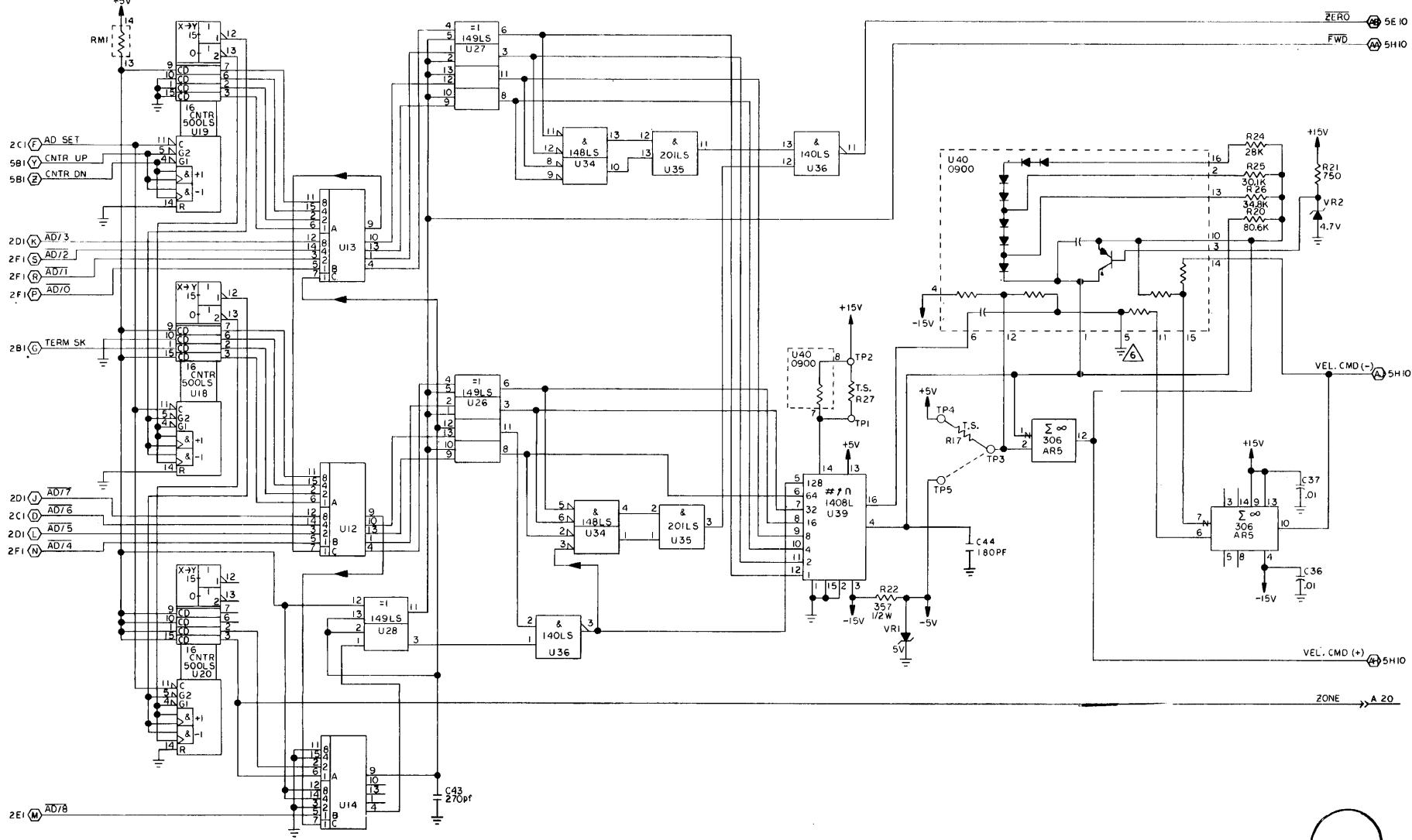


FIGURE 5-17. SERVO BOARD ASSEMBLY (SHEET 9 OF 10)

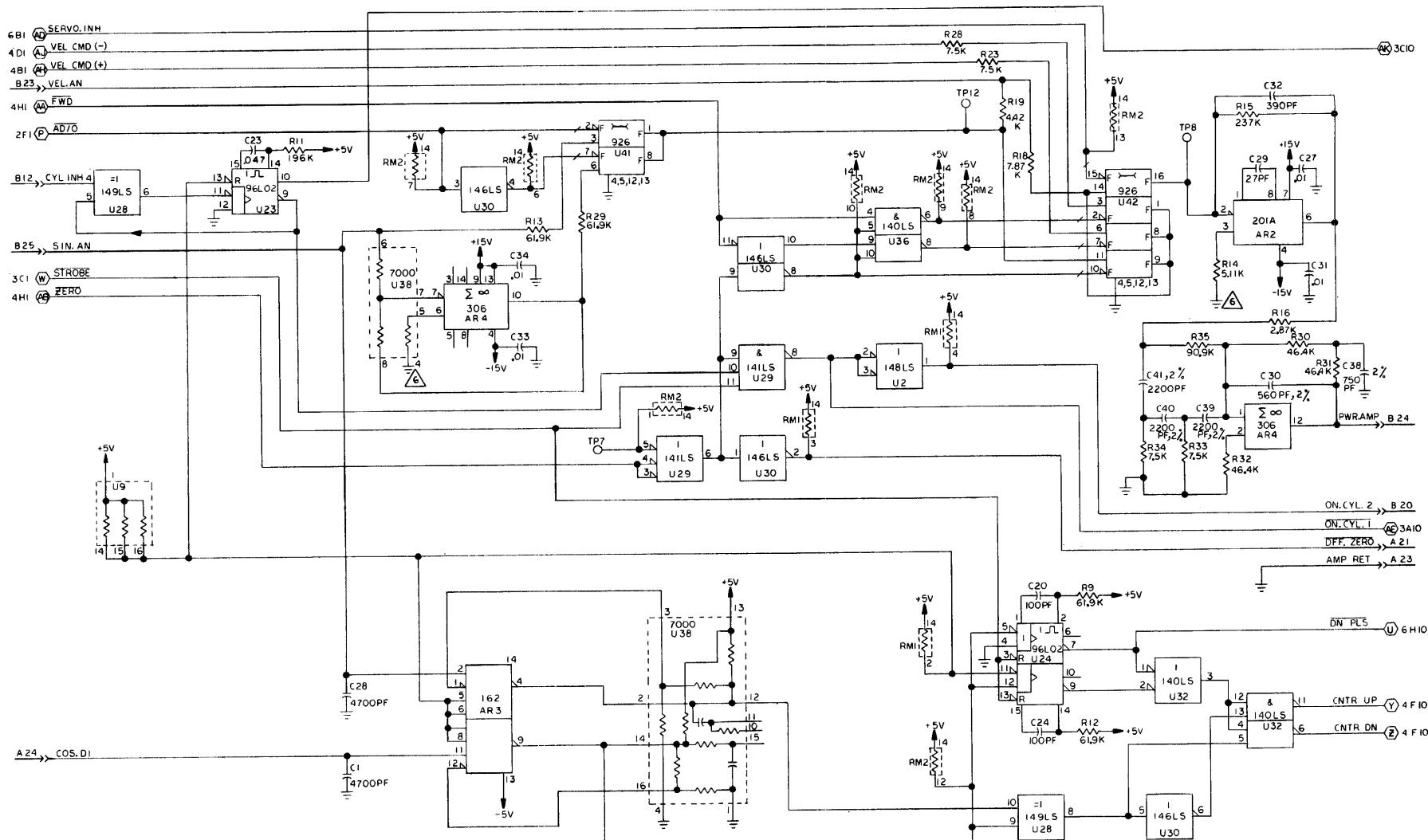
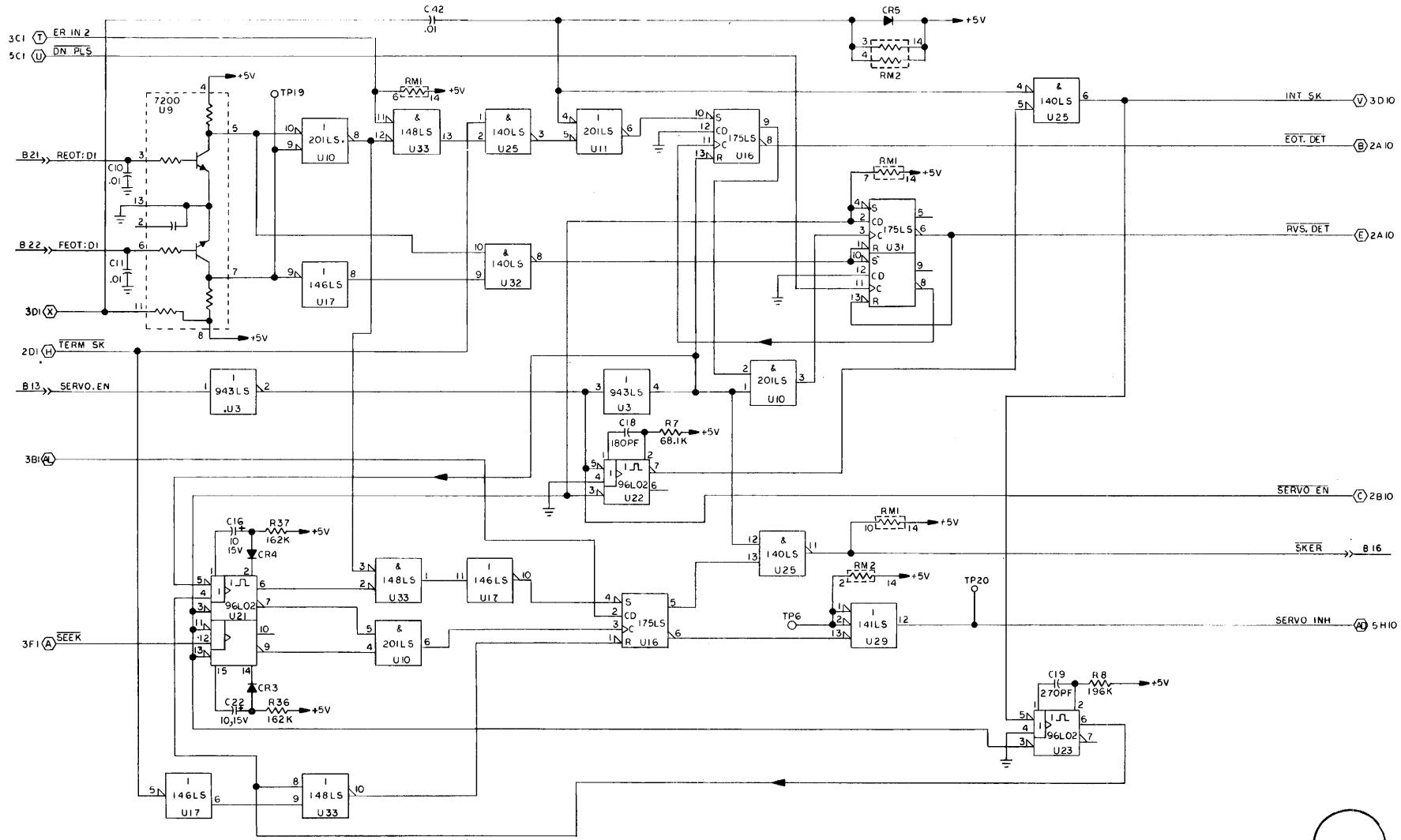


FIGURE 5-17. SERVO BOARD ASSEMBLY (SHEET 10 OF 10)



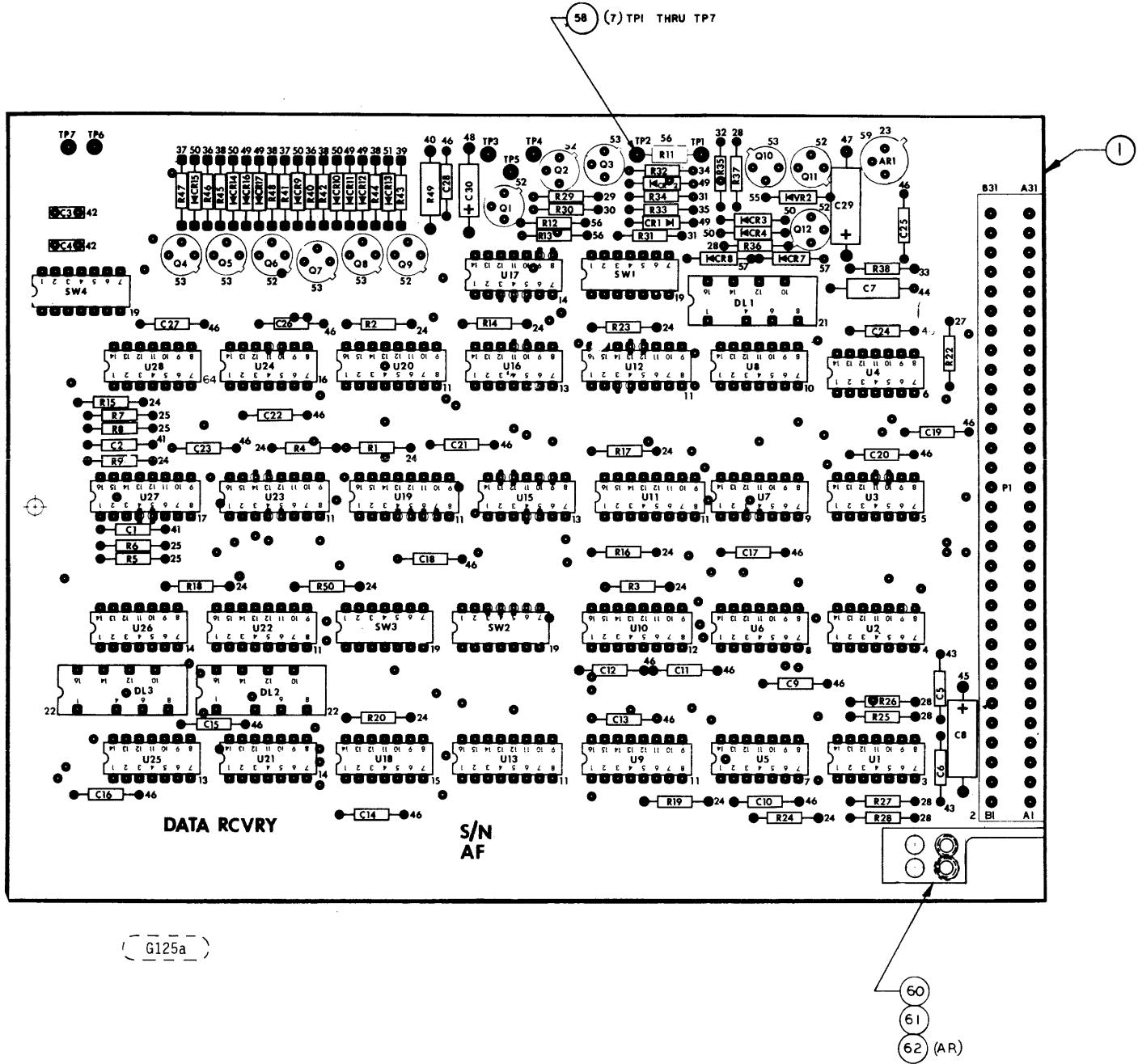


FIGURE 5-18. DATA RECOVERY BOARD ASM (SHEET 1 OF 7)

<u>ITEM NO.</u>	<u>IDENTIFICATION NUMBER</u>	<u>DRAWING TITLE</u>
1	75297105	PWA Data Recovery
2	75297005	Board PC Data - Recovery
3	77836070	PWB Socket Connector
4	51768200	IC Dual
5	36187900	IC 7453
6	15112700	IC 75L04
6	15158700	IC 74S140
7	00005070	IC 500 HM Dual, Intch
7	15112300	IC 74L00
8	15104800	IC 7474
8	88882100	IC 7474, Intch
9	36188700	IC 74H00
10	88885300	IC CA 74H00 HS Quad, Intch
10	50254900	IC 74S20
11	15158600	IC Dual 4, Intch
11	15109400	IC 74S112
12	15160600	IC 74S112, Intch
12	00005060	IC 93L16
13	88884500	IC 4-Bit Counter, Intch
13	50254600	IC 74 S00
14	88883700	IC 74S00, Intch
14	15109200	IC 74S04
15	88923000	IC 74S04, Intch
15	15109700	IC 74S74
16	88884200	IC Dual D Flip-Flop, Intch
16	50254700	IC 74S10
17	15104301	IC Triple 3, Intch
17	88886500	IC 9602, Intch
18	88924500	IC 9602
18	36187100	IC 7404, Intch
19	83452204	IC 7404, Intch
21	83406502	Switch, 7 Position
22	83406501	Delay Line 100 NS
23	15130400	Delay Line 50 NS
24	94360300	Volt Regulator
25	94360430	Res 1/4W 1% 1.00K
27	94360335	Res 1/4W 1% 20.5K
28	94360224	Res 1/4W 1% 2.32K
29	94360220	Res 1/4W 1% 178
30	94360359	Res 1/4W 1% 162
31	94360232	Res 1/4W 1% 4.12K
32	94360316	Res 1/4W 1% 215
33	94360200	Res 1/4W 1% 1.47K
34	94360257	Res 1/4W 1% 100
35	94360280	Res 1/4W 1% 392
36	94360168	Res 1/4W 1% 681
37	94360165	Res 1/4W 1% 51.1
38	94360264	Res 1/4W 1% 47.5
39	94360272	Res 1/4W 1% 464
		Res 1/4W 1% 562

FIGURE 5-18. DATA RECOVERY BOARD ASM (SHEET 2 OF 7)

<u>ITEM NO.</u>	<u>IDENTIFICATION NUMBER</u>	<u>DRAWING TITLE</u>
40	24500131	Res 1/2W 5% 47
41	92496147	Cap 200V 10% 1200
42	94227236	Cap 300V 2% 270
43	92496267	Cap Non 200V 10% 220
44	92496393	Cap Non 80V 10% 0.033 UF
45	24504353	Cap 10V 20% 33UF
46	92496227	Cap 100V 20% 0.01UF
47	24504339	Cap 35V 20% 6.8UF
48	24504329	Cap 35V 20% 1.0UF
49	51736700	Diode 1N914A
50	50241400	Diode Silicon
51	11801200	Spec Diode Germanium
52	50210310	TSTR, SNPN, 15V NN3646
53	50211510	TSTR, 2N4258 SPNP 12V
55	50240146	Diode Silicon
56		
57	24553500	Diode Silicon Planar
58	92498021	Terminal, Swaged
59	94335900	Pad-Transistor Mtg
60	83479801	Key, Inject, Mold
61	10125703	Scr Flat Hd
62	75312701	Spec-Epoxy Adhesive

FIGURE 5-18. DATA RECOVERY BOARD ASM (SHEET 3 OF 7)

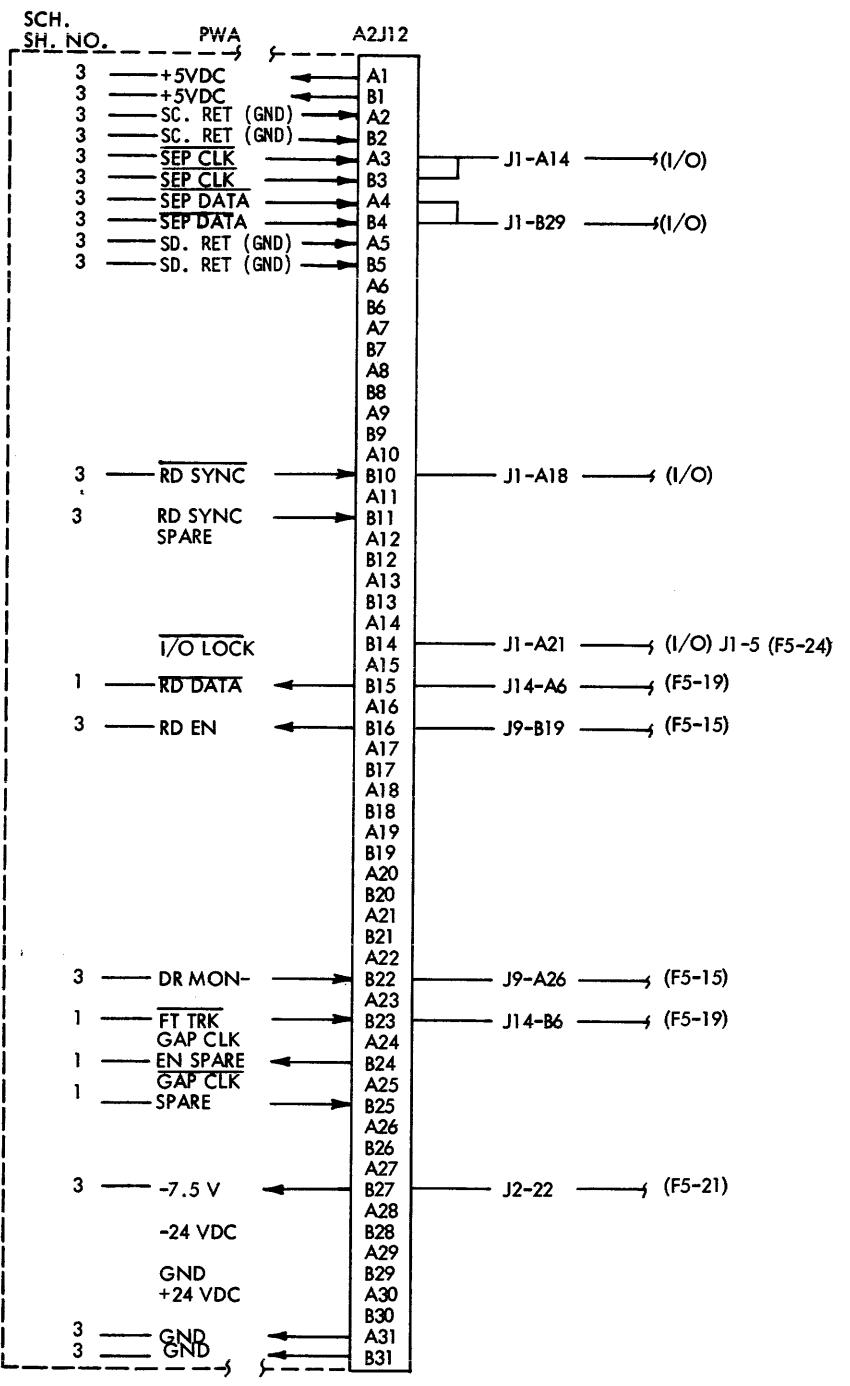
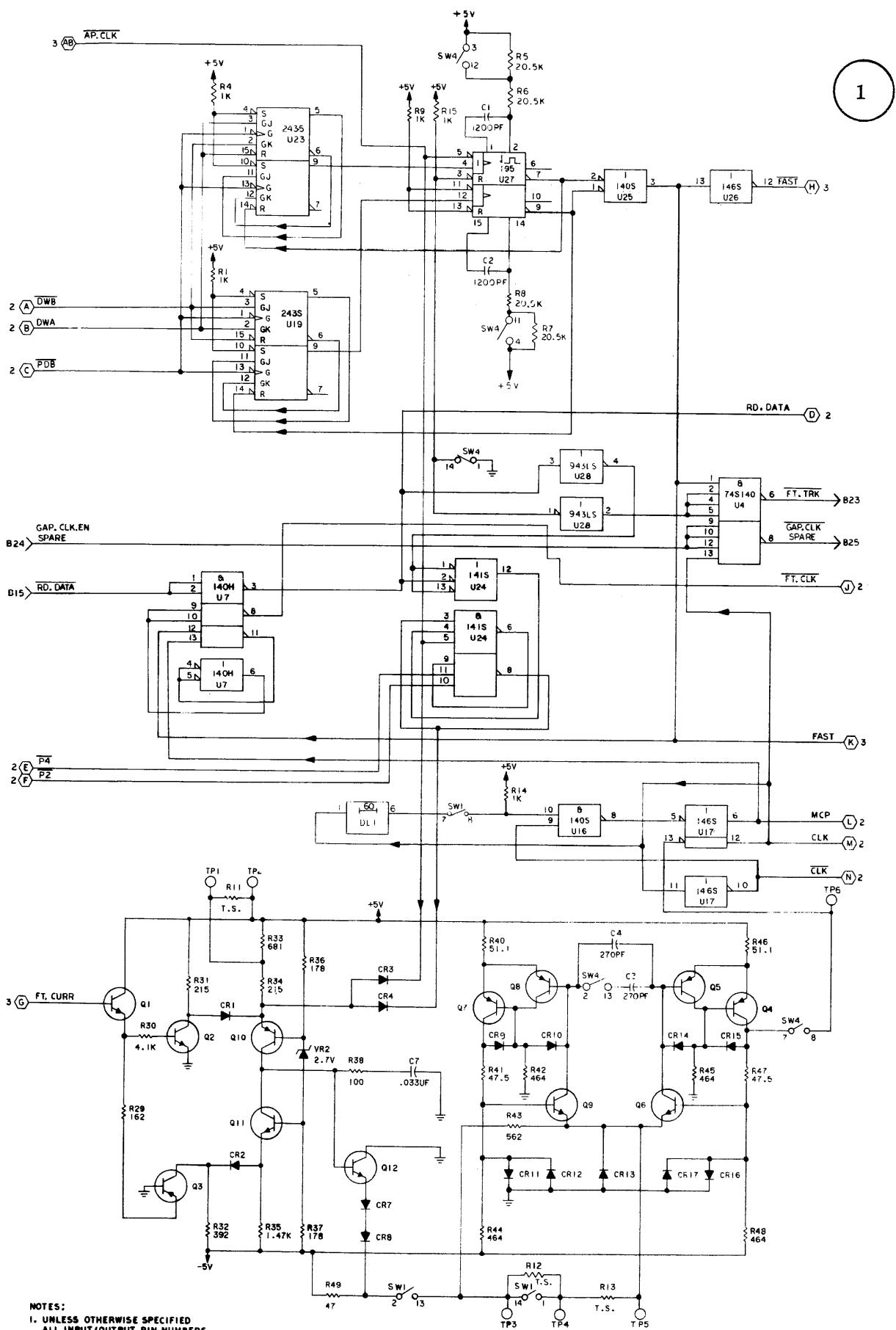


FIGURE 5-18. DATA RECOVERY BOARD ASM (SHEET 4 OF 7)



NOTES:

**I. UNLESS OTHERWISE SPECIFIED
ALL INPUT/OUTPUT PIN NUMBERS
ARE FOR PI CONNECTOR.**

FIGURE 5-18. DATA RECOVERY BOARD ASM (SHEET 5 OF 7)

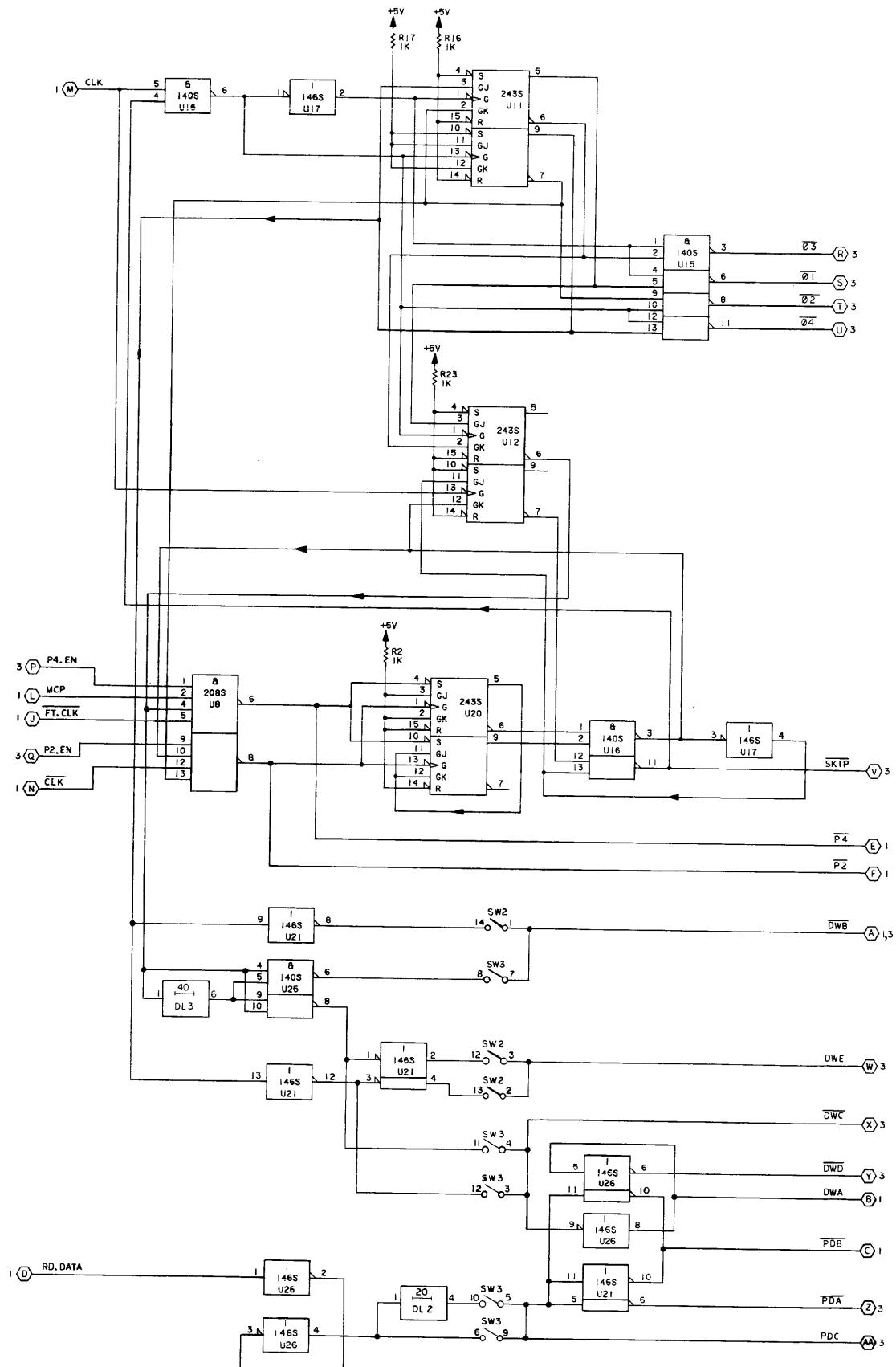


FIGURE 5-18. DATA RECOVERY BOARD ASM (SHEET 6 OF 7)

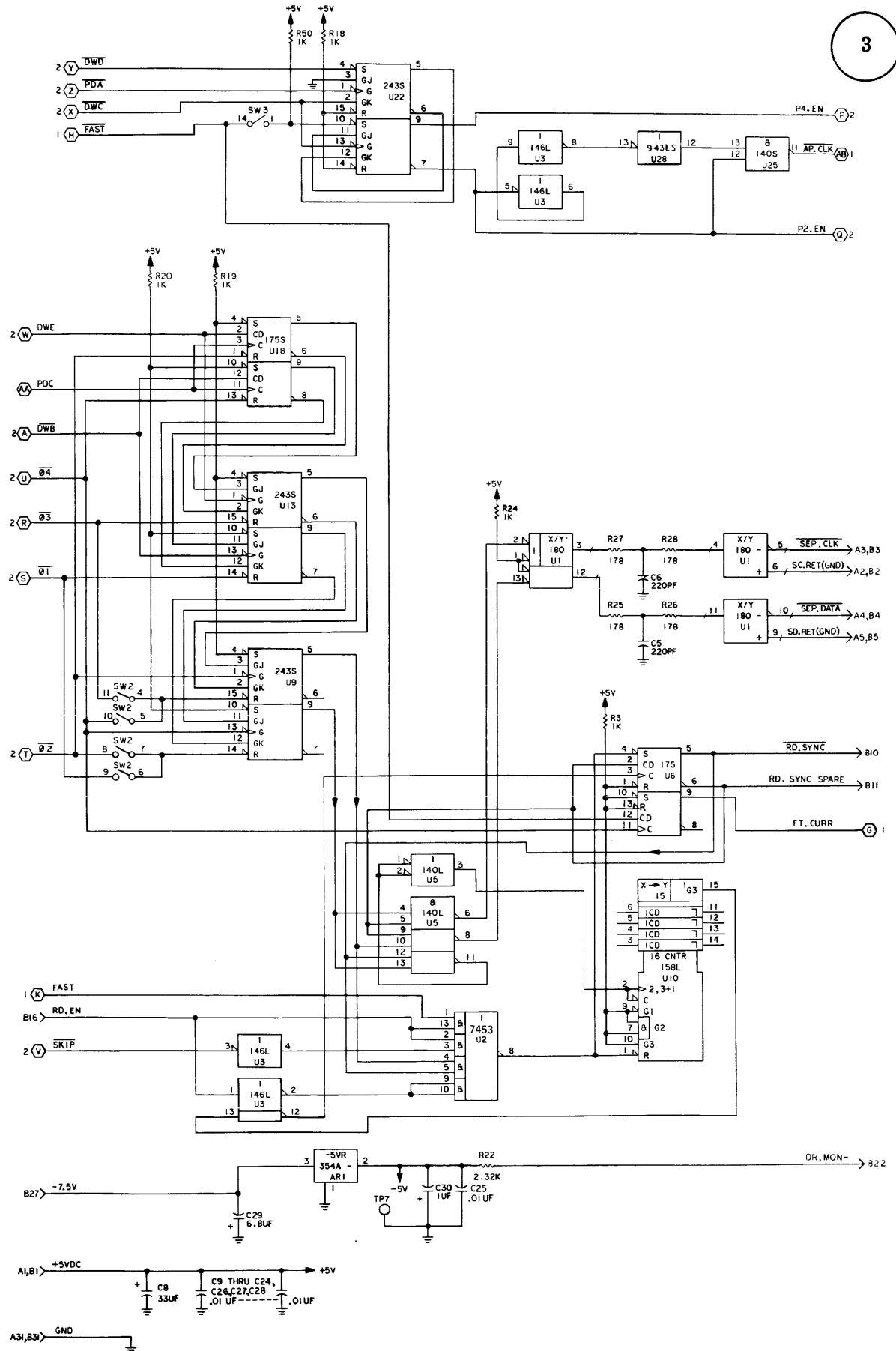


FIGURE 5-18. DATA RECOVERY BOARD ASM (SHEET 7 OF 7)

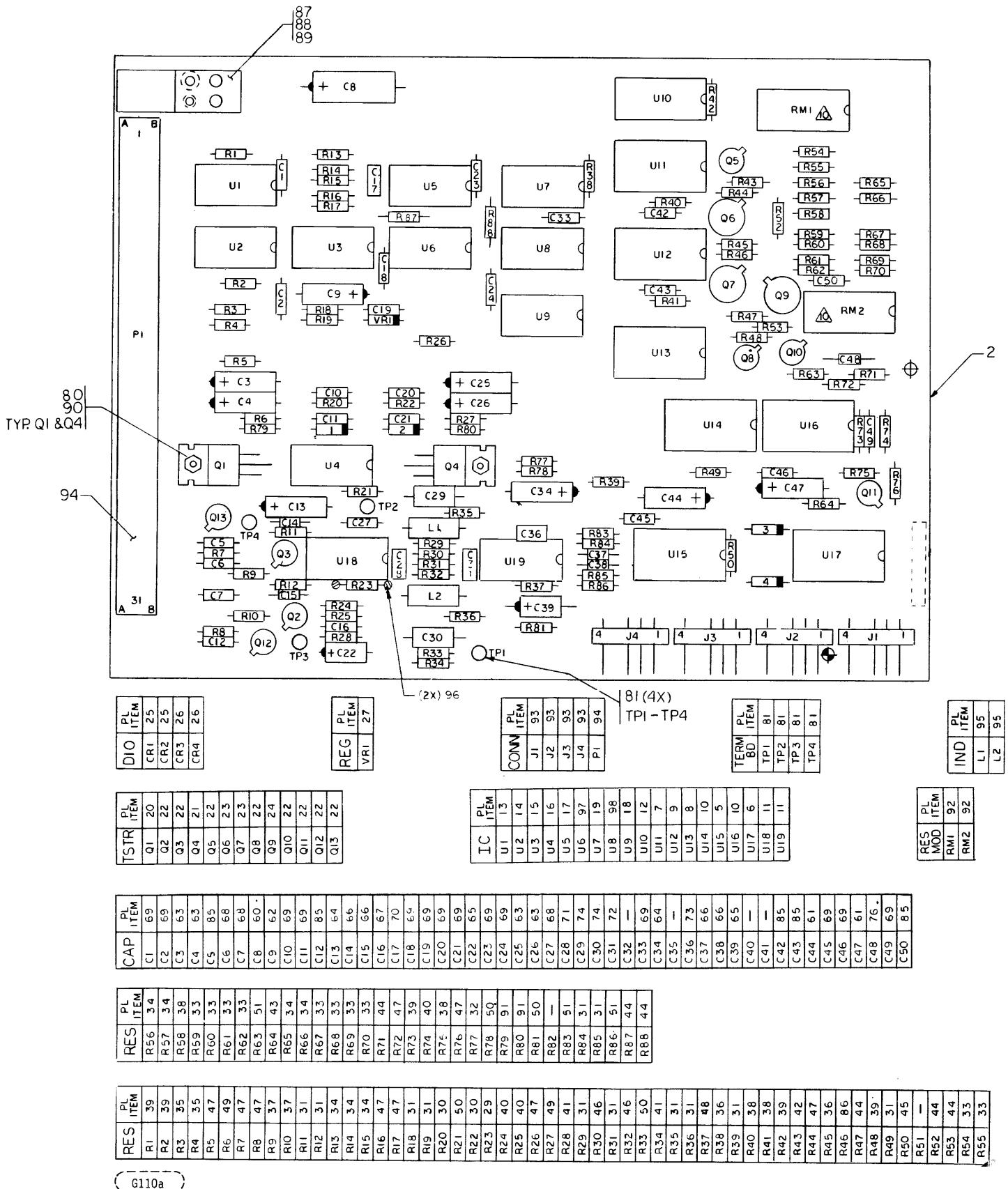


FIGURE 5-19. READ/WRITE/ERASE BD ASM (SHEET 1 OF 7)

<u>ITEM NO.</u>	<u>IDENTIFICATION NUMBER</u>	<u>DRAWING TITLE</u>
2	75891100	PWA - R/W/E (2400 r/min)
5	75880500	PWA - R/W/E (1500 r/min)
6	75891120	PWB R/W/E
7	75300300	ID Read Matrix Special
8	75300400	Diode Matrix Special
9	75300500	Current Zone Special
10	75300600	ID R/W Fault Special
11	75300700	Write Switch Special
12	75300800	IC Head Select Special
13	15126900	IC 733C Video Amp
14	15158600	IC 74S112
15	88898200	IC 7410
16	50252900	IC 75107
17	88882200	IC 74H01
18	15132600	IC Volt Regulator
19	15146400	IC 74LS86
19	88924400	IC 7400
20	39389700	IC 7404
21	51701800	IC 7404, Intch
22	75752300	Transistor Power
23	75752400	Transistor Power
24	50210310	TSTR, SNP, 15V NN3646
25	75722201	Transistor NPN 2N2219A
26	50211210	TSTR, SPNP, 60V NN3645
27	50241001	Diode Silicon
27	50241400	Diode Silicon
27	50240106	Diode, Sil Zener 5.1V
30	94360168	Res 1/4W 1% 51.1
31	94360216	Res 1/4W 1% 147
32	94360210	Res 1/4W 1% 127
33	94360240	Res 1/4W 1% 261
34	94360243	Res 1/4W 1% 280
35	94360252	Res 1/4W 1% 348
36	94360268	Res 1/4W 1% 511
37	94360288	Res 1/4W 1% 825
38	94360300	Res 1/4W 1% 1.00K
39	94360316	Res 1/4W 1% 1.47K
40	94360332	Res 1/4W 1% 2.15K
41	94360340	Res 1/4W 1% 2.61K
42	94360348	Res 1/4W 1% 3.16K
43	94360360	Res 1/4W 1% 4.22K
44	94360368	Res 1/4W 1% 5.11K
45	94360375	Res 1/4W 1% 6.04K
46	94360220	Res 1/4W 1% 162
47	94360400	Res 1/4W 1% 10.0K

FIGURE 5-19. READ/WRITE/ERASE BD ASM (SHEET 2 OF 7)

<u>ITEM NO.</u>	<u>IDENTIFICATION NUMBER</u>	<u>DRAWING TITLE</u>
48	94360160	Res 1/4W 1% 42.2
49	92512464	Resistor 3.3 Ohm 1/4
50	24500015	Res 1/4W 5% 10
51	94360329	Res 1/4W 1% 2000K
60	24504374	Cap 15V 20% 68UF
61	24504383	Cap 20V 20% 15UF
62	24504371	Cap 15V 20% 22UF
63	24504339	Cap 25V 20% 6.8 UF
64	24504379	Cap 20V 20% 3.3UF
65	24504346	Cap 10V 20% 4.7UF
66	94240433	Cap 50V 10% Used on 75891100 Only
67	94240401	Cap 50V 10% 1000 Used on 75891100 Only
67	94240409	Cap 50V 10% 1500 Used on 75880500 Only
68	94240411	Cap 50V 10% 0.01UF
69	92496227	Cap 100V 20% 0.01UF
70	94227218	Cap 500V +/-PF 47
71	94227236	Cap 300V 2% 270
71	94227241	Cap 100V 2% 430 Used on 75880500 Only
72	94227226	Cap 300V 2% 100
72	94227230	Cap 500V 2% 150 Used on 75880500 Only
73	94227252	Cap 100V 2% 1200
74	94240448	Cap 50V 10% 0.10 UF
75	94227248	Cap 100V 2% 820 Used on 75891100 Only
76	94240435	Cap 50V 10% 5600
80	95683502	Stud, Press
81	92498021	Terminal, Swaged
82	94335900	Pad-Transistor Mtg
85	94240400	Cap 50V 10% 470
86	94360344	Res 1/4W 1% 2.87
87	83479701	Key, Inject. Mold
88	10125703	Scr Flat Hd
89	75312701	Spec-Epoxy Adhesive
90	92583002	Nut, Lock
91	24500006	Res 1/4W 5% 4.3
92	94260301	Socket 16 Pin
93	75772401	Header 4 Pin Rt Angle
94	77836070	PWB Socket Connector
95	94356324	Inductor 10UH Used on 75891100 Only
95	94356326	Inductor 15UH Used on 75880500 Only
96	77612165	Terminal, Slotted
97	15145200	74LS03
98	88883700	IC 74S04

FIGURE 5-19. READ/WRITE/ERASE BD ASM (SHEET 3 OF 7)

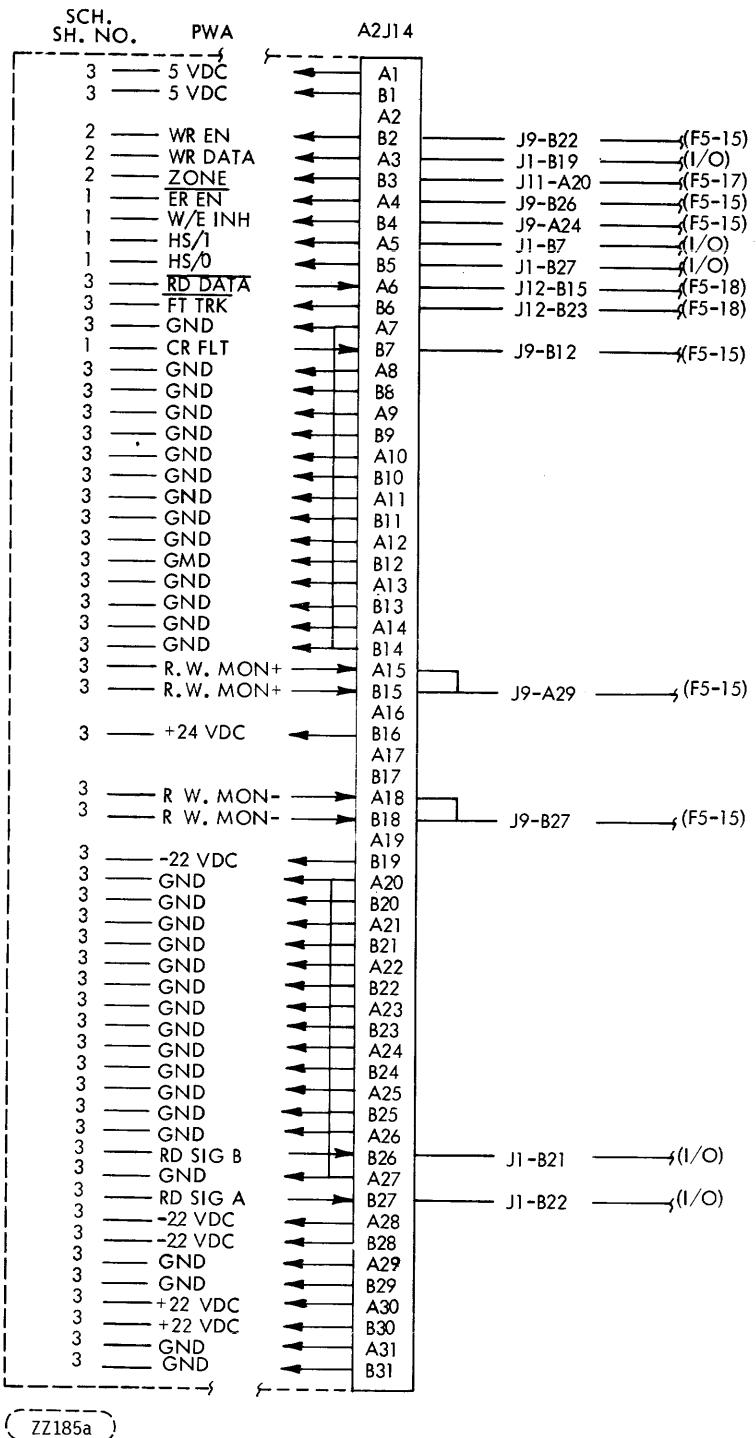


FIGURE 5-19. READ/WRITE/ERASE BD ASM (SHEET 4 OF 7)

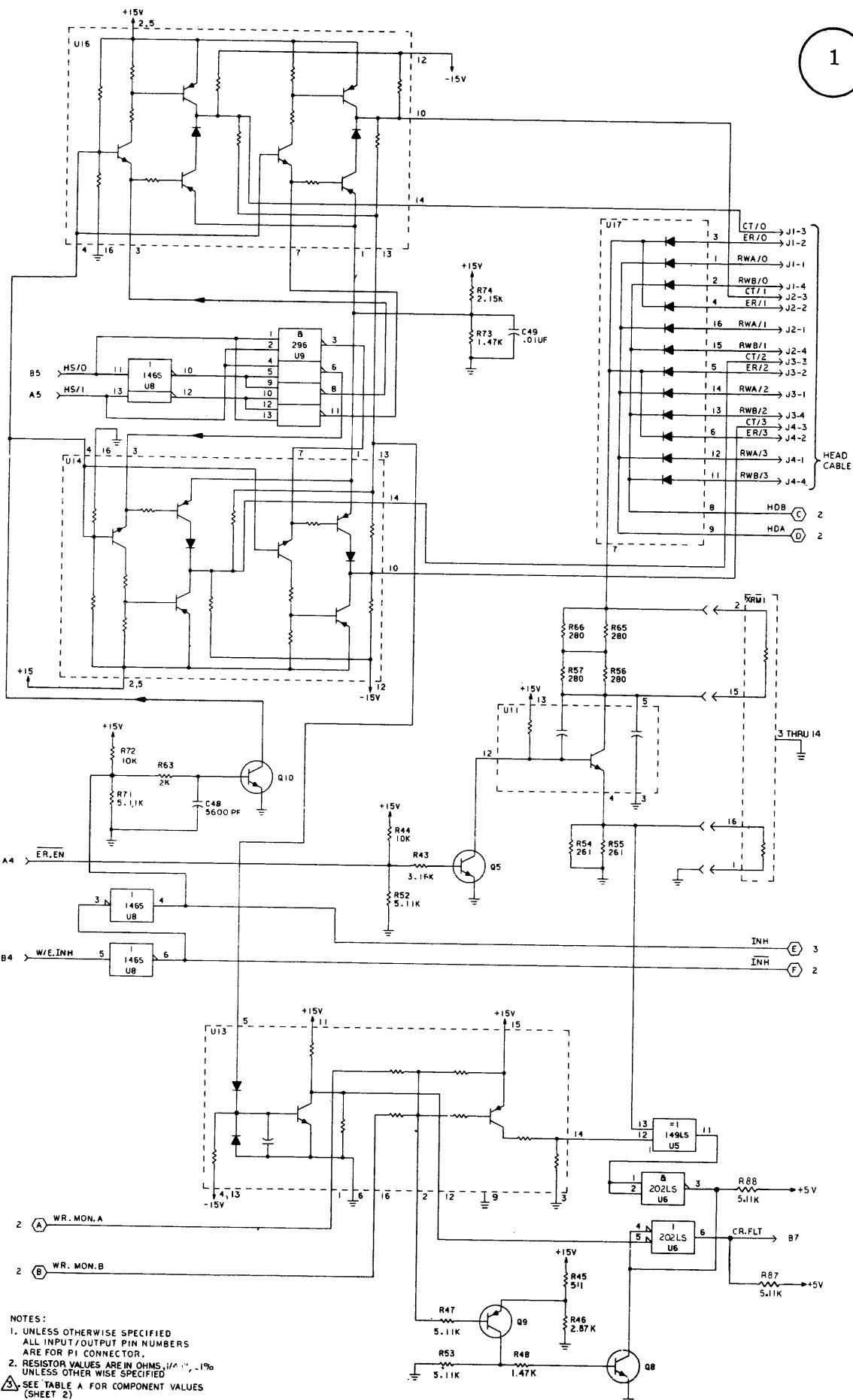


FIGURE 5-19. READ/WRITE/ERASE BD ASM (SHEET 5 OF 7)

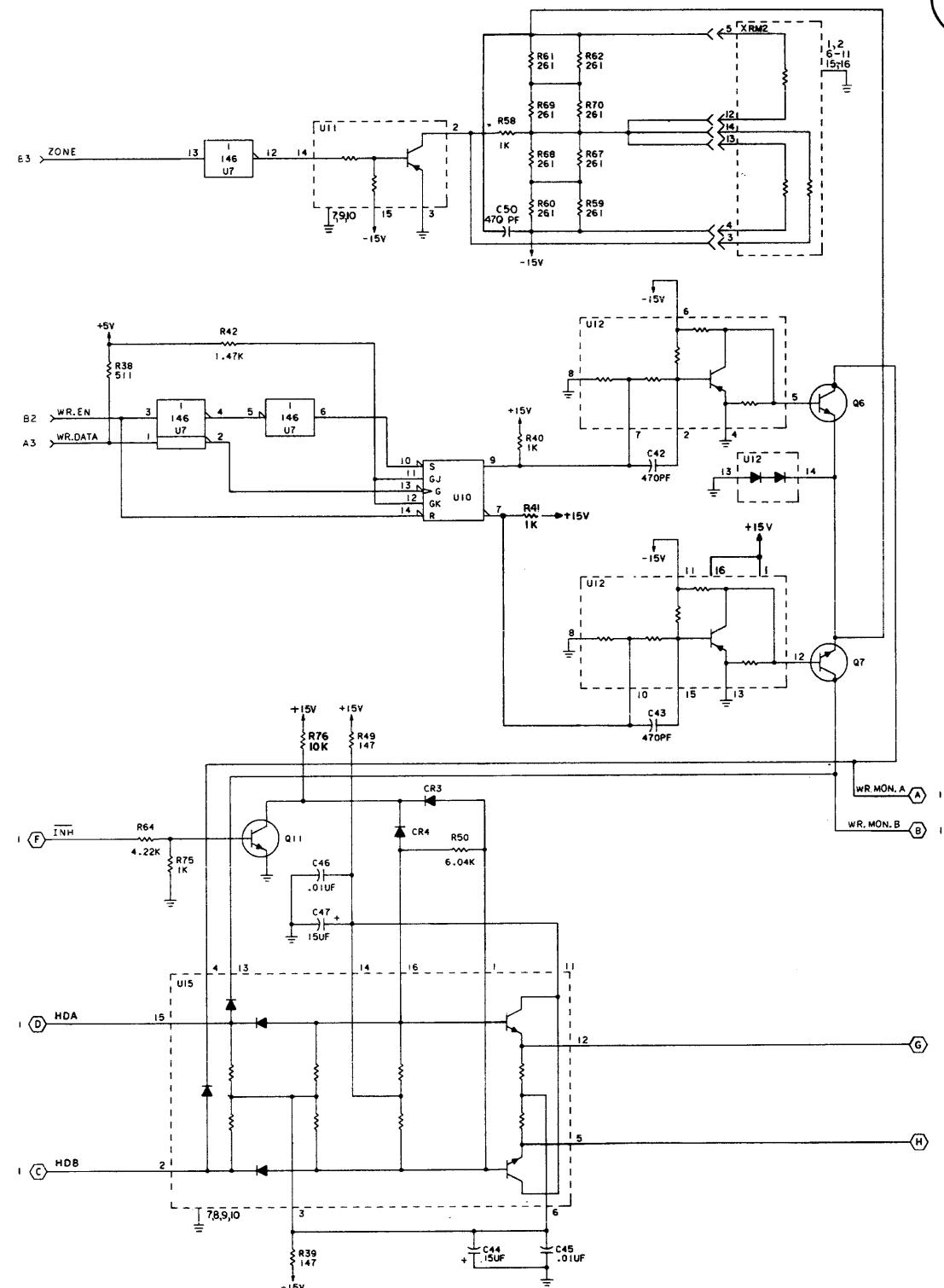


TABLE A										
ASM. NO.	C38	C37	C35	L2	L1	C28	C31	C15	C14	R23
1500 758800000	5600pf	5600pf	820pf	15uh	15uh	430pf	150pf	5600pf	5600pf	T.S.
7400 758100000	3300pf	3300pf	—	10uh	10uh	270pf	100pf	3300pf	3300pf	T.S.

FIGURE 5-19. READ/WRITE/ERASE BD ASM (SHEET 6 OF 7)

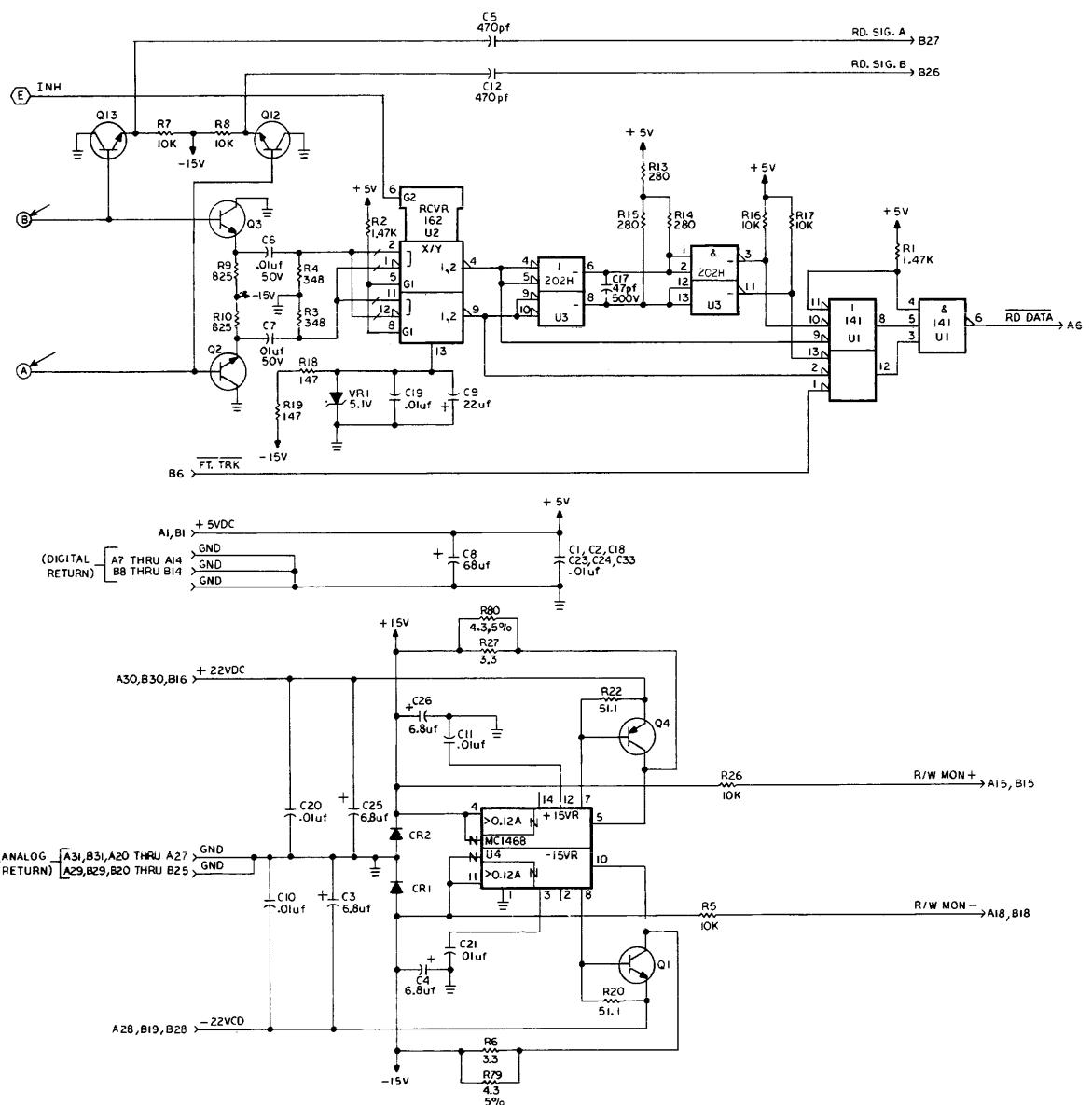
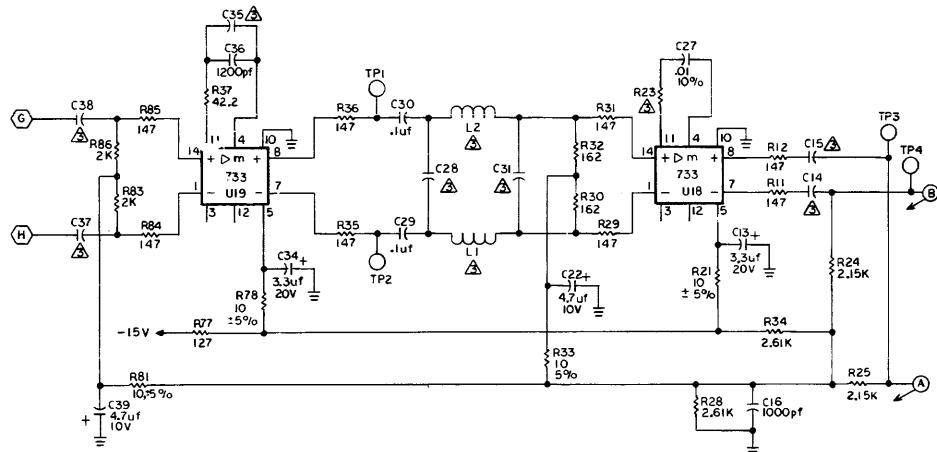


FIGURE 5-19. READ/WRITE/ERASE BD ASM (SHEET 7 OF 7)

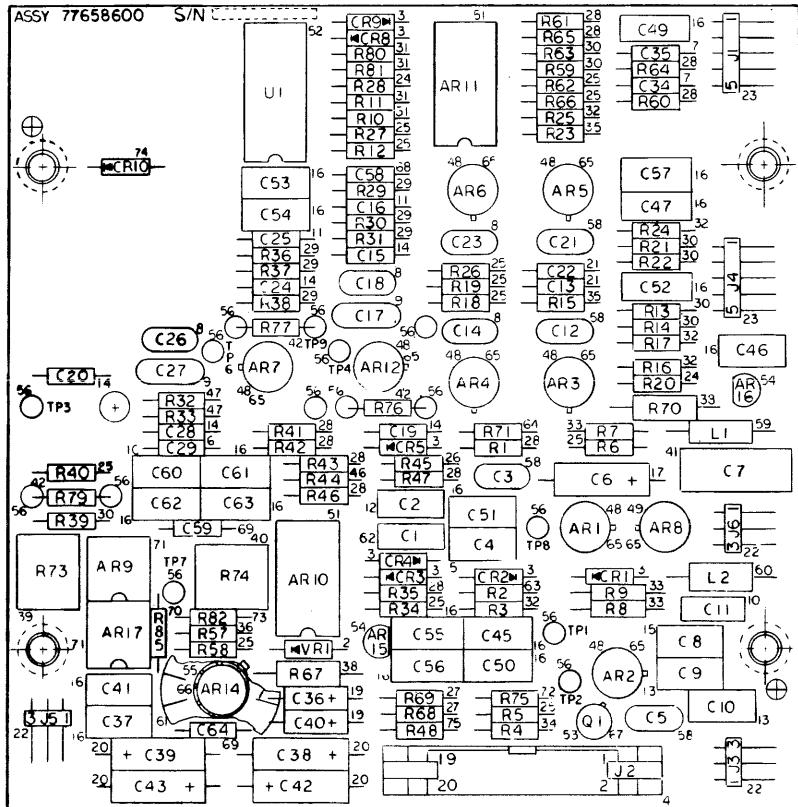


FIGURE 5-20. AGC SERVO PREAMP BD ASM (SHEET 1 OF 6)

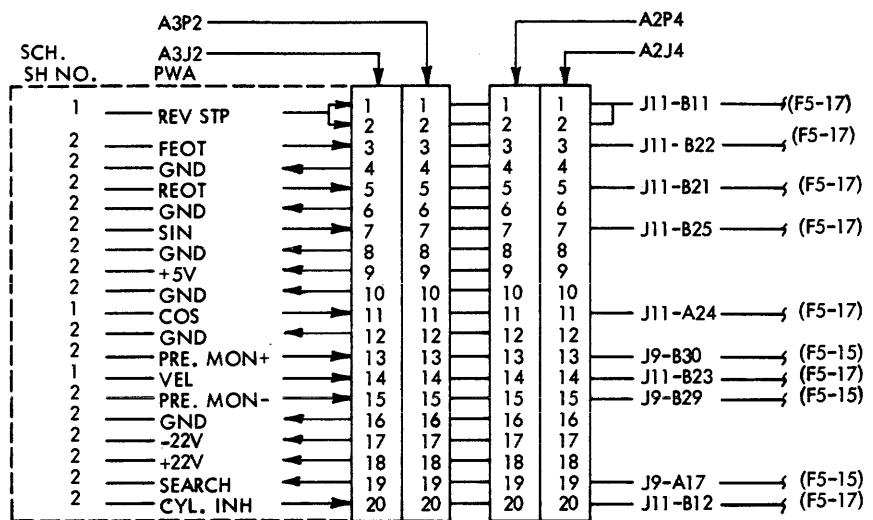
<u>ITEM NO.</u>	<u>IDENTIFICATION NO.</u>	<u>DRAWING TITLE</u>
1	77658600-0 77831221-5	PWA, AGC Servo Preamp PC Bd, AGC Pre Amp
2	50240115-1	Diode Silicon
3	51736700-9	Diode 1N914A
4	94359510-8	Connector 3M 20 Pin
5	83453805-0	Cap 100V 10% 0.047 UF
6	75808526-0	Cap 100V 10% 1200
7	92496205-3	Cap 100V 10% 100
8	95593012-8	Capacitor 150 PF 1000
9	95593008-6	Capacitor Disk 1000V
10	94227244-4	Cap 100V 2% 560
11	92496215-2	Cap 100V 10% 1000
12	94227250-1	Cap 100V 2% 1000
13	83465070-7	Cap 600V 2% 0.0022UF
14	75808531-0	Cap 100V 10% 3300
15	93453801-9	Cap 100V 10% 0.022UF
16	83453835-7	Cap 200V 10% 0.010UF
17	24504382-3	Cap 20V 20% 10UF
19	24504329-4	Cap 35V 20% 1.0UF
20	24504339-3	Cap 35V 20% 6.8UF
21	92496227-7	Cap 100V 20% 0.01 UF
22	75743703-3	Header-Right Angle
23	75743705-8	Header-Right Angle
24	94360336-5	Res 1/4W 1% 2.37K
25	94360368-8	Res 1/4W 1% 5.11K
26	94360204-5	Res 1/4W 1% 110
27	94360384-5	Res 1/4W 1% 7.50K
28	94360400-9	Res 1/4W 1% 10.0K
29	94360429-8	Res 1/4W 1% 20.0K
30	94360468-6	Res 1/4W 1% 51.1K
31	94360500-6	Res 1/4W 1% 100K
32	94360529-5	Res 1/4W 1% 200K
33	94360596-4	Res 1/4W 1% 1.00Meg
34	94360328-2	Res 1/4W 1% 1.96K
35	17705946-6	Res 1/4W 5% 2.7 Meg
36	94360446-2	Res 1/4W 1% 30.1K
38	24500153-2	Res 1/2W 5% 390
39	94372604-2	Res Vari 20% 2.0K
40	94372606-7	Res Vari 20% 10K
41	83453809-2	Cap 100V 10% 0.10 UF
46	94360300-1	Res 1/4W 1% 1.00K
47	94360329-0	Res 1/4W 1% 2.00K
48	83452801-0	IC CA3130T
49	83452804-4	IC CA3080T
51	15126600-4	IC LM339
52	15135100-4	IC 4053B
53	16547200-2	Trans PNP 2N2907A
54	83452805-1	Volt Reg 78L12 AWC

FIGURE 5-20. AGC SERVO PREAMP BD ASM (SHEET 2 OF 6)

<u>ITEM NO.</u>	<u>IDENTIFICATION NO.</u>	<u>DRAWING TITLE</u>
55	83452806-9	Volt Reg 79M05
56	92498021-2	Terminal, Swaged
57	75738867-3	Spacer-Standoff
58	95593011-0	Capacitor 56 PF
59	94356358-5	Inductor 6800UH
60	94356356-9	Inductor 4700UH
61	51853102-5	Heatsink
62	94227240-2	Capacitor MICA 390 P
63	94360452-0	Res 1/4W 1% 34.8K
64	94360388-6	Res 1/4W 1% 8.25K
65	94335903-4	Pad-Transistor Mount
66	94335900-0	Pad-Transistor Mtg
67	94335901-8	Pad-Transistor Mount
68	75808504-7	Cap 100V 10% 18
69	75808506-2	Cap 100V 10% 27
70	17705953-2	Res 1/4W 5% 5.1 Meg
71	15156600-7	IC 201A
72	94360274-8	Res 1/4W 1% 590
73	17705944-1	Res 1/4W 5% 2.2 Meg
74	50241400-6	Diode, Silicon
75	94360361-3	Res 1/4W 4.32K 1%

FIGURE 5-20. AGC SERVO PREAMP BD ASM (SHEET 3 OF 6)

AGC SERVO PREAMP



(AA089b)

FIGURE 5-20. AGC SERVO PREAMP BD ASM (SHEET 4 OF 6)

FIGURE 5-20. AGC SERVO PREAMP BD ASM (SHEET 5 OF 6)

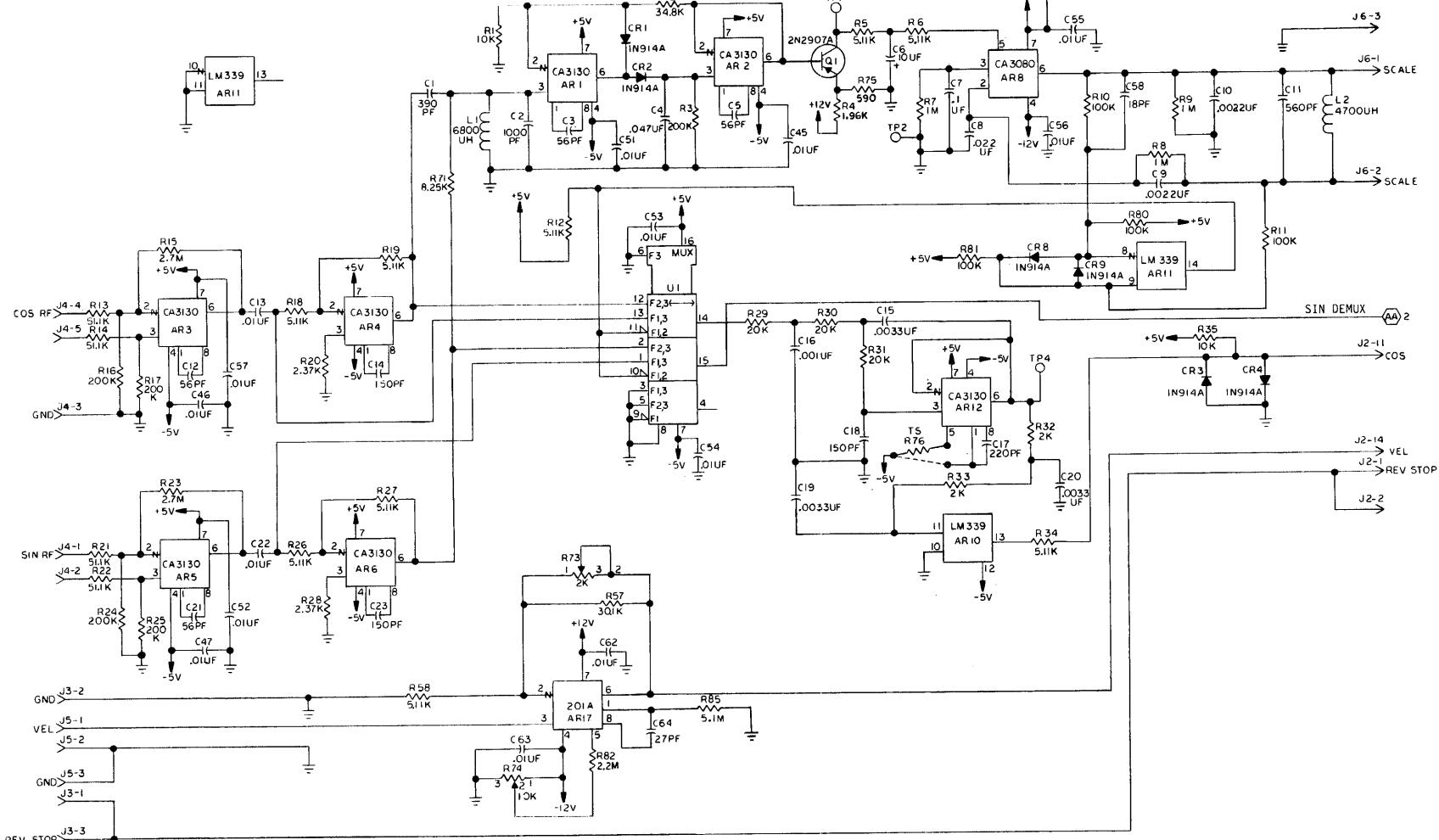
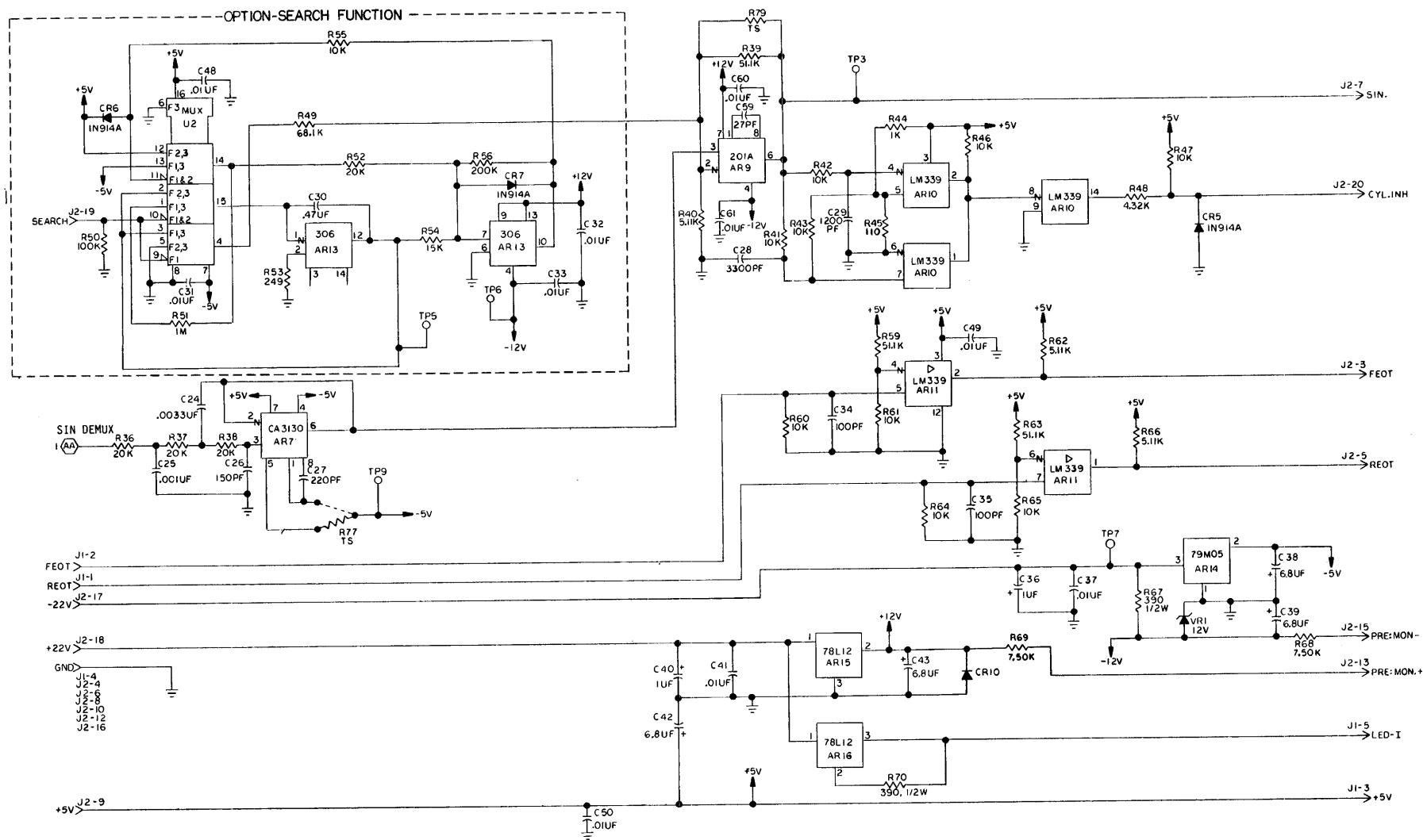


FIGURE 5-20. AGC SERVO PREAMP BD ASM (SHEET 6 OF 6)



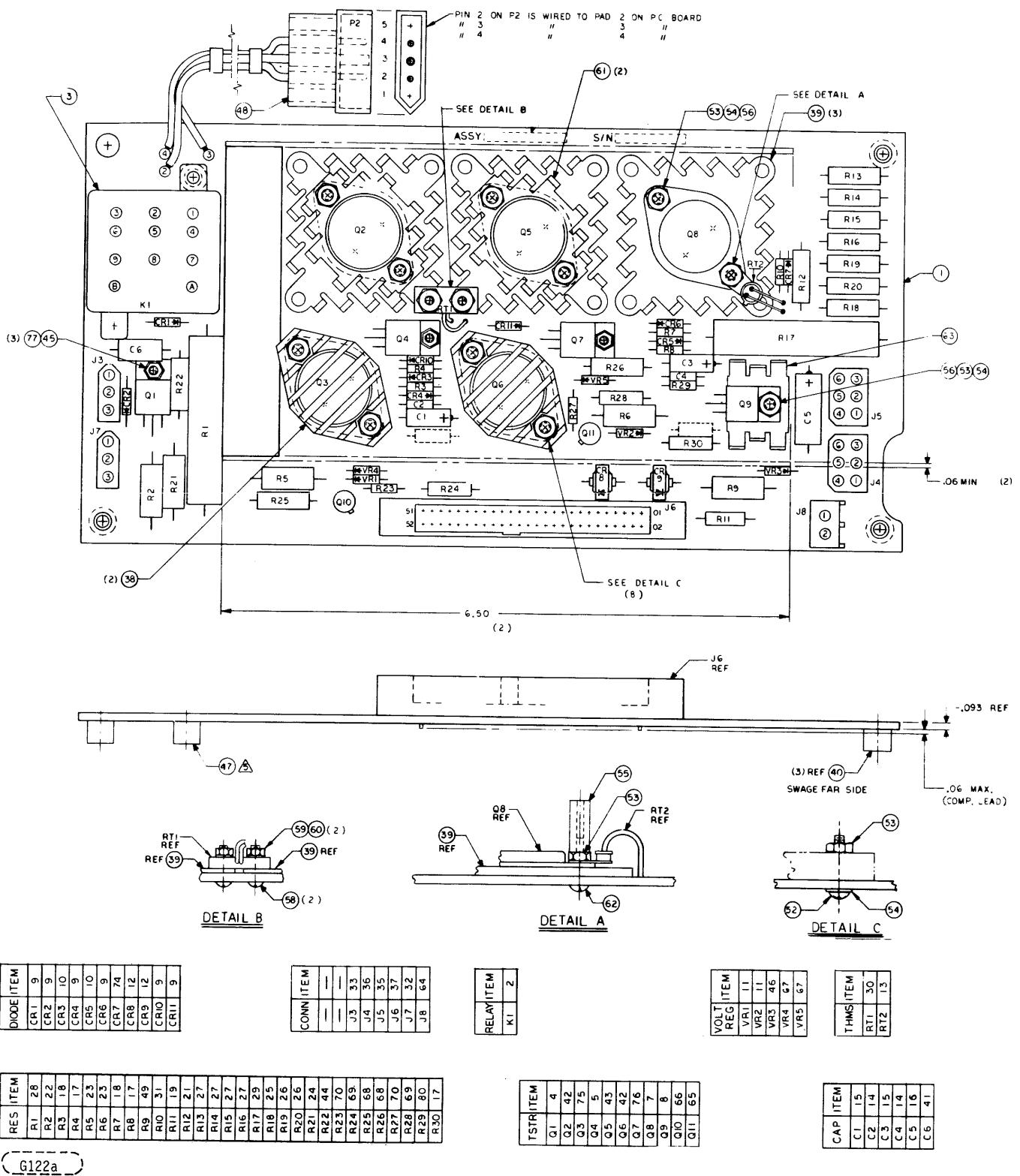


FIGURE 5-21. POWER SUPPLY BD NO. 1 (SHEET 1 OF 15)

<u>ITEM NO.</u>	<u>IDENTIFICATION NO.</u>	<u>DRAWING TITLE</u>
1	77830321-4	PWA Pwr Sup #1
2	77830323-0	PWB Pwr Sup #1
3	22940804-2	Relay Gen Purp 3PDT
4	22940901-6	Relay Socket
5	75752300-6	Transistor Power
7	75752402-0	Transistor Power
8	50221700-3	Transistor MJ 4502
9	15151500-4	Volt Regulator
10	50241001-2	Diode Silicon
11	51736700-9	Diode 1N 914A
12	50240920-4	Diode Zener
13	77832208-1	Diode Silicon
14	77612612-0	Thermistor Probe
15	83465304-0	Therm Sensor Switch-Intch
16	92496227-7	Cap 100V 20% .01 UF
17	17706043-1	Cap 50V 20% 4.7UF
18	24504386-4	Cap 20V 20% 47UF
19	94360236-7	Res 1/4W 1% 237
21	94360200-3	Res 1/4W 1% 100
22	24500139-1	Res 1/2W 5% 100
23	94318601-5	Resistor WW 3W 1.5
24	24507118-8	Res 1W 5% 51
25	24507139-4	Res 1W 5% 390
26	24507170-9	Res 1W 5% 2.0K
27	94318632-0	Resistor WW 3W 100
28	94318661-9	Resistor WW 3W 1000
29	94318697-3	Resistor WW 3W 0.5
30	62065805-4	Resistor
31	95594151-3	Res Fxd Wire WD 10W
32	77613025-4	Thermistor
33	94360100-5	Res 1/4W 1% 10.0
35	75808402-4	Conn Wafer 3-Pin
36	75808403-2	Conn Wafer 3-Pin MFM
37	75808448-7	Conn Wafer 6-Pin
38	75808451-1	Conn Wafer 6-Pin
39	97109269-7	Conn 32 Pin Male
40	75811802-0	Heatsink
41	75738874-9	Heatsink
42	95596205-5	Standoff
43	75738874-9	Cap 50V 10% 0.22MF
44	94240452-6	Motorola Tran 2N6030
45	77830635-7	Motorola Tran 2N5630
46	94646506-0	Res Wire WD 3W 50 OH
47	94318625-4	Stud-Self Clinching
48	93650012-6	Volt Reg 6.2V 5%
49	50240108-6	Standoff
52	75738858-2	Pwr Bd Harness Assy
	83456701-8	Res 1W 1.2K 10
	92512399-4	Screw SS Pan Hd 6-32
	92743168-4	

FIGURE 5-21. POWER SUPPLY BD NO. 1 (SHEET 2 OF 5)

<u>ITEM NO.</u>	<u>IDENTIFICATION NO.</u>	<u>DRAWING TITLE</u>
53	95510026-8	Nut Hex Mach Screw
54	10126103-0	Wash Int Tooth LK #6
55	83475701-5	Std Off-Wind Tunnel
56	92743164-3	Screw SS Pan Hd 6-32
58	92743088-4	Screw-Mach Hd SS 4-4
59	10126101-4	Wash Int Tooth Lock
60	10125103-1	Scr Nut-Hex Mach 4-4
61	77830638-1	Heat Dissipator
62	92743166-8	Screw-Pan Hd 6-32X5
63	94778801-4	Heatsink
64	95882700-8	Connector
65	75722200-5	Transistor NPN
66	16547200-2	Trans PNP 2N2907A
67	50240102-9	Diode-Zener 3.6V
68	94318604-9	Resistor 3 3W
69	24500174-8	Res 1/2W 5% 3.0K
70	94360368-8	Res 1/4W 1% 5.11K
74	83452901-8	Diode A14B
75	92162069-6	Transistor 2N3055
76	75752302-2	Transistor Power
77	92583002-8	Nut Lock
80	15164522-3	Res 1/4W 5% 2.2

CONNECTOR	DESTINATION (SCH)
J3	F5-31, BASEPLATE ELECTRONICS
J4 & J5	F5-26, F5-27, F5-28, F5-29 or F5-30, AC-DC POWER DISTRIBUTION.
J6	F5-22, POWER SUPPLY BD NO. 2
J7 & J8	F5-31, BASEPLATE ELECTRONICS
P2	DESTINATION NOT SHOWN - SIGNAL USED WHEN ADJUSTING HEADS TO BYPASS RELAY K1.

(AA291c)

FIGURE 5-21. POWER SUPPLY BD NO. 1 (SHEET 3 OF 5)

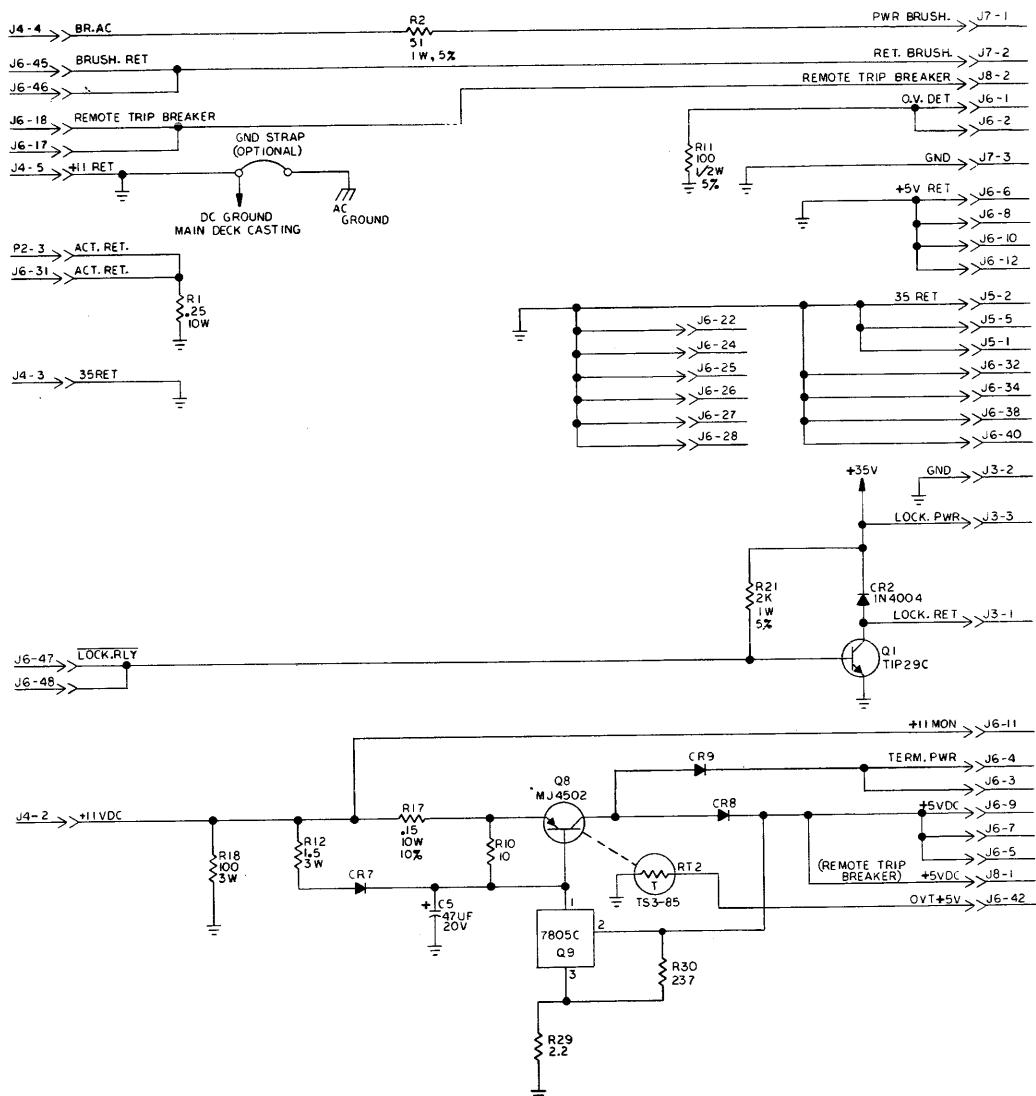
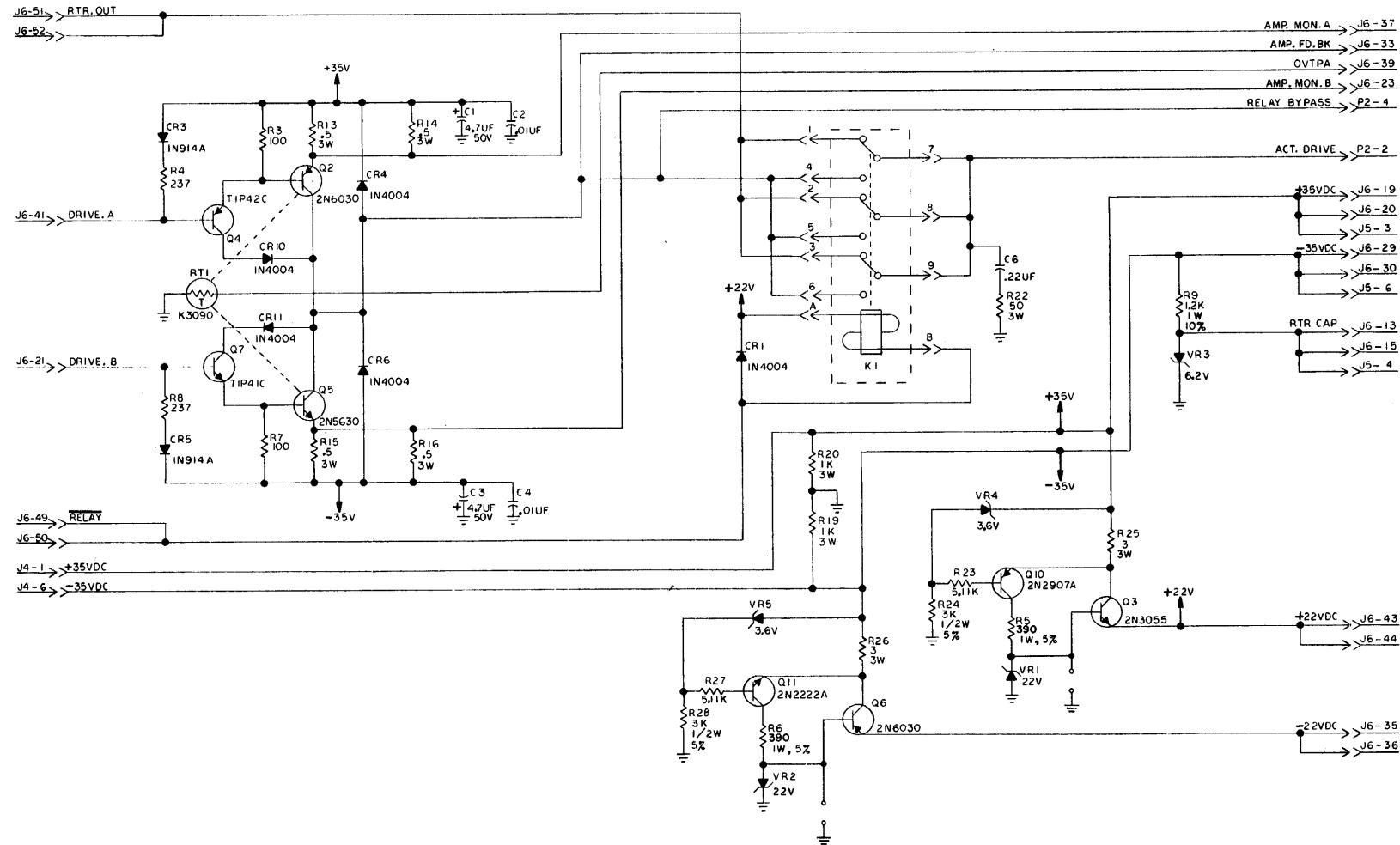
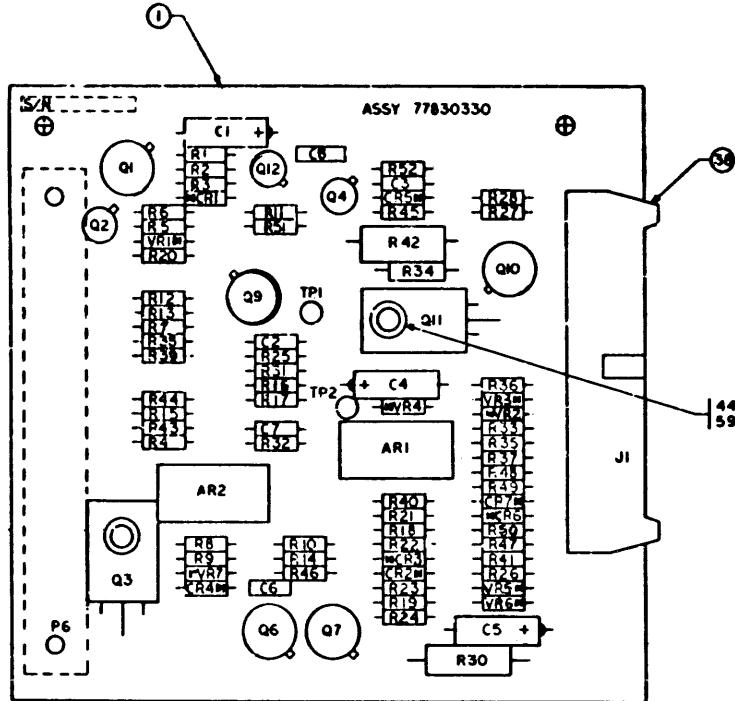


FIGURE 5-21. POWER SUPPLY BD NO. 1 (SHEET 4 OF 5)

FIGURE 5-21. POWER SUPPLY BD NO. 1 (SHEET 5 OF 5)





RES	PL ITEM	CAP	PL ITEM	TSTR	PL ITEM
R1	22	C1	18	Q1	8,45
R2	32	C2	21	Q2	5
R3	22	C3	17	Q3	36
R4	26	C4	19	Q4	6
R5	27	C5	19	Q5	—
R6	31	C6	60	Q6	7,45
R7	30	C7	56	Q7	4,45
R8	43	C8	60	Q8	—
R9	43	R39	50	Q9	9,45
R10	43	R40	57	Q10	20,45
R11	23	R41	24	Q11	2
R12	24	R42	47	Q12	3
R13	23	R43	51		
R14	23	R44	51		
R15	23	R45	54		
R16	33	R46	31		
R17	27	R47	58		
R18	22	R48	58		
R19	22	R49	58		
R20	28	R50	58		
R21	29	R51	61		
R22	25	R52	22	VOLT	PL ITEM
R23	25			REG	11
R24	29			CR4	11
R25	42			CR5	12
R26	24			CR6	12
R27	26			CR7	12
R28	62				
R29	—				
R30	41				

RES	PL ITEM	CAP	PL ITEM	TSTR	PL ITEM
R1	22	C1	18	Q1	8,45
R2	32	C2	21	Q2	5
R3	22	C3	17	Q3	36
R4	26	C4	19	Q4	6
R5	27	C5	19	Q5	—
R6	31	C6	60	Q6	7,45
R7	30	C7	56	Q7	4,45
R8	43	C8	60	Q8	—
R9	43	R39	50	Q9	9,45
R10	43	R40	57	Q10	20,45
R11	23	R41	24	Q11	2
R12	24	R42	47	Q12	3
R13	23	R43	51		
R14	23	R44	51		
R15	23	R45	54		
R16	33	R46	31		
R17	27	R47	58		
R18	22	R48	58		
R19	22	R49	58		
R20	28	R50	58		
R21	29	R51	61		
R22	25	R52	22	VOLT	PL ITEM
R23	25			REG	11
R24	29			CR4	11
R25	42			CR5	12
R26	24			CR6	12
R27	26			CR7	12
R28	62				
R29	—				
R30	41				

RES	PL ITEM	CAP	PL ITEM	TSTR	PL ITEM
R1	22	C1	18	Q1	8,45
R2	32	C2	21	Q2	5
R3	22	C3	17	Q3	36
R4	26	C4	19	Q4	6
R5	27	C5	19	Q5	—
R6	31	C6	60	Q6	7,45
R7	30	C7	56	Q7	4,45
R8	43	C8	60	Q8	—
R9	43	R39	50	Q9	9,45
R10	43	R40	57	Q10	20,45
R11	23	R41	24	Q11	2
R12	24	R42	47	Q12	3
R13	23	R43	51		
R14	23	R44	51		
R15	23	R45	54		
R16	33	R46	31		
R17	27	R47	58		
R18	22	R48	58		
R19	22	R49	58		
R20	28	R50	58		
R21	29	R51	61		
R22	25	R52	22	VOLT	PL ITEM
R23	25			REG	11
R24	29			CR4	11
R25	42			CR5	12
R26	24			CR6	12
R27	26			CR7	12
R28	62				
R29	—				
R30	41				

RES	PL ITEM	CAP	PL ITEM	TSTR	PL ITEM
R1	22	C1	18	Q1	8,45
R2	32	C2	21	Q2	5
R3	22	C3	17	Q3	36
R4	26	C4	19	Q4	6
R5	27	C5	19	Q5	—
R6	31	C6	60	Q6	7,45
R7	30	C7	56	Q7	4,45
R8	43	C8	60	Q8	—
R9	43	R39	50	Q9	9,45
R10	43	R40	57	Q10	20,45
R11	23	R41	24	Q11	2
R12	24	R42	47	Q12	3
R13	23	R43	51		
R14	23	R44	51		
R15	23	R45	54		
R16	33	R46	31		
R17	27	R47	58		
R18	22	R48	58		
R19	22	R49	58		
R20	28	R50	58		
R21	29	R51	61		
R22	25	R52	22	VOLT	PL ITEM
R23	25			REG	11
R24	29			CR4	11
R25	42			CR5	12
R26	24			CR6	12
R27	26			CR7	12
R28	62				
R29	—				
R30	41				

IC	PL ITEM	TERM	PL ITEM
ARI	IO	TP1	40
AR2	55	TP2	40

FIGURE 5-22. POWER SUPPLY BD NO. 2 (SHEET 1 OF 5)

<u>ITEM NO.</u>	<u>IDENTIFICATION NO.</u>	DRAWING TITLE
1	77830330-5	PWA Pwr Sup #2
1	77830334-7	PWB Pwr Sup #2
1	77830333-0	PWB Pwr Sup #2, Intch
2	75752300-6	Transistor Power
3	50219900-3	Transistor- Unijunction
4	95592700-9	Transistor 2N2905
5	75722200-5	Transistor NPN
6	16547200-2	Trans PNP 2N2907A
7	75722201-3	Transistor NPN 2N2219A
8	95327201-0	Silicon Triac
9	83464203-5	Sensitive Gate Triac
10	51812800-4	IC Dual UA 747
11	50241001-2	Diode Silicon
12	51736700-9	Diode 1N914A
13	50240102-9	Diode-Zener 3.6V
14	50240109-4	Diode Silicon
15	50240117-7	Diode Zener
16	50240110-2	Diode Silicon
17	92496227-7	Cap 100V 20% .01UF
18	24504337-7	Cap 35V 20% 4.7UF
19	24504339-3	Cap 35V 20% 6.8UF
20	83464202-7	IC
21	75808533-6	Cap 100V 10% 4700
22	94360200-3	Res 1/4W 1% 100
23	94360236-7	Res 1/4W 1% 237
24	94360280-5	Res 1/4W 1% 681
25	94360284-7	Res 1/4W 1% 750
26	94360300-1	Res 1/4W 1% 1.00K
27	94360329-0	Res 1/4W 1% 2.00K
28	94360368-8	Res 1/4W 1% 5.11K
29	94360380-3	Res 1/4W 1% 6.81K
30	94360385-2	Res 1/4W 1% 7.68K
31	94360400-9	Res 1/4W 1% 10.0K
32	94360448-8	Res 1/4W 1% 31.6K
33	94360568-3	Res 1/4W 1% 511K
35	24500170-6	Res 1/2W 5% 2.0K
36	75885251-1	Diode, Silicon Control
38	94359502-5	Header Flat Cable
39	97113325-1	Connector Header
40	92498021-2	Terminal, Swaged
41	94318633-8	Resistor WW 3W 110
42	94360550-1	Res 1/4W 1% 332K
43	94360240-9	Res 1/4W 1% 261
44	93640012-6	Stud-Self Clinching
45	94335900-0	Pad-Transistor Mtg
46	95694204-9	Spacer
47	24507118-8	Res 1W 5% 51
49	94360400-9	Res 1/4W 1% 10.0K

FIGURE 5-22. POWER SUPPLY BD NO. 2 (SHEET 2 OF 5)

ITEM NO.	IDENTIFICATION NO.	DRAWING TITLE
50	94360355-5	Res 1/4W 1% 3.74K
51	94360384-5	Res 1/4W 1% 7.50K
52	50240106-0	Diode Silicon, Zener, 5.1V
54	94360373-8	Res 1/4W 1% 5.76K
55	15126600-4	IC LM339
56	75808537-7	Cap 100V 10% 0.01 UF
57	94360311-8	Res 1/4W 1% 1.30K
58	94360325-8	Res 1/4W 1% 1.82K
59	92583002-8	Nut Lock
60	94354832-1	Capacitor Ceramic
61	94360304-3	Res 1/4W 1% 1.10K
62	94360429-8	Res 1/4W 1% 20.0K

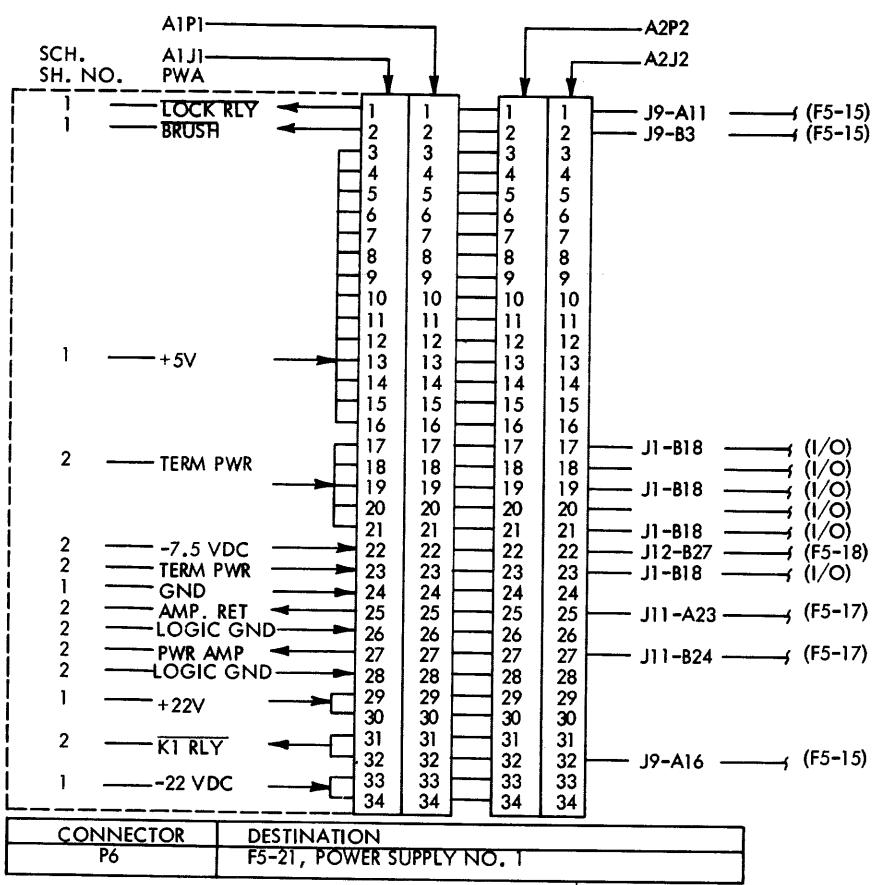


FIGURE 5-22. POWER SUPPLY BD NO. 2 (SHEET 3 OF 5)

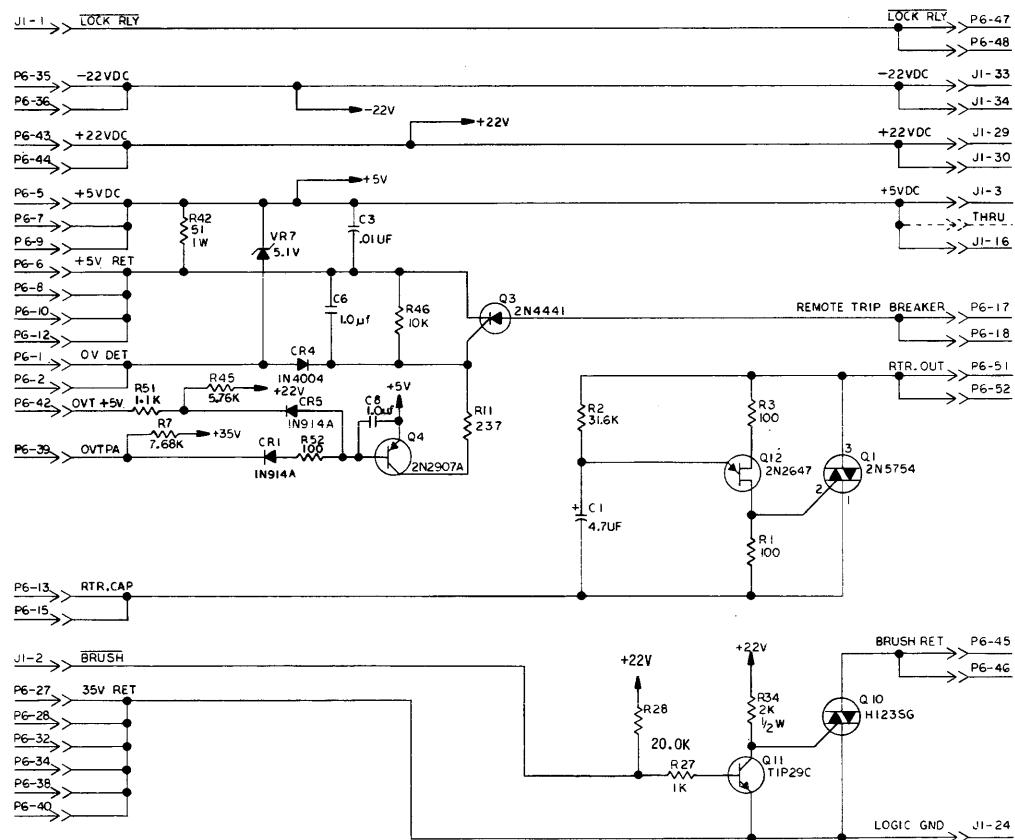
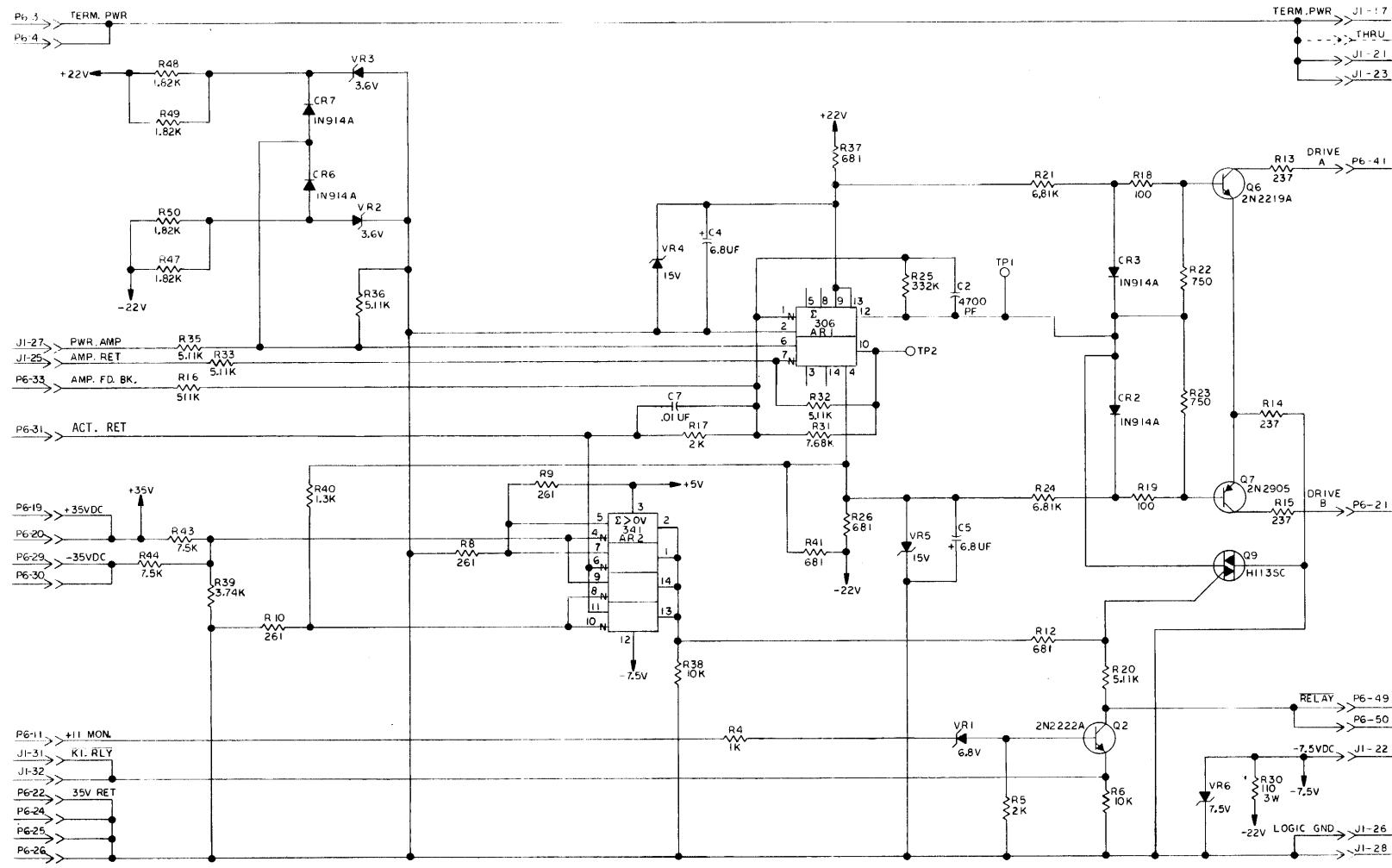
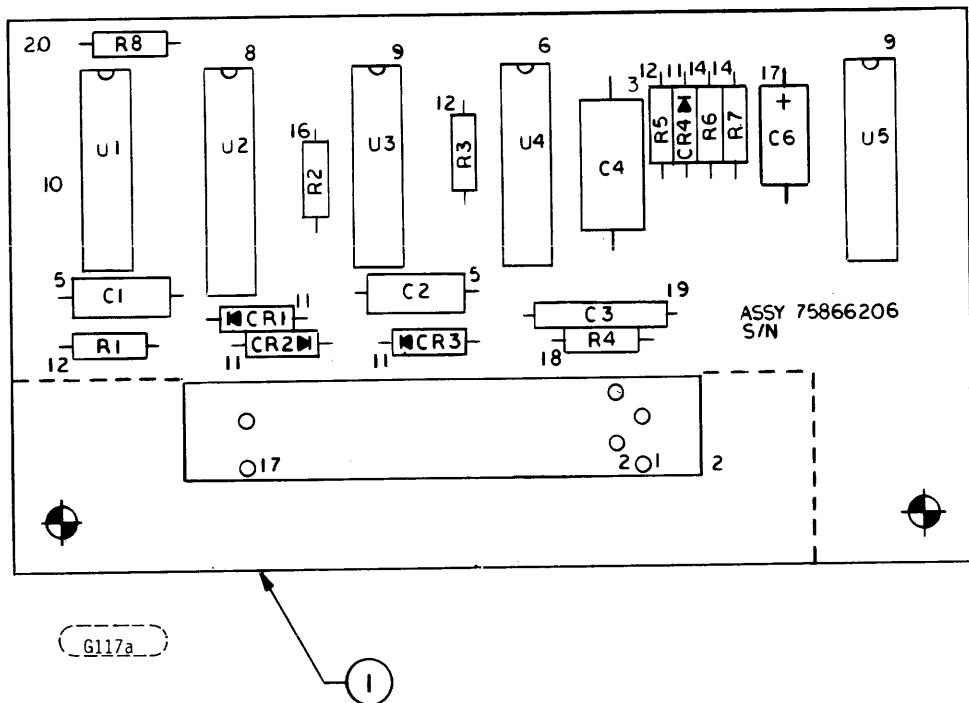


FIGURE 5-22. POWER SUPPLY BD NO. 2 (SHEET 4 OF 5)

FIGURE 5-22. POWER SUPPLY BD NO. 2 (SHEET 5 OF 5)





<u>ITEM NO.</u>	<u>IDENTIFICATION NUMBER</u>	<u>DRAWING TITLE</u>
1	75866206	PWA , Spindle Mtr Brake
	75866107	PWB, Spindle Mtr Brke
2	75885581	Connector PWB
2	00005184	Connector PR017579, Intch
3	94240452	Cap 50V 10% 0.22 MF
5	94240448	Cap 50V 10% 0.10 UF
6	15133200	IC CMOS 4011B
8	15134700	IC CMOS 4049B
9	15135000	IC CMOS 4001B
10	51768200	IC Dual
11	51736700	Diode 1N914A
12	17705953	Res 1/4W 5% 5.1Meg
14	24500087	Res 1/4W 5% 10K
16	94360500	Res 1/4W 1% 100K
17	24504346	Cap 10V 20% 4.7UF
18	17705951	Res 1/4W 5% 4.3Meg
19	83452013	Cap 100V 10% 0.22 UF
20	94360357	Res 1/4W 1% 3.92K

FIGURE 5-23. SPINDLE MOTOR BRAKE ASM (SHEET 1 OF 3)

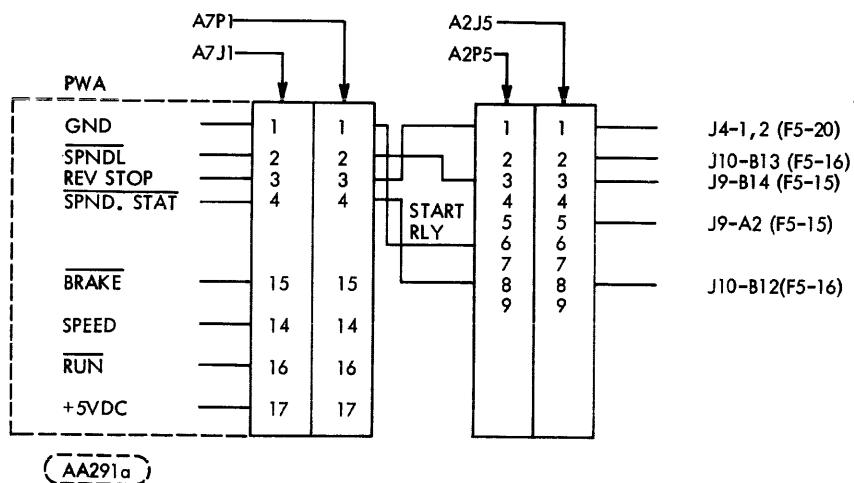


FIGURE 5-23. SPINDLE MOTOR BRAKE ASM (SHEET 2 OF 3)

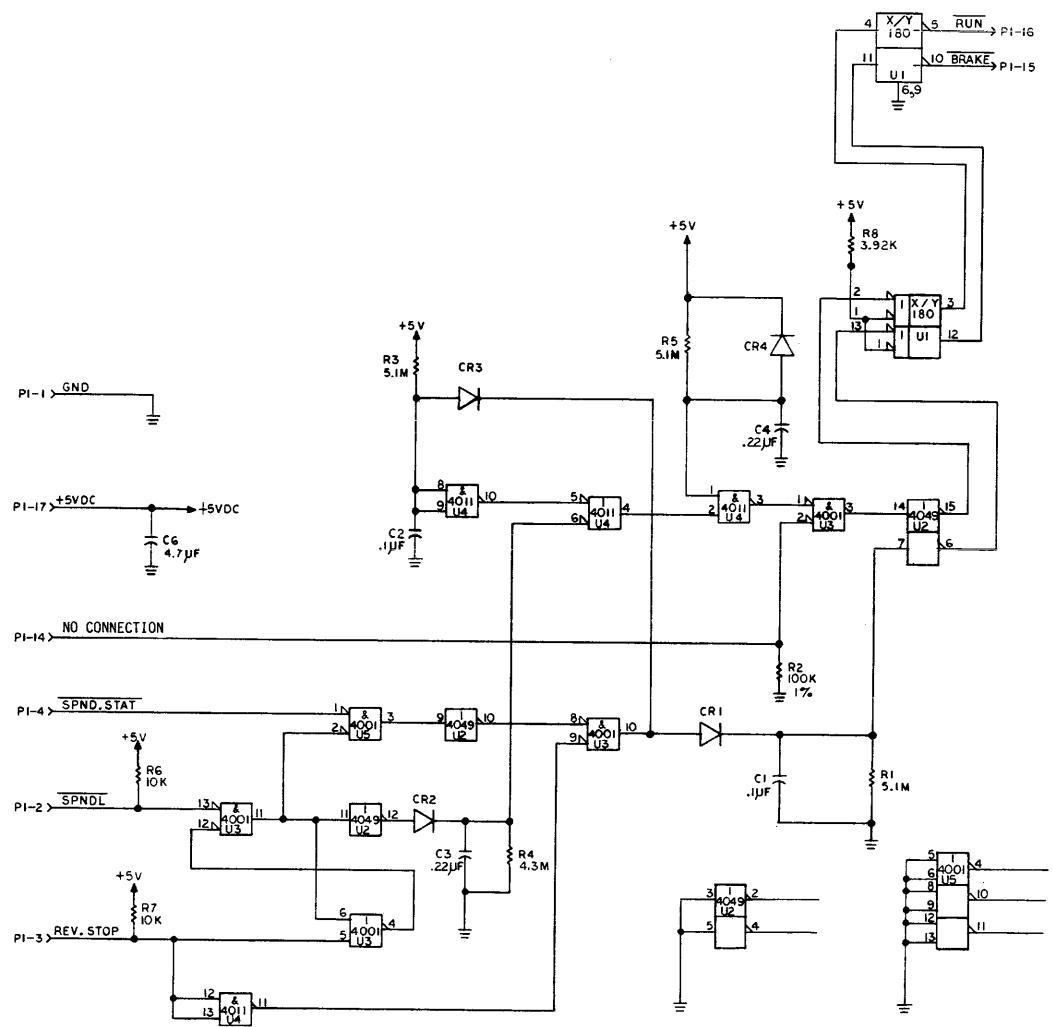


FIGURE 5-23. SPINDLE MOTOR BRAKE ASM (SHEET 3 OF 3)

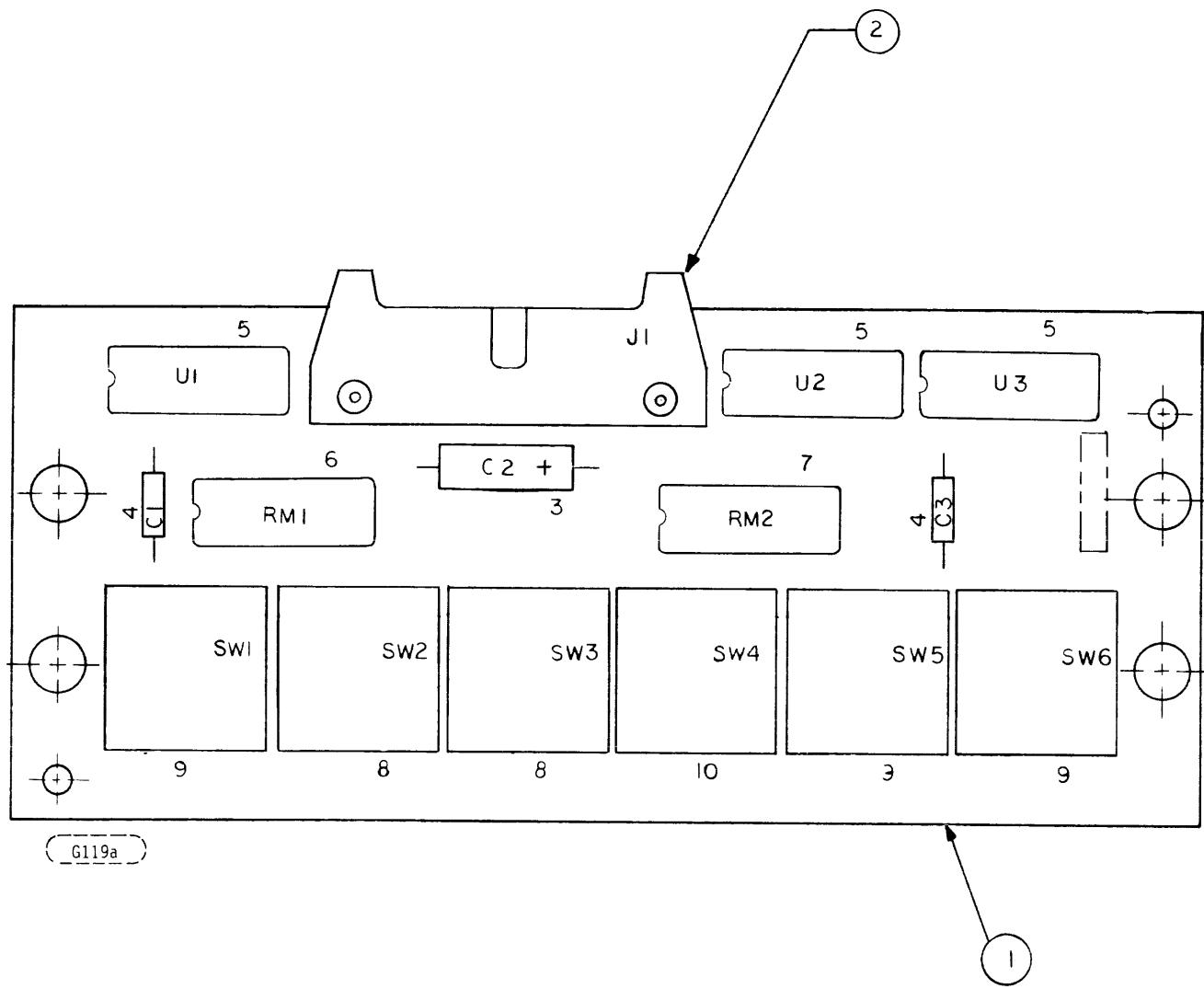


FIGURE 5-24. SWITCH BD ASM (SHEET 1 OF 3)

<u>ITEM NO.</u>	<u>IDENT NO.</u>	<u>DRAWING TITLE</u>
1	75299102	PWA Switch Board
2	75299001	PC Board, Switch
3	94359505	Header-Flat Cable
4	24504353	Cap 10V 20% 33UF
5	92496227	Cap 100V 20% .01UF
6	51768200	IC Dual
7	75009976	Res Pac 2% 2.0K (7)
8	75009955	Res Pac 2% 100 (7)
9	75299600	Switch Assy
10	75299700	Switch Assy
11	75299800	Switch Assy
11	83490700	Button-Switch Assy (on 75299103 only)
11	75299900	Button-Switch Assy (on 75299102 only)

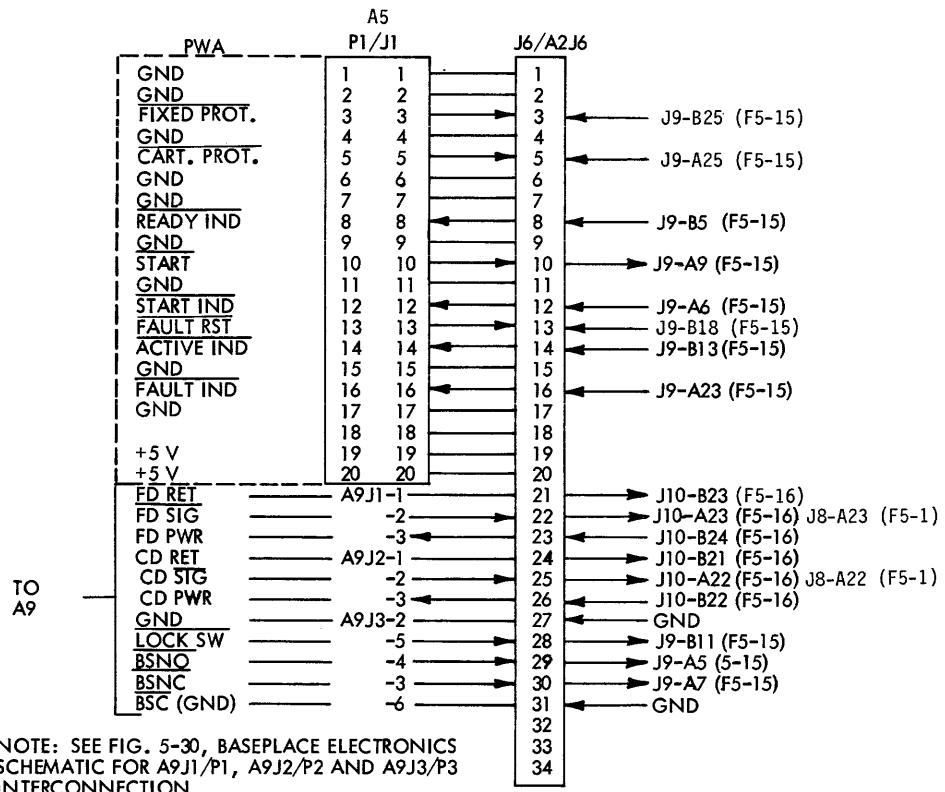


FIGURE 5-24. SWITCH BD ASM (SHEET 2 OF 3)

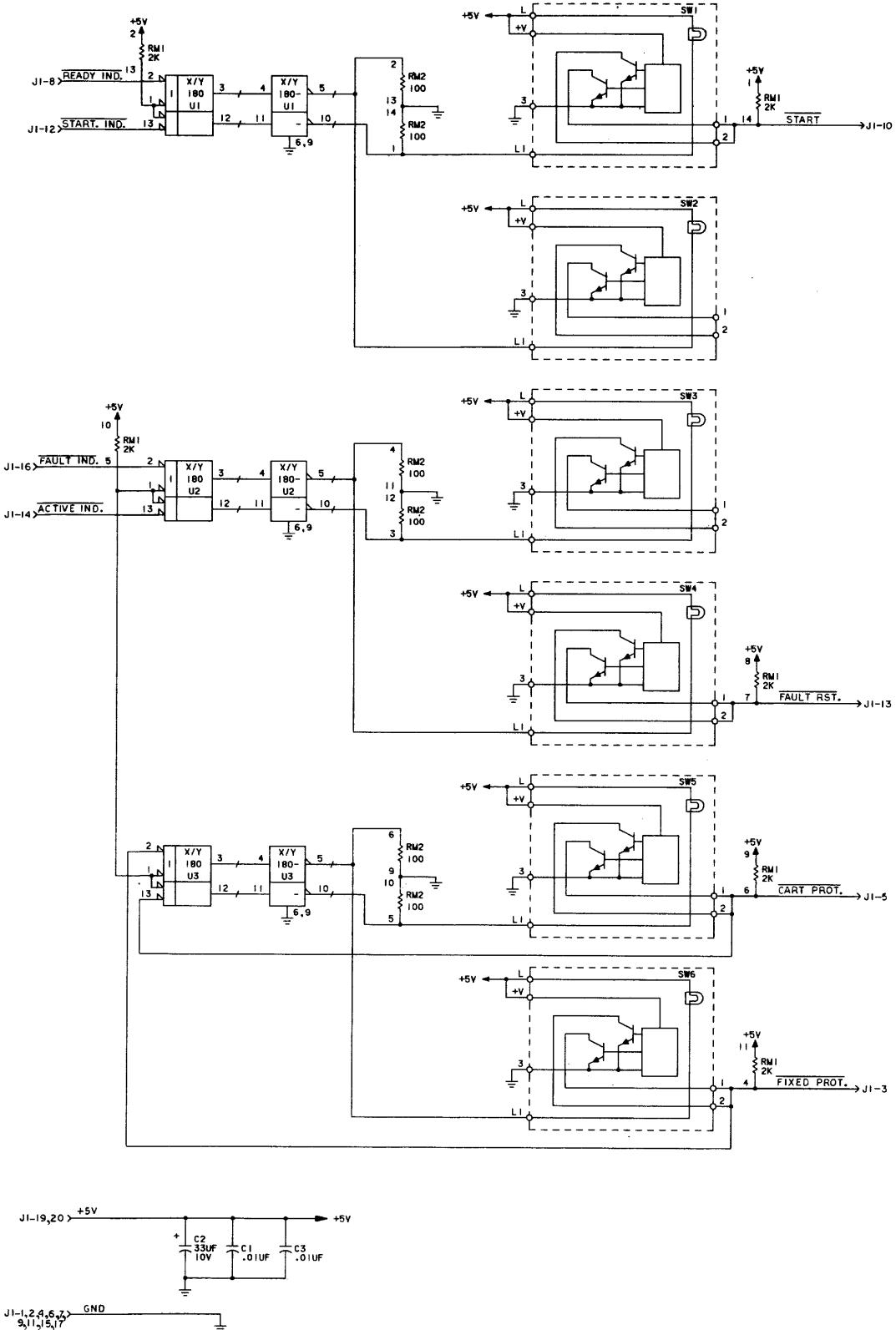


FIGURE 5-24. SWITCH BD ASM (SHEET 3 OF 3)

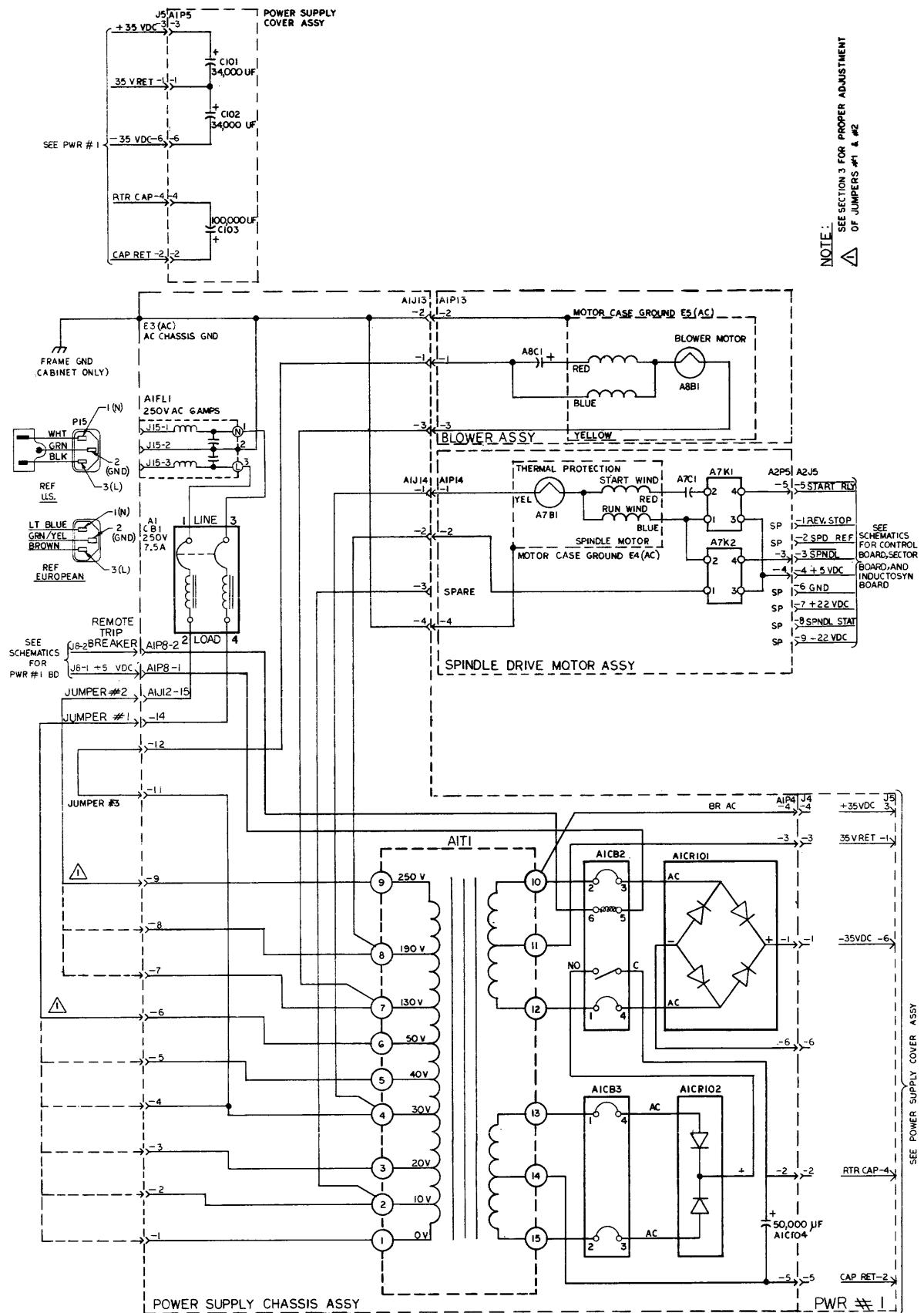


FIGURE 5-25. AC-DC WITHOUT DYNAMIC BRAKE

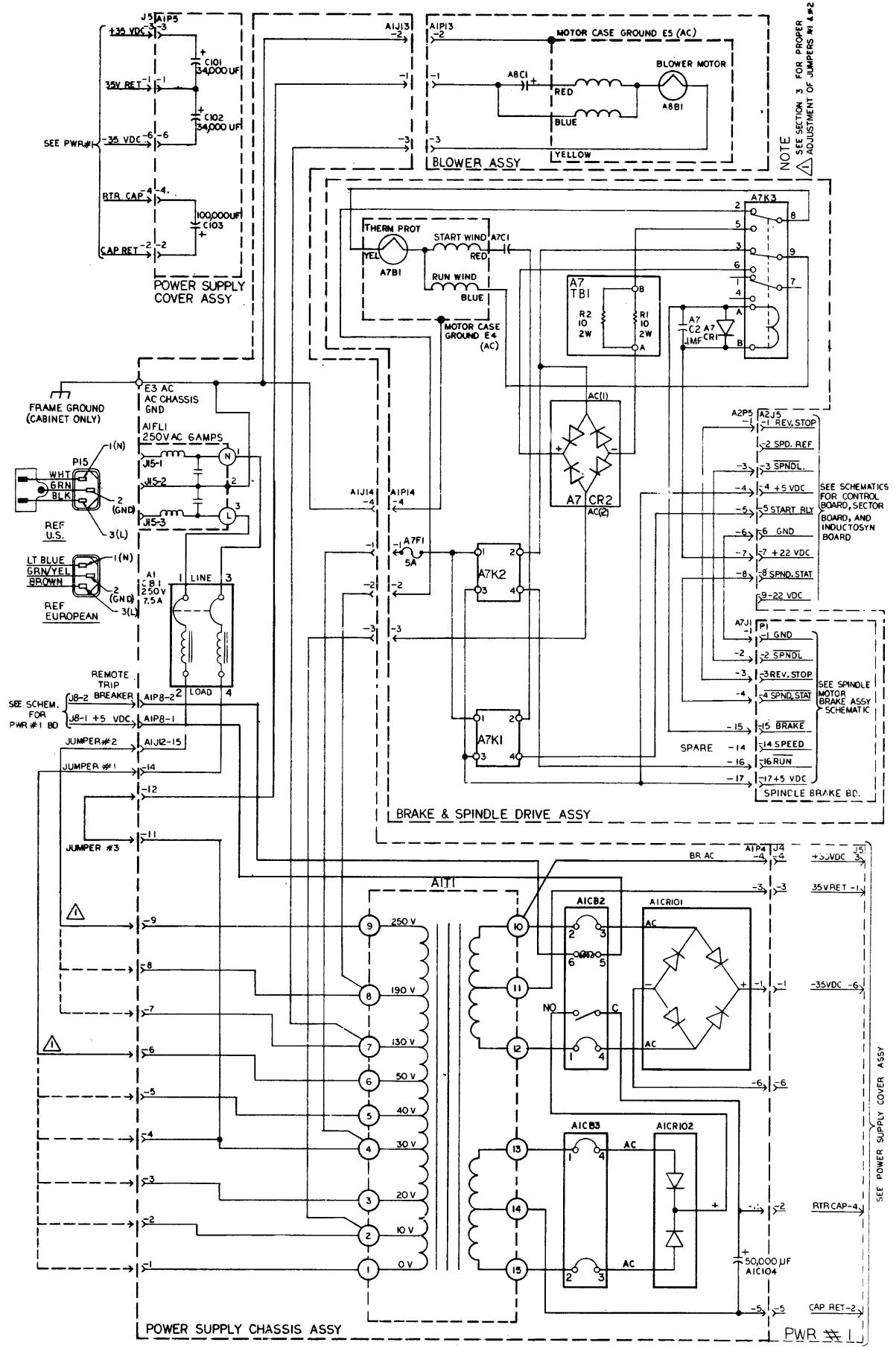


FIGURE 5-26. AC-DC WITH DYNAMIC BRAKE

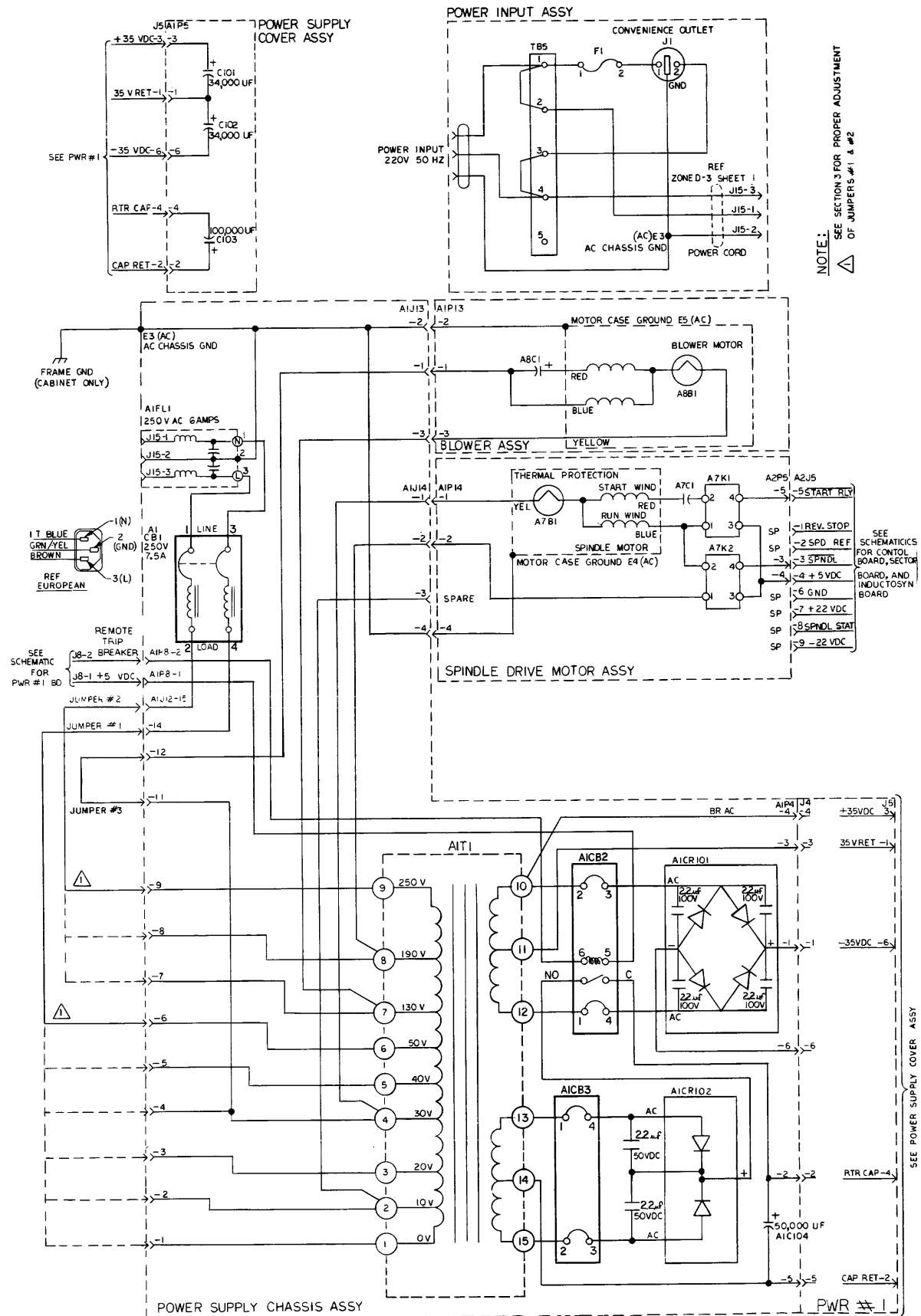


FIGURE 5-27. AC-DC WITHOUT BRAKE AND WITH FILTERS AND POWER INPUT ASSEMBLY

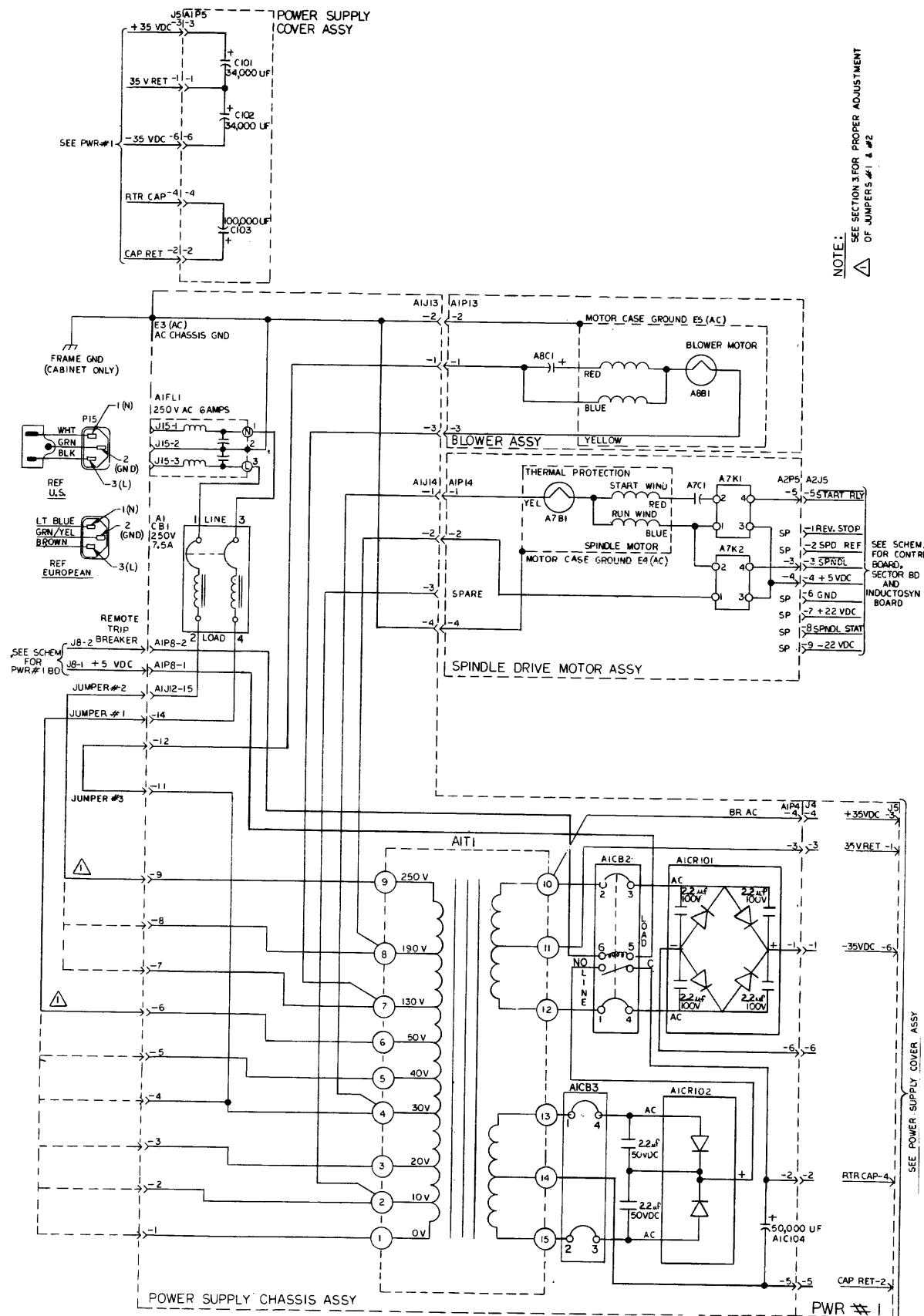


FIGURE 5-28. AC-DC WITHOUT DYNAMIC BRAKE - WITH FILTERS

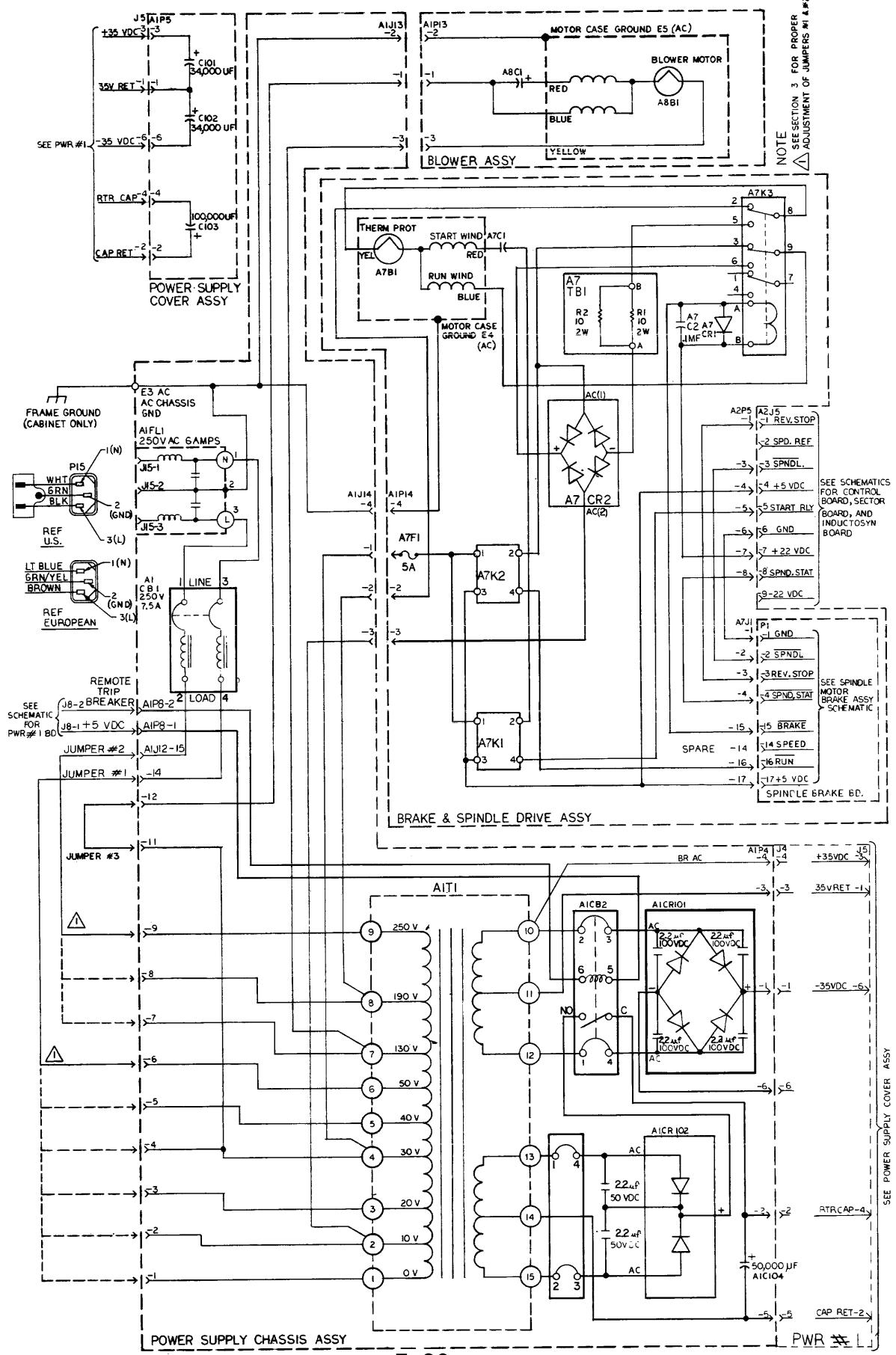


FIGURE 5-29. AC-DC WITH BRAKE AND FILTERS

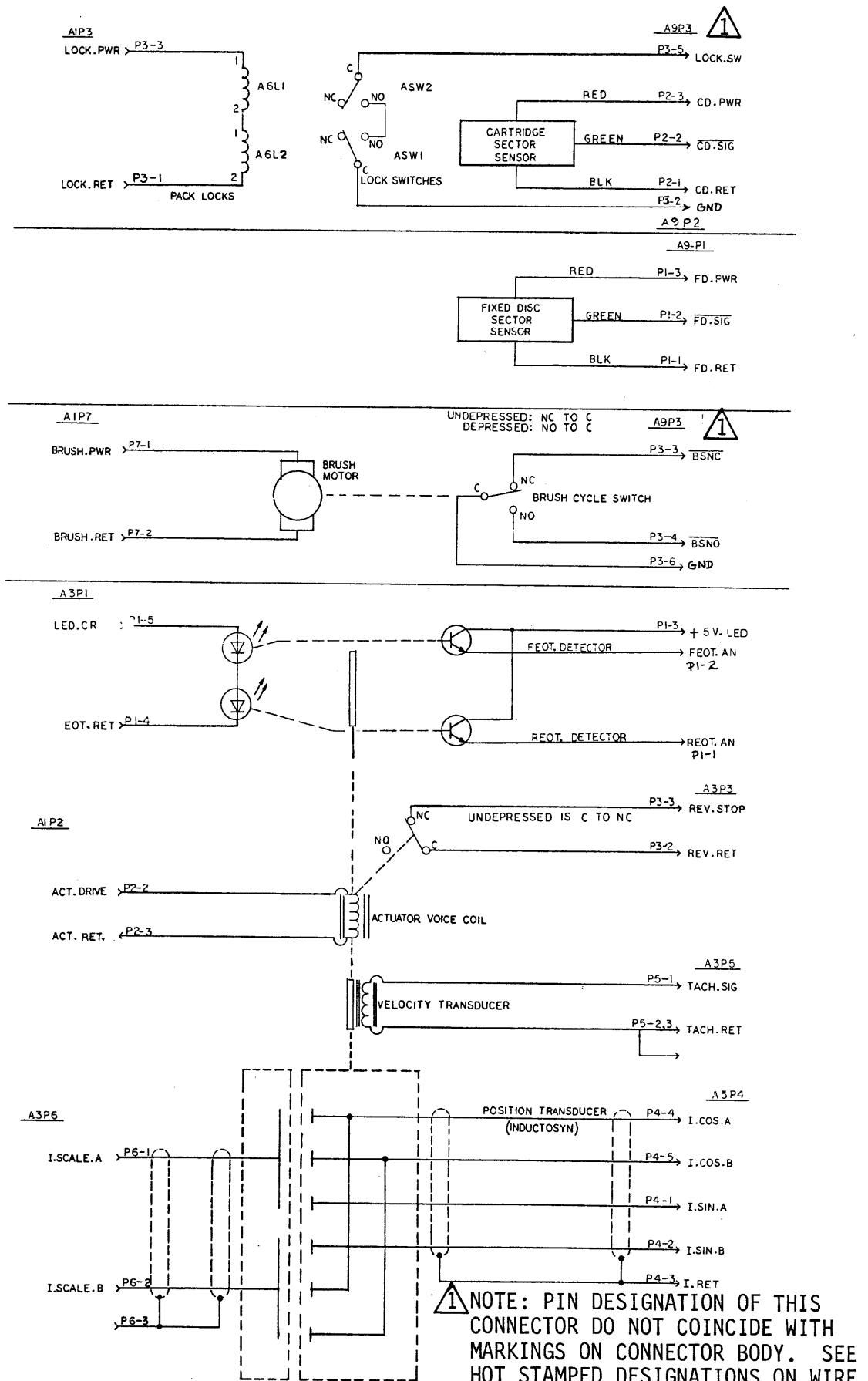


FIGURE 5-30, BASEPLATE ELECTRONICS

6.1 INTRODUCTION

This section contains the instructions required to maintain the Model 9427H Disk Drive. The information is provided in the form of preventive maintenance and corrective maintenance. All maintenance should be performed by qualified and trained service personnel, using procedures specified in this section.

6.2 MAINTENANCE TOOLS

The special tools required to maintain the disk drive are listed in Table 6-1.

6.3 MAINTENANCE MATERIALS

The materials used in the procedures of this section are listed in Table 6-2.

TABLE 6-1. MAINTENANCE TOOLS

DESCRIPTION	CDC PART NUMBER
Plastic Feeler Gauges	Commercially available plastic shim
Head Alignment Tool	75797900
Multimeter, Simpson 260 (or equivalent) Oscilloscope, Dual-Trace, Tektronix 453 (or equivalent)	
Ball Allen Drivers (1/16, 0.050, 9/64, 5/32, 3/32)	
CE Disk Cartridge Model 847-51	89296000
Card Extender	75861504
Card Extractor	83485801 (or equivalent)*
Fault Board Kit, including: Fault Board Instruction Manual	83457801 75863204 75535900
Armature Plate Simulator	83455500
Pin Extractor for Voltage Plug A1P12 Molex Products Corp.	
HT-2038 Extractor	
OEM Field Tester	77833135
Torque Screwdrivers 1-30 in./lbs & 1-100 in./lbs with Hex Bit Adapter and Phillips Adapter	Commercially available
Bulb Removal Tool	83439200

* **WARNING** Exercise care to avoid damage to cards or to attached components, when using card extraction tool.

TABLE 6-2. MAINTENANCE MATERIALS

MATERIAL	SOURCE
Gauze, Lint-Free	Control Data 12209713
Media Cleaning Solution	Control Data 82365800
Loctite, Grade C or #242	Loctite Corporation
Loctite Primer, Grade N	Loctite Corporation
Tongue Depressors	Commercially available
Tape, Masking	Commercially available
Duco Cement (or Equivalent)	Commercially available
Adhesive (RTV 108)	Commercially available

6.4 MAINTENANCE INDEX AND SCHEDULE

The Model 9427H is designed to require minimal preventive maintenance. The preventive maintenance index provided in Table 6-3 is meant to be used only as a general guideline. The preventive maintenance index consists of seven levels based on a calendar period or on hours of operation (whichever comes first).

The corrective maintenance procedures listed in Table 6-3 are included to facilitate the replacement of malfunctioning assemblies. Adjustment procedures are provided to adjust the unit to the published specifications. Maintenance personnel should read the entire procedure prior to performing any of the steps. Steps of these procedures should be performed in sequence.

The check and adjustments procedures listed in Table 6-3 may be used to check for malfunctioning parts, to determine whether the disk drive is operating within published specification s, or to adjust the disk drive for proper operations.

6.5 PREVENTIVE MAINTENANCE PROCEDURES

6.5.1 CONTROL PANEL LAMP REPLACEMENT

CAUTION Do not remove buttons from alternate action switches when they are in the depressed position or internal damage to the switch will occur.

1. Remove the Switch Button from the switch assembly by pulling the button outward from the switch. Note Orientation of metal bracket inside pushbutton cover for re-installation during Step 4.
2. Using the bulb removal tool, remove the lamp from the socket. (Do not turn the lamp since it is a plug-in device).
3. Install new lamp.
4. Re-install Switch Button. Care must be taken that the metal tabs on the pushbutton bracket do not come in contact with the metal clamps supplying voltage to the lamp or damage to the switch logic will occur.

6.5.2 INSPECT AND CLEAN READ/WRITE HEADS

1. Depress START /STOP switch to STOP (out) and wait for spindle to stop rotating (START /STOP light extinguished).
2. Open top cover.
3. Set main circuit breaker to off position.
4. Remove electronics cover.

TABLE 6-3. MAINTENANCE INDEX AND SCHEDULE

PREVENTIVE MAINTENANCE	Schedule
Control Panel Lamp Replacement	6
Inspect and Clean Read/Write Heads	3
Disk Cartridge Inspection and Cleaning	3
Fixed Disk Inspection and Cleaning	3
Absolute Filter Removal and Replacement (Office or Industrial Environment)	4
Absolute Filter Removal and Replacement (Compute Room Environment)	5
Pre-Filter Cleaning (Base Cabinet)	3
Pre-Filter Cleaning (Rack Mount Unit only)	3
Disk Brush-Check and Replacement	5
Inspect and Dry Magnetic Chuck	0
DEFINITION OF SCHEDULE	
Level 0 - Daily, depending on condition state	
Level 1 - Weekly or 150 hours (no preventive maintenance scheduled)	
Level 2 - Monthly or 500 hours (no preventive maintenance scheduled)	
Level 3 - Quarterly or 1500 hours	
Level 4 - Semi-annually or 3000 hours (no preventive maintenance scheduled)	
Level 5 - Annually or 6000 hours	
Level 6 - 15,000 hours	
CORRECTIVE MAINTENACE	
REMOVAL AND REPLACEMENT PROCEDURES (R&R)	
Title	Paragraph No.
Actuator Assembly R & R	6.6.1
Head R & R	6.6.2
EOT Assembly R & R	6.6.3
Fixed Disk R & R	6.6.4
Position Transducer Scale R & R	6.6.5
Velocity Transducer R & R	6.6.6
Velocity Transducer Magnet R & R	6.6.7
Spindle Assembly R & R	6.6.8
Cartridge Disk Index/Sector Transducer R & R	6.6.9
Fixed Disk Index/Sector Transducer R & R	6.6.10
Static Eliminator R & R	6.6.11
Sector Ring R & R	6.6.12
Cartridge On Switch R & R	6.6.13
Disk Brush Assembly R & R	6.6.14
Brush Motor R & R	6.6.15
Spindle Drive Motor Assembly R & R	6.6.16

TABLE 6-3. MAINTENANCE INDEX AND SCHEDULE (CONTINUED)

CORRECTIVE MAINTENANCE	
REMOVAL AND REPLACEMENT PROCEDURES (R&R) cont'd	
<u>Title</u>	<u>Paragraph No.</u>
Card Cage Printed Circuit Board R & R	6.6.17
Power Supply R & R	6.6.18
Piggyback Power Board R & R	6.6.19
Card Cage/Mother Board R & R	6.6.20
Blower Motor Assembly R & R (Base Cabinet)	6.6.21
Blower Motor Assembly R & R	6.6.22
Drive Motor and Belt R & R	6.6.23
Idler Motor and Belt R & R	6.6.24
Pack Lock Assembly or Pack Lock Solenoid R & R	6.6.25
CHECK AND ADJUSTMENT PROCEDURES (C&A)	
<u>Title</u>	<u>Paragraph No.</u>
Temperature Stabilization Check and Adjustment	6.7.1
AGC Servo Preamplifier and Inductosyn C & A	6.7.2
FEOT Check and Adjustment	6.7.3
Head Alignment Check and Adjustment	6.7.4
Head Skew and Index-to-Burst Period Check and Adjustment	6.7.5
Track Indicator Check and Adjustment	6.7.6
Cartridge-On Switch Check and Adjustment	6.7.7
Static Eliminator Check	6.7.8
Disk Brush Switch Check and Adjustment	6.7.9
Cartridge Index/Sector Transducer C & A	6.7.10
Fixed Disk Index/Sector Transducer C & A	6.7.11

5. Upper heads can be cleaned and removed without removal of actuator. To clean and remove lower heads, perform removal steps 1 through 21 of the actuator assembly removal and replacement procedure.

Do not smoke while cleaning heads. Do not touch head face. When cleaning or buffing, always move tongue depressor perpendicular to length of head/arm assembly. Do not leave residue or lint on head faces.

6. Inspect heads for dirt on head face. Clean heads, if required, as follows:

- a. Use lint-free gauze on a tongue depressor to lightly dry buff head face.
- b. If dry buffing does not remove dirt, dampen (do not soak) gauze to lightly buff head face.

7. Install actuator by performing replacement steps 1 through 22 of Actuator Removal and Replacement procedure, if lower heads were cleaned.

6.5.3 DISK CARTRIDGE INSPECTION AND CLEANING

1. Depress START/STOP switch to STOP (out) and wait for spindle to stop rotating (START/STOP lamp extinguished).
2. Remove disk cartridge.
3. Using a bright, directional light, inspect both sides of disk. If disk is dirty, have disk cartridge cleaned.
4. If disk surface is scratched, cartridge should be replaced.

6.5.4 FIXED DISK INSPECTION AND CLEANING

Cleaning of fixed disk will not normally be necessary, if disk area is kept covered. Clean disk by performing the following procedure.

1. Perform removal steps 1 through 11 of fixed disk removal and replacement procedures.
2. Inspect fixed disk brushes for dust. If brushes are dirty and show excessive wear, replace all brushes.
3. Slowly rotate spindle by hand and inspect both sides of disk. If scratches are found, replace disk.
4. To clean disk, wrap a piece of lint free gauze around tongue depressor and dampen (do not soak) with media cleaning solution.
5. While rotating spindle by hand, move tip of spatula (applying moderate pressure) across disk to outer edge.
6. Repeat step 5 for both disk surfaces until gauze comes away clean from disk surface.
7. Wrap a clean, dry piece of gauze around spatula and repeat step 5 to remove any residue left by cleaning solution.
8. To complete installation, perform replacement steps 4 through 9 of fixed disk removal and replacement procedure.

6.5.5 ABSOLUTE FILTER R & R

1. Depress START/STOP switch to STOP (out) and wait for spindle to stop rotating (START/STOP lamp extinguished).
2. Open top cover (base cabinet only).
3. Set main circuit breaker to off position.
4. Using a 5/32 Allen driver, place tool into holes on end panels and remove front and rear end panels by loosening hardware base cabinet only).
5. Remove left side panel of unit (when received from rear of unit, base cabinet only).
6. Loosen filter clamp (Figure 6-1) and swing clamp clear of filter.
7. Remove filter expander bracket.
8. Slide blower expander forward until filter is free.
9. Remove filter.
10. Remove per-filter (Rack Mount Units only).
11. Clean pre-filter (Rack Mount Units only).
12. Secure pre-filter to new absolute filter by applying Duco cement at the four corners. Use old filter as a reference making sure pre-filter does not block unfiltered side of absolute filter (rack-mount units only).
13. Install replacement absolute filter and pre-filter.

NOTE: Insure that foam gasket between absolute filter and power supply are properly aligned. If not properly aligned, air flow can be restricted causing damage to power supply.

14. Install filter expander.

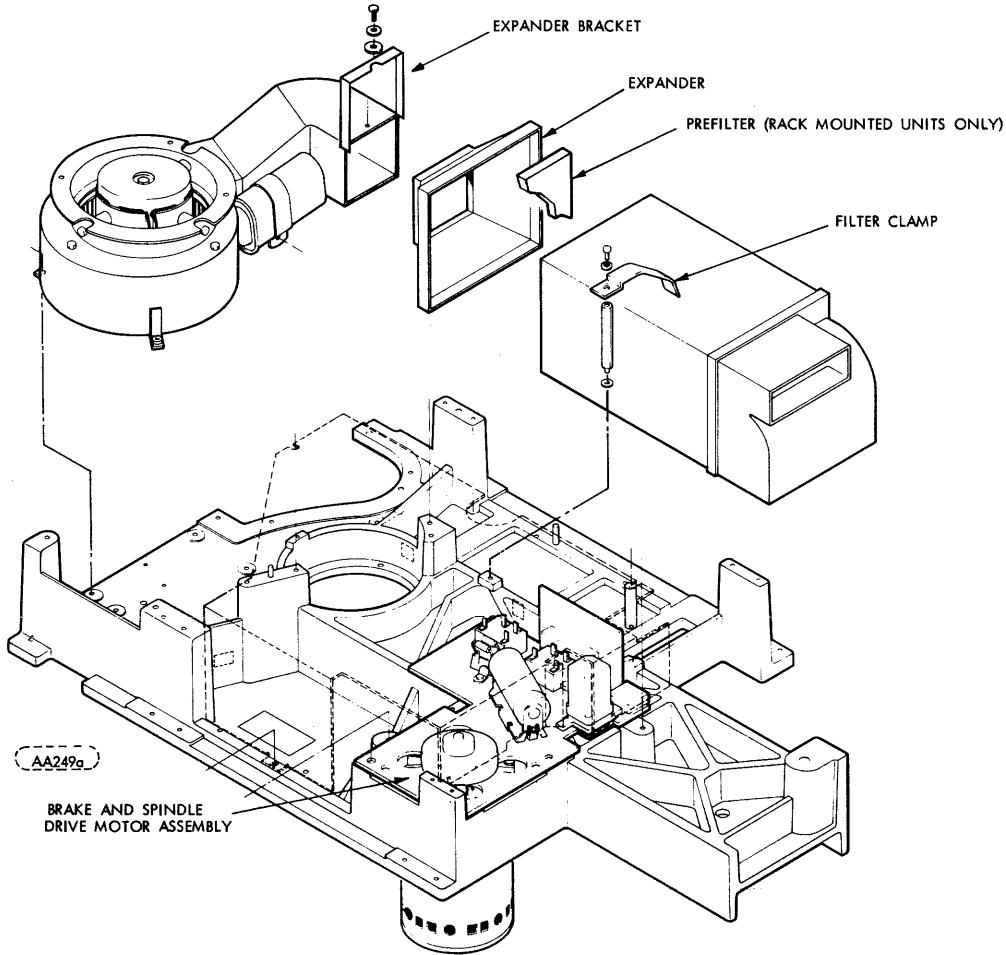


FIGURE 6-1. FILTER MOUNTING

15. Install expander bracket.
16. Install filter clamp.
17. Install cabinet side skin.
18. Close top cover.
19. Install front and rear end panels (base cabinet only).

6.5.6 PRE-FILTER CLEANING (BASE CABINET)

1. Using a 5/32 Allen driver, place tool into hole on front end panel and remove panel by loosening hardware.
2. Remove pre-filter from cabinet.
3. Remove pre-filter element from aluminum frame and clean by washing in warm water and soap.
4. Rinse and dry filter element and install in aluminum frame.
5. Install filter in cabinet. Insure that expanded metal screen is up.
6. Install front end panel.

6.5.7 PRE-FILTER CLEANING (RACK MOUNT UNIT ONLY)

1. Depress START/STOP switch to STOP (out) and wait for spindle to stop rotating (START/STOP lamp extinguished).
2. Set main circuit breaker to off position.
3. Loosen filter clamp (Figure 6-1) and swing clamp clear of filter.
4. Remove filter expander bracket.
5. Slide blower expander forward until filter is free.
6. Remove pre-filter.
7. Clean pre-filter by washing in warm water and soap.
8. Rinse and dry pre-filter.
9. Install pre-filter to absolute filter by applying Duco cement at the four corners, making sure pre-filter does not block unfiltered side of absolute filter.

Insure that foam gasket between absolute filter and power supply

NOTE: is properly aligned. If not properly aligned, air flow can be restricted causing damage to power supply.

10. Install filter expander.
11. Install expander bracket.
12. Install filter clamp.

6.5.8 DISK BRUSH CHECK AND REPLACEMENT

1. Perform removal steps 1 through 11 of disk brush assembly R&R procedure.
2. If disk brushes are dirty and show excessive ware, replace all brushes. Pull brush horizontally to remove from holding bracket. The new brush snaps into place when seated properly.
3. Perform replacement steps 3 through 11 of disk brush assembly removal and replacement procedure.

6.5.9 INSPECT AND DRY MAGNETIC CHUCK

This procedure should be performed at least once each day, if device goes through dewpoint daily.

NOTE: If the Drive is stored or operated in environmental conditions outside the envelope in the Product Specification, condensation will form in the Drive. In order to prevent corrosion, use a soft absorbent cotton cloth and wipe dry the surface of the Chuck.

1. Depress START/STOP switch to STOP (out) and wait for spindle to stop rotating (START/STOP lamp extinguished).
2. Remove disk cartridge.
3. Inspect Magnetic Chuck for condensation.
4. If condensation is present use a soft absorbent cotton cloth and wipe dry.

6.6 CORRECTIVE MAINTENANCE PROCEDURES (R & R)

6.6.1 ACTUATOR ASSEMBLY R & R

The actuator assembly must be removed to clean or replace lower read/write heads.

- REMOVAL

1. Depress START/STOP switch to STOP (out) and wait for spindle to stop rotating (START/STOP lamp extinguished).

2. Remove Disk Cartridge.
3. Remove top cover by lifting cover straight up (base cabinet only).
4. Set main circuit breaker to off position.
5. Remove electronics cover from card cage.
6. Using a 5/32 Allen driver, place tool into hole on rear end panel and remove panel by loosening hardware (base cabinet only).
7. Remove power supply cover and disconnect A1P5.
8. Disconnect A3P1, A3P2, A3P3, A3P4, A3P5 and A3P6 from AGC Preamplifier.
9. Remove the four screws securing the AGC preamplifier to the magnet and remove preamplifier.
10. Between the two sets of upper and lower heads, and approximately half way along the length of the head arm assembly, insert a 1/16 inch (1.59 mm) thick, 1/2 inch (12.7 mm) wide rolled up masking tape (or similar spacer) to prevent the head pads from touching when actuator is removed.
11. Remove card cage, by performing removal Steps 1 through 13 of card cage removal and replacement procedure.
12. Remove velocity transducer end cap and velocity transducer (see Figure 6-2 and 6-10).
13. Remove two screws that fasten the magnet to the main deck. Screws are located underneath the base casting, one screw in back of magnet and one in front (see Figure 6-3).
14. Move carriage and voice coil assembly forward.
15. Lift magnet slightly and very carefully slide the magnet assembly out from the voice coil. Extreme care must be taken to avoid any bending stress to the velocity transducer magnet.
16. Unplug A2P2 (see Figure 6-13) connecting the voice coil flexible lead to the power supply.
17. Unlace A3P6 located on top of actuator frame.
18. Remove head harness clip for heads 3 and 4 located on front of voice coil.
19. Using 9/64 ball Allen driver, remove the three mounting bolts from the actuator frame securing the actuator to the deck (see Figure 6-3).
20. Lift rear of actuator frame to clear guide pin then pull actuator frame slightly back from eccentric screw located at front of actuator frame then lift actuator clear of unit.

CAUTION Extreme care must be exercised to avoid damage to fixed disk, position transducer scale and position transducer slider.

21. Heads, velocity transducer magnet and EOT assembly can be replaced at this time, if required. When actuator is removed the heads should be cleaned.

• REPLACEMENT

1. To install new actuator assembly, align slot at front of actuator frame with eccentric screw and slide frame forward while clearing guide pin until holes for mounting screws are aligned.
- CAUTION** Extreme care must be exercised to avoid damage to fixed disk, position transducer scale and position transducer slider.
2. Using 9/64 ball Allen drive, install the three mounting bolts securing the actuator to the disk (see Figure 6-3).
 3. Install head harness clip for heads 3 and 4.
 4. Relace A3P6 across top of actuator frame.

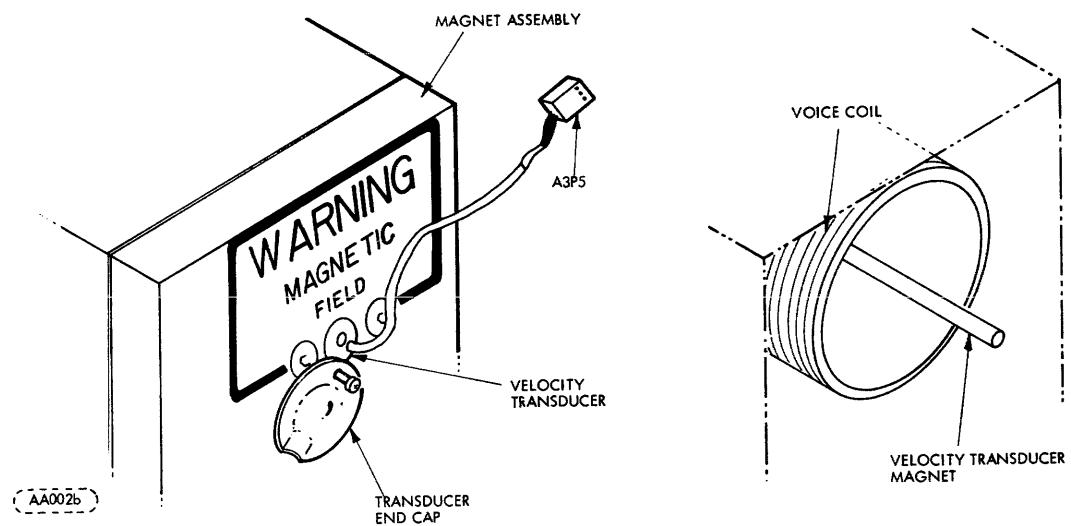


FIGURE 6-2. VELOCITY TRANSDUCER LOCATION

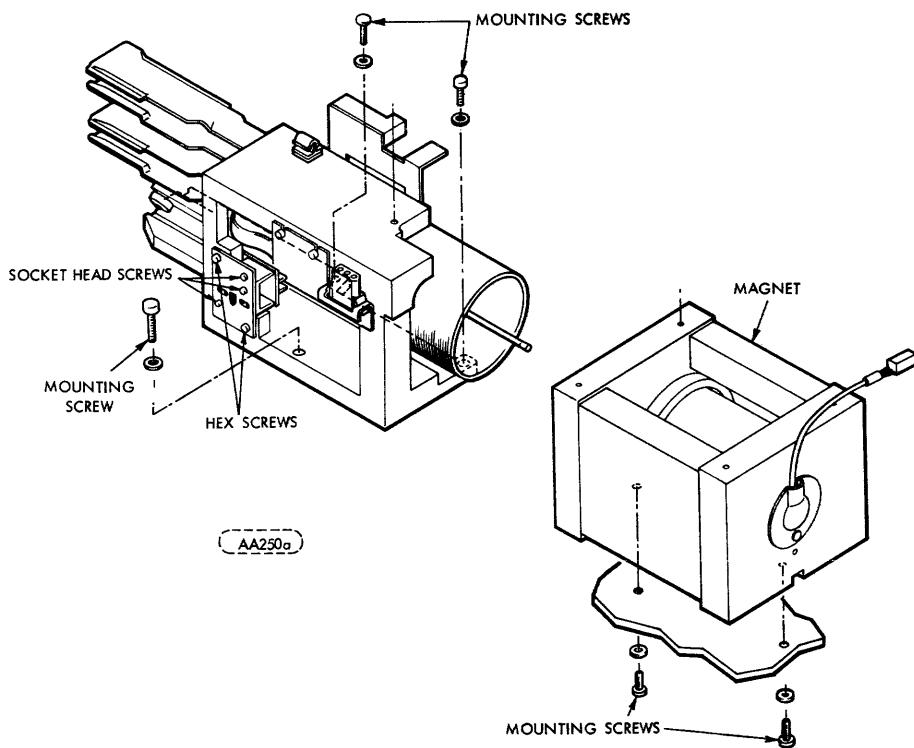


FIGURE 6-3. ACTUATOR, MAGNET AND EOT MOUNTING

5. Connect A1P2 (see Figure 6-13) connecting the voice coil flexible head to the power supply.
6. Very carefully slide magnet assembly onto the two guide pins. Extreme care must be taken to avoid any bending stress to the velocity transducer magnet.
7. Fasten magnet to the main deck with the two mounting screws (see Figure 6-3).
8. Install velocity transducer and velocity transducer end cap (see Figure 6-2).
9. Install card cage by performing replacements Steps 3 through 9 of card cage removal and replacement procedure.
10. Remove spacers from between heads.
11. Install AGC servo preamplifier to the top of magnet with the four mounting screws.
12. Connect A3P1, A3P2, A3P3, A3P4, A3P5.
13. Connect A1P5 and install power supply cover.
14. Install rear end panel (base cabinet only).
15. Connect field tester/exerciser to unit.
16. Perform AGC Servo Preamplifier and Inductosyn Check and Adjustment.
17. Perform FEOT Check and Adjustment.
18. Perform Head Alignment Check and Adjustment.
19. Perform Index-to-Burst Check and Adjustment.
20. Perform Track Indicator Check and Adjustment.
21. Install electronics cover.
22. Install top cover (Base Cabinet only).

6.6.2 HEAD R & R

- REMOVAL

- a. Upper Heads

1. Depress START/STOP switch to STOP (out) and wait for spindle to stop rotating (START/STOP Lamp extinguished).
2. Remove top cover by lifting cover straightup (base cabinet only).
3. Remove disk cartridge.
4. Set main circuit breaker to off position.
5. Remove electronics cover. Remove cover from card cage.
6. Remove head harness clamp (Figure 6-4).
7. Remove quadraclip between head plugs and card cage.
8. Remove clip holding head lead springs to carriage assembly.
9. Remove power supply cover assembly.
10. Loosen upper head clamps (Figures 6-5 and 6-6).

CAUTION Extreme care should be exercised when removing heads. Do not touch head face with fingers. Do not allow head to bang against anything.

11. Remove Head #0 or #1.

- REPLACEMENT

1. Install replacement head.
2. Tighten head clamps. (Note Torque Requirement during Head Alignment).
3. Install power supply cover assembly.

4. Install clip holding head lead springs to carriage assembly.
5. Install quadraclip.

Insure head cables are dressed such that the voice coil does not touch any cable when heads are loaded and extended to cylinder 405. This can be verified when doing head alignment check and adjustment.

6. Install head harness clamp.
7. Install card cage cover.
8. Install CE Disk Cartridge.
9. Perform Head Alignment Check and Adjustment.
10. Perform Index to Burst Check and Adjustment.
11. Install electronics cover.

- **REMOVAL**

- b. Lower Heads

1. Perform Removal Steps 1 through 21 of Actuator Assembly Removal and Replacement procedure.
2. Loosen lower head clamps (Figures 6-5 and 6-6).

Extreme care should be exercised when removing heads. Do not touch head face with fingers. Do not allow head to bang against anything.

3. Remove Head #2 or #3.

- **REPLACEMENT**

1. Install replacement head.
2. Tighten head clamps. (Not Torque Requirement during Head Alignment).
3. Install spacer between heads.
4. Perform replacement Steps 1 through 22 of Actuator Assembly Removal and Replacement procedure.

6.6.3 EOT ASSEMBLY R & R

- **REMOVAL**

1. Depress START/STOP switch to STOP (out) and wait for spindle to stop rotating (START/STOP lamp extinguished). Remove cartridge.
2. Open top cover (base cabinet only).
3. Set main circuit breaker to off position.
4. Remove electronics cover.
5. Remove power supply cover and disconnect A1P5.
6. Remove Relay K1 from power supply board.
7. On EOT assembly bracket remove top and bottom mounting hex screws (see Figure 6-3).
8. Remove EOT assembly.

- **REPLACEMENT**

1. Install new EOT assembly.

Insure the EOT scale on carriage assembly does not rub against EOT assembly.

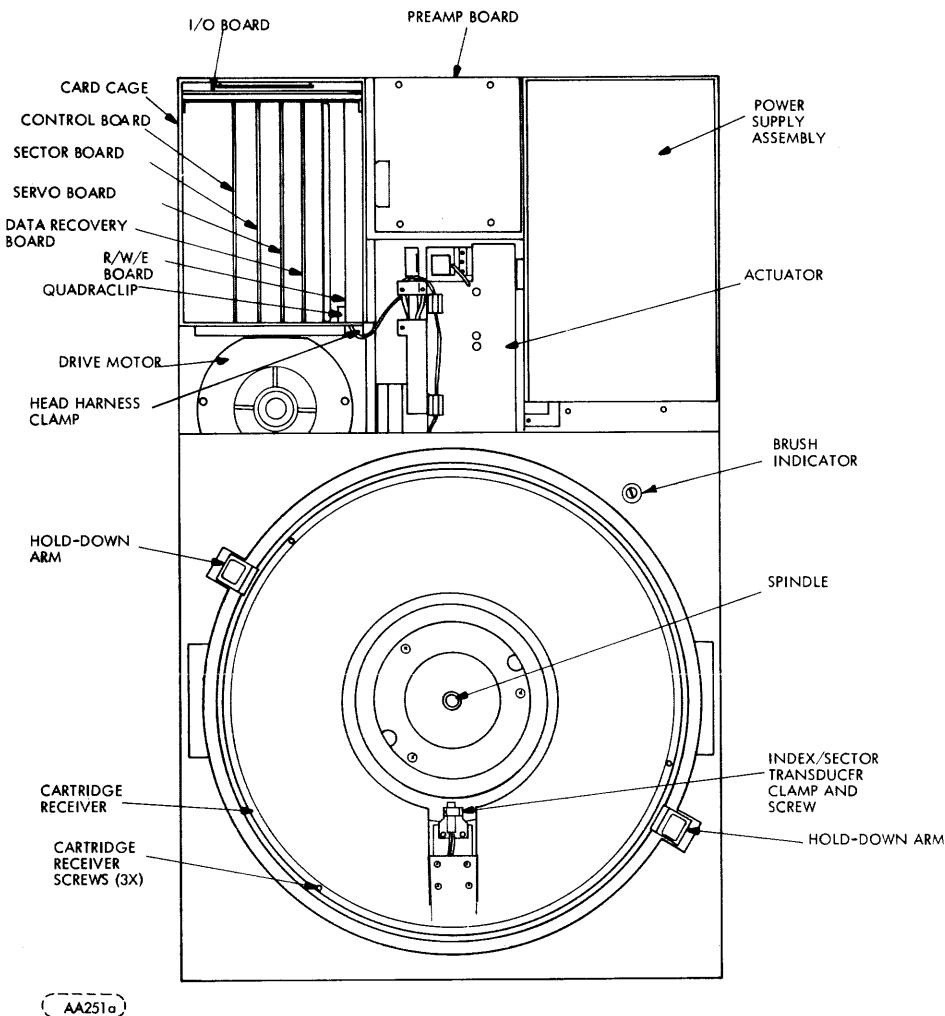


FIGURE 6-4. MODULE LOCATION (ABOVE DECK)

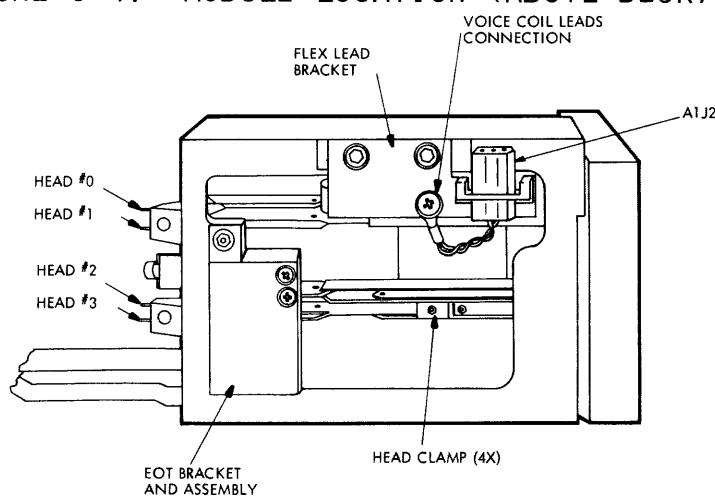


FIGURE 6-5. ACTUATOR ASSEMBLY-HEADS INSTALLED

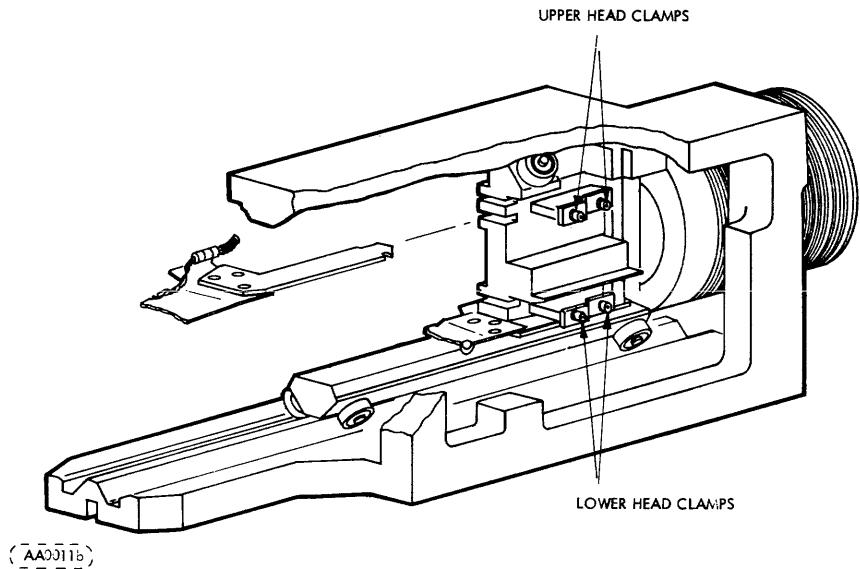


FIGURE 6-6. HEAD REMOVAL AND REPLACEMENT

2. Install relay K1.
3. Install power supply cover and connect A1P5.
4. Perform FEOT Check and Adjustment.
5. Perform Head Alignment Check and Adjustment.
6. Perform Index to Burst Period Check and Adjustment.
7. Perform Track Indicator Check and Adjustment.
8. Install electronics cover.
9. Close top cover (base cabinet only).

6.6.4 FIXED DISK R & R

- REMOVAL (See Figure 6-10)

1. Depress START/STOP pushbutton to STOP (out) and wait for spindle to stop rotating (START/STOP lamp extinguished).
 2. Remove top cover by lifting cover straight up (base cabinet only).
 3. Remove disk cartridge.
 4. Set main circuit breaker to off position.
 5. Remove electronics cover.
 6. Remove power supply cover and disconnect A1P5.
 7. On rack mounted units with Accuride slides, remove coupling screw securing latch knob to latch mechanism (see Figure 6-7).
 8. Disconnect ground straps from front panel (one on rack mounted units, two on base cabinet units is present).
 9. Remove front panel by loosening two screws at bottom of panel and removing two screws on each side of panel (see Figure 6-7).
 10. Remove the three screws from inside cartridge receiver.
 11. Lift the cartridge receiver up until connector A9P2 can be unplugged (see Figure 6-7). After A9P2 is unplugged further remove cartridge receiver.
- CAUTION** While lifting cartridge receiver be extremely careful to avoid damage to the fixed disk.

12. Remove fixed disk clamp (see Figure 6-8).
13. Remove fixed disk.

- REPLACEMENT

1. Inspect replacement disk for defects, replace if required.
2. Install fixed disk and insure proper seating.
3. Install disk clamp. Torque screws to 12 in/lbs.
4. Install cartridge receiver by aligning it on the two small pins on the deck and connecting A9P2.

CAUTION While installing cartridge receiver be extremely careful to avoid damage to fixed disk and receiver harness.

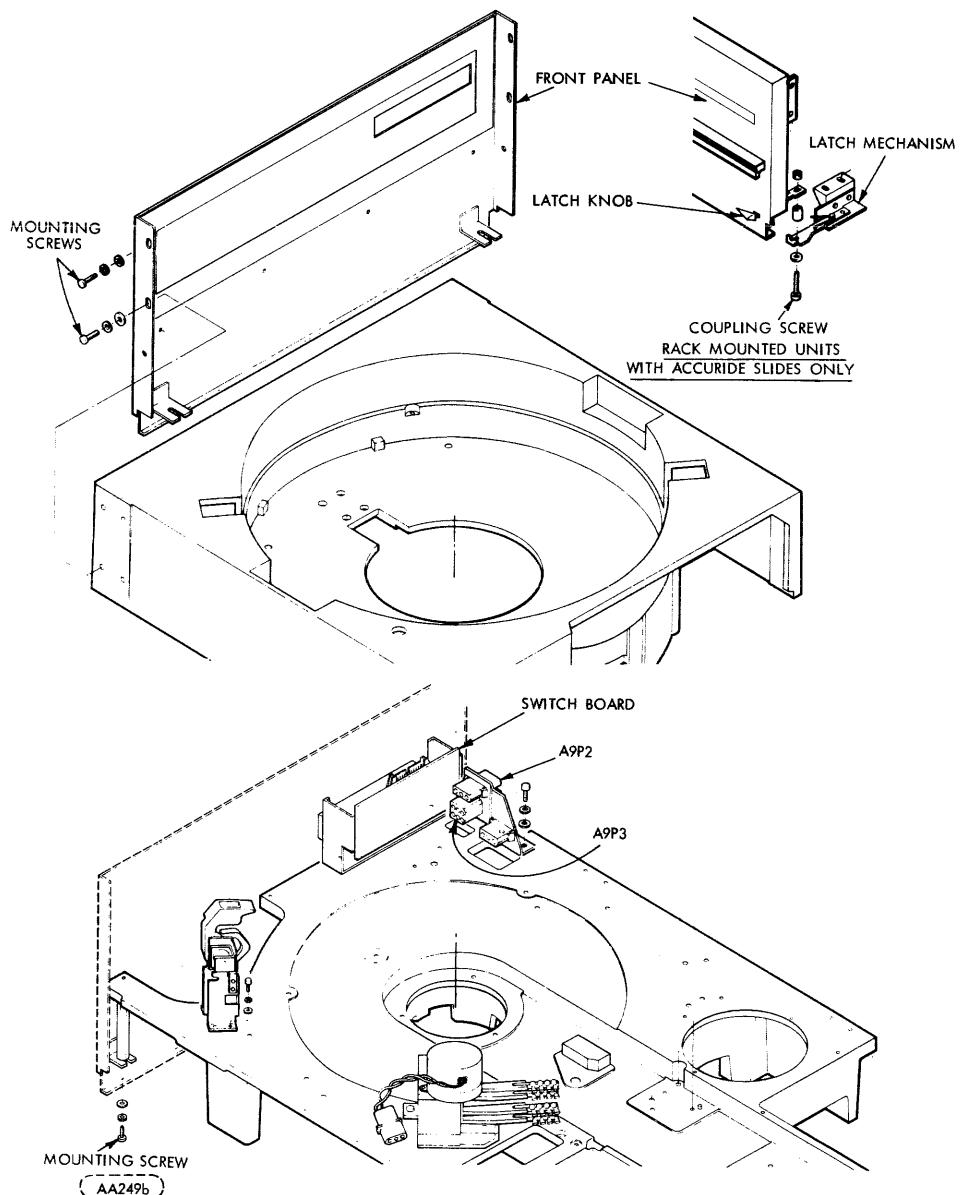


FIGURE 6-7. FRONT PANEL REMOVAL

5. Fasten cartridge receiver with three screws.
6. Install front panel and ground straps. Insure that insulating strips are still mounted to front panel and there is electrical isolation between front panel and deck.
7. Install latch assembly or knob as required.
8. Perform index to burst period check and adjustment procedure.
9. Install electronics cover.
10. Install top cover (base cabinet only).

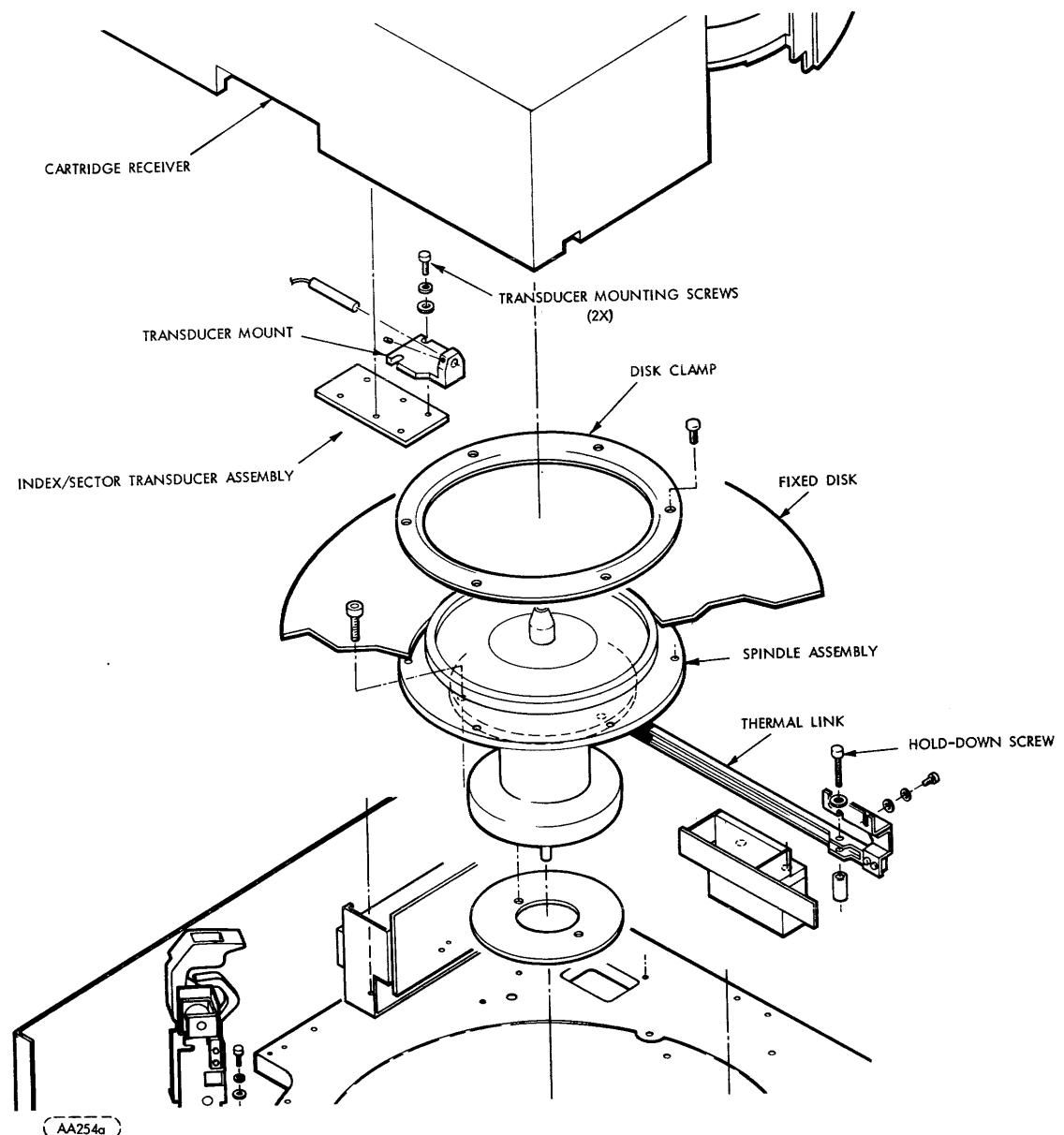


FIGURE 6-8. FIXED DISK REMOVAL

6.6.5 POSITION TRANSDUCER SCALE R & R

- **REMOVAL**

1. Depress START/STOP pushbutton to STOP (out) and wait for spindle to stop rotating (START/STOP lamp extinguished).
2. Remove top cover by lifting cover straight up (base cabinet only).
3. Remove disk cartridge.
4. Set main circuit breaker to Off position.
5. Remove electronics cover.
6. Remove power supply cover and disconnect A1P5.
7. On rack mounted units with Accuride slides, remove coupling screw securing latch knob to latch mechanism (see Figure 6-7).
8. Disconnect ground straps from front panel (one on rack mounted units, two on base cabinet units).
9. Remove front panel by loosening two screws at bottom of panel and removing two screws on each side of panel (see Figure 6-7).
10. Remove the three screws from inside cartridge receiver.
11. Lift the cartridge receiver up until connector A9P2 can be unplugged (see Figure 6-7). After A9P2 is unplugged further remove cartridge receiver.

CAUTION While lifting cartridge receiver be extremely careful to avoid damage to the fixed disk.

12. Perform removal Steps 1 through 11 of upper head removal and replacement procedure.
13. Loosen two screws in thermal link bracket (Figure 6-19).
14. Disconnect A3P6 from AGC preamp Board and unlac from actuator frame.
15. Remove transducer scale assembly by removing the two mounting screws (Item 3, Figure 6-10), which hold position transducer mount block to deck.

CAUTION Extreme care must be exercised in preventing face of transducer from coming in contact with other parts.

- **REPLACEMENT**

1. Install replacement transducer scale assembly.
2. Verify that thermal link bracket is flush with top of transducer scale. If not, adjust thermal link hold-down screw (Figure 6-9).
3. Tighten screws in thermal link bracket.
4. Lace A3P6 over top of actuator frame and connect to AGC preamp board.
5. Perform Steps 1 through 8 of upper heads replacement procedure.
6. Install cartridge receiver by aligning it on the two small pins on the deck and connecting A9P2.

CAUTION While installing cartridge receiver be extremely careful to avoid damage to fixed disk.

7. Fasten cartridge receiver with three screws.
8. Install front panel and ground straps.
9. Install latch assembly or knob as required.
10. Perform AGC Servo Preamplifier and Inductosyn Check and Adjustment.
11. Perform FEOT Check and Adjustment.
12. Perform Head Alignment Check and Adjustment.
13. Perform Index-to-Burst Check and Adjustment.
14. Perform Track Indicator Check and Adjustment.

15. Install electronics cover.
16. Install top cover (base cabinet only).

6.6.6 VELOCITY TRANSDUCER R & R

- REMOVAL

1. Depress START/STOP switch to STOP (out) and wait for spindle to stop rotating (START/STOP Lamp extinguished).
2. Open top cover (base cabinet).
3. Set main circuit breaker to Off position.
4. Remove electronics cover.
5. Disconnect connector A3P5 from Preamp Board.
6. Remove transducer and end cap from magnet assembly (Figure 6-2).
7. Loosen velocity transducer set screw (Figure 6-10) through hole in preamp and magnet assembly.
8. Remove transducer through rear of magnet assembly.

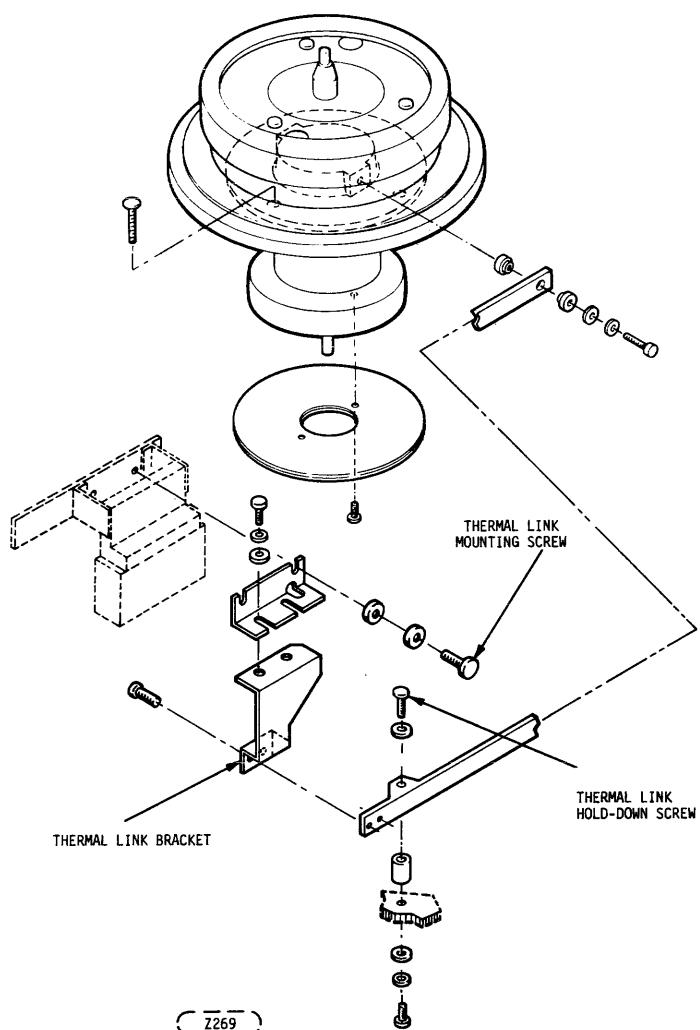


FIGURE 6-9. THERMAL LINK R & R

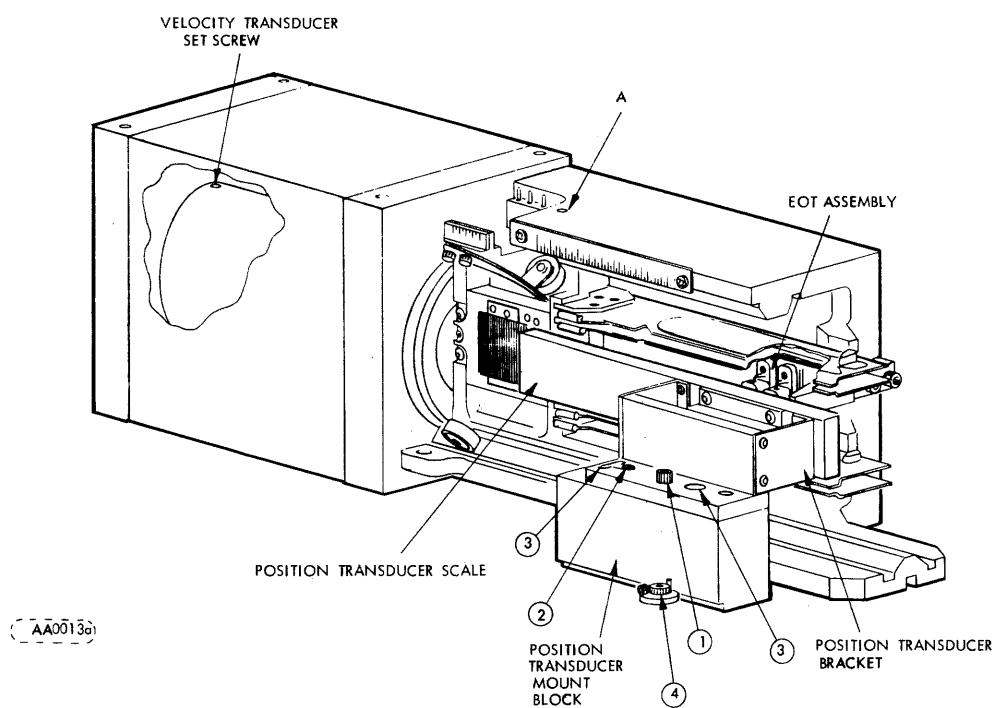
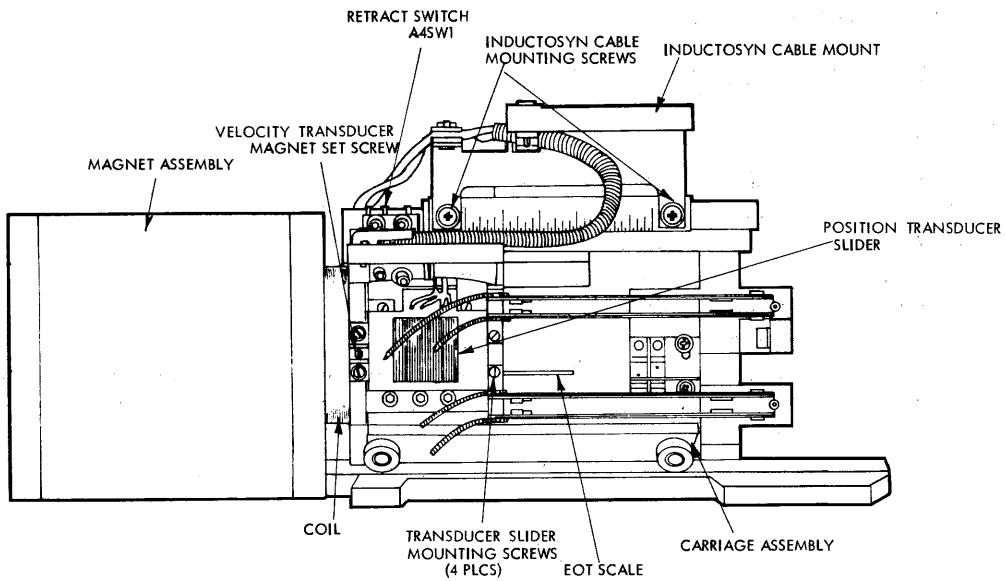


FIGURE 6-10. ACTUATOR ASSEMBLY

- REPLACEMENT
 1. Insert replacement transducer into magnet assembly until flush with end of magnet.
 2. Tighten set screw through hole in preamp Board.
 3. Install velocity transducer and cap.
 4. Connector A3P5 to preamp Board.
 5. Connect Field Tester/Exerciser to Unit.
 6. Install disk cartridge.
 7. Remove A1P2 from the actuator and power up drive for normal operation. Insure that K1 has energized.
 8. Manually load heads.
 9. Move carriage by hand insuring that the velocity transducer magnet is not rubbing against velocity transducer. If rubbing occurs, unload heads, power down unit and reposition transducer or transducer magnet.
 10. Push carriage forward so that carriage is at forward stop position.

CAUTION While performing Steps 11 and 12 keep hands clear of carriage.

 11. Reconnect A1P2.
 12. Execute RTZ command from field tester.
 13. Perform temperature stabilization procedure.
 14. Perform alternate seek between cylinders 293 and 405 (146 and 202 for 100 TPI units).
 15. Monitor "on cylinder" signal from field tester and adjust velocity gain potentiometer (see Figure 6-14) for a seek time of 35 ± 1 milliseconds. (See Fig. 6-17b).
 16. Install electronics cover.
 17. Close top cover.

6.6.7 VELOCITY TRANSDUCER MAGNET R & R

- REMOVAL

CAUTION Keep replacement transducer magnet in its shipping container until ready for installation since contact between magnet and metal objects is harmful to magnet.

 1. Depress Start/Stop switch to stop rotating (Start/Stop lamp extinguished).
 2. Remove disk cartridge.
 3. Open top cover.
 4. Set main circuit breaker to off position.
 5. Remove electronics cover.
 6. Using a 5/32 Allen driver, place tool into hole on rear end panel and remove panel by loosening hardware (base cabinet only).
 7. Remove power supply cover and disconnect A1P5.
 8. Disconnect A3P1, A3P2, AeP3, A3P4, A3P5 and A3P6 from AGC Servo Preamplifier.
 9. Remove AGC Servo Preamplifier.
 10. Remove velocity transducer end cap and velocity transducer (see Figure 6-2).
 11. Remove two screws that fasten the magnet to the main deck. Screws are located underneath the base casting (see Figure 6-3).
 12. Lift the magnet slightly and very carefully slide the magnet assembly out from the voice coil. Extreme care must be taken to avoid any bending stress to the velocity transducer magnet.
 13. Remove card cage by performing removal Steps 1 through 13 of card Cage removal and replacement procedure.
 14. Loosen velocity transducer magnet set screw (Fig. 6-10) and remove magnet.

- REPLACEMENT

1. Install replacement velocity transducer magnet and tighten set screw.
 2. Very carefully slide magnet assembly onto the two guide pins. Extreme care must be taken to avoid any bending stress to the velocity transducer magnet.
 3. Fasten magnet to the main deck with the two mounting screws (see Figure 6-3).
 4. Install card cage by performing Steps 3 through 9 of Card Cage removal and replacement procedure.
 5. Install velocity transducer and velocity transducer end cap.
 6. Install AGC Servo Preamplifier.
 7. Connect A3P1, A3P2, A3P3, A3P4, A3P5 and A3P6 to AGC Servo Preamplifier.
 8. Install power supply cover and connect A1P5.
 9. Install rear door panel (base cabinet only).
 10. Install disk cartridge.
 11. Remove A1P2 from the actuator and power up drive for normal operation. Insure that K1 has energized.
 12. Manually load heads.
 13. Move carriage by hand insuring that the velocity transducer magnet is not rubbing against velocity transducer. If rubbing occurs, unload heads, power down unit and reposition transducer or transducer magnet.
 14. Push carriage forward so that carriage is at forward stop position.
- CAUTION** While performing Steps 11 and 12 keep hands clear of carriage.
15. Reconnect A1P2.
 16. Execute RTZ command from field tester.
 17. Perform temperature stabilization procedure.
 18. Perform alternate seek between cylinders 293 and 405 (146 and 202 for 100 TPI units).
 19. Monitor "on cylinder" signal from field tester and adjust velocity gain potentiometer (see Figure 6-14) for a seek time of 35 ± 1 milliseconds.
 20. Install electronics cover.
 21. Close top cover.

6.6.8 SPINDLE ASSEMBLY R & R

- REMOVAL

1. Depress START/STOP pushbutton to STOP (out) and wait for spindle to stop rotating (START/STOP lamp extinguished).
2. Remove top cover by lifting cover straight up (base cabinet only).
3. Remove disk cartridge.
4. Set main circuit breaker to off position.
5. Remove electronics cover.
6. Remove power supply cover and disconnect A1P5.
7. On rack mounted units with Accuride slides, remove coupling screw securing latch knob to latch mechanism (see Figure 6-7).
8. Disconnect ground straps from front panel (one on rack mounted units, two on base cabinet units if present).
9. Remove front panel by loosening two screws at bottom of panel and removing two screws on each side of panel (see Figure 6-7).
10. Remove the three screws from inside cartridge receiver.
11. Lift the cartridge receiver up until connector A9P2 can be unplugged (see Figure 6-7). After A9P2 is unplugged further remove cartridge receiver.

CAUTION While lifting cartridge receiver be extremely careful to avoid damage to the fixed disk.

12. Remove fixed disk clamp.
 13. Remove fixed disk, carefully avoiding contact with recording surfaces. Place disk on soft clean surface.
 14. Remove mounting screws from thermal link bracket (Figure 6-9).
- CAUTION** Do not perform Step 15 until Step 14 has been performed.
15. Remove thermal link hold-down screw (Figure 6-9).
 16. Using a 5/32 Allen driver, place tool into hole on front end panel and remove panel by loosening hardware.
 17. Remove cabinet panels from both sides (base cabinet only).
 18. Remove Module bottom cover.
 19. Unplug connector A9P1.
 20. Perform removal Steps 1 through 6 of the sector ring removal and replacement procedure.
 21. Remove spindle drive belt (Figure 6-11), by applying pressure to edge of drive-motor plate near A7TB1.
 22. Rotate spindle to positions where spindle mounting bolts are visible through access hole and remove bolts through access hole.
 23. Carefully lift spindle slightly.
 23. Detach thermal link from spindle. Note sequence of fiber washers mounting bolt (Figure 6-9). Swing thermal link out of the way.
 25. Remove spindle assembly.

REPLACEMENT

1. Attach thermal link to replacement spindle.
2. Install spindle with the mounting bolts.
3. Rotate spindle and verify that thermal link is not contacting spindle flange.
4. Install thermal link hold-down screw and tighten until thermal link bracket is flush with top of transducer scale. (Figure 6-9).

CAUTION Do not perform Step 5 until Step 4 has been performed.

5. Install thermal link bracket screws.
6. Install spindle drive belt (Figure 6-11) by applying pressure to edge of drive motor plate near A7TB1.
7. Install sector ring.
8. Install transducer mount assembly by performing replacement Steps 7 through 12 of the sector ring removal and replacement procedure.
9. Reconnect A9O1.
10. Clean spindle rim area with media cleaning solution.
11. Prior to installing fixed disk, inspect disk for scratches or defects. If disk is unacceptable, replace with new one.
12. Clean disk surface with lint-free gauze, dampened (not soaked) with media cleaning solution.
13. Install fixed disk and insure proper seating.
14. Install disk clamp. Torque screws to 12 in./lbs.
15. Install cartridge receiver by aligning it on the two small pins on the deck and connecting A9P2.

CAUTION While cartridge receiver be extremely careful to avoid damage to fixed disk and receiver harness.

16. Fasten cartridge receiver with three screws.
17. Install front panel and ground straps. Insure that insulating strips are still mounted to front panel and there is electrical isolation between front panel and deck.

18. Install latch assembly or knob as required.
19. Perform Fixed Disk Index/Sector Transducer Check and Adjustment.
20. Perform Static Eliminator Check.
21. Perform Cartridge Index/Sector Transducer Check and Adjustment.
22. Perform AGC Servo Preamplifier and Inductosyn Check and Adjustment.
23. Perform EOT Check and Adjustment.
24. Perform Head Alignment Check and Adjustment.
25. Perform Index to Burst Period Check and Adjustment procedure.
26. Install module bottom cover.
27. Install side panels (base cabinet only).
28. Install front end panel (base cabinet only).
29. Install electronics cover.
30. Install top cover (base cabinet only).

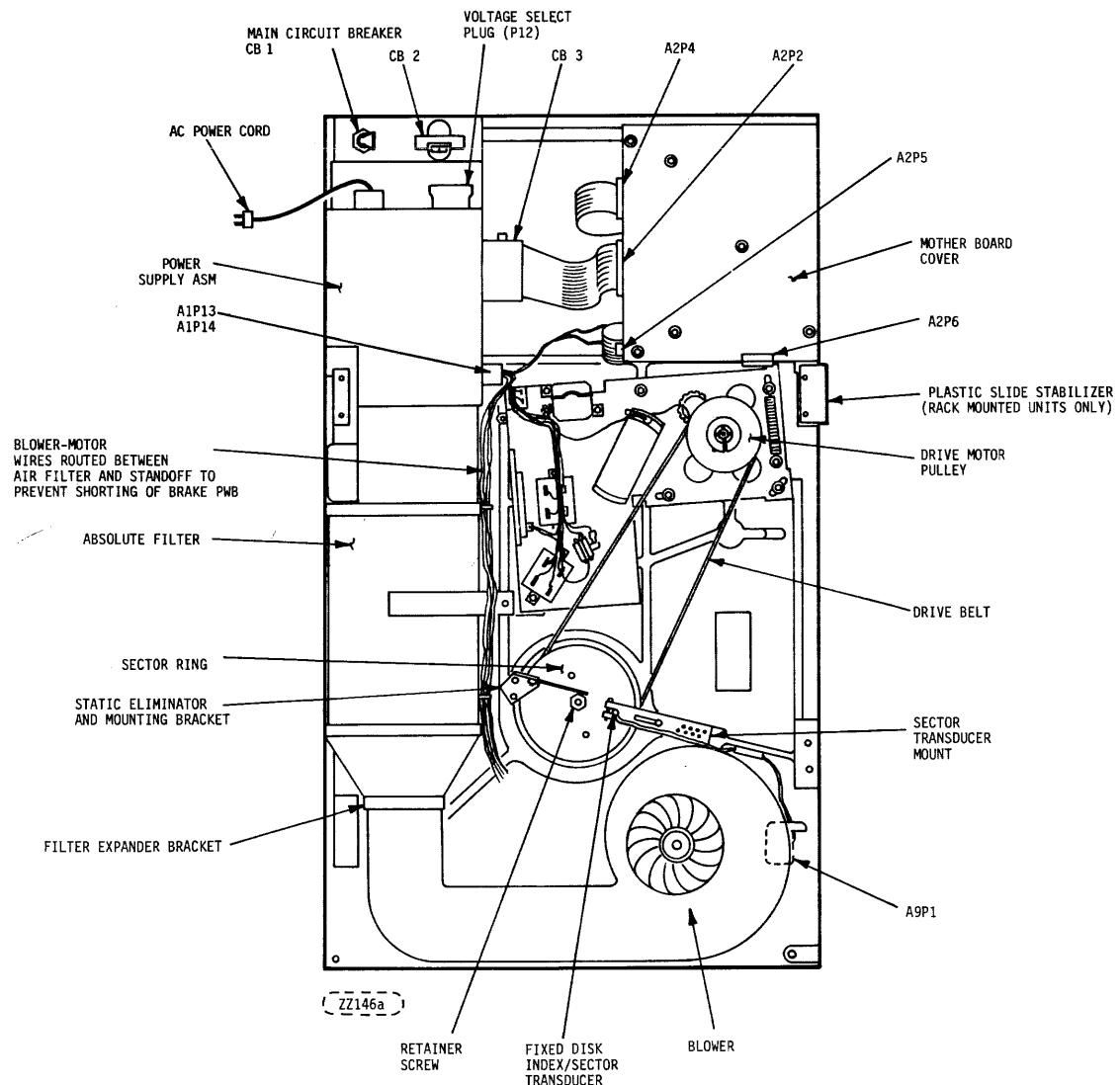


FIGURE 6-11. MODULE LOCATOR (BELOW DECK)

6.6.9 CARTRIDGE DISK INDEX/SECTOR TRANSDUCER R & R

- REMOVAL

1. Depress START/STOP pushbutton to STOP (out) and wait for spindle to stop rotating (START/STOP lamp extinguished).
2. Remove top cover by lifting cover straightup (base cabinet only).
3. Remove disk cartridge.
4. Set main circuit breaker to off position.
5. Remove electronics cover.
6. Remove power supply cover and disconnect A1P5.
7. On rack mounted units with Accuride slides remove coupling screw securing latch knob to latch mechanism (see Figure 6-7).
8. Disconnect ground straps from front panel (one on rack mounted units, two on base cabinet units if present).
9. Remove front panel by loosening two screws at bottom of panel and removing two screws on each side of panel (see Figure 6-7).
10. Remove the three screws from inside cartridge receiver.
11. Lift the cartridge receiver up until connector A9P2 can be unplugged (see Figure 6-7). After A9P2 is unplugged further remove cartridge receiver.

CAUTION While lifting cartridge receiver be extremely careful to avoid damage to the fixed disk.

12. Remove transducer assembly from receiver by removing 4 screws (Figure 6-8).
13. Remove transducer from mount by loosening clamp Allen set screw.

- REPLACEMENT

1. Install new transducer into mount. Tighten Allen screw.
2. Install transducer assembly on receiver with four mounting screws making sure harness lies in groove.
3. Install cartridge receiver by aligning it on the two small pins on the deck and connecting A9P2.

CAUTION While installing cartridge receiver be extremely careful to avoid damage to fixed disk and receiver harness.

4. Fasten cartridge receiver with three screws.
5. Install front panel and ground straps. Insure that insulating strips are still mounted to front panel and there is electrical isolation between front panel and deck.
6. Install latch assembly or knob as required.
7. Perform Cartridge Index/Sector Transducer Check and Adjustment.
8. Perform Index-to-Burst period check and adjustment.
9. Install electronics cover.
10. Install top cover (base cabinet only).

6.6.10 FIXED DISK INDEX/SECTOR TRANSDUCER R & R

- REMOVAL

1. Depress START/STOP switch to STOP (out) and wait for spindle to stop rotating (START/STOP lamp extinguished).
2. Remove top cover by lifting cover straightup (base cabinet only).
3. Remove disk cartridge.

4. Set main circuit breaker to off position.
5. Using a 5/32 Allen driver, place tool into hole on front end panel and remove panel by loosening hardware.
6. Remove right side panel (when viewed from rear of unit, base cabinet only).
7. Remove module bottom cover.
8. On rack mounted units with Accuride slides, remove coupling screw securing latch knob to latch mechanism (see Figure 6-7).
9. Disconnect ground straps from front panel (one on rack mounted units, two on base cabinet units is present).
10. Remove front panel by loosening two screws at bottom of panel and removing two screws on each side of panel (see Figure 6-7).
11. Remove electronics cover.
12. Remove the three screws from inside cartridge receiver.
13. Lift the cartridge receiver up until connector A9P2 can be unplugged (see Figure 6-7). After A9P2 is unplugged further remove cartridge receiver.

CAUTION While lifting cartridge receiver be extremely careful to avoid damage to the fixed disk.

14. Disconnect A9P1 and unlace harness from around blower motor assembly.
15. Loosen index sector transducer clamp screw.
16. Remove transducer from mount.

● REPLACEMENT

1. Install new transducer in mount.
2. Connect A9P1 and lace harness around blower motor assembly.
3. Perform fixed disk index/sector transducer check and adjustment procedure.
4. Replace cartridge receiver by aligning it on the two small pins on the deck and connecting A9P2.

CAUTION While installing cartridge receiver be extremely careful to avoid damage to fixed disk and receiver harness.

5. Fasten cartridge receiver with three screws.
6. Install front panel and grounds straps. Insure that insulating strips are still mounted to front panel and there is electrical isolation between front panel and deck.
7. Install latch assembly or knob as required.
8. Install electronics cover.
9. Install module bottom cover.
10. Install cabinet side panel.
11. Install front end panel (base cabinet only).
12. Install top cover.

6.6.11 STATIC ELEMINATOR AND RETAINER SCREW R & R

● REMOVAL

1. Depress START/STOP switch to STOP (out) and wait for spindle to stop rotating (START/STOP lamp extinguished).
2. Remove disk cartridge.
3. Set main circuit breaker to off position.
4. Using a 5/32 Allen driver, place tool into hole on front panel and remove panel by loosening hardware.
5. Remove right side panel (when viewed from rear of unit, base cabinet only).
6. Remove module bottom cover.
7. Remove static eliminator (Figure 6-11) by removing one screw.
8. At the cartridge receiver side, align one of the holes in the spindle assembly with one of the Allen head screws which mounts the spindle to the base deck. Insert the proper size wrench into the screw head. This will prevent the spindle turning while removing the retainer screw.
9. Remove retainer screw (Figure 6-11).

- REPLACEMENT

1. Apply Loctite to threads of replacement retainer screw and install.
2. Install replacement static eliminator.
3. Adjust static eliminator for contact with spindle shaft (retainer screw) to a spring deflection of approximately 1/32 in. (0.79 mm).
4. Perform Static Eliminator Check procedure.
5. Install module bottom cover.
6. Install cabinet side panel.
7. Install front end panel (base cabinet only).

6.6.12 SECTOR RING R & R

- REMOVAL

1. Depress START/STOP switch to STOP (out) and wait for spindle to stop rotating (START/STOP lamp extinguished).
2. Set main circuit breaker to off position.
3. Using a 5/32 Allen driver, place tool into holes on front end panel by loosening hardware.
4. Remove right side panel (when viewed from rear of unit, base cabinet only), and remove module bottom cover.
5. Remove transducer assembly mount (see Figure 6-11) by removing one screw (note orientation of sector option).
6. Remove static eliminator and its mounting bracket (see Figure 6-11).
7. Remove sector ring (see Figure 6-11) by removing two screws.

- REPLACEMENT

1. Install replacement sector ring.
2. Install static eliminator and bracket.
3. Install transducer and mount.
4. Perform Fixed Disk Index/Sector Transducer Adjustment Procedure.
5. Adjust static eliminator for contact with spindle shaft.
6. Perform Static Eliminator Check.
7. Install module bottom cover.
8. Install cabinet side panel.
9. Install front end panel (base cabinet only).

6.6.13 CARTRIDGE ON SWITCH R & R

- REMOVAL

1. Depress START/STOP pushbutton to STOP (out) and wait for spindle to stop rotating (START/STOP lamp extinguished).
2. Remove top cover by lifting cover straightup (base cabinet only).
3. Remove disk cartridge.
4. Set main circuit breaker to off position.
5. Remove electronics cover.
6. Remove power supply cover and disconnect A1P5.
7. On rack mounted units with Accuride slides, remove coupling screw securing latch knob to latch mechanism (see Figure 6-7).
8. Disconnect ground straps from front panel (one on rack mounted units, two on base cabinet units if present).
9. Remove front panel by loosening two screws at bottom of panel and removing two screws on each side of panel (see Figure 6-7).
10. Remove the three screws from inside cartridge receiver.

11. Lift the cartridge receiver up until connector A9P2 can be unplugged (see Figure 6-7). After A9P2 is unplugged further remove cartridge receiver.

CAUTION While lifting cartridge receiver be extremely careful to avoid damage to the fixed disk.

12. Disconnect wires from cartridge on switch.
13. Remove two screws, washers and nuts securing switch assembly to hold-down arm and remove switch. (Reference Figure 6-12).

- REPLACEMENT

1. Install replacement switch.
2. Close hold-down arms.
3. Check switch status with multimeter set on RX1 scale. Indication should be zero ohms.
4. With disk cartridge installed, check switch status with multimeter set to RX1 scale. Meter should indicate zero ohms.
5. If switch does not read zero ohms, adjust as follows:
 - a. Loosen hold-down arm adjustment screws (Figure 6-12).
 - b. Adjust hold-down arm for contact with cartridge disk cover.
 - c. Tighten adjustment screws.
6. Check switch status with multimeter for zero ohms. If switch does not indicate zero ohms, replace switch.
7. Connect wires to switch.
8. Override solenoid (see Figure 2-1) and open hold-down arms.
9. Install cartridge receiver by aligning it on the two small pins on the deck and connecting A9P2.

CAUTION While installing cartridge receiver be extremely careful to avoid damage to fixed disk and receiver harness.

10. Fasten cartridge receiver with three screws.
11. Install front panel and ground straps. Insure that insulating strips are still mounted to front panel and there is electrical isolation between front panel and deck.
12. Install latch assembly or knob as required.
13. Perform index to burst period check and adjustment procedure.
14. Install electronics cover.
15. Install top cover (base cabinet only).

6.6.14 DISK BRUSH ASSEMBLY R & R

- REMOVAL

1. Depress START/STOP pushbutton to STOP (out) and wait for spindle to stop rotating (START/STOP lamp extinguished).
2. Remove top cover by lifting cover straight up. (Base cabinet only)
3. Remove disk cartridge.
4. Set main circuit breaker to off position.
5. Remove electronics cover.
6. Remove power supply cover and disconnect A1P5.
7. On rack mounted units with Accuride slides, remove coupling screw securing latch knob to latch mechanism (see Figure 6-7).
8. Disconnect ground straps from front panel (one on rack mounted units, two on base cabinet units).

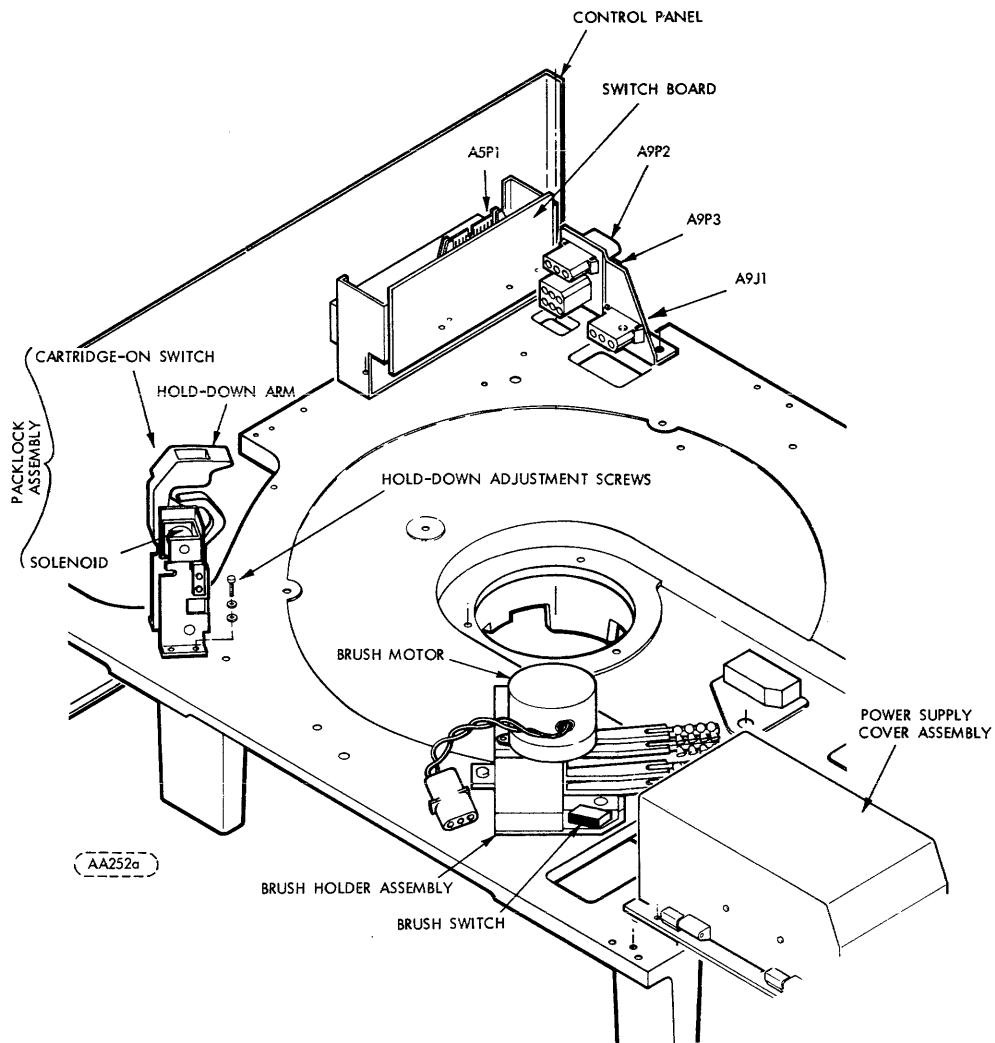


FIGURE 6-12. PACKLOCK AND BRUSH ASSEMBLIES

9. Remove front panel by loosening two screws at bottom of panel and removing two screws on each side of unit holding front panel to cartridge receiver (see Figure 6-7).
 10. Remove the three screws from inside cartridge receiver.
 11. Lift the cartridge receiver up until connector A9P2 can be unplugged (see Figure 6-7). After A9P2 is unplugged further remove cartridge receiver.
- CAUTION** While lifting cartridge receiver, be extremely careful to avoid damage to the fixed disk.
12. Disconnect A1P3 and A1P7.
 13. Disconnect wires from brush retract switch (see Figure 6-12).
 14. Remove three mounting screws from the brush assembly. One screw is countersunk.
 15. Remove brush assembly.

- REPLACEMENT

1. Install new brush assembly with the 3 mounting screws.

NOTE: Verify that brushes are full retracted for the following check.

2. With a multimeter set on RX1 scale check that switch actuates when brushes are clear of disk area.
3. If switch actuation does not occur as indicated in previous step, replace switch.
4. Reconnect wires to brush retract switch.
5. Install cartridge receiver by aligning it on the two small pins on the deck and connecting A9P2.

CAUTION While installing cartridge receiver be extremely careful to avoid damage to fixed disk and receiver harness.

6. Fasten cartridge receiver with three screws.
7. Install front panel and ground straps. Insure that insulating strips are still mounted to front panel and there is electrical isolation between front panel and deck.
8. Install latch assembly or knob as required.
9. Connect A1P3 and A1P7.
10. Install power supply cover and reconnect A1P5.
11. Perform Index to Burst Period Check and Adjustment procedure.
12. Install electronics cover.
13. If necessary mark up label on cartridge receiver showing brush alignment when full retracted.
14. Install top cover (base cabinet only).

6.6.15 BRUSH MOTOR R & R

- REMOVAL

1. Perform removal Steps 1 through 12 of Disk brush removal procedure.
2. Remove the two mounting screws from the motor.
3. Remove brush motor.

- REPLACEMENT

1. Install new brush motor. Insure brushes are fully retracted. Turn motor as necessary until mounting holes are aligned and brushes are fully retracted. Brush indicator should align with indicator on cartridge receiver.
2. Perform replacement Steps 3 through 11 of Disk brush removal and replacement procedure to complete installation.

6.6.16 SPINDLE DRIVE MOTOR ASSEMBLY R & R

- REMOVAL

1. Depress START/STOP switch to STOP (out) and wait for spindle to stop rotating (START/STOP lamp extinguished).
2. Set main circuit breaker to off position.
3. Disconnect unit from main power source.

CAUTION Failure to disconnect or turn off main power source may result in injury to service personnel.

4. Using a 5/32 Allen driver, place tool into holes on end panels and remove front and rear end panels by loosening hardware (base cabinet only).
5. Remove both cabinet side panels (base cabinet only).
6. Remove module bottom cover.
7. Disconnect A2P5, A1P13 and A1P14 (Figure 6-11) from power supply.
8. Remove plastic slide stabilizer (rack mount unit only).

9. Remove spindle drive (Figure 6-11) by applying pressure to edge of drive-motor plate near A7TB1.
10. Remove nut and washers from stud of post-motor A (Figure 6-13.1).
11. Remove spring from post-motor A. Then remove post-motor and flat washers from stud.
12. Support motor assembly to prevent it from falling and remove the four mounting screws.

Note hardware buildup on mounting screws: also be careful not to lose the four shoulder washers between motor plate and base deck.

13. Carefully lower drive-motor assembly out of unit.
14. Remove locking collar on drive-motor pulley and remove pulley from shaft.

- REPLACEMENT

1. Install pulley on replacement drive-motor assembly. Insure that Woodruff key is still installed on motor shaft. Install locking collar and torque to 70 in/lbs. Pulley must be 0.031 ± 0.010 in. (0.79 ± 0.25 mm) above motor plate.
2. Place the four shoulder washers in the one mounting hole and three slots between the motor plate and base deck (Figure 6-11 and 6-13.1).
3. Install the assembly to the base deck. Tighten the four mounting screws far enough to hold the assembly so the other end of the spring can be installed.
4. Using Figure 6-13.1, place washers and post-motor A onto the stud.
5. Mount the spring into the post-motor slot.
6. Install washers and nut.
7. Torque the four mounting screws to 15 in/lbs. Insure that the motor plate moves freely on the Delrin washers.
8. Install the belt on the pulley.
9. Turn the pulley and belt by hand and verify that the belt and pulleys have proper clearance and the belt tracks properly.
10. Install the plastic slide stabilizer (rack mount only).
11. Connect A2P5, A1P13 and A1P14 (Figure 6-11).
12. Check the resistance between the drive-motor plate and the module casting. If DC ground is connected to AC ground, the resistance should be less than one ohm. If DC ground is isolated from AC ground, the resistance should be greater than 1000 ohms.
13. Install the module bottom cover.
14. Install the cabinet side panels.
15. Install front and rear end panels (base cabinet only).
16. Connect the unit to the main power source.

6.6.17 CARD CAGE PRINTED CIRCUIT BOARD R & R

1. Depress START/STOP switch to STOP (out) and wait for spindle to stop rotating (START/STOP lamp extinguished).
2. Set main circuit breaker to off position.
3. Open top cover (base cabinet only).
4. Remove electronics cover.
5. Remove clamp from card cage cover.
6. Remove card cage cover.
7. Using card extractor remove required circuit board. Not setting of any option switches (I/O Control, Sector and Data Recovery board). Set option switches on replacement board to same setting.

NOTE: If I/O Board is to be replaced, remove four board mounting screws. Also Terminator modules, if required, must be removed from old board and installed in new one.

NOTE: If R/W/E Board is replaced, head connectors must be disconnected and two resistor modules must be removed from old board and installed in new one.

CAUTION Insure head cables are dressed such that the voice coil does not touch any cable when heads are loaded and extended to cylinder 405.

8. Carefully install replacement board, insuring that all pins are engaged before completely installing board.
9. If the following circuit boards are replaced, the designated checks and adjustments must be performed.

A. Servo Preamp

1. AGC Servo Preamplifier and Inductosyn Check and Adjustment.
2. FEOT Check and Adjustment.
3. Head Alignment.
4. Index-to-Burst Period Check and Adjustment.

B. Servo Board

1. Connect Field Tester/Exerciser to unit.
2. Perform Temperature Stabilization.
3. Perform Steps 19 through 27 of AGC Servo Preamplifier and Inductosyn Check and Adjustment.

C. Sector Board

1. Index-to-Burst Period Check and Adjustment.

10. Install card cage cover and clamp.
11. Install electronics cover.

6.6.18 POWER SUPPLY R & R

• REMOVAL

1. Depress START/STOP switch to STOP (out) and wait for spindle to stop rotating (START/STOP lamp extinguished).
2. Open top cover (base cabinet only).
3. Set main circuit breaker to OFF position.
4. Disconnect unit from main power source.

CAUTION Failure to disconnect or turn off main power source may result in injury to service personnel.

5. Using a 5/32 Allen driver, place tool into hole on rear end panel and remove panel by loosening hardware (base cabinet only).
6. Remove electronics cover.
7. Remove AC line cord and bracket (see Figure 6-11).
8. Open power supply cover assembly, disconnect A1P5 and remove cover.
9. Disconnect A1P2, A1P3 and A1P7 (see Figure 6-13).
10. Disconnect A1P13 and A1P14 (see Figure 6-11).
11. Disconnect ribbon cable A2P2 from mother board (see Figure 6-11).
12. At rear of power supply, disconnect AC ground cable connected to base or rack frame.
13. Disconnect DC ground strap on deck plate (see paragraph 3.9.2 and note below).
14. Remove three screws holding power supply in place.
15. Remove power supply being very careful not to lose nylon isolation washers between power supply and deck plate.

- REPLACEMENT

NOTE: Power supply is shipped with logic (DC) ground and chassis (AC) ground connected together. Verify needed configuration from removed power supply or see paragraph 3.9.2 (Grounding Option) if Installation instructions.

1. Install new power supply so thet mounting holes are aligned.

CAUTION

Insure gasket between power supply and absolute filter is properly aligned. If not properly aligned, air flow can be restricted causing damage to power supply.

2. Reverse removal procedure to complete installation.

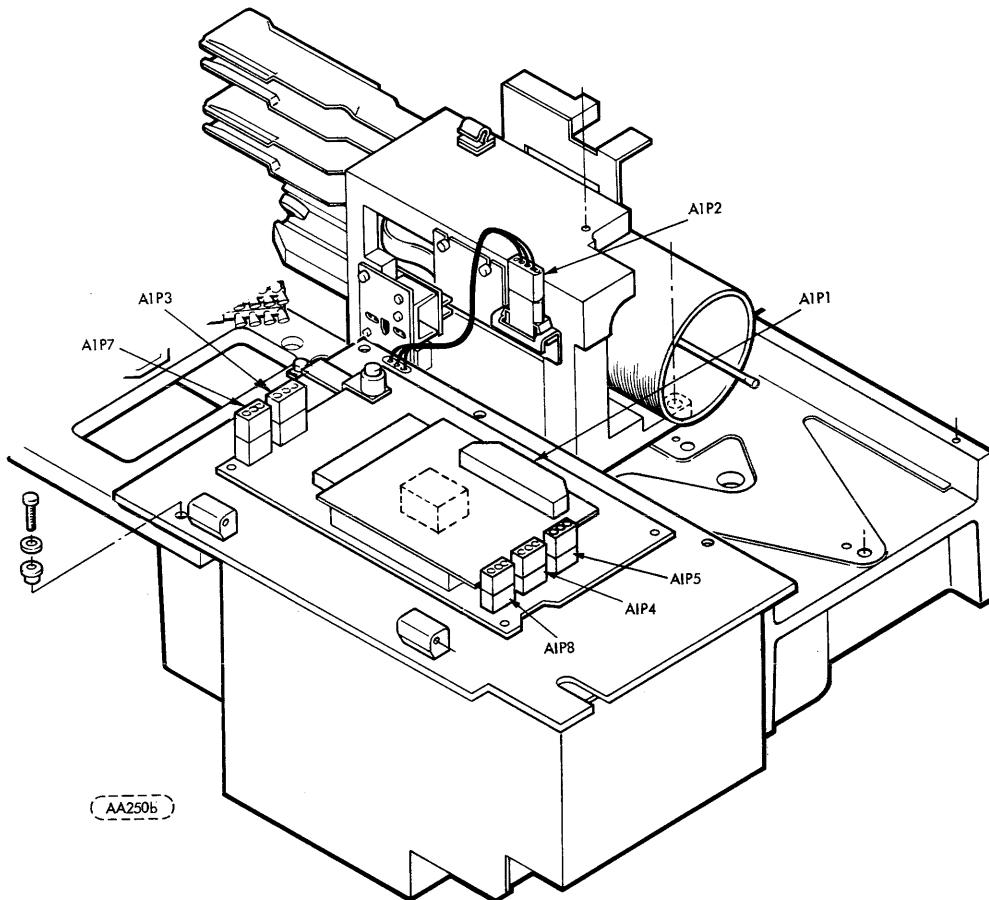


FIGURE 6-13. POWER SUPPLY ASSEMBLY

6.6.19 PIGGYBACK POWER BOARD R & R

- REMOVAL

1. Depress START/STOP switch to STOP (out) and wait for spindle to stop rotating (START/STOP lamp extinguished).
2. Open top cover (base cabinet only).
3. Set main current breaker to off position.
4. Disconnect unit from main power source.

CAUTION

Failure to disconnect or turn off main power source may result in injury to service personnel.

5. Remove electronics cover.
6. Open power supply cover assembly.
7. Disconnect A1P5 and remove power supply cover.

8. Disconnect A1P1, A1P2, A1P3, A1P4, A1P7 and A1P8 (see Figure 6-13).
9. Remove DC grounding screw noting assembly configuration.
10. Remove screw and insulating washer from wind tunnel located between relay K1 and power board #2.
11. Remove board assembly being careful not to lose spacers located under ground option (corner of board assembly).

- REPLACEMENT

1. Install new board assembly
2. Reverse removal procedure to complete installation.

6.6.20 CARD CAGE/MOTHER BOARD R & R

- REMOVAL

1. Depress START/STOP switch to STOP (out) and wait for spindle to stop rotating (START/STOP lamp extinguished).
2. Open top cover (base cabinet only).
3. Set main circuit breaker to off position.
4. Disconnect unit from main power source.

Failure to disconnect or turn off main power source may result in injury to service personnel.

5. Remove electronics cover.
6. Disconnect I/O connector ribbon cables.
7. Remove four screws holding I/O Board to card cage and remove Board. Disregard this step if card cage is only removed to facilitate other removal and replacement procedures.
8. Remove card page cover and clamp and quadraclip from head connectors on R/W/E board (see Figure 6-4).
9. Disconnect head connectors.
10. Using a 5/32 Allen driver, place tool into hole on rear end panel and remove panel by loosening hardware (base cabinet only).
11. Disconnect A2P2, A2P4, A2P5 and A2P6 from mother board (see Figure 6-11).
12. Disconnect ground strap from deck plate.
13. Remove three screws securing card cage and remove card cage.
14. Using card extractor, remove all boards.
15. Remove the 5 screws holding the mother cover and board together. Watch for fiber washer.
16. Separate mother cover and board from card cage. Do not lose star washers.

- REPLACEMENT

1. Attach mother cover and board to card cage assembly. Be careful not to over-tighten, plastic bracket strips out easily.
2. Install all circuit boards.
3. Install card cage with three mounting screws.
4. Install connectors removed in Steps 9 and 11.

Insure head cables are dressed such that the voice coil does not touch any cable when heads are loaded and extended to cylinder 405.

5. Install quadraclip and head cable clamp.
6. Replace I/O Board if removed in Step 7. (Removal procedures).
7. Reconnect I/O Ribbon Cables.
8. Install ground strap.
9. Install carc cover and clamp.
10. Install electronics cover.
11. Install rear end panel (base cabinet only).
12. Connect unit to main power source.
13. Close top cover (base cabinet only).

6.6.21 BLOWER MOTOR ASSEMBLY R & R (BASE CABINET)

● REMOVAL

1. Depress START/STOP switch to STOP (out) and wait for spindle to stop rotating (START/STOP lamp extinguished).
2. Set main circuit breaker to off position.
3. Remove top cover by lifting cover straight up (base cabinet only).
4. Using a 5/32 Allen driver, place tool into holes on end panels and remove front and rear end panels by loosening hardware (base cabinet only).
5. Disconnect ground straps from front panel if present.
6. Remove both cabinet side panels (base cabinet only).
7. Remove front panel by loosening two screws at bottom of panel and removing two screws on each side of panel (see Figure 6-7).
8. Remove the pre-filter and disconnect A1P13 (Figure 6-11) from power supply assembly.
9. Remove filter expander bracket and absolute filter (Figure 6-1).
10. Remove nuts from studs that secure module to base frame (two nuts are in pre-filter area and one nut is below actuator magnet).
11. Unlace motor harness.
12. Support blower assembly to prevent it from falling and remove three screws securing blower assembly.
13. Remove blower assembly.

● REPLACEMENT

1. Install replacement blower motor assembly.
2. Reverse the removal procedure to complete the installation.

NOTE: Slightly tighten the three screws securing the blower motor then align the air chute with the absolute filter. Finish tightening the blower motor screws (do not over compress rubber washes on the three screws).

6.6.22 BLOWER MOTOR ASSEMBLY R & R

● REMOVAL

1. Depress START/STOP switch to STOP (out) and wait for spindle to stop rotating (START/STOP lamp extinguished).
2. Set main circuit breaker to off position.
3. Unlatch the latch assembly securing the unit in the cabinet.
4. Remove the front panel by loosening two screws at the bottom of the panel and removing two screws on each side of the panel (see Figure 6-7).
5. Disconnect plug A1P13 from power supply (see Figure 6-11).
6. Remove filter, expander, bracket and absolute filter (see Figure 6-1).
7. Unlace the motor harness from side of main deck.
8. Remove the air inlet cover (held in place by three screws).
9. Remove the three screws holding the blower motor in place and remove blower motor.

● REPLACEMENT

1. Install blower motor assembly.
2. Reverse the removal procedure to complete the installation.

NOTE: Slightly tighten the three screws securing the blower motor then align the air chute with the absolute filter. Finish tightening the blower motor screws (do not over compress rubber washers on the three screws).

6.6.23 DRIVE MOTOR PULLEY AND BELT R & R

o REMOVAL

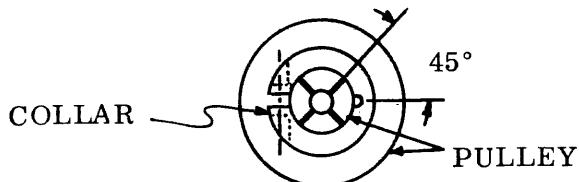
1. Depress START/STOP switch to STOP (out) and wait for spindle to stop rotating (START/STOP lamp extinguished).
2. Set main circuit breaker to OFF position.
3. Disconnect unit from main power source.

CAUTION Failure to disconnect or turn off main power source may result in injury to service personnel.

4. Using a 5/32 Allen driver, place tool into holes on end panels and remove front and rear end panels by loosening hardware (base cabinet only).
5. Remove right side panel (when viewed from rear of unit, cabinet only).
6. Extend unit to its fully extended position (rack only).
7. Remove module bottom cover.
8. Remove mounting screw from fixed disk index sensor mount. Note hole orientation of dowel pin for sector option (see Figure 3-11).
9. Remove spindle drive belt (Figure 6-11) by applying pressure to edge of drive-motor plate near A7TB1.
10. Remove belt by guiding belt between static eliminator and retainer screw (see Figure 6-11).
11. Remove locking collar on drive motor pulley.
12. Remove drive motor pulley. Be careful not to lose Woodruff key.

● REPLACEMENT

1. Place Woodruff key into drive motor keyway.
2. Install new drive motor pulley. Insure that Woodruff key is properly placed in keyway.



3. Install locking collar per figure above and tighten to 70 in/lbs. Gap between drive motor plate and top of pulley must be 0.031 ± 0.01 in. (0.79 ± 0.25 mm).
4. Guide new drive belt between static eliminator and retainer screw.
5. Install spindle drive belt (Figure 6-11) by applying pressure to edge of drive-motor plate near A7TB1.
6. Replace fixed disk sensor mount.
7. Perform Fixed Disk Index/Sector Transducer Check and Adjustment.
8. Install module bottom cover.
9. Install side panel (base cabinet only).
10. Connect unit to main power source.
11. Install rear end panel (base cabinet only).

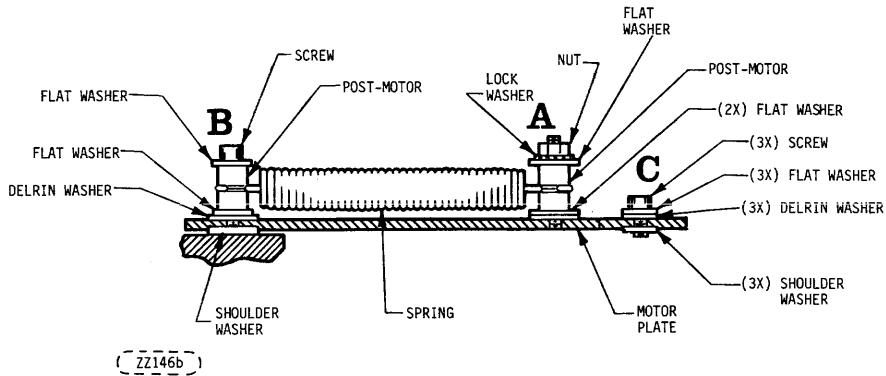


FIGURE 6-13.1. HARDWARE BUILDUP

6.6.24 PACK LOCK ASSEMBLY OR PACK LOCK SOLENOID R & R

- REMOVAL

1. Depress START /STOP switch to STOP (out) and wait for spindle to stop rotating (START /STOP lamp extinguished).
2. Remove top cover by lifting cover straight up (base cabinet only).
3. Extend unit to its fully extended position (rack only).
4. Remove disk cartridge.
5. Set main circuit breaker to Off position.
6. Remove electronics cover.
7. On rack mounted units, remove coupling screw securing latch knob to latch mechanism (see Figure 6-7).
8. Disconnect ground straps from font panel (one on rack-mounted units, two on base cabinet units if present).
9. Remove front panel by loosening two screws at bottom of panel and removing two screws on each side of unit holding front panel to cartridge receiver (see Figure 6-7).
10. Remove the three screws from inside cartridge receiver.
11. Lift the cartridge receiver up until connector A9P2 can be disconnected. After A9P2 is disconnected, further remove cartridge receiver.

CAUTION While lifting cartridge receiver be extremely careful to avoid damage to the fixed disk.

12. If not replacing solenoid only, proceed to Step 18. Remove solenoid from pack lock assembly and receiver harness.
13. Loosely install replacement solenoid on pack lock assembly.
14. With the pack lock in an open position, place a 0.015 in. (0.38 mm) shim between pack lock and solenoid plunger. Push solenoid toward pack lock as far as it will go (plunger touching rear of solenoid).
15. Tighten solenoid screws and remove shim.
16. Using a small screwdriver, push back plunger and verify clearance.

17. Reconnect receiver harness to solenoids. Proceed to Step 3 of Replacement Procedure.
18. Using a pencil, outline the outside edges of the bracket legs on the pack lock assembly to be removed.
19. Note orientation of the wires connected to the pack lock switch.
20. Disconnect receiver harness terminals connected to pack lock switch and pack lock solenoid.
21. Remove pack lock assembly from deck.

- REPLACEMENT

1. Install new pack lock assembly within outline on deck.
2. Connect receiver harness terminals to pack lock switch and pack lock solenoid.
3. Install cartridge receiver by aligning it on the two small pins on the deck and connecting A9P2.

CAUTION While installing cartridge receiver be extremely careful to avoid damage to fixed disk and receiver harness.

4. Fasten cartridge receiver with three screws.
5. Install front panel to cartridge receiver. Insure that insulating strips are still mounted to brackets on front panel and there is electrical isolation between front panel and deck.
6. Connect ground straps.
7. Install latch assembly (rack only).
8. Perform Index to Burst Period Check and Adjustment.
9. Install electronics cover.
10. Install top cover (base cabinet only).

6.7 CHECK AND ADJUSTMENT PROCEDURES

This section contains procedures that may be used to check for malfunctioning parts, to determine whether disk drive is operating within published specifications, or to adjust disk drive for proper operations. Before any electronics checks or adjustment are performed, the disk drive must go through a temperature stabilization process.

6.7.1 TEMPERATURE STABILIZATION CHECK AND ADJUSTMENT

1. If disk unit has not been operating, or a CE disk cartridge has been installed, allow unit to exercise for twenty minutes. For an additional ten minutes, allow unit to sit in a heads loaded, unit ready condition. Perform this with electronic cover on. Perform needed checks and adjustments or;
2. If disk unit has been operating, allow unit to sit in a heads loaded, unit ready condition, for ten minutes (with electronic cover on), before proceeding with checks and adjustments.

6.7.2 AGC SERVO PREAMPLIFIER AND INDUCTOSYN CHECK AND ADJUSTMENT

NOTE 1: Prior to performing this adjustment perform Steps 12, 13 and 14. If Step 14 is within spec proceed with Step 15, if not, start with Step 1.

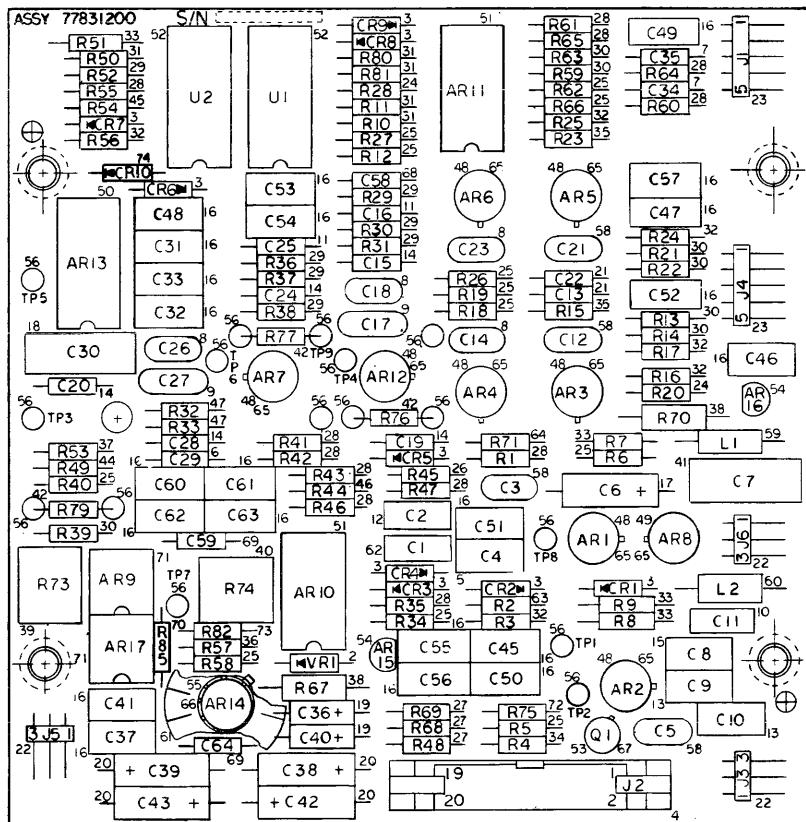
NOTE 2: Portions of the Inductosyn alignment must be made under dynamic conditions. If the Field Test Exerciser is not utilized appropriate provisions must be made in the computer system to cover these conditions.

CAUTION In performing this procedure, care must be exercised to prevent severe and extended contact between position transducer and slider.

1. If position transducer, AGC preamp, or Servo Board has been replaced, insure that all connectors are plugged into their respective receptacles.
2. Connect field tester/exerciser to unit.
3. Remove A1P2 from the actuator and power up drive for normal operation. It is necessary that a disk cartridge is installed in the drive and relay K1 on power board #1 has energized.
4. Install a jumper from TP1 to -5 V supply (TP9). See Figure 6-14.
5. Connect oscilloscope to C24 (point A of Figure 6-14). Set scope for internal trigger and auto sync.
6. Move carriage by hand, back and forth between cylinders 000 and 405 (000 and 202 for 100 TPI units) and observe waveform on oscilloscope.
7. If amplitude of waveform is 1.0 ± 0.05 volts peak to peak (see Figure 6-15), do not make any adjustment and proceed to Step 9, if not proceed to Step 8.
8. If waveform is not within above stated tolerances, loosen transducer mount block forward-most screw (right item 3, Figure 6-10), and adjust cam (item 4, Figure 6-10) for proper amplitude. If this adjustment is not sufficient, loosen transducer scale mounting screw (item 1, Figure 6-10). It may be necessary to make sequential adjustments of the cam and eccentric screw to obtain proper amplitude tolerances.
9. Tighten transducer scale mounting screw (item 1, Figure 6-10) to 20 in/lb.
10. Verify the waveform amplitude is still 1.0 ± 0.05 volts peak to peak between cylinders 000 and 405 (000 and 202 for 100 TPI units).
11. Remove jumper from TP1 and TP9.
12. Connect oscilloscope to TP3.
13. Move carriage by hand back and forth between cylinders 000 and 405 (000 and 202 for 100 TPI units) and observe waveform on oscilloscope.
14. Amplitude of waveform must be $5 +0.6, -0.2$ volts peak to peak. If not, repeat Steps 4 through 10 again. If adjustment cannot be performed, replace AGC preamp. Waveform will be similar to Figure 6-15 except for difference in amplitude.
15. Push carriage forward so that carriage is at forward stop position.

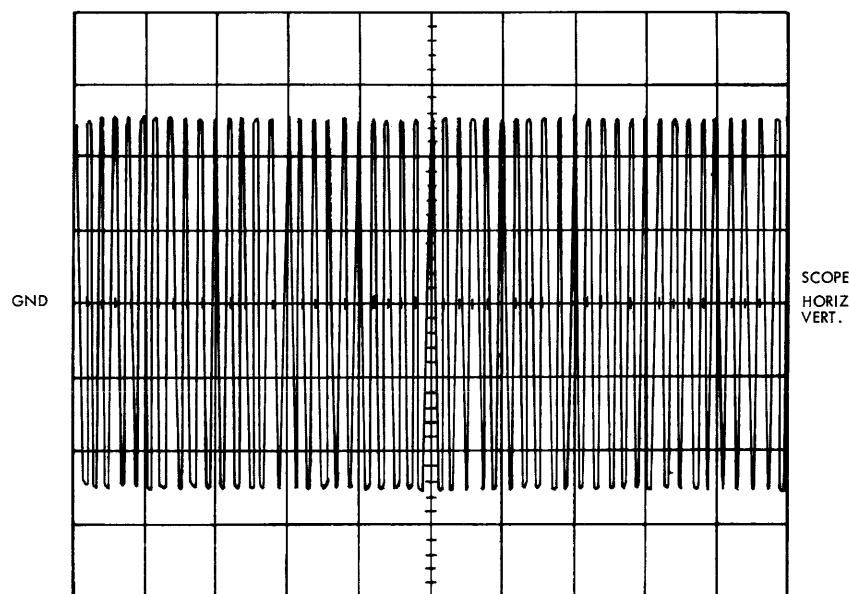
CAUTION While performing Steps 16 and 17, keep hands clear of carriage.

16. Reconnect A1P2.
17. Execute RTZ Command from field tester.
18. Perform temperature stabilization procedure.
19. Perform alternate seek between cylinders 293 and 405 (146 and 202 for 100 TPI units).
20. Monitor "On Cylinder" signal from field tester and adjust velocity gain potentiometer R73 (see Figure 6-14) for a seek time of 35 ± 1 milliseconds (see Figure 6-17b). Adjust sync to get correct waveform.



(XX244a)

FIGURE 6-14. PREAMP BOARD ADJUSTMENT LOCATION



(AA005b)

FIGURE 6-15. POSITION TRANSDUCER WAVEFORM

21. Perform an alternate seek from cylinder 200 to 201 (100 to 101 for 100 TPI units). Sync oscilloscope with "On Cylinder" signal on exerciser. Monitor TP3 and adjust potentiometer R74 on preamp board (see Figure 6-14) so that the amplitudes are balanced (in relationship to each other) within ± 100 mV of logic ground. Figure 6-16a shows waveforms unbalanced and Figure 6-16b shows them balanced.
22. This adjustment should be repeated whenever the drive exceeds ± 150 mV from logic ground.
23. Verify the adjustment, seeking from cylinder 000 to 001, and from 400 to 401 (000 to 001 and 200 to 201 for 100 TPI units). It may be necessary to adjust R74 to bring all three locations into adjustment.
24. Verify the adjustment again seeking from cylinder 000 to 002 and 400 to 402 (000 to 002 and 200 to 202 for 100 TPI units). It may be necessary to adjust R74 to bring both locations into adjustment (see Figure 6-16c).
25. Perform alternate seek between cylinders 293 and 405 (146 and 202 for 100 TPI units).
26. Monitor waveform at TP3. The peak to peak amplitude of the last full sinewave before "On Cylinder" goes negative must be 5 ± 0.5 volts (see Figure 6-17). Figure 6-17 shows a forward seek.
27. By resyncing oscilloscope obtain a reverse seek waveform (see Figure 6-17b). The peak to peak amplitude of the last full sinewave before "On Cylinder" goes negative must be 5 ± 0.5 volts.
28. Perform EOT Check and Adjustment Procedure.
29. Perform Head Alignment Check and Adjustment Procedure.
30. Perform Index-to-Burst Check and Adjustment Procedure.

6.7.3 EOT CHECK AND ADJUSTMENT

EOT adjustments must be made under dynamic conditions. Alternate seek to cylinder address 410 and 408 (205 and 204 on 100 TPI units) and cycle restarts are required to perform this adjustment.

NOTE:

Appropriate provisions must be made in the computer system for these conditions if the Field Test Exerciser is not utilized.

1. Set main circuit breaker to off position.
2. Connect Field Tester/Exerciser to unit.
3. Install servo board on card extender.
4. Set main circuit breaker to on position.
5. Depress START/STOP switch to START (in) and wait for completion of first seek.
6. Perform temperature stabilization procedure.
7. Unplug A1P2 on actuator.
8. On Servo Board, ground TP20 and TP21.
9. Set Actuator at forward stop and reconnect A1P2.
10. Perform RTZ function on Field/Tester Exerciser.
11. Insure that error halt switch is down on Field Tester/Exerciser.
12. Monitor TP19 on Servo board with channel A of oscilloscope and sync negative on this signal. Monitor TP3 (Figure 6-14) on AGC Preamp board with channel B of oscilloscope. Place channel B in uncalibrated vertical position and adjust until waveform is five centimeters in amplitude.

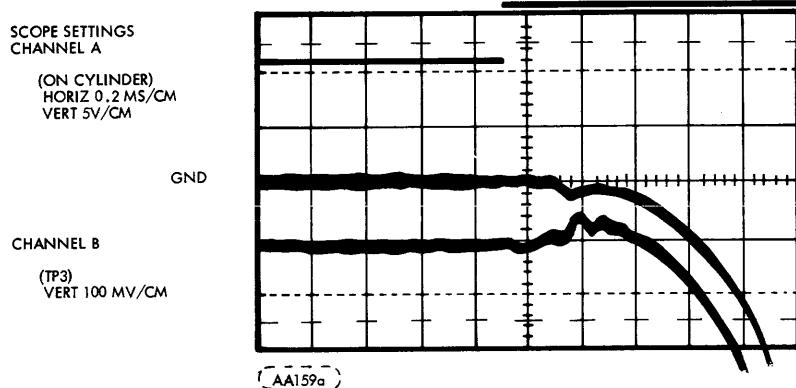


FIGURE 6-16A. ONE TRACK SEEK UNBALANCED

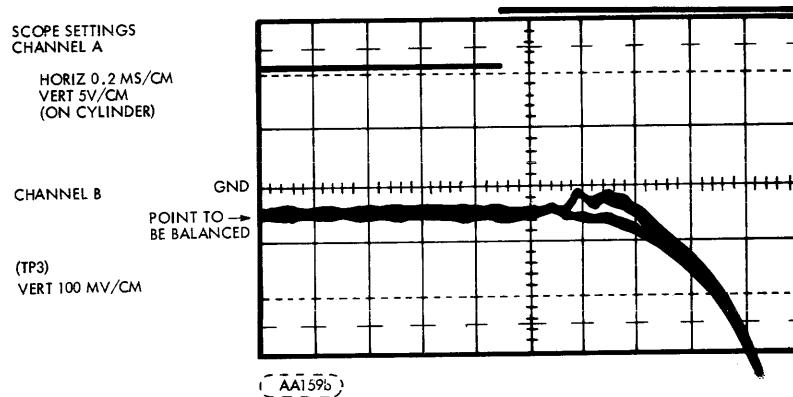


FIGURE 6-16B. ONE TRACK SEEK BALANCED

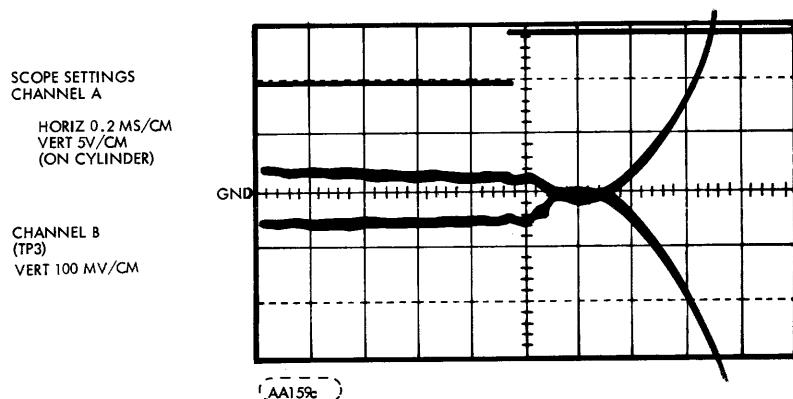


FIGURE 6-16C. TWO TRACK SEEK WITHIN TOLERANCE

13. Perform alternate seek in the access mode between cylinders 408 and 410 (204-205 for 100 TPI). Alternate seek in the access mode is defined as movement of the heads back and forth between cylinders without performing a read operation.

NOTE: Horizontal sweep time of Figure 6-18a and 6-18b depends upon switch settings on the I/O board.

14. Adjust oscilloscope until waveform looks similar to Figure 6-18a or 6-18b. Place crossover of signals A and B in middle of screen and place horizontal sweep time to 10X. Waveform should be similar to Figure 6-18c depending on sweep time.
15. If waveform is not within limits shown in Figure 6-18c, slightly loosen two socket head screws (Phillips on early units) on EOT Detector (Figure 6-3). Place screw driver in slot and adjust detector horizontally to limits shown in Figure 6-18c.

NOTE: Limits are defined as signal A must go Positive within ± 1 vertical centimeter of signal B ground along slope of signal B.

16. Tighten screws and verify that adjustment has not changed.
17. Unplug A1P2 on actuator.
18. On Servo Board, remove grounds from TP20 and TP21.
19. Set actuator at forward stop and reconnect A1P2.
20. Perform RTZ function on Field/Tester Exerciser.
21. Perform Head Alignment Check and Adjustment.
22. Perform Index to Burst Period Check and Adjustment procedure.

6.7.4 HEAD ALIGNMENT CHECK AND ADJUSTMENT

NOTE: Refer to HPC package located in front of manual for option switch and terminator locations.

1. Depress START/STOP switch to STOP and wait for spindle to stop rotating (START/STOP LAMP extinguished).
2. Remove disk cartridge and install CE disk cartridge. Refer to disk cartridge removal and installation procedure in section 2.
3. Open top cover (base cabinet only).
4. Set main circuit breaker to off position.
5. Remove electronics cover.
6. Record setting of all switches on I/O board.
7. Verify that resistor modules are installed on I/O board. If not, install terminator plug in I/O board connector J1 if required.
8. Install OEM field tester. If no OEM field tester or system is available to perform the required functions refer to HPC package to star select unit and terminator power.

K1 should not be removed until main circuit breaker is in off position.

CAUTION With K1 removed, emergency retract is disabled. Consequently, heads must be manually retracted if spindle slows down below tolerance limit.

9. Open power supply cover and remove relay K1 to provide access to heads.
10. Disconnect A1P2 (Note Orientation).
11. Set main circuit breaker to on position.
12. Depress W/PROT CART and W/PROT FIXED switches to ON (in).

SCOPE SETTINGS
CHANNEL A
ON CYLINDER

HORIZ 5MS/CM
VERT 5V/CM

CHANNEL B
TP3
VERT 1V/CM

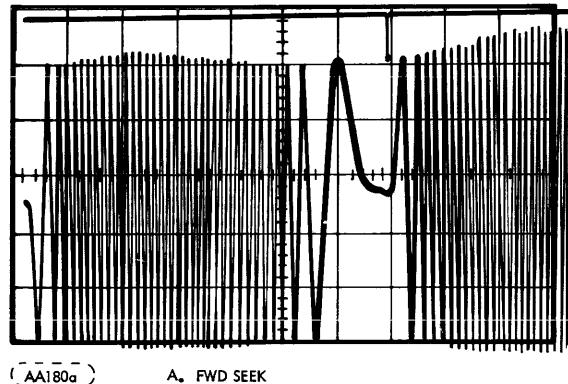


FIGURE 6-17A. FORWARD SEEK

SCOPE SETTINGS
CHANNEL A
ON CYLINDER
HORIZ 5MS/CM
VERT 1V/CM

CHANNEL B
TP3
VERT 1V/CM

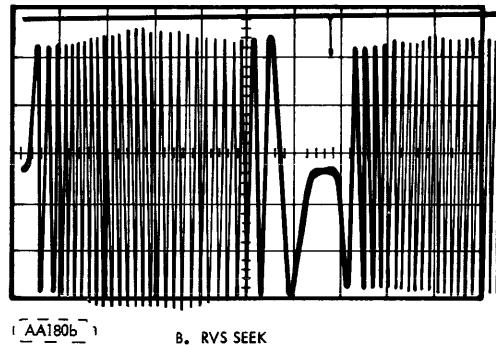
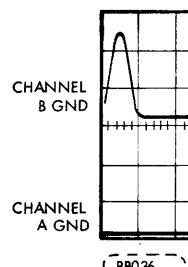
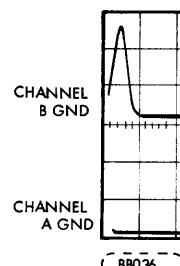


FIGURE 6-17B. REVERSE SEEK



SCOPE SETTINGS:
HORIZ 2MS/CM
VERT "B" UNCAL
ADJUST FOR
5 CM HIGH
VERT "A" 1V/CM

FIGURE 6-18A. EOT WAVEFORMS



SCOPE SETTINGS
HORIZ 5MS/CM
VERT "B" UNCAL
ADJUST FOR
5 CM HIGH
VERT "A" 1V/CM

FIGURE 6-18B. EOT WAVEFORMS

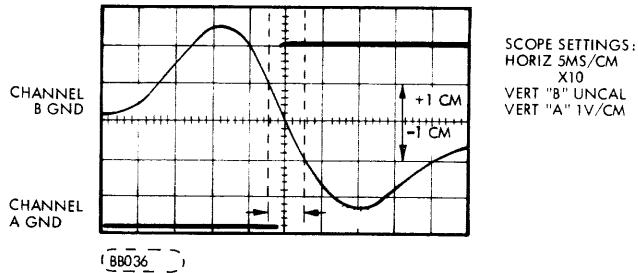


FIGURE 6-18C. EOT WAVEFORMS

13. Depress START/STOP switch to start (in) and allow spindle to attain operating speed.
14. Reconnect A1P2, but reverse orientation as noted in Step 10, immediately upon completion of brush cycle.
15. Perform temperature stabilization procedure.
16. Select upper head of disk cartridge and command unit to seek to cyl 146₁₀ (73₁₀ for 100 TPI units). For units without OEM tester proceed to Step 17. For other units proceed to Step 19.
17. If no OEM field tester or system is available to perform required functions. Refer to HPC package for proper switch settings.
18. After switches have been set to select head and cylinder desired, momentarily toggle cylinder address strobe switch on then off. This must be performed quickly or a seek error might occur.
19. Actuator should move to cylinder #146 (#73 for 100 TPI units).
20. Place oscilloscope external sync on Sector (P1-B10 on I/O Board for multi-sector units, index (P1-A31 I/O Board) for single-sector units without field tester and index (on field tester) for single-sector units with field tester.
21. Also monitor this signal and set up oscilloscope to indicate one complete revolution. Horizontal setting will be 2 ms/cm uncalibrated (see Figure 6-19A).
22. Monitor TP1 and TP2 on I/O board with channels A and B of the oscilloscope.
23. Set Oscilloscope to add signals and invert one channel.

This alignment procedure must be performed entirely with the oscilloscope calibrated for a sweep of 10 divisions equals one spindle revolution. (See Step 21 of this procedure.)

NOTE: Ideal head alignment occurs when the length of a single "cat eye" pattern equals one half of a spindle revolution or 5.0 oscilloscope divisions when calibrated to Step 21. Pattern crossover points are not necessarily coincident with the sweep start (index) and the position of these points relative to the index has no effect on proper head alignment. Pattern amplitude relationships are of no importance and should not be considered when aligning the heads.

24. Using the horizontal position control, move the display so that an accurate measurement between two consecutive crossover points can be obtained. (See Figure 6-19b.) The head is in alignment if this measurement does not exceed 5 ± 0.8 divisions. If this head meets the alignment requirements proceed to Step 28 and repeat this procedure. If not aligned to specification, continue.
25. Loosen upper head clamp if adjustment is required. (See Figure 6-6).
26. Using head alignment tool (CDC #75797900) adjust head to 5 ± 0.5 divisions. (See Figure 6-19b.)
27. Tighten upper head clamp and torque to 6 ± 0.5 in./lbs. Verify head alignment meets 5 ± 0.5 divisions after tightening.
28. Select lower head of disk cartridge. If no OEM field tester and no system is available to perform selection, refer to the HPC package for proper switch

- setting. After head selection follow the procedure outlines in Step 24.
29. Loosen lower head clamp if adjustment is required.
 30. Using head alignment tool (CDC #75797900) adjust head to 5 ± 0.5 divisions. (See Figure 6-19b.)
 31. Tighten lower head clamp and torque to 6 ± 0.5 in.lbs. Verify head alignment meets 5 ± 0.5 divisions after tightening.
 32. If new heads have been installed or actuator has been removed, proceed to Step 16 of index-to-burst period check and adjustment. Otherwise continue procedure.
 33. Depress START/STOP switch to STOP (out) and wait for spindle to stop rotating (START/STOP lamp extinguished).
 34. Remove CE disk cartridge.
 35. Set main circuit breaker to off position.
 36. Disconnect A1P2, reverse plug, and reconnect.
 37. Install K1 and close power supply cover.
 38. Set all switches on I/O board back to original positions noted in Step 6.
 39. Disconnect oscilloscope.
 40. Install electronics cover.
 41. Close top cover (base cabinet only).

6.7.5 HEAD SKEW AND INDEX-TO-BURST PERIOD CHECK AND ADJUSTMENT

NOTE: Refer to HPC package located in front of manual for option switch and terminator locations.

1. Depress START/STOP switch to STOP and wait for spindle to stop rotating (START/STOP lamp extinguished).
2. Remove disk cartridge and install CE disk cartridge. Refer to disk cartridge removal and installation procedure in section 2.
3. Set main circuit breaker to off position.
4. Open top cover.
5. Remove electronics cover.
6. Record setting of all switches on I/O board.
7. Verify that resistor modules are installed on I/O board. If not, install terminator plug in I/O board connector J1 if required.
8. Install OEM field tester. If no OEM field tester or system is available to perform the required functions refer to HPC package to star select unit and terminator power.

K1 should not be removed until main circuit breaker is in off position.

CAUTION With K1 removed, emergency retract is disabled. Consequently, heads must be manually retracted if spindle slows down below tolerance limit.

9. Open power supply cover and remove relay K1 to provide access to heads.
10. Disconnect A1P2 (note orientation).
11. Set main circuit breaker to on position.
12. Depress W/PROT CART and W/PROT FIXED switches to on (in).
13. Depress START/STOP switch to start (in) and allow spindle to attain operating speed.
14. Reconnect A1P2, but reverse orientation as noted in Step 10, immediately upon completion of brush cycle.
15. Perform temperature stabilization procedure.
16. Select upper head of disk cartridge and command unit to seek to cyl 10₁₀ (5₁₀ for 100 TPI units). For units without OEM tester proceed to Step 17. For other units proceed to Step 19.
17. If no OEM field tester or system is available to perform required functions, refer to HPC package for proper switch settings.
18. After switches have been set to select head and cylinder desired, momentarily toggle cylinder address strobe switches on then off. This must be performed quickly or a seek error might occur.

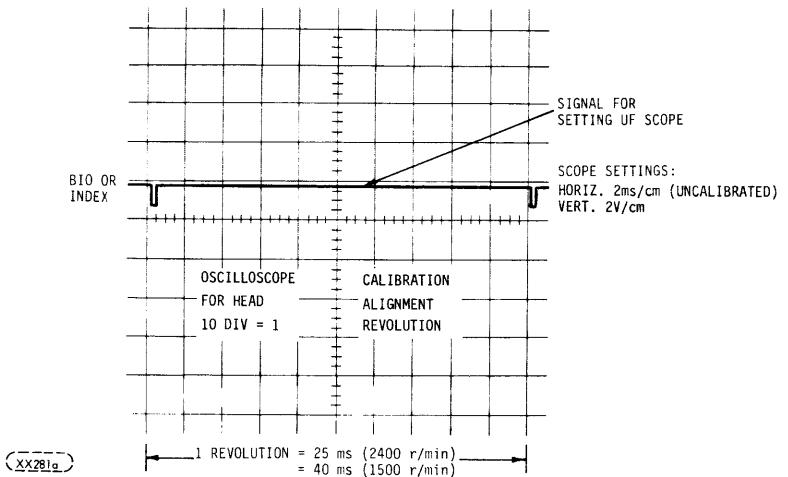


FIGURE 6-19A. HEAD ALIGNMENT SCOPE SETTING

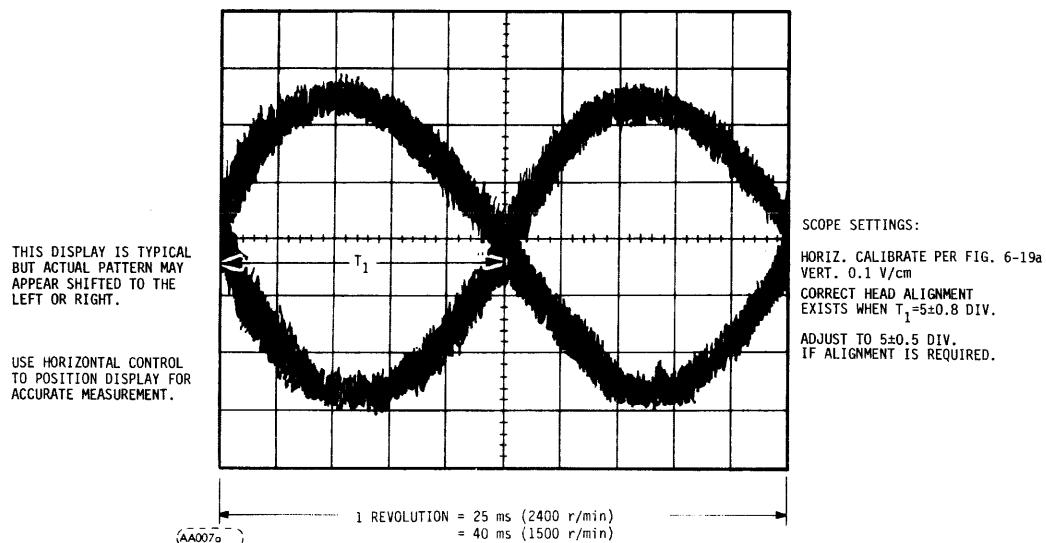


FIGURE 6-19B. HEAD ALIGNMENT WAVEFORM

19. Actuator should move to cylinder #10 (#5 for 100 TPI units).
20. Place oscilloscope external sync and channel A on sector (P1-B10 on I/O Board) for multi-sector units, index (P1-A31 I/O board) for single-sector units without field tester and index (on field tester) for single-sector units with field tester (see Figure 20).
21. Connect oscilloscope channel B to TPI on I/O Board.

Head-skew check (Steps 22 through 24) should only be performed if a head has been replaced. If the check fails specification, keep replacing that head until the check passes specification. All measurements are to be made on the peak of the leading pulse derived by the CE pack regardless of polarity. To measure head skew with reliable accuracy, the index-to-data burst should be observed on a delayed sweep having a time base of 1 μ s per division for straddle-erase heads and 5 μ s per division for pre-erase heads. An alternate procedure is to change the index-to-burst timing so the pulse can be centered on the scope screen having the above horizontal time base (Figure 6-20b).

NOTE:

22. With the upper head of the disk cartridge selected, place the burst pulse in the center of the scope (Figure 6-20b).
23. Next select the lower head of the disk cartridge. If no OEM field tester or system is available to perform the selection, refer to the HPC package for the proper switch settings.

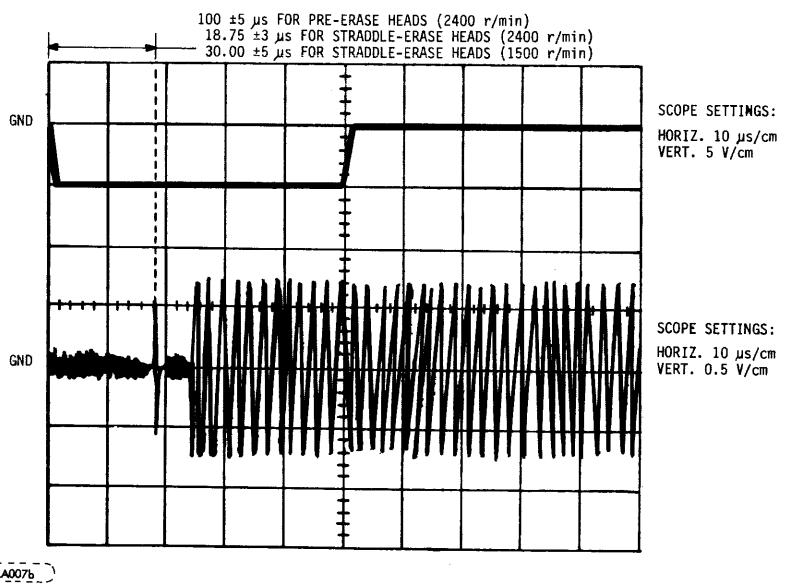
24. With the lower head of the disk cartridge selected, measure the difference between the burst point of the upper head to the burst point of the lower head. The head to head difference must be within the following limits:
 - 3 μ s maximum for straddle-erase heads (2400 r/min)
 - 4 μ s maximum for straddle-erase heads (1500 r/min)
 - 4 μ s maximum for pre-erase heads (2400 r/min)
25. Select the upper head of the disk cartridge. If no OEM field tester or system is available to perform the required functions, refer to the HPC package for the proper switch settings.
26. Check and record the index-to-burst period as shown in Figure 6-20a.
27. Select the lower head of the disk cartridge. If no OEM field tester or system is available to perform the selection, refer to the HPC package for the proper switch settings.
28. Check and record the index-to-burst period as shown in Figure 6-20a.
29. Determine which head has the lowest index-to-burst period and verify that it meets the following limits:
 - 100.0 ± 5 μ s for pre-erase heads (2400 r/min)
 - 18.8 ± 3 μ s for straddle-erase heads (2400 r/min)
 - 30.0 ± 5 μ s for straddle-erase heads (1500 r/min)

If the check meets the above limits, go to Step 31, if not, continue procedure.
30. If the head with the lowest index-to-burst period does not fall within the above limits, select that head and adjust the potentiometer on the sector board to the following:
 - 100.0 ± 1 μ s for pre-erase heads (2400 r/min)
 - 18.8 ± 0.1 μ s for straddle-erase heads (2400 r/min)
 - 30.0 ± 0.5 μ s for straddle-erase heads (1500 r/min)

If the potentiometer is not present or if the adjustment range of the potentiometer does not reach far enough, depress the START/STOP pushbutton to STOP and perform the cartridge index/sector transducer check and adjustment. Then repeat Steps 26 through 30.
31. Depress START/STOP switch to STOP (out) and wait for spindle to stop rotating (START/STOP lamp extinguished).
32. Remove CE disk cartridge.
33. Set main circuit breaker to Off position.
34. Disconnect A1P2, reverse plug, and reconnect.
35. Install K1 and close power supply cover.
36. Set all switches on I/O board back to original positions noted in step 6.
37. Disconnect oscilloscope.
38. Install electronics cover.
39. Close top cover (base cabinet only).

6.7.6 TRACK INDICATOR CHECK AND ADJUSTMENT

1. Open top cover (base cabinet only).
2. Remove electronics cover.
3. Set main circuit breaker to on position.
4. Install disk cartridge.
5. Depress START/STOP switch to START (in) and wait for unit to complete FIRST SEEK.



NOTE: Measurement to be made at the peak of the leading pulse regardless of polarity. Some CE modes produce pulses inverted to pulse shown in Figure.

FIGURE 6-20A. INDEX-TO-BURST PERIOD WAVEFORMS

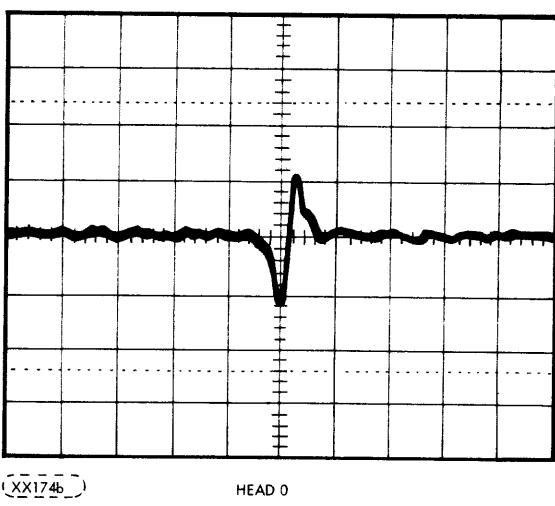


FIGURE 6-20B. INDEX-TO-BURST WAVEFORMS

6. Check that zero marks on fixed and movable sections of track indicators (Figure 6-21) are lined up.
7. If marks are not aligned, loosen fixed section of track indicator and position for alignment with movable section.
8. Check that gap between the fixed and movable sections of track indicator is 0.1 to 0.3 inches (2.54 to 7.62 mm).
9. Install electronics cover.

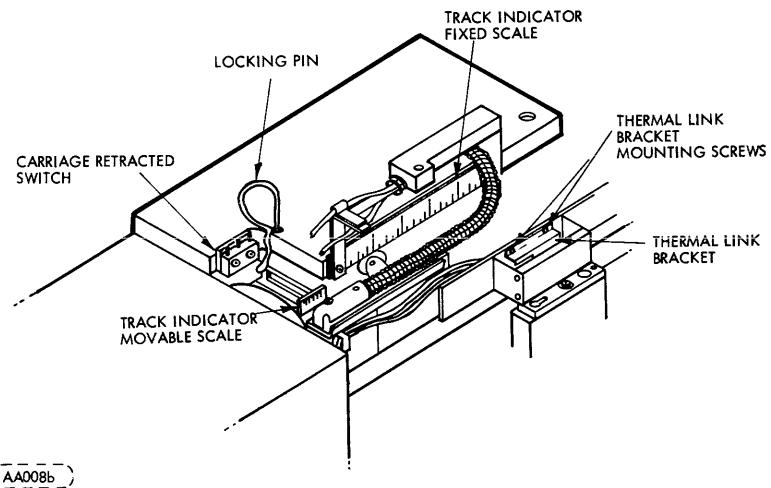


FIGURE 6-21. TRACK INDICATOR

6.7.7 CARTRIDGE-ON SWITCH CHECK AND ADJUSTMENT

NOTE: There are two cartridge-on switches, one on each Hold-Down arm. Perform cartridge-on switch removal and replacement procedure except for actual removal of switches.

6.7.8 STATIC ELIMINATOR CHECK

1. Depress START/STOP switch to STOP (out) and wait for spindle to stop rotating (START/STOP lamp extinguished).
2. Remove disk cartridge.
3. Open top cover (base cabinet only).
4. Set main circuit breaker to off position.
5. Using multimeter check for five ohms or less between module ground and side of rotating spindle cone while turning spindle by hand.
6. If resistance is above five ohms clean static eliminator and perform Step 5 again.
7. If multimeter indicates no continuity or high resistance after cleaning replace static eliminator by following Static Eliminator Removal and Replacement procedure.

6.7.9 DISK BRUSH SWITCH CHECK AND ADJUSTMENT

Perform disk brush assembly removal and replacement procedure except for actual removal of brush assembly.

6.7.10 CARTRIDGE INDEX/SECTOR TRANSDUCER CHECK AND ADJUSTMENT

1. Depress START/STOP switch to STOP (out) and wait for spindle to stop rotating (START/STOP lamp extinguished).
2. Open top cover (base cabinet only).
3. Remove disk cartridge.

4. Set main circuit breaker to off position.
5. Install armature plate simulator onto spindle as shown in Figure 6-22.
6. Using plastic shim stock, adjust clearance A to 0.030 ± 0.005 inch (0.76 ± 0.13 mm) for 2400 r/min units and 0.018 ± 0.005 , -0.000 inch (0.46 ± 0.13 , -0.00 mm) for 1500 r/min units. The adjustment is made by loosening the clamp screw and sliding the transducer in or out for proper clearance. Tighten the clamp screw.
7. After the transducer is properly adjusted, perform the Index to Burst Period Check and Adjustment procedure.

6.7.11 FIXED DISK INDEX/SECTOR TRANSDUCER CHECK AND ADJUSTMENT

1. Depress START/STOP switch to STOP(out) and wait for spindle to stop rotating (START/STOP lamp extinguish).
2. Set main circuit breaker to Off position.
3. Using a 5/32 Allen driver, place tool into hole on front end panel and remove panel by loosening hardware (base cabinet only).
4. Remove left side panel (when viewed from rear of unit, cabinet only).
5. Remove module bottom cover.
6. Using plastic shim stock, check clearance A (Figure 6-23). Clearance should be between $0.010 + 0.003$, -0.000 inch ($0.25 + 0.076$, -0.000 mm). If clearance is out of tolerance, loosen transducer clamp and slide transducer in or out to adjust for proper clearance.
7. Tighten transducer clamp.
8. Install module bottom cover.
9. Install side panel (base cabinet only).
10. Install rear end panel (base cabinet only).

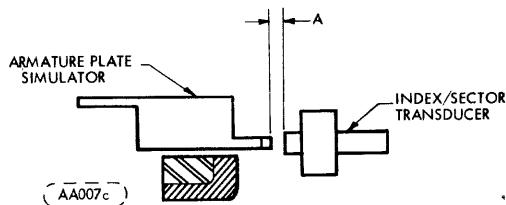


FIGURE 6-22. INDEX/SECTOR TRANSDUCER ADJUSTMENT

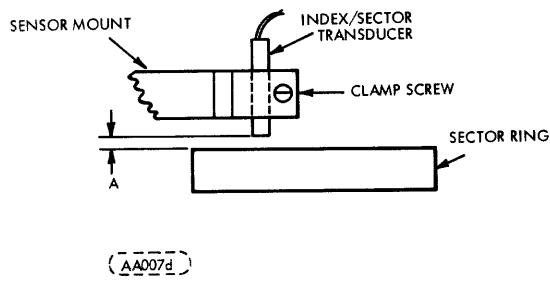


FIGURE 6-23. FIXED DISK INDEX/SECTOR TRANSDUCER ADJUSTMENT

7.1 GENERAL

This section contains information useful for maintaining the 9427H Disk Drive.

7.2 CIRCUIT BOARD DESCRIPTION

All disk drive electronics is contained on printed circuit boards. Six of the boards (R/W/E, Data Recovery, Sector, Servo, Control & I/O) measure 6 in. X 8 in. (152 X 203 mm) and are plugged into the card cage assembly mother board. The Inductosyn Pre-amp board measures 5 in. X 8 in. (127 X 203 mm) and is mounted on top of the magnet assembly. The Power board measures 4.75 in. X 7.50 in. (121 X 191 mm) and is part of the power supply assembly. Both integrated and discrete circuit are used on the boards.

7.3 CIRCUIT BOARD LOCATIONS

The Printed Circuit Boards are located in the Card Cage as shown in Figure 7-1.

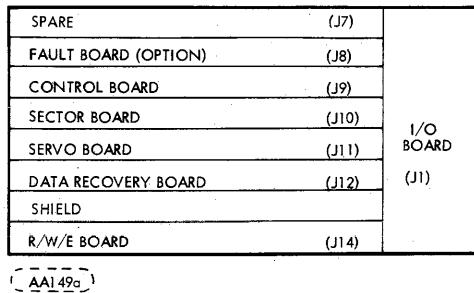


FIGURE 7-1. CIRCUIT BOARD LOCATION

7.4 TROUBLESHOOTING DIAGRAMS

The following diagrams are intended to guide service personnel to the probable cause of malfunctions in the 9427H disk drive.

The first series of diagrams illustrate the normal sequence of events when everything is functioning properly. However, at certain intervals during the normal sequential flow, service personnel are directed to specific flow chart locations if a malfunction does occur (refer to paragraph 7.5).

NOTE: In the flowcharts, imperative instructions (e.g. replace control board) are intended only to suggest a possible cause of the malfunction and the recommended solution.

7.5 FLOW DIAGRAM REFERENCES

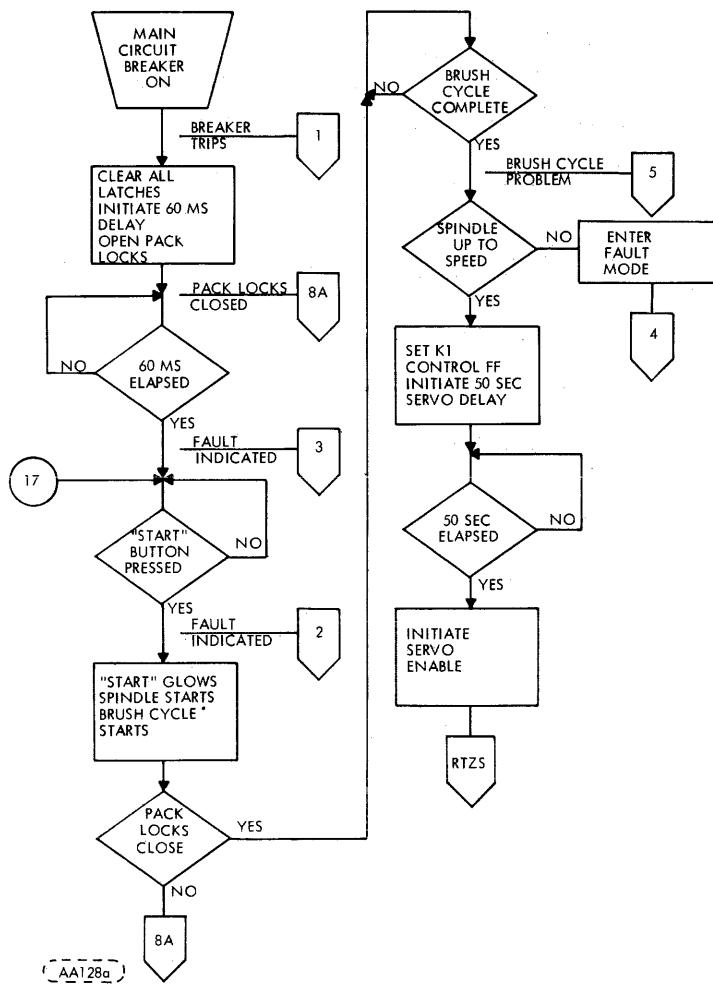
Each diagram page is sequentially page numbered in the upper right-hand corner of the page. When the diagram flow is interrupted (**3**), the page location, where the flow will be continued is referenced in the Lower right-hand corner of the page.

EXAMPLE:

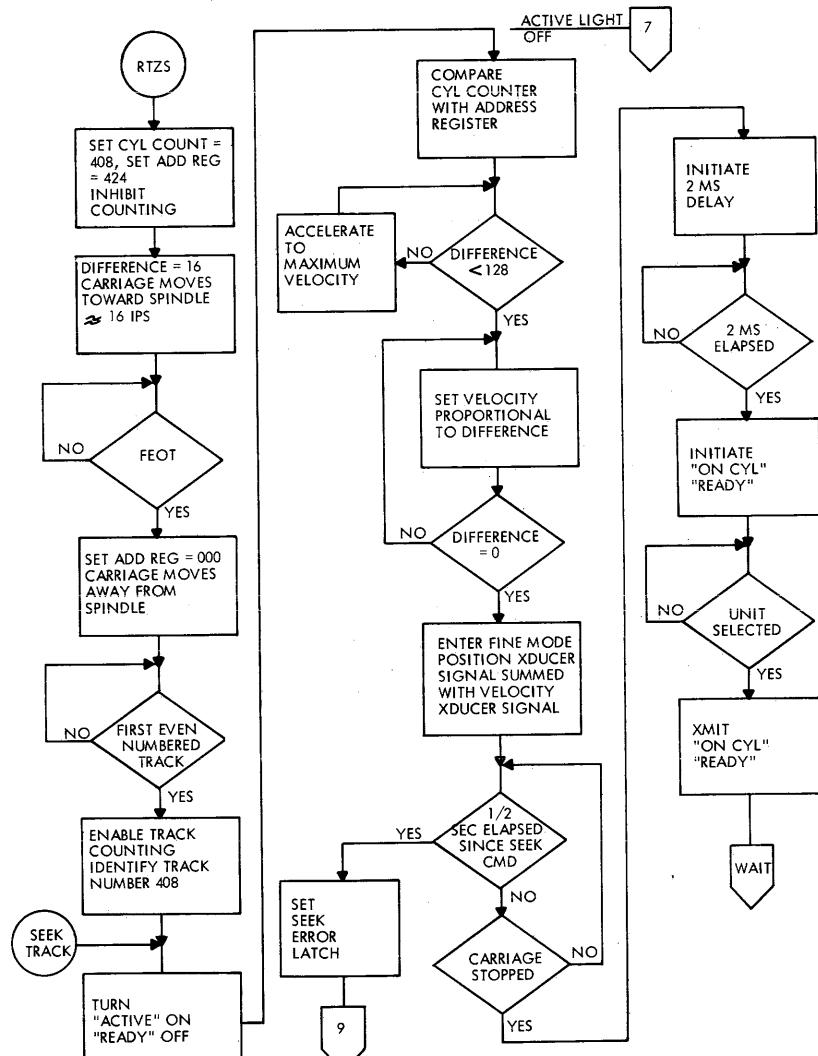


Location
3 → 18

This indicates that the flow will continue on another page or a Fault has occurred. and on page 18 the flow will start at (3).

LOCATION

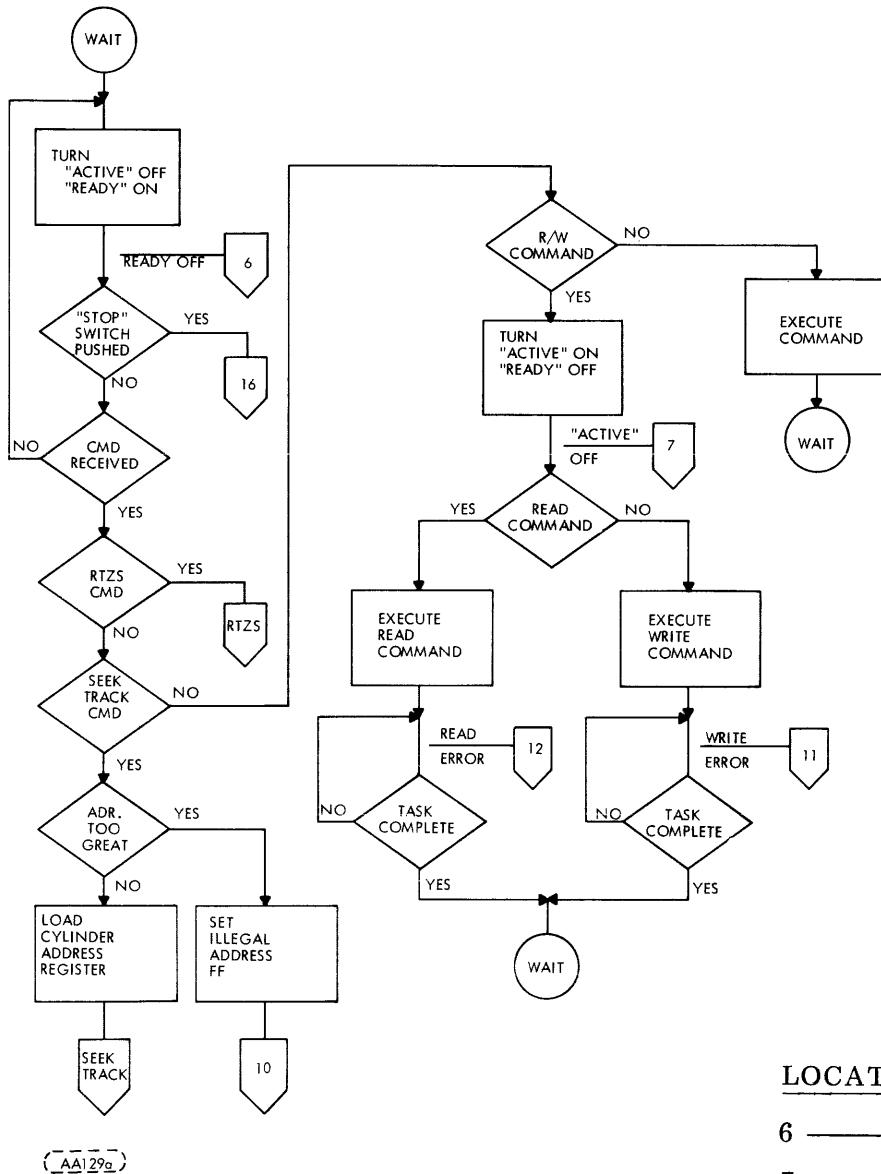
1	→	7
2	→	11
3	→	11
4	→	11
5	→	8
8A	→	5
RTZS	→	2



(AA128b)

LOCATION

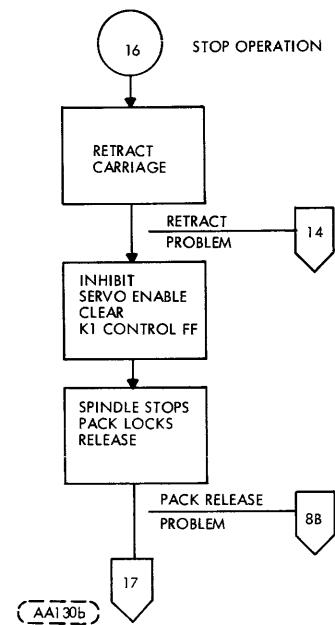
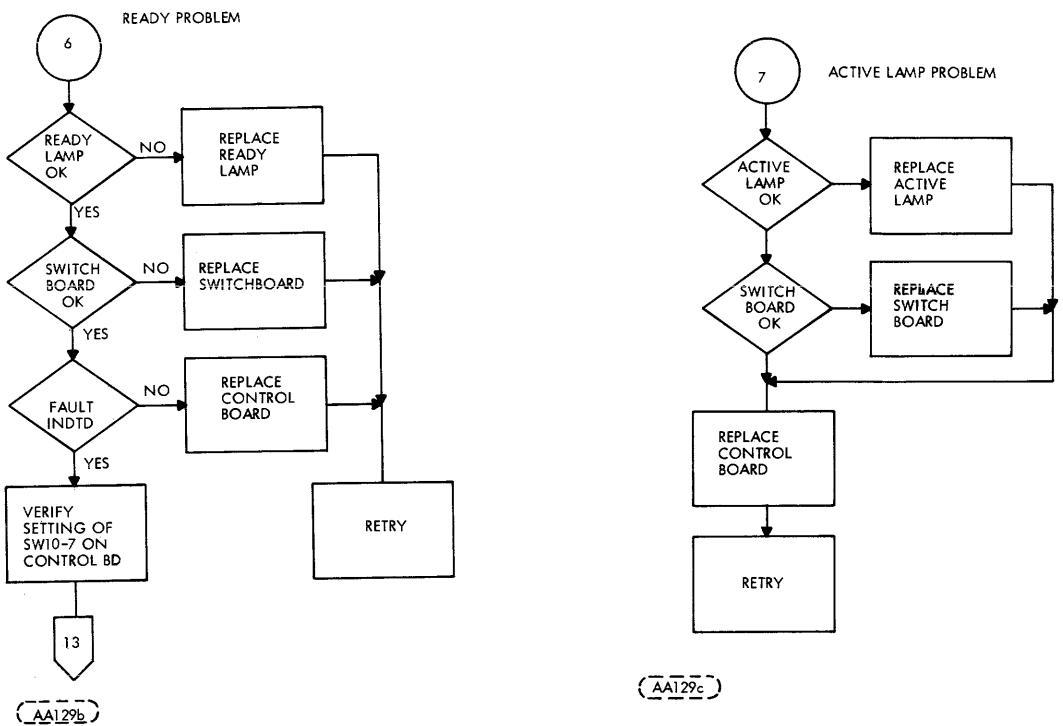
7	→	4
9	→	14
WAIT	→	3

LOCATION

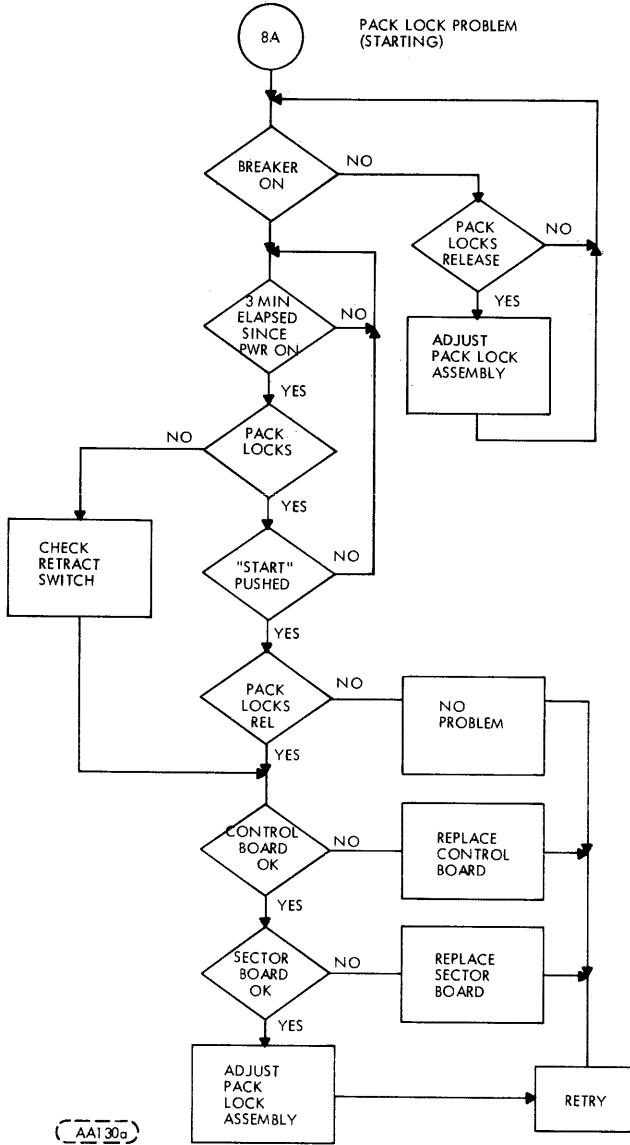
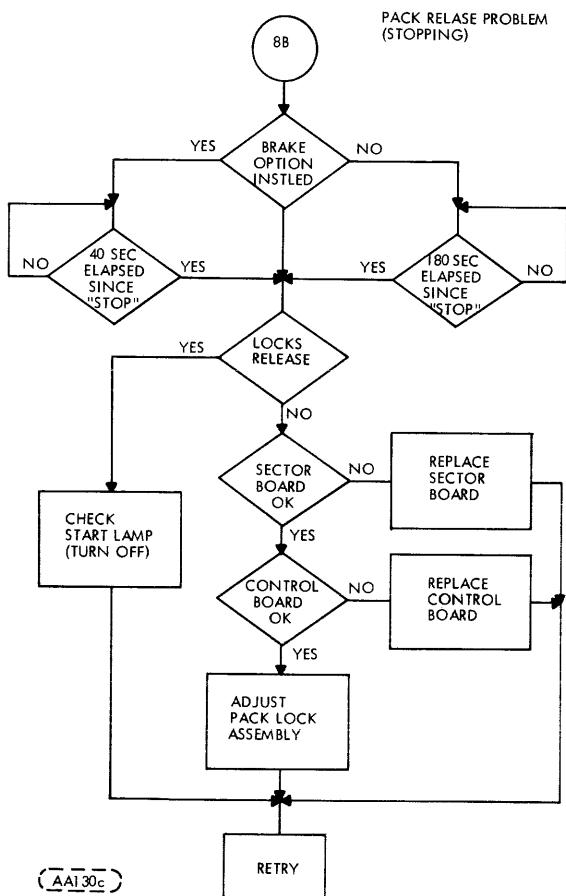
6	→	4
7	→	4
10	→	10
11	→	6
12	→	6
16	→	4

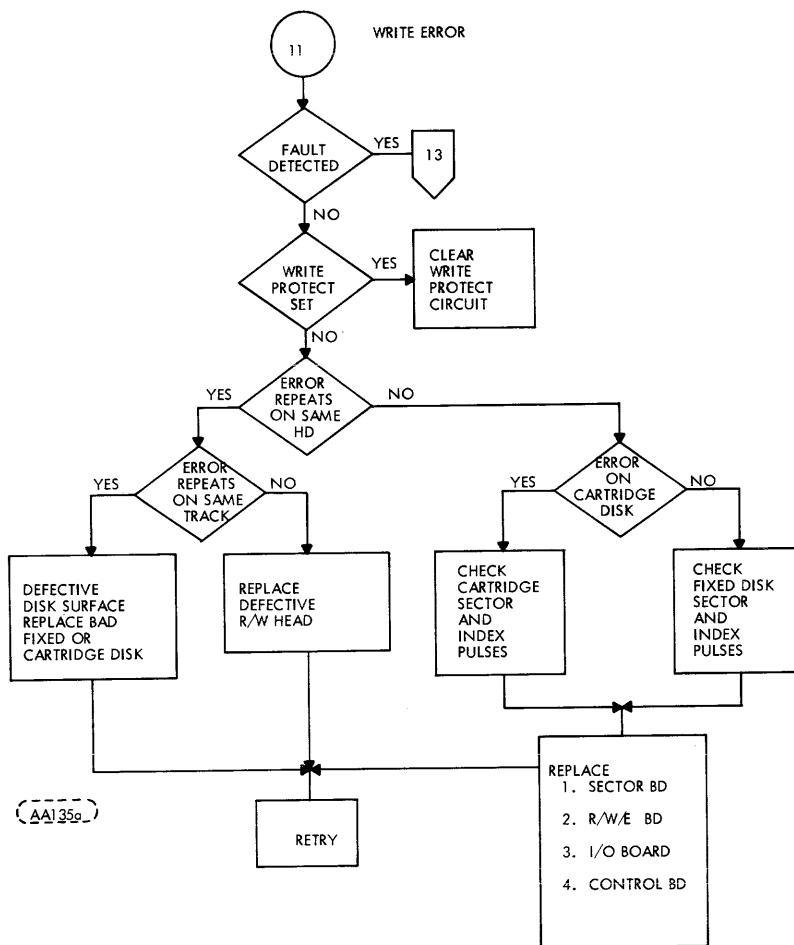
SEEK TRACK → 2

RTZS → 2

LOCATION

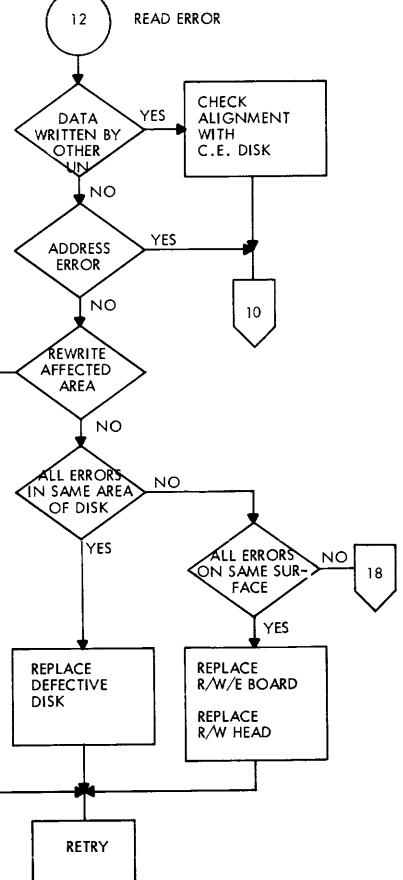
8B	→	5
13	→	12
14	→	11
17	→	1

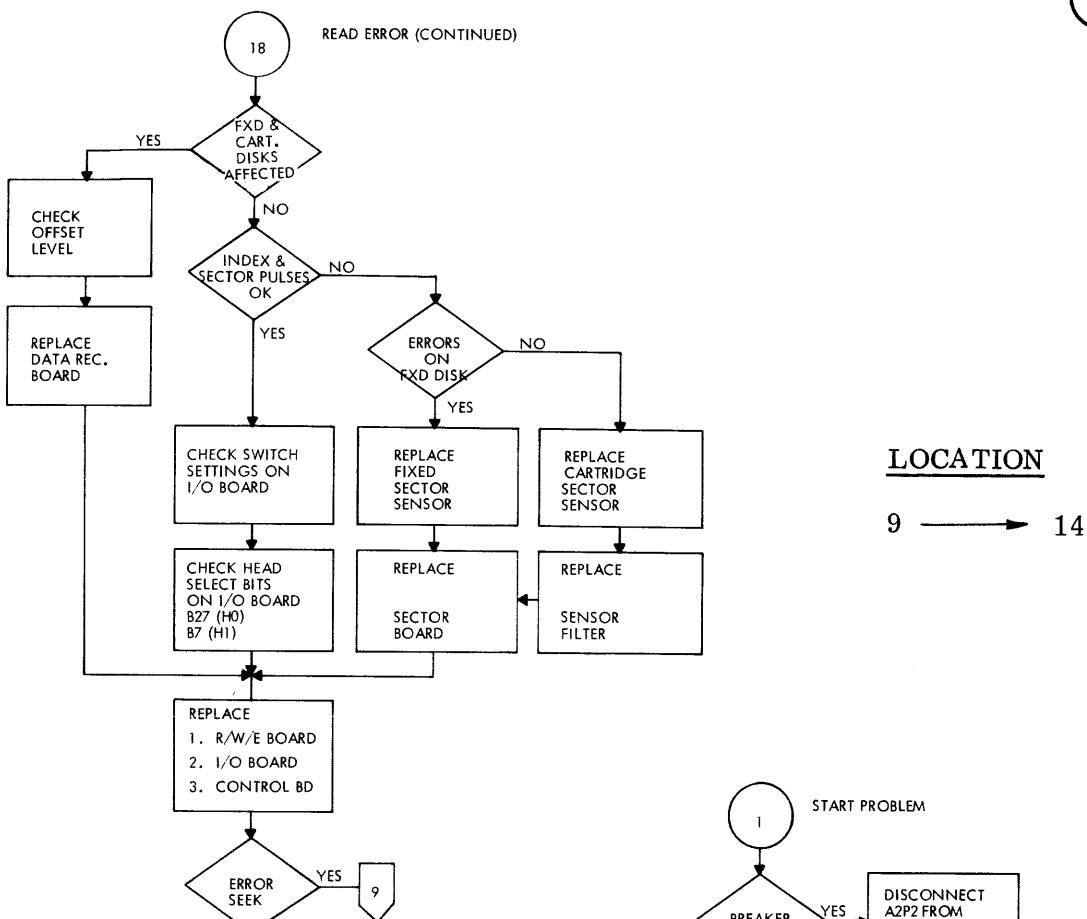


LOCATION

10 → 10

18 → 7

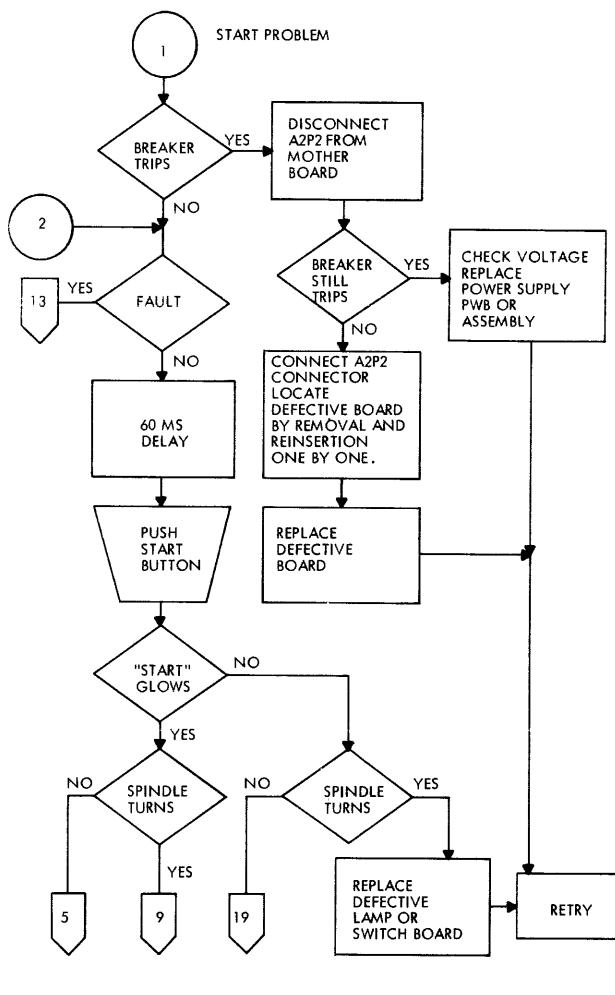




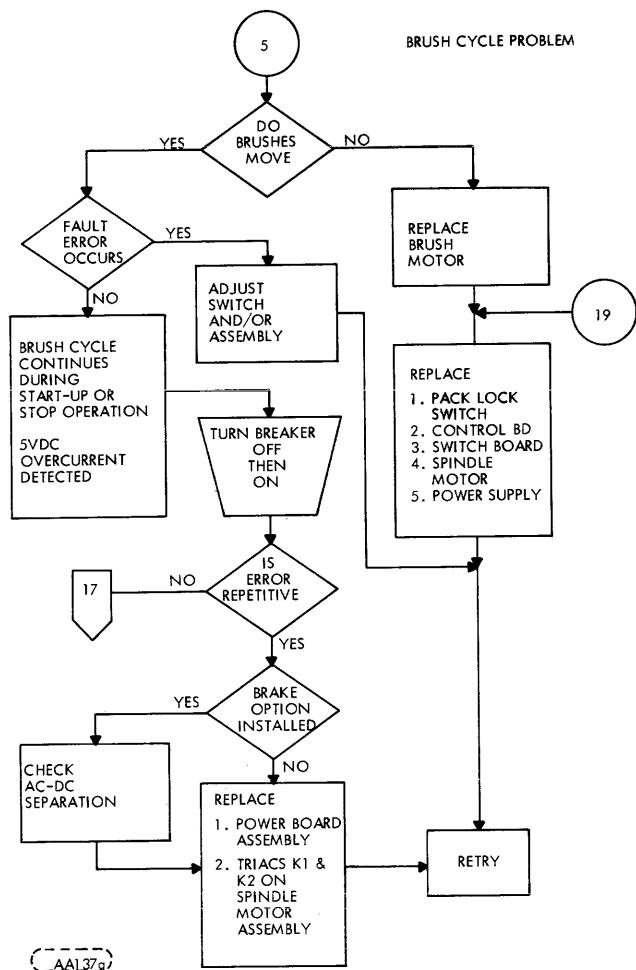
(AA136a)

LOCATION

5 → 8
9 → 14
13 → 12
19 → 8



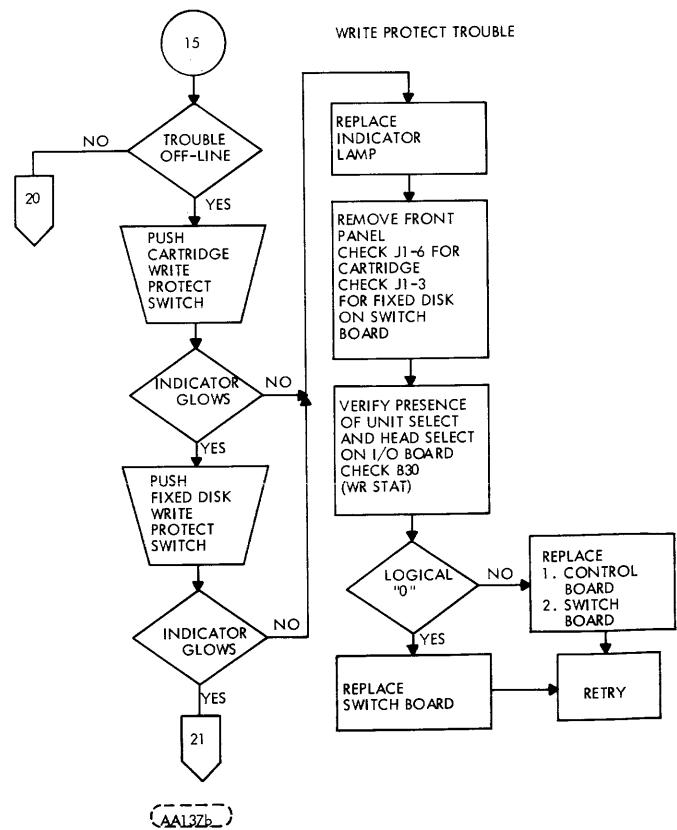
(AA136b)

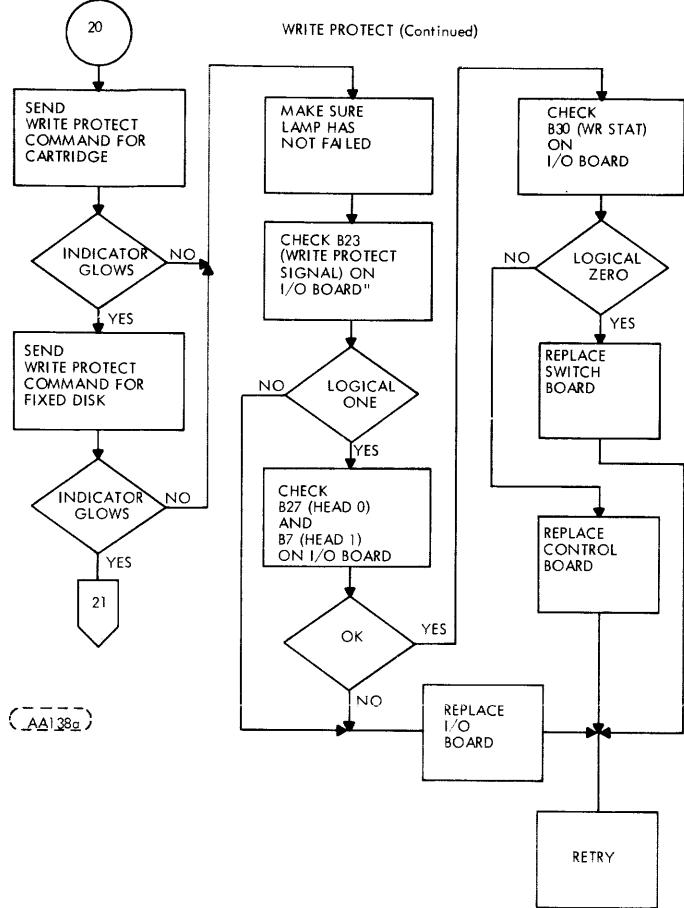
LOCATION

17 → 1

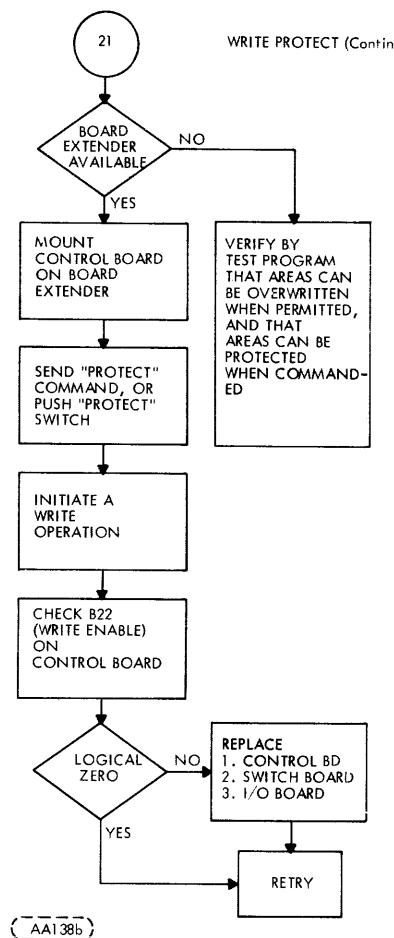
LOCATION

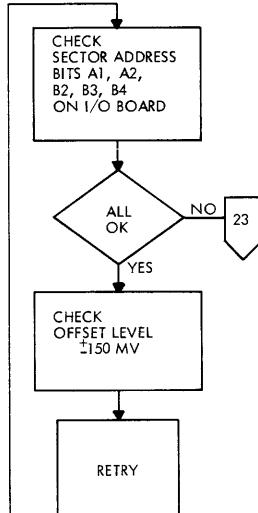
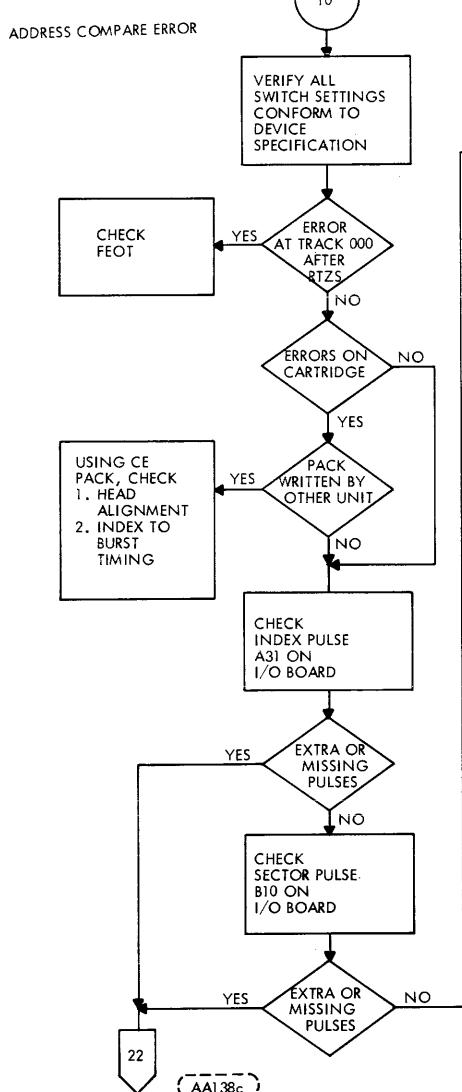
21 → 9



LOCATION

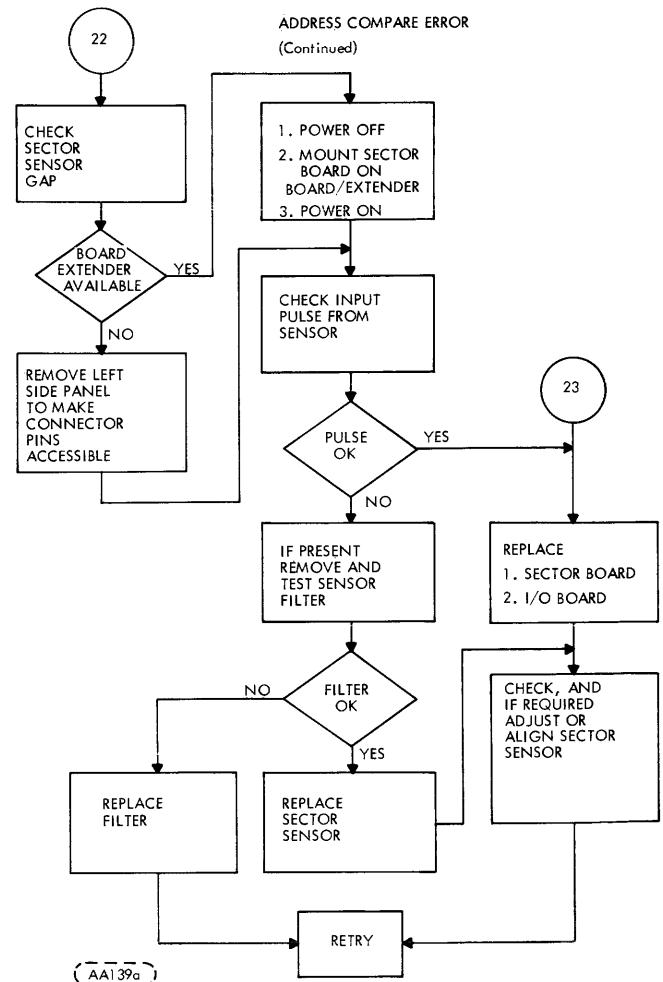
21 → 9

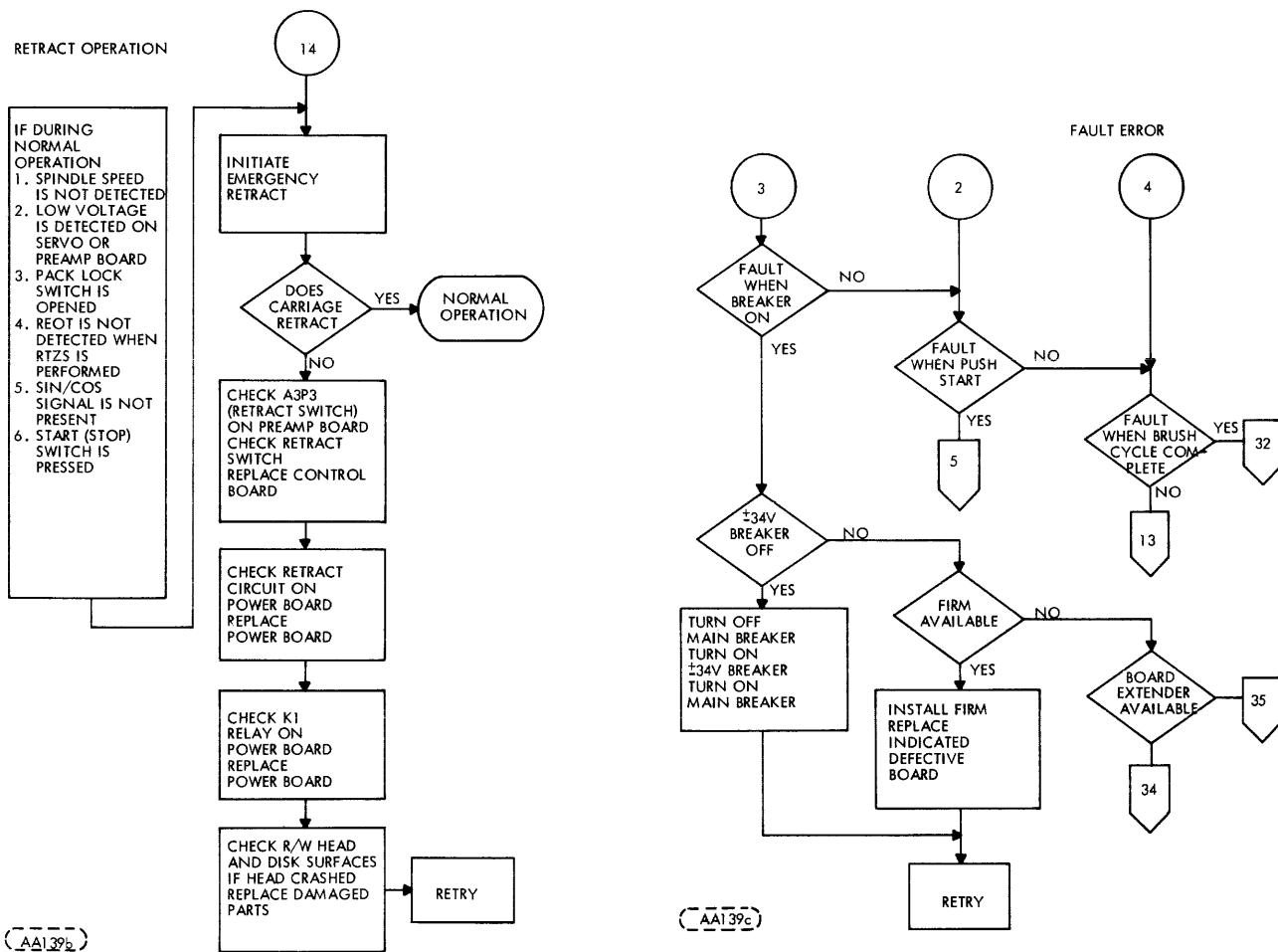


LOCATION

22 → 10

23 → 10





LOCATION

$$5 \longrightarrow 8$$

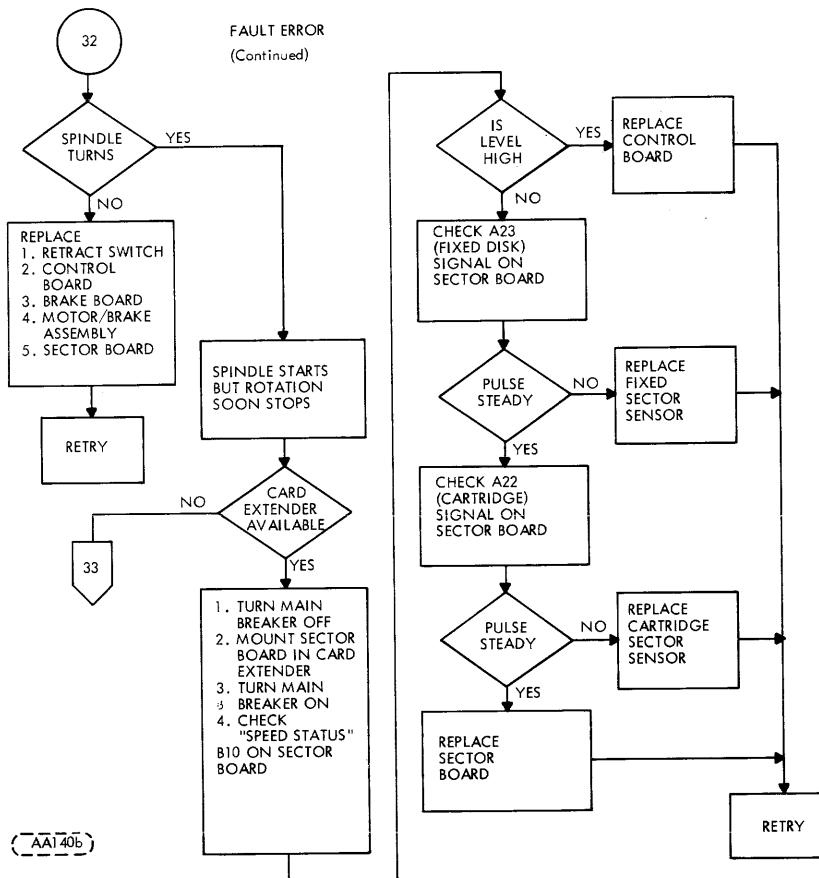
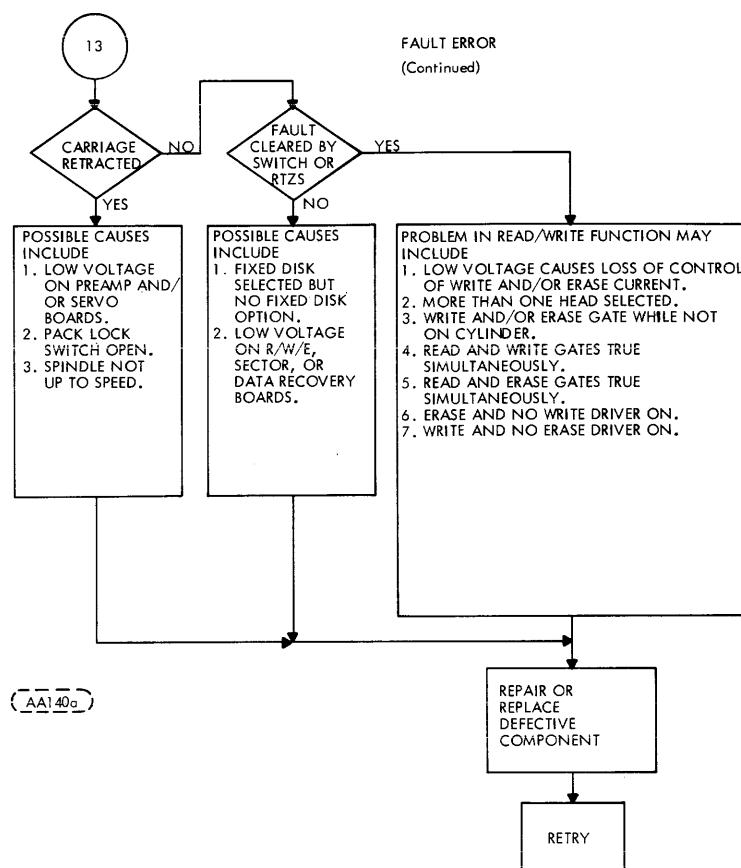
13 → 12

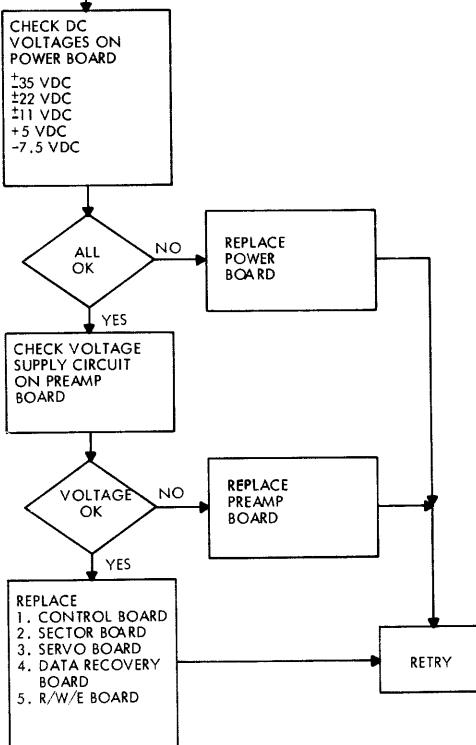
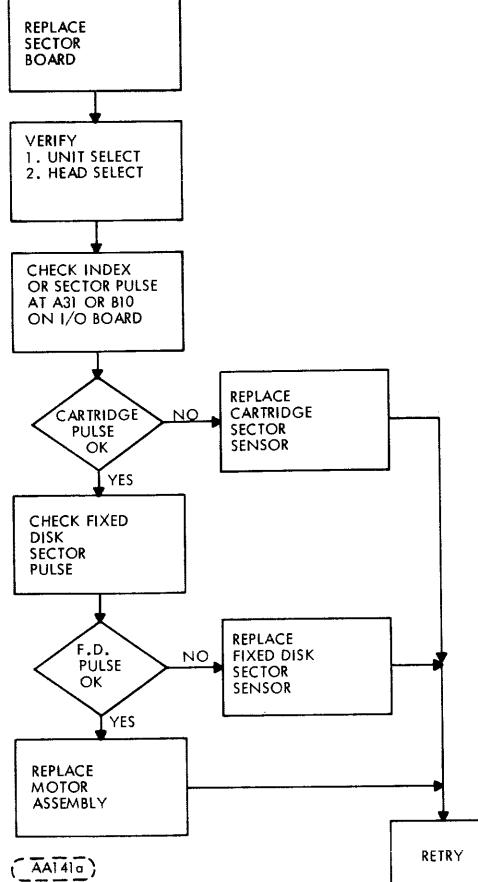
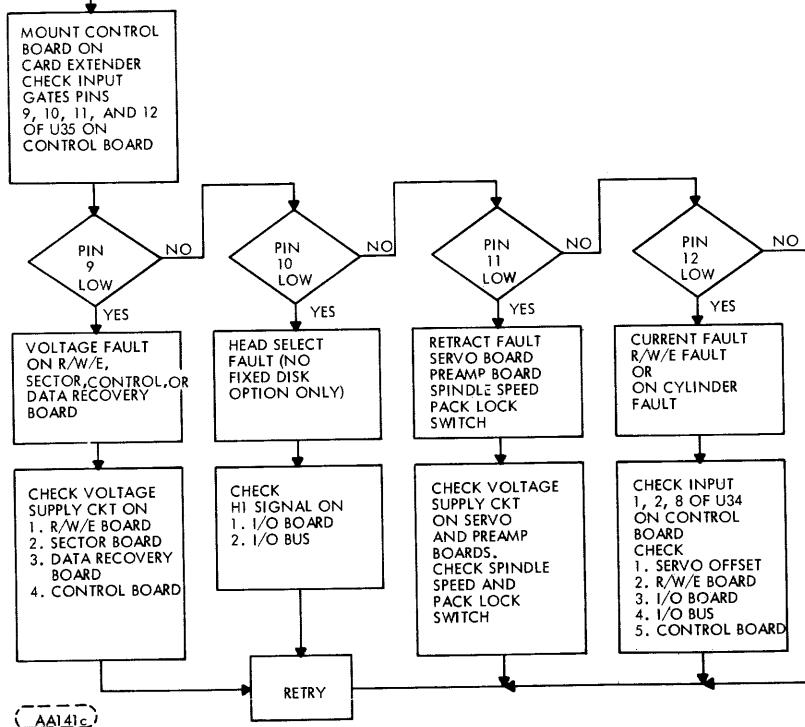
32 → 12

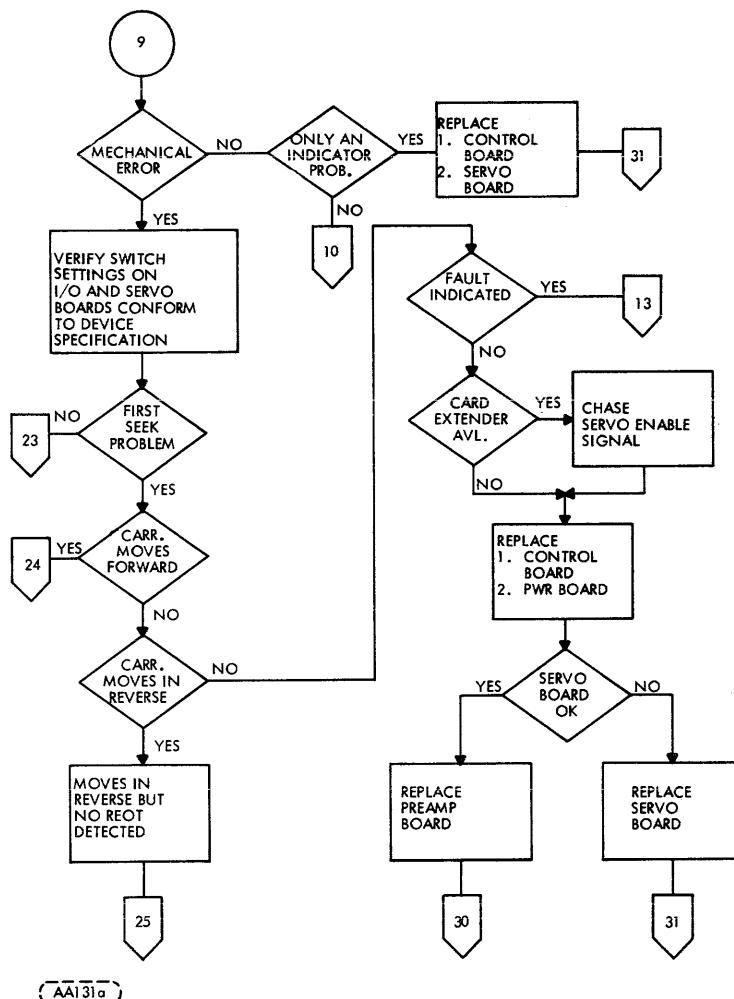
34 → 13

35 → 13

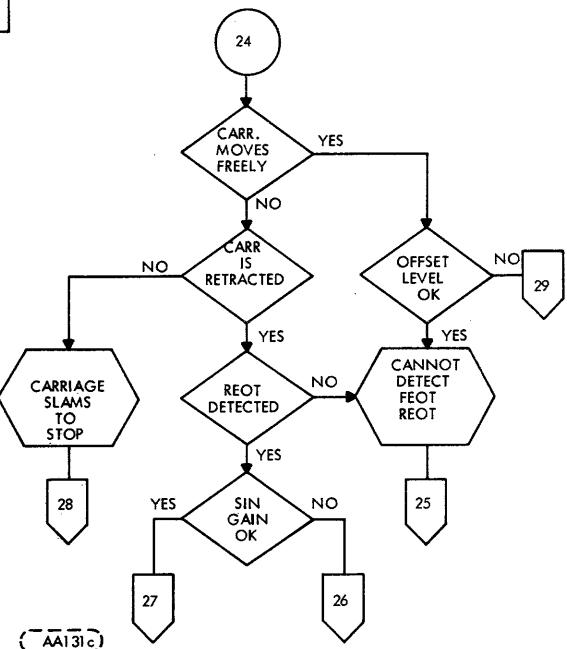
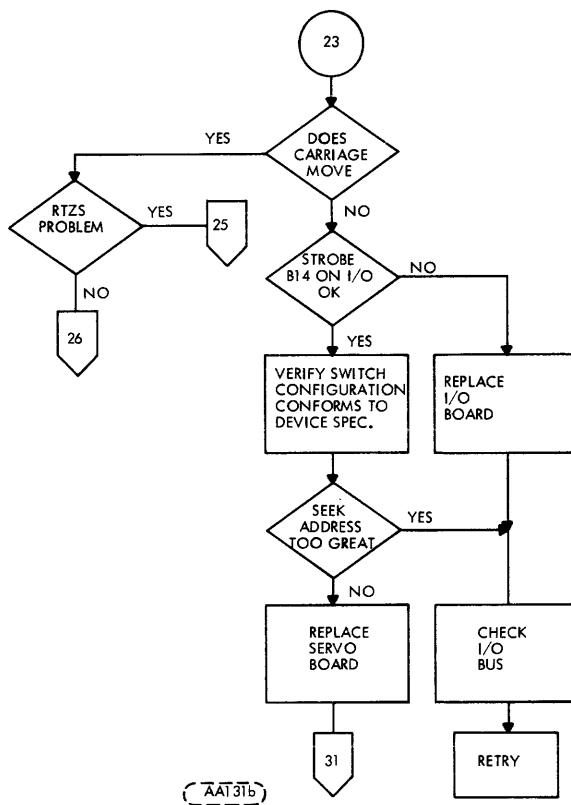
FAULT ERROR
(Continued)

LOCATION

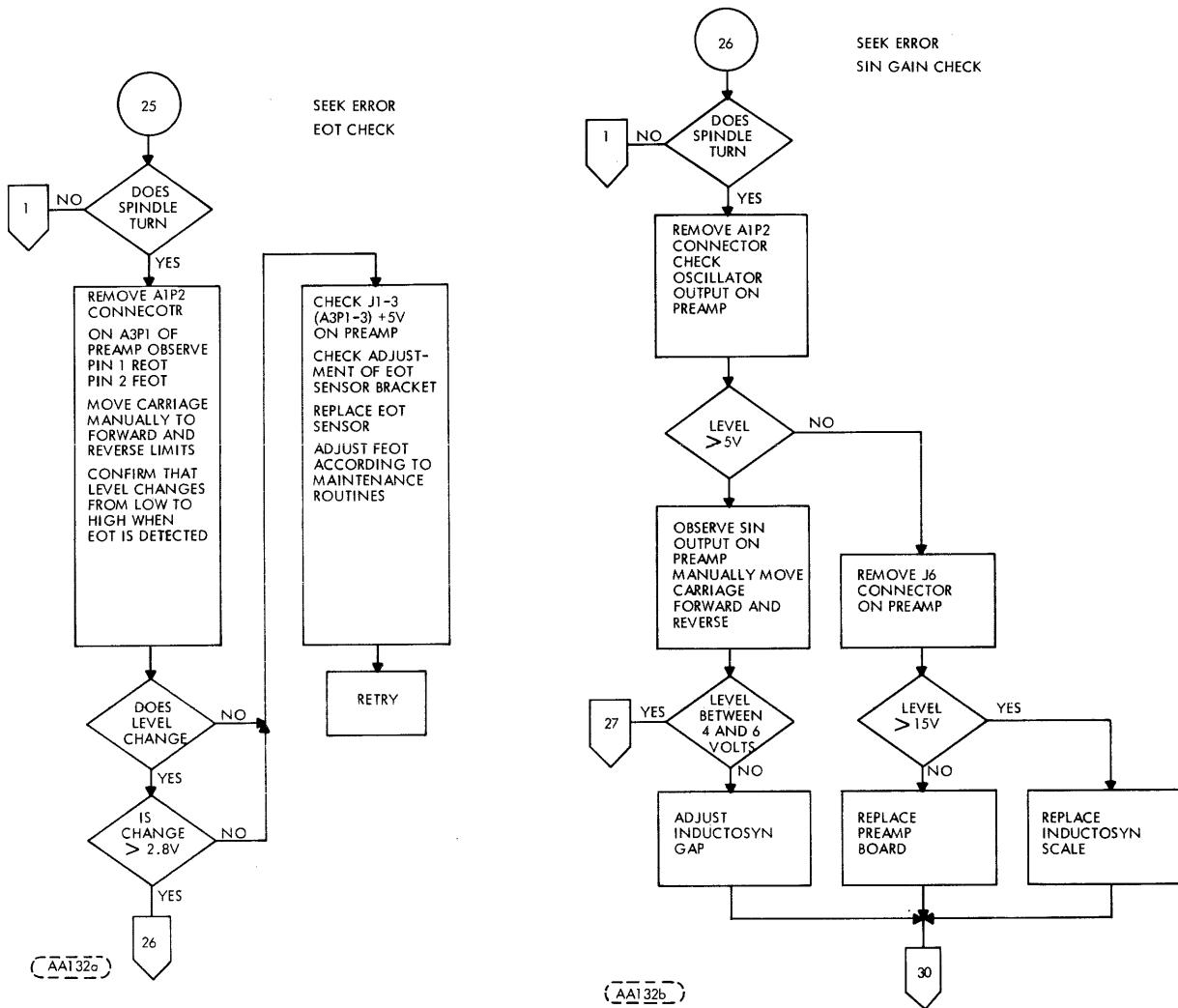


LOCATION

10	→	10
13	→	12
23	→	14
24	→	14
25	→	15
30	→	18
31	→	19

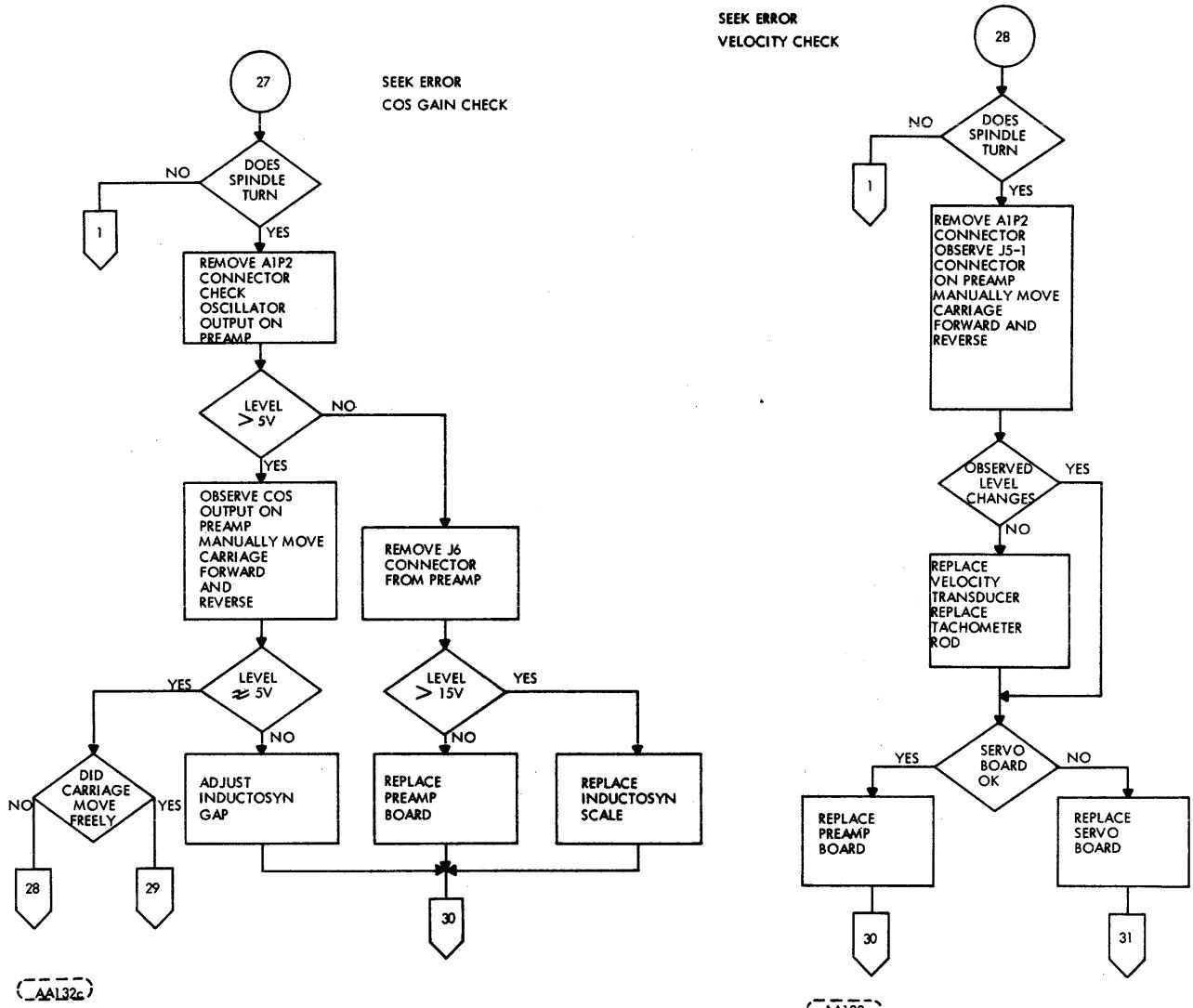
LOCATION

25	→	15
26	→	15
27	→	16
28	→	16
29	→	17
31	→	19



LOCATION

- | | | |
|----|---|----|
| 1 | → | 7 |
| 26 | → | 15 |
| 27 | → | 16 |
| 30 | → | 18 |

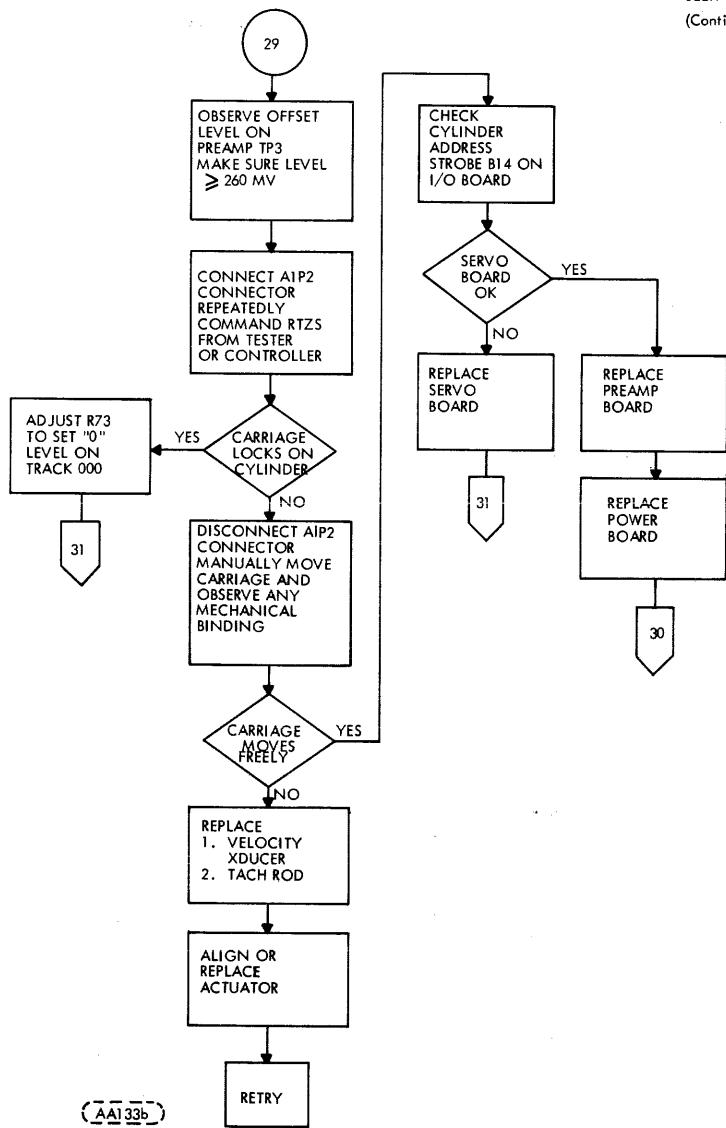
LOCATION

- 1 → 7
- 28 → 16
- 29 → 17
- 30 → 18

LOCATION

- 1 → 7
- 30 → 18
- 31 → 19

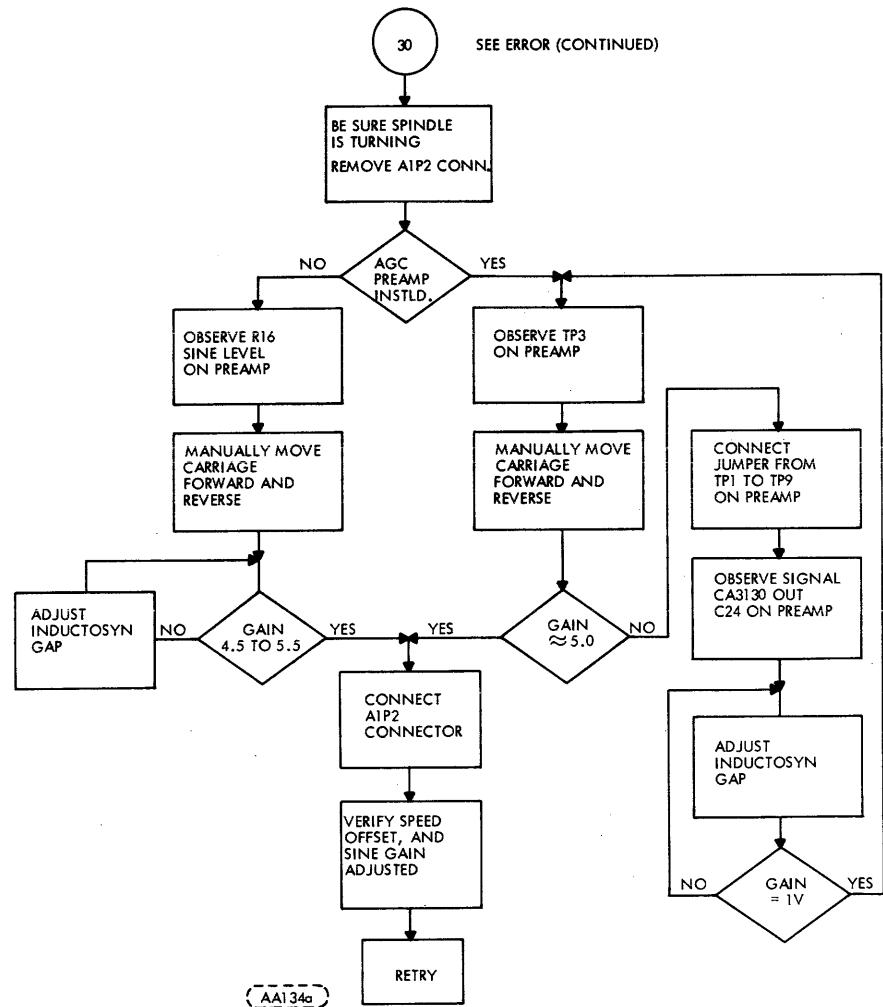
SEEK ERROR
(Continued)

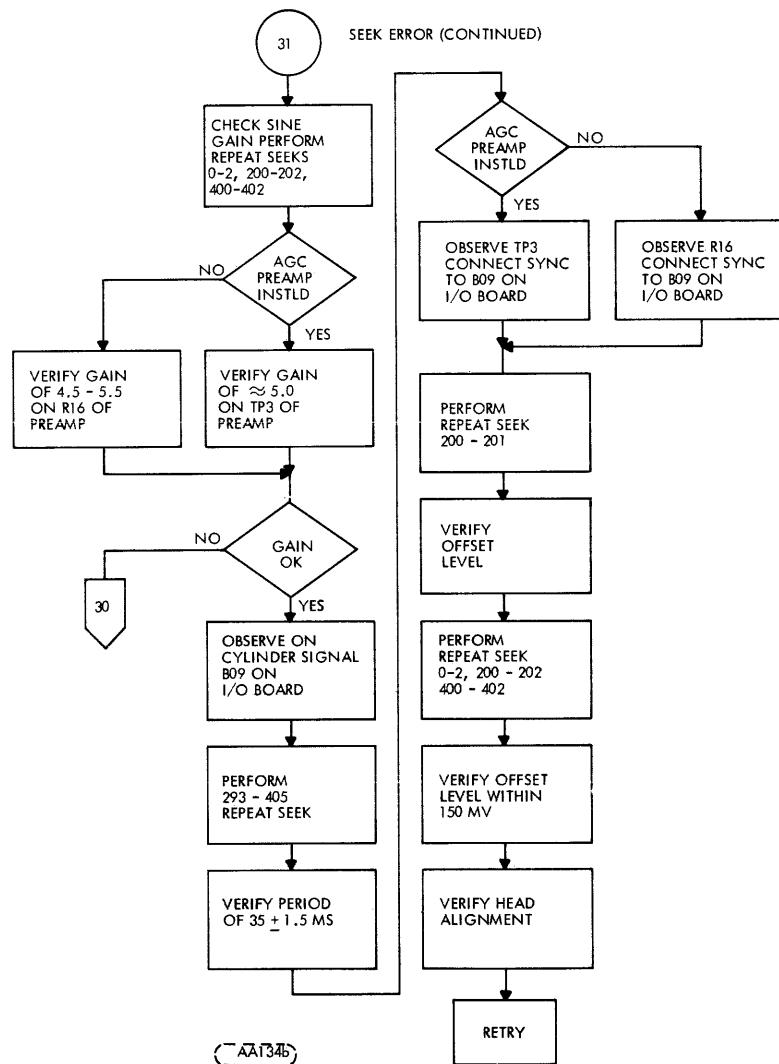


LOCATION

30 → 18

31 → 19



LOCATION

30 → 18

8.1 INTRODUCTION

This section contains an illustrated parts breakdown that details the different variations of the Model 9427H Disk Storage Drive. In general, parts are in dis-assembly of parts in the field.

8.2 GENERAL INSTRUCTIONS

8.2.1 ILLUSTRATIONS

Item numbers within a circle ① indicate an assembly (group of parts). Item numbers without a circle, 1, indicate a single part; a group of parts that are pinned or press fitted together; or a group of parts which is normally replaced as an assembly.

8.2.2 PARTS LISTS

In addition to the accompanying parts list on each illustration, two additional Parts Lists are available; the Top-Down Assembly/Component Parts List and the Cross Reference Index. Instruction for the use of all parts lists in paragraph 8.3.

8.2.3 ASSEMBLY LOCATOR

Figure 8-1 depicts and identifies the major assemblies within the device and references, by sheet number, where each assembly is broken down.

8.2.4 TOP MECHANICAL ASSEMBLY

The content of all 9427H variations are depicted and listed in Figure 8-2. To determine the Top Mechanical Assembly (TMA) and applicable parts and assemblies, refer to the Hardware Product Configurator document package (Parts Data Configurator) located in front of the manual. Instructions for its use are included. The TMA number referenced in the Parts Data configuration table represents the last three digits in TMA number 75741???.

NOTE

It may be desirable to insert the Parts Data Configurator in front of this section.

8.2.5 MODULE ASSEMBLY

The Content of each Module Assembly configuration is depicted and listed in Figure 8-3. Refer to the Parts Data Configurator for Module Assembly part number and applicable parts.

8.2.6 NOTES

Special instructions clarifying parts breakdown, replacement, references, unique parts usage, etc, are included on each sheet, as required, throughout this section.

8.2.7 PART REPLACEMENT

When ordering replacement parts for the 9427H, the inclusion of the following information for each part ordered will ensure positive identification:

- * { 1. Device Serial Number
2. TMA# (75741???)
3. Parts Data # and Rev. Status (77653386-?)
4. Figure #
5. Item #
6. Part Identification #
7. Part Description

8.3 PARTS LIST INSTRUCTIONS

8.3.1 ILLUSTRATION PARTS LIST

The parts list for each illustration is an extract from the Master Top-Down Assembly/Component Parts List, and contains only the parts depicted.

8.3.2 TOP-DOWN ASSEMBLY/COMPONENT PARTS LIST

- Starts at TMA level and lists all parts in Item Number sequence.
- Correlates Item numbers with part Identification numbers and the Description of each.
- Identifies where each part is used (where used column) within the device by listing the item number(s) of the next higher assembly.

NOTE

Where used data for Figures 8-2 and 8-3 are labeled TMA and MOD respectively.
Refer to Parts Data Configuration for correct application of parts (ref paragraphs 8.2.4 and 8.2.5).

- Defines the location of each part by listing the sheet number(s) where depicted.

NOTE

The same part may be used in any number of assemblies or sheet locations.

*Before ordering replacement parts refer to paragraph 8.4.

8.3.3 CROSS REFERENCE INDEX

- Lists all parts in numeric sequence (by Identification Number).
- In conjunction with the referenced sheet number (third column) and illustrations defines the physical location of each item identified.

8.3.4 SHEET NUMBER REFERENCES

Sheet number reference on Parts Lists and Illustrations refers to sheet locations in this section. Example: Sheet reference 3 represents sheet 8-3, sheet 4 represents sheet 8-4, etc.

8.4 SPARE PARTS (SP)

This Illustrated Parts Breakdown is complete to the extent that all parts and assemblies are depicted and identified. Replacement part availability depends on the materials and provisioning operation of the supplier.

To assist the service representative in selecting replacement parts with minimum requisitioning lead times, engineering recommended spare parts which reflect the intended service level of the device are identified with the letters SP adjacent to the item number on the face of each illustration. Replaceable non-spared items will require longer requisitioning lead times.

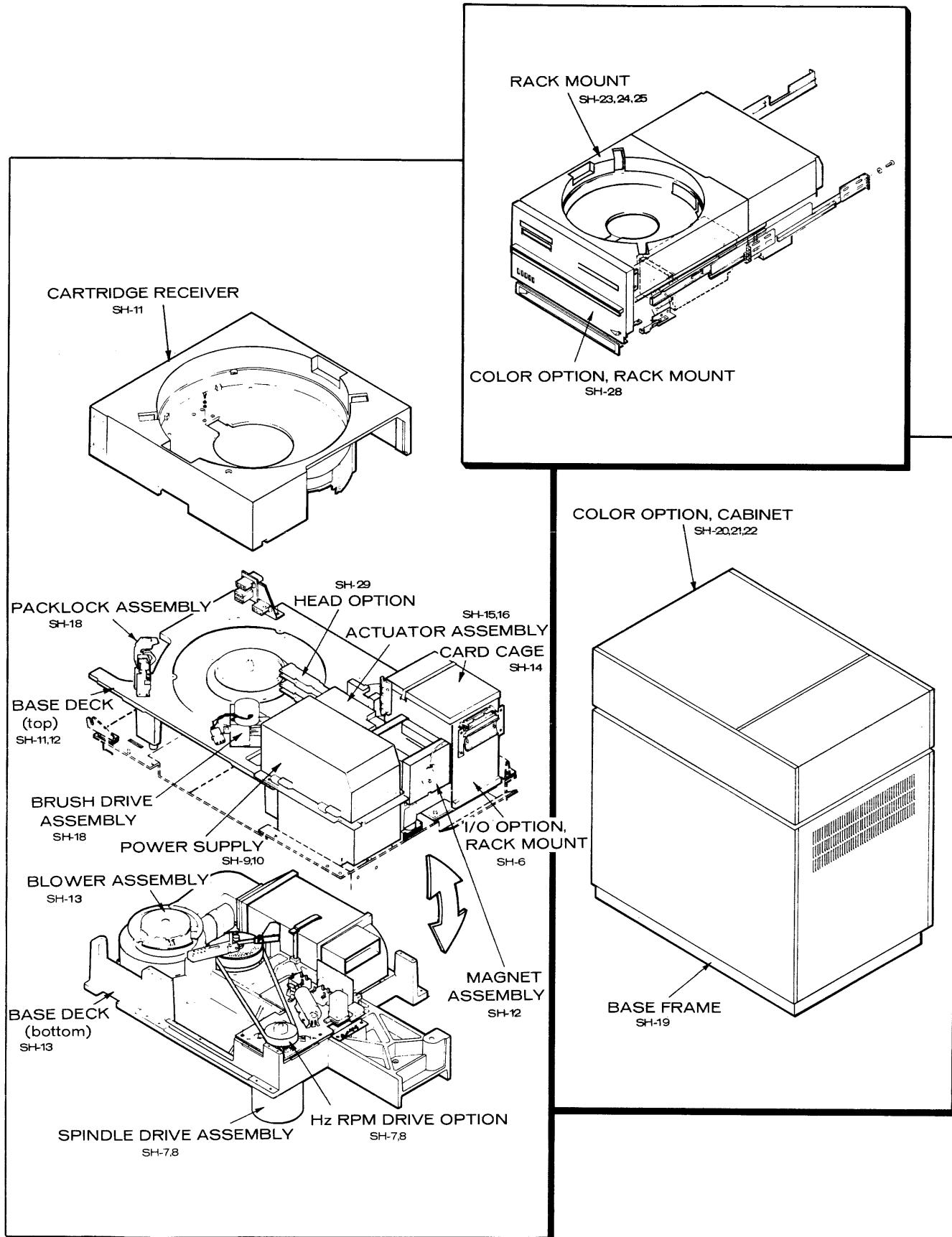


FIGURE 8-1. ASSEMBLY LOCATORS

*FOR ALL PWA'S SEE DIAGRAM
SECTION OF MANUAL FOR
CORRECT CIRCUIT BOARD IDENTI-
FICATION AND BREAKDOWN

**SEE SHEET 30
FOR SPARE PARTS PROVISIONING

NOTE: REFER TO PARTS DATA CONFIGURATOR
(SHEET 8A-1), LOCATED IN HPC DOCUMENT
PACKAGE FOR TMA NUMBER AND APPLICABLE
PARTS.

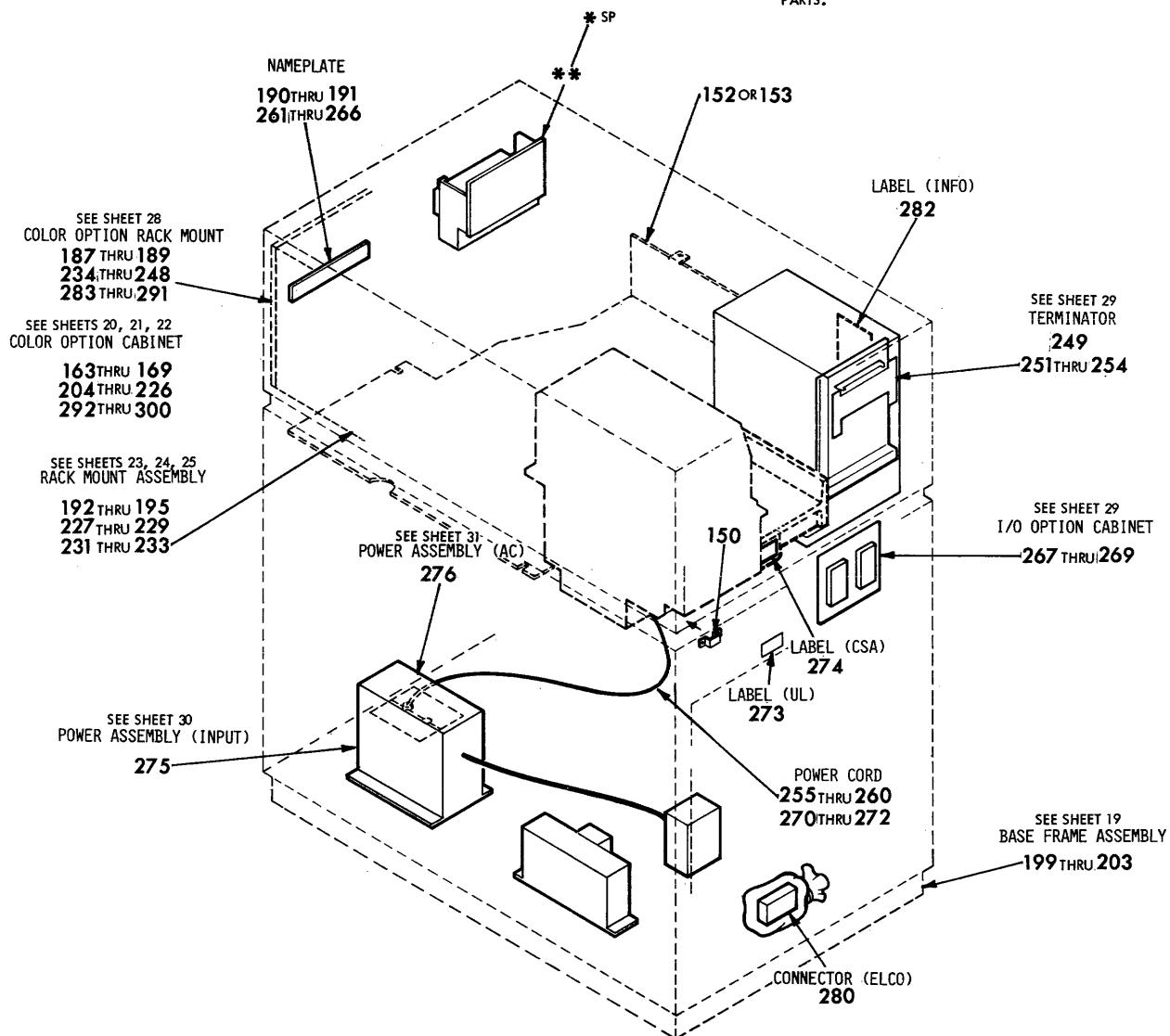


FIGURE 8-2. TOP MECHANICAL ASSEMBLY

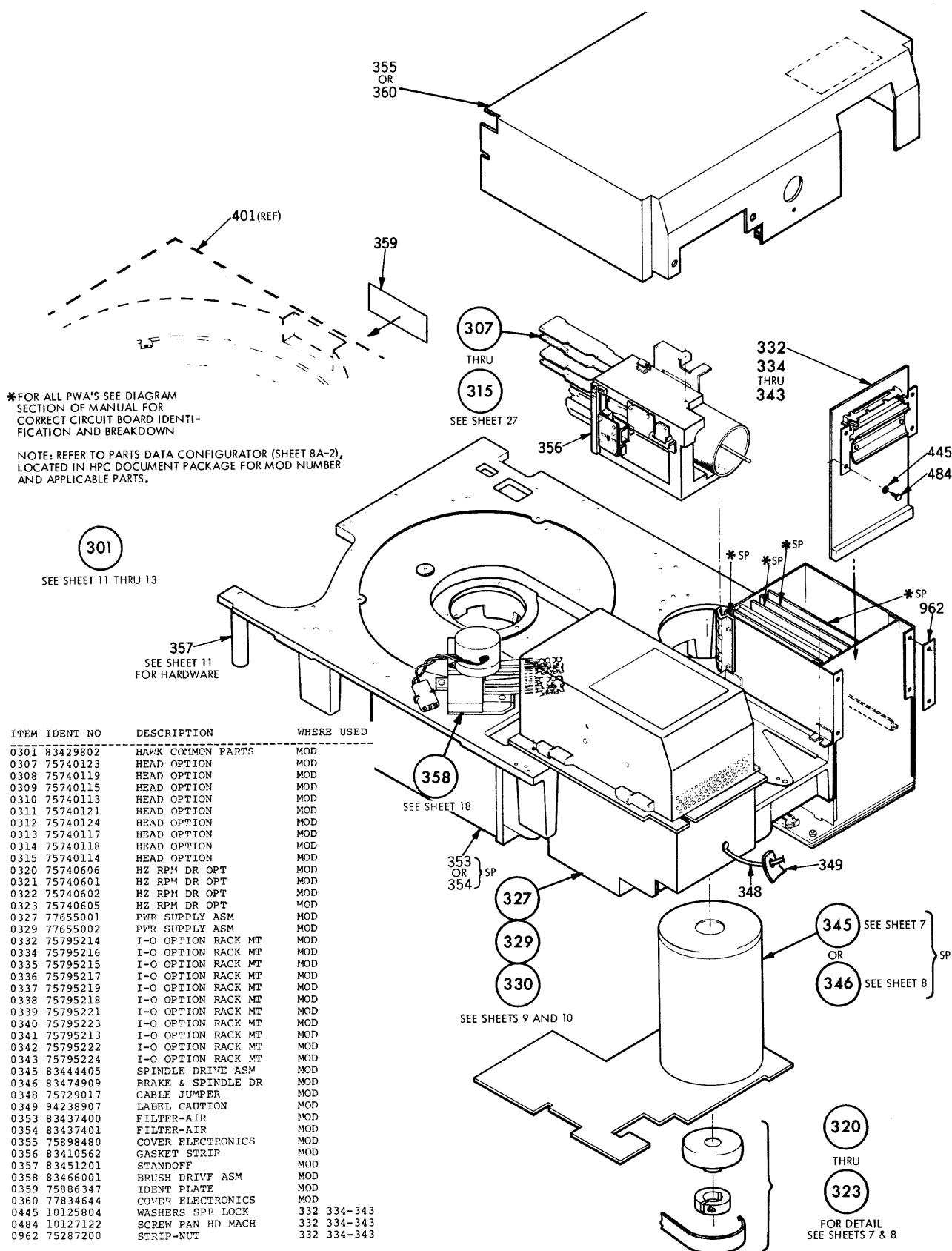
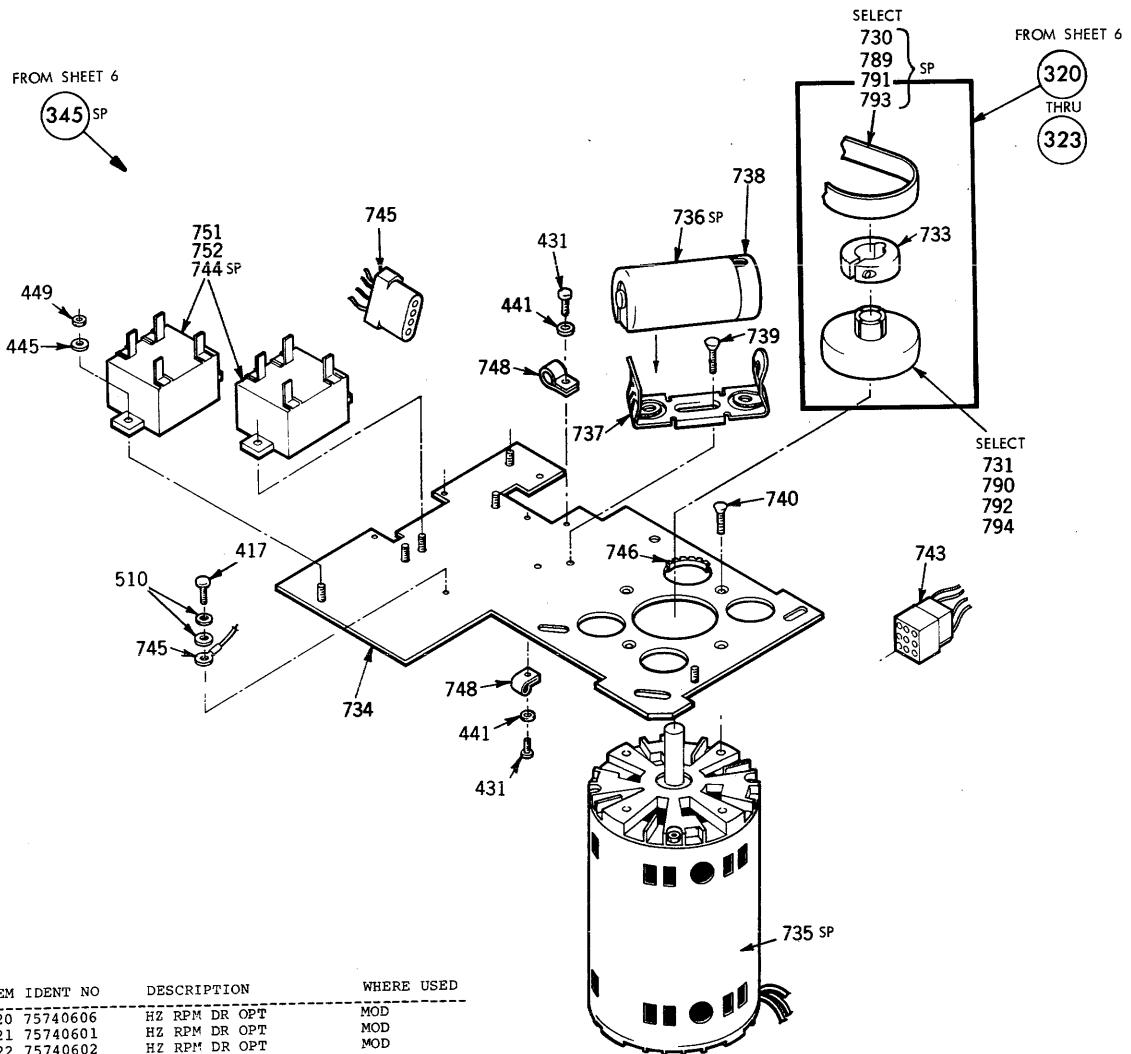
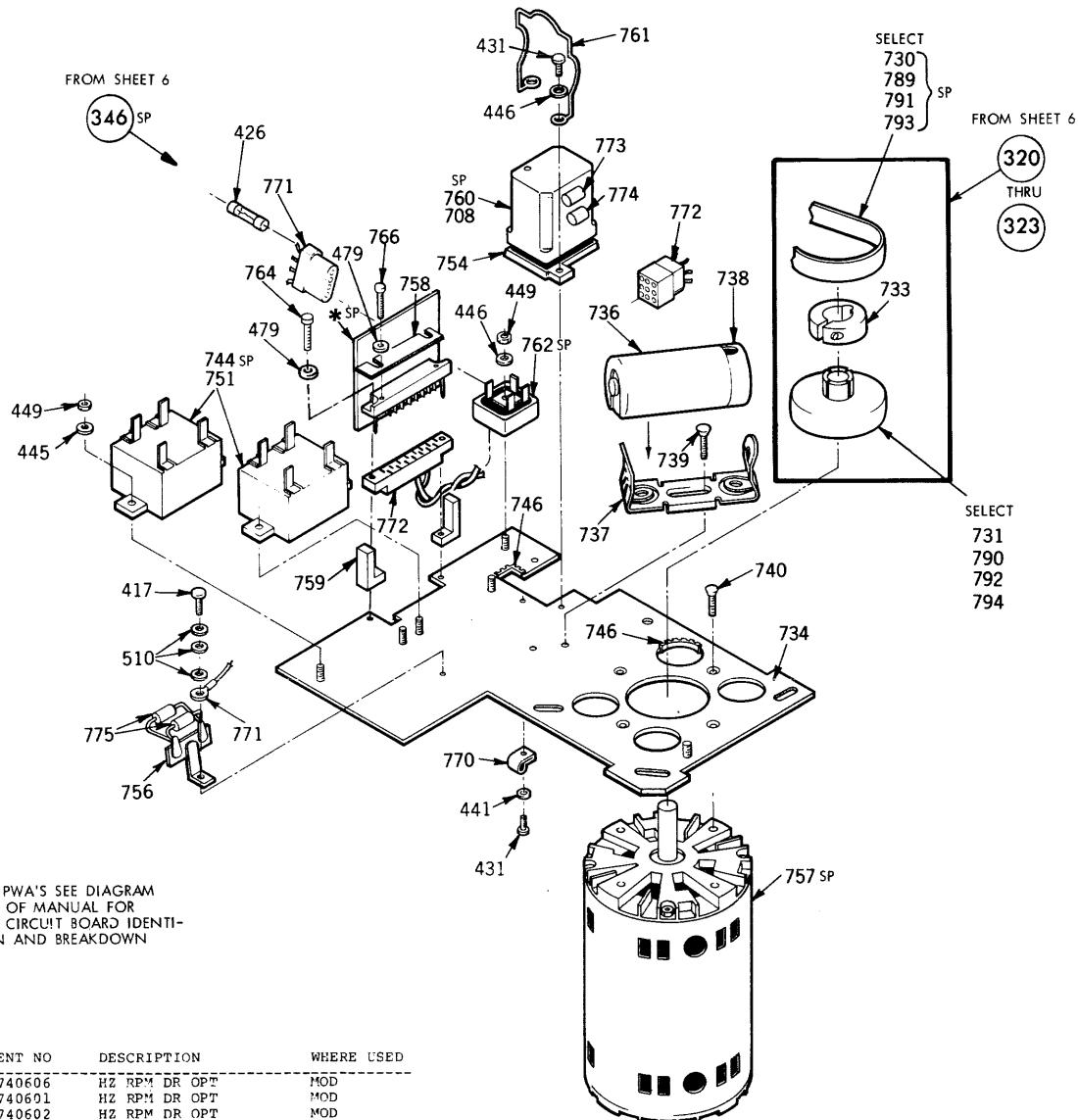


FIGURE 8-3. MODULE ASSEMBLY



ITEM IDENT NO	DESCRIPTION	WHERE USED
0320 75740606	HZ RPM DR OPT	MOD
0321 75740601	HZ RPM DR OPT	MOD
0322 75740602	HZ RPM DR OPT	MOD
0323 75740605	HZ RPM DR OPT	MOD
0345 83444405	SPINDLE DRIVE ASM	MOD
0417 10127112	SCREW PAN HD MACH	345
0431 10127113	SCRFW PAN HD MACH	345
0441 10125605	WASHERS PLAIN	345
0445 10125804	WASHERS SPR LOCK	345
0449 10125105	NUT HEX MACH	345
0510 10126401	WASH EXT TOOTH LO	345
0730 75722910	BELT-DRIVE NEOPREN	323
0731 77599708	PULLEY-DRIVE MOTOR	323
0733 77613625	COLLAR-MOTOR PULLEY	320-323
0734 75891472	PLATE-DYNAMIC MOTOR	345
0735 83456001	DRIVE MTR HARNESS AS	345
0736 94255105	CAPACITOR-MOTOR AC 2	345
0737 94260500	ACCESSORIFS-CAPACITOR	345
0738 94260503	ACCESSORIES-CAPACITOR	345
0739 10125747	SCR FLAT HD	345
0740 10125725	SCR FLAT HD	345
0743 83457401	DC SPINDLE HARN ASM	345
0744 77612677	SW SOLID STATE	345
0745 83457601	AC SPINDLE HARN ASM	345
0746 00845503	GROMMET-CATERPILLAR	345
0748 92602002	CLAMP, CABLE-NYLON	345
0751 94309802	POD, TERMINAL INSULAT	345
0752 93154948	TUBING, SHRINKING	345
0789 75722930	BELT-DRIVE NEOPRENE	321
0790 77599706	PULLEY-DRIVE MOTOR	321
0791 75722940	BELT-DRIVE NEOPRENE	322
0792 77599705	PULLEY-DRIVE MOTOR	322
0793 75722926	BELT-DRIVE NEOPRENE	320
0794 77599707	PULLEY-DRIVE MOTOR	320

FIGURE 8-4. SPINDLE DRIVE ASSEMBLY



ITEM IDENT NO	DESCRIPTION	WHERE USED
0320 75740606	HZ RPM DR OPT	MOD
0321 75740601	HZ RPM DR OPT	MOD
0322 75740602	HZ RPM DR OPT	MOD
0323 75740605	HZ RPM DR OPT	MOD
0346 83474909	BRAKE & SPINDLE DR	MOD
0417 10127112	SCREW PAN HD MACH	346
0426 75885069	FUSE	346
0431 10127113	SCREW PAN HD MACH	346
0441 10125605	WASHERS PLAIN	346
0445 10125804	WASHERS SPR LOCK	346
0446 10125803	WASHERS SPR LOCK	346
0449 10125105	NUT HEX MACH	346
0479 10125801	WASHERS SPR LOCK	346
0510 10126401	WASH EXT TOOTH LO	346
0708 24534709	SLEEVING	346
0730 75722910	BELT-DRIVE NEOPREN	323
0731 77599708	PULLEY-DRIVE MOTOR	323
0733 77613625	COLLAR-MOTOR PULLEY	320-323
0734 75891472	PLATE-DYNAMIC MOTOR	346
0736 94255105	CAPACITOR-MOTOR AC 2	346
0737 94260500	ACCESSORIES-CAPACITOR	346
0738 94260503	ACCESSORIES-CAPACITOR	346
0739 10125747	SCR FLAT HD	346
0740 10125725	SCR FLAT HD	346
0744 77612677	SW SOLID STATE	346
0746 00845503	GROMMET-CATERPILLAR	346
0751 94309802	POP, TERMINAL INSULAT	346
0754 22940902	RELAY SOCKFT	346
0756 84686903	TERMINAL STRIP	346
0757 83467401	BRAKE MOTOR ASM	346
0758 83474702	BAR-LOCKING	346
0759 83474800	BLOCK-SPACER	346
0760 77612660	RELAY	346
0761 22940903	SPRING-RETAINER SOCK	346
0762 95582007	RECT BRIDGE	346

ITEM IDENT NO	DESCRIPTION	WHERE USED
0764 10127106	SCREW PAN HD MACH	346
0766 95655503	SCREW	346
0770 92602003	CLAMP, CABLE-NYLON	346
0771 83467502	A.C. BRAKE HARNESS	346
0772 83467701	D.C. BRAKE HARNESS	346
0773 50241001	DIODE SILICON	346
0774 75808549	CAP 100V 10R .10UF	346
0775 92512142	RESISTOR	346
0789 75722930	BELT-DRIVE NEOPRENE	321
0790 77599706	PULLEY-DRIVE MOTOR	321
0791 75722940	BELT-DRIVE NEOPRENE	322
0792 77599705	PULLEY-DRIVE MOTOR	322
0793 75722920	BELT-DRIVE NEOPPFNE	320
0794 77599707	PULLEY-DRIVE MOTOR	320

FIGURE 8-5. BRAKE AND SPINDLE DRIVE ASSEMBLY

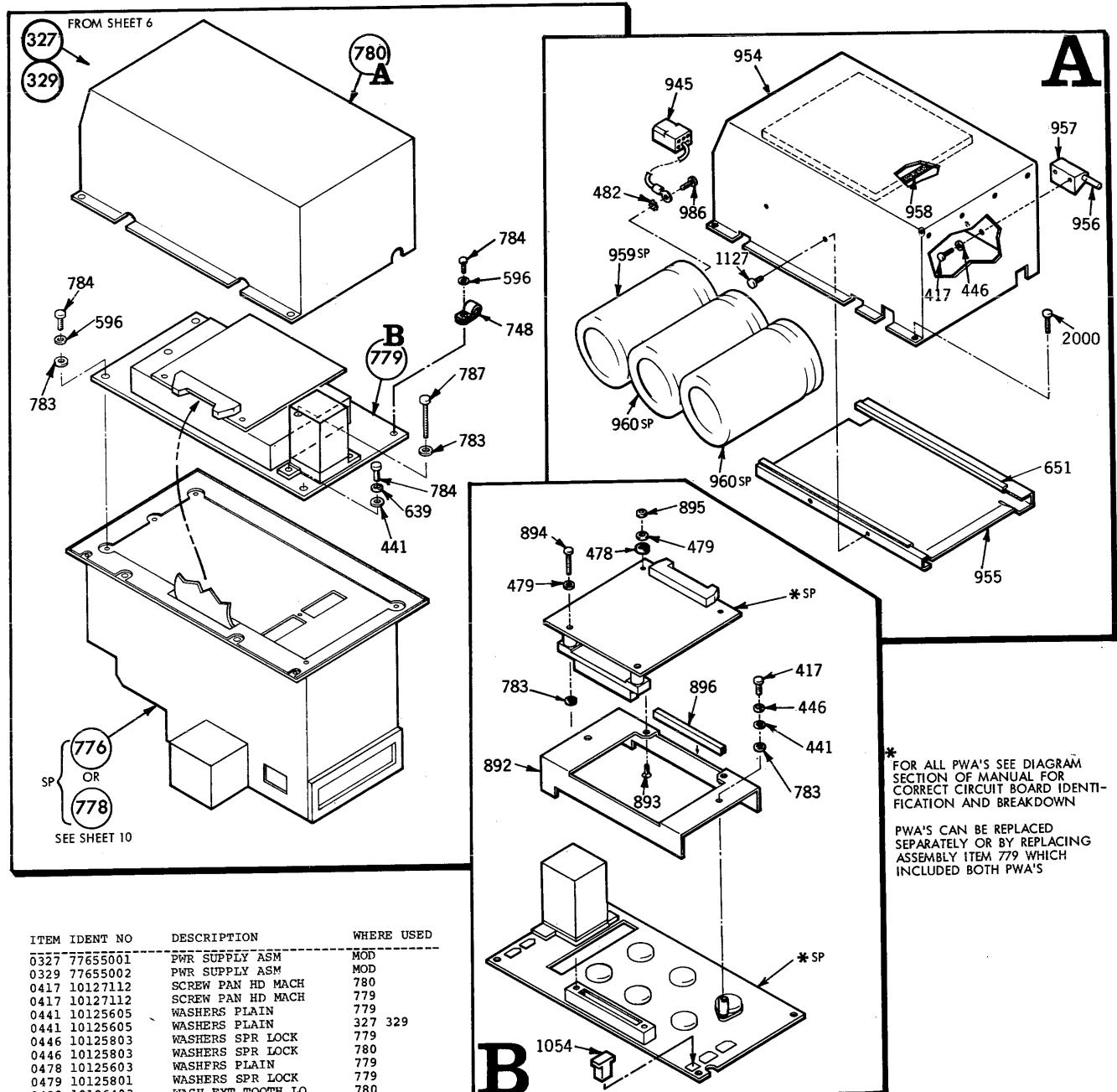


FIGURE 8-6. POWER SUPPLY (SHEET 1 OF 2)

DISASSEMBLY NOT RECOMMENDED
HOWEVER, ITEMS 973, 978, 979, 1002
& 1003 ARE REPLACEABLE AS SEPARATE
PARTS

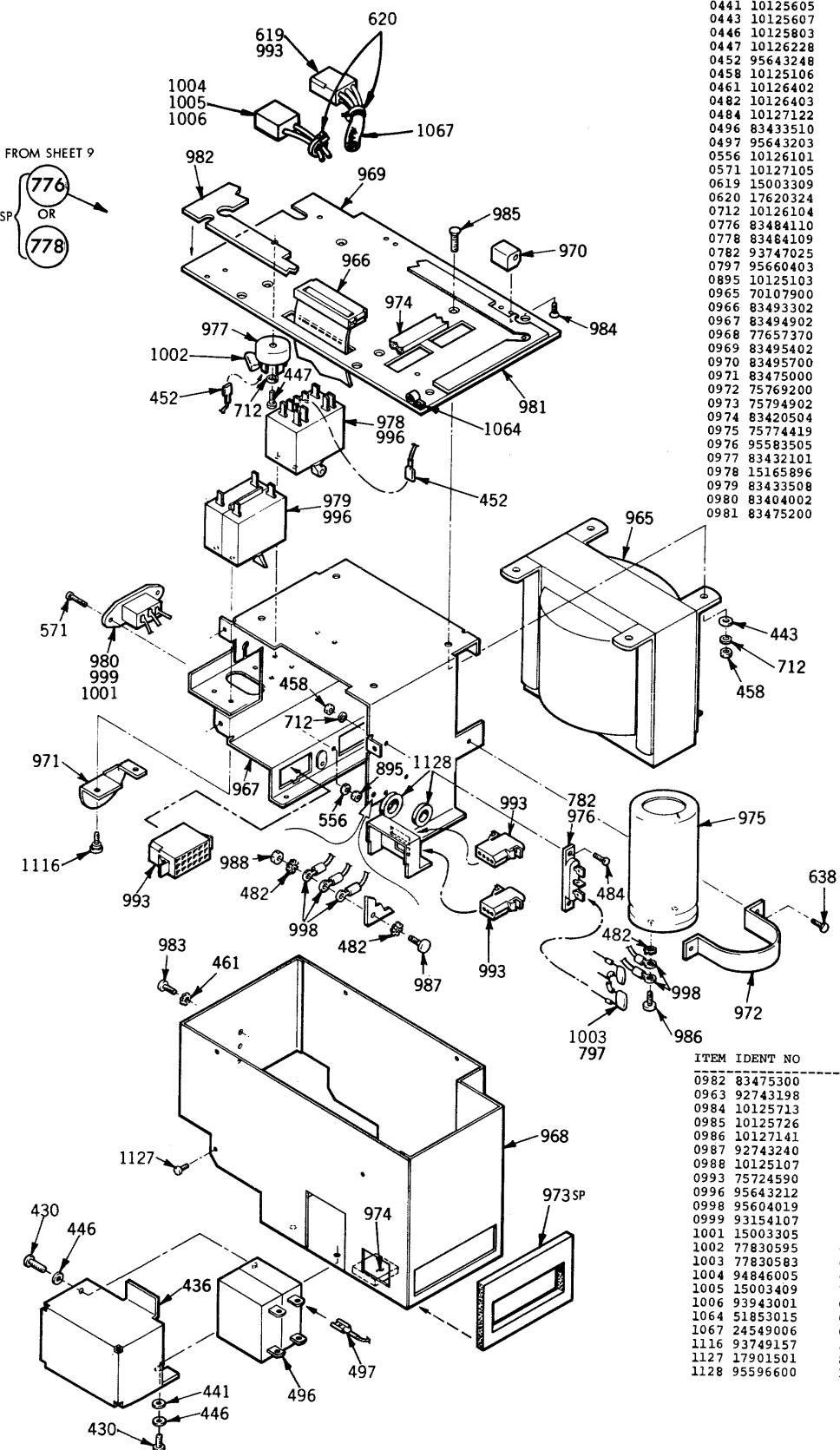
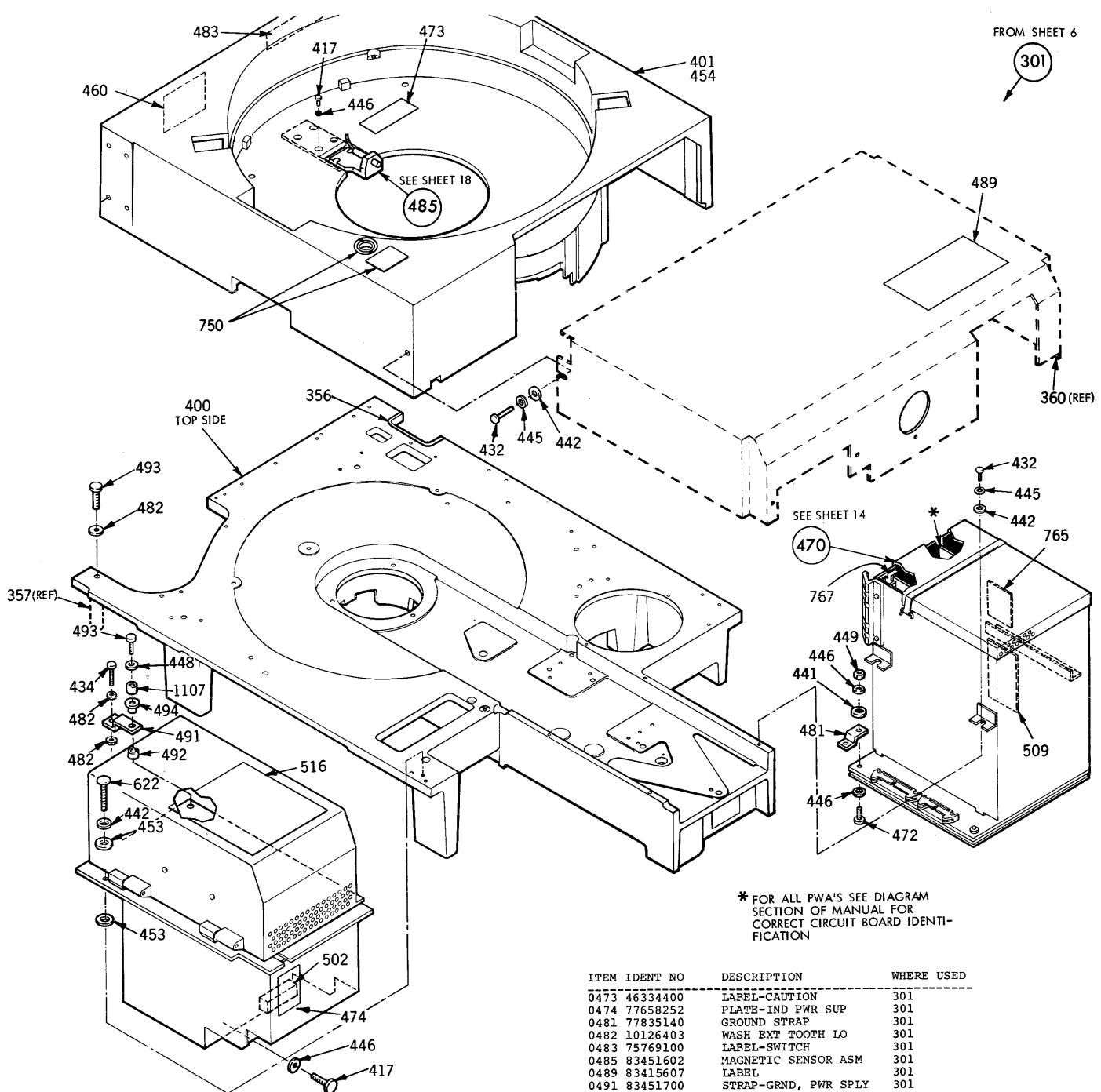


FIGURE 8-6. POWER SUPPLY (SHEET 2 OF 2)



ITEM IDENT NO	DESCRIPTION	WHERE USED
0301 83429802	HAWK COMMON PARTS	MOD
0356 83410562	GASKET STRIP	301
0400 83456502	BASE DECK-MACHINED	301
0401 83451403	CARTRIDGE REC	301
0417 10127112	SCREW PAN HD MACH	301
0432 10127121	SCREW PAN HD MACH	301
0434 10127123	SCREW PAN HD MACH	301
0441 10125605	WASHERS PLAIN	301
0442 10125606	WASHERS PLAIN	301
0445 10125804	WASHERS SPR LOCK	301
0446 10125803	WASHERS SPR LOCK	301
0448 10125805	WASHERS SPR LOCK	301
0449 10125105	NUT HEX MACH	301
0453 51568605	WASHER	301
0454 92742222	SCREW PH HD MACH	301
0460 24547502	PLATE, WARNING	301
0470 75308012	CARD CAGE ASM	301
0472 10127114	SCR PAN HD	301

ITEM IDENT NO	DESCRIPTION	WHERE USED
0473 46334400	LABEL-CAUTION	301
0474 77658252	PLATE-IND PWR SUP	301
0481 77835140	GROUND STRAP	301
0482 10126403	WASH EXT TOOTH LO	301
0483 75769100	LABEL-SWITCH	301
0485 83451602	MAGNETIC SENSOR ASM	301
0489 83415607	LABEL	301
0491 83451700	STRAP-GRND, PWR SPLY	301
0492 95694202	SPACER-BRASS	301
0493 10127146	SCREW PAN HD MACH	301
0494 92615012	WASHER-SHOULDER FIBF	301
0502 75802302	VOLTAGE ADJUST PLUG	301
0509 73669601	LABEL-CONFIG	301
0516 72959300	LABEL-FIELD CHANGF L	301
0622 77610636	SCREW SELF LK	301
0750 77830734	LABEL-SWITCH	301
0765 77834781	WARNING LABEL	301
0767 83484400	QUADRACLIP	301
1107 95694206	SPACER	301

FIGURE 8-7. COMMON PARTS (SHEET 1 OF 3)

ITEM IDENT NO	DESCRIPTION	WHERE USED
0301 834258602	HAWK COMMON PARTS	MOD
0400 834556502	BASF DFCK-MACHINFD	301
0403 75286701	SPINDLE	301
0404 75316008	ACTUATOR ASM	301
0405 75319001	MAGNET ASM	301
0407 75317102	TRANSDUCER-CONN ASM	301
0408 46317900	CAP-TRANSDUCER END	301
0410 77598300	BRACKET-CONNECTOR	301
0420 82993100	DISK FIXED, RECORDING	301
0421 75288900	CLAMP - DISC	301
0422 75797301	TRANSDUCER CAM ASM	301
0423 75315405	TRANSDUCER SCALE ASM	301
0425 75797700	BAR EXPANSION MACHINE	301
0429 93788082	SCREW SELF LOCKING 4	301
0430 10127111	SCREW PAN HD MACH	301
0431 10127113	SCREW PAN HD MACH	301
0432 10127121	SCREW PAN HD MACH	301
0435 10126255	SCR SOC HD	301

ITEM	IDENT NO	DESCRIPTION	WHERE USED
0437	92815197	SCREW CAP SOC HD	301
0438	92815229	SCREW CAP SOC HD	301
0441	10125605	WASHERS PLAIN	301
0443	10125607	WASHERS PLAIN	301
0445	10125804	WASHERS SPR LOCK	301
0446	10125803	WASHERS SPR LOCK	301
0448	10125805	WASHERS SPR LOCK	301
0455	75796902	DAMPER-OSCILLATION	301
0456	75313921	ADHESIVE RUBBER BASE	301
0457	75800400	PIN-ACTUATOR ALIGNMENT	301
0458	10125106	NUT HEX MACH	301
0462	51853006	CLAMP, CABLE ADHESIVE	301
0463	75800602	RETRACT HARNESS ASSY	301
0464	75739501	PRE-AMP HARNESS ASSY	301
0465	75739701	SWITCH BOARD HARNESS	301
0466	92021004	PIN, DOWEL	301
0467	51853005	CLAMP	301
0469	95125305	LOCTITE GRADE C	301
0472	10127114	SCR PAN HD	301
0475	77830539	IDENT PLATE-PRODUCT	301
0476	75797100	STAND OFF	301
0480	12211011	LUBRIPRIATE 30-AA	301
0482	10126403	WASH EXT TOOTH LO	301
0487	94655401	PIN, HITCH	301
0489	83415607	LABEL	301
0493	10127146	SCREW PAN HD MACH	301
0495	83482400	SECTOR RING ASSY 8	301
0513	92021093	PIN-DOWEL	301
0514	75312013	SPEC TAPE	301
0519	83457902	PACKLOCK ASSY	301
0520	75739105	RECEIVER HARNESS ASSY	301
0521	83450500	BRACKET-SWITCH BD	301
0523	92196031	NUT-SPEED	301
0546	10127124	SCREW PAN HEAD MACH	301
0553	75319801	VELOCITY TRANSDUCER	407
0628	77832201	COMP BRKT	301
0637	77832202	BRACKET	301
0640	750293953	CONNECTOR HOUSING	407
0680	77617079	SCREW CAP	301
0673	94245602	CONTACT CRIMP INSERT	407
0798	94337703	TUBING HEAT SRNK	407
1046	51853011	CLAMP CABLE ADHESIVE	301
1090	24548310	WIRE ELEC	407

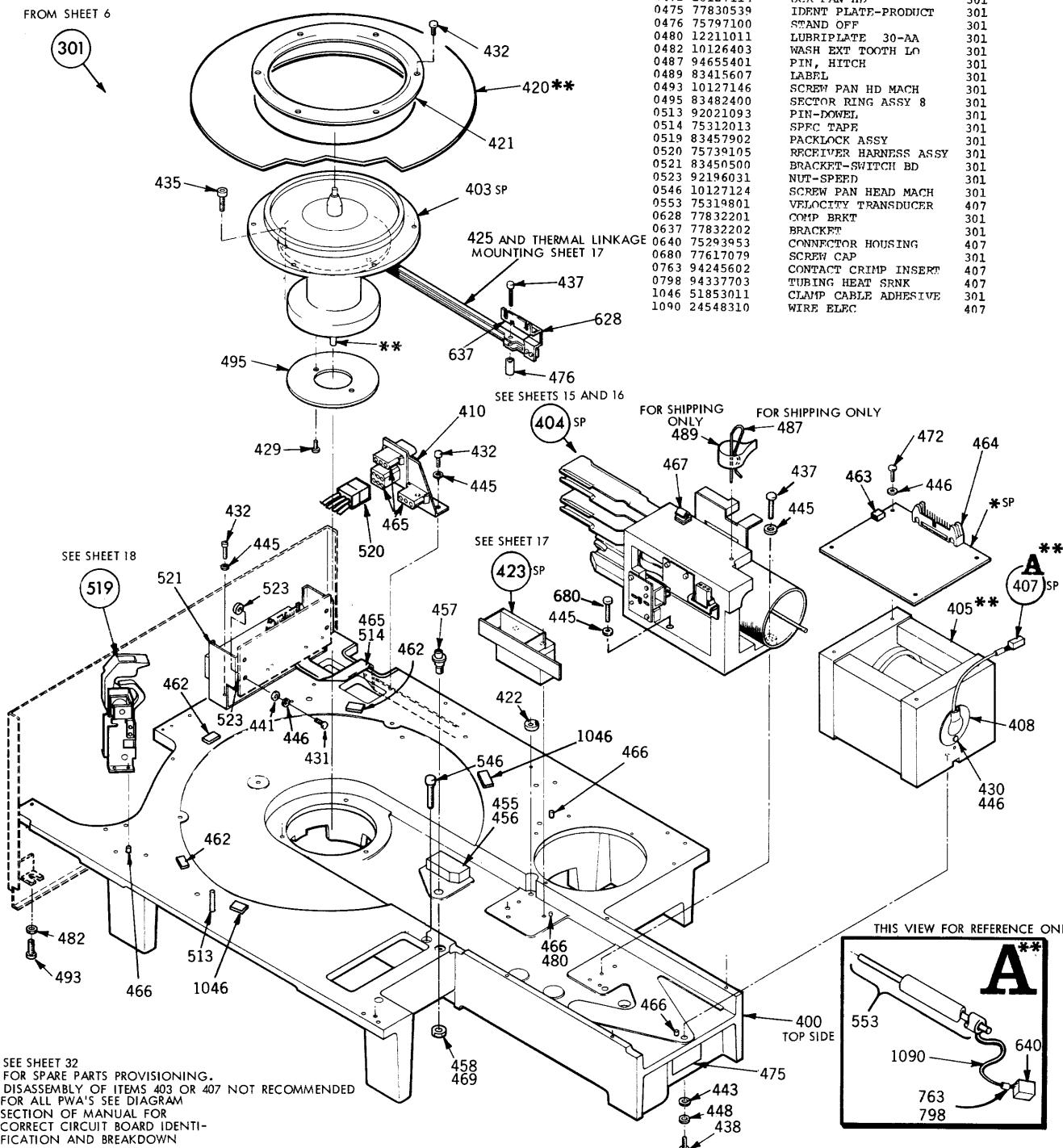


FIGURE 8-7. COMMON PARTS (SHEET 2 OF 3)

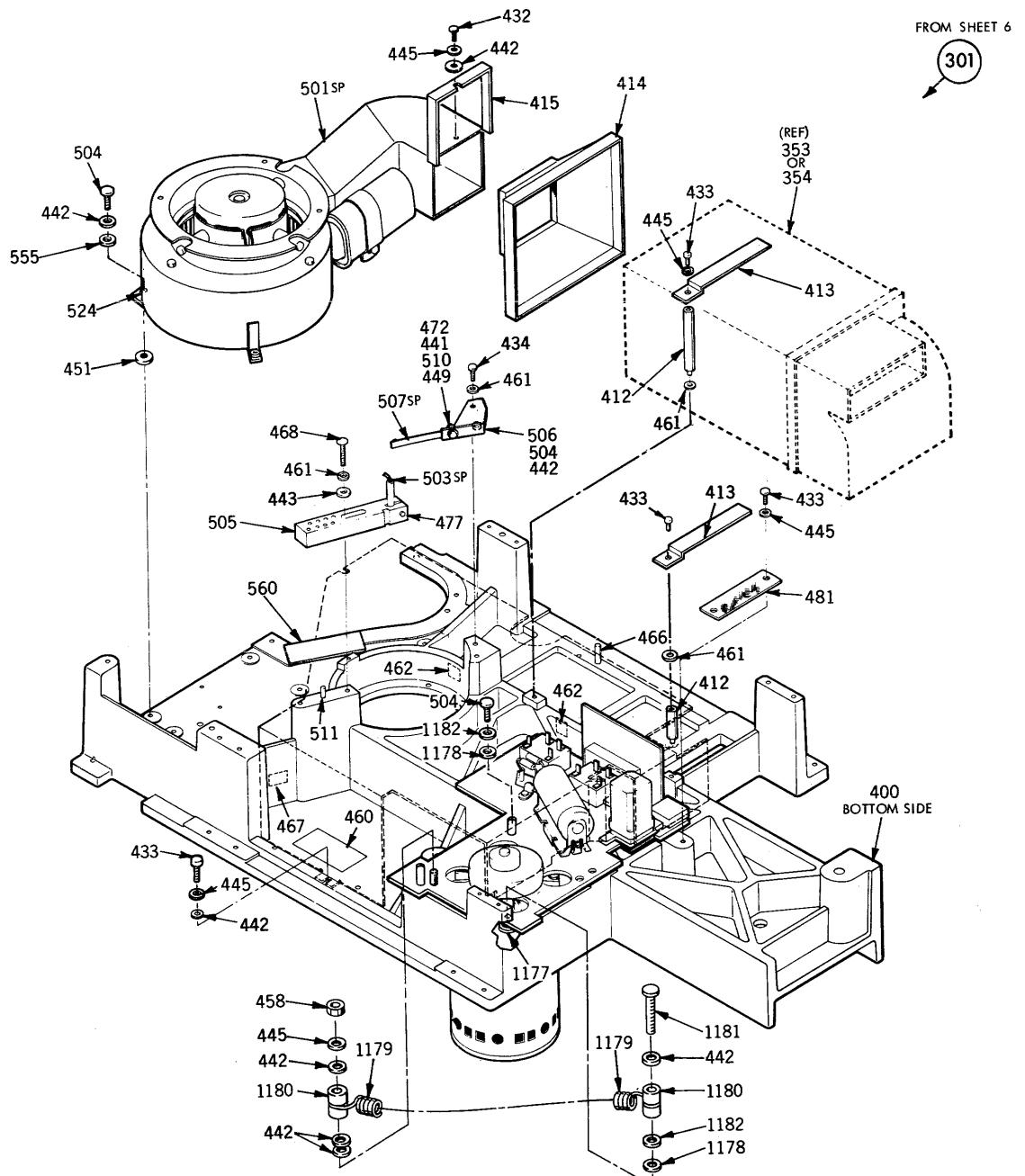
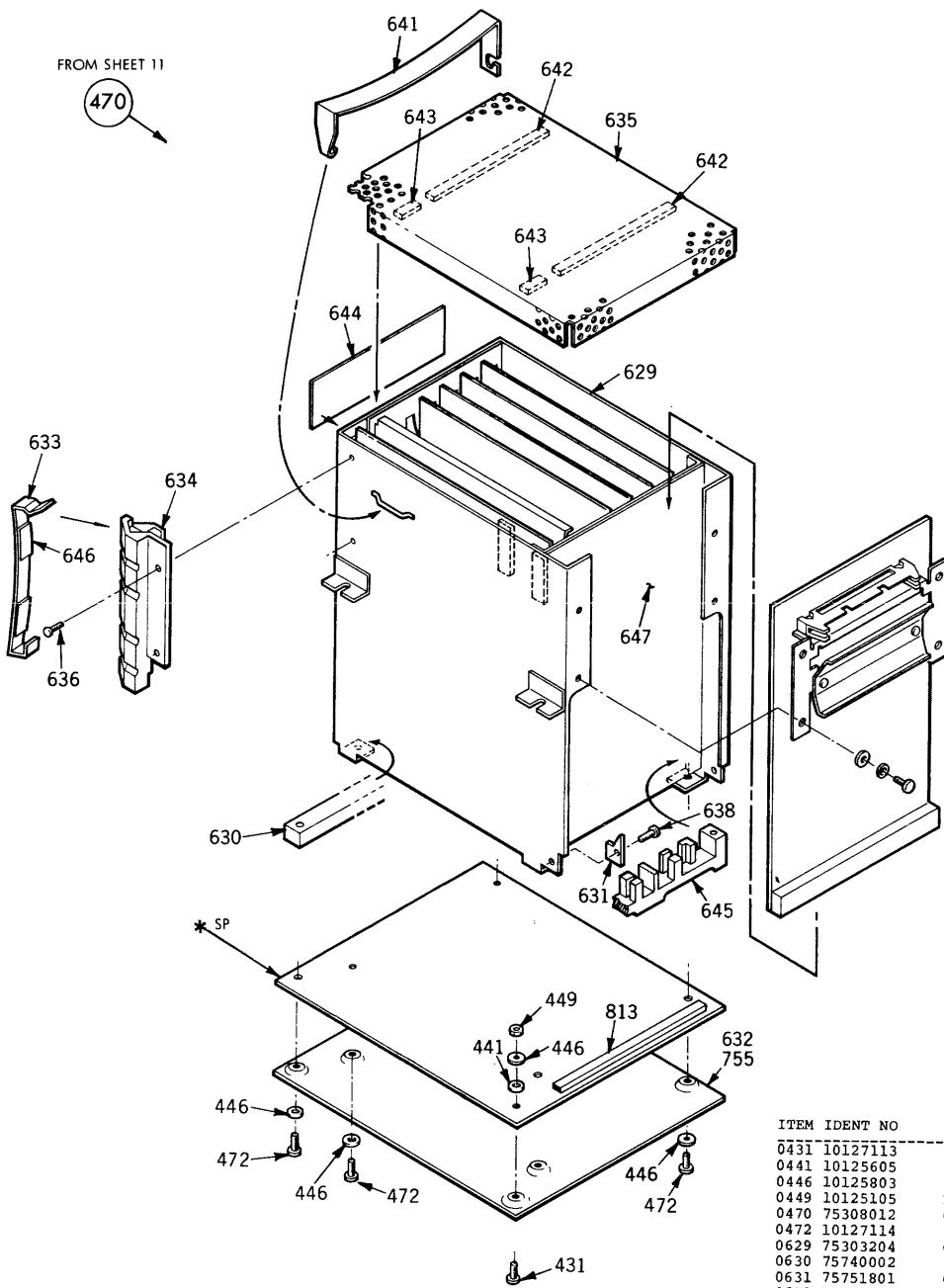


FIGURE 8-7. COMMON PARTS (SHEET 3 OF 3)

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8-13

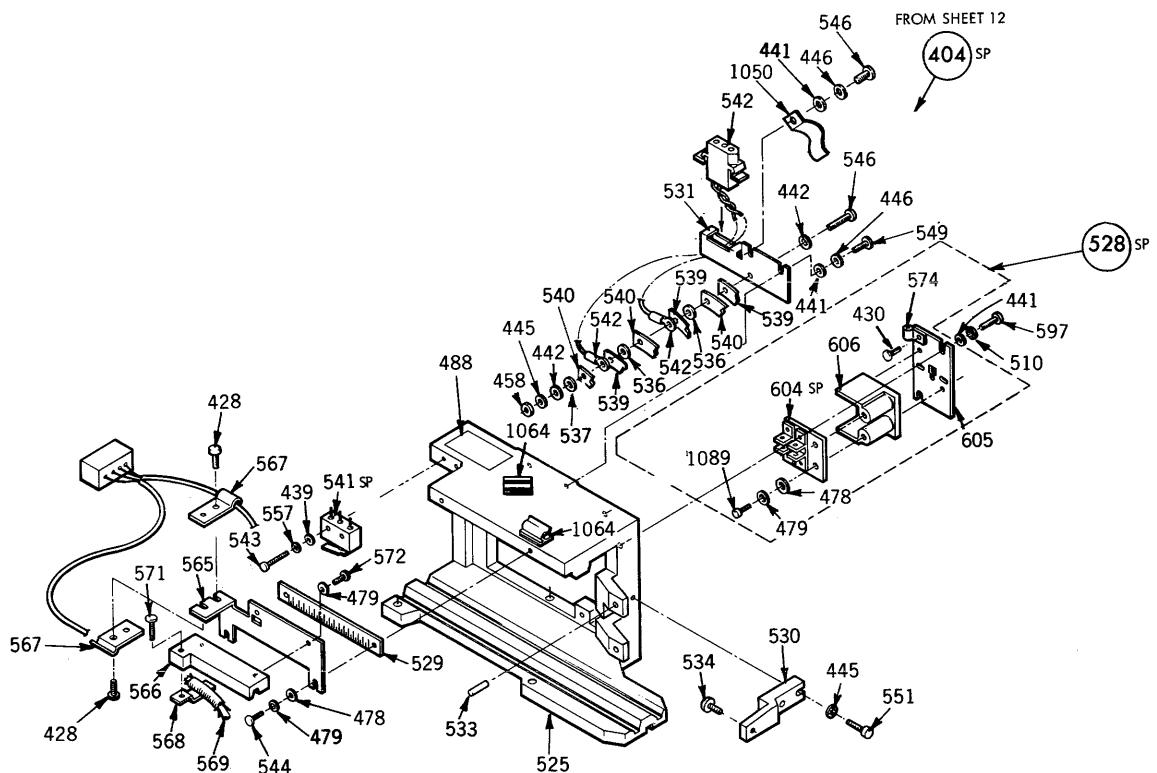


* FOR ALL PWA's SEE DIAGRAM SECTION
OF MANUAL FOR CORRECT CIRCUIT BOARD
IDENTIFICATION AND BREAKDOWN.

ITEM IDENT NO	DESCRIPTION	WHERE USED
0431 10127113	SCREW PAN HD MACH	470
0441 10125605	WASHERS PLAIN	470
0446 10125803	WASHERS SPR LOCK	470
0449 10125105	NUT HEX MACH	470
0470 75308012	CARD CAGE ASM	301
0472 10127114	SCR PAN HD	470
0629 75303204	CARD CAGE	470
0630 75740002	STOP-CIRCUIT BOARD	470
0631 75751801	GUIDE-CIRCUIT	470
0632 75792602	COVER MOTHER	470
0633 75799402	CLIP-HEAD CABLE, QUALE	470
0634 83445400	GUIDE WIRE	470
0635 75739900	COVER-CARD CAGE	470
0636 95655501	SCREW SHEET METAL	470
0638 95655500	SCREW SHEET METAL	470
0641 75803301	CLAMP-CAGE COVER	470
0642 75803500	STRIP-CORE RUBBER	470
0643 75803501	STRIP-CORE RUBBER	470
0644 75802700	LABEL-CARD LOCATION	470
0645 83479600	STOP-KEYED INJ MOLD	470
0646 75803503	STRIP-PRESSURE	470
0647 83451814	INSULATOR	470
0755 83455800	INSULATOR MOTHER COV	470
0813 75287700	GASKET	470

FIGURE 8-8. CARD CAGE ASSEMBLY

THIS VIEW FOR REFERENCE ONLY.
DISASSEMBLY NOT RECOMMENDED.
HOWEVER ITEMS 528, 530, & 541
CAN BE REPLACED.



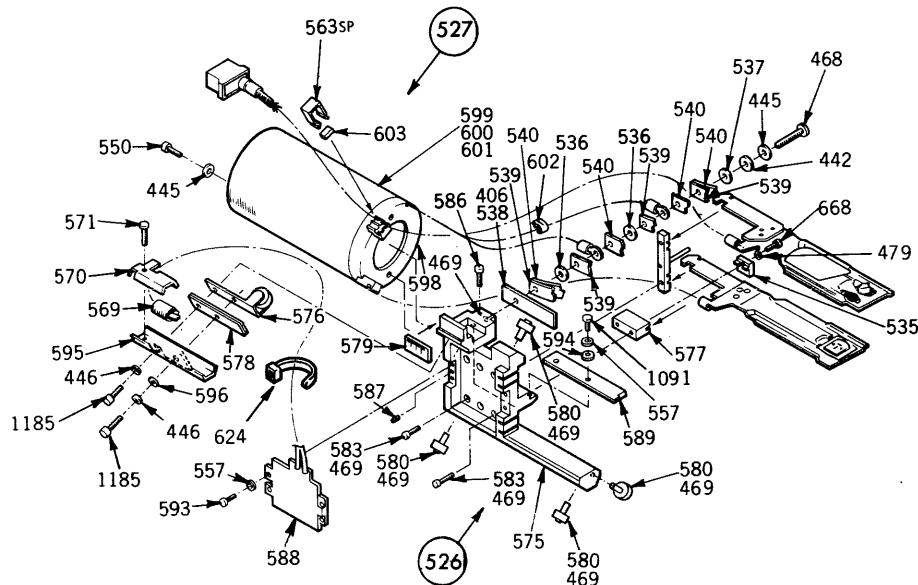
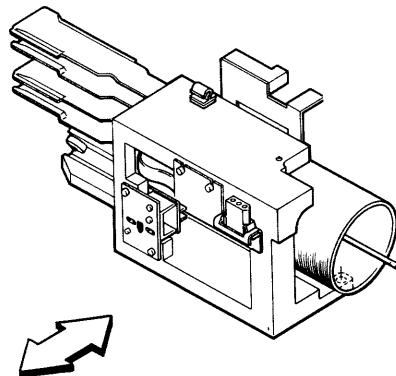
ITEM IDENT NO	DESCRIPTION	WHERE USED
0404 75316008	ACTUATOR ASM	301
0428 92815096	SCREW CAP SOC HD	404
0430 10127111	SCREW PAN HD MACH	528
0439 10125602	WASHERS PLAIN	404
0441 10125605	WASHERS PLAIN	404
0442 10125606	WASHERS PLAIN	404
0445 10125804	WASHERS SPR LOCK	404
0446 10125803	WASHERS SPR LOCK	404
0458 10125106	NUT HEX MACH	404
0478 10125603	WASHERS PLAIN	404
0478 10125603	WASHERS PLAIN	528
0479 10125801	WASHERS SPR LOCK	404
0479 10125801	WASHERS SPR LOCK	528
0488 83415603	LABEL	404
0510 10126401	WASH INT TOOTH LK	404
0525 75316104	FRAME-ACTUATOR MACH	404
0528 83447302	DETECTOR ASM-END TR	404
0529 75317900	SCALE-VERNIER FIXED	404
0530 75797400	BRACKET-BUMPPR, CAST	404
0531 75317501	STRIP-BACKUP ACTUATOR	404
0533 75317200	CAM-HEAD ARM	404
0534 93623000	BUMPER, RUBBER	404
0536 75296101	WASHER PHENOLIC	404
0537 75296201	SPACER PHENOLIC	404
0539 75797500	LEAD-FLEX COIL PR	404
0540 73555101	INSULATOR-FLEX LEAD	404
0541 92549007	SW SUBMINIATURE BASI	404
0542 75800502	COIL POWER HARNESS	404
0543 10127169	SCREW PAN HD MACH	404
0544 10126213	SCREW PAN HD MACH	404
0546 10127124	SCREW PAN HD MACH	404
0549 92815160	SCREW CAP SOC HD	404
0551 92815195	SCREW CAP SOC HD	404
0557 10126100	WASH INT TOOTH LK	404
0565 83493900	BRACKET-CHANNEL	404
0566 83493800	CHANNEL-UPPER	404
0567 83494200	CLAMP-WIRE	404
0568 83494001	CLAMP-SPIRAL GUIDE	404
0569 83454400	STIFFNER	404
0571 10127105	SCREW PAN HD MACH	404
0572 10127102	SCREW PAN HD	404
0574 00863701	CLAMP CABLE	528
0597 10125015	SCR PAN HD	404
0604 77612607	OPTICAL SWITCH ASM	528
0605 83447401	PLATE-DETECTOR MTG	528
0606 83447500	ADAPTER-HORIZ POS	528
1050 77613869	CLIP	404
1064 51853015	CLAMP CABLE	404
1089 10126214	SCREW HEX	528

FIGURE 8-9. ACTUATOR WITH DETECTOR ASSEMBLY

THIS VIEW FOR REFERENCE ONLY.
DISASSEMBLY NOT RECOMMENDED.
HOWEVER ITEMS 535, & 563 CAN BE REPLACED.

FROM SHEET 12

404 SP



ITEM	IDENT NO	DESCRIPTION	WHERE USED
0404	75316008	ACTUATOR ASSY	301
0406	95125324	LOCTITE	404
0442	10125606	WASHERS PLAIN	404
0445	10125804	WASHERS SPR LOCK	404
0446	10125803	WASHERS SPR LOCK	526
0468	10127125	SCREW PAN HD MACH	404
0469	95125305	LOCTITE GRADE C	526
0469	95125305	LOCTITE GRADE C	404
0479	10125801	WASHERS SPR LOCK	404
0526	83475501	CARRIAGE ASSY	404
0527	75319603	COIL ASSY	404
0535	73228200	PLATE-ARM CLAMP	404
0536	75296101	WASHER PHENOLIC	404
0537	75296201	SPACER PHENOLIC	404
0538	73555300	STRIP-BACKUP	404
0539	75797500	LEAD-FLEX COIL PR	404
0540	73555101	INSULATOR-FLEX LEAD	404
0550	92815193	SCREW CAP SOC HD	404
0557	10126100	WASH INT TOOTH LK	404
0557	10126100	WASH INT TOOTH LK	526
0563	83490600	CLIP-CLAMP	404
0563	83454400	STIFFNER	404
0570	83494500	CLAMP-CHANNEL	404
0571	10127105	SCREW PAN HD MACH	404
0575	75316600	CARRIAGE ACTUATOR	526
0576	73197400	SPR-BEARING ASSY	526
0577	73584400	BASE-ARM CLAMP	526
0578	73197000	SPRING BEARING	526
0579	75317700	SCALE-VERNIER MOVING	526
0580	92054251	BALL BEARING	526
0583	92815097	SCREW CAP SOC HD	526

ITEM	IDENT NO	DESCRIPTION	WHERE USED
0586	93344096	SCREW NYLON	526
0587	93071163	SCREW SET SOC HD	526
0588	83475401	POS TRANSDUCER SL-CO	526
0589	75314202	SCALE-END	526
0593	10127311	SCREW SLOTTED	526
0594	75806501	WASHER-REDUCED O.D.	526
0595	83494400	CHANNEL-MODULE	526
0596	75806503	WASHER	526
0598	83441700	CAP-COIL MACHINED	527
0599	94258205	WIRE-MAGNET	527
0600	95280500	EPOXY, IMPREGNATING	527
0601	75786000	INSULATION MAT	527
0602	93355001	MARKER, WIRE NUMBER 1	527
0603	75803502	STRIP-PRESSURE	527
0624	94277416	TIE WRAP	404
0668	10126212	SCH HEX SOC HD CAP	404
1091	10127310	SCREW SLOTTED	526
1185	83215631	SCREW	526

FIGURE 8-10. ACTUATOR WITH CARRIAGE AND COIL ASSEMBLIES

ITEM IDENT NO	DESCRIPTION	WHERE USED
0406 95125324	LOCTITE	423
0423 75315405	TRANSDUCER SCALE ASM	301
0424 75276203	SPACER NYLON	301
0425 75797700	BAR EXPANSION MACHINE	301
0427 10126209	SCR-SOC HP CAP	301
0428 92815096	SCREW CAP SOC HD	301
0429 93788082	SCREW SELF LOCKING 4	301
0435 10126255	SCR SOC HD	301
0437 92815197	SCREW CAP SOC HD	301
0439 10125602	WASHERS PLAIN	301
0444 10125800	WASHERS SPR	301
0444 10125800	WASHERS SPR	423
0445 10125804	WASHERS SPR LOCK	301
0447 10126228	SCR EEX SOC HD	301
0450 75792800	IDLER	416
0451 75806504	WASHFR-REDUCED	301
0459 92054227	CR BEARING BALL	416
0466 92021004	PIN, DOWEL	423
0469 95125305	LOCTITE GRADE C	301
0471 92824097	SCREW CAP	423
0476 75797100	STAND OFF	301
0477 10126215	SCREW CAP SOC HD	301
0478 10125603	WASHERS PLAIN	301
0479 10125801	WASHERS SPR LOCK	301
0490 75312751	SPFC-EPOXY ADHESIVE	301
0495 83482400	SECTOR RING ASM 8	301
0517 75886381	LUBRICANT	301
0581 93115168	SCR HEX SOC HD	301
0591 77617072	SCREW CAP	423
0613 75315501	SCALE-FLEX MOUNT	423
0614 75315600	MOUNT-TRANSDUCER	423
0615 75315901	POS TRANS SCALE	423
0616 75797001	EASE TRANSDUCER MOUNT	423
0617 75797200	PIN XDUCER ALIGNMENT	423
0621 10126208	SCREW BUTTON HD	423
0623 93651029	WASHER, BELLEVILLE	423
0626 95010890	GREASE-LUERIPLATE	423
0628 77832201	COMP BRKT	301
0637 77832202	BRACKET	301
0668 10126212	SCR HEX SOC HD CAP	423
0680 77616079	SCREW CAP	423
0891 95125322	LOCITE	301
1061 95125317	LOCITE PRIMER	301
1076 10125608	WASHER	301
1115 95125311	LOCITE PRIMER	423

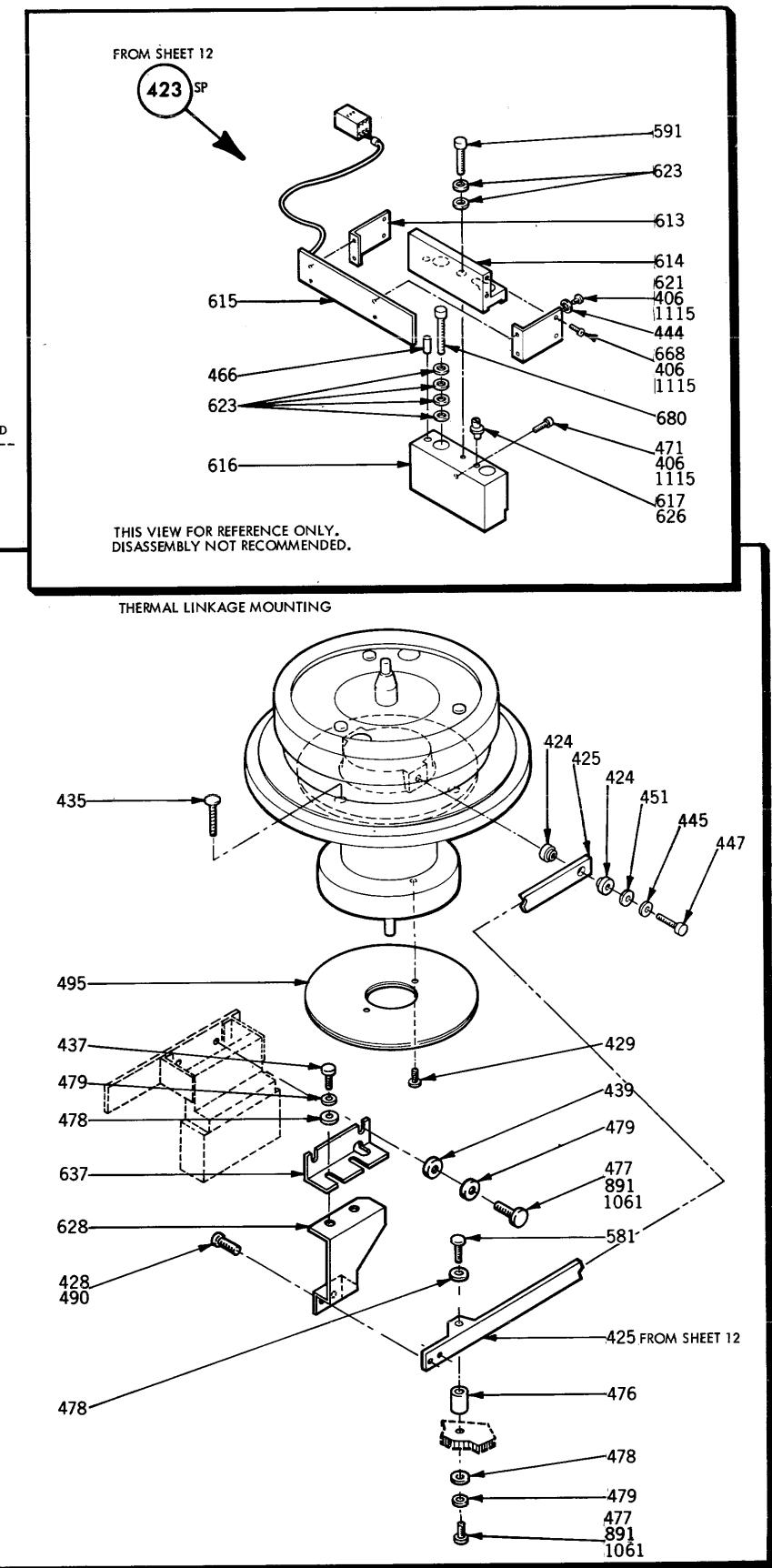
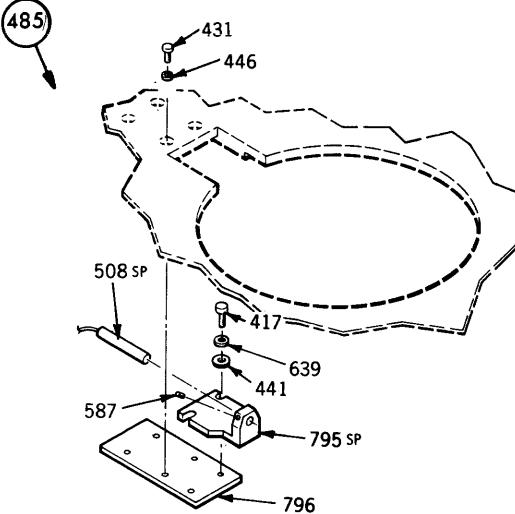
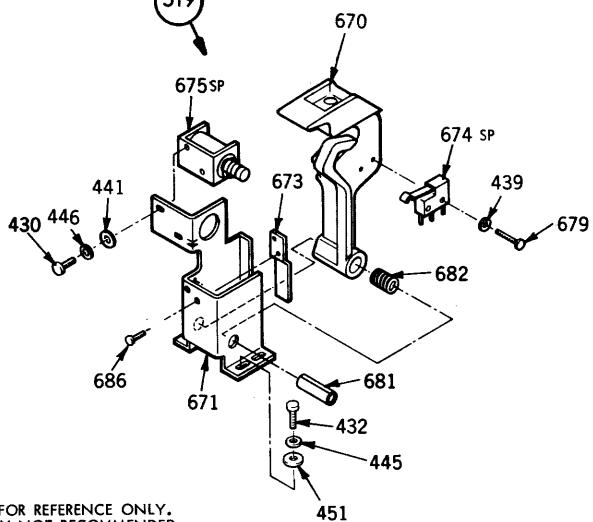


FIGURE 8-11. COMMON PARTS SUB ASSEMBLIES (SHEET 1 OF 2)

FROM SHEET 11

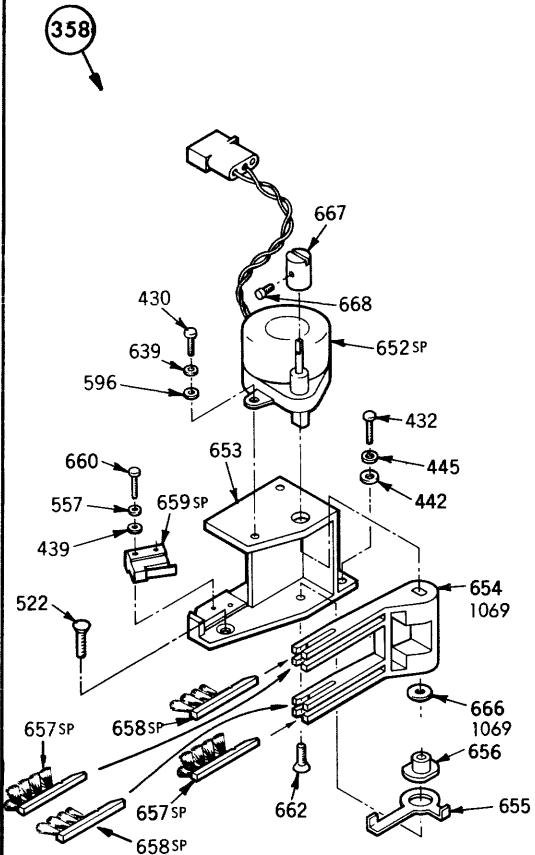


FROM SHEET 12



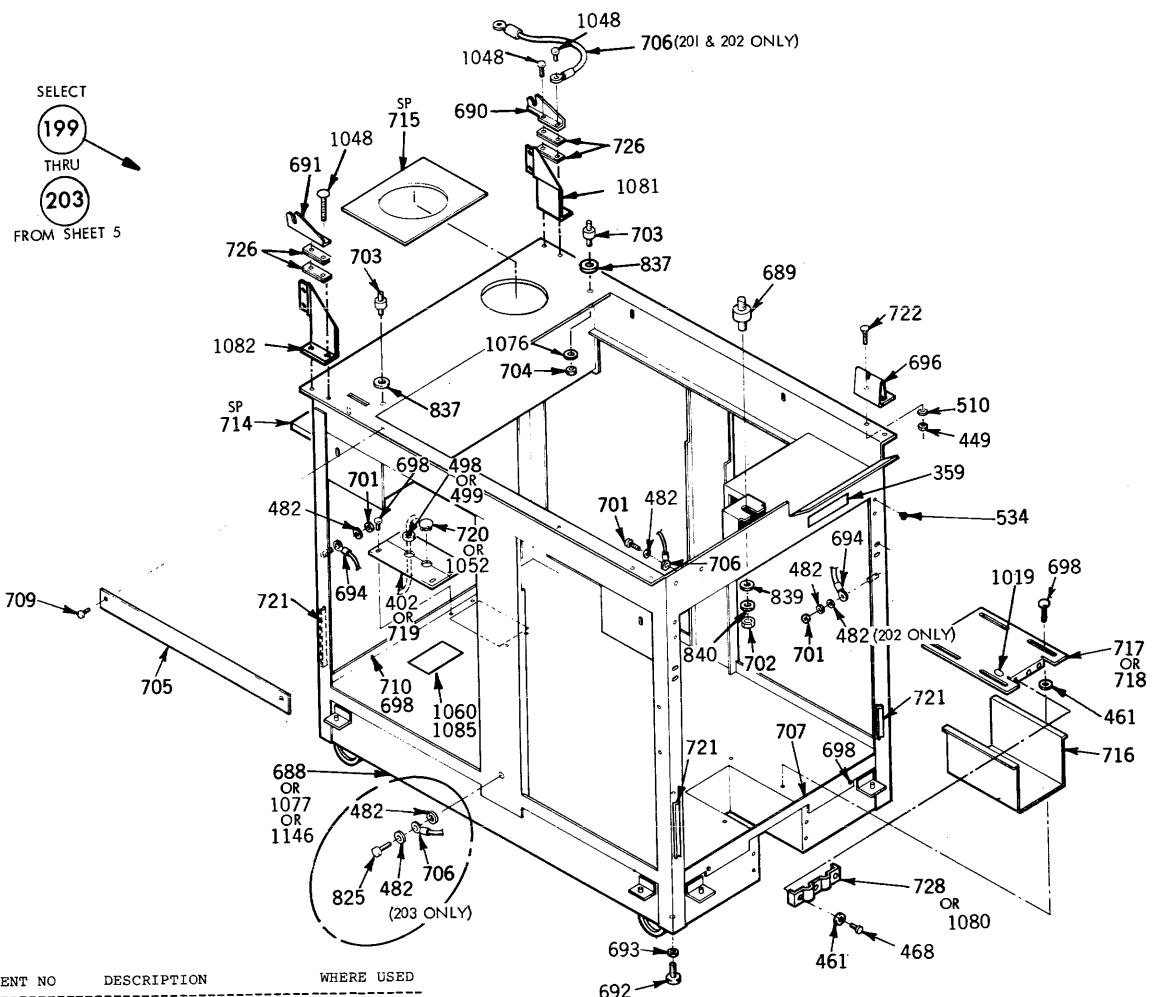
THIS VIEW FOR REFERENCE ONLY.
DISASSEMBLY NOT RECOMMENDED.
HOWEVER ITEMS 674, & 675 CAN
BE REPLACED.

FROM SHEET 6



ITEM IDENT NO	DESCRIPTION	WHERE USED
0358 83466001	BRUSH DRIVE ASM	MOD
0417 10127112	SCREW PAN HD MACH	485
0430 10127111	SCREW PAN HD MACH	358 519
0431 10127113	SCREW PAN HD MACH	485
0432 10127121	SCREW PAN HD MACH	519
0432 10127121	SCREW PAN ED MACH	301
0439 10125602	WASHERS PLAIN	519
0439 10125603	WASHERS PLAIN	358
0441 10125605	WASHERS PLAIN	519
0441 10125605	WASHERS PLAIN	485
0442 10125606	WASHERS PLAIN	301
0445 10125804	WASHERS SPR LOCK	301
0446 10125803	WASHERS SPR LOCK	485
0446 10125803	WASHERS SPR LOCK	519
0451 75806504	WASHER REDUCED	519
0485 83451602	MAGNETIC SENSOR ASM	301
0508 75793802	SENSOR CABLE ASM	485
0519 83457902	PACKLOCK ASM	301
0522 10125920	SCREW FL HD	301
0557 10126100	WASH INT TOOTH LK	358
0587 93071163	SCREW SET SOC HD	485
0596 75806503	WASHER	358
0639 10126103	WASH INT TOOTH LK	358
0639 10126103	WASH INT TOOTH LK	485
0652 75740701	BRUSH MOTOR ASM	358
0653 83466100	BRUSH DRIVE MOUNT	358
0654 83466200	BRUSH HOLDER	358
0655 83466300	DELAY ARM	358
0656 83466400	ERUSH HOLDER STUD	358
0657 40024501	ERUSH, DISK	358
0658 40024502	BRUSH, DISK	358
0659 36159806	SWITCH-PIVOT LEVER	358
0660 92742011	SCREW M-C PAN HD	358
0662 10125919	SCREW FLAT HD	358
0666 93529003	WASHER, SPRING WAVE	358
0667 83467100	BRUSH INDICATOR	358
0668 10126212	SCR HEX SOC HD CAP	358
0670 83457201	ARM LOCK MOLDER	519
0671 83457302	PACK LOCK BRACKET	519
0673 77598701	SPRING ARM	519
0674 77598501	SWITCH SUBMINIATURE	519
0675 94357804	SOLENOID DC	519
0679 18607916	SCREW THD CUTTING	519
0681 93530436	ROLL PIN	519
0682 75779867	SPRING	519
0684 10127120	SCREW PAN HD MACH	519
0795 83451104	UPPER SENSOR HOLDER	485
0796 83450000	PLATE-SENSOR MTG	485
1069 95016100	LUBRICANT	358

FIGURE 8-11. COMMON PARTS SUB ASSEMBLIES (SHEET 2 OF 2)

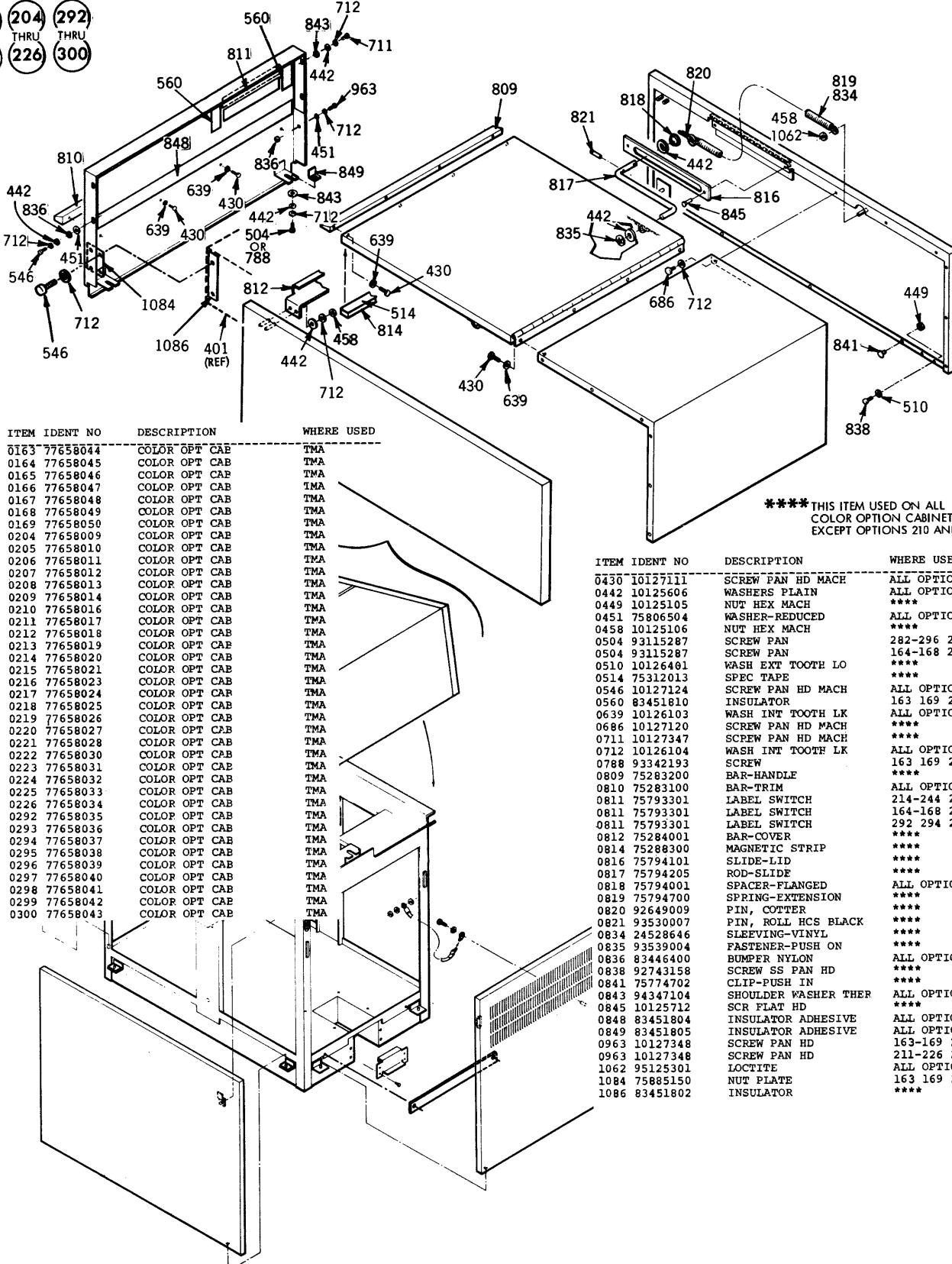


ITEM IDENT NO	DESCRIPTION	WHERE USED	ITEM IDENT NO	DESCRIPTION	WHERE USED
0199 83442309	BASE FR ASM	TMA	692		
0200 83442310	BASE FR ASM	TMA			
0201 83442311	BASE FR ASM	TMA			
0202 83442312	BASE FR ASM	TMA			
0203 83442313	BASE FR ASM	TMA			
0356 83410562	GASKET STRIP	199-203			
0359 75886347	IDENT PLATE	203	0718 83478701	CLAMP	202 203
0402 83494802	PLATE-AC CABLE	201	0719 83494801	PLATE, AC CABLE	199-203
0443 10125607	WASHERS PLAIN	202 203	0720 93522008	PLUG-SNAP BUTTON	200
0445 10125804	WASHERS SPR LOCK	519	0722 92932206	SCR FLAT HD SST	199-203
0449 10125105	NUT HEX MACH	199-203	0726 83444900	SHIM PLATE	199-203
0461 10126402	WASH EXT TOOTH LO	199 200 202 203	0728 77832300	CLAMP	202
0468 10127125	SCREW PAN HD MACH	202 203	0825 17901516	SCR THD ROLL	202 203
0482 10126403	WASH EXT TOOTH LO	199-203	0837 10125806	SPRING LK WSHR	199-203
0498 95596604	BUSHING	199-203	0839 10125610	WSHR PLAIN	199-203
0499 95596601	BUSHING	201	0840 10125808	SPRING LK WSHR	199-203
0510 10126401	WASH EXT TOOTH LO	199-203	1019 75731301	SYMBOL GRND (DECAL)	203
0518 10125030	SCREW HEX HD	199-203	1048 17901519	SCR THD ROLL PAN HD	199-203
0534 93623000	BUMPFER, RUBBFR	199-203	1052 93522009	PLUG-SNAP BUTTON	201
0688 83445709	FRAME CABINET	199 200	1060 77658250	LABEL, RATING	199 200 202 203
0689 75884516	SHOCK MOUNT-LORD	199-203	1076 10125608	WASHER	199-203
0690 73469100	PIVOT-COVER	199-203	1077 83445710	FRAME CABINET	201
0691 73469101	PIVOT-COVER	199-203	1080 77832301	CLAMP	203
0692 93679013	LEVELLER	199-203	1081 75884875	GR FLEXIBLE	199 200 203
0693 93006033	NUT JAM HEX	199-203	1082 75884876	GR FLEXIBLE	199 200 203
0694 75730805	CABLE ASM GROUND	199-203	1085 77658251	LABEL, RATING	201
0696 83444100	GROUND WIPER	199-203	1146 83445711	FRAME CABINET	199 202 203
0698 93592200	SCR TPG HEX PNL	199-203			
0701 10125108	NUT HEX MACH	199-203			
0702 10125303	NUT HEXAGON	199-203			
0703 75884517	SHOCK MOUNT-LORD	199-203			
0704 10125301	NUT HEXAGON	199-203			
0705 83492800	PLATE-COVER	199-203			
0706 94281426	BB CABLE, GROUND	199-203			
0707 83474601	FIRE-STOP, REAR	199-203			
0709 92723234	SCREW BUTTON SOC HD	199-203			
0710 77831951	FIRE-STOP, FRONT	199-203			
0714 75804800	AIR FILTER	199-203			
0715 77599600	GASKET BLOWER CAB	199-203			
0716 83478200	COVER	199-203			
0717 83478700	CLAMP	200 201			

FIGURE 8-12. BASE FRAME ASSEMBLY

FROM SHEET 5
SELECT

(163) (204) (292)
THRU THRU THRU
(169) (226) (300)



***** THIS ITEM USED ON ALL COLOR OPTION CABINETS EXCEPT OPTIONS 210 AND 214.

ITEM IDENT NO	DESCRIPTION	WHERE USED
0430 10127111	SCREW PAN HD MACH	ALL OPTIONS
0442 10125606	WASHERS PLAIN	ALL OPTIONS
0449 10125105	NUT HEX MACH	****
0451 75806504	WASHER REDUCED	ALL OPTIONS
0458 10125106	NUT HEX MACH	****
0504 93115287	SCREW PAN	282-296 298-300
0504 93115287	SCREW PAN	164-168 204-226
0510 10126461	WASH EXT TOOTH LO	****
0514 75312013	SPEC TAPE	****
0546 10127124	SCREW PAN HD MACH	ALL OPTIONS
0560 83451810	INSULATOR	163 169 297
0639 10126103	WASH INT TOOTH LK	ALL OPTIONS
0686 10127120	SCREW PAN HD MACH	****
0711 10127347	SCREW PAN HD MACH	****
0712 10126104	WASH INT TOOTH LK	ALL OPTIONS
0788 93342193	SCREW	163 169 297
0809 75283200	BAR HANDLE	****
0810 75283100	BAR TRIM	ALL OPTIONS
0811 75793301	LABEL SWITCH	214-244 296-300
0811 75793301	LABEL SWITCH	164-168 204-212
0811 75793301	LABEL SWITCH	292 294 296-300
0812 75284001	BAR COVER	****
0814 75288300	MAGNETIC STRIP	****
0816 75794101	SLIDE LID	****
0817 75794205	ROD SLIDE	****
0818 75794001	SPACER FLANGED	ALL OPTIONS
0819 75794700	SPRING EXTENSION	****
0820 92649009	PIN COTTER	****
0821 93530007	PIN ROLL HCS BLACK	****
0834 24528646	SLEEVING VINYL	****
0835 93539004	FASTENER PUSH ON	****
0836 83446400	BUMPER NYLON	ALL OPTIONS
0838 92743158	SCREW SS PAN HD	****
0841 75774702	CLIP PUSH IN	****
0843 94347104	SHOULDER WASHER THER	ALL OPTIONS
0845 10125712	SCR FLAT HD	****
0848 83451804	INSULATOR ADHESIVE	ALL OPTIONS
0849 83451805	INSULATOR ADHESIVE	ALL OPTIONS
0963 10127348	SCREW PAN HD	163-169 204-209
0963 10127348	SCREW PAN HD	211-226 292-300
1062 95125301	LOCTITE	ALL OPTIONS
1084 75885150	NUT PLATE	163 169 297
1086 83451802	INSULATOR	****

FIGURE 8-13. COLOR OPTION CABINET (SHEET 1 OF 3)

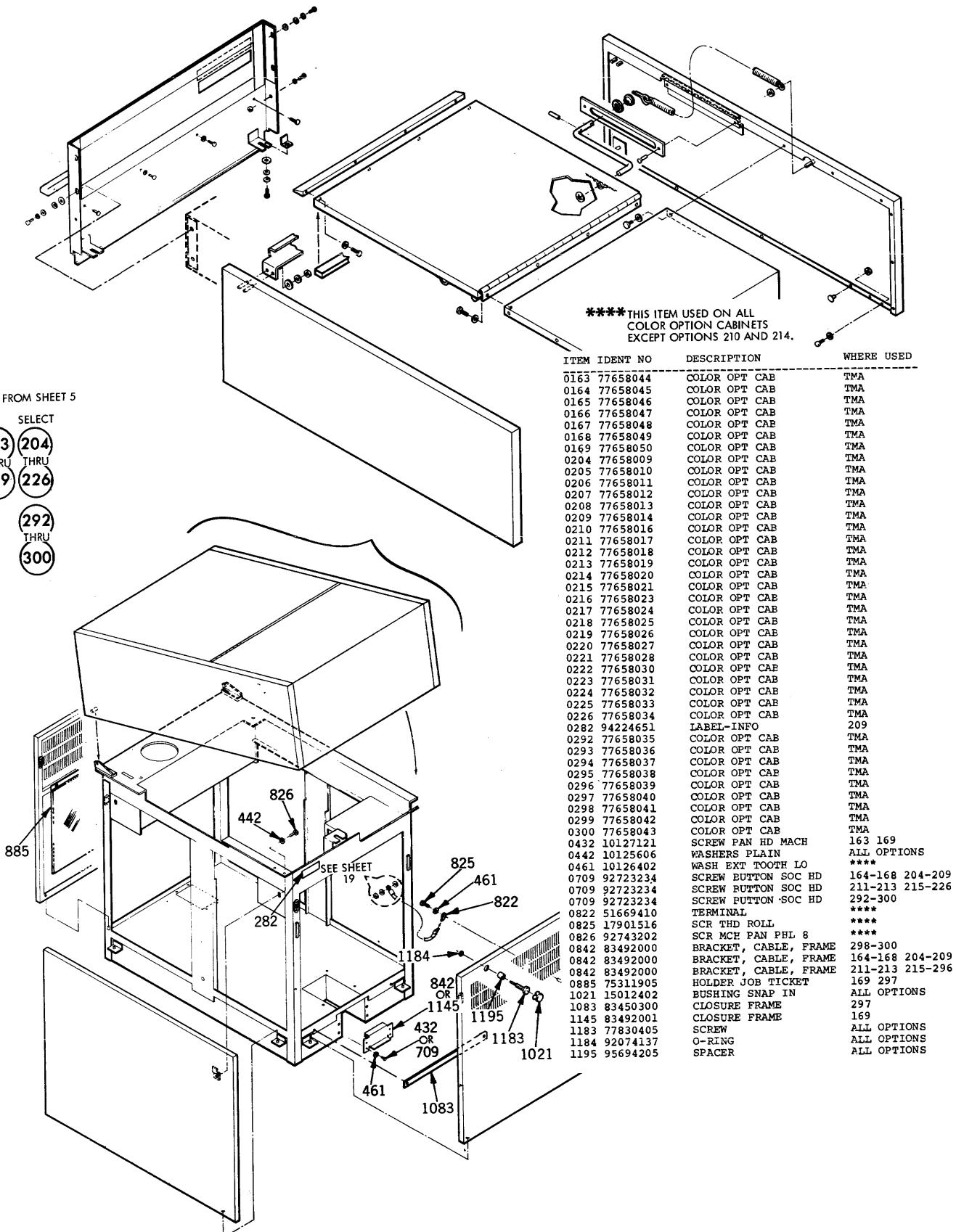
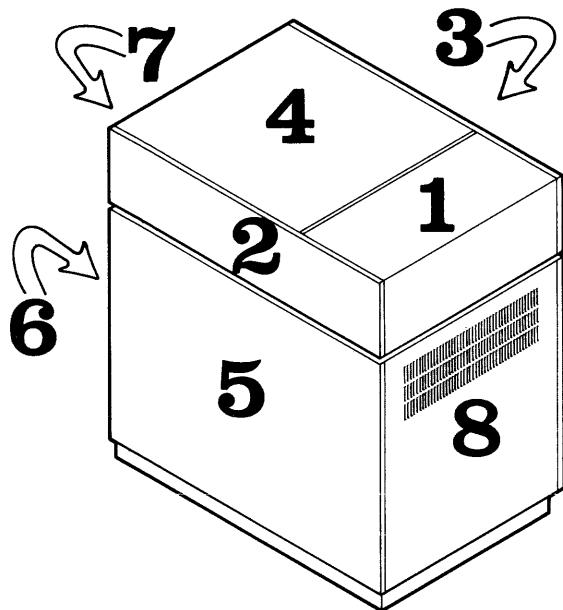


FIGURE 8-13. COLOR OPTION CABINET (SHEET 2 OF 3)



FROM SHEET 5

SELECT

(163) THRU (169) (204) THRU (226)

(292) THRU (300)

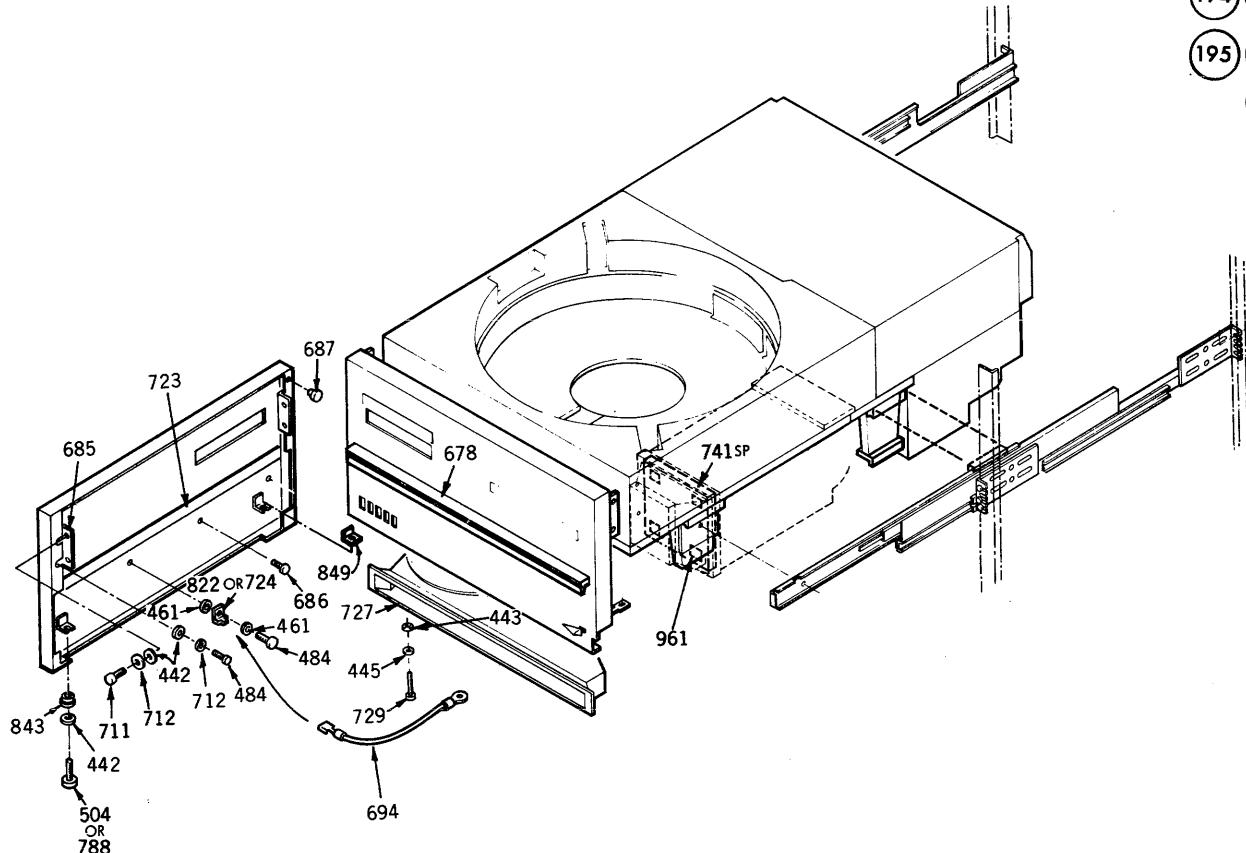
NOTE: REFER TO ASSEMBLY - COMPONENT PARTS LIST
FOR PANEL IDENTIFICATION.

COLOR OPTION DESCRIPTION TABLE

COLOR OPT ITEM NO.	#1 TOP COVER REAR	#2 TOP COVER R.H.	#3 TOP COVER L.H.	#4 DOOR	#5 PANEL AC-CESS PTD	#6 PANEL SIDE PTD	#7 PANEL END REAR	#8 PANEL CON-TROL END REAR
163	1147	989	990	991	992	997	1143	1144
164	1156	1157	1158	1159	1160	1161	1162	
165	1148	1149	1150	1151	1152	1153	1154	1155
166	1163	803	1165	1166	806	1168	1169	
167	1156	1157	1158	1159	1160		1162	1161
168	1163	1164	804	1166	806	1168	512	
169	1189	1190	1191	991	1192	997	1143	
204	802	803	804	805	806	807	808	
205	1058	852	853	854	855	856	857	
206	858	803	804	859	806	860	861	
207	862	863	864	865	866	867	868	
208	869	870	871	872	873	874	875	
209	802	803	804	805	806	807	808	
210							808	
211	898	899	900	901	902	903	904	
212	905	906	907	908	909	910	911	
213	912	913	914	915	906	917	918	
214							861	
215	919	920	921	922	923	924	925	
216	851	934	935	936	937	953	876	
217	938	939	940	941	942	943	944	
218	946	947	948	949	950	951	952	
219	862	863	864	865	866	867	868	
220	926	927	928	929	930	931	932	1113
221	1057	886	887	888	933	1078	1079	
222	548	552	554	683	700	753	890	
223	1093	1094	1095	1096	1097	1098	1099	
224	802	803	804	805	806		808	807
225	1100	1101	1102	1103	1104		1105	1106
226	858	803	804	859	806		861	860
292	964	1008	1030	1059	1109	1110	1111	
293	1057	886	887	888	933		1079	1078
294	1117	1118	1119	1120	1121		861	807
295	1117	1122	1123	1120	1124		1125	1126
296	1129	1130	1131	1132	1133		1134	1142
297	877	769	781	880	785	882	786	884
298	1058	799	800	854	801	833	844	846
299	1058	799	800	854	801	846	857	
300	1087	1112	1114	1136	1137	1138	1139	

FIGURE 8-13. COLOR OPTION CABINET (SHEET 3 OF 3)

(194) (229)
 (195) (231)
 THRU
 (233)



RACK MOUNT ASSY ITEM#	INSTALLATION KIT	
	ITEM#	DETAIL
194	564	SHEET 27
195	713	SHEET 26
229	713	SHEET 26
231	713	SHEET 26
232	NONE	—
233	713	SHEET 26

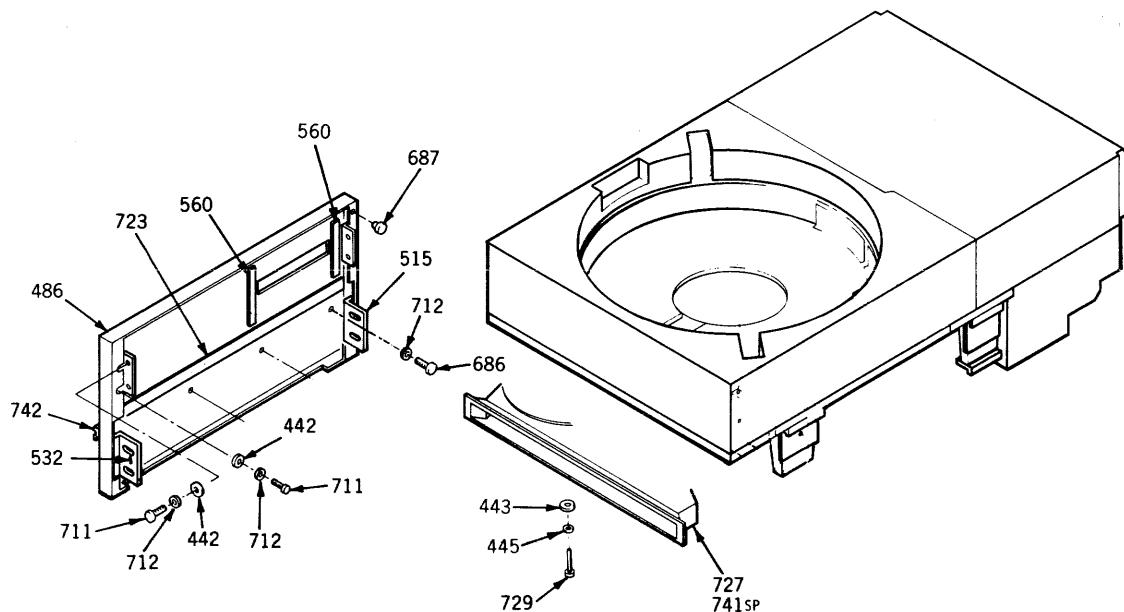
ITEM IDENT NO	DESCRIPTION	WHERE USED
0194 83443513	RACK MT ASM	TMA
0195 83443514	RACK MT ASM	TMA
0229 83443504	RACK MT ASM	TMA
0231 83443506	RACK MT ASM	TMA
0232 83443507	RACK MT ASM	TMA
0233 83443509	RACK MT ASM	TMA
0442 10125606	WASHERS PLAIN	194 195 229
0443 10125607	WASHPINS PLAIN	194 195 229 233
0445 10125804	WASHERS SPR LOCK	194 195
0445 10125804	WASHERS SPR LOCK	229 231-233
0461 10126402	WASH EXT TOOTH LO	194 229 231 232
0484 10127122	SCREW PAN HD MACH	194 229 231 232
0504 93115287	SCREW PAN	194 229 231 232
0546 10127124	SCREW PAN HD MACH	229 231 232
0564 83447808	INSTLN KIT-RACK MT	194
0678 75284701	HANDLE PULL RACK	194 195
0678 75284701	HANDLE-PULL RACK	229 231 232
0685 83444200	ANGLE-FRT PANEL	194 195
0685 83444200	ANGLE-FRT PANEL	229 231 232
0686 10127120	SCREW PAN HD MACH	194 195
0686 10127120	SCREW PAN HD MACH	229 231 232
0687 92172000	BUMPER RUBBER	194 195
0687 92172000	BUMPER RUBBER	229 231 232
0694 75730805	CABLE ASM GROUND	194 229 231 232
0711 10127347	SCREW PAN HD MACH	194 195 229
0712 10126104	WASH INT TOOTH LK	194 195
0712 10126104	WASH INT TOOTH LK	229 231 232
0713 83447805	INSTLN KIT-RACK MT	195 229 231 233
0723 83451806	INSULATOR ADHESIVE	194 195
0723 83451806	INSULATOR ADHESIVE	229 231 232
0724 51669404	TERMINAL	231
0727 83457001	AIR INTAKE	194 195 229 233
0729 10127128	PAN HD MACH SCR	194 195 229 233
0741 77604000	PRE-FILTER-FILTER	194 195
0741 77604000	PRE-FILTER-FILTER	229 231 233
0788 93342193	SCREW	195
0822 51669410	TERMINAL	194 229
0843 94347104	SHOULDER WASHER THER	194 195
0843 94347104	SHOULDER WASHER THER	229 231 232
0849 83451805	INSULATOR ADHESIVE	194 195
0849 83451805	INSULATOR ADHESIVE	229 231 232
0961 77611443	CEMENT	194 195
0961 77611443	CEMENT	229 231-233

FIGURE 8-14. RACK MOUNT ASSEMBLY (SHEET 1 OF 3)

FROM SHEET 5

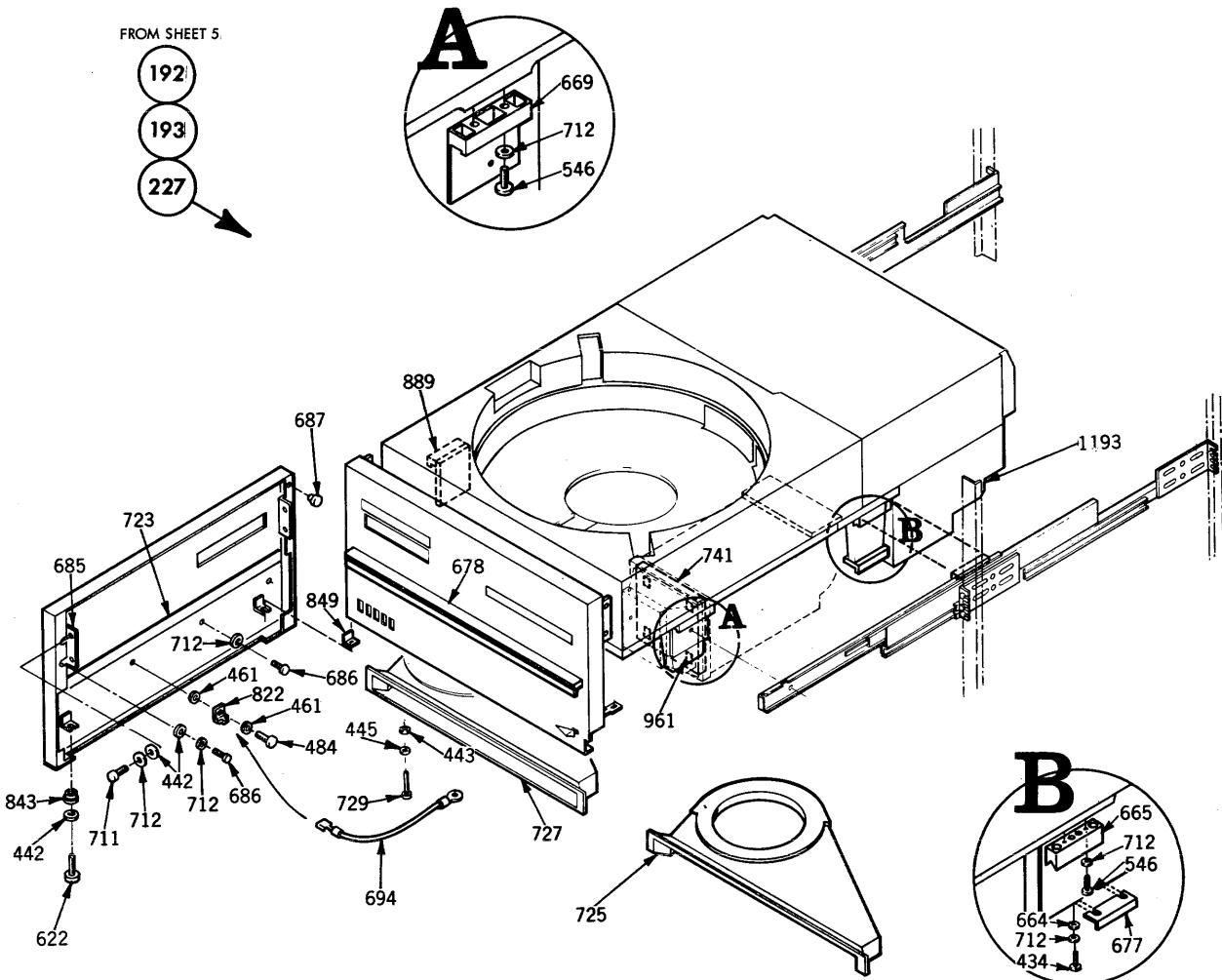
(228)

RACK MOUNT ASSY ITEM#	INSTALLATION KIT	
	ITEM#	DETAIL
228	749	SHEET 26



ITEM IDENT NO	DESCRIPTION	WHERE USED
0228 75884907	RACK MT ASSY	TMA
0442 10125606	WASHERS PLAIN 8	228
0443 10125607	WASHERS PLAIN 10	228
0445 10125804	WASHERS SPR LOCK	228
0486 75880261	FRONT PANEL	228
0515 75884887	BRKT ASSY L.H.	228
0532 75884902	BRKT ASSY R.H.	228
0560 83451810	INSULATOR	228
0686 10127120	SCREW PAN HD MACH	228
0687 92172000	BUMPER, RUBBER	228
0711 10127347	SCREW PAN HD MACH	228
0712 10126104	WASH INT TOOTH LOCK	228
0723 83451806	INSULATOR, ADH BACK	228
0727 83457001	AIR INTAKE	228
0729 10127128	PAN HEAD MACH SCREW	228
0741 77604000	PRE-FILTER-FILTER	228
0742 75284702	HANDLE-PULL RACK	228
0749 83447806	INSTLN KIT-RACK MT	228

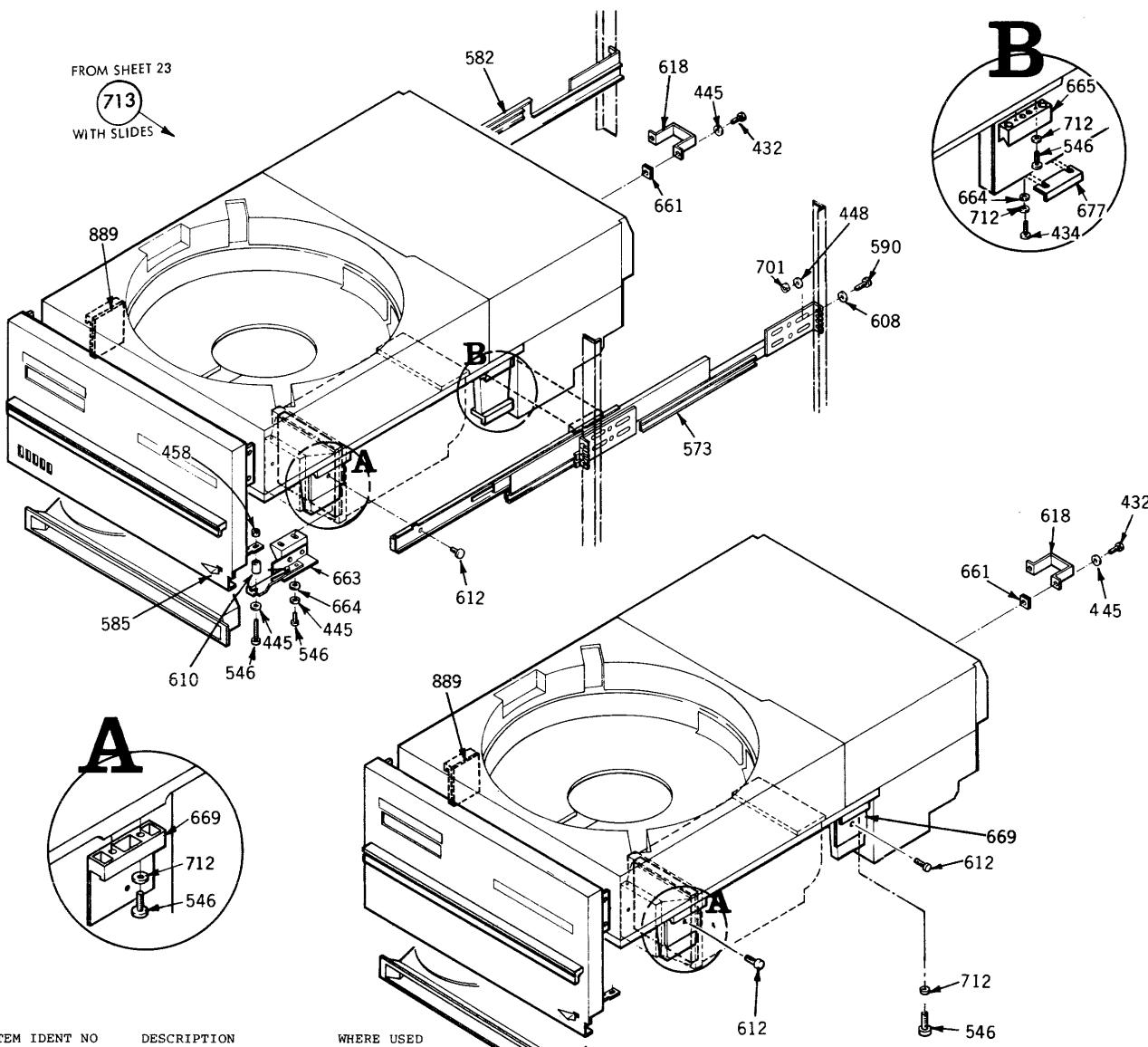
FIGURE 8-14. RACK MOUNT ASSEMBLY (SHEET 2 OF 3)



RACK MOUNT ASSY ITEM#	INSTALLATION KIT	
	ITEM#	DETAIL
192	NONE	_____
193	NONE	_____
227	1007	SHEET 27

ITEM IDENT NO	DESCRIPTION	WHERE USED
0192 83443511	RACK MT ASM	TMA
0193 83443512	RACK MT ASM	TMA
0194 83443513	RACK MT ASM	TMA
0195 83443514	RACK MT ASM	TMA
0227 83443510	RACK MT ASM	TMA
0434 10127123	SCREW PAN HD MACH	227
0442 10125606	WASHERS PLAIN	193 227
0443 10125607	WASHERS PLAIN	193 227
0445 10125804	WASHERS SPR LOCK	227
0461 10126402	WASH EXT TOOTH LO	227
0484 10127122	SCREW PAN HD MACH	227
0546 10127124	SCREW PAN HD MACH	227
0622 77610636	SCREW, MACH, SELF-LOCK	227
0664 93211008	WASHER	227
0665 83484500	MOUNT-SLIDE	227
0669 83484602	MOUNT-SLIDE KEYED	227
0677 83485700	STABILIZER	227
0678 75284701	HANDLE-PULL RACK	227
0685 83444200	ANGLE-FRT PNL	227
0686 10127120	SCREW PAN HD MACH	227
0687 92172000	BUMPER, RUBBER	227
0694 75730805	CAELE ASM GROUND	192 193 227
0711 10127347	SCREW PAN HD MACH	227
0712 10126104	WASH INT TOOTH LK	227
0723 83451806	INSULATOR, ADH BACK	227
0725 83456900	AIR INTAKE	192
0727 83457001	AIR INTAKE	193 227
0729 10127128	PAN HEAD MACH SCREW	192 193 227
0741 77604000	PRE-FILTER-FILTER	192 193 227
0822 51669410	TERMINAL	227
0843 94347104	SHOULDER WASHER THER	227
0849 83451805	INSULATOR, ADH BACK	227
0889 77830705	INSULATOR	227
0961 77611443	CEMENT	192 193 227
1007 83447807	INSTLN KIT-RACK MT	227
1193 94238905	LABEL, CAUTION	227

FIGURE 8-14. RACK MOUNT ASSEMBLY (SHEET 3 OF 3)



ITEM IDENT NO	DESCRIPTION	WHERE USED
0432 10127121	SCREW PAN HD MACH	713
0432 10127121	SCREW PAN HD MACH	749
0434 10127123	SCREW PAN HD MACH	713
0445 10125804	WASHERS SPR LOCK	713
0445 10125804	WASHERS SPR LOCK	749
0448 10125805	WASHERS SPR LOCK	713
0458 10125106	NUT HEX MACH	713
0546 10127124	SCREW PAN HD MACH	713
0546 10127124	SCREW PAN HD MACH	749
0573 83478301	SLIDE ASM RH	713
0582 83478302	SLIDE ASM LH	713
0585 83443601	KNOB ASM	713
0590 10127144	SCREW PAN HD	713
0608 93211009	WASHER PLAIN 10	713
0610 93109322	SPACER	713
0612 10127346	SCREW	713 749
0618 83436601	FENDER CARLE	713
0618 83436601	FENDER CABLE	749
0661 92196007	NUT-SPFED	713
0661 92196007	NUT-SPEED	749
0663 83479501	LATCH ASM	713
0664 93211008	WASHER	713
0665 83484500	MOUNT-SLIDE	713
0669 83484602	MOUNT-SLIDE KEYED	713
0669 83484602	MOUNT-SLIDE KFYFD	749
0677 83485700	STABILIZER	713
0701 10125108	NUT HEX MACH	713
0712 10126104	WASH INT TOOTH LK	713
0712 10126104	WASH INT TOOTH LK	749
0713 83447805	INSTLN KIT-RACK MT	229 231
0749 83447806	INSTLN KIT-RACK MT	230
0889 77830705	INSULATOR	749
0889 77830705	INSULATOR	713

FROM SHEET 23
749
WITHOUT SLIDES

FIGURE 8-15. INSTALLATION KIT (SHEET 1 OF 2)

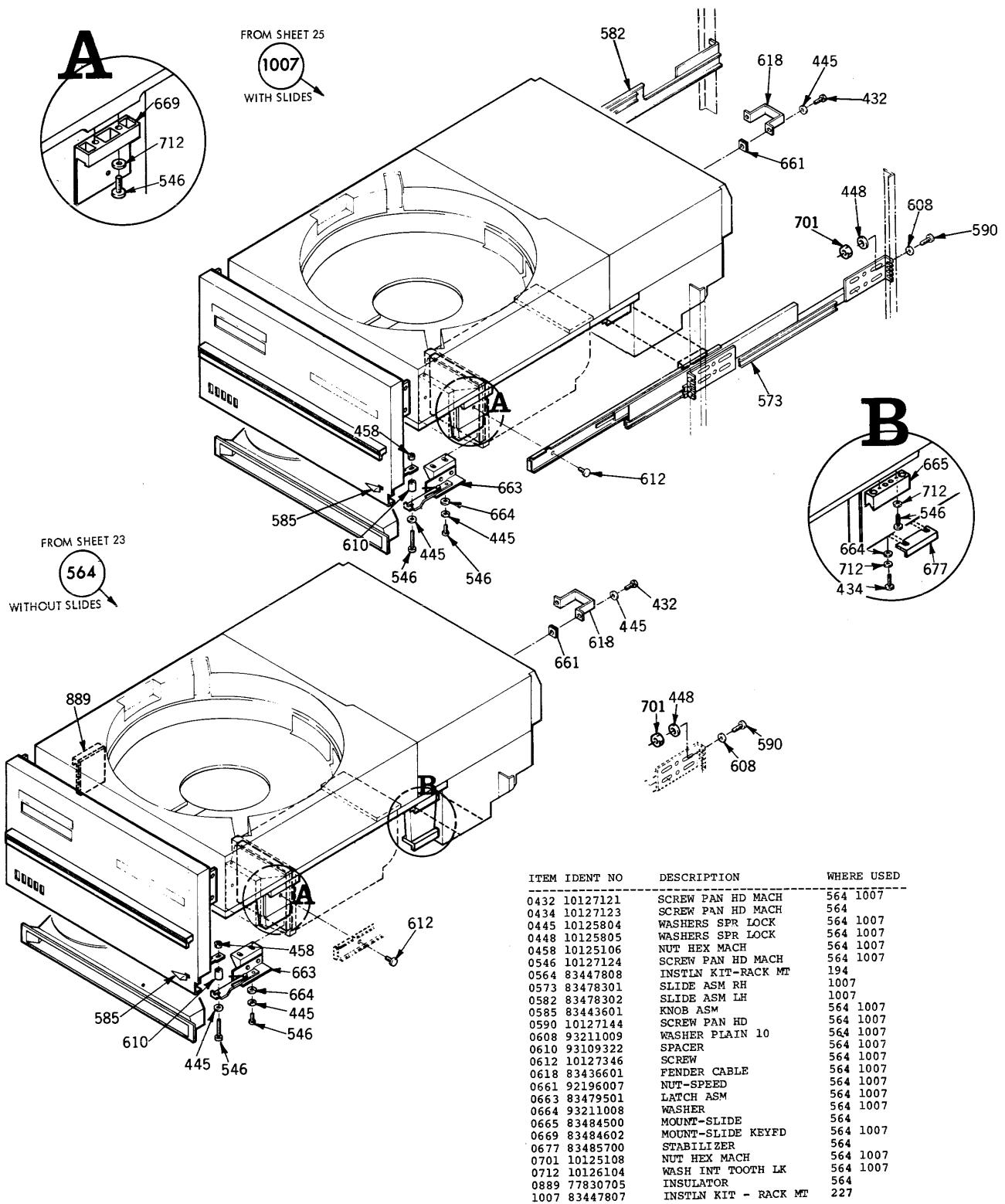
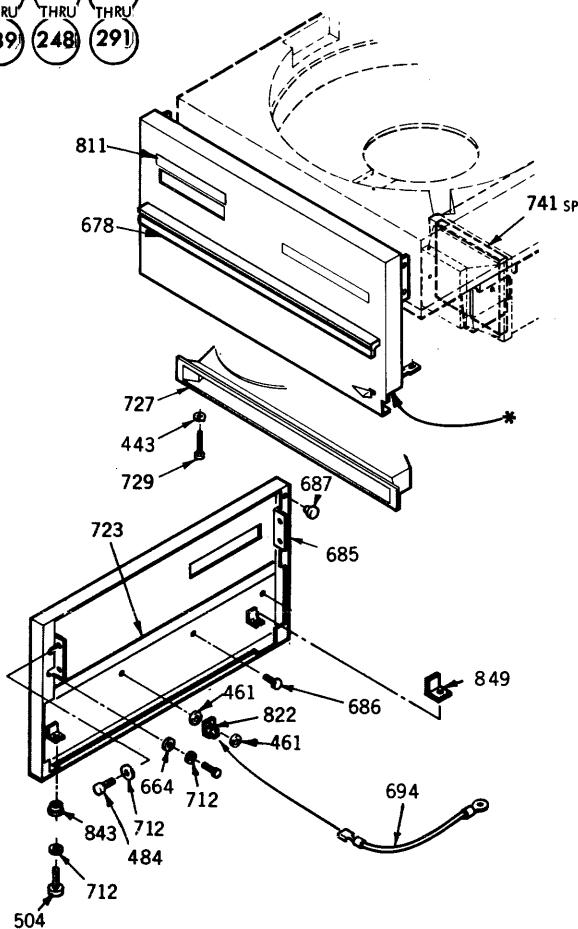


FIGURE 8-15. INSTALLATION KIT (SHEET 2 OF 2)

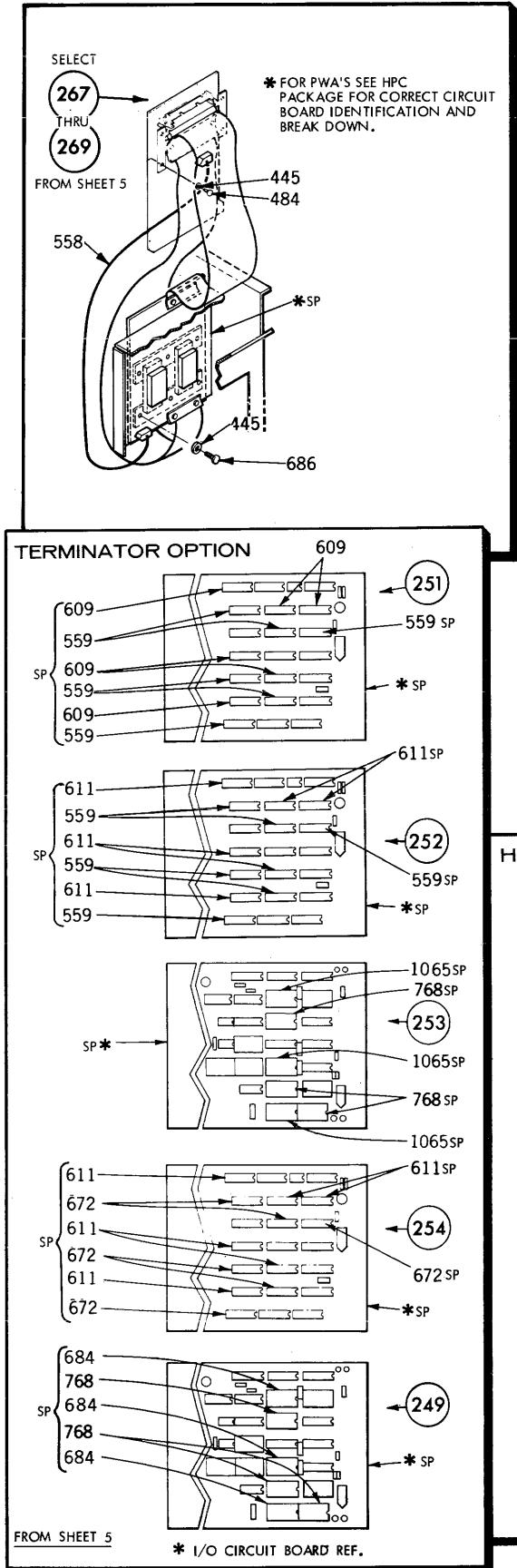
FROM SHEET 5

(187) (234) (283)
THRU THRU THRU
(189) (248) (291)

* IDENTIFICATION OF COLOR OF EACH RACK MOUNT OPTION IS PROVIDED BY AN ITEM NUMBER WHICH APPEARS IN PARENTHESES IN THE "DESCRIPTION" COLUMN ON THIS SHEET. REFER TO ASSEMBLY COMPONENT PARTS LIST, SHEETS 33 THRU 39, USING THIS ITEM NUMBER, TO DETERMINE IDENTIFICATION NUMBER OF PANEL PAINT.

ITEM IDENT NO	DESCRIPTION	WHERE USED
0187 83442530	COLOR OPT RACK MT(1188) TMA	
0188 83442529	COLOR OPT RACK MT(0416) TMA	
0189 83442528	COLOR OPT RACK MT(0409) TMA	
0234 83442501	COLOR OPT RACK MT(1066) TMA	
0235 83442502	COLOR OPT RACK MT(0545) TMA	
0236 83442503	COLOR OPT RACK MT(0547) TMA	
0237 83442505	COLOR OPT RACK MT(0547) TMA	
0238 83442506	COLOR OPT RACK MT(0625) TMA	
0239 83442507	COLOR OPT RACK MT(0627) TMA	
0240 83442508	COLOR OPT RACK MT(0561) TMA	
0241 83442509	COLOR OPT RACK MT(0649) TMA	
0242 83442510	COLOR OPT RACK MT(0650) TMA	
0243 83442511	COLOR OPT RACK MT(0545) TMA	
0244 83442527	COLOR OPT RACK MT(0847) TMA	
0245 83442513	COLOR OPT RACK MT(0562) TMA	
0246 83442514	COLOR OPT RACK MT(1063) TMA	
0247 83442504	COLOR OPT RACK MT(0418) TMA	
0248 83442516	COLOR OPT RACK MT(1088) TMA	
0283 83442525	COLOR OPT RACK MT(0994) TMA	
0284 83442524	COLOR OPT RACK MT(0995) TMA	
0285 83442517	COLOR OPT RACK MT(1092) TMA	
0286 83442518	COLOR OPT RACK MT(1108) TMA	
0287 83442526	COLOR OPT RACK MT(0897) TMA	
0288 83442521	COLOR OPT RACK MT(1141) TMA	
0289* 83442520	COLOR OPT RACK MT(0607) TMA	
0290 83442522	COLOR OPT RACK MT(1140) TMA	
0291 83442523	COLOR OPT RACK MT(0547) TMA	
0409 83440314	FRONT PNL RACK	189
0416 83442121	FRONT PNL RACK	188
0418 83442103	FRONT PNL RACK	247
0443 10125607	WASHERS PLAIN	237 243
0461 10126402	WASH EXT TOOTH LO	237 243
0484 10127122	SCREW PAN HD MACH	237 243
0504 93115287	SCREW PAN	237 243
0545 83442106	FRONT PNL RACK PAINT	235 243
0547 83442109	FRONT PNL RACK	236 237 291
0561 83442143	FRONT PNL RACK PAINT	240
0562 77834340	FRONT PNL RACK PAINT	245
0607 83442178	FRONT PNL RACK PAINT	289
0625 83466801	PNL CNTL RACK SLKSCN	238
0627 83442123	FRONT PNL RACK PAINT	239
0649 83442166	FRONT PNL RACK PAINT	241
0650 83442154	FRONT PNL RACK PAINT	242
0678 75284701	HANDLE PULL RACK	237 243
0685 83444200	ANGLE-FRT PANEL	237 243
0686 10127120	SCREW PAN HD MACH	237 243 247
0687 92172000	BUMPER RUBBER	237 243
0694 75730805	CABLE ASM GROUND	237 243
0712 10126104	WASH INT TOOTH LK	237 243
0723 83451806	INSULATOR ADHESIVE	237 243
0727 83457001	AIR INTAKE	237 243
0729 10127128	PAN HD MACH SCR	237 243
0741 77604000	PRE-FILTER-FILTER	237 243
0811 75793301	LABEL SWITCH	287-290 295
0811 75793301	LABEL SWITCH	187 188 248 285
0811 75793301	LABEL SWITCH	234-237 239-245
0922 51669410	TERMINAL	237
0843 94347104	SHOULDER WASHER THER	237 243
0847 83442108	FRONT PNL RACK	244
0849 83451805	INSULATOR ADHESIVE	237 243
0897 83442110	FRONT PNL RACK	287
0994 83442197	FRONT PNL RACK PAINT	0283
0995 83442198	FRONT PNL RACK PAINT	0284
1063 83442165	FRT PNL RCK PNT	246
1066 83442104	FRONT PNL RACK PAINT	234
1088 83442136	FRONT PNL RACK PAINT	248
1092 83442172	FRONT PNL RACK PAINT	285
1108 83442170	FRONT PNL RACK PAINT	286
1140 83442190	FRONT PNL	290
1141 83442189	FRONT PNL RACK	288
1188 83442157	FRONT PANEL RACK	187

FIGURE 8-16. TOP MECHANICAL ASSEMBLY OPTIONS



ITEM IDENT NO	DESCRIPTION	WHERE USED
0249 75305707	TERMINATOR	TMA
0251 75305703	TERMINATOR	TMA
0252 75305704	TERMINATOR	TMA
0253 75305706	TERMINATOR	TMA
0254 75305705	TERMINATOR	TMA
0267 75795309	I-O OPT CAB	TMA
0268 75795307	I-O OPT CAB	TMA
0269 75795308	I-O OPT CAB	TMA
0307 75740123	HEAD OPTION	MOD
0308 75740119	HEAD OPTION	MOD
0309 75740115	HEAD OPTION	MOD
0310 75740113	HEAD OPTION	MOD
0311 75740121	HEAD OPTION	MOD
0312 75740124	HEAD OPTION	MOD
0313 75740117	HEAD OPTION	MOD
0314 75740118	HEAD OPTION	MOD
0315 75740114	HEAD OPTION	MOD
0445 10125804	WASHERS SPR LOCK	267-269
0445 10125804	WASHERS SPR LOCK	267-269
0485 83451602	MAGNETIC SENSOR ASM	267-269
0558 83444701	JUMPER ASM	267-269
0559 75738604	RESISTOR MODULE 110	251 252
0600 75738610	RESISTOR MODULE 1K	251
0611 75738607	RESISTOR MODULE 330	252 254
0674 75738608	RESISTOR MODULE	254
0684 75738654	RESISTOR MODULE 220	249
0684 10127120	SCREW PAN HD MACH	267-269
0764 75738655	RESISTOR MODULE 330	249 253
0815 75037504	HEAD ASM (LOWER)	307 312 314
0823 75037505	HEAD ASM (UPPER)	307 312
0824 75300200	RESISTOR MODULE	307 311 312
0827 70590208	HEAD ASM (LOWER)	308
0828 70590209	HEAD ASM (UPPER)	308
0829 75300100	RESISTOR MODULE	308 310 313 315
0831 70590306	HEAD ASM (LOWER)	309
0831 70590307	HEAD ASM (UPPER)	309
0832 73460700	CARRIAGE WEIGHT	312 314 315
1065 75738652	RESISTOR MODULE	253
1070 75037506	HEAD ASM (LOWER)	311
1071 75037507	HEAD ASM (UPPER)	311
1072 70590304	HEAD ASM (LOWER)	313 314
1073 70590305	HEAD ASM (UPPER)	313 314
1074 70590206	HEAD ASM (LOWER)	310 315
1075 70590207	HEAD ASM (UPPER)	310 315

HEAD OPTION

FROM SHEET 6

307	308	309	310	311	312	313	314	315
815	827	829	829	824	815	1072	1072	829
823	828	830	1074	1070	823	1073	1073	1074

** 824
829

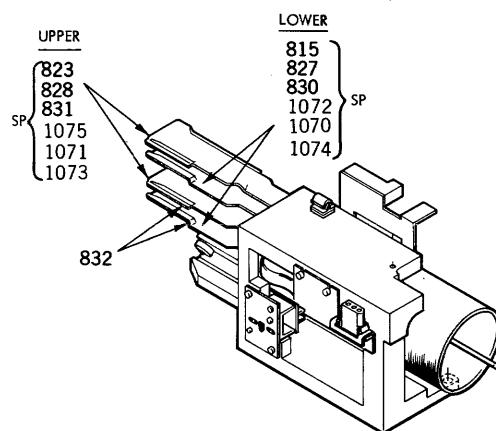
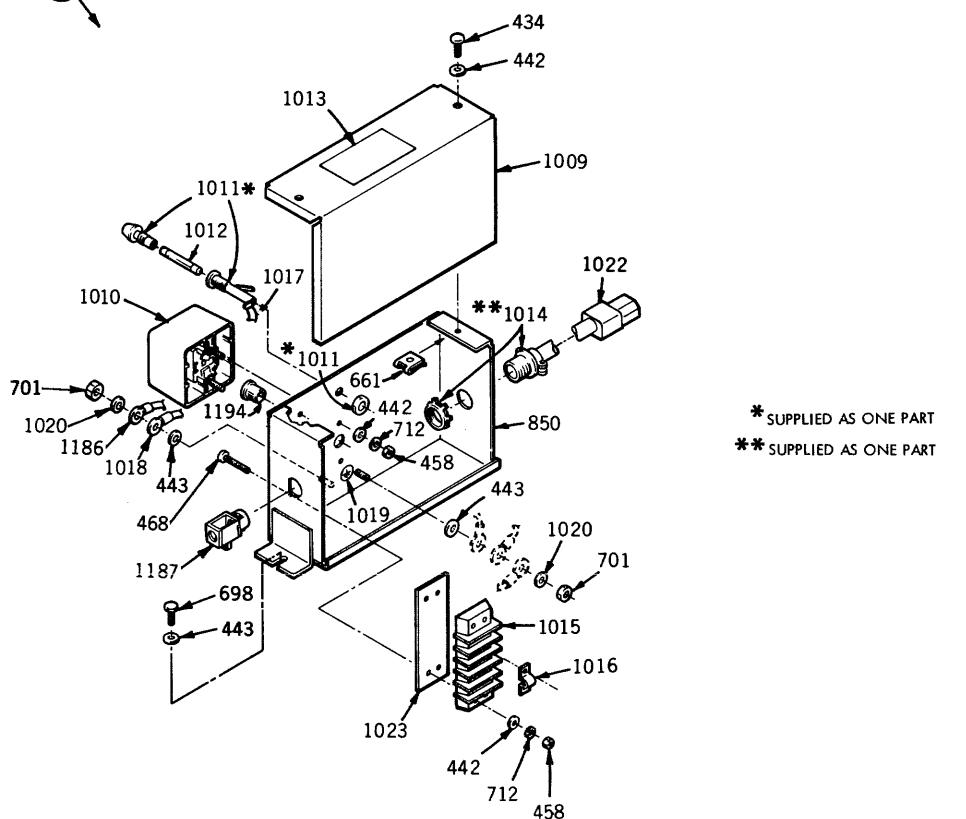


FIGURE 8-17. OPTIONS

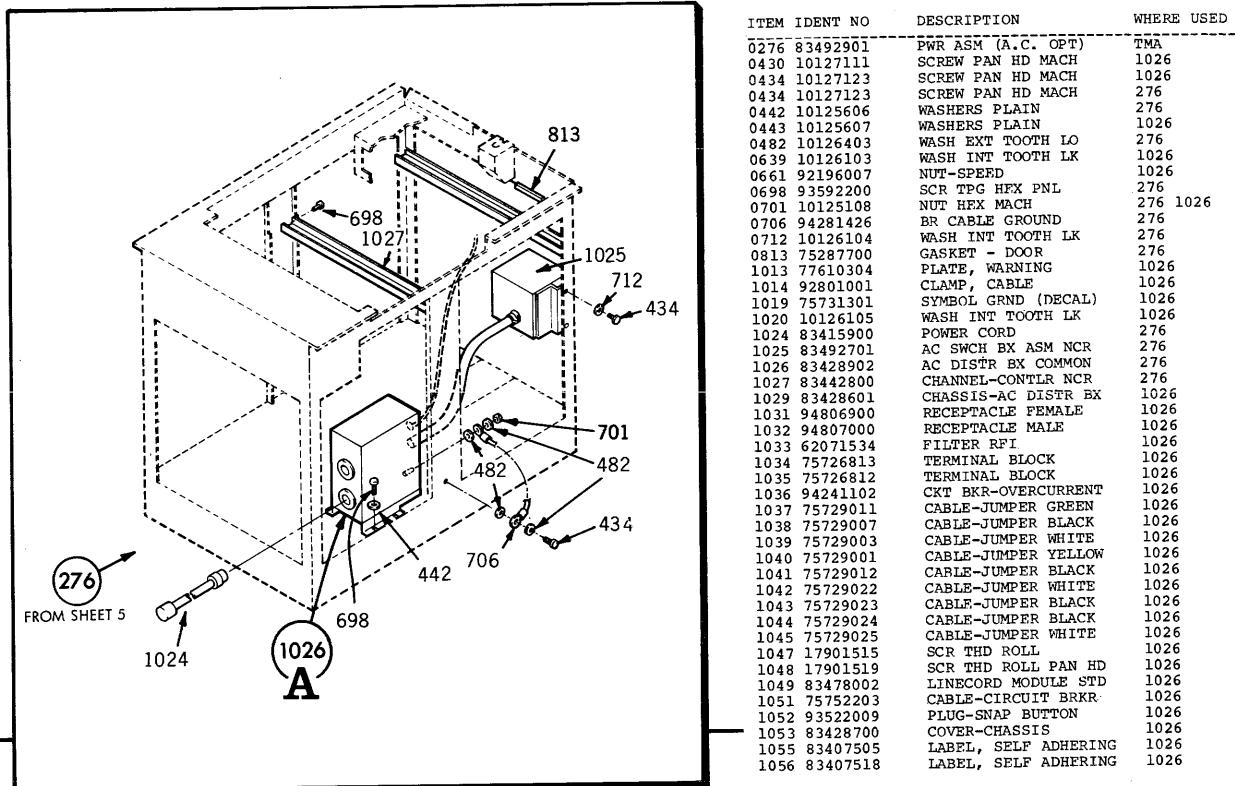
FROM SHEET 5

275



ITEM IDENT NO	DESCRIPTION	WHERE USED
0275 77599402	PWR ASM (INPUT)	TMA
0434 10127123	SCREW PAN HD MACH	275
0442 10125606	WASHERS PLAIN	275
0443 10125607	WASHERS PLAIN	275
0458 10125106	NUT HEX MACH	275
0468 10127125	SCREW PAN ED MACH	275
0661 92196007	NUT-SPEED	275
0698 93592200	SCR TPG HEX PNL	275
0701 10125108	NUT HEX MACH	275
0712 10126104	WASH INT TOOTH LK	275
0850 75730603	CHASSIS AC BOX 220V	275
1009 75730701	CVR CHASSIS AC INP	275
1010 75731001	CONVENIENCE OUTLET	275
1011 92411002	FUSE HOLDER	275
1012 92371016	FUSE QK ACTING 5 AMP	275
1013 77610304	PLATE, WARNING	275
1014 92801001	CLAMP, CABLE	275
1015 93041205	STRIP TERMINAL	275
1016 93067003	JUMPER, BARRIER ST	275
1017 75731104	CABLE-JUMPER BLACK	275
1018 75730806	CABLE ASM GRND	275
1019 75731301	SYMBOL GRND (DECAL)	275
1020 10126105	WASH INT TOOTH LK	275
1022 77599501	POWER CORD ASM	275
1023 93105305	MARKER STRIP	275
1186 75730807	CABLE GND	275
1187 92491020	STRAIN RELIEF	275
1194 15012410	SHUSHING SNAP IN	ALL OPTIONS

FIGURE 8-18, POWER INPUT ASSEMBLY



A

* SUPPLIED AS ONE PART

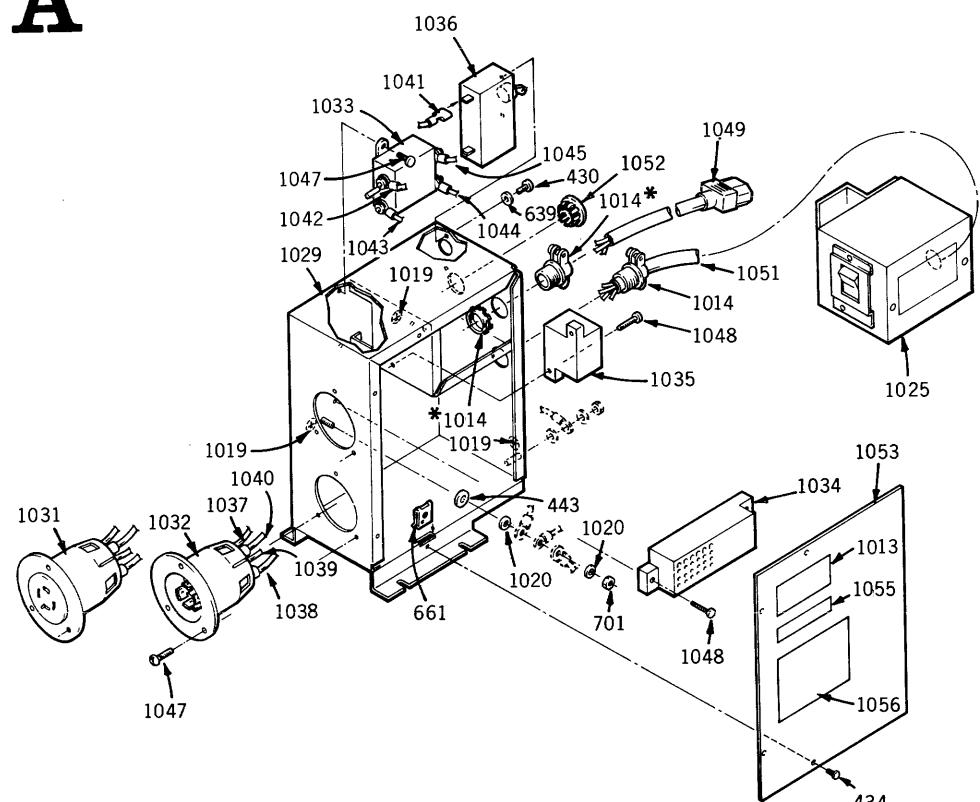
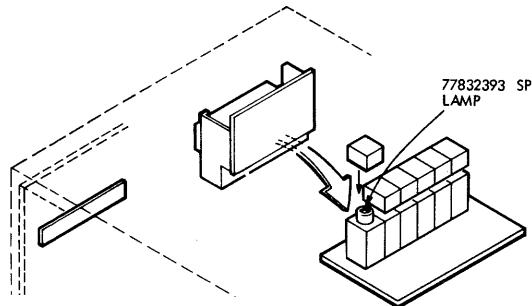
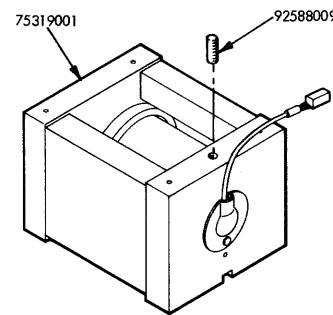


FIGURE 8-19. POWER ASSEMBLY (AC OPTION)

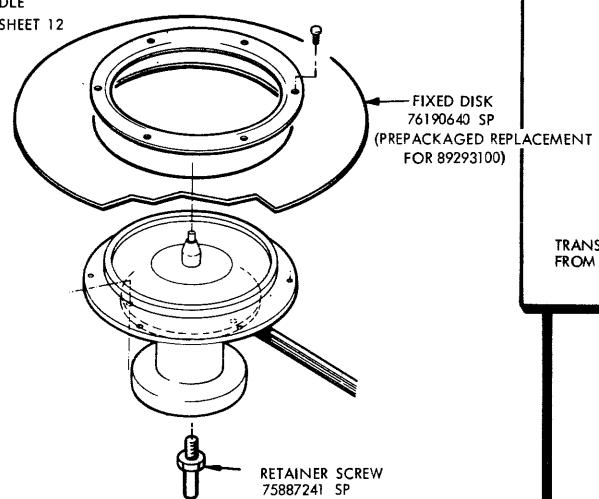
SWITCH BOARD ASSEMBLY
FROM SHEET 5



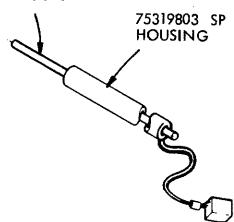
MAGNET ASSEMBLY
FROM SHEET 12



SPINDLE
FROM SHEET 12



75319802 SP
MAGNETIC CORE



TRANSDUCER-CONN ASSEMBLY
FROM SHEET 12

FIGURE 8-20. SPARE PARTS PROVISIONING

ASSEMBLY - COMPONENT PARTS LIST

ITEM IDENT NO	DESCRIPTION	WHERE USED	SHEET	ITEM IDENT NO	DESCRIPTION	WHERE USED	SHEET
0150 75306101	TETHER LINE	TMA	S5	0215 77658021	COLOR OPT CAB	TMA	S5
0152 75895231	UNDERCOVER ASSY	TMA	S5	0215 77658021	COLOR OPT CAB	TMA	S21
0153 77830701	UNDERCOVER ASSY	TMA	S5	0215 77658021	COLOR OPT CAB	TMA	S20
0163 77658044	COLOR OPT CAB	TMA	S5	0215 77658021	COLOR OPT CAB	TMA	S22
0163 77658044	COLOR OPT CAB	TMA	S21	0216 77658023	COLOR OPT CAB	TMA	S5
0163 77658044	COLOR OPT CAB	TMA	S20	0216 77658023	COLOR OPT CAB	TMA	S21
0164 77658045	COLOR OPT CAB	TMA	S5	0216 77658023	COLOR OPT CAB	TMA	S20
0164 77658045	COLOR OPT CAB	TMA	S21	0217 77658024	COLOR OPT CAB	TMA	S5
0164 77658045	COLOR OPT CAB	TMA	S20	0217 77658024	COLOR OPT CAB	TMA	S21
0164 77658045	COLOR OPT CAB	TMA	S22	0217 77658024	COLOR OPT CAB	TMA	S20
0165 77658046	COLOR OPT CAB	TMA	S5	0217 77658024	COLOR OPT CAB	TMA	S22
0165 77658046	COLOR OPT CAB	TMA	S21	0218 77658025	COLOR OPT CAB	TMA	S5
0165 77658046	COLOR OPT CAB	TMA	S20	0218 77658025	COLOR OPT CAB	TMA	S21
0165 77658046	COLOR OPT CAB	TMA	S22	0218 77658025	COLOR OPT CAB	TMA	S20
0166 77658047	COLOR OPT CAB	TMA	S5	0218 77658025	COLOR OPT CAB	TMA	S22
0166 77658047	COLOR OPT CAB	TMA	S21	0219 77658026	COLOR OPT CAB	TMA	S5
0166 77658047	COLOR OPT CAB	TMA	S20	0219 77658026	COLOR OPT CAB	TMA	S21
0166 77658047	COLOR OPT CAB	TMA	S22	0219 77658026	COLOR OPT CAB	TMA	S20
0167 77658048	COLOR OPT CAB	TMA	S5	0219 77658026	COLOR OPT CAB	TMA	S22
0167 77658048	COLOR OPT CAB	TMA	S21	0220 77658027	COLOR OPT CAB	TMA	S5
0167 77658048	COLOR OPT CAB	TMA	S20	0220 77658027	COLOR OPT CAB	TMA	S21
0167 77658048	COLOR OPT CAB	TMA	S22	0220 77658027	COLOR OPT CAB	TMA	S20
0168 77658049	COLOR OPT CAB	TMA	S5	0220 77658027	COLOR OPT CAB	TMA	S22
0168 77658049	COLOR OPT CAB	TMA	S20	0221 77658028	COLOR OPT CAB	TMA	S5
0168 77658049	COLOR OPT CAB	TMA	S21	0221 77658028	COLOR OPT CAB	TMA	S21
0168 77658049	COLOR OPT CAB	TMA	S22	0221 77658028	COLOR OPT CAB	TMA	S20
0169 77658050	COLOR OPT CAB	TMA	S5	0221 77658028	COLOR OPT CAB	TMA	S22
0169 77658050	COLOR OPT CAB	TMA	S20	0222 77658030	COLOR OPT CAB	TMA	S5
0169 77658050	COLOR OPT CAB	TMA	S21	0222 77658030	COLOR OPT CAB	TMA	S20
0169 77658050	COLOR OPT CAB	TMA	S22	0222 77658030	COLOR OPT CAB	TMA	S21
0187 83442530	COLOR OPT RACK MT(1188)	TMA	S5	0223 77658031	COLOR OPT CAB	TMA	S5
0187 83442530	COLOR OPT RACK MT(1188)	TMA	S28	0223 77658031	COLOR OPT CAB	TMA	S21
0188 83442529	COLOR OPT RACK MT(0416)	TMA	S5	0223 77658031	COLOR OPT CAB	TMA	S20
0188 83442529	COLOR OPT RACK MT(0416)	TMA	S28	0223 77658031	COLOR OPT CAB	TMA	S22
0189 83442528	COLOR OPT RACK MT(0409)	TMA	S5	0224 77658032	COLOR OPT CAB	TMA	S5
0189 83442528	COLOR OPT RACK MT(0409)	TMA	S28	0224 77658032	COLOR OPT CAB	TMA	S22
0190 75890915	NAMEPLATE	TMA	S5	0224 77658032	COLOR OPT CAB	TMA	S20
0191 77611483	NAMEPLATE	TMA	S5	0224 77658032	COLOR OPT CAB	TMA	S21
0192 83443511	RACK MT ASM	TMA	S5	0224 77658032	COLOR OPT CAB	TMA	S5
0192 83443511	RACK MT ASM	TMA	S25	0225 77658033	COLOR OPT CAB	TMA	S21
0193 83443512	RACK MT ASM	TMA	S5	0225 77658033	COLOR OPT CAB	TMA	S20
0193 83443512	RACK MT ASM	TMA	S25	0225 77658033	COLOR OPT CAB	TMA	S22
0194 83443513	RACK MT ASM	TMA	S5	0225 77658033	COLOR OPT CAB	TMA	S5
0194 83443513	RACK MT ASM	TMA	S25	0226 77658034	COLOR OPT CAB	TMA	S21
0194 83443513	RACK MT ASM	TMA	S24	0226 77658034	COLOR OPT CAB	TMA	S20
0194 83443513	RACK MT ASM	TMA	S23	0226 77658034	COLOR OPT CAB	TMA	S22
0195 83443514	RACK MT ASM	TMA	S5	0226 77658034	COLOR OPT CAB	TMA	S22
0195 83443514	RACK MT ASM	TMA	S25	0227 83443510	RACK MT ASM	TMA	S5
0195 83443514	RACK MT ASM	TMA	S24	0227 83443510	RACK MT ASM	TMA	S25
0195 83443514	RACK MT ASM	TMA	S23	0228 75884907	RACK MT ASM	TMA	S5
0199 83442309	EASE FR ASM	TMA	S5	0228 75884907	RACK MT ASM	TMA	S24
0199 83442309	EASE FR ASM	TMA	S19	0229 83443504	RACK MT ASM	TMA	S5
0200 83442310	EASE FR ASM	TMA	S5	0229 83443504	RACK MT ASM	TMA	S23
0200 83442310	EASE FR ASM	TMA	S19	0231 83443506	RACK MT ASM	TMA	S5
0201 83442311	EASE FR ASM	TMA	S5	0231 83443506	RACK MT ASM	TMA	S23
0201 83442311	EASE FR ASM	TMA	S19	0232 83443507	RACK MT ASM	TMA	S5
0202 83442312	EASE FR ASM	TMA	S5	0232 83443507	RACK MT ASM	TMA	S23
0202 83442312	EASE FR ASM	TMA	S19	0233 83443509	RACK MT ASM	TMA	S5
0203 83442313	EASE FR ASM	TMA	S5	0233 83443509	RACK MT ASM	TMA	S23
0203 83442313	EASE FR ASM	TMA	S19	0234 83442501	COLOR OPT RACK MT(1066)	TMA	S5
0204 77658009	COLOR OPT CAB	TMA	S5	0234 83442501	COLOR OPT RACK MT(1066)	TMA	S28
0204 77658009	COLOR OPT CAB	TMA	S21	0235 83442502	COLOR OPT RACK MT(0545)	TMA	S5
0204 77658009	COLOR OPT CAB	TMA	S20	0235 83442502	COLOR OPT RACK MT(0545)	TMA	S28
0204 77658009	COLOR OPT CAB	TMA	S22	0236 83442503	COLOR OPT RACK MT(0547)	TMA	S5
0205 77658010	COLOR OPT CAB	TMA	S5	0236 83442503	COLOR OPT RACK MT(0547)	TMA	S28
0205 77658010	COLOR OPT CAB	TMA	S21	0237 83442505	COLOR OPT RACK MT(0547)	TMA	S5
0205 77658010	COLOR OPT CAB	TMA	S20	0237 83442505	COLOR OPT RACK MT(0547)	TMA	S28
0205 77658010	COLOR OPT CAB	TMA	S22	0238 83442506	COLOR OPT RACK MT(0625)	TMA	S5
0206 77658011	COLOR OPT CAB	TMA	S5	0238 83442506	COLOR OPT RACK MT(0625)	TMA	S28
0206 77658011	COLOR OPT CAB	TMA	S21	0239 83442507	COLOR OPT RACK MT(0627)	TMA	S5
0206 77658011	COLOR OPT CAB	TMA	S20	0239 83442507	COLOR OPT RACK MT(0627)	TMA	S28
0206 77658011	COLOR OPT CAB	TMA	S22	0240 83442508	COLOR OPT RACK MT(0561)	TMA	S5
0207 77658012	COLOR OPT CAB	TMA	S5	0240 83442508	COLOR OPT RACK MT(0561)	TMA	S28
0207 77658012	COLOR OPT CAB	TMA	S21	0241 83442509	COLOR OPT RACK MT(0649)	TMA	S5
0207 77658012	COLOR OPT CAB	TMA	S20	0241 83442509	COLOR OPT RACK MT(0649)	TMA	S28
0207 77658012	COLOR OPT CAB	TMA	S22	0242 83442510	COLOR OPT RACK MT(0650)	TMA	S5
0208 77658013	COLOR OPT CAB	TMA	S5	0242 83442510	COLOR OPT RACK MT(0650)	TMA	S28
0208 77658013	COLOR OPT CAB	TMA	S21	0243 83442511	COLOR OPT RACK MT(0545)	TMA	S5
0208 77658013	COLOR OPT CAB	TMA	S20	0243 83442511	COLOR OPT RACK MT(0545)	TMA	S28
0208 77658013	COLOR OPT CAB	TMA	S22	0244 83442527	COLOR OPT RACK MT(0847)	TMA	S5
0209 77658014	COLOR OPT CAB	TMA	S5	0244 83442527	COLOR OPT RACK MT(0847)	TMA	S28
0209 77658014	COLOR OPT CAB	TMA	S21	0245 83442513	COLOR OPT RACK MT(0562)	TMA	S5
0209 77658014	COLOR OPT CAB	TMA	S20	0245 83442513	COLOR OPT RACK MT(0562)	TMA	S28
0209 77658014	COLOR OPT CAB	TMA	S22	0246 83442514	COLOR OPT RACK MT(1063)	TMA	S5
0209 77658014	COLOR OPT CAB	TMA	S5	0246 83442514	COLOR OPT RACK MT(1063)	TMA	S28
0210 77658016	COLOR OPT CAB	TMA	S5	0246 83442514	COLOR OPT RACK MT(1063)	TMA	S5
0210 77658016	COLOR OPT CAB	TMA	S21	0247 83442504	COLOR OPT RACK MT(0418)	TMA	S28
0210 77658016	COLOR OPT CAB	TMA	S20	0247 83442504	COLOR OPT RACK MT(0418)	TMA	S5
0210 77658016	COLOR OPT CAB	TMA	S22	0248 83442516	COLOR OPT RACK MT(1088)	TMA	S5
0211 77658017	COLOR OPT CAB	TMA	S5	0248 83442516	COLOR OPT RACK MT(1088)	TMA	S28
0211 77658017	COLOR OPT CAB	TMA	S21	0249 75305707	TERMINATOR	TMA	S5
0211 77658017	COLOR OPT CAB	TMA	S20	0249 75305707	TERMINATOR	TMA	S29
0211 77658017	COLOR OPT CAB	TMA	S22	0251 75305703	TERMINATOR	TMA	S5
0211 77658017	COLOR OPT CAB	TMA	S5	0251 75305703	TERMINATOR	TMA	S29
0212 77658018	COLOR OPT CAB	TMA	S5	0252 75305704	TERMINATOR	TMA	S5
0212 77658018	COLOR OPT CAB	TMA	S21	0252 75305704	TERMINATOR	TMA	S29
0212 77658018	COLOR OPT CAB	TMA	S20	0252 75305704	TERMINATOR	TMA	S5
0212 77658018	COLOR OPT CAB	TMA	S22	0253 75305706	TERMINATOR	TMA	S5
0212 77658018	COLOR OPT CAB	TMA	S5	0253 75305706	TERMINATOR	TMA	S29
0212 77658019	COLOR OPT CAB	TMA	S21	0254 75305705	TERMINATOR	TMA	S5
0212 77658019	COLOR OPT CAB	TMA	S20	0254 75305705	TERMINATOR	TMA	S29
0212 77658019	COLOR OPT CAB	TMA	S22	0255 75778701	LINECORD	TMA	S5
0212 77658020	COLOR OPT CAB	TMA	S5	0256 75778701	LINECORD	TMA	S5
0212 77658020	COLOR OPT CAB	TMA	S21	0257 75778710	LINECORD	TMA	S5
0212 77658020	COLOR OPT CAB	TMA	S20	0258 75778721	LINECORD	TMA	S5
0212 77658020	COLOR OPT CAB	TMA	S22	0259 75892986	LINECORD	TMA	S5

ASSEMBLY - COMPONENT PARTS LIST

ITEM IDENT NO	DESCRIPTION	WHERE USED	SHEET	ITEM IDENT NO	DESCRIPTION	WHERE USED	SHEET
0260 75778717	POWER CORD	TMA	S5	0321 75740601	HZ RPM DR OPT	MOD	S7
0261 75795401	NAMEPLATE (942-H)	TMA	S5	0321 75740601	HZ RPM DR OPT	MOD	S6
0262 75795402	NAMEPLATE (BLNK)	TMA	S5	0322 75740602	HZ RPM DR OPT	MOD	S6
0263 75795404	NAMEPLATE (ASM)	TMA	S5	0322 75740602	HZ RPM DR OPT	MOD	S8
0264 75795405	NAMEPLATE (ASM)	TMA	S5	0322 75740602	HZ RPM DR OPT	MOD	S7
0265 75795406	NAMEPLATE	TMA	S5	0323 75740605	HZ RPM DR OPT	MOD	S7
0266 75795408	NAMEPLATE	TMA	S5	0323 75740605	HZ RPM DR OPT	MOD	S6
0267 75795309	I-O OPT CAB	TMA	S29	0327 77655001	PWR SUPPLY ASM	MOD	S6
0267 75795309	I-O OPT CAB	TMA	S29	0327 77655001	PWR SUPPLY ASM	MOD	S9
0268 75795307	I-O OPT CAB	TMA	S29	0329 77655002	PWR SUPPLY ASM	MOD	S6
0269 75795308	I-O OPT CAB	TMA	S29	0329 77655002	PWR SUPPLY ASM	MOD	S9
0269 75795308	I-O OPT CAB	TMA	S29	0332 75795214	I-O OPTION RACK MT	MOD	S6
0270 75897972	POWER CORD	TMA	S5	0334 75795216	I-O OPTION RACK MT	MOD	S6
0271 75897971	POWER CORD	TMA	S5	0335 75795215	I-O OPTION RACK MT	MOD	S6
0272 75778724	LINECORD	TMA	S5	0336 75795217	I-O OPTION RACK MT	MOD	S6
0273 77830537	UL LABEL	TMA	S5	0337 75795219	I-O OPTION RACK MT	MOD	S6
0274 77830538	LABEL - CSA	TMA	S5	0338 75795218	I-O OPTION RACK MT	MOD	S6
0275 77599402	PWR ASM (INPUT)	TMA	S30	0339 75795221	I-O OPTION RACK MT	MOD	S6
0275 77599402	PWR ASM (INPUT)	TMA	S5	0340 75795223	I-O OPTION RACK MT	MOD	S6
0276 83492901	PWR ASM (A.C. OPT)	TMA	S31	0341 75795213	I-O OPTION RACK MT	MOD	S6
0276 83492901	PWR ASM (A.C. OPT)	TMA	S5	0342 75795222	I-O OPTION RACK MT	MOD	S6
0280 77603741	ELCO CONN OPT	TMA	S5	0343 75795224	I-O OPTION RACK MT	MOD	S6
0282 94224651	LABEL - INFO	TMA	S5	0345 83444405	SPINDLE DRIVE ASM	MOD	S7
0282 94224651	LABEL-INFO	209	S21	0345 83444405	SPINDLE DRIVE ASM	MOD	S6
0283 83442525	COLOR OPT RACK MT (0994)	TMA	S5	0346 83474909	BRAKE & SPINDLE DR	MOD	S8
0283 83442525	COLOR OPT RACK MT (0994)	TMA	S28	0346 83474909	BRAKE & SPINDLE DR	MOD	S6
0284 83442524	COLOR OPT RACK MT (0995)	TMA	S5	0348 75729017	CABLE JUMPER	MOD	S6
0284 83442524	COLOR OPT RACK MT (0995)	TMA	S28	0349 94238907	LABEL CAUTION	MOD	S6
0285 83442517	COLOR OPT RACK MT (1092)	TMA	S5	0353 83437400	FILTER-AIR	MOD	S6
0285 83442517	COLOR OPT RACK MT (1092)	TMA	S28	0354 83437401	FILTER-AIR	MOD	S6
0286 83442518	COLOR OPT RACK MT (1108)	TMA	S5	0355 75898480	COVER ELECTRONICS	MOD	S6
0286 83442518	COLOR OPT RACK MT (1108)	TMA	S28	0356 83410562	GASKET STRIP	MOD	S6
0287 83442526	COLOR OPT RACK MT (0897)	TMA	S5	0356 83410562	GASKET STRIP	199-203	S19
0287 83442526	COLOR OPT RACK MT (0897)	TMA	S28	0356 83410562	GASKET STRIP	301	S11
0288 83442521	COLOR OPT RACK MT (1141)	TMA	S5	0357 83451201	STANDOFF	MOD	S6
0288 83442521	COLOR OPT RACK MT (1141)	TMA	S28	0358 83466001	BRUSH DRIVE ASM	MOD	S18
0289 83442520	COLOR OPT RACK MT (0607)	TMA	S5	0358 83466001	BRUSH DRIVE ASM	MOD	S6
0289 83442520	COLOR OPT RACK MT (0607)	TMA	S28	0359 75886347	IDENT PLATE	MOD	S6
0290 83442522	COLOR OPT RACK MT (1140)	TMA	S5	0359 75886347	IDENT PLATE	203	S19
0290 83442522	COLOR OPT RACK MT (1140)	TMA	S28	0360 77834644	COVER ELECTRONICS	MOD	S6
0291 83442523	COLOR OPT RACK MT (0547)	TMA	S5	0400 83456502	BASE DECK-MACHINED	301	S12
0291 83442523	COLOR OPT RACK MT (0547)	TMA	S28	0400 83456502	BASE DECK-MACHINED	301	S11
0292 77658035	COLOR OPT CAB	TMA	S5	0400 83456502	BASE DECK-MACHINED	301	S13
0292 77658035	COLOR OPT CAB	TMA	S22	0401 83451403	CARTRIDGE REC	301	S11
0292 77658035	COLOR OPT CAB	TMA	S21	0402 83494802	PLATE-AC CABLE	201	S19
0292 77658035	COLOR OPT CAB	TMA	S20	0403 75286701	SPINDLE	301	S12
0293 77658036	COLOR OPT CAB	TMA	S5	0404 75316008	ACTUATOR ASM	301	S16
0293 77658036	COLOR OPT CAB	TMA	S22	0404 75316008	ACTUATOR ASM	301	S15
0293 77658036	COLOR OPT CAB	TMA	S21	0404 75316008	ACTUATOR ASM	301	S12
0293 77658036	COLOR OPT CAB	TMA	S20	0405 75319001	MAGNET ASM	301	S12
0294 77658037	COLOR OPT CAB	TMA	S5	0406 95125324	LOCTITE	404	S16
0294 77658037	COLOR OPT CAB	TMA	S22	0406 95125324	LOCTITE	423	S17
0294 77658037	COLOR OPT CAB	TMA	S21	0407 75317102	TRANSDUCER-CONN ASM	301	S12
0294 77658037	COLOR OPT CAB	TMA	S20	0408 46317900	CAP-TRANSDUCER END	301	S12
0295 77658038	COLOR OPT CAB	TMA	S5	0409 83440314	FRONT PNL PACK	189	S28
0295 77658038	COLOR OPT CAB	TMA	S22	0410 77598300	PRACKET-CONNECTOR	301	S12
0295 77658038	COLOR OPT CAB	TMA	S21	0412 75749000	STANDOFF CLAMP	301	S13
0295 77658038	COLOR OPT CAB	TMA	S20	0413 75748903	CLAMP FILTER	301	S13
0296 77658039	COLOR OPT CAB	TMA	S5	0414 75308100	EXPANDER-FLOWER	301	S13
0296 77658039	COLOR OPT CAB	TMA	S22	0415 75749201	PRACKET-EXPANDER	301	S13
0296 77658039	COLOR OPT CAB	TMA	S21	0416 83442121	FRONT PNL PACK	188	S28
0296 77658039	COLOR OPT CAB	TMA	S20	0417 10127112	SCREW PAN FD MACH	780	S9
0297 77658040	COLOR OPT CAB	TMA	S5	0417 10127112	SCREW PAN HD MACH	345	S7
0297 77658040	COLOR OPT CAB	TMA	S22	0417 10127112	SCREW PAN HD MACH	779	S9
0297 77658040	COLOR OPT CAB	TMA	S21	0417 10127112	SCREW PAN HD MACH	346	S8
0297 77658040	COLOR OPT CAB	TMA	S20	0417 10127112	SCREW PAN HD MACH	485	S18
0298 77658041	COLOR OPT CAB	TMA	S5	0417 10127112	SCREW PAN HD MACH	301	S11
0298 77658041	COLOR OPT CAB	TMA	S22	0418 83442103	FRONT PNL PACK	247	S28
0298 77658041	COLOR OPT CAB	TMA	S21	0420 89293100	DISK FIXED, RECORDING	301	S12
0298 77658041	COLOR OPT CAB	TMA	S20	0421 75288900	CLAMP - DISC	301	S12
0299 77658042	COLOR OPT CAB	TMA	S5	0422 75797301	TRANSDUCER CAM ASM	301	S12
0299 77658042	COLOR OPT CAB	TMA	S20	0423 75315405	TRANSDUCER SCALE ASM	301	S17
0299 77658042	COLOR OPT CAB	TMA	S22	0423 75315405	TRANSDUCER SCALE ASM	301	S12
0300 77658043	COLOR OPT CAB	TMA	S21	0424 75276203	SPACER NYLON	301	S17
0300 77658043	COLOR OPT CAB	TMA	S5	0425 75797700	BAR EXPANSION MACHINE	301	S17
0300 77658043	COLOR OPT CAB	TMA	S20	0425 75797700	BAR EXPANSION MACHINE	301	S12
0300 77658043	COLOR OPT CAB	TMA	S22	0426 75885069	FUSE	346	S8
0300 77658043	COLOR OPT CAB	TMA	S21	0427 10126209	SCR-SOC HP CAP	301	S17
0301 83429802	HAWK COMMON PARTS	MOD	S6	0428 92815096	SCREW CAP SOC HD	404	S15
0301 83429802	HAWK COMMON PARTS	MOD	S13	0428 92815096	SCREW CAP SOC HD	301	S17
0301 83429802	HAWK COMMON PARTS	MOD	S12	0429 93788082	SCREW SELF LOCKING 4	301	S17
0301 83429802	HAWK COMMON PARTS	MOD	S11	0429 93788082	SCREW SELF LOCKING 4	301	S12
0307 75740123	HEAD OPTION	MOD	S29	0430 10127111	SCREW PAN HD MACH	528	S15
0307 75740123	HEAD OPTION	MOD	S6	0430 10127111	SCREW PAN HD MACH	776 778	S10
0308 75740119	HEAD OPTION	MOD	S29	0430 10127111	SCREW PAN HD MACH	301	S12
0308 75740119	HEAD OPTION	MOD	S6	0430 10127111	SCREW PAN HD MACH	1026	S31
0309 75740115	HEAD OPTION	MOD	S29	0430 10127111	SCREW PAN ED MACH	ALL OPTIONS	S20
0309 75740115	HEAD OPTION	MOD	S6	0430 10127111	SCREW PAN ED MACH	358 519	S18
0310 75740113	HEAD OPTION	MOD	S29	0431 10127113	SCREW PAN HD MACH	301	S12
0310 75740113	HEAD OPTION	MOD	S6	0431 10127113	SCREW PAN HD MACH	485	S18
0311 75740121	HEAD OPTION	MOD	S29	0431 10127113	SCREW PAN HD MACH	346	S8
0311 75740121	HEAD OPTION	MOD	S6	0431 10127113	SCREW PAN HD MACH	345	S7
0312 75740124	HEAD OPTION	MOD	S29	0431 10127113	SCREW PAN HD MACH	470	S14
0312 75740124	HEAD OPTION	MOD	S6	0432 10127121	SCREW PAN HD MACH	564 1007	S27
0313 75740117	HEAD OPTION	MOD	S29	0432 10127121	SCREW PAN ED MACH	519	S18
0313 75740117	HEAD OPTION	MOD	S6	0432 10127121	SCREW PAN HD MACH	713	S26
0314 75740118	HEAD OPTION	MOD	S29	0432 10127121	SCREW PAN HD MACH	749	S26
0314 75740118	HEAD OPTION	MOD	S6	0432 10127121	SCREW PAN HD MACH	301	S18
0315 75740114	HEAD OPTION	MOD	S29	0432 10127121	SCREW PAN HD MACH	301	S13
0315 75740114	HEAD OPTION	MOD	S6	0432 10127121	SCREW PAN HD MACH	301	S12
0320 75740606	HZ RPM DR OPT	MOD	S6	0432 10127121	SCREW PAN HD MACH	163 169	S21
0320 75740606	HZ RPM DR OPT	MOD	S8	0432 10127121	SCREW PAN HD MACH	301	S11
0320 75740606	HZ RPM DR OPT	MOD	S7	0433 92742201	SCREW PAN ED MACH	301	S13
0321 75740601	HZ RPM DR OPT	MOD	S8	0434 10127123	SCREW PAN ED MACH	713	S26

ASSEMBLY - COMPONENT PARTS LIST

ITEM IDENT NO	DESCRIPTION	WHERE USED	SHEET	ITEM IDENT NO	DESCRIPTION	WHERE USED	SHEET
0434 10127123	SCREW PAN HD MACH	301	S11	0455 75796902	DAMPER-OSCILLATION	301	S12
0434 10127123	SCREW PAN HD MACH	301	S13	0456 75313921	ADHESIVE RUBBER BASE	301	S12
0434 10127123	SCREW PAN HD MACH	275	S30	0457 75800400	PIN-ACTUATOR ALIGNMENT	301	S12
0434 10127123	SCREW PAN HD MACH	1026	S31	0458 10125106	NUT HEX MACH	301	S12
0434 10127123	SCREW PAN HD MACH	276	S31	0458 10125106	NUT HEX MACH	275	S30
0434 10127123	SCREW PAN HD MACH	227	S25	0458 10125106	NUT HEX MACH	564 1007	S27
0434 10127123	SCREW PAN HD MACH	564	S27	0458 10125106	NUT HEX MACH	776 778	S10
0435 10126255	SCR SOC HD	301	S17	0458 10125106	NUT HEX MACH	404	S15
0435 10126255	SCR SOC HD	301	S12	0458 10125106	NUT HEX MACH	713	S26
0436 77657375	CIRCUIT BRKR BOX	776 778	S10	0458 10125106	NUT HEX MACH	****	S20
0437 92815197	SCREW CAP SOC HD	301	S17	0459 92054227	CR BEARING BALL	416	S17
0437 92815197	SCREW CAP SOC HD	301	S12	0460 24547502	PLATE, WARNING	301	S11
0438 92815229	SCREW CAP SOC HD	301	S12	0460 24547502	PLATE, WARNING	301	S13
0439 10125602	WASHERS PLAIN	301	S17	0461 10126402	WASH EXT TOOTH LO	301	S13
0439 10125602	WASHERS PLAIN	519	S18	0461 10126402	WASH EXT TOOTH LO	199 200 202 203	S19
0439 10125602	WASHERS PLAIN	358	S18	0461 10126402	WASH EXT TOOTH LO	227	S25
0440 10125602	WASHERS PLAIN	404	S15	0461 10126402	WASH EXT TOOTH LO	776 778	S10
0441 10125605	WASHERS PLAIN	301	S11	0461 10126402	WASH EXT TOOTH LO	194 229 231 232	S23
0441 10125605	WASHERS PLAIN	776 778	S10	0461 10126402	WASH EXT TOOTH LO	237 243	S28
0441 10125605	WASHERS PLAIN	301	S13	0461 10126402	WASH EXT TOOTH LO	301	S12
0441 10125605	WASHERS PLAIN	519	S18	0462 51853006	CLAMP, CABLE ADHESIVE	301	S12
0441 10125605	WASHERS PLAIN	404	S15	0462 51853006	CLAMP, CABLE ADHESIVE	301	S13
0441 10125605	WASHERS PLAIN	301	S12	0463 75800602	RETRACT HARNESS ASM	301	S12
0441 10125605	WASHERS PLAIN	470	S14	0464 75739501	PRE-AMP HARNESS ASM	301	S12
0441 10125605	WASHERS PLAIN	485	S18	0465 75739701	SWITCH BOARD HARNESS	301	S12
0441 10125605	WASHERS PLAIN	779	S9	0466 92021004	PIN, DOWEL	301	S12
0441 10125605	WASHERS PLAIN	327 329	S9	0466 92021004	PIN, DOWEL	423	S17
0441 10125605	WASHERS PLAIN	346	S8	0466 92021004	PIN, DOWEL	301	S13
0441 10125605	WASHERS PLAIN	345	S7	0467 51853005	CLAMP	301	S13
0442 10125606	WASHFRS PLAIN	301	S13	0467 51853005	CLAMP	301	S12
0442 10125606	WASHERS PLAIN	301	S11	0468 10127125	SCREW PAN HD MACH	404	S16
0442 10125606	WASHERS PLAIN	194 195 229	S23	0468 10127125	SCREW PAN HD MACH	301	S13
0442 10125606	WASHERS PLAIN	275	S30	0468 10127125	SCREW PAN HD MACH	202 203	S19
0442 10125606	WASHERS PLAIN	276	S31	0468 10127125	SCREW PAN HD MACH	275	S30
0442 10125606	WASHERS PLAIN	ALL OPTIONS	S20	0469 95125305	LOCTITE GRADE C	526	S16
0442 10125606	WASHERS PLAIN	404	S16	0469 95125305	LOCTITE GRADE C	301	S12
0442 10125606	WASHERS PLAIN	404	S15	0469 95125305	LOCTITE GRADE C	404	S16
0442 10125606	WASHERS PLAIN	301	S18	0469 95125305	LOCTITE GRADE C	301	S17
0442 10125606	WASHERS PLAIN	193 227	S25	0470 75308012	CARD CAGE ASM	301	S14
0442 10125606	WASHERS PLAIN	ALL OPTIONS	S21	0470 75308012	CARD CAGE ASM	301	S11
0442 10125606	WASHERS PLAIN	228	S24	0471 92824097	SCREW CAP	423	S17
0443 10125607	WASHERS PLAIN	194 195 229 233	S23	0472 10127114	SCR PAN HD	301	S12
0443 10125607	WASHERS PLAIN	237 243	S28	0472 10127114	SCR PAN HD	301	S13
0443 10125607	WASHERS PLAIN	202 203	S19	0472 10127114	SCR PAN HD	301	S11
0443 10125607	WASHERS PLAIN	301	S12	0472 10127114	SCR PAN HD	470	S14
0443 10125607	WASHERS PLAIN	301	S13	0473 46334400	LABEL-CAUTION	301	S11
0443 10125607	WASHERS PLAIN	193 227	S25	0474 77658252	PLATE-IND PWR SUP	301	S11
0443 10125607	WASHERS PLAIN	228	S24	0475 77830539	IDENT PLATE-PRODUCT	301	S12
0443 10125607	WASHERS PLAIN	1026	S31	0476 75797100	STAND OFF	301	S17
0443 10125607	WASHERS PLAIN	275	S30	0476 75797100	STAND OFF	301	S12
0443 10125607	WASHERS PLAIN	776 778	S10	0477 10126215	SCREW CAP SOC HD	301	S17
0444 10125800	WASHERS SPR	301	S17	0477 10126215.	SCREW CAP SOC HD	301	S13
0444 10125800	WASHERS SPR	423	S17	0478 10125603	WASHERS PLAIN	528	S15
0445 10125804	WASHERS SPR LOCK	345	S7	0478 10125603	WASHERS PLAIN	404	S15
0445 10125804	WASHERS SPR LOCK	227	S25	0478 10125603	WASHERS PLAIN	779	S9
0445 10125804	WASHERS SPR LOCK	229 231-233	S23	0478 10125603	WASHERS PLAIN	301	S17
0445 10125804	WASHERS SPR LOCK	194 195	S23	0479 10125801	WASHERS SPR LOCK	528	S15
0445 10125804	WASHERS SPR LOCK	564 1007	S27	0479 10125801	WASHERS SPR LOCK	404	S16
0445 10125804	WASHERS SPR LOCK	228	S24	0479 10125801	WASHERS SPR LOCK	301	S15
0445 10125804	WASHERS SPR LOCK	267-269	S29	0479 10125801	WASHERS SPR LOCK	779	S9
0445 10125804	WASHERS SPR LOCK	713	S26	0479 10125801	WASHERS SPR LOCK	301	S12
0445 10125804	WASHERS SPR LOCK	749	S26	0479 10125801	WASHFRS SPR LOCK	346	S8
0445 10125804	WASHERS SPR LOCK	404	S16	0480 12211011	LUBRIPATE 30-AA	301	S12
0445 10125804	WASHERS SPR LOCK	404	S15	0481 77835140	GROUND STRAP	301	S11
0445 10125804	WASHERS SPR LOCK	519	S19	0481 77835140	GROUND STRAP	301	S13
0445 10125804	WASHERS SPR LOCK	301	S18	0482 10126403	WASH EXT TOOTH LO	301	S11
0445 10125804	WASHERS SPR LOCK	301	S17	0482 10126403	WASH EXT TOOTH LO	199-203	S19
0445 10125804	WASHERS SPR LOCK	301	S13	0482 10126403	WASH EXT TOOTH LO	301	S12
0445 10125804	WASHERS SPR LOCK	346	S8	0482 10126403	WASH EXT TOOTH LO	776 778	S10
0445 10125804	WASHERS SPR LOCK	267-269	S29	0483 75769100	LAEEL-SWITCH	301	S11
0445 10125804	WASHERS SPR LOCK	332 334-343	S6	0484 10127122	SCREW PAN HD MACH	776 778	S10
0446 10125803	WASHERS SPR LOCK	301	S11	0484 10127122	SCREW PAN HD MACH	194 229 231 232	S23
0446 10125803	WASHERS SPR LOCK	776 778	S10	0484 10127122	SCREW PAN HD MACH	332 334-343	S6
0446 10125803	WASHERS SPR LOCK	485	S18	0484 10127122	SCREW PAN HD MACH	237 243	S28
0446 10125803	WASHERS SPR LOCK	301	S12	0484 10127122	SCREW PAN HD MACH	227	S25
0446 10125803	WASHERS SPR LOCK	346	S8	0485 83451602	MAGNETIC SENSOR ASM	301	S11
0446 10125803	WASHERS SPR LOCK	779	S9	0485 83451602	MAGNETIC SENSOR ASM	301	S18
0446 10125803	WASHERS SPR LOCK	780	S9	0485 83451602	MAGNETIC SENSOR ASM	267-269	S29
0446 10125803	WASHERS SPR LOCK	519	S18	0486 75808261	FRONT PANEL	228	S24
0446 10125803	WASHERS SPR LOCK	526	S16	0487 94655401	PIN, HITCH	301	S12
0446 10125803	WASHERS SPR LOCK	470	S14	0488 83415603	LABEL	404	S15
0446 10125803	WASHERS SPR LOCK	301	S15	0488 83415607	LABEL	301	S11
0446 10125803	WASHERS SPR LOCK	346	S8	0485 83451602	MAGNETIC SENSOR ASM	301	S11
0446 10125803	WASHERS SPR LOCK	779	S7	0485 83451602	MAGNETIC SENSOR ASM	301	S18
0446 10125803	WASHERS SPR LOCK	780	S9	0485 83451602	MAGNETIC SENSOR ASM	267-269	S29
0446 10125803	WASHERS SPR LOCK	519	S18	0486 75808261	FRONT PANEL	228	S24
0446 10125803	WASHERS SPR LOCK	526	S16	0487 94655401	PIN, HITCH	301	S12
0446 10125803	WASHERS SPR LOCK	470	S14	0488 83415603	LABEL	404	S15
0446 10125803	WASHERS SPR LOCK	301	S15	0488 83415607	LABEL	301	S11
0447 10126228	SCR HEX SOC RD	301	S17	0489 83415607	LABEL	301	S12
0447 10126228	SCR HEX SOC RD	776 778	S10	0490 75312751	SPC-EPOXY ADHESIVE	301	S17
0448 10125805	WASHERS SPR LOCK	713	S26	0491 83451700	STRAP-GRND, PWR SPLY	301	S11
0448 10125805	WASHERS SPR LOCK	301	S12	0492 95694202	SPACER-BRASS	301	S11
0448 10125805	WASHERS SPR LOCK	301	S11	0493 10127146	SCREW PAN HD MACH	301	S12
0449 10125805	WASHERS SPR LOCK	564 1007	S27	0493 10127146	SCREW PAN HD MACH	301	S11
0449 10125105	NUT HEX MACH	346	S8	0494 92615012	WASHER-SHOULDER FIBE	301	S11
0449 10125105	NUT HEX MACH	345	S7	0495 83482400	SECTOR RING ASM 8	301	S17
0449 10125105	NUT HEX MACH	470	S14	0495 83482400	SECTOR RING ASM 8	301	S12
0449 10125105	NUT HEX MACH	***	S20	0496 83433510	CIRCUIT BRKR	776 778	S10
0449 10125105	NUT HEX MACH	301	S11	0497 95643203	CONNECTOR	776 778	S10
0449 10125105	NUT HEX MACH	199-203	S19	0498 95596604	BUSHING	199-203	S19
0449 10125105	NUT HEX MACH	301	S13	0499 95596601	BUSHING	201	S19
0450 75792800	IDLER	416	S17	0501 83457101	ELOWER ASM	301	S13
0451 75806504	WASHER-REDUCED	ALL OPTIONS	S20	0502 75802302	VOLTAGE ADJUST PLUG	301	S11
0451 75806504	WASHER-REDUCED	301	S17	0503 75793803	SENSOR CABLE ASM	301	S13
0451 75806504	WASHER-REDUCED	301	S13	0504 93115287	SCREW PAN	282-296 298-300	S20
0451 75806504	WASHER-REDUCED	519	S18	0504 93115287	SCREW PAN	164-168 204-226	S20
0452 95643248	TERM INSULATOR	776 778	S10	0504 93115287	SCREW PAN	194 229 231 232	S23
0453 51568605	WASHER	301	S11	0504 93115287	SCREW PAN	301	S13
0454 92742222	SCREW PH HD MACH	301	S11	0504 93115287	SCREW PAN	237 243	S28

ASSEMBLY - COMPONENT PARTS LIST

ITEM IDENT NO	DESCRIPTION	WHERE USED	SHEET	ITEM IDENT NO	DESCRIPTION	WHERE USED	SHEET
0505 83445600	MOUNT-SENSOR	301	S13	0581 93115168	SCR HEX SOC HD	301	S17
0506 83445900	BRACKET-STATIC GRND	301	S13	0582 83478302	SLIDE ASM LH	1007	S27
0507 40054700	SPRING STATIC GROUND	301	S13	0582 83478302	SLIDE ASM LH	713	S26
0508 75793802	SENSOR CABLE ASM	485	S18	0583 92815097	SCREW CAP SOC HD	526	S16
0509 73669601	LAEEL-CONFIG	301	S11	0585 83443601	KNOB ASM	713	S26
0510 10126401	WASH EXT TOOTH LO	345	S7	0585 83443601	KNOB ASM	564 1007	S27
0510 10126401	WASH EXT TOOTH LO	301	S13	0586 93344096	SCREW NYLON	526	S16
0510 10126401	WASH EXT TOOTH LO	199-203	S19	0587 93071163	SCREW SET SOC HD	526	S16
0510 10126401	WASH EXT TOOTH LO	****	S20	0587 93071163	SCREW SET SOC HD	485	S18
0510 10126401	WASH EXT TOOTH LO	346	S8	0588 83475401	POS TRANSDUCER SL-CO	526	S16
0510 10126401	WASH EXT TOOTH LO	404	S15	0589 75314202	SCALE-END	526	S16
0511 92021001	PIN-DOWEL .125X.38	301	S13	0590 10127144	SCREW PAN HD	713	S26
0512 83425622	PANEL-CONTROL CAB	168	S22	0590 10127144	SCREW PAN HD	564 1007	S27
0513 92021093	PIN-DOWEL	301	S12	0591 77617072	SCREW CAP	423	S17
0514 75312013	SPEC TAPE	301	S12	0593 10127311	SCREW SLOTTED	526	S16
0514 75312013	SPEC TAPE	****	S20	0594 75806501	WASHER-REDUCED O.D.	526	S16
0515 75884887	BRKT ASM L.H.	228	S24	0595 83494400	CHANNEL-MODULE	526	S16
0516 72959300	LABEL-FIELD CHANGE L	301	S11	0596 75806503	WASHER	526	S16
0517 75886381	LUBRICANT	301	S17	0596 75806503	WASHER	327 329	S9
0518 10125030	SCREW HEX HD	199-203	S19	0596 75806503	SCR PAN HD	404	S15
0519 83457902	PACKLOCK ASM	301	S18	0597 10125015	CAP-COIL MACHINED	527	S16
0519 83457902	PACKLOCK ASM	301	S12	0599 94258205	WIRE-MAGNET	527	S16
0520 75739105	RECEIVER HARNESS ASM	301	S12	0600 95280500	EPOXY, IMPREGNATING	527	S16
0521 83450500	BRACKET-SWITCH BD	301	S12	0601 75786000	INSULATION MAT	527	S16
0522 10125920	SCREW FL HD	301	S18	0602 93355001	MARKER, WIRE NUMBER 1	527	S16
0523 92196031	NUT-SPEED	301	S12	0603 75803502	STRIP-PRESSURE	527	S16
0524 95649726	GROMMET-BLOWER MTG	301	S13	0604 77612607	OPTICAL SWITCH ASM	528	S15
0525 75316104	FRAME-ACTUATOR MACH	404	S15	0605 83447401	PLATE-DETECTOR MTG	528	S15
0526 83475501	CARRIAGE ASM	404	S16	0606 83447500	ADAPTER-HORIZ POS	528	S15
0527 75319603	COIL ASM	404	S16	0607 83442178	FRONT PNL RACK PAINT	289	S28
0528 83447302	DETECTOR ASM-END TR	404	S15	0608 93211009	WASHER PLAIN 10	713	S26
0529 75317900	SCALE-VERNIER FIXED	404	S15	0608 93211009	WASHER PLAIN 10	564 1007	S27
0530 75797400	BRACKET-BUMPER, CAST	404	S15	0609 75738610	RESISTOR MODULE 1K	251	S29
0531 75317501	STRIP-BACKUP ACTUATOR	404	S15	0610 93109322	SPACER	713	S26
0532 75884902	BRKT ASM R.H.	228	S24	0610 93109322	SPACER	564 1007	S27
0533 75317200	CAM-HEAD ARM	404	S15	0611 75738607	RESISTOR MODULE 330	252 254	S29
0534 93623000	BUMPER, RUBBER	404	S15	0612 10127346	SCREW	713 749	S26
0534 93623000	BUMPER, RUBBER	199-203	S19	0612 10127346	SCREW	564 1007	S27
0535 73228200	PLATE-ARM CLAMP	404	S16	0613 75315501	SCALE-FLEX MOUNT	423	S17
0536 75296101	WASHER PHENOLIC	404	S16	0614 75315600	MOUNT-TRANSDUCER	423	S17
0536 75296101	WASHER PHENOLIC	404	S15	0615 75315901	POS TRANS SCALE	423	S17
0537 75296201	SPACER PHENOLIC	404	S16	0616 75797001	PASE TRANSDUCER MOUNT	423	S17
0538 73555300	STRIP-BACKUP	404	S16	0617 75797200	PIN XDUCFR ALIGNMENT	423	S17
0539 75797500	LEAD-FLEX COIL PR	404	S15	0618 83436601	FENDER CABLE	564 1007	S27
0539 75797500	LEAD-FLEX COIL PR	404	S16	0618 83436601	FFENDER CABLE	713	S26
0540 73555101	INSULATOR-FLEX LEAD	404	S15	0618 83436601	FENDER CABLE	749	S26
0540 73555101	INSULATOR-FLEX LEAD	404	S16	0619 15003309	WIRE 18 WHITE	776 778	S10
0541 92549007	SW SUBMINIATURE BASI	404	S15	0620 17620324	CABLE TIE	776 778	S10
0542 75800502	COIL POWER HARNESS	404	S15	0621 10126208	SCREW BUTTON HD	423	S17
0543 10127169	SCREW PAN HD MACH	404	S15	0622 77610636	SCREW, MACH, SELF-LOCK	227	S25
0544 10126213	SCREW PAN HD MACH	404	S15	0622 77610636	SCREW SELF LK	301	S11
0545 83442106	FRONT PNL RACK PAINT	235 243	S28	0623 93651029	WASHER, FELLEVILLE	423	S17
0546 10127124	SCREW PAN HD MACH	713	S26	0624 94277416	TIE WRAP	404	S16
0546 10127124	SCREW PAN HD MACH	749	S26	0625 83466801	PNL CNTL RACK SLKSCN	238	S28
0546 10127124	SCREW PAN HD MACH	ALL OPTIONS	S20	0626 95010890	GREASE-LUBRIPALATE	423	S17
0546 10127124	SCREW PAN HD MACH	404	S15	0627 83442123	FRONT PNL RACK PAINT	239	S28
0546 10127124	SCREW PAN HD MACH	301	S12	0628 77832201	COMP FRKT	301	S17
0546 10127124	SCREW PAN HD MACH	229 231 232	S23	0628 77832201	COMP FRKT	301	S12
0546 10127124	SCREW PAN HD MACH	227	S25	0629 75303204	CARD CAGE	470	S14
0546 10127124	SCREW PAN HD MACH	564 1007	S27	0630 75740002	STOP-CIRCUIT POAPD	470	S14
0547 83442109	FRONT PNL RACK	236 237 291	S28	0631 75751801	GUIDE-CIRCUIT	470	S14
0548 83425143	PNL TOP CVR REAR	222	S22	0632 75792602	COVER MOTHER	470	S14
0549 92815160	SCREW CAP SOC HD	404	S15	0633 75799402	CLIP-HEAD CABLE, QAL	470	S14
0550 92815193	SCREW CAP SOC HD	404	S16	0634 83445400	GUIDE WIRE	470	S14
0551 92815195	SCREW CAP SOC HD	404	S15	0635 75739900	COVER-CARD CAGE	470	S14
0552 83443743	PNL TOP CVR RH	222	S22	0636 95655501	SCREW SHIFT METAL	470	S14
0553 75319801	VELOCITY TRANSDUCER	407	S12	0637 77832202	BRACKET	301	S12
0554 83443843	PNL TOP CVR LH	222	S22	0638 95655500	SCREW SHEET METAL	470	S14
0555 75887562	SPACER	301	S13	0639 10126103	WASH INT TOOTH LK	358	S18
0556 10126101	WASH INT TOOTH LK	776 778	S10	0639 10126103	WASH INT TOOTH LF	327 329	S9
0557 10126100	WASH INT TOOTH LK	404	S16	0639 10126103	WASH INT TOOTH LK	1026	S31
0557 10126100	WASH INT TOOTH LK	358	S18	0639 10126103	WASH INT TOOTH LK	ALL OPTIONS	S20
0557 10126100	WASH INT TOOTH LK	526	S16	0640 75293953	CONNECTOR HOUSING	407	S12
0558 83444701	JUMPER ASM	267-269	S29	0641 75803301	CLAMP-CAGE COVER	470	S14
0559 75738604	RESISTOR MODULE 110	251 252	S29	0642 75803500	STRIP-CORK RUBBER	470	S14
0560 83451810	INSULATOR	228	S24	0643 75803501	STRIP-CORK RUBBER	470	S14
0560 83451810	INSULATOR	163 169 297	S20	0644 75802700	LABEL-CARD LOCATION	470	S14
0560 83451810	INSULATOR	301	S13	0645 83479600	STOP-KEYED INJ MOLD	470	S14
0561 83442143	FRONT PNL RACK PAINT	240	S28	0646 75803503	STRIP-PRESSURF	470	S14
0562 77834340	FRONT PNL RACK PAINT	245	S28	0647 83451814	INSULATOR	470	S14
0563 83490600	CLIP-CLAMP	404	S16	0649 83442166	FRONT PNL RACK PAINT	241	S28
0564 83447808	INSTLN KIT-RACK MT	194	S23	0650 83442154	FRONT PNL RACK PAINT	242	S28
0564 83447808	INSTLN KIT-RACK MT	194	S27	0651 94862902	GROMMFT STRIP	780	S9
0565 83493900	BRACKET-CHANNEL	404	S15	0652 75740701	PPUSH MOTOR ASM	358	S18
0566 83493800	CHANNEL-UPPER	404	S15	0653 83466100	PRUSH DRIVE MOUNT	358	S18
0567 83494200	CLAMP-WIRE	404	S15	0654 83466200	BRUSH HOLDER	358	S18
0568 83494001	CLAMP-SPRAL GUIDE	404	S15	0655 83466300	DELAY AR	358	S18
0569 83454400	STIFFNER	404	S15	0656 83466400	BFUSH HOLDER STUD	358	S18
0569 83454400	STIFFNER	404	S16	0657 40024501	PPUSH, DISK	358	S18
0570 83494500	CLAMP-CHANNEL	404	S16	0658 40024502	ERUSH, DISK	358	S18
0571 10127105	SCREW PAN HD MACP	776 778	S10	0659 36159806	SWITCH-PIVOT LEVER	358	S18
0571 10127105	SCREW PAN HD MACH	404	S16	0660 92742011	SCREW M-C PAN HD	358	S18
0571 10127105	SCREW PAN HD MACH	404	S15	0661 92196007	NUT-SPFED	713	S26
0572 10127102	SCREW PAN HD	404	S15	0661 92196007	NUT-SPFED	749	S26
0573 83478301	SLIDE ASM RH	1007	S27	0661 92196007	NUT-SPFED	564 1007	S27
0573 83478301	SLIDE ASM RH	713	S26	0661 92196007	NUT-SPFED	275	S30
0574 00863701	CLAMP CABLE	528	S15	0661 92196007	NUT-SPFED	1026	S31
0575 75316600	CARRIACE ACTUATOR	526	S16	0662 10125919	SCREW FLAT HD	358	S18
0576 73197400	SPR-PEARING ASM	526	S16	0663 83479501	LATCH ASM	713	S26
0577 73584400	BASE-ARM CLAMP	526	S16	0663 83479501	LATCH ASM	564 1007	S27
0578 73197000	SPRING BEARING	526	S16	0664 93211008	WASHER	713	S26
0579 75317700	SCALE-VERNIER MOVING	526	S16	0664 93211008	WASHER	564 1007	S27
0580 92054251	PALL BEARING	526	S16	0664 93211008	WASHER	227	S25

ASSEMBLY - COMPONENT PARTS LIST

ITEM IDENT NO	DESCRIPTION	WHERE USED	SHEET	ITEM IDENT NO	DESCRIPTION	WHERE USED	SHEET
0665 83484500	MOUNT-SLIDE	713	S26	0720 93522008	PLUG-SNAF BUTTON	200	S19
0665 83484500	MOUNT-SLIDE	564	S27	0722 92932206	SCR FLAT HD SST	199-203	S19
0665 83484500	MOUNT-SLIDE	227	S25	0723 83451806	INSULATOR ADFESIVE	237 243	S28
0666 93529003	WASHER, SPRING WAVE	358	S18	0723 83451806	INSULATOR ADFEACK	228	S24
0667 83467100	ERUSH INDICATOR	358	S18	0723 83451806	INSULATOR ADFEATIVE	229 231 232	S23
0668 10126212	SCP FEX SOC HD CAP	404	S16	0723 83451806	INSULATOR ADFEATIVE	194 195	S23
0668 10126212	SCP FFX SOC FD CAP	358	S18	0723 83451806	INSULATOR ADH EACK	227	S25
0668 10126212	SCP HEX SOC HD CAP	423	S17	0724 51669404	TEFINAL	231	S23
0669 83484602	MOUNT-SLIDE KFYFD	564 1007	S27	0725 83456900	AIR INTAKE	192	S25
0669 83484602	MOUNT-SLIDE KEYFD	713	S26	0726 83444900	SHIM PLATE	199-203	S19
0669 83484602	MOUNT-SLIDE KYFED	749	S26	0727 83457001	AIR INTAKE	228	S24
0669 83484602	MOUNT-SLIDE KEYFD	227	S25	0727 83457001	AIR INTAKE	194 195 229 233	S23
0670 83457201	ARM LOCK MOLDFR	519	S18	0727 83457001	AIR INTAKE	237 243	S28
0671 83457302	PACK LOCK FRACRFT	519	S18	0727 83457001	AIR INTAKF	193 227	S25
0672 75736608	RESISTOR MODULE	254	S29	0728 77832300	CLAMP	202	S19
0673 77598701	SPRING ARM	519	S18	0729 10127128	PAN HD MACH SCR	237 243	S28
0674 77598501	SWITCH SUPERMINIATURE	519	S18	0729 10127128	PAN HEAD MACH SCREW	228	S24
0675 94357804	SOLFNOID DC	519	S18	0729 10127128	PAN HD MACH SCP	194 195 229 233	S23
0677 83485700	STAELILIZER	227	S25	0729 10127128	PAN HEAD MACH SCPFW	192 193 227	S25
0677 83485700	STAELILIZER	564	S27	0730 75722910	FELT-DRIVE NEOPRENE	323	S7
0677 83485700	STAELILIZER	713	S26	0730 75722910	FELT-DRIVE NEOPRFNE	323	S8
0678 75284701	HANDLE PULL RACK	194 195	S23	0731 77599708	PULLEY-DFIVE MOTOR	323	S7
0678 75284701	HANDLE-PULL RACK	227	S25	0731 77599708	PULLEY-DRIVE MOTOR	323	S8
0678 75284701	HANDLE-PULL RACK	229 231 232	S23	0733 77613625	COLLAR-MOTOR PULLEY	320-323	S8
0678 75284701	HANDLF PULL RACK	237 243	S28	0733 77613625	COLLAR-MOTOR PULLEY	320-323	S7
0679 18607916	SCREW THE CUTTING	519	S18	0734 75891472	PLATE-DYNAMIC MOTOR	346	S8
0680 77617079	SCREW CAP	301	S12	0734 75891472	PLATE-DYNAMIC NOTOR	345	S7
0680 77616079	SCREW CAP	423	S17	0735 83456001	DRIVE MTR HARNESS AS	345	S7
0681 93530436	ROLL PIN	519	S18	0736 94255105	CAPACITOR-MOTOR AC 2	345	S7
0682 75779867	SPRING	519	S18	0736 94255105	CAPACITOR-MOTOR AC 2	346	S8
0683 83425343	DOOR ACC	222	S22	0737 94260500	ACCESSORIES-CAPACITOR	345	S7
0684 75738654	PESISTOP MODULE	220	S29	0737 94260500	ACCESSORIES-CAPACITOR	346	S8
0685 83444200	ANGLE-FRT PANEL	237 243	S28	0738 94260503	ACCESSORIES-CAPACITOR	345	S7
0685 83444200	ANGLE-FRT PANEL	194 195	S23	0738 94260503	ACCESSORIES-CAPACITOR	346	S8
0685 83444200	ANGLE-FRT PNL	227	S25	0739 10125747	SCR FLAT HD	345	S7
0685 83444200	ANGLE-FRT PANEL	229 231 232	S23	0739 10125747	SCR FLAT FD	346	S8
0686 10127120	SCREW PAN ID MACH	267-269	S29	0740 10125725	SCR FLAT HD	345	S7
0686 10127120	SCREW PAN HD MACH	237 243 247	S28	0740 10125725	SCR FLAT HD	346	S8
0686 10127120	SCREW PAN HD MACH	194 195	S23	0741 77604000	PRE-FILTF-FILTER	237 243	S28
0686 10127120	SCREW PAN HD MACH	****	S20	0741 77604000	PRE-FILTF-FILTFR	192 193 227	S25
0686 10127120	SCREW PAN HD MACH	519	S18	0741 77604000	PRE-FILTER-FILTER	228	S24
0686 10127120	SCREW PAN HD MACH	229 231 232	S23	0741 77604000	PRE-FILTER-FILTER	229 231 233	S23
0686 10127120	SCREW PAN HD MACH	227	S25	0742 75284702	HANDLE-PULL RACK	228	S24
0686 10127120	SCREW PAN HD MACH	228	S24	0743 83457401	TC SPINDLE FARN ASM	345	S7
0687 92172000	PUMPER RUBPF	237 243	S28	0744 77612677	SW SOLID STATE	345	S7
0687 92172000	PUMPF, RUFPER	228	S24	0744 77612677	SW SOLID STATE	346	S8
0687 92172000	PUMPER RUBPF	229 231 232	S23	0745 83457601	AC SPINDLE FARN ASM	345	S7
0687 92172000	EUMPER RUBPF	194 195	S23	0746 00845503	GPMFMET-CATERPILLAR	346	S8
0688 83445709	FRAME CARINET	199 200	S19	0746 00845503	GPMFMET-CATERPILLAR	345	S7
0689 75884516	SHOCK MOUNT-LORD	199-203	S19	0748 92602002	CLAMP, CABLE-NYLON	327 329	S9
0690 73469100	PIVOT-COVER	199-203	S19	0748 92602002	CLAMP, CABLE-NYLON	345	S7
0691 73469101	PIVOT-COVER	199-203	S19	0749 83447806	INSTLN KIT-RACK MT	230	S26
0692 93697013	IR CABLEFL	199-203	S19	0749 83447806	INSTLN KIT-RACK MT	228	S24
0693 93006033	NUT JAM HEX	199-203	S19	0750 77830734	LAEFL-SWITCH	301	S11
0694 75730805	CAPLE ASM GROUND	237 243	S28	0751 94309802	POD, TEFINAL INSULAT	346	S8
0694 75730805	CAPLE ASM GROUND	199-203	S19	0751 94309802	POD, TEFINAL INSULAT	345	S7
0694 75730805	CAPLE ASM GROUND	192 193 227	S25	0752 93154948	TUPING, SHRINKING	345	S7
0694 75730805	CAPLE ASM GROUND	194 229 231 232	S23	0753 77655743	PNL END	222	S22
0696 83444100	GROUND WIPER	199-203	S19	0754 22940902	RELAY SOCKET	346	S8
0698 93592200	SCP TFG HEX PNL	199-203	S19	0755 83455800	INSULATOR MOTHER COV	470	S14
0698 93592200	SCP TFG LFX PNL	275	S30	0756 84666903	TERMINAL STRIP	346	S8
0698 93592200	SCP TPC HFX PNL	276	S31	0757 83474701	EPAKE MOTOR ASM	346	S8
0700 83478643	PNL SIDE	222	S22	0758 83474702	PAP-LOCKING	346	S8
0701 10125108	NUT HEX MACH	199-203	S19	0759 83474800	FLOCK-SPACER	346	S8
0701 10125108	NUT HEX MACH	564 1007	S27	0760 77612660	RFLY	346	S8
0701 10125108	NUT HEX MACH	713	S26	0761 22940903	SPRING-RETAINERF SOCK	346	S8
0701 10125108	NUT HEX MACH	275	S30	0762 95582007	RFCT BRIDGE	346	S8
0701 10125108	NUT HEX MACH	276 1026	S31	0763 94245602	CONTACT CRIMP INSERT	407	S12
0702 10125303	NUT FFAGON	199-203	S19	0764 10127106	SCPFW PAN HD MACH	346	S8
0703 75884517	SPOCK MOUNT-LORD	199-203	S19	0765 77834781	WARNING LABFL	301	S11
0704 10125301	NUT FFAGON	199-203	S19	0766 95655503	SCREW	346	S8
0705 83492800	PLATE-COVFP	199-203	S19	0767 83484400	QUADPAACLIP	301	S11
0706 94281426	BR CABLE GROUND	276	S31	0768 75738655	PESISTOR MODULE	330 249 253	S29
0706 94281426	IR CABLEL, GROUND	199-203	S19	0769 83443734	PNL TOP CVR RH	297	S22
0707 83474601	FIRE-STOP, REAR	199-203	S19	0770 92602003	CLAMP, CABLE-NYLON	346	S8
0708 24534709	SLEEVING	346	S8	0771 83467502	A.C. BRAKE HARNESS	346	S8
0709 92723234	SCREW BUTTON SOC FD	164-168 204-209	S21	0772 83467701	D.C. BRAKE HARNESS	346	S8
0709 92723234	SCCPF BUTTON SOC HD	199-203	S19	0773 50241001	DIODE SILICON	346	S8
0709 92723234	SCREW BUTTON SOC HD	211-213 215-226	S21	0774 75808549	CAP 100V 10R .10UF	346	S8
0709 92723234	SCREW BUTTON SOC HD	292-300	S21	0775 92512142	FESISTOF	346	S8
0710 77831951	FIRE-STOP, FRONT	199-203	S19	0776 83484110	POWER SUPPLY CHASSIS A	329	S9
0711 10127347	SCREW PAN HD MACH	228	S24	0776 83484110	POWER SUPPLY CHASSIS A	329	S10
0711 10127347	SCREW PAN HD MACH	194 195 229	S23	0778 83484109	POWER SUPPLY CHASSIS A	327	S10
0711 10127347	SCREW PAN HD MACH	227	S25	0778 83484109	POWER SUPPLY CHASSIS A	327	S9
0711 10127347	SCREW PAN HD MACH	****	S20	0779 83475105	PWR PD ASM PIGGYBACK	327 329	S9
0712 10126104	WASH INT TOOTH LK	ALL OPTIONS	S20	0780 83484002	COVER ASM -PWR SPY 2	327 329	S9
0712 10126104	WASH INT TOOTH LK	275	S30	0781 83443834	PNL TOP CVR LH	297	S22
0712 10126104	WASH INT TOOTH LK	227	S25	0782 93747025	RECFCPTACLF, SLIDE ON	776 778	S10
0712 10126104	WASH INT TOOTH LK	564 1007	S27	0783 92980003	WASHER, FIBPF	779	S9
0712 10126104	WASH INT TOOTH LK	228	S24	0783 92980003	WASHER, FIPER	327 329	S9
0712 10126104	WASH INT TOOTH LK	276	S31	0784 10127115	SCREW PAN HD MACH	327 329	S9
0712 10126104	WASH INT TOOTH LK	194 195	S23	0785 83478654	PNL SIDE	297	S22
0712 10126104	WASH INT TOOTH LK	776 778	S10	0786 83425634	PANEL CNTL	297	S22
0712 10126104	WASH INT TOOTH LK	229 231 232	S23	0787 92742176	SCREW X-C PAN HD	327 329	S9
0712 10126104	WASH INT TOOTH LK	237 243	S28	0788 93342193	SCPFW	163 169 297	S20
0712 10126104	WASH INT TOOTH LK	713	S26	0788 93342193	SCPFW	195	S23
0712 10126104	WASH INT TOOTH LK	749	S26	0789 75722930	BELT-DRIVE NEOPRENE	321	S7
0713 83447805	INSTLN KIT-RACK MT	229 231	S26	0789 75722930	BELT-DRIVE NEOPRENE	321	S8
0713 83447805	INSTLN KIT-RACK MT	195 229 231 233	S23	0790 77599706	PULLEY-DRIVE MOTOR	321	S7
0714 75804800	AIR FILTER	199-203	S19	0790 77599706	PULLEY-DRIVE MOTOR	321	S8
0715 77599600	GASKET FLOWER CAP	199-203	S19	0791 75722940	FELT-DRIVE NEOPREN	322	S7
0716 83478200	COVER	199-203	S19	0791 75722940	FELT-DRIVE NEOPRENE	322	S8
0717 83478700	CLAMP	200 201	S19	0792 77599705	PULLEY-DRIVE MOTOR	322	S7
0718 83478701	CLAMP	202 203	S19	0792 77599705	PULLEY-DRIVE MOTOR	322	S8
0719 83494801	CLAMP, AC CABLE	199-203	S19	0793 75722920	FELT-DRIVE NEOPENNF	320	S8

ASSEMBLY - COMPONENT PARTS LIST

ITEM IDENT NO	DESCRIPTION	WHERE USED	SHEET	ITEM IDENT NO	DESCRIPTION	WHERE USED	SHEET
0793 75722920	FELT-DRIVE NEOPPENE	320	S7	0874 77657726	PANEL END FRONT BLUF	208	S22
0794 77599707	PULLEY-DRIVE MOTOP	320	S7	0875 83425626	PANEL-CNTL CAB BLUF	208	S22
0794 77599707	PULLEY-DRIVE MOTOR	320	S8	0876 83425662	PANEL-CONTROL CAB PT	216	S22
0795 83451104	UPPER SENSOR HOLDER	485	S18	0877 83425134	PNL TOP COVER REAP P	297	S22
0796 83450000	PLATE-SENSOR MTG	485	S18	0880 83425334	DOOR-ACCESS PTD WHIT	297	S22
0797 95660403	TAPE	776 778	S10	0882 77657734	PANEL END FT	297	S22
0798 94337703	TUBING HEAT SRNK	407	S12	0884 77657838	PNL END REAR PTD WHI	297	S22
0799 83443704	PNL TOP CVR RH	298 299	S22	0885 75311905	HOLDER JOE TICKET	169 297	S21
0800 83443804	PNL TOP CVR LH	298 299	S22	0886 83443768	PNL TOP CVR RH	221 293	S22
0801 83478604	PNL SIDE	298 299	S22	0887 83443868	PNL TOP CVR	221 293	S22
0802 83425106	PANFL-TOP COVER RFAR	204 209 224	S22	0888 83425367	DOOR ACC	221 293	S22
0803 83443703	PNL TOP CVR RH	168	S22	0889 77830705	INSULATOR	749	S26
0803 83443703	PNL TOP COVER RH PTD	204 206 209 224	S22	0889 77830705	INSULATOR	713	S26
0803 83443703	PNL TOP COVER RH PTD	226	S22	0889 77830705	INSULATOR	564	S27
0804 83443803	PNL TOP CVR LH PTD	168 204 206 209	S22	0889 77830705	INSULATOR	227	S25
0804 83443803	PNL TOP CVR LH PTD	224 226	S22	0890 83425643	PNL CONTROL	222	S22
0805 83425306	DOOR-ACCESS PAINTED	204 209 224	S22	0891 95125322	LOCTITE	301	S17
0806 83478603	PNL SIDE PTD LH GRAY	168 204 206 209	S22	0892 83495300	TUNNEL WIND	779	S9
0806 83478603	PNL SIDE PTD LH GRAY	224 226	S22	0893 10125704	SCP FLT ED	779	S9
0807 77657706	PANEL END FRONT PTD	204 209 224 293	S22	0894 10127108	SCP FN ED MACH	779	S9
0808 83425606	PANEL-CONTROL CAB PN	204 209 210 224	S22	0895 10125103	SCP NUT-HEX MACH	776 778	S10
0809 75283200	PAP-HANDLE	****	S20	0895 10125103	SCP NUT HEX MACH	779	S9
0810 75283100	EAR-TRIM	ALL OPTIONS	S20	0896 94862901	GROMMFT STRIP	779	S9
0811 75793301	LABEL SWITCH	214-244 296-300	S20	0897 83442110	FRONT PNL RACK	287	S28
0811 75793301	LAEFL SWITCH	164-168 204-212	S20	0898 83425144	PNL TOP COVER RFAR C	211	S22
0811 75793301	LAEFL SWITCH	287-290 295	S28	0899 83443705	PNL TOP CVR RH PT	211	S22
0811 75793301	LAEFL SWITCH	187 188 248 285	S28	0900 83443805	PNL TOP CVR LH PTD	211	S22
0811 75793301	LAEFL SWITCH	234-237 239-245	S28	0901 83425344	DOOR-ACCFFSS CHAMOIS	211	S22
0811 75793301	LAEFL SWITCH	292 294 296-300	S20	0902 83478605	PNL SIDE PTD ORANGE	211	S22
0812 75284001	PAP-COVER	****	S20	0903 77657744	PANEL END FT PT CHAM	211	S22
0813 75287700	GASKFT	470	S14	0904 83425644	PANEL-CNTL CAB PTD C	211	S22
0813 75287700	GASKFT - DOOR	276	S31	0905 83425155	PNL TOP COVER REAR P	212	S22
0814 75288300	MAGNETIC STRIP	****	S20	0906 83443756	PNL TOP CVR RH PT WH	212	S22
0815 75037504	HFAD ASM (LOWER)	307 312 314	S29	0907 83443856	PNL TOP CVR LH PTD W	212	S22
0816 75794101	SLIDE-LID	****	S20	0908 83425355	DOOR-ACCESS PTD ELK	212	S22
0817 75794205	ROD-SLIDE	****	S20	0909 83478655	PNL SIDE PTD BLACK	212	S22
0818 75794001	SPACER-FLANGFD	ALL OPTIONS	S20	0910 77657756	PNL END FT PT WHITE	212	S22
0819 75794700	SPRING-EXTENSION	****	S20	0911 83425655	PNL CNTL CAP PID BLK	212	S22
0820 92649009	PIN, COTTER	****	S20	0912 83425148	PNL TOP COVER RFAR S	213	S22
0821 93530007	PIN, ROLL HCS BLACK	****	S20	0913 83443748	PNL TOP CVR SHFL	213	S22
0822 51669410	TFRMINAL	194 229	S23	0914 83443848	PNL TOP CVR SH G	213	S22
0822 51669410	TFRMINAL	227	S25	0915 83425348	DOOR-ACCESS BLUE	213	S22
0822 51669410	TERMINAL	237	S28	0916 83478648	PNL SIDE PTD SHFL C	213	S22
0822 51669410	TERMINAL	****	S21	0917 77657748	PNL END PNT SHFL GP	213	S22
0823 75037505	HEAD ASM (UPPER)	307 312	S29	0918 83466701	PNL CNTL-CAB SLXSCRN	213	S22
0824 75300200	PESISTOR MODULE	307 311 312	S29	0919 83425136	PNL TOP COVRF REAP T	215	S22
0825 17901516	SCR THD ROLL	202 203	S19	0920 83443737	PNL TOP CVR RH TEXTU	215	S22
0825 17901516	SCP THD ROLL	****	S21	0921 83443837	PNL TOP CVR LP TEXTU	215	S22
0826 92743202	SCR MCF PAN PHL 8	308	S21	0922 83425336	DOOR-ACCFFSS TEX PLCE	215	S22
0827 70590208	HEAD ASM (LOWER)	308	S29	0923 83478637	PNL SIDE PTD TEX WHI	215	S22
0828 70590209	HEAD ASM (UPPER)	308	S29	0924 77657736	PANEL IND FT TEX FL	215	S22
0829 75300100	PFSISTOR MODULE	308 310 313 315	S29	0925 83425636	PANEL-CNTL CAB TEX E	215	S22
0830 70590306	HEAD ASM (LOWFP)	309	S29	0926 83425163	PNL TOP CVR REAP FPN	220	S22
0831 70590307	HEAD ASM (UPPER)	309	S29	0927 83443763	PNL TOP CVR RH	220	S22
0832 73460700	CARRIAGE WEIGHT	312 314 315	S29	0928 83443863	PNL TOP CVR LH BROWN	220	S22
0833 77657702	PNL END FRONT	298	S22	0929 83425363	DOOR-ACCFFSS FROWN	220	S22
0834 24528646	SLEEVING-VINYL	****	S20	0930 83478663	PNL SIDE PTD EPWN	220	S22
0835 93539004	FASTERNER-PUSH ON	****	S20	0931 77657764	PNL END FRONT BEIGE	220	S22
0836 83446400	BUMPER NYLON	ALL OPTIONS	S20	0932 83425664	PANEL-CNTL CAP BEIGE	220	S22
0837 10125806	SFPING LX WSHR	199-203	S19	0933 83478666	PNL SIDE	221 293	S22
0838 92743158	SCREW SS PAN HD	****	S20	0934 83443753	PNL TOP CVR RH OFFWH	216	S22
0839 10125610	VSHR PLAIN	199-203	S19	0935 83443853	PNL TOP CVR LH PTD O	216	S22
0840 10125808	SPPING LX WSHR	199-203	S19	0936 83425362	DOOR-ACCFFSS PAINTED	216	S22
0841 75774702	CLIP-PUSH IN	****	S20	0937 83478653	PNL SIDE PTD GOLD	216	S22
0842 83492000	BRACKET, CARFL, FRAME	298-300	S21	0938 83425137	PNL TOP CVR REAR WH	217	S22
0842 83492000	BRACKET, CARFL, FRAME	164-168 204-209	S21	0939 83443738	PNL TOP CVR RH PT FL	217	S22
0842 83492000	BRACKET, CARFL, FRAME	211-213 215-296	S21	0940 83443838	PNL TOP CVR LH PTB D	217	S22
0843 94347104	SHOULDER WASHER TPF	237 243	S28	0941 83425337	DOOR-ACCESS PTD WH	217	S22
0843 94347104	SHOULDER WASHER TPF	194 195	S23	0942 83478638	PNL SIDE PTD BLACK	217	S22
0843 94347104	SHOULDER WASHER THER	229 231 232	S23	0943 77657737	PNL END PTT WHITE	217	S22
0843 94347104	SHOULDER WASHER THER	227	S25	0944 83425637	PNL CNTL CAB PTD WH	217	S22
0844 94347104	SHOULDFR WASHER THEP	ALL OPTIONS	S20	0945 75799001	CAP HAPNESS	780	S9
0844 83425607	PANFL-CONTROL CAB	298	S22	0946 83425157	PNL TOP CVR REAP RED	218	S22
0845 10125712	SCR FLAT HD	****	S20	0947 83443758	PNL TOP CVR RP PL-GR	218	S22
0846 77657704	PNL END FRONT	298 299	S22	0948 83443858	PNL TOP CVR LH PL-GR	218	S22
0847 83442108	FRONT PNL PACK	244	S28	0949 63425357	DOOR-ACCFFSS PTD RFD	218	S22
0848 83451804	INSULATOR ADHESIVE	ALL OPTIONS	S20	0950 83478658	PNL SIDE PTD BLACK	218	S22
0849 83451805	INSULATOR ADHESIVE	237 243	S28	0951 77657758	PNL END PTT WHITE	218	S22
0849 83451805	INSULATOR ADHESIVE	194 195	S23	0952 83425657	PNL CNTL CAB PTD WH	218	S22
0849 83451805	INSULATOR ADH BACK	227	S25	0953 77657762	PANEL END FRONT BLAC	216	S22
0849 83451805	INSULATOR ADHESIVE	ALL OPTIONS	S20	0954 83495101	COVER PWF SPLY	780	S9
0849 83451805	INSULATOR ADHESIVE	229 231 232	S23	0955 83495200	FRKT	780	S9
0850 75730603	CHASSIS AC FOX 220V	275	S30	0956 83495500	PIN FNG	780	S9
0851 83425162	PANEL-TOP COVER REAR	216	S22	0957 83495600	HNG CVR	780	S9
0852 83443713	PNL TOP CVR RH PT GO	205	S22	0958 75798800	PAD CAPACITOR	780	S9
0853 83443813	PNL TOP CVR LH PTD G	205	S22	0959 75774406	CAPACITOR	780	S9
0854 83425304	DOOR-ACCFFSS PAINTED	205 298 299	S22	0960 75774466	CAPACITOR	780	S9
0855 83478613	PNL SIDE PTD GOLD	205	S22	0961 77611443	CEMENT	192 193 227	S25
0856 77657713	PANEL END FRONT PTD	205	S22	0961 77611443	CEMENT	229 231-233	S23
0857 83425604	PANEL-CONTROL CAB PN	205 299	S22	0961 77611443	CEMENT	194 195	S23
0858 83425109	PANEL-TOP COVFR REAR	206 226	S22	0962 75287200	STFIP-NUT	332 334-343	S6
0859 83425309	DOOR-ACCFFSS PAINTED	206 226	S22	0963 10127348	SCREW PAN HD	163-169 204-209	S20
0860 77657709	PANEL END FRONT PTD	206 226	S22	0963 10127348	SCREW PAN HD	211-226 292-300	S20
0861 83425609	PANEL-CONTROL CAB PN	206 214 293	S22	0964 83425176	PNL TOP CVR REAP	292	S22
0862 83425118	PANEL-TOP COVER RFAR	207 219	S22	0965 70107900	TRANSFORMER-AUTO	776 778	S10
0863 83443717	PNL TOP CVR RH PT LT	207 219	S22	0966 83495302	PWR LOGIC HAPNFSS	776 778	S10
0864 83443817	PNL TOP CVR LH PTD L	207 219	S22	0967 83494902	CHASSIS-AC	776 778	S10
0865 83425318	DOOR-ACCFFSS LT BLUF	207 219	S22	0968 77657370	COVER-BOTTOM	776 778	S10
0866 83478617	PNL SIDE PAINTED	207 219	S22	0969 83495402	PLATE-CHASFIS	776 778	S10
0867 77657718	PANEL END FRONT PTD	207 219	S22	0970 83495700	HINGE-POWEP SUPPLY	776 778	S10
0868 83425618	PANEL-CNTL CAB LT EL	207 219	S22	0971 83475000	PLATE	776 778	S10
0869 83425126	PANEL-TOP COVFR REAR	208	S22	0972 75769200	CLAMP-CAPACITOR	776 778	S10
0870 83443725	PNL TOP CVR RH PT BK	208	S22	0973 75794902	CASKET-SUPPLY DIVERT	776 778	S10
0871 83443825	PNL TOP CVR LH PTD E	208	S22	0974 83420504	GASKET STRIP	776 778	S10
0872 83425326	DOOR-ACCFFSS ELUE	208	S22	0975 75774419	CAPACITOR	776 778	S10
0873 83478625	PNL SIDE PAINTED	208	S22	0976 95583050	RECTIFIERR FLOCK	776 778	S10

ASSEMBLY - COMPONENT PARTS LIST

ITEM IDENT NO	DESCRIPTION	WHERE USED	SHEET	ITEM IDENT NO	DESCRIPTION	WHERE USED	SHEET
0577 83432101	BRIDGE, RECTIFIER	776 778	\$10	1074 70590206	HEAD ASM (LOWER)	310 315	\$29
0578 15165896	CIRCUIT BREAKER	776 778	\$10	1075 70590207	FEAD ASM (UPPER)	310 315	\$29
0579 83433508	CIRCUIT BRFACKR	776 778	\$10	1076 10125608	WASHER	199-203	\$19
0580 83404002	FILTER	776 778	\$10	1076 10125608	WASHER	301	\$17
0581 83475200	GASKET-PWR SPLY	776 778	\$10	1077 83445710	FRAME CABINFT	201	\$19
0582 83475300	GASKET	776 778	\$10	1078 77657768	PNL END FRT	221 293	\$22
0583 92743198	SCREW PAN HD MACH	776 778	\$10	1079 83425667	PNL CONTROL CAP	221 293	\$22
0584 10125713	SCREW	776 778	\$10	1081 75884875	GR FLEXIBLE	199 200 203	\$19
0585 10125726	SCREW	776 778	\$10	1082 75884876	GR FLEXIBLE	199 200 203	\$19
0586 10127141	SCR PH MACH	776 778	\$10	1083 83450300	CLOSURE FRAME	297	\$19
0586 10127141	SCR PH MACH	780	\$9	1084 75885150	NUT PLATE	163 169 297	\$20
0587 92743240	SCREW PAN HD MACH	776 778	\$10	1085 77658251	LABEL, RATING	201	\$19
0588 10125107	SCR NUT-HEX MACH	776 778	\$10	1086 83451802	INSULATOR	****	\$20
0589 83443715	PNL TOP CVR RH	163	\$22	1087 83425108	PANEL TOP CVR RFAR	300	\$22
0590 83443815	PNL TOP CVR LH	163	\$22	1088 83442136	FRONT PNL PACK PAINT	248	\$28
0591 83425314	DOOR ACCFSS	163	\$22	1089 10126212	SCREW HEX	528	\$15
0591 83425314	DOOR ACCESS	169	\$22	1090 24548310	WIRE ELEC	407	\$12
0592 83478615	PNL SIDE	163	\$22	1091 10127310	SCREW SLOTTED	526	\$16
0593 75724590	CONNECTOR-PANEL MTG	776 778	\$10	1092 83442172	FRONT PNL PACK PAINT	285	\$28
0594 83442197	FRONT PNL RACK PAINT	0283	\$28	1093 83425171	PNL TOP CVR REAR	223	\$22
0595 83442198	FRONT PNL RACK PAINT	0284	\$28	1094 83443772	PNL TOP CVR RH	223	\$22
0596 95643212	CONNECTOR	776 778	\$10	1095 83443842	PNL TOP CVR LH	223	\$22
0597 776557714	PNL FND FRONT	163	\$22	1096 83425371	DOOR ACCESS	223	\$22
0597 776557714	PNL FND FRONT	169	\$22	1097 83478672	PNL SIDE PTD	223	\$22
0598 95604019	CONN, RING TONGUE	776 778	\$10	1098 77657771	PNL END FRONT	223	\$22
0599 93154107	TUBING, FFAT SHRINK	776 778	\$10	1099 63425673	PNL CONTROL CAP	223	\$22
1001 15003305	WIPE-GRN	776 778	\$10	1100 83425170	PNL TOP CVR REAR	225	\$22
1002 77830595	CAP 100V	776	\$10	1101 83443769	PNL TOP CVR RH	225	\$22
1003 77830583	CAP 50V	776	\$10	1102 83443869	PNL TOP CVR LH	225	\$22
1004 94846005	CONNECTOR, 2 PIN	776 778	\$10	1103 83425370	DOOR ACCFSS PTD	225	\$22
1005 15003409	WIPE WFT	776 778	\$10	1104 83478669	PNL SIDE PTD LT GRAY	225	\$22
1006 93943001	CONTACT, SOCKET	776 778	\$10	1105 83425674	PNL CONTROL CAP	225	\$22
1007 83447807	INSTLN KIT - PACK MT	227	\$27	1106 77657769	FND PNL PTD	225	\$22
1007 83447807	INSTLN KIT-RACK MT	227	\$25	1107 95694206	SPACEF	301	\$11
1008 83443777	PNL TOP CVR RH	292	\$22	1108 83442170	FRONT PNL PACK PAINT	286	\$28
1009 75730701	CVR CHASSIS AC INP	275	\$30	1109 83478677	PNL SIDE PTD	292	\$22
1010 75731001	CONVENINFCE OUTLET	275	\$30	1110 77657776	PNL END FRONT	292	\$22
1011 92411002	FUSE HOLDER	275	\$30	1111 83425676	PANEL CNTL CAP	292	\$22
1012 92371016	FUSE QK ACTING 5 AMP	275	\$30	1112 83443708	PNL TOP CVR RH	300	\$22
1013 77610304	PLATE, WARNING	1026	\$31	1113 77657763	PNL END FRONT	220	\$22
1013 77610304	PLATE, WARNING	275	\$30	1114 83443808	PNL TOP CVR LH	300	\$22
1014 92801001	CLAMP, CABLE	1026	\$31	1115 95125311	LOCTITE PRIMER	423	\$17
1014 92801001	CLAMP, CABLE	275	\$30	1116 93749157	SCREW	776 778	\$10
1015 93041205	STRIP TERMINAL	275	\$30	1117 83425184	PANEL TOP CVR RFAR	294 295	\$22
1016 93067003	JUMPER, BARRIER ST	275	\$30	1118 83443784	PANEL TOP CVR RH	294	\$22
1017 75731104	CABLE-JUMPER ELACK	275	\$30	1119 83443884	PANEL TOP CVR LH	294	\$22
1018 75730806	CABLE ASN GRND	275	\$30	1120 83425384	DOOP ACCESS	294 295	\$22
1019 75731301	SYMBOL GRND (DECAL)	1026	\$31	1121 83478606	PANFL SIDE	294	\$22
1019 75731301	SYMBOL GRND (DECAL)	275	\$30	1122 83443786	PANEL TOP CVR PH	295	\$22
1019 75731301	SYMBOL GRND (DECAL)	203	\$19	1123 83443886	PANEL TOP CVR LH	295	\$22
1020 10126105	WASH INT TOOTH LK	275	\$30	1124 83478686	PANEL SIDE	295	\$22
1020 10126105	WASH INT TOOTH LK	1026	\$31	1125 83425685	PANEL CONTROL CAP	295	\$22
1021 15012402	FUSHING SNAP IN	ALL OPTIONS	\$21	1126 77657786	PANEL END FRONT	295	\$22
1022 77599501	POWER CORD ASM	275	\$30	1127 17901501	SCREW THREAD FORM	780	\$9
1023 93105305	MAPKER STRI	275	\$30	1127 17901501	SCREW THREAD FORM	776 778	\$10
1024 83415900	POWER COPD	276	\$31	1128 95596600	RUSHING	776 778	\$10
1025 83492701	AC SWCH PX ASM NCR	276	\$31	1129 83425198	PANEL TOP CVR REAR	296	\$22
1026 83428902	AC DISTF EX COMMON	276	\$31	1130 83443798	PANEL TOP CVR RH	296	\$22
1027 83442800	CHANNEL-CONTLR NCR	276	\$31	1131 83443898	PANEL TOP CVR LH	296	\$22
1029 83428601	CHASSIS-AC DISTR EX	1026	\$31	1132 83425399	DOOR ACCESS	296	\$22
1030 83443877	PNL TOP CVR LH	292	\$22	1133 83478698	PANEL SIDE	296	\$22
1031 94806900	PECFPTACLE FEMALE	1026	\$31	1134 83425698	PANEL CONTROL CAB	296	\$22
1032 94807000	PECFPTACLE MALE	1026	\$31	1136 83425308	DOOP ACCESS	300	\$22
1033 62071534	FILTER FFI	1026	\$31	1137 83478608	PNL SIDE	300	\$22
1034 75726813	TERMINAL BLOCK	1026	\$31	1138 77657711	PANEL END FRONT	300	\$22
1035 75726812	TFRINAL BLOCK	1026	\$31	1139 77644811	PANEL CONTROL	300	\$22
1036 94241102	CKT FKR-OVFP CURRENT	1026	\$31	1140 83442190	FRONT PNL	290	\$28
1037 75729011	CABLE-JUMPF'R GREEN	1026	\$31	1141 83442189	FRONT PNL RACK	288	\$28
1038 75729007	CABLE-JUMPF'R ELACK	1026	\$31	1142 77657795	PANEL-END FRONT	296	\$22
1039 75729003	CABLE-JUMPF'R WHITE	1026	\$31	1143 77644814	PANEL-CONTROL CAB	163	\$22
1040 75729001	CABLE-JUMPF'R YLOWW	1026	\$31	1144 77644814	PANEL-CONTROL CAB	169	\$22
1041 75729012	CABLE-JUMPF'R BLACK	1026	\$31	1144 77657715	PNL END RFAR	163	\$22
1042 75729022	CABLE-JUMPF'R WHITE	1026	\$31	1145 83492001	CLOSURE FRAME	169	\$21
1043 75729023	CABLE-JUMPF'R BLACK	1026	\$31	1146 83445711	FRAME CABINET	199 202 203	\$19
1044 75729024	CABLE-JUMPF'R BLACK	1026	\$31	1147 83425115	PANEL-TOP CVR REAR	163	\$22
1045 75729025	CABLE-JUMPF'R WHITE	1026	\$31	1148 83425128	PANEL-TOP CVR REAR	165	\$22
1046 51853011	CLAMP CABLE ADHESIVE	301	\$12	1149 83443728	PNL TOP CVR PH	165	\$22
1047 17901515	SCP THR ROLL	1026	\$31	1150 83443828	PNL TOP CVR LH	165	\$22
1048 17901519	SCP THR ROLL PAN HD	199-203	\$19	1151 83425328	DOOP ACCFSS	165	\$22
1049 83478002	LINECORD MODULE STD	1026	\$31	1152 83478628	PNL SIDE	165	\$22
1050 77613869	CLIP	404	\$15	1153 77657729	PANEL END FRONT	165	\$22
1051 75752203	CABL-CIRCUIT BRKR	1026	\$31	1154 83425629	PANEL CONTROL CAB	165	\$22
1052 93522009	PLUG-SNAP FUTTON	1026	\$31	1155 77657728	PNL FND FEAP	165	\$22
1052 93522009	PLUG-SNAP FUTTON	201	\$19	1156 83425119	PANEL-TOP CVR REAR	164 167	\$22
1053 63426700	COVER-CHASSIS	1026	\$31	1157 83443720	PNL TOP CVR RH	164 167	\$22
1054 75884153	JUMPER PLUG	779	\$9	1158 83443820	PNL TOP CVR LH	164 167	\$22
1055 83407505	LABEL, SELF ADHFRING	1026	\$31	1159 83425319	DOOP ACCESS	164 167	\$22
1056 63407518	LAFFL, SELF ADHFRING	1026	\$31	1160 83478620	PNL SIDE	164 167	\$22
1057 83425168	PNL TOP CVR REAR	221	\$22	1161 77657719	PANEL END FRONT	164 167	\$22
1058 83425104	PNL TOP CVR REAR	205 298 299	\$22	1162 83425619	PANEL CONTROL CAB	164 167	\$22
1059 83425376	POOR ACCFSS	292	\$22	1163 83425103	PANEL-TOP CVR REAR	168	\$22
1060 77652250	LABEL, RATING	199 200 202 203	\$19	1166 83425303	DOOR ACCESS	168	\$22
1061 95125317	LOCTITE PRIMER	301	\$17	1168 77657703	PNL END FRONT	168	\$22
1062 95125301	LOCTITE	ALL OPTIONS	\$20	1169 776444804	PANEL CONTROL CAP	168	\$22
1063 83442165	FPT PNL PKC PNT	246	\$28	1177 75892866	WASHER SHOULDER	301	\$13
1064 51853015	CLAMP CABLE	404	\$15	1178 75062400	WASHER FLAT	301	\$13
1064 51853015	CLAMP CABLE	776 778	\$10	1179 75889099	SPRING	301	\$13
1065 75738652	RFISISTOR MODULE	253	\$29	1180 75881538	POST, MOTOR	301	\$13
1066 83442104	FRONT PNL RACK PAINT	234	\$28	1181 93115291	SCREW	301	\$13
1067 24549006	CBL WRAP	776 778	\$10	1182 77830612	WASHER FLAT	301	\$13
1069 95016100	IUBRICANT	358	\$18	1183 77830405	SCREW	ALL OPTIONS	\$21
1070 75037506	FEAD ASM (LOWER)	311	\$29	1184 92074137	O-RING	ALL OPTIONS	\$21
1071 75037507	FEAD ASM (UPPER)	311	\$29	1185 92815161	SCREW	526	\$16
1072 70590304	FEAD ASM (LOWER)	313 314	\$29	1186 75730807	CABLE GND	275	\$30
1073 70590305	HEAD ASM (UPPER)	313 314	\$29	1187 92491020	STRAIN RELIEF	275	\$30

ASSEMBLY - COMPONENT PARTS LIST

ITEM IDENT NO	DESCRIPTION	WHERE USED	SHEET	ITEM IDENT NO	DESCRIPTION	WHERE USED	SHEET
1188 63442157	FFONT PANEL RACK	167	S28				
1189 83425114	PANEL-TOP COVER PFAP	169	S22				
1190 83443714	PANEL-TOP COVER RH	169	S22				
1191 83443814	PANEL-TOP COVER LH	169	S22				
1192 83478614	PANEL-SIDE	169	S22				
1193 94238905	LABEL, CAUTION	227	S25				
1194 15012410	PUSHING SNAP IN	ALL OPTIONS	S30				
1195 95694205	SPACEP	ALL OPTIONS	S21				
2000 75887326	SCREW CAPTIVE	780	S9				

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ITEM IDENT NO	ITEM IDENT NO	ITEM IDENT NO	ITEM IDENT NO
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0746 00845503	0445 10125804	0472 10127114	0467 51853005
0574 00863701	0445 10125804	0472 10127114	0467 51853005
0597 10125015	0445 10125804	0472 10127114	0462 51853006
0518 10125030	0445 10125804	0784 10127115	0462 51853006
0895 10125103	0445 10125804	0686 10127120	1046 51853011
0449 10125105	0445 10125804	0686 10127120	1064 51853015
0449 10125105	0445 10125804	0686 10127120	1033 62071534
0449 10125105	0445 10125804	0686 10127120	0965 70107900
0449 10125105	0445 10125804	0686 10127120	1074 70590206
0449 10125105	0445 10125804	0686 10127120	1075 70590207
0449 10125105	0445 10125804	0686 10127120	0827 70590208
0449 10125105	0445 10125804	0432 10127121	0828 70590209
0458 10125106	0445 10125804	0432 10127121	1072 70590304
0458 10125106	0445 10125804	0432 10127121	1073 70590305
0458 10125106	0445 10125804	0432 10127121	0830 70590306
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0458 10125106	0448 10125805	0432 10127121	0516 72959300
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0988 10125107	0837 10125806	0432 10127121	0535 73228200
0701 10125108	0840 10125808	0484 10127122	0832 73460700
0701 10125108	0662 10125919	0484 10127122	0690 73469100
0701 10125108	0522 10125920	0484 10127122	0691 73469101
0701 10125108	0557 10126100	0484 10127122	0540 73555101
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0704 10125301	0557 10126100	0434 10127123	0538 73555300
0702 10125303	0557 10126100	0434 10127123	0577 73584400
0439 10125602	0556 10126101	0434 10127123	0509 73669601
0439 10125602	0639 10126103	0434 10127123	0815 75037504
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0478 10125603	0639 10126103	0434 10127123	1071 75037507
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1038 75729007	S31	0337 75795219	S6	0961 77611443	S23	0215 77658021	S20
1037 75729011	S31	0339 75795221	S6	0961 77611443	S25	0216 77658023	S21
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0313 75740117	S6	0603 75803502	S16	0882 77657734	S22	0225 77658033	S22
0313 75740117	S29	0646 75803503	S14	0924 77657736	S22	0225 77658033	S20
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0973 75794902	S10	0741 77604000	S28	0214 77658020	S21	0167 77658048	S22
0341 75795213	S6	0741 77604000	S23	0214 77658020	S5	0167 77658049	S20

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0168 77658049	S21	0868 83425618	S22	0290 83442522	S5	0685 83444200	S23
0168 77658049	S20	1162 83425619	S22	0290 83442522	S28	0345 83444405	S6
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0169 77658050	S22	0875 83425626	S22	0291 83442523	S5	0558 83444701	S29
0169 77658050	S21	1154 83425629	S22	0284 83442524	S28	0726 83444900	S19
0169 77658050	S20	0786 83425634	S22	0284 83442524	S5	0634 83445400	S14
0169 77658050	S5	0925 83425636	S22	0283 83442525	S28	0688 83445709	S19
1060 77658250	S19	0944 83425637	S22	0283 83442525	S5	1077 83445710	S19
1085 77658251	S19	0890 83425643	S22	0287 83442526	S5	1146 83445711	S19
0474 77658252	S11	0904 83425644	S22	0287 83442526	S28	0505 83445800	S13
1183 77830405	S21	0911 83425655	S22	0244 83442527	S28	0506 83445900	S13
0273 77830537	S5	0952 83425657	S22	0244 83442527	S5	0836 83446400	S20
0274 77830538	S5	0876 83425662	S22	0189 83442528	S28	0528 83447302	S15
0475 77830539	S12	0932 83425664	S22	0189 83442528	S5	0605 83447401	S15
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1002 77830595	S10	1099 83425673	S22	0188 83442529	S5	0713 83447805	S26
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0889 77830705	S25	1125 83425685	S22	1027 83442800	S31	0749 83447806	S26
0889 77830705	S27	1134 83425698	S22	0229 83443504	S23	1007 83447807	S27
0889 77830705	S26	1029 83428601	S31	0229 83443504	S5	1007 83447807	S25
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0750 77830734	S11	1026 83428902	S31	0231 83443506	S5	0564 83447808	S23
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0356 83410562	S11	1066 83442104	S28	0195 83443514	S24	0849 83451805	S25
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0488 83415603	S15	0547 83442109	S28	0585 83443601	S26	0723 83451806	S23
0489 83415607	S11	0897 83442110	S28	0585 83443601	S27	0723 83451806	S25
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1024 83415900	S31	0627 83442123	S28	0803 83443703	S22	0723 83451806	S28
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1156 83425119	S22	1141 83442189	S28	0870 83443725	S22	0400 83456502	S11
0869 83425126	S22	1140 83442190	S28	1112 83443728	S22	0400 83456502	S12
1148 83425128	S22	0994 83442197	S28	0769 83443734	S22	0725 83456900	S25
0877 83425134	S22	0995 83442198	S28	0920 83443737	S22	0727 83457001	S25
0919 83425136	S22	0195 83442309	S19	0939 83443738	S22	0727 83457001	S28
0938 83425137	S22	0195 83442309	S5	0552 83443743	S22	0727 83457001	S23
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0946 83425157	S22	0202 83442312	S19	0927 83443763	S22	0743 83457401	S7
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1100 83425170	S22	0234 83442501	S28	1008 83443777	S22	0358 83466001	S6
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1117 83425184	S22	0235 83442502	S5	1130 83443798	S22	0654 83466200	S18
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0865 83425318	S22	0239 83442507	S28	0864 83443817	S22	0707 83474601	S19
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0938 83425362	S22	0246 83442514	S28	0948 83443858	S22	0716 83478200	S19
0929 83425363	S22	0246 83442514	S5	0928 83443863	S22	0573 83478301	S26
0888 83425367	S22	0248 83442516	S28	0887 83443868	S22	0573 83478301	S27
1103 83425370	S22	0248 83442516	S5	1102 83443869	S22	0582 83478302	S26
1096 83425371	S22	0285 83442517	S5	1030 83443877	S22	0582 83478302	S27
1059 83425376	S22	0285 83442517	S28	1119 83443884	S22	0806 83478603	S22
1124 83425384	S22	0286 83442518	S5	1123 83443886	S22	0806 83478603	S22
1132 83425399	S22	0286 83442518	S28	1131 83443898	S22	0801 83478604	S22
0857 83425604	S22	0289 83442520	S28	0696 83444100	S19	0902 83478605	S22

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ITEM IDENT NO	SHEET	ITEM IDENT NO	SHEET	ITEM IDENT NO	SHEET	ITEM IDENT NO	SHEET
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1192 83478614	S22	0709 92723234	S21	0469 95125305	S16		
0992 83478615	S22	0660 92742011	S18	0469 95125305	S12		
0866 83478617	S22	0787 92742176	S9	0469 95125305	S16		
1160 83478620	S22	0433 92742201	S13	0469 95125305	S17		
0873 83478625	S22	0454 92742222	S11	1115 95125311	S17		
1152 83478628	S22	0838 92743158	S20	1061 95125317	S17		
0923 83478637	S22	0963 92743198	S10	0891 95125322	S17		
0942 83478638	S22	0826 92743202	S21	0406 95125324	S17		
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0785 83478654	S22	0428 92815096	S17	0976 95583505	S10		
0909 83478655	S22	0428 92815096	S15	1128 95596600	S10		
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1097 83478672	S22	0551 92815195	S15	0996 95643212	S10		
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0717 83478700	S19	0471 92824097	S17	0636 95655501	S14		
0718 83478701	S19	0722 92932206	S19	0766 95655503	S8		
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0776 83484110	S10	0610 93109322	S26				
0776 83484110	S9	0610 93109322	S27				
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0677 83485700	S26	0752 93154948	S7				
0677 83485700	S27	0664 93211008	S25				
0677 83485700	S25	0664 93211008	S27				
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0842 83492000	S21	0608 93211009	S27				
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1145 83492001	S21	0788 93342193	S23				
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0966 83493302	S10	1052 93522009	S19				
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0565 83493900	S15	0821 93530007	S20				
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0567 83494200	S15	0835 93539004	S20				
0595 83494400	S16	0698 93592200	S19				
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0719 83494801	S19	0698 93592200	S31				
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0955 83495200	S9	0692 93697013	S19				
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0969 83495402	S10	1116 93749157	S10				
0956 83495500	S9	0429 93788082	S17				
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0970 83495700	S10	1006 93943001	S10				
0756 84686903	S8	0282 94224651	S5				
0420 89293100	S12	0282 94224651	S21				
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0466 92021004	S17	1036 94241102	S31				
0466 92021004	S13	0763 94245602	S12				
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0687 92172000	S24	0737 94260500	S8				
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0687 92172000	S23	0738 94260503	S7				
0687 92172000	S28	0624 94277416	S16				
0687 92172000	S25	0706 94281426	S19				
0661 92196007	S27	0706 94281426	S31				
0661 92196007	S30	0751 94309802	S8				
0661 92196007	S31	0751 94309802	S7				
0661 92196007	S26	0798 94337703	S12				
0661 92196007	S26	0843 94347104	S25				
0523 92196031	S12	0843 94347104	S20				
1012 92371016	S30	0843 94347104	S23				
1011 92411002	S30	0843 94347104	S28				
1187 92491020	S30	0843 94347104	S23				
0775 92512142	S8	0675 94357804	S18				
0541 92549007	S15	0487 94655401	S12				
0748 92602002	S7	1031 94806900	S31				
0748 92602002	S9	1032 94807000	S31				
0770 92602003	S8	1004 94846005	S10				
0494 92615012	S11	0896 94862901	S9				
0820 92649009	S20	0651 94862902	S9				

WIRE LISTS

9

9.1 INTRODUCTION

The following paragraphs contain the Harness Assembly wire lists for the Disk Cartridge Drive Model 9427H.

9.2 PRE AMP

<u>Wire Color</u>	<u>Origin</u>	<u>Destination</u>	<u>Approximate Length Inches</u>	<u>Remarks</u>
Red	A2P4-1	A3P2-1	11	
Gray	-2 -3 -4 -5 -6 -7 -8 -9 -10 -11 -12 -13 -14 -15 -16 -17 -18 -19	-2 -3 -4 -5 -6 -7 -8 -9 -10 -11 -12 -13 -14 -15 -16 -17 -18 -19		
	A2P4-20	A3P2-20	11	

9.3 RECEIVER

<u>Wire Color</u>	<u>Origin</u>	<u>Destination</u>	<u>Approximate Length Inches</u>	<u>Remarks</u>
White	A9P3-6 A9P3-5 A9P3-4 A9P3-3 A9P3-2 A9P3-1 A6SW-1 A6L1-1 A1P3-1 A1P3-3 A1P3-2	A6SW-3 A6SW-2 A6SW-3 A5SW-3 A5SW-1 - A6SW-2 A6L2-1 A6L2-2 A6L1-2 -	26.2 16.8 27.8 27.8 17.5 - 32.5 30.5 20.3 45.0 -	Closed Closed Normally Open Normally Closed Closed Not Used Normally Open

9.4 RETRACT

<u>Wire Color</u>	<u>Origin</u>	<u>Destination</u>	<u>Approximate Length Inches</u>	<u>*Remarks</u>
White	A3P3-3	A4SW1	6	
White	A3P3-2	A4SW1	6	Normally Open Closed

*Twisted Pair

9.5 CAPACITOR

<u>Wire Color</u>	<u>Origin</u>	<u>Destination</u>	<u>Approximate Length Inches</u>	<u>Remarks</u>
White	A1C101-(+)	A1P5-3	13 1/2	
	A1C101-(-)	A1C102-(+)	7.8	
	A1C102-(+)	A1P5-1	10.8	
	A1C102-(-)	A1P5-6	10.8	
	A1C103-(+)	A1P5-2	8	
	A1C103-(-)	A1P5-4	8	

9.6 SWITCH BOARD

<u>Wire Color</u>	<u>Origin</u>	<u>Destination</u>	<u>Approximate Length Inches</u>	<u>Remarks</u>
Red	A2P6-1	A5P1-1	36	
Gray	A2P6-2	A5P1-2		
	-3	-3		
	-4	-4		
	-5	-5		
	-6	-6		
	-7	-7		
	-8	-8		
	-9	-9		
	-10	-10		
	-11	-11		
	-12	-12		
	-13	-13		
	-14	-14		
	-15	-15		
	-16	-16		
	-17	-17		
	-18	-18		
	-19	-19		
Gray	A2P6-20	A5P1-20	36	
				Switch Board
				Switch Board

<u>Wire Color</u>	<u>Origin</u>	<u>Destination</u>	<u>Approximate Length Inches</u>	<u>Remarks</u>
Gray	A2P6-21	A9J1-1	36	Lower Sensor
	-22	A9J1-2		Lower Sensor
	-23	A9J1-3		Lower Sensor
	-24	A9J2-1		Upper Sensor
	-25	A9J2-2		Upper Sensor
	-26	A9J2-3		Upper Sensor
	-27	A9J3-2		Receiver Harness
	-28	A9J3-5		Receiver Harness
	-29	A9J3-4		Receiver Harness
	-30	A9J3-3		Receiver Harness
	-31	A9J3-6		Receiver Harness
	-32			Not Used
	-33			Not Used
Gray	A2P6-34		36	Not Used

9.7 DC SPINDLE (NO BRAKE)

<u>Wire Color</u>	<u>Origin</u>	<u>Destination</u>	<u>Approximate Length (Inch)</u>	<u>Remarks</u>
White	A2P5-3	A7K2-4	13.5	
	A2P5-4	A7K1-3	10.7	
	A7K1-3	A7K2-3	5.0	
	A2P5-5	A7K1-4	11.4	
	A2P5-6			Not Used
	A2P5-7			Not Used
	A2P5-8			Not Used
	A2P5-1			Not Used

9.8 AC SPINDLE (NO BRAKE)

<u>Wire Color</u>	<u>Origin</u>	<u>Destination</u>	<u>Approximate Length (Inch)</u>	<u>Remarks</u>
White	A1P14-2	A7K2-1	9.5	
Green	A1P1-4	E4AC (GND)	10.0	
White	A7K1-2	A7C1-TOP	7.5	
White	A7K1-1	A7K2-2	5.3	

9.9 DRIVE MOTOR AND CONNECTOR (NO BRAKE)

<u>Wire Color</u>	<u>Origin</u>	<u>Destination</u>	<u>Approximate Length (Inch)</u>	<u>Remarks</u>
Red	A7B1	A7C1-B	10 1/2	
Blue	A7B1	A7K2-2	10 1/2	
Yellow	A7B1	A1P14-1	14 1/2	
White	A1P14-2	A7K2-1	6	
	A1P14-3			Spare
Green	A1P14-4	E4 (AC)	5 1/2	Mot Plate - GND

9.10

AC BRAKE

<u>Wire Color</u>	<u>Origin</u>	<u>Destination</u>	<u>Approximate Length (Inch)</u>	<u>Remarks</u>
White	A7TB1-A	A7CR2-NG	8.8	
	A7K3-6	A7CR2-PS	6.5	
	A7K3-3	A7CR2-AC1	6.5	
	A7K2-2	A7CR2-AC1	8.8	
	A7TB1-B	A7K3-5	10.2	
	A7K1-2	A7C1-TOP	6.5	
	A7F01-2	A7K1-1	2.0	
	A7K2-1	A7K1-1	4.5	
	A1P14-2	A7K3-2	7.5	
	A1P14-3	A7CR2-AC2	4.2	
Green White	A1P14-4	E4 (AC GND)	10.2	
	A1P14-1	A7FO1-1	3.2	

9.11

DC BRAKE

<u>Wire Color</u>	<u>Origin</u>	<u>Destination</u>	<u>Approximate Length (Inch)</u>	<u>Remarks</u>
White	A2P5-1	A7J1-3	8.8	
	A2P5-3	A7K1-2	8.8	
	A2P5-4	A7K1-3	14.5	
	A7K2-3	A7K1-3	3.8	
	A7K2-3	A7K1-17	4.3	
	A2P5-5	A7K1-4	13.5	
	A2P5-6	A7K1-1	8.8	
	A2P5-7	A7K3-B	6.5	
	A2P5-8	A7H1-4	8.8	
	A7J1-15	A7K3-A	6.5	
White	A6J1-16	A7K2-4	5.3	

9.12

POWER AND LOGIC

<u>Wire Color</u>	<u>Origin</u>	<u>Destination</u>	<u>Approximate Length (Inch)</u>	<u>Remarks</u>
Red (Stripe) Gray	A1P1-1	A2P2-1	12	
	-2	-2		
	-3	-3		
	-4	-4		
	-5	-5		
	-6	-6		
	-7	-7		
	-8	-8		
	-9	-9		
	-10	-1		
	-11	-11		
	A1P1-12	A2P2-12	12	

<u>Wire Color</u>	<u>Origin</u>	<u>Destination</u>	<u>Approximate Length (Inch)</u>	<u>Remarks</u>
Gray	A1P1-13	A2P2-13	12	
	-14	-14		
	-15	-15		
	-16	-16		
	-17	-17		
	-18	-18		
	-19	-19		
	-20	-20		
	-21	-21		
	-22	-22		
	-23	-23		
	-24	-24		
	-25	-25		
	-26	-26		
	-27	-27		
	-28	-28		
	-29	-29		
	-30	-30		
	-31	-31		
	-32	-32		
	-33	-33		
Gray	A1P1-34	A2P2-34	12	

9.13 POWER SUPPLY CHASSIS II

<u>Wire Color</u>	<u>Origin</u>	<u>Destination</u>	<u>Approximate Length (Inch)</u>	<u>Remarks</u>
Brown	A1T1-1	A1J12-1	9	
Red	A1T1-2	A1J12-2	8 1/2	
Red	A1T1-2	A1J14-3	10	
Orange	-3	A1J12-3	8	
Yellow	-4	A1J12-4	7 3/4	
Yellow	-4	A1J12-11	6 1/2	
Yellow	-4	A1J14-1	7 1/2	
Green	-5	A1J12-5	7 1/2	
Blue	-6	A1J12-6	7	
Violet	-7	A1J12-7	6	
Violet	-7	A1J13-3	6	
Gray	-8	A1J12-8	6 1/2	
Gray	-8	A1J14-2	5 3/4	
White	-9	A1J12-9	7 3/4	
White	-9	Not Used	7	Not Used
W/Black	-10	A1CB2-2	10	
W/Black	-10	A1P4-4	15	
W/Brown	-11	A1P4-3	14	
W/Red	-12	A1CB2-1	10	
W/Orange	-13	A1CB3-1	3 1/2	
W/Yellow	-14	A1C104-(-)	6	

<u>Wire Color</u>	<u>Origin</u>	<u>Destination</u>	<u>Approximate Length (Inch)</u>	<u>Remarks</u>
W/Green	A1T1-15	A1CB3-2	5 1/2	
White	A1CB1-2	A1J12-14	15	
	A1CB1-4	A1J12-15	14	
	A1CR101-AC	A1CB2-3	4	
	A1CR101-AC	A1CB2-4	4 1/2	
	A1CR101-(+)	A1P4-1	7 1/2	
	A1CR101(-)	A1P4-6	7 1/2	
	A1J12-12	A1J13-1	11	
	A1C104-(+)	A1P4-2	18 1/4	
White	A1C104(-)	A1P4-5	18 1/2	
Green	A1J13-2	E3 (AC)	6 1/2	
Green	A1J14-4	E3 (AC)	6 1/2	
Green	A1FL1-2	E3 (AC)	9	
White	A1FK1-3	A1CB1-1	12 3/4	
White	A1FL1-1	A1CB1-2	13 1/2	
White	A1CB2-5	A1P8-1	8 1/2	
White	A1CB2-6	A1P8-2	8 1/2	
White	A1CB3-4	A1CR102-AC	12	
White	A1CB3-3	A1CR102-AC	12	
White	A1CR102-(+)	A1CB2-AUX NO.	15	
White	A1CB2-AUX	A1C104-(+)	14 1/2	

HARDWARE PRODUCT CONFIGURATOR
DOCUMENT PACKAGE AND
MANUAL TO EQUIPMENT LEVEL
CORRELATION

SCOPE

The documentation provided in this package supplements the Model 9427H Hardware Maintenance Manual and makes it unique to the equipment described below. This documentation package, when referenced, should be identified by the Hardware Product Configurator (HPC) number, and the title 'HPC Document Package', i.e., 83448215 HPC Document Package.

EQUIPMENT

HPC NUMBER	83448215
TOP MECHANICAL ASSEMBLY	75741190

PACKAGE CONTENTS

DEVICE SPEC AND SWITCH SELECTION	83449215
I-O DIAGRAM PACKAGE (RACK)	77834701
(SPD) DATA RECOVERY BD ASSEMBLY	77614937
(SPD) CONTROL BOARD ASSEMBLY	77614938
(SPD) SERVO MOD	77653387
SEEK TERM TO ADDRESS REGISTER	(68698) 75890887
INSTALL OF OPER RK MT (68748-2)	75896672
PARTS DATA CONFIGURATOR	75741190

OTHER INFORMATION

HARDWARE MAINT. MANUAL OEM (BP11)	77653380
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 DEVICE SPECIFICATIONS
 AND SWITCH SELECTIONS

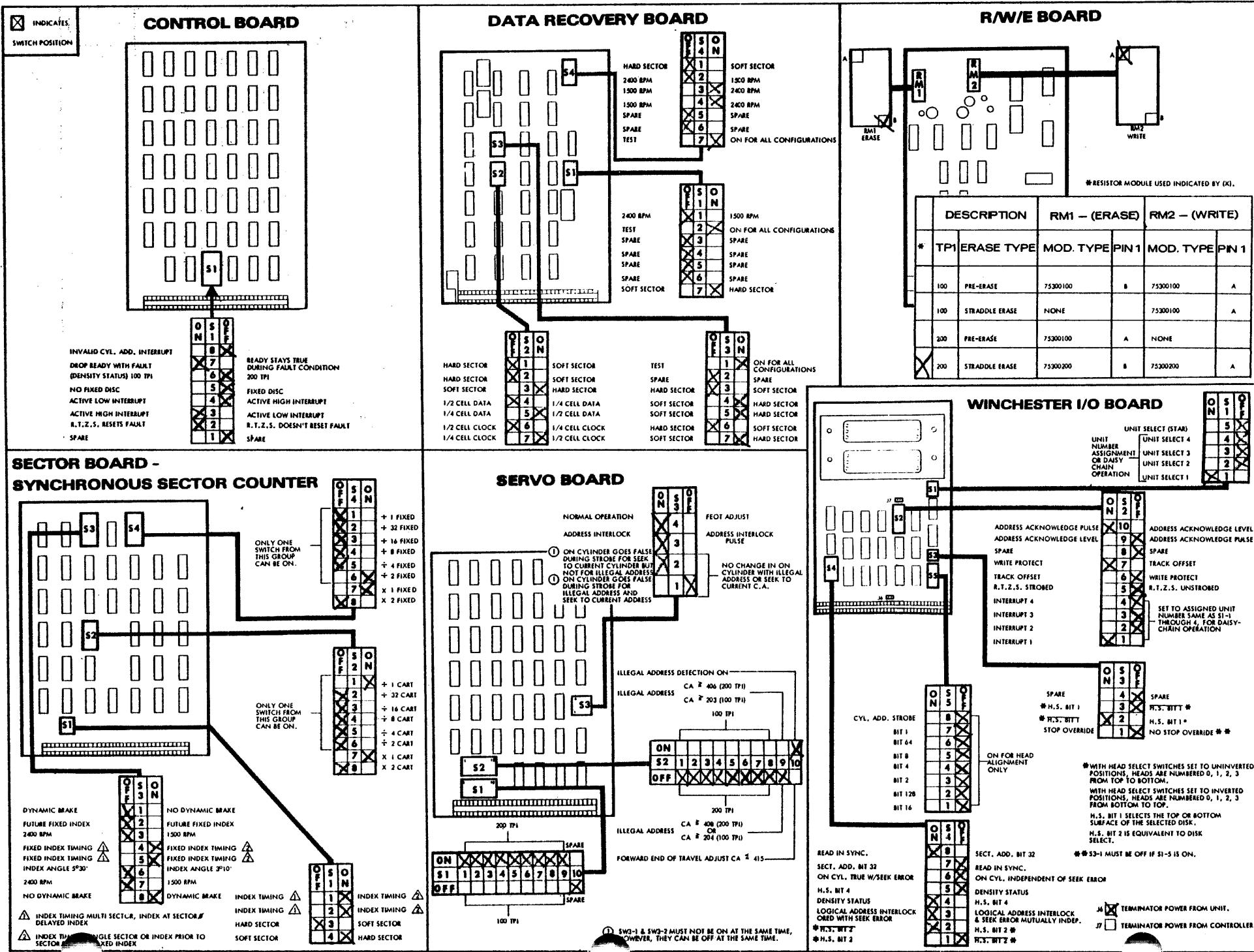
SCOPE

This document defines the unique mechanical/electrical requirements and switch adjustment selections for the 9427H Disk Storage Drive Hardware Product Configurator (HPC) number 83448215.

The following is a summary of customer selected items. This configuration has been prepared to meet the requirements of the HPC specified above. Immediately following the summary are the Printed Circuit Board switch selections.

DEVICE SPECIFICATION SUMMARY

INPUT VOLTAGE:	110 Volts, 5.0 Amps
SECTORING (HARD):	20 Sectors, Mt Hole #2, divided by 2
MOUNTING:	Rack
TERMINATOR:	110-330 Ohms
REVOLUTIONS PER MINUTE:	2400
HEADS:	200 Tracks Per Inch
HEADS:	Straddle Erase
HEADS:	Fixed Disk
FREQUENCY:	60 Hz
SPINDLE DRIVE:	With Dynamic Brake
CONTROLLER INTERFACE:	Non-Standard
I-O CONNECTOR:	Winchester
MAXIMUM TRACK:	407
TERMINATOR POWER:	Unit
INDEX ANGLE:	5 degrees 30 minutes
INDEX TIMING:	Single Sector or Index prior to '0' degrees
ADDRESS ACKNOWLEDGE:	Pulse
HEAD & DISK SELECT:	Numbered Bottom Up
UNIT SELECT:	Daisy Chain
DRIVE TRACKS PER INCH:	200
LOGICAL ADDR INTERLOCK:	OR'd with Seek Error
ACTIVE INTERRUPT:	High
FEATURE:	Write Protect
FEATURE:	ON Cyl Independent of Seek Error
FEATURE:	Density Status
FEATURE:	Drop Ready with Fault
FEATURE:	RTZS Resets Fault
FEATURE:	ON Cyl goes false during strobe for Seek to current Cyl but not for Illegal Addr.
:	



SW1-1 & SW2-2 MUST NOT BE ON AT THE SAME TIME, HOWEVER, THEY CAN BE OFF AT THE SAME TIME.

9427H
PARTS DATA CONFIGURATOR

SCOPE

This document defines the unique mechanical requirements for the Model 9427H Disk Storage Drive Top Mechanical Assembly (TMA) number 75741190.

When used with Section 8 of the Hardware Maintenance Manual, the table below physically describes the above TMA based on customer selected items. This table must be used with Figures 8-2 and 8-3 of Section 8. It is recommended that this document be inserted in an appropriate location within the Section.

ITEM IDENT NO	DESCRIPTION	REMARKS
75741190	TOP MECHANICAL ASSEMBLY	FIG 8-2
0150 75306101	TETHER LINE	FIG 8-2
0152 75895231	UNDERCOVER ASSY	FIG 8-2
0229 83443504	RACK MT ASM	FIG 8-2
0252 75305704	TERMINATOR	FIG 8-2
0255 75778701	LINECORD	FIG 8-2
0286 83442518	COLOR OPT RACK MT(1108)	FIG 8-2
83429721	MODULE ASSEMBLY	FIG 8-3
0301 83429802	HAWK COMMON PARTS	FIG 8-3
0307 75740123	HEAD OPTION	FIG 8-3
0321 75740601	HZ RPM DR OPT	FIG 8-3
0327 77655001	PWR SUPPLY ASM	FIG 8-3
0334 75795216	I-O OPTION RACK MT	FIG 8-3
0346 83474909	BRAKE & SPINDLE DR	FIG 8-3
0353 83437400	FILTER-AIR	FIG 8-3
0357 83451201	STANDOFF	FIG 8-3
0358 83466001	BRUSH DRIVE ASM	FIG 8-3
0360 77834644	COVER ELECTRONICS	FIG 8-3

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A 75890885-9 THRU
75890892-5

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TITLE
SPECIAL OPTION 68698-1

P. C. REVISION STATUS FOR
A 75890885 THRU
75890892

SHEE
1/1

REV
B

REFERENCE SPECIFICATION NUMBER	
	900
	901
	902
	903

REVISION RECORD					
REV	ECO	DESCRIPTION	DRFT	DATE	CHKD APP

SPECIAL OPTION 68698
 FIRST USED ON BR7K6A
 (TABS 132, 195)

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES			MAGNETIC PERIPHERALS INC.  a subsidiary of CONTROL DATA CORPORATION OKLAHOMA CITY, OKLAHOMA			TITLE SPECIAL OPTION 68698			
TOLERANCES 3 PLACE 2 PLACE ANGLES ± ± ±									
DO NOT SCALE DRAWING			DWN	Engraving	22 JUL 77				
MATERIAL			CHKD	QC 686 -	7/26/77				
FINISH			ENGR						
			MFG						
			APPR	Engraving	7/25/77	SIZE	DRAWING NUMBER	CD	REV
						A	75890885 THRU 75890892	9 5	A
			SCALE	NONE		SHEET			
						1 OF 6			

NOTES:

1. DESCRIPTION:

THIS SPO SUPPLIES A KIT TO MODIFY THE 9427H "HAWK" TO IMPLEMENT A LOGIC CHANGE THAT INVERTS THE SEEK TERM TO THE ADDRESS REGISTER.

2. PARTS:

PARTS SHALL BE PACKAGED IN KIT FORM AND IDENTIFIED AS PART NUMBER 75890886-7.

3. INSTALLATION:

- A. POWER DOWN THE UNIT BY OPENING CB-1.
- B. REMOVE UNIT TOP COVER AND ELECTRONICS COVER.
- C. REMOVE SERVO BOARD FROM CARD CAGE.
- D. CUT ETCH ON SOLDER SIDE U6-09 TO FEED THROUGH WEST. (FIG. 1)
- E. CUT ETCH ON COMPONENT SIDE TO U21-12. (FIG. 2)
- F. ADD 2 JUMPERS (30GA WIRE) ON COMPONENT SIDE U6-09 TO U10-11 AND U21-12 TO U8-13. (FIG. 3)
- G. REIDENTIFY MODIFIED SERVO BOARD AS 75890887 REV. A
- H. INSTALL THE MODIFIED SERVO BOARD IN ITS PROPER SLOT IN THE CARD CAGE ON AN EXTENDER CARD AND POWER UP THE UNIT.

4. CHECKOUT:

- A. ISSUE AN ALTERNATE SEEK CYL 0 TO CYL 64 WITH A FIELD TESTER OR ON LINE.
- B. CONNECT SCOPE CHAN. 1/SYNC TO B-18 (CYL. STR)
CONNECT SCOPE CHAN. 2 TO U15-08 (AD/6)
- C. VERIFY U15-08 CHANGES STATE AFTER THE RISING EDGE AND BEFORE THE FALLING EDGE OF B-18.
- D. POWER DOWN THE UNIT, REMOVE THE EXTENDER CARD AND INSTALL THE MODIFIED SERVO BOARD IN ITS PROPER SLOT.

5. INSTALL COVERS FROM STEP B. UNIT IS READY FOR NORMAL OPERATION.

6. LOG SPO NUMBER 68698 ON UNIT FEATURE LIST.

7. SPARE PARTS:

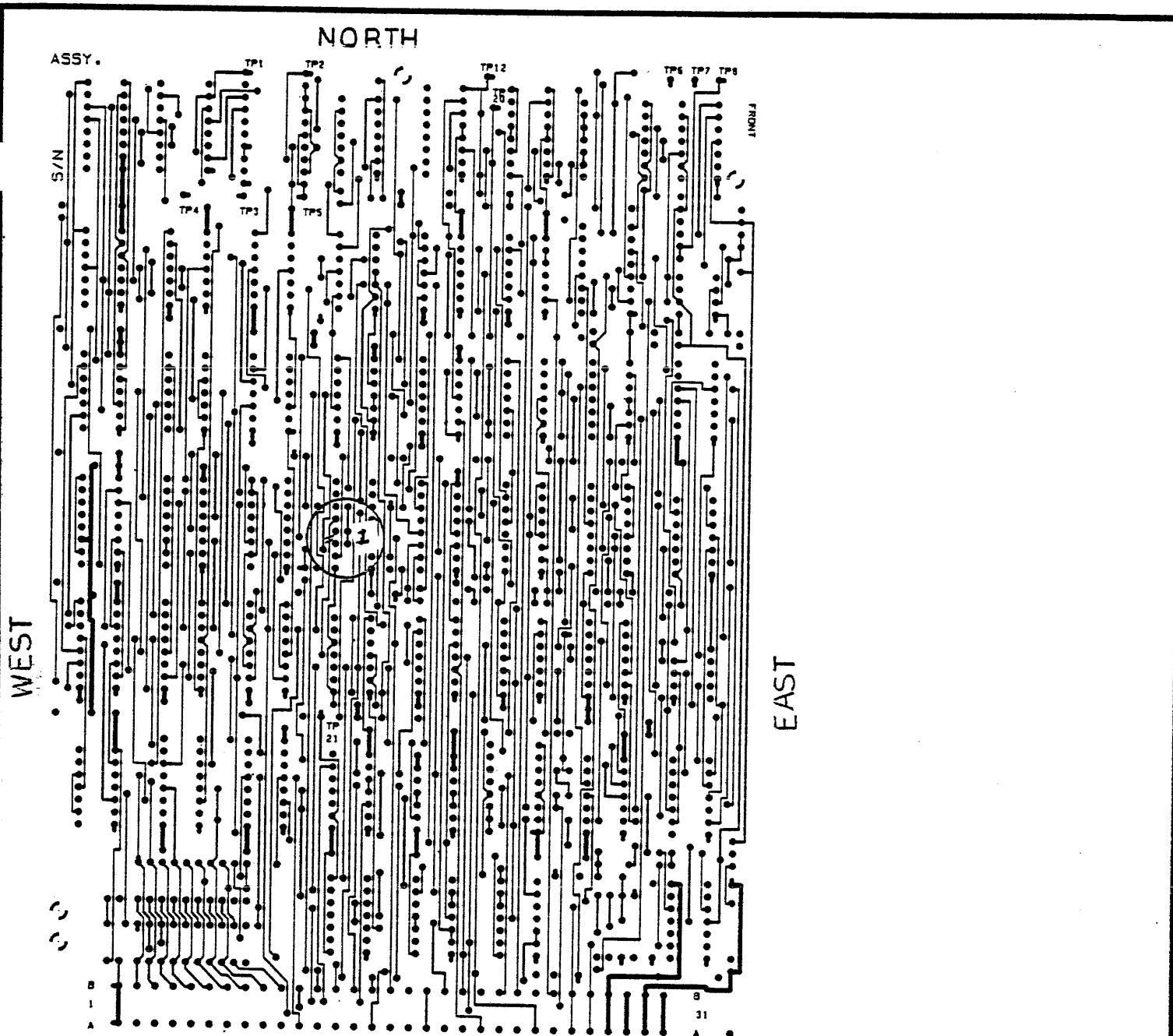
WHEN ORDERING REPLACEMENT FOR SERVO BOARD WITH SPO 68698-1 INSTALLED, ORDER PART NUMBER 75890887-5.

8. PWB TEST (MANUFACTURING USE ONLY)

VERIFY OUTPUTS OF U5, U6 AND U15-8 CHANGE STATE OR RISING EDGE OF B-18.

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SIZE	DRAWING NUMBER	CD	SH	REV
A	75890885 THRU 75890892	9	2	B



SOUTH
FIGURE 2 - COMPONENT SIDE

CUT RUN LIST

NO	FROM	TO
1	U21-12	SEEK  3FI

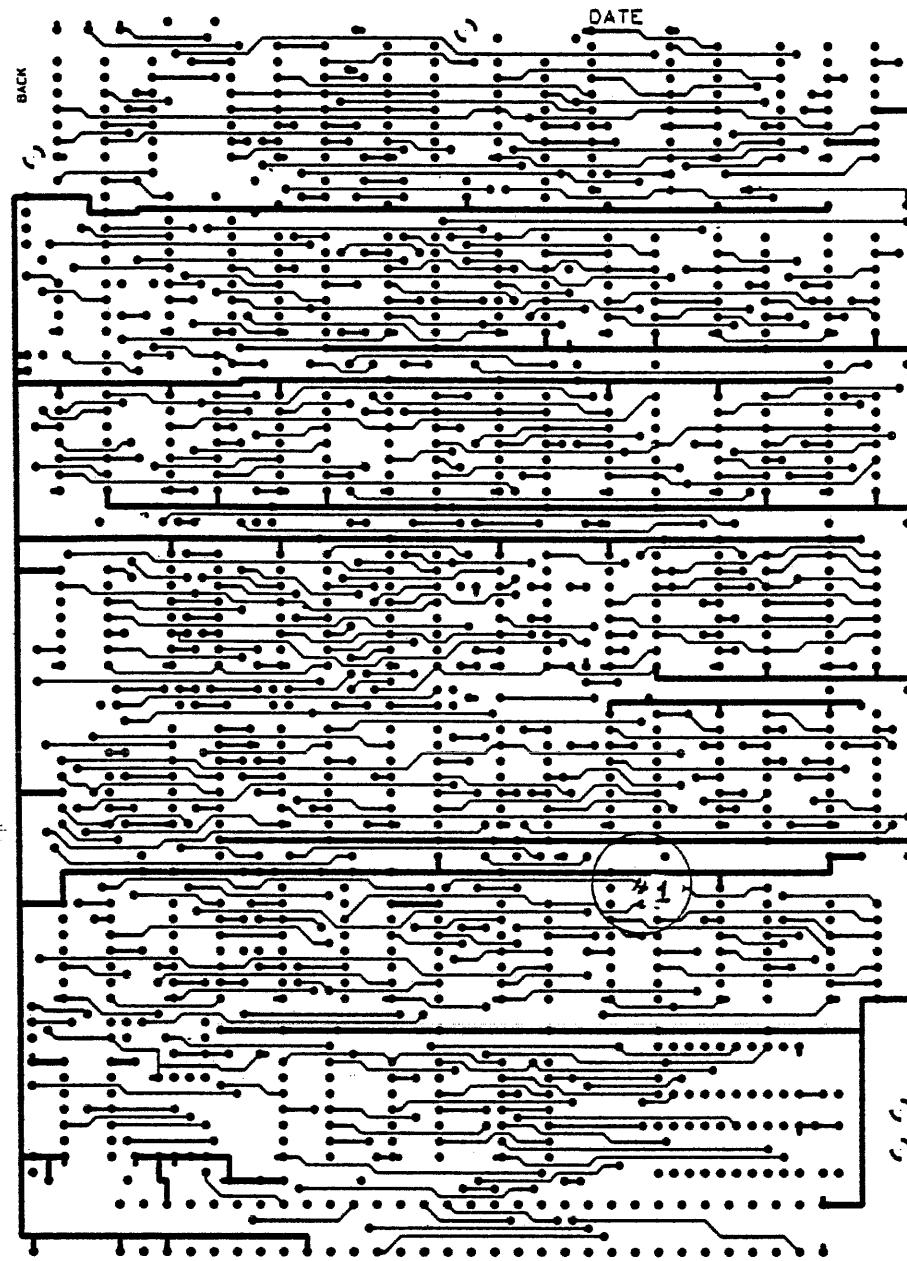
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SIZE	DRAWING NUMBER	CD	SH	REV
A	75890885 THRU 75890892	9 5	3	A

NORTH



SOUTH

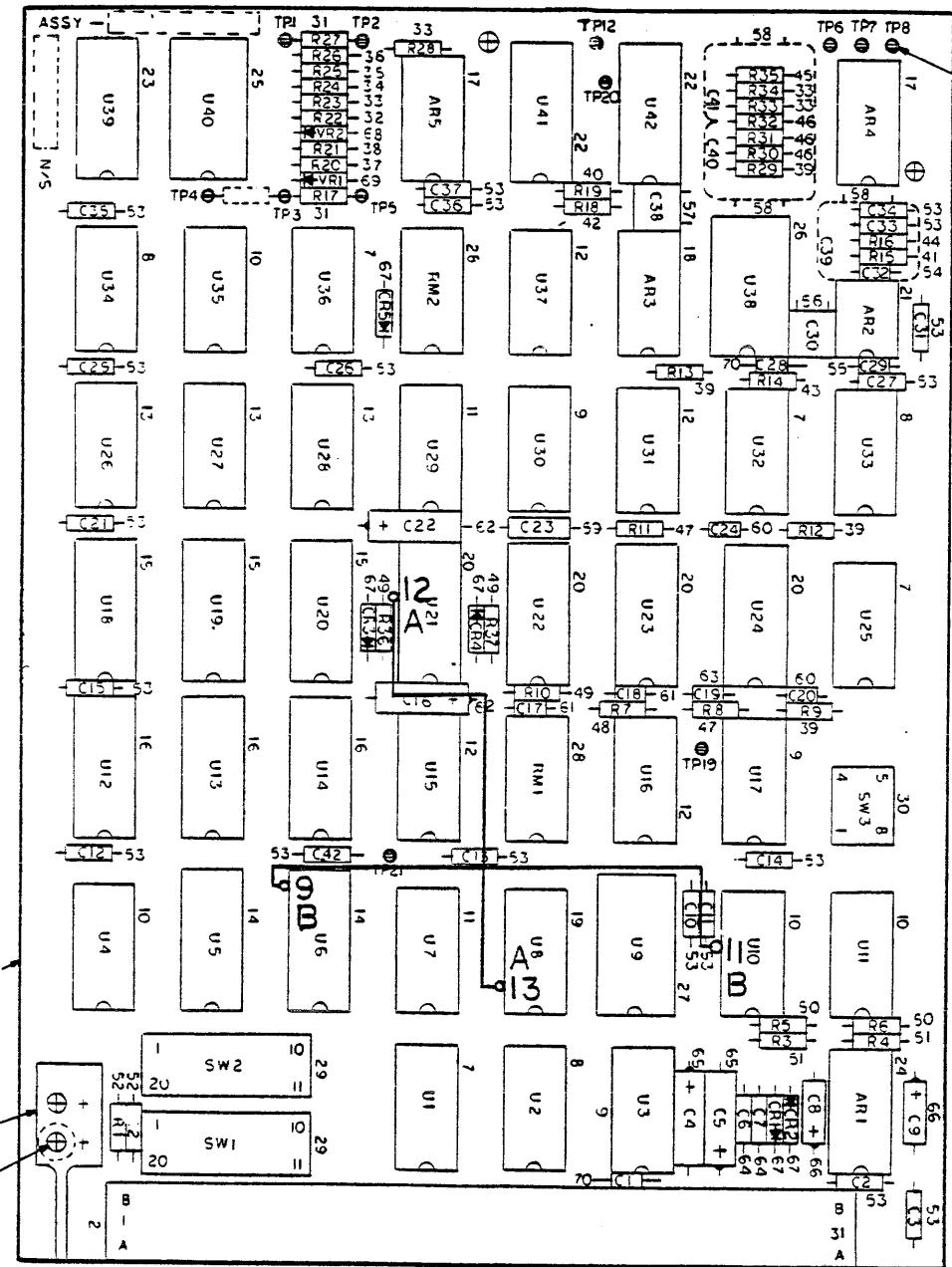
FIGURE 1 - SOLDER SIDE

CUT RUN LIST

NO	FROM	TO
1	U6-9	SEEK A 3FI

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SIZE	DRAWING NUMBER	CD	SH	REV
A	75890885 THRU 75890892	9 5	4	A



JUMPER LIST

NO	FROM	TO
AA	U21-12	U8-13
BB	U6-9	U10-11

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A

DRAWING NUMBER
75890885 THRU
75890892

CD	SH	REV
9	5	A

3G3  SEEK

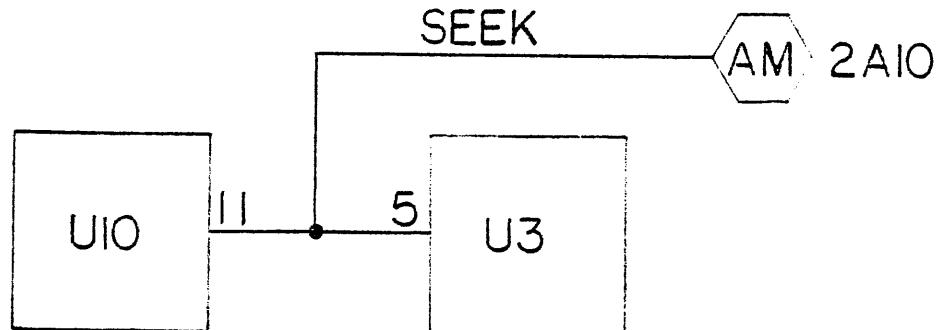
SH2 - A10

FIGURE 1

SEEK  6B10

SH3- F1

FIGURE 2



SH3- G3

FIGURE 3

SCHEMATIC

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SIZE	DRAWING NUMBER	CD	SH	REV
A	75890885 THRU 75890892	9	67	A
		5		

.1/77 A 75890886-7 1/ 1 A

001 002 003 004 005 006 007 008

* 1 1A 94243731-0 P WIRE AWG 30 BLUE	12	IN
* 2 0A 75890885-9 D SPECIAL OPTION 68698	1	EA

SPD 68698-1 KIT

USA

A 75890886-7 1/ 1 A

1/77 A 75890887-5 1/ 1 A

		001	002	003	004	005	006	007	008	
*	1 OD	77831400-5	A PWA SERVO (GEM)	1						EA
*	2 OA	75890886-7	A SPD 68698-1 KIT	1						EA
*	3 OA	75890885-9	D SPECIAL OPTION 68698	REF						EA

SPARE ASSY SPD 68698

USA

A 75890887-5 1/ 1 A

A 75896 72-5

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APPROVED *[Signature]* 11-2-79

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3 3 TITL

SPO 68748-2 KIT

P.C.	REVISION STATUS FOR	SHEET	REV
A	75896672-5	111	9

10/23/79 A

75896672-5

1/ 1 A

QTY SPC

*	1 OD	77624812-2	A FILTER FRAME ASSY	1	EA
*	2 1A	83410501-7	P GASKET STRIP	46	IN
*	3 OA	75896671-7	D SPD 68748-2	X	EA

SPD 68748-2 KIT

USA

A 75896672-5

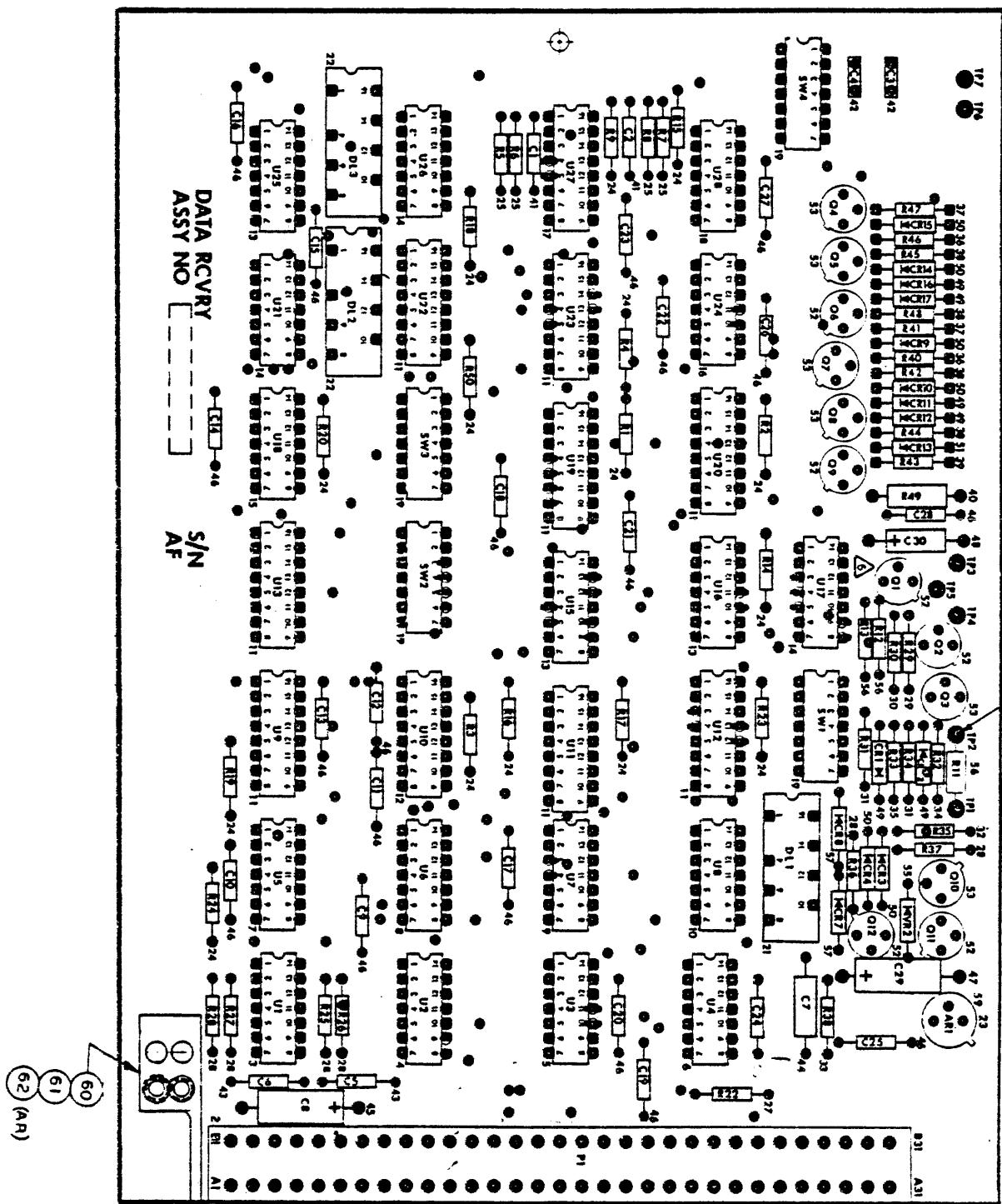
1/ 1 A

SPECIAL EQUIPMENT DOCUMENTATION

This publication, when used with the 9427H Hardware Maintenance Manual, will support specific equipment configurations. The data contained herein physically describes the DATA RECOVERY circuit board assembly (75886537) and includes the circuit board component layout, interconnection and schematic diagrams. Circuit board functional description however, is contained in the Theory of Operation section of the Hardware Maintenance Manual.

This documentation replaces the corresponding circuit board figure in section 5 of the Hardware Maintenance manual. It is recommended that this document be inserted in an appropriate location in section 5.

68 (1) TPI TURN TPI

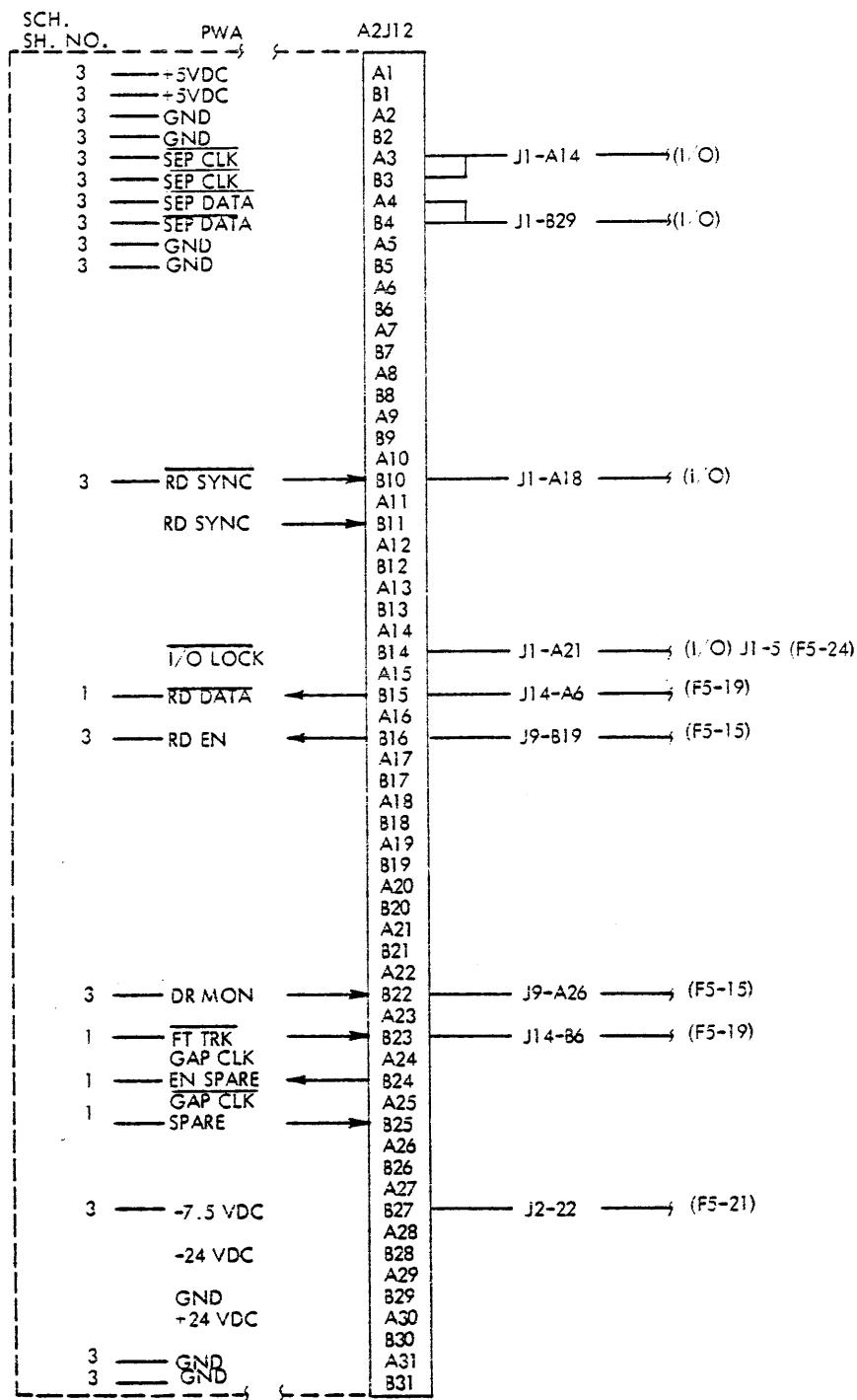


ITEM IDENT NO	DESCRIPTION	REMARKS
75886537	PWA-DATA RECOVERY	
1 75297005-3	BOARD PC DATA-RECOVE	TAB 1
2 77836070-1	PWB SOCKET CONNECTOR	TAB 1
3 51768200-1	I C DUAL	TAB 1
4 36187900-0	I.C. 7453	TAB 1
5 15112700-8	I.C. 74L04	TAB 1
6 15158700-3	I.C. 74S140	TAB 1
7 15112300-7	I.C. 74L00	TAB 1
8 96744156-9	I.C. 7474	TAB 1
9 88882100-6	IC 74H00	TAB 1
10 88885300-9	I.C. 74S20	TAB 1
11 15158600-5	I.C. 74S112	TAB 1
12 15160600-1	I.C. 93L16	TAB 1
13 88884500-5	I.C. 74S00	TAB 1
14 88883700-2	I.C. 74S04	TAB 1
15 88923000-9	I.C. 74S74	TAB 1
16 88884200-2	I.C. 74S10	TAB 1
17 88886500-3	I.C. 9602	TAB 1
18 88924500-7	I.C. 7404	TAB 1
19 83452204-7	SWITCH-7 POSITION	TAB 1
21 83406502-1	DELAY LINE 100 NS	TAB 1
22 83406501-3	DELAY LINE 50 NS	TAB 1
23 15130400-3	VOLT REGULATOR	TAB 1
24 94360300-1	RES 1/4W 1% 1.00K	TAB 1
25 94360430-6	RES 1/4W 1% 20.5K	TAB 1
27 94360335-7	RES 1/4W 1% 2.32K	TAB 1
28 94360224-3	RES 1/4W 1% 178	TAB 1
29 94360220-1	RES 1/4W 1% 162	TAB 1
30 94360359-7	RES 1/4W 1% 4.12K	TAB 1
31 94360232-6	RES 1/4W 1% 215	TAB 1
32 94360316-7	RES 1/4W 1% 1.47K	TAB 1
33 94360200-3	RES 1/4W 1% 100	TAB 1
34 94360257-3	RES 1/4W 1% 392	TAB 1
35 94360280-5	RES 1/4W 1% 681	TAB 1
36 94360168-2	RES 1/4W 1% 51.1	TAB 1
37 94360165-8	RES 1/4W 1% 47.5	TAB 1
38 94360264-9	RES 1/4W 1% 464	TAB 1
39 94360272-2	RES 1/4W 1% 562	TAB 1
40 24500131-8	RES 1/2W 5% 47	TAB 1
41 92496147-7	CAP 200V 10% 1200	TAB 1
42 94227236-0	CAP 300V 2% 270	TAB 1
43 92496267-3	CAP 200V 10% 220	TAB 1
44 92496393-7	CAP 80V 10% .033UF	TAB 1
45 24504353-4	CAP 10V 20% 33UF +	TAB 1
46 92496227-7	CAP 100V 20% .01UF	TAB 1
47 24504339-3	CAP 35V 20% 6.8UF +	TAB 1
48 24504329-4	CAP 35V 20% 1.0UF +	TAB 1
49 51736700-9	DIODE IN914A	TAB 1
50 50241400-6	DIODE SPECIAL	TAB 1

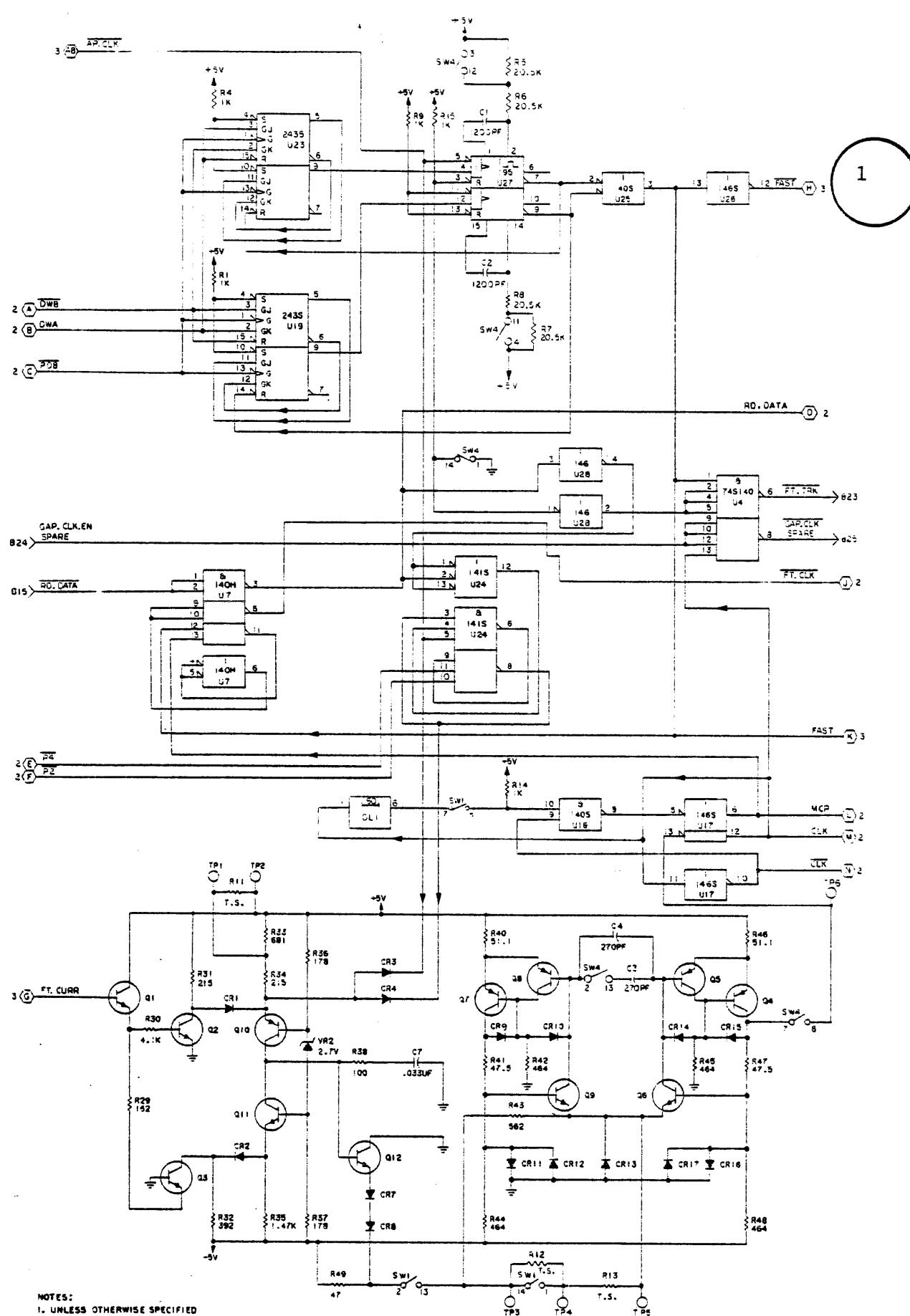
Circuit Board Assembly

ITEM IDENT NO	DESCRIPTION	REMARKS
51 11801200-4	SPEC DIODE GERMANIUM	TAB 1
52 50210310-4	TSTR,SNPN,15V NN3646	TAB 1
53 50211510-8	TSTR,SPNP,12V NN4258	TAB 1
55 50240146-6	DIODE SILICON	TAB 1
56 94357500-1	RESISTOR TEST SELECT	TAB 1
57 24553500-0	DIODE SI PLANAR	TAB 1
58 92498021-2	TERMINAL SWAGED	TAB 1
59 94335900-0	PAD-TRANSISTOR MTG	TAB 1
60 83479801-9	KEY, INJECT.MOLD	TAB 1
61 10125703-8	SCR FLAT HD	TAB 1
62 75312701-8	SPEC-EPOXY ADHESIVE	TAB 1
66 94243731-0	WIRE AWG 30 BLUE	TAB 1

Circuit Board Assembly

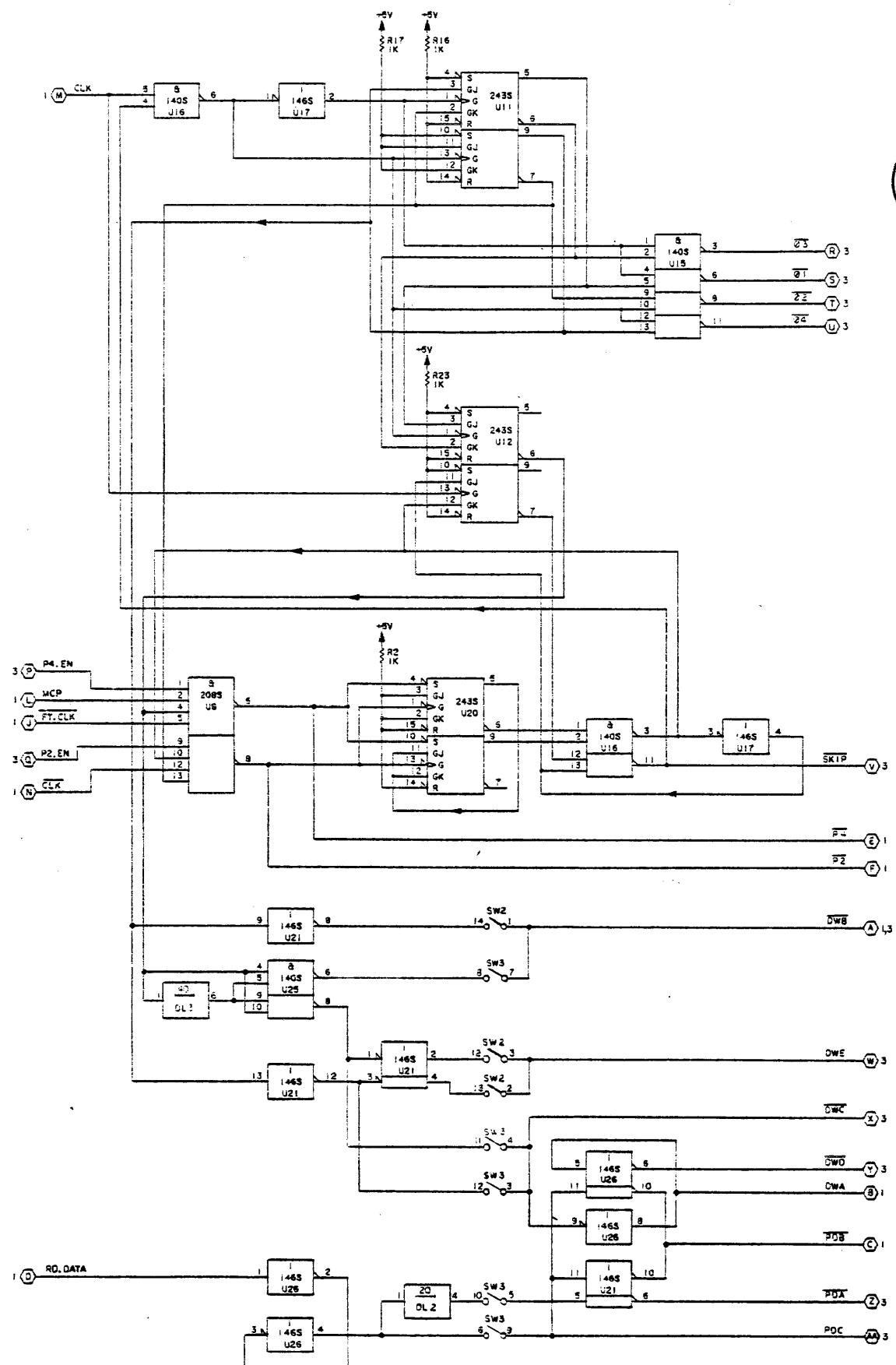


Interconnection Diagram

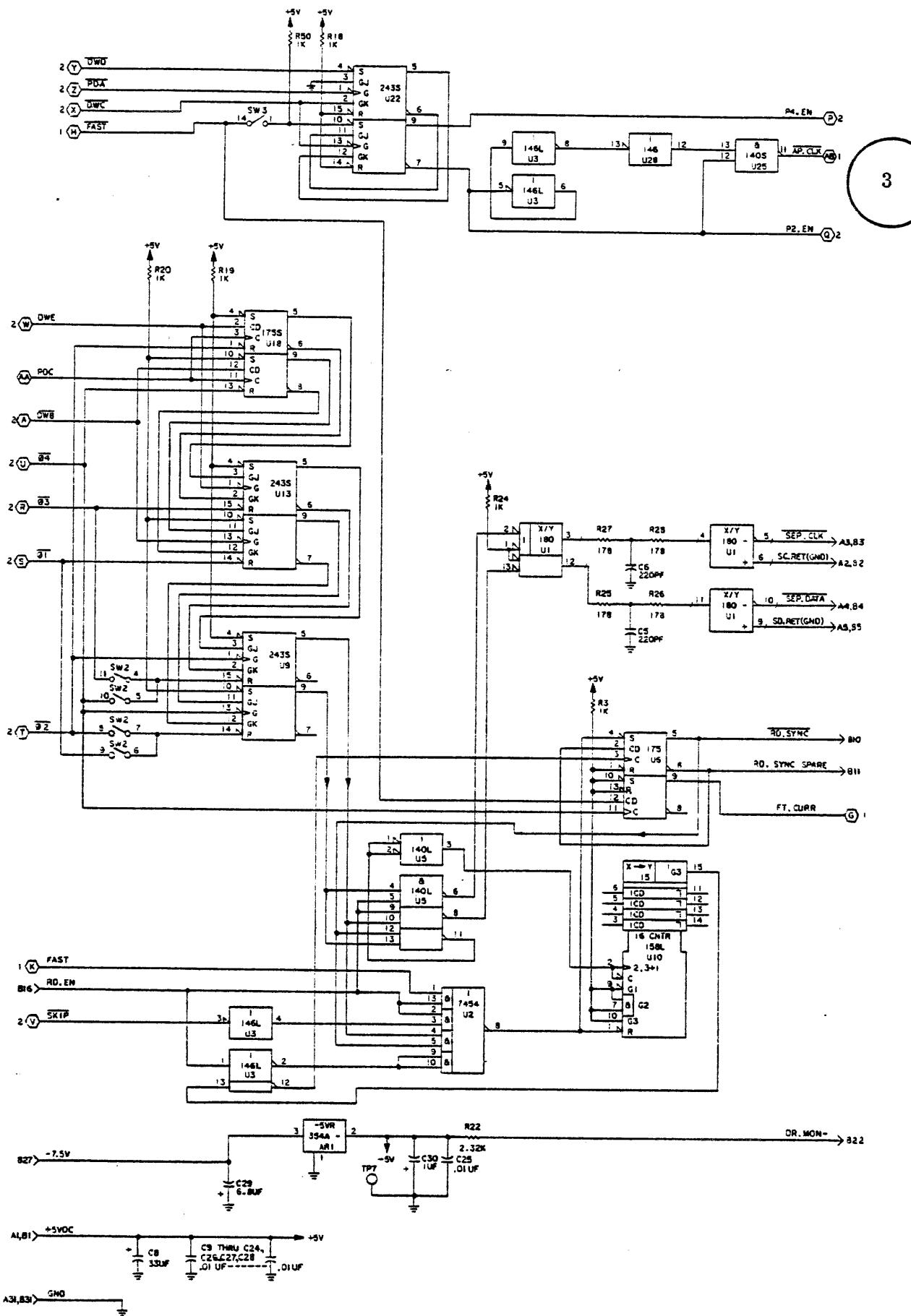


Schematic

2



Schematic

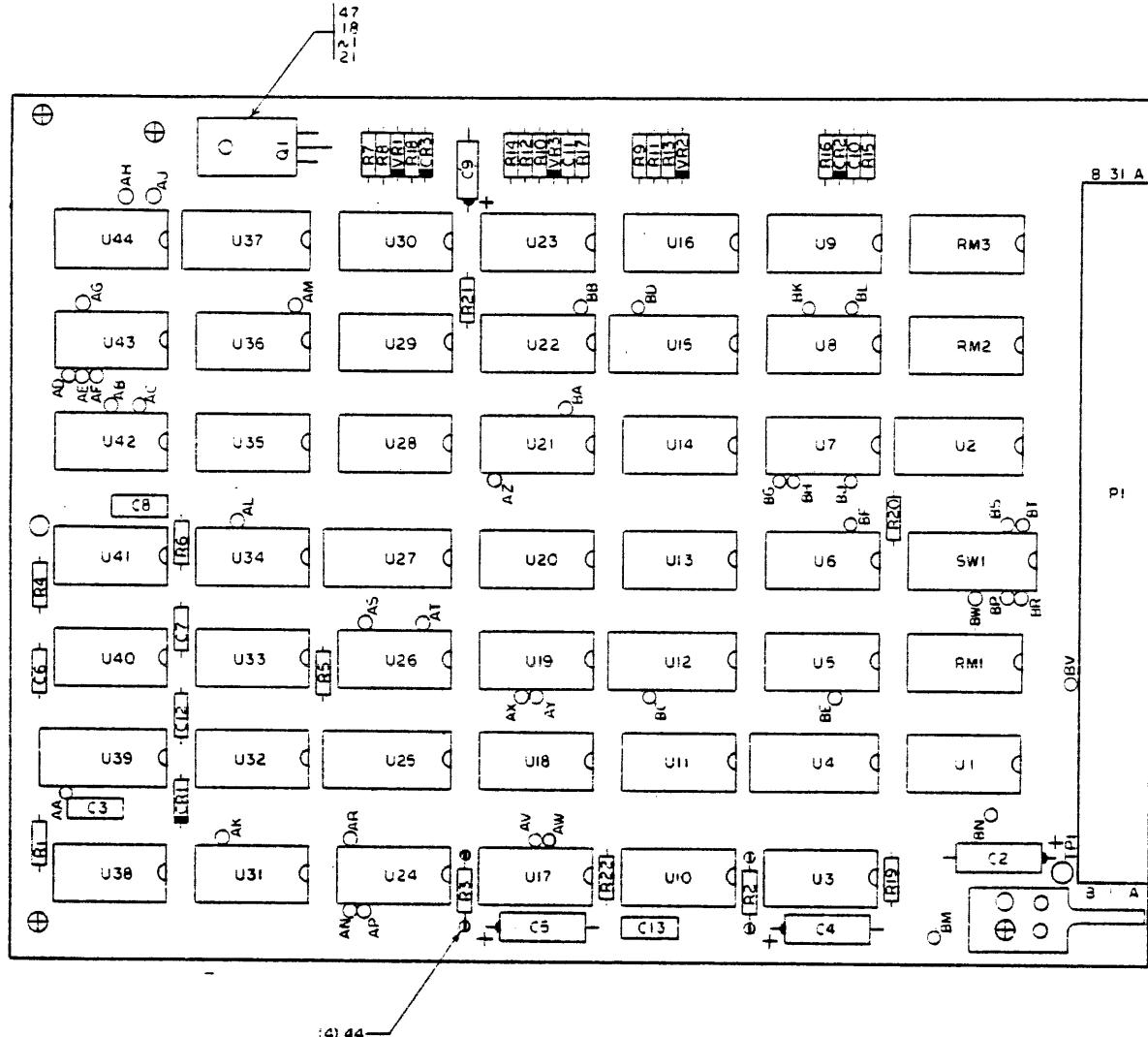


Schematic

SPECIAL EQUIPMENT DOCUMENTATION

This publication, when used with the 9427H Hardware Maintenance Manual, will support specific equipment configurations. The data contained herein physically describes the CONTROL circuit board assembly (75891658) and includes the circuit board component layout, interconnection and schematic diagrams. Circuit board functional description however, is contained in the Theory of Operation section of the Hardware Maintenance Manual.

This documentation replaces the corresponding circuit board figure in section 5 of the Hardware Maintenance manual. It is recommended that this document be inserted in an appropriate location in section 5.



RES	PL	ITEM
R1	28	
R2	43	
R3	45	
R4	30	
R5	30	
R6	31	
R7	22	
R8	22	
R9	23	
R10	23	
R11	26	
R12	26	
R13	24	
R14	24	
R15	27	
R16	29	
R17	27	
R18	29	
R19	25	
R20	25	
R21	25	
R22	38	
R23	—	
R24	—	

(XX225a)

CAP	PL	ITEM
C1	—	
C2	32	
C3	36	
C4	32	
C5	32	
C6	37	
C7	37	
C8	36	
C9	33	
C10	34	
C11	34	
C12	34	
C13	36	
C14	—	
C15	—	
C16	—	

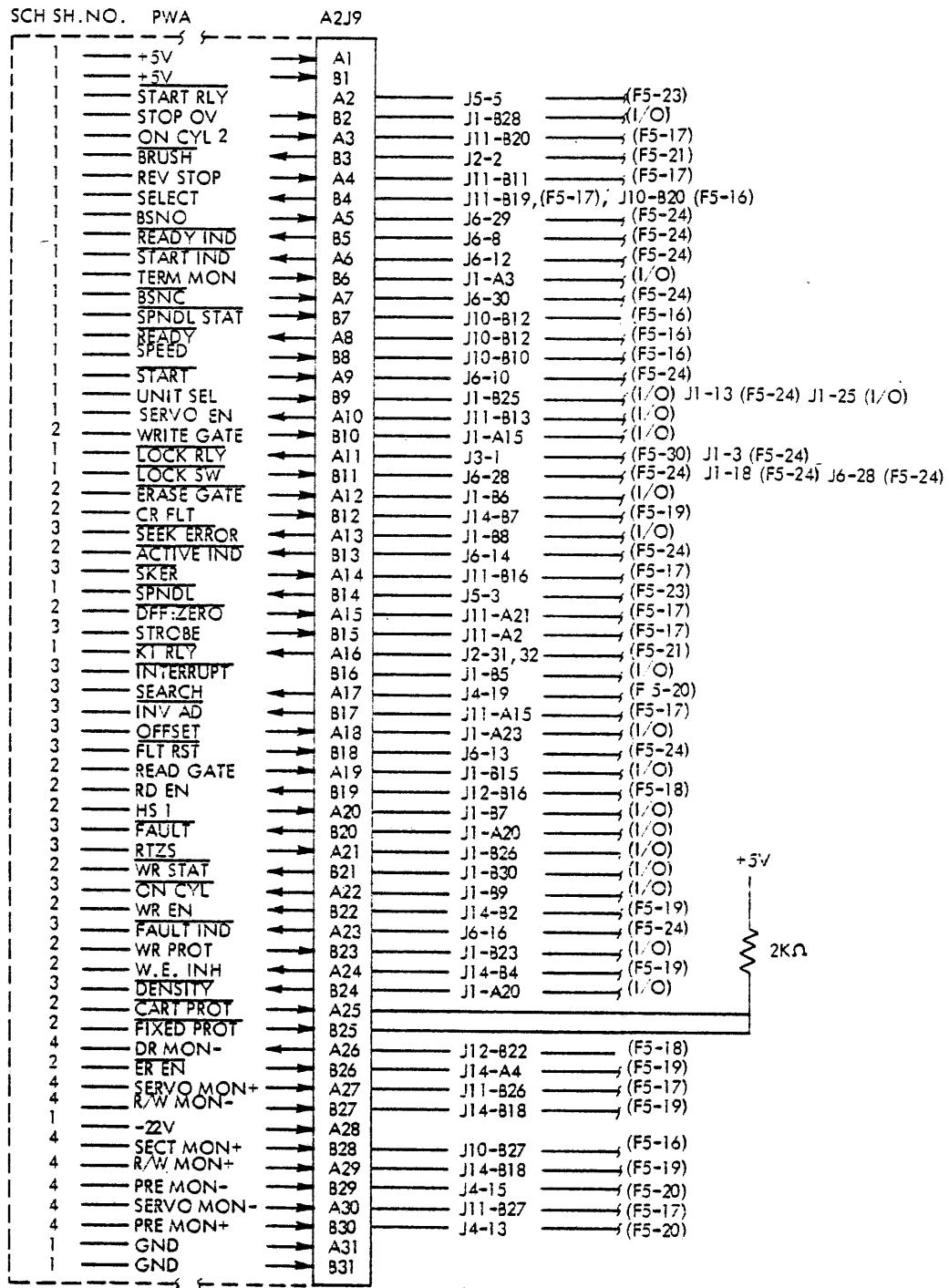
REG	PL ITEM
VRI	16
VR2	17
VR3	17

PL
ITEM

Circuit Board Assembly

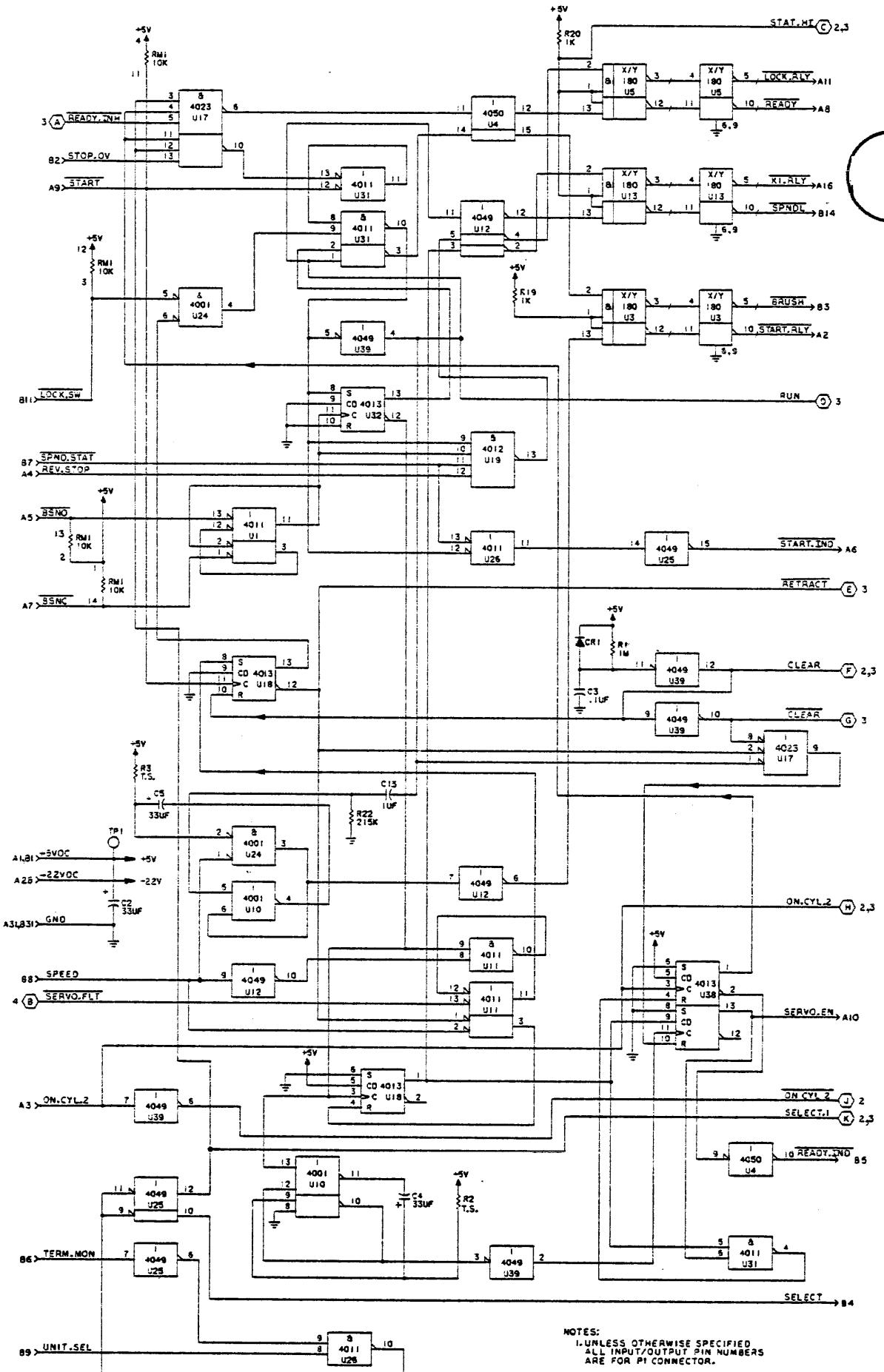
ITEM IDENT NO	DESCRIPTION	REMARKS
75891658	PWA-CONTROL	
1 75892420-3	PWB , CONTROL BOARD	TAB 1
2 77836070-1	PWB SOCKET CONNECTOR	TAB 1
3 15134700-2	I.C. CMOS 4049B	TAB 1
4 15134800-0	I.C. CMOS 4050B	TAB 1
5 15135000-6	I.C. CMOS 4001B	TAB 1
6 15133700-3	I.C. CMOS 4023B	TAB 1
7 15133300-2	I.C. CMOS 4012B	TAB 1
8 15126600-4	I.C. LM339	TAB 1
9 51768200-1	I C DUAL	TAB 1
10 15133200-4	I.C. CMOS 4011B	TAB 1
11 15133400-0	I.C. CMOS 4013B	TAB 1
12 15134600-4	IC 4047 CMOS 1 SHOT	TAB 1
13 51736700-9	DIODE IN914A	TAB 1
14 75009901-2	RES PAC 2% 1.0K (13)	TAB 1
15 75009993-9	RES PAC 2% 10K (7)	TAB 1
16 50240107-8	VOLT REG 5.6V 5%	TAB 1
17 50240101-1	DIODE ZENER 3.3V	TAB 1
18 75752400-4	TRANSISTOR POWER	TAB 1
19 83452205-4	SWITCH-8 POSITION	TAB 1
21 93640012-6	STUD-SELF CLINCHING	TAB 1
22 94360344-9	RES 1/4W 1% 2.87K	TAB 1
23 94360187-2	RES 1/4W 1% 80.6	TAB 1
24 94360287-0	RES 1/4W 1% 806	TAB 1
25 94360300-1	RES 1/4W 1% 1.00K	TAB 1
26 94360317-5	RES 1/4W 1% 1.50K	TAB 1
27 94360346-4	RES 1/4W 1% 3.01K	TAB 1
28 94360596-4	RES 1/4W 1% 1.00MEG	TAB 1
29 94360500-6	RES 1/4W 1% 100K	TAB 1
30 94360457-9	RES 1/4W 1% 39.2K	TAB 1
31 92512629-4	RES 2.2M OHM 1/4W 1=	TAB 1
32 24504353-4	CAP 10V 20% 33UF +	TAB 1
33 24504329-4	CAP 35V 20% 1.0UF +	TAB 1
34 92496211-1	CAP 100V 10% 470	TAB 1
36 92496046-1	CAP 50V 20% .1UF	TAB 1
37 92496219-4	CAP 100V 20% 2200	TAB 1
38 94360532-9	RES 1/4W 1% 215K	TAB 1
39 92498021-2	TERMINAL SWAGED	TAB 1
40 83479901-7	KEY, INJECT.MOLD	TAB 1
41 10125703-8	SCR FLAT HD	TAB 1
42 75312701-8	SPEC-EPOXY ADHESIVE	TAB 1
43 92512000-8	RESISTOR TEST SEL	TAB 1
44 77612165-9	TERMINAL, SLOTTED	TAB 1
45 94357500-1	RESISTOR TEST SELECT	TAB 1
47 92583002-8	NUT LOCK	TAB 1
50 94243731-0	WIRE AWG 30 BLUE	TAB 1

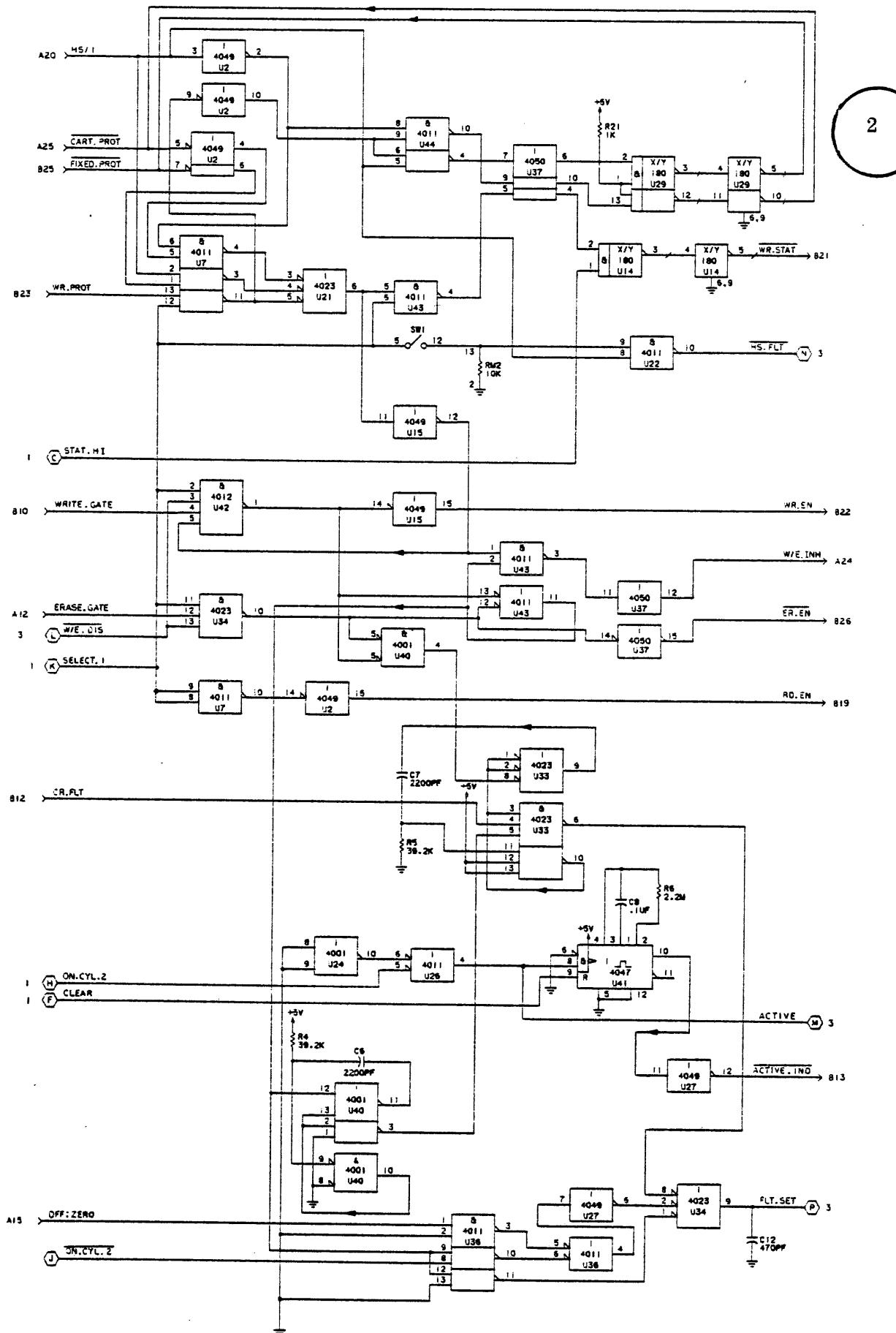
Circuit Board Assembly



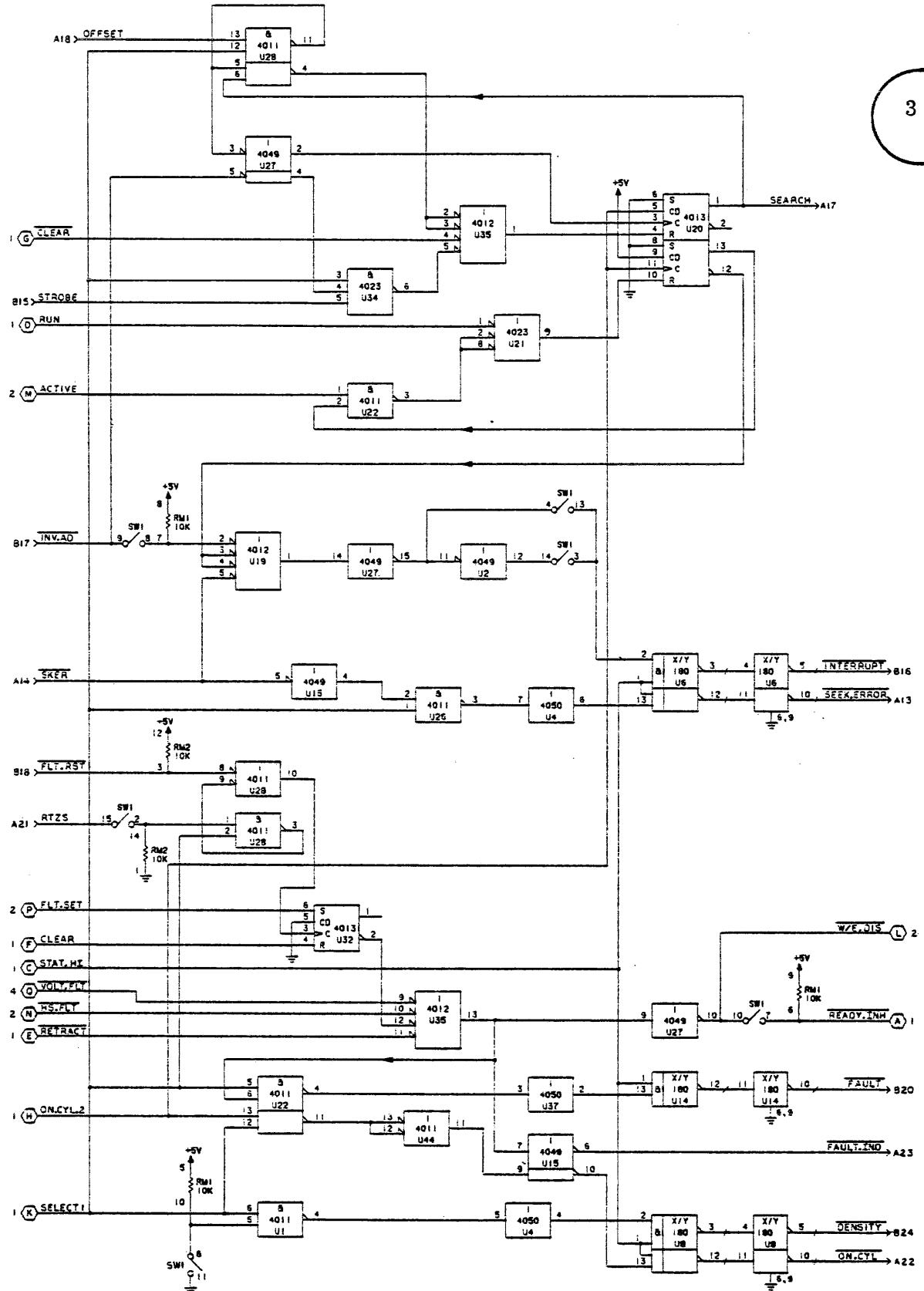
(AA092a)

Interconnection Diagram



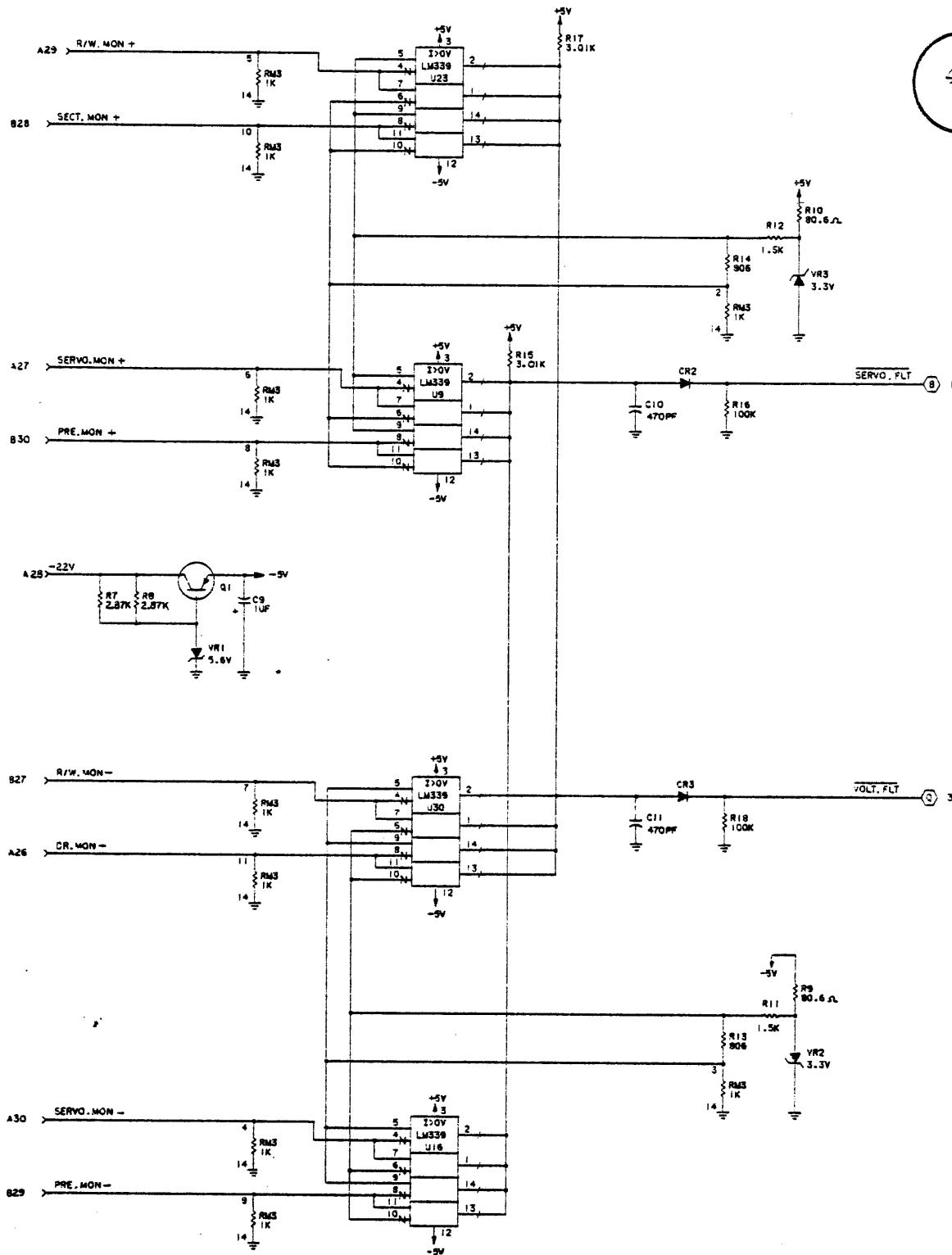


Schematic



Schematic

4



Schematic

SPECIAL DOCUMENTATION PACKAGE

This publication when used with the 9427H Hardware Maintenance Manual will support specific equipment configurations. The data contained herein physically describes the following circuit board:

77664400 SERVO MOD T

and includes the circuit-board component layout, parts list and schematic diagram. The functional description for the circuit board is contained in the Theory of Operations (Section 4) of the Hardware Maintenance Manual.

This documentation replaces the corresponding circuit-board figures in Section 5 of the Hardware Maintenance Manual. It is recommended that this document be inserted in the appropriate location in Section 5.

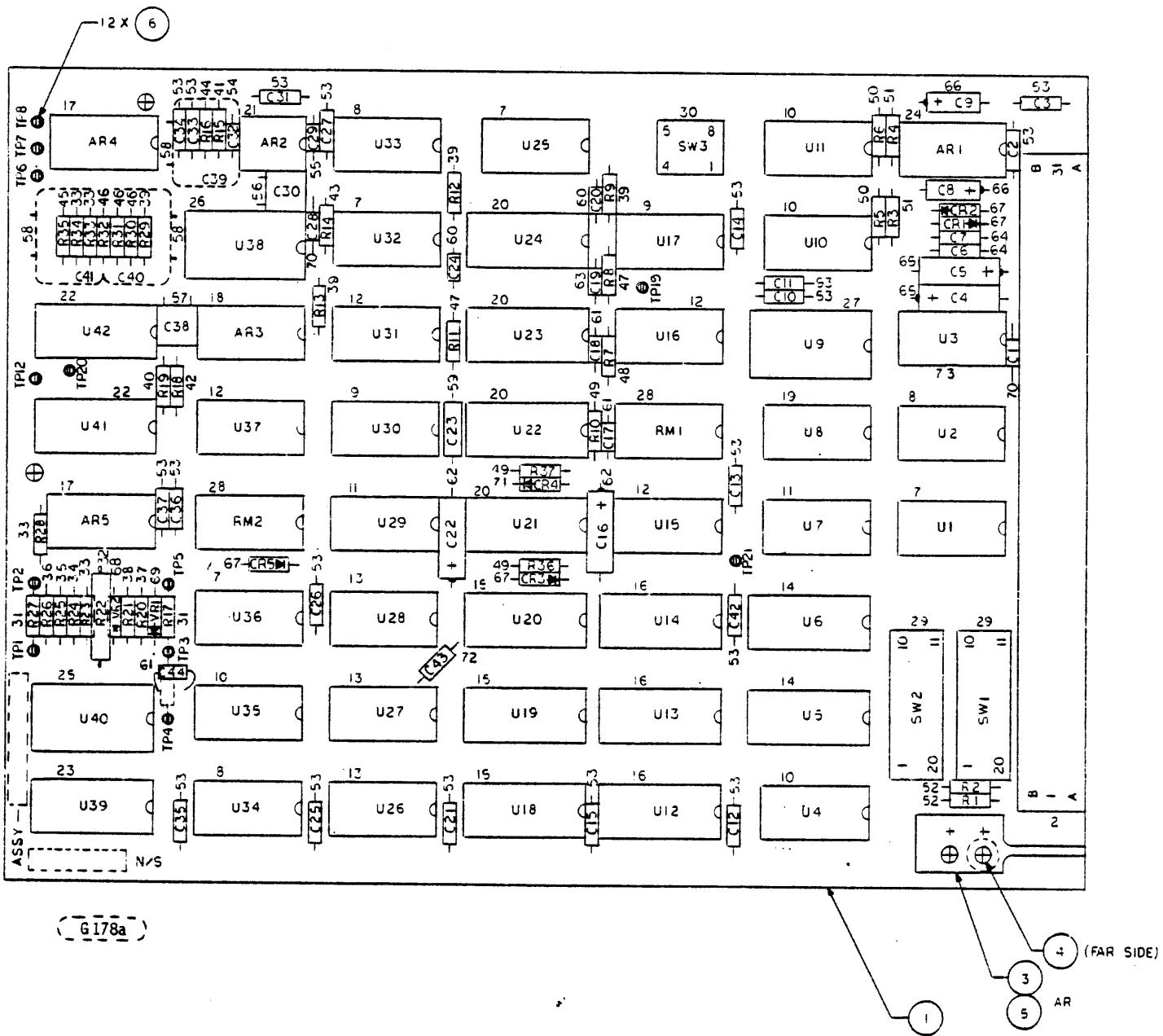


FIGURE 5-17. SERVO BOARD ASSEMBLY (SHEET 1 OF 10)

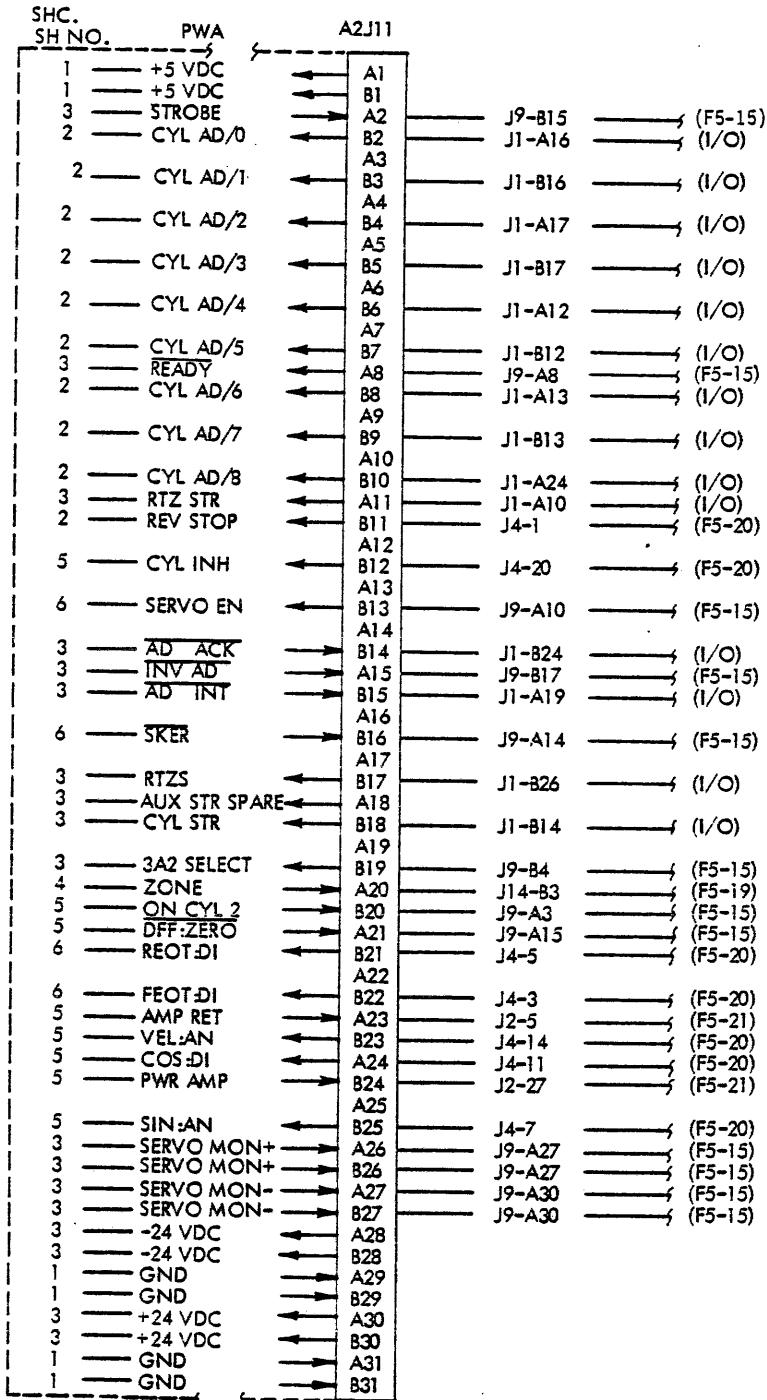
<u>ITEM NO.</u>	<u>IDENTIFICATION NO.</u>	<u>DRAWING TITLE</u>
1	77664400-7	PWA, Servo MOD T
2	77664420-5	PWB, Servo MOD T
3	77836070-1	PWB Socket Connector
4	83479901-7	Key, Inject Mold
5	10125702-0	Scr Flat Hd
6	77612165-9	Terminal, Slotted
7	75732602-0	Pin-Wire Wrap Intch
8	15144900-6	I.C. 74LS00
9	15145000-4	I.C. 74LS02
10	15145100-2	I.C. 74LS04
11	15145400-6	I.C. 74LS08
12	15145600-1	I.C. 74LS10
13	15146300-7	I.C. 74LS74
14	15146400-5	I.C. 74LS86
15	15146900-4	I.C. 74LS175
16	15147000-2	I.C. 74LS193
17	15148200-7	I.C. 74LS283
18	51812800-4	I.C. Dual UA747
19	50252900-1	I.C. 75107
20	51768200-1	I.C. Dual
21	15150700-1	I.C. 96L02
22	15156600-7	I.C. 201A
23	15129400-6	I.C. AH 5012
24	15164442-4	I.C. 1408-8
25	15132702-0	I.C. D to A Converter Intch
26	15132600-6	I.C. Volt Regulator
27	75300900-0	ID Square Root Circu
28	75737000-2	ID Servo Input
29	75737200-8	ID Servo E.O.T.
30	75009935-0	Res Pac 2% 5.1K (13)
31	83452207-0	Switch-10 Position
32	83452201-3	Switch-4 Position
33	94357500-1	Resistor Test Select
34	92577253-5	Res, 1/2W 1% 357
35	94360384-5	Res 1/4W 1% 7.50K
36	94360443-9	Res 1/4W 1% 28.0K
37	94360446-2	Res 1/4W 1% 30.1K
38	94360452-0	Res 1/4W 1% 34.8K
39	94360487-6	Res 1/4W 1% 80.6K
40	94360284-7	Res 1/4W 1% 750
41	94360476-9	Res 1/4W 1% 61.9K
42	94360362-1	Res 1/4W 1% 4.42K
43	94360536-0	Res 1/4W 1% 237K
44	94360386-0	Res 1/4W 1% 7.87K
45	94360368-8	Res 1/4W 1% 5.11K
46	94360344-9	Res 1/4W 1% 2.87K
	94360492-6	Res 1/4W 1% 90.9K
	94360464-5	Res 1/4W 1% 46.4K

FIGURE 5-17. SERVO BOARD ASSEMBLY (SHEET 2 OF 10)

<u>ITEM NO.</u>	<u>IDENTIFICATION NO.</u>	<u>DRAWING TITLE</u>
47	94360528-7	Res 1/4W 1% 196K
48	94360480-1	Res 1/4W 1% 68.1K
49	94360520-4	Res 1/4W 1% 162K
50	94402104-7	Res 1/4W 5% 6.8
50	92512468-7	Res 1/4W 6.8 OHM Intch
51	94360400-9	Res 1/4W 1% 10.0K
52	94360300-1	Res 1/4W 1% 1.00K
53	92496227-7	Cap 100V 20% 0.01UF
54	75808520-3	Cap 100V 10% 390
55	75808506-2	Cap 100V 10% 27
56	94227244-4	Cap 100V 2% 560
57	94227247-7	Cap 100V 2% 750
58	94227257-6	Cap 500V 2% 2200
59	75808545-0	Cap 100V 10% 0.047UF
60	75808513-8	Cap 100V 10% 100
61	75808516-1	Cap 100V 10% 180
62	24504369-0	Cap 15V 20% 10UF
63	75808518-7	Cap 100V 10% 270
64	92496217-8	Cap 100V 20% 1500
65	24504339-3	Cap 35V 20% 6.8UF
66	24504329-4	Cap 35V 20% 1.0UF
67	51736700-9	Diode 1N914A
68	50240105-2	Diode Silicon
69	50240106-0	Diode, Sil Zener 5.1V
70	75808533-6	Cap 100V 10% 4700
71	50241400-6	Diode Special
72	94240425-2	Cap 50V 10% 270
73	15148500-0	I.C. 74LS14

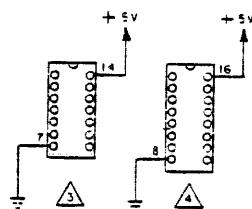
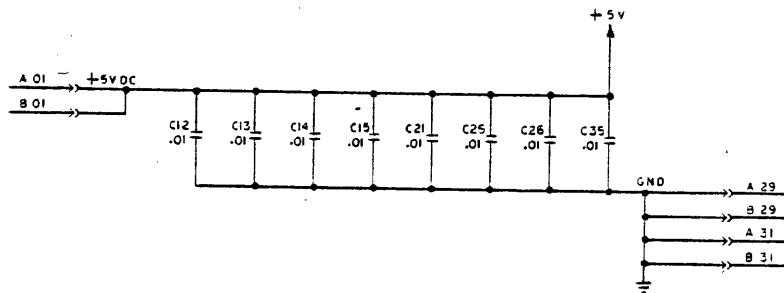
FIGURE 5-17. SERVO BOARD ASSEMBLY (SHEET 3 OF 10)

SERVO BOARD



(AA091a)

FIGURE 5-17. SERVO BOARD ASSEMBLY (SHEET 4 OF 10)



NOTES:
 UNLESS OTHERWISE SPECIFIED
 1. RESISTOR VALUES ARE IN
 OHMS, $\frac{1}{4}$ W, 1%.
 2. CAPACITOR VALUES ARE IN
 MICROFARADS.
 3. TYPICAL POWER CONNECTIONS
 FOR 14 PIN DIPS.
 4. TYPICAL POWER CONNECTIONS
 FOR 16 PIN DIPS.
 5. XXX  INDICATES INTERSHEET
 CONNECTION BY SHEET NUMBER,
 ZONE AND SIGNAL IDENTIFIER.
 6. QUIET GROUND

FIGURE 5-17. SERVO BOARD ASSEMBLY (SHEET 5 OF 10)

FIGURE 5-17. SERVO BOARD ASSEMBLY (SHEET 6 OF 10)

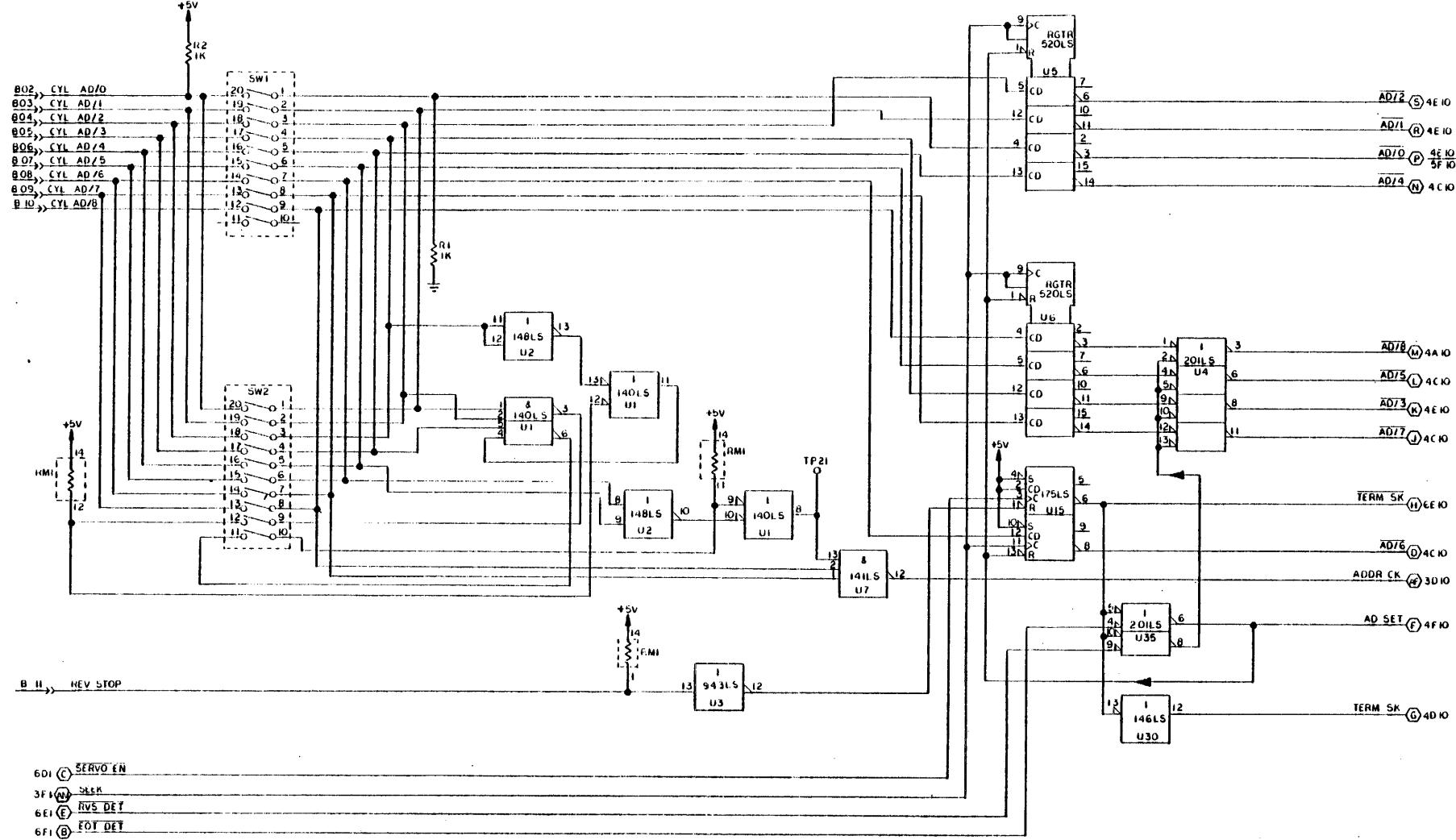


FIGURE 5-17. SERVO BOARD ASSEMBLY (SHEET 7 OF 10)

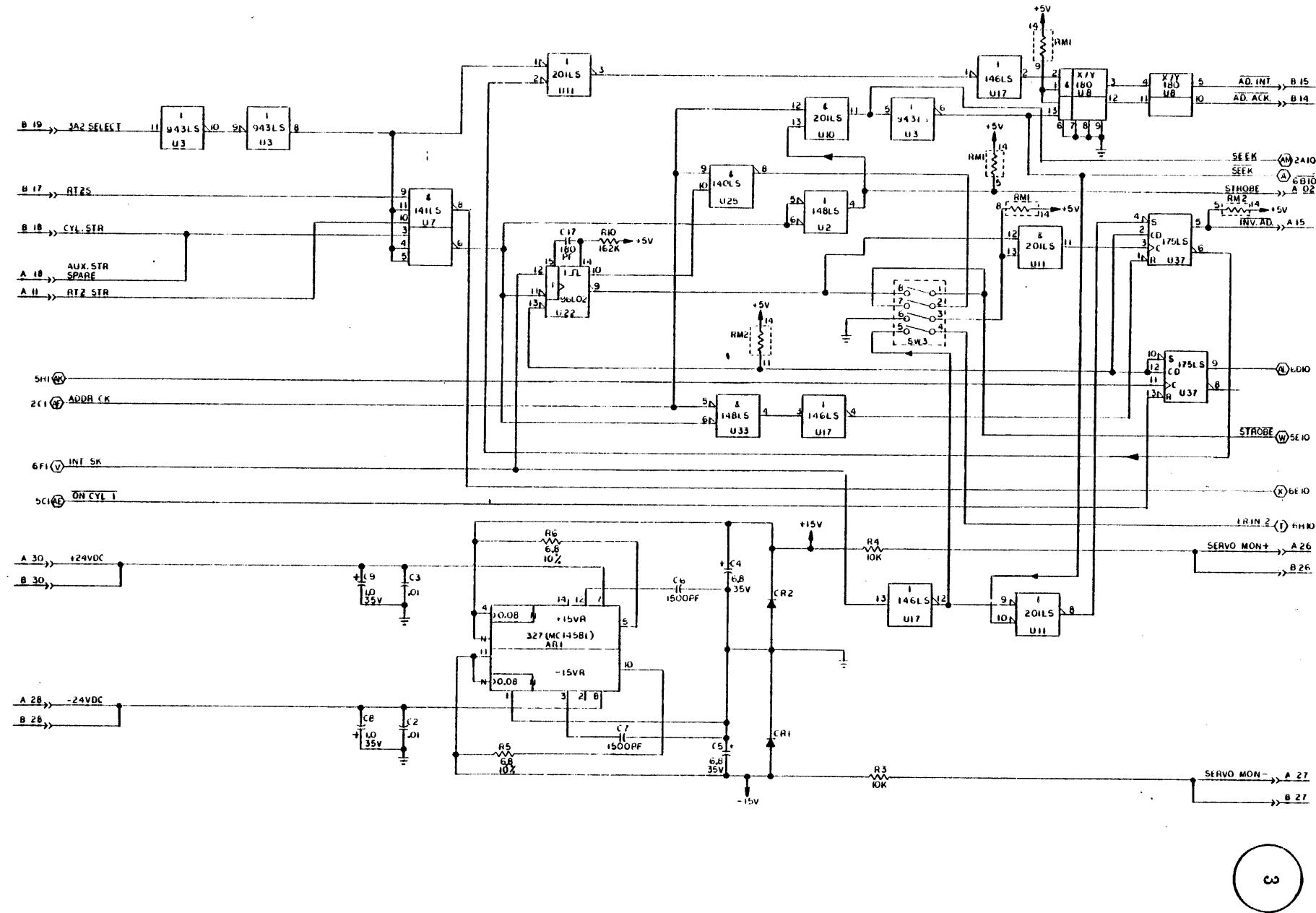


FIGURE 5-17. SERVO BOARD ASSEMBLY (SHEET 8 OF 10)

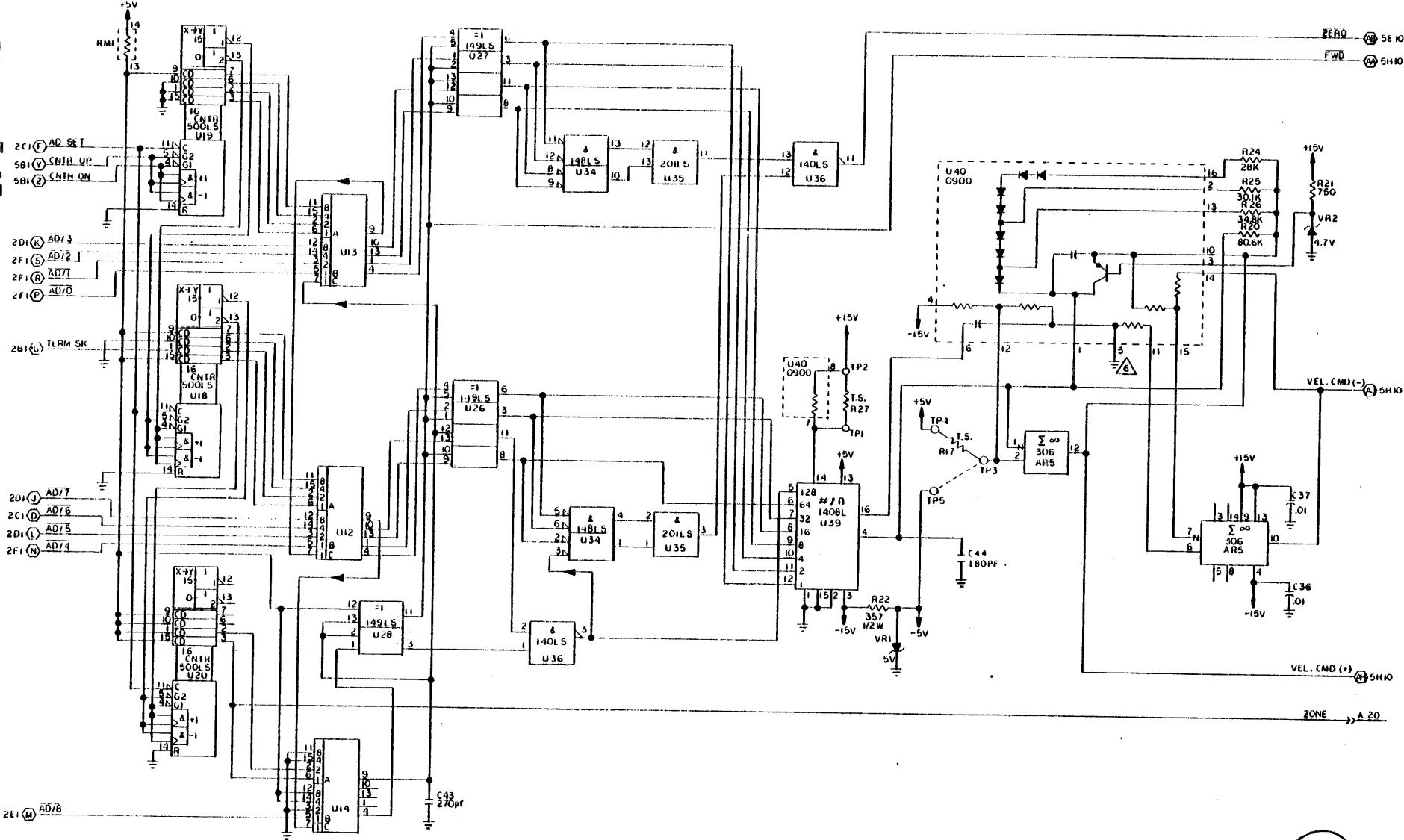


FIGURE 5-17. SERVO BOARD ASSEMBLY (SHEET 9 OF 10)

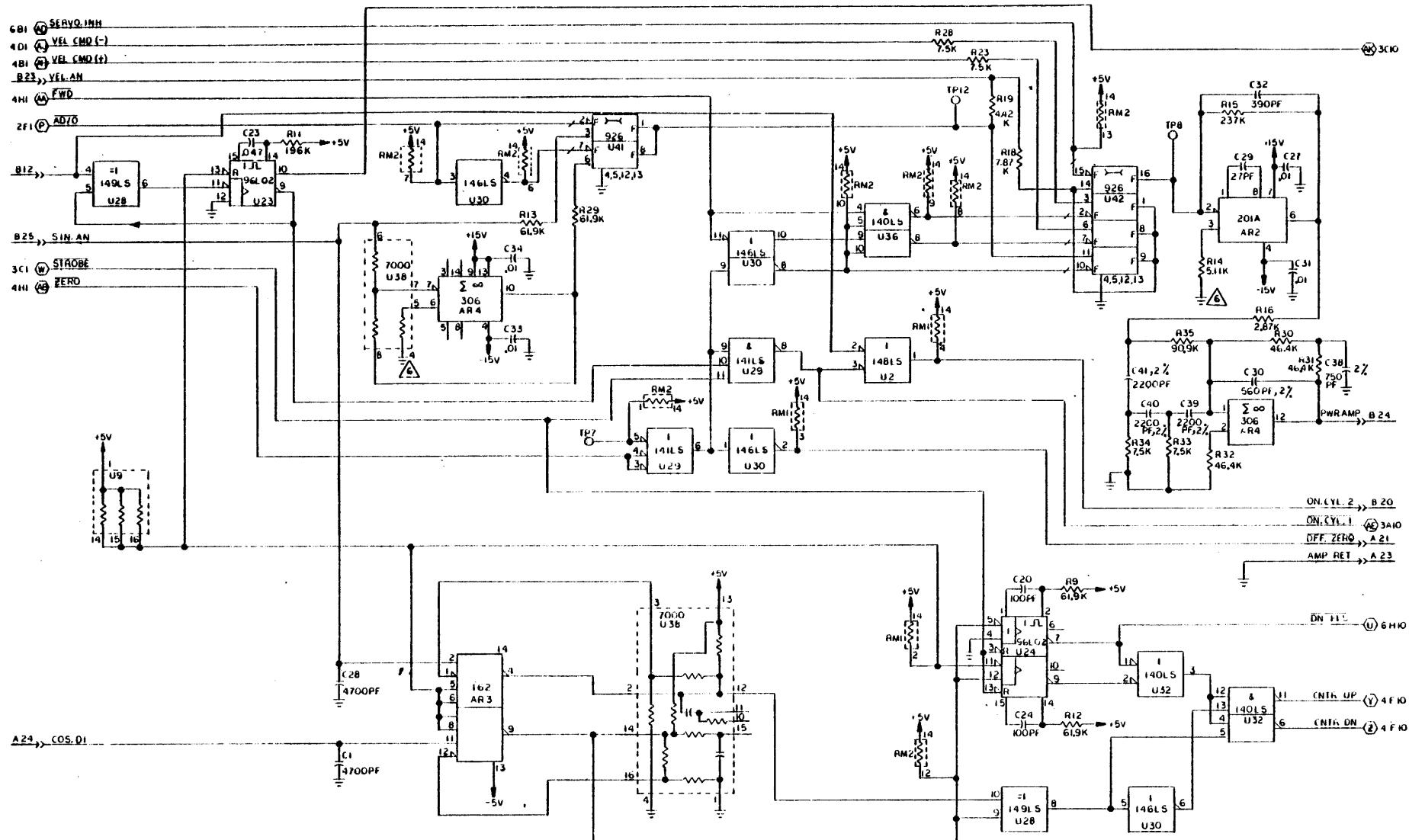
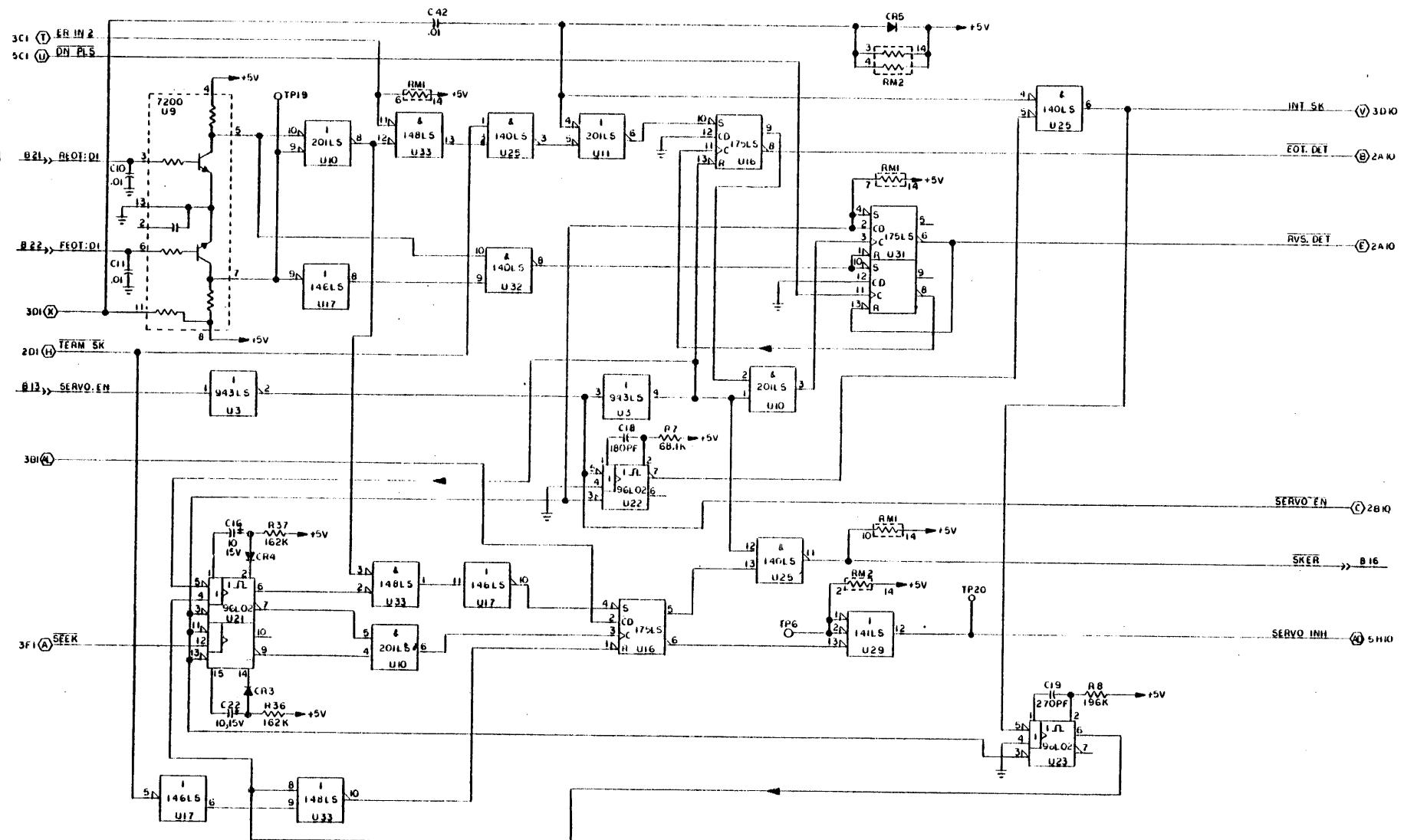


FIGURE 5-17. SERVO BOARD ASSEMBLY (SHEET 10 OF 10)

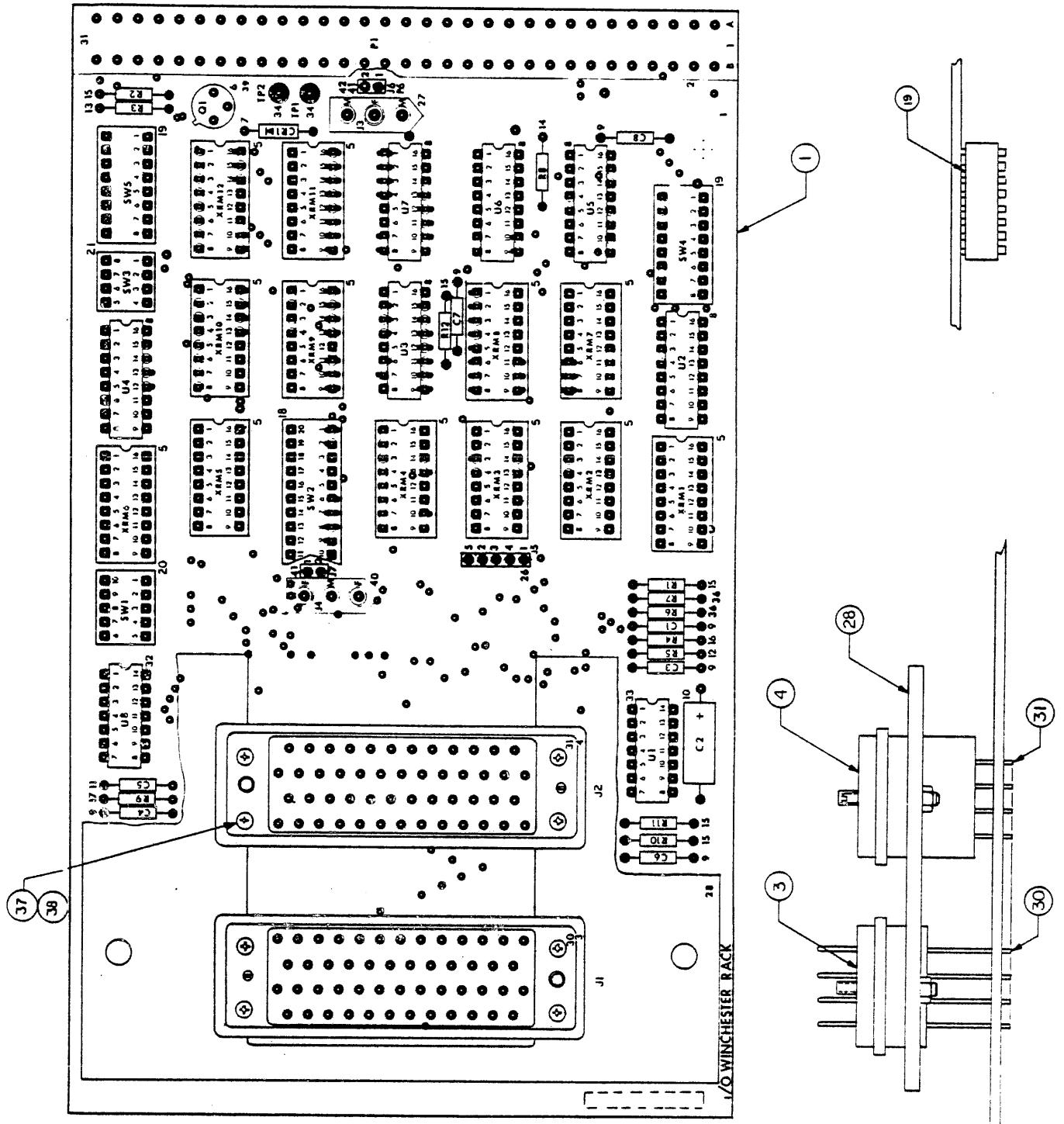


VA
DIAGRAMS
(I/O PACKAGE)

SCOPE

This publication, when used with the 9427H Product Manual makes the manual unique to a specific equipment configuration. The following data pertains to the Winchester I/O Rack printed circuit board and is to be used as part of Section 5 of the manual.

- Sheet 5A-2 Circuit Board Assembly (75857706)
- Sheet 5A-4 Interconnection Diagram
- Sheet 5A-5 Schematic (75857805)

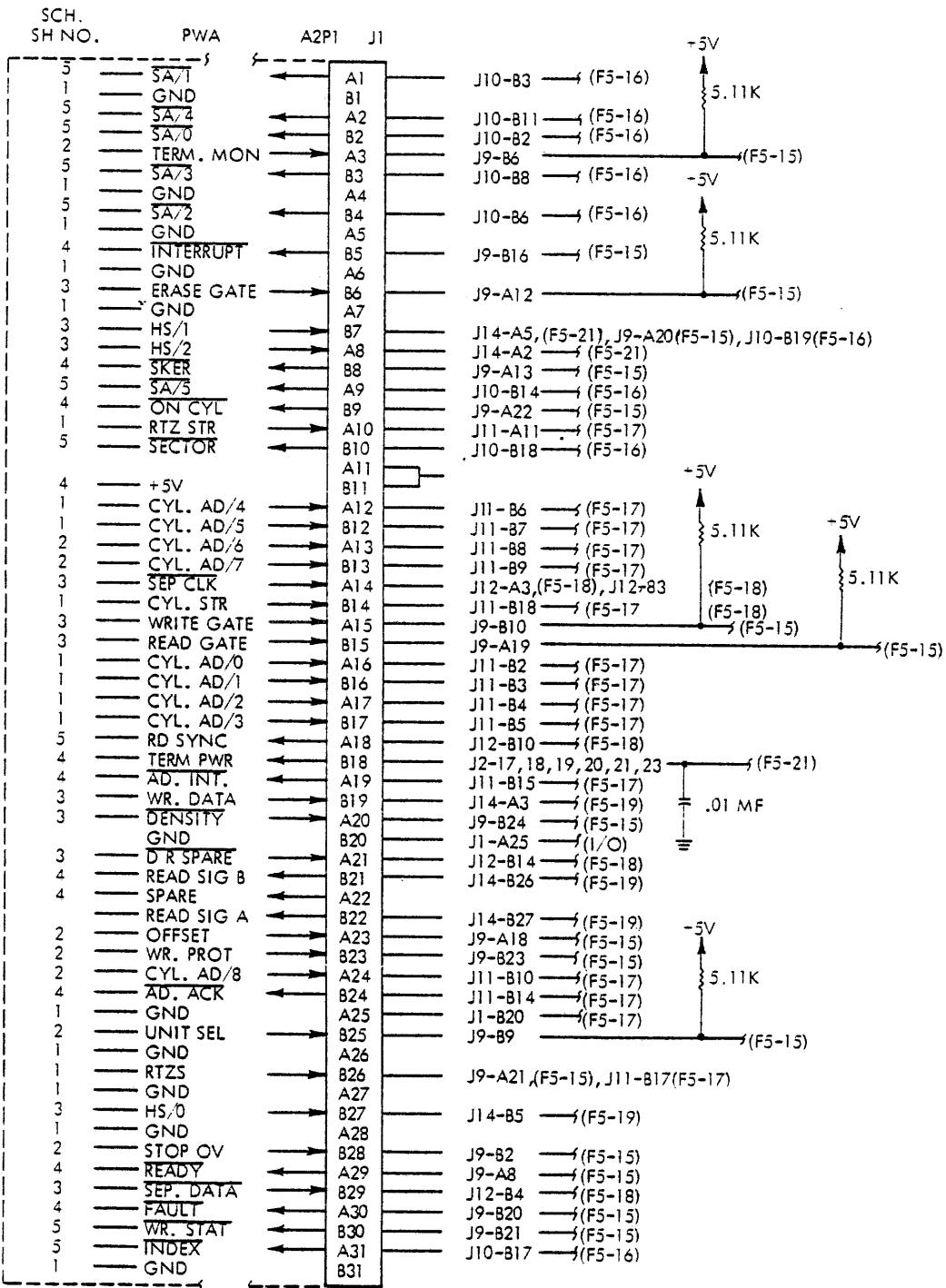


Circuit Board Assembly

<u>ITEM NO.</u>	<u>IDENTIFICATION NUMBER</u>	<u>DRAWING TITLE</u>
	75857706	Comp Bd Assy - I/O Rack
1	75857604	Bd P.C. - I/O Rack WNH
2	94243400	Conn-Card Mtd 62Sock
3	75770501	Connector
4	75770502	Connector
5	94260301	Socket 16 Pin
6	75722201	Transistor NPN
7	50241001	Diode Silicon
8	50254500	IC Rec2
9	92496227	Cap 100V 20% .01UF
10	24504353	Cap 10V 20% 33UF
11	75808521	Cap 100V 10% 470
12	94360467	Res 1/4W 1% 49.1K
13	94360264	Res 1/4W 1% 464
14	94360400	Res 1/4W 1% 10.0K
15	94360368	Res 1/4W 1% 5.11K
16	94360328	Res 1/4W 1% 1.96K
17	94360377	Res 1/4W 1% 6.34K
18	83452207	Switch-10 Position
19	83452205	Switch-8 Position
20	83452202	Switch-5 Position
21	83452201	Switch-4 Position
22	75300006	Switch Cover 10-Sect
23	75300004	Switch Cover 8-Sect
24	75300001	Switch Cover 5-Sect
25	75300000	Switch Cover 4-Sect
26	76379303	Header-Straight 5 PI
27	75808403	Conn Wafer 3-Pin
28	75798902	Plate-Winchester Fac
30	75771101	Pin Contact
31	75771201	XX
32	51718600	IC TTL Adnr MV-A
33	51768200	IC Dual
34	92498021	Terminal, Swaged
36	94360500	Res 1/4W 1% 100K
37	95125309	Loctite
38	93728082	Screw Fil Hd Mach 4-
39	94335900	Pad-Transistor Mtg
40	75808406	Conn Molex F-M-F
41	76379300	Header-Straight 2 PI
42	83433002	Shunt Assembly

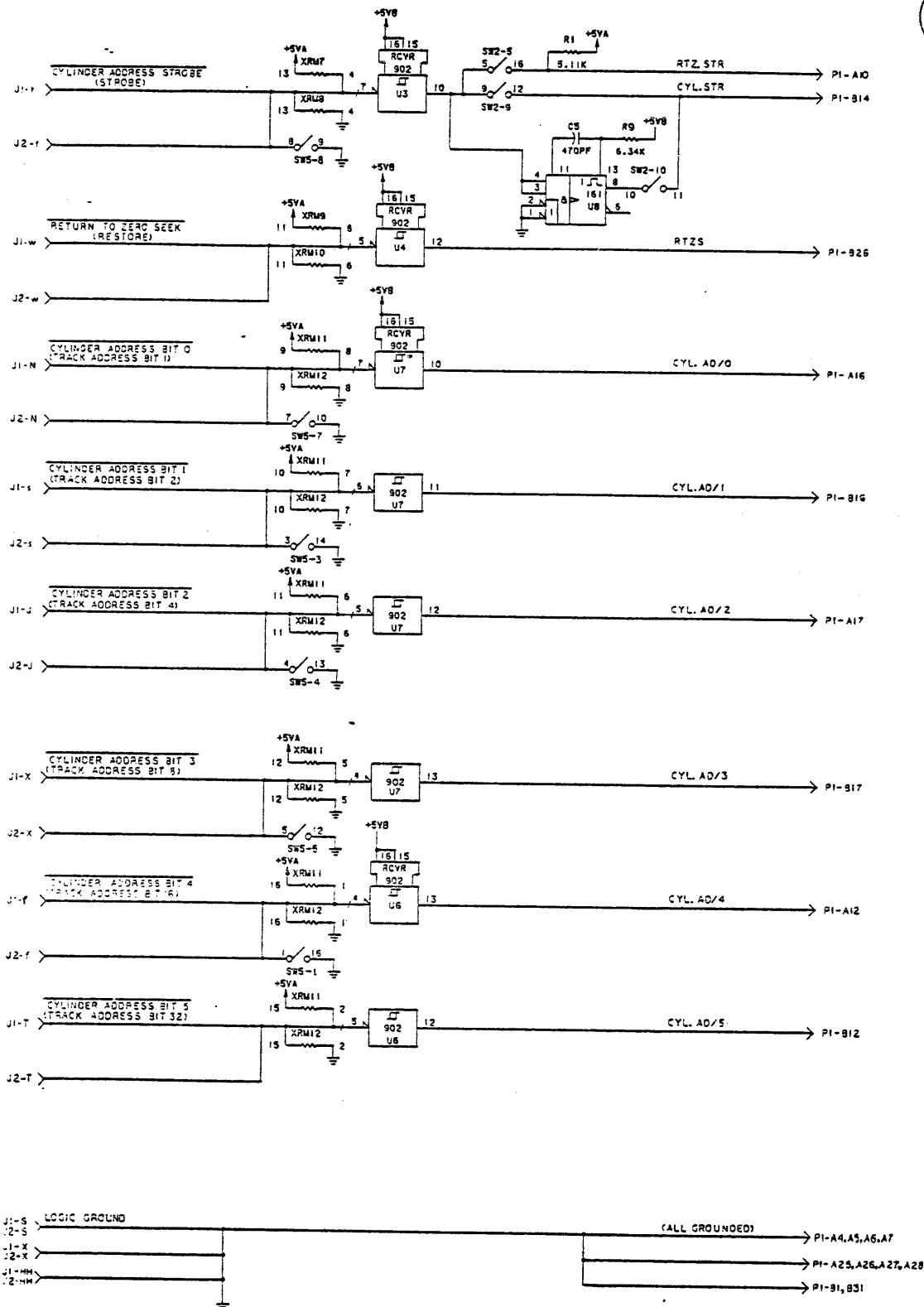
Circuit Board Assembly

I/O CARD

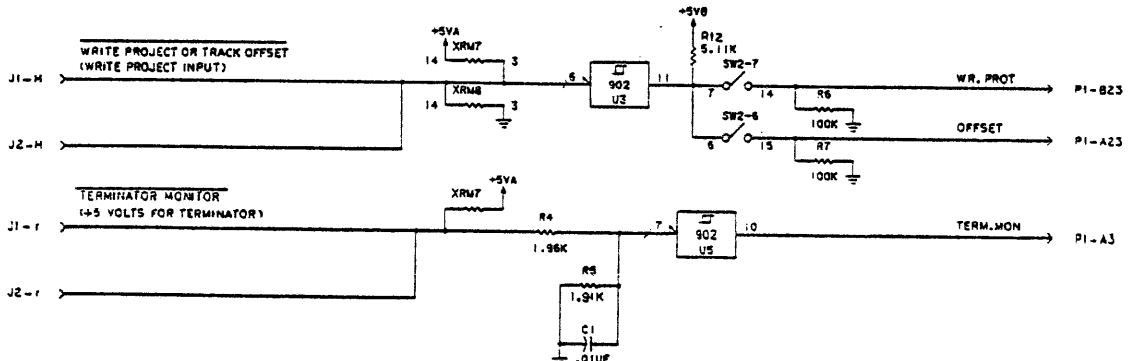
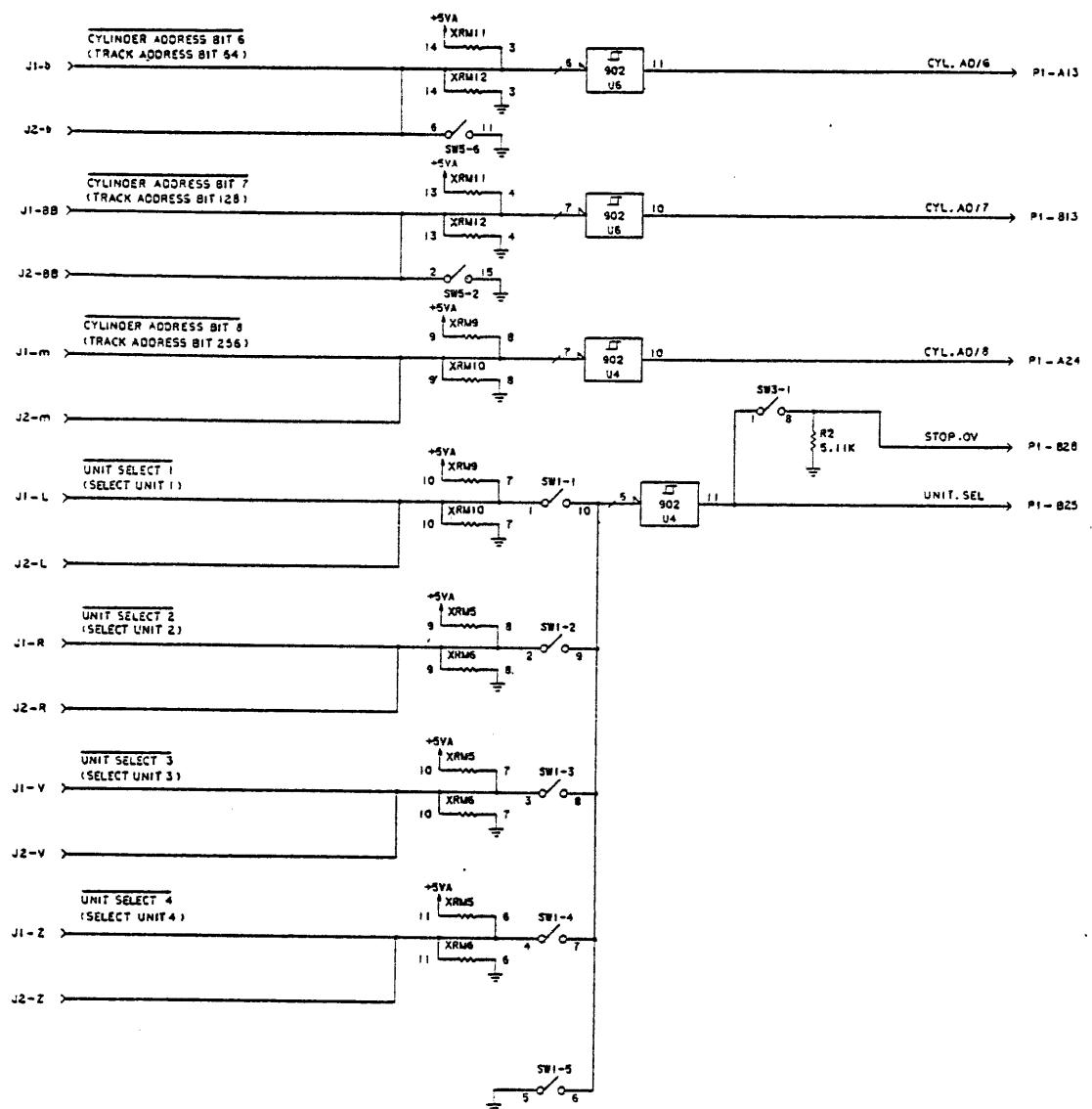


(AA090b)

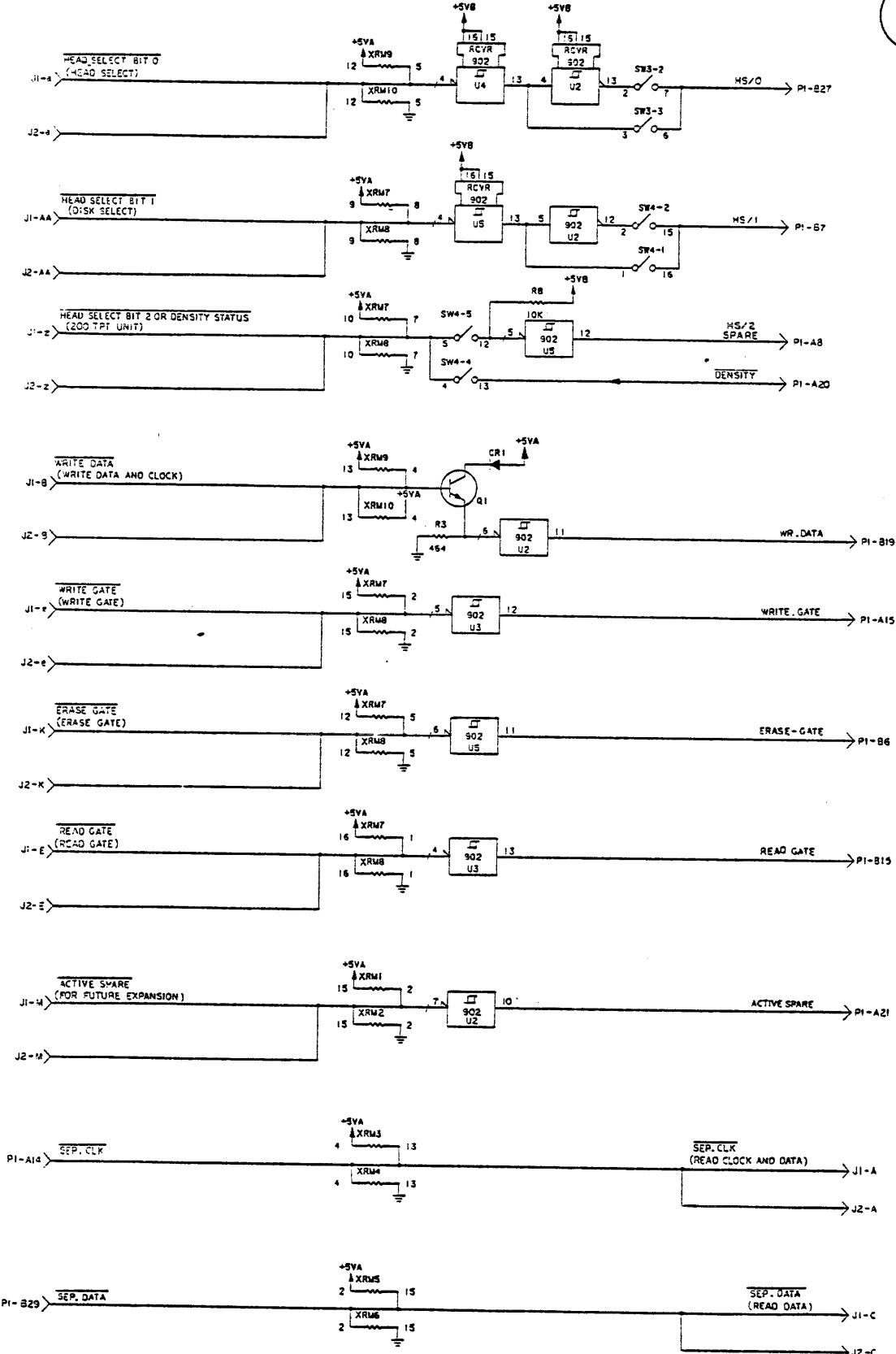
Interconnection Diagram



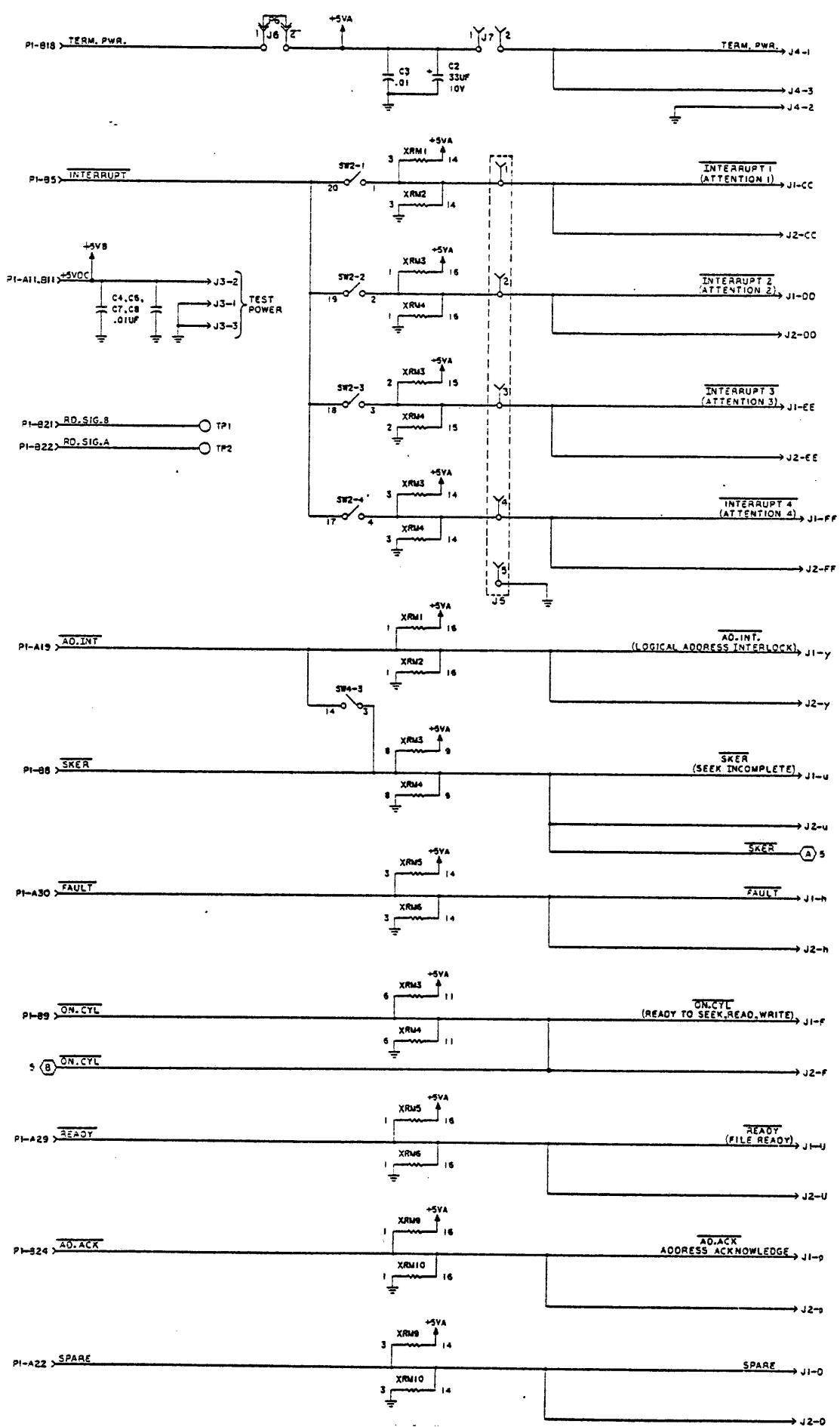
Schematic



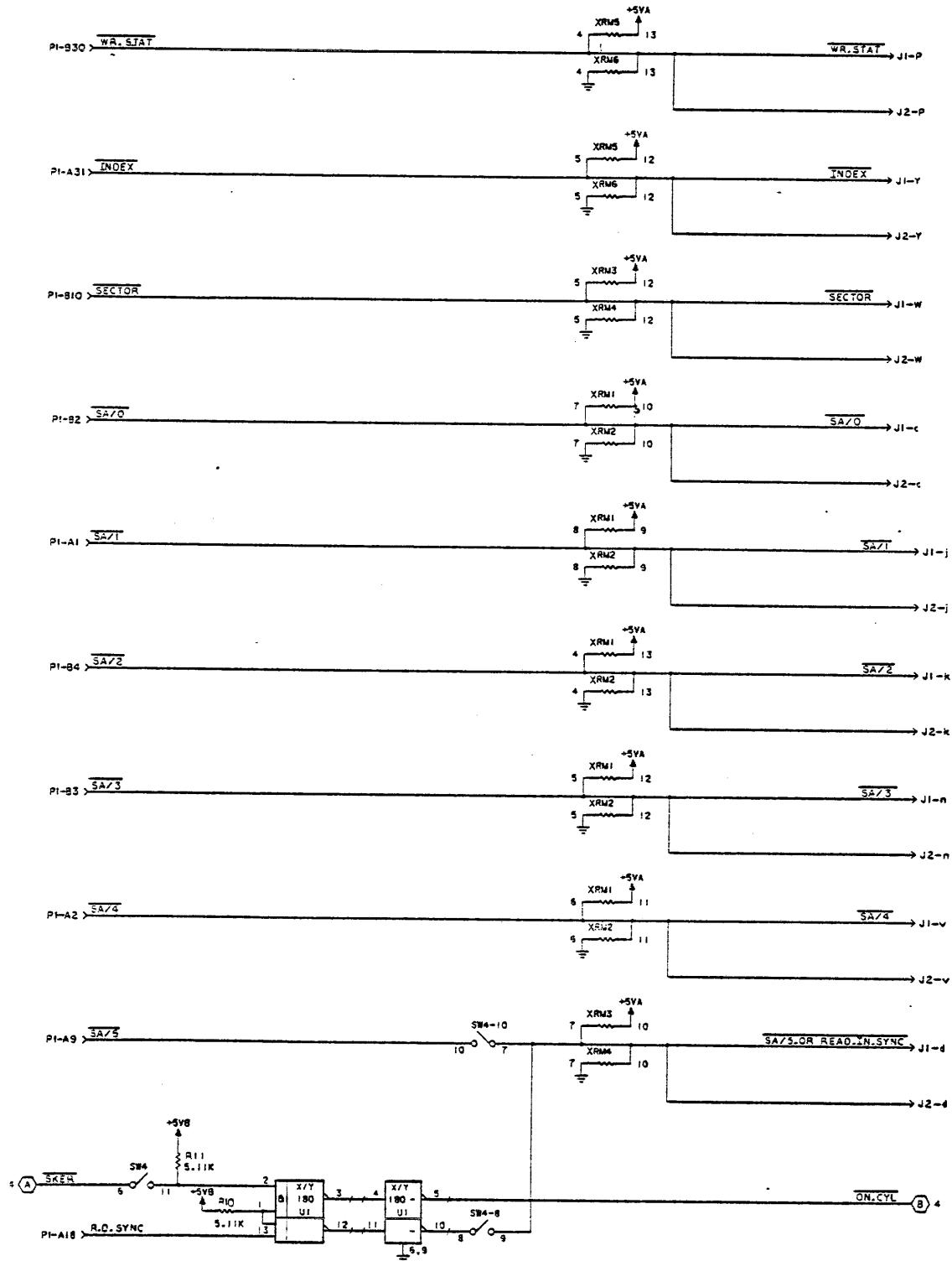
Schematic



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